Northeast Site Solutions
Denise Sabo
4 Angela's Way, Burlington CT 06013
denise@northeastsitesolutions.com

October 8, 2021

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

RE: Tower Share Application
473 Denslow Hill Road, Hamden, CT 06514
Latitude: 41.3773
Longitude: - 72.9277
Site# BOHVN00194A

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 473 Denslow Hill Road, Hamden, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/19005G MHz antenna and six (6) RRUs, at the 185 foot level of the existing 200 foot monopole , one (1) Fiber cables will also be installed. Dish Wireless LLC equipment cabinets will be placed within 7x5 lease area. Included are plans by Infinigy, dated September 29, 2021 Exhibit C. Also included is a structural analysis prepared by Vertical Bridge Engineering, LLC, dated May 24, 2021, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. This facility was originally approved by the Planning and Zoning Commission town of Hamden, Special Permit 00-910, on December 12, 2000. Please see attached Exhibit A.

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 Curt Leng Mayor for the Town of Hamden, Brack Poitier, Chair Planning and Zoning Commission for the Town of Hamden, as well as the property owner Vertical Bridge AM II and Vertical Bridge REIT, LLC tower owner.

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 modifications will not result in an increase in the height of the existing structure. The top of the tower is 200-feet; Dish Wireless LLC proposed antennas will be located at a center line height of 185-feet.

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

3.The proposed modification will not increase the 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.

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Turnkey Wireless Development

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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 density of 2.85% as evidenced by Exhibit F.

Connecticut General Statutes 16-50-aa 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 in Exhibit D.

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 Manchester. 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 Authorization is included as Exhibit G, 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 155-foot level of the existing 625-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 F, 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 Authorization has been provided by the owner to assist Dish Wireless LLC with this tower share 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 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 Manchester.

Sincerely,

Denise Sabo

Denise Sabo
Mobile: 203-435-3640
Fax: 413-521-0558
Office: Angela's Way, Burlington CT 06013
Email: denise@northeastsitesolutions.com

Attachments
Cc: Curt Leng
Mayor
Town of Hamden
Hamden Government Center
2750 Dixwell Avenue
Hamden, CT 06518

Brack Poitier, Chair
Planning and Zoning Commission
Town of Hamden
Memorial Town Hall
2372 Whitney Avenue
Legislative Council Chambers
Hamden, CT 06518

Vertical Bridge AM II (Property Owner)
750 Park of Commerce Drive, Suite 200
Boca Ratan, FL 33487

Vertical Bridge, REIT, LLC, Tower Owner

Exhibit A

Original Facility Approval

TOWN OF HAMDEN
PLANNING & ZONING DEPARTMENT
2372 Whitney Avenue
Hamden, CT 06518
Telephone (203) 287-2592

MINUTES: The Planning and Zoning Commission, Town of Hamden, held a Public Hearing and Regular Meeting on Tuesday, December 12, 2000 at 7:30 p.m. in the Council Chambers, Memorial Town Hall. The following issues were discussed:

Commissioners in Attendance:	Mr. Roscow
	Mr. Sims
	Mr. McDonagh
	Mr. Pappas
	Mr. DelVecchio
Mr. DelVecchio	
	Mr. Crocco
Staff in Attendance:	Mr. O'Brien, Town Planner
	Mr. Lee, Assistant Town Attorney
	Ms. Raccio, Court Reporting Monitor
	Ms. Mana, Commission Clerk

Mr. Crocco called the meeting to order at 7:30 p.m. Ms. Mana read the Public Hearing announcement into the record. Mr. Crocco introduced the panel and explained the procedures for the evening.

A. PUBLIC HEARING

1. Special Permit /WS 00-908
1049-1051 Dixwell Avenue
General Repair/Used Car Sales
SLH Investors, Inc., Trustees
George Scarvales, Applicant
Continued January 9, 2000

2. Special Permit 00-910
473 Denslow Hill Road
Replacement of two Radio Towers.
Joseph Rubertone, Agent for Quinnipiac University/Applicant

Bernard Pellegrino approaches and introduces himself and Joseph Rubertone, Howard Pfrommer, Ray Andjursen and Cliff Mills. Mr. Pellegrino states that the property is located at 473 Denslow Hill Rd. 12-acre site with a 40-yr. old antenna in disrepair, and also an operations center, where electronic equipment is stored. Project is to remove /demolish two antenna and replace with brand new antenna in exact same place 205 ft. high. Also street side improvements including repairing eroded curb cuts, repave etc. Mr. Pellegrino shows pictures of eroding antennas. Severed metal in some places is unsafe. Bulbs cannot be replaced because no one will climb the towers. Applicant has already received wetlands approval. Zoning Board of Appeals gave four variances. Existing towers are non-conforming. Main issue is 200-ft. high tower within 165 ft. from property line, could be a problem if they fell. The nearest home is 245 feet, so there is no problem, how can we assure they don't fall-We have added an extra guy wire in the center at 60 ft. from the ground. The added guy wire would snap the tower off at 60 ft. if it doesn't hold the tower up. Height of towers is 5 ft. higher but is regulated by the FCC for transmission and licensing purposes. Application also meets special permit requirements, and is in the best interest of public safety. Metal tower poles are solid not hollow like current.

Mr. Crocco states that he was at wetlands meeting and notes the wetlands commission indicated some change in setbacks that in turn went to the Zoning Board of appeals. Howard Pfrommer of Nathan Jacobsen Engineers approaches, and states that improvements include paving in front of house. Towers are located east and west. Closest house is 220 ft. if towers failed they would not leave the property. Range fence would be erected during the work. Cliff Mills engineer for the radio station states that WQUN has a pattern to protect other stations in other states. Tower needs to be aligned and erected to 205 ft. high to accomplish the correct transmission. He compares PCS antenna to an am radio antenna. Actual tower is higher because of antenna as opposed to PCS, which is mounted onto a

structure. He refers to map lines and ground wires, which will be reattached. Mr. McDonagh asks about safety of electrical grounding. Mr. Mills states that 120 copper wires extend from tower that are approximately one foot underground, this is the best grounding system you can have. Voltage build up gets shunted into ground system. Mr. McDonagh asks how it is dissipated once in the ground-? Mr Mills states through the copper wires. Mr. Mills states that there is also a lightning rod. Mr. McDonagh asks if there is any theoretical way a charge can go to the house through septic, well etc. and asks if he thinks it is a concern? Mr. Mills states no. Mr. Crocco asks if the wires are straight? Mr. Mills states yes. Mr. Roscow asks if there is fencing around the tower? Mr. Mills states no, that there are wood fences around towers, and they would like to add peripheral fencing as well. Mr. Roscow asks if the guy wires should be fenced to avoid trespassers? Mr. Crocco states that it will be similar to WELI. Mr. Pappas states that it is quite isolated.

Mr. Andrusen approaches and states that he is the operations manager, and has a radio show. States that it is an informational CBS affiliate with a weather reporting system, and has won awards in public service etc. Local community events are a large part of station as well as having Quinnipiac student interns. The station is committed to the Town of Hamden.

Mr. Pellegrino states that they have increased inspection time for 6 months as opposed to 1 year, to maintain the towers. Mr. Crocco asks if there are any comments from commissioners or public? Mr. O'Brien asks if they could file a maintenance plan with the town along with the inspection reports. Answer:yes. Mr. Crocco closes public Hearing for this Special Permit at 8:15 p.m.

3. **Special Permit 00-913**
   215 Sherman/Kenwood R-4
   26,378 sq. ft. site.
   Proposed addition to office building in a residential zone.
   VIN Group, LLC, Owner/Applicant
   POSTPONED (Later withdrawn)

4. **Special Permit 00-916**
   900 Whitney Avenue
   Demolition and on site crushing of existing structure.

Whitney Water Authority Treatment Plant
South Central Connecticut Regional Water Authority, Owner/Applicant

Mr. Peter Gaiewski, Engineer for Regional Water Authority approaches and states intentions to demolish and crush stone and debris on site, using a crusher. This is the most sensitive type of demolition because it will eliminate traffic from trucks, better dust control and the reuse of materials. They have worked with neighbors and held meetings. Eli Whitney Museum also agreed. Tighe-Bond will speak more. He states they will install a wall to keep noise down 200,000 s.f of crushing, M-F 8:00-4:30 p.m. no holidays. Dust and emissions will not be a problem; Contractor will have departmental certification. Materials will be wetted down prior to demolition. Crusher is about as loud as a garbage truck when standing next to it. Contractor will be required to keep all machinery in good shape no blasting. Jan.-April project will be complete. Crushed materials will be recycled for drainage. This is a RWA project and will have on site inspectors from the Regional Water Authority as well as neighborhood representatives. Mark Sullivan from Tighe-Bond hands out packets states that project is necessary to restore the building, and that crushing is the best way. He has video to address crushing and posters to outline. Crushing is a process to break up materials and pass through screen to make consistent size, if too big it's recrushed. The procedure is as follows:

1. Pile is put into hopper, then crusher, which is enclosed in metal. Then screened, then goes to stockpile or secondary crusher. Mr. Sullivan states that rebar used in the original project was the first of its kind used in the State, and is unlike any rebar used today. Noise with crusher comes from screen-vibration on conveyor, and from the diesel motors used in crusher. Refers to crushing video. Material can be 4-6 ft. long and 1 ft. thick to avoid small breakage noise. He also points out electromagnet that lifts material. Conveyor will have rubber neoprene covering as well as having a noise wall.

Mr. Crocco states that this video shows a larger site than proposed. Mr. Sullivan states-yes it is a large asphalt batch plant, and he also states that material will be moistened there are misters in the crushers and anywhere that there could be dust. This video doesn't have misters-this is the worst case scenario. Video shows end product. Mr. Crocco asks if they could point out exits and entrances on site plan. Mr. Sullivan shows plans to access the site through existing access off Whitney Avenue that passes by the Eli Whitney barn. He states that they

will install a new base for the road, not paved, there will no access off Edgehill or Armory. Perimeter fence will be installed on temporary basis for life of construction.

The South side of the site is totally walled. 10-15 ft. from the wall will be a snow fence. On the East Side there is chain link fence on Whitney side- a standard 6 ft. chain link fence. There is a gate on the West Side and one on the access rd and just north of the third gate the fence changes to slatted chain link fence to protect the barns vision. Near Armory the fence changes to a noise fence. Pressure treated plywood with a 2x4 structure inside it. Mr. O'Brien states that the fence is permanent but temporary, because it is coming down after the project is complete. Mr. Sullivan states that yes, it's coming down. Mr Crocco asks if any trees are coming down? Mr. Sullivan states no. Stockpiling will be near crusher to help reduce sound. Final grading plan is semi depressed because of runoff. A detention basin has been proposed to allow a place for run off running south or east. At end of demolition all disturbed areas will be hydroseeded and mulched. Mr. Crocco states that because of crushing you are eliminating some time to complete. Mr. Sullivan states yes, but it is more environmentally sound. Mr. McDonagh asks about stockpiling- how long will it be up before it is reused. Mr. Sullivan states that in the building contract the road is one of the first projects-700 cubic yards will go quickly in about a month. The remaining cubic yards will be used for fill under the building. Mr. Gaiewski states that it will be there about 1 yr. or 1.5 years. The fence will be up the whole time. Mr. McDonagh asks if material is not all concrete what will happen to it? Mr. Sullivan states that the majority of it is concrete and the other materials will be removed from the site, such as wood. Mr. McDonagh asks if the concrete contains asbestos? Mr. Sullivan states that concrete was cleaner then than it is now. Mr. McDonagh asks when is blasting if at all? Mr. Gaiewski states that it is possible that blasting will occur. Mr. Roscow asks if bricks will be crushed? Mr. Sullivan states yes. Mr. Roscow asks if this project will begin in January? My concern is that operation will exceed time frame, when windows are shut. Mr. Gaiewski states that they targeted this time frame for this reason, so that windows are shut to cut down on noise and dust.

Mr. Roscow asks if they anticipate sedimentary rock? Mr.Sullivan states that the Regional Water Authority did boring tests until they hit refusal, the engineers are not sure exactly what type of rock there is. Mr. Roscow asks if

they don't know this could impact the time frame. Mr. Crocco asks if they can report what the concrete contains? Mr. Mike Madelme approaches as health engineer, and states that it is not typical to test for asbestos because it was not known to contain asbestos at the time it was built.

Mr. Piscitelli asks how many people will be working at the site and what type of traffic impact there is? Mr. Sullivan states that there is not enough traffic for a traffic light, which is governed. Efforts are being made to look into possible installation of one. The number of workman the site is estimated to be 10-20 workman per day, 30 at the most. Mr. Crocco asks if the Armory entrance will be blocked off? Mr. Sullivan states-yes. The only access is by Whitney Ave. Mr. Crocco asks if there will be a policeman at the intersection of Whitney and Armory? Mr. Sullivan states -yes Mr. Pappas asks about trucks entering the project. Mr. Sullivan states that there will be approximately 6 truck trips a day. Mr. Crocco asks if anyone has any comments? Mary Beth Pannoni, approaches and asks about the greenhouse workers-are we concerned with the noise for them? Mr. Gaiewski states that noise levels because of elevation have a natural sound barrier. He feels it will be limited. Mr. Bill Brown from the Eli Whitney Museum approaches and states that he is in favor of crushing, there will be less trucks and it will e more considerate to the public. Mr. Dan Carpenter approaches and states he lives near the site on Armory Street, and is concerned about traffic, he is relieved that truck traffic will be on Whitney and is pleased that environmental issues are favorable. He strongly supports crushing. Mr. Pappas asks Mr. Gaiewski if employees on the site will have off street parking? Mr. Gaiewski states that during demolition the parking will be on site. They are still working on perhaps having a shuttle. Mr. O'Brien states that conditions could be placed if the commission wants to approve. Mr. Gaewski states that there are approximately 20 truckloads to haul the wood. Mr. Crocco closes this Public Hearing at 9:24 p.m.

5. WS 00-917
   2 Sherman Way M-1
   Self Storage, Warehouse/Outside storage/Office
   William Copeland/Owner/Applicant

Mr Crocco asks if there is a map problem. Mr. O'Brien states that the wetlands map is different from the map that was submitted to the Planning and Zoning Commission. Mr. Gordon Bilides introduces himself and Mr. William Copeland, applicant, and states that they have already gone before the Wetland Commission. Mr Lee states that Mr. O'Brien is not comfortable with the 2 maps and has not had time to review them. Mr. Bilides states that they withdrew the initial application in March and incorporated the Town Planner and the Town Engineers comments to the new application, and he changed the date on the map. Mr. O'Brien states that the map approved by the Wetlands Commission is dated differently. Mr. Bilides states that he could show all revisions are shown on current map dated November 13. Mr. Bilides states that he would like to proceed for the applicant, it is a mixed use for a business and storage.

Mr. Lee states that Mr. Bilides should make his presentation. Mr. Bilides states that commission maps and the map that he has are the same as the map submitted to Wetlands and was revised 3-4 times. Mr. O'Brien states that his 2nd objection is that the Planning and Zoning commission indicated some changes in driveway, and that the map does not show a change such as that. Mr. Bilides notes that the driveway is shown in the drawing. Mr. DelVecchio asks Mr. Bilides to show them on their map where the buildings and driveways are; they seem to be different. Mr. Bilides states that traffic is minimum in a storage facility. Mr. Crocco asks what the difference between wetlands map and current map. Mr. Bilides states that he has placed the buildings in a different position and have extended the retaining wall. He points out the various areas of storage and rental areas. Mr. DelVecchio asks if this is the same application as the outdoor storage-which is not allowed? Mr. O'Brien states that this site has been illegal and has had a number of Cease and Desists on the property over the years. Mr. Copeland approaches and states that he has made all the town required changes. Mr. O'Brien states that there has never been outdoor storage approval. Mr. McDonagh states that the plan has all the activity on the south side of the property with parking on the East Side. It appears that too much is going on at this site. Construction equipment, storage, etc. Mr. Bilides states that they have 40% of coverage if they want it, and they are only using 15%. Mr. DelVecchio states that you have heavy equipment and passenger size cars using the same access, and he feels this is a danger to the public. Mr. Bilides states that the timing for the trucks is different from the Public coming to the storage facility. Mr. McDonagh asks if this were a normal proposal there are separate uses for this property. Mr. Roscow states that this is a Special Permit

not a Site Plan. He states that the problem is that this is permanent permit if the property is sold. There would have to be so many restrictions, he would never approve this project as is. Mr. DelVecchio states that their recommendation was to eliminate one of the buildings. Mr. Crocco states that the Public Hearing will be continued to January 2001

Amendment to Final Development Plan P.U.D. No.1
Known as 714,760,782 Mix Avenue.
Reduction of units from 267 to 169
760 Mix Limited Partnership/Property Owner/John Acampora/Applicant
POSTPONED

B Regular Meeting

Mr. Crocco asks that we add an item to our agenda-
C.G.S. 8-24 Review No. 00-185
a. Bear Path School Improvements/Kirk Rd. Town of Hamden
Mr. DelVecchio motios, Mr. McDonagh seconds. Mr. O'Brien hands out maps for expansion to Bear Path School. This has to come back as a Special Permit, but the Mayor would like to approve now so they can sell the financing note and hire the architect.Mr. McDonagh motions to approve, Mr. Sims seconds
RECOMMENDED APPROVAL UNANIMOUS TO LEGISLATIVE COUNCIL.

b. Farmington Canal-Phase II

Farmington Canal
Mr. Schaeffer approaches and states that they have the same project that was approved earlier, but time limit for Zoning Permit expired. They would like to have the same plan approved. Mr. McDermott, Vice President of Milone and MacBroom approaches and states the plan that is proposed shows trail layout and states that the route layout is the same, and they would like to have an extension. Mr.Roscow asks if they are using the railroad bridge? Mr. McDermott states-no they will have a ramp behind Red Lobster. Mr. Roscow states that other bridges have been blocked off and nothing has ever been done to avoid rocks falling from this bridge onto the

road. Mr. Crocco asks about putting a fence up. He recommends bringing this up at the Farmington Canal Commission meeting. Mr. DelVecchio moves to grant an extension from July 1, 2001 to July 30, 2003. Mr. Pappas seconds.

UNANIMOUS

1 Special Permit WS 00-908
1049-1051 Dixwell Avenue
General Repair/Used Car Sales
SLH Investors Properties
First Business Investors, Inc., Trustee
George Searvales/Applicant
PUBLIC HEARING CONTINUED

2 Special Permit 00-910
473 Denslow Hill Road
Replacement of two Radio Towers
Joseph Rubertone, Agent for Quinnipiac University/Applicant
Mr. Roscow motions to approve, Mr. Pappas seconds. Mr. DelVecchio adds that Town Engineer comments be included. Mr. O'Brien states that new guy wires be included in plan. Mr. Roscow wants someone to verify that the tower will snap at 60 ft. should other wires go. Inspection and maintenance plan should be recorded on Town records.
Unanimous

3. **Special Permit 00-913**
215 Sherman/Kenwood R-4
Proposed addition to office building in a residential zone.
VIN Group, LLC/Owner/Applicant
POSTPONED (LATER WITHDRAWN)

4. **Special Permit 00-916**

900 Whitney Avenue
Demolition and on site crushing of existing structure
Whitney Water Authority Treatment Plant
South Central Connecticut Regional Water Authority,
Owner Applicant.

Mr. Pappas asks that provisions be made for on site parking for workers, and that a policeman be in place during heavy traffic hrs. Mr Roscow asks that they specify traffic control. Mr. Pappas asks for the Mr O'Brien's response. Mr. O'Brien states that he attended Regional Water Authority meetings and provided. The following conditions will be added to approval

1. Install a 10 foot tall sound attenuation wall along Edgehill Road and Armory Street.

2. Crushing equipment operation will be restricted to Monday through Friday between the hours of 8 a.m. to 4:30 p.m.

3. Regional Water Authority will provide notification to abutting residential property owners.

4. The crushing equipment will be set back an appropriate distance from adjacent dwellings.

5. Regional Water Authority will take appropriate measures to prevent the operation from adversely impacting the ecosystem or habitat of Long Island Sound.

6. Regional Water Authority will require Contractor to submit a Connecticut DEP Bureau of Air Management Permit for the crushing equipment, and the crushing equipment must adhere to DEP Regulations pertaining to dust control.

   The material to be crushed shall be clean and wetted prior to processing. Use and maintenance of shrouding will be required for the crushing equipment to further prevent dust emissions.

7. The Contractor will be required to keep all of his equipment tuned and

well maintained to avoid unnecessary noise and air pollutant emissions

8. The Regional Water Authority will provide inspection of the project with a project field representative.

9. Crushing equipment will have misters to keep the material wetted

10. Limited to four months for on-site crushing.

11. No parking on side streets. Off street parking will be prohibited

12. Traffic police-provided

    8-9 a.m.
    4-6 p.m. (peak)

13. Test for components in cement.

14. Post Bond estimated by Applicant and approved by Town Planner and Town Engineer.

Mr. DelVecchio motions to approve with conditions, Mr. Roscow seconds.
APPROVED WITH CONDITIONS
UNANIMOUS

5. **Special Permit 00-917**
   2 Sherman Way M-1
   Self Storage Warehouse/Outside Storage/Office
   William Copeland/Applicant
   CONTINUED UNTIL JANUARY

6. **Amendment to Final Plan P.U.D. No. 1**
   Known as 714,760,782 Mix Avenue
   Reduction in units from 267 to 169

760 Mix Limited Partnership/Owner
John Acampora/Applicant
POSTPONED

7. Special Permit WS 00-900
Overlook Drive
Lots 26, 27, 28
Bond Release $61,334.00
Released by Stephen Burt
Burt Processing Equipment.
Postponed to complete the work.
Mr. DelVecchio motions to postpone to January, 2001,
Mr. Pappas seconds.
POSTPONED UNANIMOUS

9. Minor Amendment to Special Permit 72-68
New number Special Permit 00-918
2080 Whitney Avenue
Proposed Site Improvements.
Twenty-Eighty Limited Partnership, Owner/Applicant
INFORMATIONAL ONLY

10. Special Permit 87-409
27 Connolly Parkway
Administrative Bond Release $2,948.00
Requested by Louis Vidala
INFORMATIONAL ONLY

11. **Hamden Hills Development.**
Discussion of outstanding planning issues:
Mr. Lee states that maintenance agreements are being revised by Bernie Pellegrino for his review.

Subdiv. 94-1139 Chatterton Woods
Progress Report/Bond Call
Bernard Barnett, President

Fieldbrook Corp
Mr. O'Brien states that work was completed-bridge was widened

Quinnipiac University
Discussion of outstanding planning issues
Mr. O'Brien states that there are unresolved issues regarding enrollment and cease and desists.
Mr. Lee states that he spoke to the Quinnipiac Attorney about regulations. The regulations state that 4 or more students constitutes a rooming house, only allowed in a certain area, not the residential area where they have purchased homes. Mr. O'Brien states that they have been acting on complaints. Mr. DelVecchio states that he is concerned that Quinnipiac University may feel targeted. Mr. O'Brien states that the houses were targeted because Quinnipiac University came to get zoning permits on these houses. Next year they will not allow seniors to live on campus, which will have to find off campus housing. Mr. Roscow states that the students are parking all over New Rd. and it poses a hazard. Mr. Crocco states that he had Chief Nolan put up a speeding radar sign on the south side of New Rd.

Mr. McDonagh motioned Mr. Pappas seconded to close meeting 11:00 p.m.

Minutes submitted by:

Amanda Mana

NOTICE OF SPECIAL PERMIT
TOWN OF HAMDEN
PLANNING AND ZONING COMMISSION

SPECIAL PERMIT NO. 00-910

The Hamden Planning and Zoning Commission hereby gives notice of a Special Permit in accordance with the Hamden Zoning Regulations to permit the following use: Replacement of two radio towers

at the following location: 473 Denslow Hill Road
Hamden, CT.

Property owned by: Quinnipiac University
275 Mt. Carmel Avenue
Hamden, CT. 06518

This Special Permit was granted at its meeting of December 12, 2000.

Maps prepared by J. Howard Pfrommer and dated July 13, 2001.

Dated this 10th **day of** September **, 2001.**

Planning and Zoning Commission
Town of Hamden

By: [signature]
Town Planner

Received for record SEP 10 2001
at 3 h 55 m PM at Hamden, CT
Vera A. Morrison
Hamden Town Clerk

Exhibit B

Property Card

473 DENSLOW HILL RD

Location	473 DENSLOW HILL RD	**Mblu**	2626/ 112/ / /
Acct#	100203	**Owner**	VERTICAL BRIDGE AM II
Assessment	$218,890	**Appraisal**	$312,700
PID	100203	**Building Count**	1

Current Value

Appraisal					
Valuation Year	**Building**	**Extra Features**	**Outbuildings**	**Land**	**Total**
2020	$118,300	$0	$1,200	$193,200	$312,700
Assessment					
Valuation Year	**Building**	**Extra Features**	**Outbuildings**	**Land**	**Total**
2020	$82,810	$0	$840	$135,240	$218,890

Owner of Record

Owner	VERTICAL BRIDGE AM II	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	750 PARK OF COMMERCE DR STE 2 BOCA RATON, FL 33487	**Book & Page**	4763/0275
		Sale Date	11/19/2020
		Instrument	29

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
VERTICAL BRIDGE AM II	$0		4763/0275	29	11/19/2020
QUINNIPIAC UNIVERSITY	$387,500		1857/0322	00	06/17/1999
STERLING CHARLES 55% &	$0		1857/0319	29	06/17/1999
STERLING CHARLES 55%&SACHS	$0		1795/0319	29	11/19/1998
STERLING CHARLES 55%+SACHS	$10,000		1604/0307	29	10/15/1996

Building Information

Building 1 : Section 1

Year Built: 1966

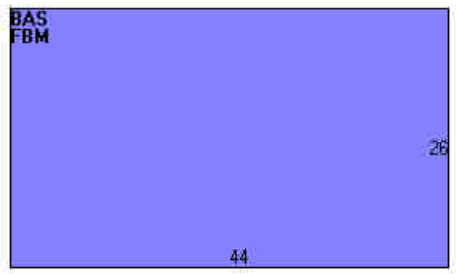
Building Photo

Living Area: 1,144
Building Percent Good: 62

Building Attributes	
Field	**Description**
Style:	Office Bldg
Model	Comm/Ind
Grade	C -
Stories:	1
Occupancy	1.00
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Asphalt
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Carpet
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Forced Air-Duc
AC Type	Central
Struct Class	
Bldg Use	PVT UNIV M94
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	904C
Heat/AC	HEAT/AC SPLIT
Frame Type	WOOD FRAME
Baths/Plumbing	AVERAGE
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	AVERAGE
Wall Height	8.00
% Comn Wall	0.00


(http://images.vgsi.com/photos/HamdenCTPhotos/\00\02\77\33.jpg)

Building Layout



(http://images.vgsi.com/photos/HamdenCTPhotos//Sketches/100203_2082

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	1,144	1,144
FBM	Basement, Finished	1,144	0
		2,288	1,144

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	904C
Description	PVT UNIV M94
Zone	R3
Neighborhood	100
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	12.27
Frontage	
Depth	
Assessed Value	$135,240
Appraised Value	$193,200

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV1	PAVING-ASPHALT			1080.00 S.F.	$1,200	1

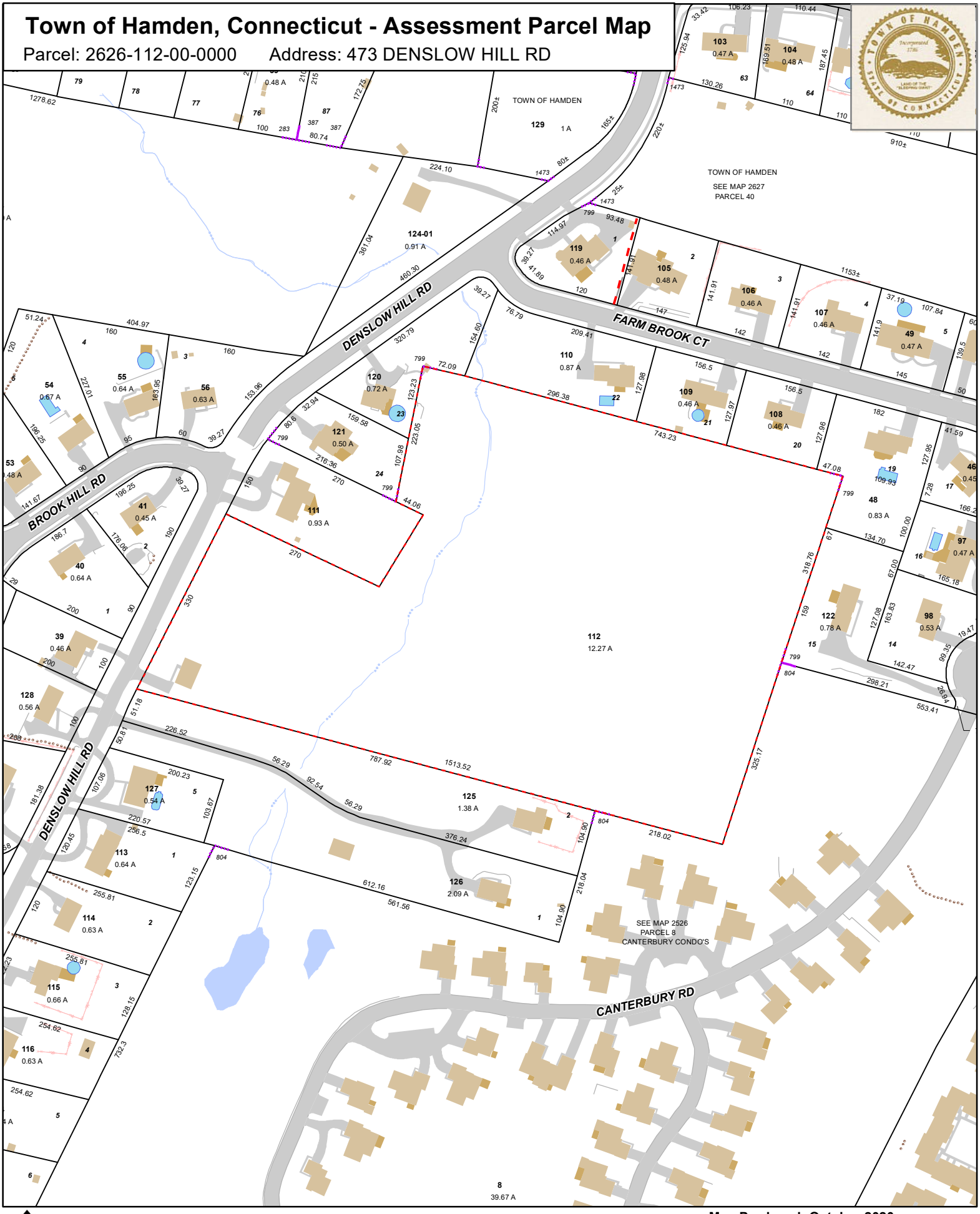
Valuation History

Appraisal					
Valuation Year	**Building**	**Extra Features**	**Outbuildings**	**Land**	**Total**
2019	$108,900	$0	$700	$250,200	$359,800
2018	$108,900	$0	$700	$250,200	$359,800
2017	$108,900	$0	$700	$250,200	$359,800

Assessment					
Valuation Year	**Building**	**Extra Features**	**Outbuildings**	**Land**	**Total**
2019	$76,230	$0	$490	$175,140	$251,860
2018	$76,230	$0	$490	$175,140	$251,860
2017	$76,230	$0	$490	$175,140	$251,860

Town of Hamden, Connecticut - Assessment Parcel Map

Parcel: 2626-112-00-0000 Address: 473 DENSLOW HILL RD



Approximate Scale: **1 inch = 200 feet**

0 100 200 300 400 Feet

Map Produced: October 2020

Disclaimer: This map is for informational purposes only. All information is subject to verification by any user. The Town of Hamden and its mapping contractors assume no legal responsibility for the information contained herein.

Exhibit C

Construction Drawings

DISH Wireless L.L.C. SITE ID:

BOHVN00194A

DISH Wireless L.L.C. SITE ADDRESS:

473 DENSLOW HILL ROAD
HAMDEN, CT 06514

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
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
RF-2	RF PLUMBING DIAGRAM
GN-1	LEGEND AND ABBREVIATIONS
GN-2	GENERAL NOTES
GN-3	GENERAL NOTES
GN-4	GENERAL NOTES

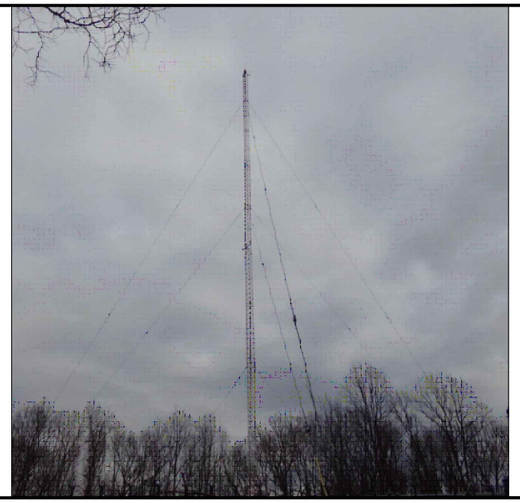
SCOPE OF WORK

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 (3) PROPOSED ANTENNA MOUNTS (1 PER SECTOR)
- 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 SAFETY SWITCH (IF REQUIRED)
- INSTALL (1) PROPOSED CIENA BOX (IF REQUIRED)
- INSTALL (1) PROPOSED METER SOCKET

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:	VERTICAL BRIDGE
ADDRESS:	DENSLOW HILL RD HAMDEN, CT 06514
TOWER TYPE:	GUYED
TOWER CO SITE ID:	US-CT-5014
TOWER APP NUMBER:	TBD
COUNTY:	NEW HAVEN
LATITUDE (NAD 83):	41° 22' 38.3" N 41.3773 N
LONGITUDE (NAD 83):	-72° 55' 39.7" W -72.9277 W
ZONING JURISDICTION:	CONNECTICUT SITING COUNCIL
ZONING DISTRICT:	CA PDO
PARCEL NUMBER:	2077-17-4-29-001
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	V-B
POWER COMPANY:	EVERSOURCE
TELEPHONE COMPANY:	AT&T

PROJECT DIRECTORY

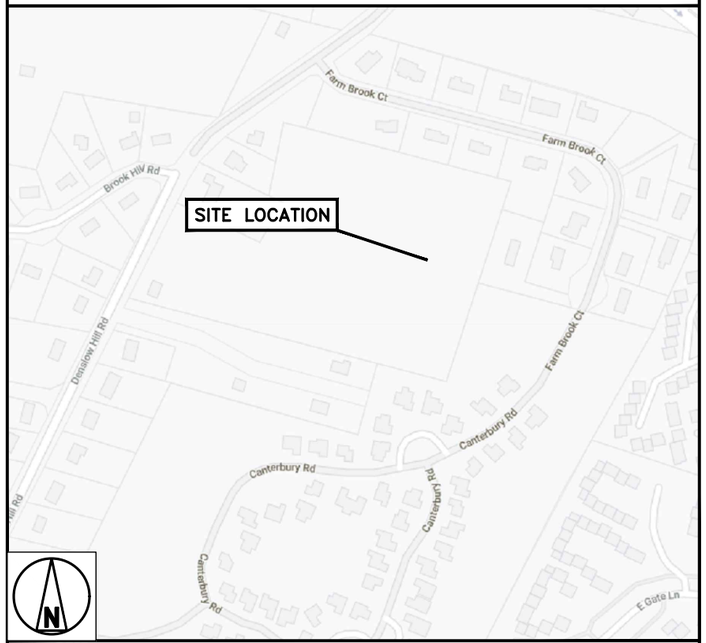
APPLICANT:	DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	VERTICAL BRIDGE 750 PARK OF COMMERCE DRIVE BOCA RATON, FLORIDA 33487 (561) 948-6367
SITE DESIGNER:	INFINIGY 1033 WATERVLIET SHAKER RD ALBANY, NY 12205 (518) 690-0790
SITE ACQUISITION:	MATT BANDLE TBD
CONSTRUCTION MANAGER:	JAVIER SOTO TBD
RF ENGINEER:	BOSSENER CHARLES

DIRECTIONS

DIRECTIONS FROM TWEED NEW HAVEN AIRPORT:

DEPART AND HEAD (NORTHEAST), TURN LEFT AVIS RENT A CAR ON THE CORNER TURN RIGHT
TURN RIGHT TOWARD FORT HALE RD, BUDGET CAR RENTAL ON THE CORNER, KEEP STRAIGHT TO GET ONTO FORT HALE RD, TURN RIGHT ONTO CT-337 / TOWNSEND AVE, TURN LEFT ONTO MAIN STREET ANNEX
TAKE THE RAMP ON THE RIGHT FOR I-95 S / GOVERNOR JOHN DAVIS LODGE TPKE S, TAKE THE RAMP ON THE RIGHT FOR I-91 NORTH AND HEAD TOWARD DOWNTOWN NEW HAVEN / HARTFORD
AT EXIT 6, HEAD ON THE RAMP LEFT AND FOLLOW SIGNS FOR BLATCHLEY AVE / WILLOW ST, TURN RIGHT ONTO WILLOW ST, TURN RIGHT ONTO MITCHELL DR, ROAD NAME CHANGES TO COLD SPRING ST, TURN RIGHT ONTO WHITNEY AVE, TURN LEFT ONTO SKIFF ST, ROAD NAME CHANGES TO SKIFF STREET EXT, KEEP STRAIGHT TO GET ONTO HOWARD DR, TURN LEFT ONTO DENSLOW HILL ROAD EXT, ROAD NAME CHANGES TO DENSLOW HILL ROAD EXT, TURN LEFT ONTO FARM BROOK CT, ARRIVE AT, 473 DENSLOW HILL ROAD, HAMDEN, CT 06514.

VICINITY MAP



NO SCALE

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STATE OF CONNECTICUT
TSUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
9/29/2021

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	9/24/2021	ISSUED FOR PERMIT

A&E PROJECT NUMBER
1197-F0001-C

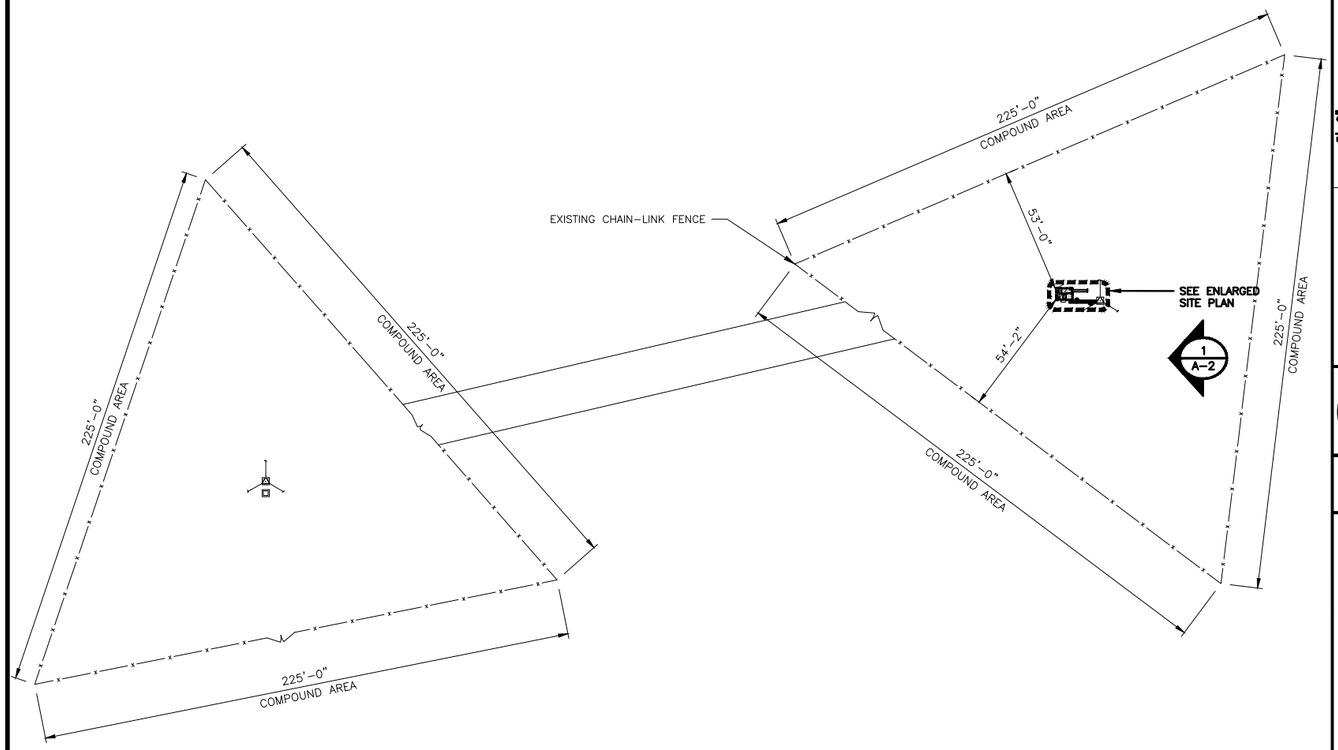
DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00194A
TBD
473 DENSLOW HILL ROAD
HAMDEN, CT 06514

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

NOTES

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



COMPOUND PLAN

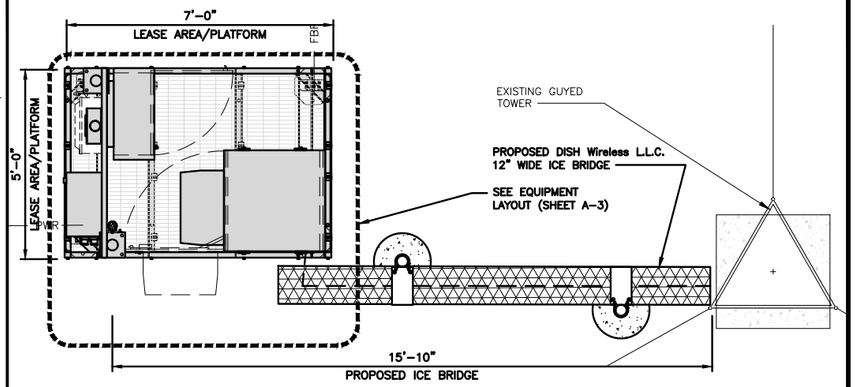
32' 24'16' 8' 0 32' 64'

1/32"=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.

