



Filed by:

G. Scott Shepherd, Site Development Specialist II - SBA Communications
134 Flanders Rd., Suite 125, Westborough, MA 01581
508.251.0720 x 3807 - gshepherd@sbsite.com

October 27, 2020

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

RE: Notice of Exempt Modification
93 Lake Street, Manchester, CT
41.789083
-72.482083
T-Mobile #: CTHA075D_L600

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) at the 105-foot level of the existing 109-foot Monopole Tower at 93 Lake Street, Manchester, CT. The 109-foot tower is owned by SBA Infrastructure, LLC. The property is owned by Alan and Gail Rossetto. T-Mobile now intends to replace six (6) antennas with six (6) new 600/700, 1900/2100 MHz antennas. The new antennas would be installed at the 105-foot level of the tower.

Please note: Per the Connecticut Siting Council Website: CSC COVID 19 Guidelines.
In order to prevent the spread of Coronavirus and protect the health and safety of our members and staff, as of March 18, 2020, the Connecticut Siting Council shall convert to full remote operations until March 30, 2020. Please be advised that during this time period, all hard copy filing requirements will be waived in lieu of an electronic filing. Please also be advised that the March 26, 2020 regular meeting shall be held via teleconference. The Council's website is not equipped with an on-line filing fee receipt service. Therefore, filing fees and/or direct cost charges associated with matters received electronically during the above-mentioned time period will be directly invoiced at a later date.

Planned Modifications:

TOWER

Remove:

- N/A

Remove and Replace:

- (3) Commscope LNX6515 Antenna (Remove) – (3) APXVAARR24_43U-NA20 Antenna (Replace)
- (3) Ericsson AIR 21 B4A/B2P antenna (remove) – (3) Ericsson AIR32 KRD901146-1_B66_B2A antenna (replace)

- (3) Ericsson S11B12 RRH- (remove) – (3) Ericsson Radio 4449 B71+B12 RRU – (replace)

Install New:

- (1) Kicker Support (MS-K122-5)
- (1) Heavy Collar Mount (MS-H1436)
- (3) 1-5/8" Fiber

Existing Equipment to Remain:

- (3) Ericsson KRY112 144 - TMAs
- (3) Ericsson ETW200VA12UB – TMAs
- (1) Low Profile Platform
- (6) 7/8" coax
- (1) 1-5/8" Fiber

Entitlements:

- (6) 7/8" coax

GROUND

Install New:

- Equipment inside existing RBS6131 Equipment cabinet

This facility was originally approved by the Council on May 8, 2008 under Docket 351. Approval was given for a monopole not to exceed 110 feet above ground level. An RF report was to be provided when site levels changed. Upon the establishment of any new State or Federal RF standards applicable to the facility, the facility was to be brought into compliance with same. Public or private entities were to be provided shared space for fair consideration barring reasons precluding same. The Town of Manchester was to be provided public safety services for no compensation as long as use could be accommodated and was compatible with the structural integrity of the tower. Any non-functioning antennas or associated equipment was to be removed within 60 days. There were no further post construction stipulations set. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16.50j-72(b)(2). In accordance with R.C.S.A. § 16.50j-73, a copy of this letter is being sent to the Town of Manchester's General Manager, Scott Shanley, and Zoning Enforcement Officer, James Davis, as well as to the property owner. (Separate notice is not being sent to tower owner, as it belongs to SBA.)

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. §16.50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modification will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modification will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above-referenced telecommunication facility constitute an exempt modifications under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

G. Scott Shepherd
 Site Development Specialist II
 SBA COMMUNICATIONS CORPORATION
 134 Flanders Rd., Suite 125
 Westborough, MA 01581
 508.251.0720 x3807 + T
 508.366.2610 + F
 508.868.6000 + C
 gshepherd@sbsite.com

Attachments

- cc: Scott Shanley, General Manager / with attachments
The Town of Manchester, 41 Center Street, Manchester, CT 06040
 James Davis, Zoning Enforcement Officer / with attachments
The Town of Manchester, 41 Center Street, Manchester, CT 06040
 Alan and Gail Rossetto / with attachments
23 Longview Drive Lancaster NH 03584

Exhibit List

Exhibit 1	Check Copy	X To be invoiced at a later per COVID 19 guidelines
Exhibit 2	Notification Receipts	x
Exhibit 3	Property Card	x
Exhibit 4	Property Map	x
Exhibit 5	Original Zoning Approval	CSC Docket 351
Exhibit 6	Construction Drawings	Chappell Engineering 9/20/19
Exhibit 7	Structural Analysis	TES 8/2/19
Exhibit 8	Post-Mod Mount Analysis	TES 8/19/19
Exhibit 9	Mount Mod Drawings	TES 8/28/19
Exhibit 10	EME Report	Transcom 6/17/19

EXHIBIT 1

Normally, Exhibit 1 would contain a copy of the check for the filing fee.

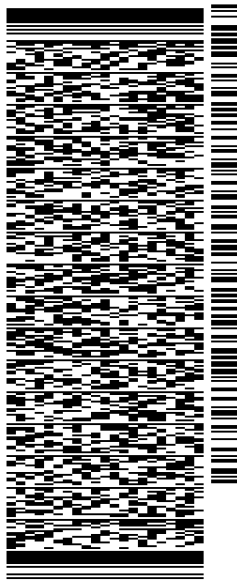
EXHIBIT 2

ORIGIN ID:BFBA (508) 614-0389
RICK WOODS
SBA COMMUNICATIONS CORPORATION
134 FLANDERS RD
SUITE 125
WESTBOROUGH, MA 01581
UNITED STATES US

SHIP DATE: 27/OCT/20
ACTWGT: 1.00 LB
CAD: 105843304/NET4280
BILL SENDER

TO **MELANIE A. BACHMAN EXEC. DIR**
CONNECTICUT SITING COUNCIL
TEN FRANKLIN SQUARE

NEW BRITAIN CT 06051
(508) 251-0720 X.3807 REF: 105692009-6089
INV# DEPT:



TRK# 7719 1641 9060
0201
WED - 28 OCT 10:30A
PRIORITY OVERNIGHT

EBBDLA
06051
CT-US BDL

56B.I2/A27E/B766

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Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

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134 FLANDERS RD
SUITE 125
WESTBOROUGH, MA 01581
UNITED STATES US

SHIP DATE: 27/OCT/20
ACTWGT: 1.00 LB
CAD: 105843304/NET4280
BILL SENDER

TO **SCOTT SHANLEY**
TOWN OF MANCHESTER GENERAL MANAGER
41 CENTER ST

MANCHESTER CT 06045

(860) 647-3130 REF: 10-56-92009-6089
INV# DEPT:
PO:

56B,I2/A27E/B766



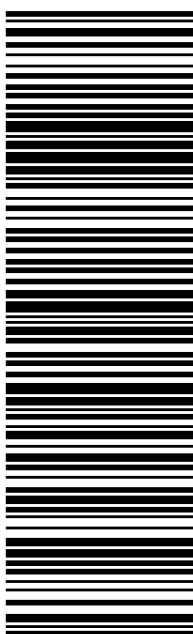
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PRIORITY OVERNIGHT

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06045
CT-US BDL



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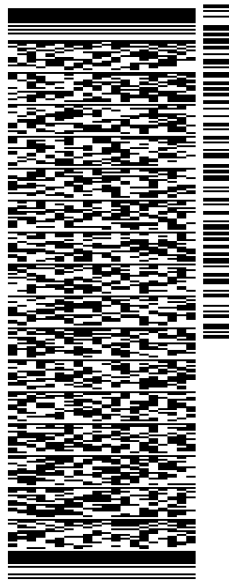
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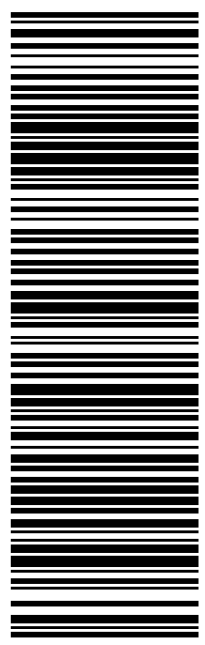
TO
JAMES DAVIS, ZONING ENF. OFFICER
TOWN OF MANCHESTER
41 CENTER ST

MANCHESTER CT 06040
(860) 647-3130 REF: 10-56-92009-6089
INV/ DEPT:
PO:



TRK# 7719 1653 2299
0201
WED - 28 OCT 10:30A
PRIORITY OVERNIGHT

EB QCWA
06040
CT-US BDL



56B,I2/A27E/B766

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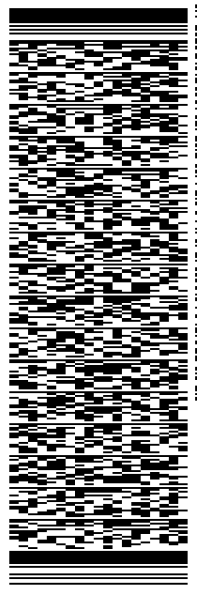
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UNITED STATES US

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ACTWGT: 1.00 LB
CAD: 105843304/NET14280
BILL SENDER

TO ALAN AND GAIL ROSSETTO
23 LONGVIEW DR.
LANCASTER NH 03584

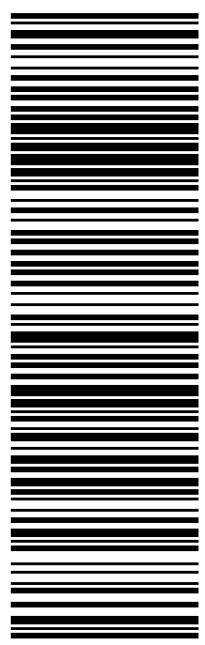
(508) 251-0720 X 3807 REF: 1056-92009-6089
INV# PO: DEPT:

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EXHIBIT 3

93 LAKE STREET

Location 93 LAKE STREET

Mblu 135/ 3330/ 93/ /

Acct# 333000093R

Owner ROSSETTO ALAN C & GAIL U

Assessment \$158,500

Appraisal \$226,400

PID 8968

Building Count 1

DISTRICT T

CONCRETE

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2016	\$157,100	\$69,300	\$226,400

Assessment			
Valuation Year	Improvements	Land	Total
2016	\$110,000	\$48,500	\$158,500

Owner of Record

Owner ROSSETTO ALAN C & GAIL U
Address 23 LONGVIEW DRIVE
LANCASTER, NH 03584

Sale Price \$0
Certificate
Book & Page 4566/ 167
Sale Date 10/30/2018
Instrument 31

Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
ROSSETTO ALAN C & GAIL U	\$0		4566/ 167	31	10/30/2018
ROSSETTO ALAN C	\$0		3432/ 212	36	04/12/2007
ROSSETTO ALAN C TR	\$0	C	739/ 164		05/21/1980

Building Information

Building 1 : Section 1

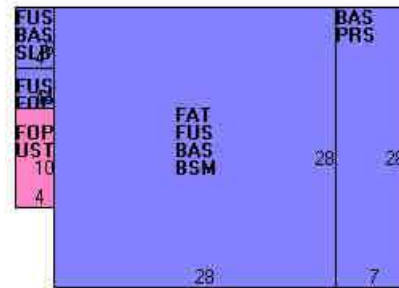
Year Built: 1913
Living Area: 1,985
Replacement Cost: \$174,215

Replacement Cost**Less Depreciation:** \$115,000

Building Attributes	
Field	Description
Style	Family Conver.
Model	Multi-Family
Grade:	Average
Stories:	2 Stories
Occupancy	2
Exterior Wall 1	Aluminum Sidin
Exterior Wall 2	
Roof Structure:	Hip/Truss
Roof Cover	Asphalt Shingl
Interior Wall 1	Plaster
Interior Wall 2	Plywood Panel
Interior Flr 1	Carpet
Interior Flr 2	
Heat Fuel	Oil
Heat Type:	Hot Water
AC Type:	Partial
Total Bedrooms:	3 Bedrooms
Total Bthrms:	2
Total Half Baths:	0
Total Xtra Fixtrs:	
Total Rooms:	7
Bath Style:	Average
Kitchen Style:	Average
Extra Kitchens	
Whirlpool	
Fireplace	
Fin Basement	
Fin Bsmnt Qual	
Fin Bsmnt 2	
Fin Bsmnt2 Qual	
Bsmnt Garage	
SFA Code	

Building Photo

(<http://images.vgsi.com/photos2/ManchesterCTPhotos//\00\01\3>)

Building Layout

(<http://images.vgsi.com/photos2/ManchesterCTPhotos//Sketches>)

Building Sub-Areas (sq ft)			Legend	
Code	Description	Gross Area	Living Area	
BAS	First Floor	1,004	1,004	
FUS	Upper Story, Finished	824	824	
FAT	Attic, Finished	784	157	
BSM	Basement	784	0	
FOP	Porch, Open	56	0	
PRS	Piers	196	0	
SLB	Slab	24	0	
UST	Utility, Storage, Unfinished	40	0	
		3,712	1,985	

Extra Features

Extra Features				Legend
Code	Description	Size	Value	Bldg #

A/C	Partial AC	1004 S.F.	\$1,300	1
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Land

Land Use

Use Code	102
Description	Two Family
Zone	RR
Neighborhood	60
Alt Land Appr Category	No

Land Line Valuation

Size (Acres)	1
Frontage	0
Depth	0
Assessed Value	\$48,500
Appraised Value	\$69,300

Outbuildings

Outbuildings						<u>Legend</u>
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
FGR4	Garage W Loft			528 S.F	\$8,400	1
FGR1	Garage Average			288 S.F.	\$4,300	1
BTH1	Cabana			60 S.F.	\$900	1
FN4	Fence 8' Chain			280 L.F.	\$8,000	1
FGR1	Garage Average			384 S.F.	\$5,800	1
PAV2	Paving Concrete			200 S.F.	\$500	1
FN1	Fence 4' Chain			180 L.F.	\$2,900	1
MISC	Miscellaneous			2 UNITS	\$10,000	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2015	\$111,700	\$85,800	\$197,500
2010	\$159,600	\$104,600	\$264,200
2005	\$85,700	\$54,000	\$139,700

Assessment			
Valuation Year	Improvements	Land	Total
2015	\$78,200	\$60,100	\$138,300
2010	\$111,800	\$73,200	\$185,000
2005	\$60,100	\$37,800	\$97,900

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EXHIBIT 4

Google Maps 93 Lake St



Map data ©2019 50 ft



93 Lake St

Manchester, CT 06042



Directions



Save



Nearby



Send to your phone



Share



QQQC+39 Manchester, CT

Photos



EXHIBIT 5

DOCKET NO. 351 - Optasite Towers LLC and Omnipoint } Connecticut
Communications, Inc. application for a Certificate of }
Environmental Compatibility and Public Need for the } Siting
construction, maintenance and operation of a telecommunications }
facility located at 93 Lake Street, Manchester, Connecticut. } Council

May 8, 2008

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility, including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate, either alone or cumulatively with other effects, when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application, and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to Optasite Towers LLC, hereinafter referred to as the Certificate Holder, for a telecommunications facility at 93 Lake Street, Manchester, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of Omnipoint Communications, Inc. and other entities, both public and private, but such tower shall not exceed a height of 110 feet above ground level.
2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of Manchester for comment, and all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
 - a) a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas, equipment compound, radio equipment, access road, utility line, and landscaping; and
 - b) construction plans for site clearing, grading, landscaping, water drainage, and erosion and sedimentation controls consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

3. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of the electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of the electromagnetic radio frequency power density be submitted to the Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.
4. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.
5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.
6. The Certificate Holder shall provide reasonable space on the tower for no compensation for any Town of Manchester public safety services (police, fire and medical services), provided such use can be accommodated and is compatible with the structural integrity of the tower.
7. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed and providing wireless services within eighteen months from the date of the mailing of the Council's Findings of Fact, Opinion, and Decision and Order (collectively called "Final Decision"), this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's Final Decision shall not be counted in calculating this deadline.
8. Any request for extension of the time period referred to in Condition 7 shall be filed with the Council not later than 60 days prior to the expiration date of this Certificate and shall be served on all parties and intervenors, as listed in the service list, and the Town of Manchester. Any proposed modifications to this Decision and Order shall likewise be so served.
9. If the facility ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.
10. The Certificate Holder shall remove any nonfunctioning antenna, and associated antenna mounting equipment, within 60 days of the date the antenna ceased to function.
11. In accordance with Section 16-50j-77 of the Regulations of Connecticut State Agencies, the Certificate Holder shall provide the Council with written notice two weeks prior to the commencement of site construction activities. In addition, the Certificate Holder shall provide the Council with written notice of the completion of site construction and the commencement of site operation.

Pursuant to General Statutes § 16-50p, the Council hereby directs that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in the Hartford Courant and the Manchester Journal-Inquirer.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

APPLICANT

Optasite Towers LLC
One Research Drive, Suite 200C
Westborough, MA 01581

Omnipoint Communications, Inc.
100 Filley Street
Bloomfield, CT 06002

ITS REPRESENTATIVE

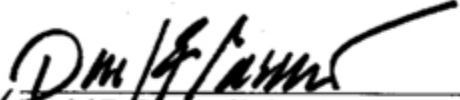
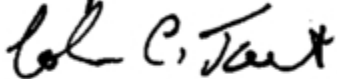
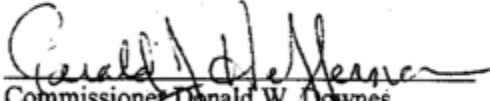
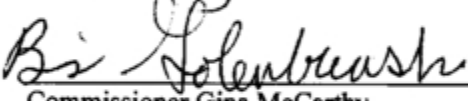


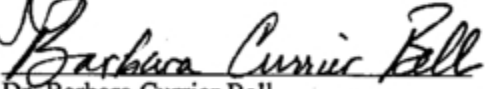
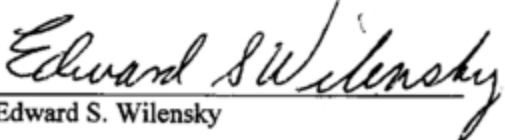
Julie Kohler, Esq.
Carrie L. Larson, Esq.
Cohen and Wolf, P.C.
1115 Broad Street
Bridgeport, CT 06604

PARTY

Laurie Morrone

CERTIFICATION

The undersigned members of the Connecticut Siting Council (Council) hereby certify that they have heard this case, or read the record thereof, in **DOCKET NO. 351 - Optasite Towers LLC and Omnipoint Communications, Inc.** application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility located at 93 Lake Street, Manchester, Connecticut, and voted as follows to approve the proposed telecommunications facility located at 93 Lake Street, Manchester, Connecticut.

<u>Council Members</u>	<u>Vote Cast</u>
 Daniel F. Caruso, Chairman	Yes
 Colin C. Tait, Vice Chairman	Yes
 Commissioner Donald W. Downes Designee: Gerald J. Heffernan	Yes
 Commissioner Gina McCarthy Designee: Brian Golembiewski	Yes
Philip T. Ashton	Abstain
 Daniel P. Lynch, Jr.	Yes
 James J. Murphy, Jr.	Yes
 Dr. Barbara Currier Bell	Yes
 Edward S. Wilensky	Yes

Dated at New Britain, Connecticut, May 8, 2008.

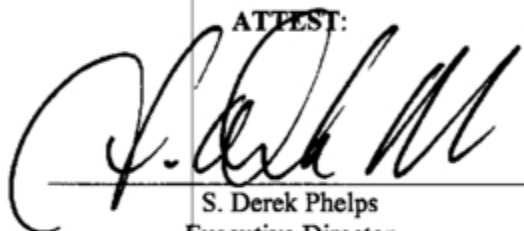
STATE OF CONNECTICUT)

ss. New Britain, Connecticut :

COUNTY OF HARTFORD)

I hereby certify that the foregoing is a true and correct copy of the Findings of Fact, Opinion, and Decision and Order issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:



S. Derek Phelps
Executive Director
Connecticut Siting Council

I certify that a copy of the Findings of Fact, Opinion, and Decision and Order in Docket No. 351 has been forwarded by Certified First Class Return Receipt Requested mail on May 13, 2008, to all parties and intervenors of record as listed on the attached service list, dated February 4, 2008.

ATTEST:



Carriann Mulcahy
Secretary II
Connecticut Siting Council

LIST OF PARTIES AND INTERVENORS
SERVICE LIST

Status Granted	Status Holder (name, address & phone number)	Representative (name, address & phone number)
Applicant	Optasite Towers LLC and Omnipoint Communications, Inc.	Julie Kohler, Esq. Carrie Larson, Esq. Cohen and Wolf, P.C. 1115 Broad Street Bridgeport, CT 06604 P-203-368-0211 F-203-394-9901 jkohler@cohenandwolf.com clarson@cohenandwolf.com
Party (Approved 1/29/08)	Laurie Morrone 119 Lake Street Manchester, CT 06042 860-649-0703 Laurie.morrone@arborsct.com	

EXHIBIT 6

HA075/OPTASITE_FT_MP

93 LAKE STREET
MANCHESTER, CT 06042
HARTFORD COUNTY

SITE NO.: CTHA075D

SITE TYPE: 109'± MONOPOLE

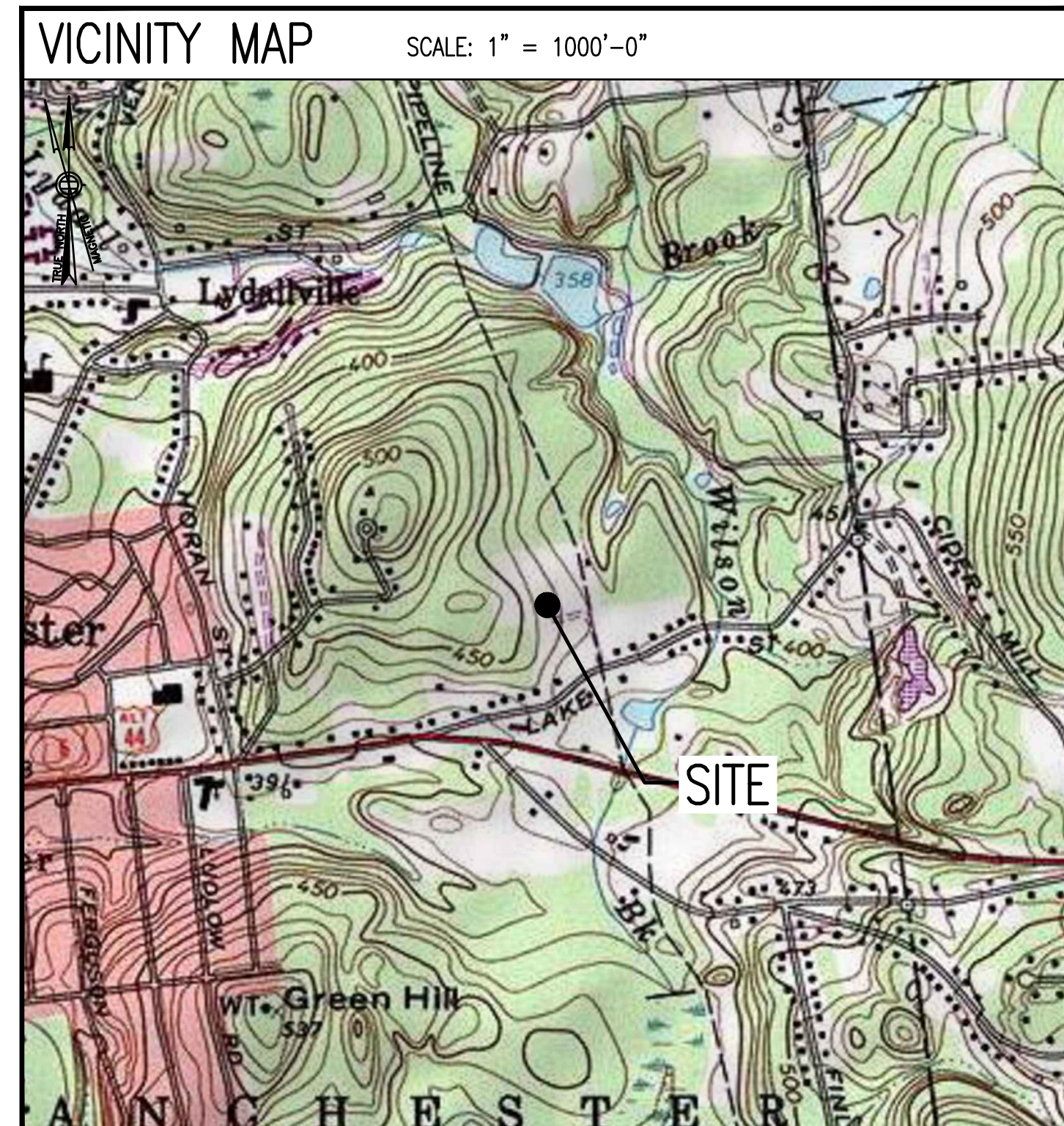
RF DESIGN GUIDELINE: 67D92DB OUTDOOR

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

T-MOBILE TECHNICIAN SITE SAFETY NOTES	
LOCATION	SPECIAL RESTRICTIONS
SECTOR A:	ACCESS BY CERTIFIED CLIMBER
SECTOR B:	ACCESS BY CERTIFIED CLIMBER
SECTOR C:	ACCESS BY CERTIFIED CLIMBER
SECTOR D:	ACCESS BY CERTIFIED CLIMBER
GPS/LMU:	UNRESTRICTED
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE

GENERAL NOTES	
1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.	11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.	12. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE OMNIPOTENT REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXTENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.	13. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.	14. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.
5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.	15. THE CONTRACTOR SHALL NOTIFY THE PROJECT OWNER'S REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE LESSEE/LICENSEE REPRESENTATIVE.
6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS/CONTRACT DOCUMENTS.	16. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.	17. ALL UNDERGROUND UTILITY INFORMATION WAS DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK.
8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.	
9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.	
10. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY CONSTRUCTION CONTROL SURVEYS, ESTABLISHING AND MAINTAINING ALL LINES AND GRADES REQUIRED TO CONSTRUCT ALL IMPROVEMENTS AS SHOWN HEREIN.	

AT LEAST 72 HOURS PRIOR TO DIGGING, THE CONTRACTOR IS REQUIRED TO CALL DIG SAFE AT 811



DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE PROJECT OWNER'S REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SHEET INDEX		
SHEET NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	1
GN-1	GENERAL NOTES	1
A-1	COMPOUND & EQUIPMENT PLAN	1
A-2	TOWER ELEVATIONS & ANTENNA PLAN	1
A-3	SITE DETAILS	1
E-1	ELECTRIC & GROUNDING DETAILS	1
-	MOUNT MODIFICATION AND DESIGN DRAWINGS (BY OTHERS)	0

SPECIAL ZONING NOTE:
BASED ON INFORMATION PROVIDED BY T-MOBILE REGULATORY COMPLIANCE PROFESSIONALS AND LEGAL COUNSEL, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS CONSIDERED AN ELIGIBLE FACILITY UNDER THE MIDDLE CLASS TAX RELIEF AND JOB CREATION ACT OF 2012, 47 USC 1455(A), SECTION 6409(A), AND IS SUBJECT TO AN ELIGIBLE FACILITY REQUEST, EXPEDITED REVIEW, AND LIMITED/PARTIAL ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW, OR ADMINISTRATIVE REVIEW).

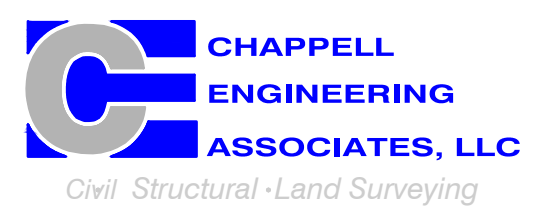
- ### SITE NOTES
- THIS IS AN UNMANNED AND RESTRICTED ACCESS TELECOMMUNICATION FACILITY, AND IS NOT FOR HUMAN HABITATION. IT WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNAL FOR THE PURPOSE OF PROVIDING PUBLIC CELLULAR SERVICE.
 - ADA COMPLIANCE NOT REQUIRED.
 - POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.
 - NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.
 - CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACE THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
 - NEW CONSTRUCTION WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.
 - BUILDING CODE: 2018 CONNECTICUT STATE BUILDING CODE
 - ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE
 - STRUCTURAL CODE: TIA/EIA-222-G STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

**T-MOBILE
NORTHEAST LLC**

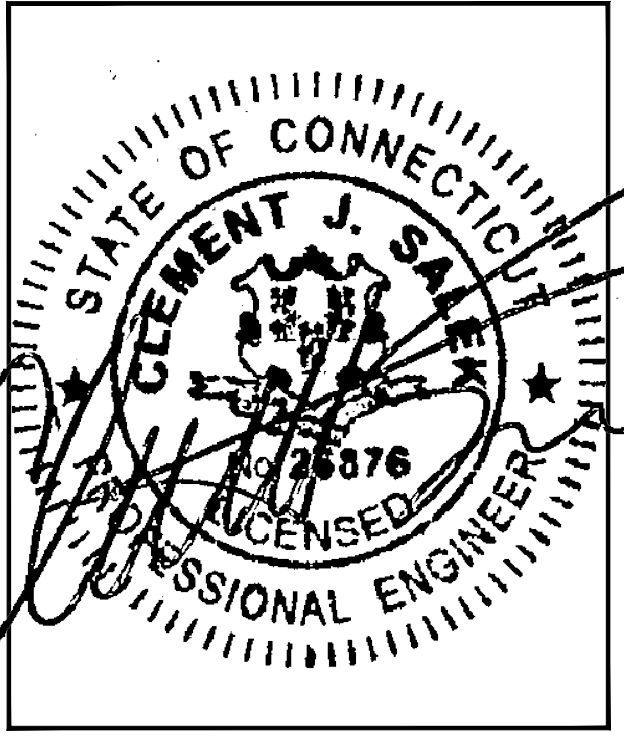
15 COMMERCE WAY, SUITE B
NORTON, MA 02766
(508) 286-2700



SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
(508) 251-0720



R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST, SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com



CHECKED BY: JMT
APPROVED BY: JMT

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
1	09/20/19	ISSUED FOR CONSTRUCTION	JRV
0	06/13/19	ISSUED FOR REVIEW	JRV

SITE NUMBER:
CTHA075D

SITE ADDRESS:
93 LAKE STREET
MANCHESTER, CT 06042

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

PROJECT SUMMARY	
SITE NUMBER:	CTHA075D
SBA SITE NUMBER:	CT13529-A
SBA SITE NAME:	MANCHESTER 1
SITE ADDRESS:	93 LAKE STREET MANCHESTER, CT 06042
PROPERTY OWNER:	ROSSETTO ALAN C. & GAIL U. 23 LONGVIEW DRIVE LANCASTER, NH 03584
TOWER OWNER:	SBA INFRASTRUCTURE, LLC 8501 CONGRESS AVENUE BOCA RATON, FL 33487 PHONE: 561-226-9523
COUNTY:	HARTFORD
ZONING DISTRICT:	TILLABLE C
STRUCTURE TYPE:	MONOPOLE
STRUCTURE HEIGHT:	109'±
APPLICANT:	T-MOBILE NORTHEAST LLC 15 COMMERCE WAY, SUITE B NORTON, MA 02766
SBA RSM:	STEPHEN ROTH PHONE: 860-539-4920 EMAIL: SROTH@sbasite.com
ARCHITECT:	CHAPPELL ENGINEERING ASSOCIATES, LLC. 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752
STRUCTURAL ENGINEER:	CHAPPELL ENGINEERING ASSOCIATES, LLC. 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752
SITE CONTROL POINT:	LATITUDE: N.41.789160° N41°47'20.98" LONGITUDE W.72.482220° W72°28'55.99"

GENERAL NOTES:

- FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR – T-MOBILE
SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
OWNER – T-MOBILE
OEM – ORIGINAL EQUIPMENT MANUFACTURER
- PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
- ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL, STATE AND FEDERAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
- DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CONTRACTOR.
- SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER, T1 CABLES AND GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR AND/OR LANDLORD PRIOR TO CONSTRUCTION.
- THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
- SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY.
- SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION AND RETURN DISTURBED AREAS TO ORIGINAL CONDITIONS.
- THE SUBCONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE SUBCONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
- SUBCONTRACTOR SHALL NOTIFY CHAPPELL ENGINEERING ASSOCIATES, LLC 48 HOURS IN ADVANCE OF POURING CONCRETE OR BACKFILLING TRENCHES, SEALING ROOF AND WALL PENETRATIONS AND POST DOWNS, FINISHING NEW WALLS OR FINAL ELECTRICAL CONNECTIONS FOR ENGINEERING REVIEW.
- CONSTRUCTION SHALL COMPLY WITH ALL T-MOBILE STANDARDS AND SPECIFICATIONS.
- SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
- THE EXISTING CELL SITES ARE IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
- IF THE EXISTING CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

SITE WORK GENERAL NOTES:

- THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
- ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY ENGINEERS. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION.
- ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
- IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
- NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
- THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF ENGINEERING, OWNER AND/OR LOCAL UTILITIES.
- THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE AND STABILIZED TO PREVENT EROSION AS SPECIFIED IN THE PROJECT SPECIFICATIONS.
- SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
- THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE T-MOBILE SPECIFICATION FOR SITE SIGNAGE.

CONCRETE AND REINFORCING STEEL NOTES:

- ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. A HIGHER STRENGTH (400PSI) MAY BE USED. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 381 CODE REQUIREMENTS
- REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
- THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
CONCRETE CAST AGAINST EARTH.....3 IN.
CONCRETE EXPOSED TO EARTH OR WEATHER:
#6 AND LARGER2 IN.
#5 AND SMALLER & WWF1½ IN.
CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
SLAB AND WALL¾ IN.
BEAMS AND COLUMNS½ IN.
- A CHAMFER ¼" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
- INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHORS SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO THE MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY SIMPSON OR APPROVED EQUAL.
- CONCRETE CYLINDER TIES ARE NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 50 CUBIC YARDS (IBC1905.6.2.3) IN THAT EVENT THE FOLLOWING RECORDS SHALL BE PROVIDED BY THE CONCRETE SUPPLIER;
(A) RESULTS OF CONCRETE CYLINDER TEST PERFORMED AT THE SUPPLIER'S PLANT.
(B) CERTIFICATION OF MINIMUM COMPRESSIVE STRENGTH FOR THE CONCRETE GRADE SUPPLIED.
FOR GREATER THAN 50 CUBIC YARDS THE GC SHALL PERFORM THE CONCRETE CYLINDER TEST.
- AS AN ALTERNATIVE TO ITEM 7. TEST CYLINDERS SHALL BE TAKEN INITIALLY AND THEREAFTER FOR EVERY 50 YARDS OF CONCRETE FROM EACH DIFFERENT BATCH PLANT.
- EQUIPMENT SHALL NOT BE PLACED ON NEW PADS FOR SEVEN DAYS AFTER PAD IS POURED, UNLESS IT IS VERIFIED BY CYLINDER TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.

STRUCTURAL STEEL NOTES:

- ALL STEEL WORK SHALL BE PAINTED OR GALVANIZED IN ACCORDANCE WITH THE DRAWINGS AND T-MOBILE SPECIFICATIONS UNLESS OTHERWISE NOTED. STRUCTURAL STEEL SHALL BE ASTM-A-36 UNLESS OTHERWISE NOTED ON THE SITE SPECIFIC DRAWINGS. STEEL DESIGN, INSTALLATION AND BOLTING SHALL BE IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION".
- ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND AWS D1.1. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 9TH EDITION. PAINTED SURFACES SHALL BE TOUCHED UP.
- BOLTED CONNECTIONS SHALL USE BEARING TYPE ASTM A325 BOLTS (¾") AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE. ALL BOLTS SHALL BE GALVANIZED OR STAINLESS STEEL.
- NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE ¾" DIA. ASTM A 307 BOLTS (GALV) UNLESS NOTED OTHERWISE.
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER REVIEW & APPROVAL ON PROJECTS REQUIRING STRUCTURAL STEEL.
- ALL STRUCTURAL STEEL WORK SHALL BE DONE IN ACCORDANCE WITH AISC SPECIFICATIONS.

SOIL COMPACTION NOTES FOR SLAB ON GRADE:

- EXCAVATE AS REQUIRED TO REMOVE VEGETATION AND TOPSOIL TO EXPOSE NATURAL SUBGRADE AND PLACE CRUSHED STONE AS REQUIRED.
- COMPACTION CERTIFICATION: AN INSPECTION AND WRITTEN CERTIFICATION BY A QUALIFIED GEOTECHNICAL TECHNICIAN OR ENGINEER IS ACCEPTABLE.
- AS AN ALTERNATE TO INSPECTION AND WRITTEN CERTIFICATION, THE "UNDISTURBED SOIL" BASE SHALL BE COMPACTED WITH "COMPACTION EQUIPMENT", LISTED BELOW, TO AT LEAST 90% MODIFIED PROCTOR MAXIMUM DENSITY PER ASTM D 1557 METHOD C.
- COMPACTED SUBBASE SHALL BE UNIFORM AND LEVELED. PROVIDE 6" MINIMUM CRUSHED STONE OR GRAVEL COMPACTED IN 3" LIFTS ABOVE COMPACTED SOIL. GRAVEL SHALL BE NATURAL OR CRUSHED WITH 100% PASSING #1 SIEVE.
- AS AN ALTERNATE TO ITEMS 2 AND 3, THE SUBGRADE SOILS WITH 5 PASSES OR A MEDIUM SIZED VIBRATORY PLATE COMPACTOR (SUCH AS BOMAG BPR 30/38) OR HAND-OPERATED SINGLE DRUM VIBRATORY ROLLER (SUCH AS BOMAG BW 55E). AND SOFT AREAS THAT ARE ENCOUNTERED SHOULD BE REMOVED AND REPLACED WITH A WELL-GRADED GRANULAR FILL AND COMPACTED AS STATED ABOVE.

COMPACTION EQUIPMENT:

- HAND OPERATED DOUBLE DRUM, VIBRATORY ROLLER, VIBRATORY PLATE COMPACTOR OR JUMPING JACK COMPACTOR.

CONSTRUCTION NOTES:

- FIELD VERIFICATION:
SUBCONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, T-MOBILE ANTENNA PLATFORM LOCATION AND UTILITY TRENCHWORK.
- COORDINATION OF WORK:
SUBCONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH CONTRACTOR.
- CABLE LADDER RACK:
SUBCONTRACTOR SHALL FURNISH AND INSTALL CABLE LADDER RACK, CABLE TRAY AND/OR ICE BRIDGE, AND CONDUIT AS REQUIRED TO SUPPORT CABLES TO THE NEW BTS LOCATION.

ELECTRICAL INSTALLATION NOTES:

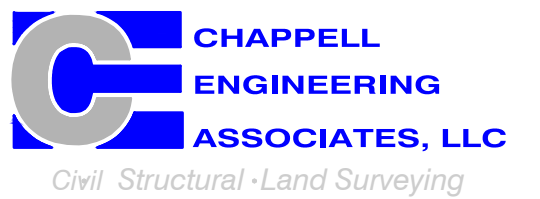
- WIRING, RACEWAY, AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELCORDIA.
- SUBCONTRACTOR SHALL MODIFY OR INSTALL CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF AND TRANSPORT CABLE TO THE NEW BTS EQUIPMENT. SUBCONTRACTOR SHALL SUBMIT MODIFICATIONS TO CONTRACTOR FOR APPROVAL.
- ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC AND TELCORDIA.
- CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.
- EACH END OF EVERY POWER, GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA, AND MATCH INSTALLATION REQUIREMENTS.
- POWER PHASE CONDUCTORS (I.E., HOTS) SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, ½ INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). PHASE CONDUCTOR COLOR CODES SHALL CONFORM WITH THE NEC AND OSHA.
- ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD AND CIRCUIT ID'S).
- PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.
- ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
- POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (#34 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
- SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (#6 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
- SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.
- POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#34 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.
- ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRENUTS BY HARGER (OR EQUAL). LUGS AND WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).
- RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANS/IEEE AND NEC.
- NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
- ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
- ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
- GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.
- RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.
- LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
- CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.
- CABINETS, BOXES AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANS/IEEE AND NEC.
- CABINETS, BOXES AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
- WIREWAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
- EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
- METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED, OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
- NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
- THE SUBCONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
- THE SUBCONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.
- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.
- CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.

T-MOBILE NORTHEAST LLC

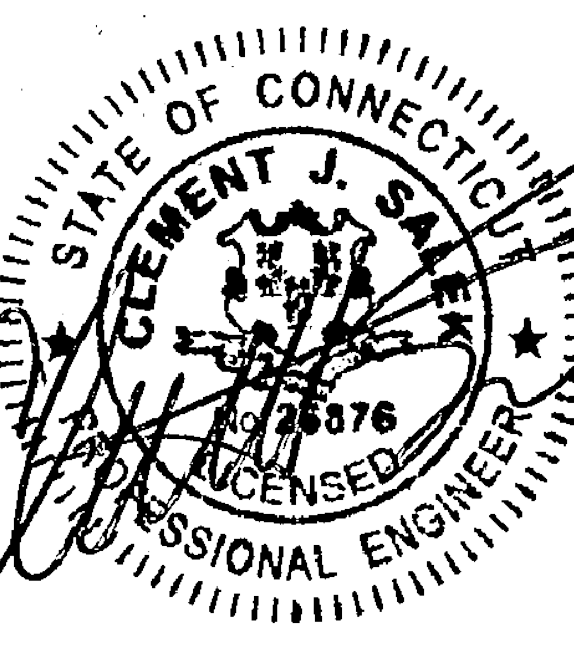
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1	09/20/19	ISSUED FOR CONSTRUCTION	JRV
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SITE NUMBER:
CTHA075D

SITE ADDRESS:
93 LAKE STREET
MANCHESTER, CT 06042

SHEET TITLE

GENERAL NOTES

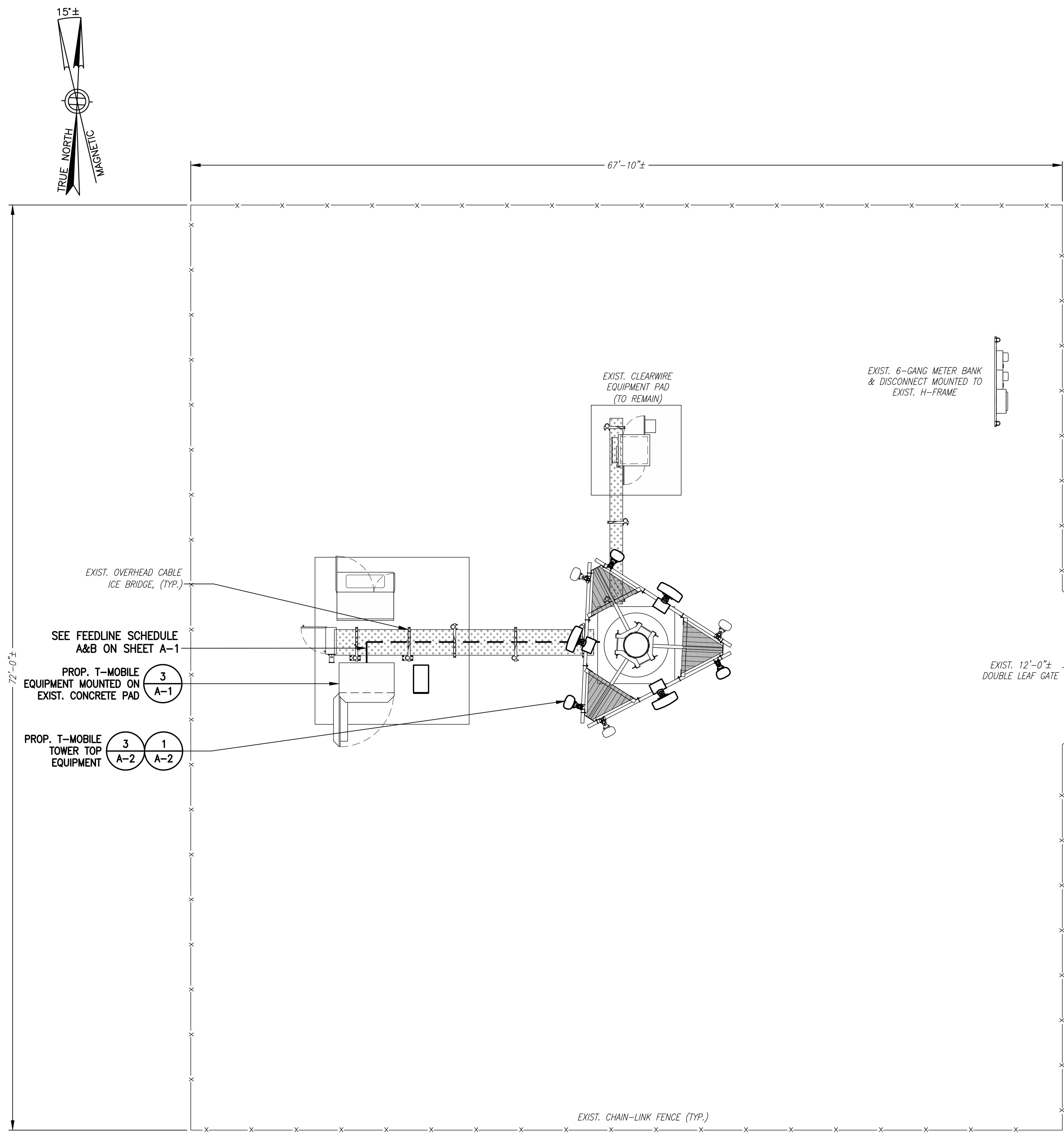
SHEET NUMBER

GN-1

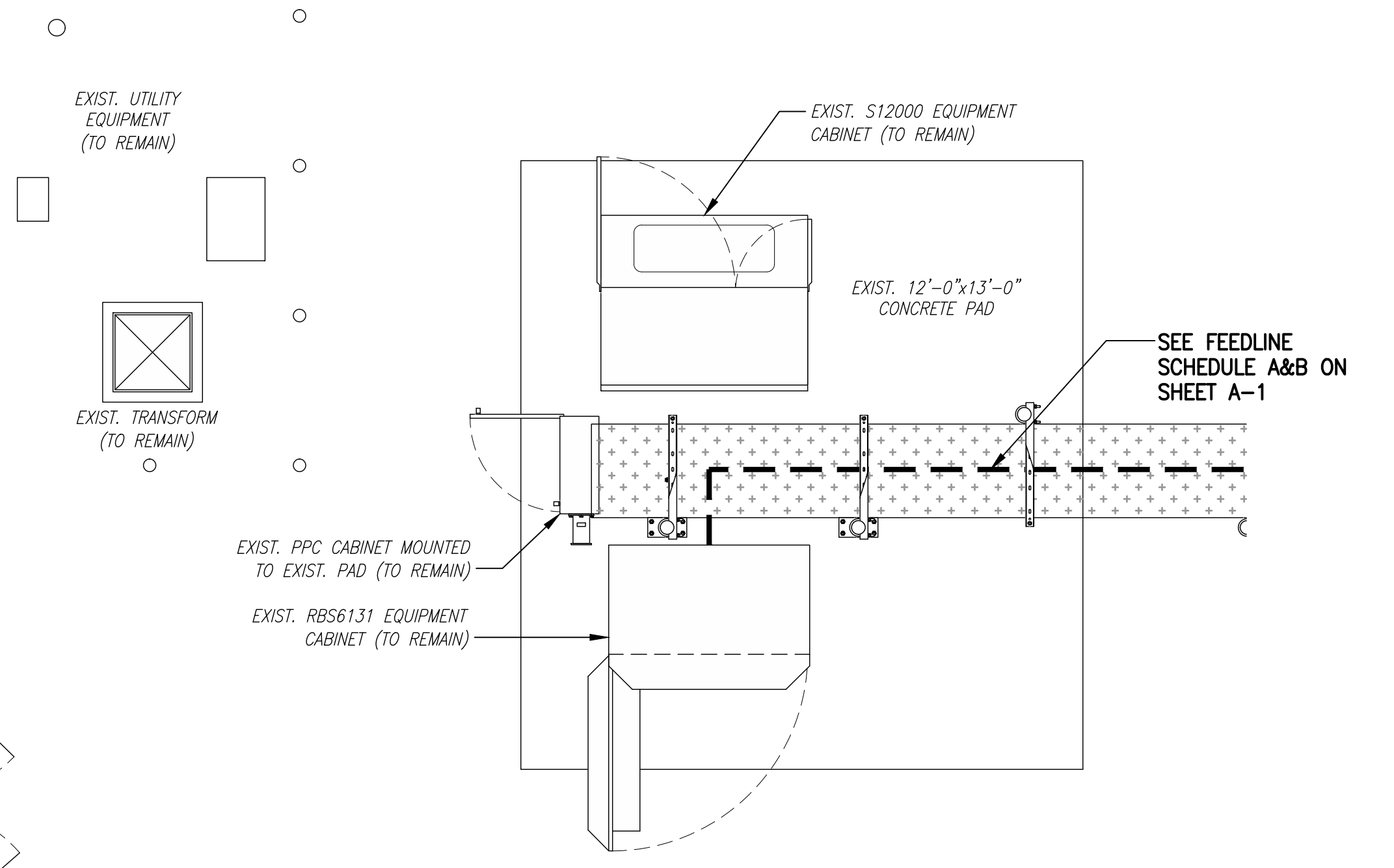
SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
 GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE BUNDLING OR RELOCATION.

