



April 29, 2022

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

Re: Tower Share Application – Dish Site 13705673
Dish Wireless Telecommunications Facility @ 20 Post Office Lane, Westport, CT 06880

Dear Ms. Bachman,

Dish Wireless (“Dish”) is proposing a wireless telecommunications facility on an existing one hundred forty two (142) foot tall monopole tower at 20 Post Office Lane, Westport, CT 06880 (Latitude: 41.12344444, Longitude: -73.3131) and within the existing fenced compound. The tower is owned and operated by American Tower Corporation. The subject property is owned by Sherwood Jay.

Dish proposes to install a five (5) foot by seven (7) foot metal platform within the existing fenced compound and install three (3) antennas, a single antenna mount, six (6) RRUs, and cables on the existing tower at fifty three (53) feet as more particularly detailed on the enclosed Construction Drawings. The overall height of the existing tower will remain at 142-feet and no changes will be made to the compound dimensions.

The existing tower was approved by the Council in Petition Number 394 on August 25, 1998.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of Dish's intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A §16-50j-73, a copy of this letter is being sent to the following individuals: American Tower Corporation as Tower Operator/Owner; Sherwood Jay as Property Owner; the Honorable Jennifer Tooker, First Selectwoman of Westport, and Mary Young, Director of Planning & Zoning for Westport.

The applicant's proposal falls squarely within those activities explicitly provided for in R.C.S.A. §16-50j-89. Specifically:

1. The proposed modifications will NOT result in an increase in the height of the existing structure.
2. The proposed modifications will NOT require an extension of the site boundary.
3. The proposed modifications will NOT increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.



4. The operation of the modified facility will NOT increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. Please see the RF emissions calculation for DISH's modified facility enclosed herewith.
5. The proposed modifications will NOT cause an ineligible change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading. Please see the structural analysis enclosed herewith.

Connecticut General Statute 16-50aa indicates that the Council must approve the shared use of a telecommunications facility provided it finds the shared use is technically, legally, environmentally, and economically feasible and meets public safety concerns. As demonstrated in this letter, Dish 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's proposed loading (see attached Structural Analysis).
- 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. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit Dish to obtain a building permit for the proposed installation. Further, a Letter of Authorization is attached, authorizing Dish 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 equipment on the monopole tower will have an insignificant visual impact on the area around the tower. Dish ground equipment would be installed within the existing facility compound. The Dish shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by the attached EME study, 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 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 with this tower sharing application.
- E. **Public Safety Concerns.** As discussed above, the tower is structurally capable of supporting the proposed loading. Dish is not aware of any public safety concerns relative to the proposed sharing of the existing tower. Dish's 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 the area.



For the foregoing reasons, Dish respectfully requests that the Council approve this request for the shared use of this tower located at 20 Post Office Lane, Westport, CT 06880.

If you have any questions, please feel free to contact me.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Jack Andrews', is written over a circular blue stamp or seal.

Jack Andrews
Zoning Manager, Centerline Communications
10130 Donleigh Drive
Columbia, MD 21046
443-677-0144

Enclosures: Exhibit 1 – Letter of Authorization from tower owner
Exhibit 2 – Property Card and GIS
Exhibit 3 – Construction Drawings
Exhibit 4 – Structural Analysis Report
Exhibit 5 – Antenna Mount Analysis Report
Exhibit 6 – EME Study Report
Exhibit 7 – (4) Notice Confirmations

cc: American Tower Corporation - Tower Operator/Owner
Sherwood Jay - Property Owner
The Honorable Jennifer Tooker - First Selectwoman of Westport
Mary Young – Westport Director of Planning & Zoning



LETTER OF AUTHORIZATION

SITE NO: See Site List Below

SITE NAME: See Site List Below

ADDRESS: See Site List Below

I, Margaret Robinson, Senior Counsel, US Tower Division on behalf of American Tower*, owner and/or operator of the tower facilities located at the addresses identified below (the "Tower Facilities"), do hereby authorize Centerline Communications, LLC ("Centerline"), its agents, successors and assigns, to act as American Tower's non-exclusive agent for the purpose of filing and securing any zoning, land-use, building permit and/or electrical permit application(s) and approvals of the applicable jurisdiction for and to conduct the construction of the installation of antennas and related telecommunications equipment owned and operated by AT&T on the Tower Facilities located at the addresses identified below. This installation shall not affect adjoining lands and will occur only within the areas leased or owned by American Tower.

American Tower understands that the applications may be denied, modified or approved with conditions. The above authorization is limited to the acceptance by American Tower of conditions related to American Tower's installations. Any such conditions of approval or modifications will not be effective unless approved in writing by American Tower.

The above authorization does not permit Centerline to modify or alter any existing permit(s) and/or zoning or land-use conditions or impose any additional conditions unrelated to American Tower's installations of telecommunications equipment without the prior written approval of American Tower.

Site Authorized:

ATC Project #	ATC Asset #	Address
13682691	302483	286 Beckley Road, Berlin, CT 06037
13682687	302469	1069 Connecticut Ave. Bridgeport, CT 06607
13682699	383598	1000 Truumball Ave. Bridgeport, CT 06606
13682693	302468	99 Meadow St. Harftford, CT 06114
13682696	370627	605 Willard Ave. Newington, CT 06111
13682689	370629	125 Washington Ave. North Haven, CT 06473
13683386	283418	50 Devine St. North Haven, CT 06473
13683396	88018	168 Catoona Lane, Stamford, CT 06902
13682841	243036	668 Jones Hill Rd. West Haven, CT 06516
13958523	283422	171 Short Beach Rd. Brandford, CT 06405
13958547	302516	438 Bridgeport Ave. Milford, CT 06460
13683394	302479	699 West St. Rocky Hill, CT 06067
13958510	302511	20 Post Office Lane. Westport, CT 06880



AMERICAN TOWER®
CORPORATION

Signature: _____

Margaret Robinson, Senior Counsel
US Tower Division

NOTARY BLOCK

COMMONWEALTH OF MASSACHUSETTS
County of Middlesex

This instrument was acknowledged before me by Margaret Robinson, Senior Counsel of American Tower (owner and/or operator of the above referenced Tower Facilities), personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that he/she executed the same.

WITNESS my hand and official seal, this 22nd day of April, 2022.

NOTARY SEAL



GERARD T. HEFFRON
Notary Public
Commonwealth of Massachusetts
My Commission Expires
August 9, 2024

Notary Public
My Commission Expires: August 9th, 2024

* American Tower as used herein is defined as American Tower Corporation and any of its affiliates or subsidiaries.

MAPLE LN

Location MAPLE LN

Mblu H06 / / 017/000 /

Acct# 11910

Owner SHERWOOD JAY

Assessment \$1,034,130

Appraisal \$1,477,400

PID 7785

Building Count 1

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2020	\$1,164,400	\$313,000	\$1,477,400

Assessment			
Valuation Year	Improvements	Land	Total
2020	\$815,030	\$219,100	\$1,034,130

Owner of Record

Owner SHERWOOD JAY
Co-Owner
Address P O BOX 48
 WESTPORT, CT 06881

Sale Price \$0
Certificate 1
Book & Page 0469/0137
Sale Date 12/08/1977
Instrument 29

Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
SHERWOOD JAY	\$0	1	0469/0137	29	12/08/1977

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost: \$0
Building Percent Good:
Replacement Cost
Less Depreciation: \$0

Building Attributes

Field	Description
Style:	Outbuildings
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Kitchens	
Whirlpool Tubs	
Hot Tubs	
Sauna (SF Area)	
Fin Basement	
Fin Bsmt Qual	
Bsmt. Garages	
Interior Cond	
Fireplaces	
Ceiling Height	
Elevator	
Sprinklers	
Acc Apts	
Fndtn Cndtn	
Basement	

Building Photo

(<https://images.vgsi.com/photos2/WestportCTPhotos/\00\01\56\27.jpg>)

Building Layout

 Building Layout (ParcelSketch.ashx?pid=7785&bid=7785)

Building Sub-Areas (sq ft)	<u>Legend</u>
No Data for Building Sub-Areas	

Extra Features

Extra Features	<u>Legend</u>
No Data for Extra Features	

Land

Land Use		Land Line Valuation	
Use Code	435	Size (Acres)	2.07
Description	Cell Site Vac Lnd	Frontage	0
Zone	AAA	Depth	0
Neighborhood	140	Assessed Value	\$219,100
Alt Land Appr	No	Appraised Value	\$313,000
Category			

Outbuildings

Outbuildings						<u>Legend</u>
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
CELL	Cell on TWR	TW		5.00 Sites	\$1,253,900	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2021	\$1,164,400	\$313,000	\$1,477,400
2020	\$1,164,400	\$313,000	\$1,477,400
2019	\$1,253,969	\$59,360	\$1,313,329

Assessment			
Valuation Year	Improvements	Land	Total
2021	\$815,030	\$219,100	\$1,034,130
2020	\$815,030	\$219,100	\$1,034,130
2019	\$877,730	\$41,600	\$919,330



13705673

Westport, CT

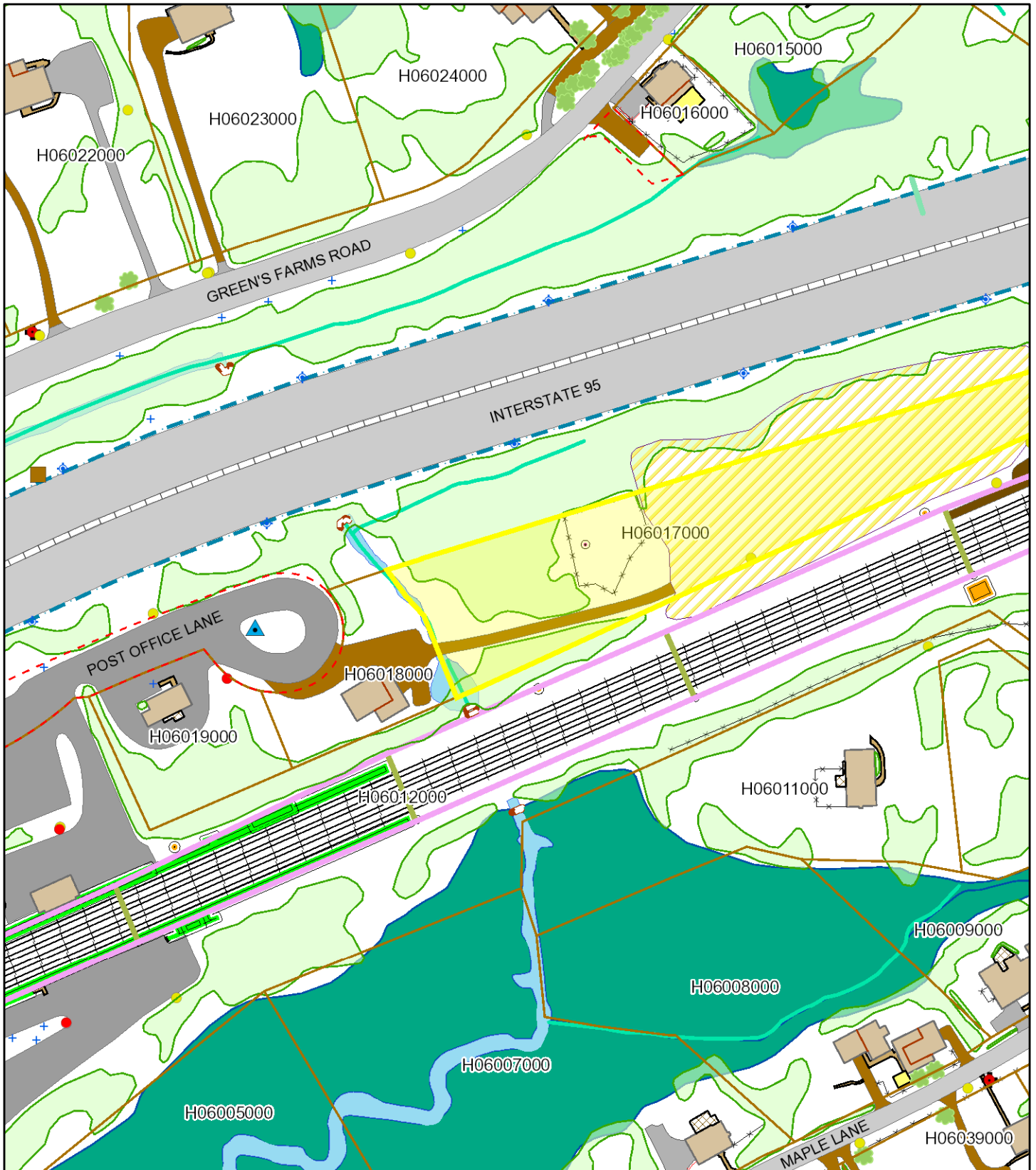
1 inch = 141 Feet



April 29, 2022



www.cai-tech.com



Data shown on this map is provided for planning and informational purposes only. The municipality and CAI Technologies are not responsible for any use for other purposes or misuse or misrepresentation of this map.

Petition No. 394
Springwich Cellular Limited Partnership
Staff Report
July 9, 1998

On Monday, June 22, 1998, Connecticut Siting Council (Council) members Edward S. Wilensky and Brian Emerick, and Council staff Joel M. Rinebold, Robert K. Erling, and Paul M. Aresta met Springwich Cellular Limited Partnership's (SCLP) representative Peter W. van Wilgen, for a site inspection for the proposed replacement of an existing telecommunications tower and expansion of the site boundaries to accommodate tower sharing, located on Post Office Lane, in Westport, Connecticut. SCLP is petitioning the Council for a declaratory ruling that the proposed project would have no substantial adverse environmental effect.