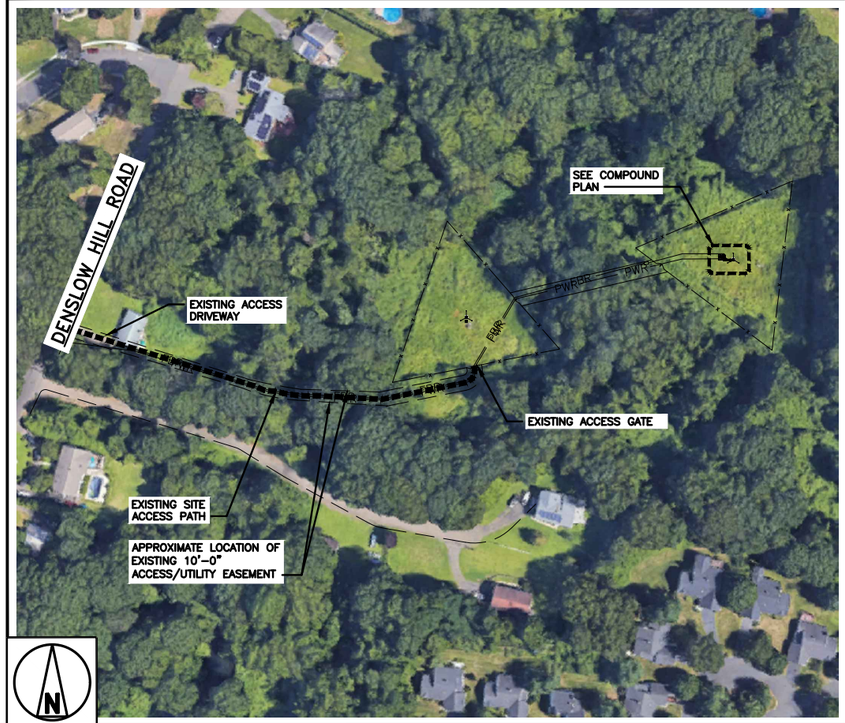


ENLARGED SITE PLAN

12" 6" 0 1' 2' 3' 4' 5'

1/2"=1'-0"

2



SITE PLAN

100' 50' 0 100' 200'

1"=100'

3

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STATE OF CONNECTICUT
KAZUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER

9/29/2021

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

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REV	DATE	DESCRIPTION
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A&E PROJECT NUMBER

1197-F0001-C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00194A
TBD
473 DENSLOW HILL ROAD
HAMDEN, CT 06514

SHEET TITLE

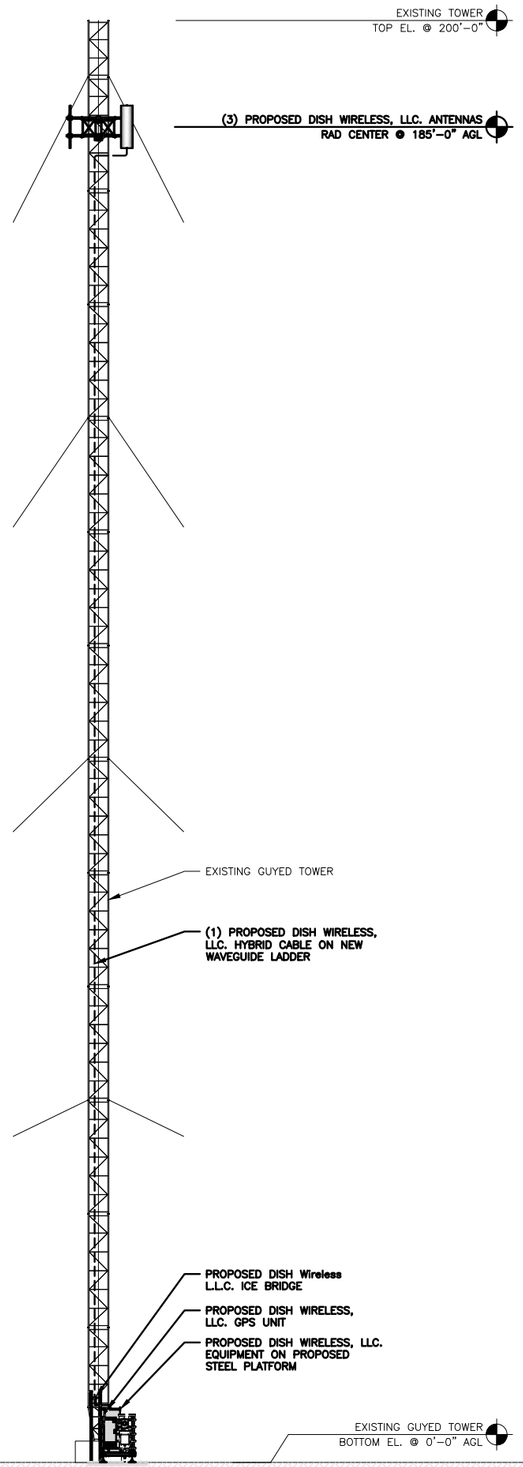
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

A-1

NOTES

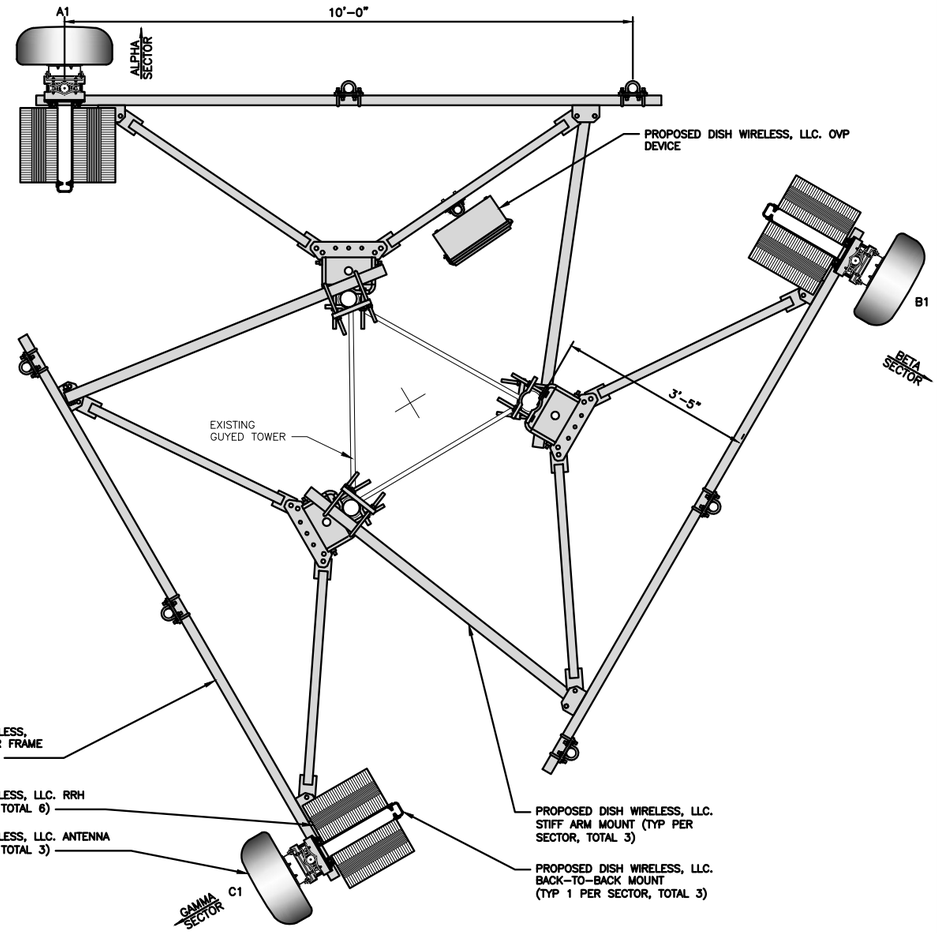
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.
4. BASED ON THE MOUNT ANALYSIS COMPLETED BY INFINIGY DATED 08/03/2021. THE EXISTING ANTENNA MOUNTS ARE CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT CONFIGURATION
5. FOR ADDITIONAL TOWER STRUCTURAL INFORMATION SEE STRUCTURAL ANALYSIS COMPLETED BY VERTICAL BRIDGE DATED: 05/24/21



PROPOSED EAST ELEVATION

12' 8' 4' 0 10' 20'
3/32"=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)	AZMUITH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	UMA WIRELESS – MX08FRO665-20	5G	72.0" x 20.0"	0°	185'-0"	(1) HIGH-CAPACITY HYBRID CABLE (215' LONG)
BETA	B1	PROPOSED	UMA WIRELESS – MX08FRO665-20	5G	72.0" x 20.0"	120°	185'-0"	
GAMMA	C1	PROPOSED	UMA WIRELESS – MX08FRO665-20	5G	72.0" x 20.0"	240°	185'-0"	

NOTES

1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS.
2. ANTENNA OR 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.

SECTOR	POSITION	RRH	
		MANUFACTURER – MODEL NUMBER	TECHNOLOGY
ALPHA	A1	FUJITSU – TA08025-B604	5G
BETA	B1	FUJITSU – TA08025-B604	5G
GAMMA	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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STATE OF CONNECTICUT
YUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
9/29/2021

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
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A&E PROJECT NUMBER

1197-F0001-C

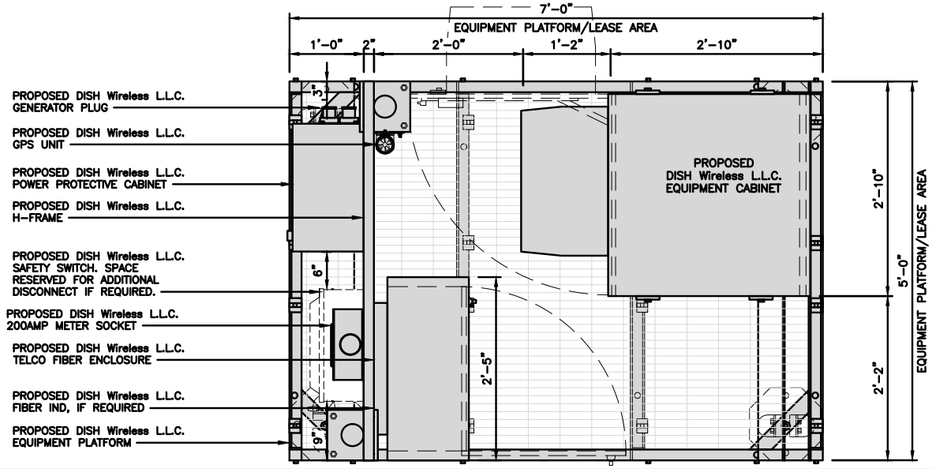
DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00194A
TBD
473 DENSLOW HILL ROAD
HAMDEN, CT 06514

SHEET TITLE

ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER

A-2



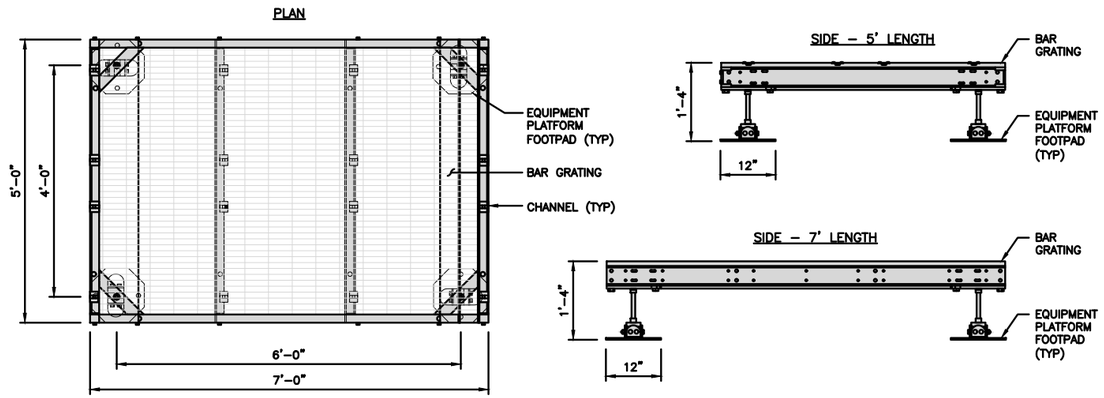
PLATFORM EQUIPMENT PLAN

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

1

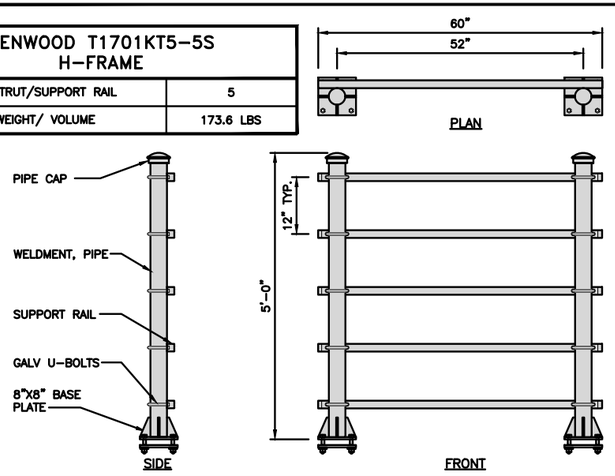
COMMSCOPE MTC4045LP 5X7 PLATFORM	
DIMENSIONS (HxWxD)	16"x84"x60"
TOTAL WEIGHT	423 LBS

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



PLATFORM DETAIL | NO SCALE | 2

KENWOOD T1701KT5-5S H-FRAME	
UNISTRUT/SUPPORT RAIL	5
WEIGHT/ VOLUME	173.6 LBS

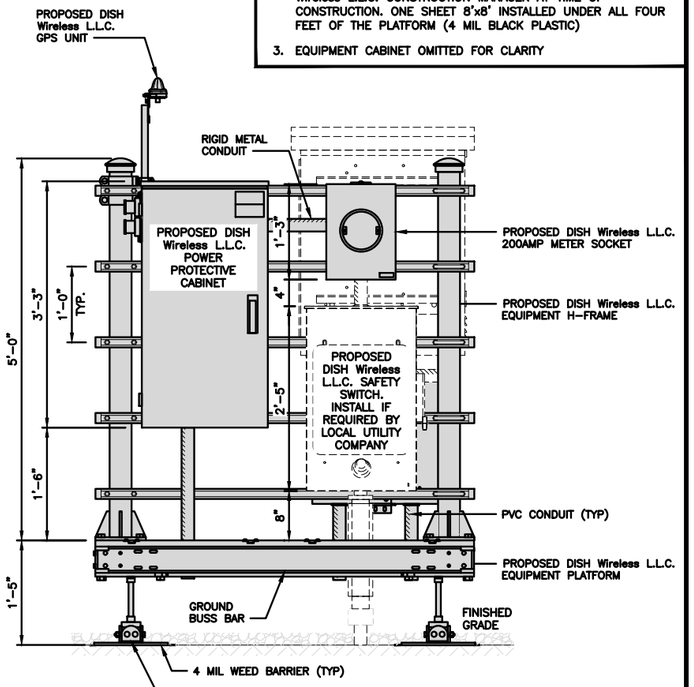


H-FRAME DETAIL | NO SCALE | 3

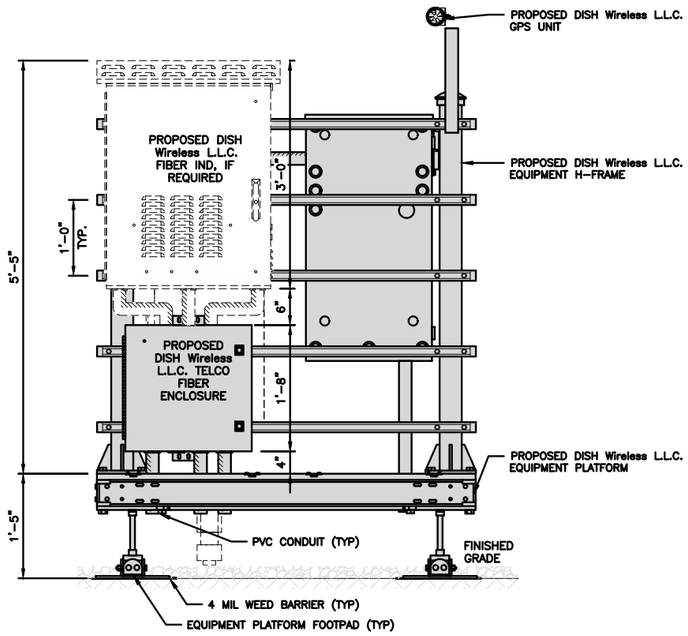
NOT USED | NO SCALE | 4

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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RFDS REV #: 1

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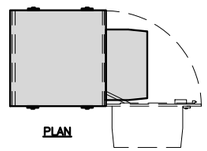
DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00194A
TBD
473 DENSLOW HILL ROAD
HAMDEN, CT 06514

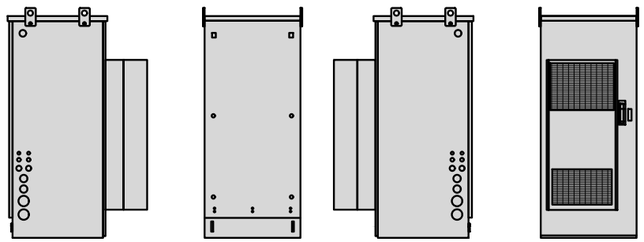
SHEET TITLE
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER
A-3

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



PLAN

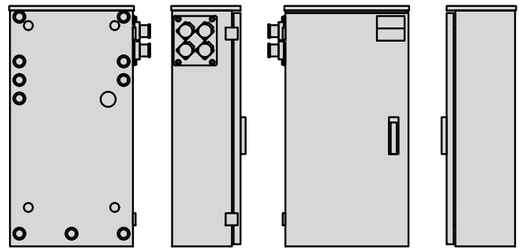


SIDE BACK SIDE FRONT

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

TOP

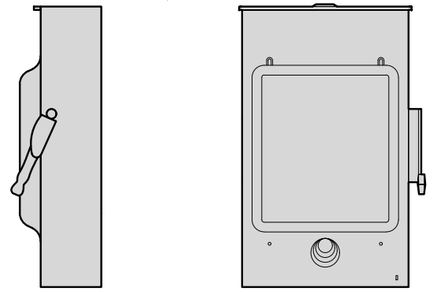


BACK SIDE FRONT SIDE

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

SQUARE D SAFETY SWITCHES D224NRB	
ENCLOSURE DIM (HxWxD)	29.25"x19.00"x8.50"
ENCLOSURE TYPE	NEMA 3R RAINPROOF
UL LISTED	FILE E–2875

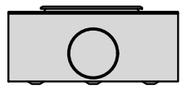
TOP



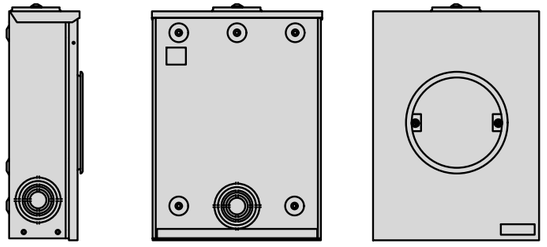
SIDE FRONT

SAFETY SWITCH DETAIL | NO SCALE | 3

EATON METER SOCKET UNRRS213BEUSE	
METER SOCKET TYPE	RING
ENCLOSURE DIM (HxWxD)	16"x12"x6"
MAIN AMPERE RATING	200A
WEIGHT	18 LBS



PLAN

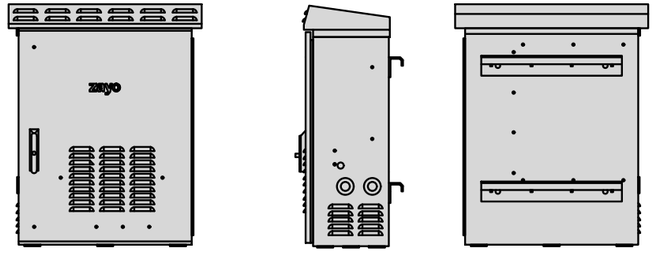


SIDE BACK FRONT

METER SOCKET DETAIL | NO SCALE | 4

ZAYO 5RU CABINET ("LIT" SITES)	
DIMENSIONS (HxWxD)	36.115"x29"x12.9"
WEIGHT	85 LBS
POWER INPUT	20A, –48VDC

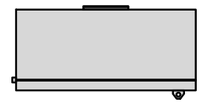
PLAN



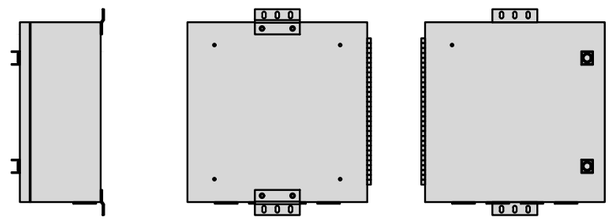
FRONT SIDE BACK

NETWORK INTERFACE UNIT 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



FRONT

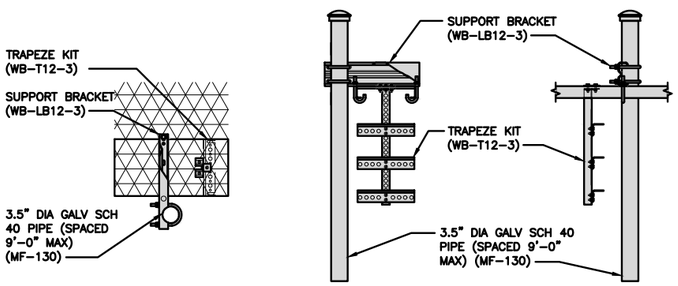


SIDE BACK FRONT

FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

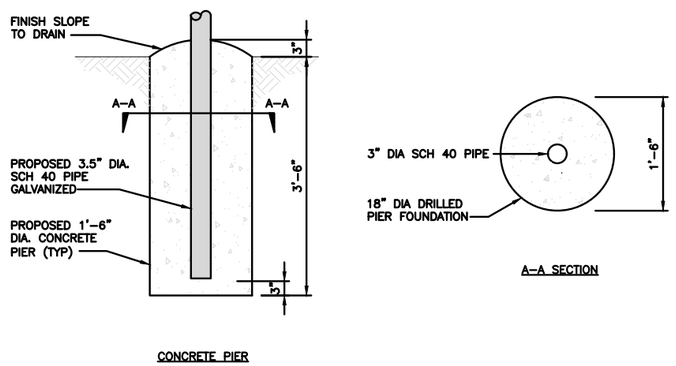
COMMSCOPE WB–K110–B WAVEGUIDE BRIDGE KIT	
DIMENSIONS (HxL)	160"x10'
WEIGHT/ VOLUME	325.0 LBS
CABLE RUN (QTY)	12

INCLUDED PRODUCTS:	
	WB–T12–3 TRAPEZE KIT, 3 RUNGS
	WB–LB12–3 SUPPORT BRACKET
	MF–130 DIRECT BURIAL PIPE COLUMN, 13'–4"



PLAN FRONT SIDE

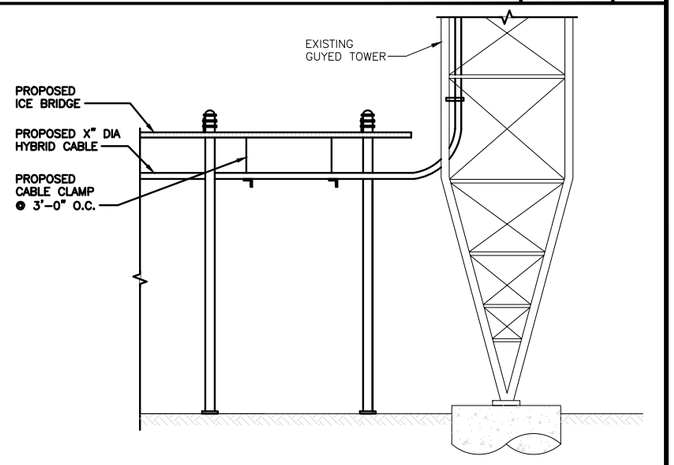
ICE BRIDGE DETAIL | NO SCALE | 7



CONCRETE PIER

A–A SECTION

TYPICAL ICE BRIDGE CONCRETE PIER DETAIL | NO SCALE | 8



HYBRID CABLE RUN | NO SCALE | 9

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STATE OF CONNECTICUT
RUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
9/29/2021

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	9/24/2021	ISSUED FOR PERMIT

A&E PROJECT NUMBER

1197–F0001–C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00194A
TBD
473 DENSLOW HILL ROAD
HAMDEN, CT 06514

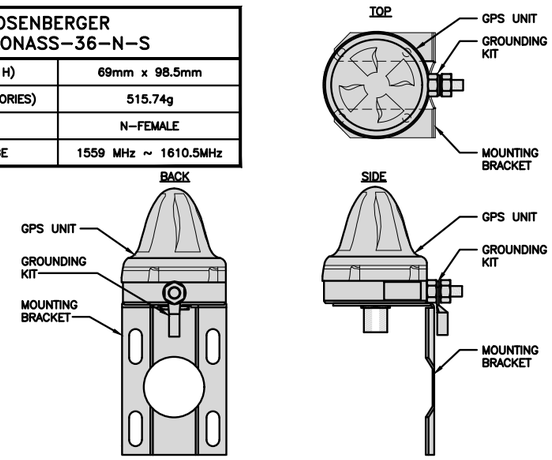
SHEET TITLE

EQUIPMENT DETAILS

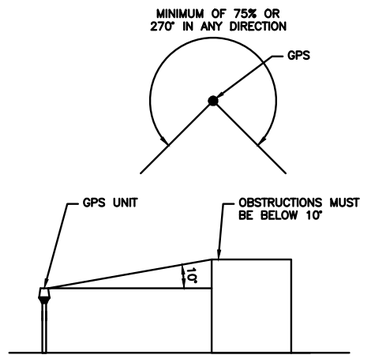
SHEET NUMBER

A-4

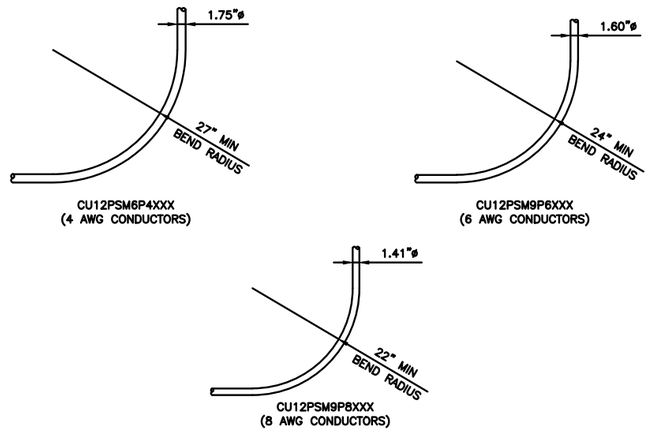
ROSENBERGER GPSGLONASS-36-N-S	
DIMENSION (DIA x H)	69mm x 98.5mm
WEIGHT (WITH ACCESSORIES)	515.74g
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1559 MHz ~ 1610.5MHz



GPS ANTENNA 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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RCD	SS	CJW

RFDS REV #: 1

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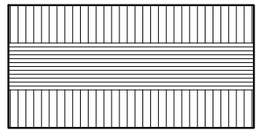
DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00194A
TBD
473 DENSLOW HILL ROAD
HAMDEN, CT 06514

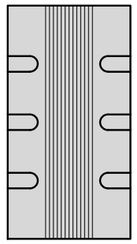
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

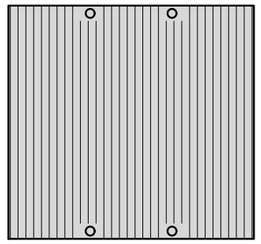
FUJITSU TA08025-B604 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x200/14.9"x15.7"x7.8"
WEIGHT(KG,LB)/ VOLUME	29kg,63.9lb/ 30L
POWER SUPPLY	DC-58~-36V



PLAN



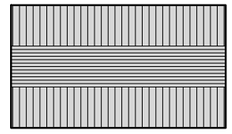
SIDE



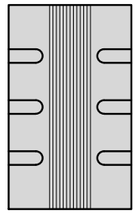
FRONT

REMOTE RADIO HEAD DETAIL | NO SCALE | 1

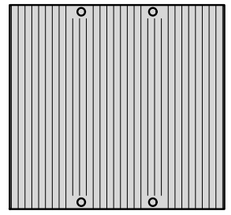
FUJITSU TA08025-B605 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x230/14.9"x15.7"x9.0"
WEIGHT(KG,LB)/ VOLUME	34kg,74.9lb/ 35L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE

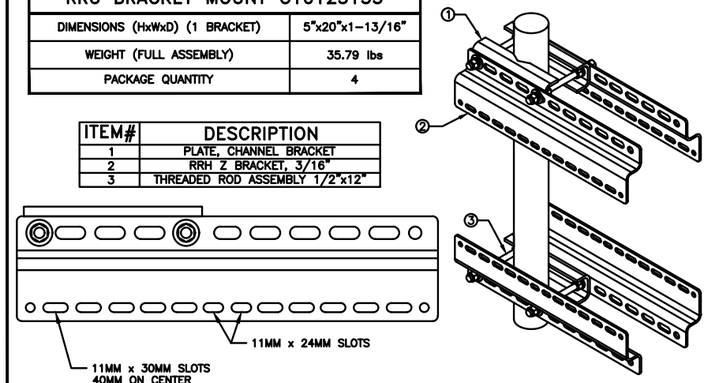


FRONT

REMOTE RADIO HEAD DETAIL | NO SCALE | 2

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

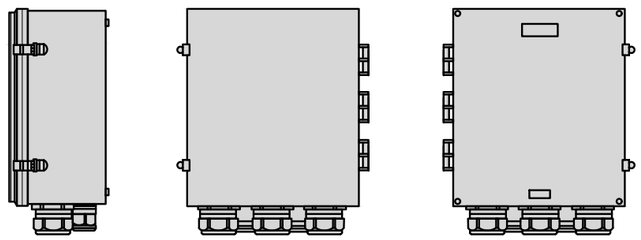
ITEM#	DESCRIPTION
1	PLATE, CHANNEL BRACKET
2	RRH Z BRACKET, 3/16"
3	THREADED ROD ASSEMBLY 1/2"x12"



REMOTE RADIO MOUNT DETAIL | NO SCALE | 3

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

PLAN

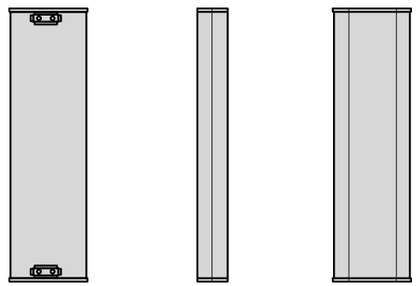


SIDE BACK FRONT

SURGE SUPPRESSION DETAIL | NO SCALE | 4

JMA WIRELESS MX08FRO665-20 ANTENNA	
DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	54 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE

PLAN



BACK SIDE FRONT

NOTES

FINAL ANTENNA SPECIFICATIONS TO BE CONFIRMED BY GC

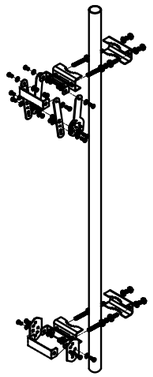
ANTENNA DETAIL | NO SCALE | 5

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

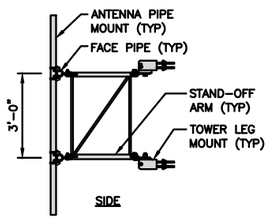
ANTENNA BRACKET NOT PART OF KIT

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

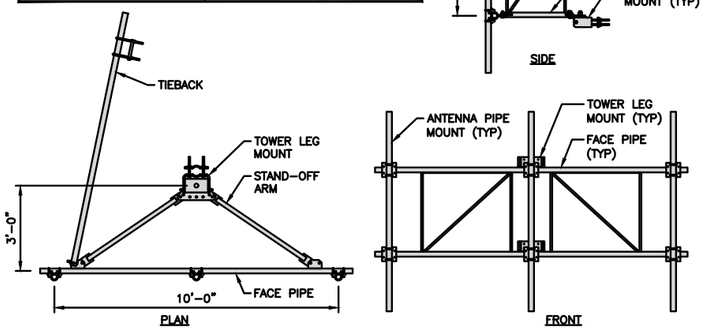


ANTENNA BRACKET DETAIL | NO SCALE | 6

SABRE INDUSTRIES C10837002C-32788 HD V-BOOM ASSEMBLY WITH TIEBACK	
FACE SIZE	10'-0"
WEIGHT	676 LB
TOWER LEG SIZE	1-1/2" TO 5-9/16" DIA ROUND LEG



SIDE



PLAN FRONT

ANTENNA FRAME DETAIL | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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RUHEI SAKAMOTO
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9/29/2021

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

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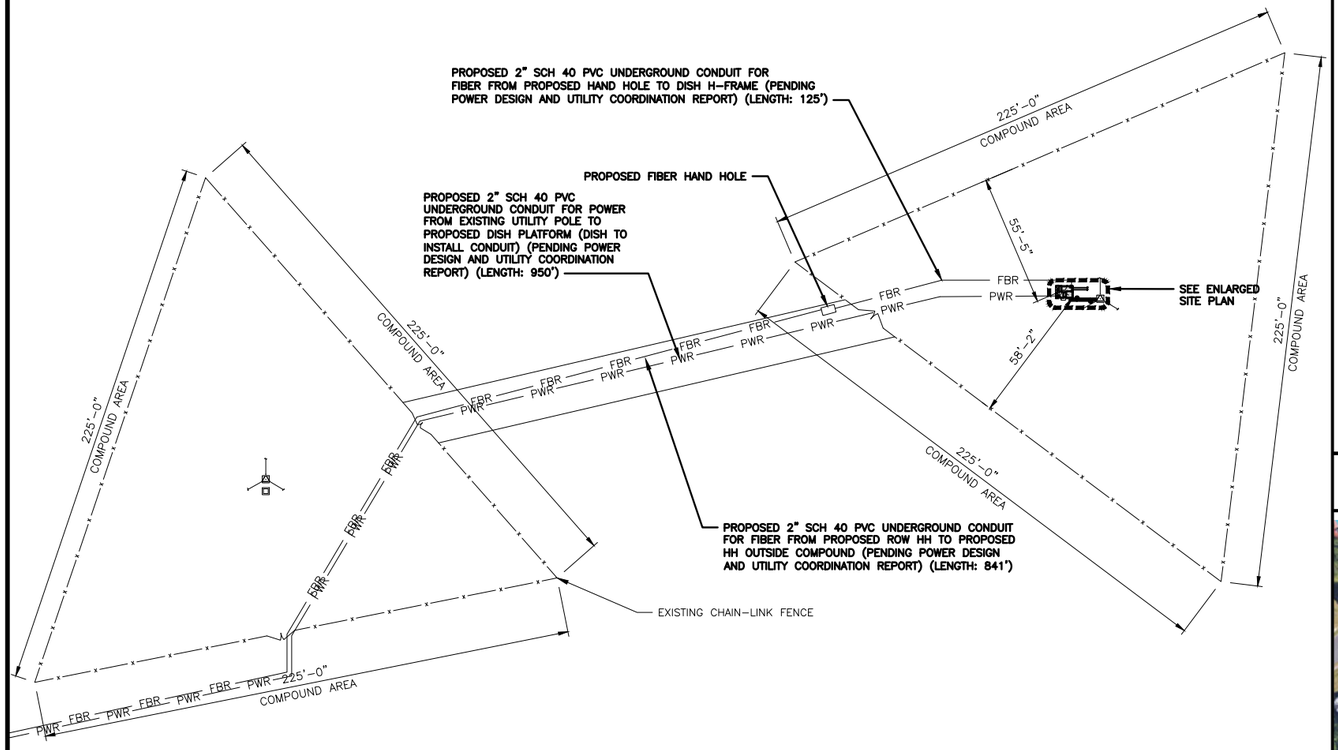
DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00194A
TBD
473 DENSLOW HILL ROAD
HAMDEN, CT 06514

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-6

NOTES

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



UTILITY ROUTE PLAN

32' 24'16' 8' 0 32' 64'
1/32"=1'-0"

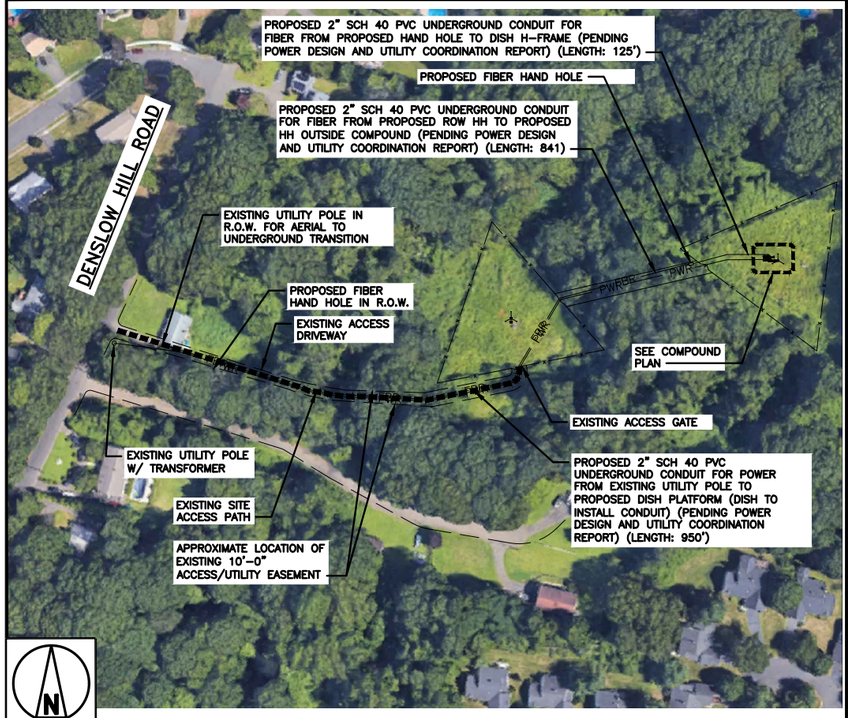
1

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. FIBER ROUTE IS PRELIMINARY, FINAL FIBER ROUTE TO BE DETERMINED ONCE UCR (UTILITY COORDINATION REPORT) HAS BEEN FINALIZED.

ELECTRICAL NOTES

2



OVERALL UTILITY ROUTE PLAN

100' 50' 0 100' 200'
1"=100'

3

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KAZUHEI SAKAMOTO
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DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: 1

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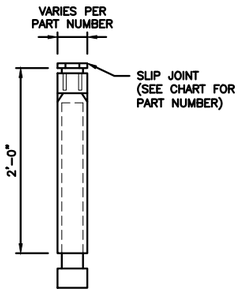
DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00194A
TBD
473 DENSLOW HILL ROAD
HAMDEN, CT 06514

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"

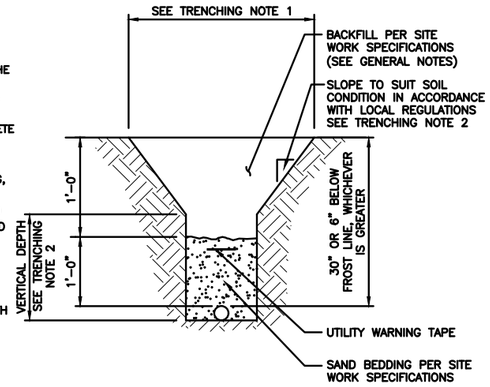


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

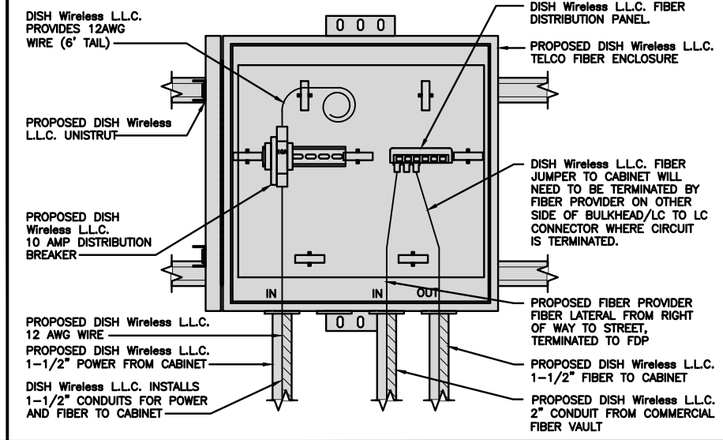
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

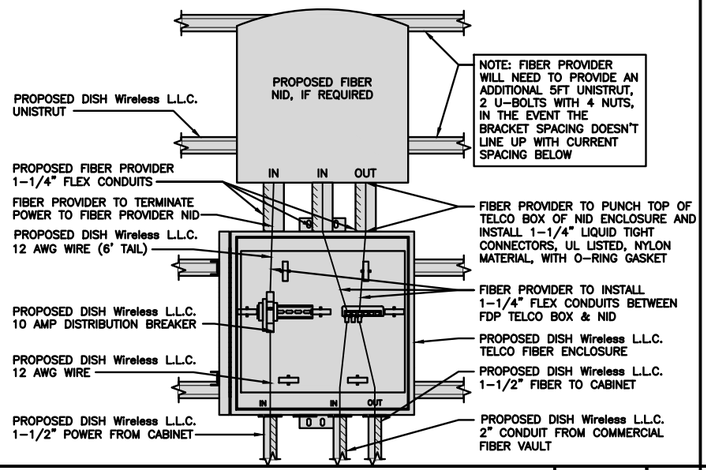
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT 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

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TSUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
9/29/2021

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS

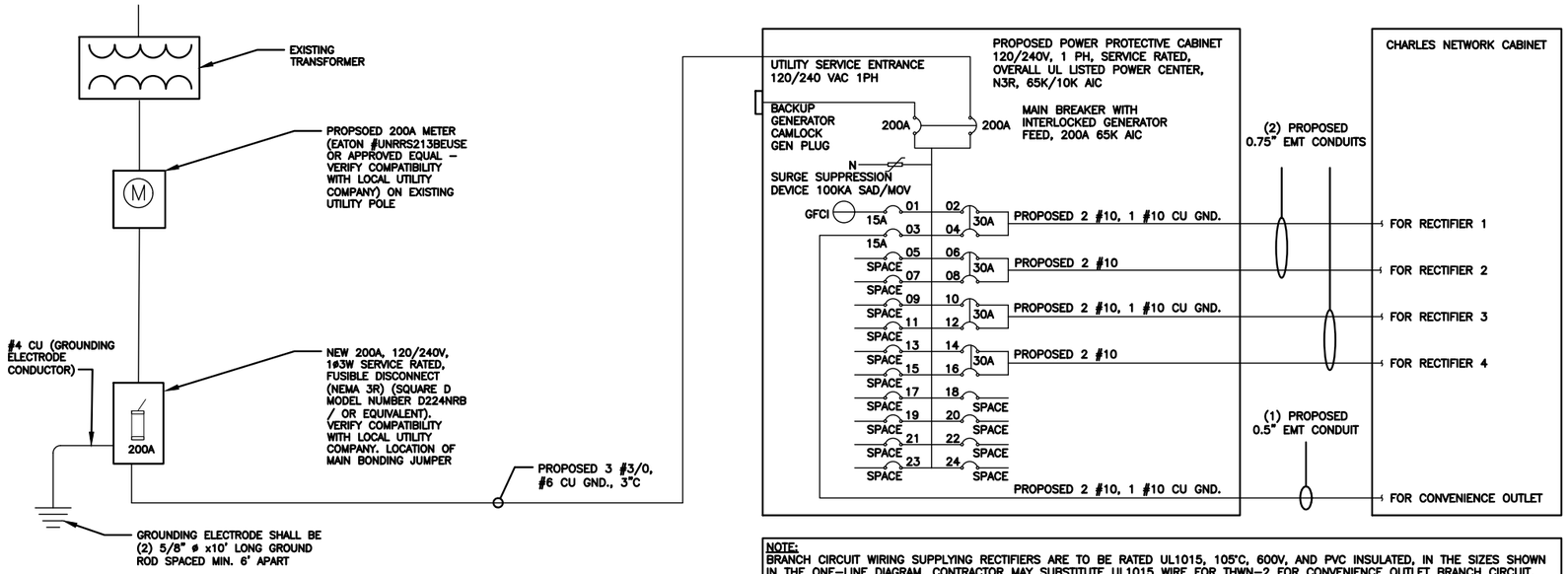
REV	DATE	DESCRIPTION
0	9/24/2021	ISSUED FOR PERMIT

A&E PROJECT NUMBER
1197-F0001-C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00194A
TBD
473 DENSLOW HILL ROAD
HAMDEN, CT 06514

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.