FEEDLINE SCHEDULE	FEEDLINES	LOCATION
A	EXISTING TO REMAIN: (6) 7/8" COAX CABLES (1) 1-1/4" HCS FIBER CABLE (3) 7/8" COAX CABLES (DISCONNECTED) EXISTING TO BE REMOVED: (3) 7/8" COAX CABLES	ROUTED PER STRUCTURAL ANALYSIS
B	PROPOSED: (3) 1-5/8" HCS FIBER CABLE	

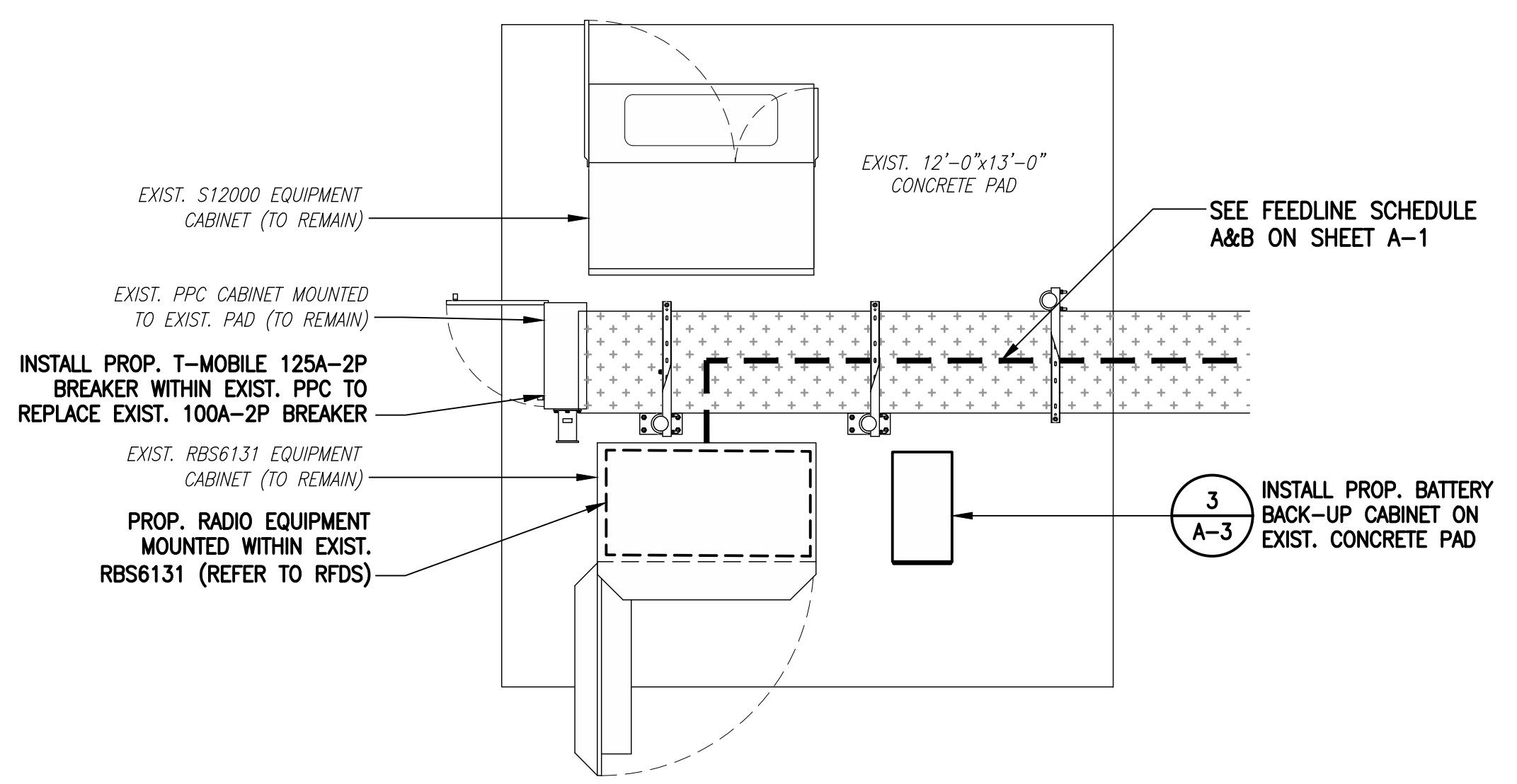
NOTE:
 EXISTING T-MOBILE EQUIPMENT FEEDLINE INVENTORY BASED ON OBSERVED FIELD CONDITIONS. RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER.



COMPOUND PLAN (1/A-1)
 SCALE: 1" = 5'-0"
 0 5'-0" 10'-0" 15'-0"



EXISTING EQUIPMENT PLAN (2/A-1)
 SCALE: 3/8" = 1'-0"
 0 2'-8" 5'-4" 8'-0"

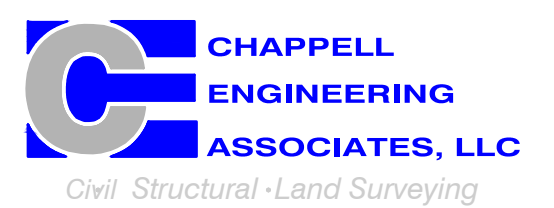


PROPOSED EQUIPMENT PLAN (3/A-1)
 SCALE: 3/8" = 1'-0"
 0 2'-8" 5'-4" 8'-0"

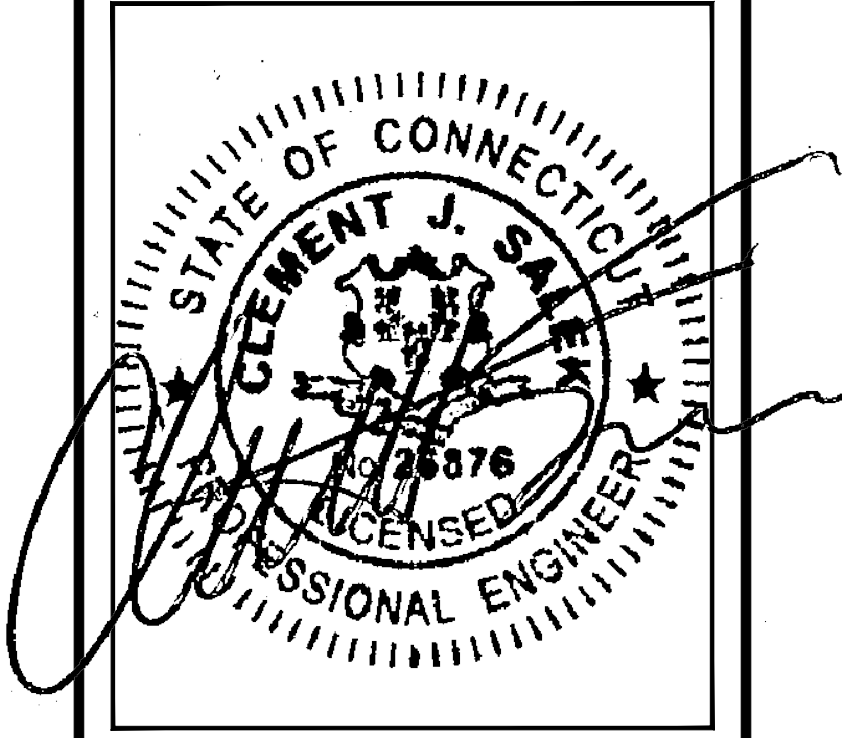
**T-MOBILE
 NORTHEAST LLC**
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 SITE ADDRESS:
 93 LAKE STREET
 MANCHESTER, CT 06042

SHEET TITLE
COMPOUND & EQUIPMENT PLAN

SHEET NUMBER
A-1

SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
 GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE BUNDLING OR RELOCATION.

RAD CENTER NOTE:
 T-MOBILE RAD CENTER SHOWN IN RED TEXT BASED ON SBA-PROVIDED CO-LOCATION APPLICATION, EQUIPMENT DATABASE, AND STRUCTURAL ANALYSIS. THE SBA-PROVIDED ANTENNA RAD CENTER SHALL SUPERSEDE ANY CONFLICTING INFORMATION DERIVED FROM THE T-MOBILE RFDS.

GENERAL CONTRACTOR NOTE:
 GENERAL CONTRACTOR SHALL REFER TO MOUNT STRUCTURAL ANALYSIS AND ANY MOUNT MODIFICATION DESIGN PROVIDED BY SBA

PROP. T-MOBILE ERICSSON RADIO 4449 (1 PER SECTOR, TOTAL OF 3) MOUNTED TO EXIST. ANTENNA MOUNT

EXIST. T-MOBILE GENERIC TWIN STYLE 1B AWS TMA (1 PER SECTOR, TOTAL OF 3) MOUNTED TO EXIST. ANTENNA MOUNT (TO REMAIN)

EXIST. ERICSSON AIR21 KRC118023-1 B2A/B4P PANEL ANTENNAS (1 PER SECTOR, TOTAL OF 3) MOUNTED TO EXIST. ANTENNA MOUNT (TO REMAIN)

PROP. T-MOBILE RFS APXVAARR24_43-U-NA20 ANTENNAS (1 PER SECTOR, TOTAL OF 3) MOUNTED TO EXIST. ANTENNA MOUNT

PROP. T-MOBILE METROSITE LIGHT COLLAR MOUNT ASSEMBLY W/KICKER SUPPORT KIT (REFER TO MOD DRAWING, BY OTHERS ATTACHED TO BACK OF THIS SET)

TOP OF EXIST. MONOPOLE
 EL. = 109'± AGL(305'±AMSL)

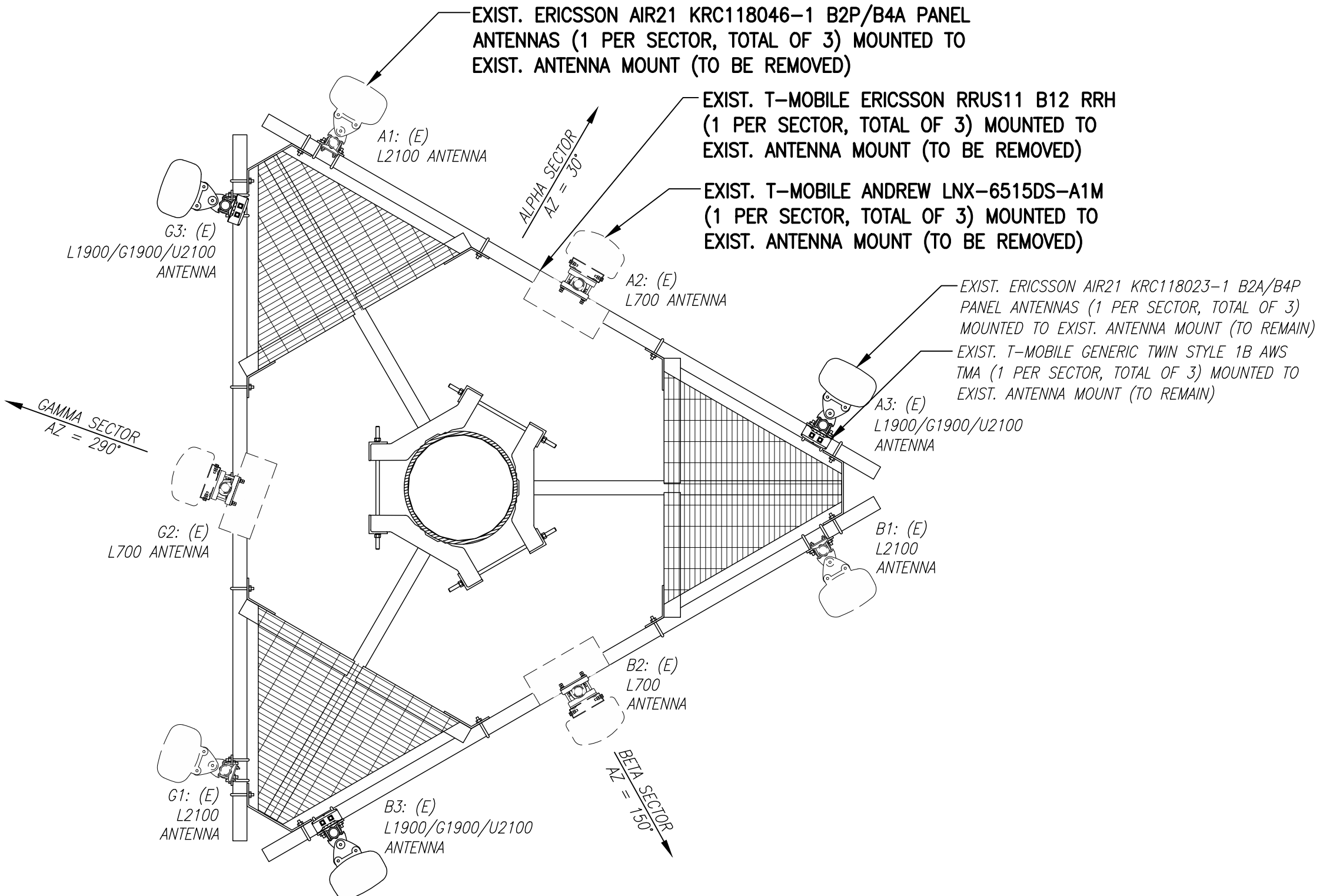
TOP OF PROP. (6) T-MOBILE ANTENNAS
 EL. = 109'± AGL(296'±AMSL)

PROP. (6) T-MOBILE ANTENNAS
 EL. = 105'± AGL(292'±AMSL)

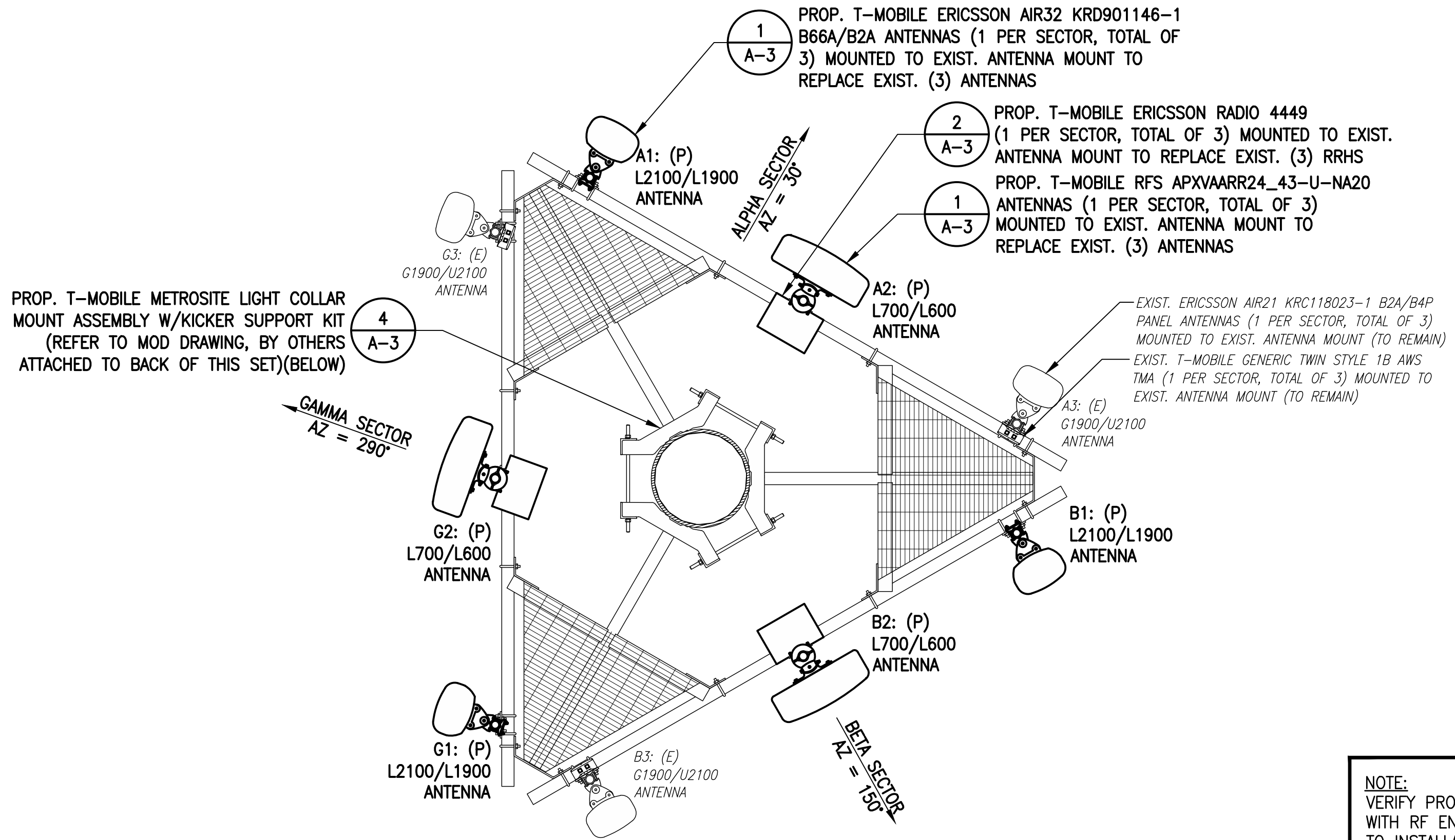
EXIST. (3) T-MOBILE ANTENNAS
 EL. = 105'± AGL(272'±AMSL)

PROP. T-MOBILE ERICSSON AIR32 KRD901146-1 B66A/B2A ANTENNAS (1 PER SECTOR, TOTAL OF 3) MOUNTED TO EXIST. ANTENNA MOUNT

EXIST. (9) AT&T ANTENNAS
 EL. = 95'± AGL(272'±AMSL)



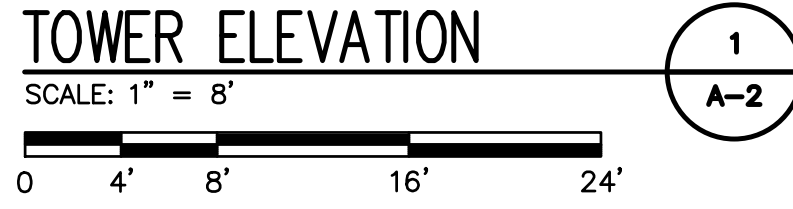
EXISTING ANTENNA PLAN
 SCALE: 1/2" = 1'-0"



PROPOSED ANTENNA PLAN
 SCALE: 1/2" = 1'-0"

ANTENNA STATUS LEGEND:
 EMPTY - EMPTY PIPE
 (E) - EXISTING
 (P) - INSTALL
 (F) - FUTURE

NOTE:
 GROUND EQUIPMENT NOT SHOWN, FOR CLARITY.



SEE FEEDLINE SCHEDULE A&B ON SHEET A-1

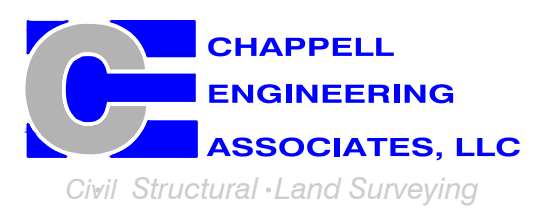
GROUND LEVEL
 EL. = 0.0' AGL(185'±AMSL)

**T-MOBILE
 NORTHEAST LLC**

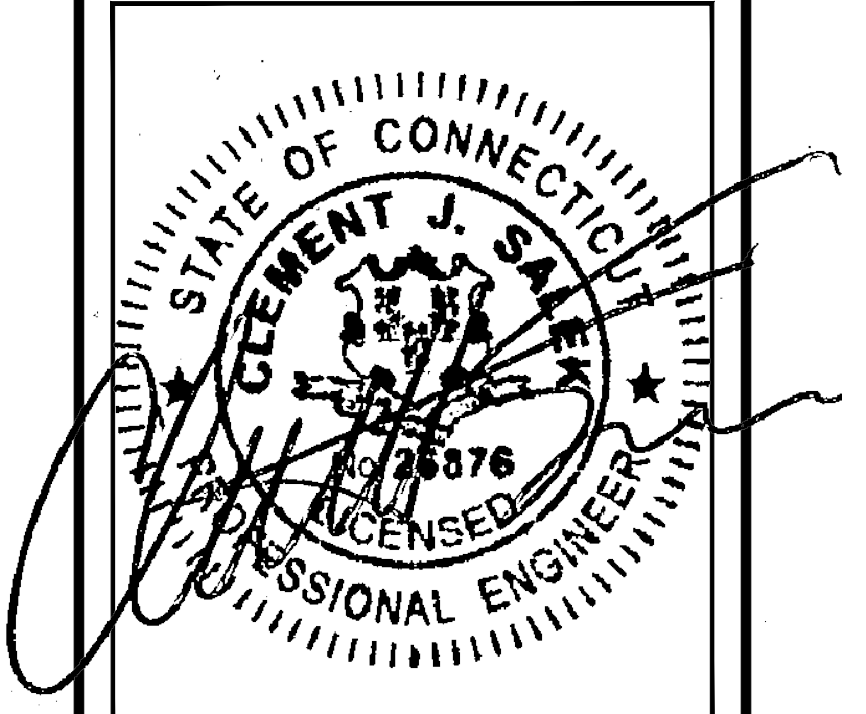
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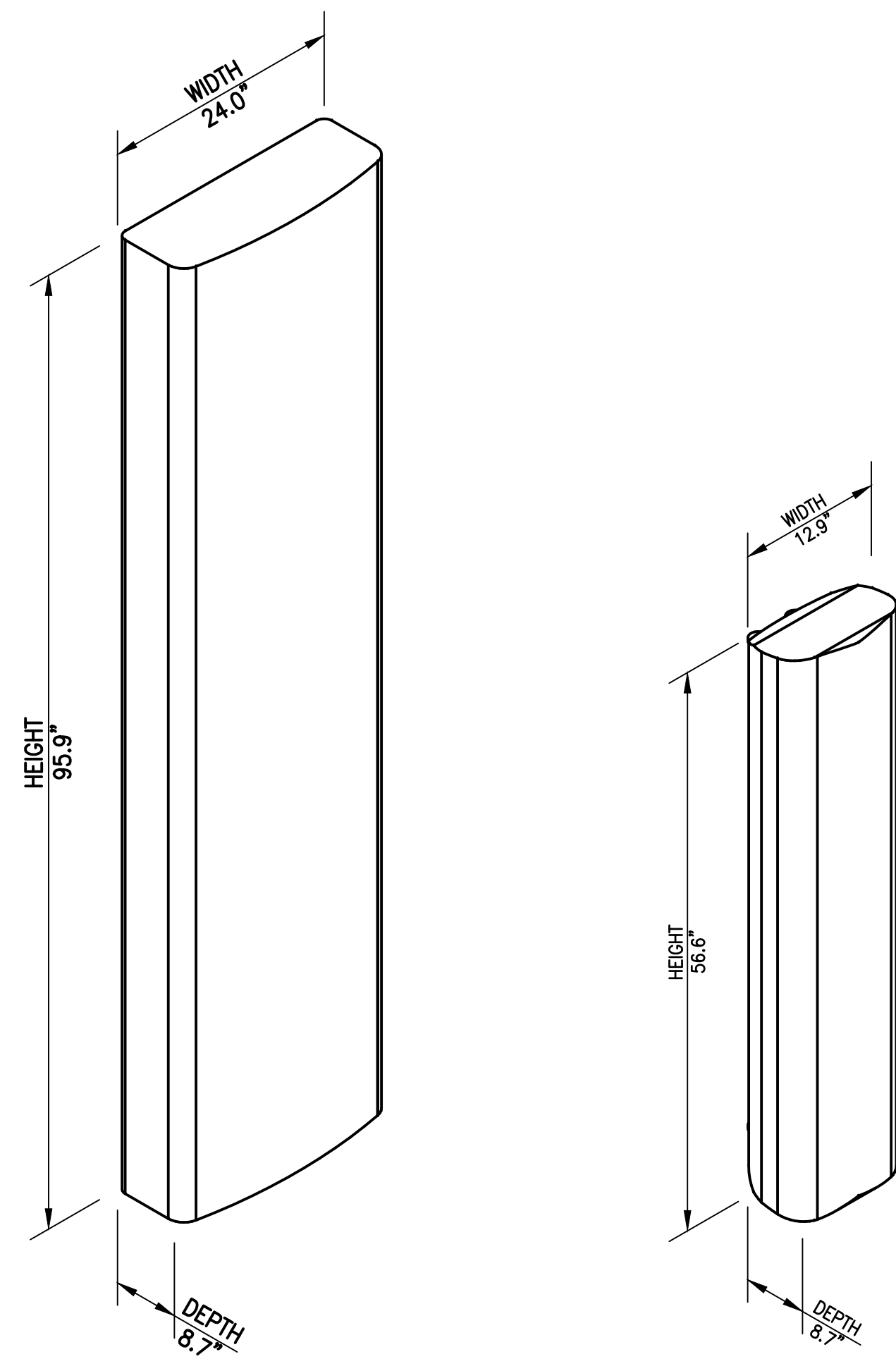
SHEET TITLE
**TOWER ELEVATIONS &
 ANTENNA PLAN**

SHEET NUMBER
A-2

FINAL ANTENNA CONFIGURATION								
SECTOR	ANTENNA	RAD CENTER	AZIMUTH (TRUE NORTH)	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	BAND	RADIOS/TMAS	CABLES
ALPHA	ERICSSON AIR32 KRD901146-1 B66A/B2A	105'± AGL	30°	0°	2'	L2100/L1900	-	(1) 9x18 (1-1/4") HCS CABLE (SHARED)
	RFS APXVAARR24_43-U-NA20	105'± AGL	30°	0°	2'	L600/L700	RADIO 4449 B71+B12	(1) 6x12 (1-5/8") HCS CABLE
	ERICSSON AIR21 KRC118023-1 B2A/B4P	105'± AGL	30°	0°	2'	U2100 G1900	GENERIC TWIN STYLE 1B AWS TMA	(2) 7/8" COAX CABLE (1) 9x18 (1-1/4") HCS CABLE (SHARED)
BETA	ERICSSON AIR32 KRD901146-1 B66A/B2A	105'± AGL	150°	0°	2'	L2100/L1900	-	(1) 9x18 (1-1/4") HCS CABLE (SHARED)
	RFS APXVAARR24_43-U-NA20	105'± AGL	150°	0°	2'	L600/L700	RADIO 4449 B71+B12	(1) 6x12 (1-5/8") HCS CABLE
	ERICSSON AIR21 KRC118023-1 B2A/B4P	105'± AGL	150°	0°	2'	U2100 G1900	GENERIC TWIN STYLE 1B AWS TMA	(2) 7/8" COAX CABLE (1) 9x18 (1-1/4") HCS CABLE (SHARED)
GAMMA	ERICSSON AIR32 KRD901146-1 B66A/B2A	105'± AGL	290°	0°	2'	L2100/L1900	-	(1) 9x18 (1-1/4") HCS CABLE (SHARED)
	RFS APXVAARR24_43-U-NA20	105'± AGL	290°	0°	2'	L600/L700	RADIO 4449 B71+B12	(1) 6x12 (1-5/8") HCS CABLE
	ERICSSON AIR21 KRC118023-1 B2A/B4P	105'± AGL	290°	0°	2'	U2100 G1900	GENERIC TWIN STYLE 1B AWS TMA	(2) 7/8" COAX CABLE (1) 9x18 (1-1/4") HCS CABLE (SHARED)

CABLE NOTE: (3)-7/8"Ø TO REMAIN UNCONNECTED (SEE FEEDLINE SCHEDULE A&B ON SHEET A-1)

NOTE: RFDS REV6.1 - 09/13/19



RFS APXVAARR24_43-NA20 PANEL ANTENNA
DIMENSIONS: 95.9"H x 24.0"W x 8.7"D
WEIGHT: 128.0 LBS
1 PER SECTOR, TOTAL OF 3

ERICSSON AIR32 KRD901146-1 B66A/B2A ANTENNA
DIMENSIONS: 56.6"H x 12.9"W x 8.7"D
WEIGHT: 132.2 LBS
1 PER SECTOR, TOTAL OF 3

ANTENNA DETAILS
SCALE: N.T.S.

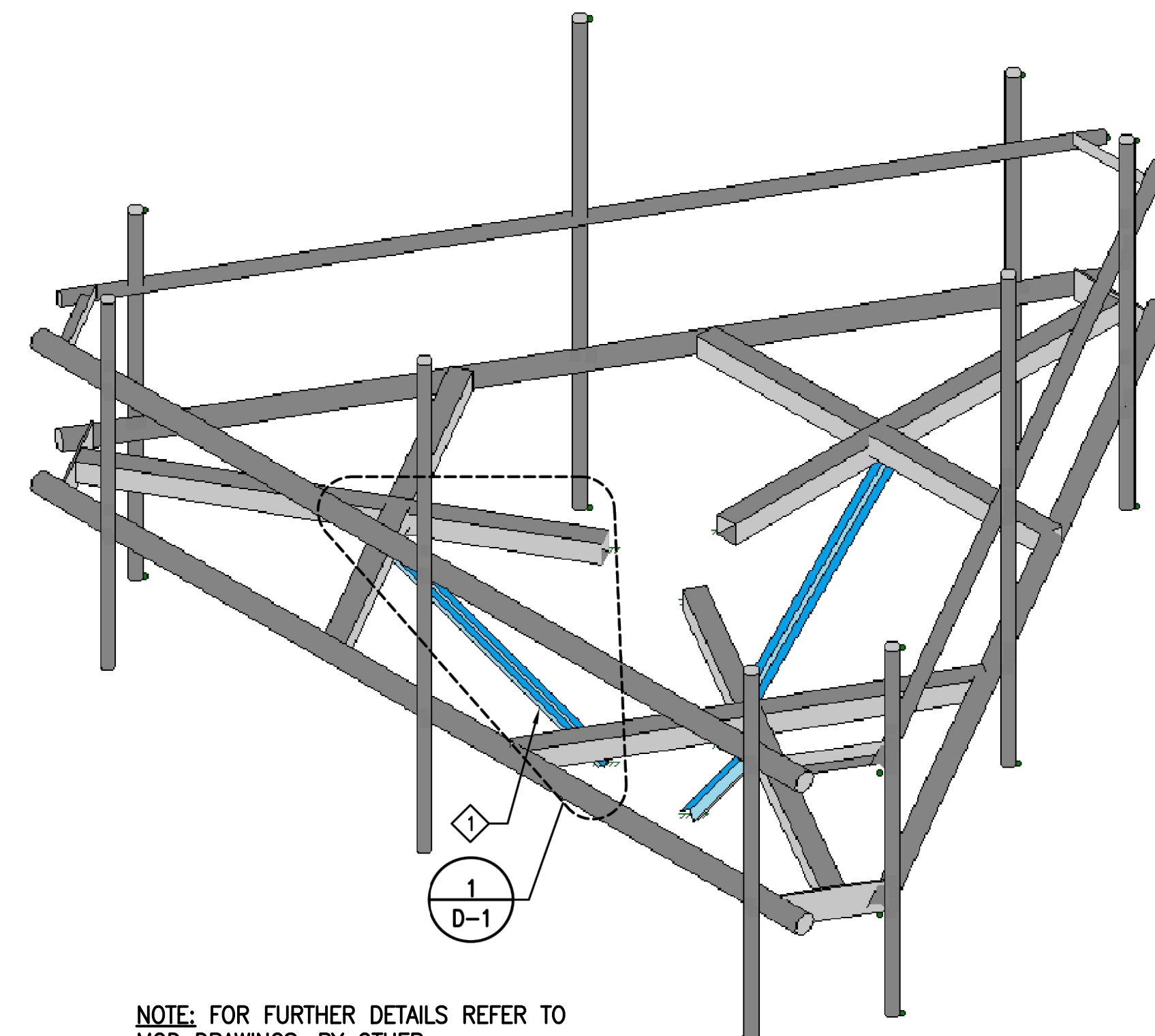
1
A-3



ERICSSON RADIO 4449 B12+B71
DIMENSIONS: 14.9"H x 13.2"W x 9.3"D
WEIGHT: 74.0 LBS
1 PER SECTOR, TOTAL OF 3

RRUS DETAILS
SCALE: N.T.S.

2
A-3

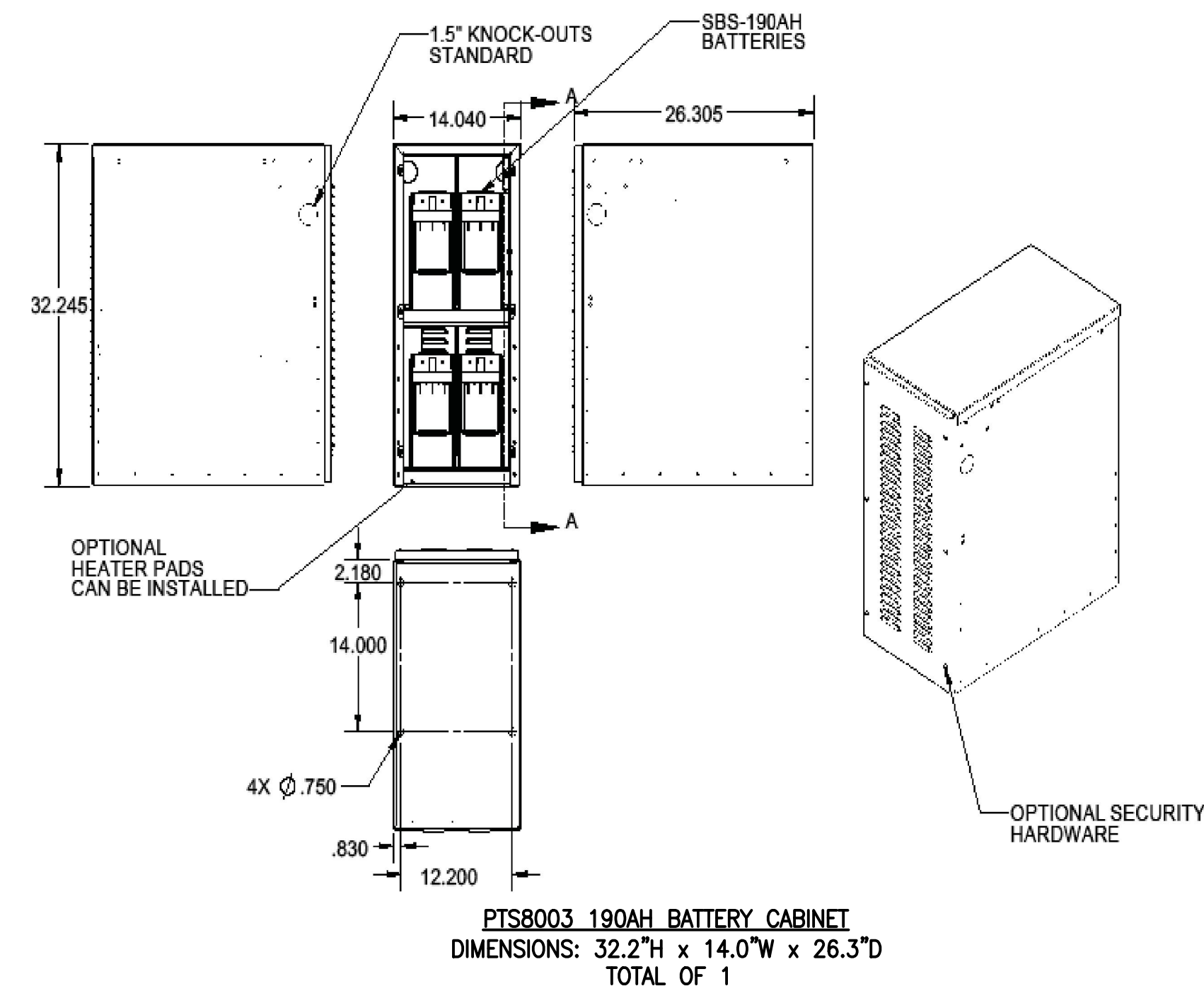


NOTE: FOR FURTHER DETAILS REFER TO MOD DRAWINGS, BY OTHER (ATTACHED TO BACK BACK OF THIS SET)

ISOMETRIC VIEW
EXISTING ANTENNA MOUNT @ 105' ELEV.

MOUNT MODIFICATION DETAIL
SCALE: N.T.S.

4
A-3



PTS8003 190AH BATTERY CABINET
DIMENSIONS: 32.2"H x 14.0"W x 26.3"D
TOTAL OF 1

BATTERY DETAIL
SCALE: N.T.S.

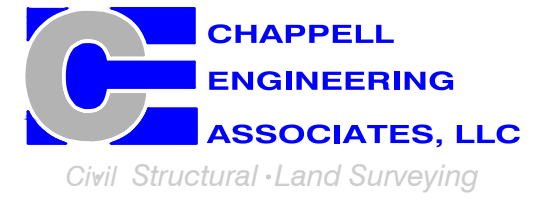
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A-3

T-MOBILE
NORTHEAST LLC

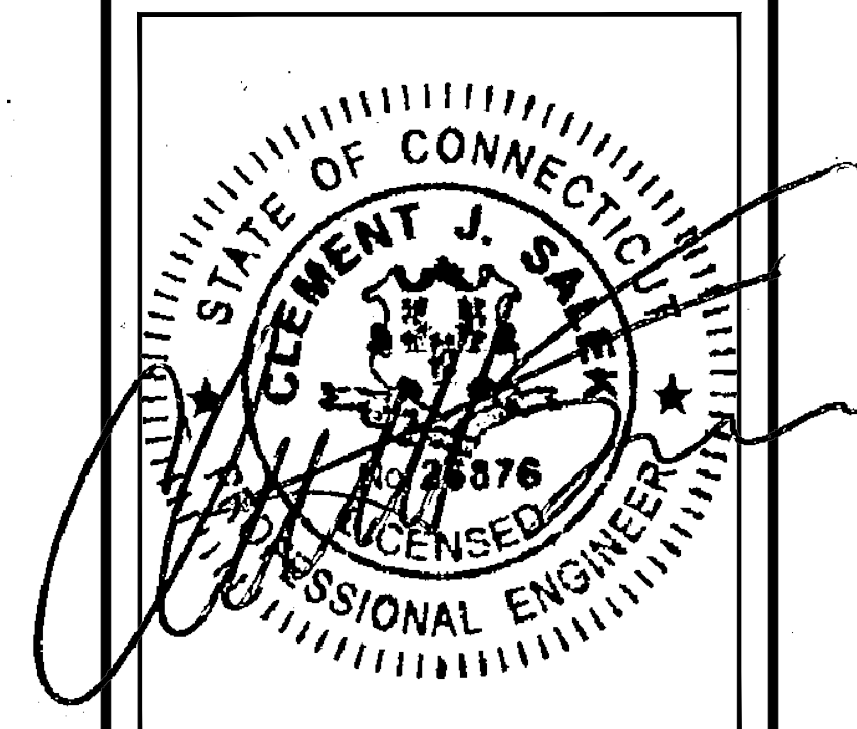
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93 LAKE STREET
MANCHESTER, CT 06042

SHEET TITLE

SITE DETAILS

SHEET NUMBER

A-3

T-MOBILE
NORTHEAST LLC

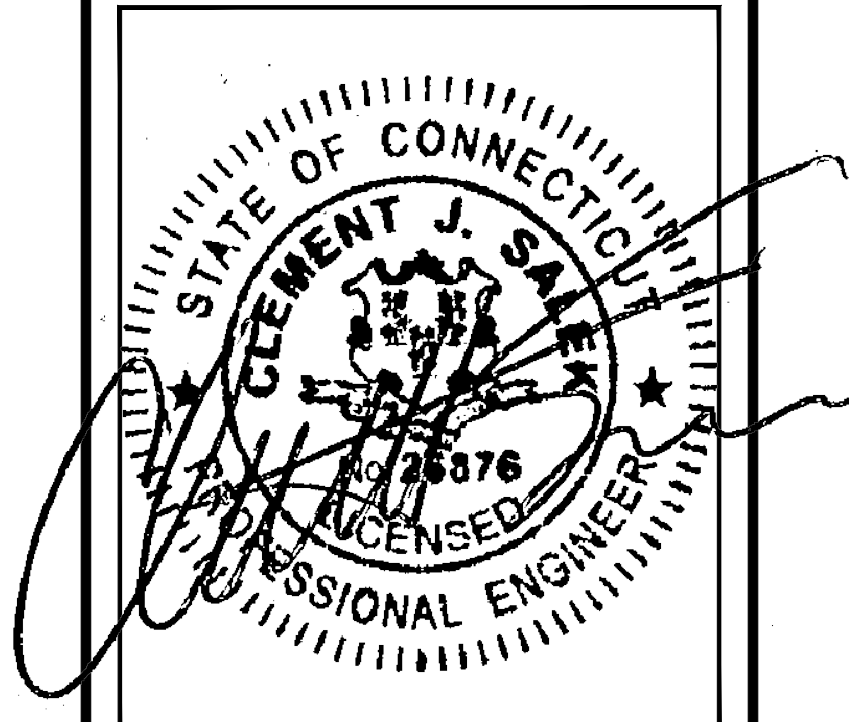
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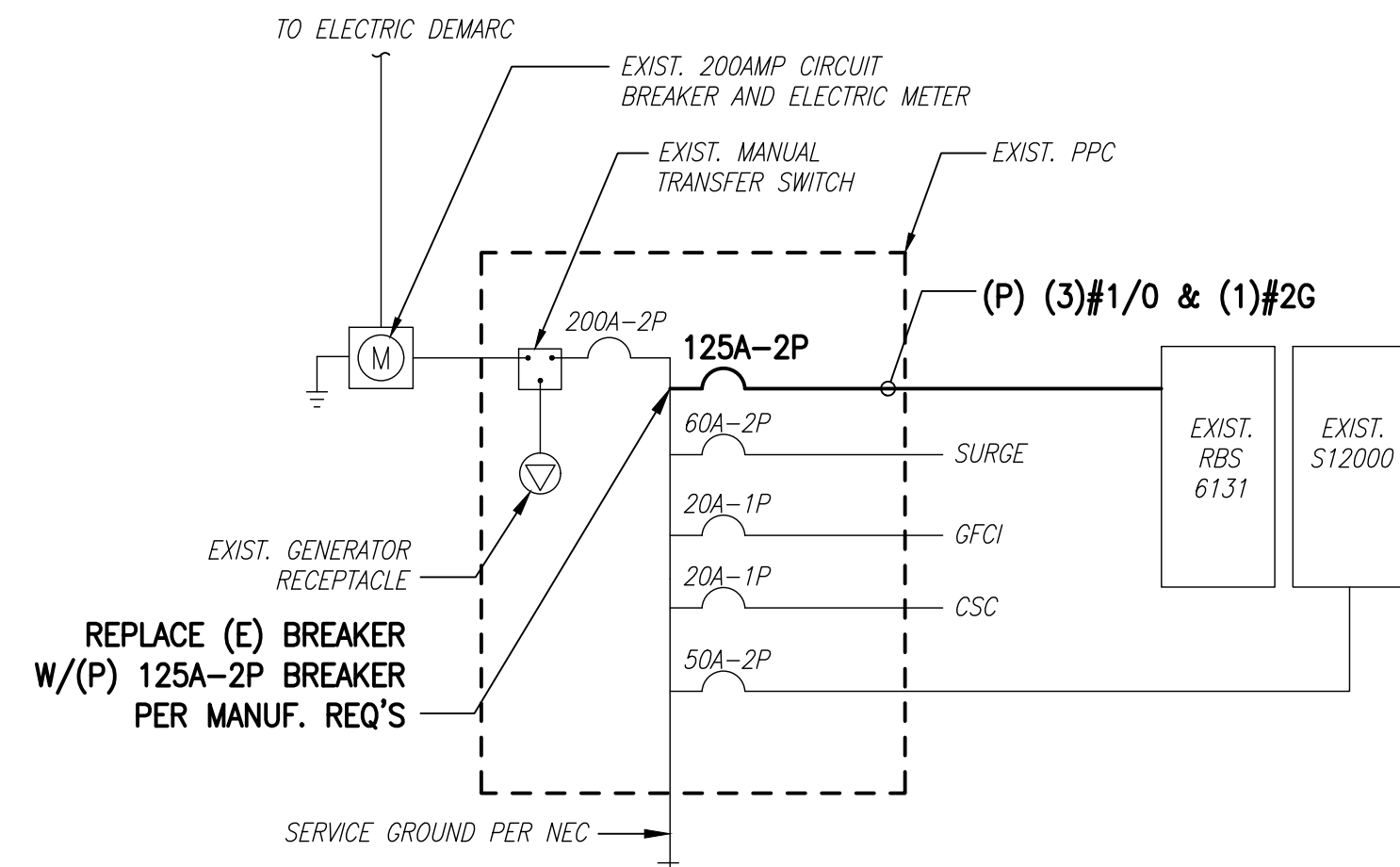
SITE ADDRESS:
93 LAKE STREET
MANCHESTER, CT 06042