SCLP proposes to replace an existing 130-foot monopole structure with a new 130-foot monopole structure and increase the site boundaries to accommodate tower sharing by SCLP, Bell Atlantic Mobile (BAM), Sprint Spectrum L.P. (Sprint), Nextel Communications (Nextel), and Omnipoint Communications, Inc. (Omnipoint). The existing tower, which was approved by the Council in Docket 166 on August 29, 1995, measures approximately 36 inches at the base and 15 inches at the top. The existing tower is not capable of supporting the additional carriers' antennas requiring the construction of a new tower of stronger design, measuring approximately six feet at the base and 3 feet at the top. The replacement tower is proposed to be located approximately 20 feet south of the existing tower, and would support the antennas for SCLP at the 130-foot level; Sprint at the 120-foot level, Nextel at the 110-foot level; BAM at the 100-foot level. In addition, Omnipoint would either place a low-profile 16-inch diameter antenna array on a mounting post at the top of the replacement tower resulting in an overall height of approximately 143 feet including appurtenances, or mount their antennas on a platform at the 90 foot level. The site currently consists of an existing 130-foot tower, a 12-foot by 26-foot equipment building, and an 8-foot high chain-link fence on a 2,400 square foot parcel. BAM would install a 12-foot by 30-foot equipment building with a generator to be shared with SCLP; Nextel would install a 10-foot by 20-foot equipment building; and Sprint and Omnipoint would each install a 10-foot by 12-foot concrete pad for their equipment cabinets. The existing 8-foot high chain-link fence would be extended around all of the equipment structures. The existing access road would be utilized by all of the carriers.

The height of the tower will remain unchanged. The noise levels at the existing facility would not increase by six decibels, under normal operating conditions. The operation of all the carriers' proposed antennas would not exceed the maximum permissible exposure limit for the worst case radio frequency power density at the base of the structure. The calculated cumulative worst case power density would not exceed 30.52 percent of the applicable standard. There are no wetlands on the proposed site and no clearing would be required. SCLP contends that the incremental visual impact from placing additional antennas on one tower is preferable to the construction of multiple towers.

SCLP contends that the proposed replacement of an existing 130-foot tower and expansion of the site boundaries to accommodate tower sharing does not cause a significant change or alteration in the physical and environmental characteristics of the site, and would not cause a substantial adverse environmental effect.

Ss

PETITION NO. 394 - Springwich Cellular Limited Partnership (Springwich) Petition for a Declaratory Ruling that no amendment to the Certificate of Environmental Compatibility and Public Need is required to replace the existing tower and expand the site boundaries to accommodate tower sharing at an existing telecommunications facility located at 20 Post Office Lane in Westport, Connecticut. }

}

}

} Connecticut

Siting

Council

August 25, 1998

Decision & Order

Pursuant to the foregoing Findings of Fact and Opinion, and in accordance with the provisions of Regulations of Connecticut State Agencies §§ 16-50j-38 through 16-50j-39, the proposed modifications to an existing telecommunications facility located at 20 Post Office Lane in Westport, Connecticut will not have a substantial adverse environmental effect; therefore, an amendment to the Certificate of Environmental Compatibility and Public Need issued in Docket 166 on August 29, 1995, is not required.

The modifications shall be implemented substantially as specified in the Council's record in this matter and subject to the following conditions:

1. Springwich Cellular Limited Partnership (SCLP) shall provide the Council a recalculated report of electromagnetic radio frequency power density when circumstances in operation cause a change in power density above the levels originally calculated and provided in the petition.
2. If the facility does not provide, or permanently ceases to provide the proposed telecommunications services following completion of construction, this Decision and Order shall be void, and the petitioner shall dismantle and remove the tower, antennas, and all associated equipment within 60

days after such equipment ceases to provide the proposed telecommunications services or reapply to the Council for any proposed new use.

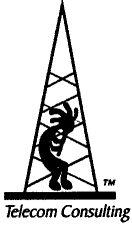
3. SCLP shall provide advance notice two days prior to the commencement of construction. SCLP shall notify the Council upon completion of construction and commencement of operations.

4. No fill material or structures shall be placed in the area adjacent to the facility compound designated as a 100-year flood zone.

5. Low profile platforms, similar in design and appearance, shall be used and painted blue to match the color of the replacement tower.

6. The antenna canister for Omnipoint Communications may not be located above the top of the replacement tower.

7. All other applicable orders issued in the Council's Decision and Order for Docket 166 remain in effect.



PINNACLE TELECOM GROUP

Professional and Technical Services

ANTENNA SITE FCC RF COMPLIANCE ASSESSMENT AND REPORT FOR MUNICIPAL SUBMISSION



PREPARED FOR:

Dish Wireless, LLC

SITE ID:

NJER01139B

SITE ADDRESS:

20 POST OFFICE LANE
WESTPORT, CT

LATITUDE:

N 41.12344444

LONGITUDE:

W 73.31310000

STRUCTURE TYPE:

Monopole

REPORT DATE:

MARCH 12, 2022

COMPLIANCE CONCLUSION:

Dish Wireless, LLC will be in compliance with the rules and regulations as described in OET Bulletin 65, following the implementation of the proposed mitigation as detailed in the report.

14 RIDGEDALE AVENUE - SUITE 260 • CEDAR KNOLLS, NJ 07927 • 973-451-1630

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CERTIFICATION

APPENDIX A. DOCUMENTS USED TO PREPARE THE ANALYSIS

APPENDIX B. BACKGROUND ON THE FCC MPE LIMIT

APPENDIX C. PROPOSED SIGNAGE

APPENDIX D. SUMMARY OF EXPERT QUALIFICATIONS

INTRODUCTION AND SUMMARY

At the request of Dish Wireless, LLC (“Dish”), Pinnacle Telecom Group has performed an independent expert assessment of radiofrequency (RF) levels and related FCC compliance for proposed wireless base station antenna operations on an existing monopole located at 20 Post Office Lane in Westport, CT. Dish refers to the antenna site by the code “NJJER01139B”, and its proposed operation involves directional panel antennas and transmission in the 600 MHz, 2000 MHz and 2100 MHz frequency bands licensed to it by the FCC.

The FCC requires all wireless antenna operators to perform an assessment of potential human exposure to radiofrequency (RF) fields emanating from all the transmitting antennas at a site whenever antenna operations are added or modified, and to ensure compliance with the Maximum Permissible Exposure (MPE) limit in the FCC’s regulations. In this case, the compliance assessment needs to take into account the RF effects of other existing antenna operations at the site by AT&T, Clearwire, Sprint, T-Mobile and Verizon Wireless. Note that FCC regulations require any future antenna collocators to assess and assure continuing compliance based on the cumulative effects of all then-proposed and then-existing antennas at the site.

This report describes a mathematical analysis of RF levels resulting around the site in areas of unrestricted public access, that is, at street level around the site. The compliance analysis employs a standard FCC formula for calculating the effects of the antennas in a very conservative manner, in order to overstate the RF levels and to ensure “safe-side” conclusions regarding compliance with the FCC limit for safe continuous exposure of the general public.

The results of a compliance assessment can be described in layman’s terms by expressing the calculated RF levels as simple percentages of the FCC MPE limit. If the normalized reference for that limit is 100 percent, then calculated RF levels higher than 100 percent indicate the MPE limit is exceeded and there is a need to mitigate the potential exposure. On the other hand, calculated RF levels consistently below 100 percent serve as a clear and sufficient demonstration of

compliance with the MPE limit. We can (and will) also describe the overall worst-case result via the “plain-English” equivalent “times-below-the-limit” factor.

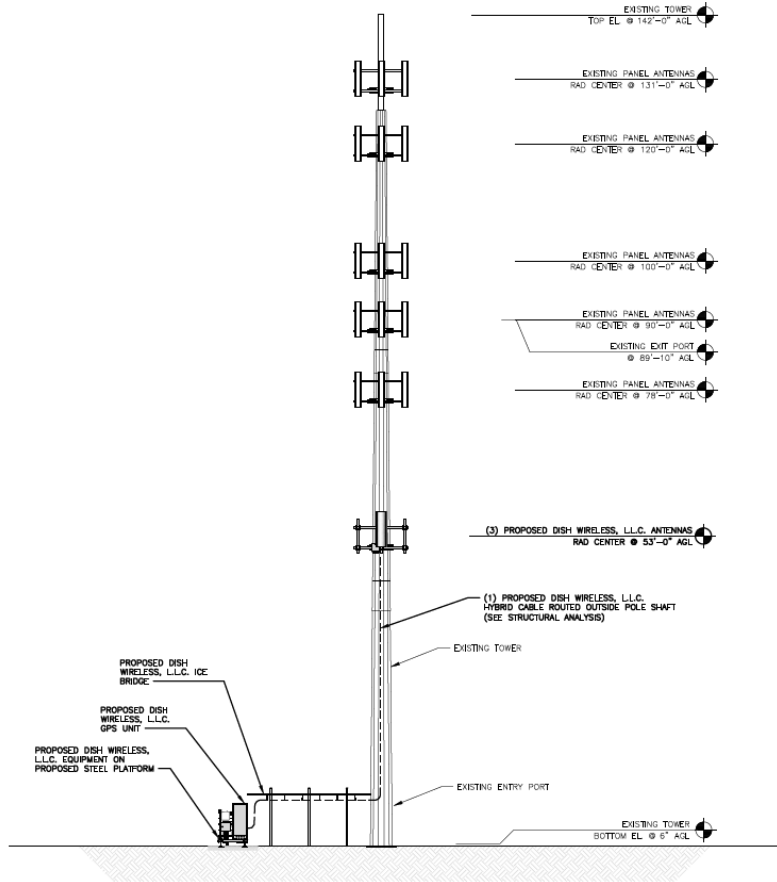
The result of the RF compliance assessment in this case is as follows:

- ❑ At street level, the conservatively calculated maximum RF level from the combination of proposed and existing antenna operations at the site is 10.4365 percent of the FCC general population MPE limit – well below the 100-percent reference for compliance. In other words, the worst-case calculated RF level – intentionally and significantly overstated by the calculations – is still more than nine times below the FCC limit for safe, continuous exposure of the general public.
- ❑ A supplemental analysis of the RF levels at the same height as the Dish antennas indicate that the FCC MPE limit is potentially exceeded. Therefore, it is recommended that two Caution signs be installed six feet below the antennas. In addition, NOC Information signs are to be installed at the base of the monopole.
- ❑ The results of the calculations, along with the proposed mitigation, combine to satisfy the FCC requirements and associated guidelines on RF compliance at street level around the site and on the subject roof. Moreover, because of the significant conservatism incorporated in the analysis, RF levels actually caused by the antennas will be lower than these calculations indicate.

The remainder of this report provides the following:

- ❑ relevant technical data on the proposed Dish antenna operations at the site, as well as on the other existing antenna operations;
- ❑ a description of the applicable FCC mathematical model for calculating RF levels, and application of the relevant technical data to that model;
- ❑ analysis of the results of the calculations against the FCC MPE limit, and the compliance conclusion for the site.

Elevation View:



The table that follows summarizes the relevant data for the proposed Dish antenna operations. Note that the "Z" height references the centerline of the antenna.

Ant. ID	Carrier	Antenna Manufacturer	Antenna Model	Type	Freq (MHz)	Ant. Dim. (ft.)	Total Input Power (watts)	Total ERP (watts)	Z AGL (ft)	Ant. Gain (dBd)	B/W	Azimuth	EDT	MDT
1	Dish	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	53	12.46	64	65	2	0
1	Dish	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	53	16.66	67	65	2	0
1	Dish	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	53	16.66	67	65	2	0
2	Dish	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	53	12.46	64	225	2	0
2	Dish	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	53	16.66	67	225	2	0
2	Dish	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	53	16.66	67	225	2	0
3	Dish	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	53	12.46	64	325	2	0
3	Dish	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	53	16.66	67	325	2	0
3	Dish	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	53	16.66	67	325	2	0

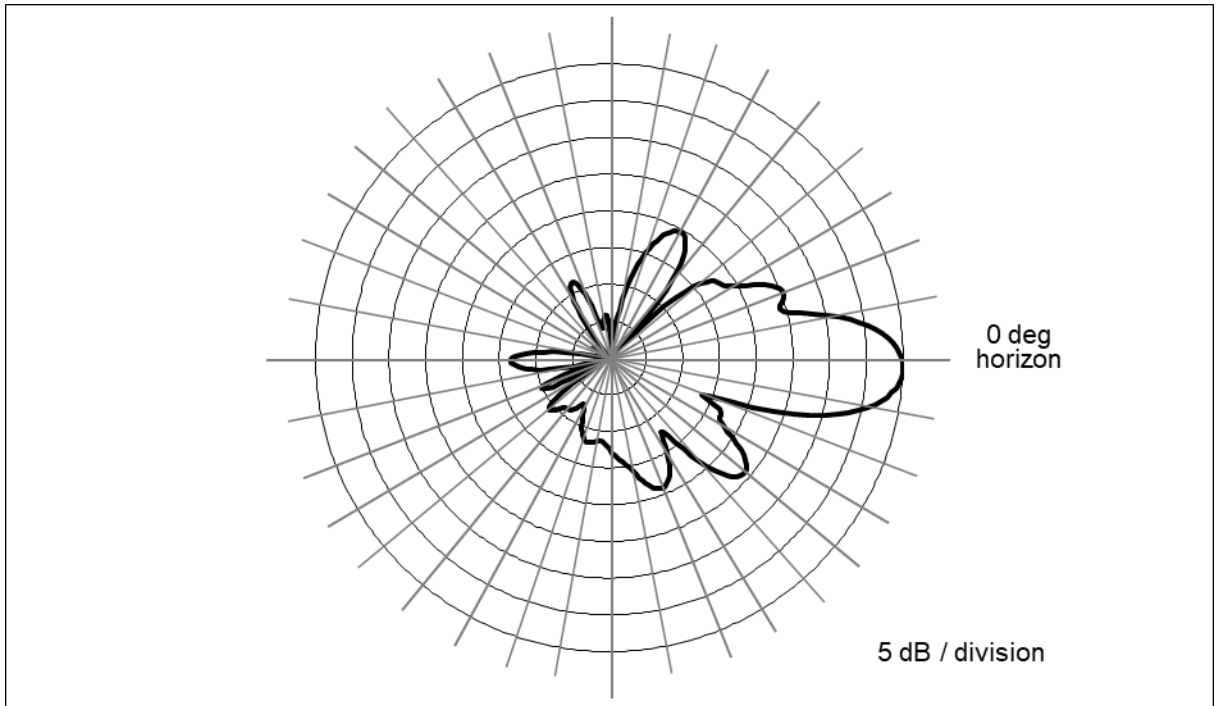
The area below the antennas, at street level, is of interest in terms of potential “uncontrolled” exposure of the general public, so the antenna’s vertical-plane emission characteristic is used in the calculations, as it is a key determinant of the relative amount of RF emissions in the “downward” direction.