1

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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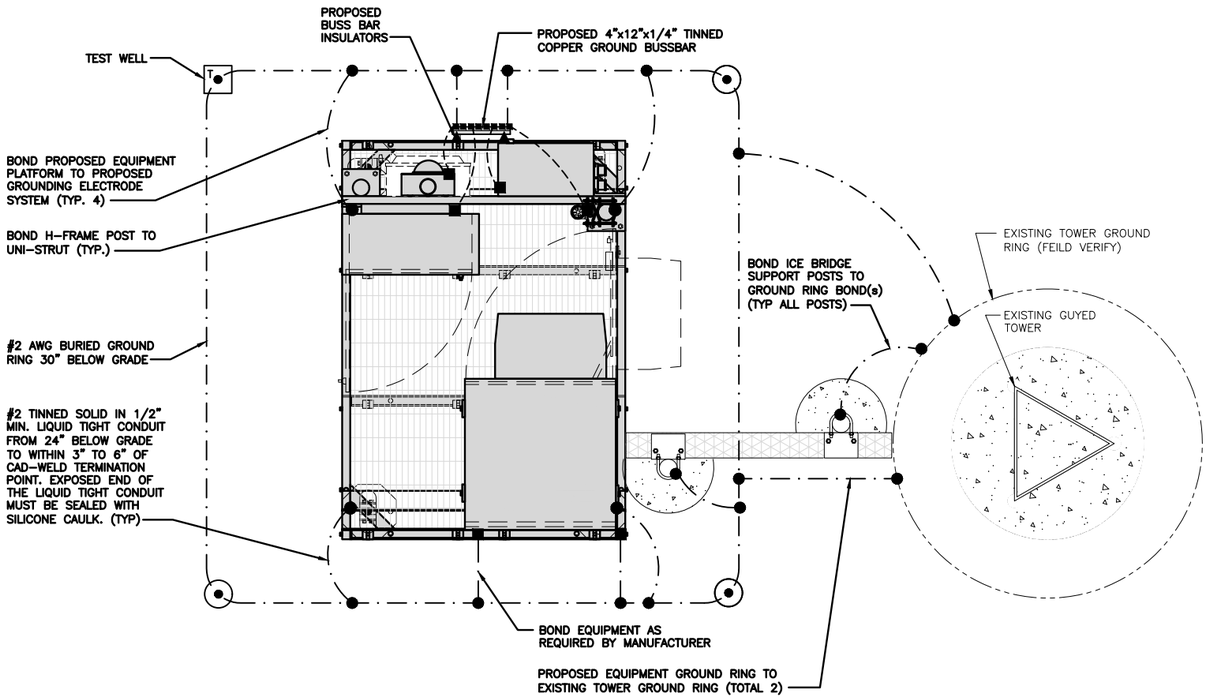
DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00194A
TBD
473 DENSLOW HILL ROAD
HAMDEN, CT 06514

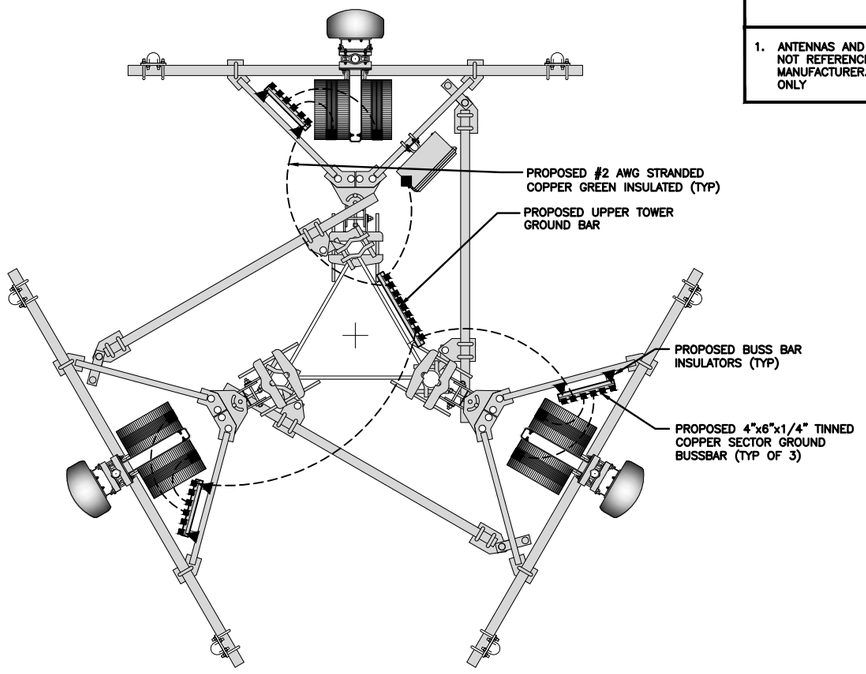
SHEET TITLE
ELECTRICAL ONE–LINE, FAULT CALCS & PANEL SCHEDULE

SHEET NUMBER
E-3



TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE | 1



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE | 2

NOTES

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

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

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.

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

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

(L) 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.

(M) 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.

(N) 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

(P) 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.

(Q) 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

(R) 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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RCD	SS	CJW

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

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A&E PROJECT NUMBER
1197-F0001-C

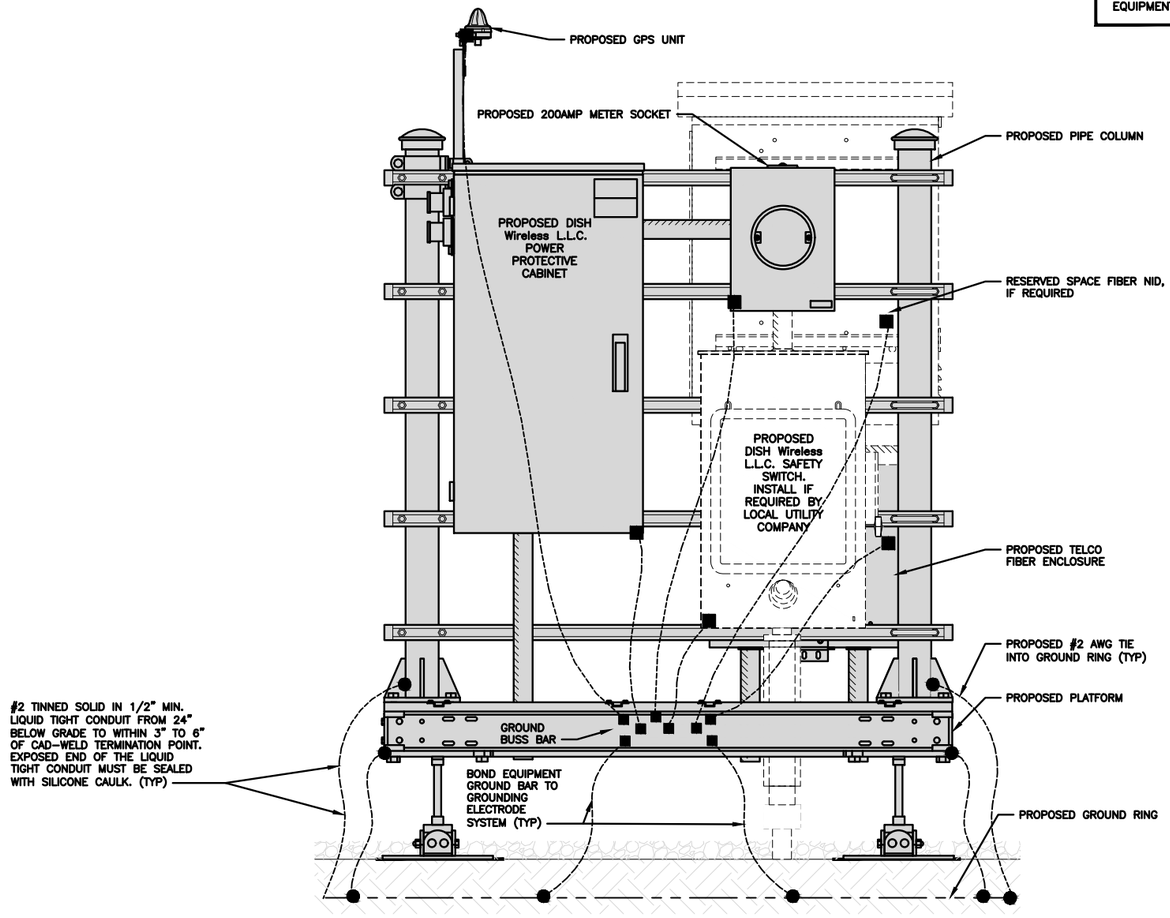
DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00194A
TBD
473 DENSLOW HILL ROAD
HAMDEN, CT 06514

SHEET TITLE
GROUNDING PLANS AND NOTES

SHEET NUMBER
G-1

NOTES

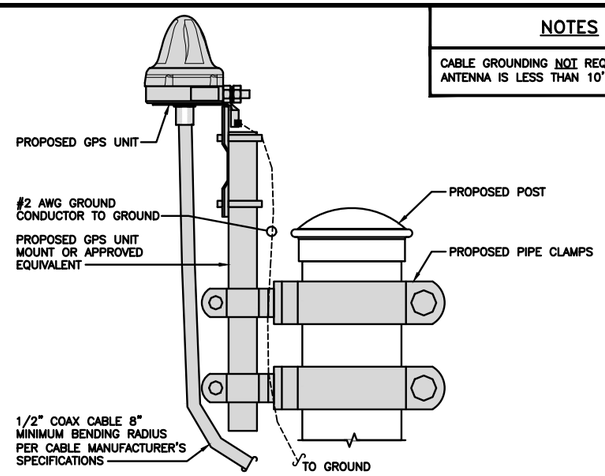
EQUIPMENT CABINET OMITTED FOR CLARITY



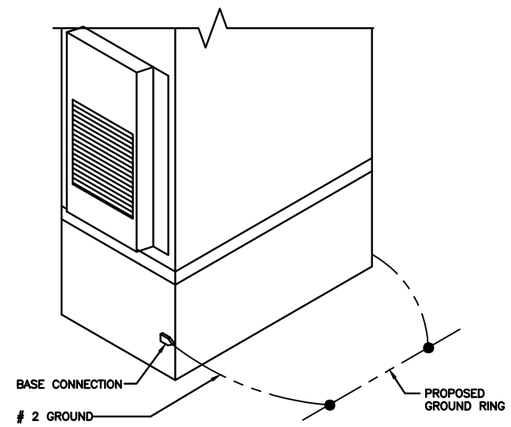
H-FRAME GROUNDING DETAIL | NO SCALE | 1

NOTES

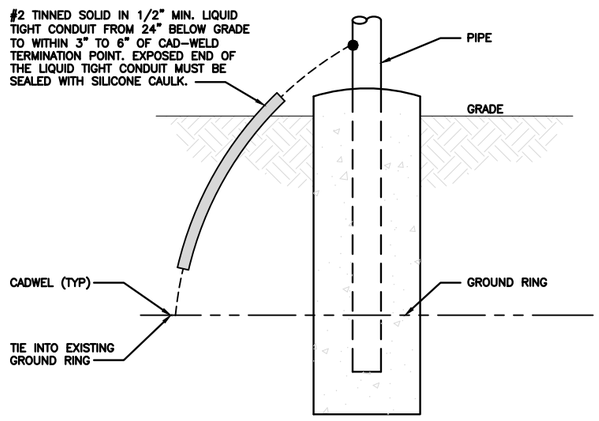
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



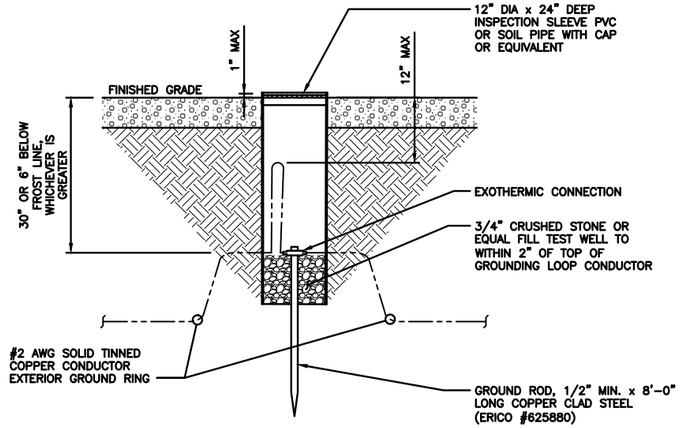
TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



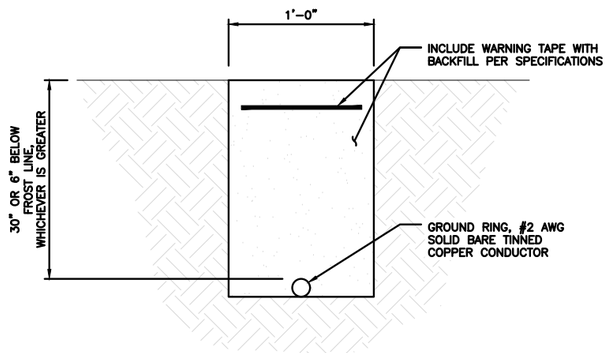
OUTDOOR CABINET GROUNDING | NO SCALE | 3



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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TBD
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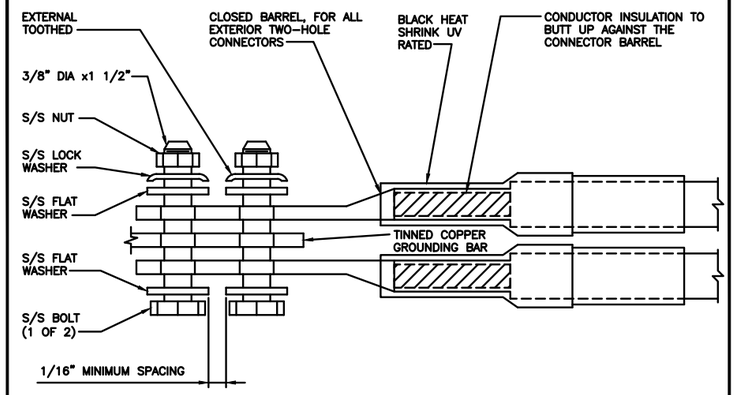
SHEET TITLE
GROUNDING DETAILS

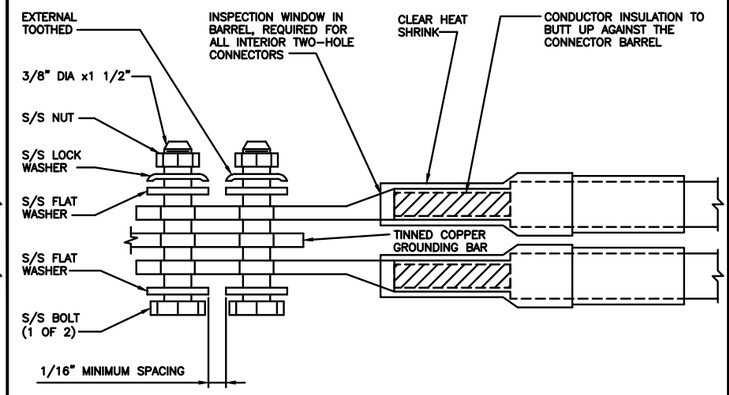
SHEET NUMBER
G-2

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).

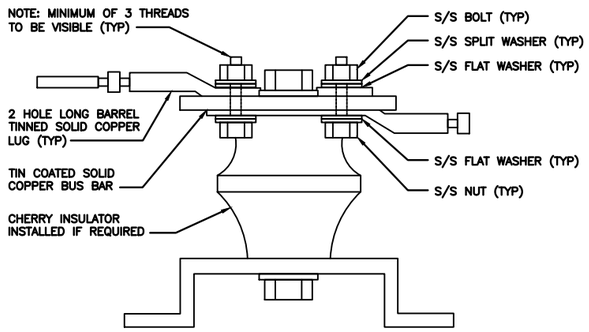
TYPICAL GROUNDING NOTES | NO SCALE | 1



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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HAMDEN, CT 06514

SHEET TITLE
GROUNDING DETAILS

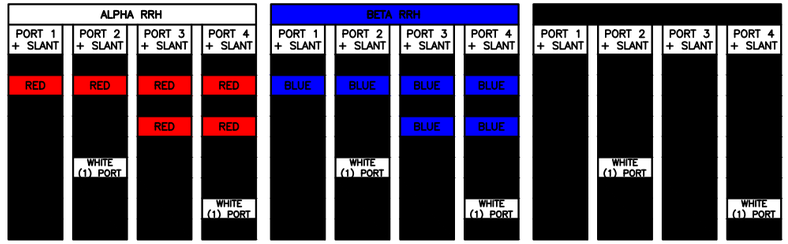
SHEET NUMBER
G-3

RF JUMPER COLOR CODING

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

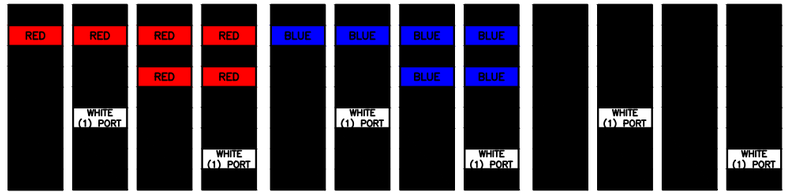
LOW-BAND RRH –
(600MHz N71 BASEBAND) +
(850MHz N26 BAND) +
(700MHz N29 BAND) – OPTIONAL PER MARKET

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)

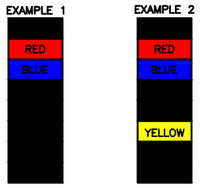


HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED AM LONG WITH FREQUENCY BANDS

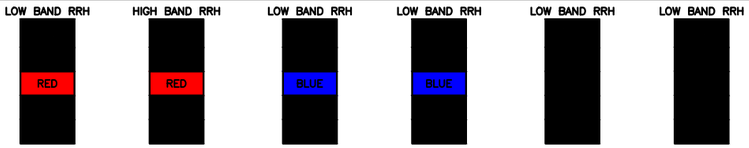
EXAMPLE 1 – HYBRID, OR DISCREET, SUPPORTS ALL SECTORS, BOTH LOW-BANDS AND MID-BANDS

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



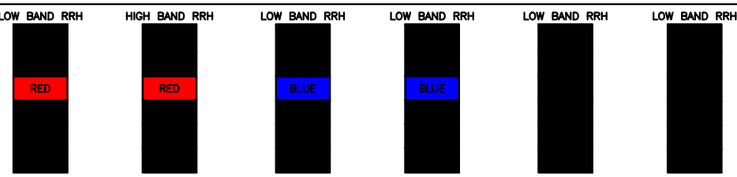
HYBRID/DISCREET CABLES

LOW-BAND RRH FIBER CABLES HAVE SECTOR STRIPE ONLY

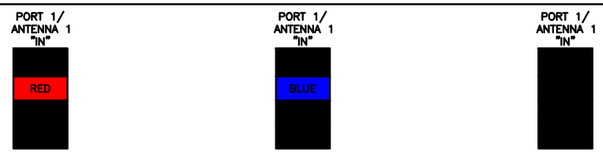


POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY



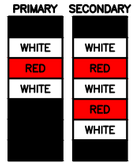
RET MOTORS AT ANTENNAS



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



LOW BANDS (N71–N28) OPTIONAL – (N29)

AWS (N65+N70+H-BLOCK)

CBRS TECH (3 GHz)
YELLOW

NEGATIVE SLANT PORT ON ANTRRH
WHITE

ALPHA SECTOR
RED

BETA SECTOR
BLUE

GAMMA SECTOR

COLOR IDENTIFIER | NO SCALE | 2

NOT USED | NO SCALE | 3

RF CABLE COLOR CODES | NO SCALE | 1

NOT USED | NO SCALE | 4

dish wireless.

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STATE OF CONNECTICUT
TSUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
9/29/2021

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS

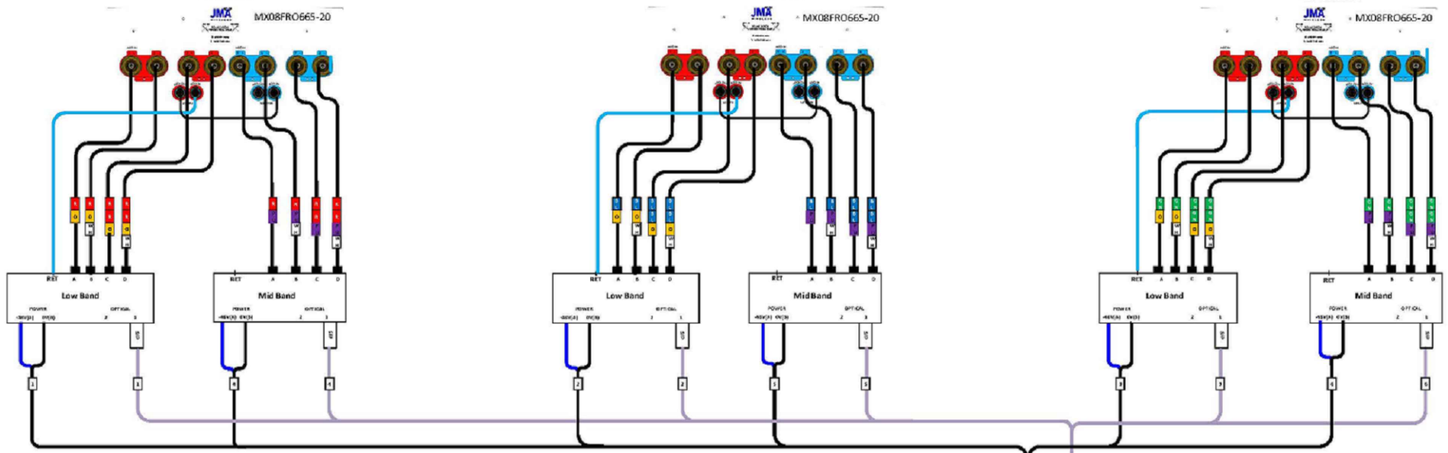
REV	DATE	DESCRIPTION
0	9/24/2021	ISSUED FOR PERMIT

A&E PROJECT NUMBER
1197-F0001-C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00194A
TBD
473 DENSLOW HILL ROAD
HAMDEN, CT 06514

SHEET TITLE
RF
CABLE COLOR CODE

SHEET NUMBER
RF-1



Fiber Patch Panel

Bottom Row	Pair 1	Pair 2	Pair 3	Pair 10	Open	Open
Middle Row	Pair 4	Pair 5	Pair 6	Pair 11	Open	Open
Top Row	Pair 7	Pair 8	Pair 9	Pair 12	Open	Open

CSR NCS540

Port	Interface	Description
0	Gi0/0/0/0	SiteBoss
1	Gi0/0/0/1	CBRS - Alpha
2	Gi0/0/0/2	CBRS - Beta
3	Gi0/0/0/3	CBRS - Gamma
4	Te0/0/0/4	Fujitsu Low-Band RU - Alpha
5	Te0/0/0/5	Fujitsu Mid-Band RU - Alpha
6	Te0/0/0/6	Fujitsu Low-Band RU - Beta
7	Te0/0/0/7	Fujitsu Mid-Band RU - Beta
8	Te0/0/0/8	Fujitsu Low-Band RU - Gamma
9	Te0/0/0/9	Fujitsu Mid-Band RU - Gamma
10	Te0/0/0/10	Fixed WN
11	Te0/0/0/11	Fixed WN
12	Te0/0/0/12	Fixed WN
13	Te0/0/0/13	Fixed WN
14	Te0/0/0/14	CBRS1
15	Te0/0/0/15	CBRS2
16	Te0/0/0/16	CBRS3
17	Gi0/0/0/17	SM1 - BMC
18	Gi0/0/0/18	SM2 - BMC
19	Te0/0/019	SM1 - Data 1
20	Te0/0/020	SM1 - Data 2
21	Te0/0/021	SM2 - Data 1
22	Te0/0/022	SM2 - Data 2
23	Te0/0/023	Reserved Uplink (EDC, LDC)
24	Te0/0/024	Blank/Future
25	Te0/0/025	Blank/Future
26	Te0/0/026	Fiber NIU
27	Te0/0/027	Fiber NIU
28	Te0/0/028	Blank/Future
29	Te0/0/029	Blank/Future

top

bottom

Bottom OVP Layout

Circuit 1	Alpha Low Band
Circuit 2	Beta Low Band
Circuit 3	Gamma Low Band
Circuit 4	Alpha Mid Band
Circuit 5	Beta Mid Band
Circuit 6	Gamma Mid Band
Circuit 7	Alpha CBRS
Circuit 8	Beta CBRS
Circuit 9	Gamma CBRS
Circuit 10	Open
Circuit 11	Open
Circuit 12	Open

Bottom OVP
Specific OVP model number detailed in RFDS

5G plumbing diagram JMA MX08FRO665-20 2-2-2(LB+MB)

Quantity: 1 | ISSV NO | DWG NO | REV: 3
9-Jan-2021 | SCALE: None | SHEET

PLUMBING DIAGRAM | NO SCALE | 1

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SHEET TITLE
RF
PLUMBING DIAGRAM

SHEET NUMBER
RF-2

EXOTHERMIC CONNECTION

MECHANICAL CONNECTION

BUSS BAR INSULATOR

CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE

SINGLE POLE SWITCH

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE

FLUORESCENT LIGHTING FIXTURE
(2) TWO LAMPS 48–T8

SMOKE DETECTION (DC)

EMERGENCY LIGHTING (DC)

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

CHAIN LINK FENCE

WOOD/WROUGHT IRON FENCE

WALL STRUCTURE

LEASE AREA

PROPERTY LINE (PL)

SETBACKS

ICE BRIDGE

CABLE TRAY

WATER LINE

UNDERGROUND POWER

UNDERGROUND TELCO

OVERHEAD POWER

OVERHEAD TELCO

UNDERGROUND TELCO/POWER

ABOVE GROUND POWER

ABOVE GROUND TELCO

ABOVE GROUND TELCO/POWER

WORKPOINT

SECTION REFERENCE

DETAIL REFERENCE

LEGEND

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

ABBREVIATIONS

dish wireless.

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RFDS REV #: 1

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A&E PROJECT NUMBER

1197–F0001–C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00194A
TBD
473 DENSLOW HILL ROAD
HAMDEN, CT 06514

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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STATE OF CONNECTICUT
YUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
9/29/2021

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	9/24/2021	ISSUED FOR PERMIT

A&E PROJECT NUMBER

1197–F0001–C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00194A
TBD
473 DENSLOW HILL ROAD
HAMDEN, CT 06514

SHEET TITLE

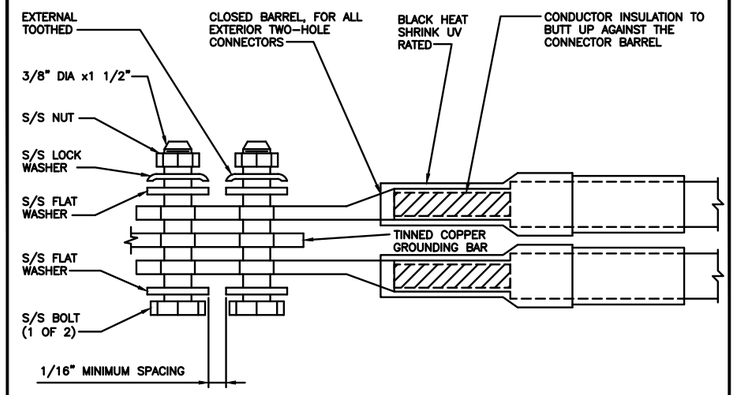
GENERAL NOTES

SHEET NUMBER

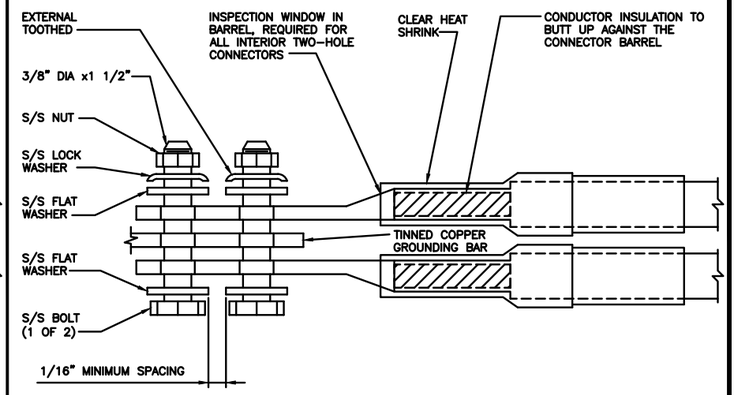
GN-2

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).

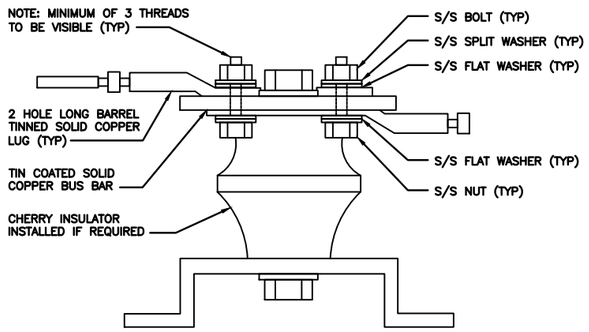
TYPICAL GROUNDING NOTES | NO SCALE | 1



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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STATE OF CONNECTICUT
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34916
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9/29/2021

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	9/24/2021	ISSUED FOR PERMIT

A&E PROJECT NUMBER
1197-F0001-C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00194A
TBD
473 DENSLOW HILL ROAD
HAMDEN, CT 06514

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.

dish wireless.

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STATE OF CONNECTICUT
TSUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
9/29/2021

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: 1

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	9/24/2021	ISSUED FOR PERMIT

A&E PROJECT NUMBER

1197-F0001-C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00194A
TBD
473 DENSLOW HILL ROAD
HAMDEN, CT 06514

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

Exhibit D

Structural Analysis Report

Dish Wireless

Structural Analysis Report

Structure	: 200 Foot Guyed Tower
VB Site Name	: Quinnipiac 1
VB Site Number	: US-CT-5014
VB Deal Number	: P-006911
Proposed Carrier	: Dish Wireless LLC
Carrier Site Name	: BOHVN00194A
Carrier Site Number	: BOHVN00194A
Site Location	: 473 Denslow Hill Road Hamden, CT 06514 (New Haven County) 41.3773, -72.9277
Date	: May 24, 2021
Max Member Stress Level	: 88%
Result	: **PASS**

05/24/2021 5:11:05 PM

Prepared by:

VERTICAL BRIDGE ENGINEERING, LLC

750 Park of Commerce Drive Suite 200 | Boca Raton, FL 33487 | 561-948-6367
VerticalBridge.com

Table of Contents

Introduction

We have completed our structural analysis of the proposed equipment installation on the foregoing tower to determine its ability to support the new loads proposed by **Dish Wireless**. The objective of the analysis was to determine if the tower meets the current structural codes and standards with the proposed equipment installation.

Existing Structural Information

The following documents for the existing structure were made available for our structural analysis.

Tower Information	PiRod Tower Drawings Job No. A-118262-1, dated April 12, 2002
Foundation Information	PiRod Foundation Drawings Job No. A-118262-1, dated April 12, 2002
Geotechnical Information	Geotechnical information was not available at the time of this analysis.
Equipment Information	Vertical Bridge Collocation Application Version 2
Tower Reinforcement Information	This tower has not been previously modified.

Final Proposed Equipment Loading for Dish Wireless

The following proposed loading was obtained from the Vertical Bridge Collocation Application:

Antenna/Equipment					Coax	
Mount (Ft.)	RAD (Ft.)	Qty.	Antenna	Type	Qty.	Size/Type
185.0	-	**3**	**Sabre C10837002C-32788***	Mount	**1**	**1.75" Hybrid**
	185.0	**3**	**JMA MX08FRO665-20_V0F**	Panel		
		3	**Fujitsu TA08025-B604**	RRU		
		3	**Fujitsu TA08025-B605**	RRU		
		1	**Raycap RDIDC-9181-PF-48**	OVP		

Note: Proposed equipment shown in bold.
Note: Other existing loading can be found on the tower profile attached.
Note: The remainder of Dish's reserve rights have been considered.
Note *: Due to the small leg size, special mounting considerations may be necessary.

Design Criteria

The tower was analyzed using tnxTower (Version 8.0.9.0) tower analysis software using the following design criteria.

State	Connecticut
City/County Building Code	New Haven County (IBC 2018)
TIA/EIA Standard Code	TIA-222-H
Basic Wind Speed	119 MPH (V_{ult})
Basic Wind Speed w/ Ice	50 MPH w/ 1" Ice
Steel Grade	50 ksi Legs and Horizontals / 36 ksi Diagonals / A325 Bolts
Exposure Category	C
Topographic Category (height)	1 (0.0 Ft.)
Risk Category	II
Ground Elevation	181.54 Ft.
S_s	0.201
Seismic Design Category	B

Analysis Results

Based on the foregoing information, our structural analysis determined that **the existing tower is structurally capable of supporting the proposed equipment loads without modification.** The tower base and anchor foundations have also been evaluated. The foundation reactions as a result of the proposed installation are less than the original design foundation reactions and as such **the existing foundation is considered to be structurally capable of supporting the proposed equipment loads.** A **seismic analysis** has been performed on this structure and **does not control.**

Assumptions

The below assumptions are true, complete, and accurate.

1. The existing tower has been maintained to manufacturer's specifications and is in good condition.
2. Foundations are considered to have been properly designed for the original design loads.
3. All member connections are considered to have been designed to meet the load carrying capacity of the connected member.
4. Antenna mount loads have been estimated based on generally accepted industry standards.
5. The mounts for the proposed antennas have been analyzed and designed by others.
6. See additional assumptions contained in the report attached.
7. Due to the utilization of Annex-S reliability factors, the structure is within acceptable engineering tolerances at 100%.

Conclusions

The existing tower described above **does have sufficient capacity** to support the proposed loading based on the governing Building Code. The existing base and anchor foundations have also been evaluated and are acceptable. A **seismic analysis** has been performed on this structure and **does not control.**

We appreciate the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance please call us anytime at 561-948-6367.

Sincerely,

Analysis by:

Jeremy Hesson, EIT
Design Engineer II

Reviewed by:

Michael T. De Boer, PE
Vice President of Structural Engineering

05/24/2021 5:11:08 PM

Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but not necessarily limited, to:

- Information supplied by the client regarding the structure itself, the antenna and transmission line loading on the structure and it components, or relevant information.

- Information from drawings in possession of Vertical Bridge Engineering, LLC, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to Vertical Bridge Engineering, LLC and used in the performance of our engineering services is correct and complete. In the absence of information contrary, we consider that all structures were constructed in accordance with the drawings and specifications and are in a un- corroded condition and have not deteriorated; and we, therefore consider that their capacity has not significantly changed from the original design condition.

All services will be performed to the codes and standards specified by the client, and we do not imply to meet any other code and standard requirements unless explicitly agreed to in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes and standards, the client shall specify the exact requirements. In the absence of information to the contrary, all work will be performed in accordance with the revision of ANSI/TIA/EIA-222-H requested.

All services are performed, results obtained and recommendations made in accordance with the generally accepted engineering principles and practices. Vertical Bridge Engineering LLC, is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

Disclaimer of Warranties

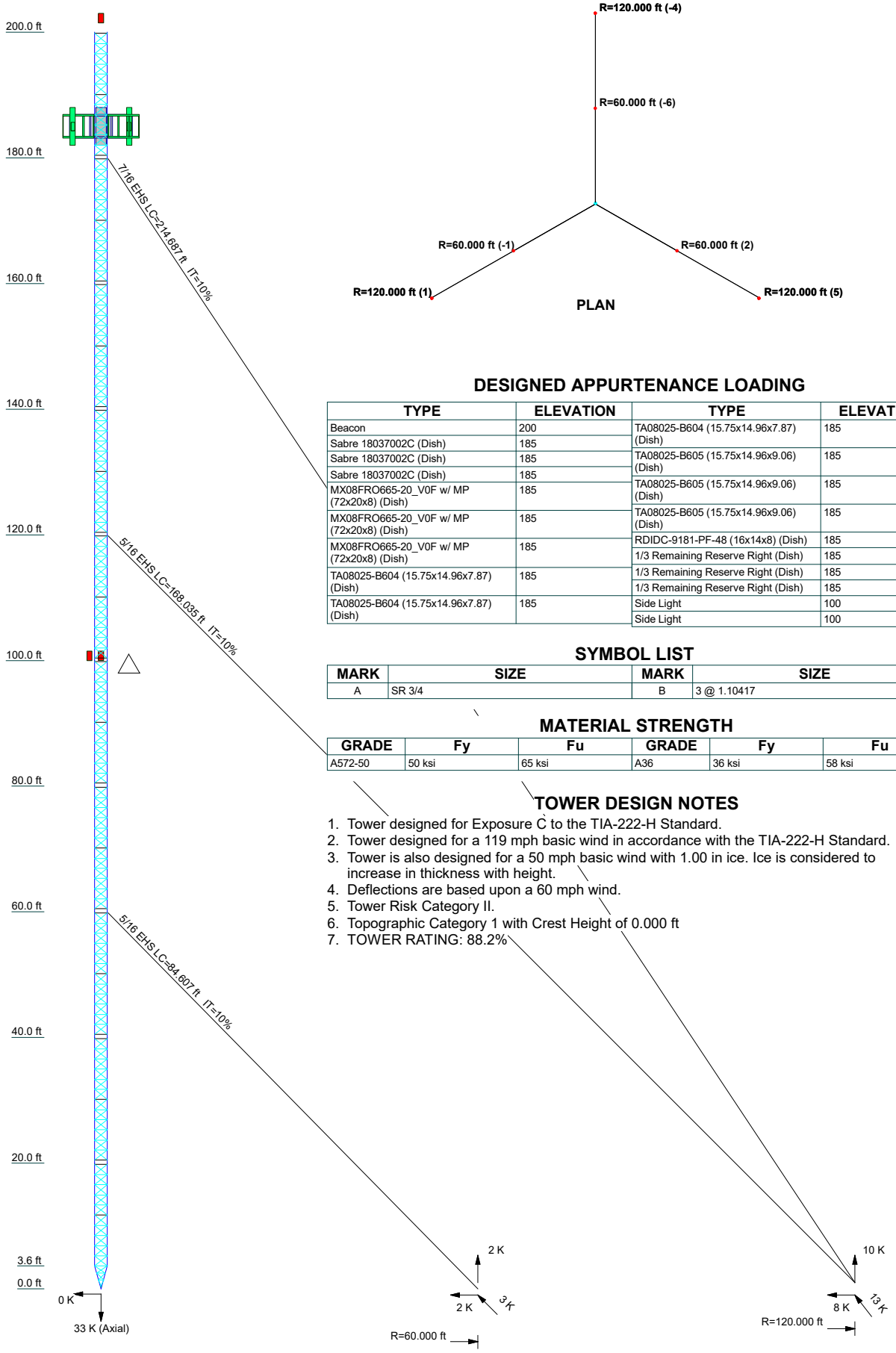
The engineering services by Vertical Bridge Engineering, LLC in connection with this Structural Analysis are limited to a computer analysis of the tower structure, size and capacity of its members. Vertical Bridge Engineering, LLC does not analyze the fabrication, including welding, except as may be expressly included in this report.

The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines. Any mention of structural modifications are reasonable estimates and should not be used a precise construction document. Precise modification drawings are obtainable from Vertical Bridge Engineering, LLC but are beyond the scope of this report.

Vertical Bridge Engineering, LLC makes no warranties, express or implied, in connection with this report and disclaims any liability arising from material, fabrication and erection of this tower, or installation and compliance with legal and permitting requirements of the proposed equipment. Vertical Bridge Engineering, LLC will not be responsible whatsoever for or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of Vertical Bridge Engineering, LLC pursuant to this report will be limited to the total fee received for preparation of this report.