SHEET TITLE

ELECTRIC & GROUNDING
DETAILS

SHEET NUMBER

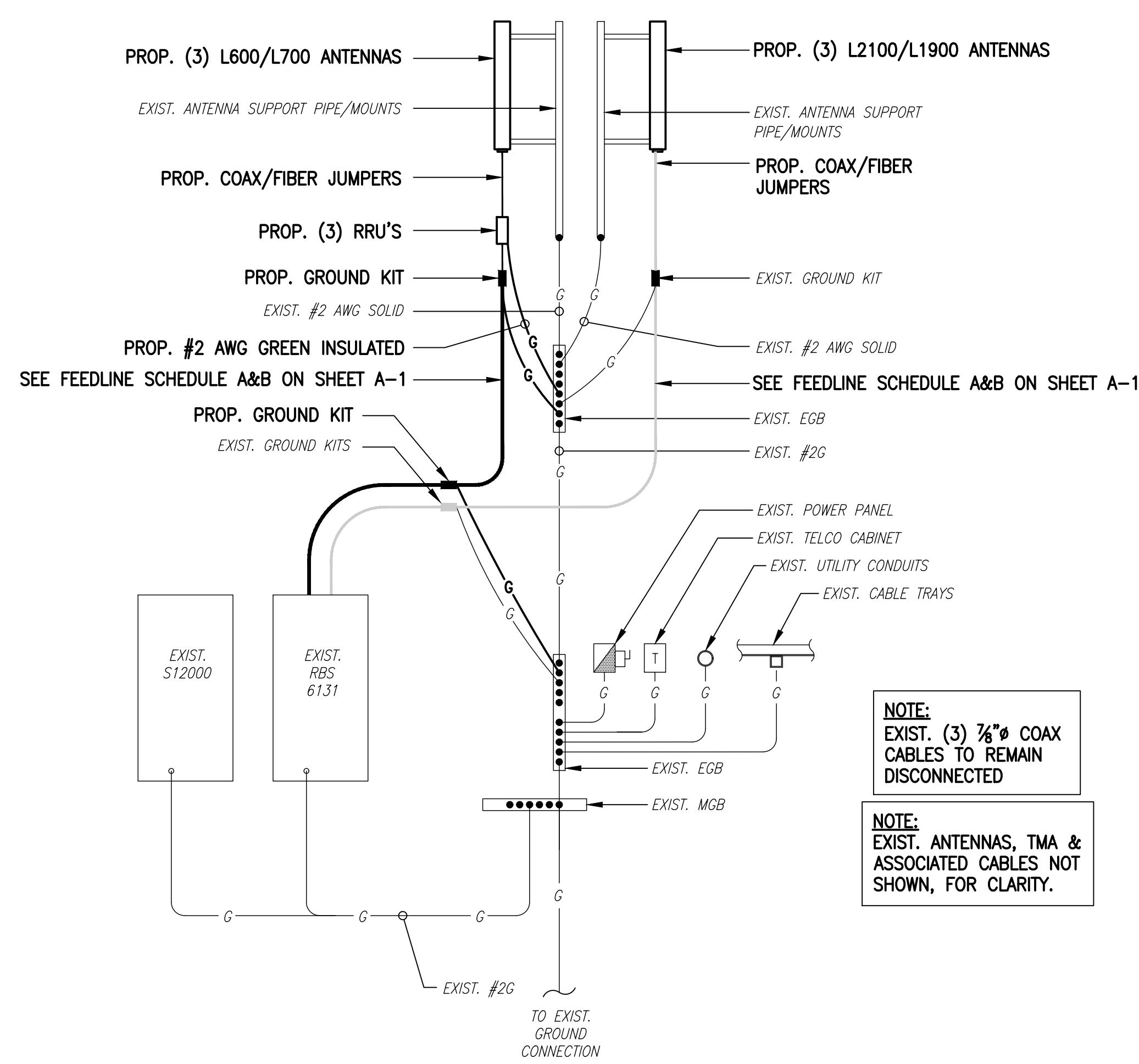
E-1



ONE LINE DIAGRAM

SCALE: NOT TO SCALE

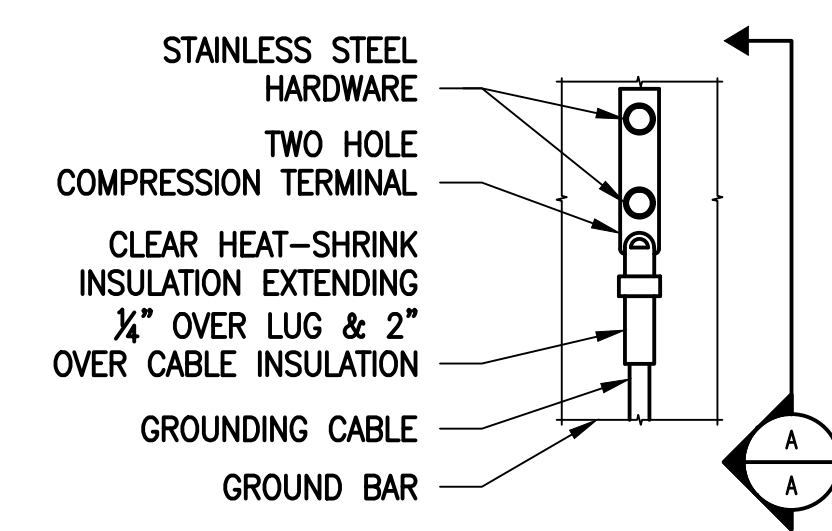
1
E-1



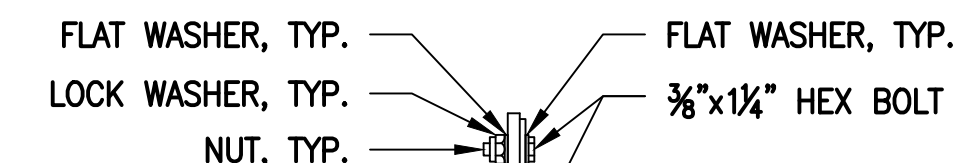
GROUNDING RISER DIAGRAM

SCALE: NOT TO SCALE

2
E-1



ELEVATION



SECTION A-A

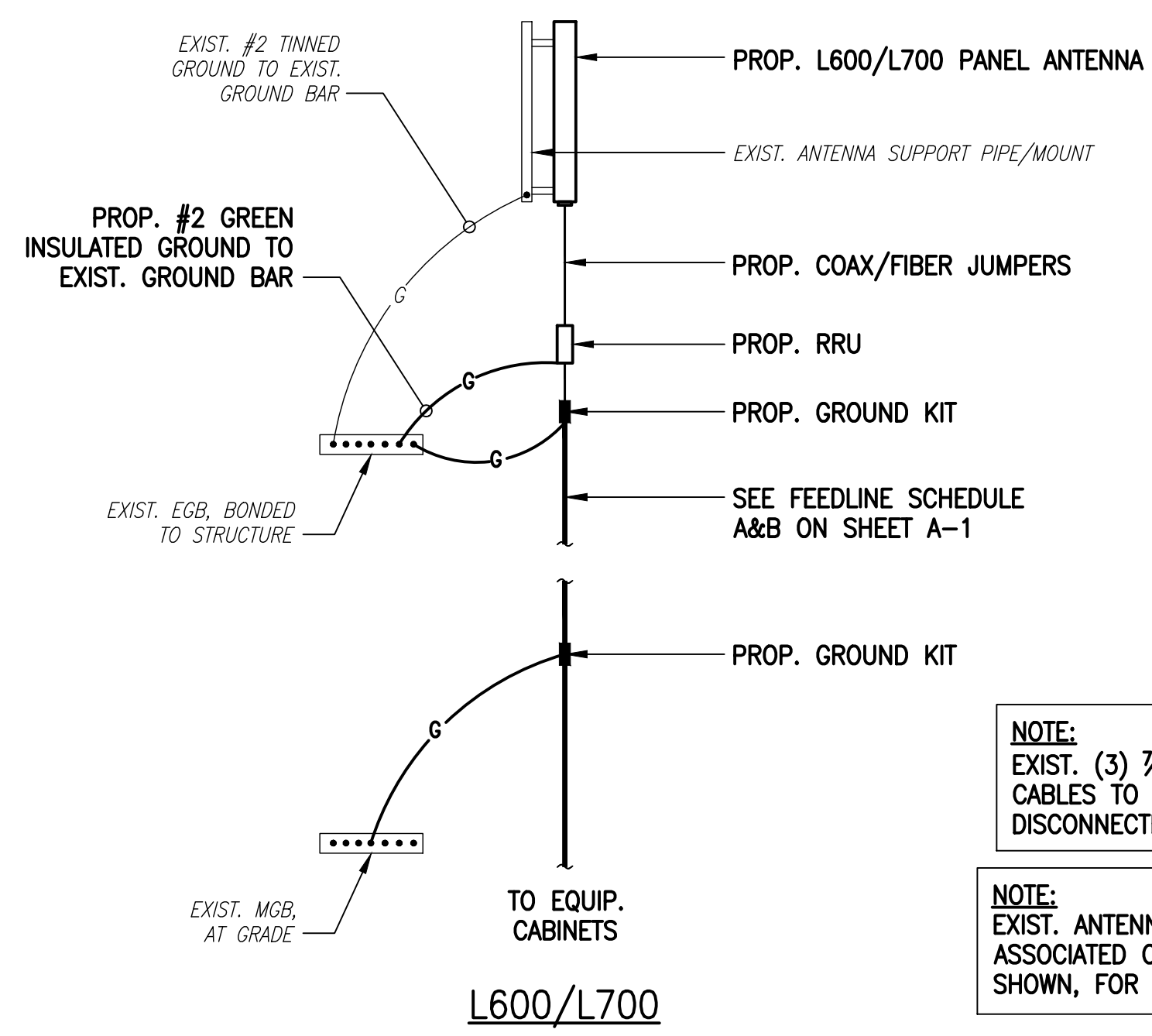
TYPICAL GROUND BAR
CONNECTIONS DETAIL

SCALE: NOT TO SCALE

3
E-1

NOTES:

- "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
- OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
- CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.

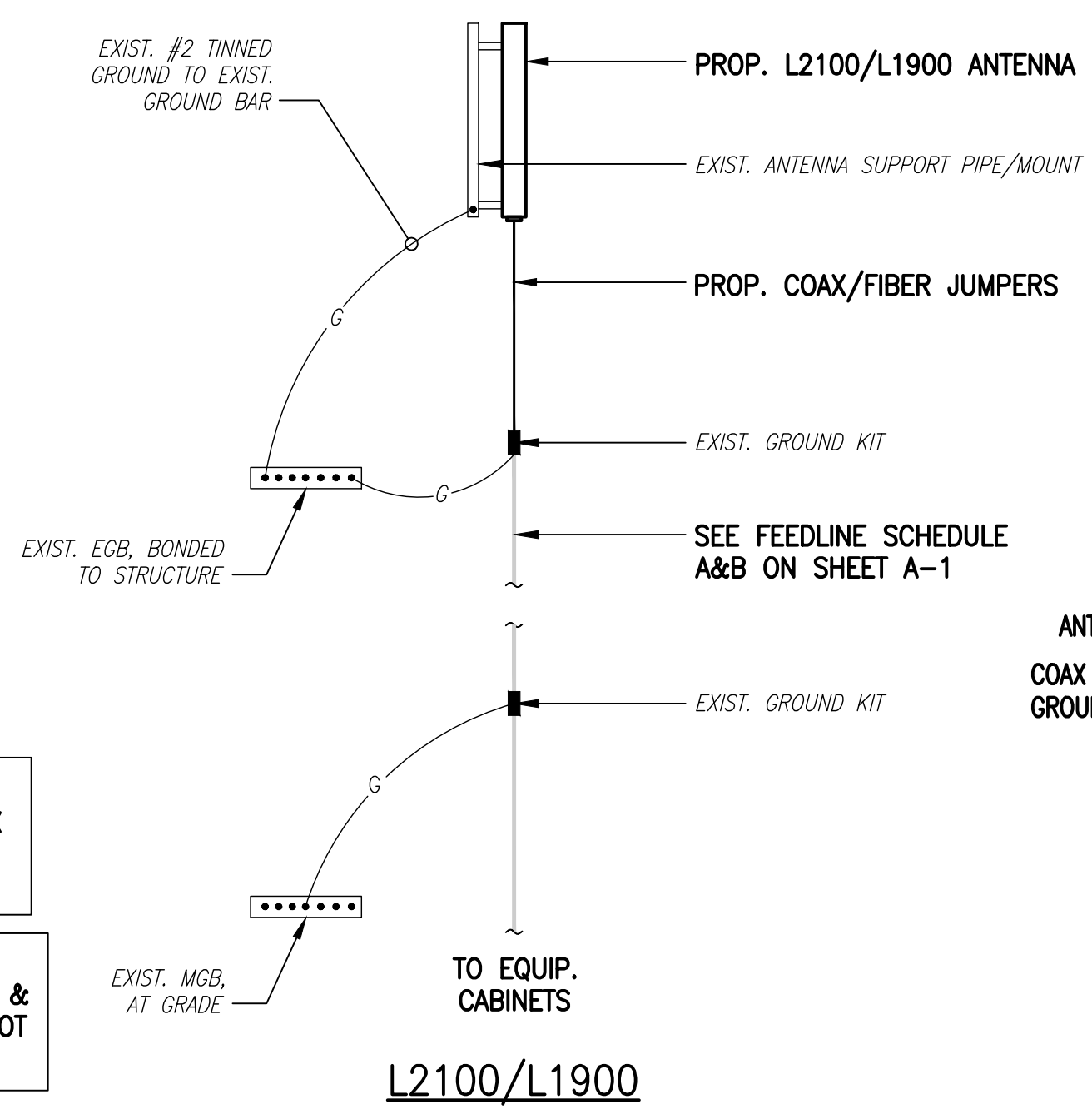


L600/L700

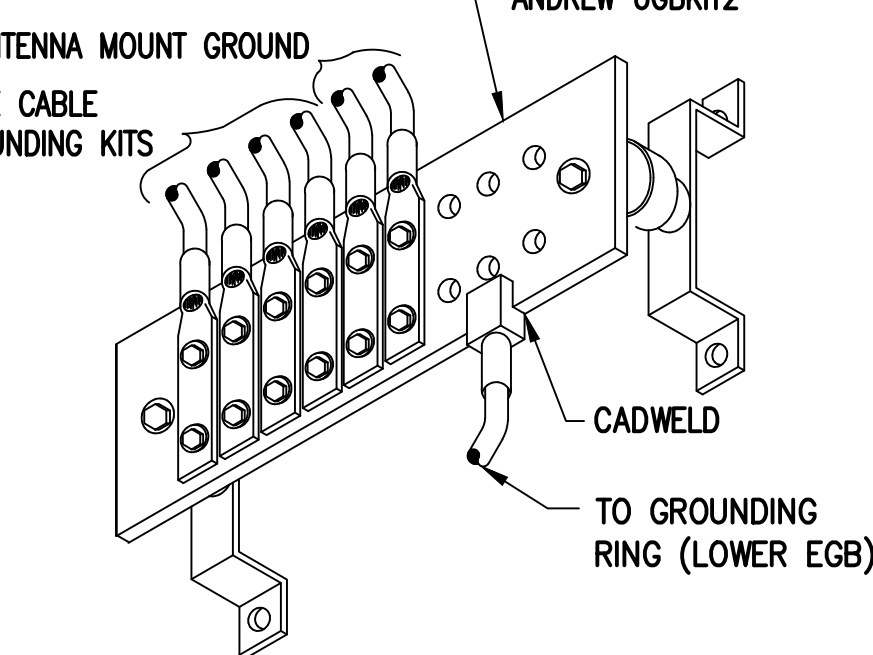
COAX CABLE CONNECTION
AND GROUNDING DETAIL

SCALE: NOT TO SCALE

4
E-1



L2100/L1900



GROUND BAR (EGB)

SCALE: NOT TO SCALE

5
E-1

ELECTRICAL AND GROUNDING NOTES

- ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
- ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
- THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
- GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
- ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
- BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
- ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THININSULATION.
- RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE PPC AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
- RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
- WHERE CONDUIT BETWEEN BTS AND PROJECT OWNER CELL SITE PPC AND BETWEEN BTS AND PROJECT OWNER CELL SITE TELCO SERVICE CABINET ARE UNDERGROUND USE PVC, SCHEDULE 40 CONDUIT. ABOVE THE GROUND PORTION OF THESE CONDUITS SHALL BE PVC CONDUIT.
- ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
- PPC SUPPLIED BY PROJECT OWNER.
- GROUNDING SHALL COMPLY WITH NEC ART. 250. ADDITIONALLY, GROUNDING, BONDING AND LIGHTNING PROTECTION SHALL BE DONE IN ACCORDANCE WITH "T-MOBILE BTS SITE GROUNDING STANDARDS".
- GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
- USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
- ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
- ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 6 FEET OF PROJECT OWNER EQUIPMENT OR CABINET TO MASTER GROUND BAR OR GROUNDING RING.
- CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
- APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
- CONTRACTOR SHALL PROVIDE AND INSTALL OMNI DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALLS OVER EACH GROUND ROD AND BONDING POINT BETWEEN EXIST. TOWER/ MONOPOLE GROUNDING RING AND EQUIPMENT GROUNDING RING.
- CONTRACTOR SHALL TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION. 5 OHMS MINIMUM RESISTANCE REQUIRED.
- CONTRACTOR SHALL CONDUCT ANTENNA, COAX, AND LNA RETURN-LOSS AND DISTANCE- TO-FAULT MEASUREMENTS (SWEEP TESTS) AND RECORD RESULTS FOR PROJECT CLOSE OUT.

EXHIBIT 7



Tower Engineering Solutions

Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

Structural Analysis Report

Existing 109 ft SABRE Monopole
Customer Name: SBA Communications Corp
Customer Site Number: CT13529-A
Customer Site Name: Manchester 1
Carrier Name: T-Mobile (App#: 117036, V1)
Carrier Site ID / Name: CTHA075D / HA075/Optasite
Site Location: 93 Lake Street
Manchester, Connecticut
Hartford County
Latitude: 41.789083
Longitude: -72.482083

Analysis Result:

Max Structural Usage: 52.5% [Pass]
Max Foundation Usage: 57.0% [Pass]
Additional Usage Caused by Mount Modification: +0.9%
Report Prepared By : Dipika Dhungana



[Handwritten signature]
8/2/19

Introduction

The purpose of this report is to summarize the analysis results on the 109 ft SABRE Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Sabre Towers & Poles (Project No. 09-06160) Structural Design Report dated June 17, 2008.
Foundation Drawing	Sabre Towers & Poles (Project No. 09-06160) Structural Design Report dated June 17, 2008.
Geotechnical Report	Terracon Consulting Engineers & Scientists (Project No. J2085152) Geotechnical Engineering Report dated June 6, 2008.
Modification Drawings	N/A

Analysis Criteria

The rigorous analysis was performed in accordance with the requirements and stipulations of the ANSI/TIA/EIA 222-G. In accordance with this standard, the structure was analyzed using **TESPoles**, a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed Vult = 125.0 mph (3-Sec. Gust)/ Nominal Design Wind Speed V _{asd} = 97.0 mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 1" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-G / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S _s = 0.178, S ₁ = 0.063

This structural analysis is based upon the tower being classified as a Structure Class II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

Existing Antennas, Mounts and Transmission Lines

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
-	105.5	3	Ericsson - Air21 B2A/B4P - Panel	Low Profile Platform	(1) 1 5/8" Fiber (12) 7/8"	T-Mobile
-		3	Ericsson - AIR 21 B4A/B2P - Panel			
-		3	Commscope - LNX-6515DS-A1M - Panel			
-		3	Ericsson KRY112 144 TMAs			
-		3	Ericsson ETW200VA12UB TMAs			
-		3	Ericsson S11B12 RRHs			
7	95.0	3	Nokia AAHC - MIMO	Low Profile Platform w/ HRK (Sitepro RMQP-496-HK)	(2) 1/2" Fiber (3) 1-1/4" Fiber (1) 1.689" Fiber	Sprint Nextel
8		3	Commscope NNVV-65B-R4			
9		2	Andrew - VHLP2.5-11 - Dish			
10		3	ALU 1900 Mhz RRUs			
11		6	ALU 800 Mhz RRUs			
12		3	ALU TD-RRH8x20-25 RRUs			

Proposed Carrier’s Final Configuration of Antennas, Mounts and Transmission Lines

Information pertaining to the proposed carrier’s final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	105.0	3	Ericsson Air 21 B2A/B4P	Platform w/ Hand Rails + (1)Kicker Support (MS-KI22-5) (1)Heavy Collar Mount (MS-H1436)	(4) 1 5/8" Fiber (9) 7/8"	T-Mobile
2		3	Ericsson Air32 KRD901146-1_B66A_B2A			
3		3	RFS APXVAARR24_43-U-NA20			
4		3	Ericsson KRY 112 144/1			
5		3	Ericsson ETW200VA12UB			
6		3	Ericsson Radio 4449 B71+B12			

See the attached coax layout for the line placement considered in the analysis.

Analysis Results

The results of the structural analysis, performed for the wind and ice loading and antenna equipment as defined above, are summarized as the following:

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	50.3%	52.5%	43.8%
Pass/Fail	Pass	Pass	Pass

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	1615.4	19.5	47.4

The foundation has been investigated using the supplied documents and soils report and was found adequate. Therefore, no modification to the foundation will be required.

Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.7763 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

Based on the analysis results, the existing structure and its foundation were found to be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the ANSI/TIA/EIA 222-G Standard under the design basic wind speed as specified in the Analysis Criteria.

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC**. Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.
2. The structural analysis was performance based upon the evidence available at the time of this report. All information provided by the client is considered to be accurate.
3. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the EIA/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.
4. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.
5. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.
6. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

Usage Diagram - Max Ratio 50.27% at 0.0ft

Structure: CT13529-A-SBA
Site Name: Manchester 1
Height: 109.00 (ft)
Base Elev: 1.000 (ft)

Code: EIA/TIA-222-G
Exposure: C
Gh: 1.1

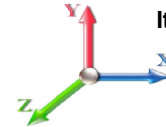
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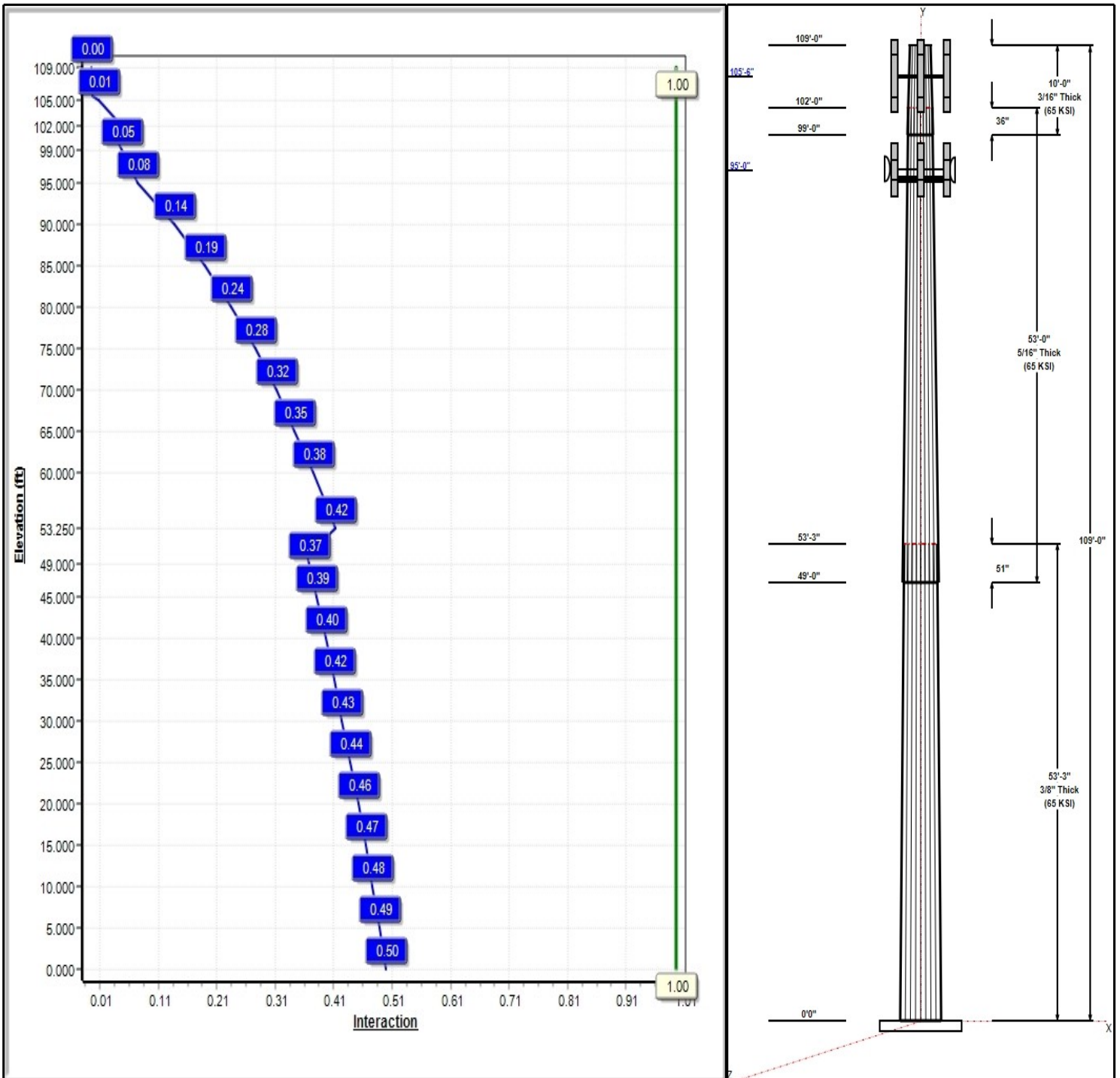
Dead Load Factor: 1.20
Wind Load Factor: 1.60

Load Case : 1.2D + 1.6W 97 mph Wind



Iterations: 21

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Structure: CT13529-A-SBA

Type: Tapered
Site Name: Manchester 1
Height: 109.00 (ft)
Base Elev: 1.00 (ft)

Base Shape: 18 Sided
Taper: 0.20697

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Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	53.25	32.68	43.70	0.375		0.20697	65
2	53.00	23.21	34.18	0.313	Slip	0.20697	65
3	10.00	22.14	24.21	0.188	Slip	0.20697	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
105.50	105.50	3	Air21 B2A/B4P	T-Mobile
105.50	105.50	3	KRD 9011461-B66A-B2A	T-Mobile
105.50	105.50	3	APXVAARR24_43-U-NA20	T-Mobile
105.50	105.50	3	Ericsson KRY112 144	T-Mobile
105.50	105.50	3	Ericsson ETW200VA12UB	T-Mobile
105.50	105.50	3	4449	T-Mobile
105.50	105.50	1	Platform w/ Hand Rails	T-Mobile
105.50	105.50	1	MS-KI22-5 (Kickers w/o	T-Mobile
95.00	95.00	3	Nokia AAHC - MIMO	Sprint Nextel
95.00	95.00	3	Commscope	Sprint Nextel
95.00	95.00	1	RMQP-496-HK	Sprint Nextel
95.00	95.00	2	VHLP2.5-11	Sprint Nextel
95.00	95.00	3	ALU 1900 Mhz RRUs	Sprint Nextel
95.00	95.00	6	ALU 800 Mhz RRUs	Sprint Nextel
95.00	95.00	3	ALU TD-RRH8x20-25	Sprint Nextel

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	105.50	Inside	1 5/8" Fiber	T-Mobile
0.00	105.50	Inside	7/8" Coax	T-Mobile
0.00	95.00	Inside	1-1/4" fiber	Sprint Nextel
0.00	95.00	Inside	1.689" Fiber	Sprint Nextel
0.00	95.00	Inside	1/2"	Sprint Nextel

Anchor Bolts

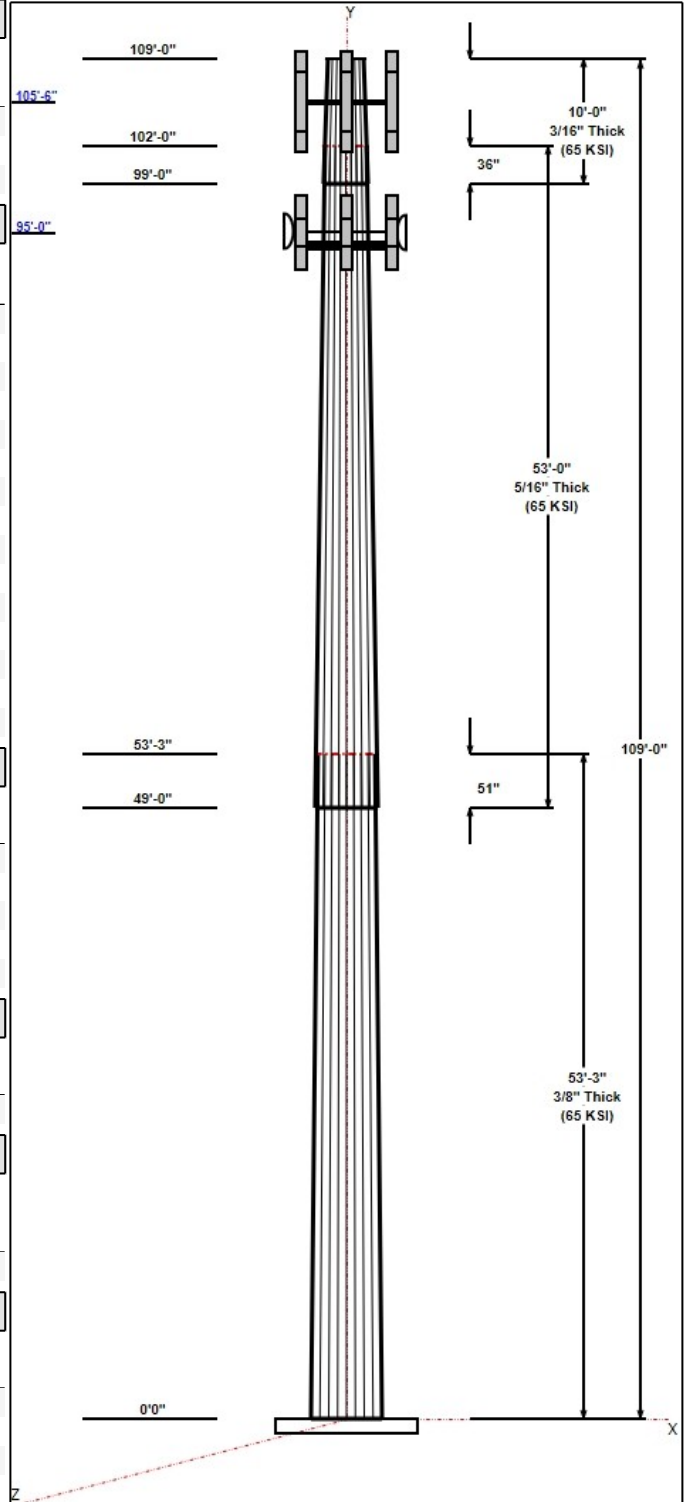
Qty	Specifications	Grade (ksi)	Arrangement
12	2.25" 18J	75.0	Cluster

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.7500	49.0	60.0	Clipped

Reactions

Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 97 mph Wind	1615.4	19.5	26.6
0.9D + 1.6W 97 mph Wind	1603.6	19.5	20.0
1.2D + 1.0Di + 1.0Wi 50 mph Wind	464.3	5.7	47.4
1.2D + 1.0E	131.9	1.4	26.7
0.9D + 1.0E	130.9	1.4	20.0
1.0D + 1.0W 60 mph Wind	384.6	4.7	22.2



Structure: CT13529-A-SBA - Coax Line Placement

Type: Monopole
Site Name: Manchester 1
Height: 109.00 (ft)

8/2/2019

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Shaft Properties

Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	53.250	0.3750	65		0.00	8,155
2	18	53.000	0.3125	65	Slip	51.00	5,078
3	18	10.000	0.1875	65	Slip	36.00	465
Total Shaft Weight:							13,698

Bottom

Top

Sec. No.	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Taper
1	43.70	0.00	51.57	12229.01	19.14	116.53	32.68	53.25	38.45	5069.13	13.96	87.14	0.206972
2	34.18	49.00	33.59	4869.37	17.88	109.39	23.21	102.00	22.71	1505.13	11.69	74.28	0.206972
3	24.21	99.00	14.30	1042.28	21.36	129.12	22.14	109.00	13.06	795.42	19.41	118.0	0.206972

Load Summary

Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice			Ice			Hor. Ecc. (ft)	Vert Ecc (ft)
				Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor		
1	105.50	Air21 B2A/B4P	3	91.50	6.09	0.86	321.42	7.531	0.86	0.00	0.00
2	105.50	KRD 9011461-B66A-B2A	3	132.20	6.51	0.87	380.94	7.982	0.87	0.00	0.00
3	105.50	APXVAARR24_43-U-NA20	3	128.00	20.24	0.70	686.39	22.715	0.70	0.00	0.00
4	105.50	Ericsson KRY112 144 TMAs	3	11.00	0.41	0.67	24.89	1.022	0.67	0.00	0.00
5	105.50	Ericsson ETW200VA12UB TMAs	3	11.00	0.47	0.67	26.81	1.124	0.67	0.00	0.00
6	105.50	4449	3	70.00	1.65	0.67	164.61	2.365	0.67	0.00	0.00
7	105.50	Platform w/ Hand Rails (flat)	1	2000.00	40.00	1.00	4698.33	66.983	1.00	0.00	0.00
8	105.50	MS-KI22-5 (Kickers w/o Collar)	1	146.00	5.33	1.00	408.64	12.521	1.00	0.00	0.00
9	95.00	Nokia AAHC - MIMO	3	104.00	4.20	0.75	277.57	5.279	0.75	0.00	0.00
10	95.00	Commscope NNVV-65B-R4	3	77.40	12.27	0.74	441.53	14.127	0.74	0.00	0.00
11	95.00	RMQP-496-HK	1	2449.00	48.00	1.00	5718.98	90.727	1.00	0.00	0.00
12	95.00	VHLP2.5-11	2	47.60	8.43	1.00	267.80	10.606	1.00	0.00	0.00
13	95.00	ALU 1900 Mhz RRUs	3	60.00	2.71	0.67	162.97	4.321	0.67	0.00	0.00
14	95.00	ALU 800 Mhz RRUs	6	53.00	2.49	0.67	147.31	3.948	0.67	0.00	0.00
15	95.00	ALU TD-RRH8x20-25 RRUs	3	70.00	4.05	0.67	219.07	5.109	0.67	0.00	0.00
Totals:			41	7,273.50			20,364.03				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	105.50	(4) 1 5/8" Fiber	0.00	Inside
0.00	105.50	(9) 7/8" Coax	0.00	Inside
0.00	95.00	(3) 1-1/4" fiber	0.00	Inside
0.00	95.00	(1) 1.689" Fiber	0.00	Inside
0.00	95.00	(2) 1/2"	0.00	Inside

Shaft Section Properties

Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Increment Length: 5 (ft)

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Fpy (ksi)	S (in ³)	Weight (lb)
0.00		0.3750	43.700	51.566	12229.0	19.14	116.53	78.9	551.2	0.0
5.00		0.3750	42.665	50.334	11373.5	18.65	113.77	79.5	525.1	866.9
10.00		0.3750	41.630	49.102	10558.8	18.16	111.01	80.0	499.6	845.9
15.00		0.3750	40.595	47.871	9784.0	17.68	108.25	80.6	474.7	824.9
20.00		0.3750	39.561	46.639	9048.0	17.19	105.49	81.2	450.5	804.0
25.00		0.3750	38.526	45.407	8349.9	16.70	102.74	81.8	426.9	783.0
30.00		0.3750	37.491	44.176	7688.7	16.22	99.98	82.3	403.9	762.1
35.00		0.3750	36.456	42.944	7063.3	15.73	97.22	82.6	381.6	741.1
40.00		0.3750	35.421	41.712	6472.8	15.24	94.46	82.6	359.9	720.2
45.00		0.3750	34.386	40.480	5916.2	14.76	91.70	82.6	338.9	699.2
49.00	Bot - Section 2	0.3750	33.558	39.495	5494.6	14.37	89.49	82.6	322.5	544.3
50.00		0.3750	33.351	39.249	5392.4	14.27	88.94	82.6	318.5	247.9
53.25	Top - Section 1	0.3125	33.304	32.722	4499.8	17.38	106.57	0.0	0.0	795.2
55.00		0.3125	32.942	32.363	4353.2	17.18	105.41	81.2	260.3	193.8
60.00		0.3125	31.907	31.336	3952.0	16.59	102.10	81.9	244.0	541.9
65.00		0.3125	30.872	30.310	3576.2	16.01	98.79	82.6	228.2	524.4
70.00		0.3125	29.837	29.283	3225.1	15.42	95.48	82.6	212.9	507.0
75.00		0.3125	28.802	28.257	2897.7	14.84	92.17	82.6	198.2	489.5
80.00		0.3125	27.767	27.231	2593.3	14.26	88.86	82.6	183.9	472.0
85.00		0.3125	26.732	26.204	2310.9	13.67	85.54	82.6	170.3	454.6
90.00		0.3125	25.697	25.178	2049.9	13.09	82.23	82.6	157.1	437.1
95.00		0.3125	24.663	24.151	1809.2	12.51	78.92	82.6	144.5	419.6
99.00	Bot - Section 3	0.3125	23.835	23.330	1630.9	12.04	76.27	82.6	134.8	323.1
100.00		0.3125	23.628	23.125	1588.2	11.92	75.61	82.6	132.4	127.5
102.00	Top - Section 2	0.1875	23.589	13.926	963.5	20.77	125.81	0.0	0.0	251.6
105.00		0.1875	22.968	13.557	888.9	20.19	122.50	77.7	76.2	140.3
105.50		0.1875	22.864	13.495	876.8	20.09	121.94	77.8	75.5	23.0
109.00		0.1875	22.140	13.064	795.4	19.41	118.08	78.6	70.8	158.2

13698.2

Wind Loading - Shaft

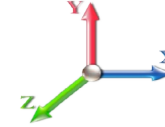
Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20
Wind Load Factor 1.60



Iterations 21

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	19.450	21.40	330.70	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	19.450	21.40	322.87	0.650	0.000	5.00	18.270	11.88	406.5	0.0	1040.2
10.00		1.00	0.85	19.450	21.40	315.03	0.650	0.000	5.00	17.832	11.59	396.8	0.0	1015.1
15.00		1.00	0.86	19.690	21.66	309.09	0.650	0.000	5.00	17.395	11.31	391.8	0.0	989.9
20.00		1.00	0.91	20.851	22.94	309.96	0.650	0.000	5.00	16.957	11.02	404.5	0.0	964.8
25.00		1.00	0.95	21.810	23.99	308.72	0.650	0.000	5.00	16.519	10.74	412.1	0.0	939.6
30.00		1.00	0.99	22.632	24.90	306.04	0.650	0.000	5.00	16.081	10.45	416.4	0.0	914.5
35.00		1.00	1.02	23.356	25.69	302.31	0.650	0.000	5.00	15.643	10.17	418.0	0.0	889.3
40.00		1.00	1.05	24.004	26.40	297.78	0.650	0.000	5.00	15.205	9.88	417.6	0.0	864.2
45.00		1.00	1.07	24.593	27.05	292.60	0.650	0.000	5.00	14.768	9.60	415.5	0.0	839.0
49.00	Bot - Section 2	1.00	1.09	25.029	27.53	288.07	0.650	0.000	4.00	11.499	7.47	329.2	0.0	653.1
50.00		1.00	1.10	25.133	27.65	286.89	0.650	0.000	1.00	2.884	1.87	82.9	0.0	297.5
53.25	Top - Section 1	1.00	1.11	25.462	28.01	282.94	0.650	0.000	3.25	9.251	6.01	269.5	0.0	954.2
55.00		1.00	1.12	25.633	28.20	286.17	0.650	0.000	1.75	4.905	3.19	143.8	0.0	232.5
60.00		1.00	1.14	26.099	28.71	279.69	0.650	0.000	5.00	13.718	8.92	409.6	0.0	650.3
65.00		1.00	1.16	26.535	29.19	272.87	0.650	0.000	5.00	13.281	8.63	403.1	0.0	629.3
70.00		1.00	1.18	26.946	29.64	265.76	0.650	0.000	5.00	12.843	8.35	395.9	0.0	608.3
75.00		1.00	1.19	27.335	30.07	258.39	0.650	0.000	5.00	12.405	8.06	387.9	0.0	587.4
80.00		1.00	1.21	27.704	30.47	250.78	0.650	0.000	5.00	11.967	7.78	379.3	0.0	566.4
85.00		1.00	1.23	28.056	30.86	242.96	0.650	0.000	5.00	11.529	7.49	370.0	0.0	545.5
90.00		1.00	1.24	28.391	31.23	234.95	0.650	0.000	5.00	11.091	7.21	360.2	0.0	524.5
95.00	Appurtenance(s)	1.00	1.25	28.713	31.58	226.76	0.650	0.000	5.00	10.654	6.92	349.9	0.0	503.6
99.00	Bot - Section 3	1.00	1.27	28.961	31.86	220.09	0.650	0.000	4.00	8.208	5.33	271.9	0.0	387.8
100.00		1.00	1.27	29.021	31.92	218.41	0.650	0.000	1.00	2.040	1.33	67.7	0.0	153.0
102.00	Top - Section 2	1.00	1.27	29.142	32.06	215.02	0.650	0.000	2.00	4.027	2.62	134.3	0.0	301.9
105.00		1.00	1.28	29.318	32.25	213.39	0.650	0.000	3.00	5.909	3.84	198.2	0.0	168.3
105.50	Appurtenance(s)	1.00	1.28	29.347	32.28	212.53	0.650	0.000	0.50	0.970	0.63	32.6	0.0	27.6
109.00		1.00	1.29	29.548	32.50	206.50	0.650	0.000	3.50	6.664	4.33	225.3	0.0	189.8
Totals:									109.00			8,490.6		16,437.9

Discrete Appurtenance Forces

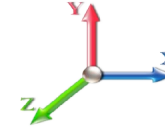
Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20
Wind Load Factor 1.60



Iterations 21

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor	x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	105.50	Air21 B2A/B4P	3	29.347	32.282	0.65	0.75	11.78	329.40	0.000	0.000	608.67	0.00	0.00	
2	105.50	Platform w/ Hand Rails	1	29.347	32.282	1.00	1.00	40.00	2400.00	0.000	0.000	2066.05	0.00	0.00	
3	105.50	4449	3	29.347	32.282	0.50	0.75	2.49	252.00	0.000	0.000	128.48	0.00	0.00	
4	105.50	Ericsson ETW200VA12UB	3	29.347	32.282	0.50	0.75	0.71	39.60	0.000	0.000	36.60	0.00	0.00	
5	105.50	Ericsson KRY112 144	3	29.347	32.282	0.50	0.75	0.62	39.60	0.000	0.000	31.92	0.00	0.00	
6	105.50	APXVAARR24_43-U-NA2	3	29.347	32.282	0.52	0.75	31.88	460.80	0.000	0.000	1646.54	0.00	0.00	
7	105.50	KRD 9011461-B66A-B2A	3	29.347	32.282	0.65	0.75	12.74	475.92	0.000	0.000	658.21	0.00	0.00	
8	105.50	MS-KI22-5 (Kickers w/o	1	29.347	32.282	1.00	1.00	5.33	175.20	0.000	0.000	275.30	0.00	0.00	
9	95.00	RMQP-496-HK	1	28.713	31.584	1.00	1.00	48.00	2938.80	0.000	0.000	2425.67	0.00	0.00	
10	95.00	Commscope	3	28.713	31.584	0.55	0.75	20.43	278.64	0.000	0.000	1032.40	0.00	0.00	
11	95.00	Nokia AAHC - MIMO	3	28.713	31.584	0.56	0.75	7.09	374.40	0.000	0.000	358.17	0.00	0.00	
12	95.00	VHLP2.5-11	2	28.713	31.584	1.00	1.00	16.86	114.24	0.000	0.000	852.02	0.00	0.00	
13	95.00	ALU TD-RRH8x20-25	3	28.713	31.584	0.50	0.75	6.11	252.00	0.000	0.000	308.53	0.00	0.00	
14	95.00	ALU 800 Mhz RRUs	6	28.713	31.584	0.50	0.75	7.51	381.60	0.000	0.000	379.38	0.00	0.00	
15	95.00	ALU 1900 Mhz RRUs	3	28.713	31.584	0.50	0.75	4.09	216.00	0.000	0.000	206.45	0.00	0.00	
Totals:									8,728.20						
											11,014.37				

Total Applied Force Summary

Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20
Wind Load Factor 1.60



Iterations 21

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		406.53	1113.07	0.00	0.00
10.00		396.79	1087.92	0.00	0.00
15.00		391.83	1062.77	0.00	0.00
20.00		404.47	1037.62	0.00	0.00
25.00		412.15	1012.48	0.00	0.00
30.00		416.36	987.33	0.00	0.00
35.00		417.98	962.18	0.00	0.00
40.00		417.56	937.04	0.00	0.00
45.00		415.48	911.89	0.00	0.00
49.00		329.24	711.41	0.00	0.00
50.00		82.92	312.09	0.00	0.00
53.25		269.48	1001.57	0.00	0.00
55.00		143.83	258.04	0.00	0.00
60.00		409.59	723.10	0.00	0.00
65.00		403.15	702.15	0.00	0.00
70.00		395.90	681.19	0.00	0.00
75.00		387.92	660.23	0.00	0.00
80.00		379.28	639.28	0.00	0.00
85.00		370.04	618.32	0.00	0.00
90.00		360.25	597.37	0.00	0.00
95.00	(21) attachments	5912.56	5132.09	0.00	0.00
99.00		271.93	430.20	0.00	0.00
100.00		67.72	163.58	0.00	0.00
102.00		134.26	323.13	0.00	0.00
105.00		198.20	200.16	0.00	0.00
105.50	(20) attachments	5484.31	4205.44	0.00	0.00
109.00		225.27	189.79	0.00	0.00
	Totals:	19,504.97	26,661.42	0.00	0.00

