



NSS **NORTHEAST**
SITE SOLUTIONS
Turnkey Wireless Development

Northeast Site Solutions
Victoria Masse
420 Main Street, Sturbridge MA 01566
860-306-2326
victoria@northeastsitesolutions.com

November 3, 2020

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Exempt Modification Application
95 HIGH STREET, PORTLAND, CT 06480
Latitude: 41.58115
Longitude: -72.72622217
T-Mobile Site#: CTHA242A-Anchor

Dear Ms. Bachman:

T-Mobile is requesting to file an exempt modification for an existing 120-foot lattice tower located at 95 High Street, Portland CT 06480. T-Mobile currently maintains nine (9) antennas at the 110-foot level of the existing 120-foot tower. The property and the tower are both owned by Town of Portland. T-Mobile now intends to replace three (3) existing antenna with three (3) new 2500MHZ antenna. The new antenna would be installed at the 110-foot and level of the tower. T-Mobile also proposes tower reinforcement modifications as shown in the enclosed drawings.

Planned Tower Modifications:
Remove: NONE

Remove and Replace:
(3) AIR21 B2A/B4P – Antenna (REMOVE) - (3) AIR6449 B41- Antenna 2500MHz (REPLACE)

Install New:
(3) Diplexers
(1) 6x12 Hybrid Line
(3) RRUS 4415 B25

Existing to Remain:
(3) TMA
(3) RRU 4449 B12/B71
(3) AIR32 B66Aa B2a Antenna –1900/2100MHz
(3) APXVARR24_43-C-NA20 – Antenna – 600/700/1900/2100MHz
(6) 1-5/8” Coax
(3) 6x12 Hybrid Lines



This facility was approved by the CT Siting Council. Per the attached TS No. TS-T-MOBILE-139-060606 – Dated June, 27 2006. Please see attached original approval minutes from 2006.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16- SOj-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-SOj-73, a copy of this letter is being sent to First Selectwoman Susan S. Bransfield and John Herring, Zoning Enforcement Officer of the Town of Portland, as well as the tower owner and property owner.

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

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

Sincerely,

Victoria Masse
Mobile: 860-306-2326
Fax: 413-521-0558
Office: 420 Main Street, Unit 2, Sturbridge MA 01566
Email: victoria@northeastsitesolutions.com



NSS

NORTHEAST
SITE SOLUTIONS

Turnkey Wireless Development

Attachments

cc: First Selectwoman Susan S. Bransfield, as elected official
John Herring, Zoning Enforcement Director
Town of Portland - as tower owner & property owner

Exhibit A

*(item 16 on the CSC agenda)*EM-CING-057-060531 - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 1 Butternut Hollow Road, Greenwich, Connecticut.

*(item 17 on the CSC agenda)*EM-CING-064-060602 - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 439-455 Homestead Avenue, Hartford, Connecticut.

*(item 18 on the CSC agenda)*EM-CING-014-084-060602 - New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunications facilities located at 21 Acorn Road, Branford; and 10 Bona Road, Milford, Connecticut.

*(item 19 on the CSC agenda)*EM-NEXTEL-161-060606 - Sprint Nextel Communications, Inc. notice of intent to modify an existing telecommunications facility located at 24-½ Richdale Drive, Wilton, Connecticut.

*(item 21 on the CSC agenda)*TS-T-MOBILE-128-060606 - Omnipoint Communications, Inc. request for an order to approve tower sharing at an existing telecommunications facility located at 344 Firetown Road, Simsbury, Connecticut.

*(item 22 on the CSC agenda)*TS-T-MOBILE-113-060607 - Omnipoint Communications, Inc. request for an order to approve tower sharing at an existing telecommunications facility located at 95 High Street, Portland, Connecticut.

*(item 25 on the CSC agenda)*EM-CING-148-101-060-060609 - New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunications facilities located at 945 East Center Street, Wallingford; 120 Universal Drive, North Haven; and 1919 Boston Post Road, Guilford, Connecticut.

*(item 26 on the CSC agenda)*EM-CING-052-132-060609 - New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunications facilities located at 263 Farmington Avenue, Farmington; and 67 McGuire Road, South Windsor, Connecticut.

*(item 27 on the CSC agenda)*TS-T-MOBILE-119-060613 - Omnipoint Communications, Inc. request for an order to approve tower sharing at an existing telecommunications facility located at North Street, Rocky Hill, Connecticut.

*(item 28 on the CSC agenda)*EM-CING-095-060613 - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 26 Washington Street, New London, Connecticut.

*(item 29 on the CSC agenda)*EM-CING-093-084-060613 - New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunications facilities located at 310 Orange Street, New Haven; and 528-530 Wheelers Farm Road, Milford, Connecticut.

*(item 30 on the CSC agenda)*EM-CING-062-014-060616 - New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunications facilities located at 2755 State Street, Hamden; and 10 Sylvia Street, Branford, Connecticut.

*(item 31 on the CSC agenda)*EM-CING-155-159-060616 - New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunications facilities located at 27-31 South Main Street, West Hartford; and 23 Kelleher Court, Wethersfield, Connecticut.

Mr. Ashton moved to approve and/or acknowledge the above referenced exempt modifications and/or tower sharing applications (items 16-19; 21-22, 25-31); seconded by Mr. Emerick. The motion passed unanimously.

Meeting Minutes
Meeting of June 27, 2006

A meeting of the Connecticut Siting Council (energy/telecommunications) was held on Monday, June 27, 2006, in Hearing Room One, Ten Franklin Square, New Britain, Connecticut. The meeting was called to order with a quorum present by Pamela B. Katz at 1:30 p.m.

Council Members Present:

Pamela B. Katz
Chairman
Brian Emerick
(designee for Commissioner McCarthy)
Gerald J. Heffernan
(designee for Commissioner Downes)

Colin C. Tait
Vice Chairman
Philip T. Ashton
Dr. Barbara Currier Bell
James J. Murphy, Jr.
Edward S. Wilensky

Council Member Absent:

Daniel P. Lynch, Jr.

Staff Members Present:

Robert Marconi
Assistant Attorney General
S. Derek Phelps
Executive Director
Fred O. Cunliffe
Supervising Siting Analyst
Christina Lepage
Siting Analyst

John Haines
Assistant Attorney General
Robert D. Mercier
Siting Analyst
David Martin
Siting Analyst
Michael Perrone
Siting Analyst

Recording Secretary:

Lisa A. Fontaine

Minutes of June 7, 2006.

Mr. Heffernan moved to approve the Minutes of June 7, 2006; seconded by Mr. Ashton. The motion passed with Mr. Emerick abstaining.

DOCKET NO. 190 - PDC - El Paso Meriden LLC Certificate of Environmental Compatibility and Public Need for a proposed Meriden Power Project located in the City of Meriden and the Town of Berlin, Connecticut. Request for Approval of Conservation Restrictions and Easements.

Mr. Murphy moved to approve that specific parties with conservation easements, a right of enforcement by a local land trust, or similarly situated parties may be incorporated into the deeds of the land transfer; seconded by Mr. Heffernan. The motion passed unanimously.

DOCKET NO. 272 - The Connecticut Light and Power Company and The United Illuminating Company Certificate of Environmental Compatibility and Public Need for the Construction of a New 345-kV Electric Transmission Line and Associated Facilities Between Scovill Rock Switching Station in Middletown and Norwalk Substation in Norwalk, Connecticut Including the Reconstruction of Portions of Existing 115-kV and 345-kV Electric Transmission Lines, the Construction of the Beseck Switching Station in Wallingford, East Devon Substation in Milford, and Singer Substation in Bridgeport, Modifications at Scovill Rock Switching Station and Norwalk Substation and the Reconfiguration of Certain Interconnections. Development and Management Plan – Segment 4b Sasco Creek, Westport to Intersection of Father Conlon Place and North Avenue, Norwalk.

Mr. Wilensky moved to approve the Development and Management (D&M) Plan for Segment 4b – Sasco Creek, Westport to Intersection of Father Conlon Place and North Avenue, Norwalk with the following conditions regarding the trenching of 345-kV XLPE transmission cable D&M Plan:

- That CL&P conduct pre-construction meetings with the Town of Westport and City of Norwalk including businesses and emergency responders, time of construction, explore vault locations to avoid former landfill in Town of Westport, and conform to the greatest extent possible with the Department of Transportation (DOT).
- That CL&P provide two weeks advance notice to the Council and municipalities prior to commencement of construction.
- That CL&P provide a weekly Environmental Inspector's report.
- That CL&P provide a quarterly construction reports noting milestones of construction activity.
- That CL&P provide the locations of the contractors' yard and staging areas to the Council prior to use.
- That CL&P provide a copy of the DOT Encroachment Permit, including management and protection of traffic plan prior to the commencement of construction.
- That CL&P submit a Spill Prevention and Response Plan which should address actions to prevent spills, to provide emergency notification if spills occur, and to clean up spills and a soil and groundwater management plan including locations for treatment and/or disposal be provided to the Council prior to construction.
- That CL&P provide noise mitigation plan prior to the commencement of construction and submit non-resolution of constituent concerns after 15 days to the Council.

DOCKET NO. 311 - Northeast Utilities Service Company, on behalf of The Connecticut Light and Power Company (CL&P) application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of the proposed Wilton 35A Substation at 53 Old Danbury Road, Wilton, Connecticut. Draft Findings of Fact.

Mr. Ashton moved to take this item off the table; seconded by Dr. Bell. The motion passed unanimously.

After reviewing the draft Findings of Fact, Chairman Katz polled the Council members with Mr. Ashton, Mr. Heffernan, Mr. Emerick, Mr. Wilensky, Dr. Bell, Mr. Murphy, and Chairman Katz in favor of granting a Certificate for the proposed Substation; and Mr. Tait abstaining.

Chairman Katz directed staff to draft a favorable Opinion and Decision and Order to be reviewed at the next meeting.

DOCKET NO. 314 - Bay Communications, LLC application for the recertification of a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at 170 Southeast Road, New Hartford, Connecticut. Draft Findings of Fact.

Chairman Katz requested that Mr. Tait act as Chairman for this discussion.

After reviewing the draft Findings of Fact, Vice Chairman Tait polled the Council members with Mr. Ashton, Mr. Heffernan, Mr. Emerick, Mr. Wilensky, Dr. Bell, and Mr. Murphy in favor of granting a Certificate for the proposed telecommunications facility.

Vice Chairman Tait directed staff to draft a favorable Opinion and Decision and Order to be reviewed at the next meeting.

Chairman Katz resumed her position as Chair.

DOCKET NO. 316 - Optasite, Inc. application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility at 50 Fairchild Road, Middletown, Connecticut. Completeness Review, Schedule, Custodian of the Docket, Deposition of the Transcript, Request for Party/Intervenor Status.

Mr. Ashton moved to approve the application as complete and to approve the schedule for processing the docket as per staff recommendations; the appointment of Lisa Fontaine as custodian of the docket; deposition of the transcript in the City of Middletown; and a public field review and hearing in Middletown on Tuesday, September 26, 2006; seconded by Mr. Murphy. The motion passed unanimously.

(item 20 on the CSC agenda)TS-T-MOBILE-139-060606 - Omnipoint Communications, Inc. request for an order to approve tower sharing at an existing telecommunications facility located at 848 East Street South, Suffield, Connecticut.

Mr. Ashton moved to approve Omnipoint Communications, Inc. request for an order to approve tower sharing at an existing telecommunications facility; seconded by Mr. Heffernan. The motion passed unanimously.

(item 23 on the CSC agenda)EM-VER-089-119-060608 - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify existing telecommunications facilities located at 1 Hartford Square, New Britain; and 1218 Cromwell Avenue, Rocky Hill, Connecticut.

Mr. Emerick moved to acknowledge Cellco Partnership d/b/a Verizon Wireless notice of intent to modify these existing telecommunications facilities with the condition that the recommendation on page 3 of the structural analysis report for the New Britain site is implemented; seconded by Mr. Tait. The motion passed unanimously.

(item 24 on the CSC agenda)EM-CING-064-043-155-094-060609 - New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunications facilities located at 11 Mountain Road, Hartford; 2 Prestige Park Drive, East Hartford; 125 South Main Street, West Hartford; and 123 Costello Road, Newington, Connecticut.

Dr. Bell moved to table the Hartford site until further information is received; seconded by Mr. Ashton. The motion passed unanimously.

Mr. Ashton moved to approve New Cingular Wireless PCS, LLC notice of intent to modify the East Hartford, West Hartford, and Newington existing telecommunications facilities; seconded by Mr. Heffernan. The motion passed unanimously.

(item 32 on the CSC agenda)EM-CING-155-060616 - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 139 North Main Street, West Hartford, Connecticut.

Mr. Emerick moved to acknowledge New Cingular Wireless PCS, LLC notice of intent to modify this existing telecommunications facility with the following conditions:

1. A detailed structural analysis letter is provided to the Council and all recommendations by the engineer are implemented prior to the antenna installation.
2. All conditions recommended by the State Historic Preservation Officer in the June 6, 2006 letter are met.

Chairman Katz thanked staff and Council members for the “wonderful ride” on the Connecticut Siting Council, and appreciated the opportunity to work with such talented individuals.

Adjournment.

Chairman Katz adjourned the Council meeting at 3:25 p.m.

Respectfully submitted,

Pamela B. Katz, P.E.
Chairman

PBK/laf

Exhibit B

Portland, CT : Assessor Database

Property Search:

Parcel ID: _____ Alternate ID: _____ Owner 1 Name: _____ Street Number: 95 Street Name: HIGH ST ▼

Property Detail:

Parcel ID: 039-0059 Alternate ID/Map Block Lot: 00217600 Card: _____ Card: _____ Street Name: HIGH ST Street Number: 95 Zoning: R15 LUC: Communication Towers Acres: 15.50

Owner Information:

Owner 1 Name: PORTLAND TOWN OF
 Owner 2 Name: PORTLAND MIDDLE SCHOOL
 Street 1: PO BOX 71
 Street 2:
 City: PORTLAND
 State: CT
 Zip: 06480
 Volume: 84
 Page: 141

Valuation:

Appraised Land: \$1,536,000.00
 Appraised Bldg: \$108,000.00
 Appraised Total: \$1,644,000.00
 Total Assessment: \$1,150,800.00

Property Images:

Picture:



Sketch:

There is no sketch available.

Out-Buildings:

Code:	Description:	Units:	Year Built:	Size1:	Size2:	Area:	Grade:	Condition:
TT4	TOWER CELLULAR	4	2009	1	120	0	1	

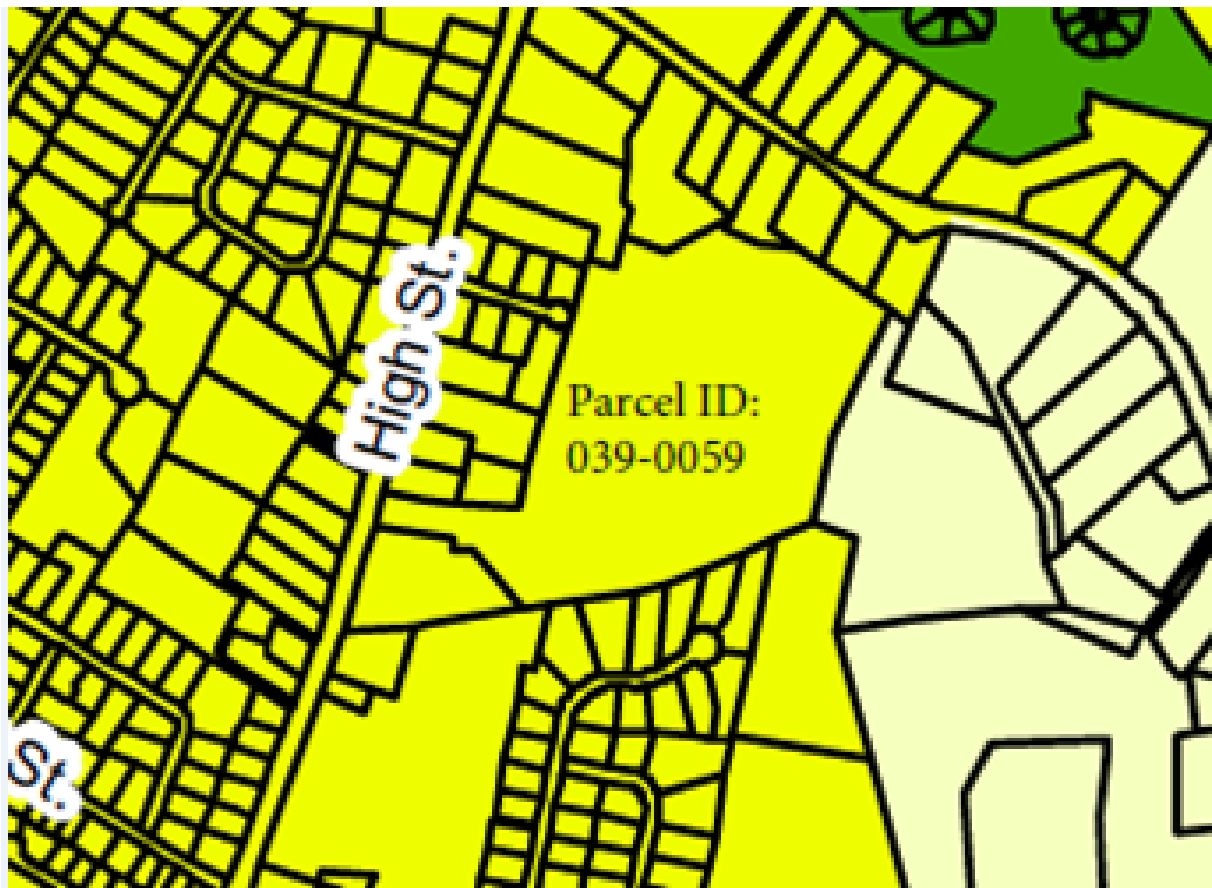


Exhibit C

..T..Mobile..

NORTHEAST, LLC.

PROJECT: ANCHOR

SITE I.D. NUMBER:

CTHA242A

SITE NAME:

HA242/PORTLANDHS_SST

SITE ADDRESS:

95 HIGH STREET

PORTLAND, CT 06480

Tectonic

PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering & Surveying Consultants P.C.
70 Pleasant Hill Road Phone: (845) 534-5959
P.O. Box 37 (800) 529-6531
Mountainville, NY 10953 www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550 Phone: (845) 567-6656

..T..Mobile..
NORTHEAST, LLC.

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002



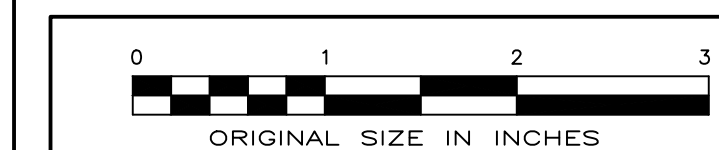
APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
10473.CTHA242A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
1	11/04/20	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY _____ DATE _____



ORIGINAL SIZE IN INCHES

SITE INFORMATION

HA242/PORTLANDHS_SST
CTHA242A
95 HIGH STREET
PORTLAND, CT 06480

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

PROJECT INDEX

SITE NUMBER: CTHA242A	PROJECT CLIENT: NORTHEAST SITE SOLUTIONS, LLC SHELDON FREINCLE (201) 776-8521
SITE NAME: HA242/PORTLANDHS_SST	CONTACT: (201) 776-8521
SITE ADDRESS: 95 HIGH STREET PORTLAND, CT 06480	ENGINEER/STRUCTURAL ENG: TECTONIC ENGINEERING & SURVEYING CONSULTANTS, P.C. EDWARD IAMICELI (845) 567-6656x2811
PROPERTY OWNER: TOWN OF PORTLAND 33 EAST MAIN STREET PORTLAND, CT 06480	CONTACT: (845) 567-6656x2811
APPLICANT: T-MOBILE NORTHEAST LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002	
STRUCTURE TYPE: 120' SELF-SUPPORT TOWER	
LATITUDE (NAD83): N 41.581115"	
LONGITUDE (NAD83): W 72.622217"	
GRADE ELEVATION: 349' AMSL (PER GOOGLE EARTH)	
MUNICIPALITY: TOWN OF PORTLAND	
ZONING: PARK	
PARCEL #: 24875	

VICINITY MAP (NTS)



SHEET INDEX

SHEET NO	DESCRIPTION	REVISION	DATE
T-1	TITLE SHEET	0	11/04/20
A-1	SITE PLAN	0	11/04/20
A-2	TOWER ELEVATION	0	11/04/20
A-3	EQUIPMENT PLANS	0	11/04/20
A-4	ANTENNA PLANS & ANTENNA SCHEMATIC	0	11/04/20
A-5	DETAILS, ANTENNA SCHEMATIC & SPECIFICATIONS	0	11/04/20
A-6	NOTES	0	11/04/20
E-1	ELECTRICAL NOTES & ONE-LINE DIAGRAM	0	11/04/20
G-1	GROUNDING DETAILS & NOTES	0	11/04/20
SN-1	TOWER REINFORCEMENT, MODIFICATION INSPECTION CHECKLIST & NOTES	A	10/06/20
SN-2	TOWER REINFORCEMENT DESIGN CRITERIA & NOTES	A	10/06/20
SD-1	TOWER REINFORCEMENT ELEVATION, MOD SCHED & TYPICAL DETAILS	A	10/06/20
SD-2	TOWER REINFORCEMENT TRUSS LEG TIE-ROD BRACING PARTIAL ELEVATION & SECTIONS	A	10/06/20
SD-3	TOWER REINFORCEMENT SPLICE BYPASS PLATE & SPLIT PIPE LEG REINFORCING DETAILS	A	10/06/20
SD-4	TOWER REINFORCEMENT SECONDARY HORIZONTAL DETAIL & SECTIONS	A	10/06/20

CODE COMPLIANCE

CODE INFORMATION

- STATE OF CONNECTICUT BUILDING CODE, LATEST EDITION
- ANSI/TIA-222-G
- NATIONAL ELECTRIC CODE, LATEST EDITION

DESIGN NOTE

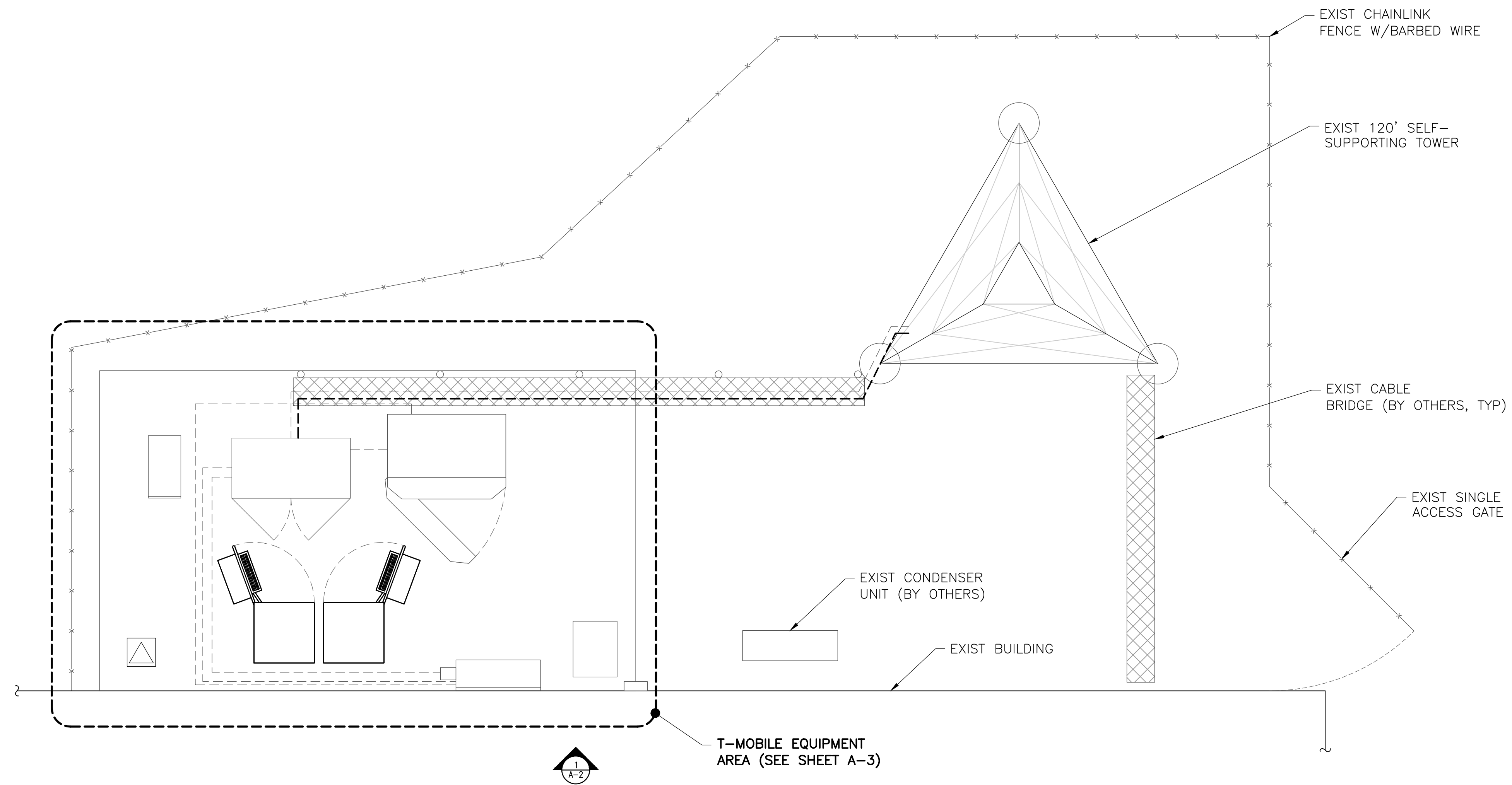
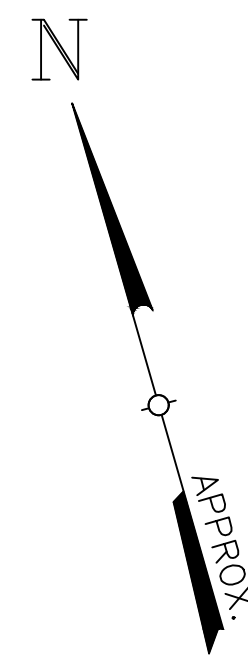
DESIGN BASED ON RFDS DATED 7/1/2020, VERSION 8.
RAN TEMPLATE: 67D5A997DB HYBRID
A&L TEMPLATE: 67D5997DB_2xAIR+10P (U21 MARKET)

STRUCTURAL NOTE

ANTENNA FRAME
REFER TO THE MOUNT ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED AUGUST 25, 2020.
TOWER
REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED OCTOBER 2, 2020.

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1
A-1

SITE PLAN

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

APPROVALS

LANDLORD _____

RF _____

CONSTRUCTION _____

OPERATIONS _____

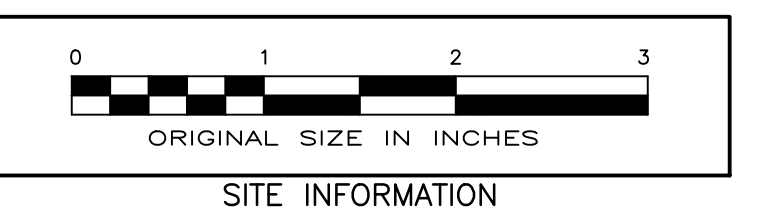
SITE ACQ. _____

PROJECT NUMBER 10473.CTHA242A

DESIGNED BY EI

REV.	DATE	DESCRIPTION	DRAWN BY
1	11/04/20	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY _____ DATE _____



SITE INFORMATION

HA242/PORTLANDHS_SST
 CTHA242A
 95 HIGH STREET
 PORTLAND, CT 06480

SHEET TITLE

SITE PLAN

SHEET NUMBER

A-1

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STRUCTURAL NOTE

ANTENNA FRAME

REFER TO THE MOUNT ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED AUGUST 25, 2020.

TOWER

REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED OCTOBER 2, 2020.

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
 Tectonic Engineering & Surveying Consultants P.C.
 70 Pleasant Hill Road Phone: (845) 534-5959
 P.O. Box 37 (800) 529-6531
 Mountainville, NY 10953 www.tectonicengineering.com
 Project Contact Info
 1279 Route 300
 Newburgh, NY 12550 Phone: (845) 567-6656

Mobile
 NORTEAST, LLC.
 35 GRIFFIN ROAD SOUTH
 BLOOMFIELD, CT 06002

NSS NORTEAST
 SITE SOLUTIONS
 Turnkey Wireless Development

APPROVALS

LANDLORD _____
 RF _____
 CONSTRUCTION _____
 OPERATIONS _____
 SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
10473.CTHA242A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
1	11/04/20	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY _____ DATE _____



SITE INFORMATION

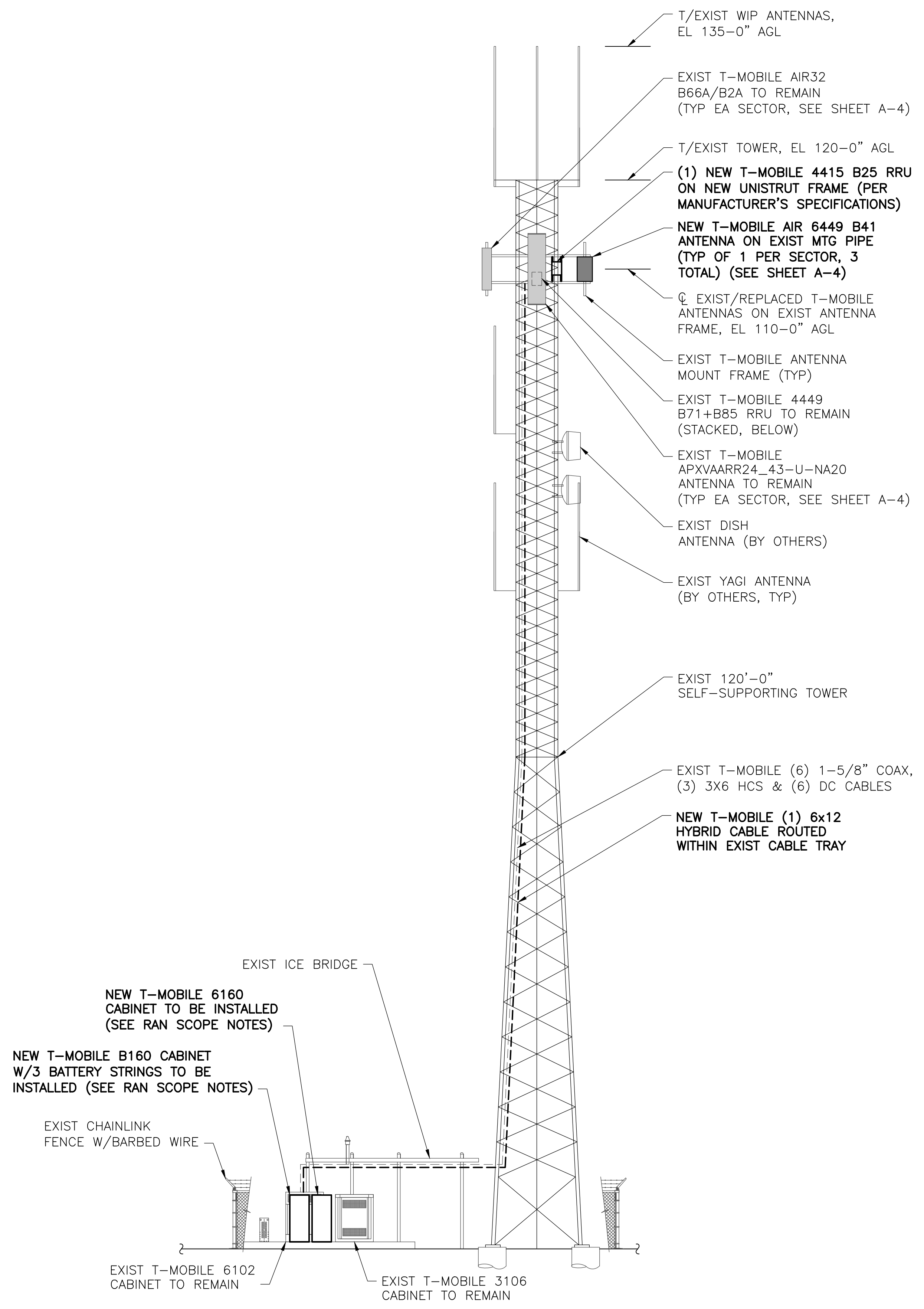
HA242/PORTLANDHS_SST
 CTHA242A
 95 HIGH STREET
 PORTLAND, CT 06480

SHEET TITLE

TOWER ELEVATION

SHEET NUMBER

A-2



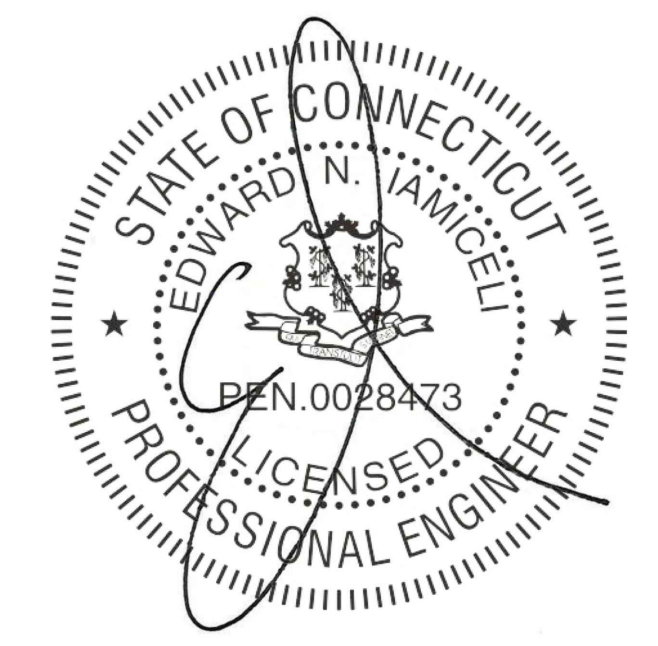
NOTE: NOT ALL SITE FEATURES SHOWN FOR CLARITY.

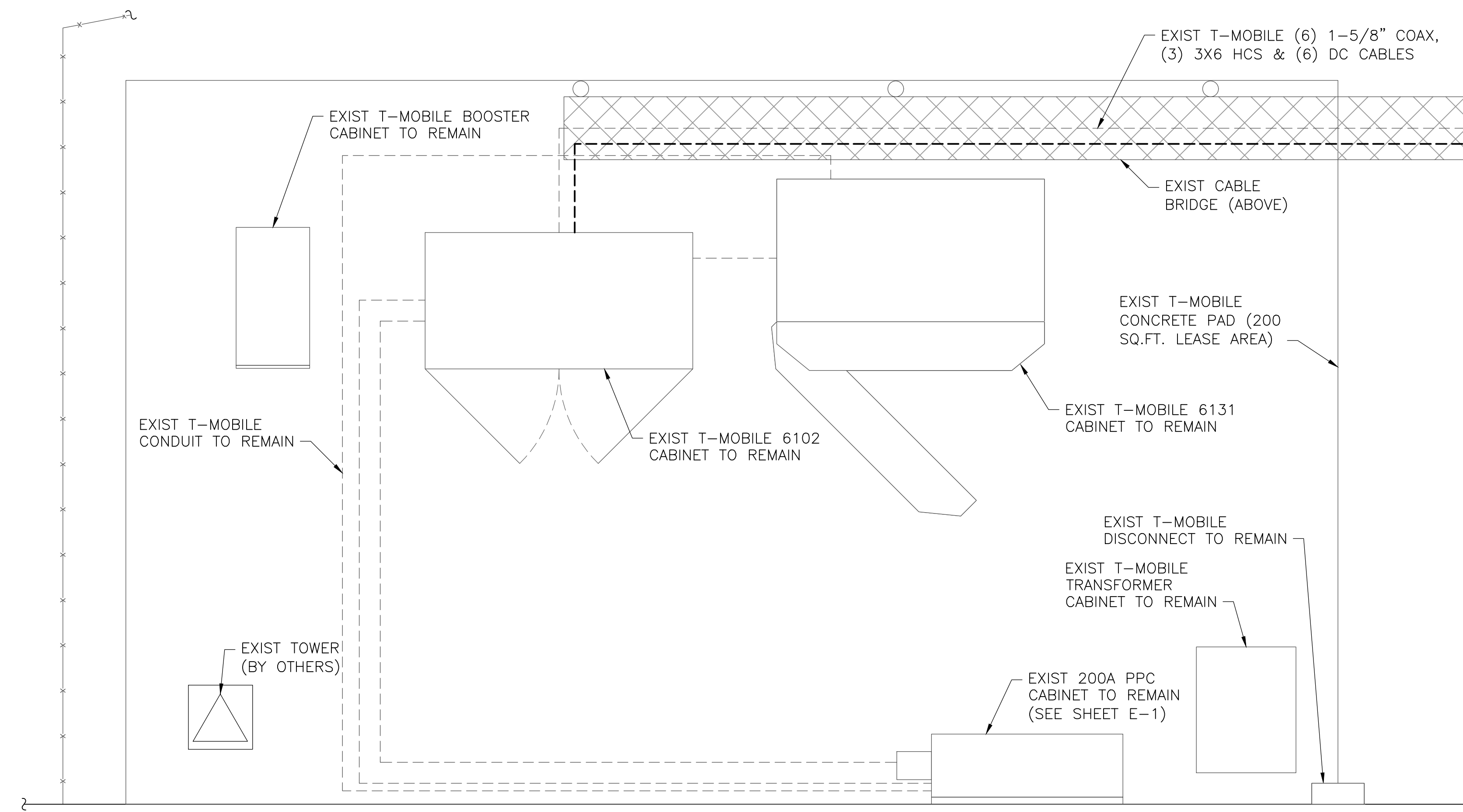
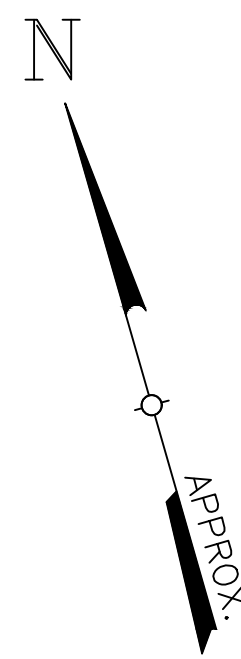
TOWER ELEVATION

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

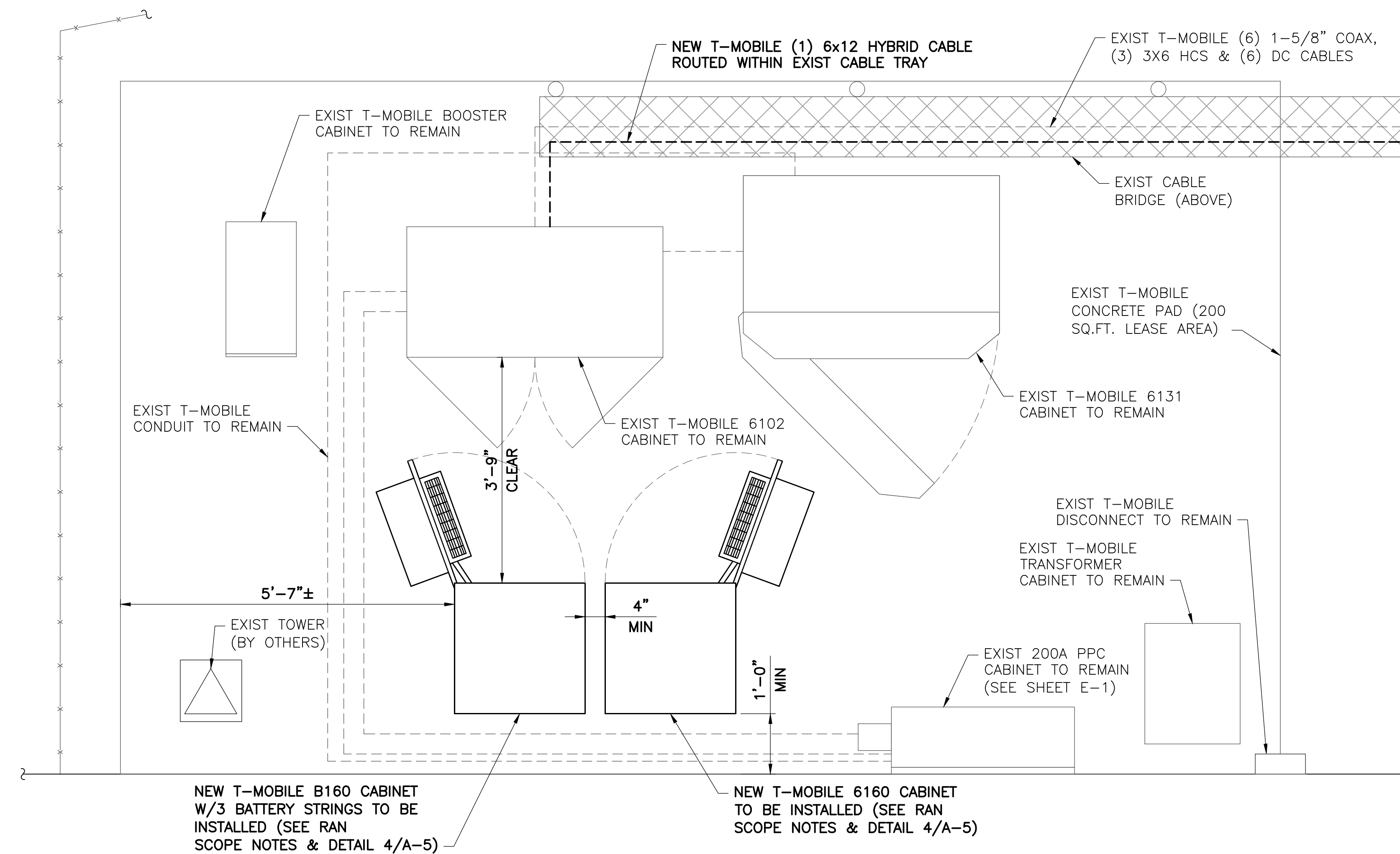
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1 EXIST T-MOBILE EQUIPMENT PLAN
A-3 SCALE: 3/4" = 1'-0"



2 NEW T-MOBILE EQUIPMENT PLAN
A-3 SCALE: 3/4" = 1'-0"

- RAN SCOPE NOTES**
- ADD (1) ENCLOSURE 6160.
 - ADD (1) BATTERY CABINET B160.
 - ADD (1) IXRE ROUTER TO NEW ENCLOSURE 6160.
 - ADD (1) BB6630 FOR L2500 TO NEW ENCLOSURE 6160.
 - ADD (1) BB6648 FOR N2500 TO NEW ENCLOSURE 6160.
 - EXISTING (3) 6X12. AND 6 1-5/8" COAX LINES.
 - ADD (1) 6X12 HCS ([1] FOR NEW RADIO 4449 AND RADIO 4415; [1] FOR AIR6449). LENGTH OF NEW HCS WILL MATCH THAT OF EXISTING HCS.
 - KEEP (6) COAX LINES FOR U2100.

STRUCTURAL NOTE

ANTENNA FRAME
REFER TO THE MOUNT ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED AUGUST 25, 2020.

TOWER
REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED OCTOBER 2, 2020.

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering & Surveying Consultants P.C.
70 Pleasant Hill Road Phone: (845) 534-5959
P.O. Box 37 (800) 529-6531
Mountainville, NY 10953 www.tectonicengineering.com
Project Contact Info
1279 Route 300
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NORTHEAST, LLC.
35 GRIFFIN ROAD SOUTH
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NSS NORTHEAST
SITE SOLUTIONS
Turnkey Wireless Development

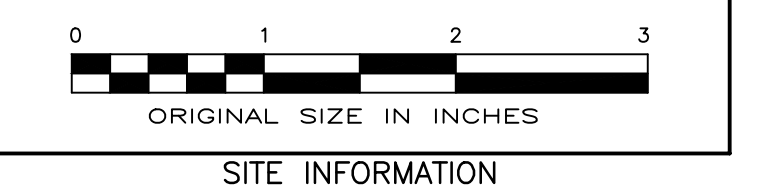
APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER 10473.CTHA242A
DESIGNED BY EI

REV.	DATE	DESCRIPTION	DRAWN BY
1	11/04/20	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY _____ DATE _____



SITE INFORMATION

HA242/PORTLANDHS_SST
CTHA242A
95 HIGH STREET
PORTLAND, CT 06480

SHEET TITLE

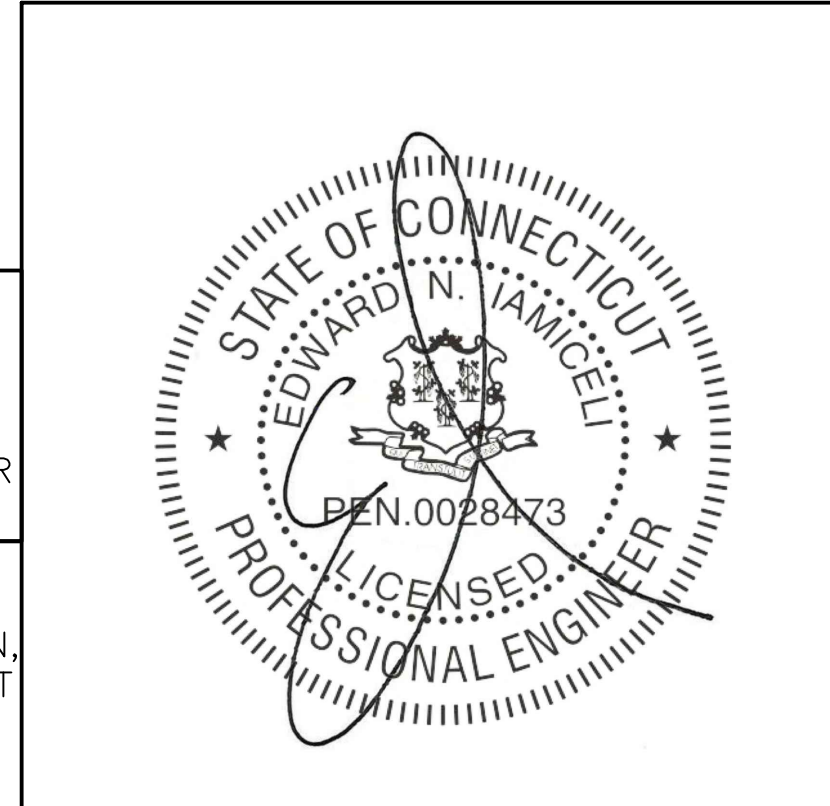
EXISTING AND PROPOSED EQUIPMENT PLANS

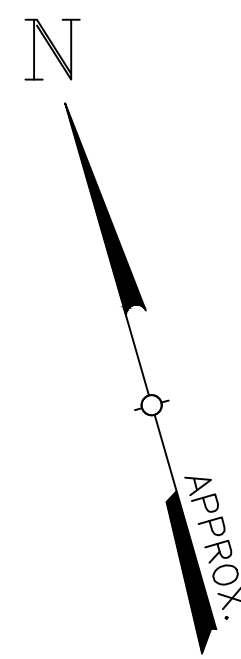
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A-3

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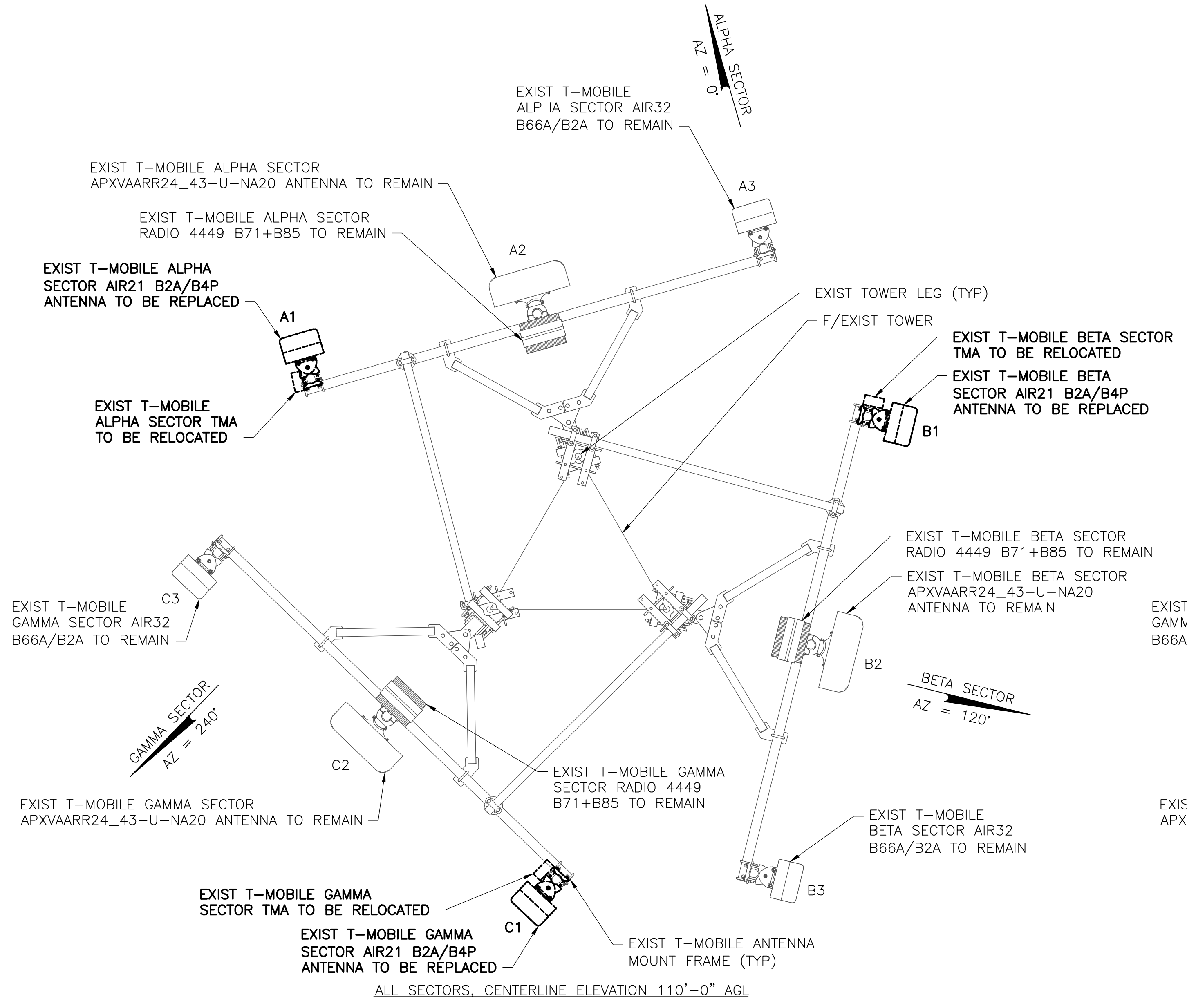
STRUCTURAL NOTE

ANTENNA FRAME
REFER TO THE MOUNT ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED AUGUST 25, 2020.

