Filed by:
G. Scott Shepherd, Sr. Property Specialist - SBA Communications
134 Flanders Rd., Suite 125, Westborough, MA 01581
508.251.0720 x 3807 - GShepherd@sbasite.com

October 25, 2021

Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Tower Share Application
1662 Route 184., Groton, CT
Latitude: 41.385666
Longitude: -72.013306
Dish Site# BOBOS00056A

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of Dish Wireless LLC. Dish Wireless LLC plans to install antennas and related equipment to the tower site located at 1662 Route 164, Groton, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900/2100 MHz antennas and six (6) RRUs, at the 117-foot level of the existing 150-foot monopole tower, one (1) Hybrid cable will also be installed. Dish Wireless LLC equipment cabinets will be placed within 7' x 5' lease area. Included are plans by B & T Group, dated September 2, 2021 Exhibit 10. Also included is a structural analysis prepared by TES, dated July 29, 2021, confirming that the existing tower is structurally capable of supporting the proposed equipment, attached as Exhibit 8. This facility was approved by the Town of Groton's Zoning Manager August 8, 2008 and approved by the Connecticut Siting Council under Docket No. 319 February 27, 2007. Please see attached Exhibit 6.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of Dish Wireless LLC intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to Patrice Granatosky, Mayor for the Town of Groton, Deborah G. Jones, AICP, Assistant Director, property owner Chester G. Crouch, Jr. Separate notice is not being sent to the tower owner as it belongs to SBA.

The planned modifications of the facility fall squarely within those activities explicitly provided for in R.C.S.A. 16-50j-89.

1. The proposed modification will not result in an increase in the height of the existing structure. The top of the tower is 150-feet; Dish Wireless LLC proposed antennas will be located at a center line height of 117-feet.

2. The proposed modifications will not result in the increase of the site boundary as depicted on the attached site plan.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed local and state criteria. The incremental effect of the proposed changes will be negligent.

4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. As indicated in the attached power density calculations, the combined site operations will result in a total power density of 13.95% as evidenced by Exhibit 7.

Connecticut General Statutes 16-50aa indicates that the Council must approve the shared use of a telecommunications facility provided it finds the shared use is technically, legally, environmentally, and economically feasible and meets public safety concerns. As demonstrated in this letter, Dish Wireless LLC respectfully indicates that the shared use of this facility satisfies these criteria.

A. Technical Feasibility. The existing monopole has been deemed structurally capable of supporting Dish Wireless LLC proposed loading. The structural analysis is included as Exhibit 8.

B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this support tower in Groton. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit Dish Wireless LLC to obtain a building permit for the proposed installation. Further, a Letter of Intent is included as Exhibit 2, authorizing Dish Wireless LLC to file this application for shared use.

C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of Dish Wireless LLC equipment at the 117-foot level of the existing 150-foot tower would have an insignificant visual impact on the area around the tower. Dish Wireless LLC ground equipment would be installed within the existing facility compound. Dish Wireless LLC shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by Exhibit 7, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.

D. Economic Feasibility. Dish Wireless LLC will be entering into an agreement with the owner of this facility to mutually agreeable terms. As previously mentioned, the Letter of Intent has been provided by the owner to assist Dish Wireless LLC with this tower sharing application.

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting Dish Wireless LLC proposed loading.

Dish Wireless LLC is not aware of any public safety concerns relative to the proposed sharing of the existing guyed tower. Dish Wireless LLC intentions of providing new and improved wireless service through the shared use of this facility is expected to enhance the safety and welfare of local residents and individuals traveling through Westbrook.

Sincerely,

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

Attachments:

cc: Patrice Granatosky, Mayor / with attachments
Town of Groton 45 Fort Hill Rd., Groton, CT 06340
Deborah G. Jones, AICP, Assistant Director / with attachments
134 Groton Long Point Rd., Groton, CT 06340-4873
Chester G. Crouch, Jr. / with attachments
603 Princeton St., Brandon, FL 33511 (SBA address on file)

EXHIBIT LIST

Exhibit 1	Copy of Check	X
Exhibit 2	Letter of Intent to Allow Shared Use of the Existing SBA Telecommunications Site	X
Exhibit 3	Notification Receipts	x
Exhibit 4	Property Card	x
Exhibit 5	Property Map	x
Exhibit 6	Original Zoning Approval	Town of Groton (8/8/04), CSC Docket No. 319 (2/27/07)
Exhibit 7	EME Report	EBI Consulting 10/19/21
Exhibit 8	Structural Analysis	TES 7/29/21
Exhibit 9	Mount Analysis	B + T Group 7/27/21
Exhibit 10	Construction Drawings	B + T Group 9/2/21

EXHIBIT 1

Copy of check

EXHIBIT 2
Letter of Intent

October 25, 2021

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

RE: **Notice of Intent to Allow Shared Use of the Existing SBA Telecommunications Site**
Location: **1662 Route 184, Groton, CT**
Dish Wireless Site No: BOBOS00056A
Site No: CT13073-A

Dear Ms. Bachman:

Please let the following serve as Evidence of Intent to allow Dish Wireless' shared use of the existing SBA telecommunications site at **164 Route 184, Groton, CT**.

SBA Infrastructure, LLC ("Owner") and Dish Wireless ("Tenant") are entering into a Site Lease Agreement. Tenant will be provided ground space within the existing site compound for its base station equipment and space at the height of 117' for antennas and associated equipment.

Thank you,

Rick Woods
Site Development Manager
SBA COMMUNICATIONS CORPORATION
134 Flanders Road, Suite 125
Westboro, MA 01581

508.251.0720 x3800 + T
508.366.2610 + F
508.614.0389 + C
rwoods@sbasite.com

EXHIBIT 3

Fedex Labels

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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

FedEx

TRACK ANOTHER SHIPMENT

775012333799

ADD NICKNAME

ON TIME

Scheduled delivery: Pending

IN TRANSIT
At FedEx destination facility
WINDSOR LOCKS, CT

GET STATUS UPDATES

FROM
SBA COMMUNICATIONS CORPORATION
Rick Woods

134 Flanders Rd
Suite 125
WESTBOROUGH, MA US 01581
508-614-0389

TO
Melanie A. Bachman Exec. Dir
Connecticut Siting Council

Ten Franklin Square
NEW BRITAIN, CT US 06051
508-251-0720

MANAGE DELIVERY

Travel History | Shipment Facts

Travel History

TIME ZONE
Local Scan Time

Tuesday, October 26, 2021

8:08 AM	EAST GRANBY, CT	At destination sort facility
8:08 AM	WINDSOR LOCKS, CT	At local FedEx facility
4:25 AM	NEWARK, NJ	Departed FedEx hub
1:51 AM	NEWARK, NJ	In transit
1:47 AM	NEWARK, NJ	Arrived at FedEx hub

Monday, October 25, 2021

10:48 PM	EAST BOSTON, MA	Local Delay Delay beyond our control
8:31 PM	FRAMINGHAM, MA	Left FedEx origin facility
4:18 PM	FRAMINGHAM, MA	Picked up
8:50 AM		Shipment information sent to FedEx

Expand History

Shipment Facts

TRACKING NUMBER
775012333799

SERVICE
FedEx Priority Overnight

WEIGHT
5 lbs / 2.27 kgs

DIMENSIONS
18x13x3 in.

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
5 lbs / 2.27 kgs

TERMS
Shipper

SHIPPER REFERENCE
10-56-92009-6089

PACKAGING
FedEx Box

SPECIAL HANDLING SECTION
Deliver Weekday

SHIP DATE
10/25/21

STANDARD TRANSIT
10/26/21 before 10:30 am

SCHEDULED DELIVERY
Pending

All (30) | Inbound (0) | Outbound (30) | Watch list (0)

After printing this label:
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FedEx

TRACK ANOTHER SHIPMENT

775012347236

ADD NICKNAME

ON TIME

Scheduled delivery: Pending

IN TRANSIT
At FedEx destination facility
WINDSOR LOCKS, CT

GET STATUS UPDATES

FROM
SBA COMMUNICATIONS CORPORATION
Rick Woods

134 Flanders Rd
Suite 125
WESTBOROUGH, MA US 01581
508-614-0389

TO
Melanie A. Bachman Exec. Dir
Connecticut Siting Council

Ten Franklin Square
NEW BRITAIN, CT US 06051
508-251-0720

MANAGE DELIVERY

Travel History | Shipment Facts

Travel History

TIME ZONE
Local Scan Time

Tuesday, October 26, 2021

8:08 AM	EAST GRANBY, CT	At destination sort facility
8:08 AM	WINDSOR LOCKS, CT	At local FedEx facility
4:25 AM	NEWARK, NJ	Departed FedEx hub
1:51 AM	NEWARK, NJ	In transit
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Monday, October 25, 2021

10:48 PM	EAST BOSTON, MA	Local Delay Delay beyond our control
8:31 PM	FRAMINGHAM, MA	Left FedEx origin facility
4:18 PM	FRAMINGHAM, MA	Picked up
8:51 AM		Shipment information sent to FedEx

Expand History

Shipment Facts

TRACKING NUMBER
775012347236

SERVICE
FedEx Priority Overnight

WEIGHT
5 lbs / 2.27 kgs

DIMENSIONS
13x18x3 in.

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
5 lbs / 2.27 kgs

TERMS
Shipper

SHIPPER REFERENCE
10-56-92009-6089

PACKAGING
FedEx Box

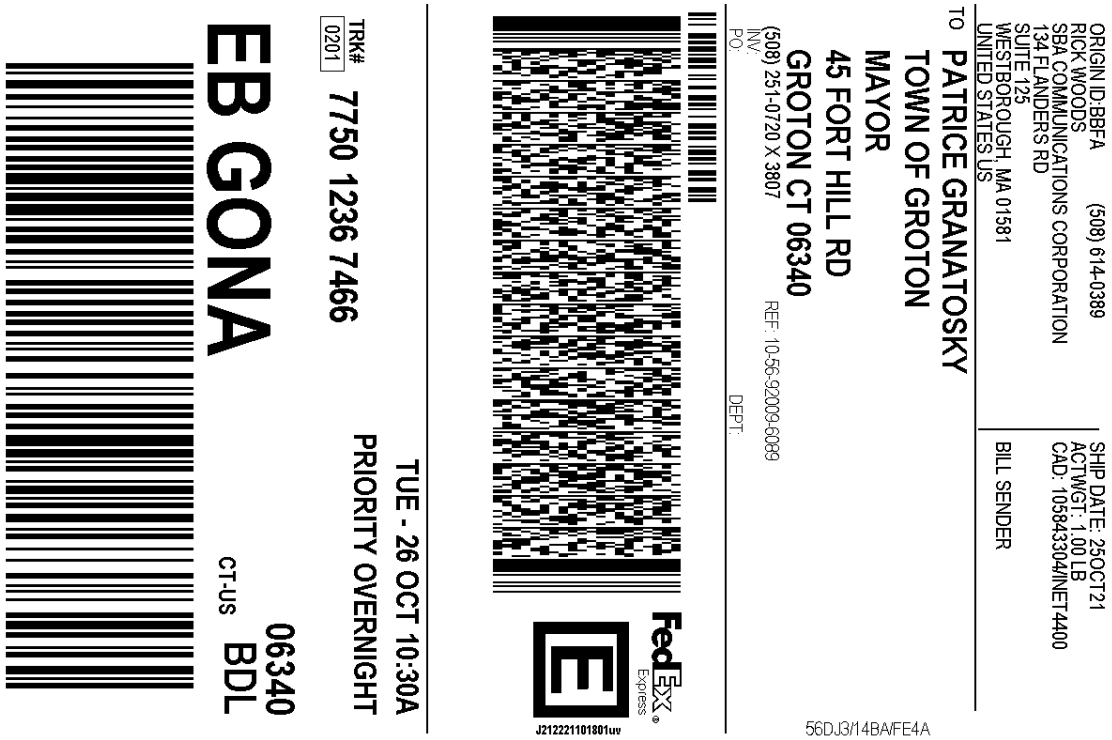
SPECIAL HANDLING SECTION
Deliver Weekday

SHIP DATE
10/25/21

STANDARD TRANSIT
10/26/21 before 10:30 am

SCHEDULED DELIVERY
Pending

All (30) | Inbound (0) | Outbound (30) | Watch list (0)



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FedEx

TRACK ANOTHER SHIPMENT

775012367466

ADD NICKNAME

ON TIME

Scheduled delivery: Pending

IN TRANSIT
At FedEx destination facility
NORWICH, CT

GET STATUS UPDATES

FROM
SBA COMMUNICATIONS CORPORATION
Rick Woods

134 Flanders Rd
Suite 125
WESTBOROUGH, MA US 01581
508-614-0389

TO
Patrice Granatosky
Town of Groton

Mayor
45 Fort Hill Rd
GROTON, CT US 06340
508-251-0720

MANAGE DELIVERY

Travel History | Shipment Facts

Travel History

TIME ZONE
Local Scan Time

Tuesday, October 26, 2021

8:45 AM	NORWICH, CT	At local FedEx facility
6:09 AM	EAST GRANBY, CT	At destination sort facility
5:20 AM	NEWARK, NJ	Departed FedEx hub
1:51 AM	NEWARK, NJ	In transit
1:47 AM	NEWARK, NJ	Arrived at FedEx hub

Monday, October 25, 2021

10:48 PM	EAST BOSTON, MA	Local Delay Delay beyond our control
7:24 PM	FRAMINGHAM, MA	Left FedEx origin facility
4:18 PM	FRAMINGHAM, MA	Picked up
8:53 AM		Shipment information sent to FedEx

Expand History

Shipment Facts

TRACKING NUMBER
775012367466

SERVICE
FedEx Priority Overnight

WEIGHT
1 lbs / 0.45 kgs

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
1 lbs / 0.45 kgs

TERMS
Shipper

SHIPPER REFERENCE
10-56-92009-6089

PACKAGING
FedEx Envelope

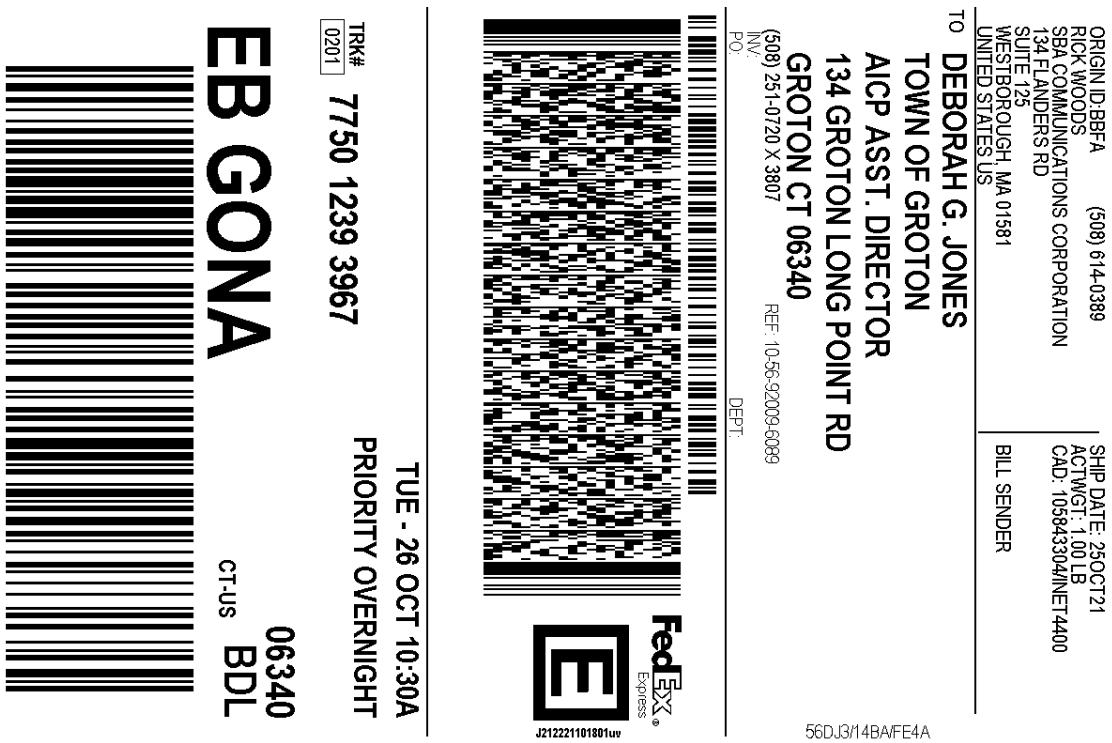
SPECIAL HANDLING SECTION
Deliver Weekday

SHIP DATE
10/25/21

STANDARD TRANSIT
10/26/21 before 10:30 am

SCHEDULED DELIVERY
Pending

All (30) Inbound (0) Outbound (30) Watch list (0)



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FedEx

TRACK ANOTHER SHIPMENT

775012393967

ADD NICKNAME

ON TIME

Scheduled delivery: Pending

IN TRANSIT
At FedEx destination facility
NORWICH, CT

GET STATUS UPDATES

FROM
SBA COMMUNICATIONS CORPORATION
Rick Woods

134 Flanders Rd
Suite 125
WESTBOROUGH, MA US 01581
508-614-0389

TO
Deborah G. Jones
Town of Groton

AICP Asst. Director
134 Groton Long Point Rd
GROTON, CT US 06340
508-251-0720

MANAGE DELIVERY

Travel History | Shipment Facts

Travel History

TIME ZONE
Local Scan Time

Tuesday, October 26, 2021

8:44 AM	NORWICH, CT	At local FedEx facility
6:09 AM	EAST GRANBY, CT	At destination sort facility
5:20 AM	NEWARK, NJ	Departed FedEx hub
1:51 AM	NEWARK, NJ	In transit
1:47 AM	NEWARK, NJ	Arrived at FedEx hub

Monday, October 25, 2021

10:48 PM	EAST BOSTON, MA	Local Delay Delay beyond our control
7:24 PM	FRAMINGHAM, MA	Left FedEx origin facility
4:18 PM	FRAMINGHAM, MA	Picked up
8:55 AM		Shipment information sent to FedEx

Expand History

Shipment Facts

TRACKING NUMBER
775012393967

SERVICE
FedEx Priority Overnight

WEIGHT
1 lbs / 0.45 kgs

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
1 lbs / 0.45 kgs

TERMS
Shipper

SHIPPER REFERENCE
10-56-92009-6089

PACKAGING
FedEx Envelope

SPECIAL HANDLING SECTION
Deliver Weekday

SHIP DATE
10/25/21

STANDARD TRANSIT
10/26/21 before 10:30 am

SCHEDULED DELIVERY
Pending

All (30) Inbound (0) Outbound (30) Watch list (0)

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
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FedEx

TRACK ANOTHER SHIPMENT

775012410210

ADD NICKNAME

ON TIME

Scheduled delivery:
Tuesday, 10/26/2021

IN TRANSIT
On FedEx vehicle for delivery
TAMPA, FL

GET STATUS UPDATES

FROM
SBA COMMUNICATIONS CORPORATION
Rick Woods
134 Flanders Rd
Suite 125
WESTBOROUGH, MA US 01581
508-614-0389

TO
Chester G. Crouch, Jr.
603 Princeton St.
BRANDON, FL US 33511
508-251-0720

MANAGE DELIVERY

Travel History | Shipment Facts

Travel History

TIME ZONE
Local Scan Time

Tuesday, October 26, 2021

9:10 AM	TAMPA, FL	On FedEx vehicle for delivery
9:03 AM	TAMPA, FL	At local FedEx facility
7:11 AM	TAMPA, FL	At destination sort facility
4:40 AM	MEMPHIS, TN	Departed FedEx hub
12:18 AM	MEMPHIS, TN	Arrived at FedEx hub

Monday, October 25, 2021

8:10 PM	FRAMINGHAM, MA	Left FedEx origin facility

4:18 PM	FRAMINGHAM, MA	Picked up
8:56 AM		Shipment information sent to FedEx

Expand History

Shipment Facts

TRACKING NUMBER
775012410210

SERVICE
FedEx Priority Overnight

WEIGHT
1 lbs / 0.45 kgs

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
1 lbs / 0.45 kgs

TERMS
Shipper

SHIPPER REFERENCE
10-56-92009-6089

PACKAGING
FedEx Envelope

SPECIAL HANDLING SECTION
Deliver Weekday

SHIP DATE
10/25/21

STANDARD TRANSIT
10/26/21 before 12:00 pm

SCHEDULED DELIVERY
10/26/21 before 12:00 pm

All (30) Inbound (0) Outbound (30) Watch list (0)

EXHIBIT 4

Property Card

Farm Property Card

Print Date: 10/13/2021

Card 1 Of 1

Account	Location	Grand List Code	Zoning	Acres
270013126797	1662 GOLD STAR HWY	FARM	RU-40	32.248

District	Neighborhood	Deed Book/Page	Use Code
CENTER GROTON	1010	1100/751	PA FOREST

Current Owner

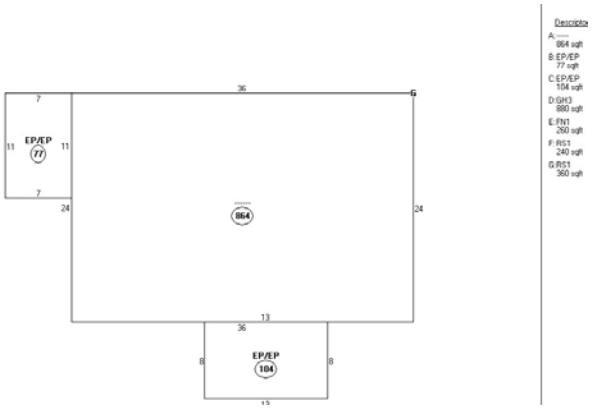
CROUCH CHESTER G JR
603 PRINCETON ST
BRANDON FL 33511

Property Picture

Residential Building Information

Style:	RAISED RANCH
Exterior:	FRAME
Attic:	NONE
Stories:	1
Basement:	FULL
Year Built:	1957
Tot Living Area:	1614 SqFt.
Fuel:	OIL
Heating:	BASIC
System:	HOT WATER
Bedrooms:	4
Full Baths:	2
Half Baths:	

Building Sketch



Valuation

Land:	$148,400
Building:	$119,300
Total:	$267,700
Assessed Value:	$187,360

Recent Sales

Book/Page	Date	Price
1100/751	9/26/2012	$0
1013/844	7/10/2008	$0

Sketch Legend

----	Main Living Area	1SMA	Masonry	GRHS	Attached Greenhouse
1FR	Frame	OMP	Open Masonry Porch	CAT	Cathedral Ceiling
OFP	Open Frame Porch	EMP	Enclosed Msry Porch	SOP	Screen Open Frame Prch
EFP	Enclosed Frame Porch	MUB	Masonry Utility	SMP	Screen Open Msnry Prch
FUB	Frame Utility Building	MB	Masonry Bay	CPAT	Concrete Patio
FB	Frame Bay	MOH	Masonry Overhang	B	Basement
FG	Frame Garage	.5MA	1/2 Story Masonry		
FOH	Frame Overhang	MP	Masonry Patio		
.5FR	1/2 Story Frame	WD	Wood Deck		
A(U)	Attic (Unfinished)	CPY	Canopy		
A(F)	Attic (Finished)				

EXHIBIT 5

Property Map

Town of Groton

GIS Map

Disclaimer:

The planimetric and topographic information depicted on this map was compiled by The Sanborn Map Company based on an aerial flight performed in April 2009. The parcel and property line information depicted on this map has been compiled from recorded deeds, maps, assessor records, and other sources of information in the Town of Groton. The intent of this map is to depict graphical representation of real property information relative to the planimetric features for the Town of Groton and is subject to change as a more accurate survey may disclose. The Town of Groton and the mapping companies assume no legal responsibility for the information contained in this data.
THIS MAP IS NOT TO BE USED FOR THE TRANSFER OF PROPERTY.

Horizontal Datum:
Connecticut State Plane Coordinates, North American Datum of 1983 (NAD83 Feet).

Vertical Datum:
North American Vertical Datum of 1988 (NAVD88)

N
W E
S

1 inch = 81 feet

Date: October 13, 2021

Map Created using the Town of Groton, Connecticut GIS Web Application

EXHIBIT 6

Zoning Approval

SITE NAME: GROTON NORTH SITE ID: CT13073-A

Transaction: Optasite 999-0020

ZONING/PERMITTING COMPLETION FORM

Address: 1662 Route 184, Groton, CT 6340

Jurisdiction: CSC and Town of Groton Zoning District: CB-15 (Commercial Business)

Zoning Approval Type: Certificate, Zoning Permit Case #: 319

Approval Date: 2/27/2007 Approved Height: 133 monopole Tower Build Date:

If tower is destroyed or drop/swap required, tower can likely be rebuilt? ☐ YES ☐ NO

Conditions of Approval:

	Yes	No	N/A
Removal Bond	☐	☑	☐
Site Plan Submittal	☐	☑	☐
Fall Zone	☐	☑	☐
Periodic Inspections	☐	☑	☐
Periodic Reporting	☐	☑	☐
Approval Renewal	☐	☑	☐
Additional Conditions	☐	☑	☐

JURISDICTION POC/DEPT.

Planning/Zoning: Kevin Quinn

Phone: 860-446-5983 Fax:

Bldg./Code Enforcement:

Phone: Fax:

Submitted by: Date:

Zoning Compliance

TO BE COMPLETED BY CORPORATE

	Yes	No	N/A	
Zoning Approval Attached (required)	☑	☐	☐	
Ordinance Attached (required)	☐	☑	☐	
Building Permit Attached (required) BP07-138	☑	☐	☐	Date Recd 5/8/2007
Certificate of Occupancy or Compliance (CO) attached (required)	☑	☐	☐	08/14/08

Zoning Manager Approval: Diane E. Borchardt, AICP Date 8/8/2008

April 27, 2007

BUILDING INSPECTION DEPARTMENT
Groton, Connecticut

№ 7064

CERTIFICATE OF USE OR OCCUPANCY ☒
CERTIFICATE OF ZONING COMPLIANCE ☐

Zone CB-15 Dated August 4, 2008

This is to certify that building at 1662 Gold Star Highway

as commercial under Permit No. 07-138 conforms substantially to the requirements of the State of Connecticut Building Code and the Zoning Regulations of the Town of Groton and is hereby approved for use or occupancy as indicated below.

Approved for use or occupancy as a telecommunication tower

Owner: Betty Jean Crouch (Life Use)

Building Inspector
Peter R. Vandenbosch

Building/Zoning Official
Kevin A. Quinn

Any change or extension of the use herein approved requires a new certificate for use or occupancy and a new certificate of zoning compliance.

If this certificate is lost or destroyed, a duplicate should be obtained immediately from the Building Inspection Department.

999-0020

DOCKET NO. 319 - Optasite, Inc. and New Cingular Wireless PCS, LLC application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility on one of two sites at 1662 Gold Star Memorial Highway (Route 184), Groton, Connecticut. } Connecticut Siting Council

February 27, 2007

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility, including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate, either alone or cumulatively with other effects, when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application, and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to Optasite, Inc. and New Cingular Wireless PCS, LLC, hereinafter referred to as the Certificate Holder, for a telecommunications facility at Site B, located at 1662 Gold Star Memorial Highway, Groton, Connecticut. The Council denies certification of Site A, also located at 1662 Gold Star Memorial Highway, Groton, Connecticut.

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

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of New Cingular Wireless PCS, LLC and other entities, both public and private, but such tower shall not exceed a height of 133 feet above ground level. The height at the top of the antennas shall not exceed 133 feet above ground level.

2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of Groton for comment, and all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
   a) a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas, equipment compound, radio equipment, access road, utility line, and landscaping; and
   b) construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

3. The Certificate Holder shall construct a reduced size equipment compound.

4. The Certificate Holder shall conduct non-routine maintenance activities during the fall, winter and early spring and plant Connecticut-native evergreens around the perimeter of the compound to minimize potential impact to whip-poor-wills (*Caprimulgus vociferous*).

5. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of electromagnetic radio frequency power density is submitted to the Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

6. Upon the establishment of any new state or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

7. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

8. The Certificate Holder shall provide reasonable space on the tower for no compensation for any Town of Groton public safety services (police, fire and medical services), provided such use can be accommodated and is compatible with the structural integrity of the tower.

9. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed and providing wireless services within eighteen months from the date of the mailing of the Council's Findings of Fact, Opinion, and Decision and Order (collectively called "Final Decision"), this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's Final Decision shall not be counted in calculating this deadline.

10. Any request for extension of the time period referred to in Condition 9 shall be filed with the Council not later than 60 days prior to the expiration date of this Certificate and shall be served on all parties and intervenors, as listed in the service list, and the Town of Groton. Any proposed modifications to this Decision and Order shall likewise be so served.

11. If the facility ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

12. The Certificate Holder shall remove any nonfunctioning antenna, and associated antenna mounting equipment, within 60 days of the date the antenna ceased to function.

13. In accordance with Section 16-50j-77 of the Regulations of Connecticut State Agencies, the Certificate Holder shall provide the Council with written notice two weeks prior to the commencement of site construction activities. In addition, the Certificate Holder shall provide the Council with written notice of the completion of site construction and the commencement of site operation.

Pursuant to General Statutes § 16-50p, the Council hereby directs that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in The New London Day and The Groton Times.

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

The parties and intervenors to this proceeding are:

Applicant	**Representative**
Optasite, Inc.	Lucia Chiocchio, Esq. Cuddy & Feder, LLC
New Cingular Wireless PCS, LLC	

ORIGINAL

PAID 4-19-07 SD

Town of Groton
BUILDING/ZONING PERMIT APPLICATION

Please Print

(office use only)

Permit No. BP07-138

Fees: Bldg. 1,620 - Zon. 10 - C.O. 32.40 State 25.76 Total 1,688.16

Estimated Cost: 161,000

Address of Building: 1662 Route 184, Groton, CT

Zone: CB-15 PIN:

Owner: Chester G. Crouch c/o Groton Garden Ctr Ph. #: ~~860~~ 860 445-6474

Address: 2501 West Keysville Rd, Plant City, FL 33567

Contractor: Anthony's Building Co., Inc Ph. #: 401-567-0600

Address: 953 Putnam Pike, Chepachet, RI 02814

Nature of Proposed Work and Use: Construction + operation of telecommunications tower

Plans: Type of Construction: Size:

No. of Stories: N/A No. of Rooms: N/A No. of Baths: N/A

Fireplace(s): N/A Garage: N/A Bay(s) N/A No. of Units: N/A

ZP07-60 ZONING PERMIT

(To be filled out in conjunction with a building permit involving any new structure, addition to an existing structure, or change of use.)

Flood Hazard District: C HDC #: — ZBA #: —

Site Plan Approval #: — Special Zoning Permit #: —

Wetlands: — Coastal Area Management: —

Site Suitability #: — Sewer #: — A2 Survey: Provided

Zoning Official — 4-26-07 Date

CERTIFICATION: I hereby certify that: ☐ I am the owner of record of the named property or ☑ that the proposed work is authorized by the owner of record and/or I have been authorized to make this application as an authorized agent, and we agree to conform to all applicable laws, codes, regulations and ordinances. All information contained within is true and accurate to the best of my knowledge and belief.

Jeff Gold (Print Name in Ink) 401-567-0600 (Phone #) 900617 (Lic. #)

Jeffrey Gold (Signature (in INK) of ~~Owner~~ Authorized Agent) 4/18/07 (Date)

Robert Vanderhoef (Building Official) 5-8-07 (Completed Application Received Date)

This permit shall become invalid unless the work authorized by such permit is commenced within 180 days after its issuance. Refunds will be subject to the refund policy.

EXHIBIT 7

EME Report

EBI Consulting

environmental | engineering | due diligence

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

Dish Wireless Existing Facility

Site ID: BOBOS00056A

BOBOS00056A
1662 Route 184
Groton, Connecticut 06340

October 19, 2021

EBI Project Number: 6221005696

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**13.95%**

October 19, 2021

Dish Wireless

Emissions Analysis for Site: BOBOS00056A - BOBOS00056A

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **1662 Route 184** in **Groton, Connecticut** for the purpose of determining whether the emissions from the Proposed Dish Wireless 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 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu W/cm^2$). The number of $\mu W/cm^2$ 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 ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed Dish Wireless antenna facility located at 1662 Route 184 in Groton, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since Dish Wireless 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 20 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) 4 n71 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) 4 n70 channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

3) 4 n66 channels (AWS Band - 2190 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

4) 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.

5) 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 20 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.

6) The antennas used in this modeling are the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz / 2190 MHz channel(s) in Sector A, the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz / 2190 MHz channel(s) in Sector B, the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz / 2190 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 20 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.

7) The antenna mounting height centerline of the proposed antennas is 117 feet above ground level (AGL).

8) 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.

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

Dish Wireless Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21
Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz	Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz	Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz
Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd
Height (AGL):	117 feet	Height (AGL):	117 feet	Height (AGL):	117 feet
Channel Count:	12	Channel Count:	12	Channel Count:	12
Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts
ERP (W):	5,236.31	ERP (W):	5,236.31	ERP (W):	5,236.31
Antenna A1 MPE %:	**1.92%**	Antenna B1 MPE %:	**1.92%**	Antenna C1 MPE %:	**1.92%**

Site Composite MPE %	
Carrier	**MPE %**
Dish Wireless (Max at Sector A):	1.92%
T-Mobile	5.01%
AT&T	4.85%
Clearwire	0.35%
Verizon	1.82%
Site Total MPE % :	13.95%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	1.92%
Dish Wireless Sector B Total:	1.92%
Dish Wireless Sector C Total:	1.92%
Site Total MPE % :	13.95%

Dish Wireless Maximum MPE Power Values (Sector A)

Dish Wireless Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
Dish Wireless 600 MHz n71	4	223.68	117.0	2.61	600 MHz n71	400	0.65%
Dish Wireless 1900 MHz n70	4	542.70	117.0	6.33	1900 MHz n70	1000	0.63%
Dish Wireless 2190 MHz n66	4	542.70	117.0	6.33	2190 MHz n66	1000	0.63%
						Total:	**1.92%**

• 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 Dish Wireless 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:

Dish Wireless Sector	Power Density Value (%)
Sector A:	1.92%
Sector B:	1.92%
Sector C:	1.92%
Dish Wireless Maximum MPE % (Sector A):	1.92%
Site Total:	13.95%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **13.95%** 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 8

Structural Analysis

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

Structural Analysis Report

Existing 150 ft Rohn Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT13073-A

Customer Site Name: Groton North

Carrier Name: Dish Wireless (App#: 163266, V#1)

Carrier Site ID / Name: BOBOS00056A / 0

Site Location: 1662 Route 184

Groton, Connecticut

New London County

Latitude: 41.385666

Longitude: -72.013306

Exp.10/31/2021

07/29/2021

Analysis Result:

Max Structural Usage: 75.7% [Pass]

Max Foundation Usage: 70% [Pass]

Additional Usage Caused by New Mount/Mount Modification:+4.6%

Report Prepared By: Mariana Franco

Introduction

The purpose of this report is to summarize the analysis results on the 150 ft Rohn Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Radian, File Nos. 060-3663 & 57974EH, Drawing No. A070130, dated March 16, 2007
Foundation Drawing	Radian, File Nos. 060-3663 & 57974EH, Drawing No. A070131, dated March 16, 2007
Geotechnical Report	Gemini Geotechnical Associates, Inc., Project No. 07022CT, dated March 13, 2007
Modification Drawings	N/A
Mount Analysis	N/A

Analysis Criteria

The rigorous analysis was performed in accordance with the requirements and stipulations of the TIA-222-G-2**.** In accordance with this standard, the structure was analyzed using **TESPoles,** a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} = 135.0 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 105.0 mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 3/4" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	TIA-222-G-2 / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	B
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.27, S_1 = 0.24

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

Existing Antennas, Mounts and Transmission Lines

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

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	149.0	3	Amphenol Antel - BXA-70063-6CF - Panel	Low Profile Platform	(13) 1 5/8"	Verizon
2		3	Andrew - HBXX-6517DS-VTM - Panel			
3		3	Andrew - HBXX-6516DS-VTM - Panel			
4		3	Andrew - LNX-6512DS-A1M - Panel			
5		1	DB-T1-6Z-8AB-0Z			
6		3	ALU RRH 2x60 AWS			
7		6	RFS FD9R6004/2C-3L Diplexer			
8	139.0	3	Ericsson - Air 3246 B66 - Panel	Platform w/ Hand Rail (Sitepro RMQP-4096-HK)	(3) 1 5/8" Fiber	T-Mobile
9		3	RFS - APXVAARR24_43-U-NA2 - Panel			
10		3	Ericsson - AIR6449 B41 - Panel			
11		3	Ericsson - 4449 B71 + B85 - RRU			
12		3	Ericsson - 4424 B25 - RRU			
13		4	Ericsson - Radio 4415 B25 - RRU			
14	128.0	3	Powerwave - 7770.00A - Panel	Low Profile Platform	(6) 1 5/8" (4) 3/4" DC (2) 5/16" Fiber	AT&T
15		1	CCI - HPA-65R-BU4AA - Panel			
16		1	CCI - DMP65R-BU4DA - Panel			
17		2	CCI - HPA-65R-BU8AA - Panel			
18		2	CCI - DMP65R-BU8DA - Panel			
19		3	Ericsson - 4449 B5/B12 - RRU			
20		3	Ericsson - 8843 B2/B66A - RRU			
21		2	Raycap - DC6-48-60-18-8F - OVP			

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

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

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
22	117.0	3	JMA Wireless MX08FRO665-21 - Panel	Commscope Platform w/HRK [MC-PK8-DSH]	(1) 1.6" Hybrid	Dish Wireless
23		3	Fujitsu TA08025-B605			
24		3	Fujitsu TA08025-B604			
25		1	Raycap RDIDC-9181-PF-48			

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

Analysis Results

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

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	**45.9%**	**59.5%**	**75.7%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	3662.5	33.2	82.7

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

Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by TIA-222 for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.5845 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

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

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC.** Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.

2. The structural analysis was performance based upon the evidence available at the time of this report. All information provided by the client is considered to be accurate.

3. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the ANSI/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.

4. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.

5. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.

6. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

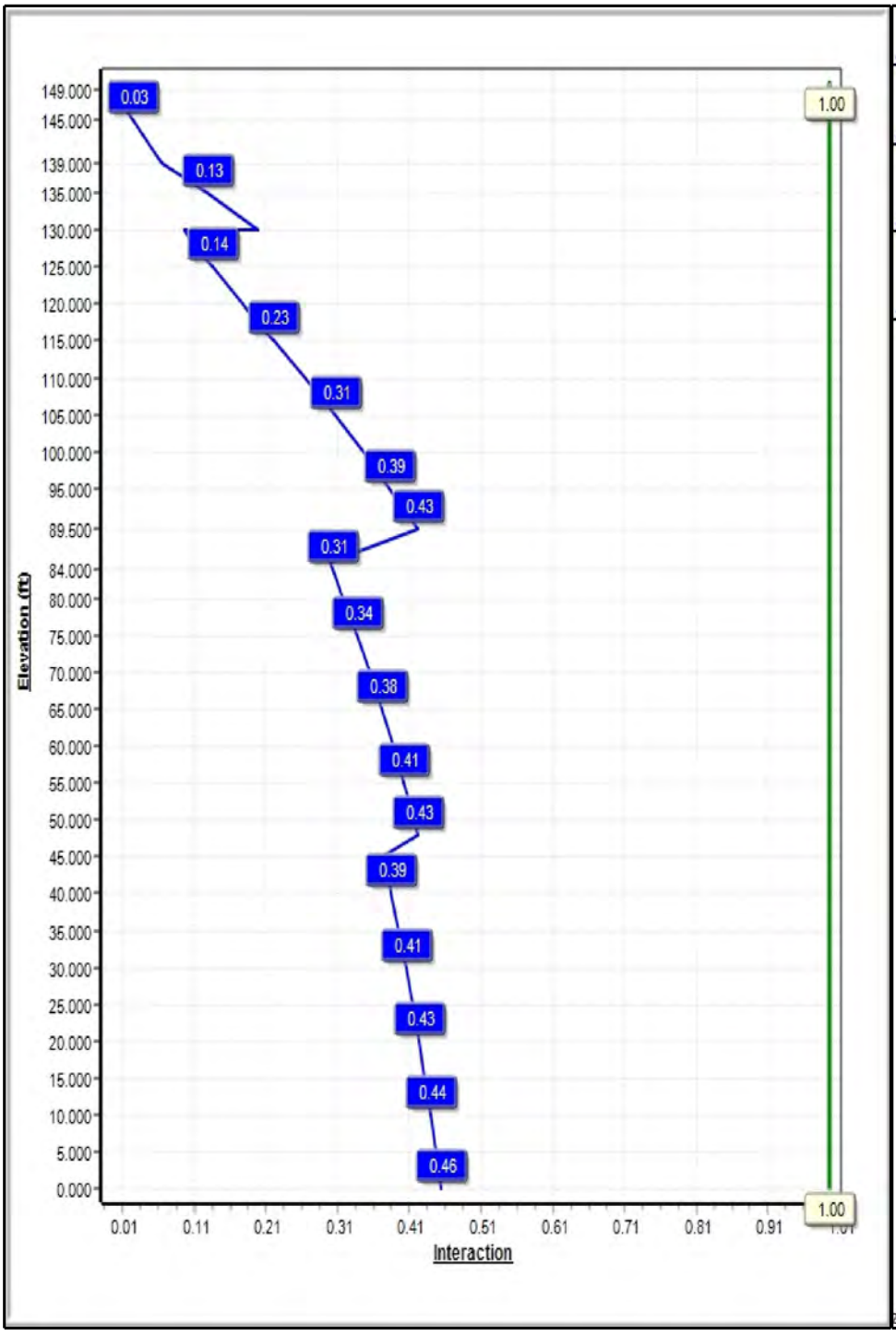
Usage Diagram - Max Ratio 45.92% at 0.0ft

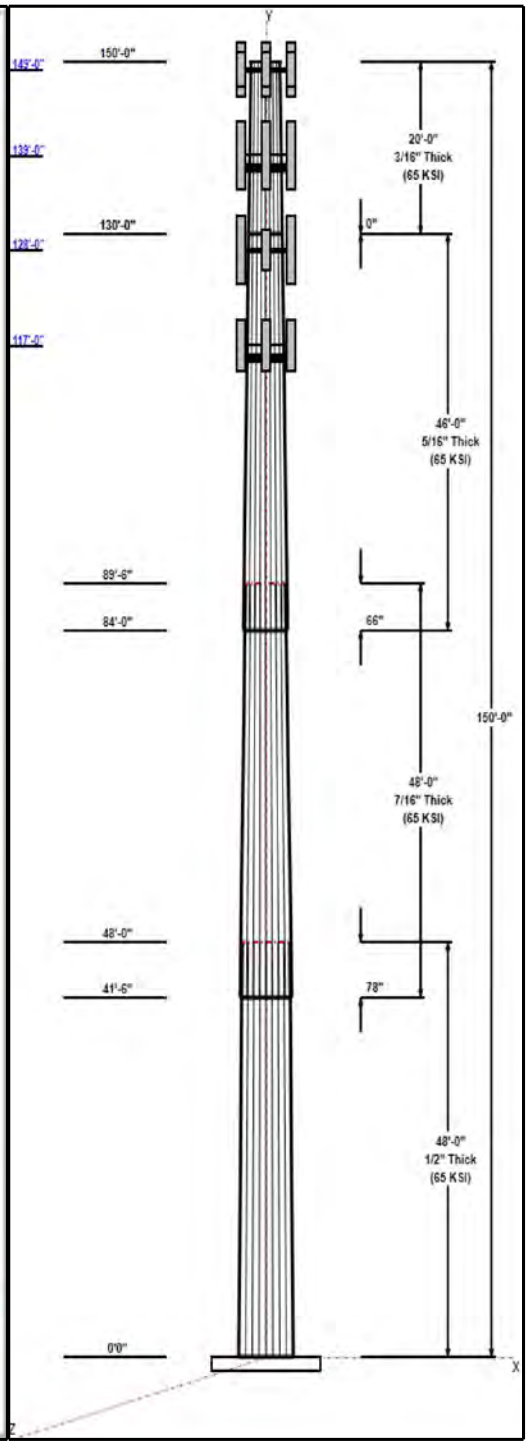
Structure:	CT13073-A-SBA	**Code:**	EIA/TIA-222-G	7/29/2021
Site Name:	Groton North	**Exposure:**	B	
Height:	150.00 (ft)	**Gh:**	1.1	
Base Elev:	0.000 (ft)			Page: 1

Tower Engineering Solutions

Dead Load Factor:	1.20	**Iterations:**	21
Wind Load Factor:	1.60		

Load Case : 1.2D + 1.6W 105 mph Wind





Structure: CT13073-A-SBA

Type: Custom
Site Name: Groton North
Height: 150.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.20967

7/29/2021

Tower Engineering Solutions

Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	48.00	49.94	60.00	0.500		0.20967	65
2	48.00	42.11	52.17	0.438	Slip	0.20967	65
3	46.00	34.24	43.89	0.313	Slip	0.20967	65
4	20.00	30.00	34.24	0.188	Butt	0.21215	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
149.00	149.00	3	BXA-70063-6CF	Verizon
149.00	149.00	3	HBXX-6517DS-VTM	Verizon
149.00	149.00	3	HBXX-6516DS-VTM	Verizon
149.00	149.00	3	LNX-6512DS-A1M	Verizon
149.00	149.00	1	DB-T1-6Z-8AB-0Z	Verizon
149.00	149.00	3	ALU RRH 2x60 AWS	Verizon
149.00	149.00	6	RFS FD9R6004/2C-3L	Verizon
149.00	149.00	1	Low Profile Platform	Verizon
139.00	139.00	3	Air 3246 B66	T-Mobile
139.00	139.00	3	APXVAARR24_43-U-NA20	T-Mobile
139.00	139.00	3	AIR6449 B41	T-Mobile
139.00	139.00	3	4449 B71 + B85	T-Mobile
139.00	139.00	3	4424	T-Mobile
139.00	139.00	4	RRUS 4415 B25	T-Mobile
139.00	139.00	1	RMQP-4096-HK	T-Mobile
128.00	128.00	1	Low Profile Platform	AT&T
128.00	128.00	1	HPA-65R-BU4AA	AT&T
128.00	128.00	1	DMP65R-BU4DA	AT&T
128.00	128.00	2	HPA-65R-BU8AA	AT&T
128.00	128.00	2	DMP65R-BU8DA	AT&T
128.00	128.00	3	4449	AT&T
128.00	128.00	3	B2 B66A 8843	AT&T
128.00	128.00	2	DC6-48-60-18-8F	AT&T
128.00	128.00	3	7770.00A	AT&T
117.00	117.00	3	MX08FRO665-21	Dish Wireless
117.00	117.00	3	TA08025-B605	Dish Wireless
117.00	117.00	3	TA08025-B604	Dish Wireless
117.00	117.00	1	RDIDC-9181-PF-48	Dish Wireless
117.00	117.00	1	MC-PK8-DSH	Dish Wireless