Calculated Forces

Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II

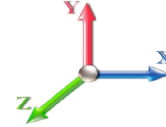


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Load Case: 1.2D + 1.6W 97 mph Wind

Iterations 21

Dead Load Factor 1.20
Wind Load Factor 1.60



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-26.63	-19.55	0.00	-1615.4	0.00	1615.45	3661.29	1830.65	6512.81	3261.25	0.00	0.000	0.000	0.503
5.00	-25.46	-19.22	0.00	-1517.7	0.00	1517.71	3599.77	1799.88	6249.10	3129.20	0.10	-0.182	0.000	0.492
10.00	-24.31	-18.90	0.00	-1421.6	0.00	1421.60	3536.97	1768.49	5988.52	2998.71	0.39	-0.366	0.000	0.481
15.00	-23.19	-18.57	0.00	-1327.1	0.00	1327.12	3472.90	1736.45	5731.22	2869.87	0.87	-0.551	0.000	0.469
20.00	-22.10	-18.23	0.00	-1234.2	0.00	1234.26	3407.57	1703.79	5477.38	2742.76	1.55	-0.737	0.000	0.457
25.00	-21.03	-17.87	0.00	-1143.1	0.00	1143.12	3340.97	1670.48	5227.15	2617.46	2.42	-0.924	0.000	0.443
30.00	-20.00	-17.50	0.00	-1053.7	0.00	1053.77	3273.10	1636.55	4980.70	2494.05	3.49	-1.111	0.000	0.429
35.00	-18.99	-17.13	0.00	-966.26	0.00	966.26	3190.51	1595.26	4718.31	2362.66	4.75	-1.298	0.000	0.415
40.00	-18.01	-16.74	0.00	-880.63	0.00	880.63	3099.00	1549.50	4450.18	2228.40	6.21	-1.484	0.000	0.401
45.00	-17.06	-16.35	0.00	-796.92	0.00	796.92	3007.49	1503.75	4189.89	2098.06	7.87	-1.669	0.000	0.386
49.00	-16.33	-16.03	0.00	-731.51	0.00	731.51	2934.29	1467.14	3987.31	1996.62	9.33	-1.816	0.000	0.372
50.00	-16.00	-15.96	0.00	-715.48	0.00	715.48	2915.98	1457.99	3937.45	1971.65	9.71	-1.853	0.000	0.368
53.25	-14.98	-15.68	0.00	-663.62	0.00	663.62	2384.18	1192.09	3226.87	1615.83	11.02	-1.971	0.000	0.417
55.00	-14.70	-15.56	0.00	-636.19	0.00	636.19	2365.01	1182.50	3165.45	1585.08	11.75	-2.035	0.000	0.408
60.00	-13.94	-15.17	0.00	-558.39	0.00	558.39	2309.37	1154.68	2992.01	1498.23	13.99	-2.230	0.000	0.379
65.00	-13.21	-14.78	0.00	-482.55	0.00	482.55	2251.87	1125.94	2821.03	1412.61	16.43	-2.418	0.000	0.348
70.00	-12.50	-14.39	0.00	-408.65	0.00	408.65	2175.62	1087.81	2632.26	1318.09	19.05	-2.595	0.000	0.316
75.00	-11.82	-14.01	0.00	-336.69	0.00	336.69	2099.36	1049.68	2450.04	1226.84	21.86	-2.759	0.000	0.280
80.00	-11.17	-13.62	0.00	-266.66	0.00	266.66	2023.10	1011.55	2274.35	1138.87	24.83	-2.907	0.000	0.240
85.00	-10.54	-13.24	0.00	-198.55	0.00	198.55	1946.84	973.42	2105.20	1054.16	27.95	-3.035	0.000	0.194
90.00	-9.95	-12.87	0.00	-132.34	0.00	132.34	1870.59	935.29	1942.58	972.73	31.18	-3.137	0.000	0.142
95.00	-5.14	-6.68	0.00	-68.02	0.00	68.02	1794.33	897.16	1786.50	894.58	34.51	-3.206	0.000	0.079
99.00	-4.73	-6.39	0.00	-41.29	0.00	41.29	1733.32	866.66	1666.34	834.41	37.21	-3.241	0.000	0.052
100.00	-4.57	-6.31	0.00	-34.90	0.00	34.90	1718.07	859.04	1636.96	819.69	37.89	-3.247	0.000	0.045
102.00	-4.25	-6.16	0.00	-22.28	0.00	22.28	964.69	482.34	927.47	464.42	39.25	-3.258	0.000	0.053
105.00	-4.06	-5.95	0.00	-3.80	0.00	3.80	947.47	473.74	886.56	443.94	41.30	-3.265	0.000	0.013
105.50	-0.18	-0.24	0.00	-0.82	0.00	0.82	944.56	472.28	879.78	440.54	41.64	-3.265	0.000	0.002
109.00	0.00	-0.23	0.00	0.00	0.00	0.00	923.81	461.90	832.74	416.99	44.04	-3.266	0.000	0.000

Wind Loading - Shaft

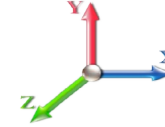
Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90
Wind Load Factor 1.60



Iterations 21

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	19.450	21.40	330.70	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	19.450	21.40	322.87	0.650	0.000	5.00	18.270	11.88	406.5	0.0	780.2
10.00		1.00	0.85	19.450	21.40	315.03	0.650	0.000	5.00	17.832	11.59	396.8	0.0	761.3
15.00		1.00	0.86	19.690	21.66	309.09	0.650	0.000	5.00	17.395	11.31	391.8	0.0	742.4
20.00		1.00	0.91	20.851	22.94	309.96	0.650	0.000	5.00	16.957	11.02	404.5	0.0	723.6
25.00		1.00	0.95	21.810	23.99	308.72	0.650	0.000	5.00	16.519	10.74	412.1	0.0	704.7
30.00		1.00	0.99	22.632	24.90	306.04	0.650	0.000	5.00	16.081	10.45	416.4	0.0	685.9
35.00		1.00	1.02	23.356	25.69	302.31	0.650	0.000	5.00	15.643	10.17	418.0	0.0	667.0
40.00		1.00	1.05	24.004	26.40	297.78	0.650	0.000	5.00	15.205	9.88	417.6	0.0	648.1
45.00		1.00	1.07	24.593	27.05	292.60	0.650	0.000	5.00	14.768	9.60	415.5	0.0	629.3
49.00 Bot - Section 2		1.00	1.09	25.029	27.53	288.07	0.650	0.000	4.00	11.499	7.47	329.2	0.0	489.8
50.00		1.00	1.10	25.133	27.65	286.89	0.650	0.000	1.00	2.884	1.87	82.9	0.0	223.1
53.25 Top - Section 1		1.00	1.11	25.462	28.01	282.94	0.650	0.000	3.25	9.251	6.01	269.5	0.0	715.7
55.00		1.00	1.12	25.633	28.20	286.17	0.650	0.000	1.75	4.905	3.19	143.8	0.0	174.4
60.00		1.00	1.14	26.099	28.71	279.69	0.650	0.000	5.00	13.718	8.92	409.6	0.0	487.7
65.00		1.00	1.16	26.535	29.19	272.87	0.650	0.000	5.00	13.281	8.63	403.1	0.0	472.0
70.00		1.00	1.18	26.946	29.64	265.76	0.650	0.000	5.00	12.843	8.35	395.9	0.0	456.3
75.00		1.00	1.19	27.335	30.07	258.39	0.650	0.000	5.00	12.405	8.06	387.9	0.0	440.5
80.00		1.00	1.21	27.704	30.47	250.78	0.650	0.000	5.00	11.967	7.78	379.3	0.0	424.8
85.00		1.00	1.23	28.056	30.86	242.96	0.650	0.000	5.00	11.529	7.49	370.0	0.0	409.1
90.00		1.00	1.24	28.391	31.23	234.95	0.650	0.000	5.00	11.091	7.21	360.2	0.0	393.4
95.00 Appurtenance(s)		1.00	1.25	28.713	31.58	226.76	0.650	0.000	5.00	10.654	6.92	349.9	0.0	377.7
99.00 Bot - Section 3		1.00	1.27	28.961	31.86	220.09	0.650	0.000	4.00	8.208	5.33	271.9	0.0	290.8
100.00		1.00	1.27	29.021	31.92	218.41	0.650	0.000	1.00	2.040	1.33	67.7	0.0	114.7
102.00 Top - Section 2		1.00	1.27	29.142	32.06	215.02	0.650	0.000	2.00	4.027	2.62	134.3	0.0	226.4
105.00		1.00	1.28	29.318	32.25	213.39	0.650	0.000	3.00	5.909	3.84	198.2	0.0	126.2
105.50 Appurtenance(s)		1.00	1.28	29.347	32.28	212.53	0.650	0.000	0.50	0.970	0.63	32.6	0.0	20.7
109.00		1.00	1.29	29.548	32.50	206.50	0.650	0.000	3.50	6.664	4.33	225.3	0.0	142.3
Totals:									109.00			8,490.6		12,328.4

Discrete Appurtenance Forces

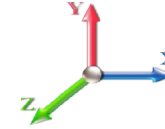
Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90
Wind Load Factor 1.60



Iterations 21

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)	
1	105.50	Air21 B2A/B4P	3	29.347	32.282	0.65	0.75	11.78	247.05	0.000	0.000	608.67	0.00	0.00	
2	105.50	Platform w/ Hand Rails	1	29.347	32.282	1.00	1.00	40.00	1800.00	0.000	0.000	2066.05	0.00	0.00	
3	105.50	4449	3	29.347	32.282	0.50	0.75	2.49	189.00	0.000	0.000	128.48	0.00	0.00	
4	105.50	Ericsson ETW200VA12UB	3	29.347	32.282	0.50	0.75	0.71	29.70	0.000	0.000	36.60	0.00	0.00	
5	105.50	Ericsson KRY112 144	3	29.347	32.282	0.50	0.75	0.62	29.70	0.000	0.000	31.92	0.00	0.00	
6	105.50	APXVAARR24_43-U-NA2	3	29.347	32.282	0.52	0.75	31.88	345.60	0.000	0.000	1646.54	0.00	0.00	
7	105.50	KRD 9011461-B66A-B2A	3	29.347	32.282	0.65	0.75	12.74	356.94	0.000	0.000	658.21	0.00	0.00	
8	105.50	MS-KI22-5 (Kickers w/o	1	29.347	32.282	1.00	1.00	5.33	131.40	0.000	0.000	275.30	0.00	0.00	
9	95.00	RMQP-496-HK	1	28.713	31.584	1.00	1.00	48.00	2204.10	0.000	0.000	2425.67	0.00	0.00	
10	95.00	Commscope	3	28.713	31.584	0.55	0.75	20.43	208.98	0.000	0.000	1032.40	0.00	0.00	
11	95.00	Nokia AAHC - MIMO	3	28.713	31.584	0.56	0.75	7.09	280.80	0.000	0.000	358.17	0.00	0.00	
12	95.00	VHLP2.5-11	2	28.713	31.584	1.00	1.00	16.86	85.68	0.000	0.000	852.02	0.00	0.00	
13	95.00	ALU TD-RRH8x20-25	3	28.713	31.584	0.50	0.75	6.11	189.00	0.000	0.000	308.53	0.00	0.00	
14	95.00	ALU 800 Mhz RRUs	6	28.713	31.584	0.50	0.75	7.51	286.20	0.000	0.000	379.38	0.00	0.00	
15	95.00	ALU 1900 Mhz RRUs	3	28.713	31.584	0.50	0.75	4.09	162.00	0.000	0.000	206.45	0.00	0.00	
Totals:									6,546.15						11,014.37

Total Applied Force Summary

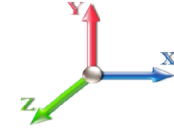
Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90
Wind Load Factor 1.60



Iterations 21

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		406.53	834.80	0.00	0.00
10.00		396.79	815.94	0.00	0.00
15.00		391.83	797.08	0.00	0.00
20.00		404.47	778.22	0.00	0.00
25.00		412.15	759.36	0.00	0.00
30.00		416.36	740.50	0.00	0.00
35.00		417.98	721.64	0.00	0.00
40.00		417.56	702.78	0.00	0.00
45.00		415.48	683.92	0.00	0.00
49.00		329.24	533.55	0.00	0.00
50.00		82.92	234.07	0.00	0.00
53.25		269.48	751.18	0.00	0.00
55.00		143.83	193.53	0.00	0.00
60.00		409.59	542.33	0.00	0.00
65.00		403.15	526.61	0.00	0.00
70.00		395.90	510.89	0.00	0.00
75.00		387.92	495.17	0.00	0.00
80.00		379.28	479.46	0.00	0.00
85.00		370.04	463.74	0.00	0.00
90.00		360.25	448.02	0.00	0.00
95.00	(21) attachments	5912.56	3849.07	0.00	0.00
99.00		271.93	322.65	0.00	0.00
100.00		67.72	122.68	0.00	0.00
102.00		134.26	242.35	0.00	0.00
105.00		198.20	150.12	0.00	0.00
105.50	(20) attachments	5484.31	3154.08	0.00	0.00
109.00		225.27	142.34	0.00	0.00
	Totals:	19,504.97	19,996.06	0.00	0.00

Calculated Forces

Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II

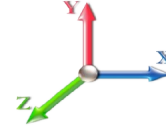


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Load Case: 0.9D + 1.6W 97 mph Wind

Iterations 21

Dead Load Factor 0.90
Wind Load Factor 1.60



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-19.96	-19.54	0.00	-1603.5	0.00	1603.59	3661.29	1830.65	6512.81	3261.25	0.00	0.000	0.000	0.497
5.00	-19.07	-19.19	0.00	-1505.9	0.00	1505.91	3599.77	1799.88	6249.10	3129.20	0.10	-0.181	0.000	0.487
10.00	-18.20	-18.85	0.00	-1409.9	0.00	1409.96	3536.97	1768.49	5988.52	2998.71	0.38	-0.363	0.000	0.475
15.00	-17.34	-18.50	0.00	-1315.7	0.00	1315.72	3472.90	1736.45	5731.22	2869.87	0.86	-0.547	0.000	0.464
20.00	-16.51	-18.15	0.00	-1223.2	0.00	1223.20	3407.57	1703.79	5477.38	2742.76	1.54	-0.731	0.000	0.451
25.00	-15.70	-17.77	0.00	-1132.4	0.00	1132.48	3340.97	1670.48	5227.15	2617.46	2.40	-0.917	0.000	0.437
30.00	-14.91	-17.39	0.00	-1043.6	0.00	1043.61	3273.10	1636.55	4980.70	2494.05	3.46	-1.102	0.000	0.423
35.00	-14.14	-17.00	0.00	-956.65	0.00	956.65	3190.51	1595.26	4718.31	2362.66	4.72	-1.287	0.000	0.409
40.00	-13.40	-16.61	0.00	-871.63	0.00	871.63	3099.00	1549.50	4450.18	2228.40	6.16	-1.471	0.000	0.396
45.00	-12.68	-16.22	0.00	-788.57	0.00	788.57	3007.49	1503.75	4189.89	2098.06	7.80	-1.653	0.000	0.380
49.00	-12.13	-15.89	0.00	-723.71	0.00	723.71	2934.29	1467.14	3987.31	1996.62	9.25	-1.799	0.000	0.367
50.00	-11.88	-15.82	0.00	-707.82	0.00	707.82	2915.98	1457.99	3937.45	1971.65	9.63	-1.836	0.000	0.363
53.25	-11.11	-15.54	0.00	-656.42	0.00	656.42	2384.18	1192.09	3226.87	1615.83	10.92	-1.953	0.000	0.411
55.00	-10.89	-15.41	0.00	-629.23	0.00	629.23	2365.01	1182.50	3165.45	1585.08	11.65	-2.016	0.000	0.402
60.00	-10.31	-15.02	0.00	-552.16	0.00	552.16	2309.37	1154.68	2992.01	1498.23	13.86	-2.209	0.000	0.373
65.00	-9.76	-14.62	0.00	-477.08	0.00	477.08	2251.87	1125.94	2821.03	1412.61	16.28	-2.394	0.000	0.342
70.00	-9.22	-14.23	0.00	-403.96	0.00	403.96	2175.62	1087.81	2632.26	1318.09	18.88	-2.570	0.000	0.311
75.00	-8.71	-13.85	0.00	-332.79	0.00	332.79	2099.36	1049.68	2450.04	1226.84	21.66	-2.732	0.000	0.276
80.00	-8.21	-13.46	0.00	-263.55	0.00	263.55	2023.10	1011.55	2274.35	1138.87	24.60	-2.878	0.000	0.236
85.00	-7.74	-13.09	0.00	-196.23	0.00	196.23	1946.84	973.42	2105.20	1054.16	27.69	-3.005	0.000	0.190
90.00	-7.30	-12.71	0.00	-130.80	0.00	130.80	1870.59	935.29	1942.58	972.73	30.89	-3.105	0.000	0.139
95.00	-3.77	-6.60	0.00	-67.24	0.00	67.24	1794.33	897.16	1786.50	894.58	34.18	-3.174	0.000	0.077
99.00	-3.46	-6.31	0.00	-40.83	0.00	40.83	1733.32	866.66	1666.34	834.41	36.86	-3.208	0.000	0.051
100.00	-3.34	-6.24	0.00	-34.51	0.00	34.51	1718.07	859.04	1636.96	819.69	37.53	-3.214	0.000	0.044
102.00	-3.11	-6.09	0.00	-22.04	0.00	22.04	964.69	482.34	927.47	464.42	38.88	-3.225	0.000	0.051
105.00	-2.97	-5.89	0.00	-3.76	0.00	3.76	947.47	473.74	886.56	443.94	40.91	-3.232	0.000	0.012
105.50	-0.13	-0.23	0.00	-0.82	0.00	0.82	944.56	472.28	879.78	440.54	41.24	-3.232	0.000	0.002
109.00	0.00	-0.23	0.00	0.00	0.00	0.00	923.81	461.90	832.74	416.99	43.61	-3.233	0.000	0.000

Wind Loading - Shaft

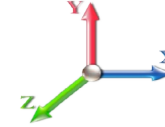
Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20
Wind Load Factor 1.00



Iterations 20

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	5.168	5.68	0.00	1.200	1.410	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	5.168	5.68	0.00	1.200	1.687	5.00	19.676	23.61	134.2	468.5	1508.7
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.792	5.00	19.326	23.19	131.8	487.3	1502.4
15.00		1.00	0.86	5.232	5.76	0.00	1.200	1.860	5.00	18.945	22.73	130.8	494.6	1484.6
20.00		1.00	0.91	5.540	6.09	0.00	1.200	1.912	5.00	18.550	22.26	135.7	496.5	1461.2
25.00		1.00	0.95	5.795	6.37	0.00	1.200	1.953	5.00	18.146	21.78	138.8	495.0	1434.7
30.00		1.00	0.99	6.013	6.61	0.00	1.200	1.988	5.00	17.737	21.28	140.8	491.3	1405.8
35.00		1.00	1.02	6.206	6.83	0.00	1.200	2.017	5.00	17.324	20.79	141.9	486.0	1375.4
40.00		1.00	1.05	6.378	7.02	0.00	1.200	2.044	5.00	16.909	20.29	142.4	479.5	1343.7
45.00		1.00	1.07	6.534	7.19	0.00	1.200	2.068	5.00	16.490	19.79	142.2	471.9	1311.0
49.00	Bot - Section 2	1.00	1.09	6.650	7.32	0.00	1.200	2.085	4.00	12.889	15.47	113.1	372.2	1025.3
50.00		1.00	1.10	6.678	7.35	0.00	1.200	2.089	1.00	3.232	3.88	28.5	94.3	391.9
53.25	Top - Section 1	1.00	1.11	6.765	7.44	0.00	1.200	2.102	3.25	10.390	12.47	92.8	302.9	1257.1
55.00		1.00	1.12	6.811	7.49	0.00	1.200	2.109	1.75	5.520	6.62	49.6	162.0	394.5
60.00		1.00	1.14	6.934	7.63	0.00	1.200	2.127	5.00	15.491	18.59	141.8	453.1	1103.4
65.00		1.00	1.16	7.050	7.76	0.00	1.200	2.144	5.00	15.067	18.08	140.2	443.1	1072.4
70.00		1.00	1.18	7.160	7.88	0.00	1.200	2.159	5.00	14.642	17.57	138.4	432.5	1040.9
75.00		1.00	1.19	7.263	7.99	0.00	1.200	2.174	5.00	14.217	17.06	136.3	421.6	1009.0
80.00		1.00	1.21	7.361	8.10	0.00	1.200	2.188	5.00	13.790	16.55	134.0	410.3	976.7
85.00		1.00	1.23	7.454	8.20	0.00	1.200	2.201	5.00	13.363	16.04	131.5	398.6	944.1
90.00		1.00	1.24	7.544	8.30	0.00	1.200	2.214	5.00	12.936	15.52	128.8	386.7	911.2
95.00	Appurtenance(s)	1.00	1.25	7.629	8.39	0.00	1.200	2.225	5.00	12.508	15.01	126.0	374.5	878.1
99.00	Bot - Section 3	1.00	1.27	7.695	8.46	0.00	1.200	2.234	4.00	9.697	11.64	98.5	291.7	679.4
100.00		1.00	1.27	7.711	8.48	0.00	1.200	2.237	1.00	2.413	2.90	24.6	73.5	226.4
102.00	Top - Section 2	1.00	1.27	7.743	8.52	0.00	1.200	2.241	2.00	4.774	5.73	48.8	144.9	446.8
105.00		1.00	1.28	7.790	8.57	0.00	1.200	2.248	3.00	7.033	8.44	72.3	212.8	381.1
105.50	Appurtenance(s)	1.00	1.28	7.798	8.58	0.00	1.200	2.249	0.50	1.157	1.39	11.9	35.3	63.0
109.00		1.00	1.29	7.851	8.64	0.00	1.200	2.256	3.50	7.980	9.58	82.7	241.1	430.9
Totals:									109.00			2,938.4		26,059.4

Discrete Appurtenance Forces

Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20
Wind Load Factor 1.00



Iterations 20

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)	
1	105.50	Air21 B2A/B4P	3	7.798	8.577	0.65	0.75	14.57	1019.17	0.000	0.000	124.99	0.00	0.00	
2	105.50	Platform w/ Hand Rails	1	7.798	8.577	1.00	1.00	66.98	4498.33	0.000	0.000	574.54	0.00	0.00	
3	105.50	4449	3	7.798	8.577	0.50	0.75	3.56	535.82	0.000	0.000	30.58	0.00	0.00	
4	105.50	Ericsson ETW200VA12UB	3	7.798	8.577	0.50	0.75	1.69	76.53	0.000	0.000	14.53	0.00	0.00	
5	105.50	Ericsson KRY112 144	3	7.798	8.577	0.50	0.75	1.54	71.97	0.000	0.000	13.22	0.00	0.00	
6	105.50	APXVAARR24_43-U-NA2	3	7.798	8.577	0.52	0.75	35.78	2135.97	0.000	0.000	306.86	0.00	0.00	
7	105.50	KRD 9011461-B66A-B2A	3	7.798	8.577	0.65	0.75	15.63	1222.14	0.000	0.000	134.02	0.00	0.00	
8	105.50	MS-KI22-5 (Kickers w/o	1	7.798	8.577	1.00	1.00	12.52	373.84	0.000	0.000	107.40	0.00	0.00	
9	95.00	RMQP-496-HK	1	7.629	8.392	1.00	1.00	90.73	5418.79	0.000	0.000	761.39	0.00	0.00	
10	95.00	Commscope	3	7.629	8.392	0.55	0.75	23.52	1173.62	0.000	0.000	197.39	0.00	0.00	
11	95.00	Nokia AAHC - MIMO	3	7.629	8.392	0.56	0.75	8.91	895.11	0.000	0.000	74.76	0.00	0.00	
12	95.00	VHLP2.5-11	2	7.629	8.392	1.00	1.00	21.21	455.85	0.000	0.000	178.01	0.00	0.00	
13	95.00	ALU TD-RRH8x20-25	3	7.629	8.392	0.50	0.75	7.70	699.22	0.000	0.000	64.63	0.00	0.00	
14	95.00	ALU 800 Mhz RRUs	6	7.629	8.392	0.50	0.75	11.90	820.86	0.000	0.000	99.90	0.00	0.00	
15	95.00	ALU 1900 Mhz RRUs	3	7.629	8.392	0.50	0.75	6.51	455.62	0.000	0.000	54.67	0.00	0.00	
Totals:									19,852.83						2,736.90

Total Applied Force Summary

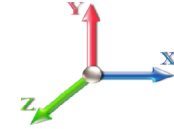
Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20
Wind Load Factor 1.00



Iterations 20

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		134.22	1581.54	0.00	0.00
10.00		131.84	1575.22	0.00	0.00
15.00		130.83	1557.39	0.00	0.00
20.00		135.65	1534.09	0.00	0.00
25.00		138.81	1507.49	0.00	0.00
30.00		140.80	1478.66	0.00	0.00
35.00		141.92	1448.21	0.00	0.00
40.00		142.35	1416.50	0.00	0.00
45.00		142.24	1383.80	0.00	0.00
49.00		113.14	1083.62	0.00	0.00
50.00		28.49	406.44	0.00	0.00
53.25		92.78	1304.44	0.00	0.00
55.00		49.62	419.99	0.00	0.00
60.00		141.79	1176.25	0.00	0.00
65.00		140.22	1145.20	0.00	0.00
70.00		138.38	1113.70	0.00	0.00
75.00		136.30	1081.79	0.00	0.00
80.00		133.99	1049.53	0.00	0.00
85.00		131.49	1016.94	0.00	0.00
90.00		128.81	984.06	0.00	0.00
95.00	(21) attachments	1556.72	10869.97	0.00	0.00
99.00		98.50	721.85	0.00	0.00
100.00		24.56	237.04	0.00	0.00
102.00		48.80	468.04	0.00	0.00
105.00		72.32	412.96	0.00	0.00
105.50	(20) attachments	1318.05	10002.03	0.00	0.00
109.00		82.70	430.86	0.00	0.00
	Totals:	5,675.33	47,407.62	0.00	0.00

Calculated Forces

Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II

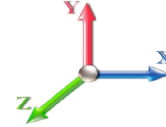


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Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Iterations 20

Dead Load Factor 1.20
Wind Load Factor 1.00



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-47.40	-5.70	0.00	-464.33	0.00	464.33	3661.29	1830.65	6512.81	3261.25	0.00	0.000	0.000	0.155
5.00	-45.82	-5.60	0.00	-435.84	0.00	435.84	3599.77	1799.88	6249.10	3129.20	0.03	-0.052	0.000	0.152
10.00	-44.24	-5.51	0.00	-407.82	0.00	407.82	3536.97	1768.49	5988.52	2998.71	0.11	-0.105	0.000	0.149
15.00	-42.68	-5.42	0.00	-380.27	0.00	380.27	3472.90	1736.45	5731.22	2869.87	0.25	-0.158	0.000	0.145
20.00	-41.14	-5.31	0.00	-353.19	0.00	353.19	3407.57	1703.79	5477.38	2742.76	0.44	-0.212	0.000	0.141
25.00	-39.63	-5.21	0.00	-326.62	0.00	326.62	3340.97	1670.48	5227.15	2617.46	0.69	-0.265	0.000	0.137
30.00	-38.14	-5.09	0.00	-300.59	0.00	300.59	3273.10	1636.55	4980.70	2494.05	1.00	-0.318	0.000	0.132
35.00	-36.69	-4.98	0.00	-275.13	0.00	275.13	3190.51	1595.26	4718.31	2362.66	1.36	-0.372	0.000	0.128
40.00	-35.27	-4.86	0.00	-250.25	0.00	250.25	3099.00	1549.50	4450.18	2228.40	1.78	-0.425	0.000	0.124
45.00	-33.88	-4.73	0.00	-225.97	0.00	225.97	3007.49	1503.75	4189.89	2098.06	2.25	-0.477	0.000	0.119
49.00	-32.80	-4.62	0.00	-207.04	0.00	207.04	2934.29	1467.14	3987.31	1996.62	2.67	-0.519	0.000	0.115
50.00	-32.39	-4.60	0.00	-202.42	0.00	202.42	2915.98	1457.99	3937.45	1971.65	2.78	-0.529	0.000	0.114
53.25	-31.09	-4.51	0.00	-187.46	0.00	187.46	2384.18	1192.09	3226.87	1615.83	3.15	-0.563	0.000	0.129
55.00	-30.66	-4.48	0.00	-179.56	0.00	179.56	2365.01	1182.50	3165.45	1585.08	3.36	-0.581	0.000	0.126
60.00	-29.49	-4.35	0.00	-157.17	0.00	157.17	2309.37	1154.68	2992.01	1498.23	4.00	-0.636	0.000	0.118
65.00	-28.34	-4.22	0.00	-135.41	0.00	135.41	2251.87	1125.94	2821.03	1412.61	4.70	-0.688	0.000	0.108
70.00	-27.22	-4.09	0.00	-114.29	0.00	114.29	2175.62	1087.81	2632.26	1318.09	5.44	-0.738	0.000	0.099
75.00	-26.14	-3.96	0.00	-93.82	0.00	93.82	2099.36	1049.68	2450.04	1226.84	6.24	-0.784	0.000	0.089
80.00	-25.09	-3.83	0.00	-74.01	0.00	74.01	2023.10	1011.55	2274.35	1138.87	7.09	-0.825	0.000	0.077
85.00	-24.07	-3.70	0.00	-54.85	0.00	54.85	1946.84	973.42	2105.20	1054.16	7.97	-0.860	0.000	0.064
90.00	-23.09	-3.56	0.00	-36.36	0.00	36.36	1870.59	935.29	1942.58	972.73	8.89	-0.888	0.000	0.050
95.00	-12.25	-1.84	0.00	-18.54	0.00	18.54	1794.33	897.16	1786.50	894.58	9.83	-0.907	0.000	0.028
99.00	-11.52	-1.73	0.00	-11.18	0.00	11.18	1733.32	866.66	1666.34	834.41	10.59	-0.917	0.000	0.020
100.00	-11.29	-1.70	0.00	-9.45	0.00	9.45	1718.07	859.04	1636.96	819.69	10.79	-0.919	0.000	0.018
102.00	-10.82	-1.65	0.00	-6.04	0.00	6.04	964.69	482.34	927.47	464.42	11.17	-0.921	0.000	0.024
105.00	-10.41	-1.57	0.00	-1.10	0.00	1.10	947.47	473.74	886.56	443.94	11.75	-0.923	0.000	0.013
105.50	-0.43	-0.09	0.00	-0.31	0.00	0.31	944.56	472.28	879.78	440.54	11.85	-0.924	0.000	0.001
109.00	0.00	-0.08	0.00	0.00	0.00	0.00	923.81	461.90	832.74	416.99	12.52	-0.924	0.000	0.000

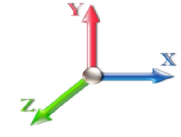
Seismic Segment Forces (Factored)

Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.2D + 1.0E				Iterations 19	
Gust Response Factor	1.10	Sds	0.19	Ss	0.18
Dead Load Factor	1.20	Seismic Load Factor	1.00	Sd1	0.10
Wind Load Factor	0.00	Structure Frequency (f1)	0.48	SA	0.05
				Seismic Importance Factor	1.00



Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50	
0.00		0.00	0.00	0.01	0.01	0.00		
5.00		866.86	0.01	0.05	0.03	16.86		
10.00		845.90	0.02	0.06	0.04	21.52		
15.00		824.94	0.04	0.07	0.04	23.16		
20.00		803.99	0.07	0.07	0.04	23.75		
25.00		783.03	0.11	0.07	0.04	24.05		
30.00		762.08	0.15	0.07	0.03	24.20		
35.00		741.12	0.20	0.06	0.02	23.86		
40.00		720.16	0.26	0.05	0.02	22.42		
45.00		699.21	0.33	0.04	0.01	19.20		
49.00	Bot - Section 2	544.28	0.39	0.02	0.01	11.95		
50.00		247.94	0.41	0.02	0.01	5.01		
53.25	Top - Section 1	795.19	0.46	0.00	0.01	10.73		
55.00		193.79	0.49	-0.01	0.01	1.81		
60.00		541.88	0.58	-0.05	0.01	-1.88		
65.00		524.42	0.68	-0.08	0.03	-7.82		
70.00		506.96	0.79	-0.11	0.05	-10.81		
75.00		489.49	0.90	-0.12	0.09	-9.80		
80.00		472.03	1.02	-0.10	0.14	-4.58		
85.00		454.57	1.16	-0.03	0.22	4.60		
90.00		437.10	1.29	0.11	0.33	17.31		
95.00	Appurtenance(s)	4216.0	1.44	0.36	0.47	332.67		
99.00	Bot - Section 3	323.14	1.56	0.67	0.62	37.97		
100.00		127.47	1.59	0.76	0.66	16.34		
102.00	Top - Section 2	251.60	1.66	0.97	0.75	37.91		
105.00		140.28	1.76	1.34	0.90	26.31		
105.50	Appurtenance(s)	3500.1	1.77	1.41	0.93	679.35		
109.00		158.16	1.89	1.98	1.14	38.37		
Totals:		20,971.7				1,384.5	Total Wind:	19,505.0

Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

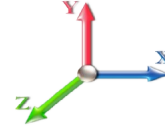
Calculated Forces

Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.2D + 1.0E						Iterations 19
Gust Response Factor	1.10			Sds	0.19	Ss 0.18
Dead Load Factor	1.20	Seismic Load Factor	1.00	Sd1	0.10	S1 0.06
Wind Load Factor	0.00	Structure Frequency (f1)	0.48	SA	0.05	Seismic Importance Factor 1.00



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-26.66	-1.42	0.00	-131.94	0.00	131.94	3661.29	1830.65	6512.81	3261.25	0.00	0.00	0.00	0.048
5.00	-25.55	-1.41	0.00	-124.82	0.00	124.82	3599.77	1799.88	6249.10	3129.20	0.01	-0.01	0.047	
10.00	-24.46	-1.40	0.00	-117.76	0.00	117.76	3536.97	1768.49	5988.52	2998.71	0.03	-0.03	0.046	
15.00	-23.40	-1.38	0.00	-110.78	0.00	110.78	3472.90	1736.45	5731.22	2869.87	0.07	-0.05	0.045	
20.00	-22.36	-1.36	0.00	-103.89	0.00	103.89	3407.57	1703.79	5477.38	2742.76	0.13	-0.06	0.044	
25.00	-21.35	-1.34	0.00	-97.08	0.00	97.08	3340.97	1670.48	5227.15	2617.46	0.20	-0.08	0.043	
30.00	-20.36	-1.32	0.00	-90.38	0.00	90.38	3273.10	1636.55	4980.70	2494.05	0.29	-0.09	0.042	
35.00	-19.40	-1.30	0.00	-83.77	0.00	83.77	3190.51	1595.26	4718.31	2362.66	0.40	-0.11	0.042	
40.00	-18.46	-1.28	0.00	-77.27	0.00	77.27	3099.00	1549.50	4450.18	2228.40	0.52	-0.13	0.041	
45.00	-17.55	-1.27	0.00	-70.86	0.00	70.86	3007.49	1503.75	4189.89	2098.06	0.66	-0.14	0.040	
49.00	-16.83	-1.25	0.00	-65.80	0.00	65.80	2934.29	1467.14	3987.31	1996.62	0.78	-0.15	0.039	
50.00	-16.52	-1.25	0.00	-64.54	0.00	64.54	2915.98	1457.99	3937.45	1971.65	0.81	-0.16	0.038	
53.25	-15.52	-1.24	0.00	-60.48	0.00	60.48	2384.18	1192.09	3226.87	1615.83	0.93	-0.17	0.044	
55.00	-15.26	-1.24	0.00	-58.31	0.00	58.31	2365.01	1182.50	3165.45	1585.08	0.99	-0.17	0.043	
60.00	-14.54	-1.24	0.00	-52.12	0.00	52.12	2309.37	1154.68	2992.01	1498.23	1.18	-0.19	0.041	
65.00	-13.84	-1.24	0.00	-45.91	0.00	45.91	2251.87	1125.94	2821.03	1412.61	1.39	-0.21	0.039	
70.00	-13.15	-1.24	0.00	-39.69	0.00	39.69	2175.62	1087.81	2632.26	1318.09	1.62	-0.23	0.036	
75.00	-12.49	-1.25	0.00	-33.47	0.00	33.47	2099.36	1049.68	2450.04	1226.84	1.87	-0.24	0.033	
80.00	-11.85	-1.25	0.00	-27.24	0.00	27.24	2023.10	1011.55	2274.35	1138.87	2.13	-0.26	0.030	
85.00	-11.24	-1.24	0.00	-21.02	0.00	21.02	1946.84	973.42	2105.20	1054.16	2.41	-0.27	0.026	
90.00	-10.64	-1.22	0.00	-14.82	0.00	14.82	1870.59	935.29	1942.58	972.73	2.70	-0.28	0.021	
95.00	-5.51	-0.86	0.00	-8.71	0.00	8.71	1794.33	897.16	1786.50	894.58	3.00	-0.29	0.013	
99.00	-5.08	-0.82	0.00	-5.25	0.00	5.25	1733.32	866.66	1666.34	834.41	3.25	-0.30	0.009	
100.00	-4.91	-0.81	0.00	-4.43	0.00	4.43	1718.07	859.04	1636.96	819.69	3.31	-0.30	0.008	
102.00	-4.59	-0.77	0.00	-2.81	0.00	2.81	964.69	482.34	927.47	464.42	3.43	-0.30	0.011	
105.00	-4.39	-0.74	0.00	-0.51	0.00	0.51	947.47	473.74	886.56	443.94	3.62	-0.30	0.006	
105.50	-0.19	-0.04	0.00	-0.14	0.00	0.14	944.56	472.28	879.78	440.54	3.65	-0.30	0.001	
109.00	0.00	-0.04	0.00	0.00	0.00	0.00	923.81	461.90	832.74	416.99	3.87	-0.30	0.000	

Seismic Segment Forces (Factored)

Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 0.9D + 1.0E

Iterations 19

Gust Response Factor 1.10	Sds 0.19	Ss 0.18	
Dead Load Factor 0.90	Seismic Load Factor 1.00	Sd1 0.10	
Wind Load Factor 0.00	Structure Frequency (f1) 0.48	S1 0.06	

SA 0.05 **Seismic Importance Factor** 1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.01	0.01	0.00	
5.00		866.86	0.01	0.05	0.03	16.86	
10.00		845.90	0.02	0.06	0.04	21.52	
15.00		824.94	0.04	0.07	0.04	23.16	
20.00		803.99	0.07	0.07	0.04	23.75	
25.00		783.03	0.11	0.07	0.04	24.05	
30.00		762.08	0.15	0.07	0.03	24.20	
35.00		741.12	0.20	0.06	0.02	23.86	
40.00		720.16	0.26	0.05	0.02	22.42	
45.00		699.21	0.33	0.04	0.01	19.20	
49.00	Bot - Section 2	544.28	0.39	0.02	0.01	11.95	
50.00		247.94	0.41	0.02	0.01	5.01	
53.25	Top - Section 1	795.19	0.46	0.00	0.01	10.73	
55.00		193.79	0.49	-0.01	0.01	1.81	
60.00		541.88	0.58	-0.05	0.01	-1.88	
65.00		524.42	0.68	-0.08	0.03	-7.82	
70.00		506.96	0.79	-0.11	0.05	-10.81	
75.00		489.49	0.90	-0.12	0.09	-9.80	
80.00		472.03	1.02	-0.10	0.14	-4.58	
85.00		454.57	1.16	-0.03	0.22	4.60	
90.00		437.10	1.29	0.11	0.33	17.31	
95.00	Appurtenance(s)	4216.0	1.44	0.36	0.47	332.67	
99.00	Bot - Section 3	323.14	1.56	0.67	0.62	37.97	
100.00		127.47	1.59	0.76	0.66	16.34	
102.00	Top - Section 2	251.60	1.66	0.97	0.75	37.91	
105.00		140.28	1.76	1.34	0.90	26.31	
105.50	Appurtenance(s)	3500.1	1.77	1.41	0.93	679.35	
109.00		158.16	1.89	1.98	1.14	38.37	
Totals:		20,971.7				1,384.5	Total Wind: 19,505.0

Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

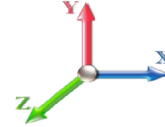
Calculated Forces

Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 0.9D + 1.0E						Iterations 19
Gust Response Factor	1.10			Sds	0.19	Ss 0.18
Dead Load Factor	0.90	Seismic Load Factor	1.00	Sd1	0.10	S1 0.06
Wind Load Factor	0.00	Structure Frequency (f1)	0.48	SA	0.05	Seismic Importance Factor 1.00



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-20.00	-1.42	0.00	-130.91	0.00	130.91	3661.29	1830.65	6512.81	3261.25	0.00	0.00	0.00	0.046
5.00	-19.16	-1.41	0.00	-123.80	0.00	123.80	3599.77	1799.88	6249.10	3129.20	0.01	-0.01	0.045	
10.00	-18.34	-1.39	0.00	-116.75	0.00	116.75	3536.97	1768.49	5988.52	2998.71	0.03	-0.03	0.044	
15.00	-17.55	-1.37	0.00	-109.79	0.00	109.79	3472.90	1736.45	5731.22	2869.87	0.07	-0.05	0.043	
20.00	-16.77	-1.35	0.00	-102.92	0.00	102.92	3407.57	1703.79	5477.38	2742.76	0.13	-0.06	0.042	
25.00	-16.01	-1.33	0.00	-96.16	0.00	96.16	3340.97	1670.48	5227.15	2617.46	0.20	-0.08	0.042	
30.00	-15.27	-1.31	0.00	-89.49	0.00	89.49	3273.10	1636.55	4980.70	2494.05	0.29	-0.09	0.041	
35.00	-14.55	-1.29	0.00	-82.93	0.00	82.93	3190.51	1595.26	4718.31	2362.66	0.39	-0.11	0.040	
40.00	-13.84	-1.27	0.00	-76.48	0.00	76.48	3099.00	1549.50	4450.18	2228.40	0.51	-0.12	0.039	
45.00	-13.16	-1.25	0.00	-70.12	0.00	70.12	3007.49	1503.75	4189.89	2098.06	0.65	-0.14	0.038	
49.00	-12.62	-1.24	0.00	-65.11	0.00	65.11	2934.29	1467.14	3987.31	1996.62	0.78	-0.15	0.037	
50.00	-12.39	-1.24	0.00	-63.87	0.00	63.87	2915.98	1457.99	3937.45	1971.65	0.81	-0.16	0.037	
53.25	-11.64	-1.23	0.00	-59.84	0.00	59.84	2384.18	1192.09	3226.87	1615.83	0.92	-0.17	0.042	
55.00	-11.45	-1.23	0.00	-57.70	0.00	57.70	2365.01	1182.50	3165.45	1585.08	0.98	-0.17	0.041	
60.00	-10.90	-1.23	0.00	-51.56	0.00	51.56	2309.37	1154.68	2992.01	1498.23	1.17	-0.19	0.039	
65.00	-10.38	-1.23	0.00	-45.42	0.00	45.42	2251.87	1125.94	2821.03	1412.61	1.38	-0.21	0.037	
70.00	-9.86	-1.23	0.00	-39.27	0.00	39.27	2175.62	1087.81	2632.26	1318.09	1.61	-0.23	0.034	
75.00	-9.37	-1.23	0.00	-33.12	0.00	33.12	2099.36	1049.68	2450.04	1226.84	1.85	-0.24	0.031	
80.00	-8.89	-1.23	0.00	-26.96	0.00	26.96	2023.10	1011.55	2274.35	1138.87	2.11	-0.26	0.028	
85.00	-8.43	-1.23	0.00	-20.81	0.00	20.81	1946.84	973.42	2105.20	1054.16	2.39	-0.27	0.024	
90.00	-7.98	-1.21	0.00	-14.68	0.00	14.68	1870.59	935.29	1942.58	972.73	2.68	-0.28	0.019	
95.00	-4.13	-0.86	0.00	-8.64	0.00	8.64	1794.33	897.16	1786.50	894.58	2.97	-0.29	0.012	
99.00	-3.81	-0.82	0.00	-5.21	0.00	5.21	1733.32	866.66	1666.34	834.41	3.22	-0.29	0.008	
100.00	-3.68	-0.80	0.00	-4.39	0.00	4.39	1718.07	859.04	1636.96	819.69	3.28	-0.29	0.008	
102.00	-3.44	-0.76	0.00	-2.79	0.00	2.79	964.69	482.34	927.47	464.42	3.40	-0.29	0.010	
105.00	-3.29	-0.73	0.00	-0.50	0.00	0.50	947.47	473.74	886.56	443.94	3.59	-0.30	0.005	
105.50	-0.14	-0.04	0.00	-0.14	0.00	0.14	944.56	472.28	879.78	440.54	3.62	-0.30	0.000	
109.00	0.00	-0.04	0.00	0.00	0.00	0.00	923.81	461.90	832.74	416.99	3.83	-0.30	0.000	