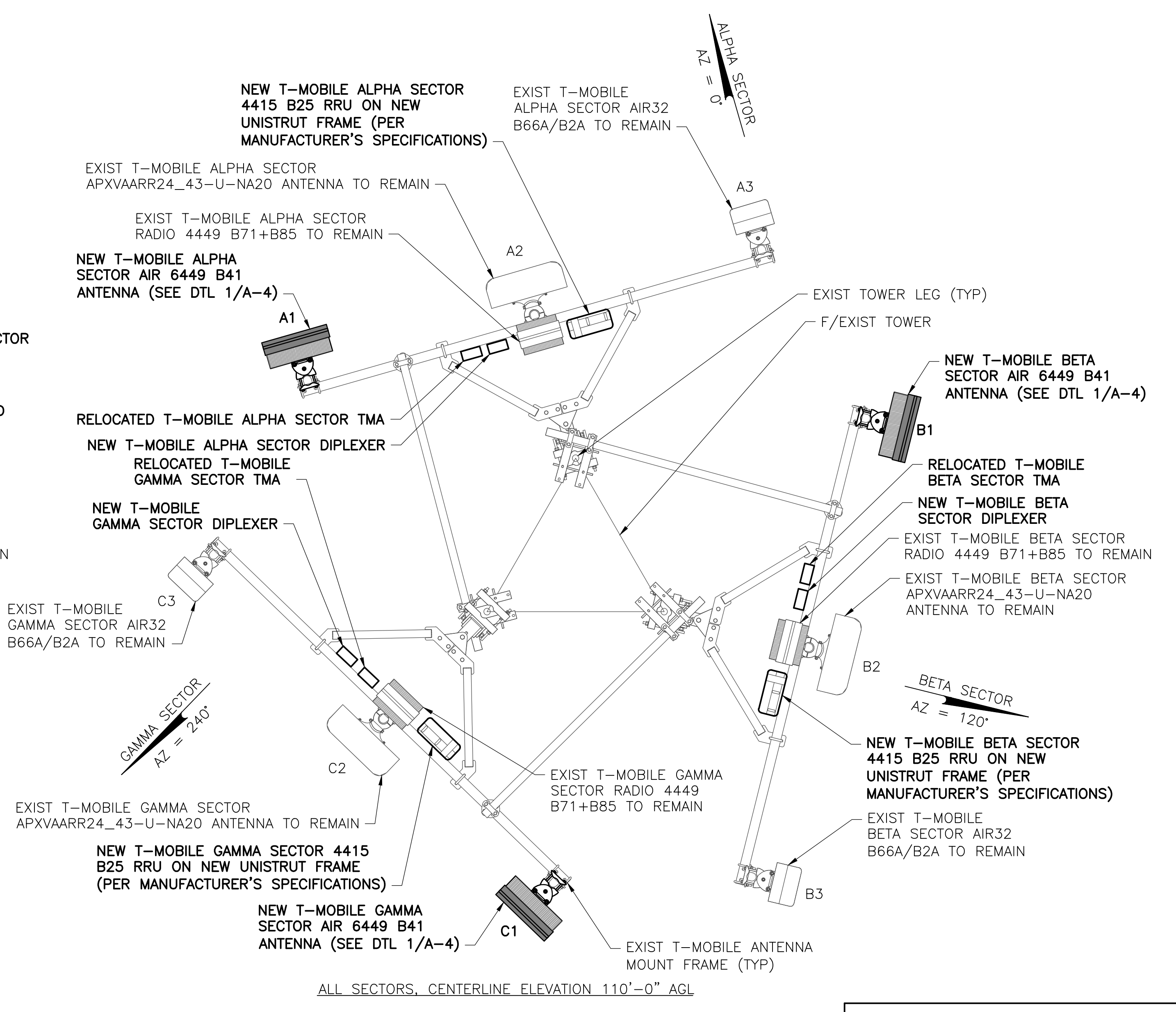
TOWER
REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED OCTOBER 2, 2020.

ANTENNA CABLE SCHEDULE

SECTOR MARK	ANTENNA MODEL	AZIMUTH	ELEC. DOWNTILT	MECH. DOWNTILT	ANTENNA CENTERLINE	SECTOR	STATUS	TMA/RRU	CABLE	JUMPER TYPE	CABLE LENGTH
A-1 LTE	ERICSSON AIR6449 B41	0°	6°	0°	110'-0"±	LEFT ALPHA	NEW/REPLACED	0/0	EXIST 6x12 HYBRID CABLE	FIBER	145'-0"
A-2 LTE/UMTS	RFS APXVAARR24-43-U-NA20	0°	3'/6°	0°	110'-0"±	CENTER ALPHA	EXIST	1/2	(2) EXIST COAX CABLES	COAX	145'-0"
A-3 LTE/GSM	ERICSSON AIR32 B66/B2A	0°	2°	0°	110'-0"±	RIGHT ALPHA	EXIST	0/0	EXIST SHARED 6x12 HYBRID CABLE	FIBER	145'-0"
B-1 LTE	ERICSSON AIR6449 B41	120°	6°	0°	110'-0"±	LEFT BETA	NEW/REPLACED	0/0	EXIST 6x12 HYBRID CABLE	FIBER	145'-0"
B-2 LTE/UMTS	RFS APXVAARR24-43-U-NA20	120°	3'/5°	0°	110'-0"±	CENTER BETA	EXIST	1/2	(2) EXIST COAX CABLES & (1) NEW 6x12 HYBRID CABLE	COAX	145'-0"
B-3 LTE/GSM	ERICSSON AIR32 B66/B2A	120°	2°	0°	110'-0"±	RIGHT BETA	EXIST	0/0	EXIST SHARED 6x12 HYBRID CABLE	FIBER	145'-0"
C-1 LTE	ERICSSON AIR6449 B41	240°	6°	0°	110'-0"±	LEFT GAMMA	NEW/REPLACED	0/0	EXIST 6x12 HYBRID CABLE	FIBER	145'-0"
C-2 LTE/UMTS	RFS APXVAARR24-43-U-NA20	240°	3'/8°	0°	110'-0"±	CENTER GAMMA	EXIST	1/2	(2) EXIST COAX CABLES	COAX	145'-0"
C-3 LTE/GSM	ERICSSON AIR32 B66/B2A	240°	2°	0°	110'-0"±	RIGHT GAMMA	EXIST	0/0	EXIST SHARED 6x12 HYBRID CABLE	FIBER	145'-0"



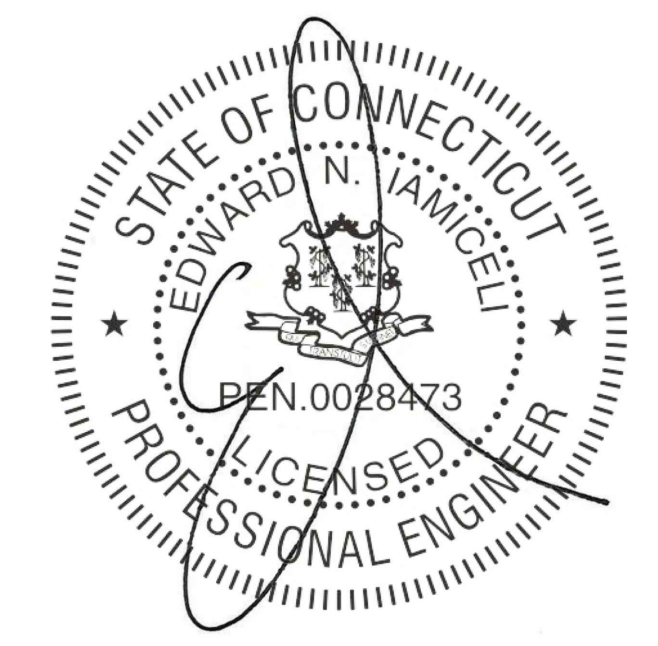
1 EXIST T-MOBILE ANTENNA PLAN
SCALE: 1/2" = 1'-0"



2 NEW T-MOBILE ANTENNA PLAN
SCALE: 1/2" = 1'-0"

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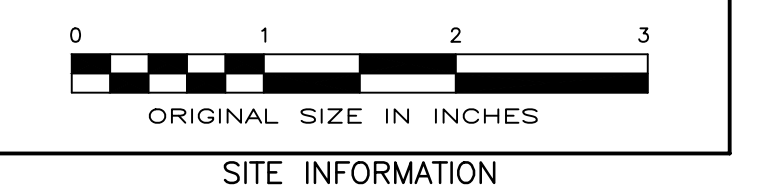
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PROJECT NUMBER 10473.CTHA242A DESIGNED BY EI

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ISSUED BY _____ DATE _____



HA242/PORTLANDHS_SST
CTHA242A
95 HIGH STREET
PORTLAND, CT 06480

SHEET TITLE
EXIST/NEW T-MOBILE
ANTENNA PLANS &
ANTENNA SCHEDULE

SHEET NUMBER
A-4

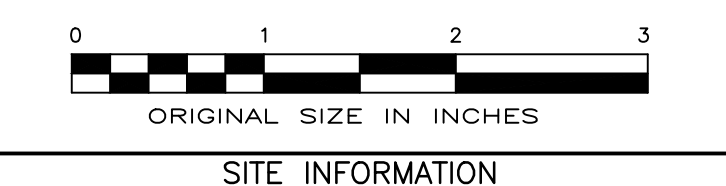
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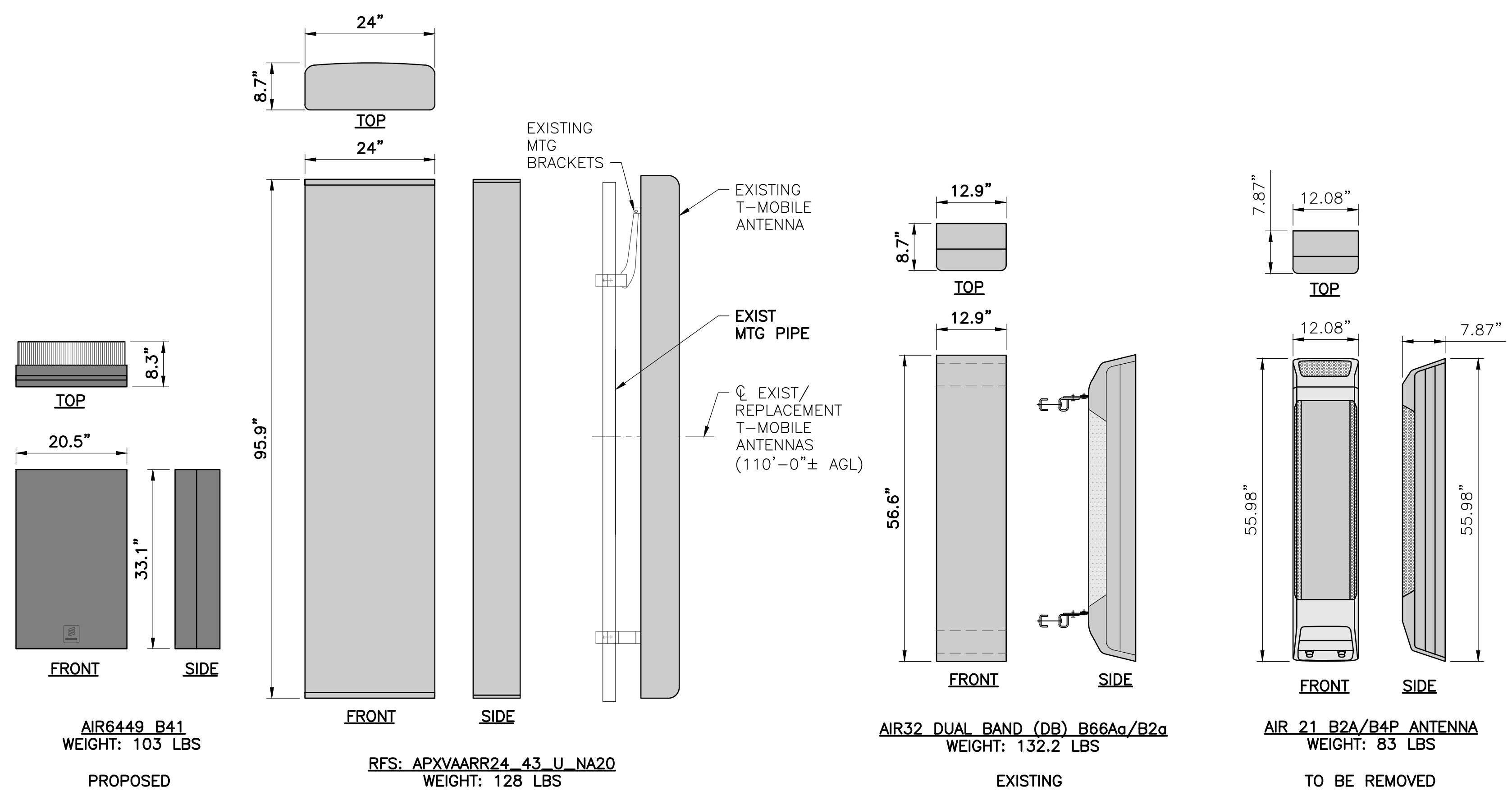
SITE INFORMATION
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 CTHA242A
 95 HIGH STREET
 PORTLAND, CT 06480

SHEET TITLE

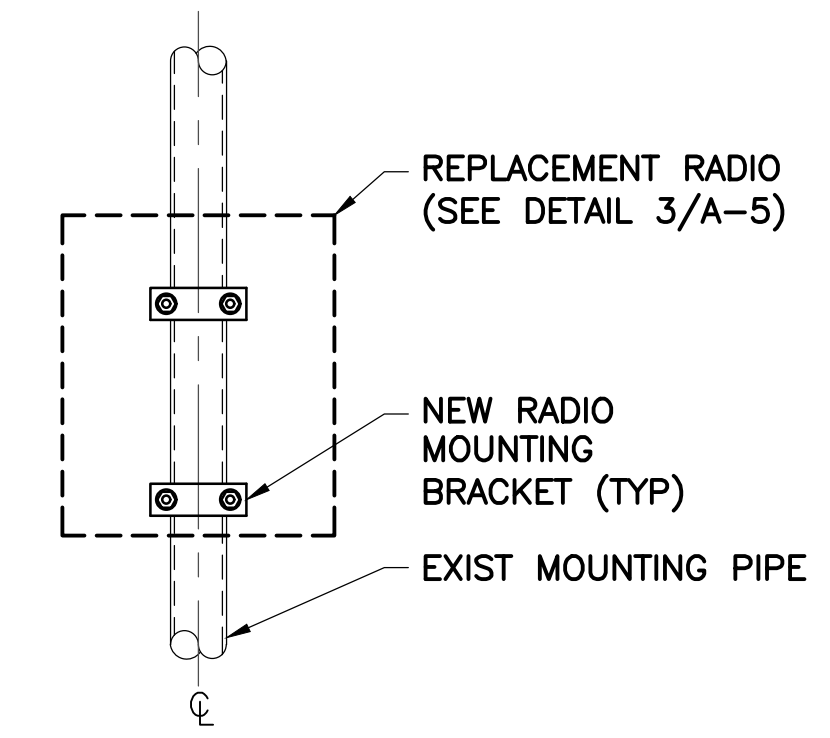
DETAILS, ANTENNA
 SCHEMATIC &
 SPECIFICATIONS

SHEET NUMBER

A-5

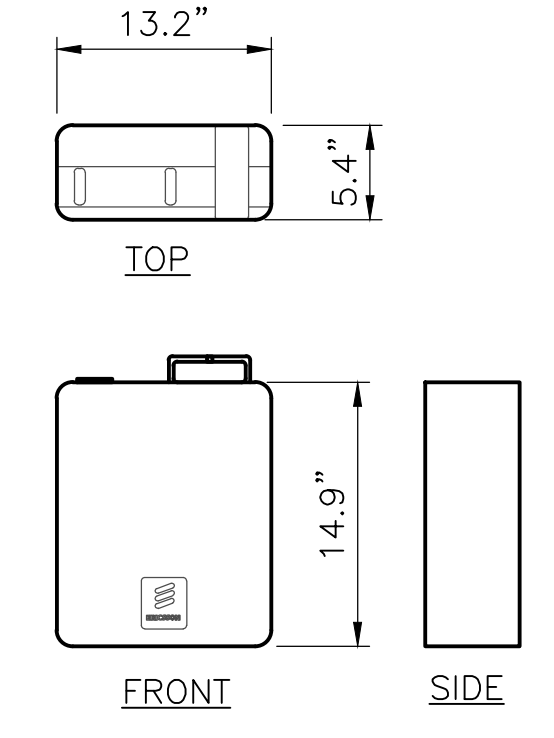


1 ANTENNA DETAILS
 A-5 SCALE: 3/4" = 1'-0"

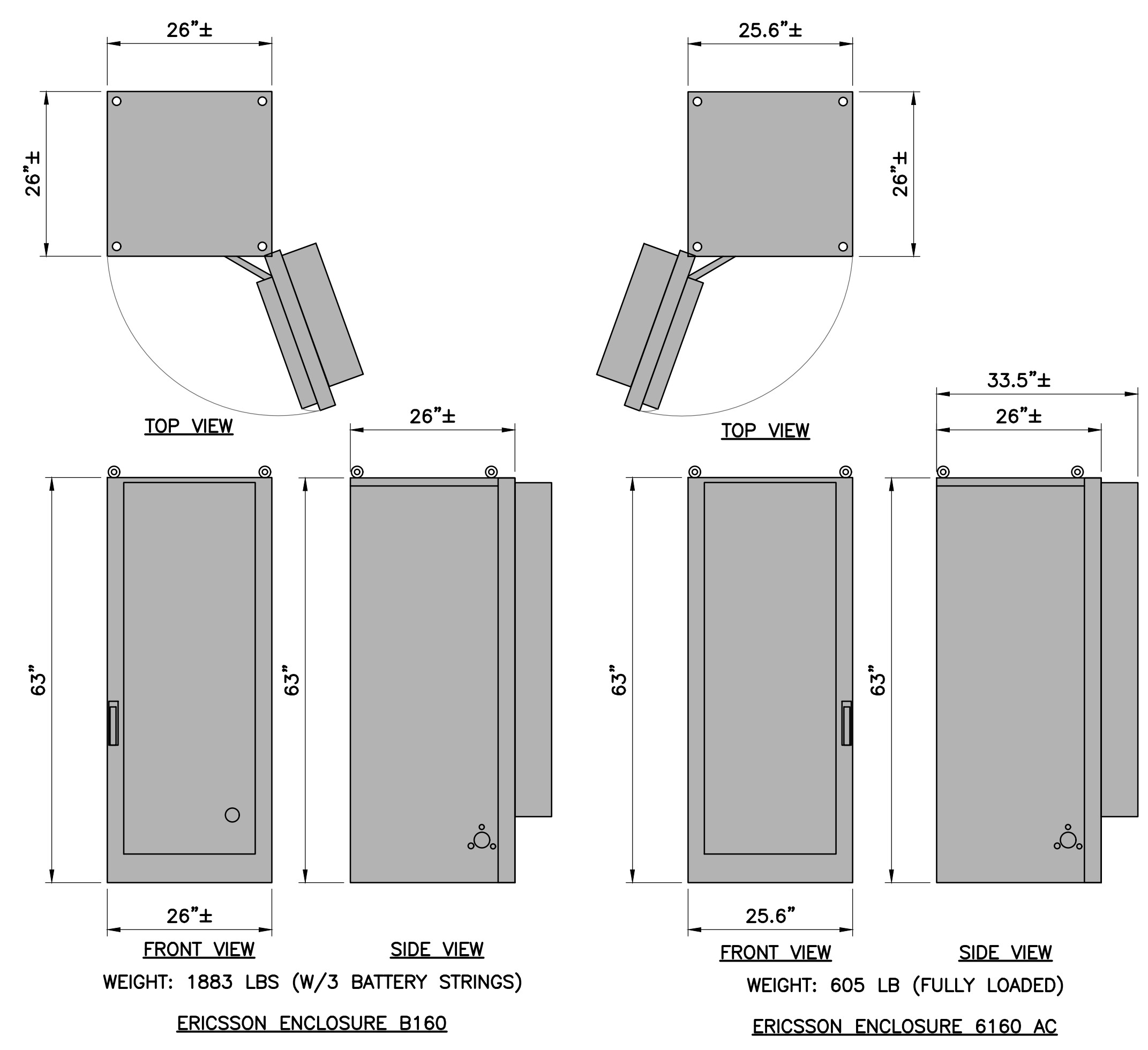


NOTE: MOUNTING OF RADIO TO MOUNTING PIPE, INCLUDING MOUNTING BRACKET ASSEMBLY SHALL BE PER MANUFACTURER DIRECTION.

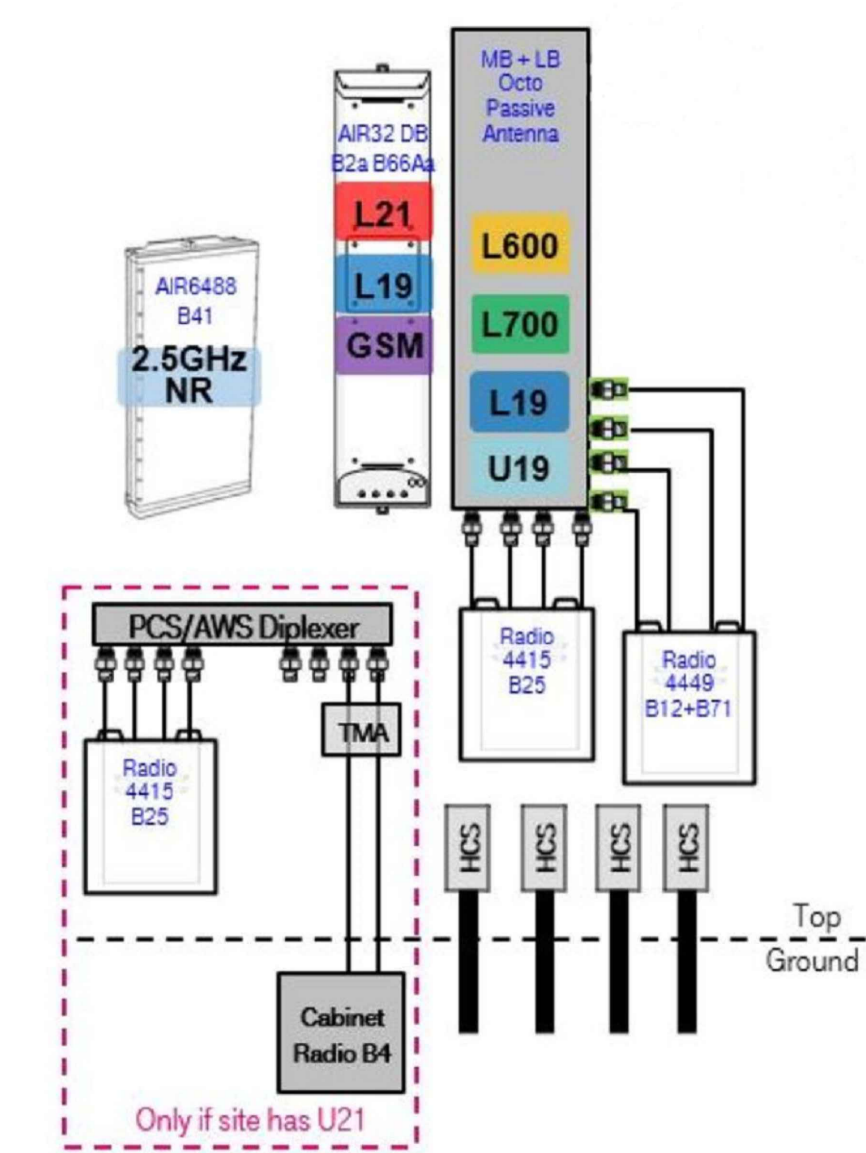
2 RADIO MTG DETAIL
 A-5 SCALE: 1" = 1'-0"



3 RADIO DETAIL
 A-5 SCALE: 1" = 1'-0"

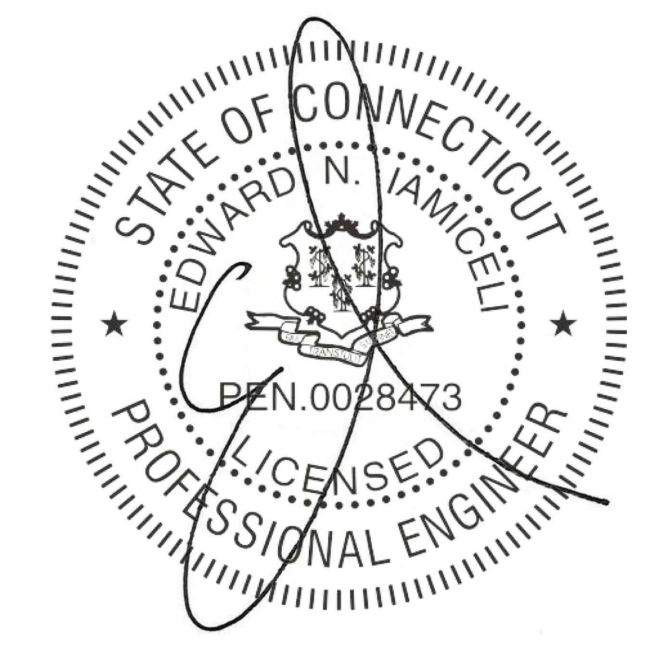


4 EQUIPMENT CABINET SPECIFICATIONS
 A-5 SCALE: NTS



5 ANTENNA SCHEMATIC
 A-5 SCALE: NTS

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GENERAL NOTES

- ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE STATE OF CONNECTICUT BUILDING CODE, LATEST VERSION AND ALL OTHER APPLICABLE CODES AND ORDINANCES.
- CONTRACTOR SHALL VISIT THE JOB SITE AND FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND MAKE PROVISIONS AS TO THE COST THEREOF. CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
- PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY, UNLESS OTHERWISE NOTED. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO EFFECT ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- DIMENSIONS SHOWN ARE TO FINISH SURFACES, UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE AUTHORIZED REPRESENTATIVE OR THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
- DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
- CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING, AND SHALL RECEIVE IN WRITING AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
- ONCE THE CONTRACTOR HAS RECEIVED AND ACCEPTED THE "NOTICE TO PROCEED," CONTRACTOR WILL CONTACT THE CONSTRUCTION MANAGER OF RECORD A MINIMUM OF 48 HOURS PRIOR TO WORK START.
- CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ALL PRODUCTS OR ITEMS NOTED AS "EXISTING" WHICH ARE NOT FOUND TO BE IN THE FIELD.
- CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST CONSTRUCTION SKILLS AND ATTENTION. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT, UNLESS OTHERWISE NOTED.
- ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMEN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE WORK AREA, ADJACENT AREAS, AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS.
- CONTRACTOR SHALL COORDINATE HIS WORK AND SCHEDULE HIS ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS OF THE OWNER.
- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.
- CONTRACTOR SHALL MAINTAIN LIABILITY INSURANCE TO PROTECT THE OWNER.
- INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
- MAKE NECESSARY PROVISIONS TO PROTECT EXISTING SURFACES, EQUIPMENT, IMPROVEMENTS, AND PIPING. REPAIR ANY DAMAGE THAT OCCURS DURING CONSTRUCTION.
- REPAIR ALL EXISTING SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND WITH ADJACENT SURFACES.
- KEEP CONTRACT AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS AND RUBBISH. EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY OF THE OWNER SHALL BE REMOVED. LEAVE PREMISES IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ITEMS UNTIL COMPLETION OF CONSTRUCTION.
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE ENGINEER.
- PROVIDE 48 HOURS WRITTEN NOTICE TO THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
- ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS AND OTHER DOCUMENTATION SHALL BE TURNED OVER TO AT COMPLETION OF CONSTRUCTION.
- COMPLETE JOB SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR AFTER DATE OF ACCEPTANCE BY. ANY WORK, MATERIALS OR EQUIPMENT FOUND TO BE DEFECTIVE DURING THAT PERIOD SHALL BE CORRECTED IMMEDIATELY UPON WRITTEN NOTIFICATION AT NO ADDITIONAL COST TO T-MOBILE.

STRUCTURAL NOTES

- CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE ENGINEER.
- DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS", LATEST EDITION.
- STRUCTURAL STEEL BEAMS SHALL CONFORM TO ASTM A992 (Fy=50ksi). STRUCTURAL STEEL PLATES AND ANGLES SHALL CONFORM TO ASTM A36.
- ROUND AND SQUARE HOLLOW STRUCTURAL SECTIONS (HSS) CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE C.
- STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 "PIPE, STEEL, BLACK AND HOT-DIPPED, ZINC-COATED WELDED AND SEAMLESS", TYPE E OR S, GRADE B.
- CONNECTIONS: WELD OR BOLT CONNECTIONS, AS INDICATED:
 - CONNECTIONS NOT DETAILED ON THE DRAWINGS SHALL CONFORM TO THE REQUIREMENTS OF THE CITED AISC SPECIFICATION.
 - STRUCTURAL BOLTS SHALL CONFORM TO THE LATEST ASTM A325 "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS".
 - WHERE THE REACTION VALUES OF BEAMS, BRACING, STRUTS, ETC., ARE NOT SHOWN ON THE DRAWINGS THE CONNECTIONS SHALL BE DESIGNED TO SUPPORT THE END REACTION DERIVED FROM THE TABLES AND FORMULA OF UNIFORM LOAD CONSTANTS IN PART 2, NINTH EDITION, OF THE AISC MANUAL OF STEEL CONSTRUCTION FOR THE GIVEN MEMBER SIZE, SPAN AND YIELD STRENGTH.
 - MINIMUM 3/16" FILLET E70-XX WELD SHALL APPLY UNLESS NOTED.
 - MINIMUM 1/2" DIA. A325 BOLTS SHALL APPLY UNLESS NOTED.
 - MINIMUM SIZE OF CLIP ANGLES SHALL BE L3x3x3/8" UNLESS NOTED.
 - ALL GUSSET PLATES SHALL BE 3/8" THICK UNLESS NOTED.
 - ALL HOLES FOR BOLTS SHALL BE 1/16 INCH LARGER THAN THE BOLT DIAMETER WITH AN EDGE DISTANCE OF AT LEAST 1 1/2 TIMES THE BOLT DIAMETER AND A SPACING OF AT LEAST 3 TIMES THE BOLT DIAMETER. ALL BOLTS SHALL BE PROVIDED WITH PALNUTS OR LOCK NUTS.
- STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS AND CONFORM TO ASTM A325 "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS", LATEST EDITION. BOLTS SHALL BE 3/4 INCH DIA. UNLESS OTHERWISE NOTED.
- CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES".
- ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
- DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
- ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
- ALL STEEL SUPPORTS SHALL BE INSTALLED WITH DOUBLE NUTS AND SHALL BE INSTALLED SNUG TIGHT.
- SLEEVE ANCHORS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 3, CLASS 3, AS MANUFACTURED BY HILTI FASTENING SYSTEMS OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM EMBEDMENT SHALL BE THREE (3) INCHES.
- EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS 1, HILTI KWIK BOLT II OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM EMBEDMENT SHALL BE FOUR (4) INCHES.
- EPOXY ANCHORING SYSTEM SHALL BE THE HILTI HY-270 FOR MASONRY CONSTRUCTION WITH HOLLOW BRICK OR BLOCK & THE HILTI HIT HY200 INJECTION ADHESIVE ANCHOR FOR GROUT FILLED CONCRETE MASONRY UNITS AND CONCRETE. EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF 1/2"Ø STAINLESS STEEL ANCHOR ROD W/NUTS & WASHERS, AN INTERNALLY THREADED INSERT, A SCREEN TUBE FOR THE HY-270 ONLY & AN EPOXY ADHESIVE (6" MIN EMBEDMENT). THE INSTALLATION PROCEDURE SHALL BE AS FOLLOWS
 - DRILL THE HOLE USING MANUFACTURER RECOMMENDED DRILL BIT UP TO SPECIFIED DEPTH. HAMMERING IS NOT PERMITTED.
 - CLEAN THE HOLE USING NYLON BRUSH AND/OR COMPRESSED AIR. THE HOLE SHOULD BE CLEAR OF ANY LOOSE MATERIAL. IF WET, THE MASONRY SHOULD BE ALLOWED TO DRY FULLY BEFORE ANCHOR INSTALLATION.
 - INSERT SPECIFIED SCREEN TUBE INTO THE HOLE.
 - FILL THE SCREEN TUBE COMPLETELY WITH ADHESIVE, BEGINNING AT THE BOTTOM END.
 - INSERT ANCHOR ROD OR INTERNALLY THREADED INSERT INTO THE ADHESIVE-FILLED SCREEN TUBE, TWISTING SLIGHTLY.
 - LOAD FASTENER ONLY AFTER MANUFACTURER SPECIFIED CURE TIME HAS ELAPSED.
- GRATING SHALL BE GALVANIZED WELDED STEEL BAR GRATING TYPE W/BA WITH 1-1/4" BEARING BARS AT 1-3/16" OC. FASTEN TO SUPPORTING MEMBERS WITH SADDLE-TYPE CLIPS AT 2'-0" O.C. AND BAND ALL EXPOSED EDGES.
- SUBMIT DRAWINGS OF ALL STRUCTURAL AND MISCELLANEOUS STEEL TO THE ENGINEER FOR APPROVAL AND INCORPORATE ALL COMMENTS PRIOR TO FABRICATION.
- INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE ENGINEER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER APPROVAL.
- ALL WORK SHALL BE INSPECTED BY THE ENGINEER DURING AND AT THE COMPLETION OF CONSTRUCTION.
- CONTRACTOR TO REMOVE MASTIC ON THE EXISTING WALL/PARAPET AT EVERY STEEL SUPPORT ATTACHMENT AND REPOINT MASONRY AS REQUIRED. A BED OF SILICONE SHALL BE APPLIED BEHIND AND ALL AROUND THE STEEL SUPPORT ATTACHMENT TO MAKE IT WEATHERPROOF.
- HAMMER DRILLS ARE NOT TO BE USED WHEN DRILLING HOLES FOR SLEEVE OR EXPANSION BOLTS INSTALLED IN MASONRY BLOCKS/BRICKS.
- ALL HOLES TO BE ADDED IN THE FIELD SHALL BE PUNCHED OR DRILLED. NO HOLE BURNING SHALL BE ALLOWED.
- NOTES ARE NOT PROJECT SPECIFIC.

SITE NOTES

- ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWING.
- 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 SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- 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 CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES.
- 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 ENGINEER.
- THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK SHALL BE GRADED TO A UNIFORM SLOPE, FERTILIZED, SEEDDED, AND COVERED WITH MULCH.
- CONTRACTOR 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.
- CARE SHALL BE TAKEN TO RETAIN NATURAL GROWTH AND PREVENT DAMAGE TO TREES WITHIN AND OUTSIDE THE LIMITS OF CONSTRUCTION AND SPECIFIED WORK AREAS CAUSED BY EQUIPMENT AND MATERIALS. ANY DAMAGE TO THIS NATURAL GROWTH SHALL BE RESTORED AT THE EXPENSE OF THE CONTRACTOR.
- ALL AREAS DISTURBED BY THE CONTRACTOR WITHOUT AUTHORIZATION SHALL BE RESTORED BY THE CONTRACTOR.
- IN THE EVENT THE CONTRACTOR DAMAGES AN EXISTING UTILITY SERVICE CAUSING AN INTERRUPTION IN SAID SERVICE, HE SHALL IMMEDIATELY COMMENCE WORK TO RESTORE SERVICE AND MAY NOT CEASE HIS WORK OPERATION UNTIL SERVICE IS RESTORED.

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 NORTEAST, LLC.
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 BLOOMFIELD, CT 06002

NSS NORTEAST
 SITE SOLUTIONS
 Turnkey Wireless Development

APPROVALS

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10473.CTHA242A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
△	11/04/20	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY _____ DATE _____



SITE INFORMATION

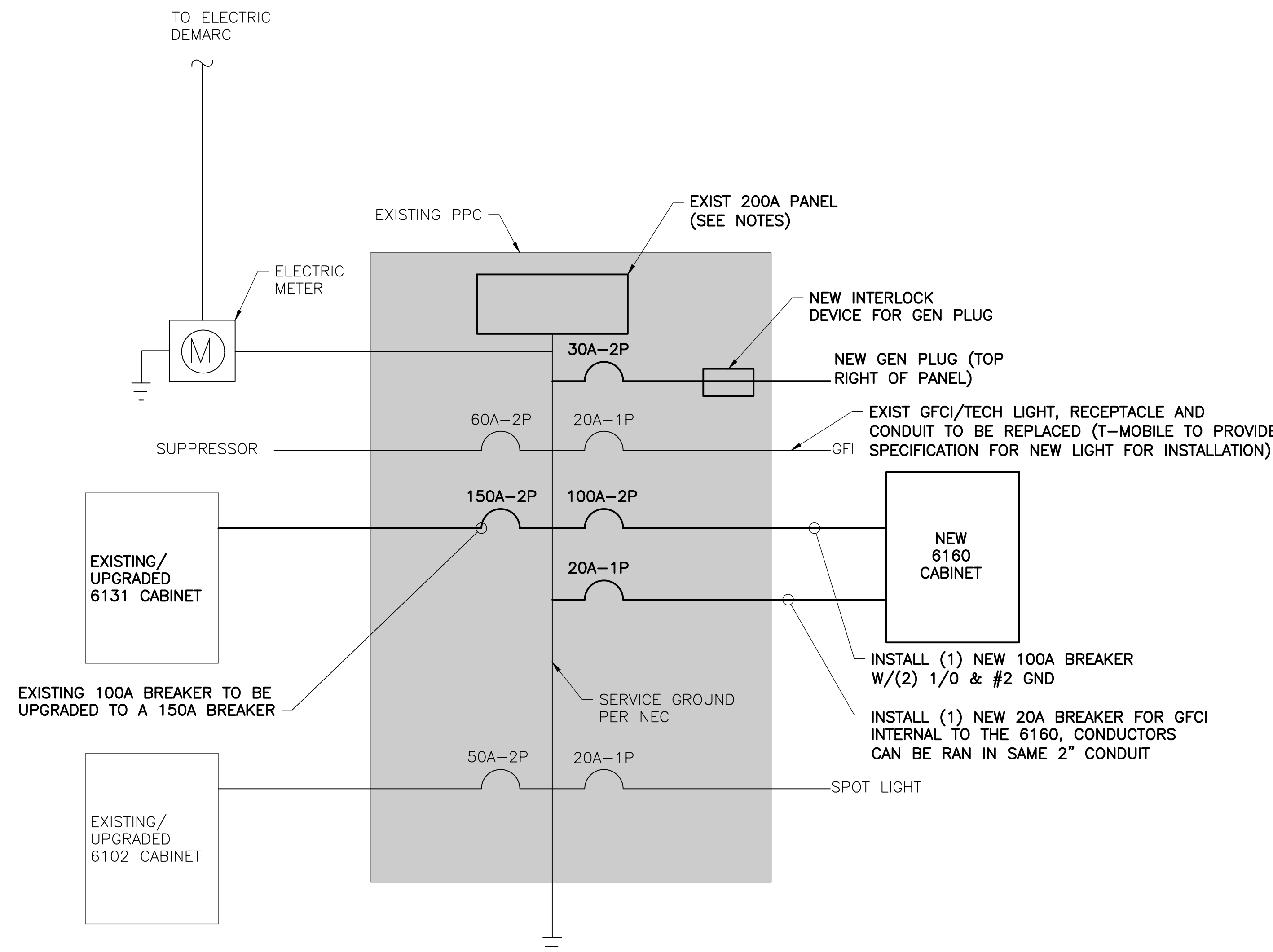
HA242/PORTLANDHS_SST
 CTHA242A
 95 HIGH STREET
 PORTLAND, CT 06480

SHEET TITLE

NOTES

SHEET NUMBER

A-6



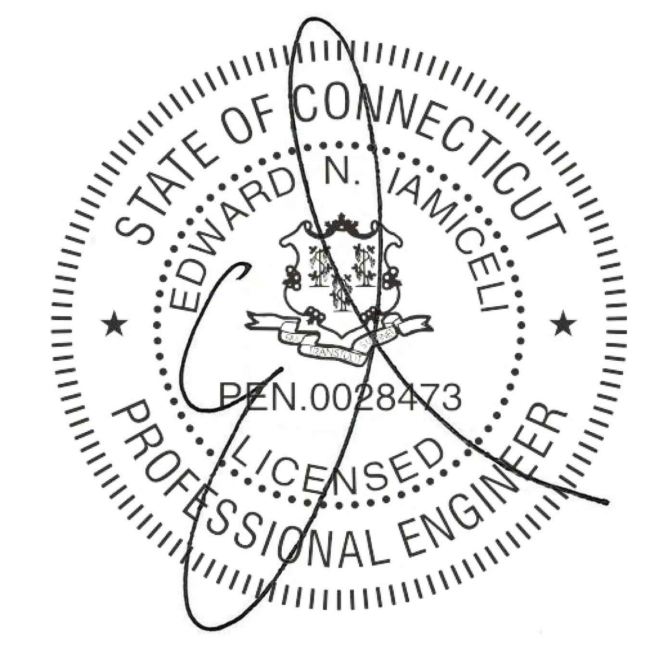
NOTES:
 1. THE ABOVE DIAGRAM IS GENERIC AND ANY ELECTRICAL WORK SHALL BE COMPLETED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH NEC STANDARDS.
 2. ELECTRICAL CONSULT SHALL BE PERFORMED TO CONSTRUCTION TO CONFIRM THE POWER REQUIREMENTS AND FEASIBILITY.

1 ONE-LINE DIAGRAM
 E-1 SCALE: NTS

GENERAL ELECTRICAL NOTES

- CONTRACTOR SHALL PERFORM ALL VERIFICATION OBSERVATION TESTS, AND EXAMINATION WORK PRIOR TO THE ORDERING OF THE ELECTRICAL EQUIPMENT AND THE ACTUAL CONSTRUCTION. CONTRACTOR SHALL ISSUE A WRITTEN NOTICE OF ALL FINDINGS TO THE ENGINEER LISTING ALL MALFUNCTIONS, FAULTY EQUIPMENT AND DISCREPANCIES.
- CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION TOOLS, TRANSPORTATION, ETC., FOR A COMPLETE AND PROPERLY OPERATIVE SYSTEM ENERGIZED THROUGHOUT AND AS INDICATED ON DRAWINGS, AS SPECIFIED HEREIN AND/OR AS OTHERWISE REQUIRED.
- ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN PERFECT CONDITION WHEN INSTALLED AND SHALL BE OF THE BEST GRADE AND OF THE SAME MANUFACTURER THROUGHOUT FOR EACH CLASS OR GROUP OF EQUIPMENT. MATERIALS SHALL BE LISTED AND APPROVED BY UNDERWRITER'S LABORATORIES (U.L.) AND SHALL BEAR THE INSPECTION LABEL "J" WHERE SUBJECT TO SUCH APPROVAL. MATERIALS SHALL MEET WITH APPROVAL OF ALL GOVERNING BODIES HAVING JURISDICTION. AND SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA AND NBFU.
- CONTRACTOR TO COORDINATE WITH SITE OWNER FOR CONNECTION OF TEMPORARY AND PERMANENT POWER TO THE SITE. THE TEMPORARY POWER AND ALL HOOKUP COSTS TO BE PAID BY CONTRACTOR.
- ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THAN THE MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED, AND A MINIMUM OF 10,000 A.I.C.
- ALL ELECTRICAL EQUIPMENT SHALL BE LABELED WITH PERMANENT ENGRAVED PLASTIC LABELS.
- METER SOCKETS AMPERES, VOLTAGE AND NUMBER OF PHASES SHALL BE NOTED AND SHALL BE MANUFACTURED BY SQUARE "D" COMPANY, SANGAMO OR APPROVED EQUAL. METER SOCKET SHALL BE APPROVED BY UTILITY COMPANY PRIOR TO INSTALLATION.
- WIRE AND CABLE CONDUCTORS SHALL BE COPPER #12 AWG MINIMUM WITH TYPE THHN INSULATION UNLESS SPECIFICALLY NOTED OTHERWISE.
- ALL CONDUCTORS SHALL BE COPPER.
- USE T-TAP CONNECTIONS ON ALL MULTI-CIRCUITS WITH COMMON NEUTRAL CONDUCTOR FOR LIGHTING FIXTURES.
- EACH CONDUCTOR OF EVERY SYSTEM SHALL BE PERMANENTLY TAGGED IN EACH PANEL BOARD, PULLBOX, J-BOX, SWITCH BOX, ETC., IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT (O.S.H.A.)
- CONDUIT:
 - RIGID CONDUIT SHALL BE U.L. LABEL GALVANIZED ZINC COATED WITH ZINC INTERIOR AND SHALL BE USED WHEN INSTALLED IN OR UNDER CONCRETE SLABS, IN CONTACT WITH THE EARTH, UNDER PUBLIC ROADWAYS, IN MASONRY WALLS OR EXPOSED ON BUILDING EXTERIOR.
 - INTERMEDIATE METAL CONDUIT SHALL BE U.L. LABEL, FITTINGS SHALL BE THREADED ALUMINUM OR STEEL AND SHALL BE USED FOR ALL EXTERIOR RUNS. THREADLESS COUPLINGS AND CONNECTORS SHALL NOT BE USED.
 - ELECTRICAL METALLIC TUBING (EMT) SHALL HAVE U.L. LABEL, FITTINGS SHALL BE NO SET SCREW OR CRIMP TYPE FITTINGS SHALL BE USED. GLAND RING COMPRESSION TYPE. EMT SHALL BE USED ONLY FOR INTERIOR RUNS.
 - FLEXIBLE METALLIC CONDUIT SHALL HAVE U.L. LISTED LABEL AND MAY BE USED WHERE PERMITTED BY CODE. FITTINGS SHALL BE "JAKE" OR "SQUEEZE" TYPE, SEAL TIGHT FLEXIBLE CONDUIT. ALL CONDUIT IN EXCESS OF SIX FEET IN LENGTH SHALL HAVE FULL SIZE GROUND WIRE.
 - CONDUIT SHALL BE SIZED PER THE NEC AND AS SHOWN.
 - CONDUIT RUNS MAY BE SURFACE MOUNTED IN CEILINGS OR WALLS UNLESS INDICATED OTHERWISE. CONDUIT INDICATED SHALL RUN PARALLEL OR AT RIGHT ANGLES TO CEILING, FLOOR OR BEAMS. VERIFY EXACT ROUTING OF ALL EXPOSED CONDUIT WITH OWNER PRIOR TO INSTALLING.
 - ALL CONDUIT ONLY (C.O.) RUNS SHALL HAVE A PULL WIRE OR ROPE.
- COVERPLATES SHALL BE BRUSHED STAINLESS STEEL FOR ALL SWITCHES, RECEPTACLES, TELEPHONE AND BLANKED OUTLETS, AND SHALL HAVE ENGRAVED LETTERING WHERE INDICATED WEATHERPROOF RECEPTACLES SHALL HAVE SIERRA #WPD-8 LIFT COVERPLATES.
- REFER TO MANUFACTURERS MANUAL FOR RECOMMENDED FUSE AND WIRE SIZES.
- ALL FINAL CONNECTIONS TO THE EQUIPMENT ARE TO BE OF FLEXIBLE WEATHERPROOF CONDUIT TO MEET APPLICABLE CODES.
- THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES.
- GROUNDING CONDUCTORS SHALL BE SOLID TINNED COPPER AND ANNEALED #2, UNLESS OTHERWISE NOTED.
- UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL OF POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO THE CONSTRUCTION MANAGER. CLEAN PREMISES OF ALL DEBRIS RESULTING FROM WORK AND LEAVE WORK IN A COMPLETE AND UNDEAMAGED CONDITION.
- PROVIDE CONSTRUCTION MANAGER WITH ONE SET OF COMPLETE ELECTRICAL "AS INSTALLED" DRAWINGS AT THE COMPLETION OF THE JOB, SHOWING ACTUAL DIMENSIONS, ROUTINGS, AND CIRCUITS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH GAINING APPROVALS AND PAYING ALL FEES ASSESSED BY UTILITY COMPANY FOR ELECTRICAL SERVICE.