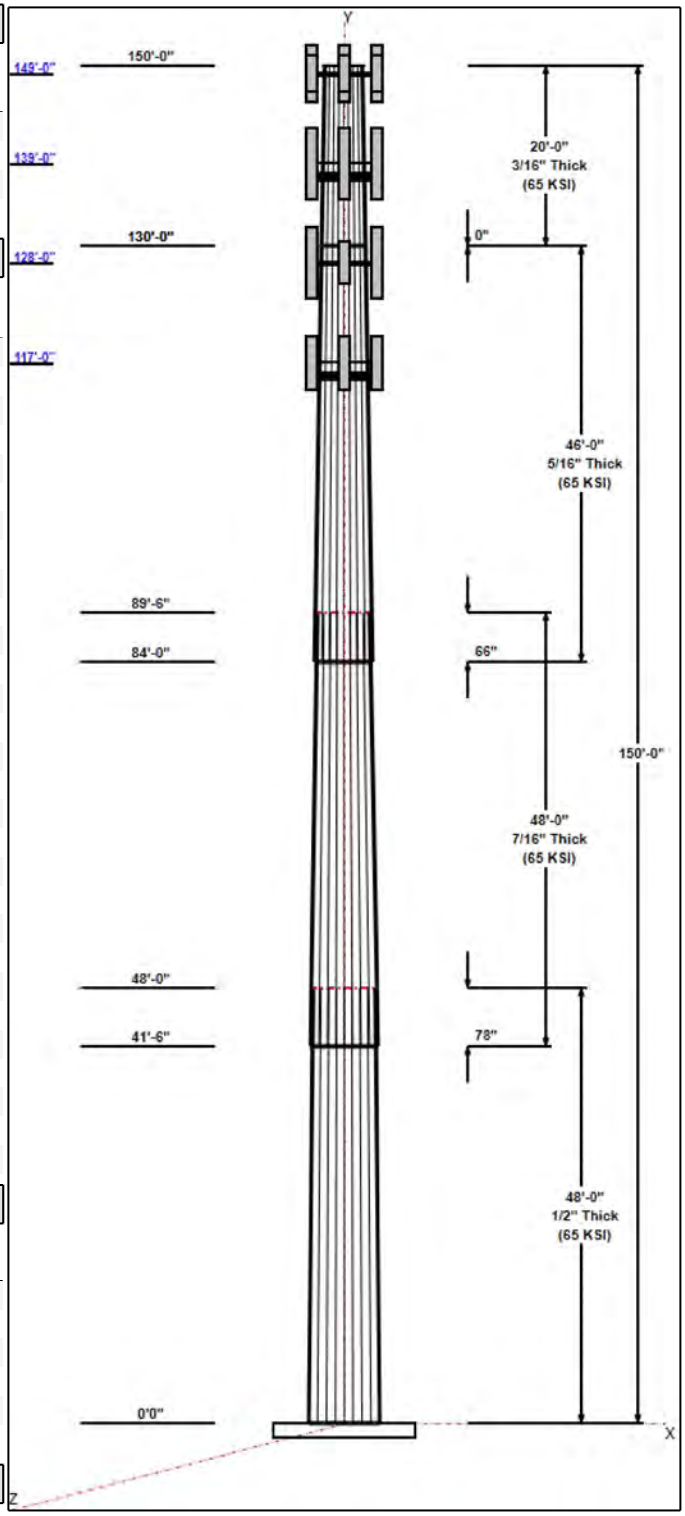
Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	149.00	Inside	1 5/8" Coax	Verizon
0.00	139.00	Inside	1 5/8" Fiber	T-Mobile
0.00	128.00	Inside	1 5/8" Coax	AT&T
0.00	128.00	Inside	3/4" DC	AT&T
0.00	128.00	Inside	5/16" Fiber	AT&T
0.00	117.00	Inside	1.6" Hybrid	Dish Wireless

Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
34	1.5" F1554 105	105.0	Radial

Base Plate



Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
1.7500	69.5	50.0	Round

Reactions

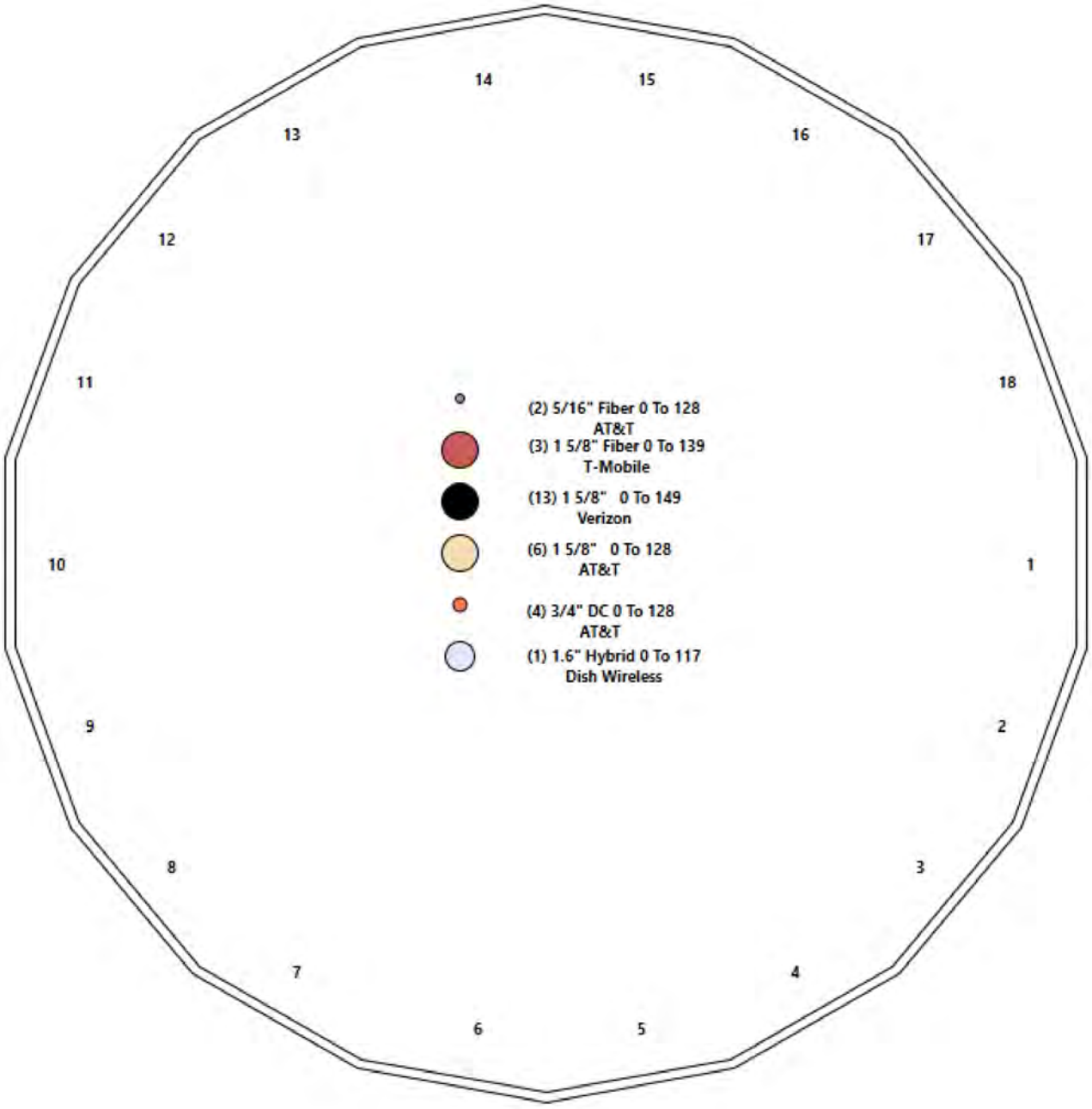
Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 105 mph Wind	3662.5	33.2	56.5
0.9D + 1.6W 105 mph Wind	3636.7	33.2	42.4
1.2D + 1.0Di + 1.0Wi 50 mph Wind	872.2	8.1	82.7
1.2D + 1.0E	452.8	3.7	56.6
0.9D + 1.0E	449.5	3.7	42.4
1.0D + 1.0W 60 mph Wind	744.2	6.8	47.1

Structure: CT13073-A-SBA - Coax Line Placement

Type: Monopole
Site Name: Groton North
Height: 150.00 (ft)

7/29/2021

Tower Engineering Solutions



Shaft Properties

Structure:	CT13073-A-SBA		**Code:**	EIA/TIA-222-G	7/29/2021
Site Name:	Groton North		**Exposure:**	B	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 5

Tower Engineering Solutions

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	48.000	0.5000	65		0.00	14,118
2	18	48.000	0.4375	65	Slip	78.00	10,593
3	18	46.000	0.3125	65	Slip	66.00	6,016
4	18	20.000	0.1875	65	Flange	0.00	1,293
					Total Shaft Weight:		**32,020**

	Bottom						Top						
Sec. No.	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Taper
1	60.00	0.00	94.42	42234.30	19.75	120.00	49.94	48.00	78.45	24223.7	16.20	99.87	0.209669
2	52.17	41.50	71.84	24294.43	19.62	119.25	42.11	89.50	57.86	12695.7	15.56	96.25	0.209669
3	43.89	84.00	43.22	10368.48	23.35	140.44	34.24	130.00	33.65	4895.14	17.91	109.5	0.209669
4	34.24	130.0	20.27	2969.66	30.79	182.63	30.00	150.00	17.74	1992.24	26.80	160.0	0.212150

Load Summary

Structure:	CT13073-A-SBA	**Code:**	EIA/TIA-222-G	7/29/2021	
Site Name:	Groton North	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 6	

Discrete Appurtenances

				No Ice			Ice				
No.	Elev (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
1	149.00	BXA-70063-6CF	3	17.00	7.57	0.73	165.20	10.332	0.73	0.00	0.00
2	149.00	HBXX-6517DS-VTM	3	40.70	8.55	0.77	216.82	11.467	0.77	0.00	0.00
3	149.00	HBXX-6516DS-VTM	3	30.60	5.43	0.77	153.82	7.411	0.77	0.00	0.00
4	149.00	LNX-6512DS-A1M	3	28.00	5.09	0.80	149.46	6.979	0.80	0.00	0.00
5	149.00	DB-T1-6Z-8AB-0Z	1	18.90	4.80	1.00	162.51	5.673	1.00	0.00	0.00
6	149.00	ALU RRH 2x60 AWS	3	55.00	3.50	0.67	134.96	4.289	0.67	0.00	0.00
7	149.00	RFS FD9R6004/2C-3L Diplexer	6	3.10	0.36	1.00	11.12	0.803	1.00	0.00	0.00
8	149.00	Low Profile Platform	1	1500.00	22.00	1.00	2808.04	39.650	1.00	0.00	0.00
9	139.00	Air 3246 B66	3	180.00	7.94	0.83	380.02	9.112	0.85	0.00	0.00
10	139.00	APXVAARR24_43-U-NA20	3	128.00	20.24	0.70	542.36	22.125	0.72	0.00	0.00
11	139.00	AIR6449 B41	3	103.00	5.65	0.71	239.08	6.593	0.73	0.00	0.00
12	139.00	4449 B71 + B85	3	73.20	1.97	0.67	130.50	2.535	0.67	0.00	0.00
13	139.00	4424	3	88.00	2.05	0.67	173.59	2.641	0.67	0.00	0.00
14	139.00	RRUS 4415 B25	4	46.00	1.64	0.67	86.79	2.151	0.67	0.00	0.00
15	139.00	RMQP-4096-HK	1	2645.00	51.70	1.00	5393.64	89.666	1.00	0.00	0.00
16	128.00	Low Profile Platform	1	1600.00	22.00	1.00	2974.20	39.384	1.00	0.00	0.00
17	128.00	HPA-65R-BU4AA	1	28.70	4.92	0.94	122.01	5.853	0.96	0.00	0.00
18	128.00	DMP65R-BU4DA	1	69.70	8.28	0.99	307.93	9.177	0.99	0.00	0.00
19	128.00	HPA-65R-BU8AA	2	54.00	11.23	0.86	315.60	12.867	0.88	0.00	0.00
20	128.00	DMP65R-BU8DA	2	95.70	17.87	0.72	445.13	19.896	0.74	0.00	0.00
21	128.00	4449	3	70.00	1.65	0.67	136.90	2.178	0.67	0.00	0.00
22	128.00	B2 B66A 8843	3	70.00	1.64	0.67	115.26	2.148	0.67	0.00	0.00
23	128.00	DC6-48-60-18-8F	2	31.80	0.92	1.00	92.65	1.351	1.00	0.00	0.00
24	128.00	7770.00A	3	27.00	5.54	0.72	139.50	7.641	0.74	0.00	0.00
25	117.00	MX08FRO665-21	3	64.50	12.49	0.74	348.23	13.919	0.74	0.00	0.00
26	117.00	TA08025-B605	3	75.00	1.96	0.80	126.02	2.507	0.80	0.00	0.00
27	117.00	TA08025-B604	3	63.90	1.96	0.76	113.29	2.507	0.76	0.00	0.00
28	117.00	RDIDC-9181-PF-48	1	21.90	2.01	1.00	73.84	2.564	1.00	0.00	0.00
29	117.00	MC-PK8-DSH	1	1727.00	37.59	1.00	3373.41	83.665	1.00	0.00	0.00
		Totals:	**72**	**11,518.50**			**27,131.28**				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	149.00	(13) 1 5/8" Coax	0.00	Inside
0.00	139.00	(3) 1 5/8" Fiber	0.00	Inside
0.00	128.00	(6) 1 5/8" Coax	0.00	Inside
0.00	128.00	(4) 3/4" DC	0.00	Inside
0.00	128.00	(2) 5/16" Fiber	0.00	Inside
0.00	117.00	(1) 1.6" Hybrid	0.00	Inside

Shaft Section Properties

Structure:	CT13073-A-SBA	**Code:**	EIA/TIA-222-G	7/29/2021	
Site Name:	Groton North	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 7	

Tower Engineering Solutions

Increment Length: **5 (ft)**

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fpy (ksi)	S (in^3)	Weight (lb)
0.00		0.5000	60.000	94.423	42234.3	19.75	120.00	78.2	1386.	0.0
5.00		0.5000	58.952	92.759	40041.0	19.38	117.90	78.6	1337.	1592.4
10.00		0.5000	57.903	91.096	37925.0	19.01	115.81	79.0	1290.	1564.0
15.00		0.5000	56.855	89.432	35884.8	18.64	113.71	79.5	1243.	1535.7
20.00		0.5000	55.807	87.768	33919.2	18.27	111.61	79.9	1197.	1507.4
25.00		0.5000	54.758	86.105	32026.7	17.90	109.52	80.3	1152.	1479.1
30.00		0.5000	53.710	84.441	30205.9	17.53	107.42	80.8	1107.	1450.8
35.00		0.5000	52.662	82.777	28455.5	17.16	105.32	81.2	1064.	1422.5
40.00		0.5000	51.613	81.114	26774.1	16.79	103.23	81.7	1021.	1394.2
41.50	Bot - Section 2	0.5000	51.299	80.615	26282.9	16.68	102.60	81.8	1009.	412.7
45.00		0.5000	50.565	79.450	25160.2	16.42	101.13	82.1	980.0	1802.7
48.00	Top - Section 1	0.4375	50.811	69.947	22424.6	19.07	116.14	0.0	0.0	1524.5
50.00		0.4375	50.392	69.365	21869.3	18.90	115.18	79.2	854.8	474.0
55.00		0.4375	49.343	67.909	20521.1	18.48	112.78	79.7	819.1	1167.8
60.00		0.4375	48.295	66.454	19229.5	18.05	110.39	80.2	784.2	1143.0
65.00		0.4375	47.247	64.998	17993.3	17.63	107.99	80.7	750.1	1118.2
70.00		0.4375	46.198	63.542	16811.2	17.21	105.60	81.2	716.7	1093.5
75.00		0.4375	45.150	62.086	15682.1	16.79	103.20	81.7	684.1	1068.7
80.00		0.4375	44.101	60.631	14604.7	16.36	100.80	82.2	652.3	1043.9
84.00	Bot - Section 3	0.4375	43.263	59.466	13779.2	16.03	98.89	82.5	627.3	817.3
85.00		0.4375	43.053	59.175	13577.8	15.94	98.41	82.5	621.2	348.6
89.50	Top - Section 2	0.3125	42.735	42.076	9566.9	22.70	136.75	0.0	0.0	1547.5
90.00		0.3125	42.630	41.972	9496.1	22.64	136.42	74.8	438.7	71.5
95.00		0.3125	41.581	40.932	8807.7	22.05	133.06	75.5	417.2	705.3
100.00		0.3125	40.533	39.892	8153.4	21.46	129.71	76.2	396.2	687.6
105.00		0.3125	39.485	38.853	7532.3	20.87	126.35	76.9	375.7	669.9
110.00		0.3125	38.436	37.813	6943.6	20.28	123.00	77.6	355.8	652.2
115.00		0.3125	37.388	36.773	6386.4	19.69	119.64	78.2	336.4	634.5
117.00		0.3125	36.969	36.357	6172.2	19.45	118.30	78.5	328.8	248.8
120.00		0.3125	36.340	35.733	5859.8	19.09	116.29	78.9	317.6	368.0
125.00		0.3125	35.291	34.693	5363.0	18.50	112.93	79.6	299.3	599.1
128.00		0.3125	34.662	34.070	5078.9	18.15	110.92	80.1	288.6	351.0
130.00	Top - Section 3	0.3125	34.243	33.654	4895.1	17.91	109.58	80.3	281.6	230.4
130.00	Bot - Section 4	0.1875	34.243	20.267	2969.7	29.85	182.63	65.2	170.8	
135.00		0.1875	33.182	19.635	2700.7	29.79	176.97	66.4	160.3	339.4
139.00		0.1875	32.334	19.130	2497.7	29.00	172.45	67.3	152.1	263.8
140.00		0.1875	32.122	19.004	2448.5	28.80	171.31	67.5	150.1	64.9
145.00		0.1875	31.061	18.373	2212.5	27.80	165.66	68.7	140.3	318.0
149.00		0.1875	30.212	17.868	2035.1	27.00	161.13	69.6	132.7	246.6
150.00		0.1875	30.000	17.742	1992.2	26.80	160.00	69.9	130.8	60.6
										32020.4

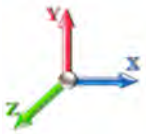
Wind Loading - Shaft

Structure:	CT13073-A-SBA	**Code:**	EIA/TIA-222-G	7/29/2021	
Site Name:	Groton North	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Load Case: 1.2D + 1.6W 105 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 21

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	18.769	20.65	446.02	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	18.769	20.65	438.23	0.650	0.000	5.00	25.164	16.36	540.3	0.0	1910.8
10.00		1.00	0.70	18.769	20.65	430.44	0.650	0.000	5.00	24.720	16.07	530.8	0.0	1876.9
15.00		1.00	0.70	18.769	20.65	422.64	0.650	0.000	5.00	24.277	15.78	521.3	0.0	1842.9
20.00		1.00	0.70	18.769	20.65	414.85	0.650	0.000	5.00	23.833	15.49	511.7	0.0	1808.9
25.00		1.00	0.70	18.769	20.65	407.06	0.650	0.000	5.00	23.390	15.20	502.2	0.0	1775.0
30.00		1.00	0.70	18.785	20.66	399.43	0.650	0.000	5.00	22.946	14.91	493.1	0.0	1741.0
35.00		1.00	0.73	19.631	21.59	400.36	0.650	0.000	5.00	22.503	14.63	505.4	0.0	1707.0
40.00		1.00	0.76	20.394	22.43	399.94	0.650	0.000	5.00	22.059	14.34	514.7	0.0	1673.1
41.50	Bot - Section 2	1.00	0.77	20.610	22.67	399.60	0.650	0.000	1.50	6.531	4.25	154.0	0.0	495.3
45.00		1.00	0.79	21.092	23.20	398.47	0.650	0.000	3.50	15.343	9.97	370.2	0.0	2163.2
48.00	Top - Section 1	1.00	0.80	21.485	23.63	397.16	0.650	0.000	3.00	12.979	8.44	319.0	0.0	1829.4
50.00		1.00	0.81	21.737	23.91	403.12	0.650	0.000	2.00	8.564	5.57	212.9	0.0	568.9
55.00		1.00	0.83	22.337	24.57	400.15	0.650	0.000	5.00	21.099	13.71	539.1	0.0	1401.3
60.00		1.00	0.85	22.899	25.19	396.55	0.650	0.000	5.00	20.655	13.43	541.1	0.0	1371.6
65.00		1.00	0.87	23.429	25.77	392.40	0.650	0.000	5.00	20.212	13.14	541.7	0.0	1341.9
70.00		1.00	0.89	23.930	26.32	387.78	0.650	0.000	5.00	19.768	12.85	541.2	0.0	1312.2
75.00		1.00	0.91	24.406	26.85	382.73	0.650	0.000	5.00	19.324	12.56	539.6	0.0	1282.5
80.00		1.00	0.93	24.861	27.35	377.31	0.650	0.000	5.00	18.881	12.27	537.0	0.0	1252.7
84.00	Bot - Section 3	1.00	0.94	25.210	27.73	372.72	0.650	0.000	4.00	14.785	9.61	426.4	0.0	980.8
85.00		1.00	0.94	25.295	27.82	371.54	0.650	0.000	1.00	3.705	2.41	107.2	0.0	418.3
89.50	Top - Section 2	1.00	0.96	25.671	28.24	366.09	0.650	0.000	4.50	16.452	10.69	483.2	0.0	1857.0
90.00		1.00	0.96	25.711	28.28	370.90	0.650	0.000	0.50	1.806	1.17	53.1	0.0	85.8
95.00		1.00	0.97	26.112	28.72	364.59	0.650	0.000	5.00	17.815	11.58	532.2	0.0	846.3
100.00		1.00	0.99	26.497	29.15	358.01	0.650	0.000	5.00	17.371	11.29	526.6	0.0	825.1
105.00		1.00	1.00	26.869	29.56	351.19	0.650	0.000	5.00	16.928	11.00	520.3	0.0	803.9
110.00		1.00	1.02	27.229	29.95	344.15	0.650	0.000	5.00	16.484	10.71	513.5	0.0	782.6
115.00		1.00	1.03	27.577	30.33	336.89	0.650	0.000	5.00	16.040	10.43	506.0	0.0	761.4
117.00	Appurtenance(s)	1.00	1.03	27.713	30.48	333.93	0.650	0.000	2.00	6.292	4.09	199.5	0.0	298.6
120.00		1.00	1.04	27.914	30.71	329.44	0.650	0.000	3.00	9.305	6.05	297.1	0.0	441.6
125.00		1.00	1.05	28.242	31.07	321.81	0.650	0.000	5.00	15.153	9.85	489.6	0.0	718.9
128.00	Appurtenance(s)	1.00	1.06	28.434	31.28	317.15	0.650	0.000	3.00	8.879	5.77	288.8	0.0	421.2
130.00	Top - Section 3	1.00	1.07	28.560	31.42	314.00	0.650	0.000	2.00	5.831	3.79	190.5	0.0	276.5
135.00		1.00	1.08	28.869	31.76	305.92	0.650	0.000	5.00	14.264	9.27	471.1	0.0	407.3
139.00	Appurtenance(s)	1.00	1.09	29.111	32.02	299.34	0.650	0.000	4.00	11.088	7.21	369.3	0.0	316.6
140.00		1.00	1.09	29.171	32.09	297.69	0.650	0.000	1.00	2.727	1.77	91.0	0.0	77.9
145.00		1.00	1.10	29.465	32.41	289.30	0.650	0.000	5.00	13.366	8.69	450.5	0.0	381.6
149.00	Appurtenance(s)	1.00	1.11	29.695	32.66	282.49	0.650	0.000	4.00	10.370	6.74	352.3	0.0	296.0
150.00		1.00	1.11	29.752	32.73	280.78	0.650	0.000	1.00	2.548	1.66	86.7	0.0	72.7
								Totals:	**150.00**			**15,370.1**		**38,424.5**

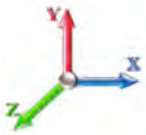
Discrete Appurtenance Forces

Structure:	CT13073-A-SBA	**Code:**	EIA/TIA-222-G	7/29/2021	
Site Name:	Groton North	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 9	

Load Case: 1.2D + 1.6W 105 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 21

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	149.00	LNX-6512DS-A1M	3	29.695	32.664	0.64	0.80	9.77	100.80	0.000	0.000	510.76	0.00	0.00
2	149.00	BXA-70063-6CF	3	29.695	32.664	0.58	0.80	13.26	61.20	0.000	0.000	693.15	0.00	0.00
3	149.00	HBXX-6517DS-VTM	3	29.695	32.664	0.62	0.80	15.80	146.52	0.000	0.000	825.78	0.00	0.00
4	149.00	HBXX-6516DS-VTM	3	29.695	32.664	0.62	0.80	10.03	110.16	0.000	0.000	524.44	0.00	0.00
5	149.00	Low Profile Platform	1	29.695	32.664	1.00	1.00	22.00	1800.00	0.000	0.000	1149.79	0.00	0.00
6	149.00	DB-T1-6Z-8AB-0Z	1	29.695	32.664	0.80	0.80	3.84	22.68	0.000	0.000	200.69	0.00	0.00
7	149.00	ALU RRH 2x60 AWS	3	29.695	32.664	0.54	0.80	5.63	198.00	0.000	0.000	294.14	0.00	0.00
8	149.00	RFS FD9R6004/2C-3L	6	29.695	32.664	0.80	0.80	1.73	22.32	0.000	0.000	90.31	0.00	0.00
9	139.00	RMQP-4096-HK	1	29.111	32.022	1.00	1.00	51.70	3174.00	0.000	0.000	2648.90	0.00	0.00
10	139.00	RRUS 4415 B25	4	29.111	32.022	0.54	0.80	3.52	220.80	0.000	0.000	180.15	0.00	0.00
11	139.00	4424	3	29.111	32.022	0.50	0.75	3.09	316.80	0.000	0.000	158.34	0.00	0.00
12	139.00	4449 B71 + B85	3	29.111	32.022	0.50	0.75	2.97	263.52	0.000	0.000	152.16	0.00	0.00
13	139.00	AIR6449 B41	3	29.111	32.022	0.53	0.75	9.03	370.80	0.000	0.000	462.45	0.00	0.00
14	139.00	APXVAARR24_43-U-NA2	3	29.111	32.022	0.52	0.75	31.88	460.80	0.000	0.000	1633.30	0.00	0.00
15	139.00	Air 3246 B66	3	29.111	32.022	0.62	0.75	14.83	648.00	0.000	0.000	759.72	0.00	0.00
16	128.00	HPA-65R-BU8AA	2	28.434	31.277	0.69	0.80	15.45	129.60	0.000	0.000	773.29	0.00	0.00
17	128.00	Low Profile Platform	1	28.434	31.277	1.00	1.00	22.00	1920.00	0.000	0.000	1100.95	0.00	0.00
18	128.00	HPA-65R-BU4AA	1	28.434	31.277	0.75	0.80	3.70	34.44	0.000	0.000	185.15	0.00	0.00
19	128.00	DMP65R-BU4DA	1	28.434	31.277	0.79	0.80	6.56	83.64	0.000	0.000	328.17	0.00	0.00
20	128.00	7770.00A	3	28.434	31.277	0.58	0.80	9.57	97.20	0.000	0.000	479.07	0.00	0.00
21	128.00	DMP65R-BU8DA	2	28.434	31.277	0.58	0.80	20.59	229.68	0.000	0.000	1030.20	0.00	0.00
22	128.00	4449	3	28.434	31.277	0.54	0.80	2.65	252.00	0.000	0.000	132.77	0.00	0.00
23	128.00	B2 B66A 8843	3	28.434	31.277	0.54	0.80	2.64	252.00	0.000	0.000	131.97	0.00	0.00
24	128.00	DC6-48-60-18-8F	2	28.434	31.277	0.80	0.80	1.47	76.32	0.000	0.000	73.66	0.00	0.00
25	117.00	MC-PK8-DSH	1	27.713	30.484	1.00	1.00	37.59	2072.40	0.000	0.000	1833.44	0.00	0.00
26	117.00	RDIDC-9181-PF-48	1	27.713	30.484	1.00	1.00	2.01	26.28	0.000	0.000	98.04	0.00	0.00
27	117.00	TA08025-B604	3	27.713	30.484	0.57	0.75	3.35	230.04	0.000	0.000	163.47	0.00	0.00
28	117.00	TA08025-B605	3	27.713	30.484	0.60	0.75	3.53	270.00	0.000	0.000	172.08	0.00	0.00
29	117.00	MX08FRO665-21	3	27.713	30.484	0.55	0.75	20.80	232.20	0.000	0.000	1014.31	0.00	0.00
							Totals:		**13,822.20**			**17,800.66**		

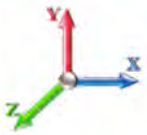
Total Applied Force Summary

Structure:	CT13073-A-SBA		**Code:**	EIA/TIA-222-G	7/29/2021
Site Name:	Groton North		**Exposure:**	B	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 10

Load Case: 1.2D + 1.6W 105 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 21

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		540.31	2064.66	0.00	0.00
10.00		530.79	2030.70	0.00	0.00
15.00		521.26	1996.73	0.00	0.00
20.00		511.74	1962.76	0.00	0.00
25.00		502.22	1928.80	0.00	0.00
30.00		493.11	1894.83	0.00	0.00
35.00		505.35	1860.86	0.00	0.00
40.00		514.66	1826.90	0.00	0.00
41.50		153.99	541.45	0.00	0.00
45.00		370.23	2270.91	0.00	0.00
48.00		318.99	1921.66	0.00	0.00
50.00		212.95	630.39	0.00	0.00
55.00		539.14	1555.18	0.00	0.00
60.00		541.09	1525.46	0.00	0.00
65.00		541.72	1495.74	0.00	0.00
70.00		541.17	1466.02	0.00	0.00
75.00		539.56	1436.30	0.00	0.00
80.00		536.98	1406.58	0.00	0.00
84.00		426.41	1103.86	0.00	0.00
85.00		107.21	449.05	0.00	0.00
89.50		483.16	1995.50	0.00	0.00
90.00		53.12	101.18	0.00	0.00
95.00		532.16	1000.15	0.00	0.00
100.00		526.57	978.92	0.00	0.00
105.00		520.33	957.69	0.00	0.00
110.00		513.47	936.47	0.00	0.00
115.00		506.04	915.24	0.00	0.00
117.00	(11) attachments	3480.82	3191.07	0.00	0.00
120.00		297.14	530.26	0.00	0.00
125.00		489.58	866.78	0.00	0.00
128.00	(18) attachments	4524.06	3584.76	0.00	0.00
130.00		190.50	316.47	0.00	0.00
135.00		471.08	507.17	0.00	0.00
139.00	(20) attachments	6364.28	5851.18	0.00	0.00
140.00		91.01	94.08	0.00	0.00
145.00		450.54	462.68	0.00	0.00
149.00	(23) attachments	4641.32	2822.54	0.00	0.00
150.00		86.71	72.70	0.00	0.00
	Totals:	**33,170.73**	**56,553.66**	**0.00**	**0.00**

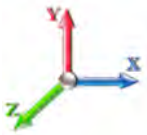
Calculated Forces

Structure:	CT13073-A-SBA	**Code:**	EIA/TIA-222-G	7/29/2021	
Site Name:	Groton North	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 11	

Load Case: 1.2D + 1.6W 105 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 21

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-56.52	-33.23	0.00	-3662.5	0.00	3662.54	6643.18	3321.59	16232.9	8128.53	0.00	0.000	0.000	0.459
5.00	-54.38	-32.80	0.00	-3496.3	0.00	3496.39	6562.43	3281.22	15750.7	7887.07	0.07	-0.121	0.000	0.452
10.00	-52.29	-32.38	0.00	-3332.3	0.00	3332.37	6480.38	3240.19	15272.4	7647.59	0.26	-0.242	0.000	0.444
15.00	-50.22	-31.95	0.00	-3170.4	0.00	3170.49	6397.03	3198.52	14798.3	7410.16	0.58	-0.364	0.000	0.436
20.00	-48.20	-31.53	0.00	-3010.7	0.00	3010.73	6312.38	3156.19	14328.4	7174.88	1.02	-0.486	0.000	0.427
25.00	-46.21	-31.11	0.00	-2853.0	0.00	2853.08	6226.42	3113.21	13863.0	6941.83	1.60	-0.609	0.000	0.419
30.00	-44.25	-30.69	0.00	-2697.5	0.00	2697.54	6139.16	3069.58	13402.2	6711.09	2.30	-0.733	0.000	0.409
35.00	-42.33	-30.25	0.00	-2544.1	0.00	2544.10	6050.60	3025.30	12946.2	6482.75	3.14	-0.856	0.000	0.400
40.00	-40.47	-29.76	0.00	-2392.8	0.00	2392.86	5960.74	2980.37	12495.2	6256.90	4.10	-0.979	0.000	0.389
41.50	-39.90	-29.64	0.00	-2348.2	0.00	2348.22	5933.53	2966.76	12360.9	6189.64	4.41	-1.017	0.000	0.386
45.00	-37.60	-29.28	0.00	-2244.4	0.00	2244.47	5869.58	2934.79	12049.3	6033.61	5.19	-1.104	0.000	0.378
48.00	-35.65	-28.96	0.00	-2156.6	0.00	2156.63	4971.57	2485.79	10282.0	5148.64	5.91	-1.179	0.000	0.426
50.00	-34.98	-28.79	0.00	-2098.7	0.00	2098.70	4942.60	2471.30	10136.2	5075.65	6.42	-1.229	0.000	0.421
55.00	-33.37	-28.30	0.00	-1954.7	0.00	1954.73	4869.24	2434.62	9774.42	4894.48	7.77	-1.361	0.000	0.406
60.00	-31.80	-27.79	0.00	-1813.2	0.00	1813.25	4794.58	2397.29	9416.42	4715.21	9.27	-1.491	0.000	0.391
65.00	-30.26	-27.27	0.00	-1674.3	0.00	1674.31	4718.63	2359.31	9062.39	4537.93	10.90	-1.620	0.000	0.376
70.00	-28.75	-26.75	0.00	-1537.9	0.00	1537.94	4641.37	2320.68	8712.52	4362.74	12.67	-1.747	0.000	0.359
75.00	-27.27	-26.23	0.00	-1404.1	0.00	1404.17	4562.80	2281.40	8366.97	4189.70	14.56	-1.872	0.000	0.341
80.00	-25.84	-25.69	0.00	-1273.0	0.00	1273.03	4482.94	2241.47	8025.91	4018.92	16.59	-1.993	0.000	0.323
84.00	-24.72	-25.25	0.00	-1170.2	0.00	1170.27	4418.04	2209.02	7756.28	3883.90	18.30	-2.088	0.000	0.307
85.00	-24.25	-25.16	0.00	-1145.0	0.00	1145.01	4396.40	2198.20	7680.13	3845.78	18.74	-2.112	0.000	0.303
89.50	-22.25	-24.62	0.00	-1031.8	0.00	1031.81	2828.72	1414.36	4933.25	2470.29	20.78	-2.215	0.000	0.426
90.00	-22.12	-24.59	0.00	-1019.5	0.00	1019.50	2824.36	1412.18	4913.38	2460.34	21.02	-2.226	0.000	0.423
95.00	-21.08	-24.07	0.00	-896.54	0.00	896.54	2780.02	1390.01	4715.55	2361.28	23.43	-2.370	0.000	0.388
100.00	-20.07	-23.55	0.00	-776.18	0.00	776.18	2734.38	1367.19	4519.43	2263.07	25.98	-2.505	0.000	0.351
105.00	-19.09	-23.03	0.00	-658.43	0.00	658.43	2687.43	1343.72	4325.17	2165.80	28.67	-2.630	0.000	0.311
110.00	-18.14	-22.50	0.00	-543.29	0.00	543.29	2639.19	1319.59	4132.95	2069.55	31.49	-2.744	0.000	0.270
115.00	-17.22	-21.97	0.00	-430.77	0.00	430.77	2589.64	1294.82	3942.93	1974.40	34.42	-2.843	0.000	0.225
117.00	-14.20	-18.35	0.00	-386.82	0.00	386.82	2569.45	1284.73	3867.58	1936.67	35.62	-2.880	0.000	0.205
120.00	-13.66	-18.04	0.00	-331.77	0.00	331.77	2538.79	1269.39	3755.30	1880.44	37.44	-2.929	0.000	0.182
125.00	-12.81	-17.52	0.00	-241.57	0.00	241.57	2486.64	1243.32	3570.20	1787.76	40.55	-2.999	0.000	0.140
128.00	-9.46	-12.82	0.00	-189.02	0.00	189.02	2454.72	1227.36	3460.44	1732.79	42.45	-3.033	0.000	0.113
130.00	-9.15	-12.61	0.00	-163.39	0.00	163.39	2433.18	1216.59	3387.83	1696.43	43.72	-3.053	0.000	0.100
130.00	-9.15	-12.61	0.00	-163.39	0.00	163.39	1188.95	594.48	1667.65	835.07	43.72	-3.053	0.000	0.204
135.00	-8.66	-12.12	0.00	-100.32	0.00	100.32	1172.65	586.33	1593.28	797.82	46.94	-3.091	0.000	0.134
139.00	-3.16	-5.45	0.00	-51.83	0.00	51.83	1158.65	579.33	1533.54	767.91	49.54	-3.123	0.000	0.070
140.00	-3.07	-5.35	0.00	-46.38	0.00	46.38	1155.02	577.51	1518.58	760.42	50.20	-3.129	0.000	0.064
145.00	-2.63	-4.88	0.00	-19.61	0.00	19.61	1136.06	568.03	1443.74	722.95	53.49	-3.148	0.000	0.030
149.00	-0.07	-0.09	0.00	-0.09	0.00	0.09	1119.92	559.96	1383.89	692.97	56.13	-3.153	0.000	0.000
150.00	0.00	-0.09	0.00	0.00	0.00	0.00	1115.76	557.88	1368.94	685.49	56.79	-3.153	0.000	0.000

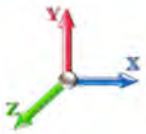
Wind Loading - Shaft

Structure:	CT13073-A-SBA	**Code:**	EIA/TIA-222-G	7/29/2021	
Site Name:	Groton North	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Load Case: 0.9D + 1.6W 105 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 21

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	18.769	20.65	446.02	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	18.769	20.65	438.23	0.650	0.000	5.00	25.164	16.36	540.3	0.0	1433.1
10.00		1.00	0.70	18.769	20.65	430.44	0.650	0.000	5.00	24.720	16.07	530.8	0.0	1407.6
15.00		1.00	0.70	18.769	20.65	422.64	0.650	0.000	5.00	24.277	15.78	521.3	0.0	1382.2
20.00		1.00	0.70	18.769	20.65	414.85	0.650	0.000	5.00	23.833	15.49	511.7	0.0	1356.7
25.00		1.00	0.70	18.769	20.65	407.06	0.650	0.000	5.00	23.390	15.20	502.2	0.0	1331.2
30.00		1.00	0.70	18.785	20.66	399.43	0.650	0.000	5.00	22.946	14.91	493.1	0.0	1305.7
35.00		1.00	0.73	19.631	21.59	400.36	0.650	0.000	5.00	22.503	14.63	505.4	0.0	1280.3
40.00		1.00	0.76	20.394	22.43	399.94	0.650	0.000	5.00	22.059	14.34	514.7	0.0	1254.8
41.50	Bot - Section 2	1.00	0.77	20.610	22.67	399.60	0.650	0.000	1.50	6.531	4.25	154.0	0.0	371.5
45.00		1.00	0.79	21.092	23.20	398.47	0.650	0.000	3.50	15.343	9.97	370.2	0.0	1622.4
48.00	Top - Section 1	1.00	0.80	21.485	23.63	397.16	0.650	0.000	3.00	12.979	8.44	319.0	0.0	1372.0
50.00		1.00	0.81	21.737	23.91	403.12	0.650	0.000	2.00	8.564	5.57	212.9	0.0	426.6
55.00		1.00	0.83	22.337	24.57	400.15	0.650	0.000	5.00	21.099	13.71	539.1	0.0	1051.0
60.00		1.00	0.85	22.899	25.19	396.55	0.650	0.000	5.00	20.655	13.43	541.1	0.0	1028.7
65.00		1.00	0.87	23.429	25.77	392.40	0.650	0.000	5.00	20.212	13.14	541.7	0.0	1006.4
70.00		1.00	0.89	23.930	26.32	387.78	0.650	0.000	5.00	19.768	12.85	541.2	0.0	984.1
75.00		1.00	0.91	24.406	26.85	382.73	0.650	0.000	5.00	19.324	12.56	539.6	0.0	961.8
80.00		1.00	0.93	24.861	27.35	377.31	0.650	0.000	5.00	18.881	12.27	537.0	0.0	939.6
84.00	Bot - Section 3	1.00	0.94	25.210	27.73	372.72	0.650	0.000	4.00	14.785	9.61	426.4	0.0	735.6
85.00		1.00	0.94	25.295	27.82	371.54	0.650	0.000	1.00	3.705	2.41	107.2	0.0	313.7
89.50	Top - Section 2	1.00	0.96	25.671	28.24	366.09	0.650	0.000	4.50	16.452	10.69	483.2	0.0	1392.8
90.00		1.00	0.96	25.711	28.28	370.90	0.650	0.000	0.50	1.806	1.17	53.1	0.0	64.3
95.00		1.00	0.97	26.112	28.72	364.59	0.650	0.000	5.00	17.815	11.58	532.2	0.0	634.7
100.00		1.00	0.99	26.497	29.15	358.01	0.650	0.000	5.00	17.371	11.29	526.6	0.0	618.8
105.00		1.00	1.00	26.869	29.56	351.19	0.650	0.000	5.00	16.928	11.00	520.3	0.0	602.9
110.00		1.00	1.02	27.229	29.95	344.15	0.650	0.000	5.00	16.484	10.71	513.5	0.0	587.0
115.00		1.00	1.03	27.577	30.33	336.89	0.650	0.000	5.00	16.040	10.43	506.0	0.0	571.0
117.00	Appurtenance(s)	1.00	1.03	27.713	30.48	333.93	0.650	0.000	2.00	6.292	4.09	199.5	0.0	224.0
120.00		1.00	1.04	27.914	30.71	329.44	0.650	0.000	3.00	9.305	6.05	297.1	0.0	331.2
125.00		1.00	1.05	28.242	31.07	321.81	0.650	0.000	5.00	15.153	9.85	489.6	0.0	539.2
128.00	Appurtenance(s)	1.00	1.06	28.434	31.28	317.15	0.650	0.000	3.00	8.879	5.77	288.8	0.0	315.9
130.00	Top - Section 3	1.00	1.07	28.560	31.42	314.00	0.650	0.000	2.00	5.831	3.79	190.5	0.0	207.4
135.00		1.00	1.08	28.869	31.76	305.92	0.650	0.000	5.00	14.264	9.27	471.1	0.0	305.5
139.00	Appurtenance(s)	1.00	1.09	29.111	32.02	299.34	0.650	0.000	4.00	11.088	7.21	369.3	0.0	237.4
140.00		1.00	1.09	29.171	32.09	297.69	0.650	0.000	1.00	2.727	1.77	91.0	0.0	58.4
145.00		1.00	1.10	29.465	32.41	289.30	0.650	0.000	5.00	13.366	8.69	450.5	0.0	286.2
149.00	Appurtenance(s)	1.00	1.11	29.695	32.66	282.49	0.650	0.000	4.00	10.370	6.74	352.3	0.0	222.0
150.00		1.00	1.11	29.752	32.73	280.78	0.650	0.000	1.00	2.548	1.66	86.7	0.0	54.5
								Totals:	**150.00**			**15,370.1**		**28,818.4**

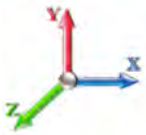
Discrete Appurtenance Forces

Structure:	CT13073-A-SBA	**Code:**	EIA/TIA-222-G	7/29/2021	
Site Name:	Groton North	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 13	

Load Case: 0.9D + 1.6W 105 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 21

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	149.00	LNX-6512DS-A1M	3	29.695	32.664	0.64	0.80	9.77	75.60	0.000	0.000	510.76	0.00	0.00
2	149.00	BXA-70063-6CF	3	29.695	32.664	0.58	0.80	13.26	45.90	0.000	0.000	693.15	0.00	0.00
3	149.00	HBXX-6517DS-VTM	3	29.695	32.664	0.62	0.80	15.80	109.89	0.000	0.000	825.78	0.00	0.00
4	149.00	HBXX-6516DS-VTM	3	29.695	32.664	0.62	0.80	10.03	82.62	0.000	0.000	524.44	0.00	0.00
5	149.00	Low Profile Platform	1	29.695	32.664	1.00	1.00	22.00	1350.00	0.000	0.000	1149.79	0.00	0.00
6	149.00	DB-T1-6Z-8AB-0Z	1	29.695	32.664	0.80	0.80	3.84	17.01	0.000	0.000	200.69	0.00	0.00
7	149.00	ALU RRH 2x60 AWS	3	29.695	32.664	0.54	0.80	5.63	148.50	0.000	0.000	294.14	0.00	0.00
8	149.00	RFS FD9R6004/2C-3L	6	29.695	32.664	0.80	0.80	1.73	16.74	0.000	0.000	90.31	0.00	0.00
9	139.00	RMQP-4096-HK	1	29.111	32.022	1.00	1.00	51.70	2380.50	0.000	0.000	2648.90	0.00	0.00
10	139.00	RRUS 4415 B25	4	29.111	32.022	0.54	0.80	3.52	165.60	0.000	0.000	180.15	0.00	0.00
11	139.00	4424	3	29.111	32.022	0.50	0.75	3.09	237.60	0.000	0.000	158.34	0.00	0.00
12	139.00	4449 B71 + B85	3	29.111	32.022	0.50	0.75	2.97	197.64	0.000	0.000	152.16	0.00	0.00
13	139.00	AIR6449 B41	3	29.111	32.022	0.53	0.75	9.03	278.10	0.000	0.000	462.45	0.00	0.00
14	139.00	APXVAARR24_43-U-NA2	3	29.111	32.022	0.52	0.75	31.88	345.60	0.000	0.000	1633.30	0.00	0.00
15	139.00	Air 3246 B66	3	29.111	32.022	0.62	0.75	14.83	486.00	0.000	0.000	759.72	0.00	0.00
16	128.00	HPA-65R-BU8AA	2	28.434	31.277	0.69	0.80	15.45	97.20	0.000	0.000	773.29	0.00	0.00
17	128.00	Low Profile Platform	1	28.434	31.277	1.00	1.00	22.00	1440.00	0.000	0.000	1100.95	0.00	0.00
18	128.00	HPA-65R-BU4AA	1	28.434	31.277	0.75	0.80	3.70	25.83	0.000	0.000	185.15	0.00	0.00
19	128.00	DMP65R-BU4DA	1	28.434	31.277	0.79	0.80	6.56	62.73	0.000	0.000	328.17	0.00	0.00
20	128.00	7770.00A	3	28.434	31.277	0.58	0.80	9.57	72.90	0.000	0.000	479.07	0.00	0.00
21	128.00	DMP65R-BU8DA	2	28.434	31.277	0.58	0.80	20.59	172.26	0.000	0.000	1030.20	0.00	0.00
22	128.00	4449	3	28.434	31.277	0.54	0.80	2.65	189.00	0.000	0.000	132.77	0.00	0.00
23	128.00	B2 B66A 8843	3	28.434	31.277	0.54	0.80	2.64	189.00	0.000	0.000	131.97	0.00	0.00
24	128.00	DC6-48-60-18-8F	2	28.434	31.277	0.80	0.80	1.47	57.24	0.000	0.000	73.66	0.00	0.00
25	117.00	MC-PK8-DSH	1	27.713	30.484	1.00	1.00	37.59	1554.30	0.000	0.000	1833.44	0.00	0.00
26	117.00	RDIDC-9181-PF-48	1	27.713	30.484	1.00	1.00	2.01	19.71	0.000	0.000	98.04	0.00	0.00
27	117.00	TA08025-B604	3	27.713	30.484	0.57	0.75	3.35	172.53	0.000	0.000	163.47	0.00	0.00
28	117.00	TA08025-B605	3	27.713	30.484	0.60	0.75	3.53	202.50	0.000	0.000	172.08	0.00	0.00
29	117.00	MX08FRO665-21	3	27.713	30.484	0.55	0.75	20.80	174.15	0.000	0.000	1014.31	0.00	0.00
							Totals:		**10,366.65**			**17,800.66**		