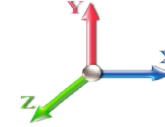
Wind Loading - Shaft

Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II
		Page: 23



Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations 20

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	7.442	8.19	204.55	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	7.442	8.19	199.71	0.650	0.000	5.00	18.270	11.88	97.2	0.0	866.9
10.00		1.00	0.85	7.442	8.19	194.87	0.650	0.000	5.00	17.832	11.59	94.9	0.0	845.9
15.00		1.00	0.86	7.534	8.29	191.19	0.650	0.000	5.00	17.395	11.31	93.7	0.0	824.9
20.00		1.00	0.91	7.978	8.78	191.73	0.650	0.000	5.00	16.957	11.02	96.7	0.0	804.0
25.00		1.00	0.95	8.345	9.18	190.96	0.650	0.000	5.00	16.519	10.74	98.6	0.0	783.0
30.00		1.00	0.99	8.659	9.53	189.30	0.650	0.000	5.00	16.081	10.45	99.6	0.0	762.1
35.00		1.00	1.02	8.936	9.83	187.00	0.650	0.000	5.00	15.643	10.17	100.0	0.0	741.1
40.00		1.00	1.05	9.184	10.10	184.19	0.650	0.000	5.00	15.205	9.88	99.9	0.0	720.2
45.00		1.00	1.07	9.410	10.35	180.99	0.650	0.000	5.00	14.768	9.60	99.4	0.0	699.2
49.00	Bot - Section 2	1.00	1.09	9.576	10.53	178.19	0.650	0.000	4.00	11.499	7.47	78.7	0.0	544.3
50.00		1.00	1.10	9.616	10.58	177.46	0.650	0.000	1.00	2.884	1.87	19.8	0.0	247.9
53.25	Top - Section 1	1.00	1.11	9.742	10.72	175.02	0.650	0.000	3.25	9.251	6.01	64.4	0.0	795.2
55.00		1.00	1.12	9.807	10.79	177.01	0.650	0.000	1.75	4.905	3.19	34.4	0.0	193.8
60.00		1.00	1.14	9.986	10.98	173.00	0.650	0.000	5.00	13.718	8.92	97.9	0.0	541.9
65.00		1.00	1.16	10.153	11.17	168.79	0.650	0.000	5.00	13.281	8.63	96.4	0.0	524.4
70.00		1.00	1.18	10.310	11.34	164.39	0.650	0.000	5.00	12.843	8.35	94.7	0.0	507.0
75.00		1.00	1.19	10.459	11.50	159.83	0.650	0.000	5.00	12.405	8.06	92.8	0.0	489.5
80.00		1.00	1.21	10.600	11.66	155.12	0.650	0.000	5.00	11.967	7.78	90.7	0.0	472.0
85.00		1.00	1.23	10.734	11.81	150.28	0.650	0.000	5.00	11.529	7.49	88.5	0.0	454.6
90.00		1.00	1.24	10.863	11.95	145.33	0.650	0.000	5.00	11.091	7.21	86.1	0.0	437.1
95.00	Appurtenance(s)	1.00	1.25	10.986	12.08	140.26	0.650	0.000	5.00	10.654	6.92	83.7	0.0	419.6
99.00	Bot - Section 3	1.00	1.27	11.081	12.19	136.14	0.650	0.000	4.00	8.208	5.33	65.0	0.0	323.1
100.00		1.00	1.27	11.104	12.21	135.10	0.650	0.000	1.00	2.040	1.33	16.2	0.0	127.5
102.00	Top - Section 2	1.00	1.27	11.150	12.26	133.00	0.650	0.000	2.00	4.027	2.62	32.1	0.0	251.6
105.00		1.00	1.28	11.218	12.34	131.99	0.650	0.000	3.00	5.909	3.84	47.4	0.0	140.3
105.50	Appurtenance(s)	1.00	1.28	11.229	12.35	131.46	0.650	0.000	0.50	0.970	0.63	7.8	0.0	23.0
109.00		1.00	1.29	11.305	12.44	127.73	0.650	0.000	3.50	6.664	4.33	53.9	0.0	158.2
Totals:									109.00			2,030.4		13,698.2

Discrete Appurtenance Forces

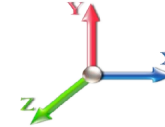
Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations 20

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)	
1	105.50	Air21 B2A/B4P	3	11.229	12.351	0.65	0.75	11.78	274.50	0.000	0.000	145.55	0.00	0.00	
2	105.50	Platform w/ Hand Rails	1	11.229	12.351	1.00	1.00	40.00	2000.00	0.000	0.000	494.06	0.00	0.00	
3	105.50	4449	3	11.229	12.351	0.50	0.75	2.49	210.00	0.000	0.000	30.72	0.00	0.00	
4	105.50	Ericsson ETW200VA12UB	3	11.229	12.351	0.50	0.75	0.71	33.00	0.000	0.000	8.75	0.00	0.00	
5	105.50	Ericsson KRY112 144	3	11.229	12.351	0.50	0.75	0.62	33.00	0.000	0.000	7.63	0.00	0.00	
6	105.50	APXVAARR24_43-U-NA2	3	11.229	12.351	0.52	0.75	31.88	384.00	0.000	0.000	393.74	0.00	0.00	
7	105.50	KRD 9011461-B66A-B2A	3	11.229	12.351	0.65	0.75	12.74	396.60	0.000	0.000	157.40	0.00	0.00	
8	105.50	MS-KI22-5 (Kickers w/o	1	11.229	12.351	1.00	1.00	5.33	146.00	0.000	0.000	65.83	0.00	0.00	
9	95.00	RMQP-496-HK	1	10.986	12.085	1.00	1.00	48.00	2449.00	0.000	0.000	580.06	0.00	0.00	
10	95.00	Commscope	3	10.986	12.085	0.55	0.75	20.43	232.20	0.000	0.000	246.88	0.00	0.00	
11	95.00	Nokia AAHC - MIMO	3	10.986	12.085	0.56	0.75	7.09	312.00	0.000	0.000	85.65	0.00	0.00	
12	95.00	VHLP2.5-11	2	10.986	12.085	1.00	1.00	16.86	95.20	0.000	0.000	203.74	0.00	0.00	
13	95.00	ALU TD-RRH8x20-25	3	10.986	12.085	0.50	0.75	6.11	210.00	0.000	0.000	73.78	0.00	0.00	
14	95.00	ALU 800 Mhz RRUs	6	10.986	12.085	0.50	0.75	7.51	318.00	0.000	0.000	90.72	0.00	0.00	
15	95.00	ALU 1900 Mhz RRUs	3	10.986	12.085	0.50	0.75	4.09	180.00	0.000	0.000	49.37	0.00	0.00	
Totals:									7,273.50						2,633.90

Total Applied Force Summary

Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations 20

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		97.22	927.56	0.00	0.00
10.00		94.89	906.60	0.00	0.00
15.00		93.70	885.64	0.00	0.00
20.00		96.72	864.69	0.00	0.00
25.00		98.56	843.73	0.00	0.00
30.00		99.57	822.78	0.00	0.00
35.00		99.95	801.82	0.00	0.00
40.00		99.85	780.86	0.00	0.00
45.00		99.35	759.91	0.00	0.00
49.00		78.73	592.84	0.00	0.00
50.00		19.83	260.08	0.00	0.00
53.25		64.44	834.64	0.00	0.00
55.00		34.39	215.03	0.00	0.00
60.00		97.95	602.58	0.00	0.00
65.00		96.41	585.12	0.00	0.00
70.00		94.67	567.66	0.00	0.00
75.00		92.76	550.19	0.00	0.00
80.00		90.70	532.73	0.00	0.00
85.00		88.49	515.27	0.00	0.00
90.00		86.15	497.80	0.00	0.00
95.00	(21) attachments	1413.89	4276.74	0.00	0.00
99.00		65.03	358.50	0.00	0.00
100.00		16.20	136.31	0.00	0.00
102.00		32.11	269.28	0.00	0.00
105.00		47.40	166.80	0.00	0.00
105.50	(20) attachments	1311.48	3504.53	0.00	0.00
109.00		53.87	158.16	0.00	0.00
	Totals:	4,664.28	22,217.85	0.00	0.00

Calculated Forces

Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II

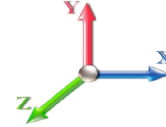


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Load Case: 1.0D + 1.0W 60 mph Wind

Iterations 20

Dead Load Factor 1.00
Wind Load Factor 1.00



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-22.22	-4.67	0.00	-384.60	0.00	384.60	3661.29	1830.65	6512.81	3261.25	0.00	0.000	0.000	0.124
5.00	-21.29	-4.59	0.00	-361.23	0.00	361.23	3599.77	1799.88	6249.10	3129.20	0.02	-0.043	0.000	0.121
10.00	-20.38	-4.51	0.00	-338.28	0.00	338.28	3536.97	1768.49	5988.52	2998.71	0.09	-0.087	0.000	0.119
15.00	-19.49	-4.43	0.00	-315.72	0.00	315.72	3472.90	1736.45	5731.22	2869.87	0.21	-0.131	0.000	0.116
20.00	-18.62	-4.35	0.00	-293.57	0.00	293.57	3407.57	1703.79	5477.38	2742.76	0.37	-0.175	0.000	0.113
25.00	-17.77	-4.26	0.00	-271.84	0.00	271.84	3340.97	1670.48	5227.15	2617.46	0.58	-0.220	0.000	0.109
30.00	-16.95	-4.17	0.00	-250.55	0.00	250.55	3273.10	1636.55	4980.70	2494.05	0.83	-0.264	0.000	0.106
35.00	-16.14	-4.08	0.00	-229.71	0.00	229.71	3190.51	1595.26	4718.31	2362.66	1.13	-0.309	0.000	0.102
40.00	-15.36	-3.98	0.00	-209.33	0.00	209.33	3099.00	1549.50	4450.18	2228.40	1.48	-0.353	0.000	0.099
45.00	-14.60	-3.89	0.00	-189.41	0.00	189.41	3007.49	1503.75	4189.89	2098.06	1.87	-0.397	0.000	0.095
49.00	-14.00	-3.81	0.00	-173.85	0.00	173.85	2934.29	1467.14	3987.31	1996.62	2.22	-0.432	0.000	0.092
50.00	-13.74	-3.79	0.00	-170.04	0.00	170.04	2915.98	1457.99	3937.45	1971.65	2.31	-0.441	0.000	0.091
53.25	-12.91	-3.73	0.00	-157.70	0.00	157.70	2384.18	1192.09	3226.87	1615.83	2.62	-0.469	0.000	0.103
55.00	-12.69	-3.70	0.00	-151.18	0.00	151.18	2365.01	1182.50	3165.45	1585.08	2.80	-0.484	0.000	0.101
60.00	-12.08	-3.61	0.00	-132.68	0.00	132.68	2309.37	1154.68	2992.01	1498.23	3.33	-0.530	0.000	0.094
65.00	-11.50	-3.51	0.00	-114.65	0.00	114.65	2251.87	1125.94	2821.03	1412.61	3.91	-0.575	0.000	0.086
70.00	-10.93	-3.42	0.00	-97.09	0.00	97.09	2175.62	1087.81	2632.26	1318.09	4.53	-0.617	0.000	0.079
75.00	-10.38	-3.33	0.00	-79.99	0.00	79.99	2099.36	1049.68	2450.04	1226.84	5.20	-0.656	0.000	0.070
80.00	-9.84	-3.24	0.00	-63.35	0.00	63.35	2023.10	1011.55	2274.35	1138.87	5.91	-0.691	0.000	0.061
85.00	-9.33	-3.15	0.00	-47.17	0.00	47.17	1946.84	973.42	2105.20	1054.16	6.65	-0.722	0.000	0.050
90.00	-8.83	-3.06	0.00	-31.44	0.00	31.44	1870.59	935.29	1942.58	972.73	7.42	-0.746	0.000	0.037
95.00	-4.57	-1.59	0.00	-16.16	0.00	16.16	1794.33	897.16	1786.50	894.58	8.21	-0.762	0.000	0.021
99.00	-4.22	-1.52	0.00	-9.81	0.00	9.81	1733.32	866.66	1666.34	834.41	8.85	-0.770	0.000	0.014
100.00	-4.08	-1.50	0.00	-8.30	0.00	8.30	1718.07	859.04	1636.96	819.69	9.01	-0.772	0.000	0.012
102.00	-3.81	-1.46	0.00	-5.30	0.00	5.30	964.69	482.34	927.47	464.42	9.34	-0.774	0.000	0.015
105.00	-3.64	-1.41	0.00	-0.90	0.00	0.90	947.47	473.74	886.56	443.94	9.82	-0.776	0.000	0.006
105.50	-0.16	-0.06	0.00	-0.20	0.00	0.20	944.56	472.28	879.78	440.54	9.91	-0.776	0.000	0.001
109.00	0.00	-0.05	0.00	0.00	0.00	0.00	923.81	461.90	832.74	416.99	10.47	-0.776	0.000	0.000

Final Analysis Summary

Structure: CT13529-A-SBA	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II
		Page: 27



Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 97 mph Wind	19.5	0.00	26.63	0.00	0.00	1615.45
0.9D + 1.6W 97 mph Wind	19.5	0.00	19.96	0.00	0.00	1603.59
1.2D + 1.0Di + 1.0Wi 50 mph Wind	5.7	0.00	47.40	0.00	0.00	464.33
1.2D + 1.0E	1.4	0.00	26.66	0.00	0.00	131.94
0.9D + 1.0E	1.4	0.00	20.00	0.00	0.00	130.91
1.0D + 1.0W 60 mph Wind	4.7	0.00	22.22	0.00	0.00	384.60

Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 97 mph Wind	-26.63	-19.55	0.00	-1615.4	0.00	-1615.4	3661.29	1830.6	6512.81	3261.25	0.00	0.503
0.9D + 1.6W 97 mph Wind	-19.96	-19.54	0.00	-1603.5	0.00	-1603.5	3661.29	1830.6	6512.81	3261.25	0.00	0.497
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-47.40	-5.70	0.00	-464.33	0.00	-464.33	3661.29	1830.6	6512.81	3261.25	0.00	0.155
1.2D + 1.0E	-26.66	-1.42	0.00	-131.94	0.00	-131.94	3661.29	1830.6	6512.81	3261.25	0.00	0.048
0.9D + 1.0E	-20.00	-1.42	0.00	-130.91	0.00	-130.91	3661.29	1830.6	6512.81	3261.25	0.00	0.046
1.0D + 1.0W 60 mph Wind	-22.22	-4.67	0.00	-384.60	0.00	-384.60	3661.29	1830.6	6512.81	3261.25	0.00	0.124

Base Plate Summary

Structure: CT13529-A-SB	Code: EIA/TIA-222-G	8/2/2019
Site Name: Manchester 1	Exposure: C	
Height: 109.00 (ft)	Crest Height: 0.00	
Base Elev: 1.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II
		Page: 28



Reactions	Base Plate	Anchor Bolts
Original Design	Yield (ksi): 60.00	Bolt Circle: 50.00
Moment (kip-ft): 2581.67	Width (in): 49.00	Number Bolts: 12.00
Axial (kip): 41.24	Style: Clipped	Bolt Type: 2.25" 18J
Shear (kip): 27.34	Polygon Sides: 4.00	Bolt Diameter (in): 2.25
Analysis	Clip Length (in): 6.00	Yield (ksi): 75.00
Moment (kip-ft): 1615.45	Effective Len (in): 9.37	Ultimate (ksi): 100.00
Axial (kip): 47.40	Moment (kip-in): 419.54	Arrangement: Clustered
Shear (kip): 19.55	Allow Stress (ksi): 81.00	Cluster Dist (in): 6.00
	Applied Stress (ksi): 0.00	Start Angle (deg): 45.00
Moment Design %: 62.57	Stress Ratio: 0.44	Compression
		Force (kip): 133.19
		Allowable (kip): 260.00
		Ratio: 0.52
		Tension
		Force (kip): 125.29
		Allowable (kip): 260.00
		Ratio: 0.49



Monopole Mat Foundation Design

Date
8/2/2019

Customer Name:	T-Mobile	EIA/TIA Standard:	EIA-222-G
Site Name:		Structure Height (Ft.):	109
Site Number:	CT13529-A-SBA	Engineer Name:	J. Chen
Engr. Number:	81986	Engineer Login ID:	

Foundation Info Obtained from:

Drawings/Calculations
Monopole
Analysis

Structure Type:

Analysis or Design?

Base Reactions (Factored):

Axial Load (Kips):	47.4	Shear Force (Kips):	19.5
Uplift Force (Kips):	0.0	Moment (Kips-ft):	1615.4

Allowable overstress %: 5.0%

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	6.0	Depth of Base BG (ft.):	5.5
Pier Height A. G. (ft.):	0.50	Thickness of Pad (ft.):	1.50
Length of Pad (ft.):	21	Width of Pad (ft.):	21

Final Length of pad (ft)	21.0	Final width of pad (ft):	21.0
--------------------------	------	--------------------------	------

Material Properties and Rebar Info:

Concrete Strength (psi):	4500	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	8	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	26	Tie Spacing (in):	12.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	8	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf

Rebar at the bottom of the concrete pad:

Qty. of Rebar in Pad (L):	30	Qty. of Rebar in Pad (W):	30
---------------------------	----	---------------------------	----

Rebar at the top of the concrete pad:

Qty. of Rebar in Pad (L):	30	Qty. of Rebar in Pad (W):	30
---------------------------	----	---------------------------	----

Apply 1.35 factor for e/w Per G: 1.35

Soil Design Parameters:

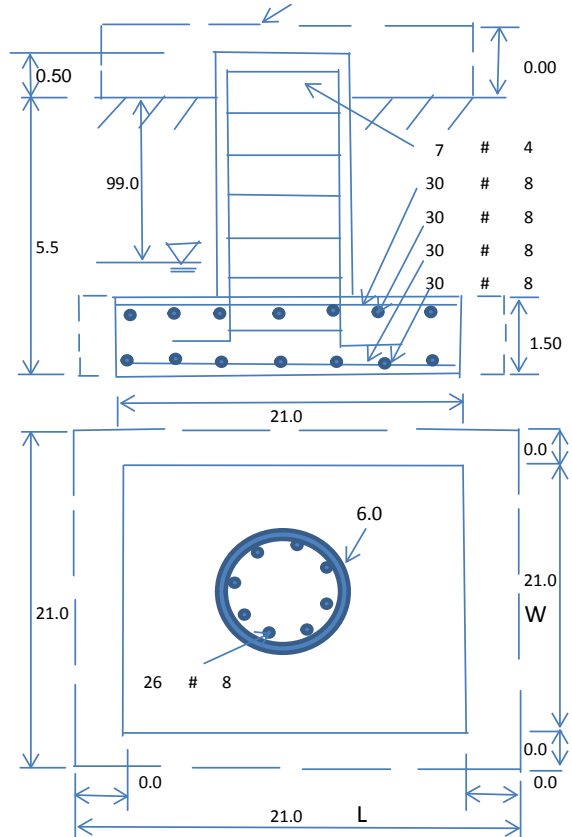
Soil Unit Weight (pcf):	120.0	Soil Buoyant Weight:	50.0	Pcf		
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	12000	Ultimate Skin Friction:	175	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	Yes		Angle from Bottm of Pad:	25
Consider soil hor. resist. for OTM.:	No	Reduction factor on the maximum soil bearing pressure:	1.00			

Foundation Analysis and Design:

Uplift Strength Reduction Factor:	0.75	Compression Strength Reduction Factor:	0.75
Total Dry Soil Volume (cu. Ft.):	1650.90	Total Dry Soil Weight (Kips):	198.11
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	198.11	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	788.73	Total Dry Concrete Weight (Kips):	118.31
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	118.31	Total Vertical Load on Base (Kips):	363.82

Check Soil Capacities:

Calculated Maxium Net Soil Pressure under the base (psf):	1946	<	Allowable Factored Soil Bearing (psf):	9000	0.22	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	3487.9	>	Design Factored Momont (kips-ft):	1732	0.50	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	2.01					OK!



Check the capacities of Reinforcing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75
Strength reduction factor (Axial compression):	0.65	Wind Load Factor on Concrete Design:	1.00

Load/
Capacity
Ratio

(1) Concrete Pier:

Vertical Steel Rebar Area (sq. in./each):	0.79	Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	3009.3	> Design Factored Moment (Mu, Kips-F	1703.2	0.57	OK!
Calculated Shear Capacity (Kips):	524.9	> Design Factored Shear (Kips):	19.5	0.04	OK!
Calculated Tension Capacity (Tn, Kips):	1109.2	> Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	8057.4	> Design Factored Axial Load (Pu Kips):	47.4	0.01	OK!
Moment & Axial Strength Combination:	0.57	OK! Check Tie Spacing (Design/Required):	1		OK!
Pier Reinforcement Ratio:	0.005	Reinforcement Ratio is satisfied per ACI			

(2).Concrete Pad:

One-Way Design Shear Capacity (L-Direction, Kips):	367.7	> One-Way Factored Shear (L-D. Kips):	146.7	0.40	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	367.7	> One-Way Factored Shear (W-D., Kips)	146.7	0.40	OK!
One-Way Design Shear Capacity (Corner-Corner, Kips):	372.6	> One-Way Factored Shear (C-C, Kips):	143.9	0.39	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0065	OK! Lower Steel Pad Reinf. Ratio (W-Direc	0.0065		
Lower Steel Pad Moment Capacity (L-Direction, Kips-ft):	1465.4	> Moment at Bottom (L-Dir. K-Ft):	605.2	0.41	OK!
Lower Steel Pad Moment Capacity (W-Direction, Kips-ft):	1465.4	> Moment at Bottom (W-Dir. K-Ft):	605.2	0.41	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	2043.3	> Moment at Bottom (C-C Dir. K-Ft):	855.9	0.42	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0065	OK! Upper Steel Reinf. Ratio (W-Dir.):	0.0065		
Upper Steel Pad Moment Capacity (L-Direc. Kips-ft):	1465.4	> Moment at the top (L-Dir K-Ft):	248.2	0.17	OK!
Upper Steel Pad Moment Capacity (W-Direc. Kips-ft):	1465.4	> Moment at the top (W-Dir K-Ft):	248.2	0.17	OK!
Upper Steel Pad Moment Capacity (Corner-Corner, K-ft):	2043.3	> Moment at the top (C-C Dir. K-Ft):	233.0	0.11	OK!

(3).Check Punching Shear Capacity due to Moment in the Pier:

Moment transferred by punching shear:	646.2	k-ft.	Max. factored shear stress $v_{u,CD}$:	2.4	Psi
Max. factored shear stress $v_{u,AB}$:	18.2	Psi	Factored shear Strength ϕv_n :	201.2	Psi
Max. factored shear stress v_u :	18.2	Psi	Check Usage of Punching Shear Capacity:	0.09	OK!

EXHIBIT 8



Tower Engineering Solutions

Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

Post-Mod Antenna Mount Analysis Report

Existing 109-Ft Monopole Tower

Customer Name: SBA Communications Corp

Customer Site Number: CT13529-A-SBA / Manchester 1

Customer Site Name: Manchester 1

Carrier Name: T-Mobile (App#: 117036-1)

Carrier Site ID / Name: CTHA075D / HA075/Optasite

Site Location: 93 Lake Street

Manchester, Connecticut

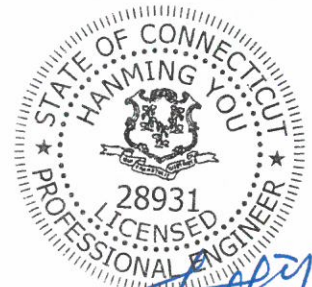
Hartford County

Latitude: 41.789083

Longitude: -72.482083

Analysis Result:

Max Structural Usage: 85.4% [Pass]



Report Prepared By : Mohammad Khanfar

Introduction

The purpose of this report is to summarize the analysis results on the Platform w/ Hand Rails at 105.00' elevation including the proposed modifications to support the proposed antenna configuration. Any existing modification listed under Sources of Information was assumed completed and was included in this analysis.

The proposed modification by **TES** listed under Sources of Information was considered completed and was included in this analysis.

Sources of Information

Mount Drawings	Mount info from SBA Application #: 117036, v1
Antenna Loading	SBA Application #: 117036, v1 dated 07/22/2019
Existing Modification	N/A
Proposed Modification	TES Project No. 82735

Analysis Criteria

Basic Wind Speed Used in the Analysis: $V_{ULT} = 125$ mph (3-Sec. Gust) / Equivalent to
 $V_{ASD} = 97$ mph (3-Sec. Gust)

Basic Wind Speed with Ice: 50 mph (3-Sec. Gust) with 1" radial ice concurrent

Operational Wind Speed: 60 mph +0" Radial ice

Standard/Codes: ANSI/TIA/EIA 222-G / 2015 IBC / 2018 Connecticut State

Exposure Category: C

Structure Class: II

Topographic Category: 1

Crest Height (Ft): 0

Mount Information

Platform w/ Hand Rails at 105.00' elevation

Final Antenna Configuration

- 3 Ericsson Air 21 B2A/B4P
- 3 Ericsson Air32 KRD901146-1_B66A_B2A
- 3 RFS APXVAARR24_43-U-NA20
- 3 Ericsson KRY 112 144/1
- 3 Andrew ETW200VA12UB
- 3 Ericsson Radio 4449 B71+B12

Any proposed antennas not currently installed should be mounted such that the centers of the antennas do not exceed 0.5 ft vertically from the center of the Platform w/ Hand Rails.

Analysis Results

Our calculations have determined that under design wind load the existing mounts will be structurally adequate to support the proposed antenna configuration after the proposed modification is successfully completed. The maximum structural usage is 85.4%, which occurs in the mount pipe. The proposed equipment must be installed as stipulated in the Final Antenna Configuration section of this report. The analysis results are void if the proposed equipment is not installed in accordance with this report.

Attachments

1. Mount Photos Before Modification
2. Antenna Placement Diagram
3. Mount Mapping Information
4. Analysis Calculations

Standard Conditions

1. The loading configuration as analyzed in this report is as provided from the customer. Any deviation from this design shall be communicated to TES to verify deviation will not adversely impact the analysis.
2. The analysis is based on the presumption that the antenna mount members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.
3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion. The mount analysis is not a condition assessment of the mount.
4. The mount analysis was performed in accordance with the loading provided, and if applicable the modification required to support the additional loading.
5. If the mount is modified, installation must adhere to the configuration communicated in the modification drawings.
6. The modification drawings are not intended to convey means or methods. These are the responsibility of the installing contractor.
7. Rigging plan review is available if the contractor requires for a construction class IV or other if required. Review fee would apply.
8. The mount modification package was created based upon information provided for the mount loading. The underlying tower is assumed to provide support and sufficient rigidity to support the mount loads as a tower analysis was not part of the mount analysis.
9. TES is not responsible for modifications to climbing facilities unless communicated to TES in writing.



Structure: CT13529-A-SBA - Manchester 1

Sector: **A**

7/22/2019

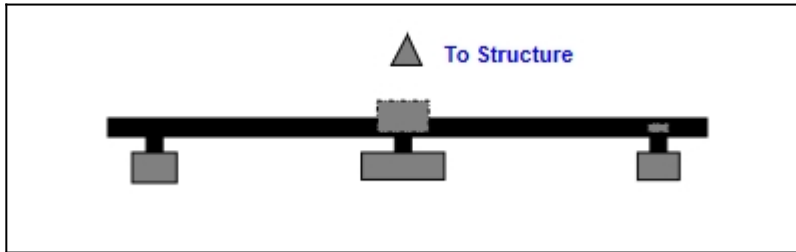
Structure Type: Monopole



Mount Elev: 105.00

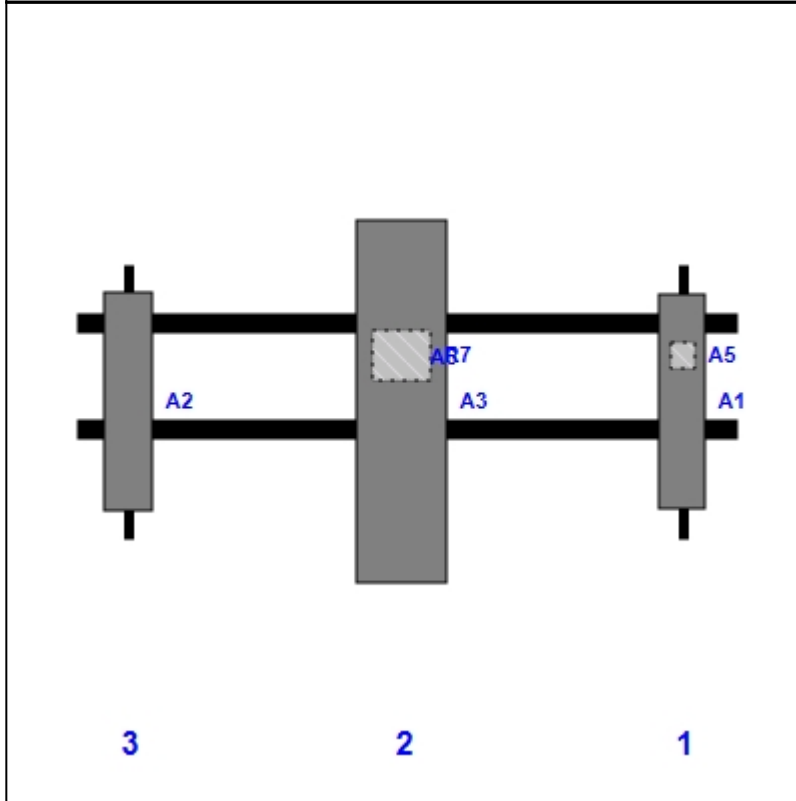
Page: 1

Plan View



Front View

Looking Toward Structure



Ref	Model	Height (in)	Width (in)	H Dist From Left	Pipe	Pipe Pos V	Antenna Pos	Center Ant From Top	Antenna H Offset
A1	Air 21 B2A/B4P	56.00	12.10	160.00	1	a	Front	36.00	0.00
A5	KRY 112 144/1	6.90	6.10	160.00	1	a	Behind	24.00	0.00
A3	APXVAARR24_43-U-NA20	95.90	24.00	86.00	2	a	Front	36.00	0.00
A6	ETW200VA12UB	6.30	7.70	86.00	2	a	Behind	24.00	0.00
R7	Radio 4449 B71+B12	13.10	14.90	86.00	2	a	Behind	24.00	0.00
A2	Air32	57.00	12.90	14.00	3	a	Front	36.00	0.00

Structure: CT13529-A-SBA - Manchester 1

Sector: B

7/22/2019

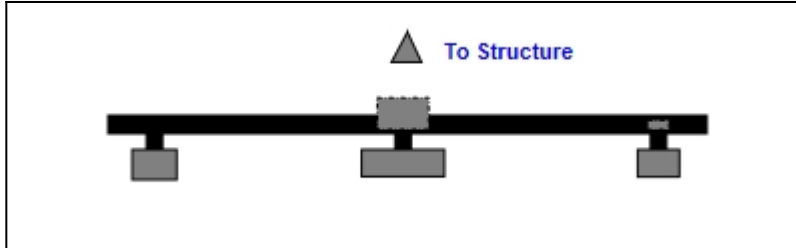
Structure Type: Monopole



Mount Elev: 105.00

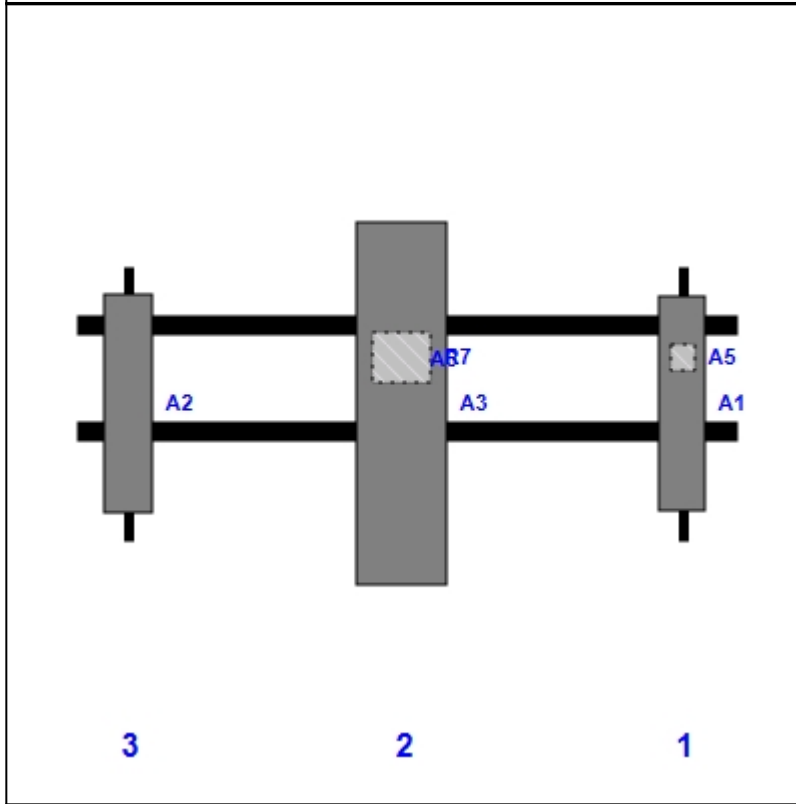
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Plan View



Front View

Looking Toward Structure



Ref	Model	Height (in)	Width (in)	H Dist From Left	Pipe	Pipe Pos V	Antenna Pos	Center Ant From Top	Antenna H Offset
A1	Air 21 B2A/B4P	56.00	12.10	160.00	1	a	Front	36.00	0.00
A5	KRY 112 144/1	6.90	6.10	160.00	1	a	Behind	24.00	0.00
A3	APXVAARR24_43-U-NA20	95.90	24.00	86.00	2	a	Front	36.00	0.00
A6	ETW200VA12UB	6.30	7.70	86.00	2	a	Behind	24.00	0.00
R7	Radio 4449 B71+B12	13.10	14.90	86.00	2	a	Behind	24.00	0.00
A2	Air32	57.00	12.90	14.00	3	a	Front	36.00	0.00

Structure: CT13529-A-SBA - Manchester 1

Sector: C

7/22/2019

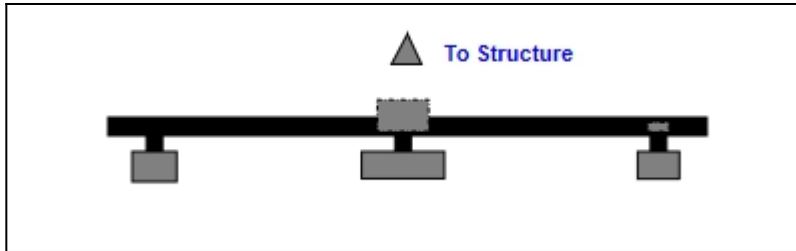
Structure Type: Monopole

Mount Elev: 105.00

Page: 3

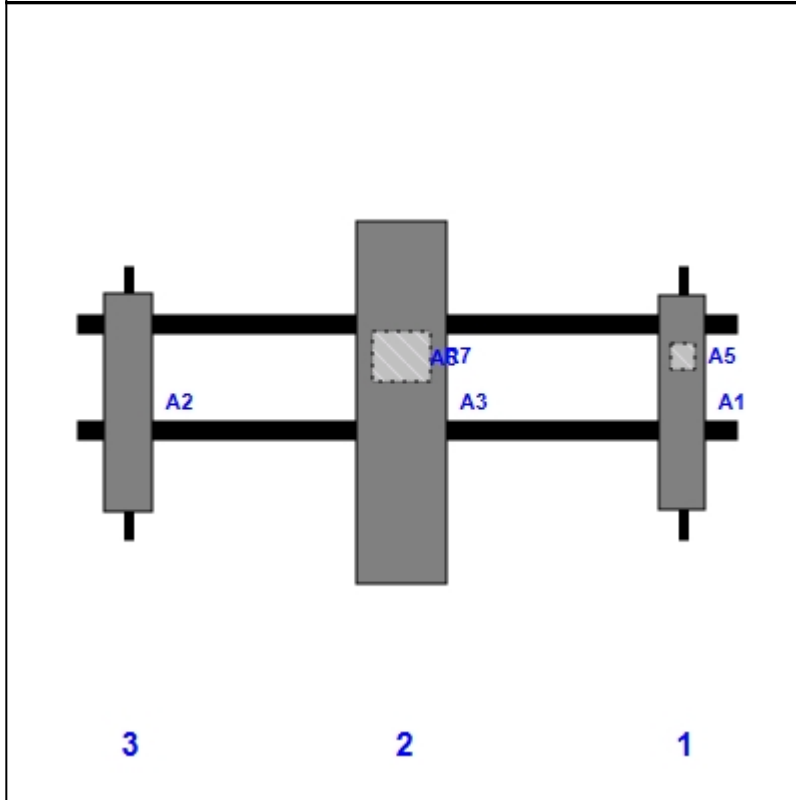


Plan View




Front View

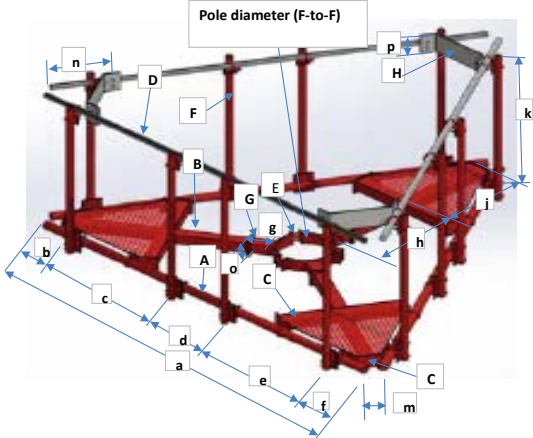
Looking Toward Structure



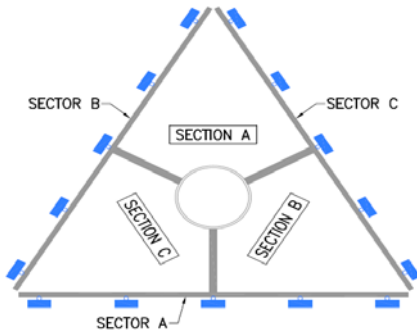
Ref	Model	Height (in)	Width (in)	H Dist From Left	Pipe	Pipe Pos V	Antenna Pos	Center Ant From Top	Antenna H Offset
A1	Air 21 B2A/B4P	56.00	12.10	160.00	1	a	Front	36.00	0.00
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A3	APXVAARR24_43-U-NA20	95.90	24.00	86.00	2	a	Front	36.00	0.00
A6	ETW200VA12UB	6.30	7.70	86.00	2	a	Behind	24.00	0.00
R7	Radio 4449 B71+B12	13.10	14.90	86.00	2	a	Behind	24.00	0.00
A2	Air32	57.00	12.90	14.00	3	a	Front	36.00	0.00

	Antenna Mount Type "MT-X" Mapping Form (PATENT PENDING)			FCC #
				1262875
	Tower Owner:	SBA Communications	Mapping Date:	4/28/19
	Site Name:	Manchester 1	Structure Type:	Monopole
Site Number or ID:	CT13529-A-SBA	Structure Height (Ft.):	110	
Mapping Contractor:	Full Metal Tower Services	Mount Height (Ft.):	105.3	

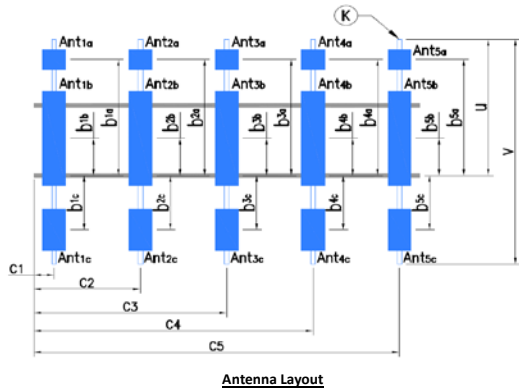
This antenna mapping form is the property of TES and under **PATENT PENDING**. The formation contained herein is considered confidential in nature and is to be used only for the specific customer it was intended for. Reproduction, transmission, publication, modification or disclosure by any method is prohibited except by express written permission of TES. All means and methods are the responsibility of the contractor and the work shall be compliant with ANSI/ASSE A 10.48, OSHA, FCC, FAA and other safety requirements that may apply. TES is not warranting the usability of the safety climb as it must be assessed prior to each use in compliance with OSHA requirements.



Geometries (Unit: inches)									
a	174	e	45	j	53	o	10	s	N/A
b	9	f	10	k	28	p	2.5	t	16.5
c	45	g	7	m	12	q	N/A	u*	43
d	65	h	31	n	14	r	N/A	v*	72
Members/Bolts (Unit: inches) * - See Ant. Layout for "u", "v" and member "K" (pipe)									
Items	Member	Lx (O.D.)	Ly (I.D.)	T	Items	Member	Lx (O.D.)	Ly (I.D.)	T
A	3.5 OD x 0.216 Pipe	3.5	3.068	0.216	F	2.375 OD x 0.154 Pipe	2.375	2.067	0.154
B	Tubing 4x4x1/4	4	4	0.25	G	1/2" Thick. Plate	0	0	0.5
C	Tubing 4x4x1/4	4	4	0.25	H	L2 1/2x2 1/2x1/4	2.5	2.5	0.25
D	2.375 OD x 0.154 Pipe	2.375	2.067	0.154	J				
E	3/4" Bolt			24	K* (pipe)	2.375 OD x 0.154 Pipe	2.375	2.067	0.154
Distance from top of main platform member to lowest tip of ant./eqpt. of Carrier above. (N/A if > 10 ft.)									N/A
Distance from top of main platform member to highest tip of ant./eqpt. of Carrier below. (N/A if > 10 ft.)									5.5'
Please enter the information below if members can't be found from the drop down lists									



Climbing ladder is located at Section A, at 90° Degree Azimuth

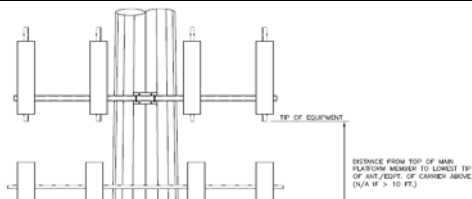


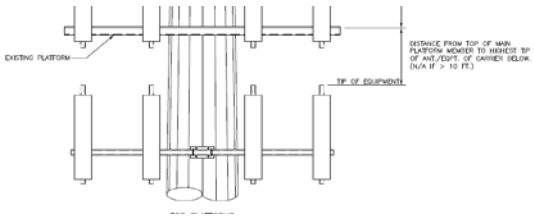
Ants. Items	Antenna Models if Known	Width (in.)	Depth (in.)	Height (in.)	Coax Size and Qty	Mounting Locations (Unit: inches)			Photos of antennas
						Vertical Distances "b _{1a} ", "b _{2a} ", "b _{3a} ", "b _{1b} "... (in.)	Horiz. offset (Use "-" if Ant. is inside)	Horiz. offset "C ₁ ", "C ₂ ", "C ₃ ", "C ₄ ", "C ₅ " (in.)	
Sector A									
Ant _{1a}									
Ant _{1b}	Antenna A	12	8	56	1/2" (1)	+11"	7	14	
Ant _{1c}									
Ant _{2a}									
Ant _{2b}	Antenna B	12	7.5	96.5	1/2" (2)	+20"	7	85	
Ant _{2c}	RRH A	17	7	20	1/2" (2)	+42"	N/A	85	
Ant _{3a}									
Ant _{3b}	Antenna C	13	9	56	1/2" (2)	+12"	8	160	
Ant _{3c}	TMA A	7.5	4	12	1/2" (2)	+12"	N/A	160	
Ant _{4a}									
Ant _{4b}									
Ant _{4c}									
Ant _{5a}									
Ant _{5b}									
Ant _{5c}									
Are Ant same as sector A?		Yes		Antennas on Sector B are the same as Sector A					

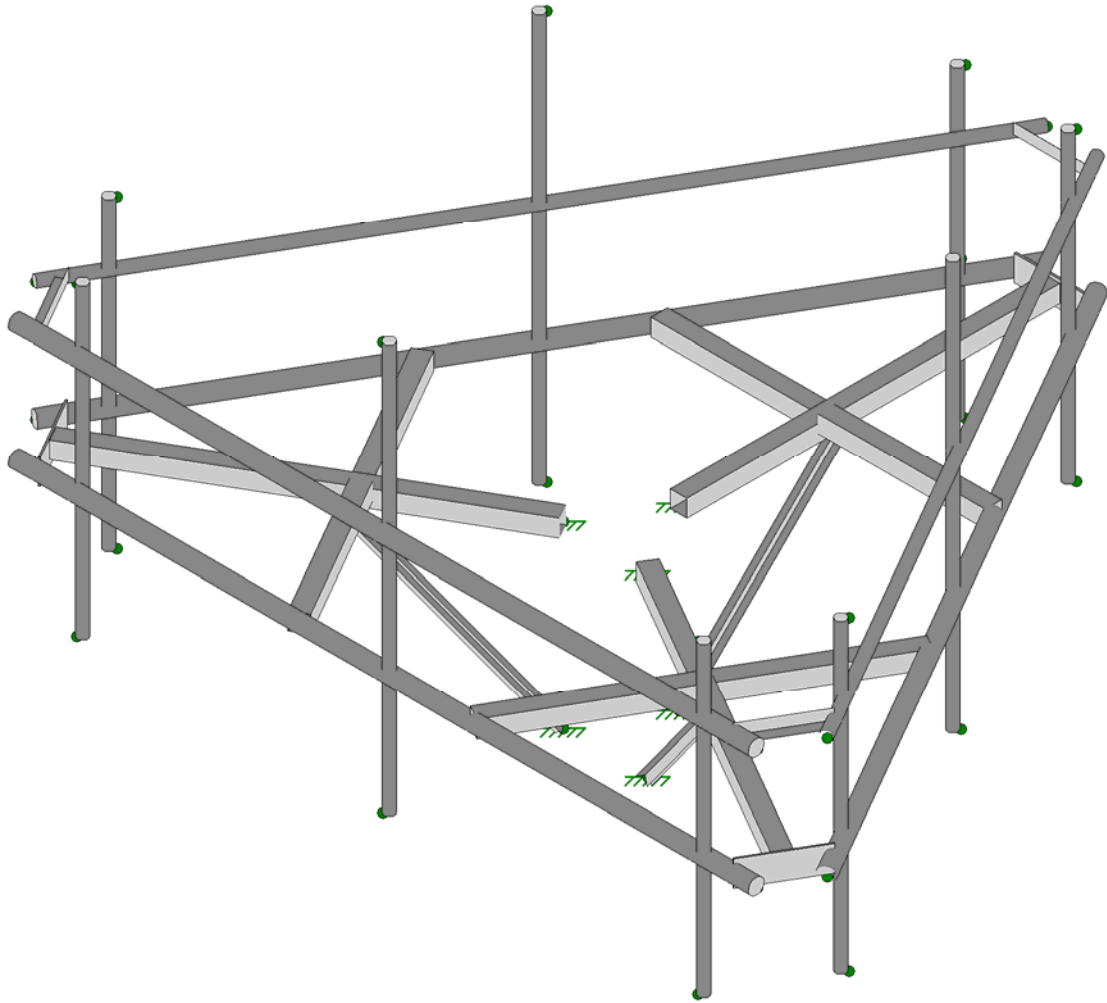
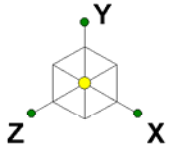
Azimuth (Degree) of Each Sector and Climbing Information

Sector A:	50°	Deg	
Sector B:	160°	Deg	
Sector C:	290°	Deg	
Climbing:	90°	Deg	Located at Section A
Climbing Facility	Corrosion Type:	No corrosion observed	
	Access:	Climbing path was unobstructed.	
	Condition:	N/A	

Are Ant same as sector A/B? Same As A Antennas on Sector C are the same as Sector A







Tower Engineering Solutio...