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 Turnkey Wireless Development

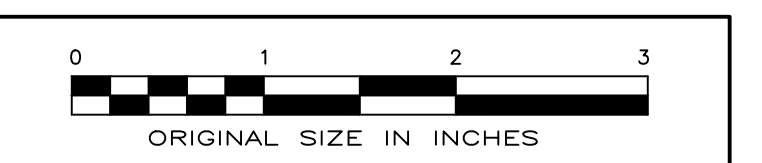
APPROVALS

LANDLORD _____
 RF _____
 CONSTRUCTION _____
 OPERATIONS _____
 SITE ACQ. _____

PROJECT NUMBER 10473.CTHA242A DESIGNED BY EI

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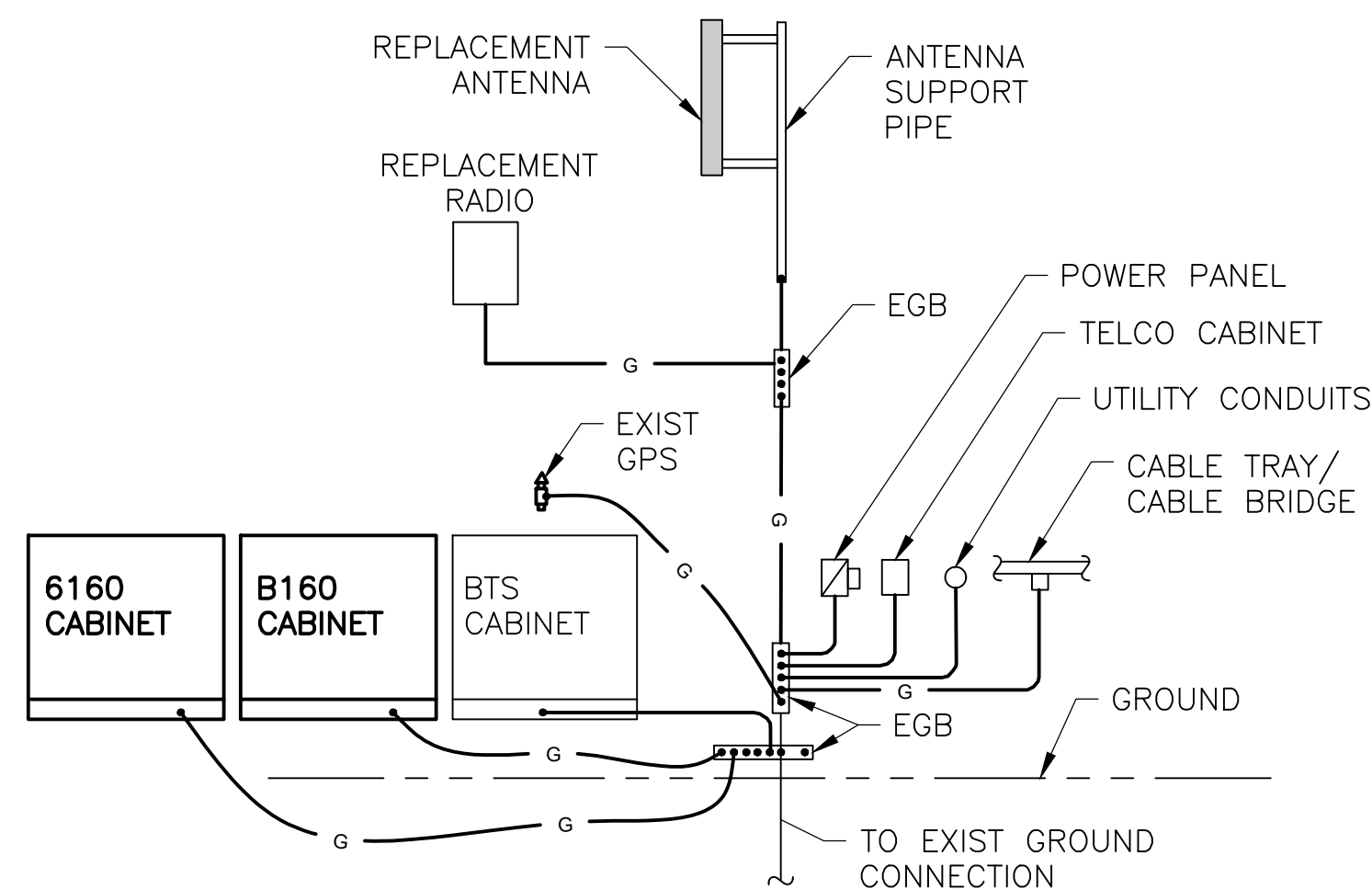
ISSUED BY _____ DATE _____



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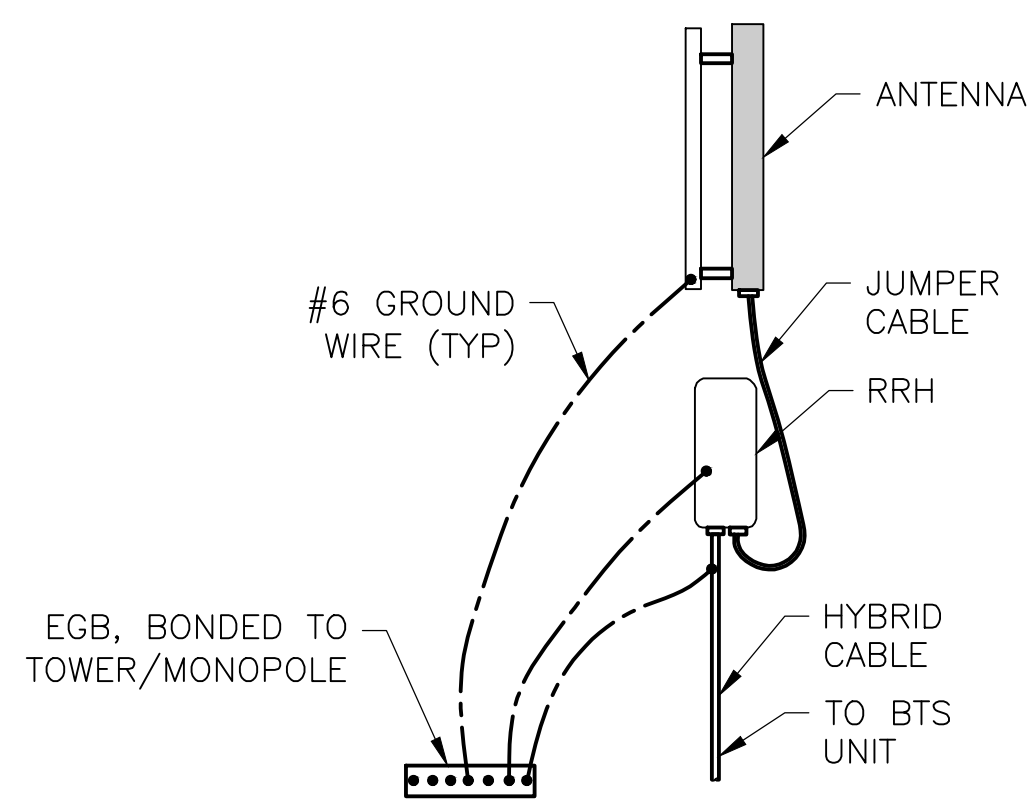
SHEET TITLE
 ELECTRICAL NOTES &
 ONE-LINE DIAGRAM

SHEET NUMBER
 E-1

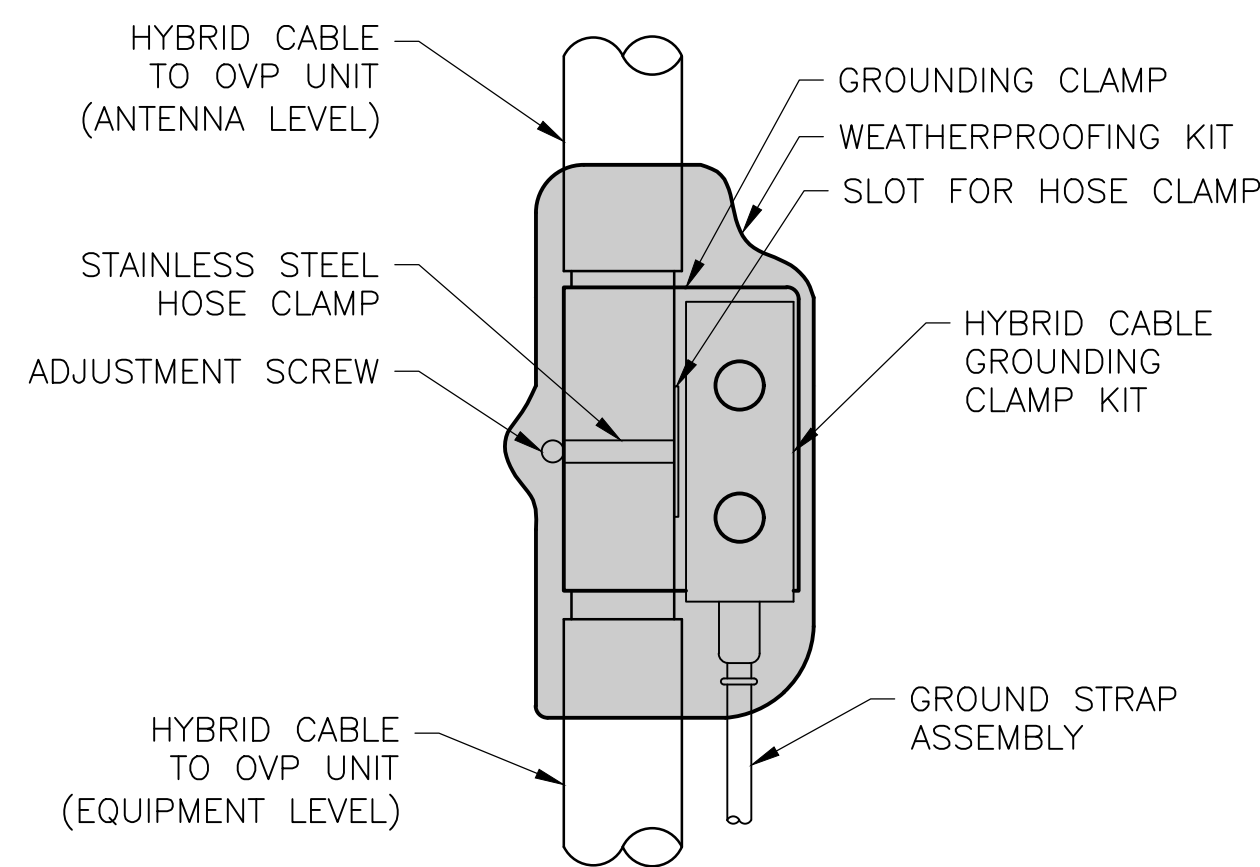


NOTE: CONTRACTOR SHALL CONFIRM ALL EQUIPMENT IS GROUNDED. IF NOT, CONTRACTOR SHALL GROUND EQUIPMENT AS SHOWN AND AS REQUIRED.

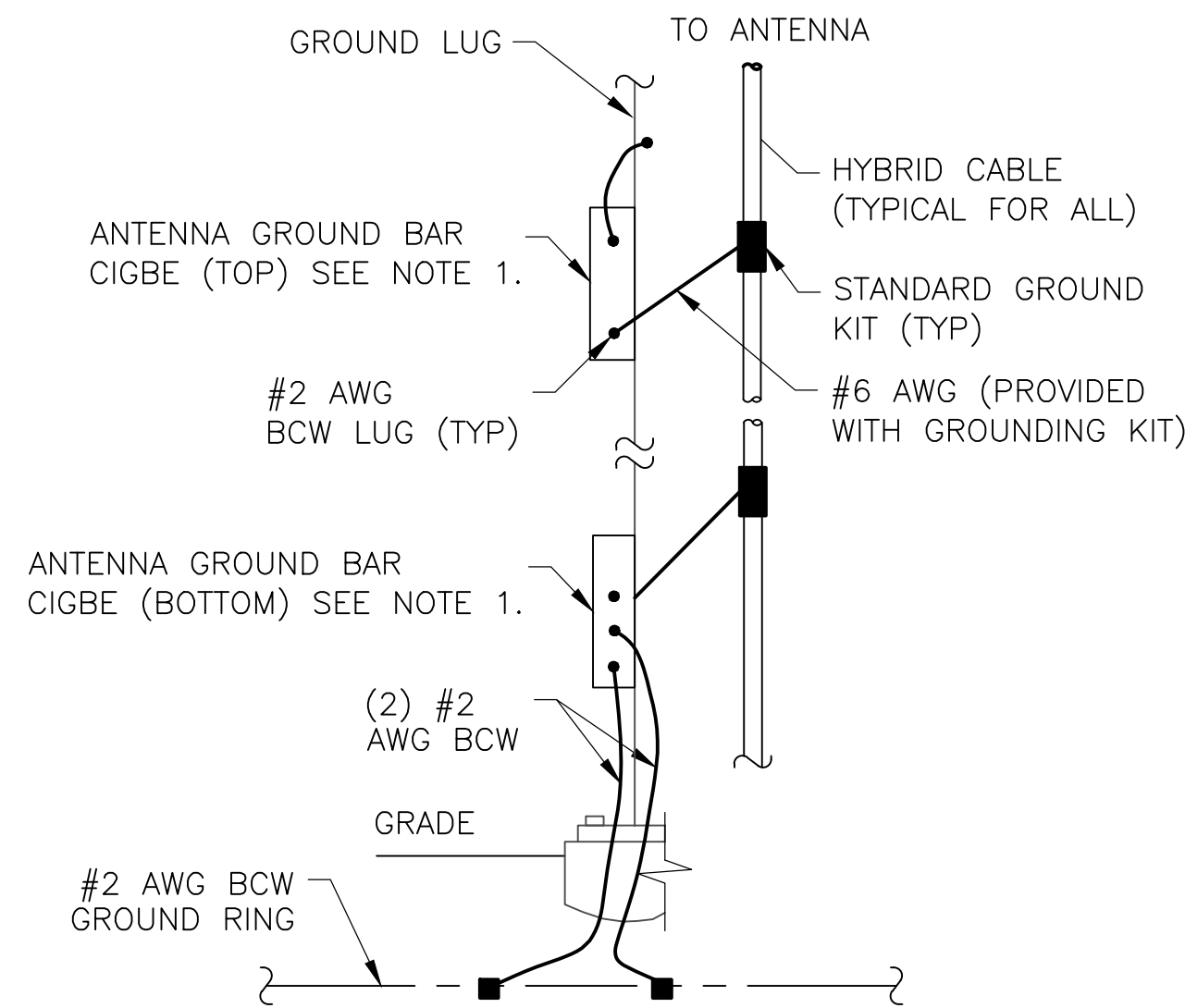
1 GROUNDING RISER DIAGRAM
G-1 SCALE: NTS



2 HYBRID CABLE CONNECTION DETAIL
G-1 SCALE: NTS

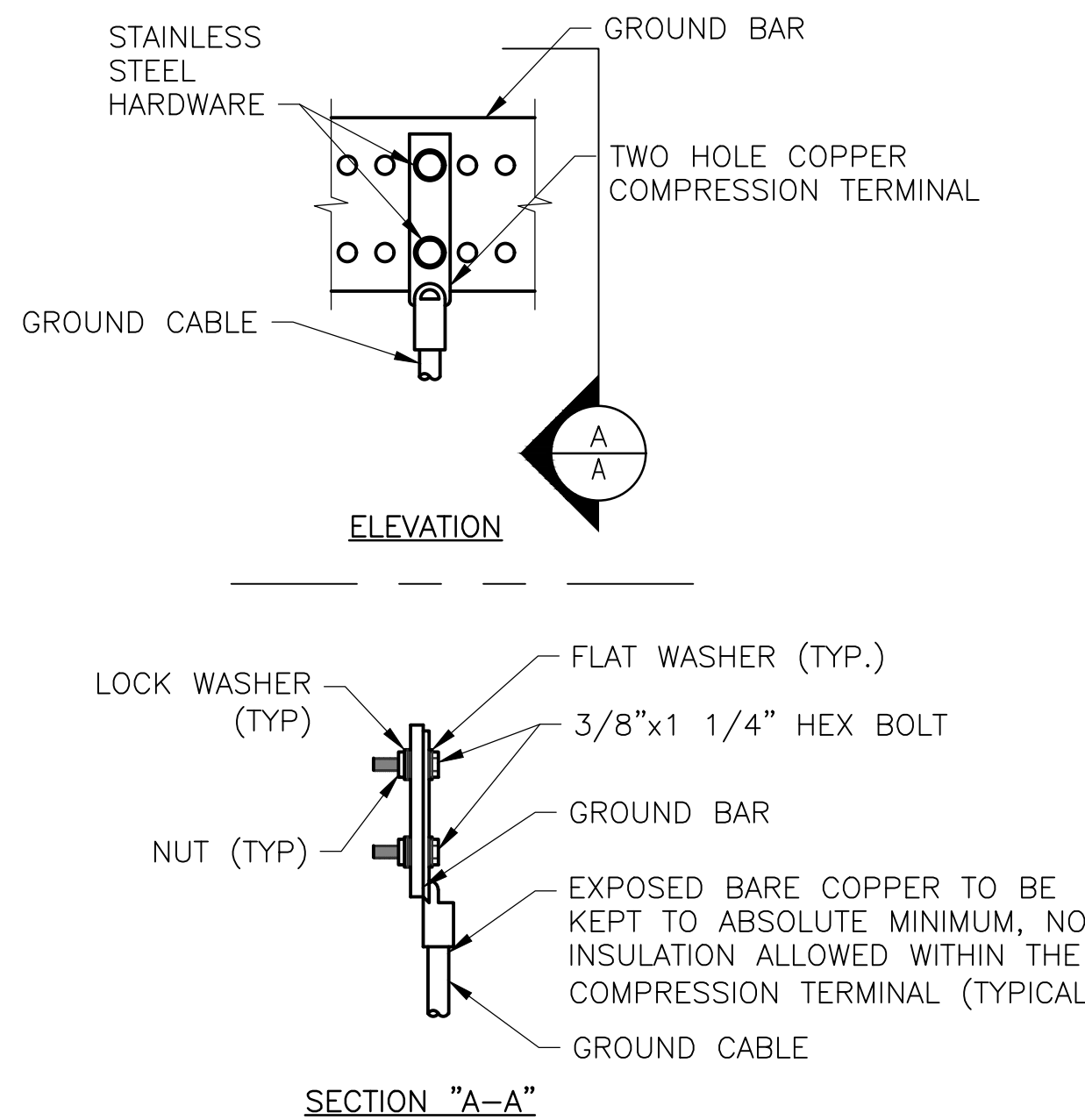


3 HYBRID CABLE GROUNDING DETAIL
G-1 SCALE: NTS



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

4 ANTENNA CABLE GROUNDING
G-1 SCALE: NTS

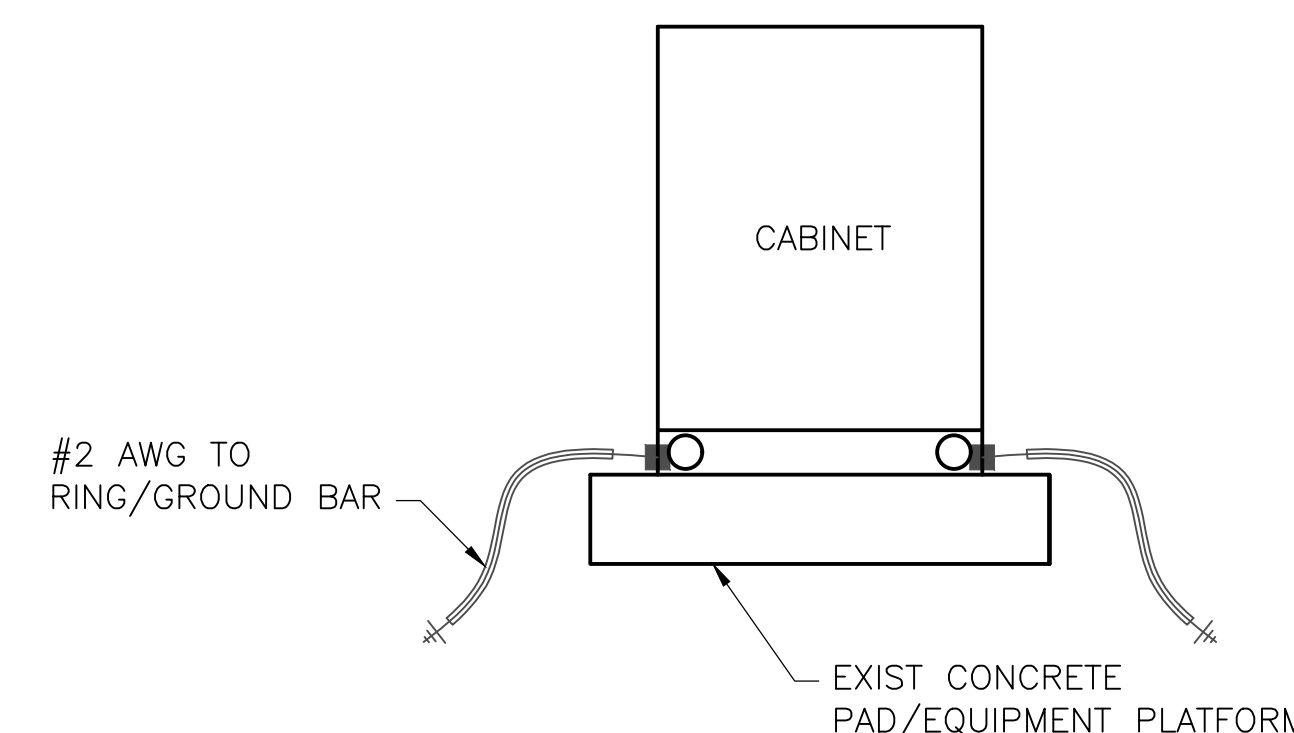


NOTES:
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELDED DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.
4. ALL GROUND LUGS MUST NE HEAT SHRUNK AT WIRE/LUG CONNECTION.

5 GROUND BAR CONNECTION DETAIL
G-1 SCALE: NTS

GROUNDING NOTES

1. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES.
2. ALL GROUNDING WORK SHALL BE IN ACCORDANCE WITH T-MOBILE STANDARD PRACTICE.
3. ALL BUS CONNECTORS SHALL BE TWO-HOLE, LONG-BARREL TYPE COMPRESSION LUGS, T&B OR EQUAL, UNLESS OTHERWISE NOTED ON DRAWINGS. ALL LUGS SHALL BE ATTACHED TO BUSES USING BOLTS, NUTS, AND LOCK WASHERS. NO WASHERS ARE ALLOWED BETWEEN THE ITEMS BEING GROUNDED.
4. ALL CONNECTORS SHALL BE CRIMPED USING HYDRAULIC CRIMPING TOOLS, T&B #TBM 8 OR EQUIVALENT.
5. ALL CONNECTIONS SHALL BE MADE TO BARE METAL. ALL PAINTED SURFACES SHALL BE FILED TO ENSURE PROPER CONTACT. NO WASHERS ARE ALLOWED BETWEEN THE ITEMS BEING GROUNDED. ALL CONNECTIONS ARE TO HAVE A NON-OXIDIZING AGENT APPLIED PRIOR TO INSTALLATION.
6. ALL COPPER BUSES SHALL BE CLEANED, POLISHED, AND A NON-OXIDIZING AGENT APPLIED. NO FINGERPRINTS OR DISCOLORED COPPER WILL BE PERMITTED.
7. ALL BENDS SHALL BE AS SHALLOW AS POSSIBLE, WITH NO TURN SHORTER THAN AN 8-INCH NOMINAL RADIUS.
8. GROUNDING CONDUCTORS SHALL BE SOLID TINNED COPPER AND ANNEALED #2. ALL GROUNDING CONDUCTORS SHALL RUN THROUGH PVC SLEEVES WHEREVER CONDUCTORS RUN THROUGH WALLS, FLOORS, OR CEILINGS. IF CONDUCTORS MUST RUN THROUGH EMT, BOTH ENDS OF CONDUIT SHALL BE GROUNDED. SEAL BOTH ENDS OF CONDUIT WITH SILICONE CAULK.
9. GROUNDING SYSTEM RESISTANCE SHALL NOT EXCEED 10 OHMS. IF THE RESISTANCE VALUE IS EXCEEDED, NOTIFY THE PROJECT MANAGER FOR FURTHER INSTRUCTION ON METHODS FOR REDUCING THE RESISTANCE VALUE.
10. ALL ROOF TOP ANTENNA MOUNTS SHALL BE GROUNDED WITH A #2 GROUND WIRE CONNECTED TO THE NEAREST GROUND BUS. ALL CONNECTIONS ARE TO BE CAD-WELDED IF POSSIBLE.
11. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL OF POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO THE PROJECT MANAGER.
12. GROUNDING CONNECTION TO TRAVEL IN A DOWNWARD DIRECTION.
13. ALL EXPOSED #2 WIRE MUST BE TINN NOT BTW.
14. TECTONIC TAKES NO RESPONSIBILITY OR LIABILITY FOR THE GROUNDING SYSTEM AS SHOWN ON THIS SITE. THIS IS A STANDARD GROUNDING SYSTEM.



6 CABINET GROUNDING DETAIL
G-1 SCALE: NTS

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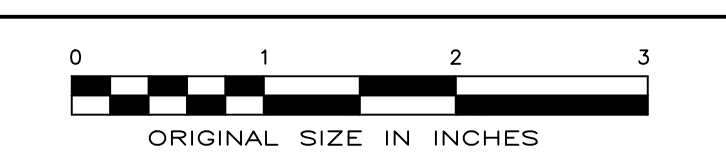
APPROVALS
LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER 10473.CTHA242A
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ISSUED BY	DATE

ISSUED BY	DATE



SITE INFORMATION

HA242/PORTLANDHS_SST
CTHA242A
95 HIGH STREET
PORTLAND, CT 06480

SHEET TITLE

GROUNDING DETAILS & NOTES

SHEET NUMBER

G-1

MODIFICATION INSPECTION (MI) CHECKLIST	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWING
X	EOR APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
X	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
NA	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS: -----	
CONSTRUCTION	
X	GENERAL CONSTRUCTION INSPECTION
X	SPECIAL INSPECTION OF STRUCTURAL STEEL ERECTION & BOLTING
X	SPECIAL INSPECTION OF FIELD WELDING
NA	CONTINUOUS FOUNDATION INSPECTIONS
NA	CONCRETE COMPRESSIVE STRENGTH AND SLUMP TESTS
NA	GROUT COMPRESSIVE STRENGTH TESTS (ASTM C942)
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION AND NDE REPORTS
NA	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
NA	NON-TENSION CONTROLLED BOLT INSPECTION (AS REQUIRED)
ADDITIONAL TESTING AND INSPECTIONS: -----	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS: -----	

NOTE: X DENOTES A DOCUMENT REQUIRED FOR THE MI REPORT
 NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT

MODIFICATION INSPECTION NOTES	
<p>GENERAL</p> <p>THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).</p> <p>THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.</p> <p>ALL MI'S SHALL BE CONDUCTED BY AN OWNER APPROVED ENGINEERING VENDOR THAT IS APPROVED TO PERFORM ELEVATED WORK FOR THE OWNER.</p> <p>TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PURCHASE ORDER (PO) IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, REFER TO THE PROJECT CONTACTS LISTED IN THE PROJECT DIRECTORY ON SHEET T-1.</p> <p>MI INSPECTOR</p> <p>THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:</p> <ul style="list-style-type: none"> REVIEW THE REQUIREMENTS OF THE MI CHECKLIST WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS <p>THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GC INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO THE OWNER.</p> <p>GENERAL CONTRACTOR</p> <p>THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:</p> <ul style="list-style-type: none"> REVIEW THE REQUIREMENTS OF THE MI CHECKLIST WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS <p>THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST.</p> <p>RECOMMENDATIONS</p> <p>THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING AN MI REPORT:</p> <ul style="list-style-type: none"> IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF FIVE (5) BUSINESS DAYS NOTICE, PREFERABLY TEN (10), TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED. THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT. WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS. IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW THE FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT. WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE. <p>CANCELLATION OR DELAYS IN SCHEDULED MI</p> <p>IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, THE OWNER SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF THE OWNER CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.</p> <p>CORRECTION OF FAILING MI'S</p> <p>IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ('FAILED MI'), THE GC SHALL WORK WITH THE OWNER TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:</p> <ul style="list-style-type: none"> CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI. OR, WITH THE OWNER'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION. <p>MI VERIFICATION INSPECTIONS</p> <p>THE OWNER RESERVES THE RIGHT TO CONDUCT AN MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.</p> <p>ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS.</p> <p>VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT INSPECTION FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.</p> <p>REQUIRED PHOTOS</p> <p>BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:</p> <ol style="list-style-type: none"> PRE-CONSTRUCTION GENERAL SITE CONDITION PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION: <ul style="list-style-type: none"> RAW MATERIALS PHOTOS OF ALL CRITICAL DETAILS FOUNDATION MODIFICATIONS WELD PREPARATION BOLT INSTALLATION AND TORQUE FINAL INSTALLED CONDITION SURFACE COATING REPAIR POST CONSTRUCTION PHOTOGRAPHS: <ul style="list-style-type: none"> FINAL IN FIELD CONDITION <p>PHOTOS OF ELEVATED MODIFICATIONS TAKEN ONLY FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.</p>	
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APPROVALS

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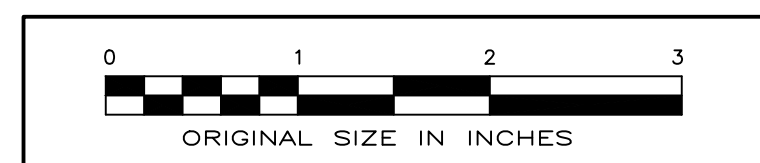
OPERATIONS _____

SITE ACQ. _____

PROJECT NUMBER 10473.CTHA242A DESIGNED BY EI

REV.	DATE	DESCRIPTION	DRAWN BY
△	10/06/20	FOR COMMENT	MB

ISSUED BY _____ DATE _____



SITE INFORMATION

HA242/PORTLANDHS_SST
 CTHA242A
 95 HIGH STREET
 PORTLAND, CT 06480

SHEET TITLE

TOWER REINFORCEMENT
 MODIFICATION
 INSPECTION
 CHECKLIST & NOTES

SHEET NUMBER

SN-1

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TOWER REINFORCEMENT NOTES

GENERAL

- ALL REFERENCES TO THE OWNER IN THESE DOCUMENTS SHALL BE CONSIDERED T-MOBILE OR ITS DESIGNATED REPRESENTATIVE.
- ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR, UNLESS NOTED OTHERWISE. THE CONTRACTOR MUST HAVE CONSIDERABLE EXPERIENCE IN THE PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED, THAT HE IS PROPERLY LICENSED, AND THAT HE IS PROPERLY REGISTERED TO DO THIS WORK IN THE STATE AND/OR COUNTY IN WHICH IT IS TO BE PERFORMED.
- NOTES AND TYPICAL DETAILS ARE APPLICABLE TO ALL PARTS OF THE STRUCTURE. ALL MATERIALS LISTED HEREIN, ANY PROCEDURES TO BE USED ON THIS PROJECT, AND SHALL BE READ IN CONJUNCTION WITH THE STRUCTURAL DRAWINGS AND PROJECT SPECIFICATIONS.
- CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING, AND SHALL RECEIVE IN WRITING, AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
- CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST CONSTRUCTION SKILLS AND ATTENTION. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT, UNLESS OTHERWISE NOTED.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS AND APPROVALS FROM ALL AUTHORITIES HAVING JURISDICTION FOR THIS PROJECT AND SHALL NOTIFY THE APPLICABLE JURISDICTIONAL (STATE, COUNTY, OR CITY) ENGINEER 24 HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
- ERECT GUARDS AND BARRIERS PER APPLICABLE LABOR AND CONSTRUCTION SAFETY REGULATIONS.
- THE CONTRACTOR SHALL INSPECT THE EXISTING STRUCTURE AND FIELD VERIFY ALL EXISTING CONDITIONS, POSSIBLE INTERFERENCES, AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO THE ENGINEER OF RECORD (EOR) AND FIELD PERSONNEL IMMEDIATELY. ANY AND ALL FIELD CHANGES SHALL BE APPROVED AND DOCUMENTED BY THE EOR PRIOR TO FIELD IMPLEMENTATION.
- ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR TWO (2) YEARS FROM THE ACCEPTANCE DATE UPON COMPLETION OF CONSTRUCTION.
- USE ONLY THE LATEST ISSUES OF ANY APPLICABLE CODES, STANDARDS, OR REGULATIONS MENTIONED IN THE FOLLOWING NOTES AND SPECIFICATIONS, UNLESS SPECIFICALLY NOTED OTHERWISE.
- ALL WORKMANSHIP SHALL BE IN ACCORDANCE WITH ANSI, ASTM, AISC, TIA, AND AISC STANDARDS AS REFERENCED IN THE APPLICABLE CODE.
- STRUCTURAL ELEMENTS SHOWN ON THESE DRAWINGS ARE DESIGNED IN ACCORDANCE WITH APPLICABLE BUILDING CODES/STANDARDS. ALL CONSTRUCTION, EXCEPT WHERE NOTED OTHERWISE, SHALL COMPLY WITH THOSE CODES/STANDARDS.
- ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS, AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER OF RECORD PRIOR TO FABRICATION AND INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
- ALL MANUFACTURER'S HARDWARE ASSEMBLY INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK WITHIN THE WORK AREA AND ANY ADJACENT AREAS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. THE CONTRACTOR IS ALSO RESPONSIBLE FOR ENSURING THAT ALL CONSTRUCTION PROCEDURES COMPLY WITH THE REQUIREMENTS OF OSHA, THE OWNER, AND ALL OTHER APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK.
- ACCESS TO THE PROPOSED WORK SITE MAY BE RESTRICTED. THE CONTRACTOR SHALL COORDINATE AND OBTAIN APPROVAL FOR INTENDED CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIAL ACCESS, WITH THE RESIDENT LEASING AGENT.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SAFEGUARD ALL EXISTING STRUCTURES OR BURIED SERVICES AFFECTED BY THIS CONSTRUCTION. CONTRACTOR IS ALSO RESPONSIBLE FOR TEMPORARILY RELOCATING ANY LINES OR STRUTS AS NECESSARY TO COMPLETE THE REQUIRED WORK.
- STRUCTURAL DESIGN IS FOR THE COMPLETE CONDITION ONLY. THE CONTRACTOR MUST BE COGNIZANT THAT THE REMOVAL OF ANY STRUCTURAL COMPONENT OF AN EXISTING TOWER HAS THE POTENTIAL TO CAUSE THE PARTIAL OR COMPLETE COLLAPSE OF THE STRUCTURE. ALL NECESSARY PRECAUTIONS MUST BE TAKEN TO ENSURE STRUCTURAL INTEGRITY, INCLUDING, BUT NOT LIMITED TO, ENGINEERING ASSESSMENT OF CONSTRUCTION STRESSES WITH INSTALLATION MAXIMUM WIND SPEED AND/OR TEMPORARY BRACING AND SHORING.
- PLANS ARE NOT TO BE SCALED. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
- FOR THIS ANALYSIS AND MODIFICATION, THE TOWER HAS BEEN ASSUMED TO BE IN GOOD CONDITION WITHOUT ANY DEFECTS. IF THE CONTRACTOR DISCOVERS ANY INDICATION OF AN EXISTING STRUCTURAL DEFECT, CONTACT THE ENGINEER OF RECORD IMMEDIATELY.
- ALL WORK SHALL BE PERFORMED IN CALM WEATHER, WITH WIND GUSTS LESS THAN 10 MPH.
- THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE ENGINEER OF RECORD.
- ALL TOWER REINFORCEMENT SHALL BE COMPLETED PRIOR TO INSTALLATION OF PROPOSED ANTENNAS, MOUNTS, AND CABLES.
- PROTECT EXISTING ANTENNAS, MOUNTS, CABLES, AND EQUIPMENT FROM DAMAGE DURING INSTALLATION OF ANTENNAS AND REINFORCING.
- IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENTS AND TO MAINTAIN TOWER ALIGNMENT AND PLUMBNESS DURING REINFORCEMENT OF MEMBERS. THIS INCLUDES, BUT IS NOT LIMITED TO, PROVIDING TEMPORARY GUYS, TIE-DOWNS, OR BRACING/SUPPORT SYSTEMS AS NECESSARY. NO STRUCTURAL MEMBERS SHALL BE REMOVED UNTIL SUCH SYSTEMS ARE ADEQUATELY INSTALLED ON THE TOWER. TOWER REINFORCEMENT WORK SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA-322 AND ANSI/ASSE A10.48.
- CONTRACTOR SHALL SUBMIT A DETAILED, SITE SPECIFIC RIGGING PLAN TO THE OWNER PRIOR TO THE START OF ANY WORK.
- REMOVE FROM THE SITE AND PROPERLY DISPOSE OF ALL TEMPORARY BRACING, REMOVED TOWER MEMBERS/BOLTS, EXCESS MATERIALS, AND DEBRIS, AS DIRECTED BY THE OWNER'S REPRESENTATIVE UPON COMPLETION OF WORK.
- GROUNDING SYSTEM SHALL BE CHECKED AND UPGRADED AS NECESSARY, AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
- CONTRACTOR SHALL ACCURATELY FIELD VERIFY LENGTHS OF ALL MATERIAL PRIOR TO FABRICATION OR ORDERING OF ANY PRODUCTS.
- INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE ENGINEER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER APPROVAL.
- CONTRACTOR SHALL FIELD VERIFY SAFETY CLIMB LOCATION AND CONTACT THE ENGINEER OF RECORD IF THE DESIGN SHOWN IMPACTS THE SAFETY CLIMB SYSTEM. THE CLIMBING FACILITIES, SAFETY CLIMB, AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED, OR ALTERED WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE TOWER OWNER OR ENGINEER OF RECORD.

STRUCTURAL STEEL & BOLTING

- DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS", LATEST EDITION.
- HOLLOW STRUCTURAL SECTION (HSS) SPLIT PIPE SECTIONS FOR LEG REINFORCING SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED AND SEAMLESS CARBON STEEL STRUCTURAL TUBING IN ROUNDS AND SHAPES" (Fy = 50 ksi). IF THE MEMBER SIZES INDICATED ARE NOT AVAILABLE IN THIS GRADE, BENT PLATE LEG REINFORCING CONFORMING TO A572 "HIGH-STRENGTH LOW-ALLOY COLUMBIUM-VANADIUM STRUCTURAL STEEL", GRADE 50, MAY BE SUBSTITUTED. BENT PLATE SHALL BE FORMED TO A RADIUS MATCHING THE EXISTING TOWER LEG. SUBSTITUTION WITH ASTM A53 PIPE IS **NOT** ACCEPTABLE.
- ALL OTHER HOLLOW STRUCTURAL SECTIONS (HSS) SHALL CONFORM TO ASTM A500, GRADE B (Fy = 42 ksi). SUBSTITUTION WITH ASTM A53 PIPE IS **NOT** ACCEPTABLE.
- FLANGE SPLICE BYPASS PLATES SHALL CONFORM TO ASTM A572 "HIGH-STRENGTH LOW-ALLOY COLUMBIUM-VANADIUM STRUCTURAL STEEL", GRADE 50, UNLESS OTHERWISE INDICATED. ALL OTHER MISCELLANEOUS STEEL, INCLUDING CHANNELS, ANGLES, PLATES, BARS, AND SOLID RODS SHALL CONFORM TO ASTM A36 "CARBON STRUCTURAL STEEL" (Fy = 36 ksi), UNLESS OTHERWISE INDICATED.
- ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
- STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS CONFORMING TO ASTM A325 "STRUCTURAL BOLTS, STEEL, HEAT TREATED, 120/105 ksi MINIMUM TENSILE STRENGTH" OR ASTM A490 "STRUCTURAL BOLTS, ALLOY STEEL, HEAT TREATED, 150 KSI MINIMUM TENSILE STRENGTH", AS INDICATED ON THE TOWER MODIFICATION SCHEDULE AND TOWER REINFORCEMENT ELEVATION, **CONNECTION TYPE X**, UNLESS OTHERWISE NOTED. **BOLT THREADS SHALL BE EXCLUDED FROM THE SHEAR PLANE.** FULLY THREADED BOLTS (A325T) SHALL NOT BE USED. EXISTING BOLTS THAT HAVE BEEN REMOVED SHALL NOT BE REUSED.
- U-BOLTS SHALL CONFORM TO ASTM A36 OR A307 "CARBON STEEL BOLTS, STUDS, AND THREADED ROD 60000 PSI TENSILE STRENGTH". ALL U-BOLTS SHALL BE 1/2" DIAMETER IN 9/16" DIAMETER HOLES, UNLESS OTHERWISE NOTED. INSTALL DOUBLE NUTS ON ALL CONNECTIONS.
- MATCHING NUTS SHALL BE HEAVY HEX TYPE, CONFORMING TO ASTM A563, "CARBON AND ALLOY STEEL NUTS". WASHERS, WHERE REQUIRED, SHALL CONFORM TO ASTM F436 "HARDENED STEEL WASHERS". INSTALL NUT-LOCKING DEVICES OR MECHANISMS SUCH AS, BUT NOT LIMITED TO, LOCK NUTS, LOCK WASHERS, OR PALNUTS, CONFORMING TO SECTION 4.9.2 OF ANSI/TIA-222 ON ALL NEW/REPLACED BOLTS TO PREVENT LOOSENING.
- ALL A325 BOLTS, U-BOLTS, AND MISCELLANEOUS HARDWARE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
- ALL ASTM A490 BOLTS SHALL BE COATED WITH ZINC/ALUMINUM CORROSION PROTECTIVE COATINGS PER ASTM F1136 "ZINC/ALUMINUM CORROSION PROTECTIVE COATINGS FOR FASTENERS", GRADE 3, USING GEOMET, MAGNI, OR OTHER ENGINEER APPROVED CORROSION PROTECTIVE COATING.
- DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780 "REPAIR OF DAMAGED AND UNCOATED AREAS OF HOT-DIP GALVANIZED COATINGS", USING Z.R.C. COLD GALVANIZING COMPOUND AS MANUFACTURED BY ZRC WORLDWIDE, OR ENGINEER APPROVED EQUAL WITH A MINIMUM METALLIC ZINC CONTENT OF 95% BY WEIGHT IN DRY FILM. DRY FINISHED COATING THICKNESS SHALL BE 3 MILS MINIMUM.
- ALL BOLT HOLES SHALL BE STANDARD HOLES AS DEFINED BY AISC, DRILLED OR PUNCHED 1/16" LARGER IN DIAMETER THAN THE CONNECTING BOLT, UNLESS OTHERWISE NOTED. OVERSIZED OR SLOTTED HOLES, OR ANY BURNING OF HOLES, IS NOT PERMITTED.
- ALL CONNECTIONS TO BE SNUG TIGHT TYPE IN ACCORDANCE WITH THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS".
- ALL CONNECTIONS THAT ARE NOT FULLY DETAILED ON THESE DRAWINGS SHALL BE DETAILED BY THE STEEL FABRICATOR. STEEL FABRICATOR SHALL MAINTAIN EDGE DISTANCES AND SPACING OF BOLT HOLES IN ACCORDANCE WITH THE TIA REQUIREMENTS AND EXISTING FIELD CONDITIONS. IF REQUIRED, COPING OF REINFORCING ANGLES SHALL BE WITHIN THE LIMITS OF ALLOWABLE COPING AS INDICATED ON THESE DRAWINGS. **IN CASE OF DISCREPANCIES, IMMEDIATELY CONTACT THE ENGINEER OF RECORD FOR FURTHER DIRECTION.**
- ALL NEW/REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH SUCH THAT THE END OF THE BOLT IS AT LEAST FLUSH WITH THE FACE OF THE NUT, PROVIDING A MINIMUM STICK-THROUGH OF ZERO. IT IS NOT PERMITTED FOR THE BOLT END TO BE BELOW THE FACE OF THE NUT AFTER TIGHTENING IS COMPLETED.
- SUBMIT SHOP DETAIL DRAWINGS OF ALL STRUCTURAL AND MISCELLANEOUS STEEL TO THE ENGINEER FOR APPROVAL, AND INCORPORATE ALL COMMENTS PRIOR TO FABRICATION.
- AFTER FINAL INSPECTION, ALL GALVANIZED STEEL SURFACES THAT HAVE BEEN DAMAGED AS THE RESULT OF THIS SCOPE OF WORK, INCLUDING AREAS AROUND GRINDING, WELDS, FIELD DRILLED HOLES, AND LEG/SHAFT INTERIORS (WHERE ACCESSIBLE), SHALL BE PREPARED BY POWER TOOL CLEANING IN ACCORDANCE WITH SSPC SP-3, AND TOUCH-UP PAINTED WITH BRUSH-APPLIED, COLD-GALVANIZING COMPOUND. PHOTO DOCUMENTATION IS REQUIRED TO BE SUBMITTED TO THE MI INSPECTOR.