Attachment 1:
Calculations

Section	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs				SR 1 1/4					SR 1		
Leg Grade						A572-50					
Diagonals							SR 1/2				
Diagonal Grade							A36				
Top Girts	N.A.						SR 3/4				
Mid Girts	N.A.						SR 3/4				
Bottom Girts	A	N.A.					SR 3/4				
Horizontals							SR 3/4				
Face Width (ft)									60 @ 1.61632		2
# Panels @ (ft)	B	10 @ 1.61458			48 @ 1.60938						
Weight (K)	4.0	0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Beacon	200	TA08025-B604 (15.75x14.96x7.87) (Dish)	185
Sabre 18037002C (Dish)	185	TA08025-B605 (15.75x14.96x9.06) (Dish)	185
Sabre 18037002C (Dish)	185	TA08025-B605 (15.75x14.96x9.06) (Dish)	185
Sabre 18037002C (Dish)	185	TA08025-B605 (15.75x14.96x9.06) (Dish)	185
MX08FRO665-20_V0F w/ MP (72x20x8) (Dish)	185	RDIDC-9181-PF-48 (16x14x8) (Dish)	185
MX08FRO665-20_V0F w/ MP (72x20x8) (Dish)	185	1/3 Remaining Reserve Right (Dish)	185
MX08FRO665-20_V0F w/ MP (72x20x8) (Dish)	185	1/3 Remaining Reserve Right (Dish)	185
TA08025-B604 (15.75x14.96x7.87) (Dish)	185	1/3 Remaining Reserve Right (Dish)	185
TA08025-B604 (15.75x14.96x7.87) (Dish)	185	Side Light	100
		Side Light	100

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	SR 3/4	B	3 @ 1.10417

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

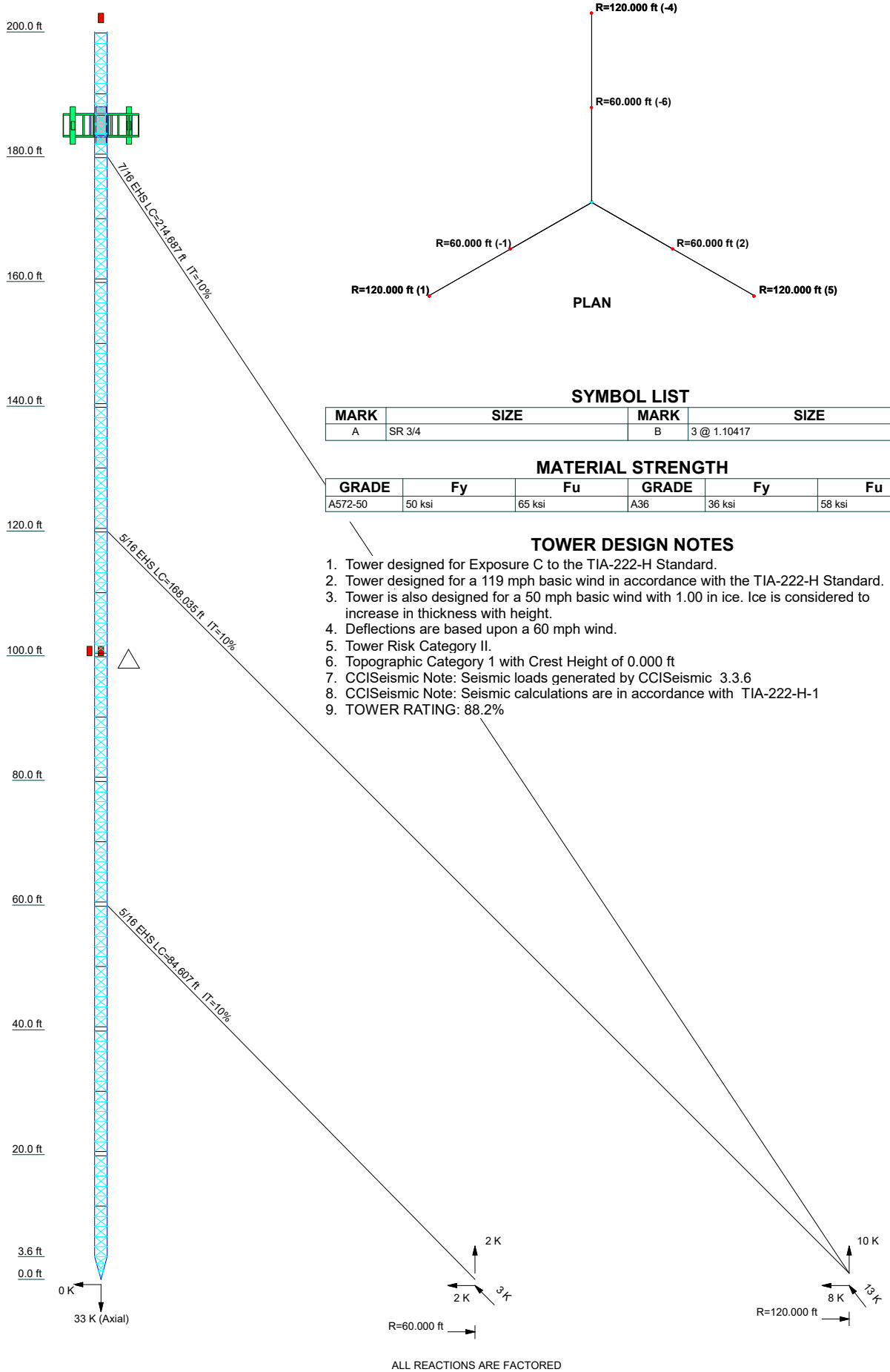
1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 119 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.000 ft
7. TOWER RATING: 88.2%

ALL REACTIONS ARE FACTORED

Vertical Bridge REIT, LLC
750 Park of Commerce Dr. Suite 200
Boca Raton, FL 33487
Phone: 561-948-6367
FAX:

Job: ***US-CT-5014***		
Project: ***Guyed Tower Structural Analysis***		
Client: Dish	Drawn by: JHesson	App'd:
Code: TIA-222-H	Date: 05/21/21	Scale: NTS
Path: C:\Users\JHesson\Documents\Working\Towers\US-CT-5014\TNX\US-CT-5014_SA_052121_Dish.eri		Dwg No. E-1

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11
Legs			SR 1					SR 1 1/4			
Leg Grade						A572-50					
Diagonals						SR 1/2					
Diagonal Grade						A36					
Top Girts					SR 3/4						N.A.
Mid Girts					SR 3/4						N.A.
Bottom Girts					SR 3/4					N.A.	A
Horizontals					SR 3/4						
Face Width (ft)					2						
# Panels @ (ft)				60 @ 1.61632			48 @ 1.60938			10 @ 1.61458	B
Weight (K)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.1



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	SR 3/4	B	3 @ 1.10417

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 119 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.000 ft
7. CCISeismic Note: Seismic loads generated by CCISeismic 3.3.6
8. CCISeismic Note: Seismic calculations are in accordance with TIA-222-H-1
9. TOWER RATING: 88.2%

Vertical Bridge REIT, LLC
750 Park of Commerce Dr. Suite 200
Boca Raton, FL 33487
Phone: 561-948-6367
FAX:

Job: ***US-CT-5014***			
Project: ***Guyed Tower Structural Analysis***			
Client: Dish	Drawn by: JHesson	App'd:	
Code: TIA-222-H	Date: 05/21/21	Scale: NTS	
Path:		Dwg No. E-1	

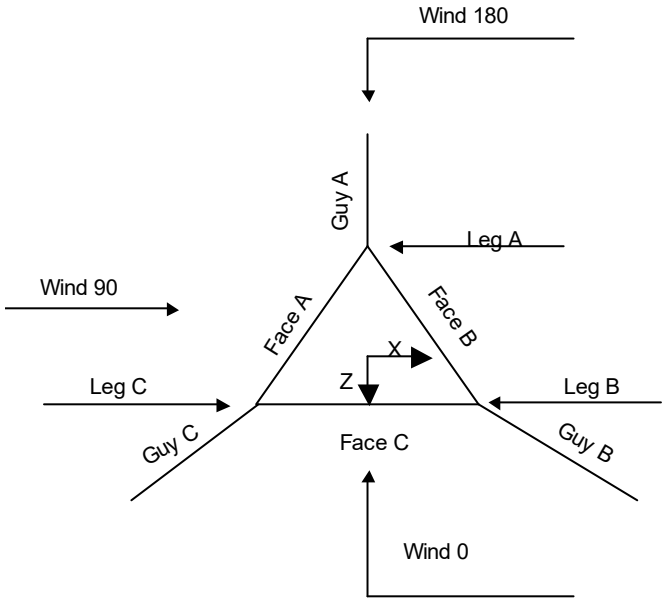
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 200.000 ft above the ground line.
The base of the tower is set at an elevation of 0.000 ft above the ground line.
The face width of the tower is 2.000 ft at the top and tapered at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower base elevation above sea level: 181.540 ft.
Basic wind speed of 119 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.000 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
CCISeismic Note: Seismic loads generated by CCISeismic 3.3.6.
CCISeismic Note: Seismic calculations are in accordance with TIA-222-H-1.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Safety factor used in guy design is 1.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$, $K_{es}(E_v$ and $E_h) = 1.0$.
Maximum demand-capacity ratio is: 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned	√	Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area	√	SR Leg Bolts Resist Compression
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys	√	Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice		Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-H Bracing Resist. Exemption
√	Include Bolts In Member Capacity	√	Autocalc Torque Arm Areas		Use TIA-222-H Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
√	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
√	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known



Corner & Starmount Guyed Tower

Tower Section Geometry

Tower Section	*Tower Elevation* *ft*	*Assembly Database*	*Description*	*Section Width* *ft*	*Number of Sections*	*Section Length* *ft*
T1	200.000-180.000			2.000	1	20.000
T2	180.000-160.000			2.000	1	20.000
T3	160.000-140.000			2.000	1	20.000
T4	140.000-120.000			2.000	1	20.000
T5	120.000-100.000			2.000	1	20.000
T6	100.000-80.000			2.000	1	20.000
T7	80.000-60.000			2.000	1	20.000
T8	60.000-40.000			2.000	1	20.000
T9	40.000-20.000			2.000	1	20.000
T10	20.000-3.646			2.000	1	16.354
T11	3.646-0.000			2.000	1	3.646

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	200.000-180.000	1.616	X Brace	No	Steps	2.5000	4.7500
T2	180.000-160.000	1.616	X Brace	No	Steps	2.5000	4.7500
T3	160.000-140.000	1.616	X Brace	No	Steps	2.5000	4.7500
T4	140.000-120.000	1.616	X Brace	No	Steps	2.5000	4.7500
T5	120.000-100.000	1.616	X Brace	No	Steps	2.5000	4.7500
T6	100.000-80.000	1.609	X Brace	No	Steps	2.5000	5.7500
T7	80.000-60.000	1.609	X Brace	No	Steps	2.5000	5.7500
T8	60.000-40.000	1.609	X Brace	No	Steps	2.5000	5.7500
T9	40.000-20.000	1.609	X Brace	No	Steps	2.5000	5.7500
T10	20.000-3.646	1.615	X Brace	No	Steps	2.5000	0.0000
T11	3.646-0.000	1.104	X Brace	No	Yes	0.0000	4.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 200.000-180.000	Solid Round	1	A572-50 (50 ksi)	Solid Round	1/2	A36 (36 ksi)
T2 180.000-160.000	Solid Round	1	A572-50 (50 ksi)	Solid Round	1/2	A36 (36 ksi)
T3 160.000-140.000	Solid Round	1	A572-50 (50 ksi)	Solid Round	1/2	A36 (36 ksi)
T4 140.000-120.000	Solid Round	1	A572-50 (50 ksi)	Solid Round	1/2	A36 (36 ksi)
T5 120.000-100.000	Solid Round	1	A572-50 (50 ksi)	Solid Round	1/2	A36 (36 ksi)
T6 100.000-80.000	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	1/2	A36 (36 ksi)
T7 80.000-60.000	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	1/2	A36 (36 ksi)
T8 60.000-40.000	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	1/2	A36 (36 ksi)
T9 40.000-20.000	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	1/2	A36 (36 ksi)
T10 20.000-3.646	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	1/2	A36 (36 ksi)
T11 3.646-0.000	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	1/2	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 200.000-180.000	Solid Round	3/4	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 180.000-160.000	Solid Round	3/4	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T3 160.000-140.000	Solid Round	3/4	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T4	Solid Round	3/4	A572-50	Solid Round	3/4	A572-50

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
140.000-120.000			(50 ksi)			(50 ksi)
T5	Solid Round	3/4	A572-50	Solid Round	3/4	A572-50
120.000-100.000			(50 ksi)			(50 ksi)
T6	Solid Round	3/4	A572-50	Solid Round	3/4	A572-50
100.000-80.000			(50 ksi)			(50 ksi)
T7 80.000-60.000	Solid Round	3/4	A572-50	Solid Round	3/4	A572-50
			(50 ksi)			(50 ksi)
T8 60.000-40.000	Solid Round	3/4	A572-50	Solid Round	3/4	A572-50
			(50 ksi)			(50 ksi)
T9 40.000-20.000	Solid Round	3/4	A572-50	Solid Round	3/4	A572-50
			(50 ksi)			(50 ksi)
T10 20.000-3.646	Solid Round	3/4	A572-50	Solid Round		A572-50
			(50 ksi)			(50 ksi)
T11 3.646-0.000	Solid Round		A572-50	Solid Round	3/4	A572-50
			(50 ksi)			(50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1	1	Solid Round	3/4	A572-50	Solid Round	3/4	A572-50
200.000-180.000				(50 ksi)			(50 ksi)
T2	1	Solid Round	3/4	A572-50	Solid Round	3/4	A572-50
180.000-160.000				(50 ksi)			(50 ksi)
T3	1	Solid Round	3/4	A572-50	Solid Round	3/4	A572-50
160.000-140.000				(50 ksi)			(50 ksi)
T4	1	Solid Round	3/4	A572-50	Solid Round	3/4	A572-50
140.000-120.000				(50 ksi)			(50 ksi)
T5	1	Solid Round	3/4	A572-50	Solid Round	3/4	A572-50
120.000-100.000				(50 ksi)			(50 ksi)
T6	1	Solid Round	3/4	A572-50	Solid Round	3/4	A572-50
100.000-80.000				(50 ksi)			(50 ksi)
T7 80.000-60.000	1	Solid Round	3/4	A572-50	Solid Round	3/4	A572-50
				(50 ksi)			(50 ksi)
T8 60.000-40.000	1	Solid Round	3/4	A572-50	Solid Round	3/4	A572-50
				(50 ksi)			(50 ksi)
T9 40.000-20.000	1	Solid Round	3/4	A572-50	Solid Round	3/4	A572-50
				(50 ksi)			(50 ksi)
T10 20.000-3.646	1	Solid Round	3/4	A572-50	Solid Round	3/4	A572-50
				(50 ksi)			(50 ksi)
T11 3.646-0.000	None	Flat Bar		A572-50	Solid Round	3/4	A572-50
				(50 ksi)			(50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 200.000-180.000	0.000	0.0000	A36 (36 ksi)	1	1.03	1.03	36.0000	36.0000	36.0000
T2 180.000-160.000	0.000	0.0000	A36 (36 ksi)	1	1.03	1.03	36.0000	36.0000	36.0000
T3 160.000-140.000	0.000	0.0000	A36 (36 ksi)	1	1.03	1.03	36.0000	36.0000	36.0000
T4 140.000-120.000	0.000	0.0000	A36 (36 ksi)	1	1.03	1.03	36.0000	36.0000	36.0000
T5 120.000-100.000	0.000	0.0000	A36 (36 ksi)	1	1.03	1.03	36.0000	36.0000	36.0000
T6 100.000-80.000	0.000	0.0000	A36 (36 ksi)	1	1.03	1.03	36.0000	36.0000	36.0000
T7 80.000-60.000	0.000	0.0000	A36 (36 ksi)	1	1.03	1.03	36.0000	36.0000	36.0000
T8 60.000-40.000	0.000	0.0000	A36 (36 ksi)	1	1.03	1.03	36.0000	36.0000	36.0000
T9 40.000-20.000	0.000	0.0000	A36 (36 ksi)	1	1.03	1.03	36.0000	36.0000	36.0000
T10 20.000-3.646	0.000	0.0000	A36 (36 ksi)	1	1.03	1.03	36.0000	36.0000	36.0000
T11 3.646-0.000	0.000	0.0000	A36 (36 ksi)	1	1.03	1.03	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 200.000-180.000	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 180.000-160.000	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 160.000-140.000	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 140.000-120.000	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 120.000-100.000	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 100.000-80.000	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T7	Yes	Yes	1	1	1	1	1	1	1	1
80.000-60.000				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
60.000-40.000				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
40.000-20.000				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1
20.000-3.646				1	1	1	1	1	1	1
T11	Yes	Yes	1	1	1	1	1	1	1	1
3.646-0.000				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
200.000-180.000														
T2	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
180.000-160.000														
T3	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
160.000-140.000														
T4	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
140.000-120.000														
T5	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
120.000-100.000														
T6	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
100.000-80.000														
T7	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
80.000-60.000														
T8	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
60.000-40.000														
T9	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
40.000-20.000														
T10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
20.000-3.646														
T11	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
3.646-0.000														

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 200.000-180.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 180.000-160.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 160.000-140.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 140.000-120.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 120.000-100.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 100.000-80.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 80.000-60.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 60.000-40.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 40.000-20.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 20.000-3.646	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 3.646-0.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 200.000-180.000	Flange	0.3750 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 180.000-160.000	Flange	0.3750 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 160.000-140.000	Flange	0.3750 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 140.000-120.000	Flange	0.3750 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 120.000-100.000	Flange	0.3750 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T6 100.000-80.000	Flange	0.5000 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 80.000-60.000	Flange	0.5000 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 60.000-40.000	Flange	0.5000 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 40.000-20.000	Flange	0.5000 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 20.000-3.646	Flange	0.7500 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 3.646-0.000	Flange	0.7500 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
179.792	EHS	A	7/16	2.080	10%	21000.000	0.399	218.683	120.000	0.0000	-4.000	100%
		B	7/16	2.080	10%	21000.000	0.399	211.188	120.000	0.0000	5.000	100%
		C	7/16	2.080	10%	21000.000	0.399	214.505	120.000	0.0000	1.000	100%
119.792	EHS	A	5/16	1.120	10%	21000.000	0.205	171.454	120.000	0.0000	-4.000	100%
		B	5/16	1.120	10%	21000.000	0.205	165.085	120.000	0.0000	5.000	100%
		C	5/16	1.120	10%	21000.000	0.205	167.886	120.000	0.0000	1.000	100%
59.7917	EHS	A	5/16	1.120	10%	21000.000	0.205	88.189	60.000	0.0000	-6.000	100%
		B	5/16	1.120	10%	21000.000	0.205	82.404	60.000	0.0000	2.000	100%
		C	5/16	1.120	10%	21000.000	0.205	84.532	60.000	0.0000	-1.000	100%

Guy Data *(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
179.792	Corner						
119.792	Corner						
59.7917	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
179.792	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Flat Bar	
119.792	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Flat Bar	
59.792	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Flat Bar	

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
179.792	0.087	0.084	0.086		4.512 3.7 sec/pulse	4.211 3.5 sec/pulse	4.343 3.6 sec/pulse	
119.792	0.035	0.034	0.034		2.663 2.8 sec/pulse	2.471 2.7 sec/pulse	2.554 2.8 sec/pulse	
59.7917	0.018	0.017	0.017		0.708 1.5 sec/pulse	0.619 1.4 sec/pulse	0.651 1.4 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
179.792	No	No			1	1	1	1
119.792	No	No			1	1	1	1
59.7917	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
179.792	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
119.792	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
59.7917	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z ksf	q_z Ice ksf	Ice Thickness in
179.792	A	87.896	0.036	0.006	0.9375
	B	92.396	0.036	0.006	0.9422
	C	90.396	0.036	0.006	0.9401
119.792	A	57.896	0.033	0.006	0.8992
	B	62.396	0.033	0.006	0.9059
	C	60.396	0.033	0.006	0.9030
59.7917	A	26.896	0.028	0.005	0.8328
	B	30.896	0.029	0.005	0.8444
	C	29.396	0.028	0.005	0.8402

Guy-Tensioning Information

				Temperature At Time Of Tensioning													
				0 F		20 F		40 F		60 F		80 F		100 F		120 F	
Guy Elevation ft		H ft	V ft	Initial Tension K	Intercept ft	Initial Tension K	Intercept ft	Initial Tension K	Intercept ft	Initial Tension K	Intercept ft	Initial Tension K	Intercept ft	Initial Tension K	Intercept ft	Initial Tension K	Intercept ft
179.792	A	118.85	183.79	2.349	4.00	2.259	4.16	2.169	4.33	2.080	4.51	1.991	4.71	1.903	4.92	1.816	5.16
	B	118.85	174.79	2.368	3.70	2.272	3.86	2.176	4.03	2.080	4.21	1.985	4.41	1.891	4.63	1.797	4.86
	C	118.85	178.79	2.359	3.83	2.266	3.99	2.173	4.16	2.080	4.34	1.988	4.54	1.897	4.76	1.806	4.99
119.792	A	118.85	123.79	1.347	2.22	1.271	2.35	1.195	2.50	1.120	2.66	1.046	2.85	0.972	3.06	0.899	3.31
	B	118.85	114.79	1.365	2.03	1.283	2.16	1.201	2.31	1.120	2.47	1.040	2.66	0.960	2.88	0.882	3.13
	C	118.85	118.79	1.356	2.11	1.277	2.24	1.198	2.39	1.120	2.55	1.042	2.74	0.966	2.96	0.890	3.21
59.7917	A	58.85	65.79	1.335	0.59	1.263	0.63	1.192	0.67	1.120	0.71	1.049	0.76	0.977	0.81	0.906	0.87
	B	58.85	57.79	1.366	0.51	1.284	0.54	1.202	0.58	1.120	0.62	1.038	0.67	0.957	0.72	0.876	0.79
	C	58.85	60.79	1.354	0.54	1.276	0.57	1.198	0.61	1.120	0.65	1.042	0.70	0.965	0.76	0.888	0.82

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
Safety Line 3/8	C	No	No	Ar (CaAa)	200.000 - 8.000	0.0000	0	1	1	0.3750	0.3750		0.000
*185 Dish 1 5/8 Hybrid Flex (1.98" 1.3lbs) (DIsh) ***	B	No	No	Ar (CaAa)	185.000 - 8.000	0.0000	0.5	1	1	1.9800	1.9800		0.001

Feed Line/Linear Appurtenances - Entered As Area

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

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	200.000-180.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.990	0.000	0.006
		C	0.000	0.000	0.750	0.000	0.004
T2	180.000-160.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	3.960	0.000	0.026
		C	0.000	0.000	0.750	0.000	0.004
T3	160.000-140.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	3.960	0.000	0.026
		C	0.000	0.000	0.750	0.000	0.004
T4	140.000-120.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	3.960	0.000	0.026
		C	0.000	0.000	0.750	0.000	0.004
T5	120.000-100.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	3.960	0.000	0.026
		C	0.000	0.000	0.750	0.000	0.004
T6	100.000-80.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	3.960	0.000	0.026
		C	0.000	0.000	0.750	0.000	0.004
T7	80.000-60.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	3.960	0.000	0.026
		C	0.000	0.000	0.750	0.000	0.004
T8	60.000-40.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	3.960	0.000	0.026
		C	0.000	0.000	0.750	0.000	0.004
T9	40.000-20.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	3.960	0.000	0.026
		C	0.000	0.000	0.750	0.000	0.004
T10	20.000-3.646	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	2.376	0.000	0.016
		C	0.000	0.000	0.450	0.000	0.003
T11	3.646-0.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.000

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	200.000-180.000	A	1.013	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	2.003	0.000	0.025
		C		0.000	0.000	4.800	0.000	0.039
T2	180.000-160.000	A	1.001	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	7.966	0.000	0.099
		C		0.000	0.000	4.756	0.000	0.038
T3	160.000-140.000	A	0.989	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	7.916	0.000	0.098
		C		0.000	0.000	4.706	0.000	0.037
T4	140.000-120.000	A	0.975	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	7.860	0.000	0.096
		C		0.000	0.000	4.650	0.000	0.037

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T5	120.000-100.000	A	0.959	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	7.795	0.000	0.095
		C		0.000	0.000	4.585	0.000	0.036
T6	100.000-80.000	A	0.940	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	7.719	0.000	0.093
		C		0.000	0.000	4.509	0.000	0.035
T7	80.000-60.000	A	0.916	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	7.626	0.000	0.091
		C		0.000	0.000	4.416	0.000	0.033
T8	60.000-40.000	A	0.886	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	7.504	0.000	0.088
		C		0.000	0.000	4.294	0.000	0.032
T9	40.000-20.000	A	0.842	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	7.328	0.000	0.084
		C		0.000	0.000	4.118	0.000	0.029
T10	20.000-3.646	A	0.767	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	4.217	0.000	0.046
		C		0.000	0.000	2.291	0.000	0.015
T11	3.646-0.000	A	0.636	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	200.000-180.000	0.6085	0.5596	0.2701	0.4935
T2	180.000-160.000	2.1313	1.2898	1.0297	0.8554
T3	160.000-140.000	2.1313	1.2898	1.0446	0.8663
T4	140.000-120.000	2.1313	1.2898	1.0615	0.8786
T5	120.000-100.000	2.1313	1.2898	1.0809	0.8927
T6	100.000-80.000	1.9915	1.2052	1.0569	0.8705
T7	80.000-60.000	1.9915	1.2052	1.0841	0.8898
T8	60.000-40.000	1.9915	1.2052	1.1197	0.9149
T9	40.000-20.000	1.9915	1.2052	1.1721	0.9510
T10	20.000-3.646	1.5421	0.9332	0.9684	0.7757
T11	3.646-0.000	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	Safety Line 3/8	180.00 - 200.00	0.6000	0.4544
T1	3	1 5/8 Hybrid Flex (1.98" 1.3lbs)	180.00 - 185.00	0.6000	0.4544
T2	1	Safety Line 3/8	160.00 - 180.00	0.6000	0.4584
T2	3	1 5/8 Hybrid Flex (1.98" 1.3lbs)	160.00 - 180.00	0.6000	0.4584

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	1	Safety Line 3/8	140.00 - 160.00	0.6000	0.4629
T3	3	1 5/8 Hybrid Flex (1.98" 1.3lbs)	140.00 - 160.00	0.6000	0.4629
T4	1	Safety Line 3/8	120.00 - 140.00	0.6000	0.4680
T4	3	1 5/8 Hybrid Flex (1.98" 1.3lbs)	120.00 - 140.00	0.6000	0.4680
T5	1	Safety Line 3/8	100.00 - 120.00	0.6000	0.4738
T5	3	1 5/8 Hybrid Flex (1.98" 1.3lbs)	100.00 - 120.00	0.6000	0.4738
T6	1	Safety Line 3/8	80.00 - 100.00	0.6000	0.4702
T6	3	1 5/8 Hybrid Flex (1.98" 1.3lbs)	80.00 - 100.00	0.6000	0.4702
T7	1	Safety Line 3/8	60.00 - 80.00	0.6000	0.4785
T7	3	1 5/8 Hybrid Flex (1.98" 1.3lbs)	60.00 - 80.00	0.6000	0.4785
T8	1	Safety Line 3/8	40.00 - 60.00	0.6000	0.4894
T8	3	1 5/8 Hybrid Flex (1.98" 1.3lbs)	40.00 - 60.00	0.6000	0.4894
T9	1	Safety Line 3/8	20.00 - 40.00	0.6000	0.5053
T9	3	1 5/8 Hybrid Flex (1.98" 1.3lbs)	20.00 - 40.00	0.6000	0.5053
T10	1	Safety Line 3/8	8.00 - 20.00	0.6000	0.5324
T10	3	1 5/8 Hybrid Flex (1.98" 1.3lbs)	8.00 - 20.00	0.6000	0.5324

User Defined Loads - Seismic

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
CCISeismic Tower Section 1	190.000	0.000	0.0000	0.015	0.000	0.000	0.037
CCISeismic Tower Section 2	170.000	0.000	0.0000	0.015	0.000	0.000	0.033
CCISeismic Tower Section 3	150.000	0.000	0.0000	0.015	0.000	0.000	0.029
CCISeismic Tower Section 4	130.000	0.000	0.0000	0.015	0.000	0.000	0.025
CCISeismic Tower Section 5	110.000	0.000	0.0000	0.015	0.000	0.000	0.021
CCISeismic Tower Section 6	90.000	0.000	0.0000	0.019	0.000	0.000	0.022
CCISeismic Tower Section 7	70.000	0.000	0.0000	0.019	0.000	0.000	0.017
CCISeismic Tower Section 8	50.000	0.000	0.0000	0.019	0.000	0.000	0.012
CCISeismic Tower Section 9	30.000	0.000	0.0000	0.019	0.000	0.000	0.007
CCISeismic Tower Section 10	11.823	0.000	0.0000	0.016	0.000	0.000	0.002
CCISeismic Tower Section 11	1.823	0.000	0.0000	0.004	0.000	0.000	0.000
CCISeismic Guy Level 1	179.792	0.000	0.0000	0.005	0.000	0.000	0.013
CCISeismic Guy Level 2	119.792	0.000	0.0000	0.002	0.000	0.000	0.003
CCISeismic Guy Level 3	59.792	0.000	0.0000	0.001	0.000	0.000	0.001
CCISeismic b&p database_siouxcity3-pc_2 Beacon	200.000	0.000	0.0000	0.000	0.000	0.000	0.001
CCISeismic b&p database_siouxcity3-pc_2 Side Light	100.000	0.000	0.0000	0.000	0.000	0.000	0.001
CCISeismic b&p	100.000	0.000	0.0000	0.000	0.000	0.000	0.001

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
database_siouxcity3-pc_2 Side Light							
CCISeismic Sabre 18037002C	185.000	0.000	0.0000	0.026	0.000	0.000	0.062
CCISeismic Sabre 18037002C	185.000	0.000	0.0000	0.026	0.000	0.000	0.062
CCISeismic Sabre 18037002C	185.000	0.000	0.0000	0.026	0.000	0.000	0.062
CCISeismic jma MX08FRO665-20_V0F w/ MP (72x20x8)	185.000	0.000	0.0000	0.002	0.000	0.000	0.005
CCISeismic jma MX08FRO665-20_V0F w/ MP (72x20x8)	185.000	0.000	0.0000	0.002	0.000	0.000	0.005
CCISeismic jma MX08FRO665-20_V0F w/ MP (72x20x8)	185.000	0.000	0.0000	0.002	0.000	0.000	0.005
CCISeismic fujitsu TA08025-B604 (15.75x14.96x7.87)	185.000	0.000	0.0000	0.003	0.000	0.000	0.006
CCISeismic fujitsu TA08025-B604 (15.75x14.96x7.87)	185.000	0.000	0.0000	0.003	0.000	0.000	0.006
CCISeismic fujitsu TA08025-B604 (15.75x14.96x7.87)	185.000	0.000	0.0000	0.003	0.000	0.000	0.006
CCISeismic fujitsu TA08025-B605 (15.75x14.96x9.06)	185.000	0.000	0.0000	0.003	0.000	0.000	0.008
CCISeismic fujitsu TA08025-B605 (15.75x14.96x9.06)	185.000	0.000	0.0000	0.003	0.000	0.000	0.008
CCISeismic fujitsu TA08025-B605 (15.75x14.96x9.06)	185.000	0.000	0.0000	0.003	0.000	0.000	0.008
CCISeismic raycap RDIDC-9181-PF-48 (16x14x8)	185.000	0.000	0.0000	0.001	0.000	0.000	0.002
CCISeismic 1/3 Remaining Reserve Right	185.000	0.000	0.0000	0.003	0.000	0.000	0.006
CCISeismic 1/3 Remaining Reserve Right	185.000	0.000	0.0000	0.003	0.000	0.000	0.006
CCISeismic 1/3 Remaining Reserve Right	185.000	0.000	0.0000	0.003	0.000	0.000	0.006
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200 (180ft to200ft)	190.000	0.000	0.0000	0.000	0.000	0.000	0.001
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200 (160ft to180ft)	170.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200 (140ft to160ft)	150.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200 (120ft to140ft)	130.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200 (100ft to120ft)	110.000	0.000	0.0000	0.000	0.000	0.000	0.000

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200 (80ft to100ft)	90.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200 (60ft to80ft)	70.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200 (40ft to60ft)	50.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200 (20ft to40ft)	30.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200 (8ft to20ft)	14.000	0.000	0.0000	0.000	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185 (180ft to185ft)	182.500	0.000	0.0000	0.000	0.000	0.000	0.001
CCISeismic b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185 (160ft to180ft)	170.000	0.000	0.0000	0.001	0.000	0.000	0.002
CCISeismic b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185 (140ft to160ft)	150.000	0.000	0.0000	0.001	0.000	0.000	0.002
CCISeismic b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185 (120ft to140ft)	130.000	0.000	0.0000	0.001	0.000	0.000	0.002
CCISeismic b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185 (100ft to120ft)	110.000	0.000	0.0000	0.001	0.000	0.000	0.002
CCISeismic b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185 (80ft to100ft)	90.000	0.000	0.0000	0.001	0.000	0.000	0.001
CCISeismic b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185 (60ft to80ft)	70.000	0.000	0.0000	0.001	0.000	0.000	0.001
CCISeismic b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185 (40ft to60ft)	50.000	0.000	0.0000	0.001	0.000	0.000	0.001
CCISeismic b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185 (20ft to40ft)	30.000	0.000	0.0000	0.001	0.000	0.000	0.000
CCISeismic b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185 (8ft to20ft)	14.000	0.000	0.0000	0.001	0.000	0.000	0.000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Beacon	C	From Centroid-Leg	0.000 / 0.000 / 1.500	0.0000	200.000	No Ice 1/2" Ice 1" Ice	3.667 3.927 4.194	0.883 1.103 1.331	0.010 0.029 0.051
Side Light	A	From Leg	1.000 / 0.000 / 0.000	0.0000	100.000	No Ice 1/2" Ice 1" Ice	0.400 0.510 0.620	0.400 0.510 0.620	0.010 0.010 0.010
Side Light	C	From Leg	1.000 / 0.000 / 0.000	0.0000	100.000	No Ice 1/2" Ice 1" Ice	0.400 0.510 0.620	0.400 0.510 0.620	0.010 0.010 0.010
*185									
Sabre 18037002C (Dish)	A	From Leg	3.000 / 0.000 / 0.000	0.0000	185.000	No Ice 1/2" Ice 1" Ice	11.600 16.900 20.900	9.200 14.600 19.500	0.610 0.741 0.930
Sabre 18037002C (Dish)	B	From Leg	3.000 / 0.000 / 0.000	0.0000	185.000	No Ice 1/2" Ice 1" Ice	11.600 16.900 20.900	9.200 14.600 19.500	0.610 0.741 0.930
Sabre 18037002C (Dish)	C	From Leg	3.000 / 0.000 / 0.000	0.0000	185.000	No Ice 1/2" Ice 1" Ice	11.600 16.900 20.900	9.200 14.600 19.500	0.610 0.741 0.930
MX08FRO665-20_V0F w/ MP (72x20x8) (Dish)	A	From Leg	4.000 / 0.000 / 0.000	0.0000	185.000	No Ice 1/2" Ice 1" Ice	12.489 12.986 13.490	5.867 6.325 6.790	0.054 0.128 0.208
MX08FRO665-20_V0F w/ MP (72x20x8) (Dish)	B	From Leg	4.000 / 0.000 / 0.000	0.0000	185.000	No Ice 1/2" Ice 1" Ice	12.489 12.986 13.490	5.867 6.325 6.790	0.054 0.128 0.208
MX08FRO665-20_V0F w/ MP (72x20x8) (Dish)	C	From Leg	4.000 / 0.000 / 0.000	0.0000	185.000	No Ice 1/2" Ice 1" Ice	12.489 12.986 13.490	5.867 6.325 6.790	0.054 0.128 0.208
TA08025-B604 (15.75x14.96x7.87) (Dish)	A	From Leg	4.000 / 0.000 / 0.000	0.0000	185.000	No Ice 1/2" Ice 1" Ice	1.964 2.138 2.320	1.033 1.168 1.310	0.063 0.080 0.099
TA08025-B604 (15.75x14.96x7.87) (Dish)	B	From Leg	4.000 / 0.000 / 0.000	0.0000	185.000	No Ice 1/2" Ice 1" Ice	1.964 2.138 2.320	1.033 1.168 1.310	0.063 0.080 0.099
TA08025-B604 (15.75x14.96x7.87) (Dish)	C	From Leg	4.000 / 0.000 / 0.000	0.0000	185.000	No Ice 1/2" Ice 1" Ice	1.964 2.138 2.320	1.033 1.168 1.310	0.063 0.080 0.099
TA08025-B605 (15.75x14.96x9.06) (Dish)	A	From Leg	4.000 / 0.000 / 0.000	0.0000	185.000	No Ice 1/2" Ice 1" Ice	1.964 2.138 2.320	1.189 1.331 1.480	0.075 0.093 0.114
TA08025-B605 (15.75x14.96x9.06) (Dish)	B	From Leg	4.000 / 0.000 / 0.000	0.0000	185.000	No Ice 1/2" Ice 1" Ice	1.964 2.138 2.320	1.189 1.331 1.480	0.075 0.093 0.114
TA08025-B605 (15.75x14.96x9.06) (Dish)	C	From Leg	4.000 / 0.000 / 0.000	0.0000	185.000	No Ice 1/2" Ice 1" Ice	1.964 2.138 2.320	1.189 1.331 1.480	0.075 0.093 0.114
RDIDC-9181-PF-48 (16x14x8) (Dish)	C	From Leg	4.000 / 0.000 / 0.000	0.0000	185.000	No Ice 1/2" Ice 1" Ice	1.867 2.037 2.215	1.067 1.204 1.348	0.022 0.038 0.057
1/3 Remaining Reserve Right	A	From Leg	4.000	0.0000	185.000	No Ice	5.774	5.774	0.062

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(Dish)			0.000			1/2" Ice	6.755	6.755	0.092
			0.000			1" Ice	7.736	7.736	0.122
1/3 Remaining Reserve Right	B	From Leg	4.000	0.0000	185.000	No Ice	5.774	5.774	0.062
(Dish)			0.000			1/2" Ice	6.755	6.755	0.092
			0.000			1" Ice	7.736	7.736	0.122
1/3 Remaining Reserve Right	C	From Leg	4.000	0.0000	185.000	No Ice	5.774	5.774	0.062
(Dish)			0.000			1/2" Ice	6.755	6.755	0.092
			0.000			1" Ice	7.736	7.736	0.122
***									