By way of illustration, Figure 1 that follows shows the vertical-plane radiation pattern of the proposed antenna model in the 600 MHz frequency band. In this type of antenna radiation pattern diagram, the antenna is effectively pointed at the three o’clock position (the horizon) and the relative strength of the pattern at different angles is described using decibel units.

Note that the use of a decibel scale to describe the relative pattern at different angles actually serves to significantly understate the actual focusing effects of the antenna. Where the antenna pattern reads 20 dB the relative RF energy emitted at the corresponding downward angle is 1/100th of the maximum that occurs in the main beam (at 0 degrees); at 30 dB, the energy is only 1/1000th of the maximum.

Finally, note that the automatic pattern-scaling feature of our internal software may skew side-by-side visual comparisons of different antenna models, or even different parties’ depictions of the same antenna model.

Figure 1. Commscope FFVV-65B-R2 – 600 MHz Vertical-plane Pattern



As noted at the outset, there are other existing wireless antenna operations to include in the compliance assessment. For each of the wireless operators, we will conservatively assume operation with maximum channel capacity and at maximum transmitter power per channel to be used by each wireless operator in each of their respective FCC-licensed frequency bands.

The table that follows summarizes the relevant data for the collocated antenna operations.

<i>Carrier</i>	<i>Antenna Manufacturer</i>	<i>Antenna Model</i>	<i>Type</i>	<i>Freq (MHz)</i>	<i>Total ERP (watts)</i>	<i>Ant. Gain (dBd)</i>	<i>Azimuth</i>
AT&T	Generic	Generic	Panel	700	4945	11.26	N/A
AT&T	Generic	Generic	Panel	850	2400	11.76	N/A
AT&T	Generic	Generic	Panel	1900	5756	15.56	N/A
AT&T	Generic	Generic	Panel	2100	5890	15.66	N/A
AT&T	Generic	Generic	Panel	2300	4131	16.16	N/A
Clearwire	Generic	Generic	Panel	2500	2972	15.70	N/A
Clearwire	Generic	Generic	Dish	11000	70	32.40	N/A
Sprint	Generic	Generic	Panel	800	2168	13.36	N/A
Sprint	Generic	Generic	Panel	1900	6168	15.86	N/A
Sprint	Generic	Generic	Panel	2500	4669	15.90	N/A
T-Mobile	Generic	Generic	Panel	600	3163	12.96	N/A
T-Mobile	Generic	Generic	Panel	700	867	13.36	N/A
T-Mobile	Generic	Generic	Panel	1900	4123	15.36	N/A
T-Mobile	Generic	Generic	Panel	1900	1452	15.60	N/A
T-Mobile	Generic	Generic	Panel	2100	4626	15.86	N/A
T-Mobile	Generic	Generic	Panel	1900	1419	15.50	N/A
T-Mobile	Generic	Generic	Panel	2500	12804	22.35	N/A
Verizon Wireless	Generic	Generic	Panel	746	2400	11.76	N/A
Verizon Wireless	Generic	Generic	Panel	869	5166	12.36	N/A
Verizon Wireless	Generic	Generic	Panel	1900	5372	15.26	N/A
Verizon Wireless	Generic	Generic	Panel	2100	5625	15.46	N/A

Compliance Analysis

FCC Office of Engineering and Technology Bulletin 65 (“OET Bulletin 65”) provides guidelines for mathematical models to calculate the RF levels at various points around transmitting antennas. Different models apply in different areas around antennas, with one model applying to street level around a site, and another applying to the rooftop near the antennas. We will address each area of interest in turn in the subsections that follow.

Street Level Analysis

At street-level around an antenna site (in what is called the “far field” of the antennas), the RF levels are directly proportional to the total antenna input power and the relative antenna gain in the downward direction of interest – and the levels are otherwise inversely proportional to the square of the straight-line distance to the antenna.

Conservative calculations also assume the potential RF exposure is enhanced by reflection of the RF energy from the intervening ground. Our calculations will assume a 100% “perfect”, mirror-like reflection, which is the absolute worst-case scenario.

The formula for street-level compliance assessment for any given wireless antenna operation is as follows:

$$\text{MPE\%} = (100 * \text{Chans} * \text{TxPower} * 10^{(\text{Gmax}-\text{Vdisc}/10)} * 4) / (\text{MPE} * 4\pi * \text{R}^2)$$

where

MPE%	=	RF level, expressed as a percentage of the MPE limit applicable to continuous exposure of the general public
100	=	factor to convert the raw result to a percentage
Chans	=	maximum number of RF channels per sector
TxPower	=	maximum transmitter power per channel, in milliwatts

- 10 ^(G_{max}-V_{disc}/10) = numeric equivalent of the relative antenna gain in the downward direction of interest; data on the antenna vertical-plane pattern is taken from manufacturer specifications
- 4 = factor to account for a 100-percent-efficient energy reflection from the ground, and the squared relationship between RF field strength and power density ($2^2 = 4$)
- MPE = FCC general population MPE limit
- R = straight-line distance from the RF source to the point of interest, centimeters

The MPE% calculations are performed out to a distance of 500 feet from the facility to points 6.5 feet (approximately two meters, the FCC-recommended standing height) off the ground, as illustrated in Figure 2, below.

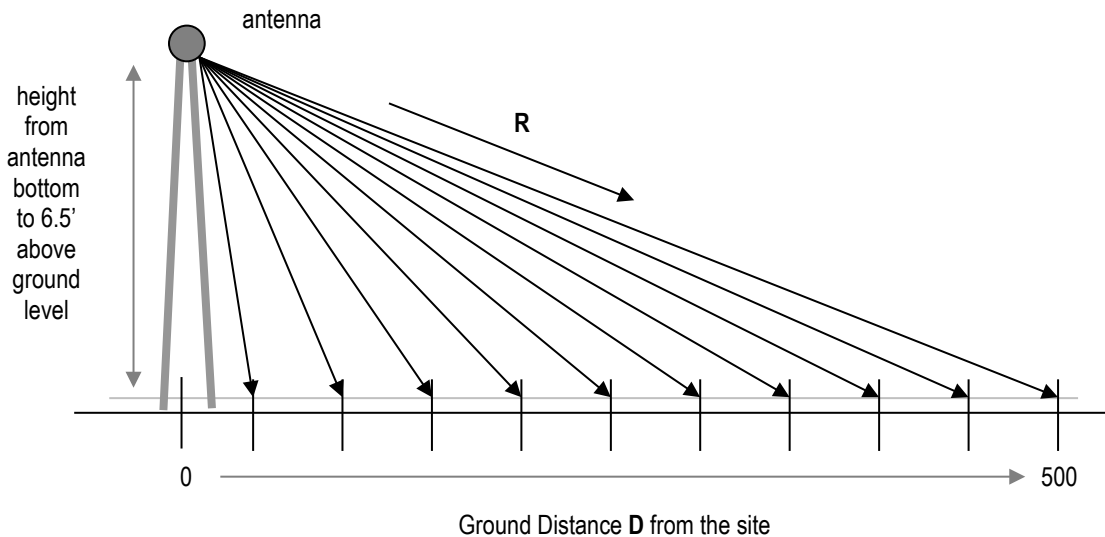


Figure 2. Street-level MPE% Calculation Geometry

It is popularly understood that the farther away one is from an antenna, the lower the RF level – which is generally but not universally correct. The results of MPE% calculations fairly close to the site will reflect the variations in the vertical-plane antenna pattern as well as the variation in straight-line distance to the antenna.

Therefore, RF levels may actually increase slightly with increasing distance within the range of zero to 500 feet from the site. As the distance approaches 500 feet and beyond, though, the antenna pattern factor becomes less significant, the RF levels become primarily distance-controlled and, as a result, the RF levels generally decrease with increasing distance. In any case, the RF levels more than 500 feet from a wireless antenna site are well understood to be sufficiently low to be comfortably in compliance.

According to the FCC, when directional antennas (such as panels) are used, compliance assessments are based on the RF effect of a single (facing) antenna sector, as the effects of directional antennas pointed away from the point(s) of interest are considered insignificant. If the different parameters apply in the different sectors, compliance is based on the worst-case parameters.

Street level FCC compliance for a collocated antenna site is assessed in the following manner. At each distance point along the ground, an MPE% calculation is made for each antenna operation (including each frequency band), and the sum of the individual MPE% contributions at each point is compared to 100 percent, the normalized reference for compliance with the MPE limit. We refer to the sum of the individual MPE% contributions as “total MPE%”, and any calculated total MPE% result exceeding 100 percent is, by definition, higher than the FCC limit and represents non-compliance and a need to mitigate the potential exposure. If all results are consistently below 100 percent, on the other hand, that set of results serves as a clear and sufficient demonstration of compliance with the MPE limit.

Note that the following conservative methodology and assumptions are incorporated into the MPE% calculations on a general basis:

1. The antennas are assumed to be operating continuously at maximum power and maximum channel capacity.
2. The power-attenuation effects of shadowing or other obstructions to the line-of-sight path from the antenna to the point of interest are ignored.
3. The calculations intentionally minimize the distance factor (R) by assuming a 6'6" human and performing the calculations from the bottom (rather than

- the centerline) of each operator’s lowest-mounted antenna, as applicable.
4. The calculations also conservatively take into account, when applicable, the different technical characteristics and related RF effects of the use of multiple antennas for transmission in the same frequency band.
 5. The RF exposure at ground level is assumed to be 100-percent enhanced (increased) via a “perfect” field reflection from the intervening ground.

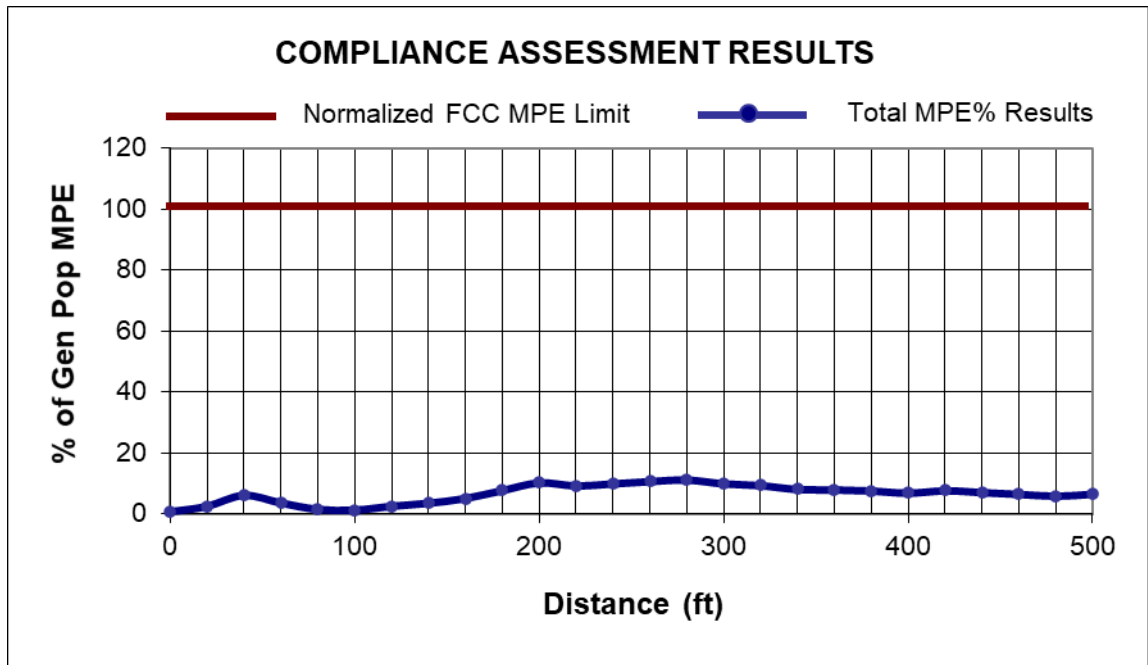
The net result of these assumptions is to intentionally and significantly overstate the calculated RF levels relative to the levels that will actually result from the antenna operations – and the purpose of this conservatism is to allow very “safe-side” conclusions about compliance.

The table that follows provides the results of the MPE% calculations for each antenna operation, with the overall worst-case calculated result highlighted in bold in the last column. Note that the transmission parameters for each Dish antenna sector are identical, and the calculations reflect the worst-case result for any/all sectors.