WELDING

- FIELD WELDING OF EXISTING TOWER MEMBERS IS NOT PERMITTED, UNLESS SPECIFICALLY INDICATED OTHERWISE ON THESE DRAWINGS.**
- CONTRACTOR SHALL COMPLY WITH AWS D1.1 "STRUCTURAL WELDING CODE - STEEL" FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES".
- REMOVE ALL GALVANIZING IN AREAS TO BE WELDED BY GRINDING. SURFACES TO BE WELDED SHALL BE FREE FROM SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER FOREIGN MATERIAL THAT WOULD PREVENT PROPER WELDING. GRIND THE SURFACE ADJACENT TO THE WELD FOR A DISTANCE OF 2" MINIMUM ALL AROUND, AND ENSURE THAT THESE AREAS ARE 100% FREE OF ALL GALVANIZING. AFTER WELDING, CLEAN AND PROTECT ALL EXPOSED STEEL AND WELDS BY COLD GALVANIZING.
- ALL WELDING TO THE TOWER SHALL BE PERFORMED USING THE SMAW PROCESS WITH E70XX LOW HYDROGEN ELECTRODES, UNLESS OTHERWISE INDICATED. LOW HYDROGEN ELECTRODES SHALL BE PURCHASED IN HERMETICALLY SEALED CONTAINERS AND SHALL BE USED WITHIN 4 HOURS AFTER OPENING THE CONTAINER. ELECTRODES NOT USED WITHIN 4 HOURS SHALL BE REDRIED AT A TEMPERATURE BETWEEN 450°F AND 500°F FOR AT LEAST 2 HOURS AND THEN STORED AT 250°F. REDRIED ELECTRODES SHALL BE USED WITHIN 4 HOURS AFTER REMOVAL FROM THE STORAGE OVEN. REDRIED ELECTRODES NOT USED WITHIN 4 HOURS SHALL BE DISCARDED.
- SPACES BETWEEN INTERMITTENT WELDS SHALL BE FILLED USING CHEM-CALK 915 SEALANT AS MANUFACTURED AND MARKETED BY BOSTIK, INC., WAUWATOSA, WI 53226 (800) 726-7845, OR ENGINEER APPROVED EQUAL.
- ALL FIELD WELDING SHALL BE VISUALLY INSPECTED BY AN AWS CERTIFIED WELDING INSPECTOR (CW) IN ACCORDANCE WITH THE ACCEPTANCE CRITERIA OF AWS D1.1, PRIOR TO INSTALLATION OF THE PROPOSED ANTENNAS AND/OR APPURTENANCES. THE CW SHALL WORK WITH THE GC ON THE LEVEL OF INTERACTION NEEDED TO CONDUCT THE REQUIRED WELDING INSPECTION(S). THE CERTIFIED WELDING INSPECTION IS THE RESPONSIBILITY OF THE GC.
- DO NOT WELD IF THE TEMPERATURE OF THE STEEL IN THE VICINITY OF THE WELD AREA IS BELOW 0°F. MINIMUM PREHEAT AND INTERPASS TEMPERATURE REQUIREMENTS SHALL COMPLY WITH AWS D1.1.
- DO NOT WELD ON WET OR FROST-COVERED SURFACES, AND PROVIDE ADEQUATE PROTECTION FROM HIGH WINDS.

TOWER REINFORCEMENT DESIGN CRITERIA

TOWER REINFORCEMENT IS DESIGNED IN CONFORMANCE TO THE REQUIREMENTS OF THE CODES AND STANDARDS LISTED BELOW. ALL TOWER REINFORCEMENT WORK, INCLUDING FABRICATION, ERECTION, ALTERATION, AND MAINTENANCE, SHALL COMPLY WITH THE REQUIREMENTS OF FOLLOWING, UNLESS SPECIFICALLY NOTED OTHERWISE:

- 2018 CONNECTICUT STATE BUILDING CODE
- ANSI/TIA-222-G "STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS"
- ANSI/TIA-322 "LOADING, ANALYSIS, AND DESIGN CRITERIA RELATED TO THE INSTALLATION, ALTERATION AND MAINTENANCE OF COMMUNICATION STRUCTURES"
- ANSI/ASSE A10.48 "CRITERIA FOR SAFETY PRACTICES WITH THE CONSTRUCTION, DEMOLITION, MODIFICATION AND MAINTENANCE OF COMMUNICATION STRUCTURES"

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NSS NORTHEAST
SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
10473.CTHA242A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
△	10/06/20	FOR COMMENT	MB

ISSUED BY _____ DATE _____

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

HA242/PORTLANDHS_SST
CTHA242A
95 HIGH STREET
PORTLAND, CT 06480

SHEET TITLE

TOWER REINFORCEMENT
DESIGN CRITERIA
& NOTES

SHEET NUMBER

SN-2

APPROVALS

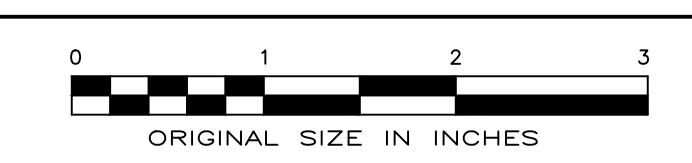
LANDLORD _____
 RF _____
 CONSTRUCTION _____
 OPERATIONS _____
 SITE ACQ. _____

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REV. DATE DESCRIPTION DRAWN BY
 10/06/20 FOR COMMENT MB

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1	10/06/20	FOR COMMENT	MB

ISSUED BY _____ DATE _____



SITE INFORMATION

HA242/PORTLANDHS_SST
 CTHA242A
 95 HIGH STREET
 PORTLAND, CT 06480

SHEET TITLE

TOWER REINFORCEMENT
 ELEVATION,
 MOD SCHED &
 TYPICAL DETAILS

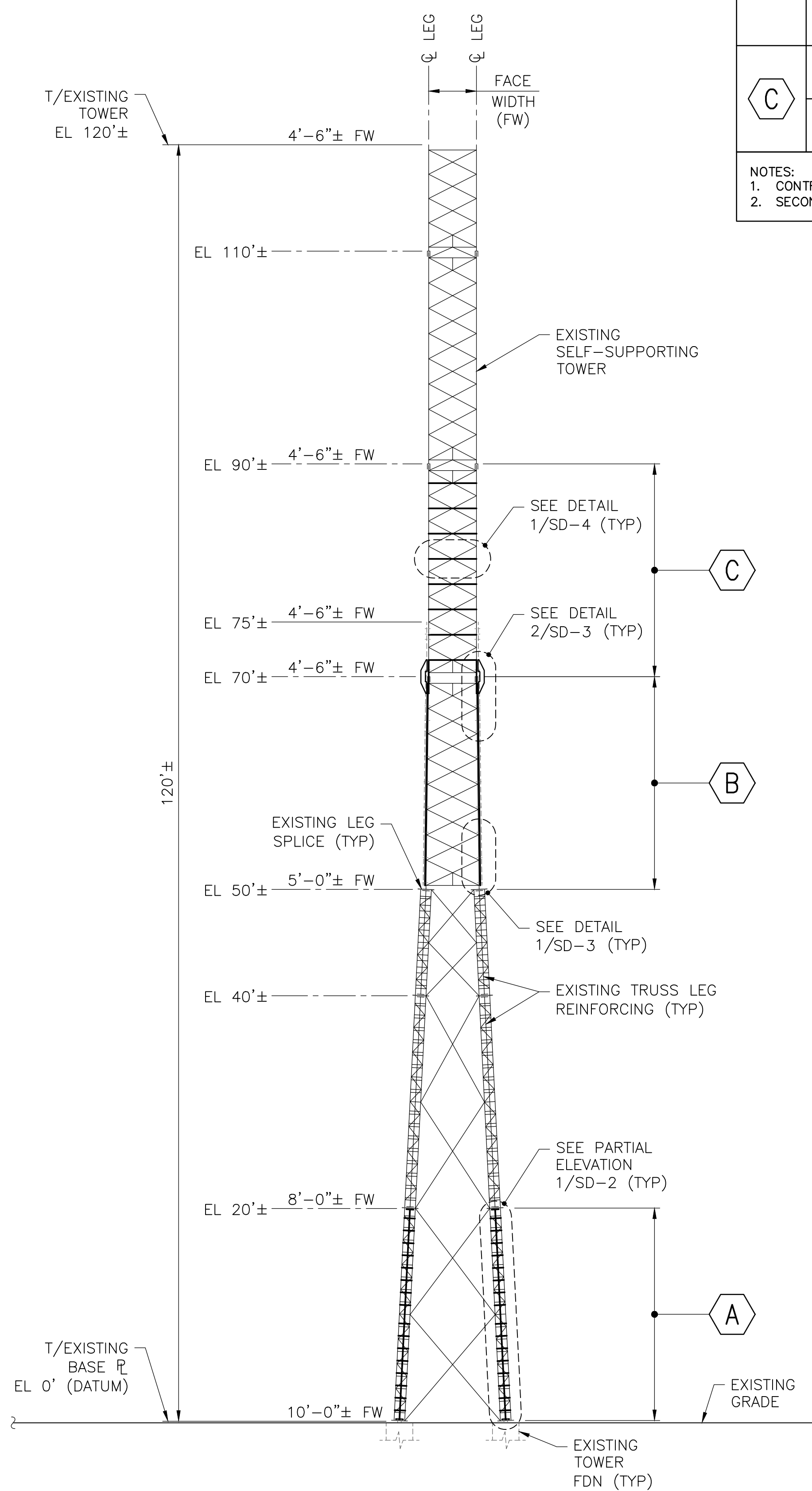
SHEET NUMBER

SD-1

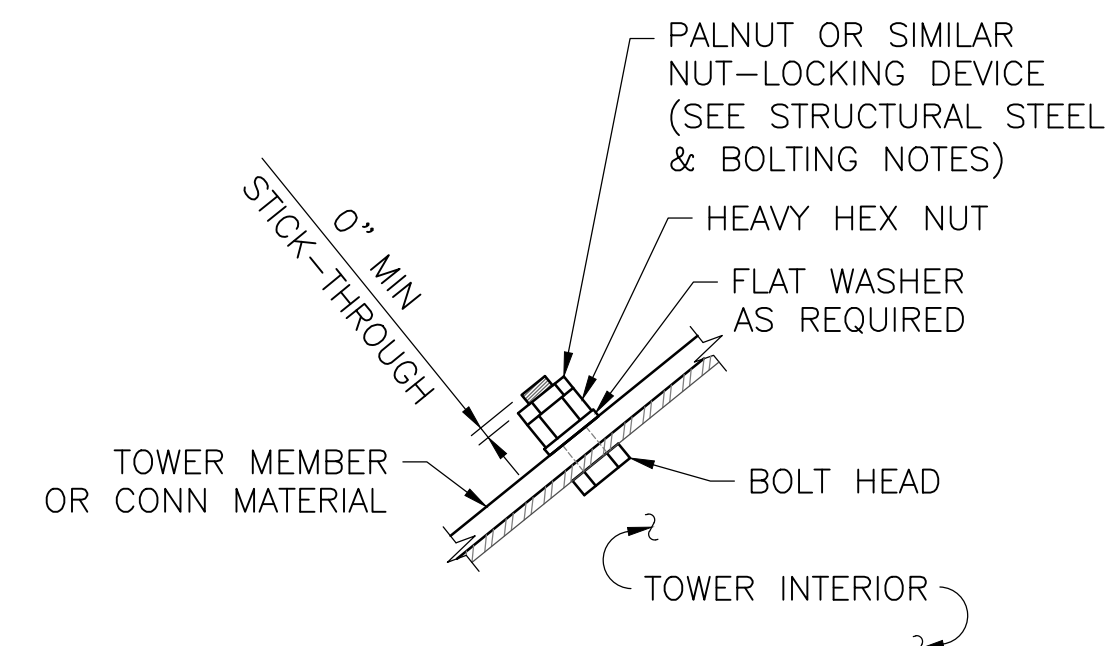
TOWER MODIFICATION SCHEDULE

SECTION	ELEVATION	MEMBER TYPE	EXISTING MEMBER	REINFORCING MEMBER	DESCRIPTION
A	0'± TO 20'±	TRUSS LEG	(3) 1 1/2" DIA SOLID ROD TRUSS LEGS (PIROD P/N: 105217)	(2) 1 1/2" DIA SOLID RODS PER LEG W/VALMONT SITE PRO 1 TIE-ROD BRACING FOR PIROD TOWERS (P/N: T18112-20-1-2 W/SHIM #127393 AT TOP & BOTTOM)	INSTALL REINFORCING RODS AND TIE-ROD BRACING FOR PIROD TOWERS ON EXISTING TRUSS LEGS. SEE PARTIAL ELEVATION 1/SD-2, SECTION 2/SD-2, AND SECTION 3/SD-2.
B	50'± TO 70'±	LEG REINFORCING	3/4" DIA THREADED ROD	-	REMOVE EXISTING THREADED ROD LEG REINFORCING AND ASSOCIATED U-BOLTED BENT PLATE CLAMPS ON ALL THREE (3) TOWER LEGS. SEE DETAIL 1/SD-3.
	70'±	LEG	2 1/4" DIA SOLID ROD	HSS 2.875x0.276 SPLIT PIPE	INSTALL SPLIT PIPE REINFORCING ON ALL THREE (3) TOWER LEGS. SEE DETAIL 1/SD-3, DETAIL 2/SD-3, AND SECTION 3/SD-3.
C	70'± TO 75'±	LEG SPLICE	-	(2) ASTM A572 GRADE 50 FLANGE SPLICE BYPASS PLATE 1/2x7±x3'-2"± (VIF) PER LEG	INSTALL FLANGE SPLICE BYPASS PLATES ON ALL THREE (3) TOWER LEGS. SEE DETAIL 2/SD-3, SECTION 4/SD-3, AND ELEVATION 5/SD-3.
	70'± TO 90'±	LEG REINFORCING	3/4" DIA THREADED ROD	-	REMOVE EXISTING THREADED ROD LEG REINFORCING AND ASSOCIATED U-BOLTED BENT PLATE CLAMPS ON ALL THREE (3) TOWER LEGS. SEE DETAIL 2/SD-3.
C	70'± TO 75'±	LEG	2" DIA SOLID ROD	SECONDARY HORIZONTAL 1 1/4" DIA THREADED ROD - VALMONT SITE PRO 1 ADJUSTABLE BOLT-ON BRACING KIT (P/N: BOB114 W/BOB114-CEN CENTER CONNECTION KIT)	INSTALL SECONDARY HORIZONTAL MEMBERS ON ALL THREE (3) TOWER FACES. SEE DETAIL 1/SD-4 AND SECTION 2/SD-4.
	70'± TO 90'±	LEG	2" DIA SOLID ROD	SECONDARY HORIZONTAL 1 1/4" DIA THREADED ROD - VALMONT SITE PRO 1 ADJUSTABLE BOLT-ON BRACING KIT (P/N: BOB114 W/BOB114-CEN CENTER CONNECTION KIT)	INSTALL SECONDARY HORIZONTAL MEMBERS ON ALL THREE (3) TOWER FACES. SEE DETAIL 1/SD-4 AND SECTION 2/SD-4.

NOTES:
 1. CONTRACTOR SHALL PROVIDE NECESSARY SITE DETAILS AND COORDINATE WITH THE MANUFACTURER FOR THE REQUIRED PRODUCT, SPECIFICATIONS, AND INSTALLATION GUIDELINES.
 2. SECONDARY HORIZONTAL AND TIE-ROD BRACING MEMBERS AND THEIR CONNECTIONS TO THE EXISTING TOWER SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN SPECIFICATIONS AND REQUIREMENTS.

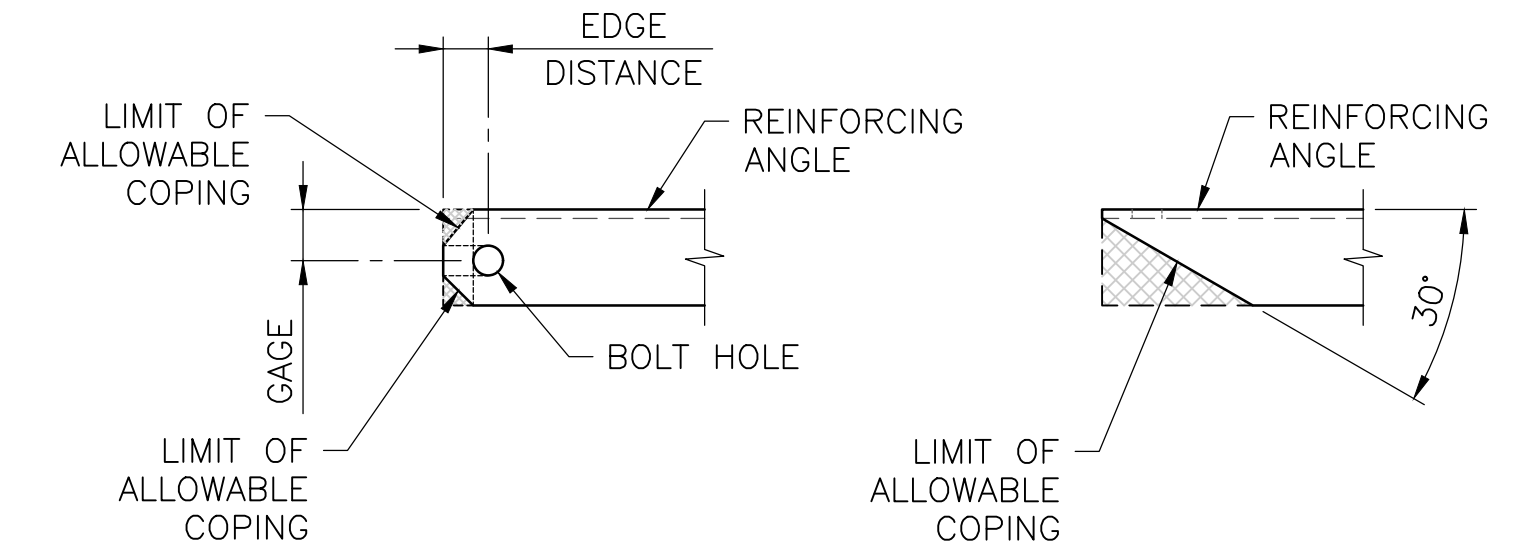


1 TOWER REINFORCEMENT ELEVATION
 SD-1 SCALE: 1/8" = 1'-0"



NOTE:
 ALL BOLTS SHALL BE INSTALLED "UP AND OUT" SO THAT:
 • THE BOLT HEAD IS BENEATH THE CONNECTED MEMBERS AND/OR TOWARD THE INTERIOR OF THE TOWER.
 • THE NUT IS ON TOP OF THE CONNECTED MEMBERS AND/OR TOWARD THE EXTERIOR OF THE TOWER.

2 TYPICAL BOLT INSTALLATION DETAIL
 SD-1 SCALE: N.T.S.



3 TYPICAL ANGLE COPING LIMITS
 SD-1 SCALE: N.T.S.

ANGLE GAGE & BOLT EDGE DISTANCE & SPACING CHART

ANGLE LEG	RECOMMENDED GAGE	BOLT DIAMETER	MIN EDGE DISTANCE	MIN SPACING
1 3/4"	1"	1/2"	3/4"	1 3/8"
2"	1 1/8"	5/8"	15/16"	1 3/4"
2 1/2"	1 3/8"	3/4"	1 1/8"	2"
3"	1 3/4"	7/8"	1 5/16"	2 3/8"
3 1/2"	2"	1"	1 1/2"	2 3/4"
4"	2 1/2"	1 1/8"	1 11/16"	3"

NOTE:
 RECOMMENDED GAGES LISTED ABOVE MAY BE ADJUSTED AS REQUIRED FOR NEW ANGLES INSTALLED BACK-TO-BACK WITH EXISTING MAIN DIAGONAL MEMBERS IN ORDER TO MATCH EXISTING BOLT HOLES, PROVIDED THAT ALL TIA MINIMUM EDGE DISTANCE AND SPACING REQUIREMENTS AND AISC BOLT ENTERING/TIGHTENING CLEARANCES ARE SATISFIED. SEE STRUCTURAL STEEL & BOLTING NOTES.

NOTES:
 1. REINFORCEMENT OF THE EXISTING TOWER HAS BEEN DESIGNED TO SUPPORT THE ANTENNAS AND CABLES LISTED IN THE STRUCTURAL MODIFICATION ANALYSIS REPORT BY TECTONIC, DATED 10/2/20. REINFORCEMENT DETAILS AS SHOWN ARE BASED ON THE RECOMMENDATIONS OUTLINED AND DOCUMENTS REFERENCED IN THE REPORT. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO FABRICATION OF STEEL OR ORDERING OF ANY PRODUCTS.
 2. EXISTING ANTENNAS, CABLES, AND OTHER APPURTENANCES ARE NOT SHOWN FOR CLARITY. CONTRACTOR SHALL IDENTIFY TO THE OWNER'S REPRESENTATIVE ALL EXISTING WAVEGUIDES, CABLES, CABLE ATTACHMENTS, ANTENNAS, AND ANTENNA SUPPORT FRAMES THAT MUST BE TEMPORARILY REMOVED OR PERMANENTLY REPOSITIONED AS REQUIRED TO ALLOW FOR INSTALLATION OF PROPOSED REINFORCEMENT. CONTRACTOR SHALL PLAN AND COORDINATE ALL TEMPORARY REMOVAL AND/OR PERMANENT RELOCATION DIRECTLY WITH THE OWNER'S REPRESENTATIVE AND OBTAIN WRITTEN PERMISSION FROM THE REPRESENTATIVE PRIOR TO ALTERATION OF ANY EXISTING WAVEGUIDES, CABLES, ANTENNAS, OR OTHER APPURTENANCES. MAINTAIN EXISTING ANTENNA AZIMUTHS.
 3. EXISTING SHELTERS, EQUIPMENT, FENCE, AND OTHER SITE FEATURES ARE NOT SHOWN FOR CLARITY.

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APPROVALS

LANDLORD _____
 RF _____
 CONSTRUCTION _____
 OPERATIONS _____
 SITE ACQ. _____

PROJECT NUMBER 10473.CTHA242A DESIGNED BY EI

REV.	DATE	DESCRIPTION	DRAWN BY
△	10/06/20	FOR COMMENT	MB

ISSUED BY _____ DATE _____



SITE INFORMATION

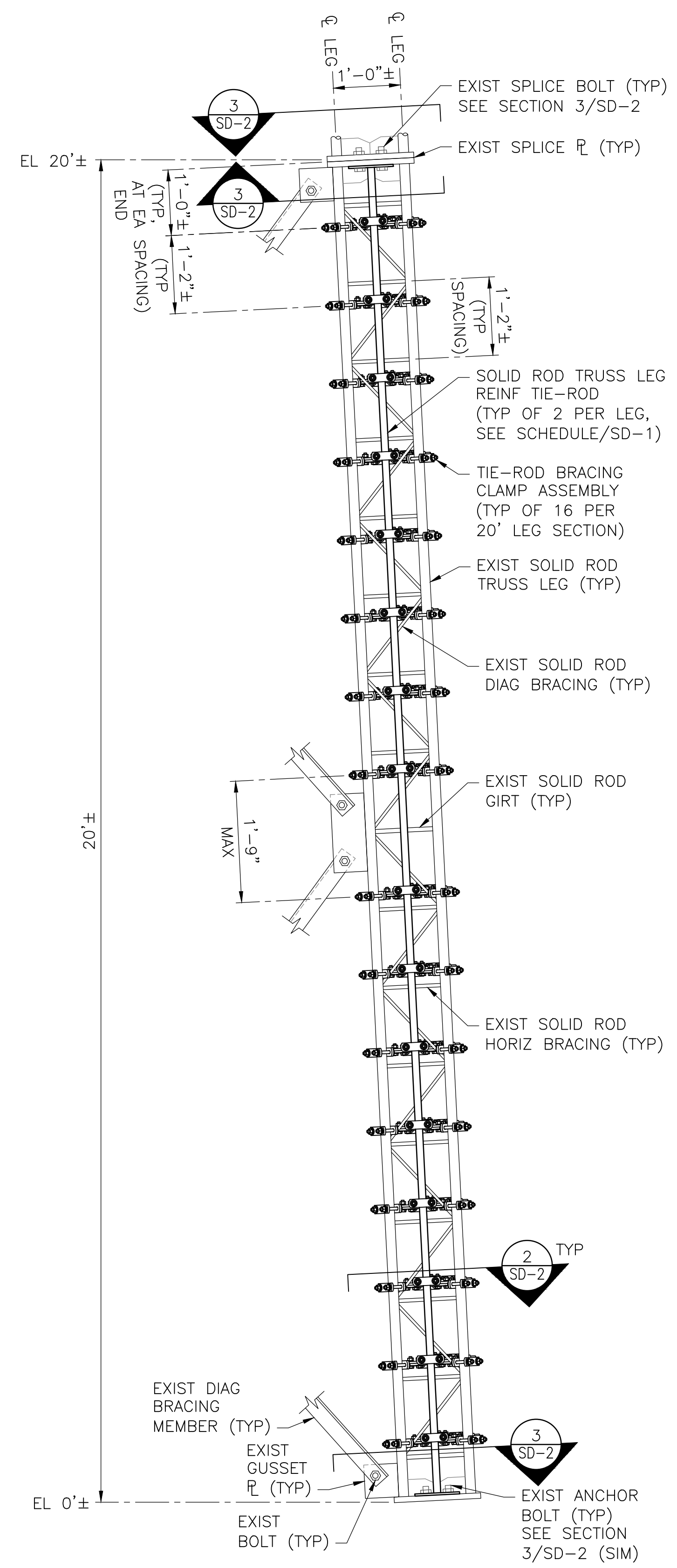
HA242/PORTLANDHS_SST
 CTHA242A
 95 HIGH STREET
 PORTLAND, CT 06480

SHEET TITLE

TOWER REINFORCEMENT
 TRUSS LEG TIE-ROD
 BRACING PARTIAL
 ELEVATION & SECTIONS

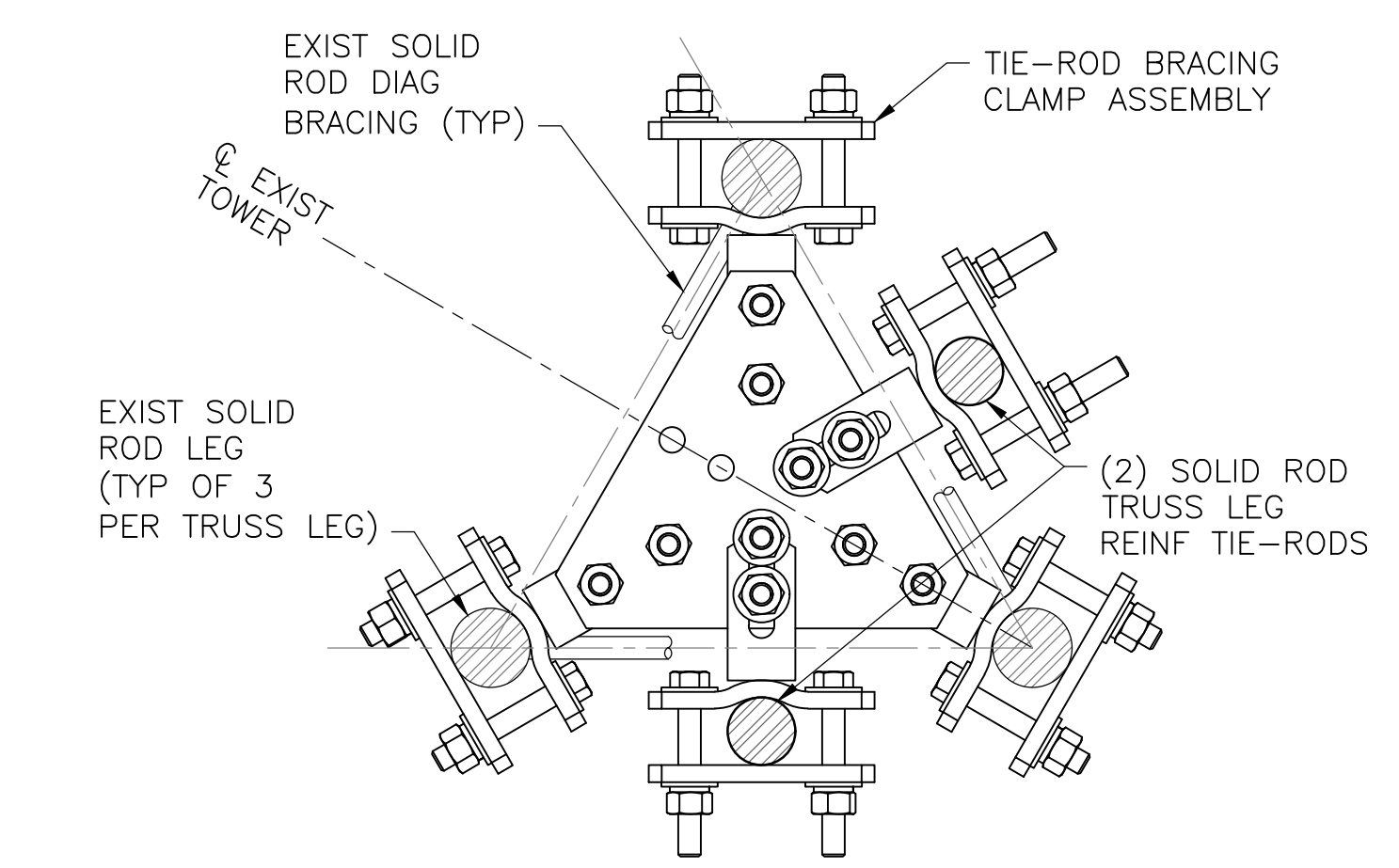
SHEET NUMBER

SD-2

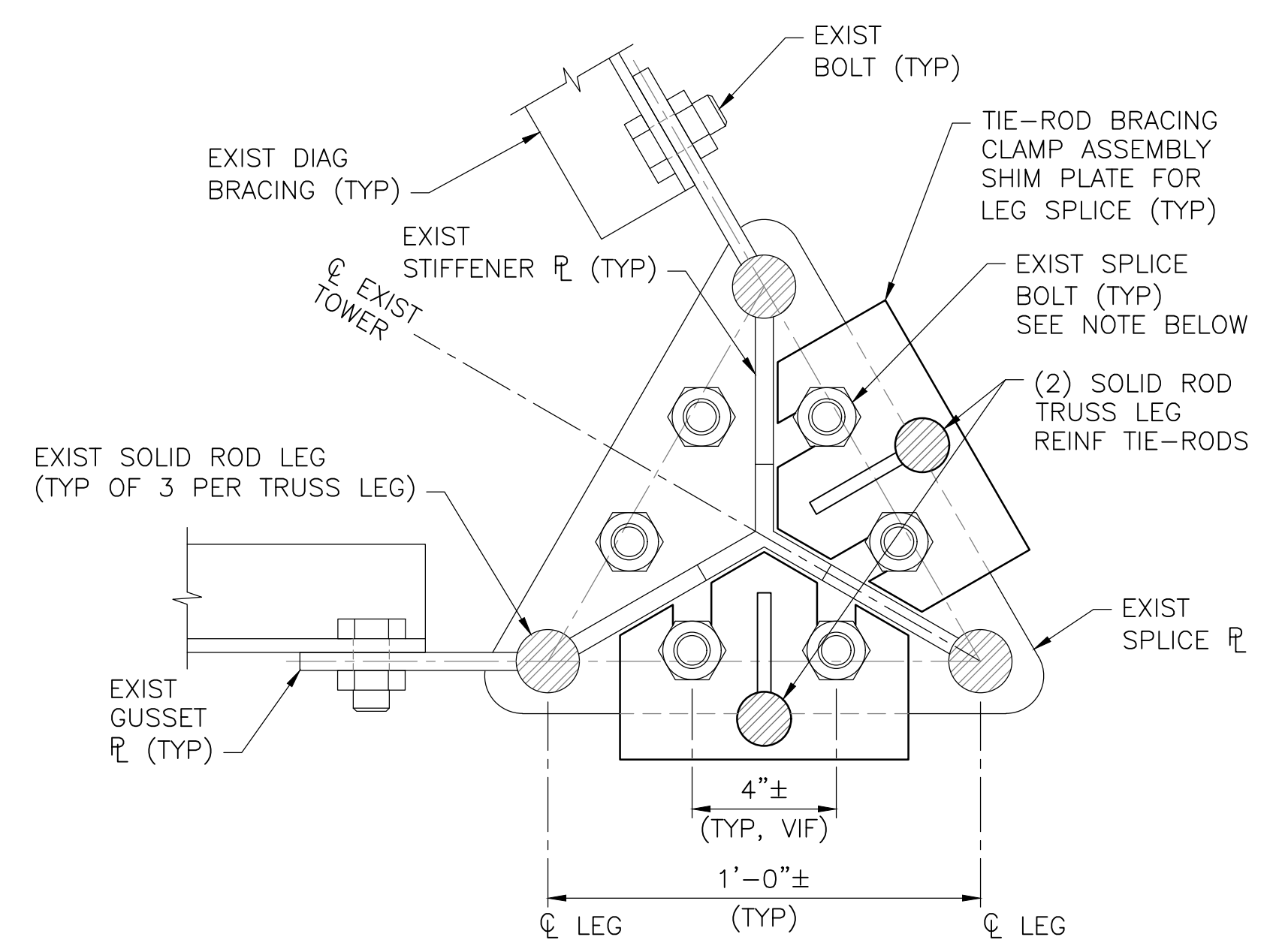


NOTE: EXISTING ANTENNA MOUNTS AND CABLES NOT SHOWN FOR CLARITY.

1
 SD-2 PARTIAL ELEVATION
 SCALE: N.T.S.



2
 SD-2 TYP TIE ROD BRACING SECTION
 SCALE: N.T.S.



NOTE:
 REMOVAL OF EXISTING SPLICE BOLTS IS NOT PERMITTED. A MAXIMUM OF TWO (2) EXISTING SPLICE BOLTS SHALL BE LOOSENED AT ANY TIME, AS REQUIRED TO ACCOMMODATE INSTALLATION OF TIE-ROD BRACING CLAMP ASSEMBLY FOR LEG SPLICE. BOLTS SHALL BE RETIGHTENED PER TOWER MANUFACTURER'S RECOMMENDATIONS UPON COMPLETION OF TIE ROD BRACING INSTALLATION.

3
 SD-2 TYP TRUSS LEG REINF SECTION AT LEG SPLICE
 SCALE: N.T.S.

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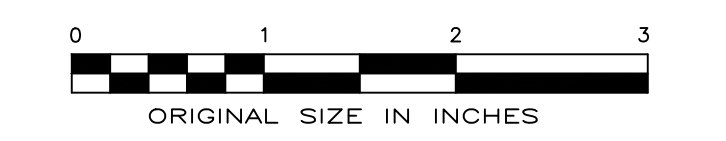
APPROVALS

LANDLORD _____
 RF _____
 CONSTRUCTION _____
 OPERATIONS _____
 SITE ACQ. _____

PROJECT NUMBER 10473.CTHA242A DESIGNED BY EI

REV.	DATE	DESCRIPTION	DRAWN BY
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SITE INFORMATION

HA242/PORTLANDHS_SST
 CTHA242A
 95 HIGH STREET
 PORTLAND, CT 06480

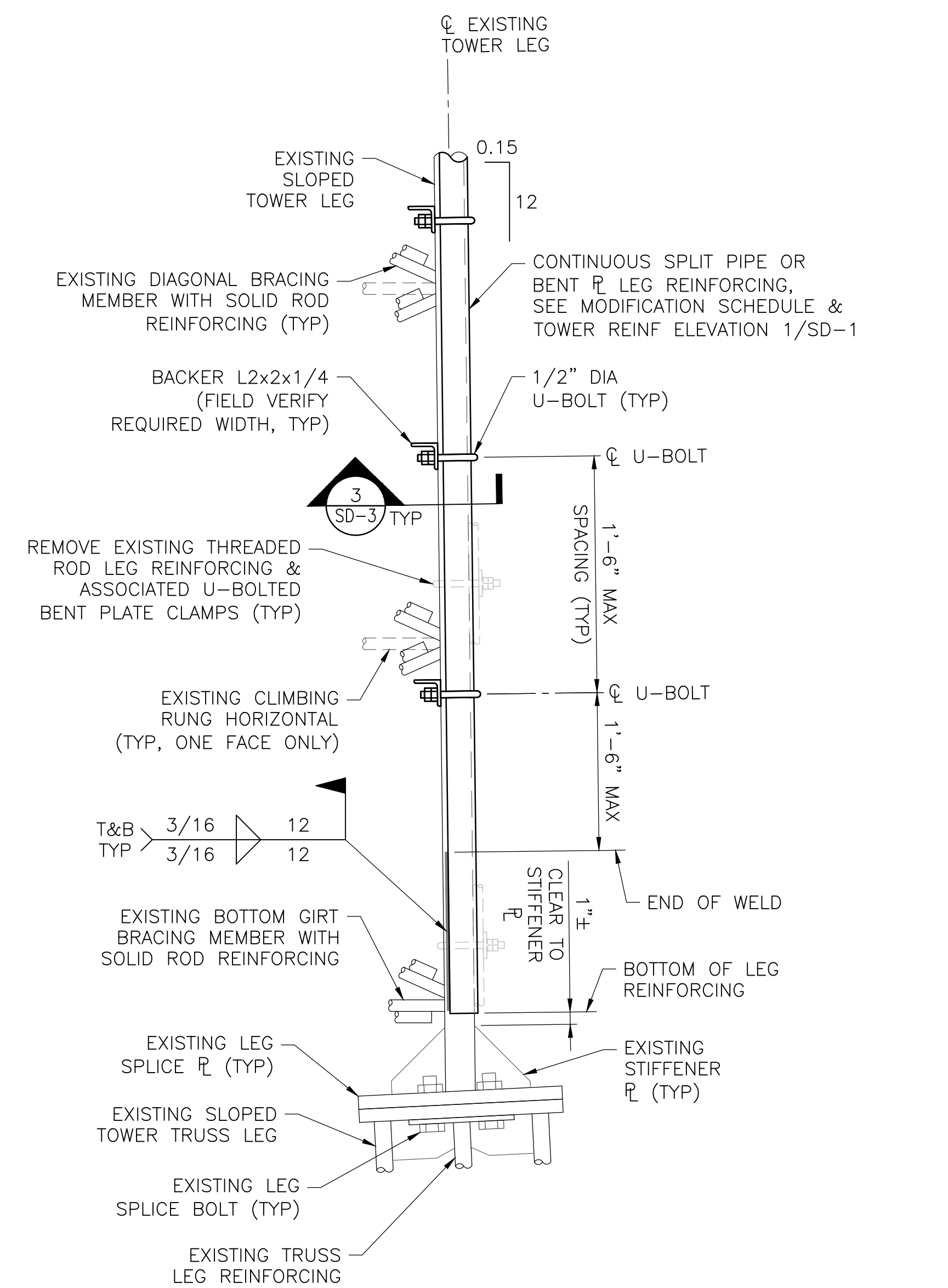
SHEET TITLE

**TOWER REINFORCEMENT
 SPLICE BYPASS PLATE
 & SPLIT PIPE LEG
 REINFORCING DETAILS**

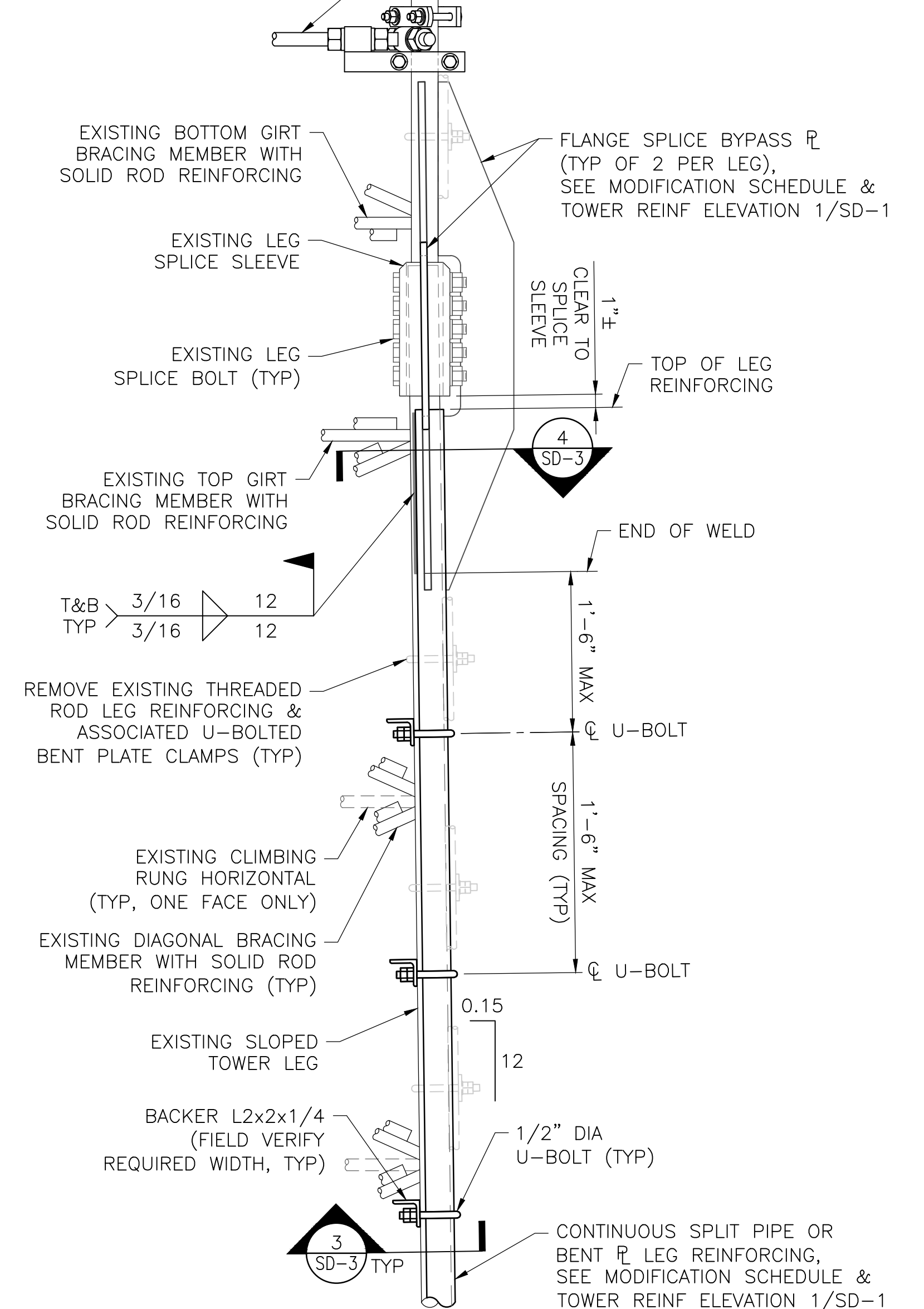
SHEET NUMBER

SD-3

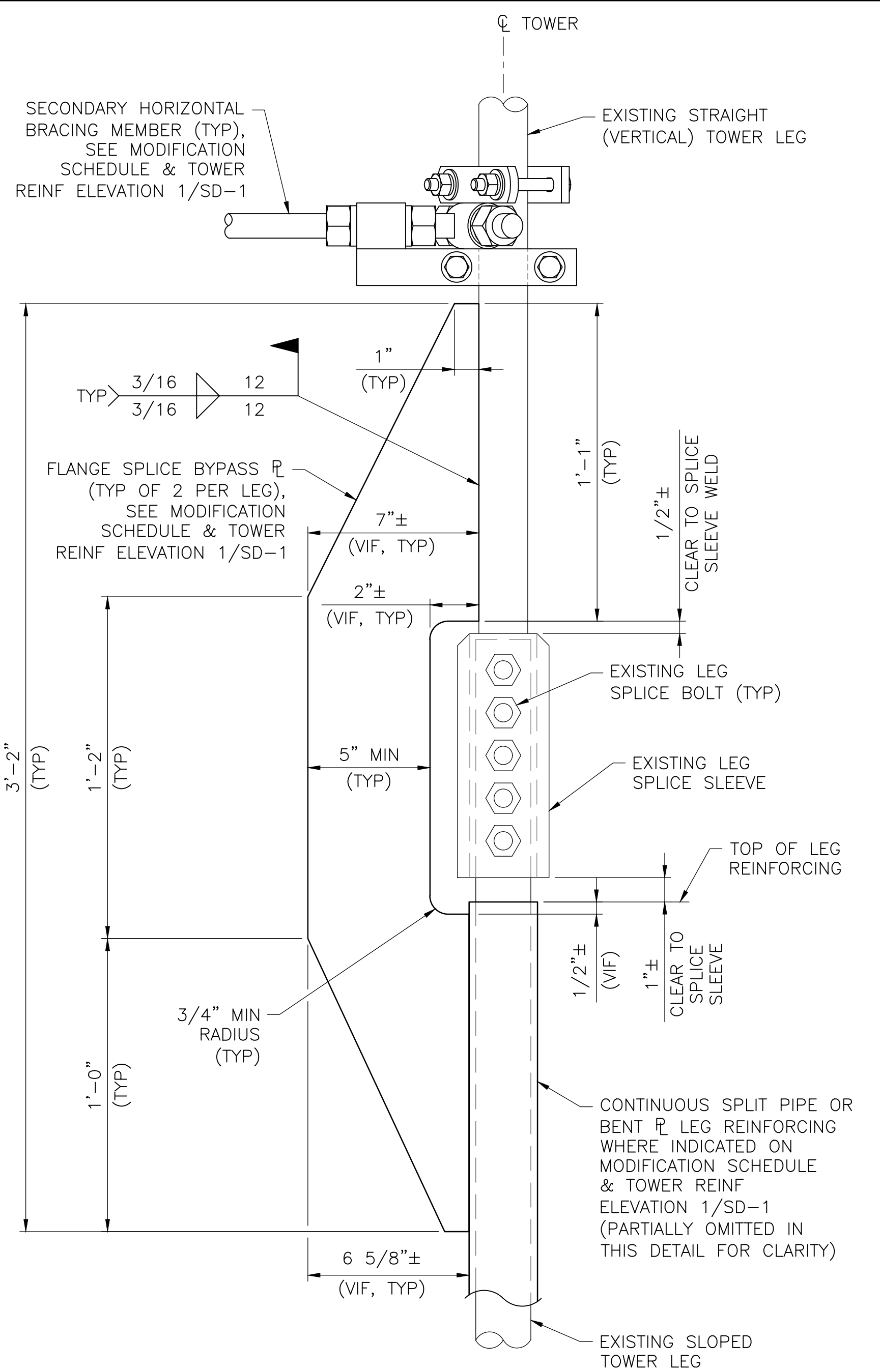
NOTE:
 EXISTING ANTENNA MOUNTS, CABLES, CABLE ATTACHMENTS, AND OTHER APPURTENANCES NOT SHOWN FOR CLARITY. ADJUST VERTICAL SPACING OF U-BOLTS AS REQUIRED TO AVOID EXISTING APPURTENANCES.