Total Applied Force Summary

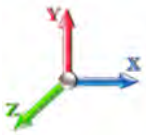
Structure:	CT13073-A-SBA		**Code:**	EIA/TIA-222-G	7/29/2021
Site Name:	Groton North		**Exposure:**	B	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 14

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 105 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 21

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		540.31	1548.50	0.00	0.00
10.00		530.79	1523.02	0.00	0.00
15.00		521.26	1497.55	0.00	0.00
20.00		511.74	1472.07	0.00	0.00
25.00		502.22	1446.60	0.00	0.00
30.00		493.11	1421.12	0.00	0.00
35.00		505.35	1395.65	0.00	0.00
40.00		514.66	1370.17	0.00	0.00
41.50		153.99	406.08	0.00	0.00
45.00		370.23	1703.18	0.00	0.00
48.00		318.99	1441.24	0.00	0.00
50.00		212.95	472.80	0.00	0.00
55.00		539.14	1166.39	0.00	0.00
60.00		541.09	1144.09	0.00	0.00
65.00		541.72	1121.80	0.00	0.00
70.00		541.17	1099.51	0.00	0.00
75.00		539.56	1077.22	0.00	0.00
80.00		536.98	1054.93	0.00	0.00
84.00		426.41	827.90	0.00	0.00
85.00		107.21	336.79	0.00	0.00
89.50		483.16	1496.63	0.00	0.00
90.00		53.12	75.89	0.00	0.00
95.00		532.16	750.11	0.00	0.00
100.00		526.57	734.19	0.00	0.00
105.00		520.33	718.27	0.00	0.00
110.00		513.47	702.35	0.00	0.00
115.00		506.04	686.43	0.00	0.00
117.00	(11) attachments	3480.82	2393.30	0.00	0.00
120.00		297.14	397.69	0.00	0.00
125.00		489.58	650.08	0.00	0.00
128.00	(18) attachments	4524.06	2688.57	0.00	0.00
130.00		190.50	237.35	0.00	0.00
135.00		471.08	380.38	0.00	0.00
139.00	(20) attachments	6364.28	4388.38	0.00	0.00
140.00		91.01	70.56	0.00	0.00
145.00		450.54	347.01	0.00	0.00
149.00	(23) attachments	4641.32	2116.91	0.00	0.00
150.00		86.71	54.53	0.00	0.00
	Totals:	**33,170.73**	**42,415.24**	**0.00**	**0.00**

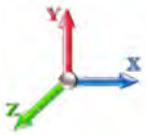
Calculated Forces

Structure:	CT13073-A-SBA	**Code:**	EIA/TIA-222-G	7/29/2021	
Site Name:	Groton North	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 15	

Load Case: 0.9D + 1.6W 105 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 21

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-42.38	-33.22	0.00	-3636.7	0.00	3636.73	6643.18	3321.59	16232.9	8128.53	0.00	0.000	0.000	0.454
5.00	-40.76	-32.76	0.00	-3470.6	0.00	3470.66	6562.43	3281.22	15750.7	7887.07	0.06	-0.120	0.000	0.446
10.00	-39.17	-32.31	0.00	-3306.8	0.00	3306.86	6480.38	3240.19	15272.4	7647.59	0.25	-0.240	0.000	0.439
15.00	-37.61	-31.86	0.00	-3145.3	0.00	3145.33	6397.03	3198.52	14798.3	7410.16	0.57	-0.361	0.000	0.430
20.00	-36.08	-31.41	0.00	-2986.0	0.00	2986.05	6312.38	3156.19	14328.4	7174.88	1.02	-0.483	0.000	0.422
25.00	-34.57	-30.97	0.00	-2829.0	0.00	2829.00	6226.42	3113.21	13863.0	6941.83	1.59	-0.605	0.000	0.413
30.00	-33.09	-30.53	0.00	-2674.1	0.00	2674.16	6139.16	3069.58	13402.2	6711.09	2.29	-0.727	0.000	0.404
35.00	-31.64	-30.07	0.00	-2521.5	0.00	2521.51	6050.60	3025.30	12946.2	6482.75	3.11	-0.849	0.000	0.394
40.00	-30.23	-29.58	0.00	-2371.1	0.00	2371.15	5960.74	2980.37	12495.2	6256.90	4.07	-0.971	0.000	0.384
41.50	-29.80	-29.45	0.00	-2326.7	0.00	2326.78	5933.53	2966.76	12360.9	6189.64	4.38	-1.009	0.000	0.381
45.00	-28.06	-29.09	0.00	-2223.7	0.00	2223.71	5869.58	2934.79	12049.3	6033.61	5.15	-1.095	0.000	0.373
48.00	-26.60	-28.77	0.00	-2136.4	0.00	2136.45	4971.57	2485.79	10282.0	5148.64	5.86	-1.169	0.000	0.420
50.00	-26.08	-28.59	0.00	-2078.9	0.00	2078.91	4942.60	2471.30	10136.2	5075.65	6.37	-1.219	0.000	0.415
55.00	-24.86	-28.08	0.00	-1935.9	0.00	1935.97	4869.24	2434.62	9774.42	4894.48	7.71	-1.349	0.000	0.401
60.00	-23.67	-27.56	0.00	-1795.5	0.00	1795.58	4794.58	2397.29	9416.42	4715.21	9.19	-1.478	0.000	0.386
65.00	-22.51	-27.04	0.00	-1657.7	0.00	1657.77	4718.63	2359.31	9062.39	4537.93	10.81	-1.606	0.000	0.370
70.00	-21.36	-26.51	0.00	-1522.5	0.00	1522.57	4641.37	2320.68	8712.52	4362.74	12.56	-1.732	0.000	0.354
75.00	-20.25	-25.98	0.00	-1390.0	0.00	1390.00	4562.80	2281.40	8366.97	4189.70	14.44	-1.855	0.000	0.336
80.00	-19.17	-25.45	0.00	-1260.0	0.00	1260.08	4482.94	2241.47	8025.91	4018.92	16.45	-1.975	0.000	0.318
84.00	-18.33	-25.01	0.00	-1158.2	0.00	1158.29	4418.04	2209.02	7756.28	3883.90	18.15	-2.070	0.000	0.303
85.00	-17.97	-24.91	0.00	-1133.2	0.00	1133.28	4396.40	2198.20	7680.13	3845.78	18.58	-2.093	0.000	0.299
89.50	-16.47	-24.39	0.00	-1021.1	0.00	1021.18	2828.72	1414.36	4933.25	2470.29	20.61	-2.195	0.000	0.420
90.00	-16.36	-24.36	0.00	-1008.9	0.00	1008.98	2824.36	1412.18	4913.38	2460.34	20.84	-2.206	0.000	0.416
95.00	-15.57	-23.83	0.00	-887.21	0.00	887.21	2780.02	1390.01	4715.55	2361.28	23.22	-2.348	0.000	0.382
100.00	-14.81	-23.31	0.00	-768.05	0.00	768.05	2734.38	1367.19	4519.43	2263.07	25.76	-2.482	0.000	0.345
105.00	-14.07	-22.79	0.00	-651.51	0.00	651.51	2687.43	1343.72	4325.17	2165.80	28.42	-2.606	0.000	0.306
110.00	-13.35	-22.26	0.00	-537.59	0.00	537.59	2639.19	1319.59	4132.95	2069.55	31.21	-2.718	0.000	0.265
115.00	-12.66	-21.74	0.00	-426.27	0.00	426.27	2589.64	1294.82	3942.93	1974.40	34.12	-2.817	0.000	0.221
117.00	-10.43	-18.15	0.00	-382.79	0.00	382.79	2569.45	1284.73	3867.58	1936.67	35.30	-2.853	0.000	0.202
120.00	-10.03	-17.85	0.00	-328.33	0.00	328.33	2538.79	1269.39	3755.30	1880.44	37.11	-2.902	0.000	0.179
125.00	-9.39	-17.33	0.00	-239.10	0.00	239.10	2486.64	1243.32	3570.20	1787.76	40.19	-2.971	0.000	0.138
128.00	-6.94	-12.68	0.00	-187.10	0.00	187.10	2454.72	1227.36	3460.44	1732.79	42.07	-3.005	0.000	0.111
130.00	-6.70	-12.48	0.00	-161.75	0.00	161.75	2433.18	1216.59	3387.83	1696.43	43.33	-3.024	0.000	0.098
130.00	-6.70	-12.48	0.00	-161.75	0.00	161.75	1188.95	594.48	1667.65	835.07	43.33	-3.024	0.000	0.200
135.00	-6.34	-11.99	0.00	-99.35	0.00	99.35	1172.65	586.33	1593.28	797.82	46.52	-3.062	0.000	0.130
139.00	-2.30	-5.40	0.00	-51.39	0.00	51.39	1158.65	579.33	1533.54	767.91	49.10	-3.094	0.000	0.069
140.00	-2.23	-5.31	0.00	-45.98	0.00	45.98	1155.02	577.51	1518.58	760.42	49.75	-3.099	0.000	0.062
145.00	-1.91	-4.84	0.00	-19.45	0.00	19.45	1136.06	568.03	1443.74	722.95	53.00	-3.118	0.000	0.029
149.00	-0.05	-0.09	0.00	-0.09	0.00	0.09	1119.92	559.96	1383.89	692.97	55.62	-3.123	0.000	0.000
150.00	0.00	-0.09	0.00	0.00	0.00	0.00	1115.76	557.88	1368.94	685.49	56.27	-3.123	0.000	0.000

Wind Loading - Shaft

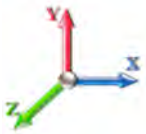
Structure:	CT13073-A-SBA	**Code:**	EIA/TIA-222-G	7/29/2021	
Site Name:	Groton North	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 20

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	4.256	4.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	4.256	4.68	0.00	1.200	1.242	5.00	26.199	31.44	147.2	468.4	2379.2
10.00		1.00	0.70	4.256	4.68	0.00	1.200	1.331	5.00	25.830	31.00	145.1	494.0	2370.8
15.00		1.00	0.70	4.256	4.68	0.00	1.200	1.386	5.00	25.432	30.52	142.9	505.8	2348.7
20.00		1.00	0.70	4.256	4.68	0.00	1.200	1.427	5.00	25.022	30.03	140.6	511.5	2320.4
25.00		1.00	0.70	4.256	4.68	0.00	1.200	1.459	5.00	24.605	29.53	138.2	513.8	2288.7
30.00		1.00	0.70	4.260	4.69	0.00	1.200	1.486	5.00	24.184	29.02	136.0	513.7	2254.7
35.00		1.00	0.73	4.451	4.90	0.00	1.200	1.509	5.00	23.760	28.51	139.6	512.0	2219.0
40.00		1.00	0.76	4.625	5.09	0.00	1.200	1.529	5.00	23.333	28.00	142.4	509.0	2182.1
41.50	Bot - Section 2	1.00	0.77	4.673	5.14	0.00	1.200	1.535	1.50	6.915	8.30	42.7	152.4	647.7
45.00		1.00	0.79	4.783	5.26	0.00	1.200	1.547	3.50	16.246	19.50	102.6	359.5	2522.7
48.00	Top - Section 1	1.00	0.80	4.872	5.36	0.00	1.200	1.557	3.00	13.757	16.51	88.5	306.5	2135.8
50.00		1.00	0.81	4.929	5.42	0.00	1.200	1.564	2.00	9.085	10.90	59.1	203.5	772.4
55.00		1.00	0.83	5.065	5.57	0.00	1.200	1.579	5.00	22.414	26.90	149.9	503.5	1904.9
60.00		1.00	0.85	5.193	5.71	0.00	1.200	1.592	5.00	21.982	26.38	150.7	497.6	1869.2
65.00		1.00	0.87	5.313	5.84	0.00	1.200	1.605	5.00	21.549	25.86	151.1	491.2	1833.1
70.00		1.00	0.89	5.426	5.97	0.00	1.200	1.617	5.00	21.116	25.34	151.2	484.3	1796.5
75.00		1.00	0.91	5.534	6.09	0.00	1.200	1.628	5.00	20.681	24.82	151.1	477.1	1759.5
80.00		1.00	0.93	5.637	6.20	0.00	1.200	1.639	5.00	20.247	24.30	150.7	469.5	1722.2
84.00	Bot - Section 3	1.00	0.94	5.716	6.29	0.00	1.200	1.647	4.00	15.883	19.06	119.9	370.6	1351.4
85.00		1.00	0.94	5.736	6.31	0.00	1.200	1.649	1.00	3.980	4.78	30.1	93.6	511.9
89.50	Top - Section 2	1.00	0.96	5.821	6.40	0.00	1.200	1.657	4.50	17.695	21.23	136.0	414.7	2271.8
90.00		1.00	0.96	5.830	6.41	0.00	1.200	1.658	0.50	1.944	2.33	15.0	46.0	131.8
95.00		1.00	0.97	5.921	6.51	0.00	1.200	1.667	5.00	19.204	23.04	150.1	451.6	1297.9
100.00		1.00	0.99	6.008	6.61	0.00	1.200	1.676	5.00	18.768	22.52	148.8	443.0	1268.1
105.00		1.00	1.00	6.093	6.70	0.00	1.200	1.684	5.00	18.331	22.00	147.4	434.2	1238.1
110.00		1.00	1.02	6.174	6.79	0.00	1.200	1.692	5.00	17.894	21.47	145.8	425.2	1207.8
115.00		1.00	1.03	6.253	6.88	0.00	1.200	1.699	5.00	17.457	20.95	144.1	416.0	1177.4
117.00	Appurtenance(s)	1.00	1.03	6.284	6.91	0.00	1.200	1.702	2.00	6.859	8.23	56.9	164.9	463.5
120.00		1.00	1.04	6.330	6.96	0.00	1.200	1.707	3.00	10.158	12.19	84.9	244.0	685.5
125.00		1.00	1.05	6.404	7.04	0.00	1.200	1.714	5.00	16.581	19.90	140.2	397.1	1116.1
128.00	Appurtenance(s)	1.00	1.06	6.448	7.09	0.00	1.200	1.718	3.00	9.738	11.69	82.9	234.8	656.0
130.00	Top - Section 3	1.00	1.07	6.476	7.12	0.00	1.200	1.720	2.00	6.404	7.68	54.7	155.0	431.5
135.00		1.00	1.08	6.546	7.20	0.00	1.200	1.727	5.00	15.703	18.84	135.7	377.5	784.8
139.00	Appurtenance(s)	1.00	1.09	6.601	7.26	0.00	1.200	1.732	4.00	12.242	14.69	106.7	295.6	612.1
140.00		1.00	1.09	6.615	7.28	0.00	1.200	1.733	1.00	3.016	3.62	26.3	73.5	151.3
145.00		1.00	1.10	6.681	7.35	0.00	1.200	1.739	5.00	14.815	17.78	130.7	357.2	738.8
149.00	Appurtenance(s)	1.00	1.11	6.734	7.41	0.00	1.200	1.744	4.00	11.532	13.84	102.5	279.2	575.1
150.00		1.00	1.11	6.746	7.42	0.00	1.200	1.745	1.00	2.838	3.41	25.3	69.4	142.1
								Totals:	**150.00**			**4,313.3**		**52,140.7**

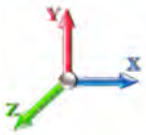
Discrete Appurtenance Forces

Structure:	CT13073-A-SBA	**Code:**	EIA/TIA-222-G	7/29/2021	
Site Name:	Groton North	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 20

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	149.00	LNX-6512DS-A1M	3	6.734	7.407	0.64	0.80	13.40	360.77	0.000	0.000	99.25	0.00	0.00
2	149.00	BXA-70063-6CF	3	6.734	7.407	0.58	0.80	18.10	378.29	0.000	0.000	134.08	0.00	0.00
3	149.00	HBXX-6517DS-VTM	3	6.734	7.407	0.62	0.80	21.19	521.29	0.000	0.000	156.96	0.00	0.00
4	149.00	HBXX-6516DS-VTM	3	6.734	7.407	0.62	0.80	13.70	373.91	0.000	0.000	101.44	0.00	0.00
5	149.00	Low Profile Platform	1	6.734	7.407	1.00	1.00	39.65	2808.04	0.000	0.000	293.68	0.00	0.00
6	149.00	DB-T1-6Z-8AB-0Z	1	6.734	7.407	0.80	0.80	4.54	166.29	0.000	0.000	33.62	0.00	0.00
7	149.00	ALU RRH 2x60 AWS	3	6.734	7.407	0.54	0.80	6.90	377.58	0.000	0.000	51.08	0.00	0.00
8	149.00	RFS FD9R6004/2C-3L	6	6.734	7.407	0.80	0.80	3.85	56.65	0.000	0.000	28.55	0.00	0.00
9	139.00	RMQP-4096-HK	1	6.601	7.261	1.00	1.00	89.67	5167.64	0.000	0.000	651.10	0.00	0.00
10	139.00	RRUS 4415 B25	4	6.601	7.261	0.54	0.80	4.61	346.37	0.000	0.000	33.49	0.00	0.00
11	139.00	4424	3	6.601	7.261	0.50	0.75	3.98	573.57	0.000	0.000	28.91	0.00	0.00
12	139.00	4449 B71 + B85	3	6.601	7.261	0.50	0.75	3.82	260.23	0.000	0.000	27.75	0.00	0.00
13	139.00	AIR6449 B41	3	6.601	7.261	0.55	0.75	10.83	683.94	0.000	0.000	78.64	0.00	0.00
14	139.00	APXVAARR24_43-U-NA2	3	6.601	7.261	0.54	0.75	35.84	1703.88	0.000	0.000	260.27	0.00	0.00
15	139.00	Air 3246 B66	3	6.601	7.261	0.64	0.75	17.43	1101.97	0.000	0.000	126.54	0.00	0.00
16	128.00	HPA-65R-BU8AA	2	6.448	7.092	0.70	0.80	18.12	652.80	0.000	0.000	128.49	0.00	0.00
17	128.00	Low Profile Platform	1	6.448	7.092	1.00	1.00	39.38	3094.20	0.000	0.000	279.32	0.00	0.00
18	128.00	HPA-65R-BU4AA	1	6.448	7.092	0.77	0.80	4.50	111.35	0.000	0.000	31.88	0.00	0.00
19	128.00	DMP65R-BU4DA	1	6.448	7.092	0.79	0.80	7.27	321.87	0.000	0.000	51.55	0.00	0.00
20	128.00	7770.00A	3	6.448	7.092	0.59	0.80	13.57	336.59	0.000	0.000	96.25	0.00	0.00
21	128.00	DMP65R-BU8DA	2	6.448	7.092	0.59	0.80	23.56	826.53	0.000	0.000	167.07	0.00	0.00
22	128.00	4449	3	6.448	7.092	0.54	0.80	3.50	452.70	0.000	0.000	24.84	0.00	0.00
23	128.00	B2 B66A 8843	3	6.448	7.092	0.54	0.80	3.45	353.88	0.000	0.000	24.50	0.00	0.00
24	128.00	DC6-48-60-18-8F	2	6.448	7.092	0.80	0.80	2.16	162.62	0.000	0.000	15.33	0.00	0.00
25	117.00	MC-PK8-DSH	1	6.284	6.913	1.00	1.00	83.66	3345.81	0.000	0.000	578.33	0.00	0.00
26	117.00	RDIDC-9181-PF-48	1	6.284	6.913	1.00	1.00	2.56	65.52	0.000	0.000	17.73	0.00	0.00
27	117.00	TA08025-B604	3	6.284	6.913	0.57	0.75	4.29	341.90	0.000	0.000	29.64	0.00	0.00
28	117.00	TA08025-B605	3	6.284	6.913	0.60	0.75	4.51	385.26	0.000	0.000	31.20	0.00	0.00
29	117.00	MX08FRO665-21	3	6.284	6.913	0.55	0.75	23.17	881.80	0.000	0.000	160.20	0.00	0.00
							Totals:		**26,213.27**			**3,741.65**		

Total Applied Force Summary

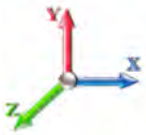
Structure:	CT13073-A-SBA		**Code:**	EIA/TIA-222-G	7/29/2021
Site Name:	Groton North		**Exposure:**	B	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 18

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 20

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		147.18	2533.03	0.00	0.00
10.00		145.11	2524.67	0.00	0.00
15.00		142.88	2502.50	0.00	0.00
20.00		140.57	2474.28	0.00	0.00
25.00		138.23	2442.56	0.00	0.00
30.00		135.98	2408.54	0.00	0.00
35.00		139.61	2372.85	0.00	0.00
40.00		142.43	2335.91	0.00	0.00
41.50		42.66	693.82	0.00	0.00
45.00		102.57	2630.39	0.00	0.00
48.00		88.47	2228.15	0.00	0.00
50.00		59.11	833.94	0.00	0.00
55.00		149.86	2058.69	0.00	0.00
60.00		150.67	2023.05	0.00	0.00
65.00		151.12	1986.91	0.00	0.00
70.00		151.25	1950.33	0.00	0.00
75.00		151.08	1913.38	0.00	0.00
80.00		150.66	1876.09	0.00	0.00
84.00		119.85	1474.45	0.00	0.00
85.00		30.13	542.67	0.00	0.00
89.50		135.97	2410.22	0.00	0.00
90.00		14.96	147.18	0.00	0.00
95.00		150.09	1451.77	0.00	0.00
100.00		148.85	1421.94	0.00	0.00
105.00		147.43	1391.90	0.00	0.00
110.00		145.84	1361.66	0.00	0.00
115.00		144.09	1331.24	0.00	0.00
117.00	(11) attachments	873.99	5545.36	0.00	0.00
120.00		84.87	774.24	0.00	0.00
125.00		140.17	1263.90	0.00	0.00
128.00	(18) attachments	902.10	7057.23	0.00	0.00
130.00		54.75	471.45	0.00	0.00
135.00		135.69	884.68	0.00	0.00
139.00	(20) attachments	1313.36	10529.62	0.00	0.00
140.00		26.33	167.57	0.00	0.00
145.00		130.66	819.90	0.00	0.00
149.00	(23) attachments	1001.16	5682.86	0.00	0.00
150.00		25.28	142.08	0.00	0.00
	Totals:	**8,055.00**	**82,661.00**	**0.00**	**0.00**

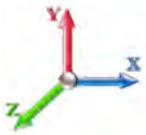
Calculated Forces

Structure:	CT13073-A-SBA	**Code:**	EIA/TIA-222-G	7/29/2021	
Site Name:	Groton North	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 19	

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 20

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-82.66	-8.08	0.00	-872.16	0.00	872.16	6643.18	3321.59	16232.9	8128.53	0.00	0.000	0.000	0.120
5.00	-80.12	-7.97	0.00	-831.78	0.00	831.78	6562.43	3281.22	15750.7	7887.07	0.02	-0.029	0.000	0.118
10.00	-77.59	-7.86	0.00	-791.94	0.00	791.94	6480.38	3240.19	15272.4	7647.59	0.06	-0.058	0.000	0.116
15.00	-75.09	-7.75	0.00	-752.64	0.00	752.64	6397.03	3198.52	14798.3	7410.16	0.14	-0.087	0.000	0.113
20.00	-72.61	-7.64	0.00	-713.88	0.00	713.88	6312.38	3156.19	14328.4	7174.88	0.24	-0.116	0.000	0.111
25.00	-70.16	-7.54	0.00	-675.66	0.00	675.66	6226.42	3113.21	13863.0	6941.83	0.38	-0.145	0.000	0.109
30.00	-67.75	-7.43	0.00	-637.98	0.00	637.98	6139.16	3069.58	13402.2	6711.09	0.55	-0.174	0.000	0.106
35.00	-65.38	-7.31	0.00	-600.85	0.00	600.85	6050.60	3025.30	12946.2	6482.75	0.75	-0.203	0.000	0.103
40.00	-63.04	-7.18	0.00	-564.28	0.00	564.28	5960.74	2980.37	12495.2	6256.90	0.97	-0.232	0.000	0.101
41.50	-62.34	-7.15	0.00	-553.50	0.00	553.50	5933.53	2966.76	12360.9	6189.64	1.05	-0.241	0.000	0.100
45.00	-59.71	-7.06	0.00	-528.47	0.00	528.47	5869.58	2934.79	12049.3	6033.61	1.23	-0.262	0.000	0.098
48.00	-57.48	-6.98	0.00	-507.29	0.00	507.29	4971.57	2485.79	10282.0	5148.64	1.40	-0.279	0.000	0.110
50.00	-56.64	-6.93	0.00	-493.34	0.00	493.34	4942.60	2471.30	10136.2	5075.65	1.52	-0.291	0.000	0.109
55.00	-54.58	-6.80	0.00	-458.68	0.00	458.68	4869.24	2434.62	9774.42	4894.48	1.84	-0.322	0.000	0.105
60.00	-52.56	-6.67	0.00	-424.67	0.00	424.67	4794.58	2397.29	9416.42	4715.21	2.20	-0.352	0.000	0.101
65.00	-50.57	-6.53	0.00	-391.34	0.00	391.34	4718.63	2359.31	9062.39	4537.93	2.58	-0.383	0.000	0.097
70.00	-48.62	-6.39	0.00	-358.69	0.00	358.69	4641.37	2320.68	8712.52	4362.74	3.00	-0.412	0.000	0.093
75.00	-46.70	-6.25	0.00	-326.74	0.00	326.74	4562.80	2281.40	8366.97	4189.70	3.45	-0.441	0.000	0.088
80.00	-44.82	-6.10	0.00	-295.51	0.00	295.51	4482.94	2241.47	8025.91	4018.92	3.93	-0.470	0.000	0.084
84.00	-43.35	-5.98	0.00	-271.10	0.00	271.10	4418.04	2209.02	7756.28	3883.90	4.33	-0.492	0.000	0.080
85.00	-42.80	-5.96	0.00	-265.12	0.00	265.12	4396.40	2198.20	7680.13	3845.78	4.43	-0.497	0.000	0.079
89.50	-40.39	-5.81	0.00	-238.32	0.00	238.32	2828.72	1414.36	4933.25	2470.29	4.91	-0.521	0.000	0.111
90.00	-40.24	-5.80	0.00	-235.42	0.00	235.42	2824.36	1412.18	4913.38	2460.34	4.97	-0.524	0.000	0.110
95.00	-38.79	-5.66	0.00	-206.40	0.00	206.40	2780.02	1390.01	4715.55	2361.28	5.53	-0.557	0.000	0.101
100.00	-37.37	-5.52	0.00	-178.09	0.00	178.09	2734.38	1367.19	4519.43	2263.07	6.13	-0.588	0.000	0.092
105.00	-35.97	-5.37	0.00	-150.49	0.00	150.49	2687.43	1343.72	4325.17	2165.80	6.76	-0.616	0.000	0.083
110.00	-34.61	-5.23	0.00	-123.63	0.00	123.63	2639.19	1319.59	4132.95	2069.55	7.42	-0.642	0.000	0.073
115.00	-33.28	-5.08	0.00	-97.49	0.00	97.49	2589.64	1294.82	3942.93	1974.40	8.11	-0.665	0.000	0.062
117.00	-27.75	-4.14	0.00	-87.33	0.00	87.33	2569.45	1284.73	3867.58	1936.67	8.39	-0.673	0.000	0.056
120.00	-26.97	-4.06	0.00	-74.90	0.00	74.90	2538.79	1269.39	3755.30	1880.44	8.82	-0.684	0.000	0.050
125.00	-25.71	-3.91	0.00	-54.63	0.00	54.63	2486.64	1243.32	3570.20	1787.76	9.54	-0.700	0.000	0.041
128.00	-18.66	-2.92	0.00	-42.91	0.00	42.91	2454.72	1227.36	3460.44	1732.79	9.99	-0.708	0.000	0.032
130.00	-18.19	-2.86	0.00	-37.07	0.00	37.07	2433.18	1216.59	3387.83	1696.43	10.28	-0.712	0.000	0.029
130.00	-18.19	-2.86	0.00	-37.07	0.00	37.07	1188.95	594.48	1667.65	835.07	10.28	-0.712	0.000	0.060
135.00	-17.31	-2.72	0.00	-22.77	0.00	22.77	1172.65	586.33	1593.28	797.82	11.03	-0.721	0.000	0.043
139.00	-6.80	-1.27	0.00	-11.91	0.00	11.91	1158.65	579.33	1533.54	767.91	11.64	-0.728	0.000	0.021
140.00	-6.63	-1.24	0.00	-10.64	0.00	10.64	1155.02	577.51	1518.58	760.42	11.79	-0.730	0.000	0.020
145.00	-5.81	-1.10	0.00	-4.43	0.00	4.43	1136.06	568.03	1443.74	722.95	12.56	-0.734	0.000	0.011
149.00	-0.14	-0.03	0.00	-0.03	0.00	0.03	1119.92	559.96	1383.89	692.97	13.18	-0.735	0.000	0.000
150.00	0.00	-0.03	0.00	0.00	0.00	0.00	1115.76	557.88	1368.94	685.49	13.33	-0.735	0.000	0.000

Seismic Segment Forces (Factored)

Structure:	CT13073-A-SBA	**Code:**	EIA/TIA-222-G	7/29/2021	
Site Name:	Groton North	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 20	

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Load Case:	1.2D + 1.0E							**Iterations**	19
Gust Response Factor	1.10				**Sds**	0.29		**Ss**	0.27
Dead Load Factor	1.20	**Seismic Load Factor**	1.00		**Sd1**	0.31		**S1**	0.24
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.41		**SA**	0.13	**Seismic Importance Factor**		1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1592.3	0.00	0.03	0.02	21.62	
10.00		1564.0	0.01	0.05	0.03	33.79	
15.00		1535.7	0.02	0.06	0.04	40.61	
20.00		1507.4	0.03	0.07	0.04	44.54	
25.00		1479.1	0.05	0.07	0.04	47.09	
30.00		1450.8	0.08	0.07	0.04	49.12	
35.00		1422.5	0.10	0.07	0.04	51.04	
40.00		1394.2	0.13	0.07	0.03	52.94	
41.50	Bot - Section 2	412.74	0.14	0.07	0.03	15.93	
45.00		1802.6	0.17	0.07	0.03	72.14	
48.00	Top - Section 1	1524.4	0.19	0.06	0.02	62.72	
50.00		474.05	0.21	0.06	0.02	19.82	
55.00		1167.7	0.25	0.05	0.02	50.24	
60.00		1143.0	0.30	0.04	0.01	49.53	
65.00		1118.2	0.35	0.03	0.01	47.45	
70.00		1093.4	0.41	0.01	0.01	43.89	
75.00		1068.7	0.47	-0.01	0.01	38.92	
80.00		1043.9	0.54	-0.03	0.01	32.94	
84.00	Bot - Section 3	817.33	0.59	-0.05	0.01	22.24	
85.00		348.57	0.61	-0.06	0.02	9.10	
89.50	Top - Section 2	1547.5	0.67	-0.08	0.02	33.29	
90.00		71.50	0.68	-0.08	0.03	1.51	
95.00		705.26	0.76	-0.10	0.04	12.40	
100.00		687.57	0.84	-0.12	0.07	11.76	
105.00		669.88	0.93	-0.12	0.10	14.08	
110.00		652.19	1.02	-0.11	0.14	19.93	
115.00		634.50	1.11	-0.06	0.19	29.65	
117.00	Appurtenance(s)	2607.9	1.15	-0.04	0.22	144.09	
120.00		367.96	1.21	0.01	0.26	25.87	
125.00		599.11	1.31	0.14	0.35	60.99	
128.00	Appurtenance(s)	2913.3	1.38	0.24	0.41	363.11	
130.00	Top - Section 3	230.45	1.42	0.32	0.45	32.62	
135.00		339.44	1.53	0.58	0.58	64.40	
139.00	Appurtenance(s)	4809.4	1.62	0.85	0.70	1127.68	
140.00		64.88	1.65	0.93	0.73	16.00	
145.00		317.96	1.77	1.39	0.92	99.22	
149.00	Appurtenance(s)	2298.0	1.86	1.85	1.09	852.17	
150.00		60.59	1.89	1.98	1.14	23.41	
	Totals:	**43,538.9**				**3,737.8**	**Total Wind:** **33,170.7**

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

Calculated Forces

Structure:	CT13073-A-SBA	**Code:**	EIA/TIA-222-G	7/29/2021	
Site Name:	Groton North	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 21	

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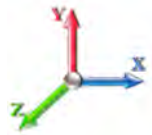
Load Case: 1.2D + 1.0E



Gust Response Factor	1.10			**Sds**	0.29			**Iterations**	19
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.31			**Ss**	0.27
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.41	**SA**	0.13			**S1**	0.24
								Seismic Importance Factor	1.00

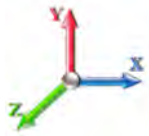
Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-56.55	-3.74	0.00	-452.82	0.00	452.82	6643.18	3321.59	16232.9	8128.53		0.00	0.00	0.064
5.00	-54.49	-3.74	0.00	-434.10	0.00	434.10	6562.43	3281.22	15750.7	7887.07		0.01	-0.01	0.063
10.00	-52.46	-3.72	0.00	-415.42	0.00	415.42	6480.38	3240.19	15272.4	7647.59		0.03	-0.03	0.062
15.00	-50.46	-3.69	0.00	-396.84	0.00	396.84	6397.03	3198.52	14798.3	7410.16		0.07	-0.05	0.061
20.00	-48.49	-3.65	0.00	-378.41	0.00	378.41	6312.38	3156.19	14328.4	7174.88		0.13	-0.06	0.060
25.00	-46.56	-3.62	0.00	-360.14	0.00	360.14	6226.42	3113.21	13863.0	6941.83		0.20	-0.08	0.059
30.00	-44.67	-3.58	0.00	-342.05	0.00	342.05	6139.16	3069.58	13402.2	6711.09		0.29	-0.09	0.058
35.00	-42.81	-3.53	0.00	-324.16	0.00	324.16	6050.60	3025.30	12946.2	6482.75		0.39	-0.11	0.057
40.00	-40.98	-3.49	0.00	-306.49	0.00	306.49	5960.74	2980.37	12495.2	6256.90		0.51	-0.12	0.056
41.50	-40.44	-3.47	0.00	-301.26	0.00	301.26	5933.53	2966.76	12360.9	6189.64		0.55	-0.13	0.055
45.00	-38.17	-3.40	0.00	-289.10	0.00	289.10	5869.58	2934.79	12049.3	6033.61		0.65	-0.14	0.054
48.00	-36.24	-3.34	0.00	-278.89	0.00	278.89	4971.57	2485.79	10282.0	5148.64		0.74	-0.15	0.061
50.00	-35.61	-3.33	0.00	-272.21	0.00	272.21	4942.60	2471.30	10136.2	5075.65		0.80	-0.16	0.061
55.00	-34.06	-3.28	0.00	-255.57	0.00	255.57	4869.24	2434.62	9774.42	4894.48		0.98	-0.17	0.059
60.00	-32.53	-3.24	0.00	-239.16	0.00	239.16	4794.58	2397.29	9416.42	4715.21		1.17	-0.19	0.058
65.00	-31.03	-3.19	0.00	-222.97	0.00	222.97	4718.63	2359.31	9062.39	4537.93		1.37	-0.21	0.056
70.00	-29.57	-3.15	0.00	-207.00	0.00	207.00	4641.37	2320.68	8712.52	4362.74		1.60	-0.22	0.054
75.00	-28.13	-3.12	0.00	-191.23	0.00	191.23	4562.80	2281.40	8366.97	4189.70		1.84	-0.24	0.052
80.00	-26.72	-3.09	0.00	-175.64	0.00	175.64	4482.94	2241.47	8025.91	4018.92		2.10	-0.26	0.050
84.00	-25.62	-3.06	0.00	-163.30	0.00	163.30	4418.04	2209.02	7756.28	3883.90		2.33	-0.27	0.048
85.00	-25.17	-3.05	0.00	-160.24	0.00	160.24	4396.40	2198.20	7680.13	3845.78		2.38	-0.27	0.047
89.50	-23.17	-3.01	0.00	-146.49	0.00	146.49	2828.72	1414.36	4933.25	2470.29		2.65	-0.29	0.067
90.00	-23.07	-3.02	0.00	-144.98	0.00	144.98	2824.36	1412.18	4913.38	2460.34		2.68	-0.29	0.067
95.00	-22.07	-3.01	0.00	-129.90	0.00	129.90	2780.02	1390.01	4715.55	2361.28		2.99	-0.31	0.063
100.00	-21.09	-3.00	0.00	-114.86	0.00	114.86	2734.38	1367.19	4519.43	2263.07		3.33	-0.33	0.058
105.00	-20.13	-2.98	0.00	-99.87	0.00	99.87	2687.43	1343.72	4325.17	2165.80		3.68	-0.35	0.054
110.00	-19.20	-2.96	0.00	-84.95	0.00	84.95	2639.19	1319.59	4132.95	2069.55		4.06	-0.37	0.048
115.00	-18.28	-2.93	0.00	-70.13	0.00	70.13	2589.64	1294.82	3942.93	1974.40		4.45	-0.38	0.043
117.00	-15.09	-2.77	0.00	-64.27	0.00	64.27	2569.45	1284.73	3867.58	1936.67		4.61	-0.39	0.039
120.00	-14.56	-2.74	0.00	-55.97	0.00	55.97	2538.79	1269.39	3755.30	1880.44		4.86	-0.40	0.036
125.00	-13.69	-2.68	0.00	-42.26	0.00	42.26	2486.64	1243.32	3570.20	1787.76		5.28	-0.41	0.029
128.00	-10.11	-2.29	0.00	-34.23	0.00	34.23	2454.72	1227.36	3460.44	1732.79		5.54	-0.41	0.024
130.00	-9.79	-2.25	0.00	-29.65	0.00	29.65	2433.18	1216.59	3387.83	1696.43		5.72	-0.42	0.022
130.00	-9.79	-2.25	0.00	-29.65	0.00	29.65	1188.95	594.48	1667.65	835.07		5.72	-0.42	0.044
135.00	-9.29	-2.19	0.00	-18.38	0.00	18.38	1172.65	586.33	1593.28	797.82		6.16	-0.43	0.031
139.00	-3.44	-1.02	0.00	-9.63	0.00	9.63	1158.65	579.33	1533.54	767.91		6.52	-0.43	0.016
140.00	-3.35	-1.00	0.00	-8.61	0.00	8.61	1155.02	577.51	1518.58	760.42		6.61	-0.43	0.014
145.00	-2.89	-0.90	0.00	-3.61	0.00	3.61	1136.06	568.03	1443.74	722.95		7.06	-0.44	0.008
149.00	-0.07	-0.02	0.00	-0.02	0.00	0.02	1119.92	559.96	1383.89	692.97		7.43	-0.44	0.000
150.00	0.00	-0.02	0.00	0.00	0.00	0.00	1115.76	557.88	1368.94	685.49		7.52	-0.44	0.000

Seismic Segment Forces (Factored)

Structure:	CT13073-A-SBA	**Code:**	EIA/TIA-222-G	7/29/2021	
Site Name:	Groton North	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 22	

Tower Engineering Solutions

Load Case: 0.9D + 1.0E



Gust Response Factor	1.10			**Sds**	0.29	**Iterations**	19
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.31	**Ss**	0.27
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.41	**SA**	0.13	**S1**	0.24
						Seismic Importance Factor	1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1592.3	0.00	0.03	0.02	21.62	
10.00		1564.0	0.01	0.05	0.03	33.79	
15.00		1535.7	0.02	0.06	0.04	40.61	
20.00		1507.4	0.03	0.07	0.04	44.54	
25.00		1479.1	0.05	0.07	0.04	47.09	
30.00		1450.8	0.08	0.07	0.04	49.12	
35.00		1422.5	0.10	0.07	0.04	51.04	
40.00		1394.2	0.13	0.07	0.03	52.94	
41.50	Bot - Section 2	412.74	0.14	0.07	0.03	15.93	
45.00		1802.6	0.17	0.07	0.03	72.14	
48.00	Top - Section 1	1524.4	0.19	0.06	0.02	62.72	
50.00		474.05	0.21	0.06	0.02	19.82	
55.00		1167.7	0.25	0.05	0.02	50.24	
60.00		1143.0	0.30	0.04	0.01	49.53	
65.00		1118.2	0.35	0.03	0.01	47.45	
70.00		1093.4	0.41	0.01	0.01	43.89	
75.00		1068.7	0.47	-0.01	0.01	38.92	
80.00		1043.9	0.54	-0.03	0.01	32.94	
84.00	Bot - Section 3	817.33	0.59	-0.05	0.01	22.24	
85.00		348.57	0.61	-0.06	0.02	9.10	
89.50	Top - Section 2	1547.5	0.67	-0.08	0.02	33.29	
90.00		71.50	0.68	-0.08	0.03	1.51	
95.00		705.26	0.76	-0.10	0.04	12.40	
100.00		687.57	0.84	-0.12	0.07	11.76	
105.00		669.88	0.93	-0.12	0.10	14.08	
110.00		652.19	1.02	-0.11	0.14	19.93	
115.00		634.50	1.11	-0.06	0.19	29.65	
117.00	Appurtenance(s)	2607.9	1.15	-0.04	0.22	144.09	
120.00		367.96	1.21	0.01	0.26	25.87	
125.00		599.11	1.31	0.14	0.35	60.99	
128.00	Appurtenance(s)	2913.3	1.38	0.24	0.41	363.11	
130.00	Top - Section 3	230.45	1.42	0.32	0.45	32.62	
135.00		339.44	1.53	0.58	0.58	64.40	
139.00	Appurtenance(s)	4809.4	1.62	0.85	0.70	1127.68	
140.00		64.88	1.65	0.93	0.73	16.00	
145.00		317.96	1.77	1.39	0.92	99.22	
149.00	Appurtenance(s)	2298.0	1.86	1.85	1.09	852.17	
150.00		60.59	1.89	1.98	1.14	23.41	
	Totals:	**43,538.9**				**3,737.8**	**Total Wind:** **33,170.7**

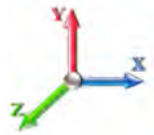
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT13073-A-SBA	**Code:**	EIA/TIA-222-G	7/29/2021	
Site Name:	Groton North	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 23	

Tower Engineering Solutions

Load Case: 0.9D + 1.0E



Gust Response Factor	1.10			**Sds**	0.29	**Iterations**	19		
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.31	**Ss**	0.27		
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.41	**SA**	0.13	**S1**	0.24	**Seismic Importance Factor**	1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-42.41	-3.74	0.00	-449.47	0.00	449.47	6643.18	3321.59	16232.9	8128.53		0.00	0.00	0.062
5.00	-40.87	-3.73	0.00	-430.76	0.00	430.76	6562.43	3281.22	15750.7	7887.07		0.01	-0.01	0.061
10.00	-39.34	-3.71	0.00	-412.10	0.00	412.10	6480.38	3240.19	15272.4	7647.59		0.03	-0.03	0.060
15.00	-37.84	-3.68	0.00	-393.57	0.00	393.57	6397.03	3198.52	14798.3	7410.16		0.07	-0.04	0.059
20.00	-36.37	-3.64	0.00	-375.19	0.00	375.19	6312.38	3156.19	14328.4	7174.88		0.13	-0.06	0.058
25.00	-34.92	-3.60	0.00	-357.00	0.00	357.00	6226.42	3113.21	13863.0	6941.83		0.20	-0.08	0.057
30.00	-33.50	-3.56	0.00	-339.00	0.00	339.00	6139.16	3069.58	13402.2	6711.09		0.28	-0.09	0.056
35.00	-32.10	-3.51	0.00	-321.21	0.00	321.21	6050.60	3025.30	12946.2	6482.75		0.39	-0.11	0.055
40.00	-30.73	-3.46	0.00	-303.65	0.00	303.65	5960.74	2980.37	12495.2	6256.90		0.51	-0.12	0.054
41.50	-30.33	-3.45	0.00	-298.46	0.00	298.46	5933.53	2966.76	12360.9	6189.64		0.55	-0.13	0.053
45.00	-28.62	-3.38	0.00	-286.38	0.00	286.38	5869.58	2934.79	12049.3	6033.61		0.64	-0.14	0.052
48.00	-27.18	-3.32	0.00	-276.24	0.00	276.24	4971.57	2485.79	10282.0	5148.64		0.73	-0.15	0.059
50.00	-26.71	-3.30	0.00	-269.61	0.00	269.61	4942.60	2471.30	10136.2	5075.65		0.80	-0.15	0.059
55.00	-25.54	-3.26	0.00	-253.10	0.00	253.10	4869.24	2434.62	9774.42	4894.48		0.97	-0.17	0.057
60.00	-24.40	-3.21	0.00	-236.83	0.00	236.83	4794.58	2397.29	9416.42	4715.21		1.16	-0.19	0.055
65.00	-23.27	-3.16	0.00	-220.78	0.00	220.78	4718.63	2359.31	9062.39	4537.93		1.36	-0.20	0.054
70.00	-22.17	-3.12	0.00	-204.96	0.00	204.96	4641.37	2320.68	8712.52	4362.74		1.59	-0.22	0.052
75.00	-21.10	-3.09	0.00	-189.34	0.00	189.34	4562.80	2281.40	8366.97	4189.70		1.83	-0.24	0.050
80.00	-20.04	-3.05	0.00	-173.91	0.00	173.91	4482.94	2241.47	8025.91	4018.92		2.09	-0.25	0.048
84.00	-19.21	-3.03	0.00	-161.70	0.00	161.70	4418.04	2209.02	7756.28	3883.90		2.31	-0.27	0.046
85.00	-18.87	-3.02	0.00	-158.67	0.00	158.67	4396.40	2198.20	7680.13	3845.78		2.36	-0.27	0.046
89.50	-17.38	-2.98	0.00	-145.06	0.00	145.06	2828.72	1414.36	4933.25	2470.29		2.62	-0.29	0.065
90.00	-17.30	-2.99	0.00	-143.57	0.00	143.57	2824.36	1412.18	4913.38	2460.34		2.65	-0.29	0.064
95.00	-16.55	-2.98	0.00	-128.64	0.00	128.64	2780.02	1390.01	4715.55	2361.28		2.97	-0.31	0.060
100.00	-15.81	-2.97	0.00	-113.76	0.00	113.76	2734.38	1367.19	4519.43	2263.07		3.30	-0.33	0.056
105.00	-15.10	-2.95	0.00	-98.94	0.00	98.94	2687.43	1343.72	4325.17	2165.80		3.65	-0.35	0.051
110.00	-14.39	-2.93	0.00	-84.18	0.00	84.18	2639.19	1319.59	4132.95	2069.55		4.02	-0.36	0.046
115.00	-13.71	-2.90	0.00	-69.52	0.00	69.52	2589.64	1294.82	3942.93	1974.40		4.41	-0.38	0.041
117.00	-11.31	-2.74	0.00	-63.72	0.00	63.72	2569.45	1284.73	3867.58	1936.67		4.57	-0.38	0.037
120.00	-10.92	-2.72	0.00	-55.49	0.00	55.49	2538.79	1269.39	3755.30	1880.44		4.82	-0.39	0.034
125.00	-10.27	-2.65	0.00	-41.92	0.00	41.92	2486.64	1243.32	3570.20	1787.76		5.23	-0.40	0.028
128.00	-7.58	-2.27	0.00	-33.97	0.00	33.97	2454.72	1227.36	3460.44	1732.79		5.49	-0.41	0.023
130.00	-7.34	-2.24	0.00	-29.43	0.00	29.43	2433.18	1216.59	3387.83	1696.43		5.66	-0.41	0.020
130.00	-7.34	-2.24	0.00	-29.43	0.00	29.43	1188.95	594.48	1667.65	835.07		5.66	-0.41	0.041
135.00	-6.96	-2.17	0.00	-18.25	0.00	18.25	1172.65	586.33	1593.28	797.82		6.10	-0.42	0.029
139.00	-2.58	-1.01	0.00	-9.57	0.00	9.57	1158.65	579.33	1533.54	767.91		6.46	-0.43	0.015
140.00	-2.51	-0.99	0.00	-8.56	0.00	8.56	1155.02	577.51	1518.58	760.42		6.55	-0.43	0.013
145.00	-2.16	-0.89	0.00	-3.59	0.00	3.59	1136.06	568.03	1443.74	722.95		7.00	-0.43	0.007
149.00	-0.05	-0.02	0.00	-0.02	0.00	0.02	1119.92	559.96	1383.89	692.97		7.36	-0.43	0.000
150.00	0.00	-0.02	0.00	0.00	0.00	0.00	1115.76	557.88	1368.94	685.49		7.45	-0.43	0.000