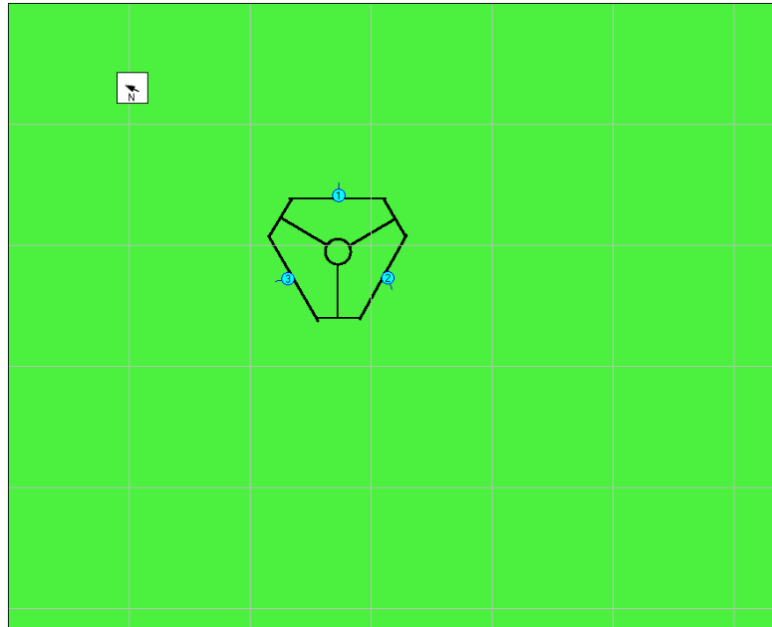
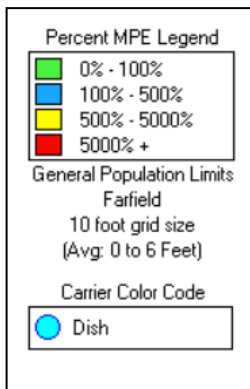
Ground Distance (ft)	Dish 600 MHz MPE%	Dish 2000 MHz MPE%	Dish 2100 MHz MPE%	AT&T MPE%	Clearwire MPE%	Sprint MPE%	T-Mobile MPE%	Verizon Wireless MPE%	Total MPE%
0	0.2573	0.0122	0.0019	0.0790	0.0004	0.0322	0.6081	0.0405	1.0316
20	0.9039	0.3369	0.0675	0.0919	0.0031	0.0117	0.9238	0.0688	2.4076
40	1.0007	1.1238	2.1761	0.1864	0.0006	0.0132	2.0339	0.2285	6.7632
60	0.7738	0.0982	0.5650	0.2891	0.0017	0.0513	1.2115	0.2967	3.2873
80	0.1717	0.2010	0.1082	0.4089	0.0085	0.0540	0.8866	0.2190	2.0579
100	0.0665	0.0801	0.4164	0.4036	0.0002	0.0707	1.4286	0.5246	2.9907
120	0.2002	0.5765	0.6543	0.4758	0.0102	0.0748	2.4557	0.4581	4.9056
140	0.5384	0.0958	0.4097	0.7702	0.0039	0.1417	4.0031	0.6606	6.6234
160	1.0769	0.0233	0.0541	0.7770	0.0075	0.1900	5.0198	0.8879	8.0365
180	1.7588	0.0359	0.0110	0.7771	0.0150	0.0979	4.7094	0.6792	8.0843
200	1.9243	0.1249	0.0480	0.9619	0.0019	0.0480	4.7269	0.4256	8.2615
220	2.0649	0.2620	0.1536	0.9808	0.0066	0.0556	6.5932	0.1905	10.3072
240	2.1724	0.3299	0.2644	0.7424	0.0168	0.0791	6.7801	0.0514	10.4365
260	2.2463	0.2437	0.2660	0.5688	0.0131	0.0815	6.2292	0.0507	9.6993
280	2.2789	0.0761	0.1406	0.3547	0.0068	0.1008	5.7240	0.0897	8.7716
300	1.9912	0.0665	0.1229	0.3032	0.0004	0.0997	5.3409	0.3168	8.2416
320	2.0006	0.0421	0.0480	0.2630	0.0020	0.0841	5.0675	0.4769	7.9842
340	1.7758	0.0374	0.0426	0.2893	0.0046	0.0547	4.8302	0.4261	7.4607
360	1.7640	0.2883	0.2032	0.2959	0.0063	0.0258	4.6207	0.5933	7.7975
380	1.5856	0.2592	0.1826	0.2928	0.0060	0.0174	4.2639	0.7879	7.3954
400	1.4328	0.2342	0.1650	0.3718	0.0044	0.0336	3.9813	0.9882	7.2113
420	1.4102	0.6881	0.5632	0.3399	0.0040	0.0616	3.6959	0.9004	7.6633
440	1.2861	0.6276	0.5136	0.5018	0.0031	0.0564	3.4529	1.1011	7.5426
460	1.1777	0.5746	0.4703	0.7218	0.0044	0.0767	3.3338	1.0110	7.3703
480	1.0823	0.5281	0.4323	0.6665	0.0041	0.0934	3.0729	1.1933	7.0729
500	1.0573	0.9673	0.8761	1.0151	0.0075	0.0824	2.8382	1.1028	7.9467

As indicated, the maximum calculated overall RF level is 10.4365 percent of the FCC MPE limit – well below the 100-percent reference for compliance.

A graph of the overall calculation results, shown below, perhaps provides a clearer *visual* illustration of the relative compliance of the calculated RF levels. The line representing the overall calculation results shows an obviously clear, consistent margin to the FCC MPE limit.



The graphic output for the areas at street level surrounding the site is reproduced on the next page.

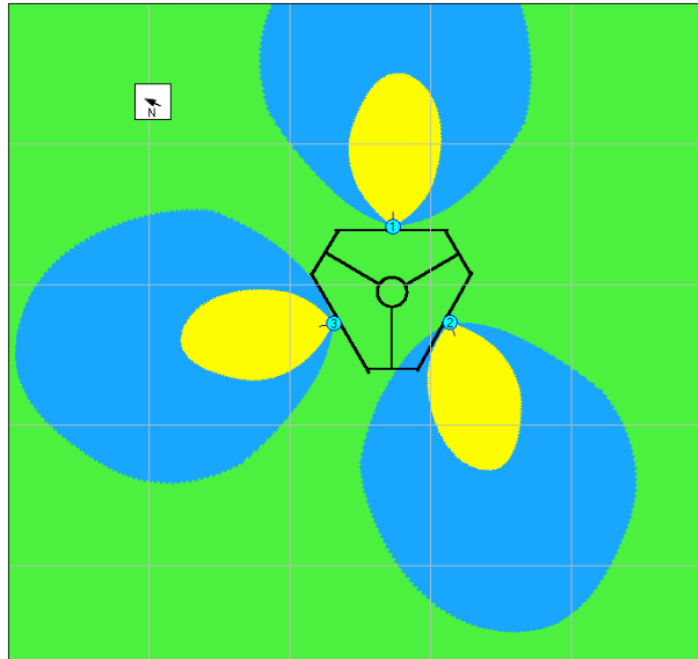
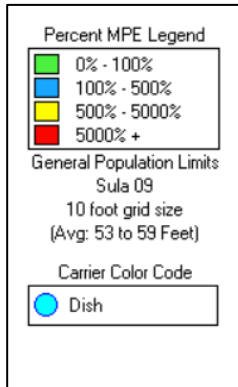


Near-field Analysis

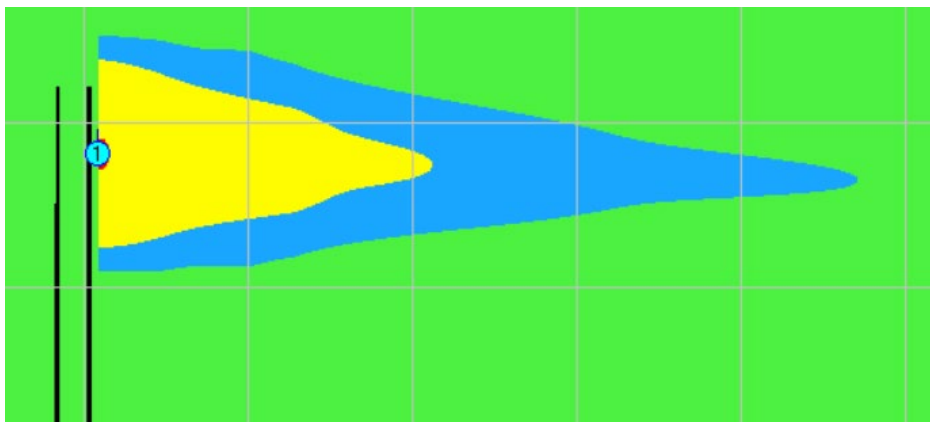
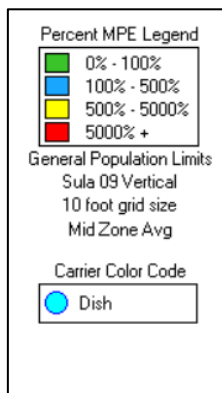
The compliance analysis for the same height as the antennas is performed using the RoofMaster program by Waterford Consultants.

RF levels in the near field of an antenna depend on the power input to the antenna, the antenna's length and horizontal beamwidth, the mounting height of the antenna above nearby roof, and one's position and distance from the antenna. RF levels in front of a directional antenna are higher than they are to the sides or rear, and in any given horizontal direction are inversely proportional to the straight-line distance to the antenna.

The RoofMaster graphic outputs for the same height as the Dish antennas are reproduced on the next page.



**RoofMaster – Same Height as the Antennas –
Alpha / Beta / Gamma sectors**



**RoofMaster – Same Height as the Antennas –
Alpha / Beta / Gamma sectors**

COMPLIANCE CONCLUSION

According to the FCC, the MPE limit has been constructed in such a manner that continuous human exposure to RF fields up to and including 100 percent of the MPE limit is acceptable and safe.

The conservative analysis in this case shows that the maximum calculated RF level from the combination of proposed and existing antenna operations at street level around the site is 10.4365 percent of the FCC general population MPE limit. At the same height as the antennas, the analysis shows that the calculated RF levels potentially exceed the FCC MPE limit. Per Dish guidelines, and consistent with FCC guidance on compliance, it is recommended that two Caution signs be installed six feet below the antennas. In addition, NOC Information signs be installed at the base of the monopole.

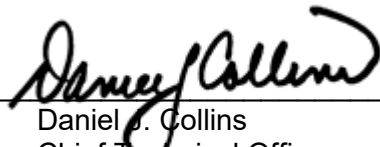
The results of the calculations, along with the described RF mitigation, combine to satisfy the FCC's RF compliance requirements and associated guidelines on compliance.

Moreover, because of the extremely conservative calculation methodology and operational assumptions we applied in the analysis, RF levels actually caused by the antennas will be significantly lower than the calculation results here indicate.

CERTIFICATION

It is the policy of Pinnacle Telecom Group that all FCC RF compliance assessments are reviewed, approved, and signed by the firm's Chief Technical Officer who certifies as follows:

1. I have read and fully understand the FCC regulations concerning RF safety and the control of human exposure to RF fields (47 CFR 1.1301 *et seq*).
2. To the best of my knowledge, the statements and information disclosed in this report are true, complete and accurate.
3. The analysis of site RF compliance provided herein is consistent with the applicable FCC regulations, additional guidelines issued by the FCC, and industry practice.
4. The results of the analysis indicate that the subject antenna operations will be in compliance with the FCC regulations concerning the control of potential human exposure to the RF emissions from antennas.



Daniel J. Collins
Chief Technical Officer
Pinnacle Telecom Group, LLC

3/12/22

Date

Appendix A. DOCUMENTS Used to Prepare the Analysis

RFDS: RFDS-NJJER01139B-Final-20211115-v.0_20211116092316

CD: NJJER01139B_FinalStampedCDs_20211104170503

Appendix B. Background on the FCC MPE Limit

As directed by the Telecommunications Act of 1996, the FCC has established limits for maximum continuous human exposure to RF fields.

The FCC maximum permissible exposure (MPE) limits represent the consensus of federal agencies and independent experts responsible for RF safety matters. Those agencies include the National Council on Radiation Protection and Measurements (NCRP), the Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), the American National Standards Institute (ANSI), the Environmental Protection Agency (EPA), and the Food and Drug Administration (FDA). In formulating its guidelines, the FCC also considered input from the public and technical community – notably the Institute of Electrical and Electronics Engineers (IEEE).

The FCC's RF exposure guidelines are incorporated in Section 1.301 *et seq* of its Rules and Regulations (47 CFR 1.1301-1.1310). Those guidelines specify MPE limits for both occupational and general population exposure.