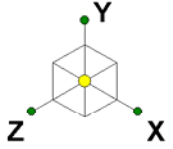
TES Project No. 82735

CT13529-A-SBA_MT-X_Loads Only_G

SK - 4

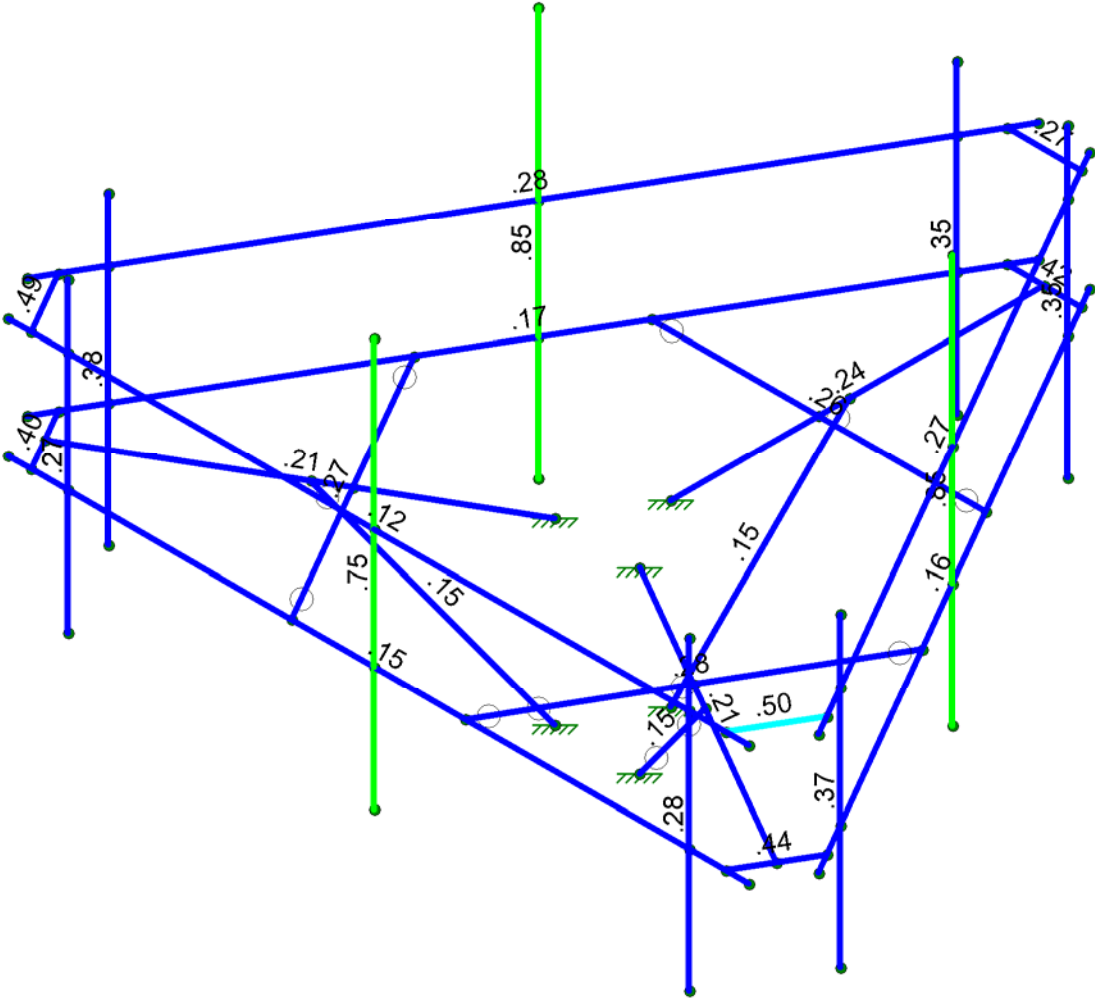
Aug 19, 2019 at 1:54 PM

CT13529-A-SBA_82735_G_RISA_L...



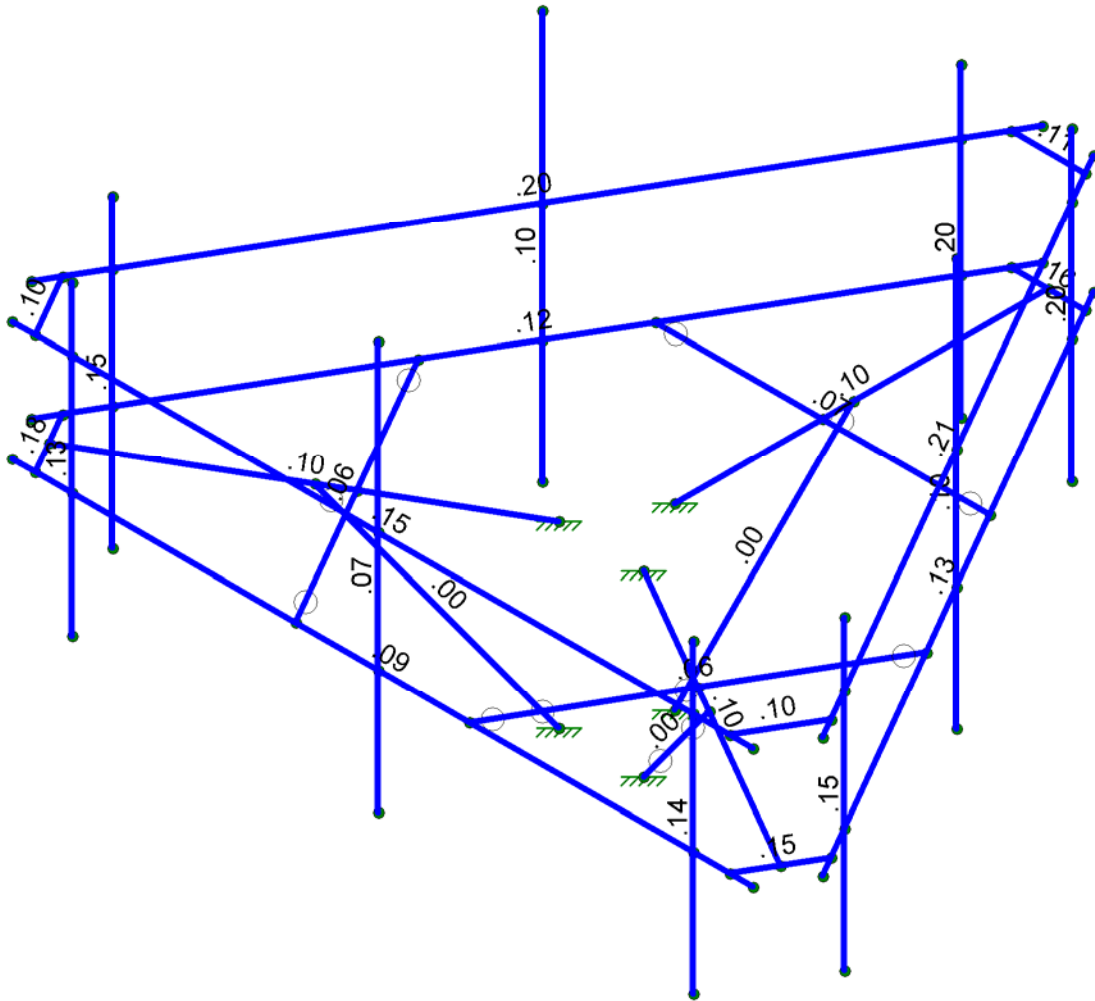
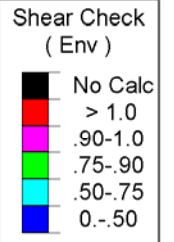
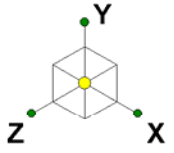
Code Check (Env)

- No Calc
- > 1.0
- .90-1.0
- .75-.90
- .50-.75
- 0.-.50



Member Code Checks Displayed (Enveloped)
Results for LC 1, 1.2D+1.6W (Front)

Tower Engineering Solutio...	CT13529-A-SBA_MT-X_Loads Only_G	SK - 5
		Aug 19, 2019 at 1:54 PM
TES Project No. 82735		CT13529-A-SBA_82735_G_RISA_L...



Member Shear Checks Displayed (Enveloped)
Results for LC 1, 1.2D+1.6W (Front)

Tower Engineering Solutio...	CT13529-A-SBA_MT-X_Loads Only_G	SK - 6
		Aug 19, 2019 at 1:54 PM
TES Project No. 82735		CT13529-A-SBA_82735_G_RISA_L...



Company : Tower Engineering Solutions, LLC
 Designer :
 Job Number : TES Project No. 82735
 Model Name : CT13529-A-SBA_MT-X_Loads Only_G

Aug 19, 2019
 1:57 PM
 Checked By: _____

Basic Load Cases

BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...	Surface(P...
1	Antenna D	None				27		
2	Antenna Di	None				27		
3	Antenna W Front	None				27		
4	Antenna Wi Front	None				27		
5	Antenna W Side	None				27		
6	Antenna Wi Side	None				27		
7	Service Lm1	None				1		
8	Service Lm2	None				1		
9	Structure D	None	-1				3	
10	Structure Di	None					30	3
11	Structure W Front	None					30	
12	Structure Wi Front	None					30	
13	Structure W Side	None					30	
14	Structure Wi Side	None					30	
15	BLC 9 Transient Area..	None					42	
16	BLC 10 Transient Are..	None					42	

Load Combinations

Description	So...	P...	S...	BLC Fac...	BLC Fac...	BLC Fac...	BLC Fac...	BLC Fac...	BLC Fac...	BLC Fac...	BLC Fac...	BLC Fac...	BLC Fac...	BLC Fac...	
1	1.2D+1.6W (Front)	Yes	Y	1	1.2	9	1.2	3	1.6	11	1.6				
2	1.2D+1.6W (Back)	Yes	Y	1	1.2	9	1.2	3	-1.6	11	-1.6				
3	1.2D+1.6W (Left)	Yes	Y	1	1.2	9	1.2	5	1.6	13	1.6				
4	1.2D+1.6W (Right)	Yes	Y	1	1.2	9	1.2	5	-1.6	13	-1.6				
5	1.2D+1.0Di+1.0Wi (...)	Yes	Y	1	1.2	9	1.2	2	1	10	1	4	1	12	1
6	1.2D+1.0Di+1.0Wi (...)	Yes	Y	1	1.2	9	1.2	2	1	10	1	4	-1	12	-1
7	1.2D+1.0Di+1.0Wi (...)	Yes	Y	1	1.2	9	1.2	2	1	10	1	6	1	14	1
8	1.2D+1.0Di+1.0Wi (...)	Yes	Y	1	1.2	9	1.2	2	1	10	1	6	-1	14	-1
9	1.2D+1.5L1+.16W (...)	Yes	Y	1	1.2	9	1.2	7	1.5	3	.16	11	.16		
10	1.2D+1.5L2+.16W (...)	Yes	Y	1	1.2	9	1.2	8	1.5	3	.16	11	.16		
11	1.4D	Yes	Y	1	1.4	9	1.4								

Joint Coordinates and Temperatures

Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	-0.831384	0	.48	0
2	N2	0.831384	0	.48	0
3	N3	0	0	-.96	0
4	N4	-7.25	0	4.76314	0
5	N5	7.25	0	4.76314	0
6	N6	7.75	0	3.897114	0
7	N7	.5	0	-8.660254	0
8	N8	-.5	0	-8.660254	0
9	N9	-7.75	0	3.897114	0
10	N10	-7.162752	0	4.135417	0
11	N11	7.162752	0	4.135417	0
12	N12	-2e-14	0	-8.270833	0
13	N13	-6.800336	0	4.76314	0
14	N14	-1.700408	0	4.76314	0
15	N15	1.700408	0	4.76314	0
16	N16	6.800336	0	4.76314	0
17	N17	7.525168	0	3.507694	0



Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
18	N18	4.975204	0	-0.908973	0	
19	N19	3.274796	0	-3.854167	0	
20	N20	0.724832	0	-8.270833	0	
21	N21	-0.724832	0	-8.270833	0	
22	N22	-3.274796	0	-3.854167	0	
23	N23	-4.975204	0	-0.908973	0	
24	N24	-7.525168	0	3.507694	0	
25	N25	-7.25	2.333333	4.76314	0	
26	N26	7.25	2.333333	4.76314	0	
27	N27	7.75	2.333333	3.897114	0	
28	N28	.5	2.333333	-8.660254	0	
29	N29	-.5	2.333333	-8.660254	0	
30	N30	-7.75	2.333333	3.897114	0	
31	N31	-6.083333	2.333333	4.76314	0	
32	N32	6.083333	2.333333	4.76314	0	
33	N33	7.166667	2.333333	2.886751	0	
34	N34	1.083333	2.333333	-7.649891	0	
35	N35	-1.083333	2.333333	-7.649891	0	
36	N36	-7.166667	2.333333	2.886751	0	
37	NP1	6.083333	3.583333	4.76314	0	
38	NP2	6.083333	-2.416667	4.76314	0	
39	NP3	-0.083333	5.583333	4.76314	0	
40	NP4	-0.083333	-2.416667	4.76314	0	
41	NP5	-6.083333	3.583333	4.76314	0	
42	NP6	-6.083333	-2.416667	4.76314	0	
43	NP11	-7.166667	3.583333	2.886751	0	
44	NP12	-7.166667	-2.416667	2.886751	0	
45	NP13	-4.083333	5.583333	-2.453739	0	
46	NP14	-4.083333	-2.416667	-2.453739	0	
47	NP15	-1.083333	3.583333	-7.649891	0	
48	NP16	-1.083333	-2.416667	-7.649891	0	
49	NP21	1.083333	3.583333	-7.649891	0	
50	NP22	1.083333	-2.416667	-7.649891	0	
51	NP23	4.166667	5.583333	-2.309401	0	
52	NP24	4.166667	-2.416667	-2.309401	0	
53	NP25	7.166667	3.583333	2.886751	0	
54	NP26	7.166667	-2.416667	2.886751	0	
55	N55	6.083333	0	4.76314	0	
56	N56	-0.083333	0	4.76314	0	
57	N57	-6.083333	0	4.76314	0	
58	N58	1.083333	0	-7.649891	0	
59	N59	4.166667	0	-2.309401	0	
60	N60	7.166667	0	2.886751	0	
61	N61	-7.166667	0	2.886751	0	
62	N62	-4.083333	0	-2.453739	0	
63	N63	-1.083333	0	-7.649891	0	
64	N64	-3.337806	0	1.927083	0	
65	N65	3.337806	0	1.927083	0	
66	N66	-1e-14	0	-3.854167	0	
67	N67	-0.083333	2.333333	4.76314	0	
68	N68	4.166667	2.333333	-2.309401	0	
69	N69	-4.083333	2.333333	-2.453739	0	
70	N70	-6.800336	2.333333	4.76314	0	
71	N71	6.800336	2.333333	4.76314	0	
72	N72	7.525168	2.333333	3.507694	0	
73	N73	0.724832	2.333333	-8.270833	0	
74	N74	-0.724832	2.333333	-8.270833	0	



Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
75	N75	-7.525168	2.333333	3.507694	0	
76	N76	0	-3.5	-.96	0	
77	N77	0	0	-4.46	0	
78	N78	-0.831384	-3.5	.48	0	
79	N79	-3.862473	0	2.23	0	
80	N80	0.831384	-3.5	.48	0	
81	N81	3.862473	0	2.23	0	

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	xxxxx	HSS16x0.438	Beam	None	A572 Gr.50	Typical	19.9	606	606	1210

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	CF	4CU5.25X03...	Beam	CU	A570 Gr.33	Typical	4.854	13.238	12.817	.228

Aluminum Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	AL1A	AACS14X13.9	Beam	AA Channel	3003-H14	Typical	11.8	44.7	401	1.19

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[k/ft^3]	Yield[ksi]	Fu[ksi]
1	A570 Gr.33	29500	11346	.3	.65	.49	33	52
2	A607 C1 Gr.55	29500	11346	.3	.65	.49	55	70

Aluminum Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (...	Density[...]	Table B.4	kt	Ftu[ksi]	Fty[ksi]	Fcy[ksi]	Fsu[ksi]	Ct
1	3003-H14	10100	3787.5	.33	1.3	.173	Table B...	1	19	16	13	12	141
2	6061-T6	10100	3787.5	.33	1.3	.173	Table B...	1	38	35	35	24	141
3	6063-T5	10100	3787.5	.33	1.3	.173	Table B...	1	22	16	16	13	141
4	6063-T6	10100	3787.5	.33	1.3	.173	Table B...	1	30	25	25	19	141
5	5052-H34	10200	3787.5	.33	1.3	.173	Table B...	1	34	26	24	20	141
6	6061-T6 W	10100	3787.5	.33	1.3	.173	Table B...	1	24	15	15	15	141



Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Analysis ...	Inactive	Seismic Design ...
1	M1						Yes			None
2	M2						Yes			None
3	M3						Yes			None
4	M4						Yes			None
5	M5						Yes			None
6	M6						Yes			None
7	M7	BenPIN	BenPIN				Yes			None
8	M8	BenPIN	BenPIN				Yes			None
9	M9	BenPIN	BenPIN				Yes			None
10	M10						Yes			None
11	M11						Yes			None
12	M12						Yes			None
13	M13						Yes			None
14	M14						Yes			None
15	M15						Yes			None
16	MP1A						Yes	-z		None
17	MP2A						Yes	-z		None
18	MP3A						Yes	-z		None
19	MP1B						Yes	+z		None
20	MP2B						Yes	+z		None
21	MP3B						Yes	+z		None
22	MP1C						Yes	+z		None
23	MP2C						Yes	+z		None
24	MP3C						Yes	+z		None
25	M28						Yes			None
26	M29						Yes			None
27	M30						Yes			None
28	M28A	BenPIN	BenPIN				Yes			None
29	M29A	BenPIN	BenPIN				Yes			None
30	M30A	BenPIN	BenPIN				Yes			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torq...	Kyy	Kzz	Cb	Function
1	M1	PIPE 3.0	14.5			Lbyy						Lateral
2	M2	PIPE 3.0	14.5			Lbyy						Gravity
3	M3	PIPE 3.0	14.5			Lbyy						Gravity
4	M4	HSS4x4x4	7.311			Lbyy						Lateral
5	M5	HSS4x4x4	7.311			Lbyy						Gravity
6	M6	HSS4x4x4	7.311			Lbyy						Gravity
7	M7	HSS4x4x4	6.55			Lbyy						Lateral
8	M8	HSS4x4x4	6.55			Lbyy						Gravity
9	M9	HSS4x4x4	6.55			Lbyy						Gravity
10	M10	PL1/2x6	1.45			Lbyy						Lateral
11	M11	PL1/2x6	1.45			Lbyy						Gravity
12	M12	PL1/2x6	1.45			Lbyy						Gravity
13	M13	PIPE 3.0	14.5			Lbyy						Lateral
14	M14	PIPE 2.0	14.5			Lbyy						Gravity
15	M15	PIPE 2.0	14.5			Lbyy						Gravity
16	MP1A	PIPE 2.0	6			Lbyy						Gravity
17	MP2A	PIPE 2.0	8			Lbyy						Lateral
18	MP3A	PIPE 2.0	6			Lbyy						Gravity
19	MP1B	PIPE 2.0	6			Lbyy						Gravity
20	MP2B	PIPE 2.0	8			Lbyy						Gravity
21	MP3B	PIPE 2.0	6			Lbyy						Gravity



Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torg...	Kyy	Kzz	Cb	Function
22	MP1C	PIPE 2.0	6			Lbyy						Gravity
23	MP2C	PIPE 2.0	8			Lbyy						Gravity
24	MP3C	PIPE 2.0	6			Lbyy						Gravity
25	M28	L2.5x2.5x4	1.45			Lbyy						Lateral
26	M29	L2.5x2.5x4	1.45			Lbyy						Gravity
27	M30	L2.5x2.5x4	1.45			Lbyy						Gravity
28	M28A	LL2x2x4x0	4.95			Lbyy						Lateral
29	M29A	LL2x2x4x0	4.95			Lbyy						Lateral
30	M30A	LL2x2x4x0	4.95			Lbyy						Lateral

Cold Formed Steel Design Parameters

Label	Shape	Length...	Lbyy[ft]	Lbzz[ft]	Lcomp t...	Lcomp ...	L-torque...	Kyy	Kzz	Cm-...	Cm-...	Cb	R	a[ft]	y sw...	z sw...
No Data to Print ...																

Aluminum Design Parameters

Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torg...	Kyy	Kzz	Cb	Function
No Data to Print ...											

Joint Loads and Enforced Displacements

Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2...
No Data to Print ...			

Member Point Loads (BLC 1 : Antenna D)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[ft,%]
1	MP1A	Y	-45.75	1
2	MP1A	Y	-45.75	5
3	MP1B	Y	-45.75	1
4	MP1B	Y	-45.75	5
5	MP1C	Y	-45.75	1
6	MP1C	Y	-45.75	5
7	MP3A	Y	-66.1	1
8	MP3A	Y	-66.1	5
9	MP3B	Y	-66.1	1
10	MP3B	Y	-66.1	5
11	MP3C	Y	-66.1	1
12	MP3C	Y	-66.1	5
13	MP2A	Y	-64	1
14	MP2A	Y	-64	7
15	MP2B	Y	-64	1
16	MP2B	Y	-64	7
17	MP2C	Y	-64	1
18	MP2C	Y	-64	7
19	MP1A	Y	-11	2
20	MP1B	Y	-11	2
21	MP1C	Y	-11	2
22	MP2A	Y	-11	2
23	MP2B	Y	-11	2
24	MP2C	Y	-11	2
25	MP2A	Y	-74	2
26	MP2B	Y	-74	2
27	MP2C	Y	-74	2



Member Point Loads (BLC 2 : Antenna Di)

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft,%]
1	MP1A	Y	-114.76	1
2	MP1A	Y	-114.76	5
3	MP1B	Y	-114.76	1
4	MP1B	Y	-114.76	5
5	MP1C	Y	-114.76	1
6	MP1C	Y	-114.76	5
7	MP3A	Y	-124.912	1
8	MP3A	Y	-124.912	5
9	MP3B	Y	-124.912	1
10	MP3B	Y	-124.912	5
11	MP3C	Y	-124.912	1
12	MP3C	Y	-124.912	5
13	MP2A	Y	-278.736	1
14	MP2A	Y	-278.736	7
15	MP2B	Y	-278.736	1
16	MP2B	Y	-278.736	7
17	MP2C	Y	-278.736	1
18	MP2C	Y	-278.736	7
19	MP1A	Y	-24.43	2
20	MP1B	Y	-24.43	2
21	MP1C	Y	-24.43	2
22	MP2A	Y	-27.219	2
23	MP2B	Y	-27.219	2
24	MP2C	Y	-27.219	2
25	MP2A	Y	-93.146	2
26	MP2B	Y	-93.146	2
27	MP2C	Y	-93.146	2

Member Point Loads (BLC 3 : Antenna W Front)

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft,%]
1	MP1A	Z	-98.006	1
2	MP1A	Z	-98.006	5
3	MP1B	Z	-76.524	1
4	MP1B	Z	-76.524	5
5	MP1C	Z	-76.524	1
6	MP1C	Z	-76.524	5
7	MP3A	Z	-104.765	1
8	MP3A	Z	-104.765	5
9	MP3B	Z	-83.554	1
10	MP3B	Z	-83.554	5
11	MP3C	Z	-83.554	1
12	MP3C	Z	-83.554	5
13	MP2A	Z	-325.72	1
14	MP2A	Z	-325.72	7
15	MP2B	Z	-180.271	1
16	MP2B	Z	-180.271	7
17	MP2C	Z	-180.271	1
18	MP2C	Z	-180.271	7
19	MP1A	Z	-13.196	2
20	MP1B	Z	-7.054	2
21	MP1C	Z	-7.054	2
22	MP2A	Z	-15.127	2
23	MP2B	Z	-7.584	2
24	MP2C	Z	-7.584	2
25	MP2A	Z	-52.463	2
26	MP2B	Z	-37.36	2



Member Point Loads (BLC 3 : Antenna W Front) (Continued)

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft,%]
27	MP2C	Z	-37.36	2

Member Point Loads (BLC 4 : Antenna Wi Front)

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft,%]
1	MP1A	Z	-32.192	1
2	MP1A	Z	-32.192	5
3	MP1B	Z	-26.064	1
4	MP1B	Z	-26.064	5
5	MP1C	Z	-26.064	1
6	MP1C	Z	-26.064	5
7	MP3A	Z	-34.378	1
8	MP3A	Z	-34.378	5
9	MP3B	Z	-28.159	1
10	MP3B	Z	-28.159	5
11	MP3C	Z	-28.159	1
12	MP3C	Z	-28.159	5
13	MP2A	Z	-97.11	1
14	MP2A	Z	-97.11	7
15	MP2B	Z	-57.186	1
16	MP2B	Z	-57.186	7
17	MP2C	Z	-57.186	1
18	MP2C	Z	-57.186	7
19	MP1A	Z	-6.265	2
20	MP1B	Z	-4.535	2
21	MP1C	Z	-4.535	2
22	MP2A	Z	-6.909	2
23	MP2B	Z	-4.668	2
24	MP2C	Z	-4.668	2
25	MP2A	Z	-19.976	2
26	MP2B	Z	-15.187	2
27	MP2C	Z	-15.187	2

Member Point Loads (BLC 5 : Antenna W Side)

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft,%]
1	MP1A	X	69.363	1
2	MP1A	X	69.363	5
3	MP1B	X	90.845	1
4	MP1B	X	90.845	5
5	MP1C	X	90.845	1
6	MP1C	X	90.845	5
7	MP3A	X	76.484	1
8	MP3A	X	76.484	5
9	MP3B	X	97.694	1
10	MP3B	X	97.694	5
11	MP3C	X	97.694	1
12	MP3C	X	97.694	5
13	MP2A	X	131.788	1
14	MP2A	X	131.788	7
15	MP2B	X	277.237	1
16	MP2B	X	277.237	7
17	MP2C	X	277.237	1
18	MP2C	X	277.237	7
19	MP1A	X	5.007	2
20	MP1B	X	11.149	2
21	MP1C	X	11.149	2
22	MP2A	X	5.069	2



Member Point Loads (BLC 5 : Antenna W Side) (Continued)

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft.%]
23	MP2B	X	12.613	2
24	MP2C	X	12.613	2
25	MP2A	X	32.325	2
26	MP2B	X	47.428	2
27	MP2C	X	47.428	2

Member Point Loads (BLC 6 : Antenna Wi Side)

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft.%]
1	MP1A	X	24.021	1
2	MP1A	X	24.021	5
3	MP1B	X	30.149	1
4	MP1B	X	30.149	5
5	MP1C	X	30.149	1
6	MP1C	X	30.149	5
7	MP3A	X	26.087	1
8	MP3A	X	26.087	5
9	MP3B	X	32.305	1
10	MP3B	X	32.305	5
11	MP3C	X	32.305	1
12	MP3C	X	32.305	5
13	MP2A	X	43.877	1
14	MP2A	X	43.877	7
15	MP2B	X	83.802	1
16	MP2B	X	83.802	7
17	MP2C	X	83.802	1
18	MP2C	X	83.802	7
19	MP1A	X	3.958	2
20	MP1B	X	5.688	2
21	MP1C	X	5.688	2
22	MP2A	X	3.922	2
23	MP2B	X	6.162	2
24	MP2C	X	6.162	2
25	MP2A	X	13.591	2
26	MP2B	X	18.38	2
27	MP2C	X	18.38	2

Member Point Loads (BLC 7 : Service Lm1)

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft.%]
1	M1	Y	-500	0

Member Point Loads (BLC 8 : Service Lm2)

	Member Label	Direction	Magnitude[lb.k-ft]	Location[ft.%]
1	M1	Y	-500	%50

Member Distributed Loads (BLC 10 : Structure Di)

	Member Label	Direction	Start Magnitude[lb/ft....]	End Magnitude[lb/ft....]	Start Location[ft.%]	End Location[ft.%]
1	M1	Y	-15.761	-15.761	0	%100
2	M2	Y	-15.761	-15.761	0	%100
3	M3	Y	-15.761	-15.761	0	%100
4	M4	Y	-21.814	-21.814	0	%100
5	M5	Y	-21.814	-21.814	0	%100
6	M6	Y	-21.814	-21.814	0	%100
7	M7	Y	-21.814	-21.814	0	%100
8	M8	Y	-21.814	-21.814	0	%100



Member Distributed Loads (BLC 10 : Structure Di) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft....	End Magnitude[lb/ft....	Start Location[ft.%,]	End Location[ft.%,]
9	M9	Y	-21.814	-21.814	0	%100
10	M10	Y	-19.195	-19.195	0	%100
11	M11	Y	-19.195	-19.195	0	%100
12	M12	Y	-19.195	-19.195	0	%100
13	M13	Y	-12.675	-12.675	0	%100
14	M14	Y	-12.675	-12.675	0	%100
15	M15	Y	-12.675	-12.675	0	%100
16	MP1A	Y	-12.675	-12.675	0	%100
17	MP2A	Y	-12.675	-12.675	0	%100
18	MP3A	Y	-12.675	-12.675	0	%100
19	MP1B	Y	-12.675	-12.675	0	%100
20	MP2B	Y	-12.675	-12.675	0	%100
21	MP3B	Y	-12.675	-12.675	0	%100
22	MP1C	Y	-12.675	-12.675	0	%100
23	MP2C	Y	-12.675	-12.675	0	%100
24	MP3C	Y	-12.675	-12.675	0	%100
25	M28	Y	-12.654	-12.654	0	%100
26	M29	Y	-12.654	-12.654	0	%100
27	M30	Y	-12.654	-12.654	0	%100
28	M28A	Y	-18.322	-18.322	0	%100
29	M29A	Y	-18.322	-18.322	0	%100
30	M30A	Y	-18.322	-18.322	0	%100

Member Distributed Loads (BLC 11 : Structure W Front)

	Member Label	Direction	Start Magnitude[lb/ft....	End Magnitude[lb/ft....	Start Location[ft.%,]	End Location[ft.%,]
1	M1	PZ	-11.265	-11.265	0	%100
2	M2	PZ	-11.265	-11.265	0	%100
3	M3	PZ	-11.265	-11.265	0	%100
4	M4	PZ	-21.457	-21.457	0	%100
5	M5	PZ	-21.457	-21.457	0	%100
6	M6	PZ	-21.457	-21.457	0	%100
7	M7	PZ	-21.457	-21.457	0	%100
8	M8	PZ	-21.457	-21.457	0	%100
9	M9	PZ	-21.457	-21.457	0	%100
10	M10	PZ	-32.186	-32.186	0	%100
11	M11	PZ	-32.186	-32.186	0	%100
12	M12	PZ	-32.186	-32.186	0	%100
13	M13	PZ	-7.644	-7.644	0	%100
14	M14	PZ	-7.644	-7.644	0	%100
15	M15	PZ	-7.644	-7.644	0	%100
16	MP1A	PZ	-7.644	-7.644	0	%100
17	MP2A	PZ	-7.644	-7.644	0	%100
18	MP3A	PZ	-7.644	-7.644	0	%100
19	MP1B	PZ	-7.644	-7.644	0	%100
20	MP2B	PZ	-7.644	-7.644	0	%100
21	MP3B	PZ	-7.644	-7.644	0	%100
22	MP1C	PZ	-7.644	-7.644	0	%100
23	MP2C	PZ	-7.644	-7.644	0	%100
24	MP3C	PZ	-7.644	-7.644	0	%100
25	M28	PZ	-13.411	-13.411	0	%100
26	M29	PZ	-13.411	-13.411	0	%100
27	M30	PZ	-13.411	-13.411	0	%100
28	M28A	PZ	-10.729	-10.729	0	%100
29	M29A	PZ	-10.729	-10.729	0	%100
30	M30A	PZ	-10.729	-10.729	0	%100



Member Distributed Loads (BLC 12 : Structure Wi Front)

	Member Label	Direction	Start Magnitude[lb/ft....]	End Magnitude[lb/ft....]	Start Location[ft.%]	End Location[ft.%]
1	M1	PZ	-6.834	-6.834	0	%100
2	M2	PZ	-6.834	-6.834	0	%100
3	M3	PZ	-6.834	-6.834	0	%100
4	M4	PZ	-9.542	-9.542	0	%100
5	M5	PZ	-9.542	-9.542	0	%100
6	M6	PZ	-9.542	-9.542	0	%100
7	M7	PZ	-9.542	-9.542	0	%100
8	M8	PZ	-9.542	-9.542	0	%100
9	M9	PZ	-9.542	-9.542	0	%100
10	M10	PZ	-12.392	-12.392	0	%100
11	M11	PZ	-12.392	-12.392	0	%100
12	M12	PZ	-12.392	-12.392	0	%100
13	M13	PZ	-5.872	-5.872	0	%100
14	M14	PZ	-5.872	-5.872	0	%100
15	M15	PZ	-5.872	-5.872	0	%100
16	MP1A	PZ	-5.872	-5.872	0	%100
17	MP2A	PZ	-5.872	-5.872	0	%100
18	MP3A	PZ	-5.872	-5.872	0	%100
19	MP1B	PZ	-5.872	-5.872	0	%100
20	MP2B	PZ	-5.872	-5.872	0	%100
21	MP3B	PZ	-5.872	-5.872	0	%100
22	MP1C	PZ	-5.872	-5.872	0	%100
23	MP2C	PZ	-5.872	-5.872	0	%100
24	MP3C	PZ	-5.872	-5.872	0	%100
25	M28	PZ	-7.404	-7.404	0	%100
26	M29	PZ	-7.404	-7.404	0	%100
27	M30	PZ	-7.404	-7.404	0	%100
28	M28A	PZ	-6.691	-6.691	0	%100
29	M29A	PZ	-6.691	-6.691	0	%100
30	M30A	PZ	-6.691	-6.691	0	%100

Member Distributed Loads (BLC 13 : Structure W Side)

	Member Label	Direction	Start Magnitude[lb/ft....]	End Magnitude[lb/ft....]	Start Location[ft.%]	End Location[ft.%]
1	M1	PX	11.265	11.265	0	%100
2	M2	PX	11.265	11.265	0	%100
3	M3	PX	11.265	11.265	0	%100
4	M4	PX	21.457	21.457	0	%100
5	M5	PX	21.457	21.457	0	%100
6	M6	PX	21.457	21.457	0	%100
7	M7	PX	21.457	21.457	0	%100
8	M8	PX	21.457	21.457	0	%100
9	M9	PX	21.457	21.457	0	%100
10	M10	PX	32.186	32.186	0	%100
11	M11	PX	32.186	32.186	0	%100
12	M12	PX	32.186	32.186	0	%100
13	M13	PX	7.644	7.644	0	%100
14	M14	PX	7.644	7.644	0	%100
15	M15	PX	7.644	7.644	0	%100
16	MP1A	PX	7.644	7.644	0	%100
17	MP2A	PX	7.644	7.644	0	%100
18	MP3A	PX	7.644	7.644	0	%100
19	MP1B	PX	7.644	7.644	0	%100
20	MP2B	PX	7.644	7.644	0	%100
21	MP3B	PX	7.644	7.644	0	%100
22	MP1C	PX	7.644	7.644	0	%100
23	MP2C	PX	7.644	7.644	0	%100



Member Distributed Loads (BLC 13 : Structure W Side) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft....]	End Magnitude[lb/ft....]	Start Location[ft.-%]	End Location[ft.-%]
24	MP3C	PX	7.644	7.644	0	%100
25	M28	PX	13.411	13.411	0	%100
26	M29	PX	13.411	13.411	0	%100
27	M30	PX	13.411	13.411	0	%100
28	M28A	PX	10.729	10.729	0	%100
29	M29A	PX	10.729	10.729	0	%100
30	M30A	PX	10.729	10.729	0	%100

Member Distributed Loads (BLC 14 : Structure Wi Side)

	Member Label	Direction	Start Magnitude[lb/ft....]	End Magnitude[lb/ft....]	Start Location[ft.-%]	End Location[ft.-%]
1	M1	PX	6.834	6.834	0	%100
2	M2	PX	6.834	6.834	0	%100
3	M3	PX	6.834	6.834	0	%100
4	M4	PX	9.542	9.542	0	%100
5	M5	PX	9.542	9.542	0	%100
6	M6	PX	9.542	9.542	0	%100
7	M7	PX	9.542	9.542	0	%100
8	M8	PX	9.542	9.542	0	%100
9	M9	PX	9.542	9.542	0	%100
10	M10	PX	12.392	12.392	0	%100
11	M11	PX	12.392	12.392	0	%100
12	M12	PX	12.392	12.392	0	%100
13	M13	PX	5.872	5.872	0	%100
14	M14	PX	5.872	5.872	0	%100
15	M15	PX	5.872	5.872	0	%100
16	MP1A	PX	5.872	5.872	0	%100
17	MP2A	PX	5.872	5.872	0	%100
18	MP3A	PX	5.872	5.872	0	%100
19	MP1B	PX	5.872	5.872	0	%100
20	MP2B	PX	5.872	5.872	0	%100
21	MP3B	PX	5.872	5.872	0	%100
22	MP1C	PX	5.872	5.872	0	%100
23	MP2C	PX	5.872	5.872	0	%100
24	MP3C	PX	5.872	5.872	0	%100
25	M28	PX	7.404	7.404	0	%100
26	M29	PX	7.404	7.404	0	%100
27	M30	PX	7.404	7.404	0	%100
28	M28A	PX	6.691	6.691	0	%100
29	M29A	PX	6.691	6.691	0	%100
30	M30A	PX	6.691	6.691	0	%100

Member Distributed Loads (BLC 15 : BLC 9 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft....]	End Magnitude[lb/ft....]	Start Location[ft.-%]	End Location[ft.-%]
1	M1	Y	-.572	-4.426	0	1.933
2	M1	Y	-4.426	-4.851	1.933	3.867
3	M1	Y	-4.851	-1.06	3.867	5.8
4	M3	Y	-.531	-4.109	8.7	10.15
5	M3	Y	-4.109	-4.765	10.15	11.6
6	M3	Y	-4.765	-2.975	11.6	13.05
7	M3	Y	-2.975	-1.659	13.05	14.5
8	M4	Y	-.283	-7.025	2.193	3.217
9	M4	Y	-7.025	-11.424	3.217	4.24
10	M4	Y	-11.424	-9.724	4.24	5.264
11	M4	Y	-9.724	-7.534	5.264	6.287
12	M4	Y	-7.534	-1.869	6.287	7.311
13	M7	Y	-2.723	-2.737	.655	3.275



Member Distributed Loads (BLC 15 : BLC 9 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft....]	End Magnitude[lb/ft....]	Start Location[ft.%]	End Location[ft.%]
14	M7	Y	-2.737	-2.752	3.275	5.895
15	M10	Y	-1.095	-1.095	0	1.45
16	M2	Y	-1.06	-4.851	8.7	10.633
17	M2	Y	-4.851	-4.426	10.633	12.567
18	M2	Y	-4.426	-.572	12.567	14.5
19	M3	Y	-.572	-4.426	0	1.933
20	M3	Y	-4.426	-4.851	1.933	3.867
21	M3	Y	-4.851	-1.06	3.867	5.8
22	M6	Y	-7.255	-10.413	2.924	4.386
23	M6	Y	-10.413	-9.266	4.386	5.849
24	M6	Y	-9.266	-3.815	5.849	7.311
25	M9	Y	-2.744	-2.744	.655	3.275
26	M9	Y	-2.744	-2.744	3.275	5.895
27	M12	Y	-1.095	-1.095	0	1.45
28	M1	Y	-1.06	-4.851	8.7	10.633
29	M1	Y	-4.851	-4.426	10.633	12.567
30	M1	Y	-4.426	-.572	12.567	14.5
31	M2	Y	-1.659	-2.974	0	1.45
32	M2	Y	-2.974	-4.764	1.45	2.9
33	M2	Y	-4.764	-4.108	2.9	4.35
34	M2	Y	-4.108	-.53	4.35	5.8
35	M5	Y	-.283	-7.024	2.193	3.217
36	M5	Y	-7.024	-11.425	3.217	4.24
37	M5	Y	-11.425	-9.725	4.24	5.264
38	M5	Y	-9.725	-7.533	5.264	6.287
39	M5	Y	-7.533	-1.869	6.287	7.311
40	M8	Y	-2.75	-2.738	.655	3.275
41	M8	Y	-2.738	-2.726	3.275	5.895
42	M11	Y	-1.095	-1.095	0	1.45

Member Distributed Loads (BLC 16 : BLC 10 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft....]	End Magnitude[lb/ft....]	Start Location[ft.%]	End Location[ft.%]
1	M1	Y	-1.665	-12.891	0	1.933
2	M1	Y	-12.891	-14.128	1.933	3.867
3	M1	Y	-14.128	-3.086	3.867	5.8
4	M3	Y	-1.546	-11.967	8.7	10.15
5	M3	Y	-11.967	-13.879	10.15	11.6
6	M3	Y	-13.879	-8.665	11.6	13.05
7	M3	Y	-8.665	-4.833	13.05	14.5
8	M4	Y	-.825	-20.459	2.193	3.217
9	M4	Y	-20.459	-33.273	3.217	4.24
10	M4	Y	-33.273	-28.322	4.24	5.264
11	M4	Y	-28.322	-21.942	5.264	6.287
12	M4	Y	-21.942	-5.443	6.287	7.311
13	M7	Y	-7.93	-7.972	.655	3.275
14	M7	Y	-7.972	-8.015	3.275	5.895
15	M10	Y	-3.189	-3.189	0	1.45
16	M2	Y	-3.086	-14.129	8.7	10.633
17	M2	Y	-14.129	-12.891	10.633	12.567
18	M2	Y	-12.891	-1.665	12.567	14.5
19	M3	Y	-1.665	-12.891	0	1.933
20	M3	Y	-12.891	-14.129	1.933	3.867
21	M3	Y	-14.129	-3.086	3.867	5.8
22	M6	Y	-21.131	-30.328	2.924	4.386
23	M6	Y	-30.328	-26.988	4.386	5.849
24	M6	Y	-26.988	-11.111	5.849	7.311



Member Distributed Loads (BLC 16 : BLC 10 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft....]	End Magnitude[lb/ft....]	Start Location[ft.%]	End Location[ft.%]
25	M9	Y	-7.992	-7.992	.655	3.275
26	M9	Y	-7.992	-7.992	3.275	5.895
27	M12	Y	-3.19	-3.19	0	1.45
28	M1	Y	-3.086	-14.129	8.7	10.633
29	M1	Y	-14.129	-12.891	10.633	12.567
30	M1	Y	-12.891	-1.665	12.567	14.5
31	M2	Y	-4.83	-8.662	0	1.45
32	M2	Y	-8.662	-13.876	1.45	2.9
33	M2	Y	-13.876	-11.964	2.9	4.35
34	M2	Y	-11.964	-1.544	4.35	5.8
35	M5	Y	-.825	-20.457	2.193	3.217
36	M5	Y	-20.457	-33.274	3.217	4.24
37	M5	Y	-33.274	-28.324	4.24	5.264
38	M5	Y	-28.324	-21.941	5.264	6.287
39	M5	Y	-21.941	-5.443	6.287	7.311
40	M8	Y	-8.01	-7.975	.655	3.275
41	M8	Y	-7.975	-7.94	3.275	5.895
42	M11	Y	-3.189	-3.189	0	1.45

Member Area Loads (BLC 9 : Structure D)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
1	N13	N24	N23	N14	Y	Two Way	-.005
2	N20	N19	N22	N21	Y	Two Way	-.005
3	N16	N15	N18	N17	Y	Two Way	-.005

Member Area Loads (BLC 10 : Structure Di)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
1	N13	N24	N23	N14	Y	Two Way	-.015
2	N20	N19	N22	N21	Y	Two Way	-.015
3	N16	N15	N18	N17	Y	Two Way	-.015

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N2	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N3	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N76	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
5	N77						
6	N78	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
7	N79						
8	N80	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
9	N81						

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	4431.682	8	143.736	3	1517.748	1	.377	1	2.249	1	.71	9
2		min	-1921.425	3	-835.74	9	-2864.66	2	-.282	3	-2.238	2	-.198	1
3	N2	max	2262.579	4	175.792	4	1532.903	1	.362	1	2.266	2	.237	1
4		min	-4588.504	3	-596.946	7	-2876.056	2	-.324	2	-2.276	1	-.483	2
5	N3	max	1975.848	4	176.326	2	5517.629	1	.161	2	3.668	3	.526	3
6		min	-1975.584	3	-672.59	5	-2928.449	2	-.464	5	-3.671	4	-.585	4
7	N76	max	40.17	4	4594.218	5	-269.362	2	0	1	0	4	0	3



Envelope Joint Reactions (Continued)

Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC	
8		min	-40.159	3	258.432	2	-4519.874	5	0	1	0	3	0	4
9	N78	max	-420.392	3	4582.123	8	2259.895	8	0	4	0	3	0	3
10		min	-3900.915	8	465.719	3	223.254	3	0	3	0	4	0	4
11	N80	max	3885.153	7	4564.049	7	2250.805	7	0	3	0	3	0	3
12		min	406.825	4	450.052	4	215.421	4	0	4	0	4	0	4
13	Totals:	max	6952.657	4	11270.343	6	7091.264	1						
14		min	-6952.657	3	3607.745	1	-7091.264	2						