1 TYP SPLIT PIPE LEG REINF DETAIL
 SD-3 SCALE: N.T.S. (AT LOWER END)

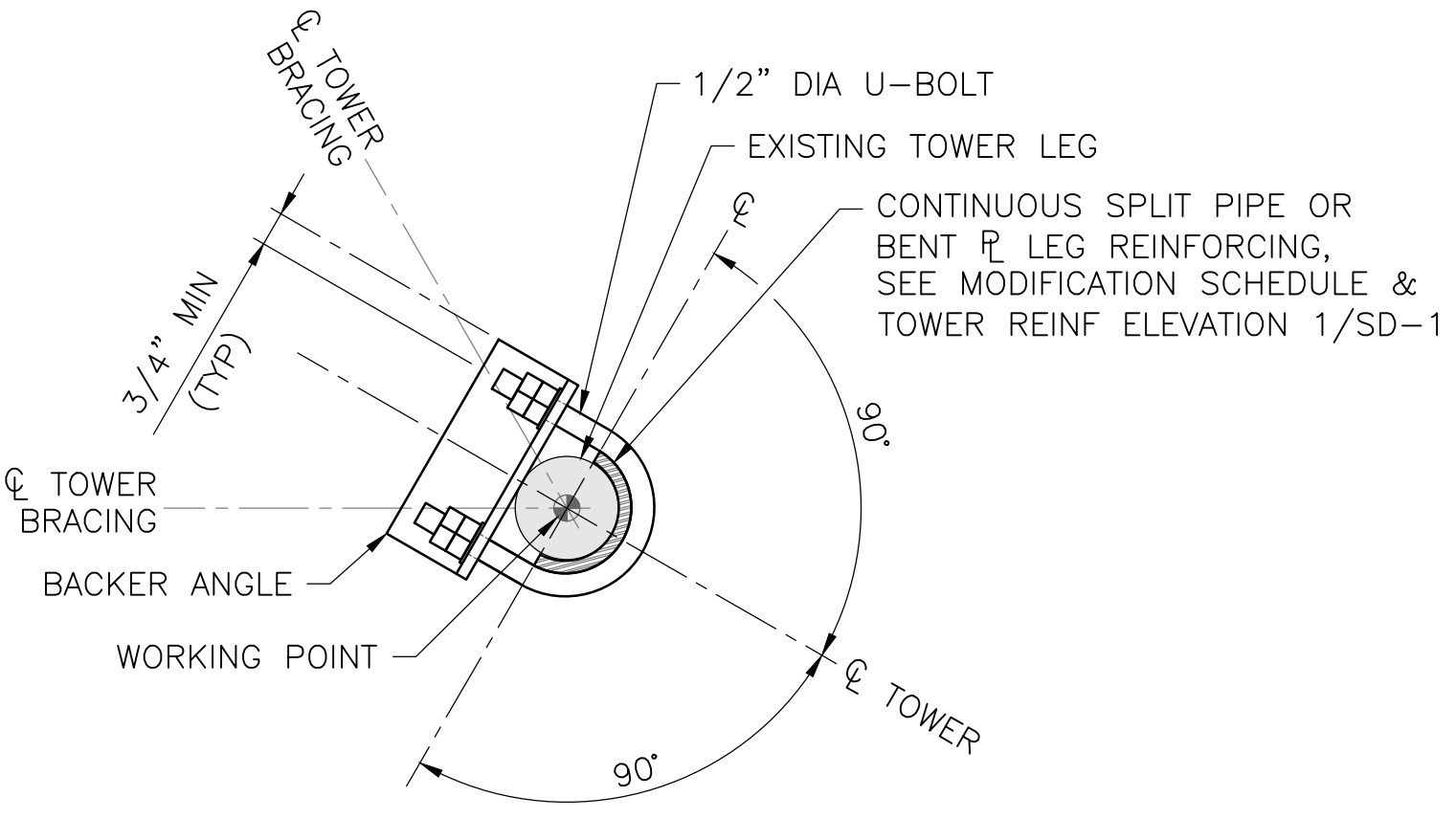


2 TYP SPLIT PIPE LEG REINF DETAIL
 SD-3 SCALE: N.T.S. (AT UPPER END)

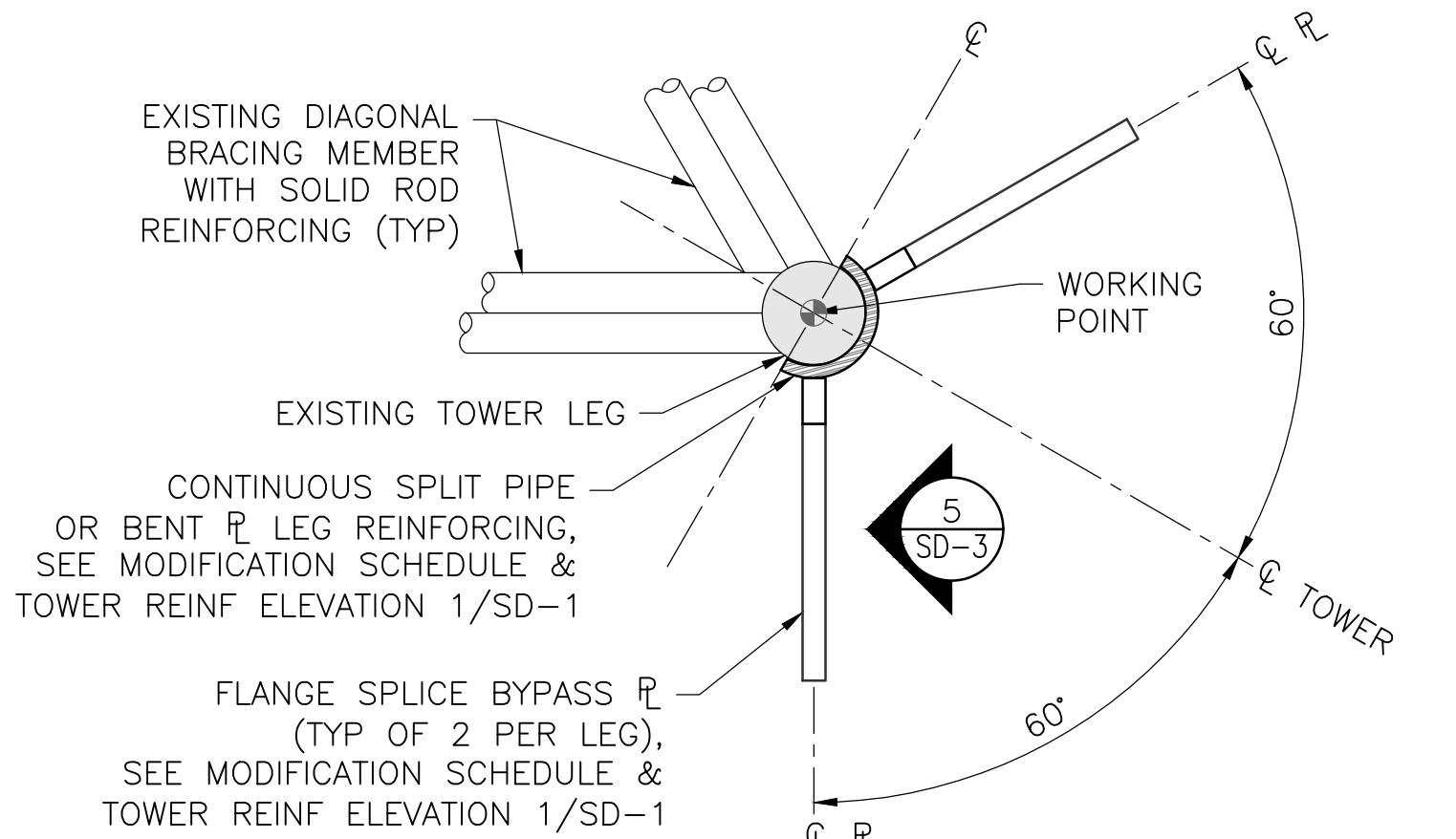


5 TYP FLANGE SPLICE BYPASS PLATE ELEVATION
 SD-3 SCALE: N.T.S.

NOTE:
 EXISTING TOWER LEG IS SLOPED BELOW LEG SPLICE ONLY, SO VERTICAL INSTALLATION OF FLANGE SPLICE BYPASS PLATES MAY NOT BE FEASIBLE. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO FABRICATION OF ANY STEEL. BEVEL EDGES OF FLANGE SPLICE BYPASS PLATES AS REQUIRED TO MATCH SLOPE OF TOWER LEG TO ALLOW PROPER FIT-UP. FABRICATE PLATES WITH ADDITIONAL MATERIAL AT EDGES TO BE FIELD WELDED, AND FIELD TRIM EXCESS AS REQUIRED FOR FIT-UP WITH EXISTING TOWER LEG AND PROPOSED SPLIT PIPE REINFORCING.



3 TYP SPLIT PIPE LEG REINF SECTION
 SD-3 SCALE: N.T.S. (AT U-BOLT CONN)



4 TYP SPLIT PIPE LEG REINF SECTION
 SD-3 SCALE: N.T.S. (AT FLANGE SPLICE BYPASS PLATE)

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APPROVALS

LANDLORD _____
 RF _____
 CONSTRUCTION _____
 OPERATIONS _____
 SITE ACQ. _____

PROJECT NUMBER 10473.CTHA242A DESIGNED BY EI

REV.	DATE	DESCRIPTION	DRAWN BY
△	10/06/20	FOR COMMENT	MB

ISSUED BY _____ DATE _____



SITE INFORMATION

HA242/PORTLANDHS_SST
 CTHA242A
 95 HIGH STREET
 PORTLAND, CT 06480

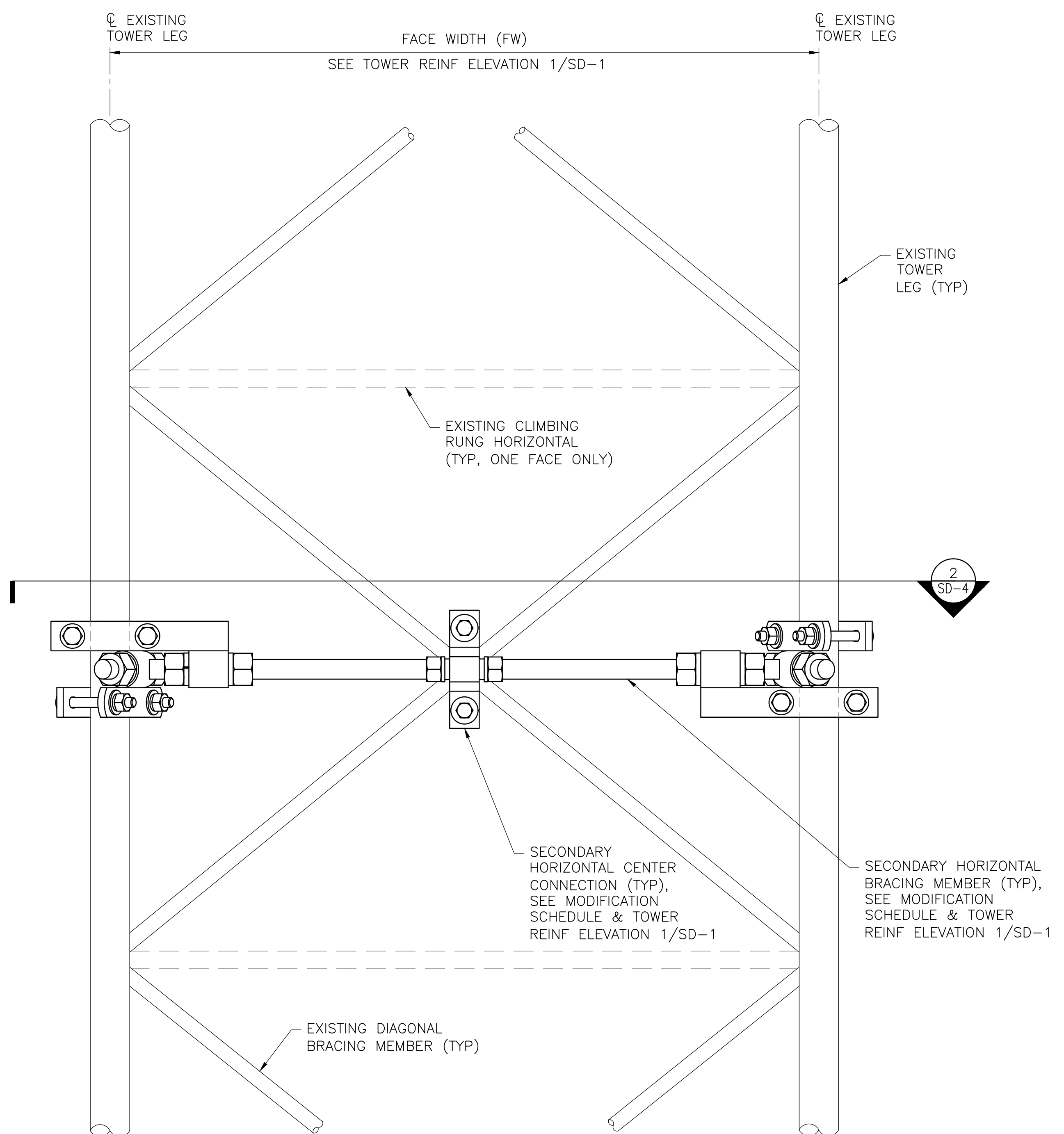
SHEET TITLE

TOWER REINFORCEMENT
 SECONDARY
 HORIZONTAL
 DETAIL & SECTION

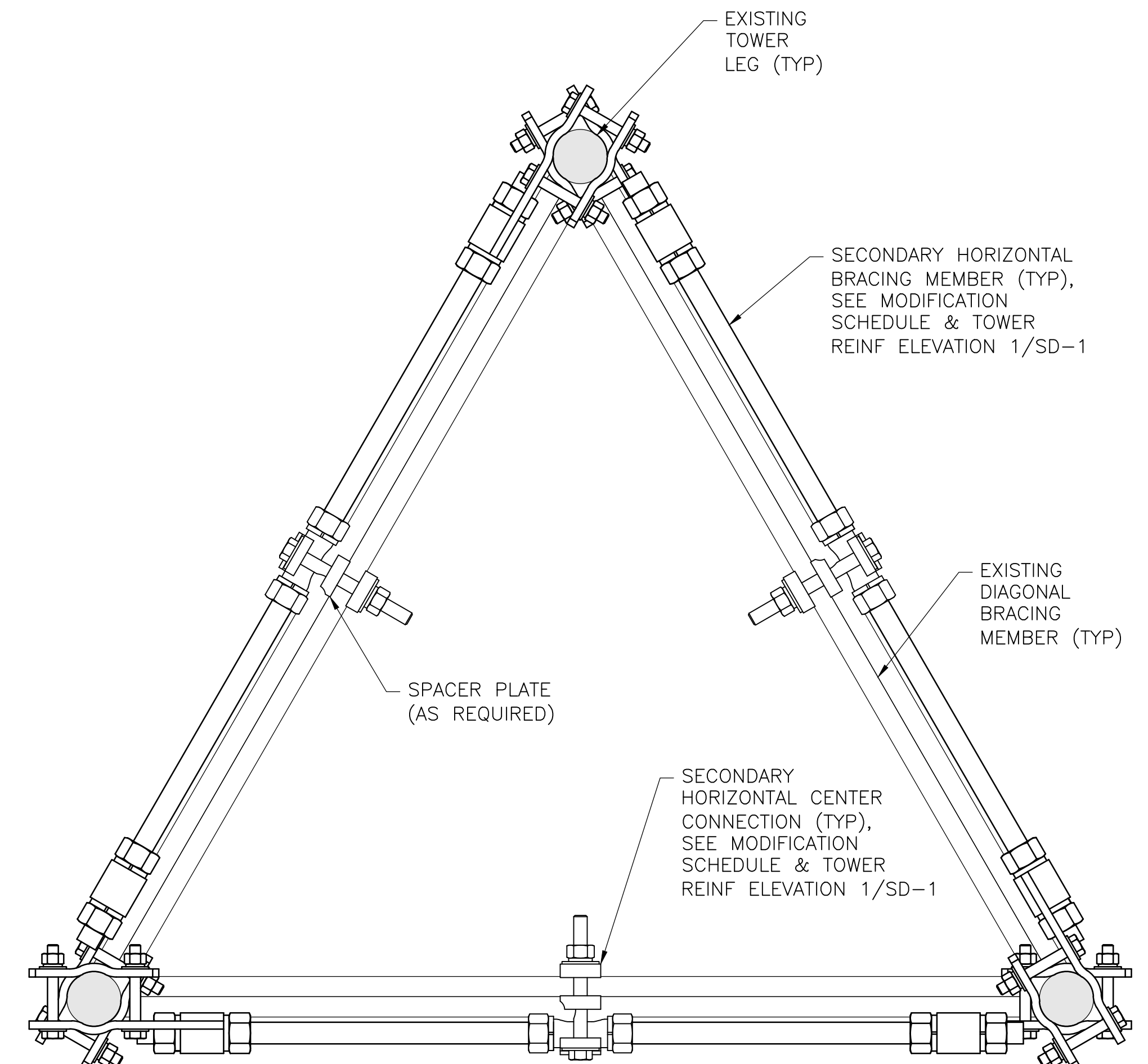
SHEET NUMBER

SD-4

- NOTES:
- EXISTING ANTENNA MOUNTS, CABLES, CABLE ATTACHMENTS, AND OTHER APPURTENANCES NOT SHOWN FOR CLARITY.
 - EXISTING CABLE LADDERS SHALL BE TEMPORARILY REMOVED AS REQUIRED TO ALLOW FOR INSTALLATION OF SECONDARY HORIZONTAL BRACING MEMBERS AND REINSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
 - CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS, INCLUDING FITTING OF THE PROPOSED MODIFICATIONS, PRIOR TO ORDERING OF ANY PRODUCTS.



1 TYP SECONDARY HORIZONTAL TOWER LEG CONN DETAIL
 SD-4 SCALE: N.T.S.



2 TYP SECONDARY HORIZONTAL TOWER LEG CONN SECTION
 SD-4 SCALE: N.T.S.

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Exhibit D

Structural Modification Analysis Report

Tower Owner: City of Middletown
Carrier: T-Mobile Northeast LLC

Site ID: CTHA242A
Site Name: HA242/PortlandHS_SST
Site Data: 95 High Street, Portland, Middlesex County, CT 06480
Latitude 41° 34' 52.01", Longitude -72° 37' 19.98"
120 ft Self-Support Tower

Tectonic Project Number: 10473.CTHA242A

Tectonic Engineering & Surveying Consultants P.C. is pleased to submit this “**Structural Modification Analysis Report**” to determine the structural integrity of the above mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level upon proposed modifications. Based on our analysis we have determined the tower stress level for the structure and foundation upon installation of proposed modifications to be:

Structure: **Sufficient Capacity – 99.8%**
Foundation: **Sufficient Capacity – 97.5%**

This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 130 mph converted to a nominal 3-second gust wind speed of 101 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C with a maximum topographic factor, Kzt, of 1.0 and Structure Class III were used in this analysis.

All modifications and equipment proposed in this report shall be installed in accordance with this analysis for the determined available structural capacity to be effective.

We at Tectonic appreciate the opportunity of providing our continuing professional services to you and T-Mobile. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural modification analysis prepared by: John-Fritz Julien / Ian Marinaccio

Respectfully submitted by:
Tectonic Engineering & Surveying Consultants P.C.

Edward N. Iamiceli, P.E.
Managing Director - Structural

Project Contact Info

1279 Route 300 | Newburgh, NY 12550
845.567.6656 Tel | 845.567.8703 Fax

tectonicengineering.com
Equal Opportunity Employer

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1) INTRODUCTION

This tower is a 120 ft Self Support tower designed by PiRod, Inc. The tower is located in Portland Connecticut and is currently being used by T-Mobile and City of Middletown.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-G
Risk Category:	III
Wind Speed:	101 mph
Exposure Category:	C
Topographic Factor:	1.0
Ice Thickness:	0.75 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
110.0	T-Mobile	3	commscope	SDX1926Q-43	1	6x12 Hybrid	-
		3	ericsson	AIR 6449 B41			
		3	ericsson	RRUS 4415 B25			

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
119.0	Unknown	1	rfs celwave	PD220-9	1	1/2	1
		1	-	TMA	1	7/8	
118.0	Unknown	2	rfs celwave	PD220-2	2	1/2	1
		2	tower mounts	Side Arm Mount			
110.0	T-Mobile	3	-	Twin Style TMA	6 3	1-5/8 6x12 Hybrid	1
		3	ericsson	AIR 32 B66Aa B2a			
		3	ericsson	RADIO 4449 B12/B71			
		3	rfs	APXVARR24_43-C-NA20			
		3	tower mounts	12' Sector Mount			
108.0	Unknown	3	ericsson	AIR 21 B2A/B4P	-	-	2
108.0		1	telewave	ANT50D	1	7/8	1
		1	-	Twin Style TMA	1 1	EW90 7/8	1
95.0		1	andrew	Andrew 6' Dish			
		1	tower mounts	Dish Mount			
91.0		1	telewave	ANT50D	1	7/8	1
90.0		1	andrew	Andrew 4' Dish	1	EW90	1
		1	tower mounts	Dish Mount			
87.0		1	misc	10' Omni	1	1/2	1
		1	tower mounts	Side Arm Mount			

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
80.0	Unknown	1	rfs celwave	PD220-2	2	1/2	1
		1	rfs celwave	PD220-9			
		2	tower mounts	Side Arm Mount			

Notes:

- 1) Existing equipment
- 2) Existing equipment to be removed, not considered in analysis

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Dated
GEOTECHNICAL REPORT	Clarence Welti Assoc., Inc.	12/20/04
ORIGINAL TOWER AND FOUNDATION DRAWINGS	PiRod	12/28/04
TOWER REINFORCEMENT DRAWINGS & SPECIFICATIONS	KM Consulting Engineers, Inc.	09/29/17
STRUCTURAL MODIFICATION ANALYSIS REPORT	KM Consulting Engineers, Inc.	01/05/18
STRUCTURAL ANALYSIS REPORT	B+T Group	07/19/19
RFDS	T-Mobile	07/06/20
SITE VISIT	Tectonic	07/17/20
STRUCTURAL ANALYSIS REPORT	Tectonic	08/25/20
GEOTECHNICAL REVIEW	Tectonic	09/30/20

3.1) Analysis Method

tnxTower (version 8.0.5.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

tnxTower was used to determine the loads on the modified structure. Additional calculations were performed to determine the stresses in the reinforced leg sections. These calculations are presented in Appendix C.

3.2) Assumptions

- 1) Tower and structures were built and maintained in accordance with the manufacturer's specifications.
- 2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2.
- 3) The weight and wind area of certain appurtenances have been estimated.

This analysis is solely for the supporting tower structure and it may be affected if any assumptions are not valid or have been made in error. Tectonic should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	120 - 110	Leg	1 3/4	2	-4.31	77.19	5.6	Pass
T2	110 - 90	Leg	1 3/4	35	-43.95	77.19	56.9	Pass
T3	90 - 70	Leg	2	91	-110.44	132.51	83.3	Pass
T4	70 - 50	Leg	*2-1/4 SR w/ Half 2.5 X-Strong	172	-178.57	194.35	91.9	Pass
T5	50 - 40	Leg	PiRod 105244 + (2) 1-1/4" Tie-Rods	229	-178.99	252.06	71.0	Pass
T6	40 - 20	Leg	PiRod 105216 + (2) 1-1/4" Tie-Rods	238	-200.61	252.06	79.6	Pass
T7	20 - 0	Leg	PiRod 105217 + (2) 1-1/2" Tie-Rods	253	-220.32	373.21	59.0 63.0 (b)	Pass
T1	120 - 110	Diagonal	3/4	15	-0.67	4.87	13.8	Pass
T2	110 - 90	Diagonal	*3/4 SR w/ 3/4 Clip	44	-4.59	7.53	60.9	Pass
T3	90 - 70	Diagonal	7/8	100	-7.20	8.88	81.1	Pass
T4	70 - 50	Diagonal	*7/8 SR w/ 7/8 SR Clipped	188	-6.07	11.24	53.9	Pass
T5	50 - 40	Diagonal	L2 1/2x2 1/2x3/16	232	-8.18	13.38	61.2 82.4 (b)	Pass
T6	40 - 20	Diagonal	L2 1/2x2 1/2x3/16	244	-5.39	10.79	49.9 60.1 (b)	Pass
T7	20 - 0	Diagonal	*L2.5x2.5x3/16 + PL2.5x1/4	256	-7.73	32.37	23.9 24.3 (b)	Pass
T3	90 - 70	Secondary Horizontal	1 1/4	115	-1.91	19.47	9.8	Pass
T1	120 - 110	Top Girt	3/4	6	-0.04	2.62	1.6	Pass
T2	110 - 90	Top Girt	*3/4 SR w/ 3/4 Clip	39	-0.45	2.67	16.9	Pass
T3	90 - 70	Top Girt	7/8	96	-0.23	4.91	4.7	Pass
T4	70 - 50	Top Girt	*7/8 SR w/ 7/8 SR Clipped	177	-0.11	4.98	2.3	Pass
T1	120 - 110	Bottom Girt	3/4	8	-0.20	2.62	7.7	Pass
T2	110 - 90	Bottom Girt	*3/4 SR w/ 3/4 Clip	42	-0.30	2.67	11.3	Pass
T3	90 - 70	Bottom Girt	*7/8 SR w/ 7/8 SR Clipped	98	-0.33	4.82	6.8	Pass
T4	70 - 50	Bottom Girt	*7/8 SR w/ 7/8 SR Clipped	179	-1.38	3.99	34.6	Pass
							Summary	
							Leg (T4)	91.9 Pass
							Diagonal (T5)	82.4 Pass
							Secondary Horizontal (T3)	9.8 Pass
							Top Girt (T2)	16.9 Pass
							Bottom Girt (T4)	34.6 Pass
							Bolt Checks	82.4 Pass
							Rating =	91.9 Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Bypass	70	88	Pass
1	Anchor Rods	0	74.3	Pass
1	Base Foundation	0	72.6	Pass
1	Base Foundation Soil Interaction	0	97.5	Pass

Structure Rating (max from all components) =	99.8%
---	--------------

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Results / Conclusions

The tower and its foundation have sufficient capacity to carry the proposed load configuration once the proposed modifications are installed as detailed in the drawings.

APPENDIX A
TNXTOWER OUTPUT

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
PD220-9	119	RRUS 4415 B25	110
TMA	119	SDX1926Q-43	110
PD220-2	118	SDX1926Q-43	110
2' Side Arm Mount	118	SDX1926Q-43	110
PD220-2	118	12' Sector Mount	110
2' Side Arm Mount	118	ANT50D	108
AIR 32 B66Aa B2a	110	Dish Mount Pipe	95
AIR 32 B66Aa B2a	110	Dish Mount	95
AIR 32 B66Aa B2a	110	Twin Style TMA	95
APXVARR24_43-C-NA20 w/ Mount Pipe	110	Andrew 6' Dish	95
APXVARR24_43-C-NA20 w/ Mount Pipe	110	ANT50D	91
APXVARR24_43-C-NA20 w/ Mount Pipe	110	Dish Mount Pipe	90
APXVARR24_43-C-NA20 w/ Mount Pipe	110	Dish Mount	90
APXVARR24_43-C-NA20 w/ Mount Pipe	110	Andrew 4' Dish	90
RADIO 4449 B12/B71	110	10' horizontal x 2" Pipe Mount	87
RADIO 4449 B12/B71	110	72" Side Arm Mount	87
RADIO 4449 B12/B71	110	10' x 3" Dia Omni	87
Twin Style TMA	110	72" Side Arm Mount	80
Twin Style TMA	110	PD220-9	80
Twin Style TMA	110	72" Side Arm Mount	80
AIR 6449 B41	110	PD220-2	80
AIR 6449 B41	110	10' horizontal x 2" Pipe Mount	80
AIR 6449 B41	110	10' horizontal x 2" Pipe Mount	80
RRUS 4415 B25	110	(2) Jump Plate	70
RRUS 4415 B25	110	(2) Jump Plate	70
RRUS 4415 B25	110	(2) Jump Plate	70

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pirol 105244 + (2) 1-1/4" Tie-Rods		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

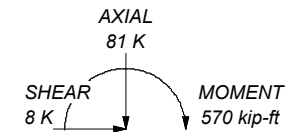
TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
 2. Tower designed for Exposure C to the TIA-222-G Standard.
 3. Tower designed for a 101 mph basic wind in accordance with the TIA-222-G Standard.
 4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
 5. Deflections are based upon a 60 mph wind.
 6. Tower Structure Class III.
- ALL REF. Topographic Category 1 with Crest Height of 0.00 ft
 ARE FA. TOWER RATING: 99.8%

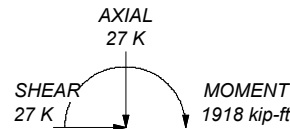
MAX. CORNER REACTIONS AT BASE:

DOWN: 230 K
 SHEAR: 20 K

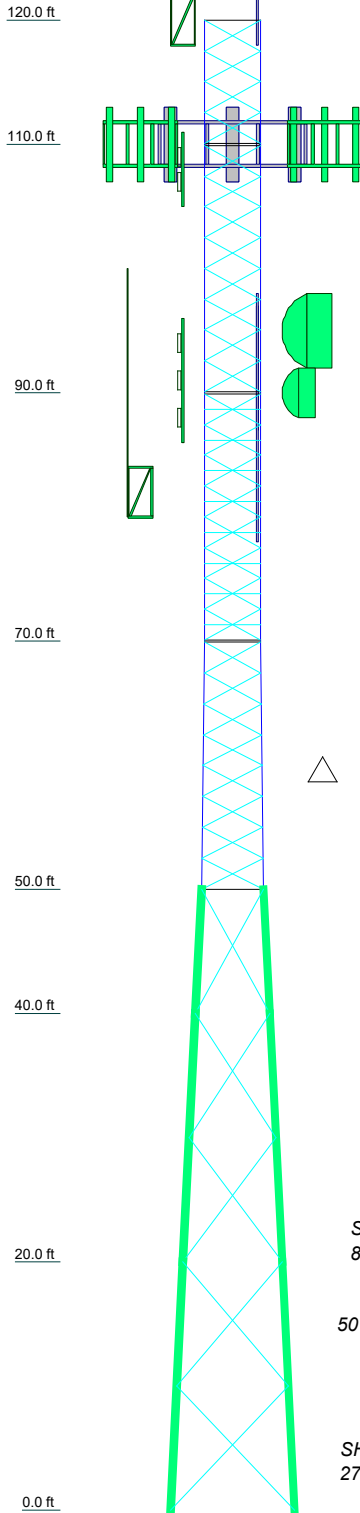
UPLIFT: -214 K
 SHEAR: 19 K



TORQUE 2 kip-ft
 50 mph WIND - 0.75 in ICE



TORQUE 20 kip-ft
 REACTIONS - 101 mph WIND



Section	T1	T2	T3	T4	T5	T6	T7		
Legs	SR 1 3/4	SR 2	SR 7/8	*2-1/4 SR w/ Half 2.5 X-Strong	A	Pirol 105216 + (2) 1-1/4" Tie-Rods	Pirol 105217 + (2) 1-1/2" Tie-Rods		
Leg Grade	SR 3/4	*3/4 SR w/ 3/4 Clip	SR 7/8	A572-50		L2 1/2x2 1/2x3/16	*L2.5x2.5x3/16 + PL2.5x1/4		
Diagonals	SR 3/4			A36					
Diagonal Grade									
Top Girts	SR 3/4	*3/4 SR w/ 3/4 Clip	SR 7/8	*7/8 SR w/ 7/8 SR Clipped		N.A.	N.A.		
Bottom Girts	SR 3/4	*3/4 SR w/ 3/4 Clip	SR 1 1/4	*7/8 SR w/ 7/8 SR Clipped		N.A.	N.A.		
Sec. Horizontals		N.A.							
Face Width (ft)	4.5				5	6	8		
# Panels @ (ft)		20 @ 2.47917	1.7	8 @ 2.48958	1.3	5 @ 10	3.7		
Weight (K)	0.5	0.9							

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Job: **10473.CTHA242A - Modification Analysis**
 Project: **120' Self-Support Tower**
 Client: T-Mobile
 Code: TIA-222-G
 Path: © Newburgh\Projects\10473\10473.CTHA242A\Structural\Tower_Analysis\Rev_1\10473.CTHA242A - TowerModification54.dwg
 Drawn by: Ian Marinaccio
 Date: 10/02/20
 App'd:
 Scale: NTS
 Dwg No. E-1

Tower Input Data

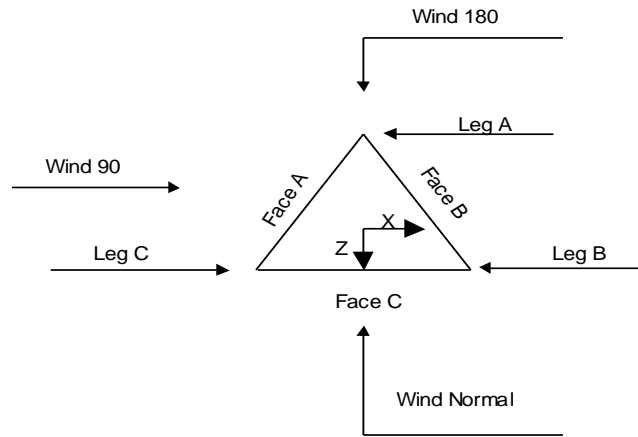
The main tower is a 3x free standing tower with an overall height of 120.00 ft above the ground line.
 The base of the tower is set at an elevation of 0.00 ft above the ground line.
 The face width of the tower is 4.50 ft at the top and 10.00 ft at the base.
 This tower is designed using the TIA-222-G standard.

The following design criteria apply:

- 1) Tower is located in Middlesex County, Connecticut.
- 2) Basic wind speed of 101 mph.
- 3) Structure Class III.
- 4) Exposure Category C.
- 5) Topographic Category 1.
- 6) Crest Height 0.00 ft.
- 7) Nominal ice thickness of 0.75 in.
- 8) Ice thickness is considered to increase with height.
- 9) Ice density of 56 pcf.
- 10) A wind speed of 50 mph is used in combination with ice.
- 11) Temperature drop of 50 °F.
- 12) Deflections calculated using a wind speed of 60 mph.
- 13) TOWER RATING: 99.8%
- 14) A non-linear (P-delta) analysis was used.
- 15) Pressures are calculated at each section.
- 16) Stress ratio used in tower member design is 1.
- 17) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

- | | | |
|--|---|--|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile
 √ Include Bolts In Member Capacity
 √ Leg Bolts Are At Top Of Section √ Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area √ Use Clear Spans For KL/r Retension Guys To Initial Tension √ Bypass Mast Stability Checks Use Azimuth Dish Coefficients √ Project Wind Area of Appurt.
 Autocalc Torque Arm Areas
 Add IBC .6D+W Combination √ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs | <ul style="list-style-type: none"> Use ASCE 10 X-Brace Ly Rules √ Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feed Line Torque √ Include Angle Block Shear Check Use TIA-222-G Bracing Resist. Exemption Use TIA-222-G Tension Splice Exemption
 <li style="text-align: center;">Poles Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known |
|--|---|--|



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	120.00-110.00			4.50	1	10.00
T2	110.00-90.00			4.50	1	20.00
T3	90.00-70.00			4.50	1	20.00
T4	70.00-50.00			4.50	1	20.00
T5	50.00-40.00			5.00	1	10.00
T6	40.00-20.00			6.00	1	20.00
T7	20.00-0.00			8.00	1	20.00

Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	120.00-110.00	2.48	X Brace	No	No	0.00	1.00
T2	110.00-90.00	2.48	X Brace	No	No	1.00	1.00
T3	90.00-70.00	2.48	X Brace	No	Yes	1.00	1.00
T4	70.00-50.00	2.49	X Brace	No	No	1.00	0.00
T5	50.00-40.00	10.00	X Brace	No	No	0.00	0.00
T6	40.00-20.00	10.00	X Brace	No	No	0.00	0.00
T7	20.00-0.00	10.00	X Brace	No	No	0.00	0.00

Tower Section Geometry (cont'd)

Tower Elevation	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
ft						

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 120.00-110.00	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	3/4	A36 (36 ksi)
T2 110.00-90.00	Solid Round	1 3/4	A572-50 (50 ksi)	Arbitrary Shape	*3/4 SR w/ 3/4 Clip	A36 (36 ksi)
T3 90.00-70.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T4 70.00-50.00	Arbitrary Shape	*2-1/4 SR w/ Half 2.5 X-Strong	A572-50 (50 ksi)	Arbitrary Shape	*7/8 SR w/ 7/8 SR Clipped	A36 (36 ksi)
T5 50.00-40.00	Truss Leg	PiRod 105244 + (2) 1-1/4" Tie-Rods	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 40.00-20.00	Truss Leg	PiRod 105216 + (2) 1-1/4" Tie-Rods	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 20.00-0.00	Truss Leg	PiRod 105217 + (2) 1-1/2" Tie-Rods	A572-50 (50 ksi)	Arbitrary Shape	*L2.5x2.5x3/16 + PL2.5x1/4	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 120.00-110.00	Solid Round	3/4	A36 (36 ksi)	Solid Round	3/4	A36 (36 ksi)
T2 110.00-90.00	Arbitrary Shape	*3/4 SR w/ 3/4 Clip	A36 (36 ksi)	Arbitrary Shape	*3/4 SR w/ 3/4 Clip	A36 (36 ksi)
T3 90.00-70.00	Solid Round	7/8	A36 (36 ksi)	Arbitrary Shape	*7/8 SR w/ 7/8 SR Clipped	A36 (36 ksi)
T4 70.00-50.00	Arbitrary Shape	*7/8 SR w/ 7/8 SR Clipped	A36 (36 ksi)	Arbitrary Shape	*7/8 SR w/ 7/8 SR Clipped	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T3 90.00-70.00	Solid Round	1 1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in	Double Angle Stitch Bolt Spacing Redundants in
T1 120.00-110.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T2 110.00-90.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T3 90.00-70.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T4 70.00-50.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T5 50.00-40.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_r	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft ²	in					in	in	in
T6 40.00-20.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T7 20.00-0.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt

Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors ¹							
			Legs	X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace
				X Y	X Y	X Y	X Y	X Y	X Y	X Y
T1 120.00-110.00	Yes	Yes	1	1	1	1	1	1	1	1
T2 110.00-90.00	Yes	Yes	1	1	1	1	1	1	1	1
T3 90.00-70.00	Yes	Yes	1	1	1	1	1	1	1	1
T4 70.00-50.00	Yes	Yes	1	1	1	1	1	1	1	1
T5 50.00-40.00	Yes	Yes	1	1	1	1	1	1	1	1
T6 40.00-20.00	Yes	Yes	1	1	1	1	1	1	1	1
T7 20.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1

¹Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.

Tower Section Geometry (cont'd)

Tower Elevation	Truss-Leg K Factors					
	Leg Panels	Truss-Legs Used As Leg Members		Leg Panels	Truss-Legs Used As Inner Members	
		X Brace Diagonals	Z Brace Diagonals		X Brace Diagonals	Z Brace Diagonals
T5 50.00-40.00	1	0.5	0.7	1	0.5	0.85
T6 40.00-20.00	1	0.5	0.7	1	0.5	0.85
T7 20.00-0.00	1	0.5	0.7	1	0.5	0.85

Tower Section Geometry (cont'd)

Tower Elevation	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width	U	Net Width	U	Net Width	U	Net Width	U	Net Width	U	Net Width	U	Net Width	U
T1 120.00-110.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	1	0.00	0.75	0.00	0.75

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T2 110.00-90.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	1	0.00	0.75	0.00	0.75
T3 90.00-70.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T4 70.00-50.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T5 50.00-40.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T6 40.00-20.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T7 20.00-0.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
				Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 120.00-110.00	Sleeve DS	0.63	0	0.00	0	0.00	0	0.00	0	0.63	0	0.75	0	0.50	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T2 110.00-90.00	Sleeve DS	0.63	4	0.00	0	0.00	0	0.00	0	0.63	0	0.75	0	0.50	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T3 90.00-70.00	Sleeve DS	0.63	5	0.00	0	0.00	0	0.00	0	0.63	0	0.75	0	0.50	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T4 70.00-50.00	Sleeve DS	0.75	0	0.00	0	0.00	0	0.00	0	0.63	0	0.75	0	0.50	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T5 50.00-40.00	Flange	1.00	6	1.00	1	0.00	0	0.00	0	0.63	0	0.75	0	0.50	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T6 40.00-20.00	Flange	1.00	6	1.00	1	0.00	0	0.00	0	0.63	0	0.75	0	0.50	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T7 20.00-0.00	Flange	1.00	6	1.00	1	0.00	0	0.00	0	0.63	0	0.75	0	0.50	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Shield Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
Reinforcement Area													
Reinf Area (2) 1-1/4" TR	A	No	No	Ar (CaAa)	50.00 - 20.00	0.00	-0.48	1	1	0.00	1.25		0.00
Reinf Area (2) 1-1/4" TR	B	No	No	Ar (CaAa)	50.00 - 20.00	0.00	-0.48	1	1	0.00	1.25		0.00
Reinf Area (2) 1-1/4" TR	C	No	No	Ar (CaAa)	50.00 - 20.00	0.00	-0.48	1	1	0.00	1.25		0.00
Reinf Area (2) 1-1/4" TR	A	No	No	Ar (CaAa)	50.00 - 20.00	0.00	0.48	1	1	0.00	1.25		0.00
Reinf Area (2) 1-1/4" TR	B	No	No	Ar (CaAa)	50.00 - 20.00	0.00	0.48	1	1	0.00	1.25		0.00
Reinf Area (2) 1-1/4" TR	C	No	No	Ar (CaAa)	50.00 - 20.00	0.00	0.48	1	1	0.00	1.25		0.00

AVA7-50(1-5/8")	B	No	No	Ar (CaAa)	110.00 - 8.00	0.00	0.45	6	6	0.50	2.01		0.00

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
HCS 6X12 4AWG(1-5/8)	C	No	No	Ar (CaAa)	110.00 - 8.00	0.00	-0.48	3	3	0.50	1.66		0.00
FXL-540(1/2")	A	No	No	Ar (CaAa)	80.00 - 8.00	0.00	0.46	6	6	0.50	0.61		0.00
FXL-540(1/2")	A	No	No	Ar (CaAa)	87.00 - 80.00	0.00	0.5	4	4	0.50	0.61		0.00
FXL-540(1/2")	A	No	No	Ar (CaAa)	118.00 - 87.00	0.00	0.5	3	3	0.50	0.61		0.00
FXL-540(1/2")	A	No	No	Ar (CaAa)	119.00 - 118.00	0.00	0.5	1	1	0.50	0.61		0.00
AVA5-50(7/8")	B	No	No	Ar (CaAa)	91.00 - 8.00	0.00	-0.45	4	4	0.50	1.10		0.00
AVA5-50(7/8")	B	No	No	Ar (CaAa)	95.00 - 91.00	0.00	-0.45	3	3	0.50	1.10		0.00
AVA5-50(7/8")	A	No	No	Ar (CaAa)	108.00 - 95.00	0.00	0.5	2	2	0.50	1.10		0.00
AVA5-50(7/8")	A	No	No	Ar (CaAa)	119.00 - 108.00	0.00	0.5	1	1	0.50	1.10		0.00
EW90(ELLIP TICAL)	B	No	No	Ar (CaAa)	90.00 - 8.00	0.00	-0.48	2	2	0.50	1.28		0.00
EW90(ELLIP TICAL)	A	No	No	Ar (CaAa)	95.00 - 90.00	0.00	0.5	1	1	1.28	1.28		0.00
Safety Line 3/8	C	No	No	Ar (CaAa)	120.00 - 8.00	0.00	0.5	1	1	0.38	0.38		0.00
Feedline Ladder (Af)	B	No	No	Af (CaAa)	120.00 - 8.00	-2.00	0.5	1	1	3.00	3.00		0.01
Feedline Ladder (Af)	A	No	No	Af (CaAa)	120.00 - 8.00	-2.00	0.5	1	1	3.00	3.00		0.01
HCS 6X12 4AWG(1-5/8)	B	No	No	Ar (CaAa)	110.00 - 8.00	-2.00	0.5	1	1	1.66	1.66		0.00
Reinforcement Area													
Reinf Area (2) 1-1/2" TR	A	No	No	Ar (CaAa)	20.00 - 0.00	0.00	-0.48	1	1	0.00	1.50		0.01
Reinf Area (2) 1-1/2" TR	B	No	No	Ar (CaAa)	20.00 - 0.00	0.00	-0.48	1	1	0.00	1.50		0.01
Reinf Area (2) 1-1/2" TR	C	No	No	Ar (CaAa)	20.00 - 0.00	0.00	-0.48	1	1	0.00	1.50		0.01
Reinf Area (2) 1-1/2" TR	A	No	No	Ar (CaAa)	20.00 - 0.00	0.00	0.48	1	1	0.00	1.50		0.01
Reinf Area (2) 1-1/2" TR	B	No	No	Ar (CaAa)	20.00 - 0.00	0.00	0.48	1	1	0.00	1.50		0.01
Reinf Area (2) 1-1/2" TR	C	No	No	Ar (CaAa)	20.00 - 0.00	0.00	0.48	1	1	0.00	1.50		0.01

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _A A _A ft ² /ft	Weight klf
**								

Feed Line/Linear Appurtenances Section Areas

Tower Sectio n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
T1	120.00-110.00	A	0.000	0.000	7.511	0.000	0.09
		B	0.000	0.000	5.000	0.000	0.08
		C	0.000	0.000	0.375	0.000	0.00
T2	110.00-90.00	A	0.000	0.000	17.386	0.000	0.19
		B	0.000	0.000	39.203	0.000	0.30
		C	0.000	0.000	10.710	0.000	0.15
T3	90.00-70.00	A	0.000	0.000	15.917	0.000	0.18
		B	0.000	0.000	51.376	0.000	0.34
		C	0.000	0.000	10.710	0.000	0.15
T4	70.00-50.00	A	0.000	0.000	17.320	0.000	0.18
		B	0.000	0.000	51.376	0.000	0.34
		C	0.000	0.000	10.710	0.000	0.15
T5	50.00-40.00	A	0.000	0.000	11.160	0.000	0.18
		B	0.000	0.000	28.188	0.000	0.25
		C	0.000	0.000	7.855	0.000	0.16
T6	40.00-20.00	A	0.000	0.000	22.320	0.000	0.35
		B	0.000	0.000	56.376	0.000	0.50
		C	0.000	0.000	15.710	0.000	0.32
T7	20.00-0.00	A	0.000	0.000	16.392	0.000	0.35
		B	0.000	0.000	36.826	0.000	0.44
		C	0.000	0.000	12.426	0.000	0.33

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Sectio n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
T1	120.00-110.00	A	2.124	0.000	0.000	22.941	0.000	0.43
		B		0.000	0.000	9.249	0.000	0.25
		C		0.000	0.000	4.624	0.000	0.07
T2	110.00-90.00	A	2.095	0.000	0.000	56.882	0.000	0.93
		B		0.000	0.000	85.878	0.000	1.59
		C		0.000	0.000	38.459	0.000	0.63
T3	90.00-70.00	A	2.049	0.000	0.000	43.592	0.000	0.78
		B		0.000	0.000	129.356	0.000	2.07
		C		0.000	0.000	37.959	0.000	0.62
T4	70.00-50.00	A	1.991	0.000	0.000	45.792	0.000	0.80
		B		0.000	0.000	127.727	0.000	2.01
		C		0.000	0.000	37.331	0.000	0.60
T5	50.00-40.00	A	1.934	0.000	0.000	32.833	0.000	0.62
		B		0.000	0.000	73.309	0.000	1.21
		C		0.000	0.000	28.596	0.000	0.52
T6	40.00-20.00	A	1.857	0.000	0.000	64.236	0.000	1.19
		B		0.000	0.000	143.853	0.000	2.33
		C		0.000	0.000	55.748	0.000	1.01
T7	20.00-0.00	A	1.664	0.000	0.000	44.715	0.000	0.90
		B		0.000	0.000	90.472	0.000	1.51
		C		0.000	0.000	39.596	0.000	0.80

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
T1	120.00-110.00	3.46	-4.48	0.85	-2.93
T2	110.00-90.00	10.77	0.80	5.92	-0.69
T3	90.00-70.00	8.82	-2.16	3.40	-1.62
T4	70.00-50.00	8.21	-2.36	4.86	-2.44
T5	50.00-40.00	6.42	-1.97	3.24	-1.69
T6	40.00-20.00	7.83	-2.45	5.02	-2.62
T7	20.00-0.00	5.98	-1.95	4.83	-2.58

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T1	13	FXL-540(1/2")	110.00 - 118.00	0.6000	0.3962
T1	14	FXL-540(1/2")	118.00 - 119.00	0.6000	0.3962
T1	18	AVA5-50(7/8")	110.00 - 119.00	0.6000	0.3962
T1	22	Safety Line 3/8	110.00 - 120.00	0.6000	0.3962
T1	23	Feedline Ladder (Af)	110.00 - 120.00	0.6000	0.3962
T1	24	Feedline Ladder (Af)	110.00 - 120.00	0.6000	0.3962
T2	9	AVA7-50(1-5/8")	90.00 - 110.00	0.6000	0.4382
T2	10	HCS 6X12 4AWG(1-5/8)	90.00 - 110.00	0.6000	0.4382
T2	13	FXL-540(1/2")	90.00 - 110.00	0.6000	0.4382
T2	15	AVA5-50(7/8")	90.00 - 91.00	0.6000	0.4382
T2	16	AVA5-50(7/8")	91.00 - 95.00	0.6000	0.4382
T2	17	AVA5-50(7/8")	95.00 - 108.00	0.6000	0.4382
T2	18	AVA5-50(7/8")	108.00 - 110.00	0.6000	0.4382
T2	20	EW90(ELLIPTICAL)	90.00 - 95.00	0.6000	0.4382
T2	22	Safety Line 3/8	90.00 - 110.00	0.6000	0.4382
T2	23	Feedline Ladder (Af)	90.00 - 110.00	0.6000	0.4382
T2	24	Feedline Ladder (Af)	90.00 - 110.00	0.6000	0.4382
T2	26	HCS 6X12 4AWG(1-5/8)	90.00 - 110.00	0.6000	0.4382
T3	9	AVA7-50(1-5/8")	70.00 - 90.00	0.6000	0.2764
T3	10	HCS 6X12 4AWG(1-5/8)	70.00 - 90.00	0.6000	0.2764
T3	11	FXL-540(1/2")	70.00 - 80.00	0.6000	0.2764
T3	12	FXL-540(1/2")	80.00 - 87.00	0.6000	0.2764
T3	13	FXL-540(1/2")	87.00 - 90.00	0.6000	0.2764
T3	15	AVA5-50(7/8")	70.00 - 90.00	0.6000	0.2764
T3	19	EW90(ELLIPTICAL)	70.00 - 90.00	0.6000	0.2764
T3	22	Safety Line 3/8	70.00 - 90.00	0.6000	0.2764
T3	23	Feedline Ladder (Af)	70.00 - 90.00	0.6000	0.2764
T3	24	Feedline Ladder (Af)	70.00 - 90.00	0.6000	0.2764
T3	26	HCS 6X12 4AWG(1-5/8)	70.00 - 90.00	0.6000	0.2764
T4	9	AVA7-50(1-5/8")	50.00 - 70.00	0.6000	0.3736
T4	10	HCS 6X12 4AWG(1-5/8)	50.00 - 70.00	0.6000	0.3736