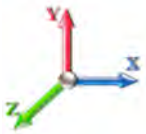
Wind Loading - Shaft

Structure:	CT13073-A-SBA	**Code:**	EIA/TIA-222-G	7/29/2021	
Site Name:	Groton North	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 20

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	6.129	6.74	254.87	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	6.129	6.74	250.42	0.650	0.000	5.00	25.164	16.36	110.3	0.0	1592.4
10.00		1.00	0.70	6.129	6.74	245.96	0.650	0.000	5.00	24.720	16.07	108.3	0.0	1564.0
15.00		1.00	0.70	6.129	6.74	241.51	0.650	0.000	5.00	24.277	15.78	106.4	0.0	1535.7
20.00		1.00	0.70	6.129	6.74	237.06	0.650	0.000	5.00	23.833	15.49	104.4	0.0	1507.4
25.00		1.00	0.70	6.129	6.74	232.60	0.650	0.000	5.00	23.390	15.20	102.5	0.0	1479.1
30.00		1.00	0.70	6.134	6.75	228.25	0.650	0.000	5.00	22.946	14.91	100.6	0.0	1450.8
35.00		1.00	0.73	6.410	7.05	228.77	0.650	0.000	5.00	22.503	14.63	103.1	0.0	1422.5
40.00		1.00	0.76	6.659	7.33	228.54	0.650	0.000	5.00	22.059	14.34	105.0	0.0	1394.2
41.50	Bot - Section 2	1.00	0.77	6.730	7.40	228.34	0.650	0.000	1.50	6.531	4.25	31.4	0.0	412.7
45.00		1.00	0.79	6.887	7.58	227.70	0.650	0.000	3.50	15.343	9.97	75.6	0.0	1802.7
48.00	Top - Section 1	1.00	0.80	7.015	7.72	226.95	0.650	0.000	3.00	12.979	8.44	65.1	0.0	1524.5
50.00		1.00	0.81	7.098	7.81	230.36	0.650	0.000	2.00	8.564	5.57	43.5	0.0	474.0
55.00		1.00	0.83	7.294	8.02	228.66	0.650	0.000	5.00	21.099	13.71	110.0	0.0	1167.8
60.00		1.00	0.85	7.477	8.22	226.60	0.650	0.000	5.00	20.655	13.43	110.4	0.0	1143.0
65.00		1.00	0.87	7.650	8.42	224.23	0.650	0.000	5.00	20.212	13.14	110.6	0.0	1118.2
70.00		1.00	0.89	7.814	8.60	221.59	0.650	0.000	5.00	19.768	12.85	110.4	0.0	1093.5
75.00		1.00	0.91	7.969	8.77	218.70	0.650	0.000	5.00	19.324	12.56	110.1	0.0	1068.7
80.00		1.00	0.93	8.118	8.93	215.60	0.650	0.000	5.00	18.881	12.27	109.6	0.0	1043.9
84.00	Bot - Section 3	1.00	0.94	8.232	9.05	212.98	0.650	0.000	4.00	14.785	9.61	87.0	0.0	817.3
85.00		1.00	0.94	8.260	9.09	212.31	0.650	0.000	1.00	3.705	2.41	21.9	0.0	348.6
89.50	Top - Section 2	1.00	0.96	8.382	9.22	209.19	0.650	0.000	4.50	16.452	10.69	98.6	0.0	1547.5
90.00		1.00	0.96	8.396	9.24	211.95	0.650	0.000	0.50	1.806	1.17	10.8	0.0	71.5
95.00		1.00	0.97	8.526	9.38	208.34	0.650	0.000	5.00	17.815	11.58	108.6	0.0	705.3
100.00		1.00	0.99	8.652	9.52	204.58	0.650	0.000	5.00	17.371	11.29	107.5	0.0	687.6
105.00		1.00	1.00	8.774	9.65	200.68	0.650	0.000	5.00	16.928	11.00	106.2	0.0	669.9
110.00		1.00	1.02	8.891	9.78	196.65	0.650	0.000	5.00	16.484	10.71	104.8	0.0	652.2
115.00		1.00	1.03	9.005	9.91	192.51	0.650	0.000	5.00	16.040	10.43	103.3	0.0	634.5
117.00	Appurtenance(s)	1.00	1.03	9.049	9.95	190.82	0.650	0.000	2.00	6.292	4.09	40.7	0.0	248.8
120.00		1.00	1.04	9.115	10.03	188.25	0.650	0.000	3.00	9.305	6.05	60.6	0.0	368.0
125.00		1.00	1.05	9.222	10.14	183.89	0.650	0.000	5.00	15.153	9.85	99.9	0.0	599.1
128.00	Appurtenance(s)	1.00	1.06	9.284	10.21	181.23	0.650	0.000	3.00	8.879	5.77	58.9	0.0	351.0
130.00	Top - Section 3	1.00	1.07	9.326	10.26	179.43	0.650	0.000	2.00	5.831	3.79	38.9	0.0	230.4
135.00		1.00	1.08	9.427	10.37	174.81	0.650	0.000	5.00	14.264	9.27	96.1	0.0	339.4
139.00	Appurtenance(s)	1.00	1.09	9.506	10.46	171.05	0.650	0.000	4.00	11.088	7.21	75.4	0.0	263.8
140.00		1.00	1.09	9.525	10.48	170.11	0.650	0.000	1.00	2.727	1.77	18.6	0.0	64.9
145.00		1.00	1.10	9.621	10.58	165.32	0.650	0.000	5.00	13.366	8.69	91.9	0.0	318.0
149.00	Appurtenance(s)	1.00	1.11	9.696	10.67	161.42	0.650	0.000	4.00	10.370	6.74	71.9	0.0	246.6
150.00		1.00	1.11	9.715	10.69	160.44	0.650	0.000	1.00	2.548	1.66	17.7	0.0	60.6
								Totals:	**150.00**			**3,136.7**		**32,020.4**

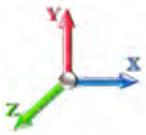
Discrete Appurtenance Forces

Structure:	CT13073-A-SBA	**Code:**	EIA/TIA-222-G	7/29/2021	
Site Name:	Groton North	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 25	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 20

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	149.00	LNX-6512DS-A1M	3	9.696	10.666	0.64	0.80	9.77	84.00	0.000	0.000	104.24	0.00	0.00
2	149.00	BXA-70063-6CF	3	9.696	10.666	0.58	0.80	13.26	51.00	0.000	0.000	141.46	0.00	0.00
3	149.00	HBXX-6517DS-VTM	3	9.696	10.666	0.62	0.80	15.80	122.10	0.000	0.000	168.53	0.00	0.00
4	149.00	HBXX-6516DS-VTM	3	9.696	10.666	0.62	0.80	10.03	91.80	0.000	0.000	107.03	0.00	0.00
5	149.00	Low Profile Platform	1	9.696	10.666	1.00	1.00	22.00	1500.00	0.000	0.000	234.65	0.00	0.00
6	149.00	DB-T1-6Z-8AB-0Z	1	9.696	10.666	0.80	0.80	3.84	18.90	0.000	0.000	40.96	0.00	0.00
7	149.00	ALU RRH 2x60 AWS	3	9.696	10.666	0.54	0.80	5.63	165.00	0.000	0.000	60.03	0.00	0.00
8	149.00	RFS FD9R6004/2C-3L	6	9.696	10.666	0.80	0.80	1.73	18.60	0.000	0.000	18.43	0.00	0.00
9	139.00	RMQP-4096-HK	1	9.506	10.456	1.00	1.00	51.70	2645.00	0.000	0.000	540.59	0.00	0.00
10	139.00	RRUS 4415 B25	4	9.506	10.456	0.54	0.80	3.52	184.00	0.000	0.000	36.77	0.00	0.00
11	139.00	4424	3	9.506	10.456	0.50	0.75	3.09	264.00	0.000	0.000	32.31	0.00	0.00
12	139.00	4449 B71 + B85	3	9.506	10.456	0.50	0.75	2.97	219.60	0.000	0.000	31.05	0.00	0.00
13	139.00	AIR6449 B41	3	9.506	10.456	0.53	0.75	9.03	309.00	0.000	0.000	94.38	0.00	0.00
14	139.00	APXVAARR24_43-U-NA2	3	9.506	10.456	0.52	0.75	31.88	384.00	0.000	0.000	333.33	0.00	0.00
15	139.00	Air 3246 B66	3	9.506	10.456	0.62	0.75	14.83	540.00	0.000	0.000	155.05	0.00	0.00
16	128.00	HPA-65R-BU8AA	2	9.284	10.213	0.69	0.80	15.45	108.00	0.000	0.000	157.81	0.00	0.00
17	128.00	Low Profile Platform	1	9.284	10.213	1.00	1.00	22.00	1600.00	0.000	0.000	224.68	0.00	0.00
18	128.00	HPA-65R-BU4AA	1	9.284	10.213	0.75	0.80	3.70	28.70	0.000	0.000	37.79	0.00	0.00
19	128.00	DMP65R-BU4DA	1	9.284	10.213	0.79	0.80	6.56	69.70	0.000	0.000	66.97	0.00	0.00
20	128.00	7770.00A	3	9.284	10.213	0.58	0.80	9.57	81.00	0.000	0.000	97.77	0.00	0.00
21	128.00	DMP65R-BU8DA	2	9.284	10.213	0.58	0.80	20.59	191.40	0.000	0.000	210.25	0.00	0.00
22	128.00	4449	3	9.284	10.213	0.54	0.80	2.65	210.00	0.000	0.000	27.10	0.00	0.00
23	128.00	B2 B66A 8843	3	9.284	10.213	0.54	0.80	2.64	210.00	0.000	0.000	26.93	0.00	0.00
24	128.00	DC6-48-60-18-8F	2	9.284	10.213	0.80	0.80	1.47	63.60	0.000	0.000	15.03	0.00	0.00
25	117.00	MC-PK8-DSH	1	9.049	9.954	1.00	1.00	37.59	1727.00	0.000	0.000	374.17	0.00	0.00
26	117.00	RDIDC-9181-PF-48	1	9.049	9.954	1.00	1.00	2.01	21.90	0.000	0.000	20.01	0.00	0.00
27	117.00	TA08025-B604	3	9.049	9.954	0.57	0.75	3.35	191.70	0.000	0.000	33.36	0.00	0.00
28	117.00	TA08025-B605	3	9.049	9.954	0.60	0.75	3.53	225.00	0.000	0.000	35.12	0.00	0.00
29	117.00	MX08FRO665-21	3	9.049	9.954	0.55	0.75	20.80	193.50	0.000	0.000	207.00	0.00	0.00
							Totals:		**11,518.50**			**3,632.79**		

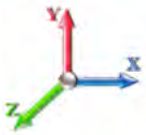
Total Applied Force Summary

Structure:	CT13073-A-SBA		**Code:**	EIA/TIA-222-G	7/29/2021
Site Name:	Groton North		**Exposure:**	B	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 26

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 20

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		110.27	1720.55	0.00	0.00
10.00		108.32	1692.25	0.00	0.00
15.00		106.38	1663.94	0.00	0.00
20.00		104.44	1635.64	0.00	0.00
25.00		102.49	1607.33	0.00	0.00
30.00		100.63	1579.02	0.00	0.00
35.00		103.13	1550.72	0.00	0.00
40.00		105.03	1522.41	0.00	0.00
41.50		31.43	451.20	0.00	0.00
45.00		75.56	1892.43	0.00	0.00
48.00		65.10	1601.38	0.00	0.00
50.00		43.46	525.33	0.00	0.00
55.00		110.03	1295.98	0.00	0.00
60.00		110.43	1271.22	0.00	0.00
65.00		110.55	1246.45	0.00	0.00
70.00		110.44	1221.68	0.00	0.00
75.00		110.11	1196.91	0.00	0.00
80.00		109.59	1172.15	0.00	0.00
84.00		87.02	919.89	0.00	0.00
85.00		21.88	374.21	0.00	0.00
89.50		98.60	1662.92	0.00	0.00
90.00		10.84	84.32	0.00	0.00
95.00		108.60	833.46	0.00	0.00
100.00		107.46	815.77	0.00	0.00
105.00		106.19	798.08	0.00	0.00
110.00		104.79	780.39	0.00	0.00
115.00		103.27	762.70	0.00	0.00
117.00	(11) attachments	710.37	2659.23	0.00	0.00
120.00		60.64	441.88	0.00	0.00
125.00		99.91	722.31	0.00	0.00
128.00	(18) attachments	923.28	2987.30	0.00	0.00
130.00		38.88	263.73	0.00	0.00
135.00		96.14	422.64	0.00	0.00
139.00	(20) attachments	1298.83	4875.98	0.00	0.00
140.00		18.57	78.40	0.00	0.00
145.00		91.95	385.56	0.00	0.00
149.00	(23) attachments	947.21	2352.12	0.00	0.00
150.00		17.70	60.59	0.00	0.00
	Totals:	**6,769.54**	**47,128.05**	**0.00**	**0.00**

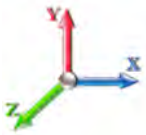
Calculated Forces

Structure:	CT13073-A-SBA	**Code:**	EIA/TIA-222-G	7/29/2021	
Site Name:	Groton North	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 27	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 20

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-47.13	-6.78	0.00	-744.23	0.00	744.23	6643.18	3321.59	16232.9	8128.53	0.00	0.000	0.000	0.099
5.00	-45.40	-6.69	0.00	-710.34	0.00	710.34	6562.43	3281.22	15750.7	7887.07	0.01	-0.024	0.000	0.097
10.00	-43.71	-6.60	0.00	-676.90	0.00	676.90	6480.38	3240.19	15272.4	7647.59	0.05	-0.049	0.000	0.095
15.00	-42.04	-6.51	0.00	-643.91	0.00	643.91	6397.03	3198.52	14798.3	7410.16	0.12	-0.074	0.000	0.093
20.00	-40.40	-6.42	0.00	-611.37	0.00	611.37	6312.38	3156.19	14328.4	7174.88	0.21	-0.099	0.000	0.092
25.00	-38.79	-6.33	0.00	-579.28	0.00	579.28	6226.42	3113.21	13863.0	6941.83	0.32	-0.124	0.000	0.090
30.00	-37.21	-6.24	0.00	-547.63	0.00	547.63	6139.16	3069.58	13402.2	6711.09	0.47	-0.149	0.000	0.088
35.00	-35.66	-6.15	0.00	-516.43	0.00	516.43	6050.60	3025.30	12946.2	6482.75	0.64	-0.174	0.000	0.086
40.00	-34.13	-6.05	0.00	-485.68	0.00	485.68	5960.74	2980.37	12495.2	6256.90	0.83	-0.199	0.000	0.083
41.50	-33.68	-6.02	0.00	-476.61	0.00	476.61	5933.53	2966.76	12360.9	6189.64	0.90	-0.207	0.000	0.083
45.00	-31.79	-5.95	0.00	-455.52	0.00	455.52	5869.58	2934.79	12049.3	6033.61	1.05	-0.224	0.000	0.081
48.00	-30.19	-5.89	0.00	-437.67	0.00	437.67	4971.57	2485.79	10282.0	5148.64	1.20	-0.239	0.000	0.091
50.00	-29.66	-5.85	0.00	-425.90	0.00	425.90	4942.60	2471.30	10136.2	5075.65	1.30	-0.250	0.000	0.090
55.00	-28.36	-5.75	0.00	-396.66	0.00	396.66	4869.24	2434.62	9774.42	4894.48	1.58	-0.276	0.000	0.087
60.00	-27.09	-5.64	0.00	-367.93	0.00	367.93	4794.58	2397.29	9416.42	4715.21	1.88	-0.303	0.000	0.084
65.00	-25.84	-5.54	0.00	-339.72	0.00	339.72	4718.63	2359.31	9062.39	4537.93	2.21	-0.329	0.000	0.080
70.00	-24.62	-5.43	0.00	-312.04	0.00	312.04	4641.37	2320.68	8712.52	4362.74	2.57	-0.355	0.000	0.077
75.00	-23.42	-5.32	0.00	-284.89	0.00	284.89	4562.80	2281.40	8366.97	4189.70	2.96	-0.380	0.000	0.073
80.00	-22.24	-5.21	0.00	-258.28	0.00	258.28	4482.94	2241.47	8025.91	4018.92	3.37	-0.405	0.000	0.069
84.00	-21.32	-5.12	0.00	-237.43	0.00	237.43	4418.04	2209.02	7756.28	3883.90	3.72	-0.424	0.000	0.066
85.00	-20.95	-5.10	0.00	-232.31	0.00	232.31	4396.40	2198.20	7680.13	3845.78	3.81	-0.429	0.000	0.065
89.50	-19.29	-5.00	0.00	-209.34	0.00	209.34	2828.72	1414.36	4933.25	2470.29	4.22	-0.450	0.000	0.092
90.00	-19.20	-4.99	0.00	-206.84	0.00	206.84	2824.36	1412.18	4913.38	2460.34	4.27	-0.452	0.000	0.091
95.00	-18.37	-4.88	0.00	-181.89	0.00	181.89	2780.02	1390.01	4715.55	2361.28	4.76	-0.481	0.000	0.084
100.00	-17.55	-4.78	0.00	-157.47	0.00	157.47	2734.38	1367.19	4519.43	2263.07	5.28	-0.508	0.000	0.076
105.00	-16.75	-4.67	0.00	-133.59	0.00	133.59	2687.43	1343.72	4325.17	2165.80	5.82	-0.534	0.000	0.068
110.00	-15.97	-4.56	0.00	-110.23	0.00	110.23	2639.19	1319.59	4132.95	2069.55	6.39	-0.557	0.000	0.059
115.00	-15.21	-4.46	0.00	-87.41	0.00	87.41	2589.64	1294.82	3942.93	1974.40	6.99	-0.577	0.000	0.050
117.00	-12.55	-3.72	0.00	-78.49	0.00	78.49	2569.45	1284.73	3867.58	1936.67	7.23	-0.584	0.000	0.045
120.00	-12.11	-3.66	0.00	-67.33	0.00	67.33	2538.79	1269.39	3755.30	1880.44	7.60	-0.595	0.000	0.041
125.00	-11.39	-3.55	0.00	-49.03	0.00	49.03	2486.64	1243.32	3570.20	1787.76	8.23	-0.609	0.000	0.032
128.00	-8.41	-2.60	0.00	-38.36	0.00	38.36	2454.72	1227.36	3460.44	1732.79	8.62	-0.616	0.000	0.026
130.00	-8.15	-2.56	0.00	-33.16	0.00	33.16	2433.18	1216.59	3387.83	1696.43	8.88	-0.620	0.000	0.023
130.00	-8.15	-2.56	0.00	-33.16	0.00	33.16	1188.95	594.48	1667.65	835.07	8.88	-0.620	0.000	0.047
135.00	-7.73	-2.46	0.00	-20.37	0.00	20.37	1172.65	586.33	1593.28	797.82	9.53	-0.627	0.000	0.032
139.00	-2.86	-1.11	0.00	-10.53	0.00	10.53	1158.65	579.33	1533.54	767.91	10.06	-0.634	0.000	0.016
140.00	-2.79	-1.09	0.00	-9.42	0.00	9.42	1155.02	577.51	1518.58	760.42	10.19	-0.635	0.000	0.015
145.00	-2.40	-0.99	0.00	-3.99	0.00	3.99	1136.06	568.03	1443.74	722.95	10.86	-0.639	0.000	0.008
149.00	-0.06	-0.02	0.00	-0.02	0.00	0.02	1119.92	559.96	1383.89	692.97	11.40	-0.640	0.000	0.000
150.00	0.00	-0.02	0.00	0.00	0.00	0.00	1115.76	557.88	1368.94	685.49	11.53	-0.640	0.000	0.000

Final Analysis Summary

Structure:	CT13073-A-SBA		**Code:**	EIA/TIA-222-G	7/29/2021
Site Name:	Groton North		**Exposure:**	B	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 28

Tower Engineering Solutions

Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 105 mph Wind	33.2	0.00	56.52	0.00	0.00	3662.54
0.9D + 1.6W 105 mph Wind	33.2	0.00	42.38	0.00	0.00	3636.73
1.2D + 1.0Di + 1.0Wi 50 mph Wind	8.1	0.00	82.66	0.00	0.00	872.16
1.2D + 1.0E	3.7	0.00	56.55	0.00	0.00	452.82
0.9D + 1.0E	3.7	0.00	42.41	0.00	0.00	449.47
1.0D + 1.0W 60 mph Wind	6.8	0.00	47.13	0.00	0.00	744.23

Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 105 mph Wind	-56.52	-33.23	0.00	-3662.5	0.00	-3662.5	6643.18	3321.5	16232.9	8128.53	0.00	0.459
0.9D + 1.6W 105 mph Wind	-42.38	-33.22	0.00	-3636.7	0.00	-3636.7	6643.18	3321.5	16232.9	8128.53	0.00	0.454
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-82.66	-8.08	0.00	-872.16	0.00	-872.16	6643.18	3321.5	16232.9	8128.53	0.00	0.120
1.2D + 1.0E	-23.17	-3.01	0.00	-146.49	0.00	-146.49	2828.72	1414.3	4933.25	2470.29	89.50	0.067
0.9D + 1.0E	-17.38	-2.98	0.00	-145.06	0.00	-145.06	2828.72	1414.3	4933.25	2470.29	89.50	0.065
1.0D + 1.0W 60 mph Wind	-47.13	-6.78	0.00	-744.23	0.00	-744.23	6643.18	3321.5	16232.9	8128.53	0.00	0.099

Base Plate Summary

Structure:	CT13073-A-SB		**Code:**	EIA/TIA-222-G	7/29/2021
Site Name:	Groton North		**Exposure:**	B	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 29

Reactions	
Original Design	
Moment (kip-ft):	6114.40
Axial (kip):	94.80
Shear (kip):	55.60
Analysis (1.2D + 1.6W)	
Moment (kip-ft):	3662.54
Axial (kip):	56.52
Shear (kip):	33.23

Base Plate	
Yield (ksi):	50.00
Width (in):	69.50
Style:	Round
Polygon Sides:	0.00
Clip Length (in):	0.00
Effective Len (in):	7.86
Moment (kip-in):	204.95
Allow Stress (ksi):	67.50
Applied Stress (ksi):	51.30
Stress Ratio:	0.76

Anchor Bolts	
Bolt Circle:	65.00
Number Bolts:	34.00
Bolt Type:	1.5" F1554 105
Bolt Diameter (in):	1.50
Yield (ksi):	105.00
Ultimate (ksi):	125.00
Arrangement:	Radial
Cluster Dist (in):	0.00
Start Angle (deg):	0.00
Compression	
Force (kip):	81.98
Allowable (kip):	141.00
Ratio:	0.60
Tension	
Force (kip):	77.12
Allowable (kip):	141.00
Ratio:	0.56

Monopole Mat Foundation Design

			Date: 7/29/2021
Customer Name:	Dish Wireless	**EIA/TIA Standard:**	EIA-222-G
Site Name:		**Structure Height (Ft.):**	150
Site Number:	CT13073-A-SBA	**Engineer Name:**	M. Franco
Engr. Number:	111942	**Engineer Login ID:**	

Foundation Info Obtained from: Mapping Operation

Structure Type: Monopole

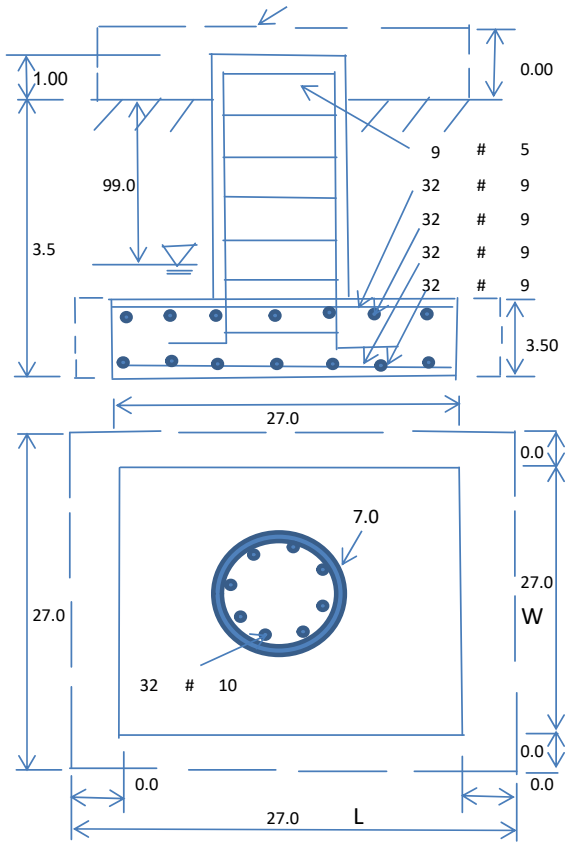
Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	56.5	Shear Force (Kips):	33.2
Uplift Force (Kips):	0.0	Moment (Kips-ft):	3662.5
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	7.0	Depth of Base BG (ft.):	3.5
Pier Height A. G. (ft.):	1.00	Thickness of Pad (ft):	3.50
Length of Pad (ft.):	27	Width of Pad (ft.):	27
Final Length of pad (ft)	27.0	Final width of pad (ft):	27.0



Material Properties and Reabr Info:

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	10	Tie / Stirrup Size #:	5	
Qty. of Vertical Rebars:	32	Tie Spacing (in):	6.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	9	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	32	Qty. of Rebar in Pad (W):	32	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	32	Qty. of Rebar in Pad (W):	32	
Apply 1.35 factor for e/w Per G:	1.35			

Soil Design Parameters:

Soil Unit Weight (pcf):	100.0	Soil Buoyant Weight:	50.0	Pcf		
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	20000	Ultimate Skin Friction:		Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	Yes		Angle from Bottm of Pad:	25
Consider soil hor. resist. for OTM.:	No	Reduction factor on the maximum soil bearing pressure:			1.00	

Foundation Analysis and Design: Uplift Strength Reduction Factor: 0.75 — Compression Strength Reduction Factor: 0.75

Total Dry Soil Volume (cu. Ft.):	0.00	Total Dry Soil Weight (Kips):	0.00
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	0.00	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	2589.98	Total Dry Concrete Weight (Kips):	388.50
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	388.50	Total Vertical Load on Base (Kips):	445.00

Check Soil Capacities:

					Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	2341	<	Allowable Factored Soil Bearing (psf):	15000	0.16	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	5483.0	>	Design Factored Momont (kips-ft):	3812	0.70	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	1.44	OK!				

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75			
Strength reduction factor (Axial compresion):	0.65	Wind Load Factor on Concrete Design:	1.00			
					Load/ Capacity Ratio	
(1) Concrete Pier:						
Vertical Steel Rebar Area (sq. in./each):	1.27		Tie / Stirrup Area (sq. in./each):	0.31		
Calculated Moment Capacity (Mn,Kips-Ft):	6654.7	>	Design Factored Moment (Mu, Kips-F	3695.7	0.56	OK!
Calculated Shear Capacity (Kips):	871.9	>	Design Factored Shear (Kips):	33.2	0.04	OK!
Calculated Tension Capacity (Tn, Kips):	2194.6	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	7294.5	>	Design Factored Axial Load (Pu Kips):	56.5	0.01	OK!
Moment & Axial Strength Combination:	0.56	OK!	Check Tie Spacing (Design/Required):		0.5	OK!
Pier Reinforcement Ratio:	0.007		Reinforcement Ratio is satisfied per ACI			
(2).Concrete Pad:						
One-Way Design Shear Capacity (L-Direction, Kips):	1023.2	>	One-Way Factored Shear (L-D. Kips):	235.4	0.23	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	1023.2	>	One-Way Factored Shear (W-D., Kips)	235.4	0.23	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	939.0	>	One-Way Factored Shear (C-C, Kips):	230.4	0.25	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0026	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0026		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	5367.7	>	Moment at Bottom (L-Dir. K-Ft):	1448.4	0.27	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	5367.7	>	Moment at Bottom (W-Dir. K-Ft):	1448.4	0.27	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	7537.9	>	Moment at Bottom (C-C Dir. K-Ft):	2048.3	0.27	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0026	OK!	Upper Steel Reinf. Ratio (W-Dir.):	0.0026		
Upper Steel Pad Moment Capacity (L-Direc. Kips-ft):	5367.7	>	Moment at the top (L-Dir K-Ft):	591.3	0.11	OK!
Upper Steel Pad Moment Capacity (W-Direc. Kips-ft):	5367.7	>	Moment at the top (W-Dir K-Ft):	591.3	0.11	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	7537.9	>	Moment at the top (C-C Dir. K-Ft):	553.4	0.07	OK!
(3).Check Punching Shear Capacity due to Moment in the Pier:						
Moment transferred by punching shear:	1465.0	k-ft.	Max. factored shear stress v_{u_CD}:		3.1	Psi
Max. factored shear stress v_{u_AB}:	9.0	Psi	Factored shear Strength ϕv_n:		164.3	Psi
Max. factored shear stress v_u:	9.0	Psi	Check Usage of Punching Shear Capacity:		0.05	OK!

EXHIBIT 9

Antenna Mount Analysis

July 27, 2021

Sherri Knapik
SBA Network Services, LLC
134 Flanders Road, Suite 125
Westborough, MA 01581
(508) 251-0720 x 3805

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
towersupport@btgrp.com

Subject:	**Appurtenance Mount Analysis Report**	
Carrier Designation:	***Dish Wireless* Co-Locate**	
	Site Number:	BOBOS00056A
	Site Name:	N/A
SBA Network Services Designation:	**Site Number:**	CT13073-A
	Site Name:	Groton North
	Application Number:	163266, v1
Engineering Firm Designation:	**B+T Group Project Number:**	149464.003.01
Site Data:	**1662 Route 184, Groton, CT, 06340, New London County** **Latitude *41.38566*°, Longitude - *72.01330*°** **Monopole** **10.5 ft. Platform Mount**	

Dear Ms. Knapik,

B+T Group is pleased to submit this **"Appurtenance Mount Analysis Report"** to determine the structural integrity of the antenna mount on the above-mentioned structure.

The purpose of the analysis is to determine acceptability of the mount's stress level. Based on our analysis we have determined the stress level for the mount under the following load case to be:

Proposed Equipment Note: See Table 1 for the final loading configuration	**Sufficient Capacity** **(Passing at 58.3%)**

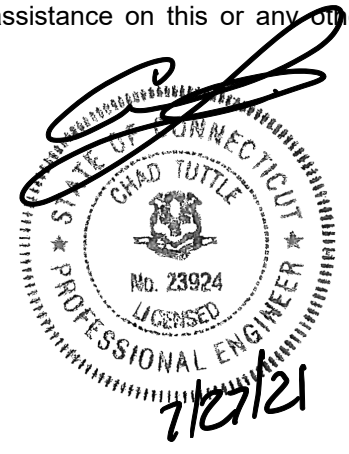
This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 135 mph converted to a nominal 3-second gust wind speed of 105 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B and Risk Category II were used in this analysis.

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

We at *B+T Group* appreciate the opportunity of providing our continuing professional services to you and *SBA Network Services, LLC*. If you have any questions or need further assistance on this or any other projects, please give us a call.

Mount structural analysis prepared by: Erik Perez

Respectfully submitted by: B&T Engineering, Inc.
COA: PEC.0001564 Expires: 02/10/2022



Chad E. Tuttle, P.E.

TABLE OF CONTENTS

1) INTRODUCTION

The appurtenance mount consists of Commscope platform mount, Part# MC-PK10-C at 117 ft., attached to monopole at 1662 Route 184, Groton, CT, 06340, New London County. The proposed antenna loading information was obtained from SBA Network Services, LLC. All information provided to B+T Group was assumed accurate and complete.

2) ANALYSIS CRITERIA

The structural analysis was performed for this mount in accordance with the ANSI/TIA-222-G-2-2005 Structural Standard for Antenna Supporting Structures and Antennas - Addendum 2 using a 3-second gust wind speed of 105 mph with no ice and 50 mph with 0.75 inch escalated ice thickness. Exposure Category B & Topographic Category 1 and Risk Category II were used in this analysis. In addition, the platform mount has been analyzed for various live loading conditions consisting of a 250-lb man live load applied individually at the midpoint and cantilevered ends of horizontal members as well as a 500-pound man live load applied individually at mount pipe locations using a 3-second gust of 30 mph. The mount was analyzed under 30º increments in the wind direction. The analyzed loading is detailed in Table 1.

Table 1 – Proposed Equipment Information

Loading	RAD Center Elev. (ft.)	Position	Qty.	Description	Note
Proposed	117	1	3	JMA Wireless MX08FRO665-21	1
			3	Fujitsu TA08025-B605	2
			3	Fujitsu TA08025-B604	
		-	1	Raycap RDIDC-9181-PF-48	3

Note:
(1) Proposed Antenna to be installed on the Mount Pipe.
(2) Proposed Equipment to be installed directly behind the Antenna.
(3) Proposed Equipment to be installed on the mount.

Table 2 – Documents Provided

Documents	Remarks	Reference	Source
SBA Application	Proposed Loading Mount Info	Date: 06/24/2021	SBA Network Services, LLC
RFDS	Proposed Loading	Date: 06/09/2021	

3) ANALYSIS PROCEDURE

3.1) Analysis Method

RISA-3D (Version 19.0.4), a commercially available analysis software package, was used to create a three-dimensional model of the mount and calculate member stresses and deflections for various loading cases. Selected output from the analysis is included in Appendix A.

Manufacturers drawing were used to create the model.

3.2) Assumptions

1. The mount was built in accordance with the manufacturer's specifications.
2. The mount has been maintained in accordance with the manufacturer's specifications and is free of damage.
3. Mount pipes were assumed to be 8' long.
4. The configuration of antennas and other appurtenances are as specified in Table 1.
5. All mount components have been assumed to be in sufficient condition to carry their full design capacity for the analysis.

6. Mount areas and weights are determined from field measurements, standard material properties, and/or manufacturer product data.
7. Serviceability with respect to antenna twist, tilt, roll or lateral translation is not checked and is left to the carrier or tower owner to ensure conformance.
8. All prior structural modifications, if any are assumed to be correctly installed and fully effective.
9. All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
10. The following material grades were assumed (Unless Noted Otherwise):
    a) Connection Bolts : ASTM A325
    b) Steel Pipe : ASTM A53 (GR. 35)
    c) HSS (Round) : ASTM 500 (GR. B-42)
    d) HSS (Rectangular) : ASTM 500 (GR. B-46)
    e) Channel : ASTM A36 (GR. 36)
    f) Steel Solid Rod : ASTM A36 (GR. 36)
    g) Steel Plate : ASTM A36 (GR. 36)
    h) Steel Angle : ASTM A36 (GR. 36)
    i) UNISTRUT : ASTM A570 (GR. 33)

This analysis may be affected if any assumptions are not valid or have been made in error. B+T Group should be notified to determine the effect on the structural integrity of the antenna mounting system.

4) ANALYSIS RESULTS

Table 3 – Mount Component Stresses vs. Capacity

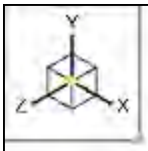
Notes	Component	Elevation (ft.)	% Capacity	Pass / Fail
-	Main Horizontals	117	15.1	Pass
-	Support Rails	117	43.9	Pass
-	Support Tubes	117	58.3	Pass
-	Support Channels	117	39.7	Pass
-	Support Angels	117	53.2	Pass
-	Mount Pipes	117	42.4	Pass
-	Connection Plates	117	23.5	Pass
-	Connection Angles	117	38.2	Pass
	Bolt Connections	117	34.1	Pass

5) RECOMMENDATIONS

The Commscope platform mount, Part# MC-PK10-C has sufficient capacity to carry the proposed loads and is in compliance with the ANSI/TIA-222-G standard for the proposed loading. (Refer to the RISA output for the specific members).

APPENDIX A

(RISA-3D Output)



Envelope Only Solution

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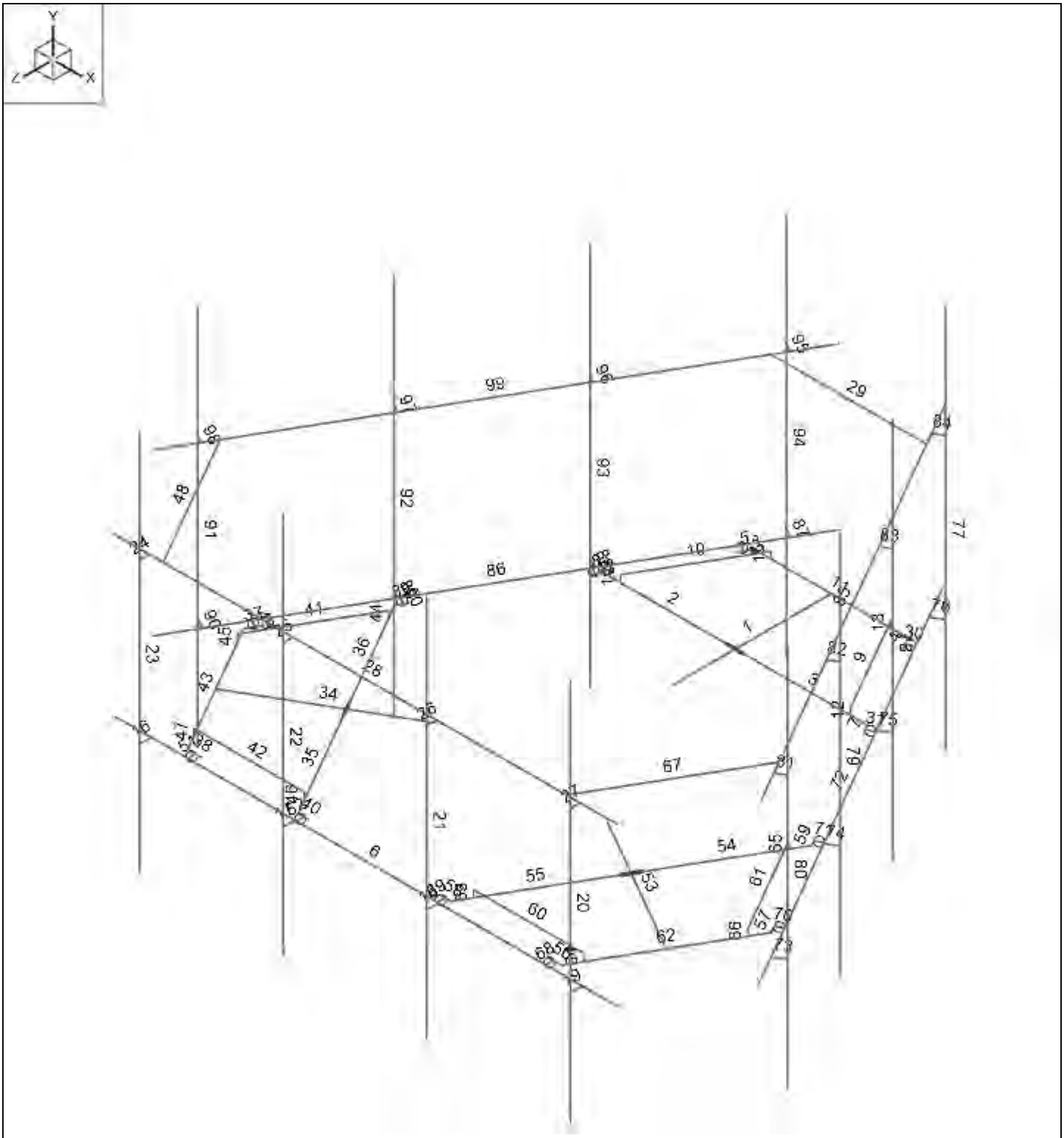

Envelope Only Solution

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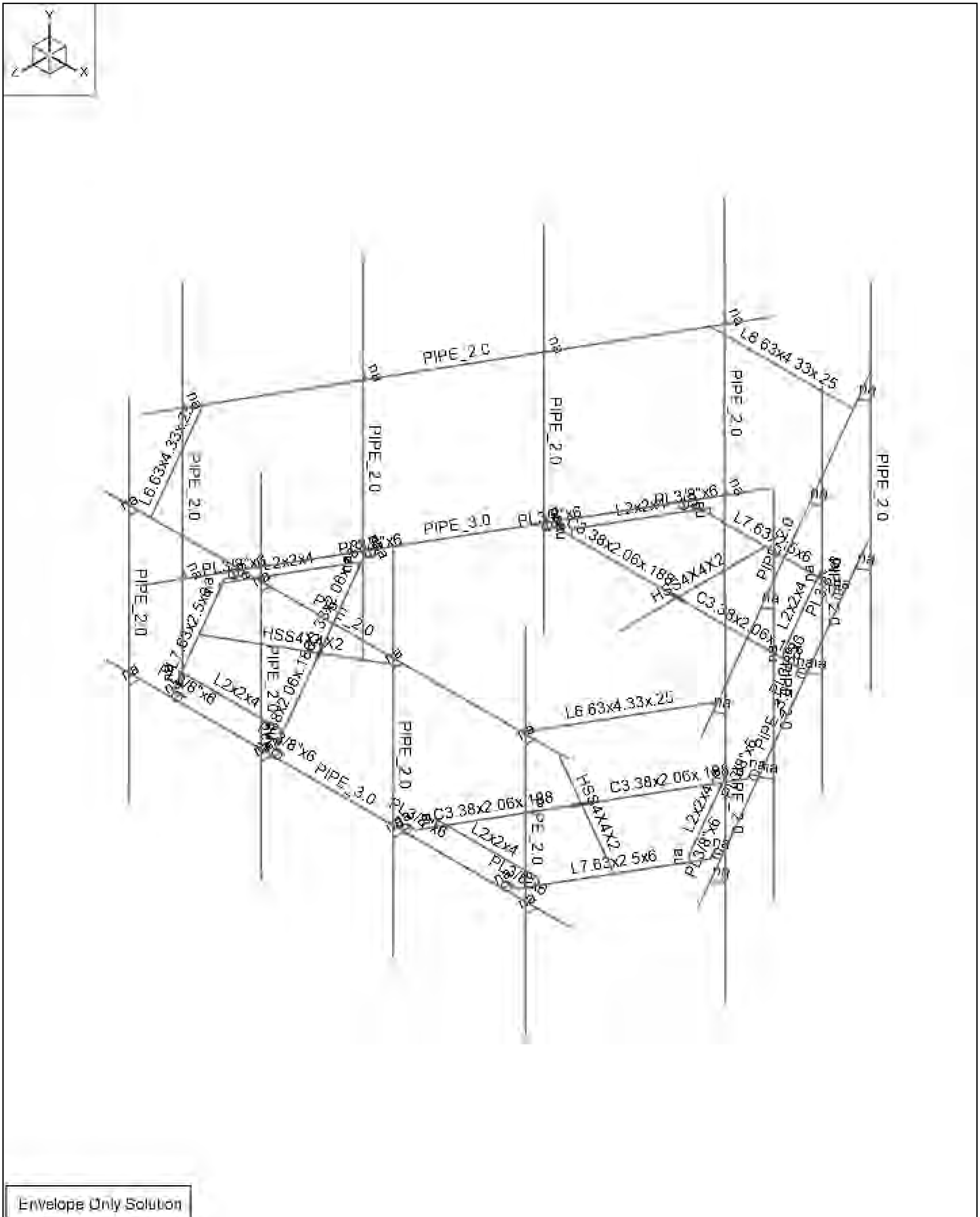

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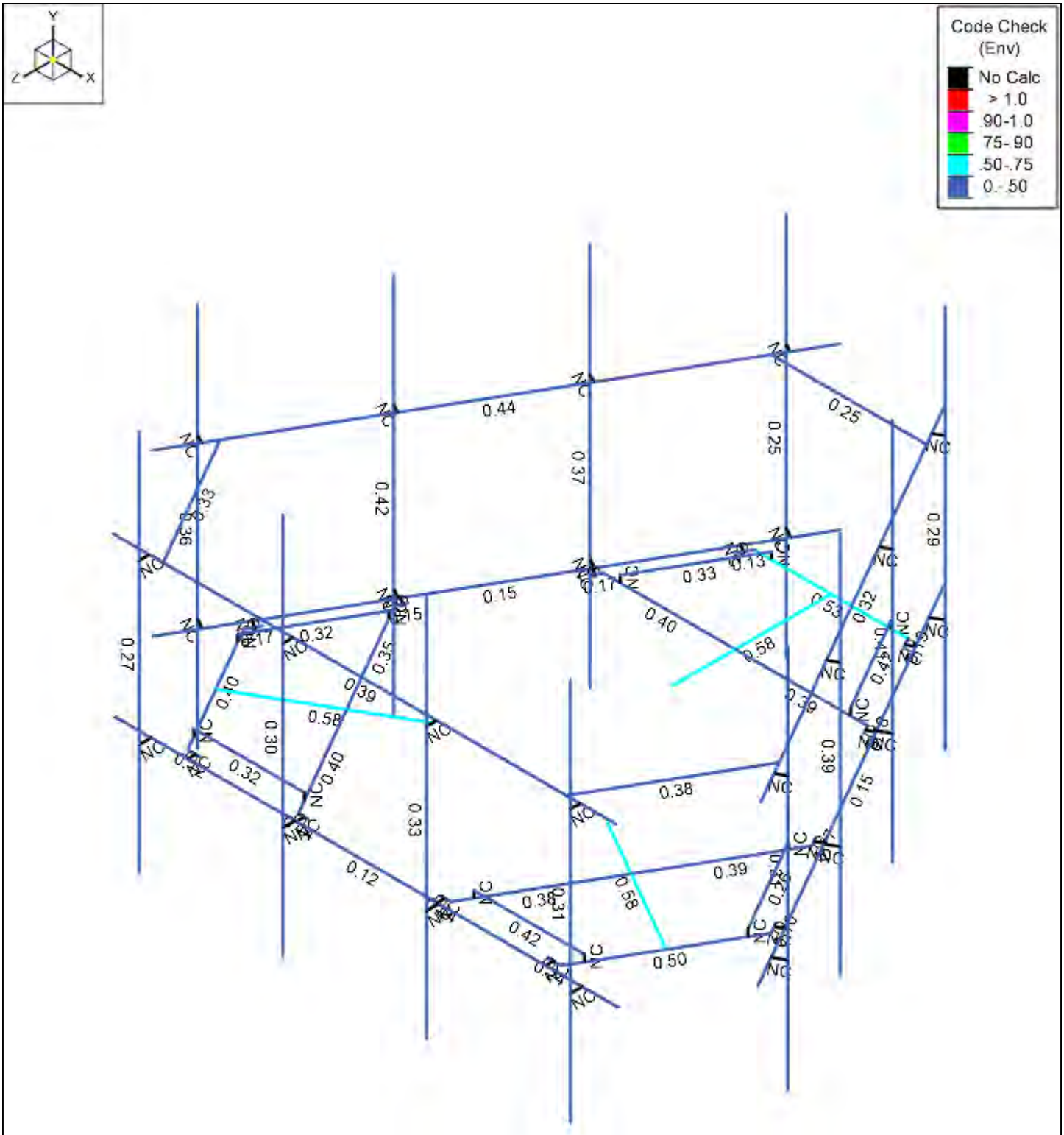