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	190.000	1.449	0.042	41.667	A	0.000	6.342	3.333	52.56	0.000	0.000
200.000-180.0					B	0.000	6.342		52.56	0.990	0.000
00					C	0.000	7.576		44.00	0.750	0.000
T2	170.000	1.415	0.041	41.667	A	0.000	6.342	3.333	52.56	0.000	0.000
180.000-160.0					B	0.000	6.342		52.56	3.960	0.000
00					C	0.000	7.576		44.00	0.750	0.000
T3	150.000	1.378	0.040	41.667	A	0.000	6.342	3.333	52.56	0.000	0.000
160.000-140.0					B	0.000	6.342		52.56	3.960	0.000
00					C	0.000	7.576		44.00	0.750	0.000
T4	130.000	1.337	0.039	41.667	A	0.000	6.342	3.333	52.56	0.000	0.000
140.000-120.0					B	0.000	6.342		52.56	3.960	0.000
00					C	0.000	7.576		44.00	0.750	0.000
T5	110.000	1.291	0.038	41.667	A	0.000	6.342	3.333	52.56	0.000	0.000
120.000-100.0					B	0.000	6.342		52.56	3.960	0.000
00					C	0.000	7.576		44.00	0.750	0.000
T6	90.000	1.238	0.036	42.083	A	0.000	7.164	4.167	58.16	0.000	0.000
100.000-80.00					B	0.000	7.164		58.16	3.960	0.000
0					C	0.000	8.385		49.69	0.750	0.000
T7	70.000	1.174	0.034	42.083	A	0.000	7.164	4.167	58.16	0.000	0.000
80.000-60.000					B	0.000	7.164		58.16	3.960	0.000
					C	0.000	8.385		49.69	0.750	0.000
T8	50.000	1.094	0.032	42.083	A	0.000	7.164	4.167	58.16	0.000	0.000
60.000-40.000					B	0.000	7.164		58.16	3.960	0.000
					C	0.000	8.385		49.69	0.750	0.000
T9	30.000	0.982	0.029	42.083	A	0.000	7.164	4.167	58.16	0.000	0.000
40.000-20.000					B	0.000	7.164		58.16	3.960	0.000
					C	0.000	8.385		49.69	0.750	0.000
T10	11.823	0.85	0.025	34.412	A	0.000	5.845	3.407	58.29	0.000	0.000
20.000-3.646					B	0.000	5.845		58.29	2.376	0.000
					C	0.000	6.821		49.95	0.450	0.000
T11	1.823	0.85	0.025	4.040	A	0.000	1.444	0.797	55.19	0.000	0.000
3.646-0.000					B	0.000	1.444		55.19	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	0.000	1.444		55.19	0.000	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	190.000	1.449	0.007	1.0126	45.042	A	0.000	24.576	10.084	41.03	0.000	0.000
200.000-180.000						B	0.000	24.576		41.03	2.003	0.000
						C	0.000	29.141		34.60	4.800	0.000
T2	170.000	1.415	0.007	1.0014	45.005	A	0.000	24.374	10.009	41.07	0.000	0.000
180.000-160.000						B	0.000	24.374		41.07	7.966	0.000
						C	0.000	28.903		34.63	4.756	0.000
T3	150.000	1.378	0.007	0.9890	44.963	A	0.000	24.150	9.926	41.10	0.000	0.000
160.000-140.000						B	0.000	24.150		41.10	7.916	0.000
						C	0.000	28.637		34.66	4.706	0.000
T4	130.000	1.337	0.007	0.9749	44.916	A	0.000	23.897	9.833	41.15	0.000	0.000
140.000-120.000						B	0.000	23.897		41.15	7.860	0.000
						C	0.000	28.338		34.70	4.650	0.000
T5	110.000	1.291	0.007	0.9588	44.863	A	0.000	23.606	9.725	41.20	0.000	0.000
120.000-100.000						B	0.000	23.606		41.20	7.795	0.000
						C	0.000	27.994		34.74	4.585	0.000
T6	90.000	1.238	0.006	0.9397	45.216	A	0.000	23.956	10.431	43.54	0.000	0.000
100.000-80.000						B	0.000	23.956		43.54	7.719	0.000
						C	0.000	28.234		36.95	4.509	0.000
T7	70.000	1.174	0.006	0.9164	45.138	A	0.000	23.539	10.276	43.66	0.000	0.000
80.000-60.000						B	0.000	23.539		43.66	7.626	0.000
						C	0.000	27.742		37.04	4.416	0.000
T8	50.000	1.094	0.006	0.8861	45.037	A	0.000	22.997	10.074	43.80	0.000	0.000
60.000-40.000						B	0.000	22.997		43.80	7.504	0.000
						C	0.000	27.101		37.17	4.294	0.000
T9	30.000	0.982	0.005	0.8419	44.890	A	0.000	22.209	9.780	44.04	0.000	0.000
40.000-20.000						B	0.000	22.209		44.04	7.328	0.000
						C	0.000	26.169		37.37	4.118	0.000
T10	11.823	0.85	0.004	0.7671	36.503	A	0.000	17.068	7.589	44.46	0.000	0.000
20.000-3.646						B	0.000	17.068		44.46	4.217	0.000
						C	0.000	20.042		37.87	2.291	0.000
T11 3.646-0.000	1.823	0.85	0.004	0.6363	4.441	A	0.000	3.649	1.608	44.06	0.000	0.000
						B	0.000	3.649		44.06	0.000	0.000
						C	0.000	3.649		44.06	0.000	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	190.000	1.449	0.011	41.667	A	0.000	6.342	3.333	52.56	0.000	0.000
200.000-180.0					B	0.000	6.342		52.56	0.990	0.000
00					C	0.000	7.576		44.00	0.750	0.000
T2	170.000	1.415	0.011	41.667	A	0.000	6.342	3.333	52.56	0.000	0.000
180.000-160.0					B	0.000	6.342		52.56	3.960	0.000
00					C	0.000	7.576		44.00	0.750	0.000
T3	150.000	1.378	0.011	41.667	A	0.000	6.342	3.333	52.56	0.000	0.000
160.000-140.0					B	0.000	6.342		52.56	3.960	0.000
00					C	0.000	7.576		44.00	0.750	0.000
T4	130.000	1.337	0.010	41.667	A	0.000	6.342	3.333	52.56	0.000	0.000
140.000-120.0					B	0.000	6.342		52.56	3.960	0.000
00					C	0.000	7.576		44.00	0.750	0.000
T5	110.000	1.291	0.010	41.667	A	0.000	6.342	3.333	52.56	0.000	0.000
120.000-100.0					B	0.000	6.342		52.56	3.960	0.000
00					C	0.000	7.576		44.00	0.750	0.000
T6	90.000	1.238	0.010	42.083	A	0.000	7.164	4.167	58.16	0.000	0.000
100.000-80.00					B	0.000	7.164		58.16	3.960	0.000
0					C	0.000	8.385		49.69	0.750	0.000
T7	70.000	1.174	0.009	42.083	A	0.000	7.164	4.167	58.16	0.000	0.000
80.000-60.000					B	0.000	7.164		58.16	3.960	0.000
					C	0.000	8.385		49.69	0.750	0.000
T8	50.000	1.094	0.009	42.083	A	0.000	7.164	4.167	58.16	0.000	0.000
60.000-40.000					B	0.000	7.164		58.16	3.960	0.000
					C	0.000	8.385		49.69	0.750	0.000
T9	30.000	0.982	0.008	42.083	A	0.000	7.164	4.167	58.16	0.000	0.000
40.000-20.000					B	0.000	7.164		58.16	3.960	0.000
					C	0.000	8.385		49.69	0.750	0.000
T10	11.823	0.85	0.007	34.412	A	0.000	5.845	3.407	58.29	0.000	0.000
20.000-3.646					B	0.000	5.845		58.29	2.376	0.000
					C	0.000	6.821		49.95	0.450	0.000
T11	1.823	0.85	0.007	4.040	A	0.000	1.444	0.797	55.19	0.000	0.000
3.646-0.000					B	0.000	1.444		55.19	0.000	0.000
					C	0.000	1.444		55.19	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.011	0.351	A	0.152	2.763	0.042	1	1	3.601	0.450	0.022	C
200.000-180.0			B	0.152	2.763		1	1	3.601			
00			C	0.182	2.658		1	1	4.330			
T2	0.030	0.351	A	0.152	2.763	0.041	1	1	3.601	0.501	0.025	C
180.000-160.0			B	0.152	2.763		1	1	3.601			
00			C	0.182	2.658		1	1	4.330			
T3	0.030	0.351	A	0.152	2.763	0.040	1	1	3.601	0.488	0.024	C
160.000-140.0			B	0.152	2.763		1	1	3.601			
00			C	0.182	2.658		1	1	4.330			
T4	0.030	0.351	A	0.152	2.763	0.039	1	1	3.601	0.474	0.024	C
140.000-120.0			B	0.152	2.763		1	1	3.601			
00			C	0.182	2.658		1	1	4.330			
T5	0.030	0.351	A	0.152	2.763	0.038	1	1	3.601	0.458	0.023	C
120.000-100.0			B	0.152	2.763		1	1	3.601			
00			C	0.182	2.658		1	1	4.330			
T6	0.030	0.444	A	0.17	2.698	0.036	1	1	4.083	0.469	0.023	C
100.000-80.00			B	0.17	2.698		1	1	4.083			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
0			C	0.199	2.599		1	1	4.816			
T7	0.030	0.444	A	0.17	2.698	0.034	1	1	4.083	0.445	0.022	C
80.000-60.000			B	0.17	2.698		1	1	4.083			
			C	0.199	2.599		1	1	4.816			
T8	0.030	0.444	A	0.17	2.698	0.032	1	1	4.083	0.415	0.021	C
60.000-40.000			B	0.17	2.698		1	1	4.083			
			C	0.199	2.599		1	1	4.816			
T9	0.030	0.444	A	0.17	2.698	0.029	1	1	4.083	0.372	0.019	C
40.000-20.000			B	0.17	2.698		1	1	4.083			
			C	0.199	2.599		1	1	4.816			
T10	0.018	0.361	A	0.17	2.7	0.025	1	1	3.331	0.250	0.015	C
20.000-3.646			B	0.17	2.7		1	1	3.331			
			C	0.198	2.602		1	1	3.916			
T11	0.000	0.090	A	0.357	2.155	0.025	1	1	0.893	0.040	0.011	C
3.646-0.000			B	0.357	2.155		1	1	0.893			
			C	0.357	2.155		1	1	0.893			
Sum Weight:	0.272	3.984								4.363		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.011	0.351	A	0.152	2.763	0.042	0.8	1	3.601	0.450	0.022	C
200.000-180.0			B	0.152	2.763		0.8	1	3.601			
00			C	0.182	2.658		0.8	1	4.330			
T2	0.030	0.351	A	0.152	2.763	0.041	0.8	1	3.601	0.501	0.025	C
180.000-160.0			B	0.152	2.763		0.8	1	3.601			
00			C	0.182	2.658		0.8	1	4.330			
T3	0.030	0.351	A	0.152	2.763	0.040	0.8	1	3.601	0.488	0.024	C
160.000-140.0			B	0.152	2.763		0.8	1	3.601			
00			C	0.182	2.658		0.8	1	4.330			
T4	0.030	0.351	A	0.152	2.763	0.039	0.8	1	3.601	0.474	0.024	C
140.000-120.0			B	0.152	2.763		0.8	1	3.601			
00			C	0.182	2.658		0.8	1	4.330			
T5	0.030	0.351	A	0.152	2.763	0.038	0.8	1	3.601	0.458	0.023	C
120.000-100.0			B	0.152	2.763		0.8	1	3.601			
00			C	0.182	2.658		0.8	1	4.330			
T6	0.030	0.444	A	0.17	2.698	0.036	0.8	1	4.083	0.469	0.023	C
100.000-80.00			B	0.17	2.698		0.8	1	4.083			
0			C	0.199	2.599		0.8	1	4.816			
T7	0.030	0.444	A	0.17	2.698	0.034	0.8	1	4.083	0.445	0.022	C
80.000-60.000			B	0.17	2.698		0.8	1	4.083			
			C	0.199	2.599		0.8	1	4.816			
T8	0.030	0.444	A	0.17	2.698	0.032	0.8	1	4.083	0.415	0.021	C
60.000-40.000			B	0.17	2.698		0.8	1	4.083			
			C	0.199	2.599		0.8	1	4.816			
T9	0.030	0.444	A	0.17	2.698	0.029	0.8	1	4.083	0.372	0.019	C
40.000-20.000			B	0.17	2.698		0.8	1	4.083			
			C	0.199	2.599		0.8	1	4.816			
T10	0.018	0.361	A	0.17	2.7	0.025	0.8	1	3.331	0.250	0.015	C
20.000-3.646			B	0.17	2.7		0.8	1	3.331			
			C	0.198	2.602		0.8	1	3.916			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T11	0.000	0.090	A	0.357	2.155	0.025	0.8	1	0.893	0.040	0.011	C
3.646-0.000			B	0.357	2.155		0.8	1	0.893			
			C	0.357	2.155		0.8	1	0.893			
Sum Weight:	0.272	3.984								4.363		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.011	0.351	A	0.152	2.763	0.042	0.85	1	3.601	0.450	0.022	C
200.000-180.0			B	0.152	2.763		0.85	1	3.601			
00			C	0.182	2.658		0.85	1	4.330			
T2	0.030	0.351	A	0.152	2.763	0.041	0.85	1	3.601	0.501	0.025	C
180.000-160.0			B	0.152	2.763		0.85	1	3.601			
00			C	0.182	2.658		0.85	1	4.330			
T3	0.030	0.351	A	0.152	2.763	0.040	0.85	1	3.601	0.488	0.024	C
160.000-140.0			B	0.152	2.763		0.85	1	3.601			
00			C	0.182	2.658		0.85	1	4.330			
T4	0.030	0.351	A	0.152	2.763	0.039	0.85	1	3.601	0.474	0.024	C
140.000-120.0			B	0.152	2.763		0.85	1	3.601			
00			C	0.182	2.658		0.85	1	4.330			
T5	0.030	0.351	A	0.152	2.763	0.038	0.85	1	3.601	0.458	0.023	C
120.000-100.0			B	0.152	2.763		0.85	1	3.601			
00			C	0.182	2.658		0.85	1	4.330			
T6	0.030	0.444	A	0.17	2.698	0.036	0.85	1	4.083	0.469	0.023	C
100.000-80.00			B	0.17	2.698		0.85	1	4.083			
0			C	0.199	2.599		0.85	1	4.816			
T7	0.030	0.444	A	0.17	2.698	0.034	0.85	1	4.083	0.445	0.022	C
80.000-60.000			B	0.17	2.698		0.85	1	4.083			
			C	0.199	2.599		0.85	1	4.816			
T8	0.030	0.444	A	0.17	2.698	0.032	0.85	1	4.083	0.415	0.021	C
60.000-40.000			B	0.17	2.698		0.85	1	4.083			
			C	0.199	2.599		0.85	1	4.816			
T9	0.030	0.444	A	0.17	2.698	0.029	0.85	1	4.083	0.372	0.019	C
40.000-20.000			B	0.17	2.698		0.85	1	4.083			
			C	0.199	2.599		0.85	1	4.816			
T10	0.018	0.361	A	0.17	2.7	0.025	0.85	1	3.331	0.250	0.015	C
20.000-3.646			B	0.17	2.7		0.85	1	3.331			
			C	0.198	2.602		0.85	1	3.916			
T11	0.000	0.090	A	0.357	2.155	0.025	0.85	1	0.893	0.040	0.011	C
3.646-0.000			B	0.357	2.155		0.85	1	0.893			
			C	0.357	2.155		0.85	1	0.893			
Sum Weight:	0.272	3.984								4.363		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.064	0.930	A	0.546	1.848	0.007	1	1	17.465	0.274	0.014	C
200.000-180.0			B	0.546	1.848		1	1	17.465			
00			C	0.647	1.782		1	1	22.567			
T2	0.137	0.920	A	0.542	1.852	0.007	1	1	17.264	0.282	0.014	C
180.000-160.0			B	0.542	1.852		1	1	17.264			
00			C	0.642	1.784		1	1	22.290			
T3	0.135	0.909	A	0.537	1.856	0.007	1	1	17.043	0.271	0.014	C
160.000-140.0			B	0.537	1.856		1	1	17.043			
00			C	0.637	1.786		1	1	21.985			
T4	0.133	0.896	A	0.532	1.862	0.007	1	1	16.795	0.260	0.013	C
140.000-120.0			B	0.532	1.862		1	1	16.795			
00			C	0.631	1.788		1	1	21.643			
T5	0.130	0.881	A	0.526	1.868	0.007	1	1	16.512	0.248	0.012	C
120.000-100.0			B	0.526	1.868		1	1	16.512			
00			C	0.624	1.791		1	1	21.253			
T6	0.128	0.974	A	0.53	1.864	0.006	1	1	16.806	0.239	0.012	C
100.000-80.00			B	0.53	1.864		1	1	16.806			
0			C	0.624	1.791		1	1	21.443			
T7	0.124	0.954	A	0.521	1.874	0.006	1	1	16.403	0.222	0.011	C
80.000-60.000			B	0.521	1.874		1	1	16.403			
			C	0.615	1.796		1	1	20.892			
T8	0.120	0.927	A	0.511	1.887	0.006	1	1	15.886	0.201	0.010	C
60.000-40.000			B	0.511	1.887		1	1	15.886			
			C	0.602	1.803		1	1	20.187			
T9	0.113	0.891	A	0.495	1.907	0.005	1	1	15.150	0.174	0.009	C
40.000-20.000			B	0.495	1.907		1	1	15.150			
			C	0.583	1.816		1	1	19.185			
T10	0.062	0.676	A	0.468	1.946	0.004	1	1	11.402	0.111	0.007	C
20.000-3.646			B	0.468	1.946		1	1	11.402			
			C	0.549	1.844		1	1	14.283			
T11	0.000	0.146	A	0.822	1.834	0.004	1	1	3.293	0.022	0.006	C
3.646-0.000			B	0.822	1.834		1	1	3.293			
			C	0.822	1.834		1	1	3.293			
Sum Weight:	1.146	9.104								2.303		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.064	0.930	A	0.546	1.848	0.007	0.8	1	17.465	0.274	0.014	C
200.000-180.0			B	0.546	1.848		0.8	1	17.465			
00			C	0.647	1.782		0.8	1	22.567			
T2	0.137	0.920	A	0.542	1.852	0.007	0.8	1	17.264	0.282	0.014	C
180.000-160.0			B	0.542	1.852		0.8	1	17.264			
00			C	0.642	1.784		0.8	1	22.290			
T3	0.135	0.909	A	0.537	1.856	0.007	0.8	1	17.043	0.271	0.014	C
160.000-140.0			B	0.537	1.856		0.8	1	17.043			
00			C	0.637	1.786		0.8	1	21.985			
T4	0.133	0.896	A	0.532	1.862	0.007	0.8	1	16.795	0.260	0.013	C
140.000-120.0			B	0.532	1.862		0.8	1	16.795			
00			C	0.631	1.788		0.8	1	21.643			
T5	0.130	0.881	A	0.526	1.868	0.007	0.8	1	16.512	0.248	0.012	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
120.000-100.0			B	0.526	1.868		0.8	1	16.512			
00			C	0.624	1.791		0.8	1	21.253			
T6	0.128	0.974	A	0.53	1.864	0.006	0.8	1	16.806	0.239	0.012	C
100.000-80.00			B	0.53	1.864		0.8	1	16.806			
0			C	0.624	1.791		0.8	1	21.443			
T7	0.124	0.954	A	0.521	1.874	0.006	0.8	1	16.403	0.222	0.011	C
80.000-60.000			B	0.521	1.874		0.8	1	16.403			
			C	0.615	1.796		0.8	1	20.892			
T8	0.120	0.927	A	0.511	1.887	0.006	0.8	1	15.886	0.201	0.010	C
60.000-40.000			B	0.511	1.887		0.8	1	15.886			
			C	0.602	1.803		0.8	1	20.187			
T9	0.113	0.891	A	0.495	1.907	0.005	0.8	1	15.150	0.174	0.009	C
40.000-20.000			B	0.495	1.907		0.8	1	15.150			
			C	0.583	1.816		0.8	1	19.185			
T10	0.062	0.676	A	0.468	1.946	0.004	0.8	1	11.402	0.111	0.007	C
20.000-3.646			B	0.468	1.946		0.8	1	11.402			
			C	0.549	1.844		0.8	1	14.283			
T11	0.000	0.146	A	0.822	1.834	0.004	0.8	1	3.293	0.022	0.006	C
3.646-0.000			B	0.822	1.834		0.8	1	3.293			
			C	0.822	1.834		0.8	1	3.293			
Sum Weight:	1.146	9.104								2.303		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.064	0.930	A	0.546	1.848	0.007	0.85	1	17.465	0.274	0.014	C
200.000-180.0			B	0.546	1.848		0.85	1	17.465			
00			C	0.647	1.782		0.85	1	22.567			
T2	0.137	0.920	A	0.542	1.852	0.007	0.85	1	17.264	0.282	0.014	C
180.000-160.0			B	0.542	1.852		0.85	1	17.264			
00			C	0.642	1.784		0.85	1	22.290			
T3	0.135	0.909	A	0.537	1.856	0.007	0.85	1	17.043	0.271	0.014	C
160.000-140.0			B	0.537	1.856		0.85	1	17.043			
00			C	0.637	1.786		0.85	1	21.985			
T4	0.133	0.896	A	0.532	1.862	0.007	0.85	1	16.795	0.260	0.013	C
140.000-120.0			B	0.532	1.862		0.85	1	16.795			
00			C	0.631	1.788		0.85	1	21.643			
T5	0.130	0.881	A	0.526	1.868	0.007	0.85	1	16.512	0.248	0.012	C
120.000-100.0			B	0.526	1.868		0.85	1	16.512			
00			C	0.624	1.791		0.85	1	21.253			
T6	0.128	0.974	A	0.53	1.864	0.006	0.85	1	16.806	0.239	0.012	C
100.000-80.00			B	0.53	1.864		0.85	1	16.806			
0			C	0.624	1.791		0.85	1	21.443			
T7	0.124	0.954	A	0.521	1.874	0.006	0.85	1	16.403	0.222	0.011	C
80.000-60.000			B	0.521	1.874		0.85	1	16.403			
			C	0.615	1.796		0.85	1	20.892			
T8	0.120	0.927	A	0.511	1.887	0.006	0.85	1	15.886	0.201	0.010	C
60.000-40.000			B	0.511	1.887		0.85	1	15.886			
			C	0.602	1.803		0.85	1	20.187			
T9	0.113	0.891	A	0.495	1.907	0.005	0.85	1	15.150	0.174	0.009	C
40.000-20.000			B	0.495	1.907		0.85	1	15.150			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
			C	0.583	1.816		0.85	1	19.185			
T10	0.062	0.676	A	0.468	1.946	0.004	0.85	1	11.402	0.111	0.007	C
20.000-3.646			B	0.468	1.946		0.85	1	11.402			
			C	0.549	1.844		0.85	1	14.283			
T11	0.000	0.146	A	0.822	1.834	0.004	0.85	1	3.293	0.022	0.006	C
3.646-0.000			B	0.822	1.834		0.85	1	3.293			
			C	0.822	1.834		0.85	1	3.293			
Sum Weight:	1.146	9.104								2.303		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.011	0.351	A	0.152	2.763	0.011	1	1	3.601	0.120	0.006	C
200.000-180.0			B	0.152	2.763		1	1	3.601			
00			C	0.182	2.658		1	1	4.330			
T2	0.030	0.351	A	0.152	2.763	0.011	1	1	3.601	0.134	0.007	C
180.000-160.0			B	0.152	2.763		1	1	3.601			
00			C	0.182	2.658		1	1	4.330			
T3	0.030	0.351	A	0.152	2.763	0.011	1	1	3.601	0.131	0.007	C
160.000-140.0			B	0.152	2.763		1	1	3.601			
00			C	0.182	2.658		1	1	4.330			
T4	0.030	0.351	A	0.152	2.763	0.010	1	1	3.601	0.127	0.006	C
140.000-120.0			B	0.152	2.763		1	1	3.601			
00			C	0.182	2.658		1	1	4.330			
T5	0.030	0.351	A	0.152	2.763	0.010	1	1	3.601	0.122	0.006	C
120.000-100.0			B	0.152	2.763		1	1	3.601			
00			C	0.182	2.658		1	1	4.330			
T6	0.030	0.444	A	0.17	2.698	0.010	1	1	4.083	0.126	0.006	C
100.000-80.00			B	0.17	2.698		1	1	4.083			
0			C	0.199	2.599		1	1	4.816			
T7	0.030	0.444	A	0.17	2.698	0.009	1	1	4.083	0.119	0.006	C
80.000-60.000			B	0.17	2.698		1	1	4.083			
			C	0.199	2.599		1	1	4.816			
T8	0.030	0.444	A	0.17	2.698	0.009	1	1	4.083	0.111	0.006	C
60.000-40.000			B	0.17	2.698		1	1	4.083			
			C	0.199	2.599		1	1	4.816			
T9	0.030	0.444	A	0.17	2.698	0.008	1	1	4.083	0.100	0.005	C
40.000-20.000			B	0.17	2.698		1	1	4.083			
			C	0.199	2.599		1	1	4.816			
T10	0.018	0.361	A	0.17	2.7	0.007	1	1	3.331	0.067	0.004	C
20.000-3.646			B	0.17	2.7		1	1	3.331			
			C	0.198	2.602		1	1	3.916			
T11	0.000	0.090	A	0.357	2.155	0.007	1	1	0.893	0.011	0.003	C
3.646-0.000			B	0.357	2.155		1	1	0.893			
			C	0.357	2.155		1	1	0.893			
Sum Weight:	0.272	3.984								1.167		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
T1	0.011	0.351	A	0.152	2.763	0.011	0.8	1	3.601	0.120	0.006	C
200.000-180.0			B	0.152	2.763		0.8	1	3.601			
00			C	0.182	2.658		0.8	1	4.330			
T2	0.030	0.351	A	0.152	2.763	0.011	0.8	1	3.601	0.134	0.007	C
180.000-160.0			B	0.152	2.763		0.8	1	3.601			
00			C	0.182	2.658		0.8	1	4.330			
T3	0.030	0.351	A	0.152	2.763	0.011	0.8	1	3.601	0.131	0.007	C
160.000-140.0			B	0.152	2.763		0.8	1	3.601			
00			C	0.182	2.658		0.8	1	4.330			
T4	0.030	0.351	A	0.152	2.763	0.010	0.8	1	3.601	0.127	0.006	C
140.000-120.0			B	0.152	2.763		0.8	1	3.601			
00			C	0.182	2.658		0.8	1	4.330			
T5	0.030	0.351	A	0.152	2.763	0.010	0.8	1	3.601	0.122	0.006	C
120.000-100.0			B	0.152	2.763		0.8	1	3.601			
00			C	0.182	2.658		0.8	1	4.330			
T6	0.030	0.444	A	0.17	2.698	0.010	0.8	1	4.083	0.126	0.006	C
100.000-80.00			B	0.17	2.698		0.8	1	4.083			
0			C	0.199	2.599		0.8	1	4.816			
T7	0.030	0.444	A	0.17	2.698	0.009	0.8	1	4.083	0.119	0.006	C
80.000-60.000			B	0.17	2.698		0.8	1	4.083			
			C	0.199	2.599		0.8	1	4.816			
T8	0.030	0.444	A	0.17	2.698	0.009	0.8	1	4.083	0.111	0.006	C
60.000-40.000			B	0.17	2.698		0.8	1	4.083			
			C	0.199	2.599		0.8	1	4.816			
T9	0.030	0.444	A	0.17	2.698	0.008	0.8	1	4.083	0.100	0.005	C
40.000-20.000			B	0.17	2.698		0.8	1	4.083			
			C	0.199	2.599		0.8	1	4.816			
T10	0.018	0.361	A	0.17	2.7	0.007	0.8	1	3.331	0.067	0.004	C
20.000-3.646			B	0.17	2.7		0.8	1	3.331			
			C	0.198	2.602		0.8	1	3.916			
T11	0.000	0.090	A	0.357	2.155	0.007	0.8	1	0.893	0.011	0.003	C
3.646-0.000			B	0.357	2.155		0.8	1	0.893			
			C	0.357	2.155		0.8	1	0.893			
Sum Weight:	0.272	3.984								1.167		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
T1	0.011	0.351	A	0.152	2.763	0.011	0.85	1	3.601	0.120	0.006	C
200.000-180.0			B	0.152	2.763		0.85	1	3.601			
00			C	0.182	2.658		0.85	1	4.330			
T2	0.030	0.351	A	0.152	2.763	0.011	0.85	1	3.601	0.134	0.007	C
180.000-160.0			B	0.152	2.763		0.85	1	3.601			
00			C	0.182	2.658		0.85	1	4.330			
T3	0.030	0.351	A	0.152	2.763	0.011	0.85	1	3.601	0.131	0.007	C
160.000-140.0			B	0.152	2.763		0.85	1	3.601			
00			C	0.182	2.658		0.85	1	4.330			
T4	0.030	0.351	A	0.152	2.763	0.010	0.85	1	3.601	0.127	0.006	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
140.000-120.0			B	0.152	2.763		0.85	1	3.601			
00			C	0.182	2.658		0.85	1	4.330			
T5	0.030	0.351	A	0.152	2.763	0.010	0.85	1	3.601	0.122	0.006	C
120.000-100.0			B	0.152	2.763		0.85	1	3.601			
00			C	0.182	2.658		0.85	1	4.330			
T6	0.030	0.444	A	0.17	2.698	0.010	0.85	1	4.083	0.126	0.006	C
100.000-80.00			B	0.17	2.698		0.85	1	4.083			
0			C	0.199	2.599		0.85	1	4.816			
T7	0.030	0.444	A	0.17	2.698	0.009	0.85	1	4.083	0.119	0.006	C
80.000-60.000			B	0.17	2.698		0.85	1	4.083			
			C	0.199	2.599		0.85	1	4.816			
T8	0.030	0.444	A	0.17	2.698	0.009	0.85	1	4.083	0.111	0.006	C
60.000-40.000			B	0.17	2.698		0.85	1	4.083			
			C	0.199	2.599		0.85	1	4.816			
T9	0.030	0.444	A	0.17	2.698	0.008	0.85	1	4.083	0.100	0.005	C
40.000-20.000			B	0.17	2.698		0.85	1	4.083			
			C	0.199	2.599		0.85	1	4.816			
T10	0.018	0.361	A	0.17	2.7	0.007	0.85	1	3.331	0.067	0.004	C
20.000-3.646			B	0.17	2.7		0.85	1	3.331			
			C	0.198	2.602		0.85	1	3.916			
T11	0.000	0.090	A	0.357	2.155	0.007	0.85	1	0.893	0.011	0.003	C
3.646-0.000			B	0.357	2.155		0.85	1	0.893			
			C	0.357	2.155		0.85	1	0.893			
Sum Weight:	0.272	3.984								1.167		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Torques kip-ft
Leg Weight	2.118			
Bracing Weight	1.865			
Total Member Self-Weight	3.984			
Guy Weight	0.413			
Total Weight	7.313			
Wind 0 deg - No Ice		0.054	-6.978	0.520
Wind 30 deg - No Ice		3.567	-6.070	0.691
Wind 60 deg - No Ice		6.124	-3.536	0.678
Wind 90 deg - No Ice		7.040	-0.054	0.483
Wind 120 deg - No Ice		5.676	3.215	0.158
Wind 150 deg - No Ice		3.246	5.622	-0.209
Wind 180 deg - No Ice		-0.054	6.523	-0.520
Wind 210 deg - No Ice		-3.339	5.676	-0.691
Wind 240 deg - No Ice		-5.729	3.308	-0.678
Wind 270 deg - No Ice		-6.585	0.054	-0.483
Wind 300 deg - No Ice		-5.676	-3.215	-0.158
Wind 330 deg - No Ice		-3.246	-5.622	0.209
Member Ice	5.120			
Guy Ice	1.996			
Total Weight Ice	17.230			
Wind 0 deg - Ice		0.010	-2.973	0.148
Wind 30 deg - Ice		1.501	-2.580	0.215
Wind 60 deg - Ice		2.590	-1.495	0.223

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Torques kip-ft
Wind 90 deg - Ice		2.985	-0.010	0.172
Wind 120 deg - Ice		2.257	1.292	0.075
Wind 150 deg - Ice		1.297	2.247	-0.042
Wind 180 deg - Ice		-0.010	2.600	-0.148
Wind 210 deg - Ice		-1.314	2.257	-0.215
Wind 240 deg - Ice		-2.267	1.309	-0.223
Wind 270 deg - Ice		-2.612	0.010	-0.172
Wind 300 deg - Ice		-2.257	-1.292	-0.075
Wind 330 deg - Ice		-1.297	-2.247	0.042
Total Weight	7.313			
Wind 0 deg - Service		0.014	-1.867	0.139
Wind 30 deg - Service		0.954	-1.624	0.185
Wind 60 deg - Service		1.639	-0.946	0.181
Wind 90 deg - Service		1.884	-0.014	0.129
Wind 120 deg - Service		1.519	0.860	0.042
Wind 150 deg - Service		0.869	1.504	-0.056
Wind 180 deg - Service		-0.014	1.745	-0.139
Wind 210 deg - Service		-0.893	1.519	-0.185
Wind 240 deg - Service		-1.533	0.885	-0.181
Wind 270 deg - Service		-1.762	0.014	-0.129
Wind 300 deg - Service		-1.519	-0.860	-0.042
Wind 330 deg - Service		-0.869	-1.504	0.056
Seismic Vertical	0.305			
Seismic Horizontal 0 deg		0.000	-0.508	0.000
Seismic Horizontal 30 deg		0.254	-0.440	0.000
Seismic Horizontal 60 deg		0.440	-0.254	0.000
Seismic Horizontal 90 deg		0.508	0.000	0.000
Seismic Horizontal 120 deg		0.440	0.254	0.000
Seismic Horizontal 150 deg		0.254	0.440	0.000
Seismic Horizontal 180 deg		0.000	0.508	0.000
Seismic Horizontal 210 deg		-0.254	0.440	0.000
Seismic Horizontal 240 deg		-0.440	0.254	0.000
Seismic Horizontal 270 deg		-0.508	0.000	0.000
Seismic Horizontal 300 deg		-0.440	-0.254	0.000
Seismic Horizontal 330 deg		-0.254	-0.440	0.000

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.0 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.0 Wind 60 deg - No Ice+1.0 Guy
5	1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy
6	1.2 Dead+1.0 Wind 120 deg - No Ice+1.0 Guy
7	1.2 Dead+1.0 Wind 150 deg - No Ice+1.0 Guy
8	1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy
9	1.2 Dead+1.0 Wind 210 deg - No Ice+1.0 Guy
10	1.2 Dead+1.0 Wind 240 deg - No Ice+1.0 Guy
11	1.2 Dead+1.0 Wind 270 deg - No Ice+1.0 Guy
12	1.2 Dead+1.0 Wind 300 deg - No Ice+1.0 Guy
13	1.2 Dead+1.0 Wind 330 deg - No Ice+1.0 Guy
14	1.2 Dead+1.0 Ice+1.0 Temp+Guy

Comb. No.	Description
15	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy
16	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy
17	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy
18	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy
19	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy
20	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy
21	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy
22	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy
23	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy
24	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy
25	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy
26	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy
27	Dead+Wind 0 deg - Service+Guy
28	Dead+Wind 30 deg - Service+Guy
29	Dead+Wind 60 deg - Service+Guy
30	Dead+Wind 90 deg - Service+Guy
31	Dead+Wind 120 deg - Service+Guy
32	Dead+Wind 150 deg - Service+Guy
33	Dead+Wind 180 deg - Service+Guy
34	Dead+Wind 210 deg - Service+Guy
35	Dead+Wind 240 deg - Service+Guy
36	Dead+Wind 270 deg - Service+Guy
37	Dead+Wind 300 deg - Service+Guy
38	Dead+Wind 330 deg - Service+Guy
39	1.2 Dead+1.0 Ev+1.0 Eh 0 deg+1.0 Guy
40	1.2 Dead+1.0 Ev+1.0 Eh 30 deg+1.0 Guy
41	1.2 Dead+1.0 Ev+1.0 Eh 60 deg+1.0 Guy
42	1.2 Dead+1.0 Ev+1.0 Eh 90 deg+1.0 Guy
43	1.2 Dead+1.0 Ev+1.0 Eh 120 deg+1.0 Guy
44	1.2 Dead+1.0 Ev+1.0 Eh 150 deg+1.0 Guy
45	1.2 Dead+1.0 Ev+1.0 Eh 180 deg+1.0 Guy
46	1.2 Dead+1.0 Ev+1.0 Eh 210 deg+1.0 Guy
47	1.2 Dead+1.0 Ev+1.0 Eh 240 deg+1.0 Guy
48	1.2 Dead+1.0 Ev+1.0 Eh 270 deg+1.0 Guy
49	1.2 Dead+1.0 Ev+1.0 Eh 300 deg+1.0 Guy
50	1.2 Dead+1.0 Ev+1.0 Eh 330 deg+1.0 Guy

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	200 - 180	Leg	Max Tension	4	10.434	0.288	-0.165
			Max. Compression	10	-12.691	0.100	-0.060
			Max. Mx	5	7.071	0.333	-0.006
			Max. My	2	-11.853	0.016	-0.323
			Max. Vy	5	1.130	-0.115	0.003
			Max. Vx	2	-1.111	-0.005	0.116
		Diagonal	Max Tension	3	1.683	0.000	0.000
			Max. Compression	11	-1.786	0.000	0.000
			Max. Mx	6	0.260	-0.001	-0.000
			Max. My	11	-1.301	-0.000	-0.001
			Max. Vy	22	0.002	-0.001	0.000
			Max. Vx	11	0.001	-0.000	-0.001
		Horizontal	Max Tension	8	0.344	0.000	0.000
			Max. Compression	8	-0.221	0.000	0.000
			Max. Mx	15	0.153	0.002	0.000
			Max. My	10	0.010	0.000	0.000
			Max. Vy	15	-0.004	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	10	-0.000	0.000	0.000
		Top Girt	Max Tension	10	0.032	0.000	0.000
			Max. Compression	4	-0.036	0.000	0.000
			Max. Mx	23	0.004	0.002	0.000
			Max. My	10	-0.014	0.000	-0.000
			Max. Vy	23	-0.004	0.000	0.000
			Max. Vx	10	0.000	0.000	0.000
		Bottom Girt	Max Tension	4	0.954	0.000	0.000
			Max. Compression	10	-1.007	0.000	0.000
			Max. Mx	23	-0.255	0.002	0.000
			Max. My	10	0.605	0.000	-0.000
			Max. Vy	23	-0.004	0.000	0.000
			Max. Vx	10	0.000	0.000	0.000
		Mid Girt	Max Tension	4	0.175	0.000	0.000
			Max. Compression	10	-0.182	0.000	0.000
			Max. Mx	23	-0.054	0.002	0.000
			Max. My	10	0.071	0.000	-0.000
			Max. Vy	23	-0.004	0.000	0.000
			Max. Vx	10	0.000	0.000	0.000
T2	180 - 160	Leg	Max Tension	4	10.431	-0.100	0.056
			Max. Compression	10	-13.023	-0.075	0.051
			Max. Mx	5	0.988	-0.353	0.008
			Max. My	2	-11.856	-0.016	0.344
			Max. Vy	5	1.143	-0.353	0.008
			Max. Vx	2	-1.095	-0.016	0.344
		Diagonal	Max Tension	2	0.321	0.000	0.000
			Max. Compression	10	-0.755	0.000	0.000
			Max. Mx	3	-0.134	-0.001	-0.000
			Max. My	5	-0.665	-0.000	-0.000
			Max. Vy	16	0.002	-0.001	-0.000
			Max. Vx	5	-0.000	0.000	0.000
		Horizontal	Max Tension	9	1.002	0.000	0.000
			Max. Compression	2	-0.119	0.000	0.000
			Max. Mx	15	0.271	0.002	0.000
			Max. My	10	0.771	0.000	0.000
			Max. Vy	15	0.004	0.000	0.000
			Max. Vx	10	-0.000	0.000	0.000
		Top Girt	Max Tension	10	3.530	0.000	0.000
			Max. Compression	4	-0.376	0.000	0.000
			Max. Mx	23	1.548	0.002	0.000
			Max. My	10	0.675	0.000	-0.000
			Max. Vy	23	-0.004	0.000	0.000
			Max. Vx	10	0.000	0.000	0.000
		Bottom Girt	Max Tension	10	0.425	0.000	0.000
			Max. Compression	4	-0.016	0.000	0.000
			Max. Mx	14	0.035	0.002	0.000
			Max. My	10	0.050	0.000	-0.000
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	10	0.000	0.000	0.000
		Mid Girt	Max Tension	9	0.776	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.073	0.002	0.000
			Max. My	10	0.105	0.000	-0.000
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	10	0.000	0.000	0.000
		Guy A	Bottom Tension	9	9.369		
			Top Tension	9	9.440		
			Top Cable Vert	9	7.967		
			Top Cable Norm	9	5.065		
			Top Cable Tan	9	0.015		
			Bot Cable Vert	9	-7.778		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Bot Cable Norm	9	5.222		
			Bot Cable Tan	9	0.114		
		Guy B	Bottom Tension	11	9.085		
			Top Tension	11	9.153		
			Top Cable Vert	11	7.610		
			Top Cable Norm	11	5.086		
			Top Cable Tan	11	0.011		
			Bot Cable Vert	11	-7.426		
			Bot Cable Norm	11	5.233		
			Bot Cable Tan	11	0.113		
		Guy C	Bottom Tension	3	9.515		
			Top Tension	3	9.585		
			Top Cable Vert	3	8.021		
			Top Cable Norm	3	5.247		
			Top Cable Tan	3	0.013		
			Bot Cable Vert	3	-7.834		
			Bot Cable Norm	3	5.399		
			Bot Cable Tan	3	0.113		
T3	160 - 140	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	10	-14.480	0.015	-0.015
			Max. Mx	5	-1.785	0.042	0.013
			Max. My	2	-2.430	-0.003	-0.054
			Max. Vy	5	0.148	-0.017	-0.008
			Max. Vx	2	-0.169	0.001	0.013
		Diagonal	Max Tension	2	0.175	0.000	0.000
			Max. Compression	6	-0.777	0.000	0.000
			Max. Mx	10	0.103	-0.001	0.000
			Max. My	2	-0.116	0.001	-0.000
			Max. Vy	17	0.002	-0.001	0.000
			Max. Vx	2	-0.000	0.000	0.000
		Horizontal	Max Tension	10	0.880	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.547	0.002	0.000
			Max. My	10	0.823	0.000	0.000
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	10	-0.000	0.000	0.000
		Top Girt	Max Tension	10	0.415	0.000	0.000
			Max. Compression	4	-0.006	0.000	0.000
			Max. Mx	14	0.028	0.002	0.000
			Max. My	10	0.046	0.000	-0.000
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	10	0.000	0.000	0.000
		Bottom Girt	Max Tension	10	0.521	0.000	0.000
			Max. Compression	6	-0.110	0.000	0.000
			Max. Mx	14	0.037	0.002	0.000
			Max. My	10	0.113	0.000	-0.000
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	10	0.000	0.000	0.000
		Mid Girt	Max Tension	10	0.804	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.069	0.002	0.000
			Max. My	10	0.110	0.000	-0.000
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	10	0.000	0.000	0.000
T4	140 - 120	Leg	Max Tension	8	3.823	0.003	0.071
			Max. Compression	10	-20.649	0.029	-0.020
			Max. Mx	5	2.830	0.085	0.012
			Max. My	2	-0.036	-0.005	-0.087
			Max. Vy	5	0.303	-0.034	-0.006
			Max. Vx	2	-0.292	0.002	0.042
		Diagonal	Max Tension	8	0.315	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	10	-1.061	0.000	0.000
			Max. Mx	10	0.169	-0.002	-0.000
			Max. My	10	-1.060	0.001	0.000
			Max. Vy	16	0.002	-0.001	-0.000
			Max. Vx	10	0.000	0.000	0.000
		Horizontal	Max Tension	9	1.069	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	21	0.659	0.002	0.000
			Max. My	10	0.937	0.000	0.000
			Max. Vy	21	0.004	0.000	0.000
			Max. Vx	10	-0.000	0.000	0.000
		Top Girt	Max Tension	10	0.415	0.000	0.000
			Max. Compression	3	-0.033	0.000	0.000
			Max. Mx	14	0.030	0.002	0.000
			Max. My	10	-0.006	0.000	-0.000
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	10	0.000	0.000	0.000
		Bottom Girt	Max Tension	9	0.715	0.000	0.000
			Max. Compression	6	-0.218	0.000	0.000
			Max. Mx	14	0.043	0.002	0.000
			Max. My	10	0.184	0.000	-0.000
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	10	0.000	0.000	0.000
		Mid Girt	Max Tension	10	0.945	0.000	0.000
			Max. Compression	10	-0.021	0.000	0.000
			Max. Mx	14	0.073	0.002	0.000
			Max. My	10	0.131	0.000	-0.000
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	10	0.000	0.000	0.000
T5	120 - 100	Leg	Max Tension	8	3.822	-0.001	-0.026
			Max. Compression	10	-20.650	0.075	-0.040
			Max. Mx	5	0.778	-0.098	-0.015
			Max. My	2	-19.671	0.004	0.100
			Max. Vy	5	0.304	-0.098	-0.015
			Max. Vx	2	-0.286	0.005	0.085
		Diagonal	Max Tension	7	0.341	0.000	0.000
			Max. Compression	10	-0.987	0.000	0.000
			Max. Mx	10	-0.232	-0.002	-0.000
			Max. My	10	-0.933	-0.001	-0.000
			Max. Vy	16	0.002	-0.001	-0.000
			Max. Vx	10	0.000	-0.001	-0.000
		Horizontal	Max Tension	9	1.211	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	22	0.861	0.002	0.000
			Max. My	10	1.173	0.000	0.000
			Max. Vy	22	0.004	0.000	0.000
			Max. Vx	10	-0.000	0.000	0.000
		Top Girt	Max Tension	15	1.369	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.744	0.002	0.000
			Max. My	10	0.447	0.000	-0.000
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	10	0.000	0.000	0.000
		Bottom Girt	Max Tension	10	0.479	0.000	0.000
			Max. Compression	4	-0.035	0.000	0.000
			Max. Mx	14	0.048	0.002	0.000
			Max. My	3	0.032	0.000	-0.000
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	3	0.000	0.000	0.000
		Mid Girt	Max Tension	10	1.056	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	14	0.099	0.002	0.000
			Max. My	3	0.109	0.000	-0.000
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	3	0.000	0.000	0.000
		Guy A	Bottom Tension	8	3.061		
			Top Tension	8	3.086		
			Top Cable Vert	8	2.258		
			Top Cable Norm	8	2.104		
			Top Cable Tan	8	0.000		
			Bot Cable Vert	8	-2.169		
			Bot Cable Norm	8	2.160		
			Bot Cable Tan	8	0.000		
		Guy B	Bottom Tension	12	2.944		
			Top Tension	12	2.968		
			Top Cable Vert	12	2.093		
			Top Cable Norm	12	2.104		
			Top Cable Tan	12	0.000		
			Bot Cable Vert	12	-2.008		
			Bot Cable Norm	12	2.153		
			Bot Cable Tan	12	0.000		
		Guy C	Bottom Tension	4	3.150		
			Top Tension	4	3.174		
			Top Cable Vert	4	2.274		
			Top Cable Norm	4	2.214		
			Top Cable Tan	4	0.000		
			Bot Cable Vert	4	-2.188		
			Bot Cable Norm	4	2.266		
			Bot Cable Tan	4	0.000		
T6	100 - 80	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	10	-14.435	-0.048	0.036
			Max. Mx	5	-4.773	0.065	0.014
			Max. My	2	-4.696	0.002	-0.068
			Max. Vy	5	-0.166	0.033	0.009
			Max. Vx	2	0.165	0.003	-0.022
		Diagonal	Max Tension	10	0.207	0.000	0.000
			Max. Compression	10	-0.612	0.000	0.000
			Max. Mx	22	0.005	-0.001	-0.000
			Max. My	10	-0.102	-0.001	-0.000
			Max. Vy	22	0.002	-0.001	-0.000
			Max. Vx	10	0.000	-0.001	-0.000
		Horizontal	Max Tension	10	0.645	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	22	0.517	0.002	0.000
			Max. My	10	0.645	0.000	0.000
			Max. Vy	22	0.004	0.000	0.000
			Max. Vx	10	-0.000	0.000	0.000
		Top Girt	Max Tension	10	0.401	0.000	0.000
			Max. Compression	10	-0.101	0.000	0.000
			Max. Mx	14	0.053	0.002	0.000
			Max. My	3	0.083	0.000	-0.000
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	3	0.000	0.000	0.000
		Bottom Girt	Max Tension	21	0.325	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.063	0.002	0.000
			Max. My	3	0.044	0.000	-0.000
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	3	0.000	0.000	0.000
		Mid Girt	Max Tension	10	0.594	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.126	0.002	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	3	0.136	0.000	-0.000
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	3	0.000	0.000	0.000
T7	80 - 60	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	2	-13.759	0.008	0.036
			Max. Mx	4	-1.788	0.076	-0.019
			Max. My	2	-5.305	0.002	-0.068
			Max. Vy	4	0.238	-0.038	0.004
			Max. Vx	8	0.214	0.003	-0.039
		Diagonal	Max Tension	8	0.285	0.000	0.000
			Max. Compression	5	-0.709	0.000	0.000
			Max. Mx	16	0.038	-0.001	-0.000
			Max. My	9	-0.273	-0.001	-0.000
			Max. Vy	16	0.002	-0.001	-0.000
			Max. Vx	9	0.000	-0.001	-0.000
		Horizontal	Max Tension	21	0.677	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	22	0.658	0.002	0.000
			Max. My	4	0.452	0.000	0.000
			Max. Vy	22	0.004	0.000	0.000
			Max. Vx	4	-0.000	0.000	0.000
		Top Girt	Max Tension	10	0.327	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.057	0.002	0.000
			Max. My	3	0.081	0.000	-0.000
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	3	0.000	0.000	0.000
		Bottom Girt	Max Tension	9	0.426	0.000	0.000
			Max. Compression	5	-0.043	0.000	0.000
			Max. Mx	14	0.075	0.002	0.000
			Max. My	3	0.049	0.000	-0.000
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	3	0.000	0.000	0.000
		Mid Girt	Max Tension	21	0.594	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.132	0.002	0.000
			Max. My	3	0.130	0.000	-0.000
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	3	0.000	0.000	0.000
T8	60 - 40	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	2	-13.760	0.019	0.066
			Max. Mx	4	-3.634	-0.087	0.014
			Max. My	8	-9.230	0.007	-0.083
			Max. Vy	4	0.238	-0.087	0.014
			Max. Vx	8	0.212	0.007	-0.083
		Diagonal	Max Tension	3	0.393	0.000	0.000
			Max. Compression	5	-0.654	0.000	0.000
			Max. Mx	16	-0.096	-0.001	-0.000
			Max. My	3	-0.383	-0.001	0.000
			Max. Vy	16	0.002	-0.001	-0.000
			Max. Vx	3	-0.000	-0.001	0.000
		Horizontal	Max Tension	21	0.755	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	22	0.730	0.002	0.000
			Max. My	4	0.424	0.000	0.000
			Max. Vy	22	-0.004	0.000	0.000
			Max. Vx	4	-0.000	0.000	0.000
		Top Girt	Max Tension	15	1.071	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.605	0.002	0.000
			Max. My	3	0.594	0.000	-0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	3	0.000	0.000	0.000
		Bottom Girt	Max Tension	2	0.423	0.000	0.000
			Max. Compression	4	-0.031	0.000	0.000
			Max. Mx	25	0.042	0.002	0.000
			Max. My	3	0.069	0.000	-0.000
			Max. Vy	25	-0.004	0.000	0.000
			Max. Vx	3	0.000	0.000	0.000
		Mid Girt	Max Tension	21	0.673	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.157	0.002	0.000
			Max. My	3	0.146	0.000	-0.000
			Max. Vy	14	-0.004	0.000	0.000
			Max. Vx	3	0.000	0.000	0.000
		Guy A	Bottom Tension	8	2.502		
			Top Tension	8	2.516		
			Top Cable Vert	8	1.889		
			Top Cable Norm	8	1.661		
			Top Cable Tan	8	0.001		
			Bot Cable Vert	8	-1.847		
			Bot Cable Norm	8	1.688		
			Bot Cable Tan	8	0.001		
		Guy B	Bottom Tension	12	2.431		
			Top Tension	12	2.443		
			Top Cable Vert	12	1.725		
			Top Cable Norm	12	1.730		
			Top Cable Tan	12	0.000		
			Bot Cable Vert	12	-1.686		
			Bot Cable Norm	12	1.751		
			Bot Cable Tan	12	0.000		
		Guy C	Bottom Tension	4	2.614		
			Top Tension	4	2.627		
			Top Cable Vert	4	1.901		
			Top Cable Norm	4	1.813		
			Top Cable Tan	4	0.001		
			Bot Cable Vert	4	-1.860		
			Bot Cable Norm	4	1.837		
			Bot Cable Tan	4	0.001		
T9	40 - 20	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	17	-11.777	-0.002	-0.013
			Max. Mx	4	-7.094	0.061	-0.013
			Max. My	3	-9.992	0.007	-0.069
			Max. Vy	4	-0.177	0.024	-0.000
			Max. Vx	3	0.173	0.004	-0.033
		Diagonal	Max Tension	3	0.247	0.000	0.000
			Max. Compression	3	-0.657	0.000	0.000
			Max. Mx	22	-0.143	-0.001	-0.000
			Max. My	9	-0.352	-0.000	-0.000
			Max. Vy	22	0.002	-0.001	-0.000
			Max. Vx	9	0.000	-0.000	-0.000
		Horizontal	Max Tension	16	0.793	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	21	0.709	0.002	0.000
			Max. My	4	0.631	0.000	0.000
			Max. Vy	21	-0.003	0.000	0.000
			Max. Vx	4	-0.000	0.000	0.000
		Top Girt	Max Tension	21	0.385	0.000	0.000
			Max. Compression	6	-0.008	0.000	0.000
			Max. Mx	25	0.107	0.002	0.000
			Max. My	3	0.069	0.000	-0.000
			Max. Vy	25	0.003	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	3	0.000	0.000	0.000
		Bottom Girt	Max Tension	16	0.387	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	21	0.358	0.002	0.000
			Max. My	3	0.071	0.000	-0.000
			Max. Vy	21	-0.003	0.000	0.000
			Max. Vx	3	0.000	0.000	0.000
		Mid Girt	Max Tension	16	0.713	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	25	0.158	0.002	0.000
			Max. My	3	0.152	0.000	-0.000
			Max. Vy	25	0.003	0.000	0.000
			Max. Vx	3	0.000	0.000	0.000
T10	20 - 3.64583	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	17	-11.778	-0.007	-0.016
			Max. Mx	3	-8.324	-0.071	-0.005
			Max. My	3	-9.825	0.025	0.064
			Max. Vy	9	0.096	-0.013	0.006
			Max. Vx	3	-0.114	-0.024	0.031
		Diagonal	Max Tension	9	0.273	0.000	0.000
			Max. Compression	3	-0.667	0.000	0.000
			Max. Mx	22	-0.193	-0.001	-0.000
			Max. My	9	-0.309	-0.001	-0.000
			Max. Vy	22	0.002	-0.001	-0.000
			Max. Vx	9	0.000	-0.001	-0.000
		Horizontal	Max Tension	16	0.784	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.580	0.002	0.000
			Max. My	4	0.480	0.000	0.000
			Max. Vy	14	0.003	0.000	0.000
			Max. Vx	4	-0.000	0.000	0.000
		Top Girt	Max Tension	15	0.410	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	21	0.354	0.002	0.000
			Max. My	3	0.094	0.000	-0.000
			Max. Vy	21	0.003	0.000	0.000
			Max. Vx	3	0.000	0.000	0.000
		Mid Girt	Max Tension	16	0.728	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.670	0.002	0.000
			Max. My	3	0.188	0.000	-0.000
			Max. Vy	14	0.003	0.000	0.000
			Max. Vx	3	0.000	0.000	0.000
T11	3.64583 - 0	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	17	-11.768	-0.027	0.111
			Max. Mx	21	-11.692	-0.027	-0.078
			Max. My	3	-9.587	-0.021	0.344
			Max. Vy	2	0.095	-0.023	0.259
			Max. Vx	3	-0.755	-0.021	0.344
		Diagonal	Max Tension	4	0.045	0.001	0.003
			Max. Compression	3	-2.100	0.000	0.000
			Max. Mx	18	-1.068	0.001	0.000
			Max. My	3	-2.007	0.001	0.005
			Max. Vy	18	0.004	0.000	0.000
			Max. Vx	3	0.020	0.001	0.005
		Horizontal	Max Tension	17	2.320	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	2.197	0.001	0.000
			Max. My	3	1.801	0.000	-0.000
			Max. Vy	14	-0.003	0.000	0.000
			Max. Vx	3	0.000	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Bottom Girt	Max Tension	17	0.772	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.733	0.000	0.000
			Max. Vy	14	-0.000	0.000	0.000