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T4	11	FXL-540(1/2")	50.00 - 70.00	0.6000	0.3736
T4	15	AVA5-50(7/8")	50.00 - 70.00	0.6000	0.3736
T4	19	EW90(ELLIPTICAL)	50.00 - 70.00	0.6000	0.3736
T4	22	Safety Line 3/8	50.00 - 70.00	0.6000	0.3736
T4	23	Feedline Ladder (Af)	50.00 - 70.00	0.6000	0.3736
T4	24	Feedline Ladder (Af)	50.00 - 70.00	0.6000	0.3736
T4	26	HCS 6X12 4AWG(1-5/8)	50.00 - 70.00	0.6000	0.3736
T5	2	Reinf Area (2) 1-1/4" TR	40.00 - 50.00	0.6000	0.3068
T5	3	Reinf Area (2) 1-1/4" TR	40.00 - 50.00	0.6000	0.3068
T5	4	Reinf Area (2) 1-1/4" TR	40.00 - 50.00	0.6000	0.3068
T5	5	Reinf Area (2) 1-1/4" TR	40.00 - 50.00	0.6000	0.3068
T5	6	Reinf Area (2) 1-1/4" TR	40.00 - 50.00	0.6000	0.3068
T5	7	Reinf Area (2) 1-1/4" TR	40.00 - 50.00	0.6000	0.3068
T5	9	AVA7-50(1-5/8")	40.00 - 50.00	0.6000	0.3068
T5	10	HCS 6X12 4AWG(1-5/8)	40.00 - 50.00	0.6000	0.3068
T5	11	FXL-540(1/2")	40.00 - 50.00	0.6000	0.3068
T5	15	AVA5-50(7/8")	40.00 - 50.00	0.6000	0.3068
T5	19	EW90(ELLIPTICAL)	40.00 - 50.00	0.6000	0.3068
T5	22	Safety Line 3/8	40.00 - 50.00	0.6000	0.3068
T5	23	Feedline Ladder (Af)	40.00 - 50.00	0.6000	0.3068
T5	24	Feedline Ladder (Af)	40.00 - 50.00	0.6000	0.3068
T5	26	HCS 6X12 4AWG(1-5/8)	40.00 - 50.00	0.6000	0.3068
T6	2	Reinf Area (2) 1-1/4" TR	20.00 - 40.00	0.6000	0.4097
T6	3	Reinf Area (2) 1-1/4" TR	20.00 - 40.00	0.6000	0.4097
T6	4	Reinf Area (2) 1-1/4" TR	20.00 - 40.00	0.6000	0.4097
T6	5	Reinf Area (2) 1-1/4" TR	20.00 - 40.00	0.6000	0.4097
T6	6	Reinf Area (2) 1-1/4" TR	20.00 - 40.00	0.6000	0.4097
T6	7	Reinf Area (2) 1-1/4" TR	20.00 - 40.00	0.6000	0.4097
T6	9	AVA7-50(1-5/8")	20.00 - 40.00	0.6000	0.4097
T6	10	HCS 6X12 4AWG(1-5/8)	20.00 - 40.00	0.6000	0.4097
T6	11	FXL-540(1/2")	20.00 - 40.00	0.6000	0.4097
T6	15	AVA5-50(7/8")	20.00 - 40.00	0.6000	0.4097
T6	19	EW90(ELLIPTICAL)	20.00 - 40.00	0.6000	0.4097
T6	22	Safety Line 3/8	20.00 - 40.00	0.6000	0.4097
T6	23	Feedline Ladder (Af)	20.00 -	0.6000	0.4097

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T6	24	Feedline Ladder (Af)	40.00 20.00 - 40.00	0.6000	0.4097
T6	26	HCS 6X12 4AWG(1-5/8)	20.00 - 40.00	0.6000	0.4097
T7	9	AVA7-50(1-5/8")	8.00 - 20.00	0.6000	0.5391
T7	10	HCS 6X12 4AWG(1-5/8)	8.00 - 20.00	0.6000	0.5391
T7	11	FXL-540(1/2")	8.00 - 20.00	0.6000	0.5391
T7	15	AVA5-50(7/8")	8.00 - 20.00	0.6000	0.5391
T7	19	EW90(ELLIPTICAL)	8.00 - 20.00	0.6000	0.5391
T7	22	Safety Line 3/8	8.00 - 20.00	0.6000	0.5391
T7	23	Feedline Ladder (Af)	8.00 - 20.00	0.6000	0.5391
T7	24	Feedline Ladder (Af)	8.00 - 20.00	0.6000	0.5391
T7	26	HCS 6X12 4AWG(1-5/8)	8.00 - 20.00	0.6000	0.5391
T7	28	Reinf Area (2) 1-1/2" TR	0.00 - 20.00	0.6000	0.5391
T7	29	Reinf Area (2) 1-1/2" TR	0.00 - 20.00	0.6000	0.5391
T7	30	Reinf Area (2) 1-1/2" TR	0.00 - 20.00	0.6000	0.5391
T7	31	Reinf Area (2) 1-1/2" TR	0.00 - 20.00	0.6000	0.5391
T7	32	Reinf Area (2) 1-1/2" TR	0.00 - 20.00	0.6000	0.5391
T7	33	Reinf Area (2) 1-1/2" TR	0.00 - 20.00	0.6000	0.5391

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K

PD220-9	B	From Leg	0.50 0.00 8.00	0.00	119.00	No Ice 1/2" Ice 1" Ice	5.17 7.08 9.01	5.17 7.08 9.01	0.02 0.06 0.11
TMA	B	From Leg	0.50 0.00 0.00	0.00	119.00	No Ice 1/2" Ice 1" Ice	1.05 1.18 1.32	0.55 0.65 0.75	0.02 0.03 0.04
PD220-2	A	From Leg	2.00 0.00 10.00	0.00	118.00	No Ice 1/2" Ice 1" Ice	5.28 7.23 9.20	5.28 7.23 9.20	0.03 0.06 0.11
2' Side Arm Mount	A	None		0.00	118.00	No Ice 1/2" Ice 1" Ice	0.31 0.50 0.73	0.88 1.26 1.67	0.02 0.03 0.05
PD220-2	C	From Leg	2.00 0.00 10.00	0.00	118.00	No Ice 1/2" Ice 1" Ice	5.28 7.23 9.20	5.28 7.23 9.20	0.03 0.06 0.11
2' Side Arm Mount	C	None		0.00	118.00	No Ice 1/2" Ice 1" Ice	0.31 0.50 0.73	0.88 1.26 1.67	0.02 0.03 0.05
**									
AIR 32 B66Aa B2a	A	From Leg	4.00 0.00 0.00	0.00	110.00	No Ice 1/2" Ice 1" Ice	6.51 6.89 7.27	4.71 5.07 5.43	0.13 0.18 0.23
AIR 32 B66Aa B2a	B	From Leg	4.00 0.00	0.00	110.00	No Ice 1/2"	6.51 6.89	4.71 5.07	0.13 0.18

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			0.00			Ice 7.27	5.43	0.23
AIR 32 B66Aa B2a	C	From Leg	4.00	0.00	110.00	1" Ice No Ice 6.51	4.71	0.13
			0.00			1/2" Ice 6.89	5.07	0.18
			0.00			Ice 7.27	5.43	0.23
APXVARR24_43-C-NA20 w/ Mount Pipe	A	From Leg	4.00	0.00	110.00	1" Ice No Ice 17.15	10.64	0.14
			0.00			1/2" Ice 17.77	12.07	0.26
			0.00			Ice 18.40	13.35	0.39
APXVARR24_43-C-NA20 w/ Mount Pipe	B	From Leg	4.00	0.00	110.00	1" Ice No Ice 17.15	10.64	0.14
			0.00			1/2" Ice 17.77	12.07	0.26
			0.00			Ice 18.40	13.35	0.39
APXVARR24_43-C-NA20 w/ Mount Pipe	C	From Leg	4.00	0.00	110.00	1" Ice No Ice 17.15	10.64	0.14
			0.00			1/2" Ice 17.77	12.07	0.26
			0.00			Ice 18.40	13.35	0.39
RADIO 4449 B12/B71	A	From Leg	4.00	0.00	110.00	1" Ice No Ice 1.65	1.16	0.07
			0.00			1/2" Ice 1.81	1.30	0.09
			0.00			Ice 1.98	1.45	0.11
RADIO 4449 B12/B71	B	From Leg	4.00	0.00	110.00	1" Ice No Ice 1.65	1.16	0.07
			0.00			1/2" Ice 1.81	1.30	0.09
			0.00			Ice 1.98	1.45	0.11
RADIO 4449 B12/B71	C	From Leg	4.00	0.00	110.00	1" Ice No Ice 1.65	1.16	0.07
			0.00			1/2" Ice 1.81	1.30	0.09
			0.00			Ice 1.98	1.45	0.11
Twin Style TMA	A	From Leg	4.00	0.00	110.00	1" Ice No Ice 1.05	0.55	0.02
			0.00			1/2" Ice 1.18	0.65	0.03
			0.00			Ice 1.32	0.75	0.04
Twin Style TMA	B	From Leg	4.00	0.00	110.00	1" Ice No Ice 1.05	0.55	0.02
			0.00			1/2" Ice 1.18	0.65	0.03
			0.00			Ice 1.32	0.75	0.04
Twin Style TMA	C	From Leg	4.00	0.00	110.00	1" Ice No Ice 1.05	0.55	0.02
			0.00			1/2" Ice 1.18	0.65	0.03
			0.00			Ice 1.32	0.75	0.04
AIR 6449 B41	A	From Leg	4.00	0.00	110.00	1" Ice No Ice 5.65	2.42	0.10
			0.00			1/2" Ice 5.96	2.64	0.14
			0.00			Ice 6.26	2.87	0.18
AIR 6449 B41	B	From Leg	4.00	0.00	110.00	1" Ice No Ice 5.65	2.42	0.10
			0.00			1/2" Ice 5.96	2.64	0.14
			0.00			Ice 6.26	2.87	0.18
AIR 6449 B41	C	From Leg	4.00	0.00	110.00	1" Ice No Ice 5.65	2.42	0.10
			0.00			1/2" Ice 5.96	2.64	0.14
			0.00			Ice 6.26	2.87	0.18
RRUS 4415 B25	A	From Leg	4.00	0.00	110.00	1" Ice No Ice 1.64	0.68	0.04
			0.00			1/2" Ice 1.80	0.79	0.06
			0.00			Ice 1.97	0.91	0.07
RRUS 4415 B25	B	From Leg	4.00	0.00	110.00	1" Ice No Ice 1.64	0.68	0.04
			0.00			1/2" Ice 1.80	0.79	0.06
			0.00			Ice 1.97	0.91	0.07
RRUS 4415 B25	C	From Leg	4.00	0.00	110.00	1" Ice No Ice 1.64	0.68	0.04
			0.00			1/2" Ice 1.80	0.79	0.06
			0.00			Ice 1.97	0.91	0.07

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral	Vert						ft
			ft	ft	ft	°	ft	ft ²	ft ²	K	
SDX1926Q-43	A	From Leg	4.00			0.00	110.00	1" Ice			
			0.00					No Ice	0.24	0.10	0.01
			0.00					1/2"	0.31	0.14	0.01
SDX1926Q-43	B	From Leg	4.00			0.00	110.00	Ice	0.38	0.19	0.01
			0.00					1" Ice			
			0.00					No Ice	0.24	0.10	0.01
SDX1926Q-43	C	From Leg	4.00			0.00	110.00	1/2"	0.31	0.14	0.01
			0.00					Ice	0.38	0.19	0.01
			0.00					1" Ice			
12' Sector Mount	C	None				0.00	110.00	No Ice	29.82	29.82	1.67
								1/2"	42.21	42.21	2.27
								Ice	54.43	54.43	3.05
** Twin Style TMA	B	From Leg	0.50			0.00	95.00	1" Ice			
			0.00					No Ice	1.05	0.55	0.02
			0.00					1/2"	1.18	0.65	0.03
Dish Mount Pipe	B	From Face	2.00			0.00	95.00	Ice	1.32	0.75	0.04
			0.00					1" Ice			
			0.00					No Ice	0.90	0.90	0.02
Dish Mount	B	None				0.00	95.00	1/2"	1.52	1.52	0.02
								Ice	2.00	2.00	0.04
								1" Ice			
Dish Mount Pipe	B	From Face	2.00			0.00	90.00	No Ice	1.78	2.97	0.11
			0.00					1/2"	2.24	3.57	0.13
			0.00					Ice	2.75	4.19	0.16
Dish Mount	B	None				0.00	90.00	1" Ice			
								No Ice	0.90	0.90	0.02
								1/2"	1.52	1.52	0.02
** 72" Side Arm Mount	A	None				0.00	87.00	Ice	2.00	2.00	0.04
								1" Ice			
								No Ice	0.41	3.06	0.05
10' horizontal x 2" Pipe Mount	A	From Face	4.00			0.00	87.00	1/2"	0.81	5.10	0.08
			0.00					Ice	1.23	7.20	0.12
			0.00					1" Ice			
10' x 3" Dia Omni	A	From Leg	6.00			45.00	87.00	No Ice	0.83	0.83	0.10
			0.00					1/2"	1.76	1.76	0.48
			5.00					Ice	2.37	2.37	0.88
* 10' horizontal x 2" Pipe Mount	C	From Face	4.00			0.00	80.00	1" Ice			
			0.00					No Ice	0.83	0.83	0.10
			0.00					1/2"	1.76	1.76	0.48
72" Side Arm Mount	C	None				0.00	80.00	Ice	2.37	2.37	0.88
								1" Ice			
								No Ice	0.41	3.06	0.05
PD220-2	C	From Leg	6.00			0.00	80.00	1/2"	0.81	5.10	0.08
			0.00					Ice	1.23	7.20	0.12
			10.00					1" Ice			
10' horizontal x 2" Pipe	A	From Face	4.00			0.00	80.00	No Ice	5.28	5.28	0.03
								1/2"	7.23	7.23	0.06
								Ice	9.20	9.20	0.11
							1" Ice				

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight	
			Horz	Lateral						Vert
Mount			0.00			1/2"	1.76	1.76	0.48	
			0.00			Ice	2.37	2.37	0.88	
72" Side Arm Mount	A	None			0.00	80.00	1" Ice	0.41	3.06	0.05
							No Ice	0.81	5.10	0.08
							1/2"	1.23	7.20	0.12
							Ice			
							1" Ice			
PD220-9	A	From Leg	0.50		0.00	80.00	No Ice	5.17	5.17	0.02
			0.00				1/2"	7.08	7.08	0.06
			8.00				Ice	9.01	9.01	0.11
							1" Ice			

ANT50D	C	From Leg	2.00		0.00	108.00	No Ice	3.30	3.30	0.04
			0.00				1/2"	4.43	4.43	0.06
			0.00				Ice	5.58	5.58	0.09
							1" Ice			
ANT50D	C	From Leg	2.00		0.00	91.00	No Ice	3.30	3.30	0.04
			0.00				1/2"	4.43	4.43	0.06
			0.00				Ice	5.58	5.58	0.09
							1" Ice			
**										
(2) Jump Plate	A	From Leg	0.00		0.00	70.00	No Ice	3.09	0.44	0.02
			0.00				1/2"	3.36	0.84	0.03
			0.00				Ice	3.64	1.17	0.05
							1" Ice			
(2) Jump Plate	B	From Leg	0.00		0.00	70.00	No Ice	3.09	0.44	0.02
			0.00				1/2"	3.36	0.84	0.03
			0.00				Ice	3.64	1.17	0.05
							1" Ice			
(2) Jump Plate	C	From Leg	0.00		0.00	70.00	No Ice	3.09	0.44	0.02
			0.00				1/2"	3.36	0.84	0.03
			0.00				Ice	3.64	1.17	0.05
							1" Ice			
**										

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight	
				Horz	Lateral							Vert

Andrew 6' Dish	B	Paraboloid w/Shroud (HP)	From Leg	2.00		Worst		95.00	6.00	No Ice	28.30	0.74
				0.00						1/2" Ice	30.00	1.00
				0.00						1" Ice	31.70	1.26
Andrew 4' Dish	B	Paraboloid w/Shroud (HP)	From Leg	2.00		Worst		90.00	4.00	No Ice	12.57	0.11
				0.00						1/2" Ice	13.10	0.18
				0.00						1" Ice	13.63	0.25
**												

Truss-Leg Properties

Section Designation	Area <i>in</i> ²	Area Ice <i>in</i> ²	Self Weight <i>K</i>	Ice Weight <i>K</i>	Equiv. Diameter <i>in</i>	Equiv. Diameter Ice <i>in</i>	Leg Area <i>in</i> ²
PiRod 105244 + (2) 1-1/4" Tie-Rods	1119.36	3295.46	0.74	0.74	7.77	22.89	6.13
PiRod 105216 + (2) 1-1/4" Tie-Rods	2190.76	6707.42	0.68	1.33	7.61	23.29	6.13
PiRod 105217 + (2) 1-1/2" Tie-Rods	2362.94	6629.58	0.87	1.14	8.20	23.02	8.83

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	1.2D+1.6W (pattern 1) 0 deg - No Ice
4	1.2D+1.6W (pattern 2) 0 deg - No Ice
5	0.9 Dead+1.6 Wind 0 deg - No Ice
6	1.2 Dead+1.6 Wind 30 deg - No Ice
7	1.2D+1.6W (pattern 1) 30 deg - No Ice
8	1.2D+1.6W (pattern 2) 30 deg - No Ice
9	0.9 Dead+1.6 Wind 30 deg - No Ice
10	1.2 Dead+1.6 Wind 60 deg - No Ice
11	1.2D+1.6W (pattern 1) 60 deg - No Ice
12	1.2D+1.6W (pattern 2) 60 deg - No Ice
13	0.9 Dead+1.6 Wind 60 deg - No Ice
14	1.2 Dead+1.6 Wind 90 deg - No Ice
15	1.2D+1.6W (pattern 1) 90 deg - No Ice
16	1.2D+1.6W (pattern 2) 90 deg - No Ice
17	0.9 Dead+1.6 Wind 90 deg - No Ice
18	1.2 Dead+1.6 Wind 120 deg - No Ice
19	1.2D+1.6W (pattern 1) 120 deg - No Ice
20	1.2D+1.6W (pattern 2) 120 deg - No Ice
21	0.9 Dead+1.6 Wind 120 deg - No Ice
22	1.2 Dead+1.6 Wind 150 deg - No Ice
23	1.2D+1.6W (pattern 1) 150 deg - No Ice
24	1.2D+1.6W (pattern 2) 150 deg - No Ice
25	0.9 Dead+1.6 Wind 150 deg - No Ice
26	1.2 Dead+1.6 Wind 180 deg - No Ice
27	1.2D+1.6W (pattern 1) 180 deg - No Ice
28	1.2D+1.6W (pattern 2) 180 deg - No Ice
29	0.9 Dead+1.6 Wind 180 deg - No Ice
30	1.2 Dead+1.6 Wind 210 deg - No Ice
31	1.2D+1.6W (pattern 1) 210 deg - No Ice
32	1.2D+1.6W (pattern 2) 210 deg - No Ice
33	0.9 Dead+1.6 Wind 210 deg - No Ice
34	1.2 Dead+1.6 Wind 240 deg - No Ice
35	1.2D+1.6W (pattern 1) 240 deg - No Ice
36	1.2D+1.6W (pattern 2) 240 deg - No Ice
37	0.9 Dead+1.6 Wind 240 deg - No Ice
38	1.2 Dead+1.6 Wind 270 deg - No Ice
39	1.2D+1.6W (pattern 1) 270 deg - No Ice
40	1.2D+1.6W (pattern 2) 270 deg - No Ice
41	0.9 Dead+1.6 Wind 270 deg - No Ice
42	1.2 Dead+1.6 Wind 300 deg - No Ice
43	1.2D+1.6W (pattern 1) 300 deg - No Ice
44	1.2D+1.6W (pattern 2) 300 deg - No Ice
45	0.9 Dead+1.6 Wind 300 deg - No Ice
46	1.2 Dead+1.6 Wind 330 deg - No Ice
47	1.2D+1.6W (pattern 1) 330 deg - No Ice
48	1.2D+1.6W (pattern 2) 330 deg - No Ice
49	0.9 Dead+1.6 Wind 330 deg - No Ice
50	1.2 Dead+1.0 Ice+1.0 Temp
51	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
52	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
53	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
54	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
55	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
56	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
57	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
58	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
59	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
60	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
61	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
62	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
63	Dead+Wind 0 deg - Service
64	Dead+Wind 30 deg - Service
65	Dead+Wind 60 deg - Service
66	Dead+Wind 90 deg - Service
67	Dead+Wind 120 deg - Service
68	Dead+Wind 150 deg - Service
69	Dead+Wind 180 deg - Service
70	Dead+Wind 210 deg - Service
71	Dead+Wind 240 deg - Service
72	Dead+Wind 270 deg - Service
73	Dead+Wind 300 deg - Service
74	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	120 - 110	Leg	Max Tension	13	4.35	0.13	-0.08
			Max. Compression	18	-4.93	0.05	0.03
			Max. Mx	38	3.14	-0.13	-0.04
			Max. My	26	4.20	0.00	0.15
			Max. Vy	18	0.91	0.05	0.03
			Max. Vx	2	-1.06	-0.00	-0.06
		Diagonal	Max Tension	6	0.68	0.00	0.00
			Max. Compression	34	-0.67	0.00	0.00
			Max. Mx	55	0.01	-0.01	0.00
			Max. My	53	-0.04	-0.01	-0.00
			Max. Vy	52	0.01	-0.01	0.00
			Max. Vx	53	-0.00	0.00	0.00
		Top Girt	Max Tension	29	0.03	0.00	0.00
			Max. Compression	55	-0.04	0.00	0.00
			Max. Mx	50	-0.03	0.02	0.00
			Max. My	6	-0.01	0.00	-0.00
			Max. Vy	50	0.02	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
		Bottom Girt	Max Tension	34	0.21	0.00	0.00
			Max. Compression	10	-0.20	0.00	0.00
			Max. Mx	50	0.02	0.02	0.00
			Max. My	6	0.01	0.00	-0.00
			Max. Vy	50	0.02	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
T2	110 - 90	Leg	Max Tension	13	42.38	-0.21	0.09
			Max. Compression	18	-47.25	-0.21	-0.10
			Max. Mx	34	-45.70	0.22	-0.09
			Max. My	2	-45.25	0.01	0.23
			Max. Vy	34	-4.83	0.22	-0.09
			Max. Vx	2	-4.89	0.01	0.23
		Diagonal	Max Tension	10	4.56	0.00	0.00
			Max. Compression	10	-4.59	0.00	0.00
			Max. Mx	55	0.97	-0.01	-0.00
			Max. My	26	-4.10	-0.00	-0.00
			Max. Vy	55	0.01	-0.01	-0.00
			Max. Vx	26	-0.00	-0.00	-0.00
		Top Girt	Max Tension	34	0.46	0.00	0.00
			Max. Compression	42	-0.45	0.00	0.00
			Max. Mx	50	0.02	0.01	0.00
			Max. My	6	0.01	0.00	-0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft		
T3	90 - 70	Bottom Girt	Max. Vy	50	0.01	0.00	0.00		
			Max. Vx	6	0.00	0.00	0.00		
			Max Tension	10	0.32	0.00	0.00		
			Max. Compression	21	-0.30	0.00	0.00		
			Max. Mx	50	0.03	0.01	0.00		
			Max. My	6	0.02	0.00	-0.00		
		Leg	Max. Vy	50	0.01	0.00	0.00		
			Max. Vx	6	0.00	0.00	0.00		
			Max Tension	13	110.30	0.42	-0.18		
			Max. Compression	34	-116.01	0.17	-0.06		
			Max. Mx	34	-49.55	0.65	-0.21		
			Max. My	2	-45.27	0.12	0.66		
		Diagonal	Max. Vy	34	-7.44	0.17	-0.06		
			Max. Vx	2	-7.58	0.04	0.17		
			Max Tension	10	7.06	-0.00	0.00		
			Max. Compression	34	-7.20	0.00	0.00		
			Max. Mx	59	1.38	-0.01	0.00		
			Max. My	30	-3.73	0.00	-0.00		
		Secondary Horizontal	Max. Vy	59	0.01	-0.01	0.00		
			Max. Vx	30	0.00	0.00	-0.00		
			Max Tension	34	1.91	-0.01	-0.00		
			Max. Compression	34	-1.91	0.00	0.00		
			Max. Mx	58	-0.23	-0.01	0.00		
			Max. My	10	-0.56	-0.01	-0.01		
		Top Girt	Max. Vy	58	0.02	-0.01	0.00		
			Max. Vx	26	0.00	0.00	0.00		
			Max Tension	34	0.22	0.00	0.00		
			Max. Compression	42	-0.23	0.00	0.00		
			Max. Mx	50	-0.00	0.03	0.00		
			Max. My	6	0.00	0.00	-0.00		
Bottom Girt	Max. Vy	50	-0.02	0.00	0.00				
	Max. Vx	6	0.00	0.00	0.00				
	Max Tension	10	0.29	0.00	0.00				
	Max. Compression	37	-0.33	0.00	0.00				
	Max. Mx	50	0.01	0.02	0.00				
	Max. My	6	0.01	0.00	-0.00				
T4	70 - 50	Leg	Max. Vy	50	0.02	0.00	0.00		
			Max. Vx	6	-0.00	0.00	0.00		
			Max Tension	13	171.46	0.14	0.00		
			Max. Compression	34	-178.57	1.38	0.03		
			Max. Mx	34	-178.57	1.38	0.03		
			Max. My	6	-7.14	0.05	-0.61		
		Diagonal	Max. Vy	34	-6.28	0.70	0.15		
			Max. Vx	30	-4.03	0.00	0.45		
			Max Tension	10	6.07	0.00	0.00		
			Max. Compression	34	-6.18	0.00	0.00		
			Max. Mx	34	2.69	-0.01	-0.00		
			Max. My	26	-5.67	0.00	-0.01		
		Top Girt	Max. Vy	55	0.01	-0.01	-0.00		
			Max. Vx	26	0.00	0.00	0.00		
			Max Tension	28	0.11	0.00	0.00		
			Max. Compression	20	-0.11	0.00	0.00		
			Max. Mx	50	0.05	0.02	0.00		
			Max. My	58	0.06	0.00	-0.00		
		Bottom Girt	Max. Vy	50	-0.02	0.00	0.00		
			Max. Vx	58	-0.00	0.00	0.00		
			Max Tension	10	1.48	0.00	0.00		
			Max. Compression	37	-1.38	0.00	0.00		
			Max. Mx	50	0.11	0.02	0.00		
			Max. My	52	0.09	0.00	-0.00		
		T5	50 - 40	Leg	Max. Vy	50	-0.02	0.00	0.00
					Max. Vx	52	0.00	0.00	0.00
				Max Tension	13	172.16	-1.34	-0.03	
				Max. Compression	34	-178.99	8.41	0.15	
				Max. Mx	10	171.58	-8.82	-0.34	
				Max. My	6	-7.28	-0.16	-14.15	
Max. Vy	10			0.88	-8.82	-0.34			
Max. Vx	6			1.54	-0.16	-14.15			

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft	
T6	40 - 20	Diagonal	Max Tension	33	7.53	0.09	0.03	
			Max. Compression	30	-8.18	0.00	0.00	
			Max. Mx	10	0.40	0.11	-0.00	
			Max. My	30	-8.16	-0.08	0.06	
			Max. Vy	53	0.03	0.06	-0.00	
			Max. Vx	30	-0.01	0.00	0.00	
		Leg	Max Tension	13	190.74	-7.66	-0.09	
			Max. Compression	34	-200.61	8.89	0.57	
			Max. Mx	34	-200.61	8.89	0.57	
			Max. My	6	-7.82	-0.16	-14.15	
			Max. Vy	61	0.30	-3.79	-0.06	
			Max. Vx	6	-0.77	-0.16	-14.15	
			Diagonal	Max Tension	3	5.50	0.00	0.00
				Max. Compression	29	-5.73	0.00	0.00
Max. Mx	34	1.47		0.11	0.02			
Max. My	31	-4.90		0.00	0.03			
Max. Vy	53	0.04		0.07	0.01			
Max. Vx	31	-0.01		0.00	0.00			
T7	20 - 0	Leg	Max Tension	13	206.17	-6.87	-0.02	
			Max. Compression	34	-220.31	-0.00	-0.00	
			Max. Mx	34	-212.36	8.89	0.57	
			Max. My	14	-7.49	-0.38	12.07	
			Max. Vy	10	-0.82	-6.98	-0.03	
			Max. Vx	6	-1.34	-0.33	-11.98	
		Diagonal	Max Tension	33	7.23	0.00	0.00	
			Max. Compression	30	-7.73	0.00	0.00	
			Max. Mx	34	1.18	-0.12	-0.02	
			Max. My	9	-3.47	0.04	0.03	
			Max. Vy	54	-0.04	-0.06	-0.01	
			Max. Vx	9	-0.01	0.04	0.03	

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	34	229.71	17.75	-9.41
	Max. H _x	34	229.71	17.75	-9.41
	Max. H _z	13	-213.80	-16.50	8.71
	Min. Vert	13	-213.80	-16.50	8.71
	Min. H _x	13	-213.80	-16.50	8.71
	Min. H _z	34	229.71	17.75	-9.41
Leg B	Max. Vert	18	221.97	-16.43	-9.89
	Max. H _x	45	-202.50	15.09	9.12
	Max. H _z	45	-202.50	15.09	9.12
	Min. Vert	45	-202.50	15.09	9.12
	Min. H _x	18	221.97	-16.43	-9.89
	Min. H _z	18	221.97	-16.43	-9.89
Leg A	Max. Vert	2	221.09	0.97	19.20
	Max. H _x	10	118.72	2.03	10.30
	Max. H _z	2	221.09	0.97	19.20
	Min. Vert	29	-204.27	-0.94	-17.72
	Min. H _x	34	-101.84	-1.93	-8.94
	Min. H _z	29	-204.27	-0.94	-17.72

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	22.60	0.00	0.00	2.33	-8.48	0.00

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
1.2 Dead+1.6 Wind 0 deg - No Ice	27.12	-0.02	-25.59	-1836.43	-8.16	16.60
1.2D+1.6W (pattern 1) 0 deg - No Ice	27.12	-0.02	-23.50	-1602.67	-8.63	16.78
1.2D+1.6W (pattern 2) 0 deg - No Ice	27.12	-0.02	-17.73	-1372.22	-8.52	13.86
0.9 Dead+1.6 Wind 0 deg - No Ice	20.34	-0.02	-25.59	-1833.04	-5.58	16.56
1.2 Dead+1.6 Wind 30 deg - No Ice	27.12	13.30	-23.04	-1652.29	-965.86	20.05
1.2D+1.6W (pattern 1) 30 deg - No Ice	27.12	12.26	-21.24	-1450.71	-849.44	20.11
1.2D+1.6W (pattern 2) 30 deg - No Ice	27.12	9.17	-15.88	-1224.53	-718.87	16.74
0.9 Dead+1.6 Wind 30 deg - No Ice	20.34	13.30	-23.04	-1649.33	-961.15	20.00
1.2 Dead+1.6 Wind 60 deg - No Ice	27.12	22.98	-13.24	-949.85	-1664.48	12.45
1.2D+1.6W (pattern 1) 60 deg - No Ice	27.12	21.17	-12.20	-833.39	-1461.79	12.40
1.2D+1.6W (pattern 2) 60 deg - No Ice	27.12	15.85	-9.13	-704.12	-1238.14	9.50
0.9 Dead+1.6 Wind 60 deg - No Ice	20.34	22.98	-13.24	-948.44	-1658.23	12.41
1.2 Dead+1.6 Wind 90 deg - No Ice	27.12	26.56	0.02	4.88	-1917.84	1.99
1.2D+1.6W (pattern 1) 90 deg - No Ice	27.12	24.46	0.02	4.41	-1683.15	1.84
1.2D+1.6W (pattern 2) 90 deg - No Ice	27.12	18.32	0.02	4.54	-1427.22	0.19
0.9 Dead+1.6 Wind 90 deg - No Ice	20.34	26.56	0.02	4.18	-1911.04	1.97
1.2 Dead+1.6 Wind 120 deg - No Ice	27.12	22.08	12.75	919.69	-1598.28	-6.11
1.2D+1.6W (pattern 1) 120 deg - No Ice	27.12	20.26	11.70	802.21	-1394.79	-6.34
1.2D+1.6W (pattern 2) 120 deg - No Ice	27.12	15.31	8.84	689.29	-1199.22	-6.31
0.9 Dead+1.6 Wind 120 deg - No Ice	20.34	22.08	12.75	916.94	-1592.17	-6.11
1.2 Dead+1.6 Wind 150 deg - No Ice	27.12	12.14	20.99	1534.56	-896.96	-10.86
1.2D+1.6W (pattern 1) 150 deg - No Ice	27.12	11.09	19.17	1331.54	-779.19	-11.11
1.2D+1.6W (pattern 2) 150 deg - No Ice	27.12	8.48	14.66	1157.55	-678.89	-9.41
0.9 Dead+1.6 Wind 150 deg - No Ice	20.34	12.14	20.99	1530.40	-892.39	-10.83
1.2 Dead+1.6 Wind 180 deg - No Ice	27.12	0.02	25.20	1832.54	-12.33	-16.60
1.2D+1.6W (pattern 1) 180 deg - No Ice	27.12	0.02	23.11	1598.77	-11.84	-16.78
1.2D+1.6W (pattern 2) 180 deg - No Ice	27.12	0.02	17.50	1372.15	-11.97	-13.86
0.9 Dead+1.6 Wind 180 deg - No Ice	20.34	0.02	25.20	1827.72	-9.75	-16.56
1.2 Dead+1.6 Wind 210 deg - No Ice	27.12	-13.30	23.04	1657.98	945.30	-20.05
1.2D+1.6W (pattern 1) 210 deg - No Ice	27.12	-12.26	21.24	1456.37	828.93	-20.11
1.2D+1.6W (pattern 2) 210 deg - No Ice	27.12	-9.17	15.88	1230.20	698.35	-16.74
0.9 Dead+1.6 Wind 210 deg - No Ice	20.34	-13.30	23.04	1653.59	945.77	-20.00
1.2 Dead+1.6 Wind 240 deg - No Ice	27.12	-23.31	13.44	960.28	1652.24	-12.45
1.2D+1.6W (pattern 1) 240 deg - No Ice	27.12	-21.50	12.40	843.80	1449.57	-12.40
1.2D+1.6W (pattern 2) 240	27.12	-16.05	9.25	712.63	1222.61	-9.51

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
deg - No Ice						
0.9 Dead+1.6 Wind 240 deg - No Ice	20.34	-23.31	13.44	957.44	1651.16	-12.42
1.2 Dead+1.6 Wind 270 deg - No Ice	27.12	-26.56	-0.02	0.70	1897.39	-1.99
1.2D+1.6W (pattern 1) 270 deg - No Ice	27.12	-24.46	-0.02	1.18	1662.69	-1.84
1.2D+1.6W (pattern 2) 270 deg - No Ice	27.12	-18.32	-0.02	1.07	1406.76	-0.20
0.9 Dead+1.6 Wind 270 deg - No Ice	20.34	-26.56	-0.02	-0.00	1895.75	-1.97
1.2 Dead+1.6 Wind 300 deg - No Ice	27.12	-21.74	-12.55	-909.30	1569.57	6.11
1.2D+1.6W (pattern 1) 300 deg - No Ice	27.12	-19.92	-11.50	-791.81	1366.07	6.34
1.2D+1.6W (pattern 2) 300 deg - No Ice	27.12	-15.11	-8.72	-680.81	1173.80	6.31
0.9 Dead+1.6 Wind 300 deg - No Ice	20.34	-21.74	-12.55	-907.97	1568.62	6.11
1.2 Dead+1.6 Wind 330 deg - No Ice	27.12	-12.14	-20.99	-1528.91	876.53	10.86
1.2D+1.6W (pattern 1) 330 deg - No Ice	27.12	-11.09	-19.17	-1325.89	758.76	11.11
1.2D+1.6W (pattern 2) 330 deg - No Ice	27.12	-8.48	-14.66	-1151.91	658.45	9.41
0.9 Dead+1.6 Wind 330 deg - No Ice	20.34	-12.14	-20.99	-1526.18	877.12	10.83
1.2 Dead+1.0 Ice+1.0 Temp	80.51	0.00	0.00	0.23	-15.13	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	80.51	-0.00	-7.36	-542.95	-14.87	2.25
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	80.51	3.74	-6.48	-477.43	-291.02	2.38
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	80.51	6.55	-3.78	-277.67	-497.34	1.39
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	80.51	7.50	0.00	0.64	-567.88	-0.19
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	80.51	6.39	3.69	272.41	-486.59	-1.23
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	80.51	3.63	6.28	466.35	-284.75	-1.72
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	80.51	0.00	7.31	542.51	-15.58	-2.25
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	80.51	-3.74	6.48	477.97	260.58	-2.38
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	80.51	-6.59	3.80	278.70	467.74	-1.39
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	80.51	-7.50	-0.00	-0.08	537.44	0.19
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	80.51	-6.35	-3.66	-271.39	455.30	1.23
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	80.51	-3.63	-6.28	-465.84	254.28	1.72
Dead+Wind 0 deg - Service	22.60	-0.00	-4.91	-349.94	-8.12	3.18
Dead+Wind 30 deg - Service	22.60	2.55	-4.42	-314.67	-191.54	3.83
Dead+Wind 60 deg - Service	22.60	4.41	-2.54	-180.12	-325.35	2.38
Dead+Wind 90 deg - Service	22.60	5.09	0.00	2.74	-373.88	0.39
Dead+Wind 120 deg - Service	22.60	4.23	2.44	177.95	-312.69	-1.17
Dead+Wind 150 deg - Service	22.60	2.33	4.03	295.70	-178.35	-2.09
Dead+Wind 180 deg - Service	22.60	0.00	4.83	352.78	-8.91	-3.18
Dead+Wind 210 deg - Service	22.60	-2.55	4.42	319.35	174.51	-3.83
Dead+Wind 240 deg - Service	22.60	-4.47	2.58	185.74	309.92	-2.38
Dead+Wind 270 deg - Service	22.60	-5.09	-0.00	1.94	356.85	-0.39
Dead+Wind 300 deg -	22.60	-4.17	-2.41	-172.35	294.06	1.17

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Service Dead+Wind 330 deg - Service	22.60	-2.33	-4.03	-291.02	161.32	2.09

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-22.60	0.00	0.00	22.60	0.00	0.000%
2	-0.02	-27.12	-25.59	0.02	27.12	25.59	0.000%
3	-0.02	-27.12	-23.50	0.02	27.12	23.50	0.000%
4	-0.02	-27.12	-17.73	0.02	27.12	17.73	0.000%
5	-0.02	-20.34	-25.59	0.02	20.34	25.59	0.000%
6	13.30	-27.12	-23.04	-13.30	27.12	23.04	0.000%
7	12.26	-27.12	-21.24	-12.26	27.12	21.24	0.000%
8	9.17	-27.12	-15.88	-9.17	27.12	15.88	0.000%
9	13.30	-20.34	-23.04	-13.30	20.34	23.04	0.000%
10	22.98	-27.12	-13.24	-22.98	27.12	13.24	0.000%
11	21.17	-27.12	-12.20	-21.17	27.12	12.20	0.000%
12	15.85	-27.12	-9.13	-15.85	27.12	9.13	0.000%
13	22.98	-20.34	-13.24	-22.98	20.34	13.24	0.000%
14	26.56	-27.12	0.02	-26.56	27.12	-0.02	0.000%
15	24.46	-27.12	0.02	-24.46	27.12	-0.02	0.000%
16	18.32	-27.12	0.02	-18.32	27.12	-0.02	0.000%
17	26.56	-20.34	0.02	-26.56	20.34	-0.02	0.000%
18	22.08	-27.12	12.75	-22.08	27.12	-12.75	0.000%
19	20.26	-27.12	11.70	-20.26	27.12	-11.70	0.000%
20	15.31	-27.12	8.84	-15.31	27.12	-8.84	0.000%
21	22.08	-20.34	12.75	-22.08	20.34	-12.75	0.000%
22	12.14	-27.12	20.99	-12.14	27.12	-20.99	0.000%
23	11.09	-27.12	19.17	-11.09	27.12	-19.17	0.000%
24	8.48	-27.12	14.66	-8.48	27.12	-14.66	0.000%
25	12.14	-20.34	20.99	-12.14	20.34	-20.99	0.000%
26	0.02	-27.12	25.20	-0.02	27.12	-25.20	0.000%
27	0.02	-27.12	23.11	-0.02	27.12	-23.11	0.000%
28	0.02	-27.12	17.50	-0.02	27.12	-17.50	0.000%
29	0.02	-20.34	25.20	-0.02	20.34	-25.20	0.000%
30	-13.30	-27.12	23.04	13.30	27.12	-23.04	0.000%
31	-12.26	-27.12	21.24	12.26	27.12	-21.24	0.000%
32	-9.17	-27.12	15.88	9.17	27.12	-15.88	0.000%
33	-13.30	-20.34	23.04	13.30	20.34	-23.04	0.000%
34	-23.31	-27.12	13.44	23.31	27.12	-13.44	0.000%
35	-21.50	-27.12	12.40	21.50	27.12	-12.40	0.000%
36	-16.05	-27.12	9.25	16.05	27.12	-9.25	0.000%
37	-23.31	-20.34	13.44	23.31	20.34	-13.44	0.000%
38	-26.56	-27.12	-0.02	26.56	27.12	0.02	0.000%
39	-24.46	-27.12	-0.02	24.46	27.12	0.02	0.000%
40	-18.32	-27.12	-0.02	18.32	27.12	0.02	0.000%
41	-26.56	-20.34	-0.02	26.56	20.34	0.02	0.000%
42	-21.74	-27.12	-12.55	21.74	27.12	12.55	0.000%
43	-19.92	-27.12	-11.50	19.92	27.12	11.50	0.000%
44	-15.11	-27.12	-8.72	15.11	27.12	8.72	0.000%
45	-21.74	-20.34	-12.55	21.74	20.34	12.55	0.000%
46	-12.14	-27.12	-20.99	12.14	27.12	20.99	0.000%
47	-11.09	-27.12	-19.17	11.09	27.12	19.17	0.000%
48	-8.48	-27.12	-14.66	8.48	27.12	14.66	0.000%
49	-12.14	-20.34	-20.99	12.14	20.34	20.99	0.000%
50	0.00	-80.51	0.00	0.00	80.51	0.00	0.000%
51	-0.00	-80.51	-7.36	0.00	80.51	7.36	0.000%
52	3.74	-80.51	-6.48	-3.74	80.51	6.48	0.000%
53	6.55	-80.51	-3.78	-6.55	80.51	3.78	0.000%
54	7.50	-80.51	0.00	-7.50	80.51	-0.00	0.000%
55	6.39	-80.51	3.69	-6.39	80.51	-3.69	0.000%
56	3.63	-80.51	6.28	-3.63	80.51	-6.28	0.000%
57	0.00	-80.51	7.31	-0.00	80.51	-7.31	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
58	-3.74	-80.51	6.48	3.74	80.51	-6.48	0.000%
59	-6.59	-80.51	3.80	6.59	80.51	-3.80	0.000%
60	-7.50	-80.51	-0.00	7.50	80.51	0.00	0.000%
61	-6.35	-80.51	-3.66	6.35	80.51	3.66	0.000%
62	-3.63	-80.51	-6.28	3.63	80.51	6.28	0.000%
63	-0.00	-22.60	-4.91	0.00	22.60	4.91	0.000%
64	2.55	-22.60	-4.42	-2.55	22.60	4.42	0.000%
65	4.41	-22.60	-2.54	-4.41	22.60	2.54	0.000%
66	5.09	-22.60	0.00	-5.09	22.60	-0.00	0.000%
67	4.23	-22.60	2.44	-4.23	22.60	-2.44	0.000%
68	2.33	-22.60	4.03	-2.33	22.60	-4.03	0.000%
69	0.00	-22.60	4.83	-0.00	22.60	-4.83	0.000%
70	-2.55	-22.60	4.42	2.55	22.60	-4.42	0.000%
71	-4.47	-22.60	2.58	4.47	22.60	-2.58	0.000%
72	-5.09	-22.60	-0.00	5.09	22.60	0.00	0.000%
73	-4.17	-22.60	-2.41	4.17	22.60	2.41	0.000%
74	-2.33	-22.60	-4.03	2.33	22.60	4.03	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000474
3	Yes	4	0.00000001	0.00000497
4	Yes	4	0.00000001	0.00000398
5	Yes	4	0.00000001	0.00000300
6	Yes	4	0.00000001	0.00001001
7	Yes	4	0.00000001	0.00000844
8	Yes	4	0.00000001	0.00000660
9	Yes	4	0.00000001	0.00000804
10	Yes	4	0.00000001	0.00000583
11	Yes	4	0.00000001	0.00000585
12	Yes	4	0.00000001	0.00000507
13	Yes	4	0.00000001	0.00000277
14	Yes	4	0.00000001	0.00000572
15	Yes	4	0.00000001	0.00000489
16	Yes	4	0.00000001	0.00000435
17	Yes	4	0.00000001	0.00000446
18	Yes	4	0.00000001	0.00000249
19	Yes	4	0.00000001	0.00000317
20	Yes	4	0.00000001	0.00000291
21	Yes	4	0.00000001	0.00000084
22	Yes	4	0.00000001	0.00000556
23	Yes	4	0.00000001	0.00000486
24	Yes	4	0.00000001	0.00000449
25	Yes	4	0.00000001	0.00000376
26	Yes	4	0.00000001	0.00000611
27	Yes	4	0.00000001	0.00000612
28	Yes	4	0.00000001	0.00000527
29	Yes	4	0.00000001	0.00000300
30	Yes	4	0.00000001	0.00001016
31	Yes	4	0.00000001	0.00000854
32	Yes	4	0.00000001	0.00000667
33	Yes	4	0.00000001	0.00000816
34	Yes	4	0.00000001	0.00000438
35	Yes	4	0.00000001	0.00000456
36	Yes	4	0.00000001	0.00000369
37	Yes	4	0.00000001	0.00000280
38	Yes	4	0.00000001	0.00000560
39	Yes	4	0.00000001	0.00000484
40	Yes	4	0.00000001	0.00000435
41	Yes	4	0.00000001	0.00000431
42	Yes	4	0.00000001	0.00000508
43	Yes	4	0.00000001	0.00000513