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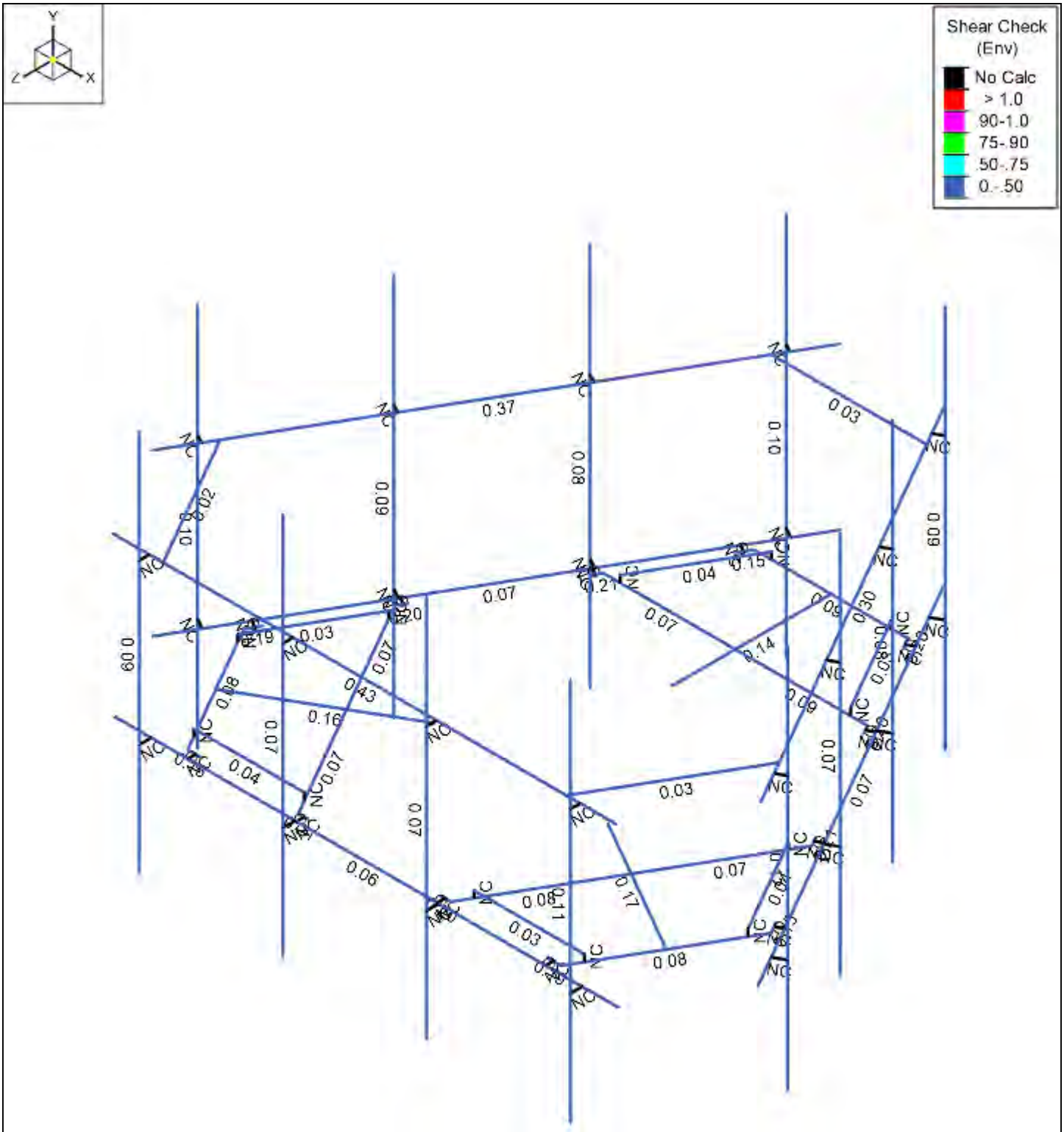

B+T Group	CT13073-A - Groton North	SK-5
MP		Jul 26, 2021
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Node Coordinates

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
1	1	0	0	-2.098625	
2	2	0	0	-5.431958	
3	3	0	0	-3.431958	
4	4	2.758333	0	-3.431958	
5	5	-2.758333	0	-3.431958	
6	6	-1.603633	0	-5.431958	
7	7	1.603633	0	-5.431958	
8	8	1.749466	0	-5.179368	
9	9	-1.749466	0	-5.179368	
10	10	1.686966	0	-5.287621	
11	11	1.826791	0	-5.368349	
12	12	-1.686966	0	-5.287621	
13	13	-1.826791	0	-5.368349	
14	14	-5.249998	0	4.266222	
15	15	5.249998	0	4.266222	
16	16	2.8625	0	-3.251536	
17	17	2.820833	0	-3.323706	
18	18	2.960658	0	-3.404434	
19	19	-2.8625	0	-3.251536	
20	20	-2.820833	0	-3.323706	
21	21	-2.960658	0	-3.404434	
22	22	-1.25	0.140833	-5.431958	
23	23	-2.404701	0.140833	-3.431958	
24	24	2.404701	0.140833	-3.431958	
25	25	1.25	0.140833	-5.431958	
26	26	-1.25	0	-5.431958	
27	27	-2.404701	0	-3.431958	
28	28	2.404701	0	-3.431958	
29	29	1.25	0	-5.431958	
30	30	-4.499998	0	4.266222	
31	31	-1.499998	0	4.266222	
32	32	1.500002	0	4.266222	
33	33	4.500002	0	4.266222	
34	34	-4.499998	0	4.516222	
35	35	-1.499998	0	4.516222	
36	36	1.500002	0	4.516222	
37	37	4.500002	0	4.516222	
38	38	-4.499998	-2.3333	4.516222	
39	39	-1.499998	-2.3333	4.516222	
40	40	1.500002	-2.3333	4.516222	
41	41	4.500002	-2.3333	4.516222	
42	42	-4.499998	5.6667	4.516222	
43	43	-1.499998	5.6667	4.516222	
44	44	1.500002	5.6667	4.516222	
45	45	4.500002	5.6667	4.516222	
46	46	-4.499998	3.333067	4.516222	
47	47	-1.499998	3.333067	4.516222	
48	48	1.500002	3.333067	4.516222	
49	49	4.500002	3.333067	4.516222	
50	50	-4.499998	3.333067	4.307888	
51	51	-1.499998	3.333067	4.307888	
52	52	1.500002	3.333067	4.307888	
53	53	4.500002	3.333067	4.307888	
54	54	-5.25	3.333067	4.307888	
55	55	5.25	3.333067	4.307888	
56	56	1.624999	3.333067	-5.801197	
57	57	-1.624999	3.333067	-5.801197	
58	58	0	0	0	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
59	59	-1.817463	0	1.049313	
60	60	-4.704214	0	2.715979	
61	61	-2.972163	0	1.715979	
62	62	-4.35133	0	-0.672808	
63	63	-1.592996	0	4.104766	
64	64	-3.902398	0	4.104766	
65	65	-5.50603	0	1.327192	
66	66	-5.360197	0	1.074602	
67	67	-3.610731	0	4.104766	
68	68	-5.422697	0	1.182855	
69	69	-5.562522	0	1.102127	
70	70	-3.735731	0	4.104766	
71	71	-3.735731	0	4.266222	
72	72	-4.247163	0	-0.85323	
73	73	-4.28883	0	-0.78106	
74	74	-4.428655	0	-0.861788	
75	75	-1.384663	0	4.104766	
76	76	-1.467998	0	4.104766	
77	77	-1.467998	0	4.266222	
78	78	-4.079214	0.140833	3.798511	
79	79	-1.769813	0.140833	3.798511	
80	80	-4.174513	0.140833	-0.366553	
81	81	-5.329214	0.140833	1.633447	
82	82	-4.079214	0	3.798511	
83	83	-1.769813	0	3.798511	
84	84	-4.174513	0	-0.366553	
85	85	-5.329214	0	1.633447	
86	86	-5.836483	3.333067	1.493308	
87	87	-4.211484	3.333067	4.307888	
88	88	1.817463	0	1.049313	
89	89	4.704214	0	2.715979	
90	90	2.972163	0	1.715979	
91	91	1.592996	0	4.104766	
92	92	4.35133	0	-0.672808	
93	93	5.50603	0	1.327192	
94	94	3.902398	0	4.104766	
95	95	3.610731	0	4.104766	
96	96	5.360197	0	1.074602	
97	97	3.735731	0	4.104766	
98	98	3.735731	0	4.266222	
99	99	5.422697	0	1.182855	
100	100	5.562522	0	1.102127	
101	101	1.384663	0	4.104766	
102	102	1.467998	0	4.104766	
103	103	1.467998	0	4.266222	
104	104	4.247163	0	-0.85323	
105	105	4.28883	0	-0.78106	
106	106	4.428655	0	-0.861788	
107	107	5.329214	0.140833	1.633447	
108	108	4.174513	0.140833	-0.366553	
109	109	1.769813	0.140833	3.798511	
110	110	4.079214	0.140833	3.798511	
111	111	5.329214	0	1.633447	
112	112	4.174513	0	-0.366553	
113	113	1.769813	0	3.798511	
114	114	4.079214	0	3.798511	
115	115	4.211484	3.333067	4.307888	
116	116	5.836483	3.333067	1.493308	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
117	117	6.319655	0	2.413521	
118	118	1.069657	0	-6.679743	
119	119	5.944655	0	1.764002	
120	120	4.444655	0	-0.834074	
121	121	2.944655	0	-3.432151	
122	122	1.444655	0	-6.030227	
123	123	6.161162	0	1.639002	
124	124	4.661162	0	-0.959074	
125	125	3.161162	0	-3.557151	
126	126	1.661162	0	-6.155227	
127	127	6.161162	-2.3333	1.639002	
128	128	4.661162	-2.3333	-0.959074	
129	129	3.161162	-2.3333	-3.557151	
130	130	1.661162	-2.3333	-6.155227	
131	131	6.161162	5.6667	1.639002	
132	132	4.661162	5.6667	-0.959074	
133	133	3.161162	5.6667	-3.557151	
134	134	1.661162	5.6667	-6.155227	
135	135	6.161162	3.333067	1.639002	
136	136	4.661162	3.333067	-0.959074	
137	137	3.161162	3.333067	-3.557151	
138	138	1.661162	3.333067	-6.155227	
139	139	5.98074	3.333067	1.743168	
140	140	4.48074	3.333067	-0.854908	
141	141	2.98074	3.333067	-3.452984	
142	142	1.48074	3.333067	-6.05106	
143	143	6.355741	3.333067	2.392689	
144	144	1.105741	3.333067	-6.700578	
145	145	-1.069657	0	-6.679743	
146	146	-6.319655	0	2.413521	
147	147	-1.444657	0	-6.030224	
148	148	-2.944657	0	-3.432147	
149	149	-4.444657	0	-0.834071	
150	150	-5.944657	0	1.764005	
151	151	-1.661164	0	-6.155224	
152	152	-3.161164	0	-3.557147	
153	153	-4.661164	0	-0.959071	
154	154	-6.161164	0	1.639005	
155	155	-1.661164	-2.3333	-6.155224	
156	156	-3.161164	-2.3333	-3.557147	
157	157	-4.661164	-2.3333	-0.959071	
158	158	-6.161164	-2.3333	1.639005	
159	159	-1.661164	5.6667	-6.155224	
160	160	-3.161164	5.6667	-3.557147	
161	161	-4.661164	5.6667	-0.959071	
162	162	-6.161164	5.6667	1.639005	
163	163	-1.661164	3.333067	-6.155224	
164	164	-3.161164	3.333067	-3.557147	
165	165	-4.661164	3.333067	-0.959071	
166	166	-6.161164	3.333067	1.639005	
167	167	-1.480742	3.333067	-6.051057	
168	168	-2.980742	3.333067	-3.452981	
169	169	-4.480742	3.333067	-0.854904	
170	170	-5.980742	3.333067	1.743172	
171	171	-1.105741	3.333067	-6.700578	
172	172	-6.355741	3.333067	2.392689	

Node Boundary Conditions

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot [k-ft/rad]	Y Rot [k-ft/rad]	Z Rot [k-ft/rad]
1	1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	2						
3	3						
4	4						
5	5						
6	16						
7	17						
8	19						
9	20						
10	22						
11	25						
12	26						
13	29						
14	59	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
15	60						
16	61						
17	62						
18	63						
19	72						
20	73						
21	75						
22	76						
23	78						
24	81						
25	82						
26	85						
27	88	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
28	89						
29	90						
30	91						
31	92						
32	101						
33	102						
34	104						
35	105						
36	107						
37	110						
38	111						
39	114						

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e^{5}°F^{-1}]	Density [k/ft^{3}]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
7	A1085	29000	11154	0.3	0.65	0.49	50	1.4	65	1.3

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in^{2}]	Iyy [in^{4}]	Izz [in^{4}]	J [in^{4}]
1	MF-H1	PIPE_3.0	Beam	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
2	MF-H2	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
3	SF-H1	HSS4X4X2	Beam	Tube	A500 Gr.B Rect	Typical	1.77	4.4	4.4	6.91
4	SF-H2	C3.38x2.06x.188	Beam	Channel	A36 Gr.36	Typical	1.339	0.562	2.4	0.015
5	SF-H3	L2x2x4	Beam	Single Angle	A36 Gr.36	Typical	0.944	0.346	0.346	0.021

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
6	SF-H4	L7.63x2.5x6	Beam	Single Angle	A36 Gr.36	Typical	3.658	1.307	22.092	0.163
7	MF-P1	PIPE_2.0	Column	Pipe	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
8	MF-CP1	PL3/8"x6	Beam	RECT	A36 Gr.36	Typical	2.25	0.026	6.75	0.101
9	MF-H3	L6.63x4.33x.25	Beam	Single Angle	A36 Gr.36	Typical	2.678	4.383	12.502	0.054

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	1	1	2		SF-H1	Beam	Tube	A500 Gr.B Rect	Typical
2	2	5	3	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
3	3	3	4	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
4	4	7	8		MF-CP1	Beam	RECT	A36 Gr.36	Typical
5	5	6	9		MF-CP1	Beam	RECT	A36 Gr.36	Typical
6	6	14	15		MF-H1	Beam	Pipe	A53 Gr.B	Typical
7	7	16	4		MF-CP1	Beam	RECT	A36 Gr.36	Typical
8	8	5	19		MF-CP1	Beam	RECT	A36 Gr.36	Typical
9	9	25	24		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
10	10	23	22		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
11	11	6	7		SF-H4	Beam	Single Angle	A36 Gr.36	Typical
12	12	28	24		RIGID	None	None	RIGID	Typical
13	13	29	25		RIGID	None	None	RIGID	Typical
14	14	27	23		RIGID	None	None	RIGID	Typical
15	15	26	22		RIGID	None	None	RIGID	Typical
16	16	34	30		RIGID	None	None	RIGID	Typical
17	17	35	31		RIGID	None	None	RIGID	Typical
18	18	36	32		RIGID	None	None	RIGID	Typical
19	19	37	33		RIGID	None	None	RIGID	Typical
20	20	45	41		MF-P1	Column	Pipe	A53 Gr.B	Typical
21	21	44	40		MF-P1	Column	Pipe	A53 Gr.B	Typical
22	22	43	39		MF-P1	Column	Pipe	A53 Gr.B	Typical
23	23	42	38		MF-P1	Column	Pipe	A53 Gr.B	Typical
24	24	46	50		RIGID	None	None	RIGID	Typical
25	25	47	51		RIGID	None	None	RIGID	Typical
26	26	48	52		RIGID	None	None	RIGID	Typical
27	27	49	53		RIGID	None	None	RIGID	Typical
28	28	54	55		MF-H2	Beam	Pipe	A53 Gr.B	Typical
29	29	56	57	180	MF-H3	Beam	Single Angle	A36 Gr.36	Typical
30	30	11	10		RIGID	None	None	RIGID	Typical
31	31	18	17		RIGID	None	None	RIGID	Typical
32	32	13	12		RIGID	None	None	RIGID	Typical
33	33	21	20		RIGID	None	None	RIGID	Typical
34	34	59	60		SF-H1	Beam	Tube	A500 Gr.B Rect	Typical
35	35	63	61	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
36	36	61	62	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
37	37	65	66		MF-CP1	Beam	RECT	A36 Gr.36	Typical
38	38	64	67		MF-CP1	Beam	RECT	A36 Gr.36	Typical
39	39	72	62		MF-CP1	Beam	RECT	A36 Gr.36	Typical
40	40	63	75		MF-CP1	Beam	RECT	A36 Gr.36	Typical
41	41	81	80		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
42	42	79	78		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
43	43	64	65		SF-H4	Beam	Single Angle	A36 Gr.36	Typical
44	44	84	80		RIGID	None	None	RIGID	Typical
45	45	85	81		RIGID	None	None	RIGID	Typical
46	46	83	79		RIGID	None	None	RIGID	Typical
47	47	82	78		RIGID	None	None	RIGID	Typical
48	48	86	87	180	MF-H3	Beam	Single Angle	A36 Gr.36	Typical
49	49	69	68		RIGID	None	None	RIGID	Typical
50	50	74	73		RIGID	None	None	RIGID	Typical
51	51	71	70		RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
52	52	77	76		RIGID	None	None	RIGID	Typical
53	53	88	89		SF-H1	Beam	Tube	A500 Gr.B Rect	Typical
54	54	92	90	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
55	55	90	91	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
56	56	94	95		MF-CP1	Beam	RECT	A36 Gr.36	Typical
57	57	93	96		MF-CP1	Beam	RECT	A36 Gr.36	Typical
58	58	101	91		MF-CP1	Beam	RECT	A36 Gr.36	Typical
59	59	92	104		MF-CP1	Beam	RECT	A36 Gr.36	Typical
60	60	110	109		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
61	61	108	107		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
62	62	93	94		SF-H4	Beam	Single Angle	A36 Gr.36	Typical
63	63	113	109		RIGID	None	None	RIGID	Typical
64	64	114	110		RIGID	None	None	RIGID	Typical
65	65	112	108		RIGID	None	None	RIGID	Typical
66	66	111	107		RIGID	None	None	RIGID	Typical
67	67	115	116	180	MF-H3	Beam	Single Angle	A36 Gr.36	Typical
68	68	98	97		RIGID	None	None	RIGID	Typical
69	69	103	102		RIGID	None	None	RIGID	Typical
70	70	100	99		RIGID	None	None	RIGID	Typical
71	71	106	105		RIGID	None	None	RIGID	Typical
72	72	117	118		MF-H1	Beam	Pipe	A53 Gr.B	Typical
73	73	123	119		RIGID	None	None	RIGID	Typical
74	74	124	120		RIGID	None	None	RIGID	Typical
75	75	125	121		RIGID	None	None	RIGID	Typical
76	76	126	122		RIGID	None	None	RIGID	Typical
77	77	134	130		MF-P1	Column	Pipe	A53 Gr.B	Typical
78	78	133	129		MF-P1	Column	Pipe	A53 Gr.B	Typical
79	79	132	128		MF-P1	Column	Pipe	A53 Gr.B	Typical
80	80	131	127		MF-P1	Column	Pipe	A53 Gr.B	Typical
81	81	135	139		RIGID	None	None	RIGID	Typical
82	82	136	140		RIGID	None	None	RIGID	Typical
83	83	137	141		RIGID	None	None	RIGID	Typical
84	84	138	142		RIGID	None	None	RIGID	Typical
85	85	143	144		MF-H2	Beam	Pipe	A53 Gr.B	Typical
86	86	145	146		MF-H1	Beam	Pipe	A53 Gr.B	Typical
87	87	151	147		RIGID	None	None	RIGID	Typical
88	88	152	148		RIGID	None	None	RIGID	Typical
89	89	153	149		RIGID	None	None	RIGID	Typical
90	90	154	150		RIGID	None	None	RIGID	Typical
91	91	162	158		MF-P1	Column	Pipe	A53 Gr.B	Typical
92	92	161	157		MF-P1	Column	Pipe	A53 Gr.B	Typical
93	93	160	156		MF-P1	Column	Pipe	A53 Gr.B	Typical
94	94	159	155		MF-P1	Column	Pipe	A53 Gr.B	Typical
95	95	163	167		RIGID	None	None	RIGID	Typical
96	96	164	168		RIGID	None	None	RIGID	Typical
97	97	165	169		RIGID	None	None	RIGID	Typical
98	98	166	170		RIGID	None	None	RIGID	Typical
99	99	171	172		MF-H2	Beam	Pipe	A53 Gr.B	Typical

Member Advanced Data

	Label	I Release	I Offset [in]	J Offset [in]	Physical	Deflection Ratio Options	Seismic DR
1	1				Yes		None
2	2			2	Yes		None
3	3		2		Yes		None
4	4				Yes		None
5	5				Yes		None
6	6				Yes		None
7	7				Yes		None

Member Advanced Data (Continued)

	Label	I Release	I Offset [in]	J Offset [in]	Physical	Deflection Ratio Options	Seismic DR
8	8				Yes		None
9	9				Yes		None
10	10				Yes		None
11	11				Yes		None
12	12				Yes	** NA **	None
13	13				Yes	** NA **	None
14	14				Yes	** NA **	None
15	15				Yes	** NA **	None
16	16				Yes	** NA **	None
17	17				Yes	** NA **	None
18	18				Yes	** NA **	None
19	19				Yes	** NA **	None
20	20				Yes	** NA **	None
21	21				Yes	** NA **	None
22	22				Yes	** NA **	None
23	23				Yes	** NA **	None
24	24				Yes	** NA **	None
25	25				Yes	** NA **	None
26	26				Yes	** NA **	None
27	27				Yes	** NA **	None
28	28				Yes		None
29	29				Yes		None
30	30	OOOOOX			Yes	** NA **	None
31	31	OOOOOX			Yes	** NA **	None
32	32	OOOOOX			Yes	** NA **	None
33	33	OOOOOX			Yes	** NA **	None
34	34				Yes		None
35	35			2	Yes		None
36	36		2		Yes		None
37	37				Yes		None
38	38				Yes		None
39	39				Yes		None
40	40				Yes		None
41	41				Yes		None
42	42				Yes		None
43	43				Yes		None
44	44				Yes	** NA **	None
45	45				Yes	** NA **	None
46	46				Yes	** NA **	None
47	47				Yes	** NA **	None
48	48				Yes		None
49	49	OOOOOX			Yes	** NA **	None
50	50	OOOOOX			Yes	** NA **	None
51	51	OOOOOX			Yes	** NA **	None
52	52	OOOOOX			Yes	** NA **	None
53	53				Yes		None
54	54			2	Yes		None
55	55		2		Yes		None
56	56				Yes		None
57	57				Yes		None
58	58				Yes		None
59	59				Yes		None
60	60				Yes		None
61	61				Yes		None
62	62				Yes		None
63	63				Yes	** NA **	None
64	64				Yes	** NA **	None
65	65				Yes	** NA **	None

Member Advanced Data (Continued)

	Label	I Release	I Offset [in]	J Offset [in]	Physical	Deflection Ratio Options	Seismic DR
66	66				Yes	** NA **	None
67	67				Yes		None
68	68	OOOOOX			Yes	** NA **	None
69	69	OOOOOX			Yes	** NA **	None
70	70	OOOOOX			Yes	** NA **	None
71	71	OOOOOX			Yes	** NA **	None
72	72				Yes		None
73	73				Yes	** NA **	None
74	74				Yes	** NA **	None
75	75				Yes	** NA **	None
76	76				Yes	** NA **	None
77	77				Yes	** NA **	None
78	78				Yes	** NA **	None
79	79				Yes	** NA **	None
80	80				Yes	** NA **	None
81	81				Yes	** NA **	None
82	82				Yes	** NA **	None
83	83				Yes	** NA **	None
84	84				Yes	** NA **	None
85	85				Yes		None
86	86				Yes		None
87	87				Yes	** NA **	None
88	88				Yes	** NA **	None
89	89				Yes	** NA **	None
90	90				Yes	** NA **	None
91	91				Yes	** NA **	None
92	92				Yes	** NA **	None
93	93				Yes	** NA **	None
94	94				Yes	** NA **	None
95	95				Yes	** NA **	None
96	96				Yes	** NA **	None
97	97				Yes	** NA **	None
98	98				Yes	** NA **	None
99	99				Yes		None

Hot Rolled Steel Design Parameters

	Label	Shape	Length [ft]	Lcomp top [ft]	Function
1	1	SF-H1	3.333	Lbyy	Lateral
2	2	SF-H2	2.758	Lbyy	Lateral
3	3	SF-H2	2.758	Lbyy	Lateral
4	4	MF-CP1	0.292	Lbyy	Lateral
5	5	MF-CP1	0.292	Lbyy	Lateral
6	6	MF-H1	10.5	Lbyy	Lateral
7	7	MF-CP1	0.208	Lbyy	Lateral
8	8	MF-CP1	0.208	Lbyy	Lateral
9	9	SF-H3	2.309	Lbyy	Lateral
10	10	SF-H3	2.309	Lbyy	Lateral
11	11	SF-H4	3.207	Lbyy	Lateral
12	20	MF-P1	8	Lbyy	Lateral
13	21	MF-P1	8	Lbyy	Lateral
14	22	MF-P1	8	Lbyy	Lateral
15	23	MF-P1	8	Lbyy	Lateral
16	28	MF-H2	10.5	Lbyy	Lateral
17	29	MF-H3	3.25	Lbyy	Lateral
18	34	SF-H1	3.333	Lbyy	Lateral
19	35	SF-H2	2.758	Lbyy	Lateral
20	36	SF-H2	2.758	Lbyy	Lateral
21	37	MF-CP1	0.292	Lbyy	Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length [ft]	Lcomp top [ft]	Function
22	38	MF-CP1	0.292	Lbyy	Lateral
23	39	MF-CP1	0.208	Lbyy	Lateral
24	40	MF-CP1	0.208	Lbyy	Lateral
25	41	SF-H3	2.309	Lbyy	Lateral
26	42	SF-H3	2.309	Lbyy	Lateral
27	43	SF-H4	3.207	Lbyy	Lateral
28	48	MF-H3	3.25	Lbyy	Lateral
29	53	SF-H1	3.333	Lbyy	Lateral
30	54	SF-H2	2.758	Lbyy	Lateral
31	55	SF-H2	2.758	Lbyy	Lateral
32	56	MF-CP1	0.292	Lbyy	Lateral
33	57	MF-CP1	0.292	Lbyy	Lateral
34	58	MF-CP1	0.208	Lbyy	Lateral
35	59	MF-CP1	0.208	Lbyy	Lateral
36	60	SF-H3	2.309	Lbyy	Lateral
37	61	SF-H3	2.309	Lbyy	Lateral
38	62	SF-H4	3.207	Lbyy	Lateral
39	67	MF-H3	3.25	Lbyy	Lateral
40	72	MF-H1	10.5	Lbyy	Lateral
41	77	MF-P1	8	Lbyy	Lateral
42	78	MF-P1	8	Lbyy	Lateral
43	79	MF-P1	8	Lbyy	Lateral
44	80	MF-P1	8	Lbyy	Lateral
45	85	MF-H2	10.5	Lbyy	Lateral
46	86	MF-H1	10.5	Lbyy	Lateral
47	91	MF-P1	8	Lbyy	Lateral
48	92	MF-P1	8	Lbyy	Lateral
49	93	MF-P1	8	Lbyy	Lateral
50	94	MF-P1	8	Lbyy	Lateral
51	99	MF-H2	10.5	Lbyy	Lateral

Member Point Loads (BLC 1 : Dead)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	20	Y	-0.032	%15
2	20	Y	-0.032	%85
3	20	Y	-0.075	%20
4	20	Y	-0.064	%50
5	20	Y	0	0
6	91	Y	-0.032	%15
7	91	Y	-0.032	%85
8	91	Y	-0.075	%20
9	91	Y	-0.064	%50
10	91	Y	0	0
11	77	Y	-0.032	%15
12	77	Y	-0.032	%85
13	77	Y	-0.075	%20
14	77	Y	-0.064	%50
15	77	Y	0	0
16	34	Y	-0.022	%20
17	34	Y	0	0
18	34	Y	0	0
19	34	Y	0	0
20	34	Y	0	0

Member Point Loads (BLC 2 : 0 Wind - No Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	20	Z	-0.173	%15
2	20	Z	-0.173	%85
3	20	Z	-0.054	%20
4	20	Z	-0.054	%50
5	20	Z	0	0
6	91	Z	-0.173	%15
7	91	Z	-0.173	%85
8	91	Z	-0.054	%20
9	91	Z	-0.054	%50
10	91	Z	0	0
11	77	Z	-0.173	%15
12	77	Z	-0.173	%85
13	77	Z	-0.054	%20
14	77	Z	-0.054	%50
15	77	Z	0	0
16	34	Z	-0.056	%20
17	34	Z	0	0
18	34	Z	0	0
19	34	Z	0	0
20	34	Z	0	0

Member Point Loads (BLC 3 : 90 Wind - No Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	20	X	-0.069	%15
2	20	X	-0.069	%85
3	20	X	-0.033	%20
4	20	X	-0.029	%50
5	20	X	0	0
6	91	X	-0.069	%15
7	91	X	-0.069	%85
8	91	X	-0.033	%20
9	91	X	-0.029	%50
10	91	X	0	0
11	77	X	-0.069	%15
12	77	X	-0.069	%85
13	77	X	-0.033	%20
14	77	X	-0.029	%50
15	77	X	0	0
16	34	X	-0.031	%20
17	34	X	0	0
18	34	X	0	0
19	34	X	0	0
20	34	X	0	0

Member Point Loads (BLC 4 : 0 Wind - Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	20	Z	-0.048	%15
2	20	Z	-0.048	%85
3	20	Z	-0.018	%20
4	20	Z	-0.018	%50
5	20	Z	0	0
6	91	Z	-0.048	%15
7	91	Z	-0.048	%85
8	91	Z	-0.018	%20
9	91	Z	-0.018	%50
10	91	Z	0	0
11	77	Z	-0.048	%15

Member Point Loads (BLC 4 : 0 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
12	77	Z	-0.048	%85
13	77	Z	-0.018	%20
14	77	Z	-0.018	%50
15	77	Z	0	0
16	34	Z	-0.019	%20
17	34	Z	0	0
18	34	Z	0	0
19	34	Z	0	0
20	34	Z	0	0

Member Point Loads (BLC 5 : 90 Wind - Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	20	X	-0.023	%15
2	20	X	-0.023	%85
3	20	X	-0.013	%20
4	20	X	-0.011	%50
5	20	X	0	0
6	91	X	-0.023	%15
7	91	X	-0.023	%85
8	91	X	-0.013	%20
9	91	X	-0.011	%50
10	91	X	0	0
11	77	X	-0.023	%15
12	77	X	-0.023	%85
13	77	X	-0.013	%20
14	77	X	-0.011	%50
15	77	X	0	0
16	34	X	-0.012	%20
17	34	X	0	0
18	34	X	0	0
19	34	X	0	0
20	34	X	0	0

Member Point Loads (BLC 6 : 0 Wind - Service)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	20	Z	-0.014	%15
2	20	Z	-0.014	%85
3	20	Z	-0.004	%20
4	20	Z	-0.004	%50
5	20	Z	0	0
6	91	Z	-0.014	%15
7	91	Z	-0.014	%85
8	91	Z	-0.004	%20
9	91	Z	-0.004	%50
10	91	Z	0	0
11	77	Z	-0.014	%15
12	77	Z	-0.014	%85
13	77	Z	-0.004	%20
14	77	Z	-0.004	%50
15	77	Z	0	0
16	34	Z	-0.005	%20
17	34	Z	0	0
18	34	Z	0	0
19	34	Z	0	0
20	34	Z	0	0

Member Point Loads (BLC 7 : 90 Wind - Service)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	20	X	-0.006	%15
2	20	X	-0.006	%85
3	20	X	-0.003	%20
4	20	X	-0.002	%50
5	20	X	0	0
6	91	X	-0.006	%15
7	91	X	-0.006	%85
8	91	X	-0.003	%20
9	91	X	-0.002	%50
10	91	X	0	0
11	77	X	-0.006	%15
12	77	X	-0.006	%85
13	77	X	-0.003	%20
14	77	X	-0.002	%50
15	77	X	0	0
16	34	X	-0.003	%20
17	34	X	0	0
18	34	X	0	0
19	34	X	0	0
20	34	X	0	0

Member Point Loads (BLC 8 : Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	20	Y	-0.145	%15
2	20	Y	-0.145	%85
3	20	Y	-0.052	%20
4	20	Y	-0.051	%50
5	20	Y	0	0
6	91	Y	-0.145	%15
7	91	Y	-0.145	%85
8	91	Y	-0.052	%20
9	91	Y	-0.051	%50
10	91	Y	0	0
11	77	Y	-0.145	%15
12	77	Y	-0.145	%85
13	77	Y	-0.052	%20
14	77	Y	-0.051	%50
15	77	Y	0	0
16	34	Y	-0.053	%20
17	34	Y	0	0
18	34	Y	0	0
19	34	Y	0	0
20	34	Y	0	0

Member Point Loads (BLC 13 : Maint LL 1)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	6	Y	-0.25	%5

Member Point Loads (BLC 14 : Maint LL 2)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	28	Y	-0.25	%5

Member Point Loads (BLC 15 : Maint LL 3)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	86	Y	-0.25	%5

Member Point Loads (BLC 16 : Maint LL 4)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	99	Y	-0.25	%5

Member Point Loads (BLC 17 : Maint LL 5)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	72	Y	-0.25	%5

Member Point Loads (BLC 18 : Maint LL 6)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	85	Y	-0.25	%5

Member Point Loads (BLC 19 : Maint LL 7)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	6	Y	-0.25	%95

Member Point Loads (BLC 20 : Maint LL 8)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	28	Y	-0.25	%95

Member Point Loads (BLC 21 : Maint LL 9)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	86	Y	-0.25	%95

Member Point Loads (BLC 22 : Maint LL 10)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	99	Y	-0.25	%95

Member Point Loads (BLC 23 : Maint LL 11)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	72	Y	-0.25	%95

Member Point Loads (BLC 24 : Maint LL 12)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	85	Y	-0.25	%95

Member Point Loads (BLC 25 : Maint LL 13)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	34	Y	-0.25	%95

Member Point Loads (BLC 26 : Maint LL 14)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	1	Y	-0.25	%95

Member Point Loads (BLC 27 : Maint LL 15)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	53	Y	-0.25	%95

Member Distributed Loads (BLC 2 : 0 Wind - No Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.014	-0.014	0	%100
2	2	Z	-0.011	-0.011	0	%100
3	3	Z	-0.011	-0.011	0	%100
4	4	Z	-0.017	-0.017	0	%100

Member Distributed Loads (BLC 2 : 0 Wind - No Ice) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
5	5	Z	-0.017	-0.017	0	%100
6	6	Z	-0.01	-0.01	0	%100
7	7	Z	-0.017	-0.017	0	%100
8	8	Z	-0.017	-0.017	0	%100
9	9	Z	-0.007	-0.007	0	%100
10	10	Z	-0.007	-0.007	0	%100
11	11	Z	-0.023	-0.023	0	%100
12	20	Z	-0.007	-0.007	0	%100
13	21	Z	-0.007	-0.007	0	%100
14	22	Z	-0.007	-0.007	0	%100
15	23	Z	-0.007	-0.007	0	%100
16	28	Z	-0.007	-0.007	0	%100
17	29	Z	-0.02	-0.02	0	%100
18	34	Z	-0.014	-0.014	0	%100
19	35	Z	-0.011	-0.011	0	%100
20	36	Z	-0.011	-0.011	0	%100
21	37	Z	-0.017	-0.017	0	%100
22	38	Z	-0.017	-0.017	0	%100
23	39	Z	-0.017	-0.017	0	%100
24	40	Z	-0.017	-0.017	0	%100
25	41	Z	-0.007	-0.007	0	%100
26	42	Z	-0.007	-0.007	0	%100
27	43	Z	-0.023	-0.023	0	%100
28	48	Z	-0.02	-0.02	0	%100
29	53	Z	-0.014	-0.014	0	%100
30	54	Z	-0.011	-0.011	0	%100
31	55	Z	-0.011	-0.011	0	%100
32	56	Z	-0.017	-0.017	0	%100
33	57	Z	-0.017	-0.017	0	%100
34	58	Z	-0.017	-0.017	0	%100
35	59	Z	-0.017	-0.017	0	%100
36	60	Z	-0.007	-0.007	0	%100
37	61	Z	-0.007	-0.007	0	%100
38	62	Z	-0.023	-0.023	0	%100
39	67	Z	-0.02	-0.02	0	%100
40	72	Z	-0.01	-0.01	0	%100
41	77	Z	-0.007	-0.007	0	%100
42	78	Z	-0.007	-0.007	0	%100
43	79	Z	-0.007	-0.007	0	%100
44	80	Z	-0.007	-0.007	0	%100
45	85	Z	-0.007	-0.007	0	%100
46	86	Z	-0.01	-0.01	0	%100
47	91	Z	-0.007	-0.007	0	%100
48	92	Z	-0.007	-0.007	0	%100
49	93	Z	-0.007	-0.007	0	%100
50	94	Z	-0.007	-0.007	0	%100
51	99	Z	-0.007	-0.007	0	%100

Member Distributed Loads (BLC 3 : 90 Wind - No Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.014	-0.014	0	%100
2	2	X	-0.011	-0.011	0	%100
3	3	X	-0.011	-0.011	0	%100
4	4	X	-0.017	-0.017	0	%100
5	5	X	-0.017	-0.017	0	%100
6	6	X	-0.01	-0.01	0	%100
7	7	X	-0.017	-0.017	0	%100
8	8	X	-0.017	-0.017	0	%100

Member Distributed Loads (BLC 3 : 90 Wind - No Ice) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
9	9	X	-0.007	-0.007	0	%100
10	10	X	-0.007	-0.007	0	%100
11	11	X	-0.023	-0.023	0	%100
12	20	X	-0.007	-0.007	0	%100
13	21	X	-0.007	-0.007	0	%100
14	22	X	-0.007	-0.007	0	%100
15	23	X	-0.007	-0.007	0	%100
16	28	X	-0.007	-0.007	0	%100
17	29	X	-0.02	-0.02	0	%100
18	34	X	-0.014	-0.014	0	%100
19	35	X	-0.011	-0.011	0	%100
20	36	X	-0.011	-0.011	0	%100
21	37	X	-0.017	-0.017	0	%100
22	38	X	-0.017	-0.017	0	%100
23	39	X	-0.017	-0.017	0	%100
24	40	X	-0.017	-0.017	0	%100
25	41	X	-0.007	-0.007	0	%100
26	42	X	-0.007	-0.007	0	%100
27	43	X	-0.023	-0.023	0	%100
28	48	X	-0.02	-0.02	0	%100
29	53	X	-0.014	-0.014	0	%100
30	54	X	-0.011	-0.011	0	%100
31	55	X	-0.011	-0.011	0	%100
32	56	X	-0.017	-0.017	0	%100
33	57	X	-0.017	-0.017	0	%100
34	58	X	-0.017	-0.017	0	%100
35	59	X	-0.017	-0.017	0	%100
36	60	X	-0.007	-0.007	0	%100
37	61	X	-0.007	-0.007	0	%100
38	62	X	-0.023	-0.023	0	%100
39	67	X	-0.02	-0.02	0	%100
40	72	X	-0.01	-0.01	0	%100
41	77	X	-0.007	-0.007	0	%100
42	78	X	-0.007	-0.007	0	%100
43	79	X	-0.007	-0.007	0	%100
44	80	X	-0.007	-0.007	0	%100
45	85	X	-0.007	-0.007	0	%100
46	86	X	-0.01	-0.01	0	%100
47	91	X	-0.007	-0.007	0	%100
48	92	X	-0.007	-0.007	0	%100
49	93	X	-0.007	-0.007	0	%100
50	94	X	-0.007	-0.007	0	%100
51	99	X	-0.007	-0.007	0	%100

Member Distributed Loads (BLC 4 : 0 Wind - Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.006	-0.006	0	%100
2	2	Z	-0.006	-0.006	0	%100
3	3	Z	-0.006	-0.006	0	%100
4	4	Z	-0.012	-0.012	0	%100
5	5	Z	-0.012	-0.012	0	%100
6	6	Z	-0.002	-0.002	0	%100
7	7	Z	-0.014	-0.014	0	%100
8	8	Z	-0.014	-0.014	0	%100
9	9	Z	-0.005	-0.005	0	%100
10	10	Z	-0.005	-0.005	0	%100
11	11	Z	-0.008	-0.008	0	%100
12	20	Z	-0.002	-0.002	0	%100

Member Distributed Loads (BLC 4 : 0 Wind - Ice) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
13	21	Z	-0.002	-0.002	0	%100
14	22	Z	-0.002	-0.002	0	%100
15	23	Z	-0.002	-0.002	0	%100
16	28	Z	-0.002	-0.002	0	%100
17	29	Z	-0.008	-0.008	0	%100
18	34	Z	-0.006	-0.006	0	%100
19	35	Z	-0.006	-0.006	0	%100
20	36	Z	-0.006	-0.006	0	%100
21	37	Z	-0.012	-0.012	0	%100
22	38	Z	-0.012	-0.012	0	%100
23	39	Z	-0.014	-0.014	0	%100
24	40	Z	-0.014	-0.014	0	%100
25	41	Z	-0.005	-0.005	0	%100
26	42	Z	-0.005	-0.005	0	%100
27	43	Z	-0.008	-0.008	0	%100
28	48	Z	-0.008	-0.008	0	%100
29	53	Z	-0.006	-0.006	0	%100
30	54	Z	-0.006	-0.006	0	%100
31	55	Z	-0.006	-0.006	0	%100
32	56	Z	-0.012	-0.012	0	%100
33	57	Z	-0.012	-0.012	0	%100
34	58	Z	-0.014	-0.014	0	%100
35	59	Z	-0.014	-0.014	0	%100
36	60	Z	-0.005	-0.005	0	%100
37	61	Z	-0.005	-0.005	0	%100
38	62	Z	-0.008	-0.008	0	%100
39	67	Z	-0.008	-0.008	0	%100
40	72	Z	-0.002	-0.002	0	%100
41	77	Z	-0.002	-0.002	0	%100
42	78	Z	-0.002	-0.002	0	%100
43	79	Z	-0.002	-0.002	0	%100
44	80	Z	-0.002	-0.002	0	%100
45	85	Z	-0.002	-0.002	0	%100
46	86	Z	-0.002	-0.002	0	%100
47	91	Z	-0.002	-0.002	0	%100
48	92	Z	-0.002	-0.002	0	%100
49	93	Z	-0.002	-0.002	0	%100
50	94	Z	-0.002	-0.002	0	%100
51	99	Z	-0.002	-0.002	0	%100

Member Distributed Loads (BLC 5 : 90 Wind - Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.006	-0.006	0	%100
2	2	X	-0.006	-0.006	0	%100
3	3	X	-0.006	-0.006	0	%100
4	4	X	-0.012	-0.012	0	%100
5	5	X	-0.012	-0.012	0	%100
6	6	X	-0.002	-0.002	0	%100
7	7	X	-0.014	-0.014	0	%100
8	8	X	-0.014	-0.014	0	%100
9	9	X	-0.005	-0.005	0	%100
10	10	X	-0.005	-0.005	0	%100
11	11	X	-0.008	-0.008	0	%100
12	20	X	-0.002	-0.002	0	%100
13	21	X	-0.002	-0.002	0	%100
14	22	X	-0.002	-0.002	0	%100
15	23	X	-0.002	-0.002	0	%100
16	28	X	-0.002	-0.002	0	%100

Member Distributed Loads (BLC 5 : 90 Wind - Ice) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
17	29	X	-0.008	-0.008	0	%100
18	34	X	-0.006	-0.006	0	%100
19	35	X	-0.006	-0.006	0	%100
20	36	X	-0.006	-0.006	0	%100
21	37	X	-0.012	-0.012	0	%100
22	38	X	-0.012	-0.012	0	%100
23	39	X	-0.014	-0.014	0	%100
24	40	X	-0.014	-0.014	0	%100
25	41	X	-0.005	-0.005	0	%100
26	42	X	-0.005	-0.005	0	%100
27	43	X	-0.008	-0.008	0	%100
28	48	X	-0.008	-0.008	0	%100
29	53	X	-0.006	-0.006	0	%100
30	54	X	-0.006	-0.006	0	%100
31	55	X	-0.006	-0.006	0	%100
32	56	X	-0.012	-0.012	0	%100
33	57	X	-0.012	-0.012	0	%100
34	58	X	-0.014	-0.014	0	%100
35	59	X	-0.014	-0.014	0	%100
36	60	X	-0.005	-0.005	0	%100
37	61	X	-0.005	-0.005	0	%100
38	62	X	-0.008	-0.008	0	%100
39	67	X	-0.008	-0.008	0	%100
40	72	X	-0.002	-0.002	0	%100
41	77	X	-0.002	-0.002	0	%100
42	78	X	-0.002	-0.002	0	%100
43	79	X	-0.002	-0.002	0	%100
44	80	X	-0.002	-0.002	0	%100
45	85	X	-0.002	-0.002	0	%100
46	86	X	-0.002	-0.002	0	%100
47	91	X	-0.002	-0.002	0	%100
48	92	X	-0.002	-0.002	0	%100
49	93	X	-0.002	-0.002	0	%100
50	94	X	-0.002	-0.002	0	%100
51	99	X	-0.002	-0.002	0	%100