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Mast	Max. Vert	17	32.800	-0.091	0.068
	Max. H_x	11	27.104	0.274	0.014
	Max. H_z	2	28.930	0.001	0.280
	Max. M_x	1	0.000	0.001	0.003
	Max. M_z	1	0.000	0.001	0.003
	Max. Torsion	9	0.367	0.131	-0.227
	Min. Vert	1	17.229	0.001	0.003
	Min. H_x	5	27.670	-0.283	0.024
	Min. H_z	8	24.561	0.004	-0.272
	Min. M_x	1	0.000	0.001	0.003
	Min. M_z	1	0.000	0.001	0.003
	Min. Torsion	3	-0.369	-0.154	0.246
Guy C @ 120 ft Elev 1 ft Azimuth 240 deg	Max. Vert	10	-0.597	-0.291	0.168
	Max. H_x	10	-0.597	-0.291	0.168
	Max. H_z	3	-9.978	-6.524	3.937
	Min. Vert	3	-9.978	-6.524	3.937
	Min. H_x	5	-9.920	-6.632	3.653
	Min. H_z	10	-0.597	-0.291	0.168
Guy B @ 120 ft Elev 5 ft Azimuth 120 deg	Max. Vert	6	-0.557	0.275	0.159
	Max. H_x	11	-9.349	6.392	3.521
	Max. H_z	13	-9.206	6.171	3.725
	Min. Vert	11	-9.349	6.392	3.521
	Min. H_x	6	-0.557	0.275	0.159
	Min. H_z	6	-0.557	0.275	0.159
Guy A @ 120 ft Elev -4 ft Azimuth 0 deg	Max. Vert	2	-0.636	-0.000	-0.343
	Max. H_x	11	-5.531	0.259	-4.038
	Max. H_z	2	-0.636	-0.000	-0.343
	Min. Vert	9	-9.879	0.148	-7.314
	Min. H_x	5	-5.474	-0.261	-4.019
	Min. H_z	9	-9.879	0.148	-7.314
Guy C @ 60 ft Elev -1 ft Azimuth 240 deg	Max. Vert	10	-0.173	-0.133	0.077
	Max. H_x	10	-0.173	-0.133	0.077
	Max. H_z	4	-1.860	-1.591	0.918
	Min. Vert	4	-1.860	-1.591	0.918
	Min. H_x	4	-1.860	-1.591	0.918
	Min. H_z	10	-0.173	-0.133	0.077
Guy B @ 60 ft Elev 2 ft Azimuth 120 deg	Max. Vert	6	-0.139	0.110	0.064

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. H_x	12	-1.686	1.517	0.876
	Max. H_z	12	-1.686	1.517	0.876
	Min. Vert	12	-1.686	1.517	0.876
	Min. H_x	6	-0.139	0.110	0.064
	Min. H_z	6	-0.139	0.110	0.064
Guy A @ 60 ft Elev -6 ft Azimuth 0 deg	Max. Vert	2	-0.168	0.000	-0.134
	Max. H_x	24	-1.061	0.037	-1.003
	Max. H_z	2	-0.168	0.000	-0.134
	Min. Vert	8	-1.847	-0.001	-1.688
	Min. H_x	18	-1.057	-0.037	-0.999
	Min. H_z	8	-1.847	-0.001	-1.688

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	17.229	-0.001	-0.003	0.000	0.000	-0.000
1.2 Dead+1.0 Wind 0 deg - No Ice+1.0 Guy	28.930	-0.001	-0.280	0.000	0.000	0.279
1.2 Dead+1.0 Wind 30 deg - No Ice+1.0 Guy	27.598	0.154	-0.246	0.000	0.000	0.369
1.2 Dead+1.0 Wind 60 deg - No Ice+1.0 Guy	24.891	0.264	-0.158	0.000	0.000	0.367
1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy	27.670	0.283	-0.024	0.000	0.000	0.232
1.2 Dead+1.0 Wind 120 deg - No Ice+1.0 Guy	28.354	0.223	0.119	0.000	0.000	0.056
1.2 Dead+1.0 Wind 150 deg - No Ice+1.0 Guy	26.993	0.121	0.225	0.000	0.000	-0.132
1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy	24.561	-0.004	0.272	0.000	0.000	-0.298
1.2 Dead+1.0 Wind 210 deg - No Ice+1.0 Guy	27.295	-0.131	0.227	0.000	0.000	-0.367
1.2 Dead+1.0 Wind 240 deg - No Ice+1.0 Guy	28.551	-0.233	0.123	0.000	0.000	-0.340
1.2 Dead+1.0 Wind 270 deg - No Ice+1.0 Guy	27.104	-0.274	-0.014	0.000	0.000	-0.236
1.2 Dead+1.0 Wind 300 deg - No Ice+1.0 Guy	24.446	-0.247	-0.144	0.000	0.000	-0.073
1.2 Dead+1.0 Wind 330 deg - No Ice+1.0 Guy	26.760	-0.144	-0.233	0.000	0.000	0.123
1.2 Dead+1.0 Ice+1.0 Temp+Guy	31.329	-0.006	-0.012	0.000	0.000	0.003
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	31.885	-0.006	-0.152	0.000	0.000	0.085
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	32.441	0.044	-0.129	0.000	0.000	0.143
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	32.800	0.091	-0.068	0.000	0.000	0.120
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	32.493	0.120	0.003	0.000	0.000	0.067
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	31.977	0.107	0.052	0.000	0.000	0.037
1.2 Dead+1.0 Wind 150	32.395	0.067	0.080	0.000	0.000	-0.003

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 180	32.692	-0.006	0.088	0.000	0.000	-0.084
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 210	32.381	-0.079	0.080	0.000	0.000	-0.144
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 240	31.926	-0.120	0.053	0.000	0.000	-0.123
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 270	32.372	-0.124	0.005	0.000	0.000	-0.067
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 300	32.667	-0.094	-0.062	0.000	0.000	-0.037
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 330	32.347	-0.050	-0.122	0.000	0.000	0.002
deg+1.0 Ice+1.0 Temp+1.0 Guy						
Dead+Wind 0 deg - Service+Guy	17.431	-0.001	-0.100	0.000	0.000	0.093
Dead+Wind 30 deg - Service+Guy	17.505	0.045	-0.086	0.000	0.000	0.127
Dead+Wind 60 deg - Service+Guy	17.548	0.079	-0.050	0.000	0.000	0.116
Dead+Wind 90 deg - Service+Guy	17.448	0.093	-0.002	0.000	0.000	0.073
Dead+Wind 120 deg - Service+Guy	17.335	0.075	0.041	0.000	0.000	0.024
Dead+Wind 150 deg - Service+Guy	17.410	0.044	0.071	0.000	0.000	-0.032
Dead+Wind 180 deg - Service+Guy	17.482	-0.001	0.081	0.000	0.000	-0.093
Dead+Wind 210 deg - Service+Guy	17.435	-0.047	0.071	0.000	0.000	-0.127
Dead+Wind 240 deg - Service+Guy	17.372	-0.078	0.041	0.000	0.000	-0.117
Dead+Wind 270 deg - Service+Guy	17.487	-0.088	-0.001	0.000	0.000	-0.073
Dead+Wind 300 deg - Service+Guy	17.570	-0.074	-0.045	0.000	0.000	-0.024
Dead+Wind 330 deg - Service+Guy	17.516	-0.042	-0.080	0.000	0.000	0.032
1.2 Dead+1.0 Ev+1.0 Eh 0 deg+1.0 Guy	18.855	-0.001	-0.006	0.000	0.000	0.002
1.2 Dead+1.0 Ev+1.0 Eh 30 deg+1.0 Guy	18.848	-0.000	-0.006	0.000	0.000	0.001
1.2 Dead+1.0 Ev+1.0 Eh 60 deg+1.0 Guy	18.839	0.001	-0.005	0.000	0.000	0.001
1.2 Dead+1.0 Ev+1.0 Eh 90 deg+1.0 Guy	18.831	0.001	-0.004	0.000	0.000	-0.001
1.2 Dead+1.0 Ev+1.0 Eh 120 deg+1.0 Guy	18.826	0.001	-0.003	0.000	0.000	-0.001
1.2 Dead+1.0 Ev+1.0 Eh 150 deg+1.0 Guy	18.821	-0.000	-0.002	0.000	0.000	-0.002
1.2 Dead+1.0 Ev+1.0 Eh 180 deg+1.0 Guy	18.821	-0.001	-0.002	0.000	0.000	-0.002
1.2 Dead+1.0 Ev+1.0 Eh 210 deg+1.0 Guy	18.828	-0.002	-0.002	0.000	0.000	0.002
1.2 Dead+1.0 Ev+1.0 Eh 240 deg+1.0 Guy	18.838	-0.003	-0.003	0.000	0.000	0.001
1.2 Dead+1.0 Ev+1.0 Eh 270 deg+1.0 Guy	18.846	-0.004	-0.004	0.000	0.000	-0.000
1.2 Dead+1.0 Ev+1.0 Eh 300 deg+1.0 Guy	18.851	-0.003	-0.005	0.000	0.000	-0.001
1.2 Dead+1.0 Ev+1.0 Eh 330 deg+1.0 Guy	18.855	-0.002	-0.006	0.000	0.000	-0.002

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-7.313	0.000	0.002	7.313	0.004	0.056%
2	0.055	-8.728	-8.084	-0.055	8.728	8.065	0.154%
3	4.118	-8.690	-7.028	-4.119	8.689	7.012	0.139%
4	7.075	-8.652	-4.090	-7.080	8.652	4.102	0.114%
5	8.136	-8.695	-0.055	-8.122	8.695	0.065	0.142%
6	6.625	-8.738	3.766	-6.610	8.737	-3.756	0.156%
7	3.794	-8.698	6.577	-3.780	8.698	-6.570	0.143%
8	-0.055	-8.657	7.628	0.046	8.657	-7.629	0.083%
9	-3.890	-8.696	6.634	3.875	8.695	-6.626	0.144%
10	-6.681	-8.734	3.862	6.665	8.733	-3.852	0.156%
11	-7.680	-8.690	0.055	7.668	8.690	-0.045	0.132%
12	-6.625	-8.647	-3.766	6.621	8.647	3.774	0.080%
13	-3.794	-8.687	-6.577	3.796	8.687	6.562	0.129%
14	0.000	-18.610	0.000	0.003	18.610	0.005	0.029%
15	0.012	-18.649	-4.110	-0.012	18.649	4.106	0.019%
16	2.067	-18.607	-3.565	-2.068	18.607	3.560	0.023%
17	3.567	-18.566	-2.065	-3.561	18.566	2.064	0.028%
18	4.109	-18.612	-0.011	-4.106	18.612	0.014	0.023%
19	3.231	-18.657	1.858	-3.229	18.657	-1.856	0.018%
20	1.860	-18.614	3.228	-1.857	18.614	-3.226	0.023%
21	-0.012	-18.570	3.737	0.012	18.570	-3.731	0.028%
22	-1.881	-18.612	3.242	1.878	18.612	-3.239	0.021%
23	-3.244	-18.653	1.878	3.241	18.653	-1.876	0.018%
24	-3.736	-18.607	0.011	3.733	18.607	-0.009	0.019%
25	-3.231	-18.562	-1.858	3.227	18.561	1.857	0.023%
26	-1.860	-18.605	-3.228	1.860	18.605	3.225	0.019%
27	0.015	-7.322	-2.163	-0.015	7.322	2.163	0.004%
28	1.102	-7.312	-1.881	-1.103	7.312	1.879	0.026%
29	1.893	-7.302	-1.094	-1.893	7.302	1.095	0.010%
30	2.177	-7.313	-0.015	-2.176	7.313	0.017	0.034%
31	1.773	-7.325	1.008	-1.773	7.325	-1.008	0.000%
32	1.015	-7.314	1.760	-1.013	7.314	-1.760	0.029%
33	-0.015	-7.303	2.041	0.015	7.303	-2.041	0.010%
34	-1.041	-7.313	1.775	1.039	7.313	-1.775	0.026%
35	-1.788	-7.324	1.033	1.788	7.324	-1.034	0.005%
36	-2.055	-7.312	0.015	2.054	7.312	-0.013	0.028%
37	-1.773	-7.301	-1.008	1.773	7.300	1.008	0.010%
38	-1.015	-7.311	-1.760	1.017	7.311	1.758	0.027%
39	0.000	-8.997	-0.508	0.000	8.997	0.507	0.009%
40	0.254	-8.997	-0.440	-0.254	8.997	0.439	0.008%
41	0.440	-8.997	-0.254	-0.439	8.997	0.254	0.007%
42	0.508	-8.997	0.000	-0.507	8.997	0.001	0.017%
43	0.440	-8.997	0.254	-0.439	8.997	-0.253	0.017%
44	0.254	-8.997	0.440	-0.253	8.997	-0.439	0.014%
45	0.000	-8.997	0.508	0.000	8.997	-0.508	0.005%
46	-0.254	-8.997	0.440	0.253	8.997	-0.439	0.011%
47	-0.440	-8.997	0.254	0.439	8.997	-0.253	0.016%
48	-0.508	-8.997	0.000	0.507	8.997	0.001	0.013%
49	-0.440	-8.997	-0.254	0.440	8.997	0.254	0.004%
50	-0.254	-8.997	-0.440	0.254	8.997	0.439	0.008%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	14	0.00000001	0.00006268
2	Yes	107	0.00019278	0.00012474
3	Yes	105	0.00019424	0.00011603
4	Yes	38	0.00018865	0.00014466
5	Yes	113	0.00019325	0.00011334
6	Yes	114	0.00019304	0.00012211
7	Yes	111	0.00019810	0.00011525
8	Yes	60	0.00019918	0.00009815
9	Yes	108	0.00019774	0.00011799
10	Yes	111	0.00019449	0.00012394
11	Yes	109	0.00019175	0.00010851
12	Yes	65	0.00019641	0.00007932
13	Yes	104	0.00019427	0.00010865
14	Yes	22	0.00020000	0.00006501
15	Yes	53	0.00019362	0.00003879
16	Yes	62	0.00018951	0.00002990
17	Yes	49	0.00019076	0.00004528
18	Yes	67	0.00018859	0.00002981
19	Yes	54	0.00000001	0.00003408
20	Yes	60	0.00019882	0.00003114
21	Yes	51	0.00019631	0.00004374
22	Yes	60	0.00018945	0.00002927
23	Yes	51	0.00000001	0.00003245
24	Yes	61	0.00018856	0.00002531
25	Yes	48	0.00019283	0.00003781
26	Yes	57	0.00019295	0.00002649
27	Yes	23	0.00000001	0.00010727
28	Yes	29	0.00000001	0.00006493
29	Yes	24	0.00000001	0.00010728
30	Yes	29	0.00000001	0.00006261
31	Yes	21	0.00000001	0.00012379
32	Yes	28	0.00000001	0.00006467
33	Yes	24	0.00000001	0.00010349
34	Yes	29	0.00000001	0.00006853
35	Yes	24	0.00000001	0.00010498
36	Yes	29	0.00000001	0.00006218
37	Yes	22	0.00000001	0.00011720
38	Yes	27	0.00000001	0.00007185
39	Yes	22	0.00000001	0.00010654
40	Yes	20	0.00000001	0.00009154
41	Yes	19	0.00000001	0.00008727
42	Yes	20	0.00000001	0.00008244
43	Yes	22	0.00000001	0.00006807
44	Yes	21	0.00000001	0.00007534
45	Yes	21	0.00000001	0.00010981
46	Yes	21	0.00000001	0.00007963
47	Yes	21	0.00000001	0.00008428
48	Yes	20	0.00000001	0.00008614
49	Yes	18	0.00000001	0.00010449
50	Yes	20	0.00000001	0.00009321

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	200 - 180	3.721	29	0.2357	0.4206
T2	180 - 160	2.728	29	0.2053	0.4224
T3	160 - 140	2.008	33	0.1521	0.4314
T4	140 - 120	1.419	33	0.1309	0.4301
T5	120 - 100	0.956	33	0.0775	0.4171
T6	100 - 80	0.744	33	0.0381	0.4012
T7	80 - 60	0.590	33	0.0392	0.3802
T8	60 - 40	0.447	33	0.0250	0.3510
T9	40 - 20	0.368	33	0.0228	0.3186
T10	20 - 3.64583	0.229	33	0.0450	0.2791
T11	3.64583 - 0	0.046	33	0.0590	0.2479

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
200.000	Beacon	29	3.721	0.2357	0.4206	52172
190.000	CCISeismic Tower Section 1	29	3.202	0.2239	0.4205	26086
185.000	Sabre 18037002C	29	2.956	0.2158	0.4211	17391
182.500	CCISeismic b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185 (180ft to185ft)	29	2.840	0.2109	0.4216	15055
179.792	CCISeismic Guy Level 1	29	2.719	0.2048	0.4225	13991
179.792	Guy	29	2.719	0.2048	0.4225	13991
170.000	CCISeismic Tower Section 2	33	2.338	0.1771	0.4270	19465
150.000	CCISeismic Tower Section 3	33	1.704	0.1412	0.4326	43832
130.000	CCISeismic Tower Section 4	33	1.160	0.1074	0.4245	21306
119.792	CCISeismic Guy Level 2	33	0.953	0.0769	0.4170	14070
119.792	Guy	33	0.953	0.0769	0.4170	14070
110.000	CCISeismic Tower Section 5	33	0.828	0.0522	0.4092	26368
100.000	Side Light	33	0.744	0.0381	0.4012	299022
90.000	CCISeismic Tower Section 6	33	0.668	0.0372	0.3927	190284
70.000	CCISeismic Tower Section 7	33	0.512	0.0339	0.3628	79938
59.792	CCISeismic Guy Level 3	33	0.446	0.0249	0.3509	37335
59.792	Guy	33	0.446	0.0249	0.3509	37335
50.000	CCISeismic Tower Section 8	33	0.406	0.0201	0.3486	157086
30.000	CCISeismic Tower Section 9	33	0.311	0.0323	0.2503	46772
14.000	CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200 (8ft to20ft)	33	0.168	0.0521	0.3781	57988
11.823	CCISeismic Tower Section 10	33	0.144	0.0543	0.4027	65592
1.823	CCISeismic Tower Section 11	33	0.023	0.0591	0.1331	116214

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	200 - 180	31.225	10	1.9507	1.2064
T2	180 - 160	23.031	10	1.8370	1.1993

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T3	160 - 140	16.095	2	1.5540	1.2267
T4	140 - 120	10.588	2	1.2604	1.2245
T5	120 - 100	6.341	2	0.7813	1.1836
T6	100 - 80	4.066	2	0.3807	1.1444
T7	80 - 60	2.742	2	0.2676	1.0900
T8	60 - 40	1.825	2	0.1519	1.0107
T9	40 - 20	1.383	8	0.1055	0.9263
T10	20 - 3.64583	0.845	4	0.1686	0.8153
T11	3.64583 - 0	0.167	4	0.2146	0.7248

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
200.000	Beacon	10	31.225	1.9507	1.2064	13776
190.000	CCISeismic Tower Section 1	10	27.043	1.9119	1.1989	6888
185.000	Sabre 18037002C	10	25.005	1.8812	1.1976	4592
182.500	CCISeismic b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185 (180ft to185ft)	10	24.008	1.8611	1.1980	3975
179.792	CCISeismic Guy Level 1	10	22.950	1.8348	1.1995	3694
179.792	Guy	10	22.950	1.8348	1.1995	3694
170.000	CCISeismic Tower Section 2	10	19.323	1.7049	1.2120	3970
150.000	CCISeismic Tower Section 3	2	13.225	1.4189	1.2317	3943
130.000	CCISeismic Tower Section 4	2	8.241	1.0381	1.2062	2380
119.792	CCISeismic Guy Level 2	2	6.308	0.7759	1.1831	1896
119.792	Guy	2	6.308	0.7759	1.1831	1896
110.000	CCISeismic Tower Section 5	2	5.001	0.5435	1.1632	2702
100.000	Side Light	2	4.066	0.3807	1.1444	5107
90.000	CCISeismic Tower Section 6	2	3.342	0.3064	1.1235	8007
70.000	CCISeismic Tower Section 7	2	2.225	0.2098	1.0409	10244
59.792	CCISeismic Guy Level 3	2	1.818	0.1510	1.0106	7670
59.792	Guy	2	1.818	0.1510	1.0106	7670
50.000	CCISeismic Tower Section 8	2	1.567	0.1215	1.0096	20811
30.000	CCISeismic Tower Section 9	4	1.154	0.0985	0.7297	14419
14.000	CCISeismic b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200 (8ft to20ft)	4	0.616	0.2637	1.1051	17031
11.823	CCISeismic Tower Section 10	4	0.527	0.2894	1.1771	19431
1.823	CCISeismic Tower Section 11	4	0.084	0.1430	0.3892	35674

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	200	Leg	A325N	0.3750	3	3.478	6.974	0.499 ✔	1	Bolt Tension
T2	180	Leg	A325N	0.3750	3	1.332	6.974	0.191 ✔	1	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T3	160	Leg	A325N	0.3750	3	1.609	6.974	0.231 ✔	1	Bolt Tension
T4	140	Leg	A325N	0.3750	3	2.294	6.974	0.329 ✔	1	Bolt Tension
T5	120	Leg	A325N	0.3750	3	1.602	6.974	0.230 ✔	1	Bolt Tension
T6	100	Leg	A325N	0.5000	3	1.297	12.771	0.102 ✔	1	Bolt Tension
T7	80	Leg	A325N	0.5000	3	1.529	12.771	0.120 ✔	1	Bolt Tension
T8	60	Leg	A325N	0.5000	3	1.179	12.771	0.092 ✔	1	Bolt Tension
T9	40	Leg	A325N	0.5000	3	1.309	12.771	0.102 ✔	1	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.
T2	179.792 (A) (959)	7/16 EHS	2.080	20.800	9.440	12.480	1.000	1.322 ✔
	179.792 (B) (958)	7/16 EHS	2.080	20.800	9.153	12.480	1.000	1.363 ✔
	179.792 (C) (957)	7/16 EHS	2.080	20.800	9.585	12.480	1.000	1.302 ✔
T5	119.792 (A) (962)	5/16 EHS	1.120	11.200	3.086	6.720	1.000	2.177 ✔
	119.792 (B) (961)	5/16 EHS	1.120	11.200	2.968	6.720	1.000	2.264 ✔
	119.792 (C) (960)	5/16 EHS	1.120	11.200	3.174	6.720	1.000	2.117 ✔
T8	59.792 (A) (965)	5/16 EHS	1.120	11.200	2.516	6.720	1.000	2.671 ✔
	59.792 (B) (964)	5/16 EHS	1.120	11.200	2.443	6.720	1.000	2.751 ✔
	59.792 (C) (963)	5/16 EHS	1.120	11.200	2.627	6.720	1.000	2.558 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u K	ϕP_n K	Ratio P_u / ϕP_n
T1	200 - 180	1	20.000	1.616	77.6 K=1.00	0.7854	1.00	-10.618	22.760	0.467 [1] ✔
T2	180 - 160	1	20.000	1.616	77.6 K=1.00	0.7854	1.00	-13.023	22.760	0.572 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T3	160 - 140	1	20.000	1.616	77.6 K=1.00	0.7854	1.00	-13.833	22.760	0.608 [1]
T4	140 - 120	1	20.000	1.616	77.6 K=1.00	0.7854	1.00	-19.742	22.760	0.867 [1]
T5	120 - 100	1	20.000	1.616	77.6 K=1.00	0.7854	1.00	-20.080	22.760	0.882 [1]
T6	100 - 80	1 1/4	20.000	1.609	61.8 K=1.00	1.2272	0.95	-13.848	39.738	0.348 [1]
T7	80 - 60	1 1/4	20.000	1.609	61.8 K=1.00	1.2272	0.95	-13.390	39.540	0.339 [1]
T8	60 - 40	1 1/4	20.000	1.609	61.8 K=1.00	1.2272	0.94	-13.580	39.188	0.347 [1]
T9	40 - 20	1 1/4	20.000	1.609	61.8 K=1.00	1.2272	0.89	-11.629	37.175	0.313 [1]
T10	20 - 3.64583	1 1/4	16.354	1.615	62.0 K=1.00	1.2272	0.89	-11.731	37.133	0.316 [1]
T11	3.64583 - 0	1 1/4	3.824	0.350	13.4 K=1.00	1.2272	0.69	-11.768	37.446	0.314 [1]

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	200 - 180	1/2	2.571	1.232	107.5 K=0.91	0.1963	-1.786	3.463	0.516 [1]
T2	180 - 160	1/2	2.571	1.232	107.5 K=0.91	0.1963	-0.755	3.463	0.218 [1]
T3	160 - 140	1/2	2.571	1.232	107.5 K=0.91	0.1963	-0.777	3.463	0.224 [1]
T4	140 - 120	1/2	2.571	1.232	107.5 K=0.91	0.1963	-1.061	3.463	0.306 [1]
T5	120 - 100	1/2	2.571	1.232	107.5 K=0.91	0.1963	-0.987	3.463	0.285 [1]
T6	100 - 80	1/2	2.567	1.217	107.0 K=0.92	0.1963	-0.612	3.482	0.176 [1]
T7	80 - 60	1/2	2.567	1.217	107.0 K=0.92	0.1963	-0.709	3.482	0.204 [1]
T8	60 - 40	1/2	2.567	1.217	107.0 K=0.92	0.1963	-0.654	3.482	0.188 [1]
T9	40 - 20	1/2	2.567	1.217	107.0 K=0.92	0.1963	-0.657	3.482	0.189 [1]
T10	20 - 3.64583	1/2	2.570	1.218	107.0 K=0.92	0.1963	-0.667	3.480	0.192 [1]
T11	3.64583 - 0	1/2	1.219	0.866	90.2 K=1.08	0.1963	-2.100	4.146	0.506 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	200 - 180	3/4	2.000	1.917	85.9 K=0.70	0.4418	-0.221	11.596	0.019 [1] ✔
T2	180 - 160	3/4	2.000	1.917	85.9 K=0.70	0.4418	-0.206	11.596	0.018 [1] ✔
T3	160 - 140	3/4	2.000	1.917	85.9 K=0.70	0.4418	-0.236	11.596	0.020 [1] ✔
T4	140 - 120	3/4	2.000	1.917	85.9 K=0.70	0.4418	-0.349	11.596	0.030 [1] ✔
T5	120 - 100	3/4	2.000	1.917	85.9 K=0.70	0.4418	-0.349	11.596	0.030 [1] ✔
T6	100 - 80	3/4	2.000	1.896	84.9 K=0.70	0.4418	-0.244	11.732	0.021 [1] ✔
T7	80 - 60	3/4	2.000	1.896	84.9 K=0.70	0.4418	-0.232	11.732	0.020 [1] ✔
T8	60 - 40	3/4	2.000	1.896	84.9 K=0.70	0.4418	-0.232	11.732	0.020 [1] ✔
T9	40 - 20	3/4	2.000	1.896	84.9 K=0.70	0.4418	-0.201	11.732	0.017 [1] ✔
T10	20 - 3.64583	3/4	2.000	1.896	84.9 K=0.70	0.4418	-0.201	11.732	0.017 [1] ✔
T11	3.64583 - 0	3/4	2.000	1.896	84.9 K=0.70	0.4418	-0.211	11.732	0.018 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	200 - 180	3/4	2.000	1.917	85.9 K=0.70	0.4418	-0.036	11.596	0.003 [1] ✔
T2	180 - 160	3/4	2.000	1.917	85.9 K=0.70	0.4418	-0.376	11.596	0.032 [1] ✔
T3	160 - 140	3/4	2.000	1.917	85.9 K=0.70	0.4418	-0.251	11.596	0.022 [1] ✔
T4	140 - 120	3/4	2.000	1.917	85.9 K=0.70	0.4418	-0.358	11.596	0.031 [1] ✔
T5	120 - 100	3/4	2.000	1.917	85.9	0.4418	-0.358	11.596	0.031 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
					K=0.70				✔
T6	100 - 80	3/4	2.000	1.896	84.9	0.4418	-0.250	11.732	0.021 [1]
					K=0.70				✔
T7	80 - 60	3/4	2.000	1.896	84.9	0.4418	-0.238	11.732	0.020 [1]
					K=0.70				✔
T8	60 - 40	3/4	2.000	1.896	84.9	0.4418	-0.238	11.732	0.020 [1]
					K=0.70				✔
T9	40 - 20	3/4	2.000	1.896	84.9	0.4418	-0.204	11.732	0.017 [1]
					K=0.70				✔
T10	20 - 3.64583	3/4	2.000	1.896	84.9	0.4418	-0.204	11.732	0.017 [1]
					K=0.70				✔

[1] $P_u / \phi P_n$ controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	200 - 180	3/4	2.000	1.917	85.9	0.4418	-1.007	11.596	0.087 [1]
					K=0.70				✔
T2	180 - 160	3/4	2.000	1.917	85.9	0.4418	-0.226	11.596	0.019 [1]
					K=0.70				✔
T3	160 - 140	3/4	2.000	1.917	85.9	0.4418	-0.251	11.596	0.022 [1]
					K=0.70				✔
T4	140 - 120	3/4	2.000	1.917	85.9	0.4418	-0.358	11.596	0.031 [1]
					K=0.70				✔
T5	120 - 100	3/4	2.000	1.917	85.9	0.4418	-0.358	11.596	0.031 [1]
					K=0.70				✔
T6	100 - 80	3/4	2.000	1.896	84.9	0.4418	-0.250	11.732	0.021 [1]
					K=0.70				✔
T7	80 - 60	3/4	2.000	1.896	84.9	0.4418	-0.238	11.732	0.020 [1]
					K=0.70				✔
T8	60 - 40	3/4	2.000	1.896	84.9	0.4418	-0.238	11.732	0.020 [1]
					K=0.70				✔
T9	40 - 20	3/4	2.000	1.896	84.9	0.4418	-0.204	11.732	0.017 [1]
					K=0.70				✔

[1] $P_u / \phi P_n$ controls

Mid Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	200 - 180	3/4	2.000	1.917	85.9	0.4418	-0.182	11.596	0.016 [1]
					K=0.70				

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T4	140 - 120	3/4	2.000	1.917	85.9 K=0.70	0.4418	-0.021	11.596	0.002 [1]

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	200 - 180	1	20.000	0.396	19.0	0.7854	10.434	35.343	0.295 [1]
T2	180 - 160	1	20.000	0.208	10.0	0.7854	10.431	35.343	0.295 [1]
T4	140 - 120	1	20.000	0.396	19.0	0.7854	3.823	35.343	0.108 [1]
T5	120 - 100	1	20.000	0.208	10.0	0.7854	3.822	35.343	0.108 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	200 - 180	1/2	2.571	1.232	118.3	0.1963	1.683	6.362	0.264 [1]
T2	180 - 160	1/2	2.571	1.232	118.3	0.1963	0.321	6.362	0.051 [1]
T3	160 - 140	1/2	2.571	1.232	118.3	0.1963	0.175	6.362	0.028 [1]
T4	140 - 120	1/2	2.571	1.232	118.3	0.1963	0.315	6.362	0.050 [1]
T5	120 - 100	1/2	2.571	1.232	118.3	0.1963	0.341	6.362	0.054 [1]
T6	100 - 80	1/2	2.567	1.217	116.8	0.1963	0.207	6.362	0.032 [1]
T7	80 - 60	1/2	2.567	1.217	116.8	0.1963	0.285	6.362	0.045 [1]
T8	60 - 40	1/2	2.567	1.217	116.8	0.1963	0.393	6.362	0.062 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T9	40 - 20	1/2	2.567	1.217	116.8	0.1963	0.247	6.362	0.039 [1] ✔
T10	20 - 3.64583	1/2	2.570	1.218	117.0	0.1963	0.273	6.362	0.043 [1] ✔
T11	3.64583 - 0	1/2	1.219	0.866	83.2	0.1963	0.045	6.362	0.007 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	200 - 180	3/4	2.000	1.917	122.7	0.4418	0.344	19.880	0.017 [1] ✔
T2	180 - 160	3/4	2.000	1.917	122.7	0.4418	1.002	19.880	0.050 [1] ✔
T3	160 - 140	3/4	2.000	1.917	122.7	0.4418	0.880	19.880	0.044 [1] ✔
T4	140 - 120	3/4	2.000	1.917	122.7	0.4418	1.069	19.880	0.054 [1] ✔
T5	120 - 100	3/4	2.000	1.917	122.7	0.4418	1.211	19.880	0.061 [1] ✔
T6	100 - 80	3/4	2.000	1.896	121.3	0.4418	0.645	19.880	0.032 [1] ✔
T7	80 - 60	3/4	2.000	1.896	121.3	0.4418	0.677	19.880	0.034 [1] ✔
T8	60 - 40	3/4	2.000	1.896	121.3	0.4418	0.755	19.880	0.038 [1] ✔
T9	40 - 20	3/4	2.000	1.896	121.3	0.4418	0.793	19.880	0.040 [1] ✔
T10	20 - 3.64583	3/4	2.000	1.896	121.3	0.4418	0.784	19.880	0.039 [1] ✔
T11	3.64583 - 0	3/4	2.000	1.896	121.3	0.4418	2.320	19.880	0.117 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	200 - 180	3/4	2.000	1.917	122.7	0.4418	0.032	19.880	0.002 [1] ✔
T2	180 - 160	3/4	2.000	1.917	122.7	0.4418	3.530	19.880	0.178 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T3	160 - 140	3/4	2.000	1.917	122.7	0.4418	0.415	19.880	0.021 [1]
T4	140 - 120	3/4	2.000	1.917	122.7	0.4418	0.415	19.880	0.021 [1]
T5	120 - 100	3/4	2.000	1.917	122.7	0.4418	1.369	19.880	0.069 [1]
T6	100 - 80	3/4	2.000	1.896	121.3	0.4418	0.401	19.880	0.020 [1]
T7	80 - 60	3/4	2.000	1.896	121.3	0.4418	0.327	19.880	0.016 [1]
T8	60 - 40	3/4	2.000	1.896	121.3	0.4418	1.071	19.880	0.054 [1]
T9	40 - 20	3/4	2.000	1.896	121.3	0.4418	0.385	19.880	0.019 [1]
T10	20 - 3.64583	3/4	2.000	1.896	121.3	0.4418	0.410	19.880	0.021 [1]