Envelope Member Section Forces

Member	Sec		Axial[lb]	LC	y Shear[...]	LC	z Shear[...]	LC	Torque[...]	LC	y-y Mo...	LC	z-z Mo...	LC	
1	M1	1	max	0	1	0	1	0	1	0	1	0	1	0	1
2			min	0	1	-750	9	0	1	0	1	0	1	0	1
3		2	max	1024.57	2	60.387	1	209.279	2	.107	9	.047	4	.219	9
4			min	-906.021	1	-295.147	6	-221.28	1	-.087	4	-.037	3	-.116	3
5		3	max	1005.41	2	.076	4	576.599	2	.288	2	.49	1	0	4
6			min	-878.646	1	-785.331	7	-575.853	1	-.269	1	-.503	2	-.634	10
7		4	max	1024.16	2	309.808	6	234.459	1	.099	3	.04	2	.196	3
8			min	-890.817	1	-56.355	1	-223.855	2	-.069	4	-.031	1	-.109	4
9		5	max	0	1	0	1	0	1	0	1	0	1	0	1
10			min	0	1	0	1	0	1	0	1	0	1	0	1
11	M2	1	max	0	1	.004	2	.004	4	0	1	0	1	0	1
12			min	0	1	0	8	0	6	0	1	0	1	0	1
13		2	max	986.903	3	16.137	2	182.658	3	.255	4	.175	4	.338	3
14			min	-869.055	4	-331.618	5	-190.519	4	-.259	3	-.168	3	-.248	4
15		3	max	985.332	1	66.688	2	562.672	3	.418	3	.349	4	.201	2
16			min	-872.586	2	-684.859	5	-563.868	4	-.398	4	-.356	3	-.364	5
17		4	max	903.079	3	336.82	7	246.488	4	.171	1	.137	3	.335	1
18			min	-782.957	4	-26.306	4	-237.85	3	-.159	2	-.13	4	-.24	2
19		5	max	0	1	0	7	0	9	0	1	0	1	0	1
20			min	0	1	-.004	1	-.002	2	0	1	0	1	0	1
21	M3	1	max	0	1	.004	1	.002	2	0	1	0	1	0	1
22			min	0	1	0	8	0	9	0	1	0	1	0	1
23		2	max	804.777	4	24.943	3	236.995	4	.168	2	.163	4	.317	1
24			min	-693.352	3	-330.464	8	-246.458	3	-.165	1	-.154	3	-.244	2
25		3	max	1020.997	4	77.482	1	240.451	4	.527	4	.258	3	.185	3
26			min	-891.354	3	-699.988	6	-241.501	3	-.498	3	-.263	4	-.387	8
27		4	max	857.142	4	340.897	5	174.111	3	.252	4	.188	3	.359	4
28			min	-723.827	3	-15.532	2	-167.574	4	-.243	3	-.182	4	-.241	3
29		5	max	0	1	0	7	0	6	0	1	0	1	0	1
30			min	0	1	-.004	2	-.004	3	0	1	0	1	0	1
31	M4	1	max	1989.01	3	143.778	3	1369.298	2	.496	2	2.249	1	.141	3
32			min	-5051.5...	8	-835.704	9	-1376.5...	1	-.425	1	-2.238	2	-.786	9
33		2	max	1961.84	3	116.728	3	1322.237	2	.496	2	.393	3	.766	9
34			min	-5044.0...	8	-862.754	9	-1329.5...	1	-.425	1	-.394	4	-.097	3
35		3	max	1628.302	3	1081.075	8	72.689	2	.641	2	.127	2	3.216	8
36			min	-1560.0...	4	149.873	3	-77.553	1	-.638	1	-.12	1	.297	3
37		4	max	1601.131	3	936.633	8	31.074	3	.641	2	.217	2	1.373	8
38			min	-1532.9...	4	100.203	3	-35.966	4	-.638	1	-.219	1	.069	3
39		5	max	1573.96	3	822.162	8	16.569	1	.641	2	.221	2	-.062	1
40			min	-1505.7...	4	59.278	3	-21.433	2	-.638	1	-.231	1	-.229	6
41	M5	1	max	2349.73	4	175.848	4	1388.619	1	.432	1	2.266	2	.176	4
42			min	-5129.0...	7	-597.787	7	-1383.2...	2	-.522	2	-2.276	1	-.406	3
43		2	max	2322.559	4	148.798	4	1341.558	1	.432	1	.467	3	.77	7
44			min	-5121.4...	7	-664.708	7	-1336.1...	2	-.522	2	-.469	4	-.12	4
45		3	max	1861.832	4	1081.22	7	76.924	1	.668	1	.119	1	3.252	7



Envelope Member Section Forces (Continued)

Member	Sec		Axial[lb]	LC	y Shear...	LC	z Shear...	LC	Torque[...	LC	y-y Mo...	LC	z-z Mo...	LC	
46		min	-1795.0...	3	141.625	4	-75.449	2	-.645	2	-.121	2	.271	4	
47	4	max	1834.662	4	936.774	7	29.863	1	.668	1	.217	1	1.409	7	
48		min	-1767.8...	3	91.954	4	-28.388	2	-.645	2	-.216	2	.058	4	
49	5	max	1807.491	4	822.304	7	18.673	2	.668	1	.228	1	-.055	3	
50		min	-1740.7...	3	51.029	4	-17.198	1	-.645	2	-.225	2	-.195	8	
51	M6	1	max	2928.449	2	176.356	2	1973.792	4	.585	4	3.668	3	.161	2
52		min	-5517.6...	1	-673.399	5	-1973.08	3	-.526	3	-3.671	4	-.464	5	
53	2	max	2928.449	2	149.306	2	1911.044	4	.585	4	.12	3	.828	5	
54		min	-5517.6...	1	-740.32	5	-1910.3...	3	-.526	3	-.121	4	-.136	2	
55	3	max	2147.639	2	1101.721	5	83.559	4	.773	4	.169	4	3.337	5	
56		min	-2076.7...	1	101.064	2	-84.882	3	-.755	3	-.167	3	.124	2	
57	4	max	2147.639	2	960.845	5	20.811	4	.773	4	.264	4	1.452	5	
58		min	-2076.7...	1	52.434	2	-22.134	3	-.755	3	-.264	3	-.017	2	
59	5	max	2147.639	2	840.45	5	40.614	3	.773	4	.245	4	-.049	1	
60		min	-2076.7...	1	9.781	2	-41.937	4	-.755	3	-.247	3	-.194	6	
61	M7	1	max	307.51	2	-119.603	3	394.458	4	.55	4	0	0	1	
62		min	-301.875	1	-1103.4...	8	-402.387	3	-.509	3	0	1	0	1	
63	2	max	331.852	2	-147.049	3	436.618	4	.55	4	.68	4	1.861	8	
64		min	-326.216	1	-1174.4...	8	-444.547	3	-.509	3	-.693	3	.217	3	
65	3	max	818.636	1	1281.356	8	478.779	4	.577	1	1.43	4	3.942	8	
66		min	-813.326	2	-613.475	9	-486.708	3	-.625	2	-1.456	3	.501	3	
67	4	max	794.295	1	1202.941	8	438.643	1	.577	1	.684	2	1.908	8	
68		min	-788.985	2	152.719	3	-424.527	2	-.625	2	-.707	1	.227	3	
69	5	max	769.953	1	1131.882	8	424.589	1	.577	1	0	1	0	1	
70		min	-764.643	2	125.245	3	-410.474	2	-.625	2	0	1	0	1	
71	M8	1	max	765.259	1	-141.784	4	415.759	2	.586	2	0	0	1	
72		min	-758.213	2	-1166.8...	7	-428.136	1	-.604	1	0	1	0	1	
73	2	max	789.601	1	-169.257	4	429.812	2	.586	2	.692	2	1.965	7	
74		min	-782.555	2	-1237.9...	7	-442.19	1	-.604	1	-.713	1	.254	4	
75	3	max	813.942	1	581.501	3	559.962	4	.586	2	1.663	3	4.056	7	
76		min	-806.896	2	-1316.3...	7	-550.032	3	-.604	1	-1.696	4	.555	4	
77	4	max	372.278	4	1196.665	7	517.801	4	.524	4	.797	3	1.898	7	
78		min	-368.286	3	154.938	4	-507.871	3	-.554	3	-.813	4	.23	4	
79	5	max	347.937	4	1125.689	7	475.64	4	.524	4	0	1	0	1	
80		min	-343.944	3	127.488	4	-465.71	3	-.554	3	0	1	0	1	
81	M9	1	max	818.127	4	-54.526	2	366.22	1	.813	3	0	0	1	
82		min	-811.11	3	-1103.8...	5	-376.172	2	-.794	4	0	1	0	1	
83	2	max	818.127	4	-81.994	2	422.434	1	.813	3	.646	1	1.862	5	
84		min	-811.11	3	-1174.8...	5	-432.386	2	-.794	4	-.662	2	.111	2	
85	3	max	909.22	3	1277.234	5	501.79	2	.813	3	1.423	1	3.928	5	
86		min	-904.024	4	-394.16	4	-490.61	1	-.829	4	-1.459	2	.305	2	
87	4	max	909.22	3	1198.803	5	445.575	2	.793	3	.665	1	1.901	5	
88		min	-904.024	4	93.054	2	-434.396	1	-.829	4	-.684	2	.129	2	
89	5	max	909.22	3	1127.764	5	389.361	2	.793	3	0	1	0	1	
90		min	-904.024	4	65.585	2	-378.181	1	-.829	4	0	1	0	1	
91	M10	1	max	450.768	4	73.053	2	921.298	4	.008	1	.325	3	.292	4
92		min	-440.23	3	-428.42	5	-939.81	3	-.122	6	-.319	4	-.282	3	
93	2	max	442.687	4	68.137	2	935.296	4	.008	1	.018	4	.366	4	
94		min	-432.148	3	-441.448	5	-953.808	3	-.122	6	-.019	3	-.271	3	
95	3	max	453.87	4	648.791	9	949.293	4	.126	5	.359	4	.445	2	
96		min	-440.528	3	-454.476	5	-967.805	3	-.122	6	-.367	3	-.258	3	
97	4	max	445.788	4	643.875	9	784.156	1	.126	5	.011	2	.282	2	
98		min	-432.447	3	-200.011	1	-740.187	2	.007	2	-.013	1	-.187	1	
99	5	max	437.707	4	638.959	9	779.49	1	.126	5	.27	1	.121	2	
100		min	-424.365	3	-204.926	1	-735.521	2	.007	2	-.256	2	-.332	9	
101	M11	1	max	512.434	3	239.256	1	733.53	2	.002	2	.263	1	.146	2
102		min	-499.808	4	-436.534	2	-767.879	1	-.108	5	-.253	2	-.119	1	



Envelope Member Section Forces (Continued)

Member	Sec		Axial[lb]	LC	y Shear[...]	LC	z Shear[...]	LC	Torque[...]	LC	y-y Mo...	LC	z-z Mo...	LC	
103	2	max	520.515	3	234.34	1	738.195	2	.002	2	.014	2	.305	2	
104		min	-507.89	4	-441.45	2	-772.545	1	-.108	5	-.016	1	-.205	1	
105	3	max	528.597	3	469.51	5	1090.378	4	.106	6	.406	3	.466	2	
106		min	-515.971	4	-446.365	2	-1063.7...	3	-.108	5	-.417	4	-.253	4	
107	4	max	524.627	3	456.482	5	1076.38	4	.106	6	.023	3	.365	3	
108		min	-511.068	4	-54.918	2	-1049.7...	3	-.011	1	-.025	4	-.27	4	
109	5	max	532.709	3	443.455	5	1062.383	4	.106	6	.363	4	.281	3	
110		min	-519.149	4	-59.834	2	-1035.74	3	-.011	1	-.354	3	-.285	4	
111	M12	1	max	624.139	1	45.896	4	1000.319	1	.028	3	.357	2	.277	3
112		min	-615.133	2	-388.66	7	-1027.4...	2	-.11	8	-.349	1	-.278	4	
113	2	max	624.139	1	40.98	4	1018.983	1	.028	3	.017	1	.369	3	
114		min	-615.133	2	-401.688	7	-1046.1...	2	-.11	8	-.019	2	-.294	4	
115	3	max	625.631	1	433.335	8	1077.63	2	.112	7	.393	1	.465	4	
116		min	-615.133	2	-414.717	7	-1044.1...	1	-.11	8	-.406	2	-.191	2	
117	4	max	625.631	1	420.307	8	1058.966	2	.112	7	.018	1	.365	4	
118		min	-614.998	2	-13.327	3	-1025.52	1	-.028	4	-.019	2	-.289	3	
119	5	max	625.631	1	407.279	8	1040.303	2	.112	7	.361	2	.267	4	
120		min	-614.998	2	-18.243	3	-1006.8...	1	-.028	4	-.351	1	-.284	3	
121	M13	1	max	0	0	1	0	1	0	1	0	1	0	1	
122		min	0	1	0	1	0	1	0	1	0	1	0	1	
123	2	max	108.747	10	125.268	4	84.493	1	.735	1	.329	1	.123	2	
124		min	-254.026	8	-204.18	3	-81.942	2	-.729	2	-.355	2	-.164	1	
125	3	max	104.212	10	227.727	4	61.748	3	.727	2	.54	1	.672	4	
126		min	-269.513	7	-98.354	3	-60.118	4	-.721	1	-.56	2	-.356	3	
127	4	max	104.212	10	197.087	4	84.769	2	.727	2	.315	1	.134	2	
128		min	-269.513	7	-128.995	3	-84.082	1	-.721	1	-.333	2	-.175	1	
129	5	max	0	1	0	1	0	1	0	1	0	1	0	1	
130		min	0	1	0	1	0	1	0	1	0	1	0	1	
131	M14	1	max	0	1	.004	3	.006	3	0	1	0	1	0	1
132		min	0	1	0	5	-.006	1	0	1	0	1	0	1	
133	2	max	-33.474	3	92.583	2	85.594	4	.316	4	.112	2	.017	3	
134		min	-234.435	8	-126.954	1	-86.636	3	-.321	3	-.117	1	-.058	8	
135	3	max	15.66	4	163.158	2	30.372	1	.248	3	.243	4	.498	2	
136		min	-239.563	7	-99.865	1	-29.07	2	-.243	4	-.251	3	-.358	1	
137	4	max	34.858	4	148.06	2	53.81	3	.248	3	.111	4	.031	1	
138		min	-248.78	7	-114.963	1	-52.894	4	-.243	4	-.116	3	-.072	6	
139	5	max	0	1	.002	3	.007	3	0	1	0	1	0	1	
140		min	0	1	-.004	1	0	1	0	1	0	1	0	1	
141	M15	1	max	0	1	.004	2	.001	1	0	1	0	1	0	1
142		min	0	1	-.002	3	-.007	4	0	1	0	1	0	1	
143	2	max	48.09	3	118.041	1	55.243	3	.252	3	.11	3	.023	1	
144		min	-242.548	8	-157.287	2	-54.523	4	-.254	4	-.117	4	-.067	6	
145	3	max	-54.192	1	135.153	1	48.702	4	.316	4	.289	3	.449	1	
146		min	-299.634	9	-77.037	2	-46.958	3	-.308	3	-.298	4	-.322	2	
147	4	max	-44.268	4	120.055	1	81.953	4	.316	4	.111	2	.021	4	
148		min	-301.554	9	-92.135	2	-80.21	3	-.308	3	-.115	1	-.061	7	
149	5	max	0	1	0	5	.006	1	0	1	0	1	0	1	
150		min	0	1	-.004	4	-.007	4	0	1	0	1	0	1	
151	MP1A	1	max	0	1	.042	4	.326	1	0	7	0	1	0	1
152		min	0	1	-.071	7	-.332	2	0	4	0	1	0	1	
153	2	max	535.395	2	418.698	4	62.201	7	.177	1	.271	1	.388	4	
154		min	-429.458	1	-265.161	3	-3.703	4	-.191	2	-.282	2	-.272	3	
155	3	max	554.842	2	445.055	4	76.393	5	.177	1	.351	1	.148	3	
156		min	-410.011	1	-291.518	3	-32.931	2	-.191	2	-.308	2	-.262	4	
157	4	max	-61.147	1	129.36	3	175.296	2	0	4	.092	1	.069	3	
158		min	-194.921	6	-129.337	4	-175.275	1	0	7	-.092	2	-.069	4	
159	5	max	0	1	.123	7	.214	6	0	4	0	1	0	1	



Envelope Member Section Forces (Continued)

Member	Sec		Axial[lb]	LC	y Shear...	LC	z Shear...	LC	Torque[...	LC	y-y Mo...	LC	z-z Mo...	LC	
160		min	-.001	6	-.01	4	-.12	1	0	7	0	6	0	2	
161	MP2A	1	max	0	1	.667	4	3.11	1	0	3	0	1	0	1
162		min	0	1	-.65	3	-3.14	2	0	4	0	1	0	1	
163		2	max	406.322	5	240.593	4	557.042	1	0	3	.552	1	.237	3
164		min	92.977	10	-240.575	3	-557.072	2	0	4	-.552	2	-.237	4	
165		3	max	1034.89	5	427.971	4	605.328	1	.023	4	.402	1	.102	4
166		min	211.143	10	-444.954	3	-603.055	2	-.025	3	-.374	2	-.105	3	
167		4	max	-85.13	1	235.229	3	545.709	2	0	7	.546	1	.235	3
168		min	-389.217	6	-235.241	4	-545.666	1	0	4	-.546	2	-.235	4	
169		5	max	0	1	.082	4	.48	6	0	7	0	6	0	1
170		min	0	1	-.168	7	-.053	1	0	4	0	1	0	1	
171	MP3A	1	max	0	1	.145	8	.462	1	0	3	0	1	0	1
172		min	0	1	-.055	3	-.479	2	0	8	0	1	0	1	
173		2	max	530.31	2	265.449	4	107.505	9	.189	2	.296	1	.263	4
174		min	-410.277	1	-412.645	3	.275	3	-.173	1	-.316	2	-.379	3	
175		3	max	536.558	2	283.794	4	109.34	9	.189	2	.355	1	.253	3
176		min	-404.03	1	-430.991	3	-4.169	2	-.173	1	-.309	2	-.149	4	
177		4	max	-85.567	1	140.726	3	186.159	2	0	8	.098	1	.075	3
178		min	-229.494	6	-140.766	4	-186.124	1	0	3	-.098	2	-.075	4	
179		5	max	0	1	.007	3	.254	6	0	8	0	1	0	4
180		min	-.001	6	-.19	8	-.155	1	0	3	0	6	0	1	
181	MP1B	1	max	0	1	.092	8	.204	1	0	8	0	1	0	1
182		min	0	1	-.062	3	-.212	2	0	3	0	1	0	1	
183		2	max	390.112	1	380.483	2	131.646	1	.169	3	.124	4	.405	2
184		min	-219.113	2	-526.222	1	-156.403	2	-.179	4	-.141	3	-.488	1	
185		3	max	410.272	5	406.146	2	146.462	1	.169	3	.205	1	.323	1
186		min	-199.665	2	-551.885	1	-171.22	2	-.179	4	-.26	2	-.188	2	
187		4	max	-61.148	3	121.927	1	141.835	3	0	3	.075	4	.065	1
188		min	-194.92	8	-121.969	2	-141.851	4	0	8	-.075	3	-.065	2	
189		5	max	0	2	.005	3	.114	2	0	3	0	1	0	4
190		min	0	8	-.208	8	-.199	5	0	8	0	2	0	3	
191	MP2B	1	max	0	1	.892	2	3.186	4	0	2	0	1	0	1
192		min	0	1	-.873	1	-3.165	3	0	1	0	1	0	1	
193		2	max	406.322	5	276.658	2	414.921	4	0	2	.412	4	.273	1
194		min	92.977	1	-276.638	1	-414.9	3	0	1	-.412	3	-.273	2	
195		3	max	863.308	6	364.071	2	443.405	4	.06	3	.79	4	.129	3
196		min	227.709	1	-335.415	1	-445.382	3	-.061	4	-.814	3	-.126	4	
197		4	max	-85.13	3	270.883	1	405.545	3	0	2	.406	4	.271	1
198		min	-389.217	8	-270.885	2	-405.575	4	0	5	-.406	3	-.271	2	
199		5	max	0	3	.09	2	.211	3	0	2	0	1	0	4
200		min	0	8	-.113	5	-.563	8	0	5	0	2	0	3	
201	MP3B	1	max	0	1	.129	2	.446	4	0	2	0	1	0	1
202		min	0	1	-.122	1	-.443	3	0	1	0	1	0	1	
203		2	max	348.636	4	435.519	4	141.616	4	.247	4	.085	4	.414	4
204		min	-186.423	3	-298.547	3	-177.142	3	-.234	3	-.087	3	-.34	3	
205		3	max	354.884	4	444.692	4	157.504	4	.247	4	.31	4	.182	1
206		min	-180.175	3	-307.72	3	-193.03	3	-.234	3	-.365	3	-.314	2	
207		4	max	-85.568	2	131.715	1	151.466	3	0	5	.08	4	.07	1
208		min	-229.493	5	-131.68	2	-151.496	4	0	2	-.08	3	-.07	2	
209		5	max	0	2	.173	5	.208	3	0	5	0	4	0	4
210		min	0	5	-.016	2	-.287	8	0	2	0	3	0	3	
211	MP1C	1	max	0	1	.088	1	.309	3	0	1	0	1	0	1
212		min	0	1	-.087	2	-.32	4	0	2	0	1	0	1	
213		2	max	337.712	3	285.686	4	137.983	3	.23	4	.076	3	.337	4
214		min	-204.39	4	-426.658	3	-168.459	4	-.243	3	-.084	4	-.411	3	
215		3	max	364.805	7	303.778	4	169.319	3	.23	4	.31	3	.313	2
216		min	-184.942	4	-444.75	3	-199.795	4	-.243	3	-.364	4	-.175	1	



Envelope Member Section Forces (Continued)

Member	Sec		Axial[lb]	LC	y Shear[...]	LC	z Shear[...]	LC	Torque[...]	LC	y-y Mo...	LC	z-z Mo...	LC	
217	4	max	-61.147	1	121.932	2	141.927	4	0	2	.075	3	.065	2	
218		min	-194.92	6	-121.965	1	-141.937	3	0	5	-.075	4	-.065	1	
219	5	max	0	5	.009	2	.161	4	0	2	0	3	0	4	
220		min	0	2	-.185	5	-.2	7	0	5	0	4	0	3	
221	MP2C	1	max	0	.876	1	3.164	3	0	1	0	1	0	1	
222		min	0	1	-.879	2	-3.167	4	0	2	0	1	0	1	
223	2	max	406.322	6	276.642	1	414.898	3	0	1	.412	3	.273	2	
224		min	92.977	3	-276.645	2	-414.902	4	0	2	-.412	4	-.273	1	
225	3	max	864.055	8	344.588	1	439.303	3	.068	3	.789	3	.128	3	
226		min	228.03	3	-344.884	2	-442.503	4	-.068	4	-.814	4	-.129	4	
227	4	max	-85.13	4	270.884	2	405.547	4	0	5	.406	3	.271	2	
228		min	-389.217	7	-270.882	1	-405.567	3	0	2	-.406	4	-.271	1	
229	5	max	0	2	.098	5	.212	4	0	5	0	1	0	4	
230		min	0	7	-.091	2	-.491	7	0	2	0	2	0	3	
231	MP3C	1	max	0	.091	4	.291	1	0	4	0	1	0	1	
232		min	0	1	-.097	3	-.305	2	0	3	0	1	0	1	
233	2	max	407.262	1	528.461	1	123.783	1	.175	3	.13	3	.488	1	
234		min	-217.707	2	-392.181	2	-156.617	2	-.163	4	-.138	4	-.409	2	
235	3	max	413.509	1	544.349	1	132.956	1	.175	3	.2	1	.192	2	
236		min	-211.459	2	-408.069	2	-165.79	2	-.163	4	-.257	2	-.317	1	
237	4	max	-85.567	3	131.717	2	151.35	4	0	7	.08	3	.07	2	
238		min	-229.492	8	-131.672	1	-151.366	3	0	1	-.08	4	-.07	1	
239	5	max	0	7	.194	7	.164	2	0	7	0	1	0	4	
240		min	0	4	-.008	1	-.19	5	0	1	0	2	0	3	
241	M28	1	max	204.855	1	432.946	1	241.457	1	.014	1	.29	2	.295	4
242		min	-250.635	2	-388.734	2	-257.911	2	-.014	2	-.282	1	-.264	3	
243	2	max	201.488	1	431.185	1	239.513	1	.014	1	.124	2	.312	4	
244		min	-247.268	2	-390.495	2	-255.967	2	-.014	2	-.11	1	-.297	3	
245	3	max	198.121	1	429.424	1	237.569	1	.014	1	.077	4	.332	4	
246		min	-243.901	2	-392.256	2	-254.023	2	-.014	2	-.058	3	-.332	3	
247	4	max	194.753	1	427.662	1	235.625	1	.014	1	.232	1	.353	4	
248		min	-240.533	2	-394.017	2	-252.079	2	-.014	2	-.207	2	-.367	3	
249	5	max	191.386	1	425.901	1	233.681	1	.014	1	.402	1	.377	4	
250		min	-237.166	2	-395.778	2	-250.135	2	-.014	2	-.373	2	-.404	3	
251	M29	1	max	182.999	4	419.228	2	239.165	2	.014	2	.409	1	.409	3
252		min	-226.604	3	-425.546	1	-233.669	1	-.014	1	-.385	2	-.41	4	
253	2	max	180.943	1	417.467	2	241.109	2	.014	2	.24	1	.383	3	
254		min	-229.014	2	-427.307	1	-235.613	1	-.014	1	-.216	2	-.379	4	
255	3	max	184.31	1	415.706	2	243.053	2	.014	2	.09	3	.358	3	
256		min	-232.381	2	-429.068	1	-237.558	1	-.014	1	-.069	4	-.349	4	
257	4	max	187.677	1	413.945	2	244.998	2	.014	2	.121	2	.335	3	
258		min	-235.748	2	-430.829	1	-239.502	1	-.014	1	-.102	1	-.32	4	
259	5	max	191.044	1	412.184	2	246.942	2	.014	2	.29	2	.314	3	
260		min	-239.116	2	-432.59	1	-241.446	1	-.014	1	-.274	1	-.292	4	
261	M30	1	max	126.933	2	344.597	3	155.223	3	.016	3	.26	4	.204	1
262		min	-167.227	1	-330.678	4	-158.649	4	-.016	4	-.245	3	-.183	2	
263	2	max	126.933	2	342.836	3	155.223	3	.016	3	.134	4	.199	1	
264		min	-167.227	1	-332.439	4	-158.649	4	-.016	4	-.117	3	-.182	2	
265	3	max	126.933	2	341.075	3	155.223	3	.016	3	.044	1	.196	1	
266		min	-167.227	1	-334.2	4	-158.649	4	-.016	4	-.026	2	-.182	2	
267	4	max	126.933	2	339.314	3	155.223	3	.016	3	.137	3	.195	1	
268		min	-167.227	1	-335.962	4	-158.649	4	-.016	4	-.118	4	-.184	2	
269	5	max	126.933	2	337.553	3	155.223	3	.016	3	.264	3	.197	1	
270		min	-167.227	1	-337.723	4	-158.649	4	-.016	4	-.245	4	-.187	2	
271	M28A	1	max	6370.059	5	53.848	5	42.483	3	0	4	0	1	0	1
272		min	303.713	2	-7.736	2	-42.483	4	0	3	0	1	0	1	
273	2	max	6388.704	5	26.924	5	21.242	3	0	4	.039	3	.007	2	



Envelope Member Section Forces (Continued)

Member	Sec		Axial[lb]	LC	y Shear...	LC	z Shear...	LC	Torque[...	LC	y-y Mo...	LC	z-z Mo...	LC	
274		min	321.086	2	-3.868	2	-21.242	4	0	3	-.039	4	-.05	5	
275	3	max	6407.348	5	0	1	0	1	0	4	.053	3	.01	2	
276		min	338.46	2	0	1	0	1	0	3	-.053	4	-.067	5	
277	4	max	6425.992	5	3.868	2	21.242	4	0	4	.039	3	.007	2	
278		min	355.834	2	-26.924	5	-21.242	3	0	3	-.039	4	-.05	5	
279	5	max	6444.636	5	7.736	2	42.483	4	0	4	0	1	0	1	
280		min	373.207	2	-53.848	5	-42.483	3	0	3	0	1	0	1	
281	M29A	1	max	6352.753	8	53.585	8	34.415	1	0	3	0	1	0	1
282		min	597.537	3	-7.061	3	-34.415	2	0	4	0	1	0	1	
283	2	max	6371.529	8	26.793	8	17.208	1	0	3	.032	1	.007	3	
284		min	614.573	3	-3.531	3	-17.208	2	0	4	-.032	2	-.05	8	
285	3	max	6390.305	8	0	1	0	1	0	3	.043	1	.009	3	
286		min	631.609	3	0	1	0	1	0	4	-.043	2	-.066	8	
287	4	max	6409.08	8	3.531	3	17.208	2	0	3	.032	1	.007	3	
288		min	648.646	3	-26.793	8	-17.208	1	0	4	-.032	2	-.05	8	
289	5	max	6427.856	8	7.061	3	34.415	2	0	3	0	1	0	1	
290		min	665.682	3	-53.585	8	-34.415	1	0	4	0	1	0	1	
291	M30A	1	max	6327.108	7	53.585	7	34.415	2	0	3	0	1	0	1
292		min	575.38	4	-7.061	4	-34.415	1	0	4	0	1	0	1	
293	2	max	6345.883	7	26.793	7	17.208	2	0	3	.032	2	.007	4	
294		min	592.416	4	-3.531	4	-17.208	1	0	4	-.032	1	-.05	7	
295	3	max	6364.659	7	0	1	0	1	0	3	.043	2	.009	4	
296		min	609.453	4	0	1	0	1	0	4	-.043	1	-.066	7	
297	4	max	6383.435	7	3.531	4	17.208	1	0	3	.032	2	.007	4	
298		min	626.489	4	-26.793	7	-17.208	2	0	4	-.032	1	-.05	7	
299	5	max	6402.211	7	7.061	4	34.415	1	0	3	0	1	0	1	
300		min	643.525	4	-53.585	7	-34.415	2	0	4	0	1	0	1	

Envelope AISC 14th(360-10): LRFD Steel Code Checks

Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	...	phi*Pn...	phi*Pn...	phi*M...	phi*M...	...	Eqn	
1	MP2C	PIPE_2.0	.854	5.583	4	.101	3.25	4	14916...	32130	1.872	1.872	... H1-1b	
2	MP2B	PIPE_2.0	.852	5.583	3	.097	3.25	4	14916...	32130	1.872	1.872	... H1-1b	
3	MP2A	PIPE_2.0	.754	3.25	1	.074	3.25	1	14916...	32130	1.872	1.872	... H1-1b	
4	M29	L2.5x2.5x4	.502	0	1	.104	0	y	2	36000...	38556	1.114	2.537	... H2-1
5	M28	L2.5x2.5x4	.492	1.45	1	.102	0	y	1	36000...	38556	1.114	2.537	... H2-1
6	M11	PL1/2x6	.444	.725	3	.153	.725	y	5	45519...	97200	1.012	12.15	... H1-1b
7	M12	PL1/2x6	.424	.725	1	.157	.725	y	7	45519...	97200	1.012	12.15	... H1-1b
8	M10	PL1/2x6	.396	.725	4	.175	.725	y	5	45519...	97200	1.012	12.15	... H1-1b
9	MP1B	PIPE_2.0	.382	3.563	1	.153	3.563	1	20866...	32130	1.872	1.872	... H1-1b	
10	MP3C	PIPE_2.0	.375	3.563	1	.153	3.563	1	20866...	32130	1.872	1.872	... H1-1b	
11	MP1C	PIPE_2.0	.351	3.563	3	.195	3.563	3	20866...	32130	1.872	1.872	... H1-1b	
12	MP3B	PIPE_2.0	.349	3.563	4	.197	3.563	4	20866...	32130	1.872	1.872	... H1-1b	
13	M15	PIPE_2.0	.283	7.099	2	.203	13.292	4	4678...	32130	1.872	1.872	... H1-1b	
14	M8	HSS4x4x4	.276	3.275	7	.056	3.275	z	1	11659...	139518	16.181	16.181	... H1-1b
15	MP1A	PIPE_2.0	.276	3.563	4	.137	3.563	2	20866...	32130	1.872	1.872	... H1-1b	
16	M14	PIPE_2.0	.274	7.25	2	.207	1.208	3	4678...	32130	1.872	1.872	... H1-1b	
17	M30	L2.5x2.5x4	.273	1.45	3	.105	0	y	3	36000...	38556	1.114	2.537	... H2-1
18	MP3A	PIPE_2.0	.267	3.563	3	.135	1.25	2	20866...	32130	1.872	1.872	... H1-1b	
19	M7	HSS4x4x4	.266	3.275	8	.058	3.275	y	2	11659...	139518	16.181	16.181	... H1-1b
20	M9	HSS4x4x4	.264	3.275	5	.071	3.275	y	4	11659...	139518	16.181	16.181	... H1-1b
21	M6	HSS4x4x4	.241	0	3	.097	3.427	y	8	11155...	139518	16.181	16.181	... H1-1b
22	M5	HSS4x4x4	.214	3.427	7	.096	3.427	y	6	11155...	139518	16.181	16.181	... H1-1b
23	M4	HSS4x4x4	.212	3.427	8	.097	3.427	y	6	11155...	139518	16.181	16.181	... H1-1b
24	M3	PIPE_3.0	.167	9.062	8	.124	8.911	4	21266...	65205	5.749	5.749	... H1-1b	
25	M2	PIPE_3.0	.164	8.911	4	.128	5.589	3	21266...	65205	5.749	5.749	... H1-1b	



Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	...	phi*Pn...	phi*Pn...	phi*M...	phi*M...	Eqn
26	M28A	LL2x2x4x0	.153	4.95	5	.002	0	y 5	42043...	85050	4.02	2.936 1 H1-1...
27	M29A	LL2x2x4x0	.153	4.95	8	.003	4.95	z 2	42043...	85050	4.02	2.936 ... H1-1...
28	M1	PIPE_3.0	.153	9.063	2	.094	5.589	2	21266...	65205	5.749	5.749 ... H1-1b
29	M30A	LL2x2x4x0	.152	4.95	7	.003	0	z 2	42043...	85050	4.02	2.936 ... H1-1...
30	M13	PIPE_3.0	.117	7.25	4	.151	1.208	1	21266...	65205	5.749	5.749 ... H1-1b

Envelope AISI S100-10: LRFD Cold Formed Steel Code Checks

Member	Shape	Code ...	Loc[ft]	LC Shear ...	Loc[ft]	Dir LC	phi*Pn[lb]	phi*Tn[lb]	phi*Mny...	phi*Mnz...	Cb	Cmyy	Cmzz	Eqn
No Data to Print ...														

Envelope AA ADM1-10: ASD - Building Aluminum Code Checks

Member	Shape	Code C...	Loc[ft]	LC Shear ...	Loc[ft]	Dir LC	Pnc/O...	Pnt/Om...	Mny/O...	Mnz/O...	Vny/O...	Vnz/O...	Cb	Eqn
No Data to Print ...														

EXHIBIT 9

MODIFICATION AND DESIGN DRAWINGS FOR EXISTING ANTENNA MOUNTS EXISTING MONOPOLE TOWER

PROPOSED CARRIER: T-MOBILE

TOWER OWNER: SBA / TOWER OWNER SITE #: CT13529-A

CARRIER SITE #/NAME: CTHA075D / HA075/OPTASITE

COORDINATES (LATITUDE: 41.789083°, LONGITUDE: -72.482083°)

PLEASE NOTE THIS SET OF DRAWINGS ARE FOR INSTALLATION AND ASSEMBLY ONLY. FABRICATION DETAIL DRAWINGS ARE NOT PROVIDED AND MUST BE COMPLETED BY THE STEEL FABRICATOR SELECTED. TES CAN PROVIDE THE FABRICATION DETAIL DRAWINGS FOR AN ADDITIONAL FEE.

SHEET	SHEET TITLE	REV
T-1	TITLE SHEET	0
BOM	BILL OF MATERIALS	0
GN-1	GENERAL NOTES	0
A-1	ANTENNA MOUNT MODIFICATION DETAILS	0
A-2	ANTENNA MOUNT PHOTOS	0
D-1	STANDARD DETAILS	0
MS-1436	METROSITE LIGHT COLLAR MOUNT PLATE ASSEMBLY DETAIL	
MPW-1	METROSITE LIGHT COLLAR MOUNT PLATE WELDMENT DETAIL	
MS-KI22-8	METROSITE KICKER SUPPORT KIT	

NOTE:

1. THE MODIFICATION DRAWINGS ARE BASED ON THE TES PROJECT NO. 81819, DATED 07/22/2019.



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PH: (972) 483-0607



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BOCA RATON, FL 33487
(800)-487-SITE

TES JOB NO:
82735

CUSTOMER SITE NO:
CT13529-A-SBA
CUSTOMER SITE NAME:
MANCHESTER 1
93 LAKE STREET
MANCHESTER, CT 06042



DRAWN BY: GA CHECKED BY: MK/HMA

REV.	DESCRIPTION	BY	DATE
△	FIRST ISSUE	GA	08/28/19
△			
△			
△			

SHEET TITLE:

TITLE SHEET

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SHEET NUMBER: T-1 REV #: 0

BILL OF MATERIALS

QUANTITY COUNTED	QUANTITY PROVIDED	PART NUMBER	DESCRIPTIONS	SHEET LIST	PIECE WEIGHT (LBS)	WEIGHT (LB)	NOTES
			MATERIAL & HARDWARE				
1	1	MS-1436	METROSITE LIGHT COLLAR MOUNT ASSEMBLY	A-1, MS-1436	87.0	87.0	Galvanized
			FOLLOWING ITEMS ARE "CUSTOM" PARTS				
1	1	MS-KI22-8	METROSITE KICKER SUPPORT KIT	A-1, D-1, MS-KI22-8	202.00	202.0	GALVANIZED
3	3	C5X6.7-725	C5 X 6.7 X 7 1/4" LONG A36 CHANNEL	D-1, F-1	4.10	12.3	GALVANIZED
12	13	---	THREADED ROD 5/8" X 12" A36	D-1	0.00	0.0	(2) HHN & LKW-EA GALVANIZED
ALL METROSITE PARTS ARE AVAILABLE FROM METROSITE, LLC.							
180 IND PARK BLVD COMMERCE, GA 30529							
OFFICE: (706) 335-7045							
FAX: (706) 335-7056							
NOTE: ALL MATERIALS, WHICH WEREN'T LISTED IN THIS SHEET, ARE ASSUMED TO BE PROVIDED BY THE CONTRACTOR.							
					TOTAL WEIGHT (LBS) =	301.3	



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SHEET TITLE:

BILL OF MATERIALS

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SHEET NUMBER: BOM	REV #: 0
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GENERAL NOTES

1. ALL WORK SHALL COMPLY WITH THE ANSI/TIA-222-G, ANSI/ASSP A10.48, 2018 CONNECTICUT STATE BUILDING CODE AND ANY OTHER GOVERNING BUILDING CODES AND OSHA SAFETY REGULATIONS.
2. ALL WORK INDICATED ON THE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS EXPERIENCED IN TELECOMMUNICATIONS TOWER, POLE AND FOUNDATION CONSTRUCTION.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND FABRICATION OF ALL MISCELLANEOUS PARTS (SUCH AS SHIMS), TEMPORARY SUPPORTS, AND GUYINGS, ETC., PER ANSI/ASSP A10.48, TO COMPLETE THE ASSEMBLY AS SHOWN IN THE DRAWINGS.
4. CONTRACTOR SHALL PROCEED WITH THE INSTALLATION WORK CAREFULLY SO THE WORK WILL NOT DAMAGE ANY EXISTING CABLE, EQUIPMENT OR THE STRUCTURE.
5. THE USE OF GAS TORCH OR WELDER, ARE NOT ALLOWED ON ANY TOWER STRUCTURE WITHOUT THE CONSENT OF THE TOWER OWNER.
6. GENERALLY THE CONTRACTOR IS RESPONSIBLE TO CONDUCT AN ONSITE VISIT SURVEY OF THE JOB SITE AFTER AWARD, AND REPORT ANY ISSUES WITH THE SITE TO **TES** BEFORE PROCEEDING CONSTRUCTION.
7. IT IS THE RESPONSIBILITY OF THE GC TO VERIFY THAT THERE IS NO INTERFERENCES (WITH SAFETY CLIMB BRACKETS, TRANSMISSION LINES, ETC.) PRIOR TO MOBILIZATION AND INSTALLATION OF THESE MODIFICATIONS.
8. PLEASE NOTIFY TES IMMEDIATELY IF ANY INSTALLATION ISSUES OCCUR RELATED TO THIS DRAWING @ 972-483-0607 OR EMAIL-TESCONSTRUCTION@TESTOWER.US

FABRICATION

1. ALL STEEL SHALL MEET OR EXCEED THE MINIMUM STRENGTH AS SPECIFIED IN THE DRAWINGS. IF YIELD STRENGTH WAS NOT NOTED IN THE DRAWINGS, CONTRACTORS SHALL CONTACT TES FOR DIRECTION.
2. ALL FIELD CUT EDGES SHALL BE GROUND SMOOTH. ALL FIELD CUT AND DRILLED SURFACES SHALL BE REPAIRED WITH A MINIMUM OF TWO COATS OF ZINGA COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURER'S RECOMMENDATIONS.

WELDING

1. ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS AND IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE D1.1. ALL ELECTRODES TO BE LOW HYDROGEN, MATCHING FILLER METAL, PER AWS D1.1, UNO. (E70XX UNLESS NOTED OTHERWISE).
2. PRIOR TO FIELD WELDING GALVANIZED MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING APPROX. 0.5" BEYOND THE PROPOSED FIELD WELD SURFACES.
3. ALL WELDS SHALL BE INSPECTED VISUALLY. A MINIMUM OF 25% OF WELDS SHALL BE INSPECTED WITH DYE PENETRANT OR MAGNETIC PARTICLE TO MEET THE ACCEPTANCE CRITERIA OF AWS D1.1. 100% OF WELDS SHALL BE INSPECTED IF DEFECTS ARE FOUND.
4. WELD INSPECTIONS SHALL BE PERFORMED BY AN AWS CERTIFIED WELD INSPECTOR.
5. AFTER INSPECTION, ALL FIELD WELDED SURFACES SHALL BE REPAIRED WITH A MINIMUM OF TWO COATS OF ZINGA COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURER'S RECOMMENDATIONS.

BOLTED ASSEMBLIES AND TIGHTENING OF CONNECTIONS

1. ALL HIGH STRENGTH BOLTS SHALL CONFORM TO THE PROVISIONS OF THE SPECIFICATIONS FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS AS APPROVED BY THE RSCC.
2. FLANGE BOLTS SHALL BE TIGHTENED BY THE AISC "TURN-OF-THE-NUT" METHOD. THE FOLLOWING TABLE SHOULD BE USED FOR THE "TURN-OF-THE-NUT" TIGHTENING.
3. SPLICE BOLTS AND ALL OTHER BOLTS IN BEARING TYPE CONNECTIONS SHALL BE TIGHTENED TO A SNUG-TIGHT CONDITION.
4. THE SNUG-TIGHT CONDITION IS DEFINED AS THE TIGHTNESS ATTAINED BY EITHER A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF AN IRONWORKER WITH AN ORDINARY SPUD WRENCH TO BRING THE CONNECTED PLIES INTO FIRM CONTACT.
5. HB HOLLO-BOLT SHALL BE INSTALLED PER ICC ESR-3330 INSTRUCTIONS.

VERIFICATION AND INSPECTION

1. IF APPLICABLE, VERIFICATION INSPECTION TO BE PERFORMED SHALL BE IN ACCORDANCE TO IBC-2015 SECTION 1705 FOR STEEL CONSTRUCTION AND TABLE 1705.3 FOR CONCRETE CONSTRUCTION.

TABLE 8.2 NUT ROTATION FROM SNUG-TIGHT CONDITION FOR TURN-OF-NUT PRETENSIONING^{a,b}

BOLT LENGTH ^f	DISPOSITION OF OUTER FACE OF BOLTED PARTS		
	BOTH FACES NORMAL TO BOLT AXIS	ONE FACE NORMAL TO BOLT AXIS, OTHER SLOPED NOT MORE THAN 1:20 ^d	BOTH FACES SLOPED NOT MORE THAN 1:20 FROM NORMAL TO BOLT AXIS ^d
NOT MORE THAN 4d _b	1/3 TURN	1/2 TURN	2/3 TURN
MORE THAN 4d _b BUT NOT MORE THAN 8d _b	1/2 TURN	2/3 TURN	5/6 TURN
MORE THAN 8d _b BUT NOT MORE THAN 12d _b	2/3 TURN	5/6 TURN	1 TURN

^a NUT ROTATION IS RELATIVE TO BOLT REGARDLESS OF THE ELEMENT (NUT OR BOLT) BEING TURNED. FOR REQUIRED NUT ROTATIONS OF 1/2 TURN AND LESS, THE TOLERANCE IS PLUS OR MINUS 30 DEGREES; FOR REQUIRED NUT ROTATIONS OF 2/3 TURN AND MORE, THE TOLERANCE IS PLUS OR MINUS 45 DEGREES.

^b APPLICABLE ONLY TO JOINTS IN WHICH ALL MATERIAL WITHIN THE GRIP IS STEEL.

^c WHEN THE BOLT LENGTH EXCEEDS 12d_b, THE REQUIRED NUT ROTATION SHALL BE DETERMINED BY ACTUAL TESTING IN A SUITABLE TENSION CALIBRATOR THAT SIMULATES THE CONDITIONS OF SOLIDLY FITTING STEEL.

^d BEVELED WASHER NOT USED.

SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS, JUNE 30, 2004 RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS

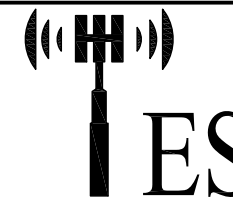
INSTALLATION TORQUE REQUIRED FOR HOLLO BOLTS AND AJAX BOLTS:

1. HB12 HOLLO BOLT: 59 FT-LBS
2. HB16 HOLLO BOLT: 140 FT-LBS
3. HB20 HOLLO BOLT: 221 FT-LBS
4. M20 AJAX BOLT: 280 FT-LBS.

FIELD HOT WORK PLAN NOTES:

FOLLOWING GUIDELINES SHALL BE COMPLIED WITH:

1. CONTRACTOR'S RESPONSIBILITY TO COMPLETE A HOT WORK PLAN IF AWARDED PER CUSTOMER SPECIFICATIONS GUIDELINES FOR WELDING, CUTTING & SPARK PRODUCING WORK.
2. HAVE A FIRE PLAN APPROVED BY THE CUSTOMER AND THEIR SAFETY MANAGEMENT DEPT.
3. CONTRACTOR MUST OBTAIN THE CONTACT INFO OF THE LOCAL FIRE DEPARTMENT AND THE 911 ADDRESS OF THE TOWER SITE BEFORE CONSTRUCTION.
4. CONTRACTOR SHALL MAKE SURE THAT CELL PHONE COVERAGE IS AVAILABLE IN THE TOWER SITE. IF CELL COVERAGE IS NOT AVAILABLE, AN IMMEDIATE AVAILABLE MEANS OF DIRECT COMMUNICATION WITH THE FIRE DEPARTMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION START.
5. ALL CONSTRUCTION SHALL BE PERFORMED UNDER WIND SPEED LESS THAN 10 MPH ON THE GROUND LEVEL. IF WIND SPEED INCREASE, CONTRACTOR MUST DETERMINE IF CONSTRUCTION SHALL BE DISCONTINUED.
6. FIRE SUPPRESSION EQUIPMENT MUST BE MADE AVAILABLE ON SITE AND READY TO USE.
7. CONTRACTOR SHALL ASSIGN A FIRE WATCHER TO PERFORM FIRE-FIGHTING DUTIES.
8. ALL WELDERS SHALL BE AWS OR STATE CERTIFIED. THEY MUST ALSO BE EXPERIENCED IN WELDING ON GALVANIZED MATERIALS.
9. IF IT IS POSSIBLE, ALL EXISTING COAX NEAR WELDING AREA SHALL BE TEMPORARILY MOVED AWAY FROM THE WELDING AREA BEFORE WELDING THE PLATES.
10. PLEASE REPORT ANY FIELD ISSUE TO TES @ 972-483-0607.