Member Distributed Loads (BLC 6 : 0 Wind - Service)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.001	-0.001	0	%100
2	2	Z	-0.0009	-0.0009	0	%100
3	3	Z	-0.0009	-0.0009	0	%100
4	4	Z	-0.001	-0.001	0	%100
5	5	Z	-0.001	-0.001	0	%100
6	6	Z	-0.0004	-0.0004	0	%100
7	7	Z	-0.001	-0.001	0	%100
8	8	Z	-0.001	-0.001	0	%100
9	9	Z	-0.0006	-0.0006	0	%100
10	10	Z	-0.0006	-0.0006	0	%100
11	11	Z	-0.002	-0.002	0	%100
12	20	Z	-0.0003	-0.0003	0	%100
13	21	Z	-0.0003	-0.0003	0	%100
14	22	Z	-0.0003	-0.0003	0	%100
15	23	Z	-0.0003	-0.0003	0	%100
16	28	Z	-0.0003	-0.0003	0	%100
17	29	Z	-0.002	-0.002	0	%100
18	34	Z	-0.001	-0.001	0	%100
19	35	Z	-0.0009	-0.0009	0	%100
20	36	Z	-0.0009	-0.0009	0	%100

Member Distributed Loads (BLC 6 : 0 Wind - Service) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
21	37	Z	-0.001	-0.001	0	%100
22	38	Z	-0.001	-0.001	0	%100
23	39	Z	-0.001	-0.001	0	%100
24	40	Z	-0.001	-0.001	0	%100
25	41	Z	-0.0006	-0.0006	0	%100
26	42	Z	-0.0006	-0.0006	0	%100
27	43	Z	-0.002	-0.002	0	%100
28	48	Z	-0.002	-0.002	0	%100
29	53	Z	-0.001	-0.001	0	%100
30	54	Z	-0.0009	-0.0009	0	%100
31	55	Z	-0.0009	-0.0009	0	%100
32	56	Z	-0.001	-0.001	0	%100
33	57	Z	-0.001	-0.001	0	%100
34	58	Z	-0.001	-0.001	0	%100
35	59	Z	-0.001	-0.001	0	%100
36	60	Z	-0.0006	-0.0006	0	%100
37	61	Z	-0.0006	-0.0006	0	%100
38	62	Z	-0.002	-0.002	0	%100
39	67	Z	-0.002	-0.002	0	%100
40	72	Z	-0.0004	-0.0004	0	%100
41	77	Z	-0.0003	-0.0003	0	%100
42	78	Z	-0.0003	-0.0003	0	%100
43	79	Z	-0.0003	-0.0003	0	%100
44	80	Z	-0.0003	-0.0003	0	%100
45	85	Z	-0.0003	-0.0003	0	%100
46	86	Z	-0.0004	-0.0004	0	%100
47	91	Z	-0.0003	-0.0003	0	%100
48	92	Z	-0.0003	-0.0003	0	%100
49	93	Z	-0.0003	-0.0003	0	%100
50	94	Z	-0.0003	-0.0003	0	%100
51	99	Z	-0.0003	-0.0003	0	%100

Member Distributed Loads (BLC 7 : 90 Wind - Service)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.001	-0.001	0	%100
2	2	X	-0.0009	-0.0009	0	%100
3	3	X	-0.0009	-0.0009	0	%100
4	4	X	-0.001	-0.001	0	%100
5	5	X	-0.001	-0.001	0	%100
6	6	X	-0.0004	-0.0004	0	%100
7	7	X	-0.001	-0.001	0	%100
8	8	X	-0.001	-0.001	0	%100
9	9	X	-0.0006	-0.0006	0	%100
10	10	X	-0.0006	-0.0006	0	%100
11	11	X	-0.002	-0.002	0	%100
12	20	X	-0.0003	-0.0003	0	%100
13	21	X	-0.0003	-0.0003	0	%100
14	22	X	-0.0003	-0.0003	0	%100
15	23	X	-0.0003	-0.0003	0	%100
16	28	X	-0.0003	-0.0003	0	%100
17	29	X	-0.002	-0.002	0	%100
18	34	X	-0.001	-0.001	0	%100
19	35	X	-0.0009	-0.0009	0	%100
20	36	X	-0.0009	-0.0009	0	%100
21	37	X	-0.001	-0.001	0	%100
22	38	X	-0.001	-0.001	0	%100
23	39	X	-0.001	-0.001	0	%100
24	40	X	-0.001	-0.001	0	%100

Member Distributed Loads (BLC 7 : 90 Wind - Service) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
25	41	X	-0.0006	-0.0006	0	%100
26	42	X	-0.0006	-0.0006	0	%100
27	43	X	-0.002	-0.002	0	%100
28	48	X	-0.002	-0.002	0	%100
29	53	X	-0.001	-0.001	0	%100
30	54	X	-0.0009	-0.0009	0	%100
31	55	X	-0.0009	-0.0009	0	%100
32	56	X	-0.001	-0.001	0	%100
33	57	X	-0.001	-0.001	0	%100
34	58	X	-0.001	-0.001	0	%100
35	59	X	-0.001	-0.001	0	%100
36	60	X	-0.0006	-0.0006	0	%100
37	61	X	-0.0006	-0.0006	0	%100
38	62	X	-0.002	-0.002	0	%100
39	67	X	-0.002	-0.002	0	%100
40	72	X	-0.0004	-0.0004	0	%100
41	77	X	-0.0003	-0.0003	0	%100
42	78	X	-0.0003	-0.0003	0	%100
43	79	X	-0.0003	-0.0003	0	%100
44	80	X	-0.0003	-0.0003	0	%100
45	85	X	-0.0003	-0.0003	0	%100
46	86	X	-0.0004	-0.0004	0	%100
47	91	X	-0.0003	-0.0003	0	%100
48	92	X	-0.0003	-0.0003	0	%100
49	93	X	-0.0003	-0.0003	0	%100
50	94	X	-0.0003	-0.0003	0	%100
51	99	X	-0.0003	-0.0003	0	%100

Member Distributed Loads (BLC 8 : Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Y	-0.015	-0.015	0	%100
2	2	Y	-0.012	-0.012	0	%100
3	3	Y	-0.012	-0.012	0	%100
4	4	Y	-0.016	-0.016	0	%100
5	5	Y	-0.016	-0.016	0	%100
6	6	Y	-0.011	-0.011	0	%100
7	7	Y	-0.016	-0.016	0	%100
8	8	Y	-0.016	-0.016	0	%100
9	9	Y	-0.009	-0.009	0	%100
10	10	Y	-0.009	-0.009	0	%100
11	11	Y	-0.02	-0.02	0	%100
12	20	Y	-0.008	-0.008	0	%100
13	21	Y	-0.008	-0.008	0	%100
14	22	Y	-0.008	-0.008	0	%100
15	23	Y	-0.008	-0.008	0	%100
16	28	Y	-0.008	-0.008	0	%100
17	29	Y	-0.02	-0.02	0	%100
18	34	Y	-0.015	-0.015	0	%100
19	35	Y	-0.012	-0.012	0	%100
20	36	Y	-0.012	-0.012	0	%100
21	37	Y	-0.016	-0.016	0	%100
22	38	Y	-0.016	-0.016	0	%100
23	39	Y	-0.016	-0.016	0	%100
24	40	Y	-0.016	-0.016	0	%100
25	41	Y	-0.009	-0.009	0	%100
26	42	Y	-0.009	-0.009	0	%100
27	43	Y	-0.02	-0.02	0	%100
28	48	Y	-0.02	-0.02	0	%100

Member Distributed Loads (BLC 8 : Ice) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
29	53	Y	-0.015	-0.015	0	%100
30	54	Y	-0.012	-0.012	0	%100
31	55	Y	-0.012	-0.012	0	%100
32	56	Y	-0.016	-0.016	0	%100
33	57	Y	-0.016	-0.016	0	%100
34	58	Y	-0.016	-0.016	0	%100
35	59	Y	-0.016	-0.016	0	%100
36	60	Y	-0.009	-0.009	0	%100
37	61	Y	-0.009	-0.009	0	%100
38	62	Y	-0.02	-0.02	0	%100
39	67	Y	-0.02	-0.02	0	%100
40	72	Y	-0.011	-0.011	0	%100
41	77	Y	-0.008	-0.008	0	%100
42	78	Y	-0.008	-0.008	0	%100
43	79	Y	-0.008	-0.008	0	%100
44	80	Y	-0.008	-0.008	0	%100
45	85	Y	-0.008	-0.008	0	%100
46	86	Y	-0.011	-0.011	0	%100
47	91	Y	-0.008	-0.008	0	%100
48	92	Y	-0.008	-0.008	0	%100
49	93	Y	-0.008	-0.008	0	%100
50	94	Y	-0.008	-0.008	0	%100
51	99	Y	-0.008	-0.008	0	%100

Member Distributed Loads (BLC 28 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	41	Y	-0.035	-0.016	0	1.155
2	41	Y	-0.016	0.0006163	1.155	2.309
3	42	Y	-0.018	-0.016	0.231	2.309
4	9	Y	-0.014	-0.016	0	2.078
5	10	Y	-0.014	-0.02	0.231	1.27
6	10	Y	-0.02	-0.026	1.27	2.309
7	60	Y	-0.014	-0.02	0	2.078
8	61	Y	0.0006164	-0.016	0	1.155
9	61	Y	-0.016	-0.035	1.155	2.309

Member Distributed Loads (BLC 29 : BLC 8 Transient Area Loads)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	41	Y	-0.028	-0.013	0	1.155
2	41	Y	-0.013	0.0004992	1.155	2.309
3	42	Y	-0.015	-0.013	0.231	2.309
4	9	Y	-0.011	-0.013	0	2.078
5	10	Y	-0.011	-0.016	0.231	1.27
6	10	Y	-0.016	-0.021	1.27	2.309
7	60	Y	-0.011	-0.016	0	2.078
8	61	Y	0.0004931	-0.013	0	1.155
9	61	Y	-0.013	-0.028	1.155	2.309

Member Area Loads (BLC 1 : Dead)

	Node A	Node B	Node C	Node D	Direction	Load Direction	Magnitude [ksf]
1	79	78	81	80	Y	Two Way	-0.01
2	23	22	25	24	Y	Two Way	-0.01
3	108	107	110	109	Y	Two Way	-0.01

Member Area Loads (BLC 8 : Ice)

	Node A	Node B	Node C	Node D	Direction	Load Direction	Magnitude [ksf]
1	79	78	81	80	Y	Two Way	-0.008
2	23	22	25	24	Y	Two Way	-0.008
3	108	107	110	109	Y	Two Way	-0.008

Node Loads and Enforced Displacements (BLC 9 : Live Load a)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s²/ft, k*s²*ft)]
1	30	L	Y	-0.5
2	119	L	Y	-0.5
3	147	L	Y	-0.5

Node Loads and Enforced Displacements (BLC 10 : Live Load b)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s²/ft, k*s²*ft)]
1	31	L	Y	-0.5
2	120	L	Y	-0.5
3	148	L	Y	-0.5

Node Loads and Enforced Displacements (BLC 11 : Live Load c)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s²/ft, k*s²*ft)]
1	32	L	Y	-0.5
2	121	L	Y	-0.5
3	149	L	Y	-0.5

Node Loads and Enforced Displacements (BLC 12 : Live Load d)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s²/ft, k*s²*ft)]
1	33	L	Y	-0.5
2	122	L	Y	-0.5
3	150	L	Y	-0.5

Basic Load Cases

	BLC Description	Category	Y Gravity	Nodal	Point	Distributed	Area(Member)
1	Dead	DL	-1		20		3
2	0 Wind - No Ice	WLZ			20	51	
3	90 Wind - No Ice	WLX			20	51	
4	0 Wind - Ice	WLZ			20	51	
5	90 Wind - Ice	WLX			20	51	
6	0 Wind - Service	WLZ			20	51	
7	90 Wind - Service	WLX			20	51	
8	Ice	OL1			20	51	3
9	Live Load a	LL		3			
10	Live Load b	LL		3			
11	Live Load c	LL		3			
12	Live Load d	LL		3			
13	Maint LL 1	LL			1		
14	Maint LL 2	LL			1		
15	Maint LL 3	LL			1		
16	Maint LL 4	LL			1		
17	Maint LL 5	LL			1		
18	Maint LL 6	LL			1		
19	Maint LL 7	LL			1		
20	Maint LL 8	LL			1		
21	Maint LL 9	LL			1		
22	Maint LL 10	LL			1		
23	Maint LL 11	LL			1		
24	Maint LL 12	LL			1		
25	Maint LL 13	LL			1		
26	Maint LL 14	LL			1		

Basic Load Cases (Continued)

	BLC Description	Category	Y Gravity	Nodal	Point	Distributed	Area(Member)
27	Maint LL 15	LL			1		
28	BLC 1 Transient Area Loads	None				9	
29	BLC 8 Transient Area Loads	None				9	

Load Combinations

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4 Dead	Yes	Y	1	1.4						
2	0.9 D + 1.6 - 0 W	Yes	Y	1	0.9	2	1.6				
3	0.9 D + 1.6 - 30 W	Yes	Y	1	0.9	2	1.386	3	0.8		
4	0.9 D + 1.6 - 60 W	Yes	Y	1	0.9	3	1.386	2	0.8		
5	0.9 D + 1.6 - 90 W	Yes	Y	1	0.9	3	1.6				
6	0.9 D + 1.6 - 120 W	Yes	Y	1	0.9	3	1.386	2	-0.8		
7	0.9 D + 1.6 - 150 W	Yes	Y	1	0.9	2	-1.386	3	0.8		
8	0.9 D + 1.6 - 180 W	Yes	Y	1	0.9	2	-1.6				
9	0.9 D + 1.6 - 210 W	Yes	Y	1	0.9	2	-1.386	3	-0.8		
10	0.9 D + 1.6 - 240 W	Yes	Y	1	0.9	3	-1.386	2	-0.8		
11	0.9 D + 1.6 - 270 W	Yes	Y	1	0.9	3	-1.6				
12	0.9 D + 1.6 - 300 W	Yes	Y	1	0.9	3	-1.386	2	0.8		
13	0.9 D + 1.6 - 330 W	Yes	Y	1	0.9	2	1.386	3	-0.8		
14	1.2 D + 1.6 - 0 W	Yes	Y	1	1.2	2	1.6				
15	1.2 D + 1.6 - 30 W	Yes	Y	1	1.2	2	1.386	3	0.8		
16	1.2 D + 1.6 - 60 W	Yes	Y	1	1.2	3	1.386	2	0.8		
17	1.2 D + 1.6 - 90 W	Yes	Y	1	1.2	3	1.6				
18	1.2 D + 1.6 - 120 W	Yes	Y	1	1.2	3	1.386	2	-0.8		
19	1.2 D + 1.6 - 150 W	Yes	Y	1	1.2	2	-1.386	3	0.8		
20	1.2 D + 1.6 - 180 W	Yes	Y	1	1.2	2	-1.6				
21	1.2 D + 1.6 - 210 W	Yes	Y	1	1.2	2	-1.386	3	-0.8		
22	1.2 D + 1.6 - 240 W	Yes	Y	1	1.2	3	-1.386	2	-0.8		
23	1.2 D + 1.6 - 270 W	Yes	Y	1	1.2	3	-1.6				
24	1.2 D + 1.6 - 300 W	Yes	Y	1	1.2	3	-1.386	2	0.8		
25	1.2 D + 1.6 - 330 W	Yes	Y	1	1.2	2	1.386	3	-0.8		
26	0.9 D + 1.6 - 0 W/Ice	Yes	Y	1	0.9	4	1.6			8	1
27	0.9 D + 1.6 - 30 W/Ice	Yes	Y	1	0.9	4	1.386	5	0.8	8	1
28	0.9 D + 1.6 - 60 W/Ice	Yes	Y	1	0.9	5	1.386	4	0.8	8	1
29	0.9 D + 1.6 - 90 W/Ice	Yes	Y	1	0.9	5	1.6			8	1
30	0.9 D + 1.6 - 120 W/Ice	Yes	Y	1	0.9	5	1.386	4	-0.8	8	1
31	0.9 D + 1.6 - 150 W/Ice	Yes	Y	1	0.9	4	-1.386	5	0.8	8	1
32	0.9 D + 1.6 - 180 W/Ice	Yes	Y	1	0.9	4	-1.6			8	1
33	0.9 D + 1.6 - 210 W/Ice	Yes	Y	1	0.9	4	-1.386	5	-0.8	8	1
34	0.9 D + 1.6 - 240 W/Ice	Yes	Y	1	0.9	5	-1.386	4	-0.8	8	1
35	0.9 D + 1.6 - 270 W/Ice	Yes	Y	1	0.9	5	-1.6			8	1
36	0.9 D + 1.6 - 300 W/Ice	Yes	Y	1	0.9	5	-1.386	4	0.8	8	1
37	0.9 D + 1.6 - 330 W/Ice	Yes	Y	1	0.9	4	1.386	5	-0.8	8	1
38	1.2 D + 1.0 - 0 W/Ice	Yes	Y	1	1.2	4	1			8	1
39	1.2 D + 1.0 - 30 W/Ice	Yes	Y	1	1.2	4	0.866	5	0.5	8	1
40	1.2 D + 1.0 - 60 W/Ice	Yes	Y	1	1.2	5	0.866	4	0.5	8	1
41	1.2 D + 1.0 - 90 W/Ice	Yes	Y	1	1.2	5	1			8	1
42	1.2 D + 1.0 - 120 W/Ice	Yes	Y	1	1.2	5	0.866	4	-0.5	8	1
43	1.2 D + 1.0 - 150 W/Ice	Yes	Y	1	1.2	4	-0.866	5	0.5	8	1
44	1.2 D + 1.0 - 180 W/Ice	Yes	Y	1	1.2	4	-1			8	1
45	1.2 D + 1.0 - 210 W/Ice	Yes	Y	1	1.2	4	-0.866	5	-0.5	8	1
46	1.2 D + 1.0 - 240 W/Ice	Yes	Y	1	1.2	5	-0.866	4	-0.5	8	1
47	1.2 D + 1.0 - 270 W/Ice	Yes	Y	1	1.2	5	-1			8	1
48	1.2 D + 1.0 - 300 W/Ice	Yes	Y	1	1.2	5	-0.866	4	0.5	8	1
49	1.2 D + 1.0 - 330 W/Ice	Yes	Y	1	1.2	4	0.866	5	-0.5	8	1
50	1.2 D + 1.5 LL a + Service - 0 W	Yes	Y	1	1.2	6	1			9	1.5
51	1.2 D + 1.5 LL a + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	9	1.5
52	1.2 D + 1.5 LL a + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	9	1.5

Load Combinations (Continued)

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
53	1.2 D + 1.5 LL a + Service - 90 W	Yes	Y	1	1.2	7	1			9	1.5
54	1.2 D + 1.5 LL a + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	9	1.5
55	1.2 D + 1.5 LL a + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	9	1.5
56	1.2 D + 1.5 LL a + Service - 180 W	Yes	Y	1	1.2	6	-1			9	1.5
57	1.2 D + 1.5 LL a + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	9	1.5
58	1.2 D + 1.5 LL a + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	9	1.5
59	1.2 D + 1.5 LL a + Service - 270 W	Yes	Y	1	1.2	7	-1			9	1.5
60	1.2 D + 1.5 LL a + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	9	1.5
61	1.2 D + 1.5 LL a + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	9	1.5
62	1.2 D + 1.5 LL b + Service - 0 W	Yes	Y	1	1.2	6	1			10	1.5
63	1.2 D + 1.5 LL b + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	10	1.5
64	1.2 D + 1.5 LL b + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	10	1.5
65	1.2 D + 1.5 LL b + Service - 90 W	Yes	Y	1	1.2	7	1			10	1.5
66	1.2 D + 1.5 LL b + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	10	1.5
67	1.2 D + 1.5 LL b + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	10	1.5
68	1.2 D + 1.5 LL b + Service - 180 W	Yes	Y	1	1.2	6	-1			10	1.5
69	1.2 D + 1.5 LL b + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	10	1.5
70	1.2 D + 1.5 LL b + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	10	1.5
71	1.2 D + 1.5 LL b + Service - 270 W	Yes	Y	1	1.2	7	-1			10	1.5
72	1.2 D + 1.5 LL b + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	10	1.5
73	1.2 D + 1.5 LL b + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	10	1.5
74	1.2 D + 1.5 LL c + Service - 0 W	Yes	Y	1	1.2	6	1			11	1.5
75	1.2 D + 1.5 LL c + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	11	1.5
76	1.2 D + 1.5 LL c + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	11	1.5
77	1.2 D + 1.5 LL c + Service - 90 W	Yes	Y	1	1.2	7	1			11	1.5
78	1.2 D + 1.5 LL c + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	11	1.5
79	1.2 D + 1.5 LL c + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	11	1.5
80	1.2 D + 1.5 LL c + Service - 180 W	Yes	Y	1	1.2	6	-1			11	1.5
81	1.2 D + 1.5 LL c + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	11	1.5
82	1.2 D + 1.5 LL c + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	11	1.5
83	1.2 D + 1.5 LL c + Service - 270 W	Yes	Y	1	1.2	7	-1			11	1.5
84	1.2 D + 1.5 LL c + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	11	1.5
85	1.2 D + 1.5 LL c + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	11	1.5
86	1.2 D + 1.5 LL d + Service - 0 W	Yes	Y	1	1.2	6	1			12	1.5
87	1.2 D + 1.5 LL d + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	12	1.5
88	1.2 D + 1.5 LL d + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	12	1.5
89	1.2 D + 1.5 LL d + Service - 90 W	Yes	Y	1	1.2	7	1			12	1.5
90	1.2 D + 1.5 LL d + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	12	1.5
91	1.2 D + 1.5 LL d + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	12	1.5
92	1.2 D + 1.5 LL d + Service - 180 W	Yes	Y	1	1.2	6	-1			12	1.5
93	1.2 D + 1.5 LL d + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	12	1.5
94	1.2 D + 1.5 LL d + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	12	1.5
95	1.2 D + 1.5 LL d + Service - 270 W	Yes	Y	1	1.2	7	-1			12	1.5
96	1.2 D + 1.5 LL d + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	12	1.5
97	1.2 D + 1.5 LL d + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	12	1.5
98	1.2 D + 1.5 LL Maint (1)	Yes	Y	1	1.2					13	1.5
99	1.2 D + 1.5 LL Maint (2)	Yes	Y	1	1.2					14	1.5
100	1.2 D + 1.5 LL Maint (3)	Yes	Y	1	1.2					15	1.5
101	1.2 D + 1.5 LL Maint (4)	Yes	Y	1	1.2					16	1.5
102	1.2 D + 1.5 LL Maint (5)	Yes	Y	1	1.2					17	1.5
103	1.2 D + 1.5 LL Maint (6)	Yes	Y	1	1.2					18	1.5
104	1.2 D + 1.5 LL Maint (7)	Yes	Y	1	1.2					19	1.5
105	1.2 D + 1.5 LL Maint (8)	Yes	Y	1	1.2					20	1.5
106	1.2 D + 1.5 LL Maint (9)	Yes	Y	1	1.2					21	1.5
107	1.2 D + 1.5 LL Maint (10)	Yes	Y	1	1.2					22	1.5
108	1.2 D + 1.5 LL Maint (11)	Yes	Y	1	1.2					23	1.5
109	1.2 D + 1.5 LL Maint (12)	Yes	Y	1	1.2					24	1.5
110	1.2 D + 1.5 LL Maint (13)	Yes	Y	1	1.2					25	1.5

Load Combinations (Continued)

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
111	1.2 D + 1.5 LL Maint (14)	Yes	Y	1	1.2					26	1.5
112	1.2 D + 1.5 LL Maint (15)	Yes	Y	1	1.2					27	1.5

Envelope Node Reactions

	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	1	max	1.3	5	2.164	38	1.915	2	4.585	38	1.38	11	0.533	24
2		min	-1.308	23	-0.463	8	-2.028	20	-1.501	8	-1.391	17	-0.375	6
3	59	max	1.507	5	2.216	42	1.747	14	0.617	13	1.705	3	0.743	12
4		min	-1.599	23	-0.219	12	-1.683	8	-2.072	43	-1.715	21	-4.086	42
5	88	max	1.459	17	2.131	46	1.87	14	0.765	3	1.72	7	3.76	46
6		min	-1.359	11	-0.251	4	-1.822	8	-2.538	45	-1.731	25	-0.785	4
7	Totals:	max	4.253	5	5.985	43	5.517	14						
8		min	-4.253	23	1.735	13	-5.517	8						

Envelope AISC 13TH (360-05): LRFD Member Steel Code Checks

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
1	1	HSS4X4X2	0.583	0	25	0.144	0	y	49	70.173	73.278	8.24	8.24	1.949	H1-1b
2	2	C3.38x2.06x.188	0.397	2.592	39	0.068	0.351	y	41	38.433	43.394	1.694	4.483	1.631	H1-1b
3	3	C3.38x2.06x.188	0.386	0	25	0.095	2.241	z	20	38.433	43.394	1.694	4.483	1.577	H1-1b
4	4	PL3/8"x6	0.187	0.164	19	0.202	0	y	14	68.856	72.9	0.57	9.113	1.615	H1-1b
5	5	PL3/8"x6	0.127	0.164	15	0.152	0	y	50	68.856	72.9	0.57	9.113	3	H1-1b
6	6	PIPE_3.0	0.12	3.828	17	0.065	9.078		21	36.138	65.205	5.749	5.749	2.859	H1-1b
7	7	PL3/8"x6	0.184	0.208	20	0.198	0.208	y	38	70.733	72.9	0.57	9.113	1.373	H1-1b
8	8	PL3/8"x6	0.175	0	25	0.212	0	y	38	70.733	72.9	0.57	9.113	2.829	H1-1b
9	9	L2x2x4	0.42	0	19	0.033	2.309	z	19	23.349	30.586	0.691	1.577	1.5	H2-1
10	10	L2x2x4	0.329	2.309	21	0.039	2.309	y	38	23.349	30.586	0.691	1.577	1.5	H2-1
11	11	L7.63x2.5x6	0.532	1.604	8	0.093	1.604	z	14	73.845	118.523	1.798	13.64	1.225	H2-1
12	20	PIPE_2.0	0.307	5.667	19	0.114	5.667		20	14.916	32.13	1.872	1.872	3	H1-1b
13	21	PIPE_2.0	0.334	5.667	17	0.071	5.667		17	14.916	32.13	1.872	1.872	3	H1-1b
14	22	PIPE_2.0	0.295	5.667	23	0.071	5.667		18	14.916	32.13	1.872	1.872	3	H1-1b
15	23	PIPE_2.0	0.269	2.417	21	0.09	5.667		21	14.916	32.13	1.872	1.872	3	H1-1b
16	28	PIPE_2.0	0.391	9.516	25	0.427	9.516		14	8.922	32.13	1.872	1.872	3	H3-6
17	29	L6.63x4.33x.25	0.254	0	12	0.03	3.25	z	25	49.975	86.751	2.311	6.976	1.5	H2-1
18	34	HSS4X4X2	0.575	0	43	0.159	0	z	15	70.173	73.278	8.24	8.24	2.111	H1-1b
19	35	C3.38x2.06x.188	0.397	2.592	43	0.069	0.351	y	45	38.433	43.394	1.694	4.483	1.63	H1-1b
20	36	C3.38x2.06x.188	0.352	0	45	0.074	2.241	z	24	38.433	43.394	1.703	4.483	1.644	H1-1b
21	37	PL3/8"x6	0.166	0.164	22	0.185	0	y	90	68.856	72.9	0.57	9.113	1.354	H1-1b
22	38	PL3/8"x6	0.125	0	19	0.153	0	y	55	68.856	72.9	0.57	9.113	2.895	H1-1b
23	39	PL3/8"x6	0.151	0.208	25	0.197	0.208	y	42	70.733	72.9	0.57	9.113	1.591	H1-1b
24	40	PL3/8"x6	0.137	0	17	0.212	0	y	43	70.733	72.9	0.57	9.113	2.92	H1-1b
25	41	L2x2x4	0.322	0	23	0.028	0	y	56	23.349	30.586	0.691	1.577	1.5	H2-1
26	42	L2x2x4	0.317	2.309	25	0.038	2.309	y	42	23.349	30.586	0.691	1.577	1.5	H2-1
27	43	L7.63x2.5x6	0.4	1.604	13	0.081	1.604	y	42	73.845	118.523	1.798	14.027	1.311	H2-1
28	48	L6.63x4.33x.25	0.331	0	3	0.025	3.25	z	16	49.975	86.751	2.311	6.976	1.5	H2-1
29	53	HSS4X4X2	0.583	0	21	0.17	0	z	19	70.173	73.278	8.24	8.24	1.946	H1-1b
30	54	C3.38x2.06x.188	0.388	2.592	47	0.069	0.351	y	38	38.433	43.394	1.694	4.483	1.629	H1-1b
31	55	C3.38x2.06x.188	0.379	0	21	0.08	2.241	z	15	38.433	43.394	1.694	4.483	1.576	H1-1b
32	56	PL3/8"x6	0.235	0.164	14	0.188	0	y	93	68.856	72.9	0.57	9.113	1.441	H1-1b
33	57	PL3/8"x6	0.102	0.164	23	0.15	0	y	58	68.856	72.9	0.57	9.113	3	H1-1b
34	58	PL3/8"x6	0.144	0.208	16	0.195	0.208	y	45	70.733	72.9	0.57	9.113	1.359	H1-1b
35	59	PL3/8"x6	0.173	0	21	0.211	0	y	47	70.733	72.9	0.57	9.113	2.852	H1-1b
36	60	L2x2x4	0.42	0	15	0.033	2.309	z	15	23.349	30.586	0.691	1.577	1.5	H2-1
37	61	L2x2x4	0.264	2.309	17	0.039	2.309	y	46	23.349	30.586	0.691	1.577	1.5	H2-1
38	62	L7.63x2.5x6	0.495	1.604	3	0.085	1.604	z	21	73.845	118.523	1.798	13.891	1.28	H2-1
39	67	L6.63x4.33x.25	0.382	0	7	0.034	3.25	z	20	49.975	86.751	2.311	6.976	1.5	H2-1
40	72	PIPE_3.0	0.151	3.828	21	0.067	3.828		21	36.138	65.205	5.749	5.749	3	H1-1b
41	77	PIPE_2.0	0.289	5.667	21	0.092	5.667		25	14.916	32.13	1.872	1.872	2.931	H1-1b

Envelope AISC 13TH (360-05): LRFD Member Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
42	78	PIPE_2.0	0.411	5.667	21	0.083	5.667		21	14.916	32.13	1.872	1.872	3	H1-1b
43	79	PIPE_2.0	0.386	5.667	15	0.069	5.667		22	14.916	32.13	1.872	1.872	3	H1-1b
44	80	PIPE_2.0	0.308	5.667	14	0.119	5.667		14	14.916	32.13	1.872	1.872	2.636	H1-1b
45	85	PIPE_2.0	0.32	9.734	21	0.301	9.516		18	8.922	32.13	1.872	1.872	3	H1-1b
46	86	PIPE_3.0	0.15	3.828	25	0.068	3.828		25	36.138	65.205	5.749	5.749	2.817	H1-1b
47	91	PIPE_2.0	0.356	5.667	14	0.096	5.667		15	14.916	32.13	1.872	1.872	3	H1-1b
48	92	PIPE_2.0	0.424	5.667	25	0.094	5.667		25	14.916	32.13	1.872	1.872	3	H1-1b
49	93	PIPE_2.0	0.371	5.667	19	0.083	5.667		14	14.916	32.13	1.872	1.872	3	H1-1b
50	94	PIPE_2.0	0.254	5.667	18	0.097	5.667		18	14.916	32.13	1.872	1.872	3	H1-1b
51	99	PIPE_2.0	0.439	9.516	20	0.374	9.516		21	8.922	32.13	1.872	1.872	3	H3-6

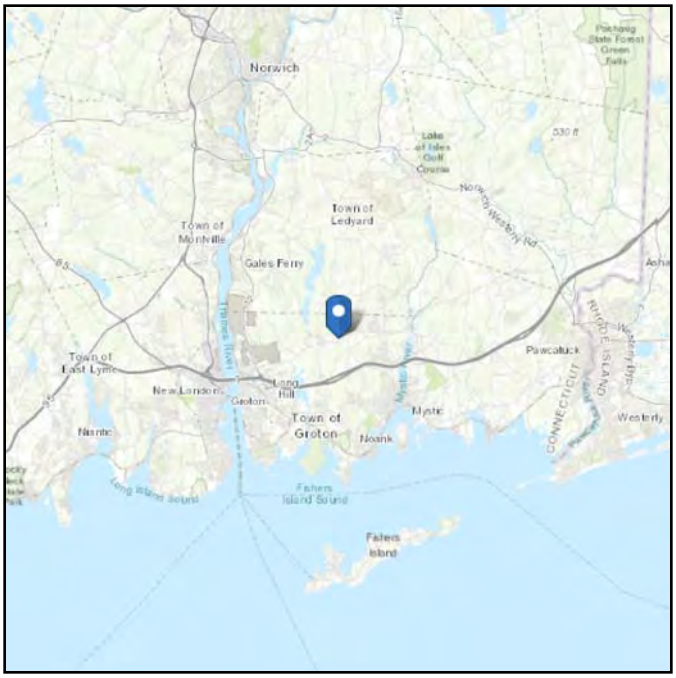
APPENDIX B

(Additional Calculations)

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-10	**Elevation:**	242.31 ft (NAVD 88)
Risk Category:	II	**Latitude:**	41.3857
Soil Class:	D - Stiff Soil	**Longitude:**	-72.0133



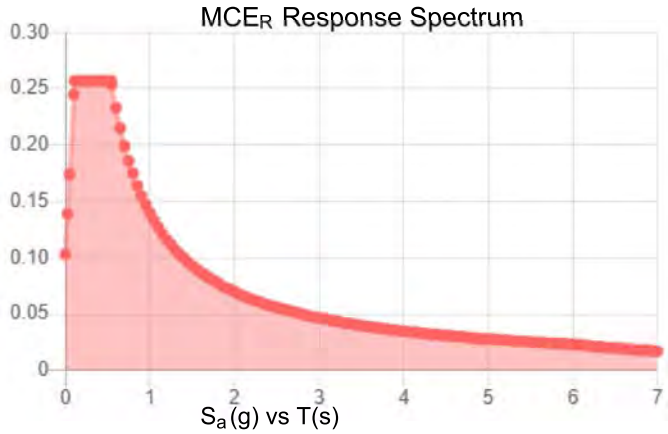
Seismic

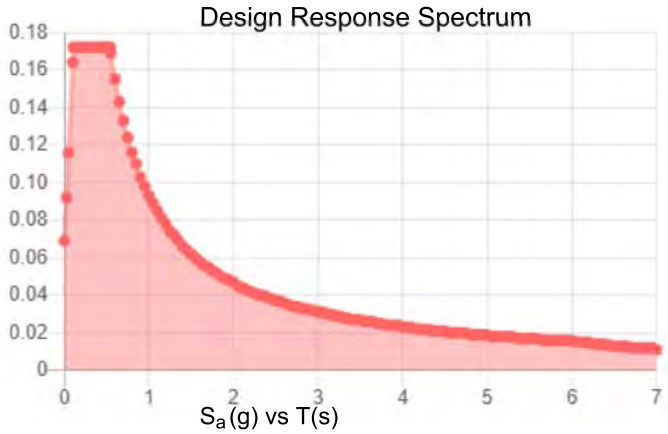
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.161	S_{DS} :	0.172
S_1 :	0.058	S_{D1} :	0.093
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.08
S_{MS} :	0.257	PGA_M :	0.128
S_{M1} :	0.14	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Thu Jul 22 2021

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

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:	Thu Jul 22 2021

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.

PROJECT	**149464.003.01 - Groton North, CT**				**KSC**
SUBJECT	**Platform- Mount Analysis**				
DATE	**07/26/21**	PAGE	1	OF	5

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

INPUT

[REF: ANSI/TIA-222-G2005]

Tower Type		: Monopole		
Tower Height		: 150	ft	
Mount Elevation		: 117	ft	
Antenna Elevation		: 117	ft	
Crest Height		: 0	ft	
Structure Class		: II		[Table 2-1]
Exposure Category		: B		[Sec. 2.6.5]
Topography Category		: 1		[Sec. 2.6.6.2]
Wind Velocity	V	: 105	mph	[Annex B]
Ice wind Velocity	V_i	: 50	mph	[Annex B]
Service Velocity	V_s	: 30	mph	[Annex B]
Base Ice thickness	t_i	: 0.75	in	[Annex B]

ANTENNAS

	Manufacturer	Model	Height (in)	Front Width (in)	Side Width (in)	Weight (lbs)	Shape	Quantity	Location (%)
Mount Pipe **20**									
	JMA Wireless	MX08FRO665-21	72.00	20.00	8.00	64.50	Flat	0.5	15
	JMA Wireless	MX08FRO665-21	72.00	20.00	8.00	64.50	Flat	0.5	85
	Fujitsu	TA08025-B605	15.75	14.96	9.05	74.95	Flat	1	20
	Fujitsu	TA08025-B604	15.75	14.96	7.87	63.93	Flat	1	50
Mount Pipe **91**									
	JMA Wireless	MX08FRO665-21	72.00	20.00	8.00	64.50	Flat	0.5	15
	JMA Wireless	MX08FRO665-21	72.00	20.00	8.00	64.50	Flat	0.5	85
	Fujitsu	TA08025-B605	15.75	14.96	9.05	74.95	Flat	1	20
	Fujitsu	TA08025-B604	15.75	14.96	7.87	63.93	Flat	1	50
Mount Pipe **77**									
	JMA Wireless	MX08FRO665-21	72.00	20.00	8.00	64.50	Flat	0.5	15
	JMA Wireless	MX08FRO665-21	72.00	20.00	8.00	64.50	Flat	0.5	85
	Fujitsu	TA08025-B605	15.75	14.96	9.05	74.95	Flat	1	20
	Fujitsu	TA08025-B604	15.75	14.96	7.87	63.93	Flat	1	50
Mount Pipe **34**									
	Raycap	RDIDC-9181-PF-48	16.57	14.57	8.15	21.85	Flat	1	20
Mount Pipe									
Mount Pipe									

PROJECT					
SUBJECT					
DATE	**07/26/21**	PAGE	1	OF	1

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

[REF: AISC 360-05]

Reactions at Bolted Connection

Tension	:	2.002	k
Vertical Shear	:	2.25	k
Horizontal Shear	:	1.35	k
Torsion	:	0.543	k.ft
Moment from Horizontal Forces	:	1.407	k.ft
Moment from Vertical Forces	:	4.654	k.ft

Bolt Parameters

Bolt Grade	:	A325	
Bolt Diameter	:	0.625	in
Nominal Bolt Area	:	0.307	in^2
Bolt spacing, Horizontal	:	6	in
Bolt spacing, Vertical	:	6	in
Bolt edge distance, plate height	:	1.5	in
Bolt edge distance, plate width	:	1.5	in
Total Number of Bolts	:	4	bolts

Summary of Forces

Shear Resultant Force	:	2.62	k
Force from Horz. Moment	:	2.55	k
Force from Vert. Moment	:	8.43	k
Shear Load / Bolt	:	0.66	k
Tension Load / Bolt	:	0.50	k
Resultant from Moments / Bolt	:	4.40	k

Bolt Checks

Nominal Tensile Stress, F_{nt}	:	90.00	ksi	[AISC Table J3.2]
Available Tensile Stress, ΦR_{nt}	:	20.72	k/bolt	[Eq. J3-1]
Unity Check, Bolt Tension	:	**23.66%**		**OKAY**
Nominal Shear Stress, F_{nv}	:	48.00	ksi	[AISC Table J3.2]
Available Shear Stress, ΦR_{nv}	:	11.05	k/bolt	[Eq. J3-1]
Unity Check, Bolt Shear	:	**10.46%**		**OKAY**
Unity Check, Combined	:	**34.13%**		**OKAY**
Available Bearing Strength, ΦR_n	:	34.66	k/bolt	
Unity Check, Bolt Bearing	:	**1.89%**		**OKAY**

EXHIBIT 10

Construction Drawings

dish wireless

DISH Wireless L.L.C. SITE ID:

BOBOS00056A

DISH Wireless L.L.C. SITE ADDRESS:

1662 ROUTE 184
GROTON, CT 06340

CONNECTICUT CODE COMPLIANCE

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

CODE TYPE	CODE
BUILDING	2018 CT STATE BUILDING CODE/2015 IBC W/ CT AMENDMENTS
MECHANICAL	2018 CT STATE BUILDING CODE/2015 IMC W/ CT AMENDMENTS
ELECTRICAL	2018 CT STATE BUILDING CODE/2017 NEC W/ CT AMENDMENTS

SHEET INDEX

SHEET NO.	SHEET TITLE
T–1	TITLE SHEET
LS–1	SITE SURVEY
A–1	OVERALL AND ENLARGED SITE PLAN
A–2	ELEVATION, ANTENNA LAYOUT AND SCHEDULE
A–3	EQUIPMENT PLATFORM AND H–FRAME DETAILS
A–4	EQUIPMENT DETAILS
A–5	EQUIPMENT DETAILS
A–6	EQUIPMENT DETAILS
E–1	ELECTRICAL/FIBER ROUTE PLAN AND NOTES
E–2	ELECTRICAL DETAILS
E–3	ELECTRICAL ONE–LINE, FAULT CALCS & PANEL SCHEDULE
G–1	GROUNDING PLANS AND NOTES
G–2	GROUNDING DETAILS
G–3	GROUNDING DETAILS
RF–1	RF CABLE COLOR CODE
GN–1	LEGEND AND ABBREVIATIONS
GN–2	GENERAL NOTES
GN–3	GENERAL NOTES
GN–4	GENERAL NOTES

SCOPE OF WORK

THIS IS NOT AN ALL INCLUSIVE LIST. CONTRACTOR SHALL UTILIZE SPECIFIED EQUIPMENT PART OR ENGINEER APPROVED EQUIVALENT. CONTRACTOR SHALL VERIFY ALL NEEDED EQUIPMENT TO PROVIDE A FUNCTIONAL SITE. THE PROJECT GENERALLY CONSISTS OF THE FOLLOWING:

TOWER SCOPE OF WORK:
- INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR)
- INSTALL (1) PROPOSED TOWER PLATFORM MOUNT
- INSTALL PROPOSED JUMPERS
- INSTALL (6) PROPOSED RRUs (2 PER SECTOR)
- INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP)
- INSTALL (1) PROPOSED HYBRID CABLE

GROUND SCOPE OF WORK:
- INSTALL (1) PROPOSED METAL PLATFORM
- INSTALL (1) PROPOSED ICE BRIDGE
- INSTALL (1) PROPOSED PPC CABINET
- INSTALL (1) PROPOSED EQUIPMENT CABINET
- INSTALL (1) PROPOSED POWER CONDUIT
- INSTALL (1) PROPOSED TELCO CONDUIT
- INSTALL (1) PROPOSED TELCO–FIBER BOX
- INSTALL (1) PROPOSED GPS UNIT
- INSTALL (1) PROPOSED FIBER NID (IF REQUIRED)

SITE PHOTO

UNDERGROUND SERVICE ALERT CBYD 811
UTILITY NOTIFICATION CENTER OF CONNECTICUT
(800) 922-4455
WWW.CBYD.COM
CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

811.

GENERAL NOTES

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE. NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

11"x17" PLOT WILL BE HALF SCALE UNLESS OTHERWISE NOTED

CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON THE JOB SITE, AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

SITE INFORMATION

PROPERTY OWNER:	CROUCH CHESTER G JR
ADDRESS:	4120 SILVERMOON DR PLANT CITY, FL 33566
TOWER TYPE:	MONOPOLE
TOWER CO SITE ID:	CT13073–A
TOWER APP NUMBER:	163266
COUNTY:	NEW LONDON
LATITUDE (NAD 83):	41° 23' 08.4" N 41.38566633 N
LONGITUDE (NAD 83):	72° 00' 47.9" W 72.0133055600 W
ZONING JURISDICTION:	NEW LONDON COUNTY
ZONING DISTRICT:	RU–40
PARCEL NUMBER:	270013126797
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	II–B
POWER COMPANY:	CONNECTICUT LIGHT & POWER CO
TELEPHONE COMPANY:	XFINITY

PROJECT DIRECTORY

APPLICANT:	DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	SBA COMMUNICATAIONS CORP. 8051 CONGRESS AVENUE BOCA RATON, FL 33487 (800) 487–7483
SITE DESIGNER:	B+T GROUP 1717 S. BOULDER AVE, SUITE 300 TULSA, OK 74119 (918) 587–4630
SITE ACQUISITION:	RYAN LYNCH RYAN.LYNCH@DISH.COM
CONSTRUCTION MANAGER:	JAVIER SOTO JAVIER.SOTO@DISH.COM
RF ENGINEER:	ARVIN SEBASTIAN ARVIN.SEBASTIAN@DISH.COM

DIRECTIONS

DIRECTIONS FROM GROTON–NEW LONDON AIRPORT:
DEPART GROTON–NEW LONDON AIRPORT ON TOWER AVE. ROAD NAME CHANGES TO SOUTH RD. TURN RIGHT ONTO US–1 [FORT HILL RD]. TURN LEFT ONTO CT–117 [NEWTOWN RD]. KEEP STRAIGHT ONTO CT–117 [NORTH RD]. TURN RIGHT ONTO CT–184 [GOLD STAR HWY]. TURN LEFT ONTO LOCAL ROAD(S). ARRIVE AT BOBOS00056A.