44	Yes	4	0.00000001	0.00000468
45	Yes	4	0.00000001	0.00000205
46	Yes	4	0.00000001	0.00000536
47	Yes	4	0.00000001	0.00000478
48	Yes	4	0.00000001	0.00000442
49	Yes	4	0.00000001	0.00000351
50	Yes	4	0.00000001	0.00000001
51	Yes	4	0.00000001	0.00010881
52	Yes	4	0.00000001	0.00011231
53	Yes	4	0.00000001	0.00011490
54	Yes	4	0.00000001	0.00011214
55	Yes	4	0.00000001	0.00010963
56	Yes	4	0.00000001	0.00011155
57	Yes	4	0.00000001	0.00011366
58	Yes	4	0.00000001	0.00011175
59	Yes	4	0.00000001	0.00010903
60	Yes	4	0.00000001	0.00011067
61	Yes	4	0.00000001	0.00011280
62	Yes	4	0.00000001	0.00011056
63	Yes	4	0.00000001	0.00000001
64	Yes	4	0.00000001	0.00000001
65	Yes	4	0.00000001	0.00000001
66	Yes	4	0.00000001	0.00000001
67	Yes	4	0.00000001	0.00000001
68	Yes	4	0.00000001	0.00000001
69	Yes	4	0.00000001	0.00000001
70	Yes	4	0.00000001	0.00000001
71	Yes	4	0.00000001	0.00000001
72	Yes	4	0.00000001	0.00000001
73	Yes	4	0.00000001	0.00000001
74	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	120 - 110	4.42	66	0.32	0.14
T2	110 - 90	3.75	66	0.32	0.14
T3	90 - 70	2.44	66	0.29	0.13
T4	70 - 50	1.34	66	0.21	0.09
T5	50 - 40	0.59	66	0.13	0.05
T6	40 - 20	0.35	66	0.09	0.03
T7	20 - 0	0.07	66	0.04	0.01

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
119.00	PD220-9	66	4.35	0.32	0.14	341772
118.00	PD220-2	66	4.29	0.32	0.14	341772
110.00	AIR 32 B66Aa B2a	66	3.75	0.32	0.14	324371
108.00	ANT50D	66	3.62	0.32	0.14	Inf
95.00	Andrew 6' Dish	66	2.76	0.30	0.14	28400
91.00	ANT50D	66	2.51	0.29	0.13	21969
90.00	Andrew 4' Dish	66	2.44	0.29	0.13	20990
87.00	72" Side Arm Mount	66	2.26	0.28	0.13	19047
80.00	10' horizontal x 2" Pipe Mount	66	1.86	0.25	0.11	16345
70.00	(2) Jump Plate	66	1.34	0.21	0.09	13725

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	120 - 110	22.43	14	1.61	0.75
T2	110 - 90	19.06	14	1.60	0.75
T3	90 - 70	12.46	10	1.45	0.69
T4	70 - 50	6.89	10	1.08	0.47
T5	50 - 40	3.01	10	0.67	0.26
T6	40 - 20	1.79	10	0.48	0.15
T7	20 - 0	0.38	14	0.18	0.03

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
119.00	PD220-9	14	22.09	1.61	0.75	72388
118.00	PD220-2	14	21.76	1.60	0.75	72388
110.00	AIR 32 B66Aa B2a	14	19.06	1.60	0.75	68833
108.00	ANT50D	14	18.39	1.59	0.75	142917
95.00	Andrew 6' Dish	10	14.06	1.51	0.72	5883
91.00	ANT50D	10	12.78	1.47	0.70	4548
90.00	Andrew 4' Dish	10	12.46	1.45	0.69	4340
87.00	72" Side Arm Mount	10	11.54	1.41	0.66	3914
80.00	10' horizontal x 2" Pipe Mount	10	9.49	1.28	0.59	3306
70.00	(2) Jump Plate	10	6.89	1.08	0.47	2732

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load Allowable	Allowable Ratio	Criteria
T2	110	Leg	A325N	0.63	4	1.09	24.85	0.044	1	Bolt DS
T3	90	Leg	A325N	0.63	5	8.48	24.85	0.341	1	Bolt DS
T5	50	Leg	A325N	1.00	6	28.69	53.01	0.541	1	Bolt Tension
		Diagonal	A325N	1.00	1	7.53	9.14	0.824	1	Member Block Shear
T6	40	Leg	A325N	1.00	6	30.42	53.01	0.574	1	Bolt Tension
		Diagonal	A325N	1.00	1	5.50	9.14	0.601	1	Member Block Shear
T7	20	Leg	A325N	1.00	6	33.42	53.01	0.630	1	Bolt Tension
		Diagonal	A325N	1.00	1	7.73	31.81	0.243	1	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
T1	120 - 110	1 3/4	10.00	2.48	68.0 K=1.00	2.41	-4.31	77.19	0.056 ¹

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
T2	110 - 90	1 3/4	20.00	2.48	68.0 K=1.00	2.41	-43.95	77.19	0.569 ¹
T3	90 - 70	2	20.00	1.24	29.8 K=1.00	3.14	-110.44	132.51	0.833 ¹
T4	70 - 50	*2-1/4 SR w/ Half 2.5 X-Strong	20.00	2.49	47.8 K=1.00	5.10	-178.57	194.35	0.919 ¹
T5	50 - 40	PiRod 105244 + (2) 1-1/4" Tie-Rods	10.02	10.02	35.2 K=1.00	6.13	-178.99	252.06	0.710 ¹
T6	40 - 20	PiRod 105216 + (2) 1-1/4" Tie-Rods	20.03	10.02	35.2 K=1.00	6.13	-200.61	252.06	0.796 ¹
T7	20 - 0	PiRod 105217 + (2) 1-1/2" Tie-Rods	20.03	10.02	29.3 K=1.00	8.83	-220.32	373.21	0.590 ¹

¹ P_u / φP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L _d ft	KI/r	φP _n K	A in ²	V _u K	φV _n K	Stress Ratio
T5	50 - 40	0.5	1.47	98.5	275.93	0.20	1.54	4.87	0.317
T6	40 - 20	0.5	1.47	98.5	275.93	0.20	0.77	4.27	0.181
T7	20 - 0	0.5	1.45	97.4	397.41	0.20	1.34	4.32	0.311

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
T1	120 - 110	3/4	5.14	2.49	143.2 K=0.90	0.44	-0.67	4.87	0.138 ¹
T2	110 - 90	*3/4 SR w/ 3/4 Clip	5.14	2.49	110.5 K=1.00	0.44	-4.59	7.53	0.609 ¹
T3	90 - 70	7/8	5.14	2.47	122.1 K=0.90	0.60	-7.20	8.88	0.811 ¹
T4	70 - 50	*7/8 SR w/ 7/8 SR Clipped	5.50	2.63	102.0 K=1.00	0.60	-6.07	11.24	0.539 ¹
T5	50 - 40	L2 1/2x2 1/2x3/16	11.42	5.02	121.8 K=1.00	0.90	-8.18	13.38	0.612 ¹
T6	40 - 20	L2 1/2x2 1/2x3/16	12.50	5.67	137.4 K=1.00	0.90	-5.39	10.79	0.499 ¹
T7	20 - 0	*L2.5x2.5x3/16 + PL2.5x1/4	13.80	6.54	106.7 K=1.00	1.82	-7.73	32.37	0.239 ¹

¹ P_u / φP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
T3	90 - 70	1 1/4	4.50	4.33	116.5 K=0.70	1.23	-1.91	19.47	0.098 ¹

¹ P_u / φP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 110	3/4	4.50	4.35	195.1 K=0.70	0.44	-0.04	2.62	0.016 ¹
T2	110 - 90	*3/4 SR w/ 3/4 Clip	4.50	4.35	193.5 K=1.00	0.44	-0.45	2.67	0.169 ¹
T3	90 - 70	7/8	4.50	4.33	166.4 K=0.70	0.60	-0.23	4.91	0.047 ¹
T4	70 - 50	*7/8 SR w/ 7/8 SR Clipped	4.50	4.26	165.0 K=1.00	0.60	-0.11	4.98	0.023 ¹

¹ P_u / φP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 110	3/4	4.50	4.35	195.1 K=0.70	0.44	-0.20	2.62	0.077 ¹
T2	110 - 90	*3/4 SR w/ 3/4 Clip	4.50	4.35	193.5 K=1.00	0.44	-0.30	2.67	0.113 ¹
T3	90 - 70	*7/8 SR w/ 7/8 SR Clipped	4.50	4.33	167.7 K=1.00	0.60	-0.33	4.82	0.068 ¹
T4	70 - 50	*7/8 SR w/ 7/8 SR Clipped	5.00	4.76	184.3 K=1.00	0.60	-1.38	3.99	0.346 ¹

¹ P_u / φP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 110	1 3/4	10.00	0.08	2.3	2.41	4.35	108.24	0.040 ¹
T2	110 - 90	1 3/4	20.00	0.08	2.3	2.41	42.38	108.24	0.392 ¹
T3	90 - 70	2	20.00	0.08	2.0	3.14	110.31	141.37	0.780 ¹
T4	70 - 50	*2-1/4 SR w/ Half 2.5 X- Strong	20.00	2.49	47.8	5.10	171.46	229.63	0.747 ¹
T5	50 - 40	PiRod 105244 + (2) 1-1/4" Tie-Rods	10.02	10.02	35.2	6.13	172.16	275.93	0.624 ¹
T6	40 - 20	PiRod 105216 + (2) 1-1/4" Tie-Rods	20.03	10.02	35.2	6.13	190.74	275.93	0.691 ¹
T7	20 - 0	PiRod 105217 + (2) 1-1/2" Tie-Rods	20.03	10.02	29.3	8.83	206.17	397.41	0.519 ¹

¹ P_u / φP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	KI/r	ϕP_n K	A in ²	V_u K	ϕV_n K	Stress Ratio
T5	50 - 40	0.5	1.47	98.5	275.93	0.20	1.54	4.87	0.317
T6	40 - 20	0.5	1.47	98.5	275.93	0.20	0.77	4.27	0.181
T7	20 - 0	0.5	1.45	97.4	397.41	0.20	1.34	4.32	0.311

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	KI/r	A in ²	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 110	3/4	5.14	2.49	159.1	0.44	0.68	14.31	0.047 ¹
T2	110 - 90	*3/4 SR w/ 3/4 Clip	5.14	2.49	110.5	0.44	4.56	14.31	0.318 ¹
T3	90 - 70	7/8	5.14	2.47	135.7	0.60	7.06	19.48	0.363 ¹
T4	70 - 50	*7/8 SR w/ 7/8 SR Clipped	5.17	2.47	95.6	0.60	6.07	19.44	0.312 ¹
T5	50 - 40	L2 1/2x2 1/2x3/16	11.42	5.02	80.1	0.52	7.53	22.55	0.334 ¹
T6	40 - 20	L2 1/2x2 1/2x3/16	11.93	5.42	86.2	0.52	5.50	22.55	0.244 ¹
T7	20 - 0	*L2.5x2.5x3/16 + PL2.5x1/4	13.80	6.54	106.7	1.82	7.23	58.94	0.123 ¹

¹ $P_u / \phi P_n$ controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	KI/r	A in ²	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T3	90 - 70	1 1/4	4.50	4.33	166.4	1.23	1.91	39.76	0.048 ¹

¹ $P_u / \phi P_n$ controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	KI/r	A in ²	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 110	3/4	4.50	4.35	278.7	0.44	0.03	14.31	0.002 ¹
T2	110 - 90	*3/4 SR w/ 3/4 Clip	4.50	4.35	193.5	0.44	0.46	14.31	0.032 ¹
T3	90 - 70	7/8	4.50	4.33	237.7	0.60	0.22	19.48	0.011 ¹
T4	70 - 50	*7/8 SR w/ 7/8 SR Clipped	4.50	4.26	165.0	0.60	0.11	19.44	0.006 ¹

¹ $P_u / \phi P_n$ controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	KI/r	A in ²	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 110	3/4	4.50	4.35	278.7	0.44	0.21	14.31	0.014 ¹

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	110 - 90	*3/4 SR w/ 3/4 Clip	4.50	4.35	193.5	0.44	0.32	14.31	0.022 ¹
T3	90 - 70	*7/8 SR w/ 7/8 SR Clipped	4.50	4.33	167.7	0.60	0.29	19.44	0.015 ¹
T4	70 - 50	*7/8 SR w/ 7/8 SR Clipped	5.00	4.76	184.3	0.60	1.48	19.44	0.076 ¹

¹ $P_u / \phi P_n$ controls

Section Capacity Table

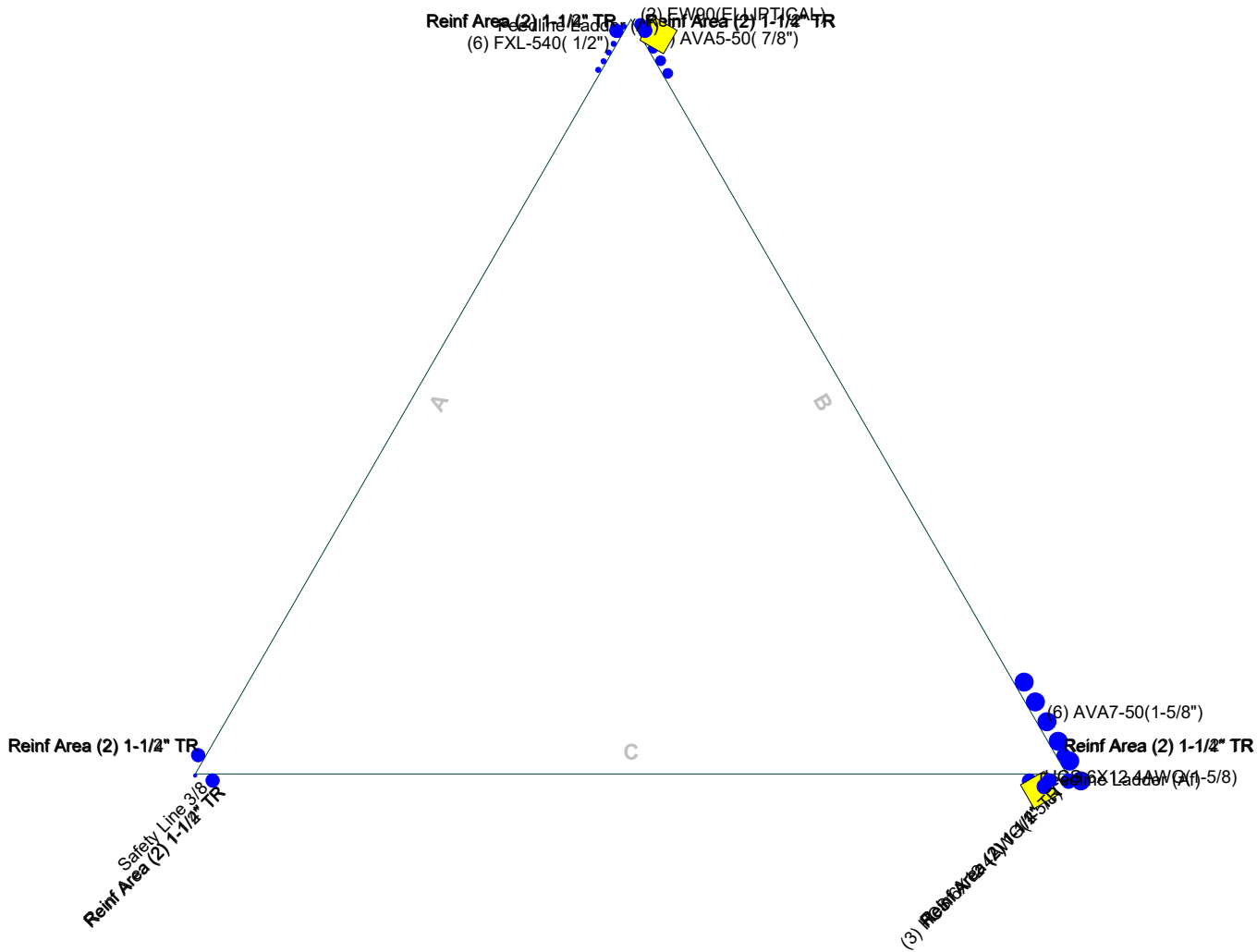
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail	
T1	120 - 110	Leg	1 3/4	2	-4.31	77.19	5.6	Pass	
T2	110 - 90	Leg	1 3/4	35	-43.95	77.19	56.9	Pass	
T3	90 - 70	Leg	2	91	-110.44	132.51	83.3	Pass	
T4	70 - 50	Leg	*2-1/4 SR w/ Half 2.5 X- Strong	172	-178.57	194.35	91.9	Pass	
T5	50 - 40	Leg	PiRod 105244 + (2) 1-1/4" Tie- Rods	229	-178.99	252.06	71.0	Pass	
T6	40 - 20	Leg	PiRod 105216 + (2) 1-1/4" Tie- Rods	238	-200.61	252.06	79.6	Pass	
T7	20 - 0	Leg	PiRod 105217 + (2) 1-1/2" Tie-Rods	253	-220.32	373.21	59.0 63.0 (b)	Pass	
T1	120 - 110	Diagonal	3/4	15	-0.67	4.87	13.8	Pass	
T2	110 - 90	Diagonal	*3/4 SR w/ 3/4 Clip	44	-4.59	7.53	60.9	Pass	
T3	90 - 70	Diagonal	7/8	100	-7.20	8.88	81.1	Pass	
T4	70 - 50	Diagonal	*7/8 SR w/ 7/8 SR Clipped	188	-6.07	11.24	53.9	Pass	
T5	50 - 40	Diagonal	L2 1/2x2 1/2x3/16	232	-8.18	13.38	61.2	Pass	
T6	40 - 20	Diagonal	L2 1/2x2 1/2x3/16	244	-5.39	10.79	82.4 (b) 49.9	Pass	
T7	20 - 0	Diagonal	*L2.5x2.5x3/16 + PL2.5x1/4	256	-7.73	32.37	60.1 (b) 23.9	Pass	
T3	90 - 70	Secondary Horizontal	1 1/4	115	-1.91	19.47	24.3 (b) 9.8	Pass	
T1	120 - 110	Top Girt	3/4	6	-0.04	2.62	1.6	Pass	
T2	110 - 90	Top Girt	*3/4 SR w/ 3/4 Clip	39	-0.45	2.67	16.9	Pass	
T3	90 - 70	Top Girt	7/8	96	-0.23	4.91	4.7	Pass	
T4	70 - 50	Top Girt	*7/8 SR w/ 7/8 SR Clipped	177	-0.11	4.98	2.3	Pass	
T1	120 - 110	Bottom Girt	3/4	8	-0.20	2.62	7.7	Pass	
T2	110 - 90	Bottom Girt	*3/4 SR w/ 3/4 Clip	42	-0.30	2.67	11.3	Pass	
T3	90 - 70	Bottom Girt	*7/8 SR w/ 7/8 SR Clipped	98	-0.33	4.82	6.8	Pass	
T4	70 - 50	Bottom Girt	*7/8 SR w/ 7/8 SR Clipped	179	-1.38	3.99	34.6	Pass	
							Summary		
							Leg (T4)	91.9	Pass
							Diagonal (T5)	82.4	Pass
							Secondary Horizontal (T3)	9.8	Pass
							Top Girt (T2)	16.9	Pass
							Bottom Girt (T4)	34.6	Pass
							Bolt	82.4	Pass
							Checks		
							RATING =	91.9	Pass

***NOTE: Above stress ratios for reinforced sections are approximate. More exact calculations are presented in Appendix C.**

APPENDIX B
BASE LEVEL DRAWING

Feed Line Plan

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





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Job: 10473.CTHA242A - Modification Analysis		
Project: 120' Self-Support Tower		
Client: T-Mobile	Drawn by: Ian Marinaccio	App'd:
Code: TIA-222-G	Date: 10/02/20	Scale: NTS
Path:		Dwg No. E-7
© Newburgh\Projects\10473-AISS\10473.CTHA242A\StructuralTower_Analysis\Reinf_Rev D\10473.CTHA242A - TowerModification54.dwg		

APPENDIX C
ADDITIONAL CALCULATIONS

Additional SR Diagonals with Clips

Work Order #:	10473.CTHA242A
Site name:	HA242/PortlandHS_SST
Elevation:	90 - 110 ft

TIA-222 Revision: **G**

Analysis Inputs		
Compression Load, P_u :	4.59	kip
Unbraced length, L_b :	2.71	ft
Existing SR Diameter:	0.75	in
SR Yield Strength:	36	ksi
Proposed SR Diameter:	0.75	in
Clip Spacing:	11	in

Max Spacing = 12in

Bracing Type		
Bracing Type, k :	K-Braced (Continuous)	

Existing Member Properties		
Area, A_e :	0.44	in ²
Moment of Inertia, I_e :	0.02	in ⁴
Radius of Gyration, r_e :	0.19	in

Proposed Member Properties		
Area, A_p :	0.44	in ²
Moment of Inertia, I_p :	0.02	in ⁴
Radius of Gyration, r_p :	0.19	in

Modified Member Properties		
Area, A_m :	0.44	in ²
Moment of Inertia, I_m :	0.03	in ⁴
Radius of Gyration, r_m :	0.27	in

Results				
	Demand	Capacity	Rating	Check
Compression (Modified Section), kip:	4.59	9.71	47.3%	Pass
Compression (Existing Section), kip:	4.59	6.59	69.7%	

Design Information		
Existing Slenderness Ratio Check:	OK	
Proposed Slenderness Ratio Check:	OK	
Number of Clips, N_c :	4	
Clip Spacing, S_c :	8.17	in
K Factor to enter into TNX:	0.495	

Complete Flange Bypass Plate Capacity Check - AISC 14th Edition						
Location:	70 ft			Code:	LRFD	
$\Phi_t =$	0.9	LRFD		$\Omega_t =$	1.67	ASD
$\Phi_{r/w} =$	0.75			$\Omega_{r/w} =$	2	
$\Phi_c =$	0.9			$\Omega_c =$	1.67	
Bypass Plate				QTY =	2	
Length=	38	in		$A_T =$	2.5	in ²
Width at Flange=	5	in		$KL/r =$	77.59588	
Thickness =	0.5	in		$F_e =$	47.53576	ksi
$F_y =$	50	ksi		$4.71V(E/F_y) =$	113.4318	
$F_u =$	65	ksi		$F_{cr} =$	32.19384	ksi
$U =$	1			$z =$	0.894447	
$L_u =$	14	in		Capacities:		
$r_x =$	1.443376	in		Tension =	112.5	k
$r_y =$	0.144338	in		Buckling =	93.8	k
$K =$	0.8			Compression =	64.8	k
$E =$	29000	ksi		Connection		
Weld Material	E70XX			$e_x =$	4.125	inch
$C1 =$	1			$a =$	0.34375	
$D =$	3	1/16 th Weld		$C =$	2.901875	
$l =$	12	inch		$\Phi R_n =$	78.35063	K
Loads per TNX (max of leg section above connection)						
	Compression=	113.5	kips			
	Tension=	113.38	kips			
Plate Capacity Ratings						
	Buckling=	61%		GOVERNS		
	Compression=	88%				
	Tension=	50%				
	Weld=	72%				

Additional SR Diagonals with Clips

Work Order #:	10473.CTHA242A
Site name:	HA242/PortlandHS_SST
Elevation:	50 - 70 ft

TIA-222 Revision: G

Analysis Inputs		
Compression Load, P_u :	6.07	kip
Unbraced length, L_b :	2.68	ft
Existing SR Diameter:	0.875	in
SR Yield Strength:	36	ksi
Proposed SR Diameter:	0.875	in
Clip Spacing:	11	in

Max Spacing = 12in

Bracing Type	
Bracing Type, k :	K-Braced (Continuous)

Existing Member Properties		
Area, A_e :	0.60	in ²
Moment of Inertia, I_e :	0.03	in ⁴
Radius of Gyration, r_e :	0.22	in

Proposed Member Properties		
Area, A_p :	0.60	in ²
Moment of Inertia, I_p :	0.03	in ⁴
Radius of Gyration, r_p :	0.22	in

Modified Member Properties		
Area, A_m :	0.60	in ²
Moment of Inertia, I_m :	0.06	in ⁴
Radius of Gyration, r_m :	0.31	in

Results				
	Demand	Capacity	Rating	Check
Compression (Modified Section), kip:	6.07	12.79	47.5%	Pass
Compression (Existing Section), kip:	6.07	11.16	54.4%	

Design Information		
Existing Slenderness Ratio Check:	OK	
Proposed Slenderness Ratio Check:	OK	
Number of Clips, N_c :	4	
Clip Spacing, S_c :	8.05	in
K Factor to enter into TNX:	0.608	

Reinforcement Capacity Check - LRFD (AISC 14th Edition)					
Section:	50 - 70 ft	2-1/4" SR w/ Half 2.5" X-Strong			
Solid Round					
E=	29000	ksi	$0.114 E/F_y = 66.12$ $F_y = 50 \text{ ksi}$ $KL/r = 53.33$ $\lambda_c = 0.70$ $F_{cr} = 40.61 \text{ ksi}$ Section Capacity = 145.33 kips		
F _y =	50	ksi			
F _U =	65	ksi			
A _p =	3.9761	in ²			
r _x = r _y	0.5625	in			
L _p =	30	in			
K=	1				
Split Pipe					
F _y =	50	ksi	$D_{sp}/t_{sp} = 10.42$ $0.114 E/F_y = 66.12$ $D_{sp}/t_{sp} \leq 0.114 E/F_y$ $F_y = 50 \text{ ksi}$ $KL/r = 24.34$ $\lambda_c = 0.32$ $F_{cr} = 47.88 \text{ ksi}$ Section Capacity = 48.56 kips		
A _{sp} =	1.1268	in ²			
D _{sp} =	2.875	in			
t _{sp} =	0.2760	in			
r _x =	0.740	in			
r _y =	0.924	in			
Spacing=	18	in			
K=	1	U-Bolted			
Composite Section					
A _c =	5.1029	in ²	$F_y = 50 \text{ ksi}$ $KL/r = 47.96$ $\lambda_c = 0.63$ $F_{cr} = 42.26 \text{ ksi}$ Section Capacity = 194.08 kips		
r _x =	0.626	in			
r _y =	0.660	in			
L _c =	30	in			
K=	1				
Connection Option					
Welded			Weld Capacity		
Length	12	in	F _w =	42	ksi
Weld Size	0.1875	in	A _w =	3.2	in ²
F _{EXX}	70	ksi	Phi * R _n =	100.2	kips
Max Load per TNX (Compression)					
With wind and Reinf. =		178.57	kips		
Force in Leg =		139.14	kips		
Force in Reinf. =		39.43	kips		
Capacity					
Existing Leg =		145.33	kips		95.7%
Reinforcing Half Pipe =		48.56	kips		81.2%
Composite Leg =		194.08	kips		92.0%
Leg Crushing =		178.92	kips		99.8%
Design Axial Strength =		186.51	kips		95.7%
Weld =		100.2	kips		39.3%

Truss Leg Reinforcement

Work Order # :	10473.CTHA242A
Site Name:	HA242/PortlandHS_SST
PiRod	105216
Elevation:	40 - 50 ft

TIA-222 Revision: G

Existing Tie Rods	
Diameter, de:	1.25 in
Unbraced Length, Le:	14.1875 in
Yield Strength, Fye:	50 ksi

(2) Additional Tie Rods	
Diameter, dn:	1.25 in
Unbraced Length, Ln:	15 in
Offset, X:	0.625 in
Yield Strength, Fyn:	50 ksi

Truss Leg	
Width, w:	12 in
Unbraced Length, Lleg:	10 ft

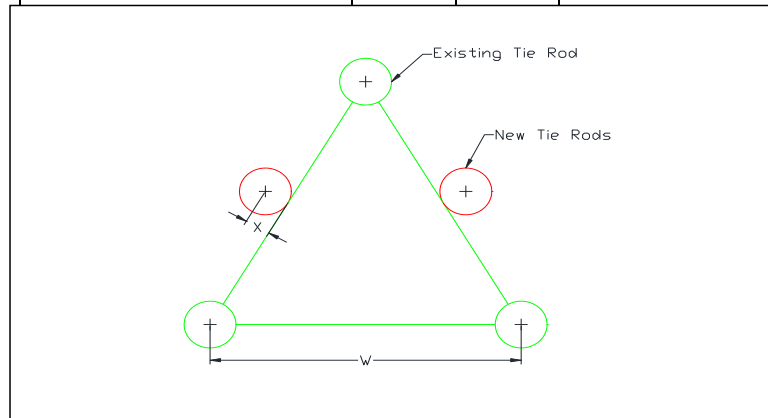
Reactions from tnx	
Compression, C:	178.99 kip
Tension, T:	172.16 kip

Output from tnx	
KL/r Modified Leg, KLtnx:	35.2

Length Factors	
Length Factor of Existing Tie Rods, Ke:	1
Length Factor of New Tie Rods, Kn:	1
Length Factor of the Leg, Kleg:	1

Results				
	Demand	Capacity	Rating	Check
Compression (Existing Tie Rods), kip:	35.80	47.50	75%	Pass
Compression (New Tie Rods), kip:	35.80	46.66	77%	Pass
Compression (Modified Tie Rods), kip:	178.99	257.98	69%	Pass
Tension (Existing Tie Rods), kip:	34.43	55.22	62%	Pass
Tension (New Tie Rods), kip:	34.43	55.22	62%	Pass
Tension (Modified Tie Rods), kip:	172.16	276.12	62%	Pass

Adjustments for tnx		
Diameter of modified truss leg, Deqv:	1.614	in



Truss Leg Reinforcement

Work Order # :	10473.CTHA242A
Site Name:	HA242/PortlandHS_SST
PiRod	105216
Elevation:	20 - 40 ft

TIA-222 Revision: G

Existing Tie Rods	
Diameter, de:	1.25 in
Unbraced Length, Le:	14.1875 in
Yield Strength, Fye:	50 ksi

(2) Additional Tie Rods	
Diameter, dn:	1.25 in
Unbraced Length, Ln:	15 in
Offset, X:	0.625 in
Yield Strength, Fyn:	50 ksi

Truss Leg	
Width, w:	12 in
Unbraced Length, Lleg:	10 ft

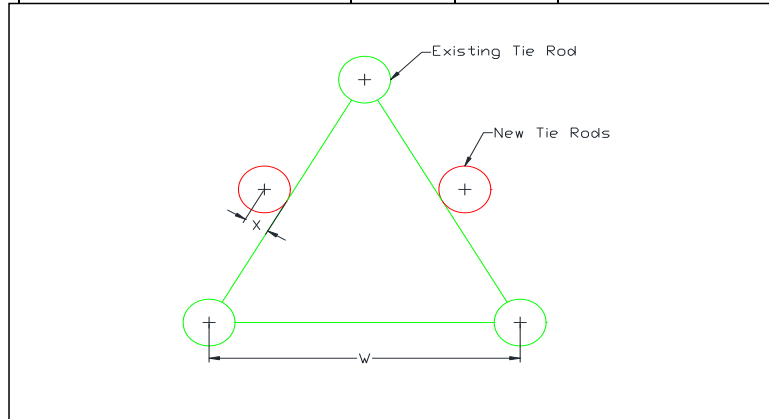
Reactions from tnx	
Compression, C:	200.61 kip
Tension, T:	190.74 kip

Output from tnx	
KL/r Modified Leg, KLtnx:	35.2

Length Factors	
Length Factor of Existing Tie Rods, Ke:	1
Length Factor of New Tie Rods, Kn:	1
Length Factor of the Leg, Kleg:	1

Results				
	Demand	Capacity	Rating	Check
Compression (Existing Tie Rods), kip:	40.12	47.50	84%	Pass
Compression (New Tie Rods), kip:	40.12	46.66	86%	Pass
Compression (Modified Tie Rods), kip:	200.61	257.98	78%	Pass
Tension (Existing Tie Rods), kip:	38.15	55.22	69%	Pass
Tension (New Tie Rods), kip:	38.15	55.22	69%	Pass
Tension (Modified Tie Rods), kip:	190.74	276.12	69%	Pass

Adjustments for tnx		
Diameter of modified truss leg, Deqv:	1.614	in



Truss Leg Reinforcement

Work Order # :	10473.CTHA242A
Site Name:	HA242/PortlandHS_SST
PiRod	105217
Elevation:	0 - 20 ft

TIA-222 Revision: G

Existing Tie Rods	
Diameter, de:	1.5 in
Unbraced Length, Le:	14.1875 in
Yield Strength, Fye:	50 ksi

(2) New Tie Rods	
Diameter, dn:	1.5 in
Unbraced Length, Ln:	21 in
Offset, X:	0.75 in
Yield Strength, Fyn:	50 ksi

Truss Leg	
Width, w:	12 in
Unbraced Length, Lleg:	10 ft

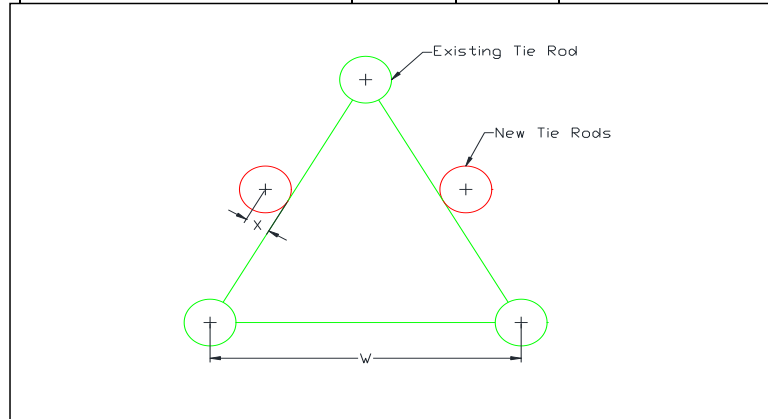
Reactions from tnx	
Compression, C:	220.32 kip
Tension, T:	206.17 kip

Output from tnx	
KL/r Modified Leg, KLtnx:	29.3

Length Factors	
Length Factor of Existing Tie Rods, Ke:	1
Length Factor of New Tie Rods, Kn:	1
Length Factor of the Leg, Kleg:	1

Results				
	Demand	Capacity	Rating	Check
Compression (Existing Tie Rods), kip:	44.06	71.62	62%	Pass
Compression (New Tie Rods), kip:	44.06	63.23	70%	Pass
Compression (Modified Tie Rods), kip:	220.32	371.67	59%	Pass
Tension (Existing Tie Rods), kip:	41.23	79.52	52%	Pass
Tension (New Tie Rods), kip:	41.23	79.52	52%	Pass
Tension (Modified Tie Rods), kip:	206.17	397.61	52%	Pass

Adjustments for tnx		
Diameter of modified truss leg, Deqv:	1.936	in



Project Information

Work Order #:	10473.CTHA242
Site Name	HA242/PortlandHS_SST

Tower Information

Tower Type	Self Support
TIA-222 Rev	G

Load Z Normalization

Applied Loads

	Comp.	Uplift
Axial (k)	230.00	214.00
Shear (k)	20.00	19.00

Anchor Rod Data

Quantity:	6
Diameter (in):	1
Material Grade:	A687
Grout Considered:	No
l_{ar} (in):	0
Eta Factor, η :	0.5
Thread Type:	N-Included
Configuration:	Symmetrical

Fy=105 ksi Fu=150 ksi

Anchor Rod Results

Axial, Pu_c (kips)	38.33
Shear, Vu (kips)	3.33
Moment, Mu (kip-in)	-
Axial Cap., ϕPn_t (kips)	60.60
Shear Cap., ϕVn (kips)	-
Moment Cap., ϕMn (kip-in)	-
Stress Rating	74.3%

Pass

SST Unit Base Foundation

Work Order # : 10473.CTHA242A
 Site Name: HA242/PortlandHS_SST

TIA-222 Revision: G

Top & Bot. Pad Rein. Different?:	<input type="checkbox"/>
Tower Centroid Offset?:	<input type="checkbox"/>
Block Foundation?:	<input type="checkbox"/>

Superstructure Analysis Reactions		
Global Moment, M :	1918	ft-kips
Global Axial, P :	27	kips
Global Shear, V :	27	kips
Leg Compression, P_{comp} :	230	kips
Leg Comp. Shear, V_{u,comp} :	20	kips
Leg Uplift, P_{uplift} :	214	kips
Leg Uplift. Shear, V_{u,uplift} :	19	kips
Tower Height, H :	120	ft
Base Face Width, BW :	10	ft
BP Dist. Above Fdn, bp_{dist} :	3	in

Foundation Analysis Checks				
	Capacity	Demand	Rating	Check
<i>Lateral (Sliding) (kips)</i>	147.51	27.00	18.3%	Pass
<i>Bearing Pressure (ksf)</i>	13.50	9.82	72.8%	Pass
<i>Overturning (kip*ft)</i>	2154.70	2100.25	97.5%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	427.58	90.00	21.0%	Pass
<i>Pier Flexure (Tension) (kip*ft)</i>	134.59	85.50	63.5%	Pass
<i>Pier Compression (kip)</i>	2321.21	233.98	10.1%	Pass
<i>Pad Flexure (kip*ft)</i>	1122.85	815.17	72.6%	Pass
<i>Pad Shear - 1-way (kips)</i>	320.26	228.99	71.5%	Pass
<i>Pad Shear - Comp 2-way (ksi)</i>	0.164	0.080	48.7%	Pass

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, dpier :	2.5	ft
Ext. Above Grade, E :	0.50	ft
Pier Rebar Size, Sc :	7	
Pier Rebar Quantity, mc :	10	
Pier Tie/Spiral Size, St :	4	
Pier Tie/Spiral Quantity, mt :	10	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

Soil Rating:	97.5%
Structural Rating:	72.6%

Pad Properties		
Depth, D :	6.00	ft
Pad Width, W :	16.50	ft
Pad Thickness, T :	2.00	ft
Pad Rebar Size (Bottom), Sp :	7	
Pad Rebar Quantity (Bottom), mp :	22	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, Fy :	60	ksi
Concrete Compressive Strength, F'c :	3	ksi
Dry Concrete Density, δc :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	130	pcf
Ultimate Gross Bearing, Qult :	18.000	ksf
Cohesion, Cu :		ksf
Friction Angle, φ :	34	degrees
SPT Blow Count, N_{blows} :		
Base Friction, μ :		
Neglected Depth, N :		ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	N/A	ft

-- Toggle between Gross and Net

CONNECTICUT DESIGN CRITERIA - STATE

Revison:

CT is NOT a Home Rule State; Tab added only for Design Criteria

(APPENDIX N) MUNICIPALITY - SPECIFIC STRUCTURAL DESIGN PARAMETERS

Municipality	Ground Snow Load	Wind Design Parameters							
		MCE Spectral Accelerations (%g)		Ultimate Design Wind Speeds, V_{ult} (mph)			Nominal Design Wind Speeds, V_{asd} (mph)		
		S_s	S_1	Risk Cat. I	Risk Cat. II	Risk Cat III-IV	Risk Cat. I	Risk Cat. II	Risk Cat. III-IV
Andover	30	0.176	0.063	120	130	140	93	101	108
Ansonia	30	0.195	0.064	115	125	135	89	97	105
Ashford	35	0.173	0.063	120	130	140	93	101	108
Avon	35	0.181	0.064	110	120	130	85	93	101
Barkhamsted	40	0.177	0.065	110	120	125	85	93	97
Beacon Falls	30	0.192	0.064	115	125	135	89	97	105
Berlin	30	0.183	0.063	115	125	135	89	97	105
Bethany	30	0.189	0.063	115	125	135	89	97	105
Bethel	30	0.215	0.066	110	120	125	85	93	97
Bethlehem	35	0.190	0.065	110	120	125	85	93	97
Bloomfield	35	0.180	0.064	115	125	130	89	97	101
Bolton	30	0.177	0.063	115	125	135	89	97	105
Bozrah	30	0.170	0.061	120	135	145	93	105	112
Branford	30	0.180	0.061	120	130	140	93	101	108
Bridgeport	30	0.209	0.064	115	125	135	89	97	105
Bridgewater	35	0.201	0.066	110	120	125	85	93	97
Bristol	35	0.185	0.064	110	120	130	85	93	101
Brookfield	35	0.208	0.066	110	120	125	85	93	97
Brooklyn	35	0.171	0.062	120	130	140	93	101	108
Burlington	35	0.182	0.064	110	120	130	85	93	101
Canaan	40	0.173	0.065	105	115	120	81	89	93
Canterbury	35	0.171	0.061	120	130	140	93	101	108
Canton	35	0.180	0.064	110	120	130	85	93	101
Chaplin	35	0.173	0.062	120	130	140	93	101	108
Cheshire	30	0.186	0.063	115	125	135	89	97	105
Chester	30	0.172	0.060	120	130	140	93	101	108
Clinton	30	0.169	0.059	120	135	140	93	105	108
Colchester	30	0.174	0.061	120	130	140	93	101	108
Colebrook	40	0.174	0.065	105	115	125	81	89	97
Columbia	30	0.175	0.062	120	130	140	93	101	108
Cornwall	40	0.180	0.065	105	115	120	81	89	93
Coventry	30	0.176	0.063	120	130	140	93	101	108
Cromwell	30	0.181	0.063	115	125	135	89	97	105
Danbury	30	0.217	0.067	110	120	125	85	93	97
Darien	30	0.242	0.068	110	120	130	85	93	101
Deep River	30	0.170	0.060	120	130	140	93	101	108
Derby	30	0.195	0.064	115	125	135	89	97	105
Durham	30	0.179	0.062	115	130	140	89	101	108
Eastford	40	0.172	0.063	120	130	140	93	101	108
East Granby	35	0.177	0.065	110	120	130	85	93	101
East Haddam	30	0.172	0.061	120	130	140	93	101	108
East Hampton	30	0.177	0.062	120	130	140	93	101	108

East Hartford	30	0.180	0.064	115	125	135	89	97	105
East Haven	30	0.182	0.062	120	130	140	93	101	108
East Lyme	30	0.164	0.059	125	135	145	97	105	112
Easton	30	0.215	0.066	110	120	130	85	93	101
East Windsor	35	0.177	0.064	115	125	135	89	97	105
Ellington	35	0.176	0.064	115	125	135	89	97	105
Enfield	35	0.176	0.065	110	125	130	85	97	101
Essex	30	0.168	0.059	120	135	145	93	105	112
Fairfield	30	0.215	0.065	115	125	135	89	97	105
Farmington	35	0.183	0.064	115	125	135	89	97	105
Franklin	30	0.171	0.061	120	130	140	93	101	108
Glastonbury	30	0.180	0.063	115	125	135	89	97	105
Goshen	40	0.181	0.065	105	115	125	81	89	97
Granby	35	0.176	0.065	110	120	130	85	93	101
Greenwich	30	0.259	0.070	110	120	130	85	93	101
Griswold	30	0.168	0.060	125	135	145	97	105	112
Groton	30	0.160	0.058	125	135	145	97	105	112
Guilford	30	0.176	0.061	120	130	140	93	101	108
Haddam	30	0.175	0.061	120	130	140	93	101	108
Hamden	30	0.185	0.063	115	125	135	89	97	105
Hampton	35	0.172	0.062	120	130	140	93	101	108
Hartford	30	0.181	0.064	115	125	135	89	97	105
Hartland	40	0.175	0.065	110	120	125	85	93	97
Harwinton	35	0.183	0.065	110	120	130	85	93	101
Hebron	30	0.177	0.063	120	130	140	93	101	108
Kent	40	0.188	0.065	105	115	120	81	89	93
Killingly	40	0.171	0.062	120	130	140	93	101	108
Killingworth	30	0.173	0.061	120	130	140	93	101	108
Lebanon	30	0.173	0.062	120	130	140	93	101	108
Ledyard	30	0.163	0.059	125	135	145	97	105	112
Lisbon	30	0.169	0.061	125	135	145	97	105	112
Litchfield	40	0.184	0.065	110	120	125	85	93	97
Lyme	30	0.164	0.059	125	135	145	97	105	112
Madison	30	0.173	0.060	120	130	140	93	101	108
Manchester	30	0.178	0.064	115	125	135	89	97	105
Mansfield	35	0.173	0.062	120	130	140	93	101	108
Marlborough	30	0.177	0.062	120	130	140	93	101	108
Meriden	30	0.183	0.063	115	125	135	89	97	105
Middlebury	35	0.191	0.064	110	120	130	85	93	101
Middlefield	30	0.181	0.063	115	125	135	89	97	105
Middletown	30	0.180	0.063	115	130	135	89	101	105
Milford	30	0.194	0.063	115	125	135	89	97	105
Monroe	30	0.205	0.065	110	120	130	85	93	101
Montville	30	0.165	0.059	125	135	145	97	105	112
Morris	35	0.187	0.065	110	120	125	85	93	97
Naugatuck	30	0.190	0.064	110	125	135	85	97	105
New Britain	30	0.183	0.064	115	125	135	89	97	105
New Canaan	30	0.240	0.068	110	120	130	85	93	101
New Fairfield	35	0.212	0.067	105	115	125	81	89	97
Portland	30	0.180	0.063	115	130	135	89	101	105
Preston	30	0.167	0.060	125	135	145	97	105	112
Prospect	30	0.188	0.064	115	125	135	89	97	105
Putnam	40	0.172	0.063	120	130	140	93	101	108

Ice

Results:

Ice Thickness: 0.75 in.

Concurrent Temperature: 15 F

Gust Speed: 50 mph

Data Source: Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

Date Accessed: Mon Jul 27 2020

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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APPENDIX D
MODIFICATION DRAWINGS

MODIFICATION INSPECTION (MI) CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWING
X	EOR APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
X	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
NA	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS: -----	
CONSTRUCTION	
X	GENERAL CONSTRUCTION INSPECTION
X	SPECIAL INSPECTION OF STRUCTURAL STEEL ERECTION & BOLTING
X	SPECIAL INSPECTION OF FIELD WELDING
NA	CONTINUOUS FOUNDATION INSPECTIONS
NA	CONCRETE COMPRESSIVE STRENGTH AND SLUMP TESTS
NA	GROUT COMPRESSIVE STRENGTH TESTS (ASTM C942)
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION AND NDE REPORTS
NA	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
NA	NON-TENSION CONTROLLED BOLT INSPECTION (AS REQUIRED)
ADDITIONAL TESTING AND INSPECTIONS: -----	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS: -----	

NOTE: X DENOTES A DOCUMENT REQUIRED FOR THE MI REPORT
 NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT

MODIFICATION INSPECTION NOTES

GENERAL
 THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY AN OWNER APPROVED ENGINEERING VENDOR THAT IS APPROVED TO PERFORM ELEVATED WORK FOR THE OWNER.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PURCHASE ORDER (PO) IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, REFER TO THE PROJECT CONTACTS LISTED IN THE PROJECT DIRECTORY ON SHEET T-1.

MI INSPECTOR
 THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GC INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO THE OWNER.

GENERAL CONTRACTOR
 THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST.