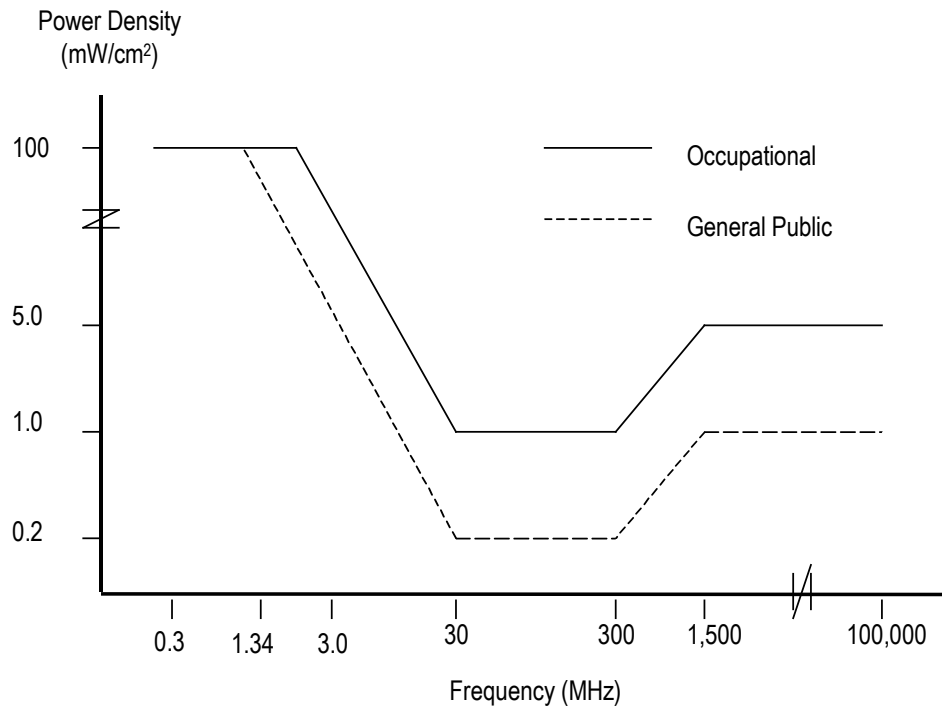
The specified continuous exposure MPE limits are based on known variation of human body susceptibility in different frequency ranges, and a Specific Absorption Rate (SAR) of 4 watts per kilogram, which is universally considered to accurately represent human capacity to dissipate incident RF energy (in the form of heat). The occupational MPE guidelines incorporate a safety factor of 10 or greater with respect to RF levels known to represent a health hazard, and an additional safety factor of five is applied to the MPE limits for general population exposure. Thus, the general population MPE limit has a built-in safety factor of more than 50. The limits were constructed to appropriately protect humans of both sexes and all ages and sizes and under all conditions – and continuous exposure at levels equal to or below the applicable MPE limits is considered to result in no adverse health effects or even health risk.

The reason for *two* tiers of MPE limits is based on an understanding and assumption that members of the general public are unlikely to have had appropriate RF safety training and may not be aware of the exposures they receive; occupational exposure in controlled environments, on the other hand, is assumed to involve individuals who have had such training, are aware of the exposures, and know how to maintain a safe personal work environment.

The FCC's RF exposure limits are expressed in two equivalent forms, using alternative units of field strength (expressed in volts per meter, or V/m), and power density (expressed in milliwatts per square centimeter, or mW/cm²). The table on the next page lists the FCC limits for both occupational and general population exposures, using the mW/cm² reference, for the different radio frequency ranges.

Frequency Range (F) (MHz)	Occupational Exposure (mW/cm ²)	General Public Exposure (mW/cm ²)
0.3 - 1.34	100	100
1.34 - 3.0	100	180 / F ²
3.0 - 30	900 / F ²	180 / F ²
30 - 300	1.0	0.2
300 - 1,500	F / 300	F / 1500
1,500 - 100,000	5.0	1.0

The diagram below provides a graphical illustration of both the FCC's occupational and general population MPE limits.



Because the FCC's RF exposure limits are frequency-shaped, the exact MPE limits applicable to the instant situation depend on the frequency range used by the systems of interest.

The most appropriate method of determining RF compliance is to calculate the RF power density attributable to a particular system and compare that to the MPE limit applicable to the operating frequency in question. The result is usually expressed as a percentage of the MPE limit.

For potential exposure from multiple systems, the respective percentages of the MPE limits are added, and the total percentage compared to 100 (percent of the limit). If the result is less than 100, the total exposure is in compliance; if it is more than 100, exposure mitigation measures are necessary to achieve compliance.

Note that the FCC “categorically excludes” all “non-building-mounted” wireless antenna operations whose mounting heights are more than 10 meters (32.8 feet) from the routine requirement to demonstrate compliance with the MPE limit, because such operations “are deemed, individually and cumulatively, to have no significant effect on the human environment”. The categorical exclusion also applies to *all* point-to-point antenna operations, regardless of the type of structure they’re mounted on. Note that the FCC considers any facility qualifying for the categorical exclusion to be automatically in compliance.

In addition, FCC Rules and Regulations Section 1.1307(b)(3) describes a provision known in the industry as “the 5% rule”. It describes that when a specific location – like a spot on a rooftop – is subject to an overall exposure level exceeding the applicable MPE limit, operators with antennas whose MPE% contributions at the point of interest are less than 5% are exempted from the obligation otherwise shared by all operators to bring the site into compliance, and those antennas are automatically deemed by the FCC to satisfy the rooftop compliance requirement.

FCC References on RF Compliance

47 CFR, FCC Rules and Regulations, Part 1 (Practice and Procedure), Section 1.1310 (Radiofrequency radiation exposure limits).

FCC Second Memorandum Opinion and Order and Notice of Proposed Rulemaking (FCC 97-303), *In the Matter of Procedures for Reviewing Requests for Relief From State and Local Regulations Pursuant to Section 332(c)(7)(B)(v) of the Communications Act of 1934 (WT Docket 97-192), Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation (ET Docket 93-62), and Petition for Rulemaking of the Cellular Telecommunications Industry Association Concerning Amendment of the Commission's Rules to Preempt State and Local Regulation of Commercial Mobile Radio Service Transmitting Facilities*, released August 25, 1997.

FCC First Memorandum Opinion and Order, ET Docket 93-62, *In the Matter of Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation*, released December 24, 1996.

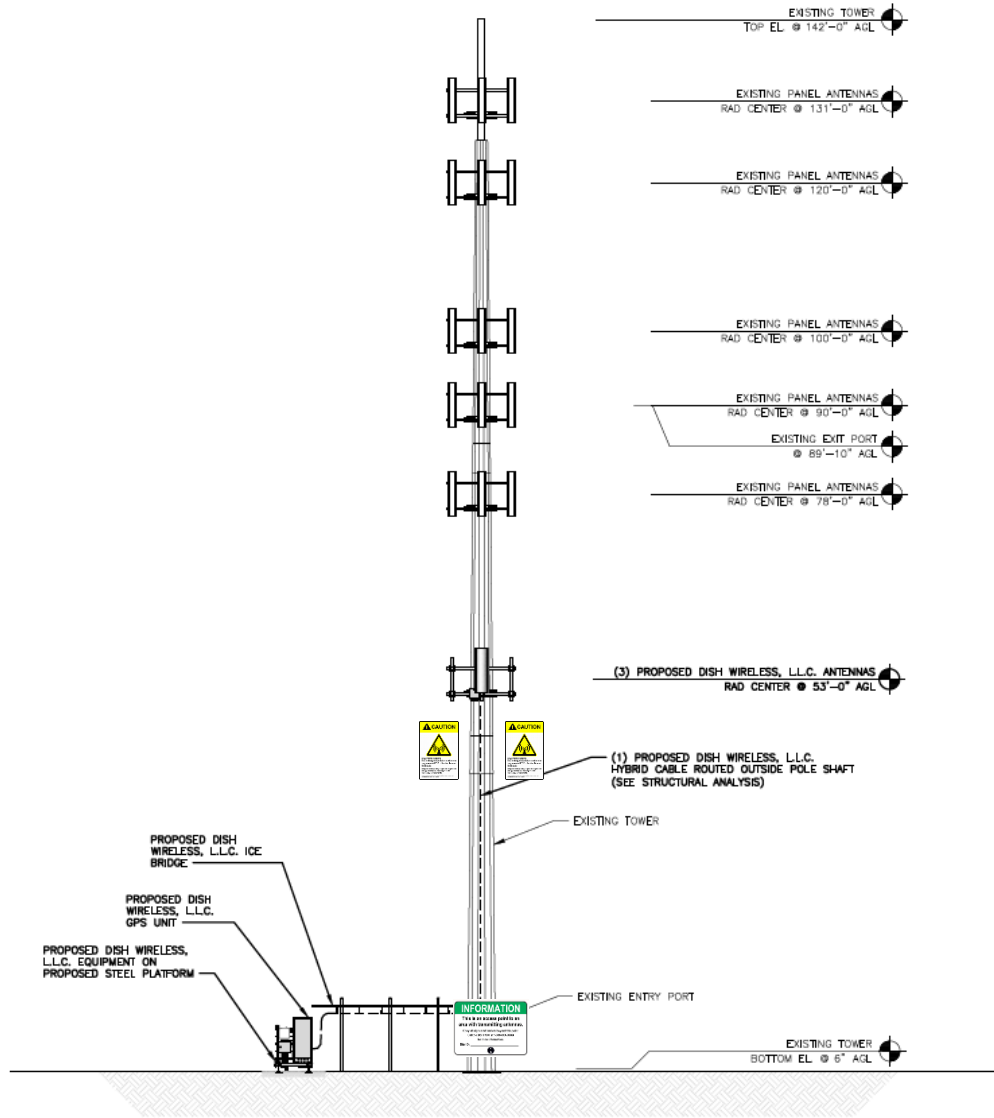
FCC Report and Order, ET Docket 93-62, *In the Matter of Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation*, released August 1, 1996.

FCC Report and Order, Notice of Proposed Rulemaking, Memorandum Opinion and Order (FCC 19-126), *Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields; Reassessment of Federal Communications Commission Radiofrequency Exposure Limits and Policies*, released December 4, 2019.

FCC Office of Engineering and Technology (OET) Bulletin 65, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", Edition 97-01, August 1997.

FCC Office of Engineering and Technology (OET) Bulletin 56, "Questions and Answers About Biological Effects and Potential Hazards of RF Radiation", edition 4, August 1999.

Appendix C. PROPOSED SIGNAGE



NOC Information Sign		Caution Sign	
Guidelines Sign		Warning Sign	
Notice Sign			

APPENDIX D. SUMMARY of EXPERT QUALIFICATIONS

Daniel J. Collins, Chief Technical Officer, Pinnacle Telecom Group, LLC

<p>Synopsis:</p>	<ul style="list-style-type: none"> • 40+ years of experience in all aspects of wireless system engineering, related regulation, and RF exposure • Has performed or led RF exposure compliance assessments on more than 20,000 antenna sites since the latest FCC regulations went into effect in 1997 • Has provided testimony as an RF compliance expert more than 1,500 times since 1997 • Have been accepted as an FCC compliance expert in New York, New Jersey, Connecticut, Pennsylvania and more than 40 other states, as well as by the FCC
<p>Education:</p>	<ul style="list-style-type: none"> • B.E.E., City College of New York (Sch. Of Eng.), 1971 • M.B.A., 1982, Fairleigh Dickinson University, 1982 • Bronx High School of Science, 1966
<p>Current Responsibilities:</p>	<ul style="list-style-type: none"> • Leads all PTG staff work involving RF safety and FCC compliance, microwave and satellite system engineering, and consulting on wireless technology and regulation
<p>Prior Experience:</p>	<ul style="list-style-type: none"> • Edwards & Kelcey, VP – RF Engineering and Chief Information Technology Officer, 1996-99 • Bellcore (a Bell Labs offshoot after AT&T's 1984 divestiture), Executive Director – Regulation and Public Policy, 1983-96 • AT&T (Corp. HQ), Division Manager – RF Engineering, and Director – Radio Spectrum Management, 1977-83 • AT&T Long Lines, Group Supervisor – Microwave Radio System Design, 1972-77
<p>Specific RF Safety / Compliance Experience:</p>	<ul style="list-style-type: none"> • Involved in RF exposure matters since 1972 • Have had lead corporate responsibility for RF safety and compliance at AT&T, Bellcore, Edwards & Kelcey, and PTG • While at AT&T, helped develop the mathematical models for calculating RF exposure levels • Have been relied on for compliance by all major wireless carriers, as well as by the federal government, several state and local governments, equipment manufacturers, system integrators, and other consulting / engineering firms
<p>Other Background:</p>	<ul style="list-style-type: none"> • Author, <i>Microwave System Engineering</i> (AT&T, 1974) • Co-author and executive editor, <i>A Guide to New Technologies and Services</i> (Bellcore, 1993) • National Spectrum Management Association (NSMA) – former three-term President and Chairman of the Board of Directors; was founding member, twice-elected Vice President, long-time member of the Board, and was named an NSMA Fellow in 1991 • Have published more than 35 articles in industry magazines



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This report was prepared for American Tower Corporation by



Antenna Mount Analysis Report

ATC Site Name : WSPT - South
ATC Site Number : 302511
Engineering Number : 13705673_C8_05
Mount Elevation : 53 ft.
Carrier : Dish Wireless
Carrier Site Name : NJJER01139B
Carrier Site Number : NJJER01139B
Site Location : 20 Post Office Lane
Westport, CT 06880-6226
41.1235°, - 73.3131°
County : Fairfield
Date : March 21, 2022
Max Usage : 51%
Result : Pass

Prepared By:
Erik Perez
Project Engineer

Reviewed By:



COA: PEC.0001564 Expires: 02/01/2023



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Calculations Attached



Introduction

The purpose of this report is to summarize results of the antenna mount analysis performed for Dish Wireless at 53 ft.

Supporting Documents

Spec Sheet	Commscope Platform Mounts (Part# MC-PK8-DSH) dated March 17, 2021
Other	NJJER01139B_Flat File
	Structural Analysis Report by Telemon #13958510_C3_03, dated March 16, 2022

Analysis

This antenna mount was analyzed using RISA-3D v19.0.4 analysis software

Basic Wind Speed:	118 mph (3-Second Gust)
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 1" radial ice concurrent
Codes:	ANSI/TIA-222-H/ 2018 Connecticut State Building Code
Exposure Category:	D
Risk Category:	II
Topographic Factor Procedure:	Method 2
Feature:	Flat
Crest Height:	0 ft
Crest Length:	0 ft
Spectral Response:	$S_s = 0.226$, $S_1 = 0.055$
Site Class:	D – Stiff Soil
Live Loads:	$L_m = 500$ lbs, $L_v = 250$ lbs

Conclusion

Based on the analysis results, the antenna mount meets the requirements per the applicable codes listed. The mount can support the equipment as described in this report. Analysis is based on new Commscope (Part# MC-PK8-DSH) Mount.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.