VICINITY MAP

NO SCALE

dish wireless.
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

SBA
8051 CONGRESS AVENUE
BOCA RATON, FL 33487

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

9/2/21

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

DRAWN BY:	CHECKED BY:	APPROVED BY:
BLJ	BLJ	JW

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	7/28/21	ISSUED FOR REVIEW
0	9/2/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
149464.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS00056A
1662 ROUTE 184
GROTON, CT 06340

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

CUSTOMER PROVIDED SITE SURVEY
UNAVAILABLE AT TIME OF RELEASE

SITE SURVEY

NO SCALE

1

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8051 CONGRESS AVENUE
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9/2/21

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PEC.0001564
Expires 2/10/22

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RFDS REV #: 0

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DISH Wireless L.L.C.
PROJECT INFORMATION

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1662 ROUTE 184
GROTON, CT 06340

SHEET TITLE

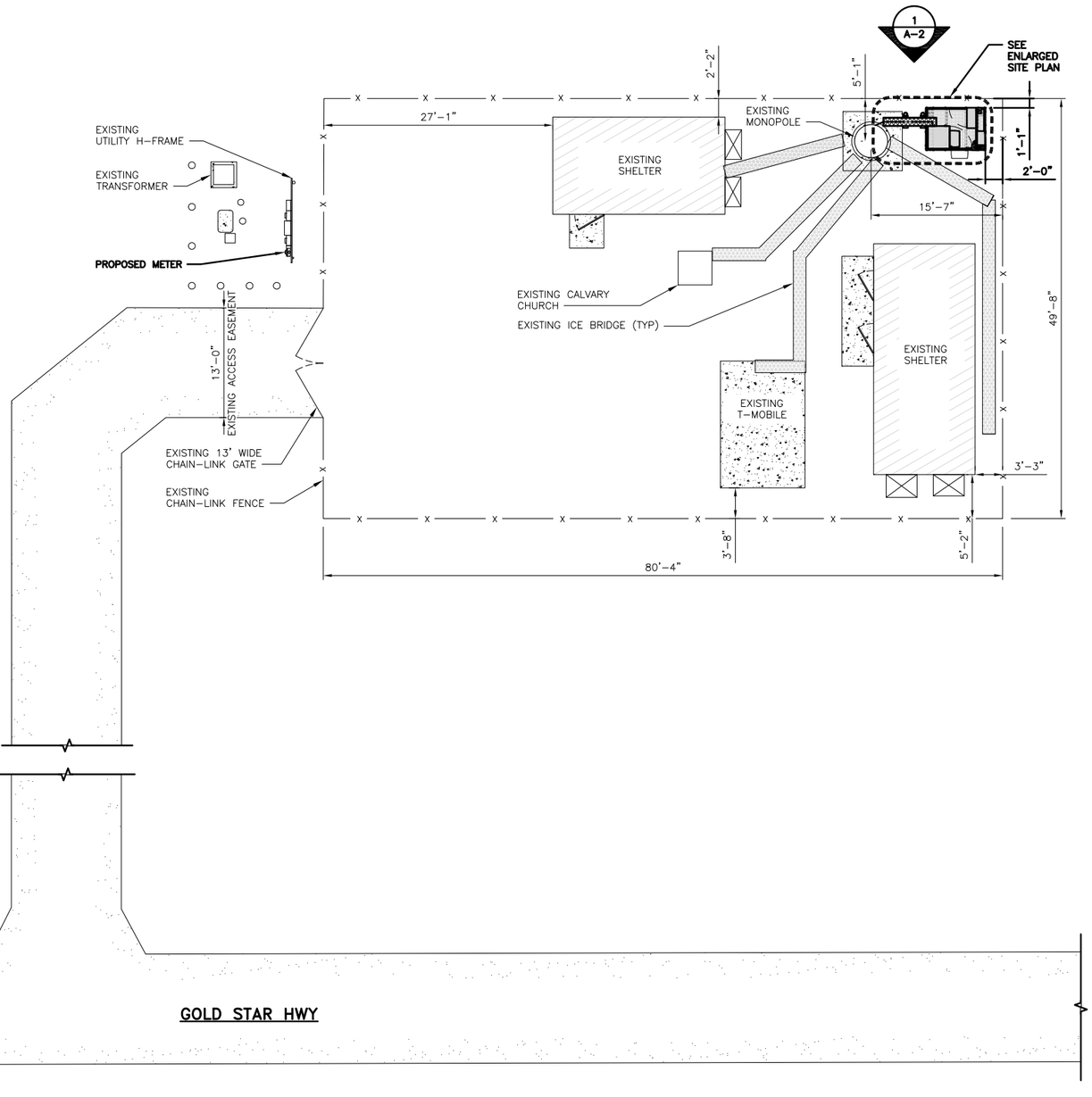
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

A-1

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



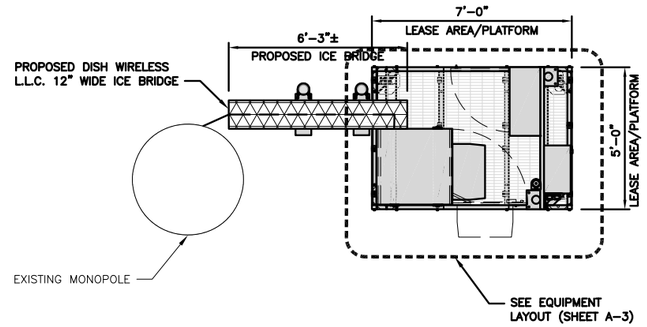
OVERALL SITE PLAN

8' 4' 0 8' 16'
1/8"=1'-0"

1

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



ENLARGED SITE PLAN

12" 6" 0 1' 2' 3' 4' 5' 6' 7'
3/8"=1'-0"

2

NOT USED

3

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SHEET TITLE

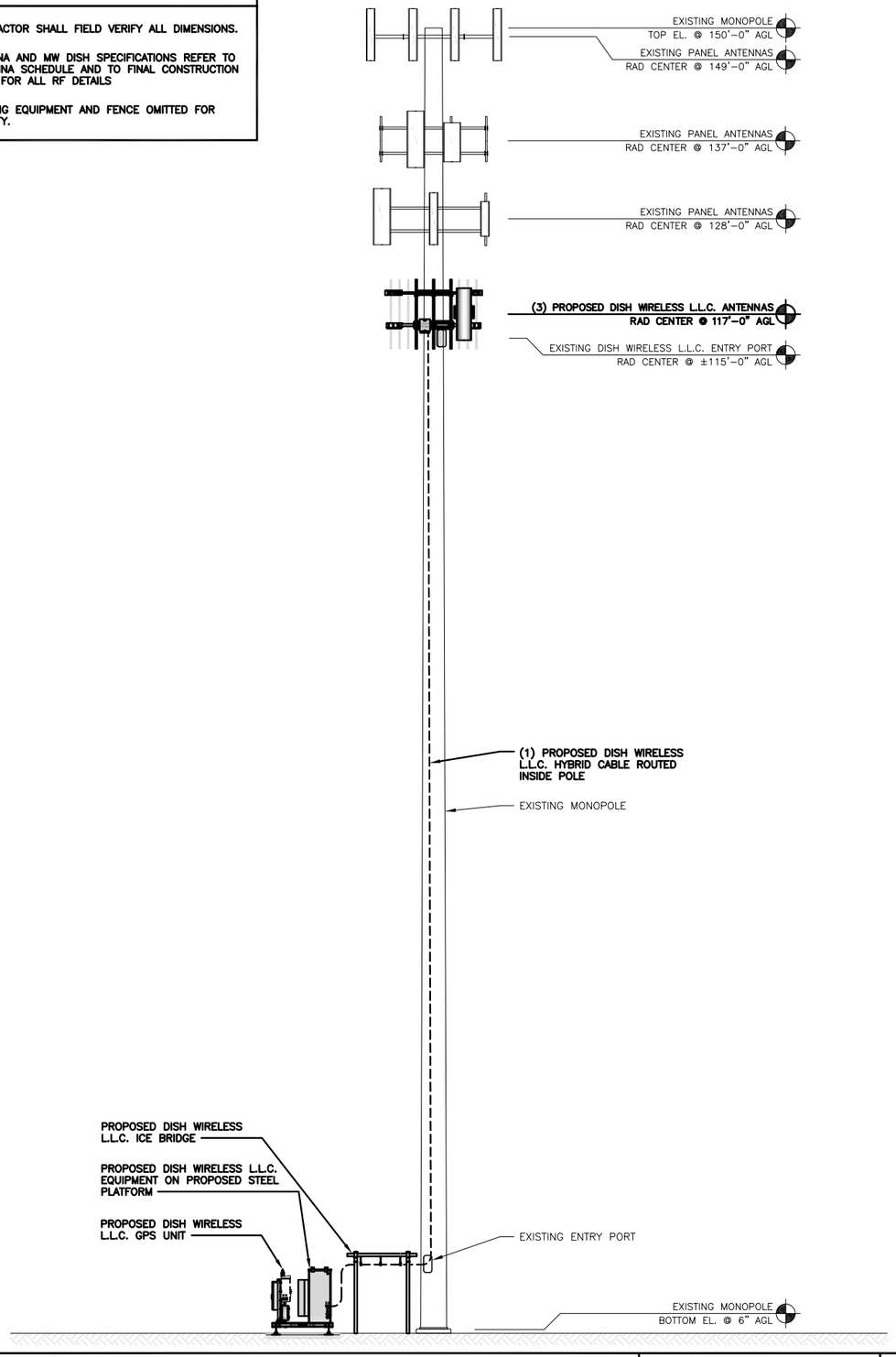
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

A-1

NOTES

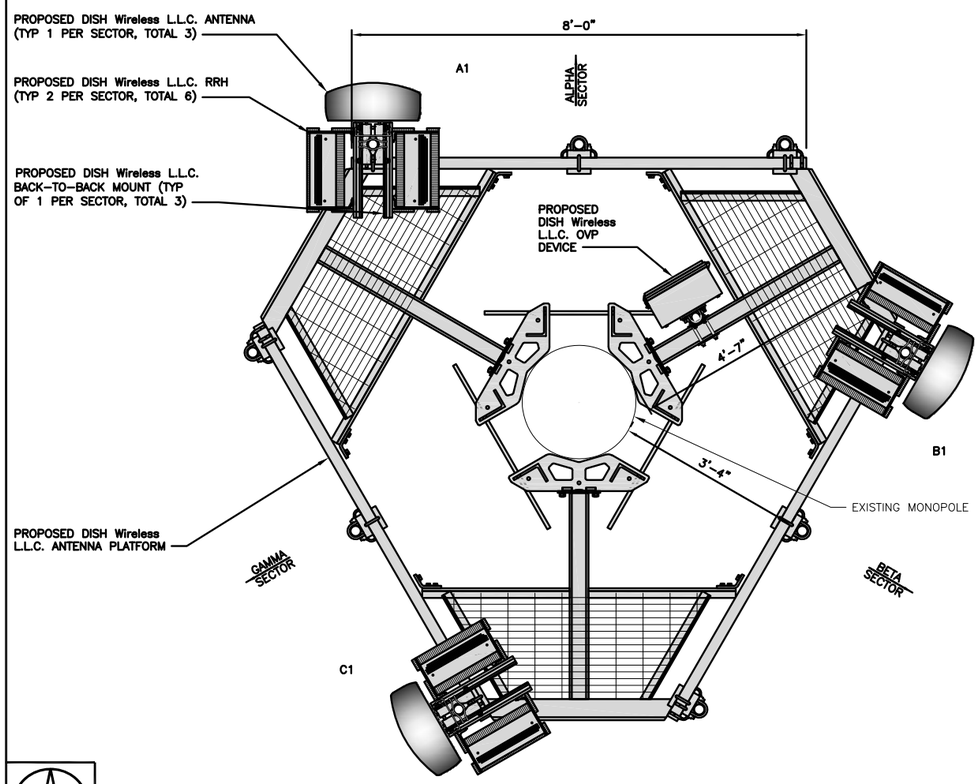
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



PROPOSED NORTH ELEVATION

8' 4' 0 8' 16'
1/8"=1'-0"

1



ANTENNA LAYOUT

12" 6" 0 1' 2' 3'
3/4"=1'-0"

2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA – MX08FRO665-21	5G	72.0" x 20.0"	0°	117'-0"	(1) HIGH-CAPACITY HYBRID CABLE (150' LONG)
BETA	B1	PROPOSED	JMA – MX08FRO665-21	5G	72.0" x 20.0"	120°	117'-0"	
GAMMA	C1	PROPOSED	JMA – MX08FRO665-21	5G	72.0" x 20.0"	240°	117'-0"	

SECTOR	POSITION	RRH	
		MANUFACTURER – MODEL NUMBER	TECHNOLOGY
ALPHA	A1	FUJITSU – TA08025-B605	5G
	A1	FUJITSU – TA08025-B604	5G
BETA	B1	FUJITSU – TA08025-B605	5G
	B1	FUJITSU – TA08025-B604	5G
GAMMA	C1	FUJITSU – TA08025-B605	5G
	C1	FUJITSU – TA08025-B604	5G

NOTES

1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS.
2. ANTENNA AND RRH MODELS MAY CHANGE DUE TO EQUIPMENT AVAILABILITY. ALL EQUIPMENT CHANGES MUST BE APPROVED AND REMAIN IN COMPLIANCE WITH THE PROPOSED DESIGN AND STRUCTURAL ANALYSES.

ANTENNA SCHEDULE

NO SCALE

3

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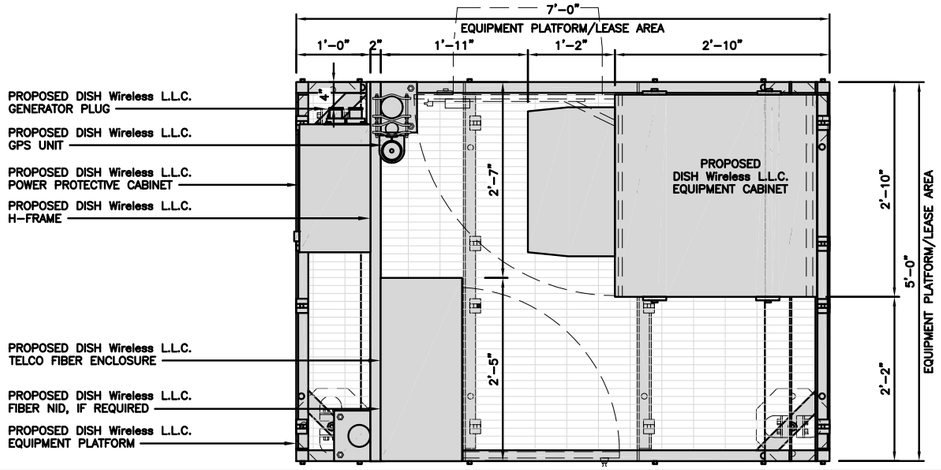
SHEET TITLE

ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER

A-2



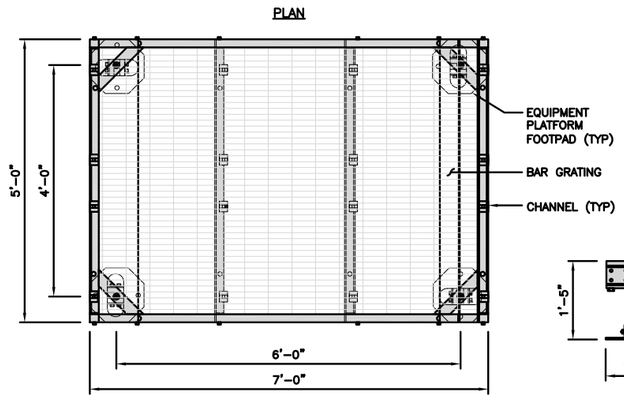
PLATFORM EQUIPMENT PLAN

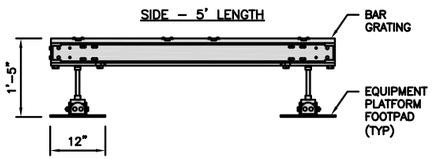
12" 9" 6" 3" 0 1' 2'
1"=1'-0"

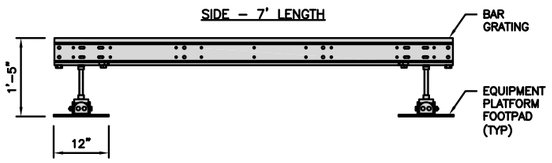
1

COMMSCOPE MTC4045LP 5X7 PLATFORM	
DIMENSIONS (HxWxD)	16"x84"x60"
TOTAL WEIGHT	423 LBS

NOTE:
GC TO PROVIDE EXTENDED THREAD FOR PLATFORM IF REQUIRED HEIGHT EXCEEDS 17"





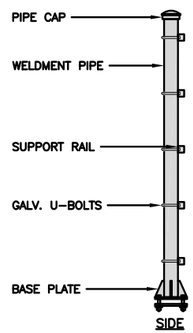


PLATFORM DETAIL

NO SCALE

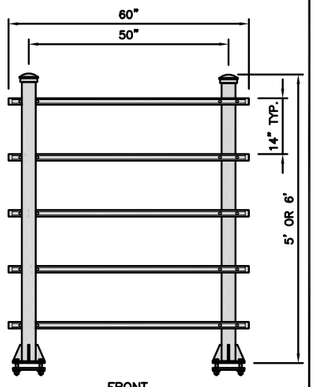
2

COMMSCOPE MTC4045HFLD H-FRAME	
UNISTRUT/SUPPORT RAILS QTY	5
WEIGHT	59.74 lbs



SIDE

NOTE:
OR DISH Wireless L.L.C. APPROVED EQUIVALENT



FRONT

H-FRAME DETAIL

NO SCALE

3

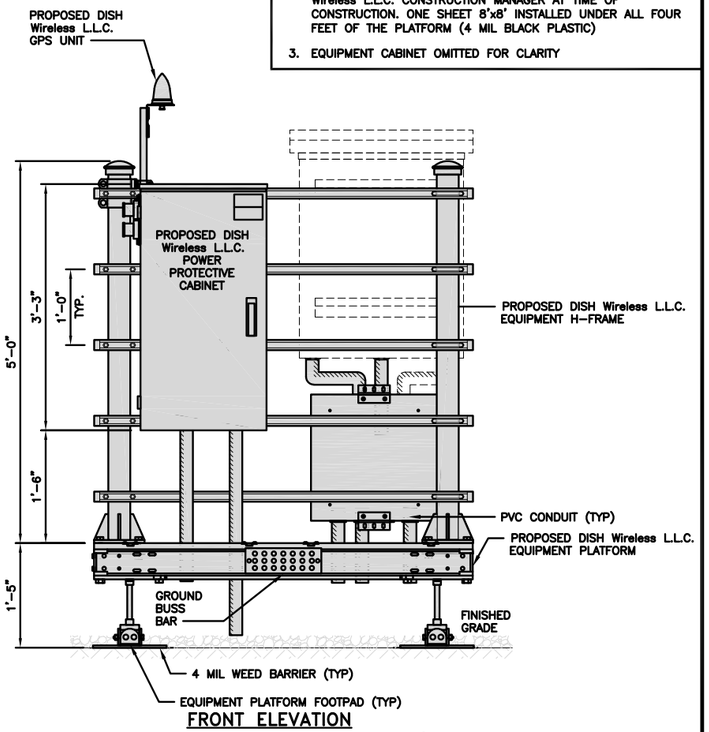
NOT USED

NO SCALE

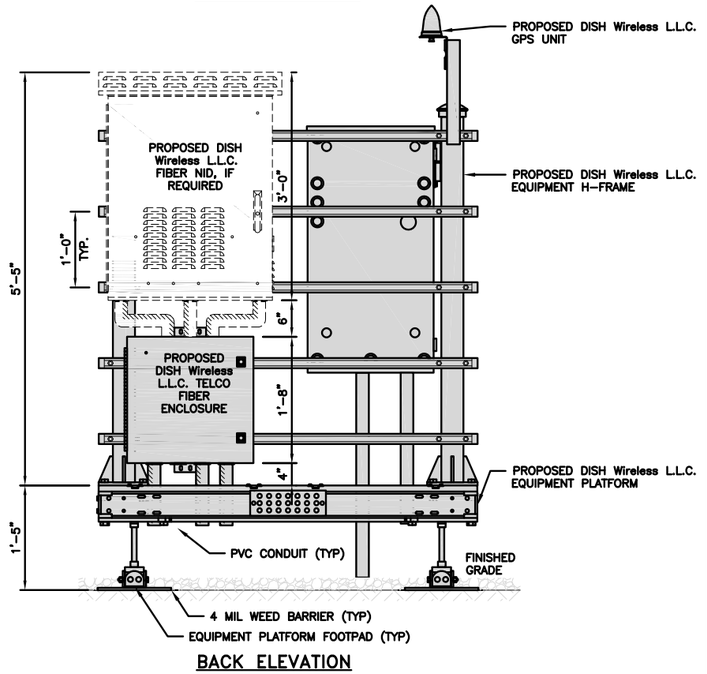
4

NOTES

1. CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF FILL PER EXISTING SITE SURFACE
2. WEED BARRIER FABRIC TO BE ADDED AT DISCRETION OF DISH Wireless L.L.C. CONSTRUCTION MANAGER AT TIME OF CONSTRUCTION. ONE SHEET 8'x8' INSTALLED UNDER ALL FOUR FEET OF THE PLATFORM (4 MIL BLACK PLASTIC)
3. EQUIPMENT CABINET OMITTED FOR CLARITY



FRONT ELEVATION



BACK ELEVATION

H-FRAME EQUIPMENT ELEVATION

12" 9" 6" 3" 0 1' 2'
1"=1'-0"

5

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9/2/21

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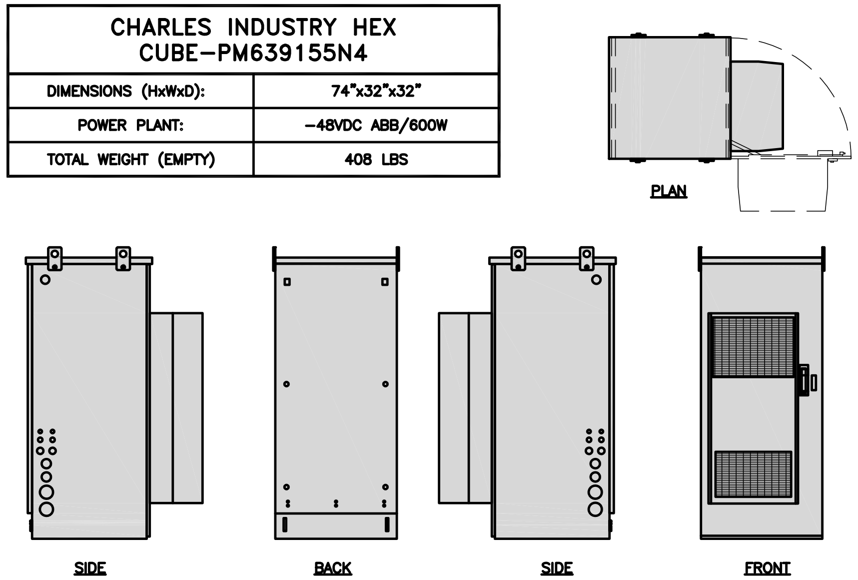
DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00056A
1662 ROUTE 184
GROTON, CT 06340

SHEET TITLE
EQUIPMENT PLATFORM AND H-FRAME DETAILS

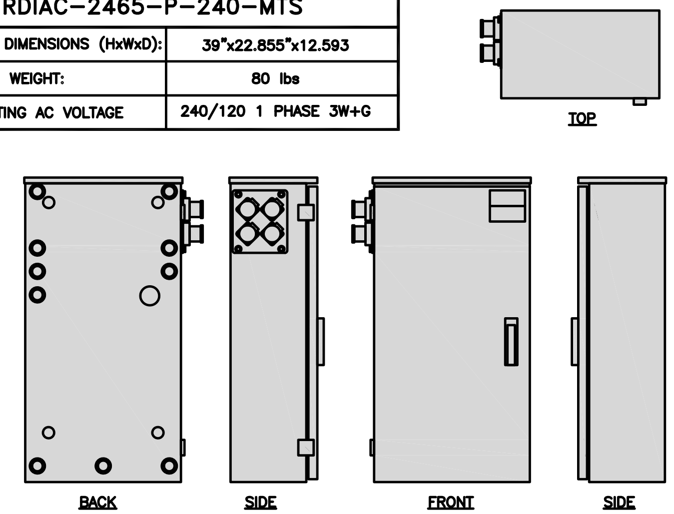
SHEET NUMBER
A-3

CHARLES INDUSTRY HEX CUBE–PM639155N4	
DIMENSIONS (HxWxD):	74"x32"x32"
POWER PLANT:	–48VDC ABB/600W
TOTAL WEIGHT (EMPTY)	408 LBS



CABINET DETAIL | NO SCALE | 1

RAYCAP PPC RDIAC–2465–P–240–MTS	
ENCLOSURE DIMENSIONS (HxWxD):	39"x22.855"x12.593
WEIGHT:	80 lbs
OPERATING AC VOLTAGE	240/120 1 PHASE 3W+G

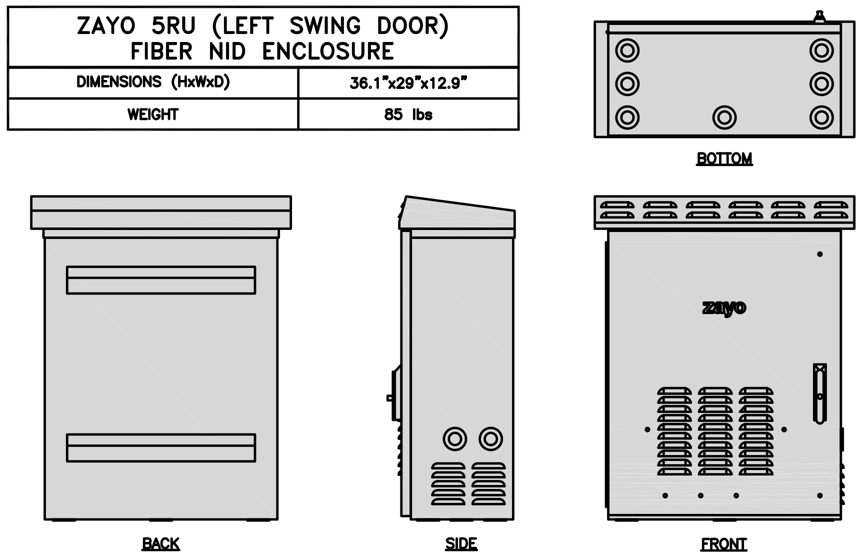


POWER PROTECTION CABINET (PPC) DETAIL | NO SCALE | 2

NOT USED | NO SCALE | 3

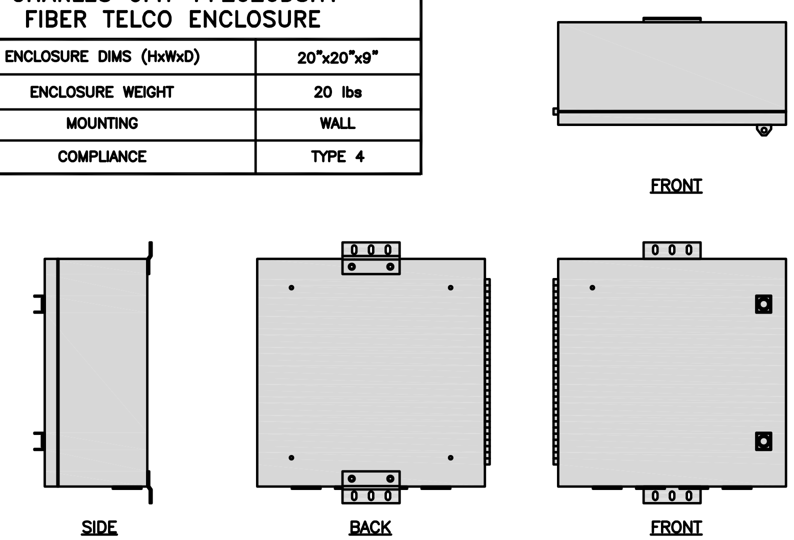
NOT USED | NO SCALE | 4

ZAYO 5RU (LEFT SWING DOOR) FIBER NID ENCLOSURE	
DIMENSIONS (HxWxD)	36.1"x29"x12.9"
WEIGHT	85 lbs



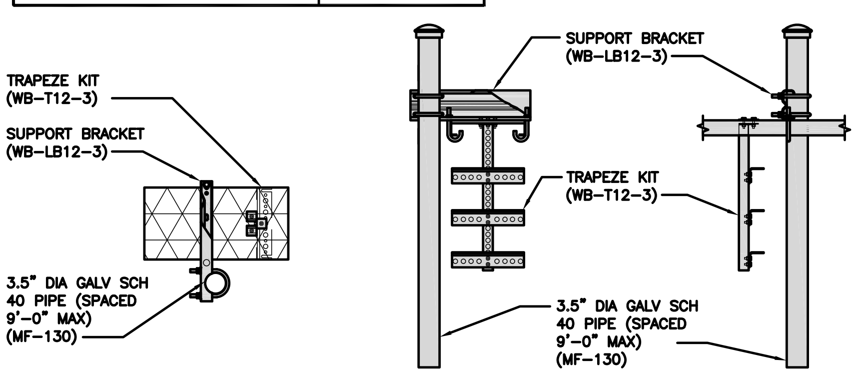
FIBER NID ENCLOSURE DETAIL | NO SCALE | 5

CHARLES CFIT–PF2020DSH1 FIBER TELCO ENCLOSURE	
ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4

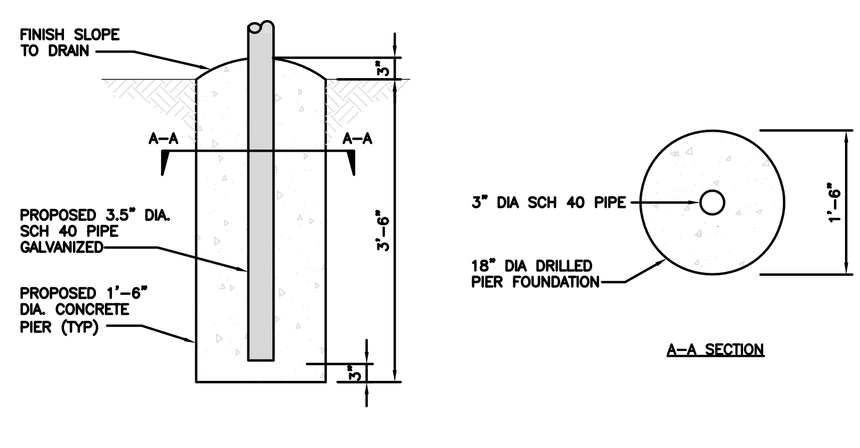


FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

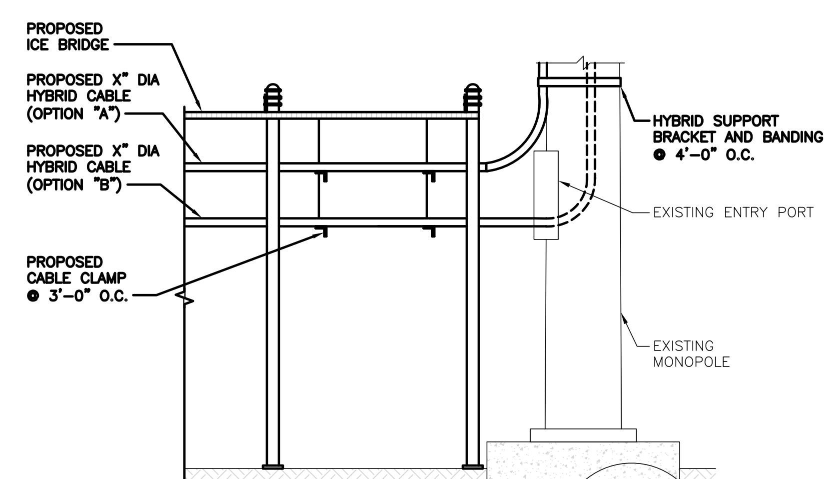
COMMSCOPE WB–K110–B WAVEGUIDE BRIDGE KIT		INCLUDED PRODUCTS:	WB–T12–3 TRAPEZE KIT, 3 RUNGS WB–LB12–3 SUPPORT BRACKET MF–130 DIRECT BURIAL PIPE COLUMN, 13'–4"
DIMENSIONS (HxL)	160"x10'		
WEIGHT/ VOLUME	325.0 LBS		
CABLE RUN (QTY)	12		



ICE BRIDGE DETAIL | NO SCALE | 7



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL | NO SCALE | 8



HYBRID CABLE RUN | NO SCALE | 9

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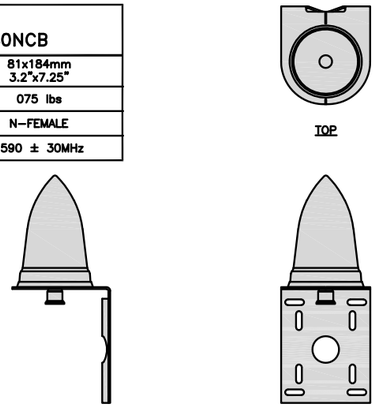
1662 ROUTE 184
GROTON, CT 06340

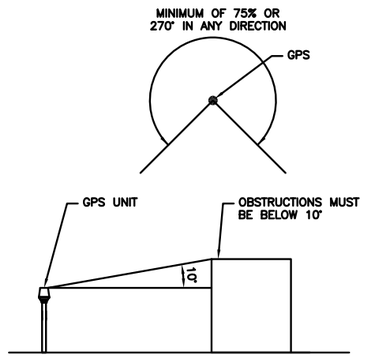
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

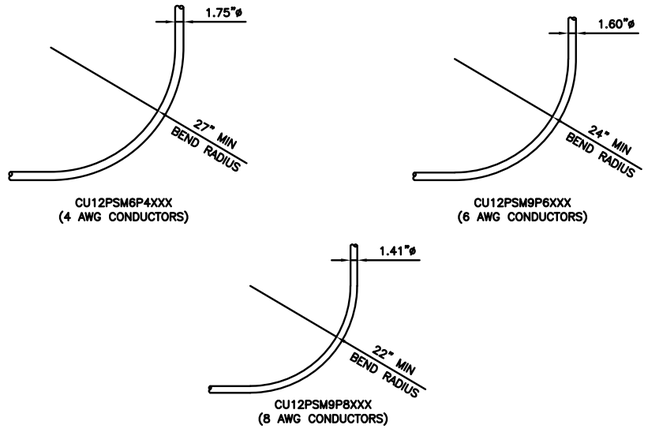
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



GPS DETAIL — NO SCALE — 1



GPS MINIMUM SKY VIEW REQUIREMENTS — NO SCALE — 2



CABLES UNLIMITED HYBRID CABLE MINIMUM BEND RADIUSES — NO SCALE — 3

NOT USED — NO SCALE — 4

NOT USED — NO SCALE — 5

NOT USED — NO SCALE — 6

NOT USED — NO SCALE — 7

NOT USED — NO SCALE — 8

NOT USED — NO SCALE — 9

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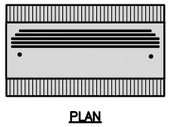
SHEET TITLE

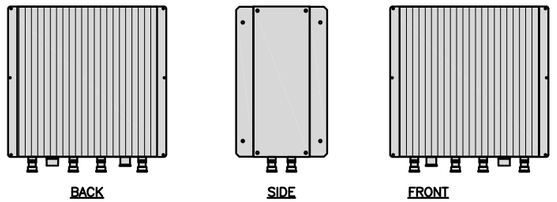
EQUIPMENT DETAILS

SHEET NUMBER

A-5

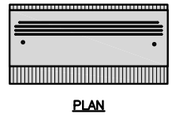
FUJITSU TRIPLE BAND TA08025-B605	
DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V

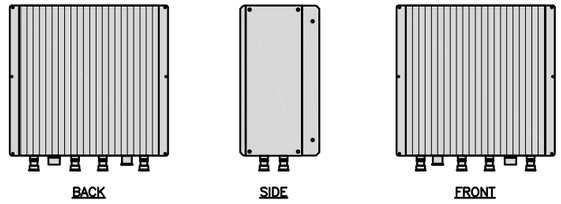




RRH DETAIL | NO SCALE | 1

FUJITSU DUAL BAND TA08025-B604	
DIMENSIONS (HxWxD)	14.9"x15.7"x7.8"
WEIGHT	63.9 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V

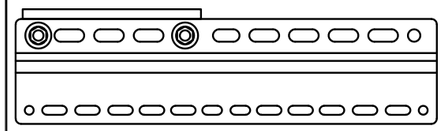


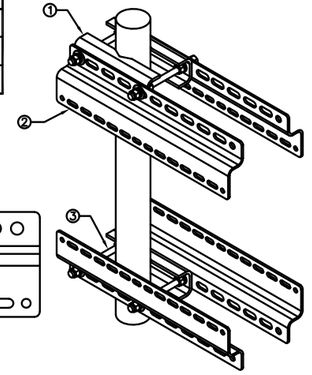


RRH DETAIL | NO SCALE | 2

SABRE DOUBLE Z-BRACKET C10123155	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"
WEIGHT (FULL ASSEMBLY)	35.79 lbs
PACKAGE QUANTITY	4

#	DESCRIPTION
1	PLATE, CHANNEL BRACKET
2	RRH Z BRACKET, 3/16"
3	THREADED ROD ASSEMBLY 1/2"x12"

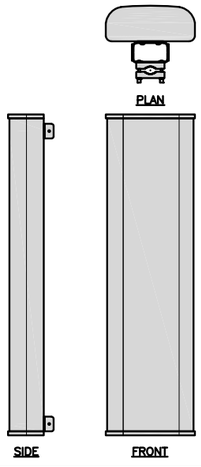




NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

RRH MOUNT DETAIL | NO SCALE | 3

JMA MX08FRO665-21	
DIMENSIONS (HxWxD)	72"x20.0"x8.0"
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE
WEIGHT	64.5 lbs
WEIGHT WITH BRACKETS	82.5 lbs



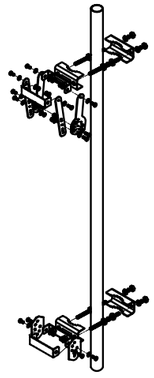
ANTENNA DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5

JMA ANTENNA MOUNT BRACKET #91900318	
TOTAL WEIGHT (WITH BRACKETS)	18 lbs (8.18 Kg)
POLE DIAMETER RANGE	2.5" TO 4.5"

NOTE:
KIT #91900318: TOP AND BOTTOM BRACKETS FOR 4-,6-, AND 8-FOOT ANTENNAS

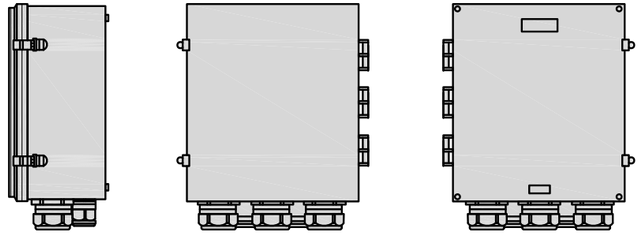
ANTENNA BRACKET NOT PART OF KIT



NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

ANTENNA BRACKET DETAIL | NO SCALE | 6

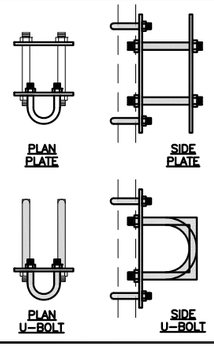
RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS

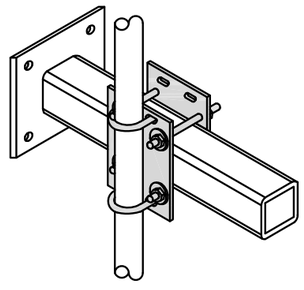


SURGE SUPPRESSION DETAIL (OVP) | NO SCALE | 7

COMMSCOPE XP-2040 CROSSOVER PLATE	
DIMENSIONS (HxW)	10"x12"
WEIGHT	11 lbs

NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

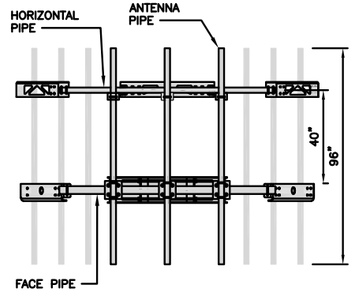


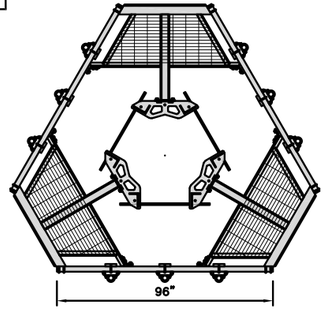


RRH/OVP MOUNT DETAIL | NO SCALE | 8

COMMSCOPE MC-PK8-DSH	
FACE WIDTH	96"
WEIGHT	1373.08 lbs
NOTE: 15" TO 38" O.D.	

NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT





ANTENNA PLATFORM DETAIL | NO SCALE | 9

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RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS

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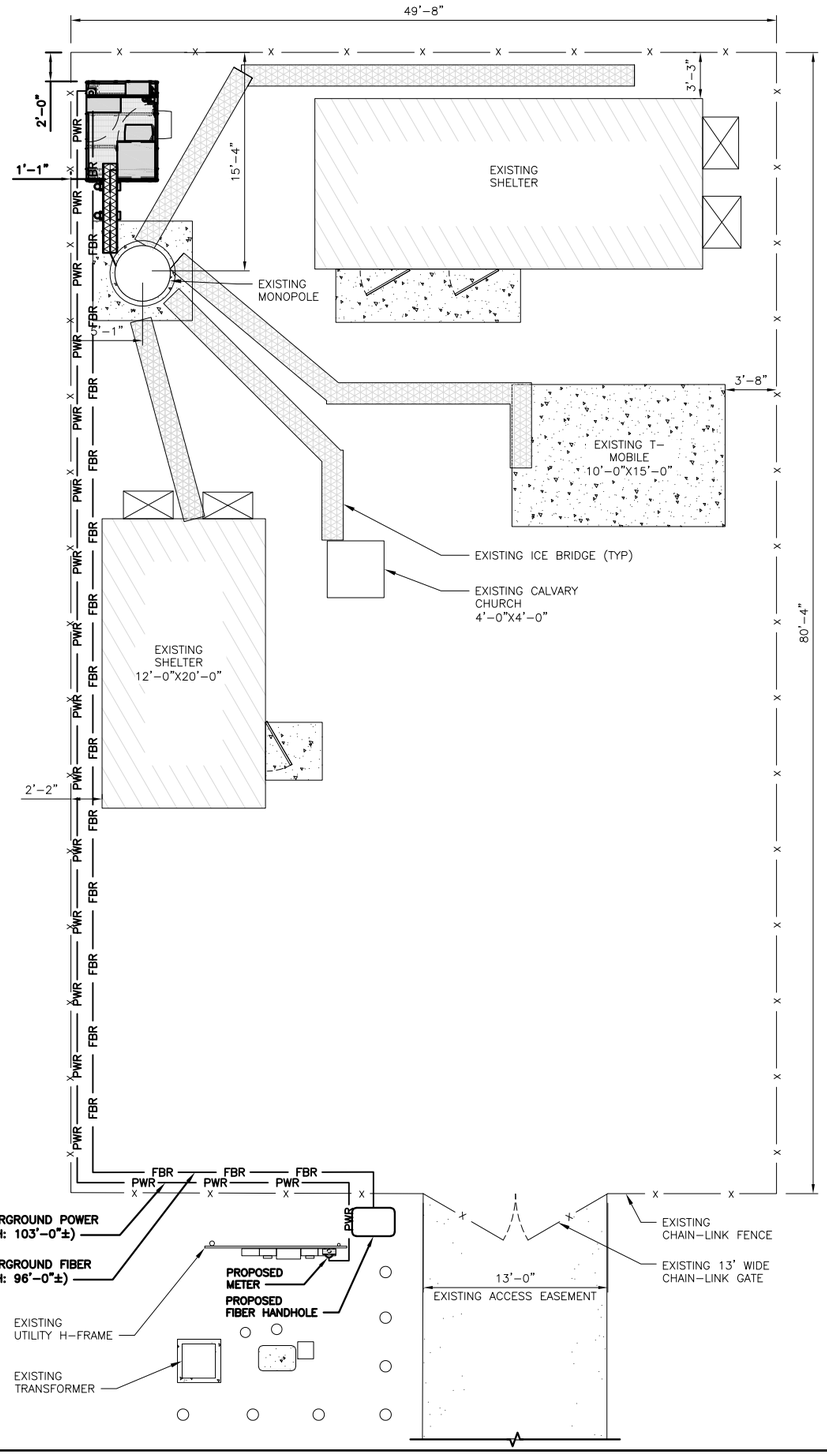
0	9/2/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
149464.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS00056A
1662 ROUTE 184
GROTON, CT 06340

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-6



UTILITY ROUTE PLAN

6' 4' 2' 0 5' 10'
3/16"=1'-0"

1

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.

DC POWER WIRING SHALL BE COLOR CODED AT EACH END FOR IDENTIFYING +24V AND -48V CONDUCTORS. RED MARKINGS SHALL IDENTIFY +24V AND BLUE MARKINGS SHALL IDENTIFY -48V.

1. CONTRACTOR SHALL INSPECT THE EXISTING CONDITIONS PRIOR TO SUBMITTING A BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS TO THE CONTRACTOR'S FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION, NOT AFTER THE CONTRACT HAS BEEN AWARDED.
2. ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH CURRENT NATIONAL ELECTRICAL CODES AND ALL STATE AND LOCAL CODES, LAWS, AND ORDINANCES. PROVIDE ALL COMPONENTS AND WIRING SIZES AS REQUIRED TO MEET NEC STANDARDS.
3. LOCATION OF EQUIPMENT, CONDUIT AND DEVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SHALL BE COORDINATED WITH FIELD CONDITIONS PRIOR TO CONSTRUCTION.
4. CONDUIT ROUGH-IN SHALL BE COORDINATED WITH THE MECHANICAL EQUIPMENT TO AVOID LOCATION CONFLICTS. VERIFY WITH THE MECHANICAL EQUIPMENT CONTRACTOR AND COMPLY AS REQUIRED.
5. CONTRACTOR SHALL PROVIDE ALL BREAKERS, CONDUITS AND CIRCUITS AS REQUIRED FOR A COMPLETE SYSTEM.
6. CONTRACTOR SHALL PROVIDE PULL BOXES AND JUNCTION BOXES AS REQUIRED BY THE NEC ARTICLE 314.
7. CONTRACTOR SHALL PROVIDE ALL STRAIN RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
8. ALL DISCONNECTS AND CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED PHENOLIC NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS INSTALLED ON, AND PANEL FIELD LOCATIONS FED FROM.
9. INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS PER THE SPECIFICATIONS AND NEC 250. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED AT ALL JUNCTION BOXES, PULL BOXES, AND ALL DISCONNECT SWITCHES, AND EQUIPMENT CABINETS.
10. ALL NEW MATERIAL SHALL HAVE A U.L. LABEL.
11. PANEL SCHEDULE LOADING AND CIRCUIT ARRANGEMENTS REFLECT POST-CONSTRUCTION EQUIPMENT.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR AS-BUILT PANEL SCHEDULE AND SITE DRAWINGS.
13. ALL TRENCHES IN COMPOUND TO BE HAND DUG

ELECTRICAL NOTES

NO SCALE

2

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1662 ROUTE 184
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SHEET TITLE

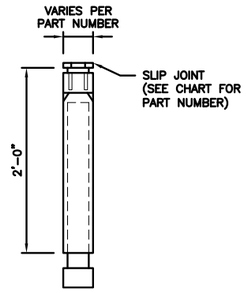
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

SHEET NUMBER

E-1

CARLON EXPANSION FITTINGS

COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
E945M	E945MX	3 1/2"	5	8"
E945N	E945NX	4"	5	8"
E945P	E945PX	5"	1	8"
E945R	E945RX	6"	1	8"

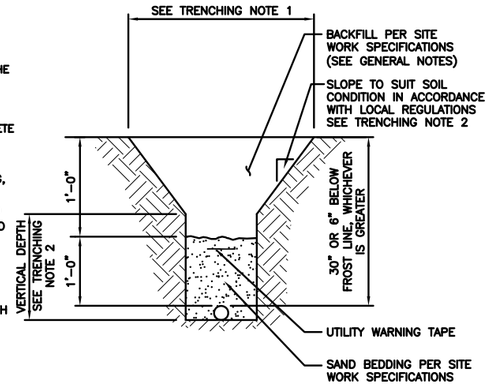


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

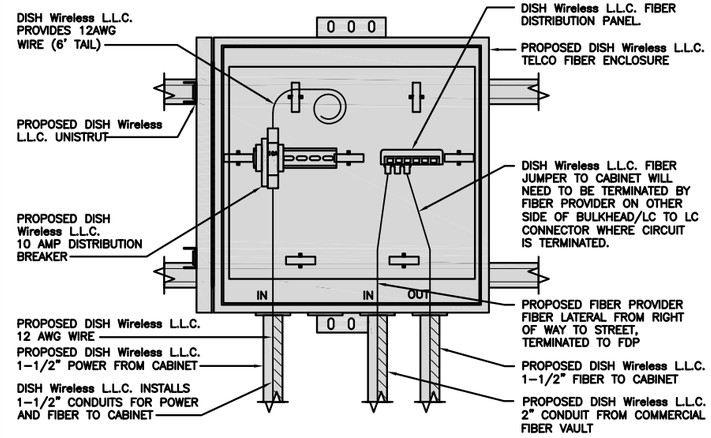
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

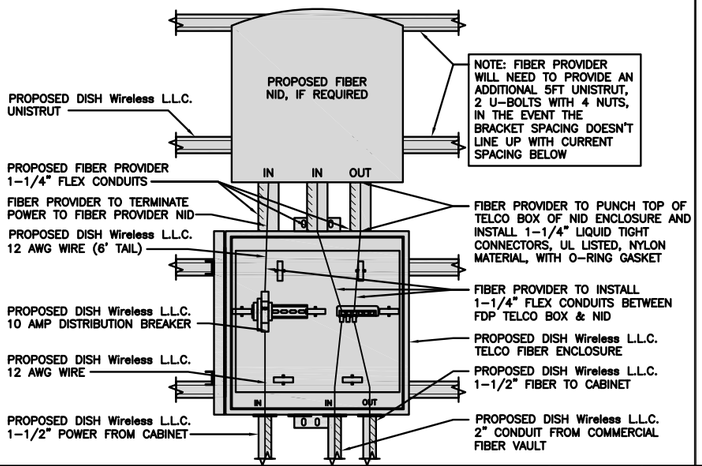
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT OSHA TRENCHING AND EXCAVATION SAFETY STANDARDS.
3. ALL CONDUITS SHALL BE INSTALLED IN COMPLIANCE WITH THE CURRENT NATIONAL ELECTRIC CODE (NEC) OR AS REQUIRED BY THE LOCAL JURISDICTION, WHICHEVER IS THE MOST STRINGENT.