RECOMMENDATIONS
 THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING AN MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF FIVE (5) BUSINESS DAYS NOTICE, PREFERABLY TEN (10), TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW THE FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI
 IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, THE OWNER SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF THE OWNER CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S
 IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ('FAILED MI'), THE GC SHALL WORK WITH THE OWNER TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH THE OWNER'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

MI VERIFICATION INSPECTIONS
 THE OWNER RESERVES THE RIGHT TO CONDUCT AN MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT INSPECTION FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

REQUIRED PHOTOS
 BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION:
 - RAW MATERIALS
 - PHOTOS OF ALL CRITICAL DETAILS
 - FOUNDATION MODIFICATIONS
 - WELD PREPARATION
 - BOLT INSTALLATION AND TORQUE
 - FINAL INSTALLED CONDITION
 - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS:
 - FINAL IN FIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN ONLY FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

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 NORTHEAST, LLC.
**35 GRIFFIN ROAD SOUTH
 BLOOMFIELD, CT 06002**

NSS NORTHEAST
 SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
 RF _____
 CONSTRUCTION _____
 OPERATIONS _____
 SITE ACQ. _____

PROJECT NUMBER 10473.CTHA242A DESIGNED BY EI

REV.	DATE	DESCRIPTION	DRAWN BY
A	10/2/20	FOR COMMENT	MB

ISSUED BY _____ DATE _____



SITE INFORMATION

HA242/PORTLANDHS_SST
 CTHA242A
 95 HIGH STREET
 PORTLAND, CT 06480

SHEET TITLE

TOWER REINFORCEMENT
 MODIFICATION
 INSPECTION
 CHECKLIST & NOTES

SHEET NUMBER

SN-1

TOWER REINFORCEMENT NOTES

GENERAL

- ALL REFERENCES TO THE OWNER IN THESE DOCUMENTS SHALL BE CONSIDERED T-MOBILE OR ITS DESIGNATED REPRESENTATIVE.
- ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR, UNLESS NOTED OTHERWISE. THE CONTRACTOR MUST HAVE CONSIDERABLE EXPERIENCE IN THE PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED, THAT HE IS PROPERLY LICENSED, AND THAT HE IS PROPERLY REGISTERED TO DO THIS WORK IN THE STATE AND/OR COUNTY IN WHICH IT IS TO BE PERFORMED.
- NOTES AND TYPICAL DETAILS ARE APPLICABLE TO ALL PARTS OF THE STRUCTURE, ALL MATERIALS LISTED HEREIN, ANY PROCEDURES TO BE USED ON THIS PROJECT, AND SHALL BE READ IN CONJUNCTION WITH THE STRUCTURAL DRAWINGS AND PROJECT SPECIFICATIONS.
- CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING, AND SHALL RECEIVE IN WRITING, AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
- CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST CONSTRUCTION SKILLS AND ATTENTION. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT, UNLESS OTHERWISE NOTED.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS AND APPROVALS FROM ALL AUTHORITIES HAVING JURISDICTION FOR THIS PROJECT AND SHALL NOTIFY THE APPLICABLE JURISDICTIONAL (STATE, COUNTY, OR CITY) ENGINEER 24 HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
- ERECT GUARDS AND BARRIERS PER APPLICABLE LABOR AND CONSTRUCTION SAFETY REGULATIONS.
- THE CONTRACTOR SHALL INSPECT THE EXISTING STRUCTURE AND FIELD VERIFY ALL EXISTING CONDITIONS, POSSIBLE INTERFERENCES, AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO THE ENGINEER OF RECORD (EOR) AND FIELD PERSONNEL IMMEDIATELY. ANY AND ALL FIELD CHANGES SHALL BE APPROVED AND DOCUMENTED BY THE EOR PRIOR TO FIELD IMPLEMENTATION.
- ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR TWO (2) YEARS FROM THE ACCEPTANCE DATE UPON COMPLETION OF CONSTRUCTION.
- USE ONLY THE LATEST ISSUES OF ANY APPLICABLE CODES, STANDARDS, OR REGULATIONS MENTIONED IN THE FOLLOWING NOTES AND SPECIFICATIONS, UNLESS SPECIFICALLY NOTED OTHERWISE.
- ALL WORKMANSHIP SHALL BE IN ACCORDANCE WITH ANSI, ASTM, ACI, TIA, AND AISC STANDARDS AS REFERENCED IN THE APPLICABLE CODE.
- STRUCTURAL ELEMENTS SHOWN ON THESE DRAWINGS ARE DESIGNED IN ACCORDANCE WITH APPLICABLE BUILDING CODES/STANDARDS. ALL CONSTRUCTION, EXCEPT WHERE NOTED OTHERWISE, SHALL COMPLY WITH THOSE CODES/STANDARDS.
- ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS, AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER OF RECORD PRIOR TO FABRICATION AND INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
- ALL MANUFACTURER'S HARDWARE ASSEMBLY INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK WITHIN THE WORK AREA AND ANY ADJACENT AREAS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. THE CONTRACTOR IS ALSO RESPONSIBLE FOR ENSURING THAT ALL CONSTRUCTION PROCEDURES COMPLY WITH THE REQUIREMENTS OF OSHA, THE OWNER, AND ALL OTHER APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK.
- ACCESS TO THE PROPOSED WORK SITE MAY BE RESTRICTED. THE CONTRACTOR SHALL COORDINATE AND OBTAIN APPROVAL FOR INTENDED CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIAL ACCESS, WITH THE RESIDENT LEASING AGENT.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SAFEGUARD ALL EXISTING STRUCTURES OR BURIED SERVICES AFFECTED BY THIS CONSTRUCTION. CONTRACTOR IS ALSO RESPONSIBLE FOR TEMPORARILY RELOCATING ANY LINES OR STRUTS AS NECESSARY TO COMPLETE THE REQUIRED WORK.
- STRUCTURAL DESIGN IS FOR THE COMPLETE CONDITION ONLY. THE CONTRACTOR MUST BE COGNIZANT THAT THE REMOVAL OF ANY STRUCTURAL COMPONENT OF AN EXISTING TOWER HAS THE POTENTIAL TO CAUSE THE PARTIAL OR COMPLETE COLLAPSE OF THE STRUCTURE. ALL NECESSARY PRECAUTIONS MUST BE TAKEN TO ENSURE STRUCTURAL INTEGRITY, INCLUDING, BUT NOT LIMITED TO, ENGINEERING ASSESSMENT OF CONSTRUCTION STRESSES WITH INSTALLATION MAXIMUM WIND SPEED AND/OR TEMPORARY BRACING AND SHORING.
- PLANS ARE NOT TO BE SCALED. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
- FOR THIS ANALYSIS AND MODIFICATION, THE TOWER HAS BEEN ASSUMED TO BE IN GOOD CONDITION WITHOUT ANY DEFECTS. IF THE CONTRACTOR DISCOVERS ANY INDICATION OF AN EXISTING STRUCTURAL DEFECT, CONTACT THE ENGINEER OF RECORD IMMEDIATELY.
- ALL WORK SHALL BE PERFORMED IN CALM WEATHER, WITH WIND GUSTS LESS THAN 10 MPH.
- THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE ENGINEER OF RECORD.
- ALL TOWER REINFORCEMENT SHALL BE COMPLETED PRIOR TO INSTALLATION OF PROPOSED ANTENNAS, MOUNTS, AND CABLES.
- PROTECT EXISTING ANTENNAS, MOUNTS, CABLES, AND EQUIPMENT FROM DAMAGE DURING INSTALLATION OF ANTENNAS AND REINFORCING.
- IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENTS AND TO MAINTAIN TOWER ALIGNMENT AND PLUMBNESS DURING REINFORCEMENT OF MEMBERS. THIS INCLUDES, BUT IS NOT LIMITED TO, PROVIDING TEMPORARY GUYS, TIE-DOWNS, OR BRACING/SUPPORT SYSTEMS AS NECESSARY. NO STRUCTURAL MEMBERS SHALL BE REMOVED UNTIL SUCH SYSTEMS ARE ADEQUATELY INSTALLED ON THE TOWER. TOWER REINFORCEMENT WORK SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA-322 AND ANSI/ASSE A10.48.
- CONTRACTOR SHALL SUBMIT A DETAILED, SITE SPECIFIC RIGGING PLAN TO THE OWNER PRIOR TO THE START OF ANY WORK.
- REMOVE FROM THE SITE AND PROPERLY DISPOSE OF ALL TEMPORARY BRACING, REMOVED TOWER MEMBERS/BOLTS, EXCESS MATERIALS, AND DEBRIS, AS DIRECTED BY THE OWNER'S REPRESENTATIVE UPON COMPLETION OF WORK.
- GROUNDING SYSTEM SHALL BE CHECKED AND UPGRADED AS NECESSARY, AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
- CONTRACTOR SHALL ACCURATELY FIELD VERIFY LENGTHS OF ALL MATERIAL PRIOR TO FABRICATION OR ORDERING OF ANY PRODUCTS.
- INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE ENGINEER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER APPROVAL.
- CONTRACTOR SHALL FIELD VERIFY SAFETY CLIMB LOCATION AND CONTACT THE ENGINEER OF RECORD IF THE DESIGN SHOWN IMPACTS THE SAFETY CLIMB SYSTEM. THE CLIMBING FACILITIES, SAFETY CLIMB, AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED, OR ALTERED WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE TOWER OWNER OR ENGINEER OF RECORD.

STRUCTURAL STEEL & BOLTING

- DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS", LATEST EDITION.
- HOLLOW STRUCTURAL SECTION (HSS) SPLIT PIPE SECTIONS FOR LEG REINFORCING SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED AND SEAMLESS CARBON STEEL STRUCTURAL TUBING IN ROUNDS AND SHAPES" ($F_y = 50$ ksi). IF THE MEMBER SIZES INDICATED ARE NOT AVAILABLE IN THIS GRADE, BENT PLATE LEG REINFORCING CONFORMING TO A572 "HIGH-STRENGTH LOW-ALLOY COLUMBIUM-VANADIUM STRUCTURAL STEEL", GRADE 50, MAY BE SUBSTITUTED. BENT PLATE SHALL BE FORMED TO A RADIUS MATCHING THE EXISTING TOWER LEG. SUBSTITUTION WITH ASTM A53 PIPE IS **NOT** ACCEPTABLE.
- ALL OTHER HOLLOW STRUCTURAL SECTIONS (HSS) SHALL CONFORM TO ASTM A500, GRADE B ($F_y = 42$ ksi). SUBSTITUTION WITH ASTM A53 PIPE IS **NOT** ACCEPTABLE.
- FLANGE SPLICE BYPASS PLATES SHALL CONFORM TO ASTM A572 "HIGH-STRENGTH LOW-ALLOY COLUMBIUM-VANADIUM STRUCTURAL STEEL", GRADE 50, UNLESS OTHERWISE INDICATED. ALL OTHER MISCELLANEOUS STEEL, INCLUDING CHANNELS, ANGLES, PLATES, BARS, AND SOLID RODS SHALL CONFORM TO ASTM A36 "CARBON STRUCTURAL STEEL" ($F_y = 36$ ksi), UNLESS OTHERWISE INDICATED.
- ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
- STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS CONFORMING TO ASTM A325 "STRUCTURAL BOLTS, STEEL, HEAT TREATED, 120/105 ksi MINIMUM TENSILE STRENGTH" OR ASTM A490 "STRUCTURAL BOLTS, ALLOY STEEL, HEAT TREATED, 150 KSI MINIMUM TENSILE STRENGTH", AS INDICATED ON THE TOWER MODIFICATION SCHEDULE AND TOWER REINFORCEMENT ELEVATION, **CONNECTION TYPE X, UNLESS OTHERWISE NOTED. BOLT THREADS SHALL BE EXCLUDED FROM THE SHEAR PLANE.** FULLY THREADED BOLTS (A325T) SHALL NOT BE USED. EXISTING BOLTS THAT HAVE BEEN REMOVED SHALL NOT BE REUSED.
- U-BOLTS SHALL CONFORM TO ASTM A36 OR A307 "CARBON STEEL BOLTS, STUDS, AND THREADED ROD 60000 PSI TENSILE STRENGTH". ALL U-BOLTS SHALL BE 1/2" DIAMETER IN 9/16" DIAMETER HOLES, UNLESS OTHERWISE NOTED. INSTALL DOUBLE NUTS ON ALL CONNECTIONS.
- MATCHING NUTS SHALL BE HEAVY HEX TYPE, CONFORMING TO ASTM A563, "CARBON AND ALLOY STEEL NUTS". WASHERS, WHERE REQUIRED, SHALL CONFORM TO ASTM F436 "HARDENED STEEL WASHERS". INSTALL NUT-LOCKING DEVICES OR MECHANISMS SUCH AS, BUT NOT LIMITED TO, LOCK NUTS, LOCK WASHERS, OR PALNUTS, CONFORMING TO SECTION 4.9.2 OF ANSI/TIA-222 ON ALL NEW/REPLACED BOLTS TO PREVENT LOOSENING.
- ALL A325 BOLTS, U-BOLTS, AND MISCELLANEOUS HARDWARE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
- ALL ASTM A490 BOLTS SHALL BE COATED WITH ZINC/ALUMINUM CORROSION PROTECTIVE COATINGS PER ASTM F1136 "ZINC/ALUMINUM CORROSION PROTECTIVE COATINGS FOR FASTENERS", GRADE 3, USING GEOMET, MAGNI, OR OTHER ENGINEER APPROVED CORROSION PROTECTIVE COATING.
- DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780 "REPAIR OF DAMAGED AND UNCOATED AREAS OF HOT-DIP GALVANIZED COATINGS", USING Z.R.C. COLD GALVANIZING COMPOUND AS MANUFACTURED BY ZRC WORLDWIDE, OR ENGINEER APPROVED EQUAL WITH A MINIMUM METALLIC ZINC CONTENT OF 95% BY WEIGHT IN DRY FILM. DRY FINISHED COATING THICKNESS SHALL BE 3 MILS MINIMUM.
- ALL BOLT HOLES SHALL BE STANDARD HOLES AS DEFINED BY AISC, DRILLED OR PUNCHED 1/16" LARGER IN DIAMETER THAN THE CONNECTING BOLT, UNLESS OTHERWISE NOTED. OVERSIZED OR SLOTTED HOLES, OR ANY BURNING OF HOLES, IS NOT PERMITTED.
- ALL CONNECTIONS TO BE SNUG TIGHT TYPE IN ACCORDANCE WITH THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS".
- ALL CONNECTIONS THAT ARE NOT FULLY DETAILED ON THESE DRAWINGS SHALL BE DETAILED BY THE STEEL FABRICATOR. STEEL FABRICATOR SHALL MAINTAIN EDGE DISTANCES AND SPACING OF BOLT HOLES IN ACCORDANCE WITH THE TIA REQUIREMENTS AND EXISTING FIELD CONDITIONS. IF REQUIRED, COPING OF REINFORCING ANGLES SHALL BE WITHIN THE LIMITS OF ALLOWABLE COPING AS INDICATED ON THESE DRAWINGS. **IN CASE OF DISCREPANCIES, IMMEDIATELY CONTACT THE ENGINEER OF RECORD FOR FURTHER DIRECTION.**
- ALL NEW/REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH SUCH THAT THE END OF THE BOLT IS AT LEAST FLUSH WITH THE FACE OF THE NUT, PROVIDING A MINIMUM STICK-THROUGH OF ZERO. IT IS NOT PERMITTED FOR THE BOLT END TO BE BELOW THE FACE OF THE NUT AFTER TIGHTENING IS COMPLETED.
- SUBMIT SHOP DETAIL DRAWINGS OF ALL STRUCTURAL AND MISCELLANEOUS STEEL TO THE ENGINEER FOR APPROVAL, AND INCORPORATE ALL COMMENTS PRIOR TO FABRICATION.
- AFTER FINAL INSPECTION, ALL GALVANIZED STEEL SURFACES THAT HAVE BEEN DAMAGED AS THE RESULT OF THIS SCOPE OF WORK, INCLUDING AREAS AROUND GRINDING, WELDS, FIELD DRILLED HOLES, AND LEG/SHAFT INTERIORS (WHERE ACCESSIBLE), SHALL BE PREPARED BY POWER TOOL CLEANING IN ACCORDANCE WITH SSPC SP-3, AND TOUCH-UP PAINTED WITH BRUSH-APPLIED, COLD-GALVANIZING COMPOUND. PHOTO DOCUMENTATION IS REQUIRED TO BE SUBMITTED TO THE MI INSPECTOR.

WELDING

- FIELD WELDING OF EXISTING TOWER MEMBERS IS NOT PERMITTED, UNLESS SPECIFICALLY INDICATED OTHERWISE ON THESE DRAWINGS.**
- CONTRACTOR SHALL COMPLY WITH AWS D1.1 "STRUCTURAL WELDING CODE - STEEL" FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES".
- REMOVE ALL GALVANIZING IN AREAS TO BE WELDED BY GRINDING. SURFACES TO BE WELDED SHALL BE FREE FROM SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER FOREIGN MATERIAL THAT WOULD PREVENT PROPER WELDING. GRIND THE SURFACE ADJACENT TO THE WELD FOR A DISTANCE OF 2" MINIMUM ALL AROUND, AND ENSURE THAT THESE AREAS ARE 100% FREE OF ALL GALVANIZING. AFTER WELDING, CLEAN AND PROTECT ALL EXPOSED STEEL AND WELDS BY COLD GALVANIZING.
- ALL WELDING TO THE TOWER SHALL BE PERFORMED USING THE SMAW PROCESS WITH E70XX LOW HYDROGEN ELECTRODES, UNLESS OTHERWISE INDICATED. LOW HYDROGEN ELECTRODES SHALL BE PURCHASED IN HERMETICALLY SEALED CONTAINERS AND SHALL BE USED WITHIN 4 HOURS AFTER OPENING THE CONTAINER. ELECTRODES NOT USED WITHIN 4 HOURS SHALL BE REDRIED AT A TEMPERATURE BETWEEN 450°F AND 500°F FOR AT LEAST 2 HOURS AND THEN STORED AT 250°F. REDRIED ELECTRODES SHALL BE USED WITHIN 4 HOURS AFTER REMOVAL FROM THE STORAGE OVEN. REDRIED ELECTRODES NOT USED WITHIN 4 HOURS SHALL BE DISCARDED.
- SPACES BETWEEN INTERMITTENT WELDS SHALL BE FILLED USING CHEM-CALK 915 SEALANT AS MANUFACTURED AND MARKETED BY BOSTIK, INC., WAUWATOSA, WI 53226 (800) 726-7845, OR ENGINEER APPROVED EQUAL.
- ALL FIELD WELDING SHALL BE VISUALLY INSPECTED BY AN AWS CERTIFIED WELDING INSPECTOR (CWI) IN ACCORDANCE WITH THE ACCEPTANCE CRITERIA OF AWS D1.1., PRIOR TO INSTALLATION OF THE PROPOSED ANTENNAS AND/OR APPURTENANCES. THE CWI SHALL WORK WITH THE GC ON THE LEVEL OF INTERACTION NEEDED TO CONDUCT THE REQUIRED WELDING INSPECTION(S). THE CERTIFIED WELDING INSPECTION IS THE RESPONSIBILITY OF THE GC.
- DO NOT WELD IF THE TEMPERATURE OF THE STEEL IN THE VICINITY OF THE WELD AREA IS BELOW 0°F. MINIMUM PREHEAT AND INTERPASS TEMPERATURE REQUIREMENTS SHALL COMPLY WITH AWS D1.1.
- DO NOT WELD ON WET OR FROST-COVERED SURFACES, AND PROVIDE ADEQUATE PROTECTION FROM HIGH WINDS.

TOWER REINFORCEMENT DESIGN CRITERIA

- TOWER REINFORCEMENT IS DESIGNED IN CONFORMANCE TO THE REQUIREMENTS OF THE CODES AND STANDARDS LISTED BELOW. ALL TOWER REINFORCEMENT WORK, INCLUDING FABRICATION, ERECTION, ALTERATION, AND MAINTENANCE, SHALL COMPLY WITH THE REQUIREMENTS OF FOLLOWING, UNLESS SPECIFICALLY NOTED OTHERWISE:
- 2018 CONNECTICUT STATE BUILDING CODE
 - ANSI/TIA-222-G "STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS"
 - ANSI/TIA-322 "LOADING, ANALYSIS, AND DESIGN CRITERIA RELATED TO THE INSTALLATION, ALTERATION AND MAINTENANCE OF COMMUNICATION STRUCTURES"
 - ANSI/ASSE A10.48 "CRITERIA FOR SAFETY PRACTICES WITH THE CONSTRUCTION, DEMOLITION, MODIFICATION AND MAINTENANCE OF COMMUNICATION STRUCTURES"

Tectonic

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Tectonic Engineering & Surveying Consultants P.C.
70 Pleasant Hill Road Phone: (845) 534-5959
P.O. Box 37 Mountainville, NY 10953 (800) 929-6531
www.tectonicengineering.com
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Newburgh, NY 12550 Phone: (845) 567-6656

•• T-Mobile ••
NORTHEAST, LLC.

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

((()))
NSS NORTHEAST
SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
10473.CTHA242A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
△	10/2/20	FOR COMMENT	MB

ISSUED BY	DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

HA242/PORTLANDHS_SST
CTHA242A
95 HIGH STREET
PORTLAND, CT 06480

SHEET TITLE

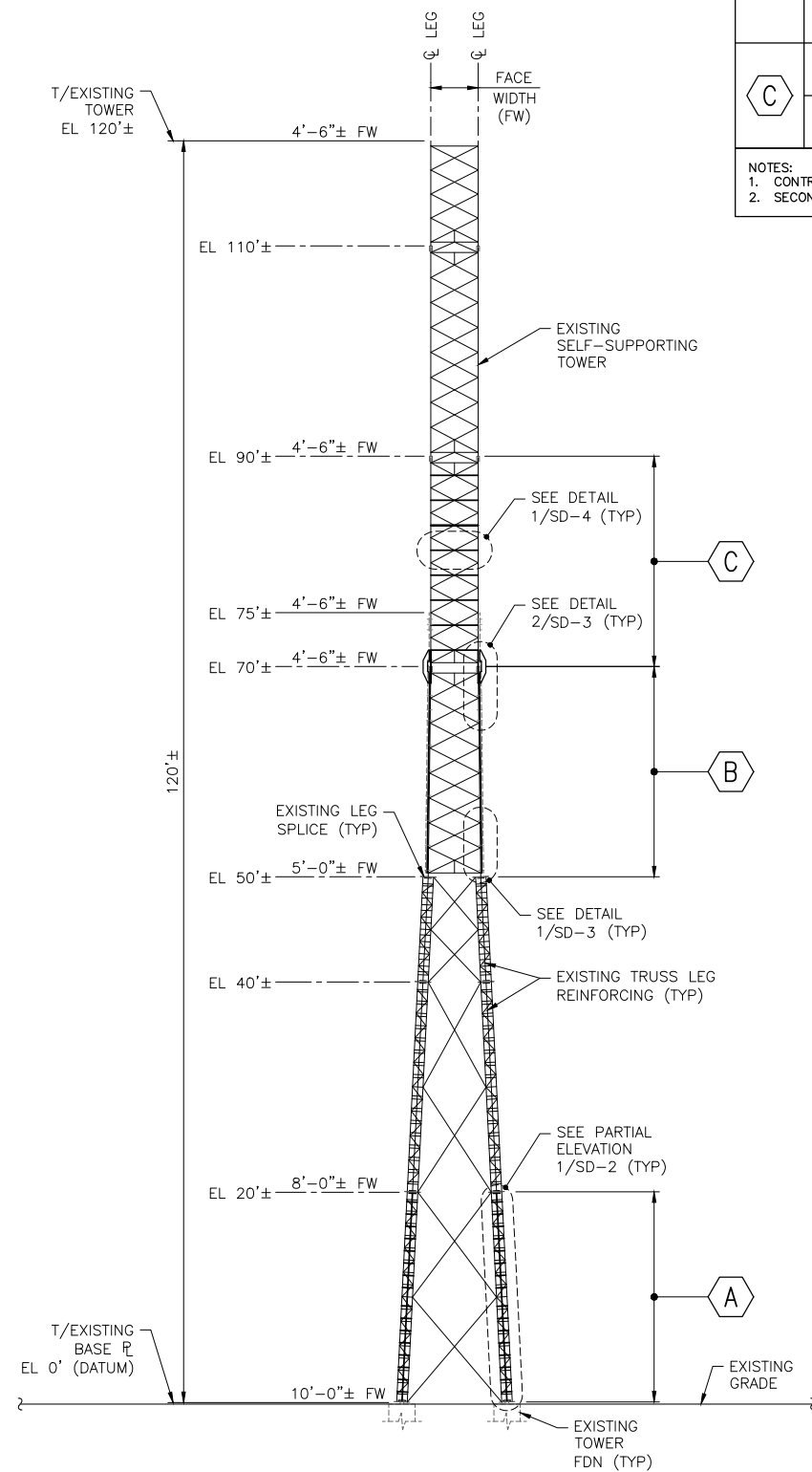
TOWER REINFORCEMENT
DESIGN CRITERIA
& NOTES

SHEET NUMBER

SN-2

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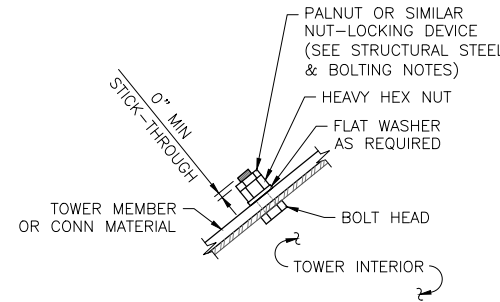
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1 TOWER REINFORCEMENT ELEVATION
SD-1 SCALE: 1/8" = 1'-0"

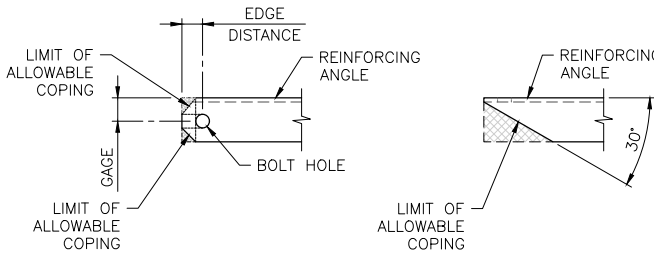
TOWER MODIFICATION SCHEDULE					
SECTION	ELEVATION	MEMBER TYPE	EXISTING MEMBER	REINFORCING MEMBER	DESCRIPTION
A	0'± TO 20'±	TRUSS LEG	(3) 1 1/2" DIA SOLID ROD TRUSS LEGS (PIROD P/N: 105217)	(2) 1 1/2" DIA SOLID RODS PER LEG W/VALMONT SITE PRO 1 TIE-ROD BRACING FOR PIROD TOWERS (P/N: TI8112-20-1-2 W/SHIM #127393 AT TOP & BOTTOM)	INSTALL REINFORCING RODS AND TIE-ROD BRACING FOR PIROD TOWERS ON EXISTING TRUSS LEGS. SEE PARTIAL ELEVATION 1/SD-2, SECTION 2/SD-2, AND SECTION 3/SD-2.
B	50'± TO 70'±	LEG REINFORCING	3/4" DIA THREADED ROD	-	REMOVE EXISTING THREADED ROD LEG REINFORCING AND ASSOCIATED U-BOLTED BENT PLATE CLAMPS ON ALL THREE (3) TOWER LEGS. SEE DETAIL 1/SD-3.
	70'±	LEG	2 1/4" DIA SOLID ROD	HSS 2.875x0.276 SPLIT PIPE	INSTALL SPLIT PIPE REINFORCING ON ALL THREE (3) TOWER LEGS. SEE DETAIL 1/SD-3, DETAIL 2/SD-3, AND SECTION 3/SD-3.
C	70'± TO 75'±	LEG SPLICE	-	(2) ASTM A572 GRADE 50 FLANGE SPLICE BYPASS PLATE 1/2x7±x3'-2± (VIF) PER LEG	INSTALL FLANGE SPLICE BYPASS PLATES ON ALL THREE (3) TOWER LEGS. SEE DETAIL 2/SD-3, SECTION 4/SD-3, AND ELEVATION 5/SD-3.
	70'± TO 90'±	LEG REINFORCING	3/4" DIA THREADED ROD	-	REMOVE EXISTING THREADED ROD LEG REINFORCING AND ASSOCIATED U-BOLTED BENT PLATE CLAMPS ON ALL THREE (3) TOWER LEGS. SEE DETAIL 2/SD-3.
	70'± TO 90'±	LEG	2" DIA SOLID ROD	SECONDARY HORIZONTAL 1 1/4" DIA THREADED ROD - VALMONT SITE PRO 1 ADJUSTABLE BOLT-ON BRACING KIT (P/N: BOB114 W/BOB114-CEN CENTER CONNECTION KIT)	INSTALL SECONDARY HORIZONTAL MEMBERS ON ALL THREE (3) TOWER FACES. SEE DETAIL 1/SD-4 AND SECTION 2/SD-4.

NOTES:
 1. CONTRACTOR SHALL PROVIDE NECESSARY SITE DETAILS AND COORDINATE WITH THE MANUFACTURER FOR THE REQUIRED PRODUCT, SPECIFICATIONS, AND INSTALLATION GUIDELINES.
 2. SECONDARY HORIZONTAL AND TIE-ROD BRACING MEMBERS AND THEIR CONNECTIONS TO THE EXISTING TOWER SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN SPECIFICATIONS AND REQUIREMENTS.



NOTE:
 ALL BOLTS SHALL BE INSTALLED "UP AND OUT" SO THAT:
 • THE BOLT HEAD IS BENEATH THE CONNECTED MEMBERS AND/OR TOWARD THE INTERIOR OF THE TOWER.
 • THE NUT IS ON TOP OF THE CONNECTED MEMBERS AND/OR TOWARD THE EXTERIOR OF THE TOWER.

2 TYPICAL BOLT INSTALLATION DETAIL
SD-1 SCALE: N.T.S.



3 TYPICAL ANGLE COPING LIMITS
SD-1 SCALE: N.T.S.

ANGLE GAGE & BOLT EDGE DISTANCE & SPACING CHART

ANGLE LEG	RECOMMENDED GAGE	BOLT DIAMETER	MIN EDGE DISTANCE	MIN SPACING
1 3/4"	1"	1/2"	3/4"	1 3/8"
2"	1 1/8"	5/8"	15/16"	1 3/4"
2 1/2"	1 3/8"	3/4"	1 1/8"	2"
3"	1 3/4"	7/8"	1 5/16"	2 3/8"
3 1/2"	2"	1"	1 1/2"	2 3/4"
4"	2 1/2"	1 1/8"	1 11/16"	3"

NOTE:
 RECOMMENDED GAGES LISTED ABOVE MAY BE ADJUSTED AS REQUIRED FOR NEW ANGLES INSTALLED BACK-TO-BACK WITH EXISTING MAIN DIAGONAL MEMBERS IN ORDER TO MATCH EXISTING BOLT HOLES, PROVIDED THAT ALL TIA MINIMUM EDGE DISTANCE AND SPACING REQUIREMENTS AND AISC BOLT ENTERING/TIGHTENING CLEARANCES ARE SATISFIED. SEE STRUCTURAL STEEL & BOLTING NOTES.

NOTES:
 1. REINFORCEMENT OF THE EXISTING TOWER HAS BEEN DESIGNED TO SUPPORT THE ANTENNAS AND CABLES LISTED IN THE STRUCTURAL MODIFICATION ANALYSIS REPORT BY TECTONIC, DATED 10/2/20. REINFORCEMENT DETAILS AS SHOWN ARE BASED ON THE RECOMMENDATIONS OUTLINED AND DOCUMENTS REFERENCED IN THE REPORT. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO FABRICATION OF STEEL OR ORDERING OF ANY PRODUCTS.
 2. EXISTING ANTENNAS, CABLES, AND OTHER APPURTENANCES ARE NOT SHOWN FOR CLARITY. CONTRACTOR SHALL IDENTIFY TO THE OWNER'S REPRESENTATIVE ALL EXISTING WAVEGUIDES, CABLES, CABLE ATTACHMENTS, ANTENNAS, AND ANTENNA SUPPORT FRAMES THAT MUST BE TEMPORARILY REMOVED OR PERMANENTLY REPOSITIONED AS REQUIRED TO ALLOW FOR INSTALLATION OF PROPOSED REINFORCEMENT. CONTRACTOR SHALL PLAN AND COORDINATE ALL TEMPORARY REMOVAL AND/OR PERMANENT RELOCATION DIRECTLY WITH THE OWNER'S REPRESENTATIVE AND OBTAIN WRITTEN PERMISSION FROM THE REPRESENTATIVE PRIOR TO ALTERATION OF ANY EXISTING WAVEGUIDES, CABLES, ANTENNAS, OR OTHER APPURTENANCES. MAINTAIN EXISTING ANTENNA AZIMUTHS.
 3. EXISTING SHELTERS, EQUIPMENT, FENCE, AND OTHER SITE FEATURES ARE NOT SHOWN FOR CLARITY.

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 BLOOMFIELD, CT 06002

NSS NORTHEAST
 SITE SOLUTIONS
 Turnkey Wireless Development

APPROVALS

LANDLORD _____
 RF _____
 CONSTRUCTION _____
 OPERATIONS _____
 SITE ACQ. _____

PROJECT NUMBER 10473.CTHA242A DESIGNED BY EI

REV.	DATE	DESCRIPTION	DRAWN BY
A	10/2/20	FOR COMMENT	MB

ISSUED BY _____ DATE _____



SITE INFORMATION
 HA242/PORTLANDHS_SST
 CTHA242A
 95 HIGH STREET
 PORTLAND, CT 06480

SHEET TITLE
 TOWER REINFORCEMENT
 ELEVATION,
 MOD SCHED &
 TYPICAL DETAILS

SHEET NUMBER
 SD-1

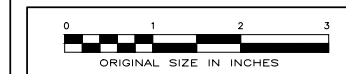
APPROVALS

LANDLORD _____
 RF _____
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 OPERATIONS _____
 SITE ACQ. _____

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SITE INFORMATION

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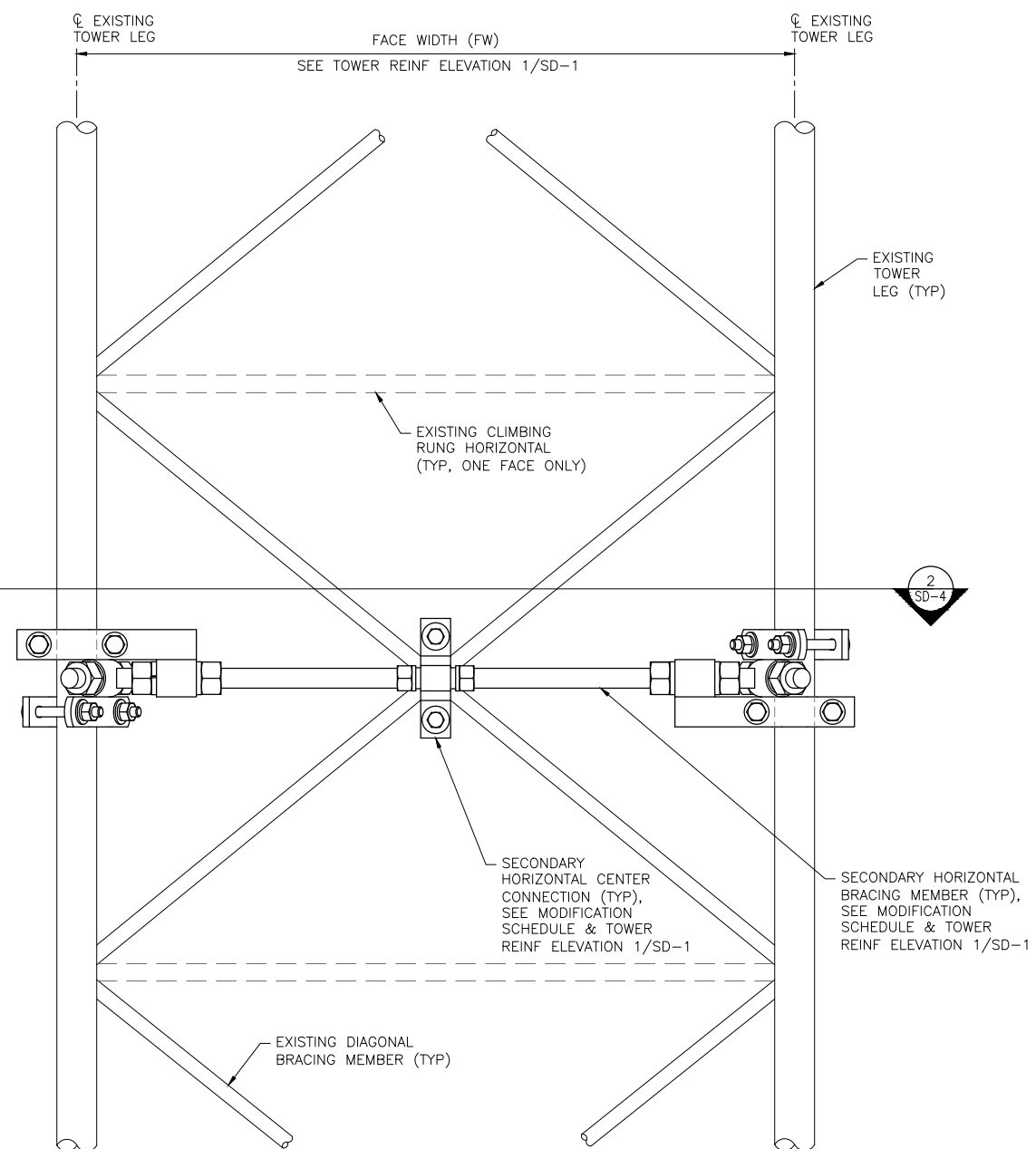
SHEET TITLE

**TOWER REINFORCEMENT
 SECONDARY
 HORIZONTAL
 DETAIL & SECTION**

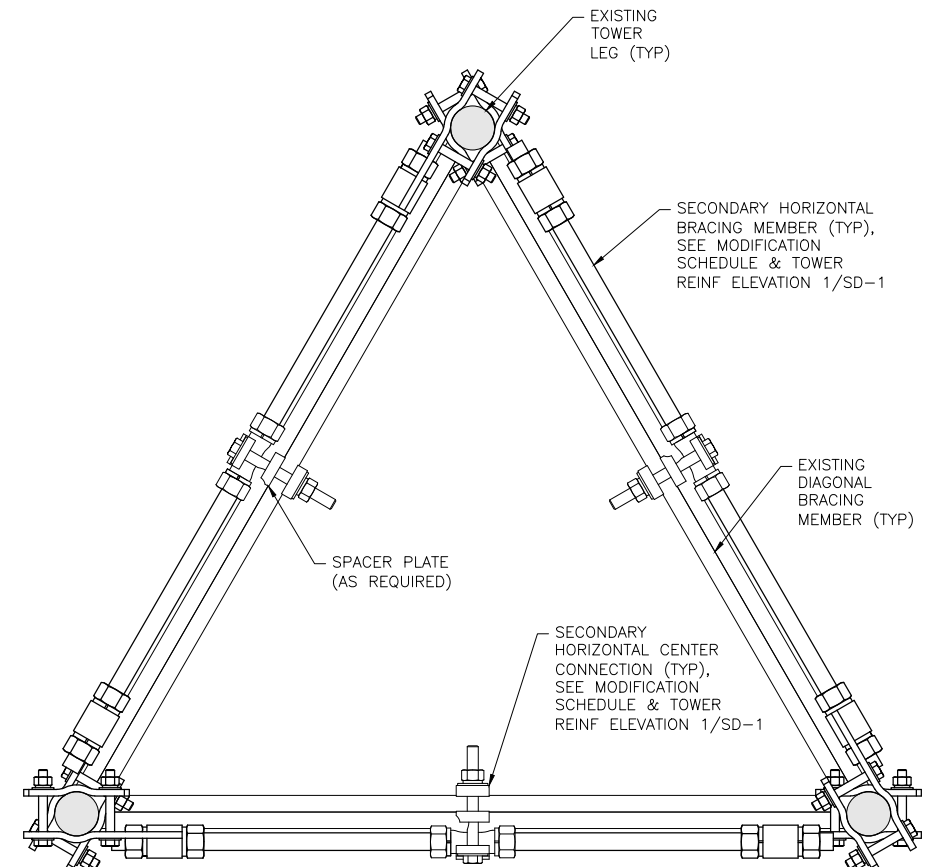
SHEET NUMBER

SD-4

- NOTES:
- EXISTING ANTENNA MOUNTS, CABLES, CABLE ATTACHMENTS, AND OTHER APPURTENANCES NOT SHOWN FOR CLARITY.
 - EXISTING CABLE LADDERS SHALL BE TEMPORARILY REMOVED AS REQUIRED TO ALLOW FOR INSTALLATION OF SECONDARY HORIZONTAL BRACING MEMBERS AND REINSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
 - CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS, INCLUDING FITTING OF THE PROPOSED MODIFICATIONS, PRIOR TO ORDERING OF ANY PRODUCTS.



1 TYP SECONDARY HORIZONTAL TOWER LEG CONN DETAIL
 SD-4 SCALE: N.T.S.



2 TYP SECONDARY HORIZONTAL TOWER LEG CONN SECTION
 SD-4 SCALE: N.T.S.

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Exhibit E

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

T-Mobile Existing Facility

Site ID: CTHA242A

HA242/PortlandHS_SST
95 High Street
Portland, Connecticut 06480

October 13, 2020

EBI Project Number: 6220005333

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	22.90%

October 13, 2020

T-Mobile

Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, Connecticut 06002

Emissions Analysis for Site: CTHA242A - HA242/PortlandHS_SST

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **95 High Street in Portland, Connecticut** 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.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency 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), 2100 MHz (AWS) and 11 GHz frequency bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 95 High Street in Portland, Connecticut 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 manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

- 1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.
- 3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 5) 4 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

- 6) 2 UMTS channels (AWS Band - 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 7) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 8) 2 LTE channels (BRS Band - 2500 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 9) 2 NR channels (BRS Band - 2500 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 10) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 11) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 12) The antennas used in this modeling are the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector A, the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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.

- 13) The antenna mounting height centerline of the proposed antennas is 110 feet above ground level (AGL).
- 14) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
- 15) All calculations were done with respect to uncontrolled / general population threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd
Height (AGL):	110 feet	Height (AGL):	110 feet	Height (AGL):	110 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	160 Watts	Total TX Power (W):	160 Watts	Total TX Power (W):	160 Watts
ERP (W):	25,651.93	ERP (W):	25,651.93	ERP (W):	25,651.93
Antenna A1 MPE %:	7.62%	Antenna B1 MPE %:	7.62%	Antenna C1 MPE %:	7.62%
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd
Height (AGL):	110 feet	Height (AGL):	110 feet	Height (AGL):	110 feet
Channel Count:	9	Channel Count:	9	Channel Count:	9
Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts
ERP (W):	11,055.53	ERP (W):	11,055.53	ERP (W):	11,055.53
Antenna A2 MPE %:	4.96%	Antenna B2 MPE %:	4.96%	Antenna C2 MPE %:	4.96%
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32
Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz
Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd
Height (AGL):	110 feet	Height (AGL):	110 feet	Height (AGL):	110 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts
ERP (W):	12,841.53	ERP (W):	12,841.53	ERP (W):	12,841.53
Antenna A3 MPE %:	3.82%	Antenna B3 MPE %:	3.82%	Antenna C3 MPE %:	3.82%

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	16.39%
Clearwire	0.19%
Whip Antenna	1.46%
212-1 Dipole	4.86%
Andrew Dish	0%
Site Total MPE % :	22.90%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	16.39%
T-Mobile Sector B Total:	16.39%
T-Mobile Sector C Total:	16.39%
Site Total MPE % :	22.90%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# 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 2500 MHz LTE	2	6412.98	110.0	38.11	2500 MHz LTE	1000	3.81%
T-Mobile 2500 MHz NR	2	6412.98	110.0	38.11	2500 MHz NR	1000	3.81%
T-Mobile 600 MHz LTE	2	591.73	110.0	3.52	600 MHz LTE	400	0.88%
T-Mobile 600 MHz NR	1	1577.94	110.0	4.69	600 MHz NR	400	1.17%
T-Mobile 700 MHz LTE	2	648.82	110.0	3.86	700 MHz LTE	467	0.83%
T-Mobile 1900 MHz LTE	2	2203.69	110.0	13.10	1900 MHz LTE	1000	1.31%
T-Mobile 2100 MHz UMTS	2	1294.56	110.0	7.69	2100 MHz UMTS	1000	0.77%
T-Mobile 1900 MHz GSM	4	1028.30	110.0	12.22	1900 MHz GSM	1000	1.22%
T-Mobile 1900 MHz LTE	2	2056.61	110.0	12.22	1900 MHz LTE	1000	1.22%
T-Mobile 2100 MHz LTE	2	2307.55	110.0	13.71	2100 MHz LTE	1000	1.37%
						Total:	16.39%

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

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:	16.39%
Sector B:	16.39%
Sector C:	16.39%
T-Mobile Maximum MPE % (Sector A):	16.39%
Site Total:	22.90%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **22.90%** 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.

Exhibit F




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 Ref#: HA242A-ANC
0006

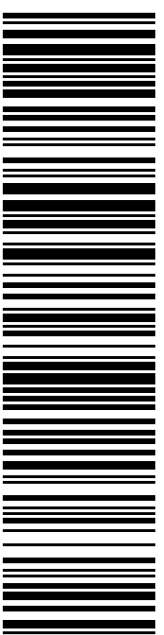
DEBORAH CHASE
 NORTHEAST SITE SOLUTIONS, LLC
 420 MAIN ST STE 2
 STURBRIDGE MA 01566-1359

Carrier -- Leave if No Response

C001

SHIP
 TO: RYAN CURLEY
 TOWN CLERK- TOWN OF PORTLAND
 33 E MAIN ST
 PORTLAND CT 06480-1801

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9405 5036 9930 0118 7469 74

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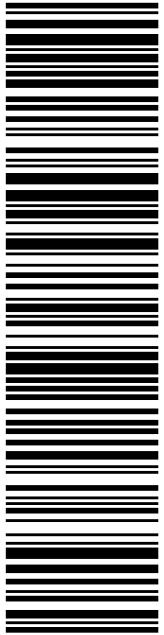
From: DEBORAH CHASE Ref#: HA242A-ANC
 NORTHEAST SITE SOLUTIONS, LLC
 420 MAIN ST STE 2
 STURBRIDGE MA 01566-1359

To: RYAN CURLEY
 TOWN CLERK- TOWN OF PORTLAND
 33 E MAIN ST
 PORTLAND CT 06480-1801

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420 MAIN ST STE 2
STURBRIDGE MA 01566-1359

Expected Delivery Date: 11/13/20
Ref#: HA242-ANCH
0006

Carrier -- Leave if No Response

C001

SHIP TO: SUSAN S BRANSFIELD
FIRST SELECTWOMAN-TOWN OF PORTLAND
33 E MAIN ST
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Trans. #: 513201020	Priority Mail® Postage: \$7.75
Print Date: 11/06/2020	Total: \$7.75
Ship Date: 11/09/2020	
Expected Delivery Date: 11/13/2020	


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NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST STE 2
STURBRIDGE MA 01566-1359

To: SUSAN S BRANSFIELD
FIRST SELECTWOMAN-TOWN OF PORTLAND
33 E MAIN ST
PORTLAND CT 06480-1801

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DEBORAH CHASE
 NORTHEAST SITE SOLUTIONS, LLC
 420 MAIN ST STE 2
 STURBRIDGE MA 01566-1359

Expected Delivery Date: 11/13/20

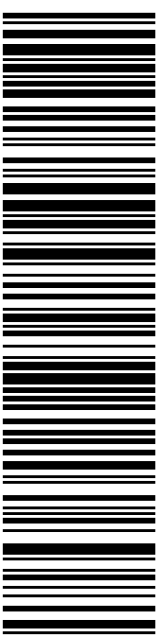
0006

Carrier -- Leave if No Response

C001

SHIP
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 ZEO- TOWN OF PORTLAND
 33 E MAIN ST
 PORTLAND CT 06480-1801

USPS TRACKING #



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Print Date: 11/06/2020	Total: \$7.75
Ship Date: 11/09/2020	
Expected Delivery Date: 11/13/2020	


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 NORTHEAST SITE SOLUTIONS, LLC
 420 MAIN ST STE 2
 STURBRIDGE MA 01566-1359

To: JOHN HERRING
 ZEO- TOWN OF PORTLAND
 33 E MAIN ST
 PORTLAND CT 06480-1801

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9405 5036 9930 0118 7470 01 0077 5000 0010 6051
\$7.75

PRIORITY MAIL 2-DAY™

Expected Delivery Date: 11/13/20

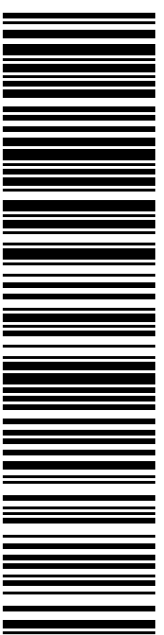
0006

SHIP TO: LISA A MATTHEWS
 CT SITING COUNCIL
 10 FRANKLIN SQ
 NEW BRITAIN CT 06051-2655

Carrier -- Leave if No Response

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Trans. #: 513201020	Priority Mail® Postage: \$7.75
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Ship Date: 11/09/2020	
Expected Delivery Date: 11/13/2020	

From: DEBORAH CHASE
 NORTHEAST SITE SOLUTIONS, LLC
 420 MAIN ST STE 2
 STURBRIDGE MA 01566-1359

To: LISA A MATTHEWS
 CT SITING COUNCIL
 10 FRANKLIN SQ
 NEW BRITAIN CT 06051-2655

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Exhibit H

Deborah Chase

From: Deborah Chase
Sent: Friday, November 6, 2020 5:58 PM
To: 'sbransfield@portlandct.org'; 'ZEO@portlandct.org'
Cc: 'rcurley@portlandct.org'
Subject: 95 HIGH STREET, PORTLAND, CT 06480 T-MOBILE EM APPLICATION (CTHA242A-ANCHOR)
Attachments: 95 HIGH STREET, PORTLAND CT 06480 T-MOBILE APPLICATION (CTHA242A-Anchor).pdf

Good afternoon-

On behalf of our client, (T-Mobile), I am forwarding copies of T-Mobile's Exempt Modification Request to collocate on a wireless telecommunications facility located at 95 High Street in Portland, CT

Hard copies will be sent as well for your records.

Please do not hesitate to contact me with any questions regarding T-Mobile's Exempt Modification Request.

Thank you very much

Deborah Chase

Senior Project Coordinator & Analyst

Mobile: 860-490-8839



🌱 Save a tree. Refuse. Reduce. Reuse. Recycle.