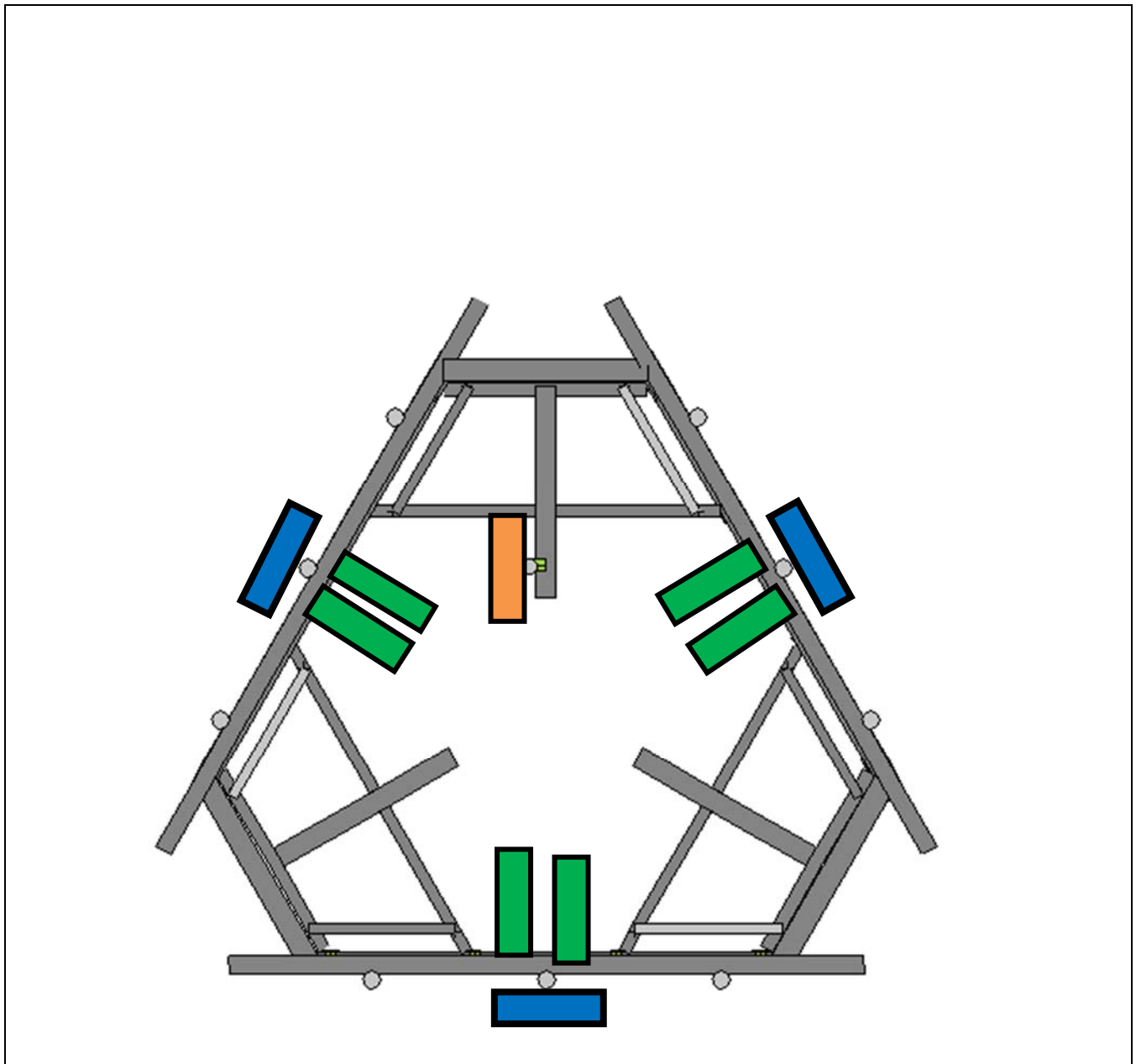
Antenna Loading

Mount Centerline (ft)	Antenna Centerline (ft)	Qty	Antenna Model
53	53	3	JMA Wireless MX08FRO665-21
		3	Fujitsu TA08025-B604
		3	Fujitsu TA08025-B605
		1	Raycap RDIDC-9181-PF-48

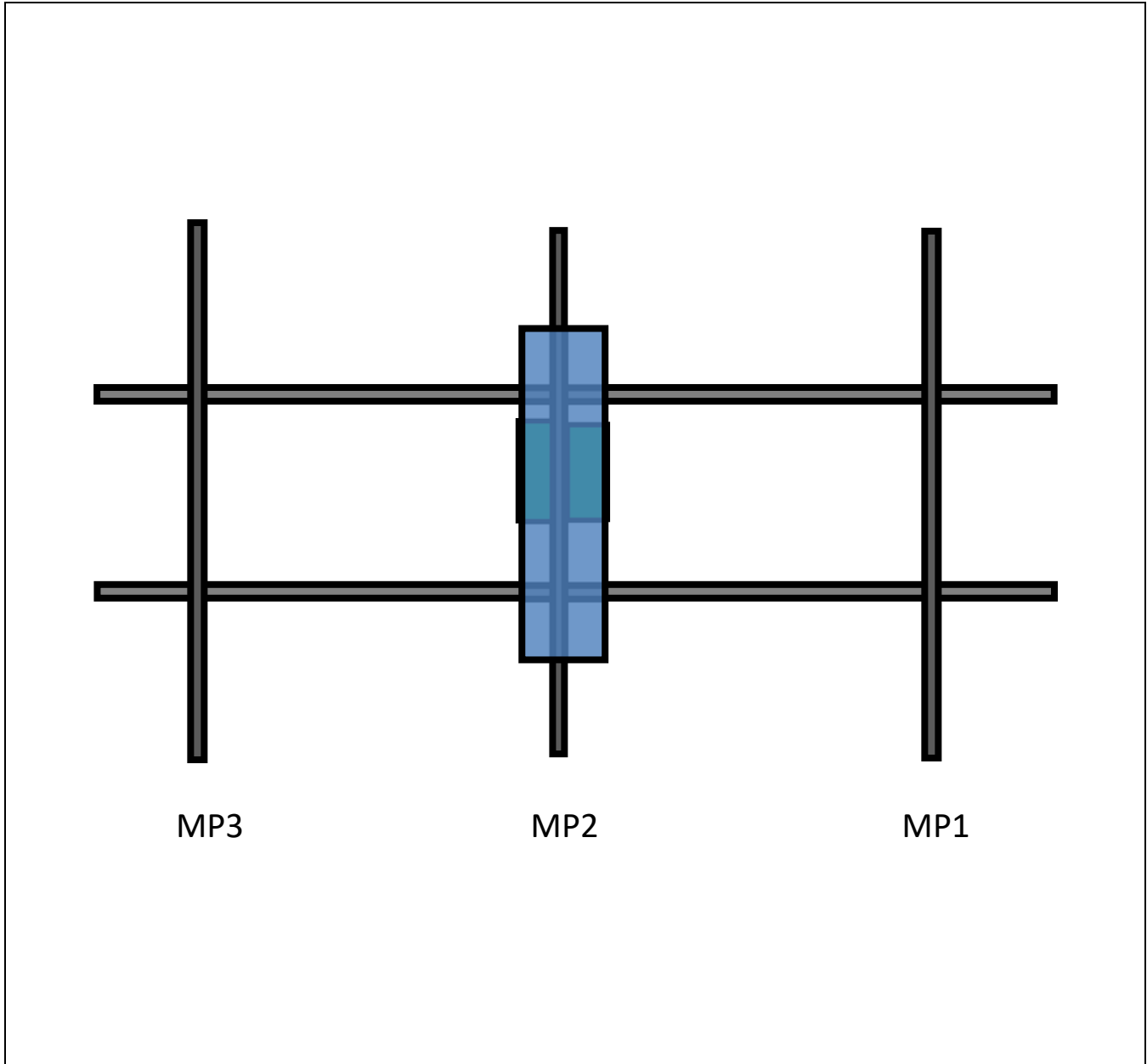
Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Main Horizontals	7%	Pass
Support Rails	11%	Pass
Support Tubes	51%	Pass
Support Channels	34%	Pass
Support Angles	30%	Pass
Mount Pipes	13%	Pass
Connection Plates	20%	Pass
Connection Angles	19%	Pass

Mount Layout



Equipment Layout



	Antenna Model	Location
1	JMA Wireless MX08FRO665-21	MP2
2	Fujitsu TA08025-B604	MP2
3	Fujitsu TA08025-B605	MP2
4	Raycap RDIDC-9181-PF-48	Support Tube mount pipe



Standard Conditions

All engineering services performed by B+T Group, Tulsa are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding antenna and mounts
- Information from drawings, design and analysis documents, and field notes in the possession of B+T Group.
- Manufacturers drawings for Commscope # MC-PK8-DSH used for analysis
- The following assumptions have been included in the analysis of the mount:

Component	Section	Length	Note
Raycap Pipe	2" Std. Pipe	4'-0"	Attached to Support Tube, Per CD's

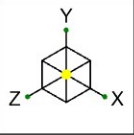
It is the responsibility of the client to ensure that the information provided to B+T Group and used in the performance of our engineering services is correct and complete.

American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

All connections are to be verified for condition and tightness by the installation contractor preceding any changes to the appurtenance mounting system and/or equipment attached to it.

Unless explicitly agreed by both the client and John B+T Group all services will be performed in accordance with the current revision of ANSI/TIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. B+T Group is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.



Envelope Only Solution

B+T Group

APK

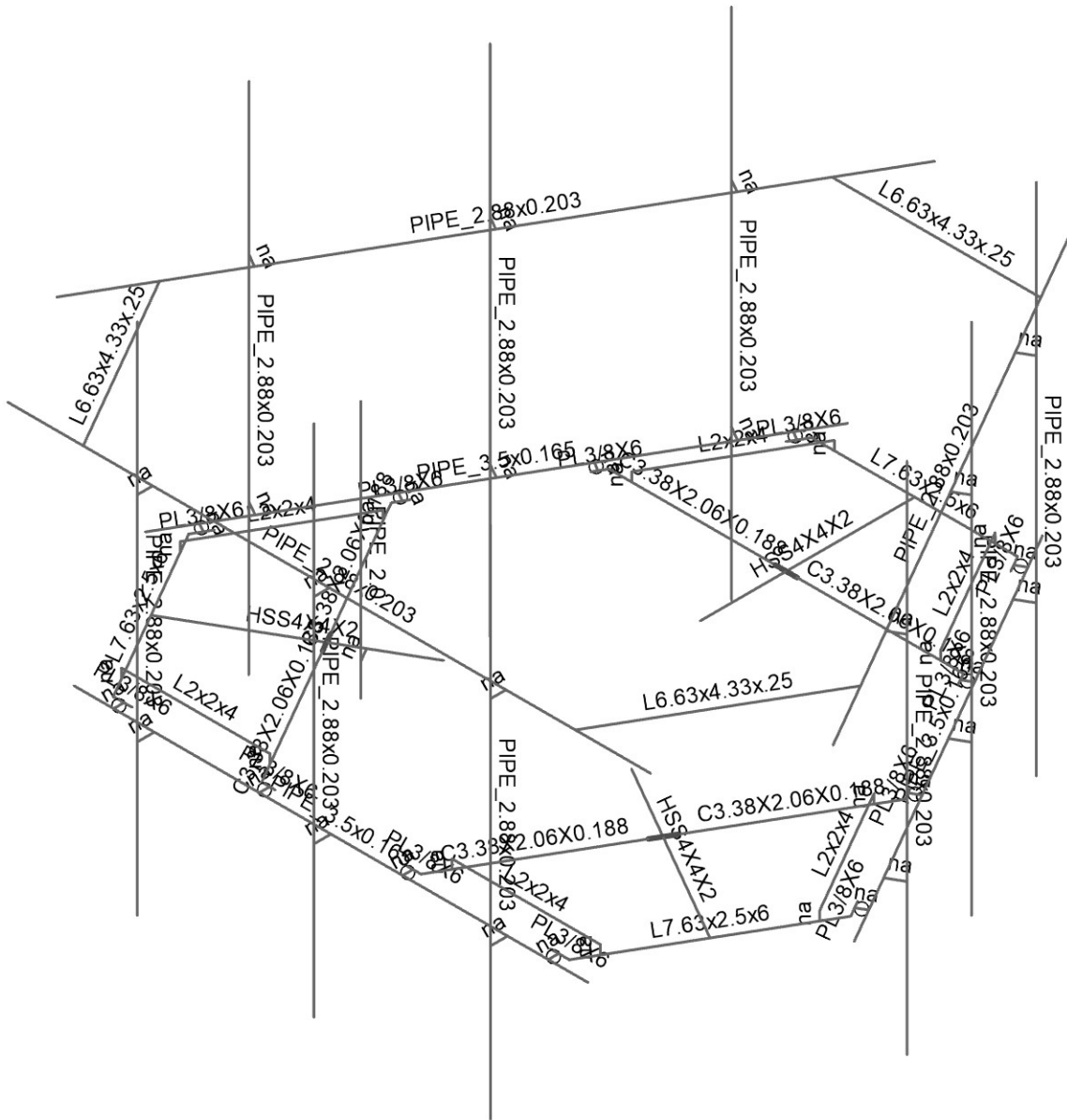
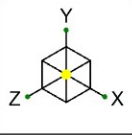
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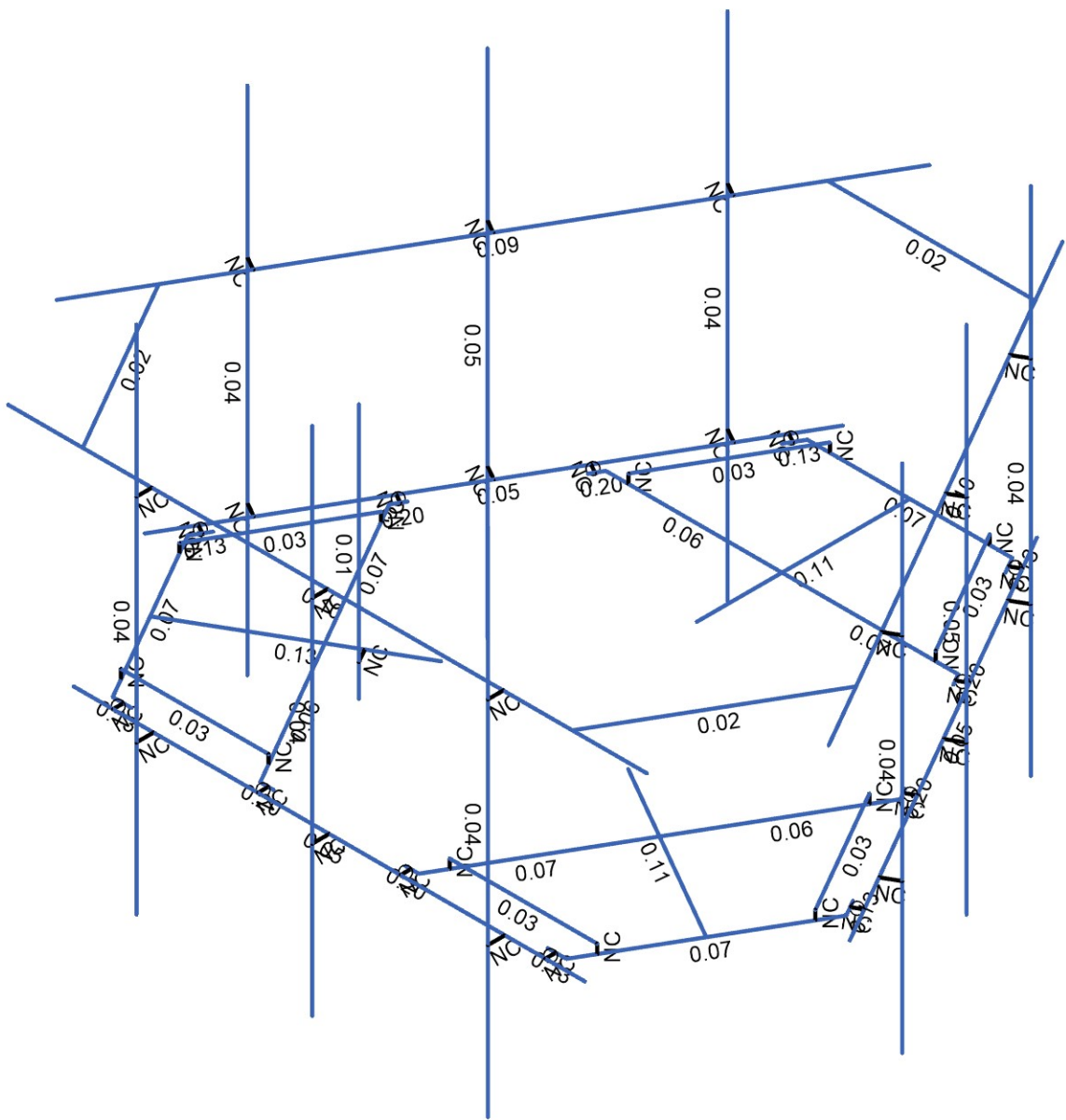
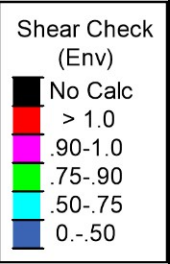