TYPICAL UNDERGROUND TRENCH DETAIL | NO SCALE | 2



DARK TELCO BOX – INTERIOR WIRING LAYOUT | NO SCALE | 3



LIT TELCO BOX – INTERIOR WIRING LAYOUT (OPTIONAL) | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

DISH Wireless L.L.C. TEMPLATE VERSION 37 – 07/09/2021

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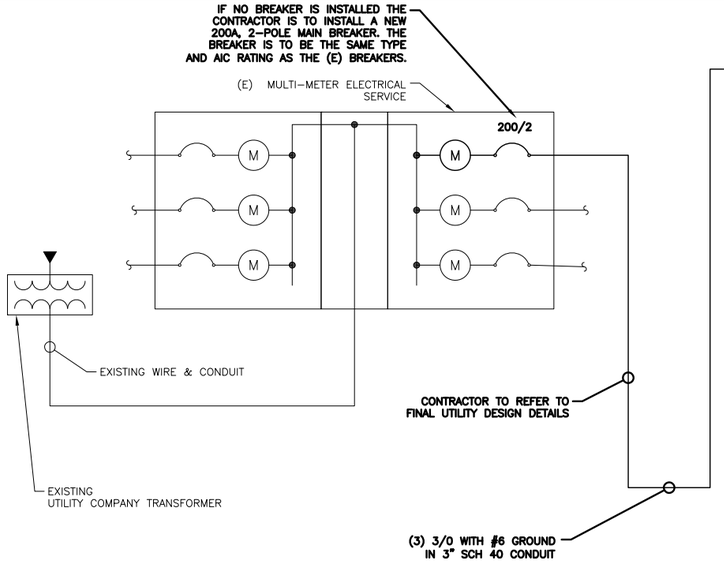
1662 ROUTE 184
GROTON, CT 06340

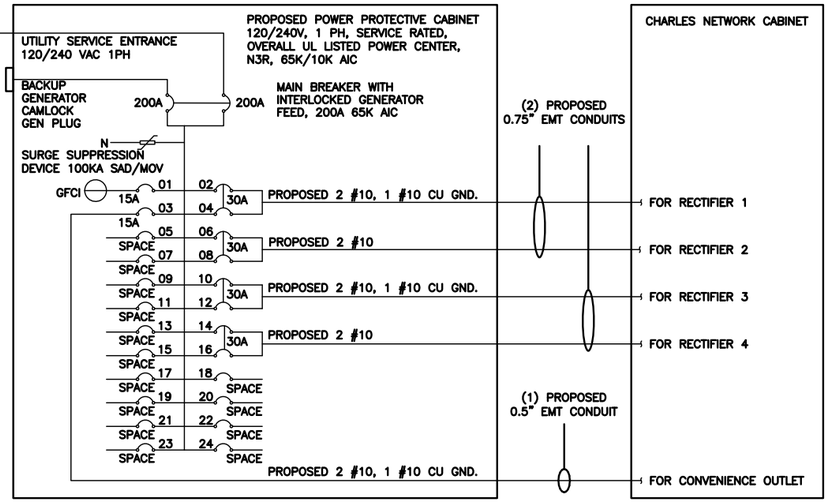
SHEET TITLE

ELECTRICAL DETAILS

SHEET NUMBER

E-2





NOTE:
BRANCH CIRCUIT WIRING SUPPLYING RECTIFIERS ARE TO BE RATED UL1015, 105°C, 600V, AND PVC INSULATED, IN THE SIZES SHOWN IN THE ONE-LINE DIAGRAM. CONTRACTOR MAY SUBSTITUTE UL1015 WIRE FOR THWN-2 FOR CONVENIENCE OUTLET BRANCH CIRCUIT.

BREAKERS REQUIRED:
(4) 30A, 2P BREAKER - SQUARE D P/N:QO230
(1) 15A, 1P BREAKER - SQUARE D P/N:QO115

NOTES

THE (2) CONDUITS WITH (4) CURRENT CARRYING CONDUCTORS EACH, SHALL APPLY THE ADJUSTMENT FACTOR OF 80% PER 2014/17 NEC TABLE 310.15(B)(3)(a) OR 2020 NEC TABLE 310.15(C)(1) FOR UL1015 WIRE.

#12 FOR 15A-20A/1P BREAKER: 0.8 x 30A = 24.0A
#10 FOR 25A-30A/2P BREAKER: 0.8 x 40A = 32.0A
#8 FOR 35A-40A/2P BREAKER: 0.8 x 55A = 44.0A
#6 FOR 45A-60A/2P BREAKER: 0.8 x 75A = 60.0A

CONDUIT SIZING: AT 40% FILL PER NEC CHAPTER 9, TABLE 4, ARTICLE 358.
0.5" CONDUIT - 0.122 SQ. IN AREA
0.75" CONDUIT - 0.213 SQ. IN AREA
2.0" CONDUIT - 1.316 SQ. IN AREA
3.0" CONDUIT - 2.907 SQ. IN AREA

CABINET CONVENIENCE OUTLET CONDUCTORS (1 CONDUIT): USING THWN-2, CU.

#10 - 0.0211 SQ. IN X 2 = 0.0422 SQ. IN
#10 - 0.0211 SQ. IN X 1 = 0.0211 SQ. IN <GROUND
TOTAL = 0.0633 SQ. IN

0.5" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (3) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

RECTIFIER CONDUCTORS (2 CONDUITS): USING UL1015, CU.

#10 - 0.0266 SQ. IN X 4 = 0.1064 SQ. IN
#10 - 0.0082 SQ. IN X 1 = 0.0082 SQ. IN <BARE GROUND
TOTAL = 0.1146 SQ. IN

0.75" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (5) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

PPC FEED CONDUCTORS (1 CONDUIT): USING THWN, CU.

3/0 - 0.2679 SQ. IN X 3 = 0.8037 SQ. IN
#6 - 0.0507 SQ. IN X 1 = 0.0507 SQ. IN <GROUND
TOTAL = 0.8544 SQ. IN

3.0" SCH 40 PVC CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (4) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

PPC ONE-LINE DIAGRAM

NO SCALE | 1

PROPOSED CHARLES PANEL SCHEDULE

LOAD SERVED	VOLT AMPS (WATTS) L1	VOLT AMPS (WATTS) L2	TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPS (WATTS) L1	VOLT AMPS (WATTS) L2	LOAD SERVED
PPC GFCI OUTLET	180		15A	1	A	2	30A	2880		ABB/GE INFINITY RECTIFIER 1
CHARLES GFCI OUTLET		180	15A	3	B	4			2880	
-SPACE-				5	A	6	30A	2880		ABB/GE INFINITY RECTIFIER 2
-SPACE-				7	B	8			2880	
-SPACE-				9	A	10	30A	2880		ABB/GE INFINITY RECTIFIER 3
-SPACE-				11	B	12			2880	
-SPACE-				13	A	14	30A	2880		ABB/GE INFINITY RECTIFIER 4
-SPACE-				15	B	16			2880	
-SPACE-				17	A	18				-SPACE-
-SPACE-				19	B	20				-SPACE-
-SPACE-				21	A	22				-SPACE-
-SPACE-				23	B	24				-SPACE-
VOLTAGE AMPS	180	180						11520	11520	
200A MCB, 1ϕ, 24 SPACE, 120/240V			L1		L2					
MB RATING: 65,000 AIC			11700		11700		VOLTAGE AMPS			
			98		98		AMPS			
			98				MAX AMPS			
			123				MAX 125%			

PANEL SCHEDULE

NO SCALE | 2

NOT USED

NO SCALE | 3

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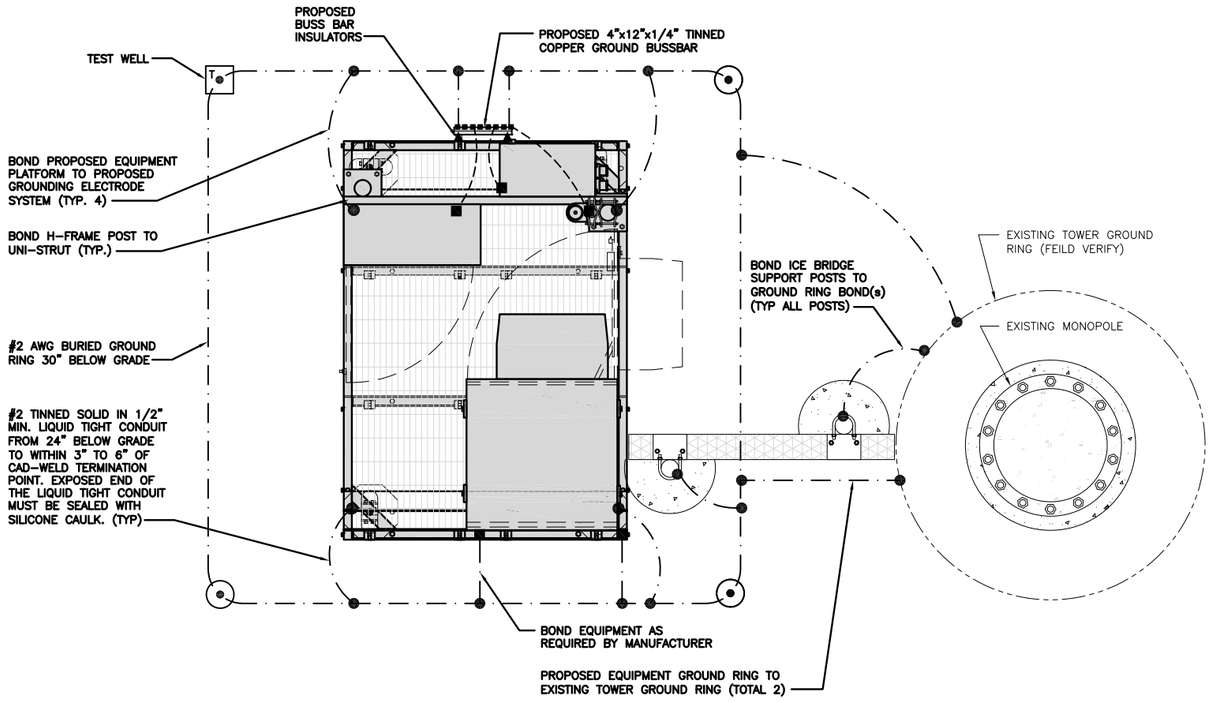
1662 ROUTE 184
GROTON, CT 06340

SHEET TITLE
ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE

SHEET NUMBER
E-3

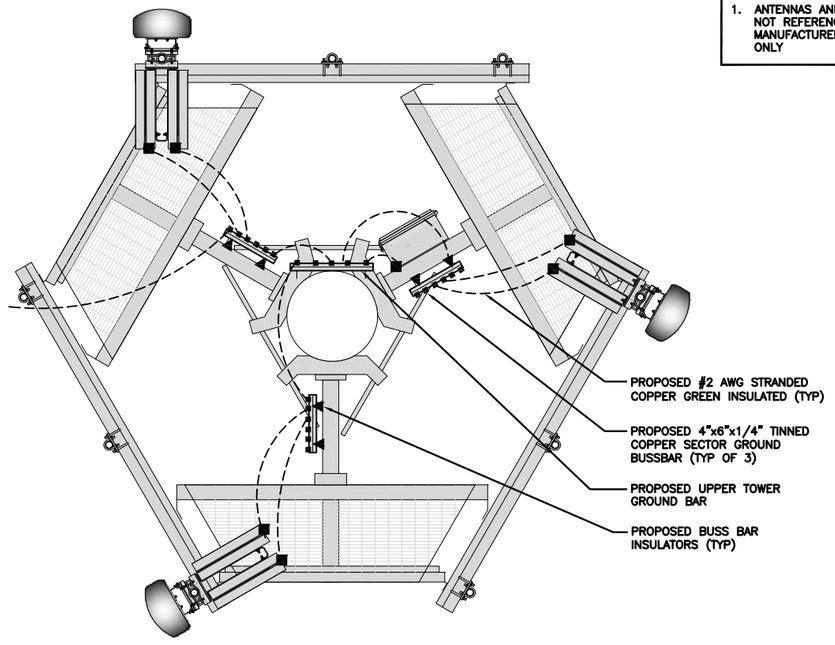


TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE | 1

NOTES

1. ANTENNAS AND OVP SHOWN ARE GENERIC AND NOT REFERENCING TO A SPECIFIC MANUFACTURER. THIS LAYOUT IS FOR REFERENCE ONLY



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE | 2

EXOTHERMIC CONNECTION
MECHANICAL CONNECTION
GROUND BUS BAR
GROUND ROD
TEST GROUND ROD WITH INSPECTION SLEEVE
#6 AWG STRANDED & INSULATED
#2 AWG SOLID COPPER TINNED
BUSS BAR INSULATOR

GROUNDING LEGEND

1. GROUNDING IS SHOWN DIAGRAMMATICALLY ONLY.
2. CONTRACTOR SHALL GROUND ALL EQUIPMENT AS A COMPLETE SYSTEM. GROUNDING SHALL BE IN COMPLIANCE WITH NEC SECTION 250 AND DISH Wireless L.L.C. GROUNDING AND BONDING REQUIREMENTS AND MANUFACTURER'S SPECIFICATIONS.
3. ALL GROUND CONDUCTORS SHALL BE COPPER; NO ALUMINUM CONDUCTORS SHALL BE USED.

GROUNDING KEY NOTES

(A) EXTERIOR GROUND RING: #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 6 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING.

(B) TOWER GROUND RING: THE GROUND RING SYSTEM SHALL BE INSTALLED AROUND AN ANTENNA TOWER'S LEGS, AND/OR GUY ANCHORS. WHERE SEPARATE SYSTEMS HAVE BEEN PROVIDED FOR THE TOWER AND THE BUILDING, AT LEAST TWO BONDS SHALL BE MADE BETWEEN THE TOWER RING GROUND SYSTEM AND THE BUILDING RING GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.

(C) INTERIOR GROUND RING: #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR EXTENDED AROUND THE PERIMETER OF THE EQUIPMENT AREA. ALL NON-TELECOMMUNICATIONS RELATED METALLIC OBJECTS FOUND WITHIN A SITE SHALL BE GROUNDED TO THE INTERIOR GROUND RING WITH #6 AWG STRANDED GREEN INSULATED CONDUCTOR.

(D) BOND TO INTERIOR GROUND RING: #2 AWG SOLID TINNED COPPER WIRE PRIMARY BONDS SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUND RING, LOCATED AT THE CORNERS OF THE BUILDING.

(E) GROUND ROD: UL LISTED COPPER CLAD STEEL. MINIMUM 1/2" DIAMETER BY EIGHT FEET LONG. GROUND RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES. GROUND RODS SHALL BE DRIVEN TO THE DEPTH OF GROUND RING CONDUCTOR.

(F) CELL REFERENCE GROUND BAR: POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BONDS ARE MADE WITH #2 AWG UNLESS NOTED OTHERWISE STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID TINNED COPPER CONDUCTORS.

(G) HATCH PLATE GROUND BAR: BOND TO THE INTERIOR GROUND RING WITH TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS. WHEN A HATCH-PLATE AND A CELL REFERENCE GROUND BAR ARE BOTH PRESENT, THE CRGB MUST BE CONNECTED TO THE HATCH-PLATE AND TO THE INTERIOR GROUND RING USING (2) TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS EACH.

(H) EXTERIOR CABLE ENTRY PORT GROUND BARS: LOCATED AT THE ENTRANCE TO THE CELL SITE BUILDING. BOND TO GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTORS WITH AN EXOTHERMIC WELD AND INSPECTION SLEEVE.

(I) TELCO GROUND BAR: BOND TO BOTH CELL REFERENCE GROUND BAR OR EXTERIOR GROUND RING.

(J) FRAME BONDING: THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK.

(K) INTERIOR UNIT BONDS: METAL FRAMES, CABINETS AND INDIVIDUAL METALLIC UNITS LOCATED WITH THE AREA OF THE INTERIOR GROUND RING REQUIRE A #6 AWG STRANDED GREEN INSULATED COPPER BOND TO THE INTERIOR GROUND RING.

(L) FENCE AND GATE GROUNDING: METAL FENCES WITHIN 7 FEET OF THE EXTERIOR GROUND RING OR OBJECTS BONDED TO THE EXTERIOR GROUND RING SHALL BE BONDED TO THE GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTOR AT AN INTERVAL NOT EXCEEDING 25 FEET. BONDS SHALL BE MADE AT EACH GATE POST AND ACROSS GATE OPENINGS.

(M) EXTERIOR UNIT BONDS: METALLIC OBJECTS, EXTERNAL TO OR MOUNTED TO THE BUILDING, SHALL BE BONDED TO THE EXTERIOR GROUND RING. USING #2 TINNED SOLID COPPER WIRE

(N) ICE BRIDGE SUPPORTS: EACH ICE BRIDGE LEG SHALL BE BONDED TO THE GROUND RING WITH #2 AWG BARE TINNED COPPER CONDUCTOR. PROVIDE EXOTHERMIC WELDS AT BOTH THE ICE BRIDGE LEG AND BURIED GROUND RING.

(O) DURING ALL DC POWER SYSTEM CHANGES INCLUDING DC SYSTEM CHANGE OUTS, RECTIFIER REPLACEMENTS OR ADDITIONS, BREAKER DISTRIBUTION CHANGES, BATTERY ADDITIONS, BATTERY REPLACEMENTS AND INSTALLATIONS OR CHANGES TO DC CONVERTER SYSTEMS IT SHALL BE REQUIRED THAT SERVICE CONTRACTORS VERIFY ALL DC POWER SYSTEMS ARE EQUIPPED WITH A MASTER DC SYSTEM RETURN GROUND CONDUCTOR FROM THE DC POWER SYSTEM COMMON RETURN BUS DIRECTLY CONNECTED TO THE CELL SITE REFERENCE GROUND BAR

(P) TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO PROPOSED ANTENNA MOUNT COLLAR.

REFER TO DISH Wireless L.L.C. GROUNDING NOTES.

GROUNDING KEY NOTES

NO SCALE | 3

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PEC.0001564
Expires 2/10/22

DRAWN BY:	CHECKED BY:	APPROVED BY:
BLJ	BLJ	JW

RFDS REV #: 0

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SUBMITTALS

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A&E PROJECT NUMBER
149464.001.01

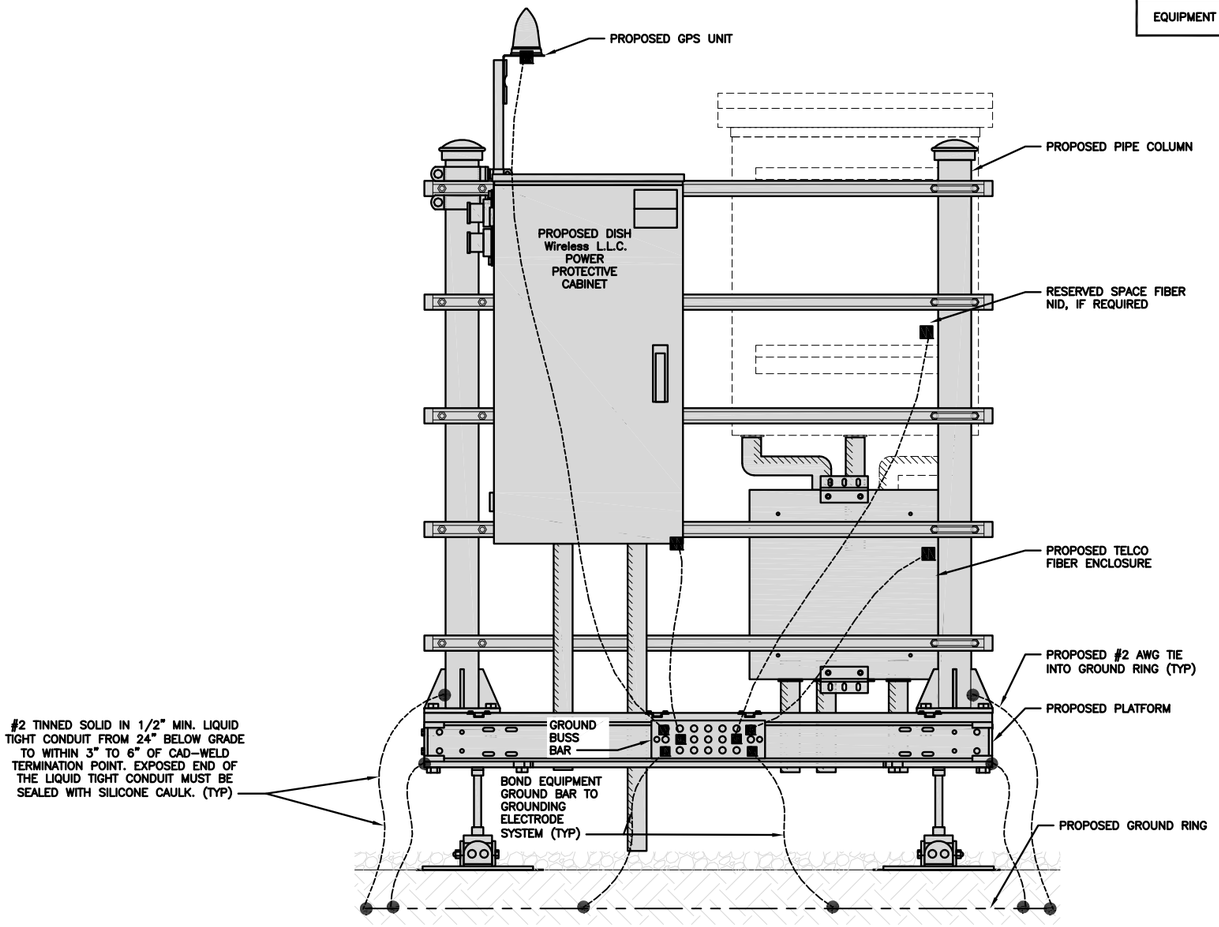
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS00056A
1662 ROUTE 184
GROTON, CT 06340

SHEET TITLE
GROUNDING PLANS AND NOTES

SHEET NUMBER
G-1

NOTES

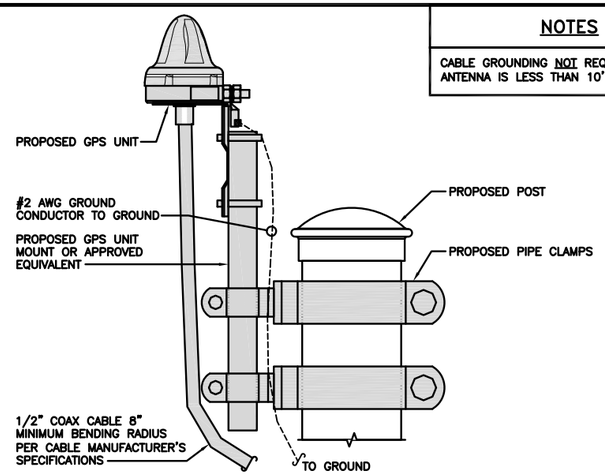
EQUIPMENT CABINET OMITTED FOR CLARITY



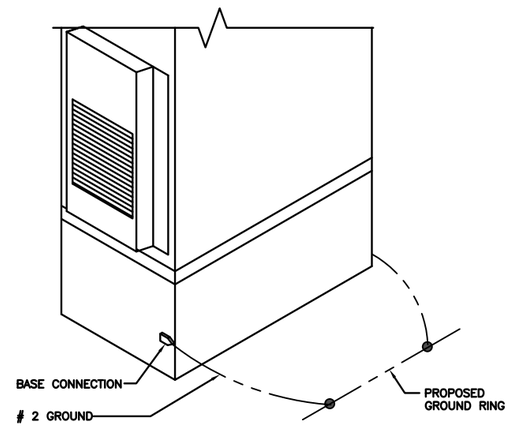
H-FRAME GROUNDING DETAIL | NO SCALE | 1

NOTES

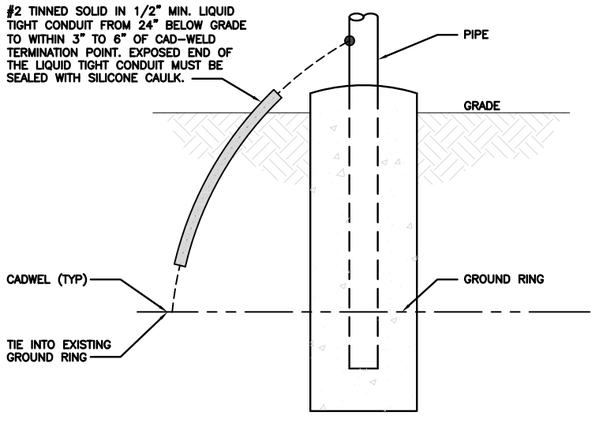
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



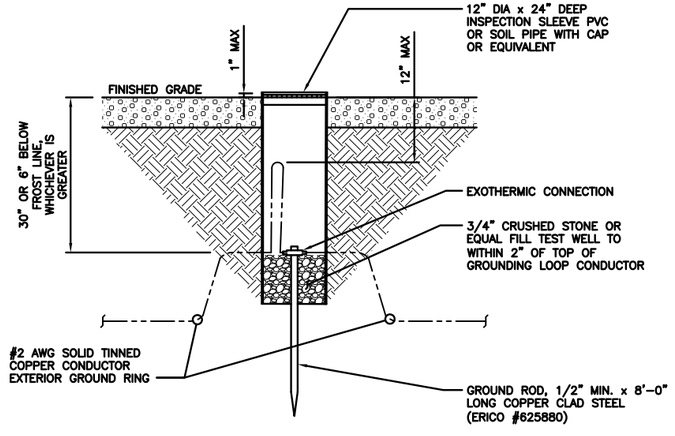
TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



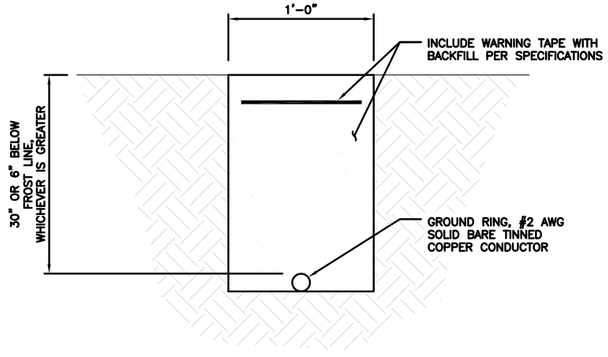
OUTDOOR CABINET GROUNDING | NO SCALE | 3



TRANSITIONING GROUND DETAIL | NO SCALE | 4



TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE | NO SCALE | 5



TYPICAL GROUND RING TRENCH | NO SCALE | 6

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SHEET TITLE

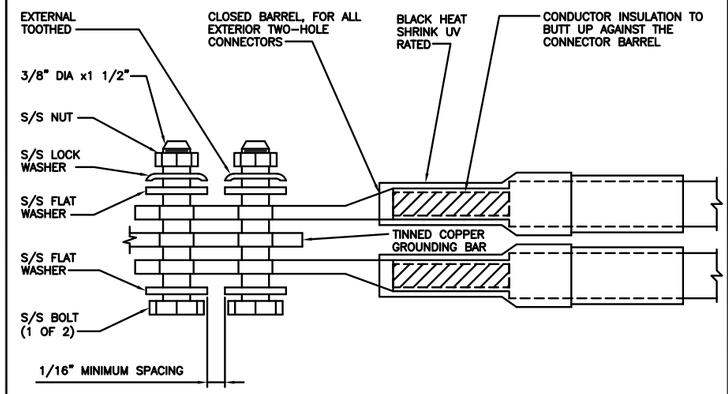
GROUNDING DETAILS

SHEET NUMBER

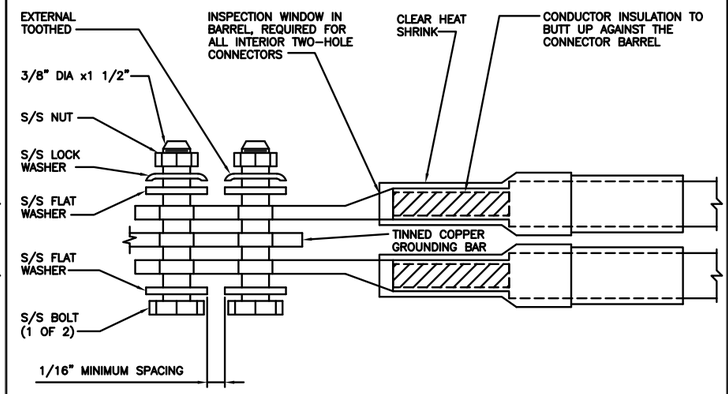
G-2

1. EXOTHERMIC WELD (2) TWO, #2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUND BAR. ROUTE CONDUCTORS TO BURIED GROUND RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
2. ALL EXTERIOR GROUNDING HARDWARE SHALL BE STAINLESS STEEL 3/8" DIAMETER OR LARGER. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
3. FOR GROUND BOND TO STEEL ONLY: COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
4. DO NOT INSTALL CABLE GROUNDING KIT AT A BEND AND ALWAYS DIRECT GROUND CONDUCTOR DOWN TO GROUNDING BUS.
5. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUND BAR AND BOLTED ON THE BACK SIDE.
6. ALL GROUNDING PARTS AND EQUIPMENT TO BE SUPPLIED AND INSTALLED BY CONTRACTOR.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL GROUND BAR AS REQUIRED.
8. ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).

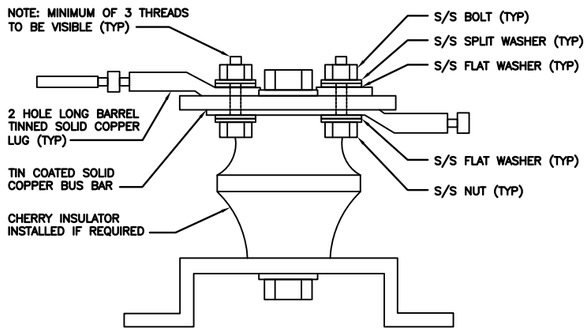
TYPICAL GROUNDING NOTES | NO SCALE | 1



TYPICAL EXTERIOR TWO HOLE LUG | NO SCALE | 2



TYPICAL INTERIOR TWO HOLE LUG | NO SCALE | 3



LUG DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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PROJECT INFORMATION

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1662 ROUTE 184
GROTON, CT 06340

SHEET TITLE
GROUNDING DETAILS

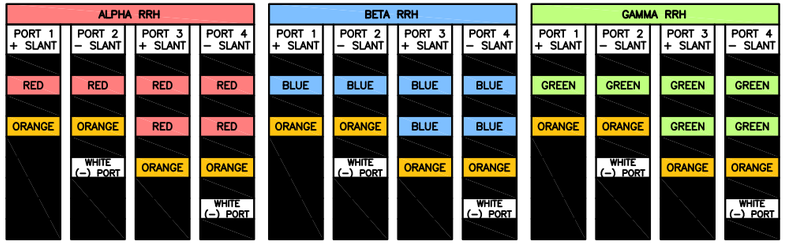
SHEET NUMBER
G-3

RF JUMPER COLOR CODING

3/4" TAPE WIDTHS WITH 3/4" SPACING

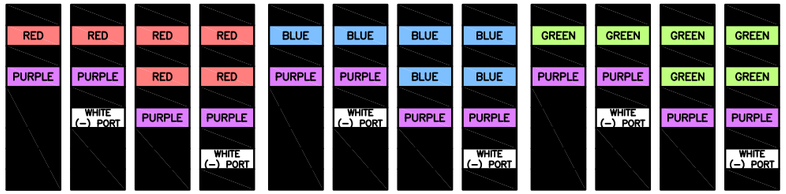
LOW-BAND RRH –
(600MHz N71 BASEBAND) +
(850MHz N26 BAND) +
(700MHz N29 BAND) – OPTIONAL PER MARKET

ADD FREQUENCY COLOR TO SECTOR BAND
(CBRS WILL USE YELLOW BANDS)



MID-BAND RRH –
(AWS BANDS N66+N70)

ADD FREQUENCY COLOR TO SECTOR BAND
(CBRS WILL USE YELLOW BANDS)

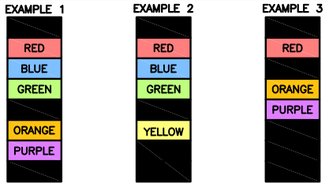


HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED
ALONG WITH FREQUENCY BANDS

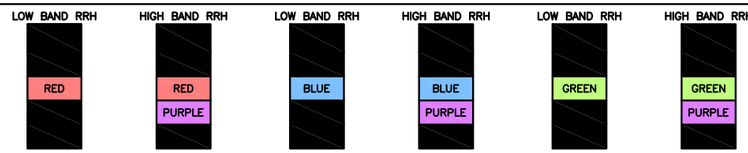
EXAMPLE 1 – HYBRID, OR DISCREET, SUPPORTS
ALL SECTORS, BOTH LOW-BANDS AND MID-BANDS

EXAMPLE 2 – HYBRID, OR DISCREET, SUPPORTS
CBRS ONLY, ALL SECTORS



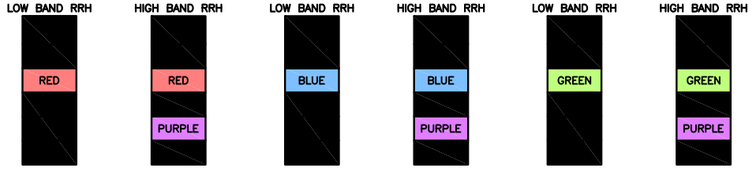
FIBER JUMPERS TO RRHs

LOW-BAND RRH FIBER CABLES HAVE SECTOR
STRIPE ONLY

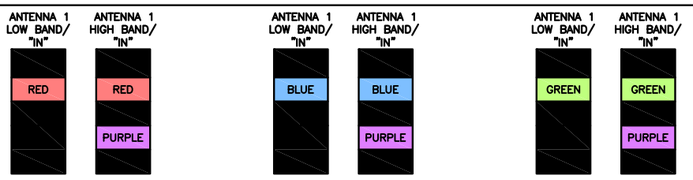


POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR
STRIPE ONLY



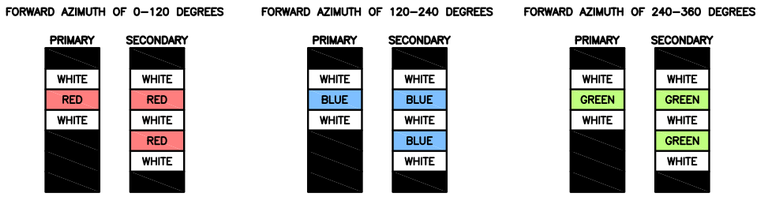
RET MOTORS AT ANTENNAS



MICROWAVE RADIO LINKS

LINKS WILL HAVE A 1.5-2 INCH WHITE WRAP WITH
THE AZIMUTH COLOR OVERLAPPING IN THE MIDDLE.
ADD ADDITIONAL SECTOR COLOR BANDS FOR EACH
ADDITIONAL MW RADIO.

MICROWAVE CABLES WILL REQUIRE P-TOUCH
LABELS INSIDE THE CABINET TO IDENTIFY THE
LOCAL AND REMOTE SITE ID'S



RF CABLE COLOR CODES	NO SCALE	1

LOW BANDS (N71+N26)
OPTIONAL – (N29)
ORANGE

AWS
(N66+N70+H-BLOCK)
PURPLE

CBRS TECH
(3 GHz)
YELLOW

NEGATIVE SLANT PORT
ON ANT/RRH
WHITE

ALPHA SECTOR
RED

BETA SECTOR
BLUE

GAMMA SECTOR
GREEN

COLOR IDENTIFIER	NO SCALE	2

NOT USED	NO SCALE	3

NOTES

CONTRACTOR TO REFFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS. FINAL RFDS IS IN NEXSYSONE.

NOT USED	NO SCALE	4

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DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00056A
1662 ROUTE 184
GROTON, CT 06340

SHEET TITLE
RF
CABLE COLOR CODES

SHEET NUMBER
RF-1

LEGEND

EXOTHERMIC CONNECTION

MECHANICAL CONNECTION

BUSS BAR INSULATOR

CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM — T

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE — T

SINGLE POLE SWITCH

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE — GFCI

FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48–T8 — F

SMOKE DETECTION (DC) — SD

EMERGENCY LIGHTING (DC)

SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW LED–1–25A400/51K–SR4–120–PE–DDBTXD

CHAIN LINK FENCE — X — X — X — X

WOOD/WROUGHT IRON FENCE

WALL STRUCTURE

LEASE AREA

PROPERTY LINE (PL)

SETBACKS

ICE BRIDGE

CABLE TRAY

WATER LINE — W — W — W — W — W

UNDERGROUND POWER — UGP — UGP — UGP — UGP — UGP

UNDERGROUND TELCO — UGT — UGT — UGT — UGT — UGT

OVERHEAD POWER — OHP — OHP — OHP — OHP

OVERHEAD TELCO — OHT — OHT — OHT — OHT

UNDERGROUND TELCO/POWER — UGT/P — UGT/P — UGT/P — UGT/P

ABOVE GROUND POWER — AGP — AGP — AGP — AGP — AGP

ABOVE GROUND TELCO — AGT — AGT — AGT — AGT — AGT

ABOVE GROUND TELCO/POWER — AGT/P — AGT/P — AGT/P — AGT/P

WORKPOINT — W.P.

SECTION REFERENCE — XX / X–X

DETAIL REFERENCE — XX / X–X

ABBREVIATIONS

AB	ANCHOR BOLT
ABV	ABOVE
AC	ALTERNATING CURRENT
ADDL	ADDITIONAL
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AGL	ABOVE GROUND LEVEL
AIC	AMPERAGE INTERRUPTION CAPACITY
ALUM	ALUMINUM
ALT	ALTERNATE
ANT	ANTENNA
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BM	BEAM
BTC	BARE TINNED COPPER CONDUCTOR
BOF	BOTTOM OF FOOTING
CAB	CABINET
CANT	CANTILEVERED
CHG	CHARGING
CLG	CEILING
CLR	CLEAR
COL	COLUMN
COMM	COMMON
CONC	CONCRETE
CONSTR	CONSTRUCTION
DBL	DOUBLE
DC	DIRECT CURRENT
DEPT	DEPARTMENT
DF	DOUGLAS FIR
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DWG	DRAWING
DWL	DOWEL
EA	EACH
EC	ELECTRICAL CONDUCTOR
EL.	ELEVATION
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ENG	ENGINEER
EQ	EQUAL
EXP	EXPANSION
EXT	EXTERIOR
EW	EACH WAY
FAB	FABRICATION
FF	FINISH FLOOR
FG	FINISH GRADE
FIF	FACILITY INTERFACE FRAME
FIN	FINISH(ED)
FLR	FLOOR
FDN	FOUNDATION
FOC	FACE OF CONCRETE
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FOW	FACE OF WALL
FS	FINISH SURFACE
FT	FOOT
FTG	FOOTING
GA	GAUGE
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GLB	GLUE LAMINATED BEAM
GLV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
GSM	GLOBAL SYSTEM FOR MOBILE
HDG	HOT DIPPED GALVANIZED
HDR	HEADER
HGR	HANGER
HVAC	HEAT/VENTILATION/AIR CONDITIONING
HT	HEIGHT
IGR	INTERIOR GROUND RING
IN	INCH
INT	INTERIOR
LB(S)	POUND(S)
LF	LINEAR FEET
LTE	LONG TERM EVOLUTION
MAS	MASONRY
MAX	MAXIMUM
MB	MACHINE BOLT
MECH	MECHANICAL
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MISC	MISCELLANEOUS
MTL	METAL
MTS	MANUAL TRANSFER SWITCH
MW	MICROWAVE
NEC	NATIONAL ELECTRIC CODE
NM	NEWTON METERS
NO.	NUMBER
#	NUMBER
NTS	NOT TO SCALE
OC	ON–CENTER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OPNG	OPENING
P/C	PRECAST CONCRETE
PCS	PERSONAL COMMUNICATION SERVICES
PCU	PRIMARY CONTROL UNIT
PRC	PRIMARY RADIO CABINET
PP	POLARIZING PRESERVING
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATED
PWR	POWER CABINET
QTY	QUANTITY
RAD	RADIUS
RECT	RECTIFIER
REF	REFERENCE
REINF	REINFORCEMENT
REQ'D	REQUIRED
RET	REMOTE ELECTRIC TILT
RF	RADIO FREQUENCY
RMC	RIGID METALLIC CONDUIT
RRH	REMOTE RADIO HEAD
RRU	REMOTE RADIO UNIT
RWY	RACEWAY
SCH	SCHEDULE
SHT	SHEET
SIAD	SMART INTEGRATED ACCESS DEVICE
SIM	SIMILAR
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
STD	STANDARD
STL	STEEL
TEMP	TEMPORARY
THK	THICKNESS
TMA	TOWER MOUNTED AMPLIFIER
TN	TOE NAIL
TOA	TOP OF ANTENNA
TOC	TOP OF CURB
TOF	TOP OF FOUNDATION
TOP	TOP OF PLATE (PARAPET)
TOS	TOP OF STEEL
TOW	TOP OF WALL
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE
UMTS	UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
UPS	UNITERRUPTIBLE POWER SYSTEM (DC POWER PLANT)
VIF	VERIFIED IN FIELD
W	WIDE
W/	WITH
WD	WOOD
WP	WEATHERPROOF
WT	WEIGHT

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PROJECT INFORMATION

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1662 ROUTE 184
GROTON, CT 06340

SHEET TITLE

LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED – NO WORK SHALL COMMENCE PRIOR TO CONTRACTOR RECEIVING A WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE DISH Wireless L.L.C. AND TOWER OWNER NOC & THE DISH Wireless L.L.C. AND TOWER OWNER CONSTRUCTION MANAGER.

2. "LOOK UP" – DISH Wireless L.L.C. AND TOWER OWNER SAFETY CLIMB REQUIREMENT:

THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR DISH Wireless L.L.C. AND DISH Wireless L.L.C. AND TOWER OWNER POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.

3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.

4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND DISH Wireless L.L.C. AND TOWER OWNER STANDARDS, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA–322 (LATEST EDITION).

5. ALL SITE WORK TO COMPLY WITH DISH Wireless L.L.C. AND TOWER OWNER INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON DISH Wireless L.L.C. AND TOWER OWNER TOWER SITE AND LATEST VERSION OF ANSI/TIA–1019–A–2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."

6. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY DISH Wireless L.L.C. AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.

7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

9. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES INCLUDING PRIVATE LOCATES SERVICES PRIOR TO THE START OF CONSTRUCTION.

10. 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 CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.

11. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND DISH PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.

12. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.

13. 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 DISH Wireless L.L.C. AND TOWER OWNER, AND/OR LOCAL UTILITIES.

14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.

15. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.

16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.

17. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.

18. 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.

19. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS AND RADIOS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

21. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

22. 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.

GENERAL NOTES:

1.FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION

CARRIER:DISH Wireless L.L.C.

TOWER OWNER:TOWER OWNER

2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.

3. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.

4. NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.

5. SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.

6. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CARRIER POC AND TOWER OWNER.

7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

8. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

9. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

10. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.

11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION, BEFORE SUBMITTING BIDS, TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.

12. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF DISH Wireless L.L.C. AND TOWER OWNER

13. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

14. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

dish wireless.

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9/2/21

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

DRAWN BY:	CHECKED BY:	APPROVED BY:
BLJ	BLJ	JW

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	7/28/21	ISSUED FOR REVIEW
0	9/2/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

149464.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00056A
1662 ROUTE 184
GROTON, CT 06340

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.

2. UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.

3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°f AT TIME OF PLACEMENT.

4. CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER-TO-CEMENT RATIO (W/C) OF 0.45.

5. ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:

#4 BARS AND SMALLER 40 ksi

#5 BARS AND LARGER 60 ksi

6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

- CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3"
- CONCRETE EXPOSED TO EARTH OR WEATHER:
- #6 BARS AND LARGER 2"
- #5 BARS AND SMALLER 1-1/2"
- CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
- SLAB AND WALLS 3/4"
- BEAMS AND COLUMNS 1-1/2"

7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.

2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.

3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.

4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.

4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.

4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.

5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.

6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).

7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.

8. TIE WRAPS ARE NOT ALLOWED.

9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.

10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.

11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.

12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.

13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).

14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.

15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.

16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.

17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.

18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.

19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.

20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.

21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).

22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).

23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER-ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.

24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3 (OR BETTER) FOR EXTERIOR LOCATIONS.

25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.

26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.

27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR DISH Wireless L.L.C. AND TOWER OWNER BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.

28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.

29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "DISH Wireless L.L.C.".

30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

dish wireless.

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9/2/21

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Expires 2/10/22

DRAWN BY:	CHECKED BY:	APPROVED BY:
BLJ	BLJ	JW

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	7/28/21	ISSUED FOR REVIEW
0	9/2/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

149464.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00056A
1662 ROUTE 184
GROTON, CT 06340

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-3

GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

2. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

3. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.

4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.

7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.

8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.

11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.

13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.

14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.

15. APPROVED ANTIOXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.

17. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

18. BOND ALL METALLIC OBJECTS WITHIN 6 ft OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.

19. GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.

20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON-METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).

21. BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY). DO NOT ATTACH GROUNDING TO FIRE SPRINKLER SYSTEM PIPES.

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Expires 2/10/22

DRAWN BY:	CHECKED BY:	APPROVED BY:
BLJ	BLJ	JW

RFDS REV #: 0

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	7/28/21	ISSUED FOR REVIEW
0	9/2/21	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

149464.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00056A
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SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4