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REV.	DESCRIPTION	BY	DATE
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SHEET NUMBER:

GN-1

REV #:

0

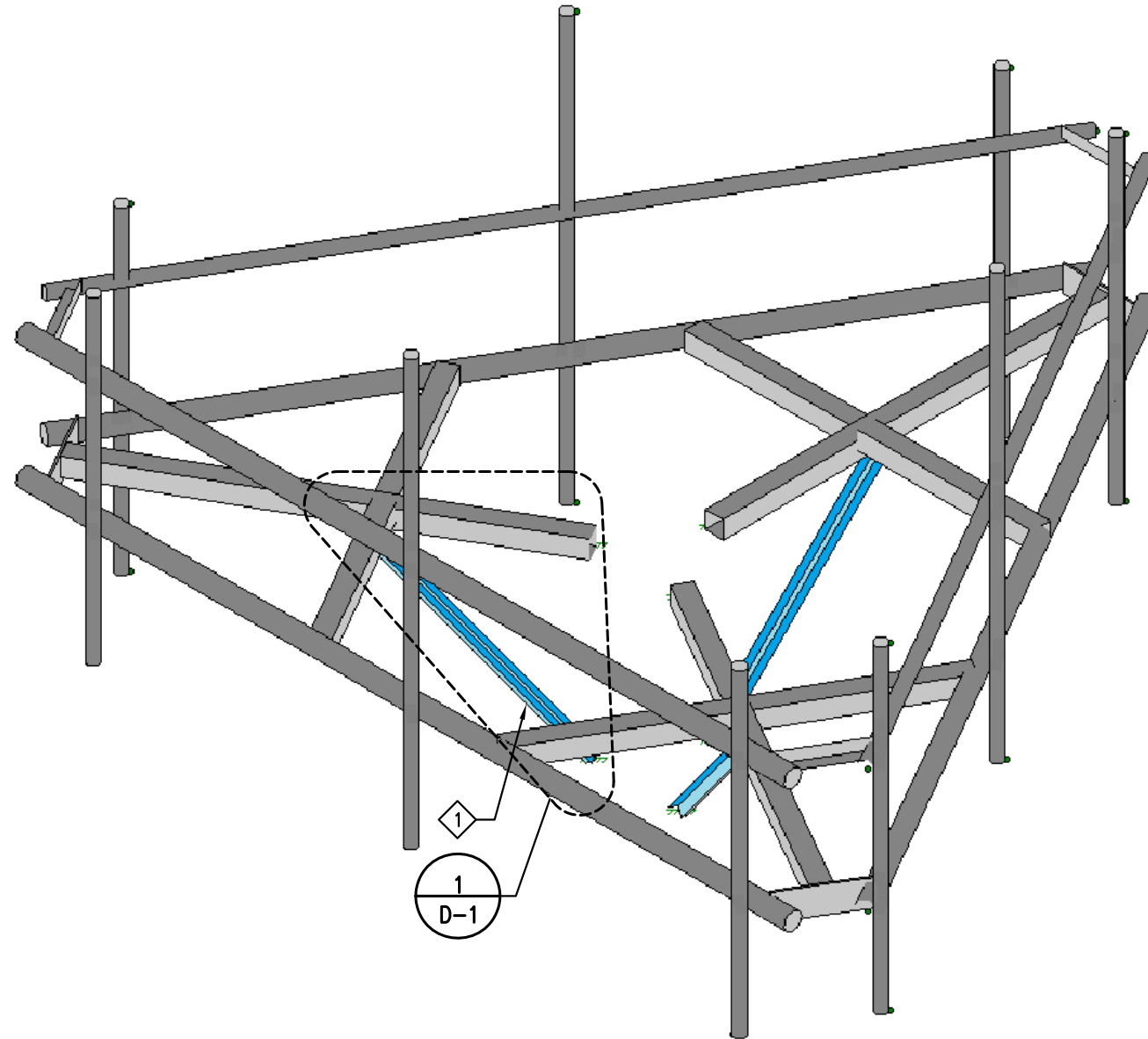
SCOPE OF WORK

- ① INSTALL NEW LIGHT COLLAR MOUNT (NOT SHOWN FOR CLARITY) & KICKER SUPPORT KIT. SEE SHEETS D-1, MS-1436 & MS-K122-8 FOR DETAILS.
- ② THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEAN-UP, REMOVAL AND DISPOSAL OF EXCESS MATERIALS USED AND REMOVED FROM THE STRUCTURE AT THE COMPLETION OF THE PROJECT.



EXISTING ANTENNA MOUNT @ 105' ELEV.

PHOTO 1



ISOMETRIC VIEW
EXISTING ANTENNA MOUNT @ 105' ELEV.

GC NOTE:

- 1. IT IS THE RESPONSIBILITY OF THE GC TO VERIFY THAT THERE IS NO INTERFERENCES WITH (PORT HOLES, SAFETY CLIMB BRACKETS, TRANSMISSION LINES, ETC.) PRIOR TO MOBILIZATION AND INSTALLATION OF THESE MODIFICATIONS.
- 2. PLEASE NOTIFY TES IMMEDIATELY IF ANY INSTALLATION ISSUES OCCUR RELATED TO THIS DRAWING @ 972-483-0607 OR EMAIL-TESCONSTRUCTION@TESTOWER.US

NOTES:

- 1. TEMPORARILY RELOCATE ANY EXISTING COAX ATTACHED TO THE LEGS AND/OR ANY OTHER MEMBERS WHERE OBSTRUCTION WITH THE PROPOSED MODIFICATION MAY OCCUR.
- 2. WHEN FIELD CUTTING AND DRILLING ANGLES, USE SAME GAGE LINES AND EDGE DISTANCES AS INDICATED ON SHOP CUT AND DRILLED ENDS.
- 3. APPLY (2) COATS OF ZINC RICH GALVANIZING COMPOUND AS PER THE MANUFACTURER'S SPECIFICATIONS TO ALL FIELD CUT AND DRILLED AREAS.
- 4. MEMBERS IN BLUE COLOR ARE NEW REINFORCEMENTS.

ITEM NO.	QTY.	PART NO.	DESCRIPTIONS
1	1	MS-1436	METROSITE LIGHT COLLAR MOUNT ASSEMBLY
2	1	MS-K122-8	METROSITE KICKER SUPPORT KIT



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REV.	DESCRIPTION	BY	DATE
△	FIRST ISSUE	GA	08/28/19
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SHEET TITLE:
**ANTENNA MOUNT
MODIFICATION DETAILS**

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SHEET NUMBER: **A-1** REV #: **0**



PHOTO 1

EXISTING COAX HANGER MAY BE RELOCATED TO ACCOMMODATE THE INSTALLATION OF MOUNT MODIFICATION



PHOTO 2



PHOTO 3



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REV.	DESCRIPTION	BY	DATE
1	FIRST ISSUE	GA	08/28/19

SHEET TITLE:

ANTENNA MOUNT
 PHOTOS

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SHEET NUMBER: A-2 REV #: 0



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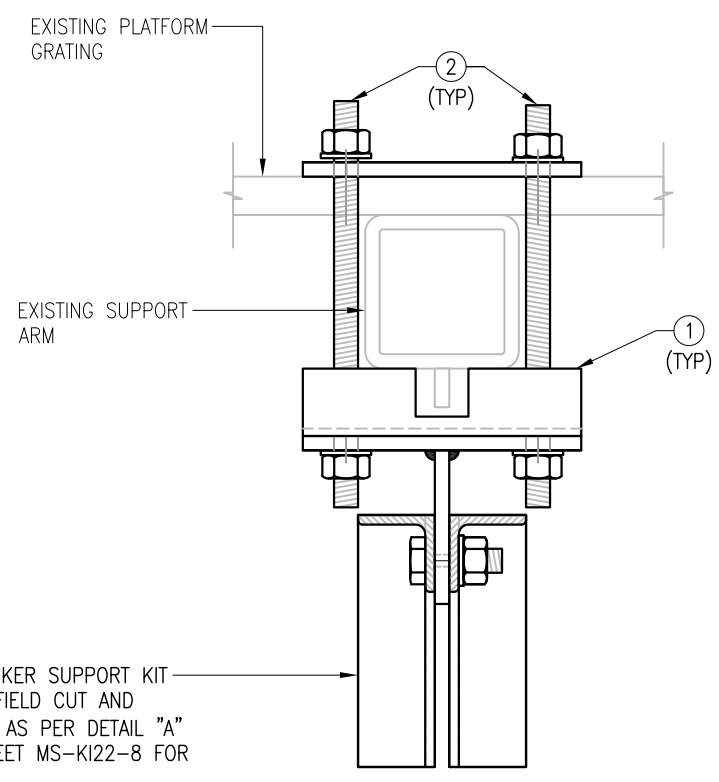
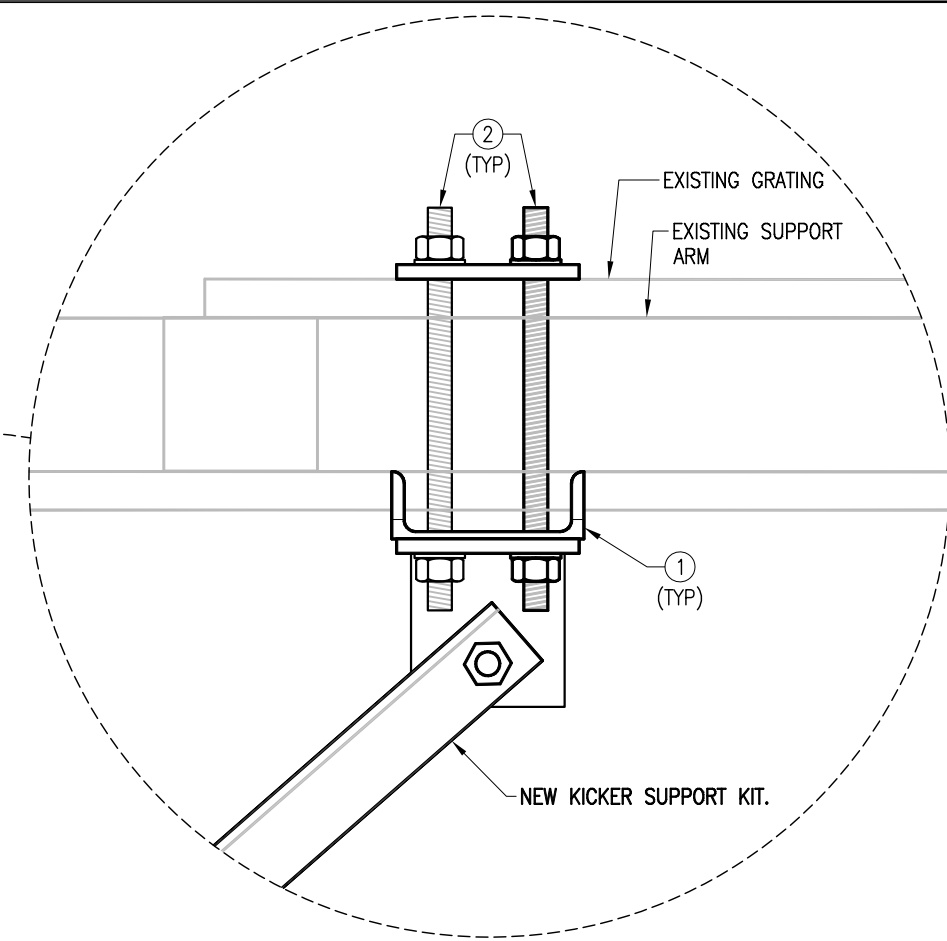
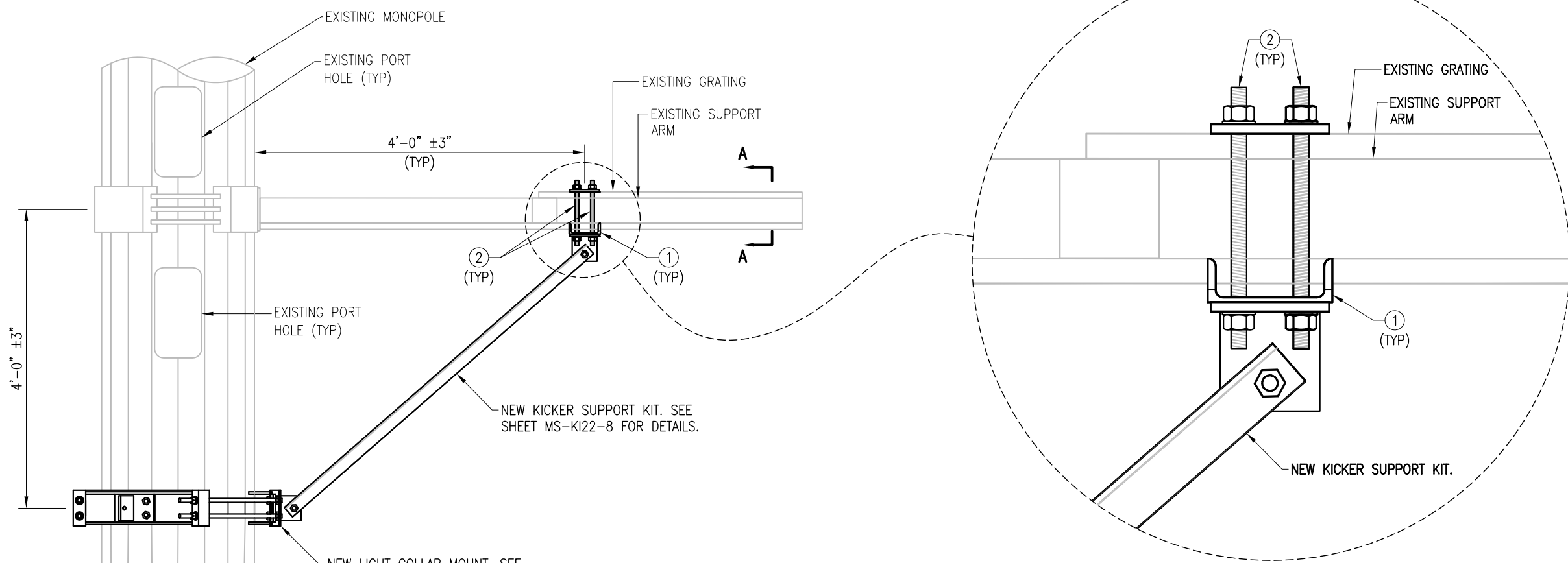
SHEET TITLE:

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SHEET NUMBER: REV #:

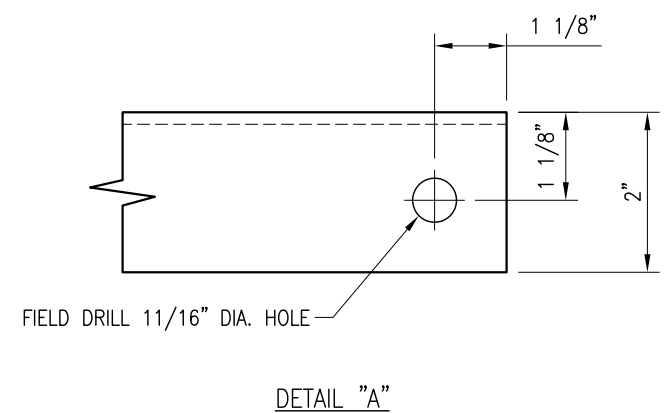
D-1 0



NEW KICKER SUPPORT KIT TO BE FIELD CUT AND DRILLED AS PER DETAIL "A" SEE SHEET MS-KI22-8 FOR DETAILS.

SECTION A-A

1
D-1
DETAIL



NOTES:
1. HOT-DIPPED GALVANIZED PER ASTM A123.
2. ALL HOLES ARE 11/16" DIA. U.N.O

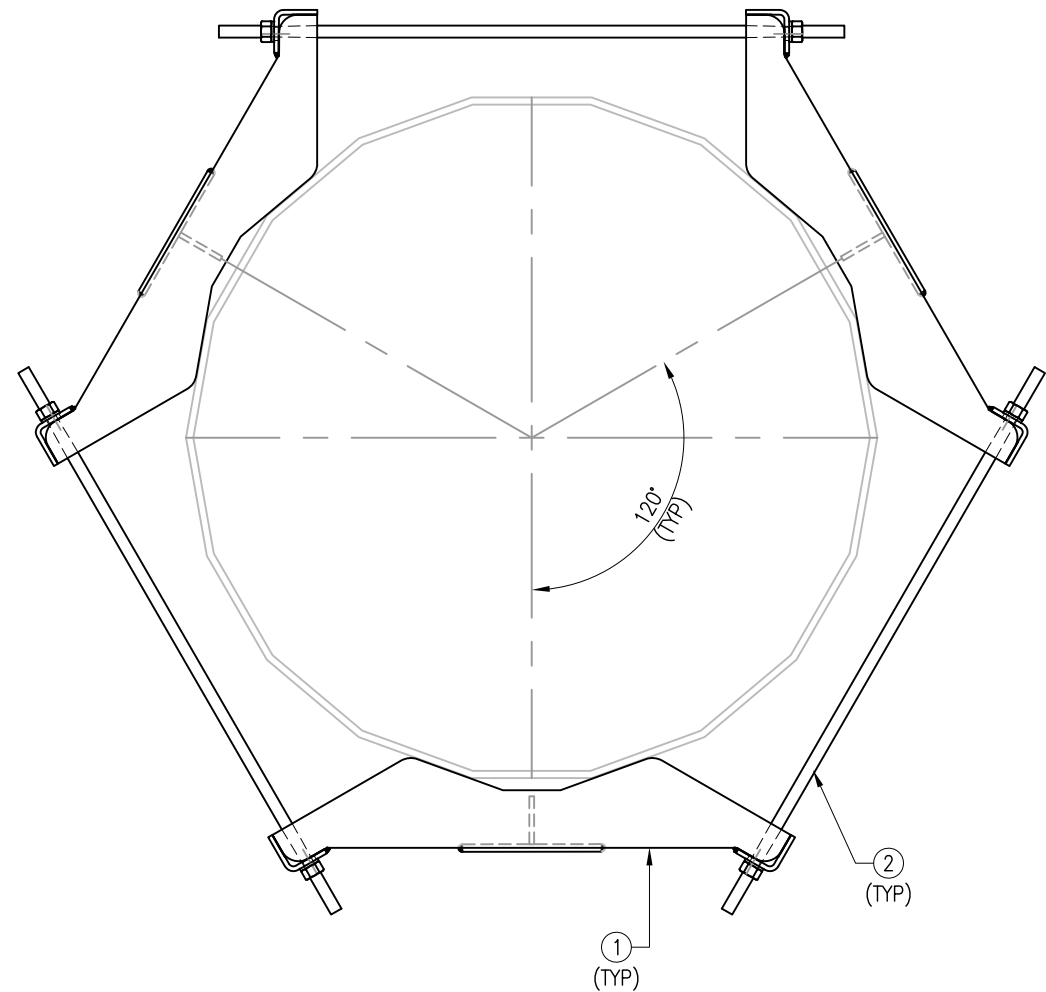
ITEM NO.	QTY.	PART NO.	DESCRIPTIONS
1	3	C5X6.7-725	C5 X 6.7 X 7 1/4" LONG A36 CHANNEL
2	12	---	THREADED ROD 5/8" X 12" A36

THE FOLLOWING DRAWINGS ARE INCLUDED FOR REFERENCE ONLY
PLEASE REFER TO THE INSTALLATION DRAWINGS FOR ACTUAL INSTALLATION DETAILS

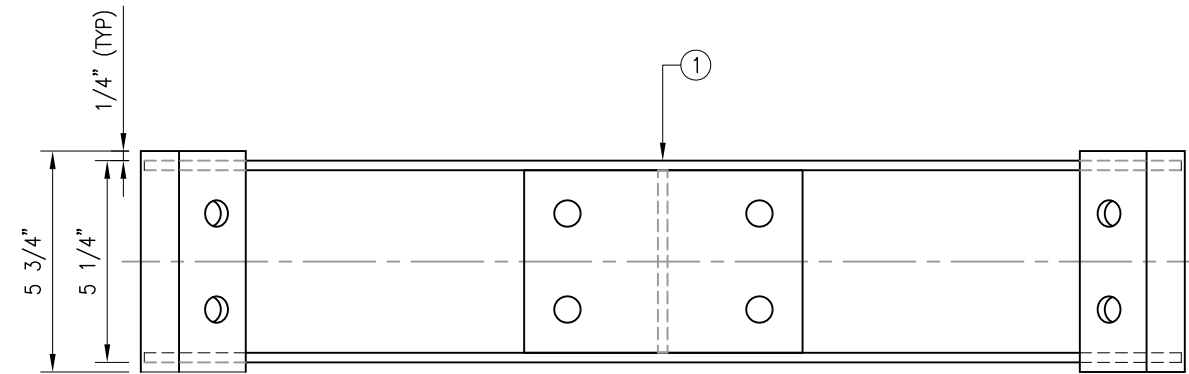
NOTE:
1) FITS 12" DIA TO 32" DIA.

2	6	---	THREADED ROD 5/8" X 2'-4 3/4" W/ 2 HHN & LK EA A36
1	3	MPW-1	MOUNT PLATE WELDMENT A36
ITEM NO.	QTY.	PART NO.	DESCRIPTION

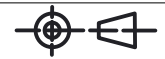

GALVANIZED WEIGHT: 65.6 LBS



TOP VIEW

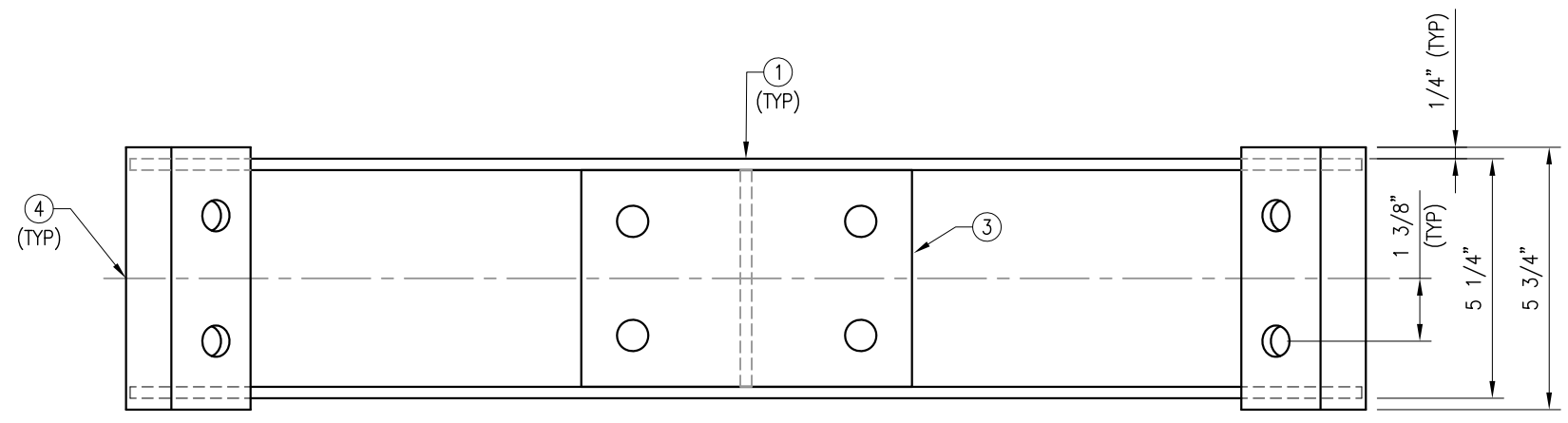
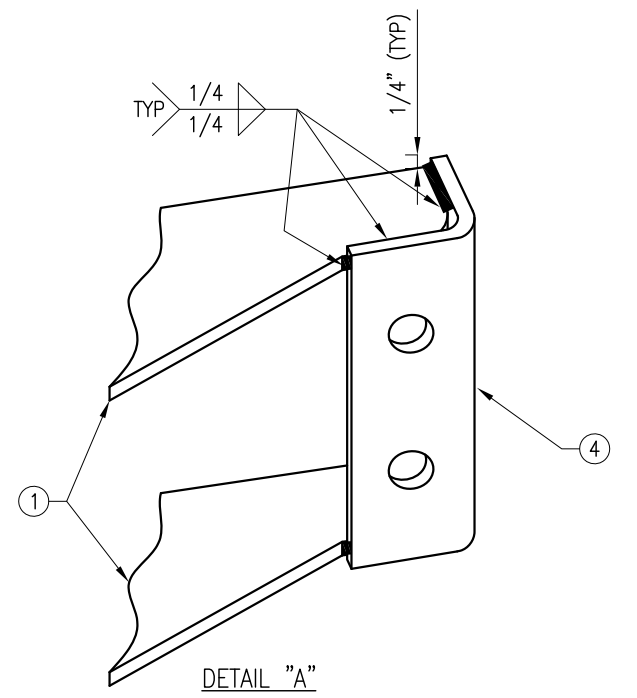
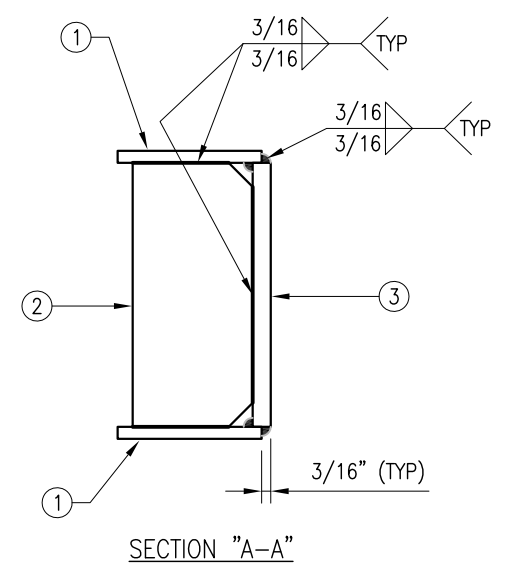
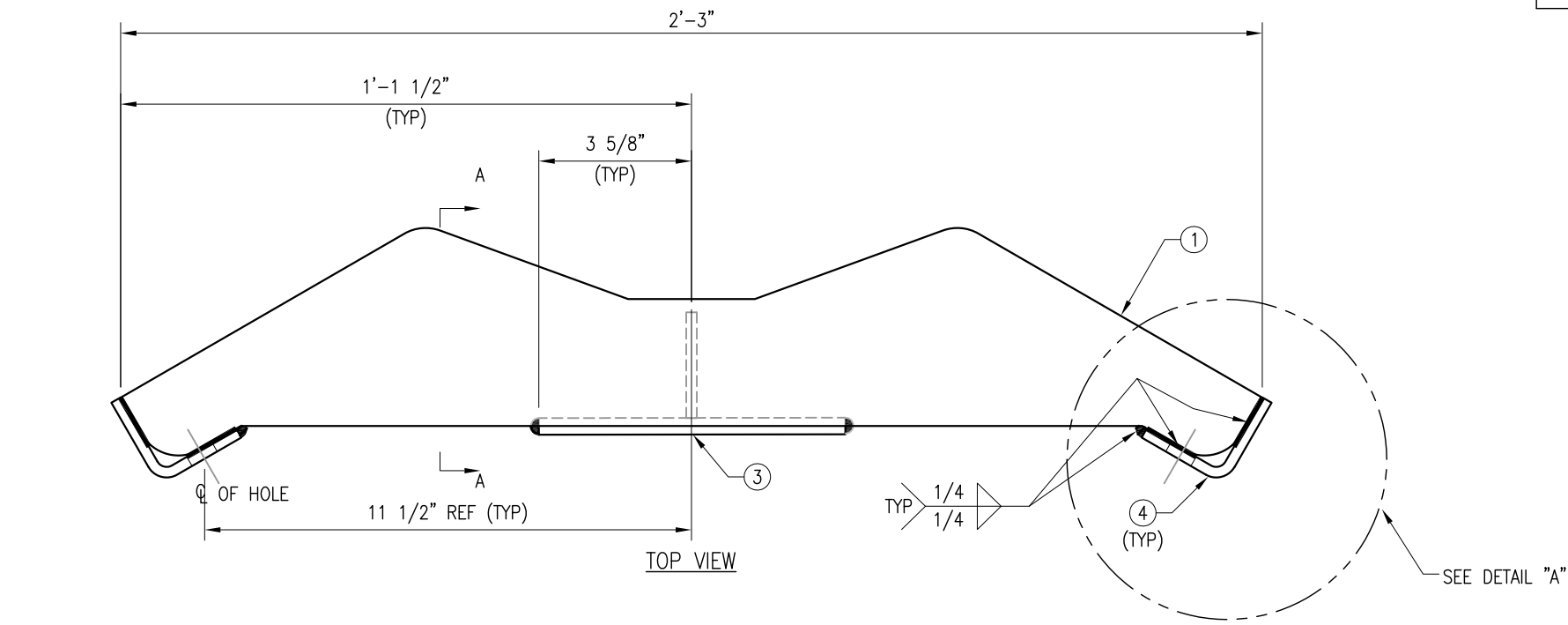


FRONT VIEW

THIRD ANGLE PROJECTION						METROSITE FABRICATORS LLC 180 INDUSTRIAL PARK BLVD. COMMERCE GA 30529			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE FINISH				CONFIDENTIAL ALL INFORMATION ON THIS DOCUMENT IS PROPERTY OF METROSITE FABRICATORS LLC				TITLE LIGHT COLLAR MOUNT PLATE ASSEMBLY DETAIL MS-1436	
STANDARD SHEET TOLERANCES		APPROVAL / SIGNATURES		DATE		SIZE/DWG NO		REV	
DECIMALS	ANGLES	DRAWN BY XXX		05/12/17		B MS-1436		1	
.X ± 0.1	± 1°	REVIEWED XXX		-		SCALE			
.XX ± 0.02	FRACTIONS	APPROVED XXX		-		SHEET 1 OF 1			
.XXX ± 0.005	± 1/32								

NOTES:
 1. HOT-DIPPED GALVANIZED PER ASTM A123.
 2. WELD TYPE: E70XX.

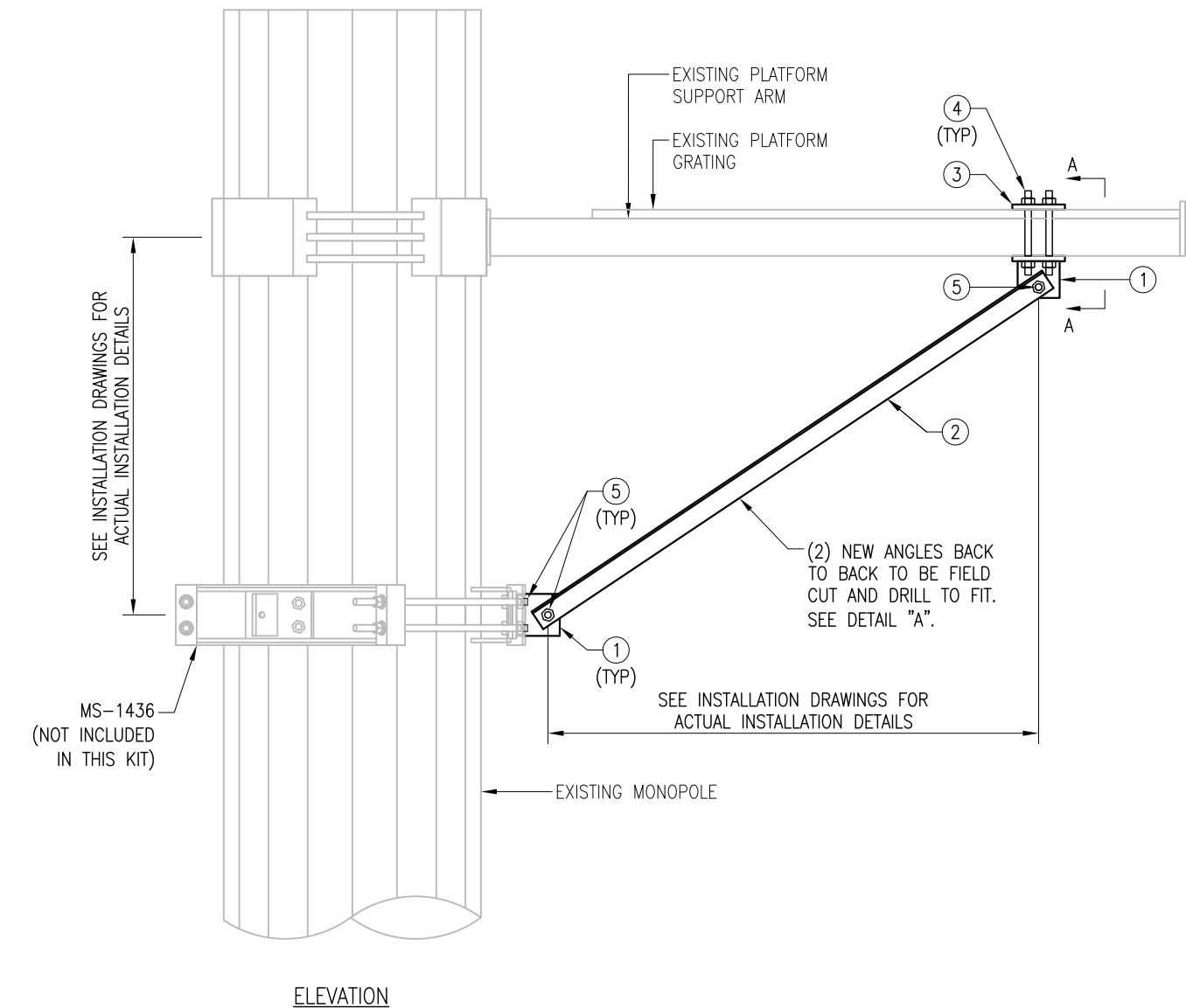
MPW-1 WELDMENT						
ITEM NO.	QTY.	PART NO.	DESCRIPTION	GRADE	SHEET #	WT
1	2	PL-1	PL 1/4" X 5 3/8" X 2'-3"	A36	F-2	12.6
2	1	PL-2	PL 1/4" X 2 1/2" X 0'-4 3/4"	A36	F-2	.83
3	1	PL-3	PL 3/8" X 4 3/4" X 0'-7 1/4"	A36	F-2	3.7
4	2	PL-8	PL 1/4" x 4 1/8" x 5 3/4"	A36	F-2	3.2
BLACK WT						20.3
GALVANIZED WT						21



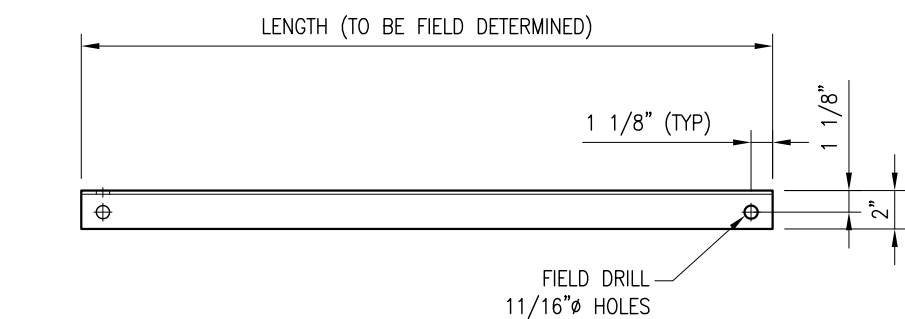
FRONT VIEW
 MPW-1 WELDMENT

THIRD ANGLE PROJECTION						METROSITE FABRICATORS LLC 180 INDUSTRIAL PARK BLVD. COMMERCE GA 30529	
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STANDARD SHEET TOLERANCES		APPROVAL / SIGNATURES		DATE		TITLE	
DECIMALS	ANGLES	DRAWN BY: XXX		05/12/17		SIZE: DWG NO	
.X ± 0.1	± 1°	REVIEWED: XXX		-		B MPW-1	
.XX ± 0.02	FRACTIONS	APPROVED: XXX		-		SCALE	
.XXX ± 0.005	± 1/32					SHEET 1 OF 1	
						LIGHT COLLAR MOUNT PLATE WELDMENT DETAIL	
						REV 0	

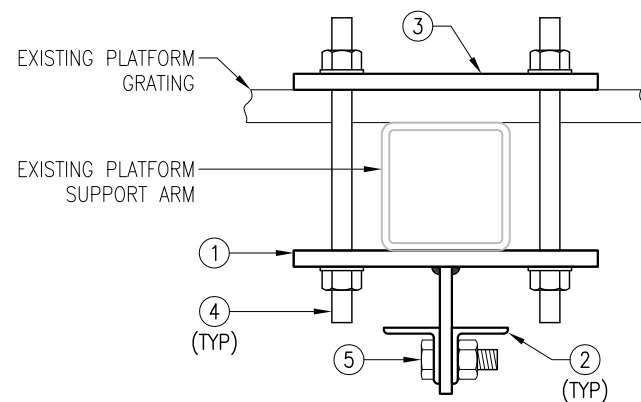
NOTE:
THE LOCATION OF KICKER AND EXISTING ANTENNA MOUNT SHOWN ON THE DRAWING IS FOR REPRESENTATION PURPOSE ONLY. SEE INSTALLATION DRAWINGS FOR ACTUAL INSTALLATION OF DETAILS.



ELEVATION

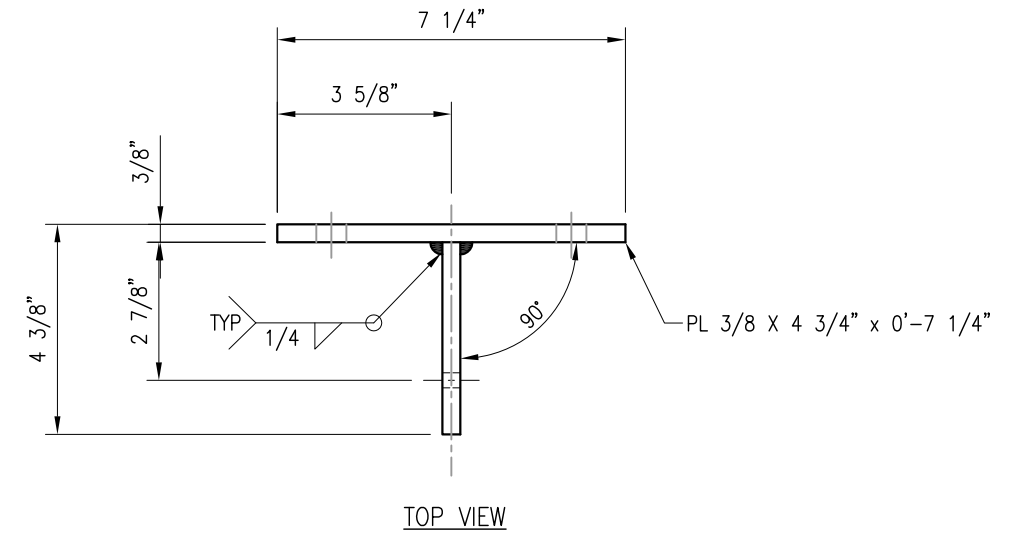


DETAIL "A"

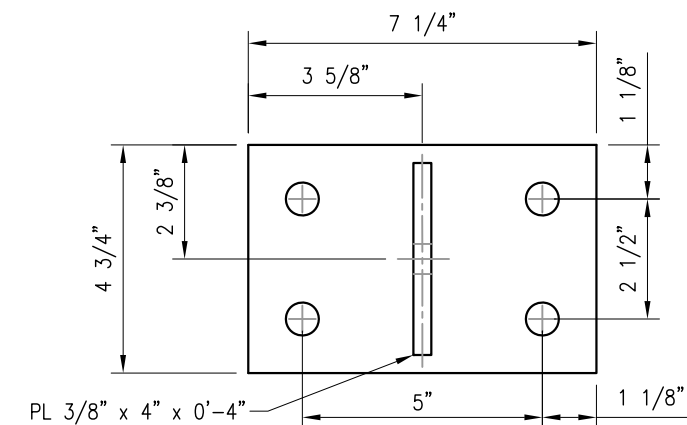


SECTION "A-A"

MS-KI22-8						
ITEM NO.	QTY.	PART NO.	DESCRIPTION	GRADE	SHEET #	WT
1	6	BRKMW-1S	BRACKET WELDMENT	---	BRKMW-1S	34.8
2	6	D2225-8	L 2" X 2" X 1/4" X 8'-0"	A36	KF-8	156.0
3	3	PL1S-375	PL 3/8" X 4 3/4" X 7 1/4"	A36	KF-8	11.1
4	12	---	ALL THREAD ROD 5/8" DIA. X 10" HDG W/ (2) HHN & LKW EA.	A36	---	---
5	18	---	BOLT 5/8" X 2" W/ HHN & LKW	A325	---	---
GALVANIZED WT						202



TOP VIEW



FRONT VIEW
BRKMW-1S WELDMENT

NOTES:
1. ALL HOLES ARE 11/16" DIA. U.N.O
2. HOT-DIPPED GALVANIZED PER ASTM A123.

THIRD ANGLE PROJECTION				METROSITE FABRICATORS LLC 180 INDUSTRIAL PARK BLVD. COMMERCE GA 30529	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE FINISH		CONFIDENTIAL ALL INFORMATION ON THIS DOCUMENT IS PROPERTY OF METROSITE FABRICATORS LLC		TITLE KICKER SUPPORT KIT	
STANDARD SHEET TOLERANCES		APPROVAL / SIGNATURES	DATE	SIZE/DWG NO	REV
DECIMALS	ANGLES	DRAWN BY: XXX	06/21/18	B MS-KI22-8	0
.X ± 0.1	± 1°				
.XX ± 0.02	FRACTIONS ± 1/32				
.XXX ± 0.005		REVIEWED: XXX	-	SCALE	-
				SHEET 1 OF 1	

EXHIBIT 10

Transcom Engineering, Inc.

Wireless Network Design and Deployment

Radio Frequency Emissions Analysis Report

T-MOBILE Existing Facility

Site ID: CTHA075D

HA075_Optasite_FT_MP
93 Lake Street
Manchester, CT 06042

June 17, 2019

Transcom Engineering Project Number: 737001-0171

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	12.62 %

Transcom Engineering, Inc.

Wireless Network Design and Deployment

June 17, 2019

T-MOBILE

Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 6009

Emissions Analysis for Site: **CTHA075D – HA075_Optasite_FT_MP**

Transcom Engineering, Inc (“Transcom”) was directed to analyze the proposed upgrades to the T-MOBILE facility located at **93 Lake Street, Manchester, CT**, for the purpose of determining whether the emissions from the Proposed T-MOBILE Antenna Installation located on this property are within specified federal limits.

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

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 600 MHz & 700 MHz bands are approximately $400 \mu\text{W}/\text{cm}^2$ and $467 \mu\text{W}/\text{cm}^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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Wireless Network Design and Deployment

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

Additional details can be found in FCC OET 65.

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Wireless Network Design and Deployment

CALCULATIONS

Calculations were performed for the proposed upgrades to the T-MOBILE antenna facility located at **93 Lake Street, Manchester, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-MOBILE is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
LTE	1900 MHz (PCS)	4	40
LTE	2100 MHz (AWS)	2	60
GSM	1900 MHz (PCS)	1	15
UMTS	2100 MHz (AWS)	1	40
LTE / 5G NR	600 MHz	2	40
LTE	700 MHz	2	20

Table 1: Channel Data Table

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The following antennas listed in *Table 2* were used in the modeling for transmission in the 600 MHz, 700 MHz, 1900 MHz (PCS) and 2100 MHz (AWS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Ericsson AIR32 B66A / B2A	105
A	2	Ericsson AIR21 B2A/B4P	105
A	3	RFS APXVAARR24_43-U-NA20	105
B	1	Ericsson AIR32 B66A / B2A	105
B	2	Ericsson AIR21 B2A/B4P	105
B	3	RFS APXVAARR24_43-U-NA20	105
C	1	Ericsson AIR32 B66A / B2A	105
C	2	Ericsson AIR21 B2A/B4P	105
C	3	RFS APXVAARR24_43-U-NA20	105

Table 2: Antenna Data

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

Cable losses were factored in the calculations for this site. Since all **2100 MHz (AWS) UMTS** radios are ground mounted the following cable loss values were used. For each ground mounted **2100 MHz (AWS) UMTS** radio there was **1.27 dB** of cable loss calculated into the system gains / losses for this site. These values were calculated based upon the manufacturers specifications for **120 feet of 1-5/8” coax**.

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RESULTS

Per the calculations completed for the proposed T-MOBILE configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85 / 15.85	6	280	10,768.57	3.95
Antenna A2	Ericsson AIR21 B2A/B4P	1900 MHz (PCS) / 2100 MHz (AWS)	15.9 / 15.9	2	55	1,745.18	0.64
Antenna A3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	2.13
Sector A Composite MPE%							6.72
Antenna B1	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85 / 15.85	6	280	10,768.57	3.95
Antenna B2	Ericsson AIR21 B2A/B4P	1900 MHz (PCS) / 2100 MHz (AWS)	15.9 / 15.9	2	55	1,745.18	0.64
Antenna B3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	2.13
Sector B Composite MPE%							6.72
Antenna C1	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85 / 15.85	6	280	10,768.57	3.95
Antenna C2	Ericsson AIR21 B2A/B4P	1900 MHz (PCS) / 2100 MHz (AWS)	15.9 / 15.9	2	55	1,745.18	0.64
Antenna C3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	2.13
Sector C Composite MPE%							6.72

Table 3: T-MOBILE Emissions Levels

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The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum T-MOBILE MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each T-MOBILE Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	MPE%
T-MOBILE – Max Per Sector Value	6.72 %
Clearwire	0.10 %
Sprint	5.80 %
Site Total MPE %:	12.62 %

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	6.72 %
T-MOBILE Sector B Total:	6.72 %
T-MOBILE Sector C Total:	6.72 %
Site Total:	12.62 %

Table 5: Site MPE Summary

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Wireless Network Design and Deployment

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated T-MOBILE sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile 1900 MHz (PCS) LTE	4	1,538.37	105	22.57	1900 MHz (PCS)	1000	2.26%
T-Mobile 2100 MHz (AWS) LTE	2	2,307.55	105	16.93	2100 MHz (AWS)	1000	1.69%
T-Mobile 1900 MHz (PCS) GSM	1	583.57	105	2.14	1900 MHz (PCS)	1000	0.21%
T-Mobile 2100 MHz (AWS) UMTS	1	1,161.61	105	4.26	2100 MHz (AWS)	1000	0.43%
T-Mobile 600 MHz LTE / 5G NR	2	788.97	105	5.79	600 MHz	400	1.45%
T-Mobile 700 MHz LTE	2	432.54	105	3.17	700 MHz	467	0.68%
						Total:	6.72%

Table 6: T-MOBILE Maximum Sector MPE Power Values

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Summary

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

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

T-MOBILE Sector	Power Density Value (%)
Sector A:	6.72 %
Sector B:	6.72 %
Sector C:	6.72 %
T-MOBILE Maximum Total (per sector):	6.72 %
Site Total:	12.62 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **12.62 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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



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