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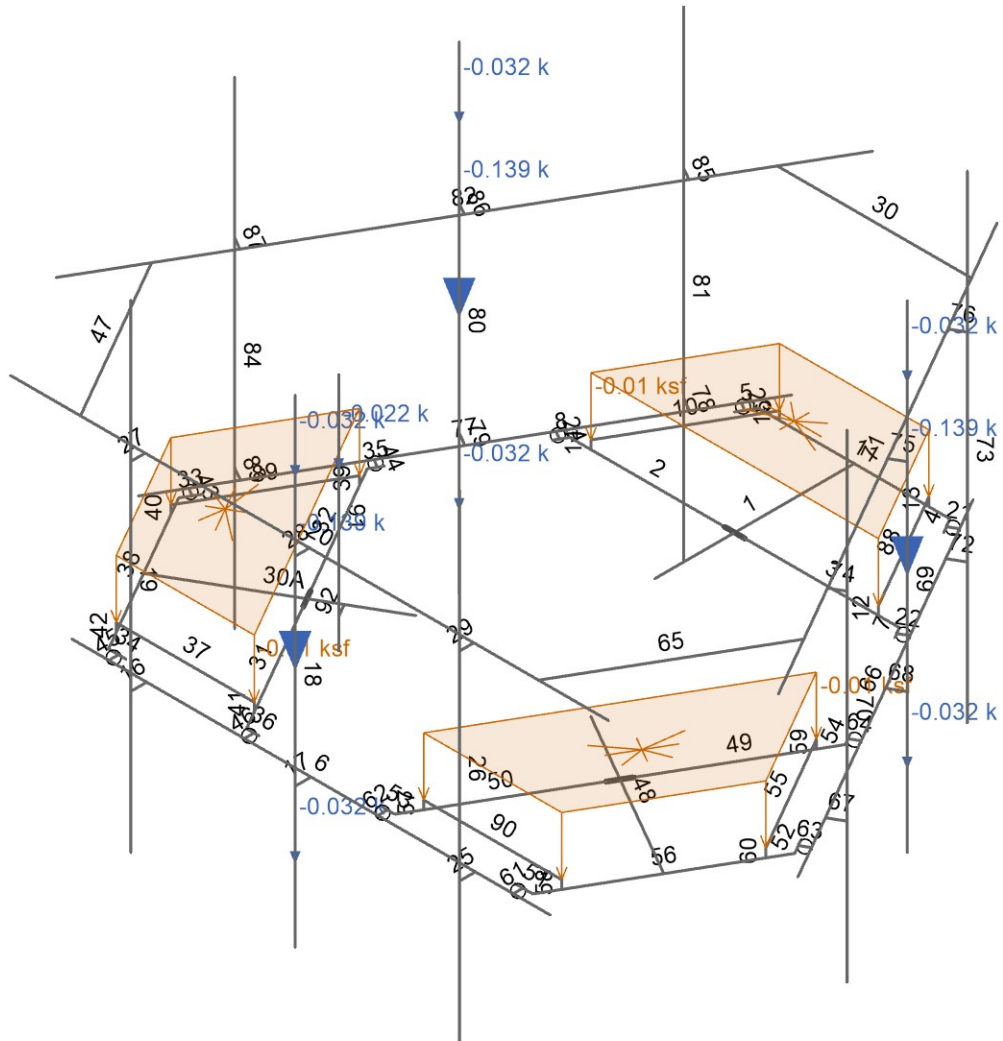
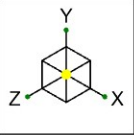
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SK-6
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Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

B+T Group	302511 - WSPT - South	SK-5
APK		Mar 21, 2022
157034.003.01		157034_003_01_WSPT - South_...



Loads: BLC 1, Dead

B+T Group
APK
157034.003.01

302511 - WSPT - South

SK-7
Mar 21, 2022
157034_003_01_WSPT - South_...

Node Boundary Conditions

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot [k-ft/rad]	Y Rot [k-ft/rad]	Z Rot [k-ft/rad]
1	1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	2						
3	3						
4	4						
5	5						
6	16						
7	17						
8	19						
9	20						
10	22						
11	25						
12	26						
13	29						
14	62	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
15	63						
16	64						
17	65						
18	66						
19	75						
20	76						
21	78						
22	79						
23	81						
24	84						
25	85						
26	88						
27	91	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
28	92						
29	93						
30	94A						
31	95						
32	104						
33	105A						
34	107						
35	108						
36	110A						
37	113						
38	114						
39	117						

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	1	1	2		SF-H1	Beam	Tube	A500 Gr.B Rect	Typical
2	2	5	3	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
3	3	3	4	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
4	4	7	8		MF-CP1	Beam	RECT	A36 Gr.36	Typical
5	5	6	9		MF-CP1	Beam	RECT	A36 Gr.36	Typical
6	6	14	15		MF-H1	Beam	Pipe	A500 Gr.C	Typical
7	7	16	4		MF-CP1	Beam	RECT	A36 Gr.36	Typical
8	8	5	19		MF-CP1	Beam	RECT	A36 Gr.36	Typical
9	10	23	22		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
10	11	6	7		SF-H4	Beam	Single Angle	A36 Gr.36	Typical
11	12	28	24		RIGID	None	None	RIGID	Typical
12	13	29	25		RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
13	14	27	23		RIGID	None	None	RIGID	Typical
14	15	26	22		RIGID	None	None	RIGID	Typical
15	16	32	30		RIGID	None	None	RIGID	Typical
16	17	33	31		RIGID	None	None	RIGID	Typical
17	18	35	37		MF-P1	Column	Pipe	A500 Gr.C	Typical
18	19	34	36		MF-P1	Column	Pipe	A500 Gr.C	Typical
19	20	38	39		MF-H2	Beam	Pipe	A500 Gr.C	Typical
20	21	11	10		RIGID	None	None	RIGID	Typical
21	22	18	17		RIGID	None	None	RIGID	Typical
22	23	13	12		RIGID	None	None	RIGID	Typical
23	24	21	20		RIGID	None	None	RIGID	Typical
24	25	41	40		RIGID	None	None	RIGID	Typical
25	26	42	43		MF-P1	Column	Pipe	A500 Gr.C	Typical
26	27	45	48		RIGID	None	None	RIGID	Typical
27	28	46	49		RIGID	None	None	RIGID	Typical
28	29	47	50		RIGID	None	None	RIGID	Typical
29	30	52	51	180	MF-H3	Beam	Single Angle	A36 Gr.36	Typical
30	30A	62	63		SF-H1	Beam	Tube	A500 Gr.B Rect	Typical
31	31	66	64	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
32	32	64	65	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
33	33	68	69		MF-CP1	Beam	RECT	A36 Gr.36	Typical
34	34	67	70		MF-CP1	Beam	RECT	A36 Gr.36	Typical
35	35	75	65		MF-CP1	Beam	RECT	A36 Gr.36	Typical
36	36	66	78		MF-CP1	Beam	RECT	A36 Gr.36	Typical
37	37	82	81		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
38	38	67	68		SF-H4	Beam	Single Angle	A36 Gr.36	Typical
39	39	87	83		RIGID	None	None	RIGID	Typical
40	40	88	84		RIGID	None	None	RIGID	Typical
41	41	86	82		RIGID	None	None	RIGID	Typical
42	42	85	81		RIGID	None	None	RIGID	Typical
43	43	72	71		RIGID	None	None	RIGID	Typical
44	44	77	76		RIGID	None	None	RIGID	Typical
45	45	74	73		RIGID	None	None	RIGID	Typical
46	46	80A	79		RIGID	None	None	RIGID	Typical
47	47	90	89	180	MF-H3	Beam	Single Angle	A36 Gr.36	Typical
48	48	91	92		SF-H1	Beam	Tube	A500 Gr.B Rect	Typical
49	49	95	93	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
50	50	93	94A	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
51	51	97	98		MF-CP1	Beam	RECT	A36 Gr.36	Typical
52	52	96	99		MF-CP1	Beam	RECT	A36 Gr.36	Typical
53	53	104	94A		MF-CP1	Beam	RECT	A36 Gr.36	Typical
54	54	95	107		MF-CP1	Beam	RECT	A36 Gr.36	Typical
55	55	111	110A		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
56	56	96	97		SF-H4	Beam	Single Angle	A36 Gr.36	Typical
57	57	116	112		RIGID	None	None	RIGID	Typical
58	58	117	113		RIGID	None	None	RIGID	Typical
59	59	115	111		RIGID	None	None	RIGID	Typical
60	60	114	110A		RIGID	None	None	RIGID	Typical
61	61	101	100		RIGID	None	None	RIGID	Typical
62	62	106	105A		RIGID	None	None	RIGID	Typical
63	63	103A	102		RIGID	None	None	RIGID	Typical
64	64	109	108		RIGID	None	None	RIGID	Typical
65	65	119	118	180	MF-H3	Beam	Single Angle	A36 Gr.36	Typical
66	66	112A	113A		MF-H1	Beam	Pipe	A500 Gr.C	Typical
67	67	116A	114A		RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
68	68	117A	115A		RIGID	None	None	RIGID	Typical
69	69	119A	121		MF-P1	Column	Pipe	A500 Gr.C	Typical
70	70	118A	120		MF-P1	Column	Pipe	A500 Gr.C	Typical
71	71	122	123		MF-H2	Beam	Pipe	A500 Gr.C	Typical
72	72	125	124		RIGID	None	None	RIGID	Typical
73	73	126	127		MF-P1	Column	Pipe	A500 Gr.C	Typical
74	74	128	131		RIGID	None	None	RIGID	Typical
75	75	129	132		RIGID	None	None	RIGID	Typical
76	76	130	133		RIGID	None	None	RIGID	Typical
77	77	135	136		MF-H1	Beam	Pipe	A500 Gr.C	Typical
78	78	139	137		RIGID	None	None	RIGID	Typical
79	79	140	138		RIGID	None	None	RIGID	Typical
80	80	142	144		MF-P1	Column	Pipe	A500 Gr.C	Typical
81	81	141	143		MF-P1	Column	Pipe	A500 Gr.C	Typical
82	82	145	146		MF-H2	Beam	Pipe	A500 Gr.C	Typical
83	83	148	147		RIGID	None	None	RIGID	Typical
84	84	149	150		MF-P1	Column	Pipe	A500 Gr.C	Typical
85	85	151	154		RIGID	None	None	RIGID	Typical
86	86	152	155		RIGID	None	None	RIGID	Typical
87	87	153	156		RIGID	None	None	RIGID	Typical
88	88	24	25	270	SF-H3	Beam	Single Angle	A36 Gr.36	Typical
89	89	83	84	270	SF-H3	Beam	Single Angle	A36 Gr.36	Typical
90	90	112	113	270	SF-H3	Beam	Single Angle	A36 Gr.36	Typical
91	91	159	160		MF-P2	Column	Pipe	A53 Gr.B	Typical
92	92	158	157		RIGID	None	None	RIGID	Typical