[1] $P_u / \phi P_n$ controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	200 - 180	3/4	2.000	1.917	122.7	0.4418	0.954	19.880	0.048 [1]
T2	180 - 160	3/4	2.000	1.917	122.7	0.4418	0.425	19.880	0.021 [1]
T3	160 - 140	3/4	2.000	1.917	122.7	0.4418	0.521	19.880	0.026 [1]
T4	140 - 120	3/4	2.000	1.917	122.7	0.4418	0.715	19.880	0.036 [1]
T5	120 - 100	3/4	2.000	1.917	122.7	0.4418	0.479	19.880	0.024 [1]
T6	100 - 80	3/4	2.000	1.896	121.3	0.4418	0.325	19.880	0.016 [1]
T7	80 - 60	3/4	2.000	1.896	121.3	0.4418	0.426	19.880	0.021 [1]
T8	60 - 40	3/4	2.000	1.896	121.3	0.4418	0.423	19.880	0.021 [1]
T9	40 - 20	3/4	2.000	1.896	121.3	0.4418	0.387	19.880	0.019 [1]
T11	3.64583 - 0	3/4	0.183	0.079	5.0	0.4418	0.772	19.880	0.039 [1]

[1] $P_u / \phi P_n$ controls

Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	200 - 180	3/4	2.000	1.917	122.7	0.4418	0.175	19.880	0.009 [1] ✔
T2	180 - 160	3/4	2.000	1.917	122.7	0.4418	0.776	19.880	0.039 [1] ✔
T3	160 - 140	3/4	2.000	1.917	122.7	0.4418	0.804	19.880	0.040 [1] ✔
T4	140 - 120	3/4	2.000	1.917	122.7	0.4418	0.945	19.880	0.048 [1] ✔
T5	120 - 100	3/4	2.000	1.917	122.7	0.4418	1.056	19.880	0.053 [1] ✔
T6	100 - 80	3/4	2.000	1.896	121.3	0.4418	0.594	19.880	0.030 [1] ✔
T7	80 - 60	3/4	2.000	1.896	121.3	0.4418	0.594	19.880	0.030 [1] ✔
T8	60 - 40	3/4	2.000	1.896	121.3	0.4418	0.673	19.880	0.034 [1] ✔
T9	40 - 20	3/4	2.000	1.896	121.3	0.4418	0.713	19.880	0.036 [1] ✔
T10	20 - 3.64583	3/4	2.000	1.896	121.3	0.4418	0.728	19.880	0.037 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	200 - 180	Leg	1	1	-10.618	22.760	46.7 49.9 (b)	Pass
T2	180 - 160	Leg	1	95	-13.023	22.760	57.2	Pass
T3	160 - 140	Leg	1	189	-13.833	22.760	60.8	Pass
T4	140 - 120	Leg	1	283	-19.742	22.760	86.7	Pass
T5	120 - 100	Leg	1	377	-20.080	22.760	88.2	Pass
T6	100 - 80	Leg	1 1/4	471	-13.848	39.738	34.8	Pass
T7	80 - 60	Leg	1 1/4	567	-13.390	39.540	33.9	Pass
T8	60 - 40	Leg	1 1/4	661	-13.580	39.188	34.7	Pass
T9	40 - 20	Leg	1 1/4	755	-11.629	37.175	31.3	Pass
T10	20 - 3.64583	Leg	1 1/4	849	-11.731	37.133	31.6	Pass
T11	3.64583 - 0	Leg	1 1/4	924	-11.768	37.446	31.4	Pass
T1	200 - 180	Diagonal	1/2	13	-1.786	3.463	51.6	Pass
T2	180 - 160	Diagonal	1/2	177	-0.755	3.463	21.8	Pass
T3	160 - 140	Diagonal	1/2	202	-0.777	3.463	22.4	Pass
T4	140 - 120	Diagonal	1/2	295	-1.061	3.463	30.6	Pass
T5	120 - 100	Diagonal	1/2	459	-0.987	3.463	28.5	Pass
T6	100 - 80	Diagonal	1/2	560	-0.612	3.482	17.6	Pass
T7	80 - 60	Diagonal	1/2	578	-0.709	3.482	20.4	Pass
T8	60 - 40	Diagonal	1/2	740	-0.654	3.482	18.8	Pass
T9	40 - 20	Diagonal	1/2	766	-0.657	3.482	18.9	Pass
T10	20 - 3.64583	Diagonal	1/2	919	-0.667	3.480	19.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T11	3.64583 - 0	Diagonal	1/2	934	-2.100	4.146	50.6	Pass
T1	200 - 180	Horizontal	3/4	33	-0.221	11.596	1.9	Pass
T2	180 - 160	Horizontal	3/4	182	1.002	19.880	5.0	Pass
T3	160 - 140	Horizontal	3/4	207	0.880	19.880	4.4	Pass
T4	140 - 120	Horizontal	3/4	301	1.069	19.880	5.4	Pass
T5	120 - 100	Horizontal	3/4	464	1.211	19.880	6.1	Pass
T6	100 - 80	Horizontal	3/4	558	0.645	19.880	3.2	Pass
T7	80 - 60	Horizontal	3/4	583	0.677	19.880	3.4	Pass
T8	60 - 40	Horizontal	3/4	746	0.755	19.880	3.8	Pass
T9	40 - 20	Horizontal	3/4	771	0.793	19.880	4.0	Pass
T10	20 - 3.64583	Horizontal	3/4	917	0.784	19.880	3.9	Pass
T11	3.64583 - 0	Horizontal	3/4	927	2.320	19.880	11.7	Pass
T1	200 - 180	Top Girt	3/4	5	-0.036	11.596	0.3	Pass
T2	180 - 160	Top Girt	3/4	99	3.530	19.880	17.8	Pass
T3	160 - 140	Top Girt	3/4	194	-0.251	11.596	2.2	Pass
T4	140 - 120	Top Girt	3/4	288	-0.358	11.596	3.1	Pass
T5	120 - 100	Top Girt	3/4	380	1.369	19.880	6.9	Pass
T6	100 - 80	Top Girt	3/4	476	-0.250	11.732	2.1	Pass
T7	80 - 60	Top Girt	3/4	569	-0.238	11.732	2.0	Pass
T8	60 - 40	Top Girt	3/4	662	1.071	19.880	5.4	Pass
T9	40 - 20	Top Girt	3/4	756	0.385	19.880	1.9	Pass
T10	20 - 3.64583	Top Girt	3/4	850	0.410	19.880	2.1	Pass
T1	200 - 180	Bottom Girt	3/4	8	-1.007	11.596	8.7	Pass
T2	180 - 160	Bottom Girt	3/4	101	0.425	19.880	2.1	Pass
T3	160 - 140	Bottom Girt	3/4	195	0.521	19.880	2.6	Pass
T4	140 - 120	Bottom Girt	3/4	289	0.715	19.880	3.6	Pass
T5	120 - 100	Bottom Girt	3/4	385	-0.358	11.596	3.1	Pass
T6	100 - 80	Bottom Girt	3/4	479	-0.250	11.732	2.1	Pass
T7	80 - 60	Bottom Girt	3/4	571	0.426	19.880	2.1	Pass
T8	60 - 40	Bottom Girt	3/4	665	0.423	19.880	2.1	Pass
T9	40 - 20	Bottom Girt	3/4	759	0.387	19.880	1.9	Pass
T11	3.64583 - 0	Bottom Girt	3/4	930	0.772	19.880	3.9	Pass
T1	200 - 180	Mid Girt	3/4	11	-0.182	11.596	1.6	Pass
T2	180 - 160	Mid Girt	3/4	104	0.776	19.880	3.9	Pass
T3	160 - 140	Mid Girt	3/4	198	0.804	19.880	4.0	Pass
T4	140 - 120	Mid Girt	3/4	292	0.945	19.880	4.8	Pass
T5	120 - 100	Mid Girt	3/4	386	1.056	19.880	5.3	Pass
T6	100 - 80	Mid Girt	3/4	480	0.594	19.880	3.0	Pass
T7	80 - 60	Mid Girt	3/4	574	0.594	19.880	3.0	Pass
T8	60 - 40	Mid Girt	3/4	668	0.673	19.880	3.4	Pass
T9	40 - 20	Mid Girt	3/4	762	0.713	19.880	3.6	Pass
T10	20 - 3.64583	Mid Girt	3/4	853	0.728	19.880	3.7	Pass
T2	180 - 160	Guy A@179.792	7/16	959	9.440	12.480	75.6	Pass
T5	120 - 100	Guy A@119.792	5/16	962	3.086	6.720	45.9	Pass
T8	60 - 40	Guy A@59.7917	5/16	965	2.516	6.720	37.4	Pass
T2	180 - 160	Guy B@179.792	7/16	958	9.153	12.480	73.3	Pass
T5	120 - 100	Guy B@119.792	5/16	961	2.968	6.720	44.2	Pass
T8	60 - 40	Guy B@59.7917	5/16	964	2.443	6.720	36.3	Pass
T2	180 - 160	Guy C@179.792	7/16	957	9.585	12.480	76.8	Pass
T5	120 - 100	Guy C@119.792	5/16	960	3.174	6.720	47.2	Pass
T8	60 - 40	Guy C@59.7917	5/16	963	2.627	6.720	39.1	Pass
							Summary	
						Leg (T5)	88.2	Pass
						Diagonal (T1)	51.6	Pass
						Horizontal (T11)	11.7	Pass
						Top Girt (T2)	17.8	Pass
						Bottom Girt (T1)	8.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
						Mid Girt (T5)	5.3	Pass
						Guy A (T2)	75.6	Pass
						Guy B (T2)	73.3	Pass
						Guy C (T2)	76.8	Pass
						Bolt Checks	49.9	Pass
						RATING =	**88.2**	**Pass**

Guyed Tower Foundation Reaction Comparison

Site#	US-CT-5014	Date	5/21/2021
Carrier	Dish	Engineer	JH

TIA Rev	TIA-222-H
Conversion Factor	1.35 *Use (1) if tower was designed in Rev G

Original Design Reactions					Current Analysis Reactions				
	Base	Inner Anchor	Middle Anchor	Outer Anchor		Base	Inner Anchor	Middle Anchor	Outer Anchor
Horizontal (kip)	1.1	3.2	0.0	9.4	Horizontal (kip)	0.0	2.0	0.0	8.0
Vertical (kip)	32.4	3.4	0.0	11.4	Vertical (kip)	33.0	2.0	0.0	10.0

Foundation Reactions	Factored Original Design		Current Analysis		Percentage		
	Horizontal (kips)	Vertical (kips)	Horizontal (kips)	Vertical (kips)	Horizontal (kips)	Vertical (kips)	Controlling (kips)
Base	1.5	43.7	0.0	33.0	0.0%	75.4%	75.4%
Inner Anchor	4.3	4.6	2.0	2.0	46.3%	43.6%	
Outer Anchor	12.7	15.4	8.0	10.0	63.0%	65.0%	

Notes:
1. Original design reactions increased by 1.35 for conversion to Rev H

BU:		Structure:	A
WO:			
Order:		Rev:	

Location

	Decimal Degrees		Deg	Min	Sec
Lat:		+			
Long:		-			

Code and Site Parameters

Seismic Design Code:	TIA-222-H-1	
Site Soil:	D (Default)	Stiff Soil (Default)
Risk Category:	II	

USGS Seismic Reference

S_S:	0.2010	g
S_1:	0.0540	g
T_L:	6	s

Seismic Design Category Determination

Importance Factor, I_e:	1	
Acceleration-based site coefficient, F_a:	1.6000	
Velocity-based site coefficient, F_v:	2.4000	
Design spectral response acceleration short period, S_{DS}:	0.2144	g
Design spectral response acceleration 1 s period, S_{D1}:	0.0864	g
T_s:	0.4030	
Seismic Design Category Based on S_{DS}:	B	
Seismic Design Category Based on S_{D1}:	B	
Seismic Design Category Based on S_1:	N/A	
Controlling Seismic Design Category:	B	

BU:		Structure:	A
WO:			
Order:		Rev:	

Tower Details

Tower Type:	Guyed Tower		
Height, h:	200	ft	
Effective Seismic Weight, W:	7.11	kips	
Amplification Factor, A_s:	1.0		2.7.8.1

Seismic Base Shear

Response Modification Factor, R:	3		
C_g:	176.5		
K_g:	0.0017		
F_a:	2.6857	hz	
Approximate Fundamental Period Guyed Towers, T_a:	0.3723	s	2.7.7.1.3.4
Seismic Response Coefficient, C_s	0.0715		2.7.7.1.1
Seismic Response Coefficient Max 1, C_{smax}	0.0773		2.7.7.1.1
Seismic Response Coefficient Max 2, C_{smax}	N/A		2.7.7.1.1
Seismic Response Coefficient Min 1, C_{smin}	0.0300		2.7.7.1.1
Seismic Response Coefficient Min 2, C_{smin}	N/A		2.7.7.1.1
Controlling Seismic Response Coefficient, C_{sc}	0.0715		
Seismic Base Shear, V	0.508	kips	2.7.7.1.1

Vertical Distribution Factors

Period Related Exponent, k:	1.000
Sum of $w_i h_i^k$	919.63

Tower Section Loads								
Section Number	**Length**	**Top Height**	**Mid Height, h_x**	**Section Weight, w_x**	**$w_x h_x^k$**	**C_{vx}**	**F_{xh}**	**F_{xv}**
1	20.00	200.00	190.00	0.3514	66.77	0.0726	0.0369	0.0151
2	20.00	180.00	170.00	0.3514	59.74	0.0650	0.0330	0.0151
3	20.00	160.00	150.00	0.3514	52.71	0.0573	0.0291	0.0151
4	20.00	140.00	130.00	0.3514	45.68	0.0497	0.0252	0.0151
5	20.00	120.00	110.00	0.3514	38.66	0.0420	0.0213	0.0151
6	20.00	100.00	90.00	0.4441	39.97	0.0435	0.0221	0.0190
7	20.00	80.00	70.00	0.4441	31.09	0.0338	0.0172	0.0190
8	20.00	60.00	50.00	0.4441	22.21	0.0241	0.0123	0.0190
9	20.00	40.00	30.00	0.4441	13.32	0.0145	0.0074	0.0190
10	16.35	20.00	11.82	0.3605	4.26	0.0046	0.0024	0.0155
11	3.65	3.65	1.82	0.0895	0.16	0.0002	0.0001	0.0038
			Sum	3.9835	374.57			

Guy Loads						
Guy Attachment Elevation, h_x	**Total Guy Weight**	**Effective Guy Weight, w_x**	**$w_x h_x^k$**	**C_{vx}**	**F_{xh}**	**F_{xv}**
179.79	0.2571	0.1286	23.11	0.0251	0.0128	0.0055
119.79	0.1034	0.0517	6.19	0.0067	0.0034	0.0022
59.79	0.0523	0.0262	1.56	0.0017	0.0009	0.0011
Sum	0.4128	0.2064	30.87			

Discrete Loads						
Name	h_x	w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
b&p database_siouxcity3-pc_2 Beacon	200.00	0.0100	2.00	0.0022	0.0011	0.0004
b&p database_siouxcity3-pc_2 Side Light	100.00	0.0100	1.00	0.0011	0.0006	0.0004
b&p database_siouxcity3-pc_2 Side Light	100.00	0.0100	1.00	0.0011	0.0006	0.0004
Sabre 18037002C	185.00	0.6100	112.85	0.1227	0.0623	0.0262
Sabre 18037002C	185.00	0.6100	112.85	0.1227	0.0623	0.0262
Sabre 18037002C	185.00	0.6100	112.85	0.1227	0.0623	0.0262
jma MX08FRO665-20_V0F w/ MP (72x20x8)	185.00	0.0540	9.99	0.0109	0.0055	0.0023
jma MX08FRO665-20_V0F w/ MP (72x20x8)	185.00	0.0540	9.99	0.0109	0.0055	0.0023
jma MX08FRO665-20_V0F w/ MP (72x20x8)	185.00	0.0540	9.99	0.0109	0.0055	0.0023
fujitsu TA08025-B604 (15.75x14.96x7.87)	185.00	0.0630	11.66	0.0127	0.0064	0.0027
fujitsu TA08025-B604 (15.75x14.96x7.87)	185.00	0.0630	11.66	0.0127	0.0064	0.0027
fujitsu TA08025-B604 (15.75x14.96x7.87)	185.00	0.0630	11.66	0.0127	0.0064	0.0027
fujitsu TA08025-B605 (15.75x14.96x9.06)	185.00	0.0750	13.88	0.0151	0.0077	0.0032
fujitsu TA08025-B605 (15.75x14.96x9.06)	185.00	0.0750	13.88	0.0151	0.0077	0.0032
fujitsu TA08025-B605 (15.75x14.96x9.06)	185.00	0.0750	13.88	0.0151	0.0077	0.0032
raycap RDIDC-9181-PF-48 (16x14x8)	185.00	0.0220	4.07	0.0044	0.0022	0.0009
1/3 Remaining Reserve Right	185.00	0.0620	11.47	0.0125	0.0063	0.0027
1/3 Remaining Reserve Right	185.00	0.0620	11.47	0.0125	0.0063	0.0027
1/3 Remaining Reserve Right	185.00	0.0620	11.47	0.0125	0.0063	0.0027
	Sum	2.6440	487.59			

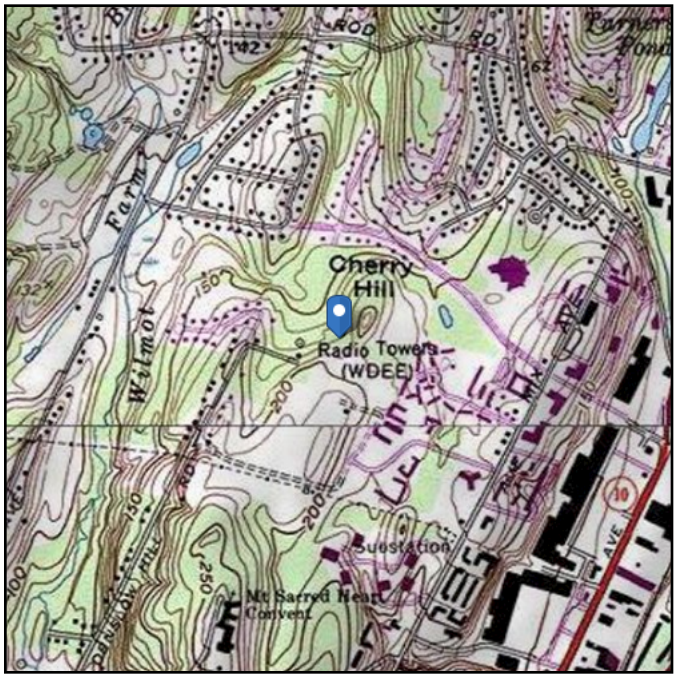
Linear Loads								
Name	Start Height	End Height	h_x	w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200	180.00	200.00	190.00	0.0044	0.84	0.0009	0.0005	0.0002
b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200	160.00	180.00	170.00	0.0044	0.75	0.0008	0.0004	0.0002
b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200	140.00	160.00	150.00	0.0044	0.66	0.0007	0.0004	0.0002
b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200	120.00	140.00	130.00	0.0044	0.57	0.0006	0.0003	0.0002
b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200	100.00	120.00	110.00	0.0044	0.48	0.0005	0.0003	0.0002
b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200	80.00	100.00	90.00	0.0044	0.40	0.0004	0.0002	0.0002
b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200	60.00	80.00	70.00	0.0044	0.31	0.0003	0.0002	0.0002
b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200	40.00	60.00	50.00	0.0044	0.22	0.0002	0.0001	0.0002
b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200	20.00	40.00	30.00	0.0044	0.13	0.0001	0.0001	0.0002
b&p database_mike-laptop_1 Safety Line 3/8 From 8 to 200	8.00	20.00	14.00	0.0026	0.04	0.0000	0.0000	0.0001
b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185	180.00	185.00	182.50	0.0065	1.19	0.0013	0.0007	0.0003
b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185	160.00	180.00	170.00	0.0260	4.42	0.0048	0.0024	0.0011
b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185	140.00	160.00	150.00	0.0260	3.90	0.0042	0.0022	0.0011
b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185	120.00	140.00	130.00	0.0260	3.38	0.0037	0.0019	0.0011
b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185	100.00	120.00	110.00	0.0260	2.86	0.0031	0.0016	0.0011
b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185	80.00	100.00	90.00	0.0260	2.34	0.0025	0.0013	0.0011
b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185	60.00	80.00	70.00	0.0260	1.82	0.0020	0.0010	0.0011
b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185	40.00	60.00	50.00	0.0260	1.30	0.0014	0.0007	0.0011
b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185	20.00	40.00	30.00	0.0260	0.78	0.0008	0.0004	0.0011
b&p database_mike-laptop_1 1 5/8 Hybrid Flex (1.98" 1.3lbs) From 8 to 185	8.00	20.00	14.00	0.0156	0.22	0.0002	0.0001	0.0007
			Sum	0.2723	26.60			

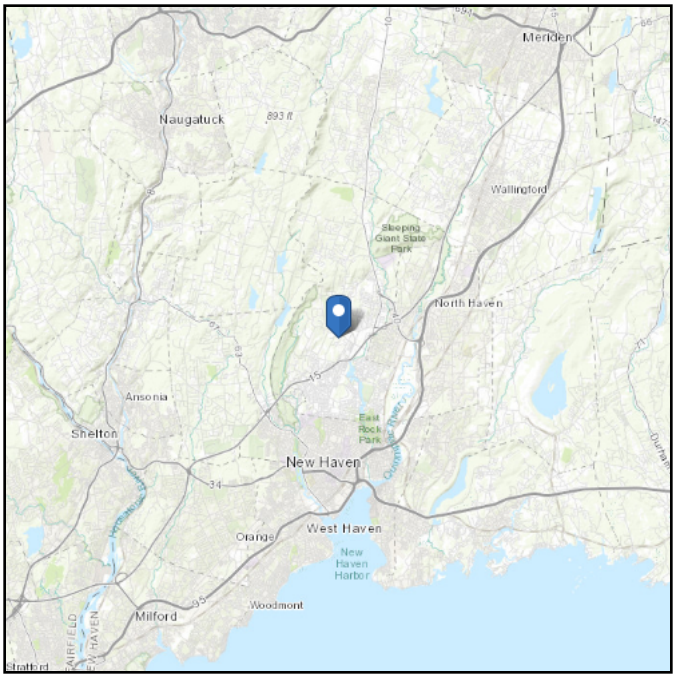
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Elevation: 181.54 ft (NAVD 88)
Latitude: 41.377344
Longitude: -72.927692





Wind

Results:

Wind Speed:	119 Vmph
10-year MRI	75 Vmph
25-year MRI	85 Vmph
50-year MRI	90 Vmph
100-year MRI	98 Vmph

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed:	Thu May 20 2021

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

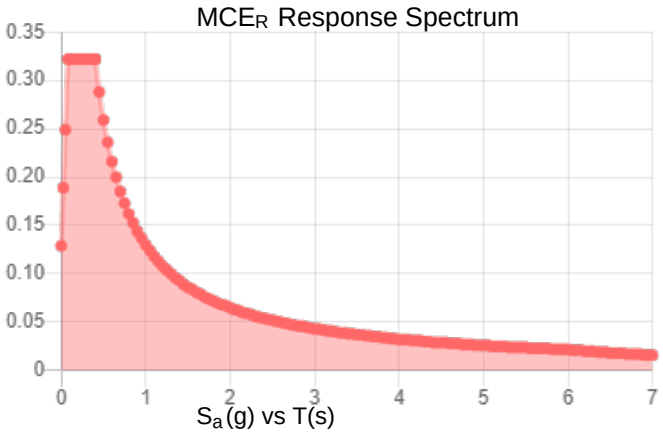
Seismic

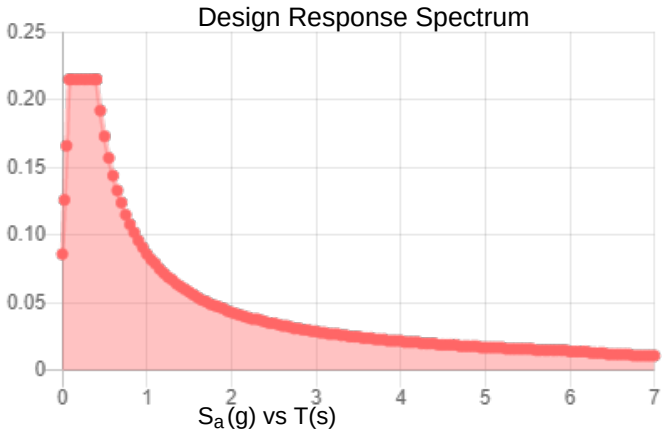
Site Soil Class: D - Default (see Section 11.4.3)

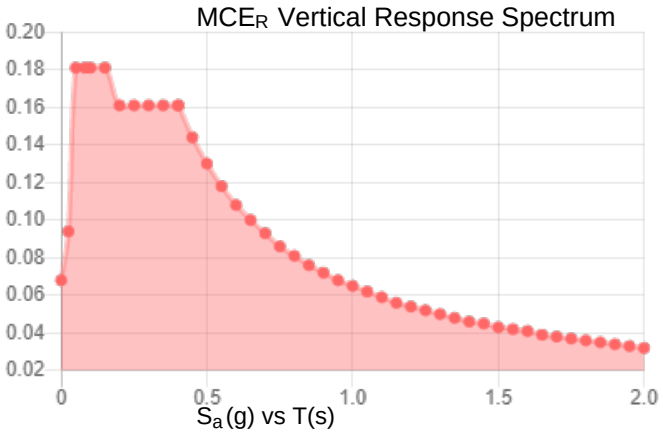
Results:

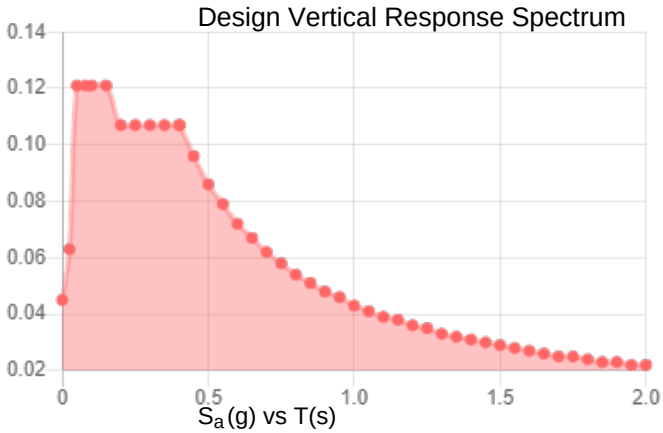
S_S :	0.201	S_{D1} :	0.086
S_1 :	0.054	T_L :	6
F_a :	1.6	PGA :	0.112
F_v :	2.4	PGA_M :	0.177
S_{MS} :	0.322	F_{PGA} :	1.575
S_{M1} :	0.13	I_e :	1
S_{DS} :	0.215	C_v :	0.703

Seismic Design Category B









Data Accessed: Thu May 20 2021

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Thu May 20 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 500-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.

Attachment 2:
Collocation Application

COLOCATION APPLICATION
US-CT-5014
Version 2
DISH Wireless L.L.C.

Vertical Bridge REIT, LLC.
750 Park of Commerce Drive
Suite 200
Boca Raton, FL 33487

SUMMARY

PRIMARY INFO

Application #: P-006911

Application Version: 2 (Submitted: 5/21/2021 5:31:00 PM)

Application Type: Broadband

Application Name: DISH Wireless BOHVN00194A

Lease Type: New Lease

Description:
Dish proposes to place 3 antennas, 6 RRUs, 1 junction box(s), and 1 cable(s) at the 185 foot RAD. Dish will require a 10' x 15' lease area for ground equipment

VERTICAL BRIDGE SITE INFO

VB Site #: US-CT-5014

VB Site Name: Quinnipiac 1

Latitude: 41.37734444

Longitude: -72.92769167

Structure Type: Guyed Tower

Structure Height: 204.0000

Site Address: 473 Denslow Hill Road -
Hamden, CT 06514

VERTICAL BRIDGE DEAL TEAM

RLM: Floyd Jenkins
FJenkins@verticalbridge.com
(301) 667-0069

RLS: Sam Bowden
SBowden@verticalbridge.com

ROM: Joe Bascelli
JBascelli@verticalbridge.com
(484) 288-9586

TENANT LEGAL INFO

Tenant Legal Name: DISH Wireless L.L.C.

State of Registration: Colorado

Type of Entity: LLC

Carrier NOC #: 2039274317

Tenant Site #: BOHVN00194A

Tenant Site Name: BOHVN00194A

APPLICANT

Name: Mai Conaway

Address 1053 Farmington Avenue
Farmington, CT 06032

Phone Number:: (410) 409-3822

Email Address: mai@northeastsitesolutions.com

FINAL LEASED RIGHTS CONFIGURATION TOTALS

This is a summary of your remaining existing equipment plus the new equipment.

FINAL EQUIPMENT

Qty	Equipment Type
1	Junction Box
3	Panel
6	RRU

FINAL LINES

Qty	Line Type
1	Hybrid

Vertical Bridge REIT, LLC.
750 Park of Commerce Drive
Suite 200
Boca Raton, FL 33487

FREQUENCY & TECHNOLOGY INFO

Type of Technology: Broadband Wireless
Is TX Frequency Licensed: Yes
TX Frequency: 127.9558044
Is RX Frequency Licensed: Yes
RX Frequency: 15633.92644

MOUNT & STRUCTURAL ANALYSIS

MOUNT ANALYSIS

Provided by Tenant: No
To Be Run by VB: Yes
Include Mount Mapping: No

STRUCTURAL HARD COPIES

Required: No
Number of Hard Copies

CONTACTS

INVOICE CONTACT

Attention To	Name	Address	Phone Number 1	Phone Number 2	Email 1	Email 2
Real Estate	Jeanne Cottrell	5701 South Sante Fe Blvd Littleton, CO 80120	(203) 927-4317		jean.cottrell@dish.com	

PO CONTACT

Name	Phone Number	Email
Jeanne Cottrell	(203) 927-4317	jean.cottrell@dish.com

LEASING CONTACT

Name	Phone Number	Email
Mai Conaway	(410) 409-3822	mai@northeastsitesolutions.com

NOTICE CONTACT

Notice To	Attention To	Name	Address
Real Estate	Real Estate	Jeanne Cottrell	5701 South Sante Fe Blvd Littleton, CO 80120

RF CONTACT

Name	Phone Number	Email
Jared Robinson	(978) 855-5870	jared.robinson@dish.com

Vertical Bridge REIT, LLC.
750 Park of Commerce Drive
Suite 200
Boca Raton, FL 33487

TENANT CONSTRUCTION MANAGER CONTACT		
Name	**Phone Number**	**Email**
Javier Soto	(617) 839-6514	javier.soto@dish.com

LINE & EQUIPMENT

NEW LINE(S)

Qty	Line Type	Line Size(in.)	Line Location	Comments
1	Hybrid	1.75	Interior	

NEW EQUIPMENT

Qty	Equipment Type	RAD Height	Mount (H')	Mount Type	Manufacturer	Model Number	Dimensions (H"xW"xD")	Weight (Lbs.)	Azimuth	Comments
3	RRU	185.00	185.00	Sector Frames	Fujitsu	TA08025-B604	15.80 x 15.90 x 7.90	64.00	0, 120, 240	
3	RRU	185.00	185.00	Platform	Fujitsu	TA08025-B605	15.75 x 14.96 x 9.06	74.95	0,120,240	
1	Junction Box	185.00	185.00	Platform	Raycap	RDIDC-9181-PF-48	16.00 x 14.00 x 8.00	21.85	na	
3	Panel	185.00	185.00	Platform	JMA	MX08FRO665-20_V0F	72.00 x 20.00 x 8.00	54.00	0, 120, 240	

NEW EQUIPMENT CABINET(S)

Quantity of Cabinets	Cabinet Dimensions (H x W x D)	Manufacturer	Comments
1	32.00 x 32.00 x 74.00	Charles(Amphenol) -H/EX (Cabinet), Commscope MTC4045LP Baseband (Base)	

ADDITIONAL SITE REQUIREMENTS

GROUND & INTERIOR SPACE REQUIREMENTS

Requirement Type	Total Lease Area (L x W)	Cabinet Required	Cabinet Area (L x W)	Shelter Required	Shelter Pad (L x W)	Comments
New	10.00 x 15.00	Yes	5.00 x 7.00		x	

GENERATOR REQUIREMENTS

Requirement Type	Fuel Type	Kilowatt Size	Pad Dimensions (L x D)	Generator Manufacturer	Fuel Tank Manufacturer	Comments
Modification	Gasoline	na	0.00 x 0.00	na	na	No generator required

AC POWER REQUIREMENTS

Meter Type	Additional Details	Comments
New Tenant Meter		

Vertical Bridge REIT, LLC.
750 Park of Commerce Drive
Suite 200
Boca Raton, FL 33487

BACKHAUL REQUIREMENTS

Requirement Type	Cable Type	Number Of Points Of Entry	Riser Size (Inches)	Comments
New	Fiber	1	1.00	

Exhibit E

Mount Analysis

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

1033 WATERVLIET SHAKER RD, ALBANY, NY 12205

Mount Analysis Report

August 3, 2021

Dish Wireless Site Number	BOHVN00194A
Infinigy Job Number	2039-Z5555C
Client	Northeast Site Solution
Carrier	Dish Wireless
Site Location	473 Denslow Hill Road, Hamden, CT 06514 41.3773 N NAD83 72.9277 W NAD83
Mount Centerline EL.	185 ft
Mount Classification	Sector Frame
Structural Usage Ratio	**16 %**
Overall Result	**Pass**

Upon reviewing the results of this analysis, it is our opinion that the structure meets the specified TIA and ASCE code requirements. The proposed antenna mounts for the proposed carrier are therefore deemed **adequate** to support the final loading configuration as listed in this report.

08-03-21
Dmitriy Albul, P.E.
Engineering Consultant to Infinigy

Contents

Introduction

Infinigy Engineering has been requested to perform a mount analysis of proposed antenna mount from the Dish Wireless equipment. All supporting documents have been obtained from the client and are assumed to be accurate and applicable to this site. The mount was analyzed using RISA-3D Version 19.0.3 analysis software.

Supporting Documentation

Mount Details	Mount Specification Sabre Industries C10837002C-32788
Construction Drawings	Infinigy Engineering PLLC, Job No. 2039-Z5555C, dated May 17, 2021
RF Design Sheet	Dish Wireless, dated February 19, 2021

Analysis Code Requirements

Wind Speed	125 mph (3-second Gust, Vult.)
Wind Speed w/ ice	50 mph (3-Second Gust) w/ 0.75” ice
TIA Revision	ANSI/TIA-222-G
Adopted IBC	2018 Connecticut Building Code (2015 IBC)
Structure Class	II
Exposure Category	C
Topographic Method	Method 1
Topographic Category	1
Spectral Response	S_s=0.185, S_1=0.063
Site Class	D – Stiff Soil (Assumed)
HMSL	161.5 ft.

Conclusion

Upon reviewing the results of this analysis, it is our opinion that the structure meets the specified TIA code requirements. The proposed antenna mounts are therefore deemed adequate to support the final loading configuration as listed in this report.

If you have any questions, require additional information, or actual conditions differ from those as detailed in this report please contact me via the information below:

Dmitriy Albul, P.E.
Professional Engineer | Engineering Consultant to Infinigy
1033 Watervliet Shaker Road, Albany, NY 12205
(O) (518) 690-0790 | (M) (518) 669-4428
www.infinigy.com

Final Configuration Loading

Mount CL (ft)	Rad. HT (ft)	Vert. O/S (ft)	Horiz. O/S (ft)*	Qty	Appurtenance	Carrier
185.0	185.0	-	9.5	3	JMA MX08FRO665-20	Dish Wireless
			9.5	3	Fujitsu TA08025-B605	
			9.5	3	Fujitsu TA08025-B604	
			-	1	Raycap RDIDC-9181-PF-48	

***Horizontal Offset is defined as the distance from the left most edge of the mount face horizontal when viewed facing the tower.**

Structure Usages

Mount Pipes	12%	Pass
Stabilizer	6%	Pass
Bracing	9%	Pass
Arms	6%	Pass
Frame Rails	8%	Pass
Plates	16%	Pass
Connections	11%	Pass
Rating	**16%**	Pass

Assumptions and Limitations

Our structural calculations are completed assuming all information provided to Infinigy Engineering is accurate and applicable to this site. For the purposes of calculations, we assume an overall structure condition of "like new" and all members and connections to be free of corrosion and/or structural defects. The structure owner and/or contractor shall verify the structure's condition prior to installation of any proposed equipment. If actual conditions differ from those described in this report Infinigy Engineering should be notified immediately to complete a revised evaluation.

Our evaluation is completed using standard TIA, AISC, ACI, and ASCE methods and procedures. Our structural results are proprietary and should not be used by others as their own. Infinigy Engineering is not responsible for decisions made by others that are or are not based on our supplied assumptions and conclusions.

This report is an evaluation of the proposed carriers mount structure only and does not reflect adequacy of the existing tower, other mounts, or coax mounting attachments. These elements are assumed to be adequate for the purposes of this analysis and are assumed to have been installed per their manufacturer requirements.

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

Date:	7/30/2021
Site Name:	BOHVN00194A
Job Engineer:	DVA
Job No:	2039-Z5555C
Customer:	Northeast Site Solutions
Carrier:	Dish Wireless

Building Code:	2015	
ASCE Standard:	ASCE 7-10	
TIA Standard:	G	
Mount Type:	Sector Frame	
	Proposed	
Mount Centerline:	185	ft
Superstructure Height:	N/A	ft
Structure Type:	Tower	

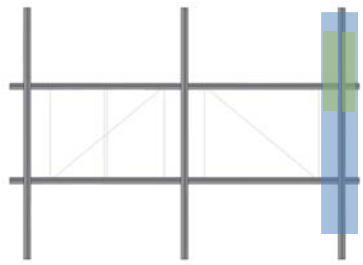
Factors	
Gh:	1.000
K_{zmin}:	0.850
K_z:	1.441
K_d:	0.950
K_{zt}:	1.000
Ka:	0.900
I wind:	1.000
I ice:	1.000

q_z:	32.85	psf
Surface Wind Pressure:	0.00	psf

Site Information		
Exposure Category:	C	
Risk Category:	II	
Ultimate Wind Speed:	125	mph
Design Wind Speed:	97	mph
Ice Thickness:	0.75	in
Ice Wind Speed:	50.0	mph
Escalated Ice Thickness:	1.78	in
Topographic Method:	1	
Topographic Category:	1	

Service Wind:	30.0	mph
Lm (man live load) =	500.0	lb
Lv (man live load) =	250.0	lb

ELEVATION VIEW



PLAN VIEW

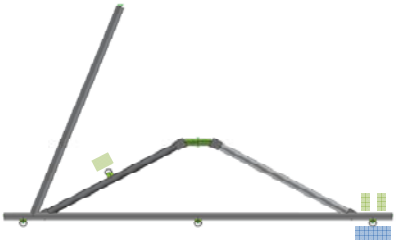


Table 1. Equipment Specifications and Wind Pressure

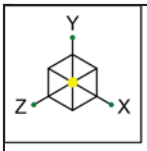
Manufacturer	Model	Elevation	Pipe Label	Weight (lb)	Height (in)	Width (in)	Depth (in)	EPA_N	EPA_T	$EPA_{N\ w/\ ice}$	$EPA_{T\ w/\ ice}$	q_z:	$q_{z\ ice}$:	$q_{z\ live}$:
JMA WIRELESS	MX08FRO665-20	185	29	54.00	72.8	20	8	8.01	3.21	8.80	3.90	32.85	8.76	3.15
Fujitsu	TA08025-B605	185	29	74.95	14.96	15.75	9.06	1.85	1.09	2.81	1.87	32.85	8.76	3.15
Fujitsu	TA08025-B604	185	29	63.93	14.96	15.75	7.87	1.85	0.96	2.81	1.71	32.85	8.76	3.15
Raycap	RDIDC-9181-PF-48	185	38	21.85	16	14	8	1.77	1.05	2.72	1.83	32.85	8.76	3.15

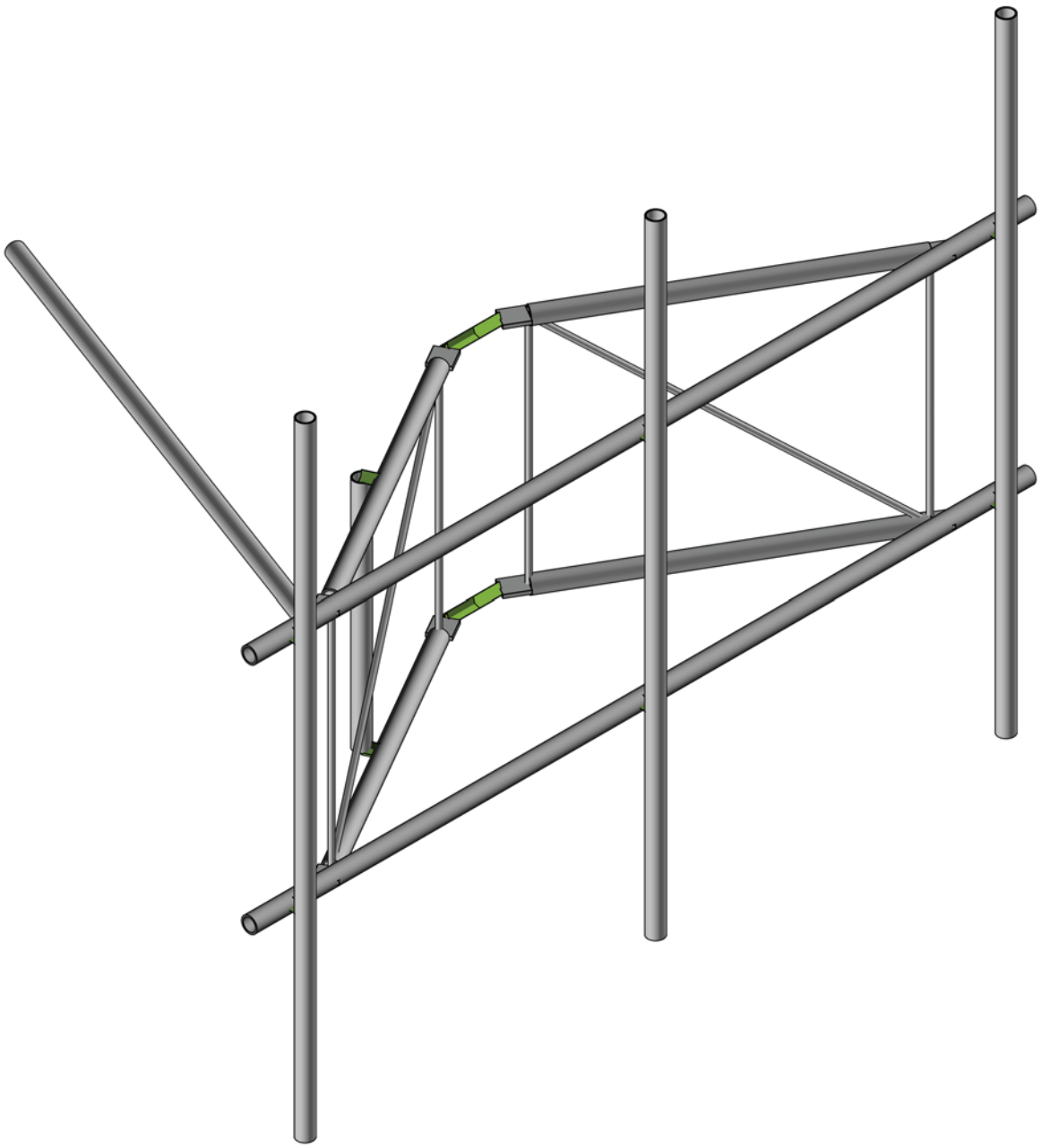
Table 2. Equipment Wind and Seismic Loads

Manufacturer	Model	Wind Load (F_A), lb		Wind Load Ice Case (F_A), lb			Wind Load Service Case		Seismic
JMA WIRELESS	MX08FRO665-20	237	95	69	31	315	23	9	0.0
Fujitsu	TA08025-B605	55	32	22	15	55	5	3	0.0
Fujitsu	TA08025-B604	55	28	22	13	54	5	3	0.0
Raycap	RDIDC-9181-PF-48	52	31	21	14	53	5	3	0.0

Table 3. Member Capacities

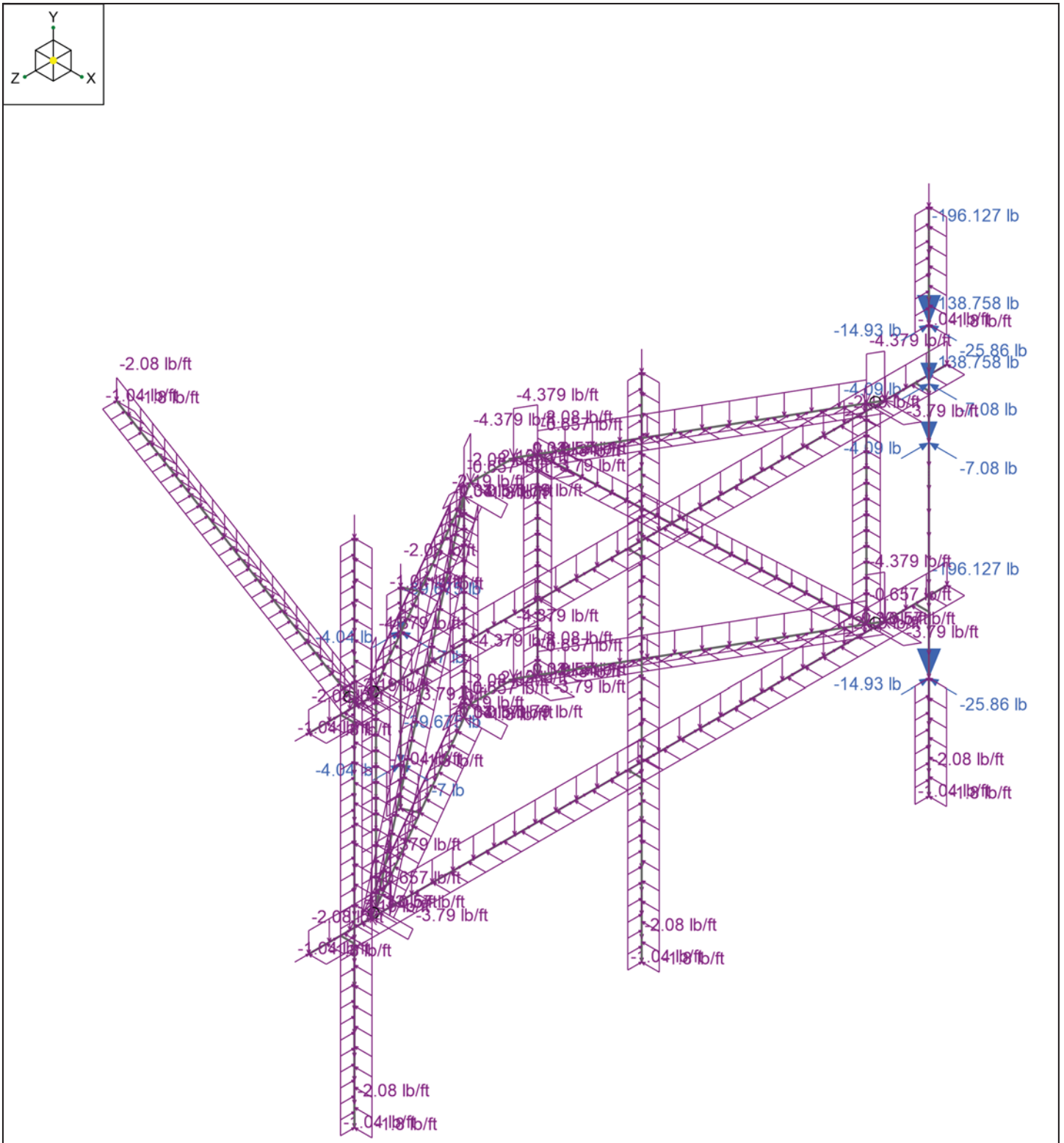
Member Name	Member Shape	Wind load (plf)	Wind Load Ice (plf)	Weight Ice (plf)	Bending Check	Shear Check	Total Capacity	Controlling Capacity
Mount Pipes	PIPE_2.0	7.80	2.08	1.10	12%	4%	12%	16%
Stabilizer	PIPE_2.0	7.80	2.08	1.10	5%	0%	5%	
Bracing	0.75" SR	2.46	0.66	0.80	9%	1%	9%	
Arm	PIPE_2.0X	7.80	2.08	1.10	4%	1%	4%	
Frame Rail	PIPE_2.0X	7.80	2.08	1.10	8%	6%	8%	
Plate	3"x.5"	16.42	4.38	1.22	16%	8%	16%	





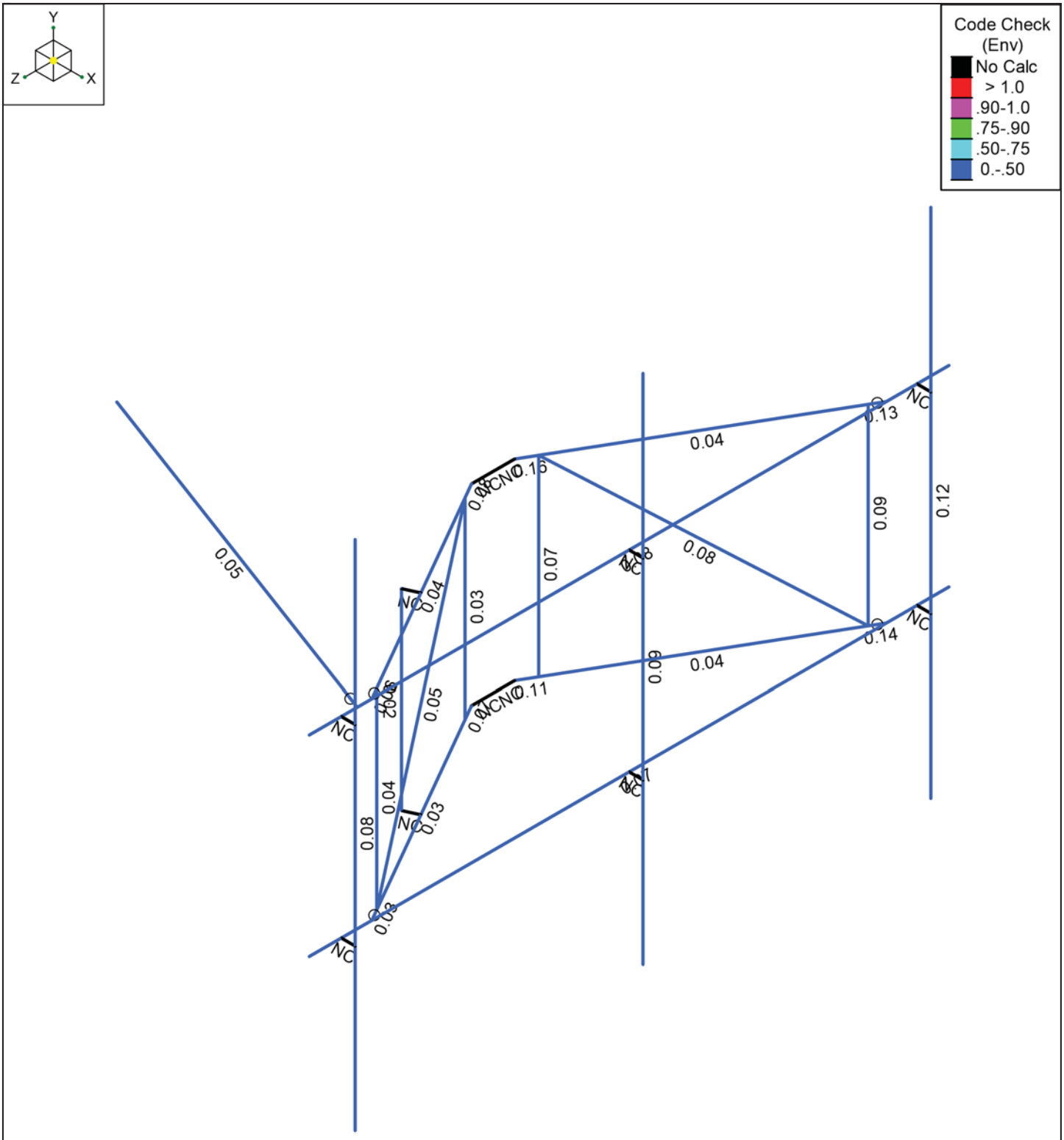
Envelope Only Solution

Infinigy Engineering, PLLC	BOHVN00194A	SK-1
DVA		Jul 30, 2021
2039-Z5555C	Proposed Configuration Model	BOBOS00010A.R3D



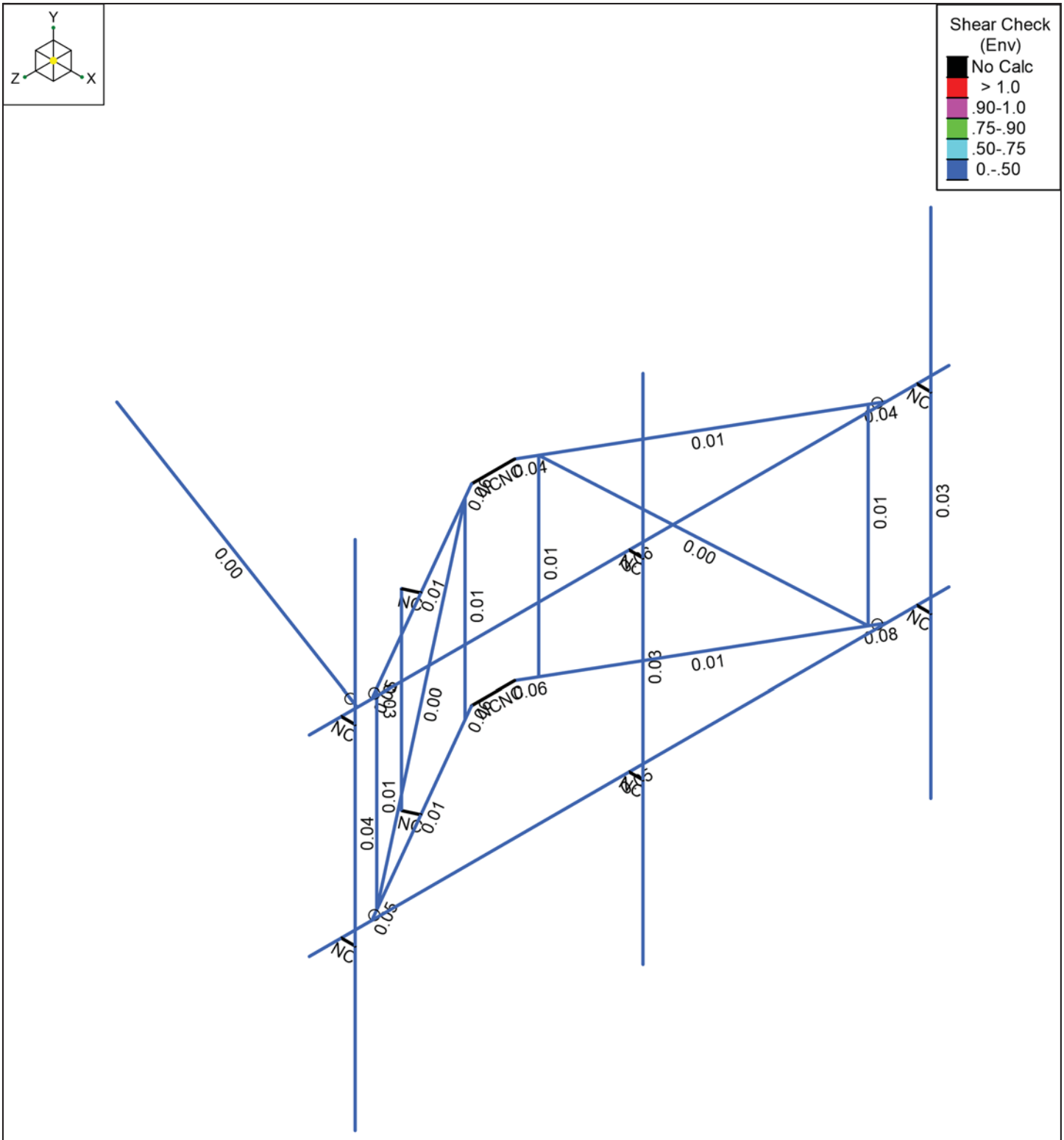
Loads: LC 28, 1.2D + 1.0Di +1.0Wi AZI 30
Envelope Only Solution

Infinigy Engineering, PLLC	BOHVN00194A	SK-2
DVA		Jul 30, 2021
2039-Z5555C	Controlling Load Combination	BOBOS00010A.R3D



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Infinigy Engineering, PLLC	BOHVN00194A	SK-3
DVA		Jul 30, 2021
2039-Z5555C	Member Bending Check	BOBOS00010A.R3D



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Infinigy Engineering, PLLC	BOHVN00194A	SK-4
DVA		Jul 30, 2021
2039-Z5555C	Member Shear Check	BOBOS00010A.R3D

Model Settings

Solution

Members

Number of Reported Sections	5
Number of Internal Sections	100
Member Area Load Mesh Size (in^2)	144
Consider Shear Deformation	Yes
Consider Torsional Warping	Yes

Wall Panels

Approximate Mesh Size (in)	12
Transfer Forces Between Intersecting Wood Walls	Yes
Increase Wood Wall Nailing Capacity for Wind Loads	Yes
Include P-Delta for Walls	Yes
Optimize Masonry and Wood Walls	Yes
Maximum Number of Iterations	3

Processor Core Utilization

Single	No
Multiple (Optimum)	Yes
Maximum	No

Axis

Vertical Global Axis

Global Axis corresponding to vertical direction	Y
Convert Existing Data	Yes

Default Member Orientation

Default Global Plane for z-axis	XZ

Plate Axis

Plate Local Axis Orientation	Nodal

Codes

Hot Rolled Steel	AISC 14th (360-10): LRFD
Stiffness Adjustment	Yes (Iterative)
Notional Annex	None
Connections	AISC 14th (360-10): LRFD
Cold Formed Steel	AISI S100-12: LRFD
Stiffness Adjustment	Yes (Iterative)
Wood	AWC NDS-12: ASD
Temperature	< 100F
Concrete	ACI 318-11
Masonry	ACI 530-11: Strength
Aluminum	AA ADM1-10: LRFD
Structure Type	Building
Stiffness Adjustment	Yes (Iterative)
Stainless	AISC 14th (360-10): LRFD
Stiffness Adjustment	Yes (Iterative)

Concrete

Column Design

Analysis Methodology	Exact Integration Method
Parme Beta Factor	0.65

Compression Stress Block	Rectangular Stress Block
Analyze using Cracked Sections	Yes
Leave room for horizontal rebar splices (2*d bar spacing)	No

Model Settings (Continued)

List forces which were ignored for design in the Detail Report	Yes

Rebar

Column Min Steel	1
Column Max Steel	8
Rebar Material Spec	ASTM A615
Warn if beam-column framing arrangement is not understood	No

Shear Reinforcement

Number of Shear Regions	4
Region 2 & 3 Spacing Increase Increment (in)	4

Seismic

RISA-3D Seismic Load Options

Code	ASCE 7-10
Risk Category	I or II
Drift Cat	Other
Base Elevation (ft)	
Include the weight of the structure in base shear calcs	Yes

Site Parameters

S_1 (g)	1
SD_1 (g)	1
SD_s (g)	1
T_L (sec)	5

Structure Characteristics

T Z (sec)	
T X (sec)	
C_tX	0.02
C_tExp. Z	0.75
C_tExp. X	0.75
R Z	3
R X	3
Ω_0Z	1
Ω_0X	1
C_dZ	4
C_dX	4
ρ Z	1
ρ X	1

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N1	N3		RIGID	None	None	RIGID	Typical
2	M2	N5	N8		Arm	Beam	Pipe	A500 Gr.C	Typical
3	M3	N2	N4		RIGID	None	None	RIGID	Typical
4	M4	N6	N7		Arm	Beam	Pipe	A500 Gr.C	Typical
5	M5	N8	N7		Bracing	VBrace	BAR	A572 Gr.50	Typical
6	M6	N5	N6		Bracing	VBrace	BAR	A572 Gr.50	Typical
7	M7	N6	N8		Bracing	VBrace	BAR	A572 Gr.50	Typical
8	M8	N1	N9		RIGID	None	None	RIGID	Typical
9	M9	N2	N10		RIGID	None	None	RIGID	Typical
10	M10	N16	N12		Frame Rail	Beam	Pipe	A500 Gr.C	Typical
11	M11	N15	N11		Frame Rail	Beam	Pipe	A500 Gr.C	Typical
12	M12	N7	N19	90	Plate	Beam	BAR	A572 Gr.50	Typical
13	M13	N8	N20	90	Plate	Beam	BAR	A572 Gr.50	Typical
14	M14	N4	N6	90	Plate	Beam	BAR	A572 Gr.50	Typical
15	M15	N3	N5	90	Plate	Beam	BAR	A572 Gr.50	Typical
16	M16	N21	N24		Arm	Beam	Pipe	A500 Gr.C	Typical
17	M17	N22	N23		Arm	Beam	Pipe	A500 Gr.C	Typical
18	M18	N24	N23		Bracing	VBrace	BAR	A572 Gr.50	Typical
19	M19	N21	N22		Bracing	VBrace	BAR	A572 Gr.50	Typical
20	M20	N22	N24		Bracing	VBrace	BAR	A572 Gr.50	Typical
21	M21	N23	N25	90	Plate	Beam	BAR	A572 Gr.50	Typical
22	M22	N24	N26	90	Plate	Beam	BAR	A572 Gr.50	Typical
23	M23	N10	N22	90	Plate	Beam	BAR	A572 Gr.50	Typical
24	M24	N9	N21	90	Plate	Beam	BAR	A572 Gr.50	Typical
25	M25	N28	N27		Stabilizer	HBrace	Pipe	A53 Gr.B	Typical
26	M27	N32	N30		RIGID	None	None	RIGID	Typical
27	M28	N29	N31		RIGID	None	None	RIGID	Typical
28	M29	N37	N38		Mount Pipes	Column	Pipe	A53 Gr.B	Typical
29	M30	N41	N42		Mount Pipes	Column	Pipe	A53 Gr.B	Typical
30	M31	N45	N46		Mount Pipes	Column	Pipe	A53 Gr.B	Typical
31	M32	N17	N39		RIGID	None	None	RIGID	Typical
32	M33	N18	N40		RIGID	None	None	RIGID	Typical
33	M34	N34	N44		RIGID	None	None	RIGID	Typical
34	M35	N33	N43		RIGID	None	None	RIGID	Typical
35	M36	N14	N36		RIGID	None	None	RIGID	Typical
36	M37	N13	N35		RIGID	None	None	RIGID	Typical
37	M38	N32	N31		Mount Pipes	Column	Pipe	A53 Gr.B	Typical

Material Take-Off

	Material	Size	Pieces	Length[in]	Weight[K]
1	General Members				
2	RIGID		12	37.3	0
3	Total General		12	37.3	0
4					
5	Hot Rolled Steel				
6	A500 Gr.C	PIPE_2.0X	6	421	0.18
7	A53 Gr.B	PIPE_2.0	5	401	0.116
8	A572 Gr.50	0.75" SR	6	259.6	0.033
9	A572 Gr.50	3"x.5"	8	23.2	0.01
10	Total HR Steel		25	1104.9	0.338

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Point	Distributed
1	Self Weight	DL		-1		8	
2	Wind Load AZI 0	WLX				16	78

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Point	Distributed
3	Wind Load AZI 30	None				16	78
4	Wind Load AZI 60	None				16	78
5	Wind Load AZI 90	WLZ				16	78
6	Wind Load AZI 120	None				16	78
7	Wind Load AZI 150	None				16	78
8	Wind Load AZI 180	None				16	78
9	Wind Load AZI 210	None				16	78
10	Wind Load AZI 240	None				16	78
11	Wind Load AZI 270	None				16	78
12	Wind Load AZI 300	None				16	78
13	Wind Load AZI 330	None				16	78
14	Ice Weight	OL1				8	37
15	Ice Wind Load AZI 0	OL2				16	78
16	Ice Wind Load AZI 30	None				16	78
17	Ice Wind Load AZI 60	None				16	78
18	Ice Wind Load AZI 90	OL3				16	78
19	Ice Wind Load AZI 120	None				16	78
20	Ice Wind Load AZI 150	None				16	78
21	Ice Wind Load AZI 180	None				16	78
22	Ice Wind Load AZI 210	None				16	78
23	Ice Wind Load AZI 240	None				16	78
24	Ice Wind Load AZI 270	None				16	78
25	Ice Wind Load AZI 300	None				16	78
26	Ice Wind Load AZI 330	None				16	78
27	Seismic Load X	ELX			-0.085	8	
28	Seismic Load Z	ELZ	-0.085			8	
29	Service Live Loads	LL					
30	Maintenance Load 1	LL				1	
31	Maintenance Load 2	LL				1	
32	Maintenance Load 3	LL				1	
33	Maintenance Load 4	LL				1	
34	Maintenance Load 5	LL				1	

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4DL	Yes	Y	1	1.4				
2	1.2DL + 1.6WL AZI 0	Yes	Y	1	1.2	2	1.6		
3	1.2DL + 1.6WL AZI 30	Yes	Y	1	1.2	3	1.6		
4	1.2DL + 1.6WL AZI 60	Yes	Y	1	1.2	4	1.6		
5	1.2DL + 1.6WL AZI 90	Yes	Y	1	1.2	5	1.6		
6	1.2DL + 1.6WL AZI 120	Yes	Y	1	1.2	6	1.6		
7	1.2DL + 1.6WL AZI 150	Yes	Y	1	1.2	7	1.6		
8	1.2DL + 1.6WL AZI 180	Yes	Y	1	1.2	8	1.6		
9	1.2DL + 1.6WL AZI 210	Yes	Y	1	1.2	9	1.6		
10	1.2DL + 1.6WL AZI 240	Yes	Y	1	1.2	10	1.6		
11	1.2DL + 1.6WL AZI 270	Yes	Y	1	1.2	11	1.6		
12	1.2DL + 1.6WL AZI 300	Yes	Y	1	1.2	12	1.6		
13	1.2DL + 1.6WL AZI 330	Yes	Y	1	1.2	13	1.6		
14	0.9DL + 1.6WL AZI 0	Yes	Y	1	0.9	2	1.6		
15	0.9DL + 1.6WL AZI 30	Yes	Y	1	0.9	3	1.6		
16	0.9DL + 1.6WL AZI 60	Yes	Y	1	0.9	4	1.6		
17	0.9DL + 1.6WL AZI 90	Yes	Y	1	0.9	5	1.6		
18	0.9DL + 1.6WL AZI 120	Yes	Y	1	0.9	6	1.6		
19	0.9DL + 1.6WL AZI 150	Yes	Y	1	0.9	7	1.6		
20	0.9DL + 1.6WL AZI 180	Yes	Y	1	0.9	8	1.6		
21	0.9DL + 1.6WL AZI 210	Yes	Y	1	0.9	9	1.6		
22	0.9DL + 1.6WL AZI 240	Yes	Y	1	0.9	10	1.6		
23	0.9DL + 1.6WL AZI 270	Yes	Y	1	0.9	11	1.6		

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
24	0.9DL + 1.6WL AZI 300	Yes	Y	1	0.9	12	1.6		
25	0.9DL + 1.6WL AZI 330	Yes	Y	1	0.9	13	1.6		
26	1.2D + 1.0Di	Yes	Y	1	1.2	14	1		
27	1.2D + 1.0Di +1.0Wi AZI 0	Yes	Y	1	1.2	14	1	15	1
28	1.2D + 1.0Di +1.0Wi AZI 30	Yes	Y	1	1.2	14	1	16	1
29	1.2D + 1.0Di +1.0Wi AZI 60	Yes	Y	1	1.2	14	1	17	1
30	1.2D + 1.0Di +1.0Wi AZI 90	Yes	Y	1	1.2	14	1	18	1
31	1.2D + 1.0Di +1.0Wi AZI 120	Yes	Y	1	1.2	14	1	19	1
32	1.2D + 1.0Di +1.0Wi AZI 150	Yes	Y	1	1.2	14	1	20	1
33	1.2D + 1.0Di +1.0Wi AZI 180	Yes	Y	1	1.2	14	1	21	1
34	1.2D + 1.0Di +1.0Wi AZI 210	Yes	Y	1	1.2	14	1	22	1
35	1.2D + 1.0Di +1.0Wi AZI 240	Yes	Y	1	1.2	14	1	23	1
36	1.2D + 1.0Di +1.0Wi AZI 270	Yes	Y	1	1.2	14	1	24	1
37	1.2D + 1.0Di +1.0Wi AZI 300	Yes	Y	1	1.2	14	1	25	1
38	1.2D + 1.0Di +1.0Wi AZI 330	Yes	Y	1	1.2	14	1	26	1
39	(1.2 + 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	1.234	27	1	28	
40	(1.2 + 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	1.234	27	0.866	28	0.5
41	(1.2 + 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	1.234	27	0.5	28	0.866
42	(1.2 + 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	1.234	27		28	1
43	(1.2 + 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	1.234	27	-0.5	28	0.866
44	(1.2 + 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	1.234	27	-0.866	28	0.5
45	(1.2 + 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	1.234	27	-1	28	
46	(1.2 + 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	1.234	27	-0.866	28	-0.5
47	(1.2 + 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	1.234	27	-0.5	28	-0.866
48	(1.2 + 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	1.234	27		28	-1
49	(1.2 + 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	1.234	27	0.5	28	-0.866
50	(1.2 + 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	1.234	27	0.866	28	-0.5
51	(0.9 - 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	0.866	27	1	28	
52	(0.9 - 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	0.866	27	0.866	28	0.5
53	(0.9 - 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	0.866	27	0.5	28	0.866
54	(0.9 - 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	0.866	27		28	1
55	(0.9 - 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	0.866	27	-0.5	28	0.866
56	(0.9 - 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	0.866	27	-0.866	28	0.5
57	(0.9 - 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	0.866	27	-1	28	
58	(0.9 - 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	0.866	27	-0.866	28	-0.5
59	(0.9 - 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	0.866	27	-0.5	28	-0.866
60	(0.9 - 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	0.866	27		28	-1
61	(0.9 - 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	0.866	27	0.5	28	-0.866
62	(0.9 - 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	0.866	27	0.866	28	-0.5
63	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 0	Yes	Y	1	1	2	0.096	29	1.5
64	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 30	Yes	Y	1	1	3	0.096	29	1.5
65	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 60	Yes	Y	1	1	4	0.096	29	1.5
66	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 90	Yes	Y	1	1	5	0.096	29	1.5
67	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 120	Yes	Y	1	1	6	0.096	29	1.5
68	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 150	Yes	Y	1	1	7	0.096	29	1.5
69	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 180	Yes	Y	1	1	8	0.096	29	1.5
70	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 210	Yes	Y	1	1	9	0.096	29	1.5
71	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 240	Yes	Y	1	1	10	0.096	29	1.5
72	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 270	Yes	Y	1	1	11	0.096	29	1.5
73	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 300	Yes	Y	1	1	12	0.096	29	1.5
74	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 330	Yes	Y	1	1	13	0.096	29	1.5
75	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	34	1.5	2	0.154
76	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	34	1.5	3	0.154
77	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	34	1.5	4	0.154
78	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	34	1.5	5	0.154
79	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	34	1.5	6	0.154
80	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	34	1.5	7	0.154
81	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	34	1.5	8	0.154

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
82	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	34	1.5	9	0.154
83	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	34	1.5	10	0.154
84	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	34	1.5	11	0.154
85	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	34	1.5	12	0.154
86	1.2DL + 1.5LM1 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	34	1.5	13	0.154
87	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	35	1.5	2	0.154
88	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	35	1.5	3	0.154
89	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	35	1.5	4	0.154
90	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	35	1.5	5	0.154
91	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	35	1.5	6	0.154
92	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	35	1.5	7	0.154
93	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	35	1.5	8	0.154
94	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	35	1.5	9	0.154
95	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	35	1.5	10	0.154
96	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	35	1.5	11	0.154
97	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	35	1.5	12	0.154
98	1.2DL + 1.5LM2 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	35	1.5	13	0.154
99	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	36	1.5	2	0.154
100	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	36	1.5	3	0.154
101	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	36	1.5	4	0.154
102	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	36	1.5	5	0.154
103	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	36	1.5	6	0.154
104	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	36	1.5	7	0.154
105	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	36	1.5	8	0.154
106	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	36	1.5	9	0.154
107	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	36	1.5	10	0.154
108	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	36	1.5	11	0.154
109	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	36	1.5	12	0.154
110	1.2DL + 1.5LM3 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	36	1.5	13	0.154
111	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	37	1.5	2	0.154
112	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	37	1.5	3	0.154
113	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	37	1.5	4	0.154
114	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	37	1.5	5	0.154
115	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	37	1.5	6	0.154
116	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	37	1.5	7	0.154
117	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	37	1.5	8	0.154
118	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	37	1.5	9	0.154
119	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	37	1.5	10	0.154
120	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	37	1.5	11	0.154
121	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	37	1.5	12	0.154
122	1.2DL + 1.5LM4 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	37	1.5	13	0.154
123	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 0	Yes	Y	1	1.2	38	1.5	2	0.154
124	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 30	Yes	Y	1	1.2	38	1.5	3	0.154
125	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 60	Yes	Y	1	1.2	38	1.5	4	0.154
126	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 90	Yes	Y	1	1.2	38	1.5	5	0.154
127	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 120	Yes	Y	1	1.2	38	1.5	6	0.154
128	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 150	Yes	Y	1	1.2	38	1.5	7	0.154
129	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 180	Yes	Y	1	1.2	38	1.5	8	0.154
130	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 210	Yes	Y	1	1.2	38	1.5	9	0.154
131	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 240	Yes	Y	1	1.2	38	1.5	10	0.154
132	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 270	Yes	Y	1	1.2	38	1.5	11	0.154
133	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 300	Yes	Y	1	1.2	38	1.5	12	0.154
134	1.2DL + 1.5LM5 + 1.6SWL (30 mph) AZI 330	Yes	Y	1	1.2	38	1.5	13	0.154

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-in]	LC	MY [lb-in]	LC	MZ [lb-in]	LC
1	N2	max	925.221	15	789.907	38	1028.038	4	2138.56	83	0	134	767.057	34
2		min	-1640.983	9	283.935	19	-519.893	22	-236.594	16	0	1	163.438	15

Envelope Node Reactions (Continued)

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-in]	LC	MY [lb-in]	LC	MZ [lb-in]	LC
3	N1	max	1059.512	2	515.001	32	198.385	18	1360.002	82	0	134	492.728	27
4		min	-343.154	20	181.662	25	-903.717	37	-388.218	15	0	1	150.514	20
5	N28	max	597.494	9	20.04	28	216.767	9	0	134	0	134	0	134
6		min	-598.31	3	9.644	57	-216.933	3	0	1	0	1	0	1
7	Totals:	max	1437.98	2	1320.119	37	967.869	18						
8		min	-1437.98	8	488.016	51	-1049.44	12						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-in]	phi*Mn z-z [lb-in]	Cb	Eqn
1	M14	3"x.5"	0.159	0	28	0.036	3.313	y	6	64929.826	67500	8460	50625	1.038	H1-1b
2	M13	3"x.5"	0.138	0	32	0.077	2.5	y	3	66023.816	67500	8460	50625	1.675	H1-1b
3	M12	3"x.5"	0.127	0	38	0.038	2.5	y	7	66023.816	67500	8460	50625	1.674	H1-1b
4	M29	PIPE_2.0	0.124	66	2	0.028	66		2	14916.096	32130	22459.5	22459.5	1.656	H1-1b
5	M15	3"x.5"	0.113	0	34	0.06	0	y	3	64929.826	67500	8460	50625	1.036	H1-1b
6	M31	PIPE_2.0	0.09	66	3	0.034	66		3	14916.096	32130	22459.5	22459.5	1.765	H1-1b
7	M5	0.75" SR	0.086	0	38	0.006	36		9	5691.919	19890	3072	3072	2.694	H1-1b*
8	M23	3"x.5"	0.084	0	32	0.056	0	y	6	64929.826	67500	8460	50625	1.05	H1-1b
9	M11	PIPE_2.0X	0.082	107.5	9	0.061	11.25		9	12974.268	57960	39909.6	39909.6	1.696	H1-1b
10	M7	0.75" SR	0.077	0	34	0.003	57.824		13	2206.248	19890	3072	3072	2.627	H1-1b*
11	M30	PIPE_2.0	0.075	30	3	0.038	30		3	14916.096	32130	22459.5	22459.5	2.785	H1-1b
12	M10	PIPE_2.0X	0.07	107.5	9	0.046	108.75		3	12974.268	57960	39909.6	39909.6	1.946	H1-1b
13	M24	3"x.5"	0.069	0	27	0.058	0	y	3	64929.826	67500	8460	50625	1.044	H1-1b
14	M6	0.75" SR	0.067	0	33	0.01	0		3	5691.919	19890	3072	3072	2.934	H1-1b*
15	M21	3"x.5"	0.055	0	3	0.049	2.5	y	8	66023.816	67500	8460	50625	1.633	H1-1b
16	M25	PIPE_2.0	0.049	38.498	12	0.004	76.996		6	19612.716	32130	22459.5	22459.5	1.136	H1-1b
17	M20	0.75" SR	0.046	0	6	0.004	57.824		3	2206.248	19890	3072	3072	2.195	H1-1b
18	M2	PIPE_2.0X	0.04	45.25	32	0.014	0		3	45905.544	57960	39909.6	39909.6	2.439	H1-1b
19	M18	0.75" SR	0.039	0	3	0.008	0		9	5691.919	19890	3072	3072	2.472	H1-1b
20	M4	PIPE_2.0X	0.037	0	3	0.007	45.25		6	45905.544	57960	39909.6	39909.6	2.393	H1-1b
21	M17	PIPE_2.0X	0.037	22.625	3	0.012	22.625		3	45905.544	57960	39909.6	39909.6	1.32	H1-1b
22	M22	3"x.5"	0.034	0	7	0.05	2.5	y	12	66023.816	67500	8460	50625	1.642	H1-1b
23	M19	0.75" SR	0.031	0	4	0.01	0		3	5691.919	19890	3072	3072	2.596	H1-1b
24	M16	PIPE_2.0X	0.029	0	38	0.012	0		3	45905.544	57960	39909.6	39909.6	1.329	H1-1b
25	M38	PIPE_2.0	0.024	36	3	0.029	36		9	28843.414	32130	22459.5	22459.5	2.406	H1-1b

INFINIGY

FROM ZERO TO INFINIGY

the solutions are endless

BOLT CONNECTION CALCULATION

BOLT PROPERTIES

Date:	7/30/2021
Site:	*BOHVN00194A*
Engineer:	*DVA*
Job No:	*2039-Z5555C*
Connection Location:	*Arm to Tower*

Bolt Capacity Equation	TIA-222-G	
Connection Type	Steel	
Bolt Size, **d**	1/2	in
Threads per Inch, **n**	13	
Steel Grade	A307	
Bolt Ultimate Tensile Stress, $\mathbf{F_u}$	60	ksi
Threads Exclusion	N	
Shear Plane	1	

Net Bolt Cross-Sectional Area, **An**	0.142	in^2
Gross Bolt Cross-Sectional Area, **Ag**	0.196	in^2
Tensile Steel Strength (per bolt), $\mathbf{\varphi R_{nt}}$	6385	lbs
Shear Steel Strength (per bolt), $\mathbf{\varphi R_{nv}}$	3976	lbs

INFINIGY

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BOLT CONNECTION CALCULATION

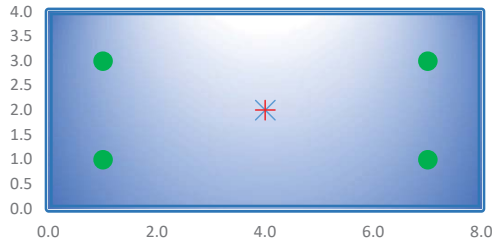
BOLT GROUP CHECK

Date:	*7/30/2021*
Contractor:	*Infinigy Engineering, PLLC*
Site:	*BOHVN00194A*
Engineer:	*DVA*
Job No:	*2039-Z5555C*
Connection Location:	*Arm to Tower*

Loads Properties					
Controlling LC:	29				
Load Point Number:	N2				
X-Coordinate (in.)	4.00				
Y-Coordinate (in.)	2.00				
Z-Coordinate (in.)	0.00				
Shear Load, Px (lbs)	-956.000	0	0	0	0
Shear Load, Py (lbs)	-787.000	0	0	0	0
Axial Load, Pz (lbs)	678.000	0	0	0	0
Moment, Mx (lb-in)	-723.000	0	0	0	0
Moment, My (lb-in)	0.000	0	0	0	0
Moment, Mz (lb-in)	1665.000	0	0	0	0

Member Properties	***X***	***Y***
Start Coordinates:	0.0	0.0
Dimentions:	8.0	4.0

Bolt Group Pattern



Number of Bolts: 4

		Bolt Coordinates		***Bolt Loads***			***Steel Bolt Usage***		
No.	***Bolt Type***	***Xo (in)***	***Yo (in)***	***Axial (lbs)***	***Shear (lbs)***	***Tension***	***Shear***	***Combined***	***Max. Capacity***
1	Main Type	1.00	1.00	350.25	289.68	5.5%	7.3%	7.3%	7.3%
2	Main Type	7.00	3.00	-11.25	377.36	0.0%	9.5%	9.5%	9.5%
3	Main Type	1.00	3.0	-11.25	210.05	0.0%	5.3%	5.3%	5.3%
4	Main Type	7.00	1.0	350.25	426.84	5.5%	10.7%	10.7%	10.7%

Bolt Group Properties:

Xc =	4.00	in.
Yc =	2.00	in.
Ic.y =	7.07	in.^2
Ic.x =	0.79	in.^2
Ic.xy =	7.85	in.^2

Loads at Center of Gravity of Bolt Group:

Pz =	678.00	lbs
Px =	-956.00	lbs
Py =	-787.00	lbs
Mx =	-723.00	lb-in
My =	0.00	lb-in
Mz =	1665.00	lb-in

Total Capacity of Bolt Group: 10.7%

U-bolt Connection: No

dish wireless

Sabre Industries™

THD 10’ V-Boom Assembly with Tieback (Tier 1, 2, 3)

C10837002C

*Sector Frame Option 2- **This is a secondary approved mount if the primary is not available***

- **C10837002C-32788 V-Boom Sector Frame**
- 10’ THD V-Boom Sector Mount with Tieback
- Face Width = 10’, Stiff Arm = 1
- Includes (3) 2-7/8” OD x 8’ Antenna
- Mounting Pipes and all associated hardware
- Kit weight – 610 lbs

Exhibit F

Power Density/RF Emissions 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: BOHVN00194A

473 Denslow Hill Road
Hamden, Connecticut 06514

September 1, 2021

EBI Project Number: 6221004686

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**0.74%**

September 1, 2021

Dish Wireless

Emissions Analysis for Site: BOHVN00194A

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **473 Denslow Hill Road** in **Hamden, 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 Wireless antenna facility located at 473 Denslow Hill Road in Hamden, 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 185 feet above ground level (AGL).

8) Emissions from additional carriers were not included because emissions data for the site location are not available.

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):	185 feet	Height (AGL):	185 feet	Height (AGL):	185 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 %:	**0.74%**	Antenna B1 MPE %:	**0.74%**	Antenna C1 MPE %:	**0.74%**

Site Composite MPE %	
Carrier	**MPE %**
Dish Wireless (Max at Sector A):	0.74%
no additional carriers	N/A
Site Total MPE % :	0.74%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	0.74%
Dish Wireless Sector B Total:	0.74%
Dish Wireless Sector C Total:	0.74%
Site Total MPE % :	0.74%

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	185.0	1.00	600 MHz n71	400	0.25%
Dish Wireless 1900 MHz n70	4	542.70	185.0	2.44	1900 MHz n70	1000	0.24%
Dish Wireless 2190 MHz n66	4	542.70	185.0	2.44	2190 MHz n66	1000	0.24%
						Total:	**0.74%**

• 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:	0.74%
Sector B:	0.74%
Sector C:	0.74%
Dish Wireless Maximum MPE % (Sector A):	0.74%
Site Total:	0.74%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **0.74%** 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 G

Letter of Authorization

Vertical Bridge NTCF, LLC
750 Park of Commerce Drive, Suite 200
Boca Raton, FL 33487
Phone: 561.406.4076

Vertical Bridge NTCF, LLC - Letter of Authorization

CT - CONNECTICUT SITING COUNCIL
Melanie A. Bachman
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: Tower Share Application
Vertical Bridge NTCF, LLC - telecommunications site at:
473 DENSLOW HILL ROAD, HAMDEN, CT 06514

Vertical Bridge NTCF, LLC a Delaware limited liability company, d/b/a Vertical Bridge ("VB") hereby authorizes DISH Wireless LLC, including their Agent, to act as our Agent in the processing of all zoning applications, building permits and approvals through the CT - CONNECTICUT SITING COUNCIL for the existing wireless communications site described below:

VB ID/Name: US-CT-5014/Quinnipiac
Customer Site ID: BOHVN00194A / VB - Denslow Hill Road
Site Address: 473 DENSLOW HILL ROAD, HAMDEN, CT 06514

Vertical Bridge NTCF, LLC

DocuSigned by:
By: Tim Tuck Date: 9/30/2021
6DCD673D644D4BD...
Name: Tim Tuck
Title: Vice President - Lease Administration

Exhibit H

Recipient Mailings