Hot Rolled Steel Design Parameters

	Label	Shape	Length [ft]	Lcomp top [ft]	Function
1	1	SF-H1	3.333	Lbyy	Lateral
2	2	SF-H2	2.758	Lbyy	Lateral
3	3	SF-H2	2.758	Lbyy	Lateral
4	4	MF-CP1	0.292	Lbyy	Lateral
5	5	MF-CP1	0.292	Lbyy	Lateral
6	6	MF-H1	8	Lbyy	Lateral
7	7	MF-CP1	0.208	Lbyy	Lateral
8	8	MF-CP1	0.208	Lbyy	Lateral
9	10	SF-H3	2.309	Lbyy	Lateral
10	11	SF-H4	3.207	Lbyy	Lateral
11	18	MF-P1	8	Lbyy	Lateral
12	19	MF-P1	8	Lbyy	Lateral
13	20	MF-H2	10	Lbyy	Lateral
14	26	MF-P1	8	Lbyy	Lateral
15	30	MF-H3	3.25	Lbyy	Lateral
16	30A	SF-H1	3.333	Lbyy	Lateral
17	31	SF-H2	2.758	Lbyy	Lateral
18	32	SF-H2	2.758	Lbyy	Lateral
19	33	MF-CP1	0.292	Lbyy	Lateral
20	34	MF-CP1	0.292	Lbyy	Lateral
21	35	MF-CP1	0.208	Lbyy	Lateral
22	36	MF-CP1	0.208	Lbyy	Lateral
23	37	SF-H3	2.309	Lbyy	Lateral
24	38	SF-H4	3.207	Lbyy	Lateral
25	47	MF-H3	3.25	Lbyy	Lateral
26	48	SF-H1	3.333	Lbyy	Lateral
27	49	SF-H2	2.758	Lbyy	Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length [ft]	Lcomp top [ft]	Function
28	50	SF-H2	2.758	Lbyy	Lateral
29	51	MF-CP1	0.292	Lbyy	Lateral
30	52	MF-CP1	0.292	Lbyy	Lateral
31	53	MF-CP1	0.208	Lbyy	Lateral
32	54	MF-CP1	0.208	Lbyy	Lateral
33	55	SF-H3	2.309	Lbyy	Lateral
34	56	SF-H4	3.207	Lbyy	Lateral
35	65	MF-H3	3.25	Lbyy	Lateral
36	66	MF-H1	8	Lbyy	Lateral
37	69	MF-P1	8	Lbyy	Lateral
38	70	MF-P1	8	Lbyy	Lateral
39	71	MF-H2	10	Lbyy	Lateral
40	73	MF-P1	8	Lbyy	Lateral
41	77	MF-H1	8	Lbyy	Lateral
42	80	MF-P1	8	Lbyy	Lateral
43	81	MF-P1	8	Lbyy	Lateral
44	82	MF-H2	10	Lbyy	Lateral
45	84	MF-P1	8	Lbyy	Lateral
46	88	SF-H3	2.309	Lbyy	Lateral
47	89	SF-H3	2.309	Lbyy	Lateral
48	90	SF-H3	2.309	Lbyy	Lateral
49	91	MF-P2	4	Lbyy	Lateral

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e ⁶ F ⁻¹]	Density [k/ft ³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
7	A1085	29000	11154	0.3	0.65	0.49	50	1.4	65	1.3
8	A500 Gr.C	29000	11154	0.3	0.65	0.49	46	1.4	62	1.3

Basic Load Cases

	BLC Description	Category	Y Gravity	Nodal	Point	Distributed	Area(Member)
1	Dead	DL	-1		20		3
2	0 Wind - No Ice	WLZ			20	49	
3	90 Wind - No Ice	WLX			20	49	
4	0 Wind - Ice	WLZ			20	49	
5	90 Wind - Ice	WLX			20	49	
6	0 Wind - Service	WLZ			20	49	
7	90 Wind - Service	WLX			20	49	
8	Ice	OL1			20	49	3
9	0 Seismic	ELZ			20	49	
10	90 Seismic	ELX			20	49	
11	Live Load a	LL		3			
12	Live Load b	LL		3			
13	Live Load c	LL		3			
14	Live Load d	LL					
15	Maint LL 1	LL			1		
16	Maint LL 2	LL			1		
17	Maint LL 3	LL			1		



Basic Load Cases (Continued)

	BLC Description	Category	Y Gravity	Nodal	Point	Distributed	Area(Member)
18	Maint LL 4	LL			1		
19	Maint LL 5	LL			1		
20	Maint LL 6	LL			1		
21	Maint LL 7	LL			1		
22	Maint LL 8	LL			1		
23	Maint LL 9	LL			1		
24	Maint LL 10	LL			1		
25	Maint LL 11	LL			1		
26	Maint LL 12	LL			1		
27	Maint LL 13	LL			1		
28	Maint LL 14	LL			1		
29	Maint LL 15	LL			1		
30	BLC 1 Transient Area Loads	None				9	
31	BLC 8 Transient Area Loads	None				9	

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4 Dead	Yes	Y	1	1.4						
2	1.2 D + 1.0 - 0 W	Yes	Y	1	1.2	2	1				
3	1.2 D + 1.0 - 30 W	Yes	Y	1	1.2	2	0.866	3	0.5		
4	1.2 D + 1.0 - 60 W	Yes	Y	1	1.2	3	0.866	2	0.5		
5	1.2 D + 1.0 - 90 W	Yes	Y	1	1.2	3	1				
6	1.2 D + 1.0 - 120 W	Yes	Y	1	1.2	3	0.866	2	-0.5		
7	1.2 D + 1.0 - 150 W	Yes	Y	1	1.2	2	-0.866	3	0.5		
8	1.2 D + 1.0 - 180 W	Yes	Y	1	1.2	2	-1				
9	1.2 D + 1.0 - 210 W	Yes	Y	1	1.2	2	-0.866	3	-0.5		
10	1.2 D + 1.0 - 240 W	Yes	Y	1	1.2	3	-0.866	2	-0.5		
11	1.2 D + 1.0 - 270 W	Yes	Y	1	1.2	3	-1				
12	1.2 D + 1.0 - 300 W	Yes	Y	1	1.2	3	-0.866	2	0.5		
13	1.2 D + 1.0 - 330 W	Yes	Y	1	1.2	2	0.866	3	-0.5		
14	1.2 D + 1.0 - 0 W/Ice	Yes	Y	1	1.2	4	1			8	1
15	1.2 D + 1.0 - 30 W/Ice	Yes	Y	1	1.2	4	0.866	5	0.5	8	1
16	1.2 D + 1.0 - 60 W/Ice	Yes	Y	1	1.2	5	0.866	4	0.5	8	1
17	1.2 D + 1.0 - 90 W/Ice	Yes	Y	1	1.2	5	1			8	1
18	1.2 D + 1.0 - 120 W/Ice	Yes	Y	1	1.2	5	0.866	4	-0.5	8	1
19	1.2 D + 1.0 - 150 W/Ice	Yes	Y	1	1.2	4	-0.866	5	0.5	8	1
20	1.2 D + 1.0 - 180 W/Ice	Yes	Y	1	1.2	4	-1			8	1
21	1.2 D + 1.0 - 210 W/Ice	Yes	Y	1	1.2	4	-0.866	5	-0.5	8	1
22	1.2 D + 1.0 - 240 W/Ice	Yes	Y	1	1.2	5	-0.866	4	-0.5	8	1
23	1.2 D + 1.0 - 270 W/Ice	Yes	Y	1	1.2	5	-1			8	1
24	1.2 D + 1.0 - 300 W/Ice	Yes	Y	1	1.2	5	-0.866	4	0.5	8	1
25	1.2 D + 1.0 - 330 W/Ice	Yes	Y	1	1.2	4	0.866	5	-0.5	8	1
26	1.2 D + 1.0 E - 0	Yes	Y	1	1.2	9	1				
27	1.2 D + 1.0 E - 30	Yes	Y	1	1.2	9	0.866	10	0.5		
28	1.2 D + 1.0 E - 60	Yes	Y	1	1.2	10	0.866	9	0.5		
29	1.2 D + 1.0 E - 90	Yes	Y	1	1.2	10	1				
30	1.2 D + 1.0 E - 120	Yes	Y	1	1.2	10	0.866	9	-0.5		
31	1.2 D + 1.0 E - 150	Yes	Y	1	1.2	9	-0.866	10	0.5		
32	1.2 D + 1.0 E - 180	Yes	Y	1	1.2	9	-1				
33	1.2 D + 1.0 E - 210	Yes	Y	1	1.2	9	-0.866	10	-0.5		
34	1.2 D + 1.0 E - 240	Yes	Y	1	1.2	10	-0.866	9	-0.5		
35	1.2 D + 1.0 E - 270	Yes	Y	1	1.2	10	-1				
36	1.2 D + 1.0 E - 300	Yes	Y	1	1.2	10	-0.866	9	0.5		
37	1.2 D + 1.0 E - 330	Yes	Y	1	1.2	9	0.866	10	-0.5		
38	1.2 D + 1.5 LL a + Service - 0 W	Yes	Y	1	1.2	6	1			11	1.5

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
39	1.2 D + 1.5 LL a + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	11	1.5
40	1.2 D + 1.5 LL a + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	11	1.5
41	1.2 D + 1.5 LL a + Service - 90 W	Yes	Y	1	1.2	7	1			11	1.5
42	1.2 D + 1.5 LL a + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	11	1.5
43	1.2 D + 1.5 LL a + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	11	1.5
44	1.2 D + 1.5 LL a + Service - 180 W	Yes	Y	1	1.2	6	-1			11	1.5
45	1.2 D + 1.5 LL a + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	11	1.5
46	1.2 D + 1.5 LL a + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	11	1.5
47	1.2 D + 1.5 LL a + Service - 270 W	Yes	Y	1	1.2	7	-1			11	1.5
48	1.2 D + 1.5 LL a + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	11	1.5
49	1.2 D + 1.5 LL a + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	11	1.5
50	1.2 D + 1.5 LL b + Service - 0 W	Yes	Y	1	1.2	6	1			12	1.5
51	1.2 D + 1.5 LL b + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	12	1.5
52	1.2 D + 1.5 LL b + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	12	1.5
53	1.2 D + 1.5 LL b + Service - 90 W	Yes	Y	1	1.2	7	1			12	1.5
54	1.2 D + 1.5 LL b + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	12	1.5
55	1.2 D + 1.5 LL b + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	12	1.5
56	1.2 D + 1.5 LL b + Service - 180 W	Yes	Y	1	1.2	6	-1			12	1.5
57	1.2 D + 1.5 LL b + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	12	1.5
58	1.2 D + 1.5 LL b + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	12	1.5
59	1.2 D + 1.5 LL b + Service - 270 W	Yes	Y	1	1.2	7	-1			12	1.5
60	1.2 D + 1.5 LL b + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	12	1.5
61	1.2 D + 1.5 LL b + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	12	1.5
62	1.2 D + 1.5 LL c + Service - 0 W	Yes	Y	1	1.2	6	1			13	1.5
63	1.2 D + 1.5 LL c + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	13	1.5
64	1.2 D + 1.5 LL c + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	13	1.5
65	1.2 D + 1.5 LL c + Service - 90 W	Yes	Y	1	1.2	7	1			13	1.5
66	1.2 D + 1.5 LL c + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	13	1.5
67	1.2 D + 1.5 LL c + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	13	1.5
68	1.2 D + 1.5 LL c + Service - 180 W	Yes	Y	1	1.2	6	-1			13	1.5
69	1.2 D + 1.5 LL c + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	13	1.5
70	1.2 D + 1.5 LL c + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	13	1.5
71	1.2 D + 1.5 LL c + Service - 270 W	Yes	Y	1	1.2	7	-1			13	1.5
72	1.2 D + 1.5 LL c + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	13	1.5
73	1.2 D + 1.5 LL c + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	13	1.5
74	1.2 D + 1.5 LL d + Service - 0 W	Yes	Y	1	1.2	6	1			14	1.5
75	1.2 D + 1.5 LL d + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	14	1.5
76	1.2 D + 1.5 LL d + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	14	1.5
77	1.2 D + 1.5 LL d + Service - 90 W	Yes	Y	1	1.2	7	1			14	1.5
78	1.2 D + 1.5 LL d + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	14	1.5
79	1.2 D + 1.5 LL d + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	14	1.5
80	1.2 D + 1.5 LL d + Service - 180 W	Yes	Y	1	1.2	6	-1			14	1.5
81	1.2 D + 1.5 LL d + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	14	1.5
82	1.2 D + 1.5 LL d + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	14	1.5
83	1.2 D + 1.5 LL d + Service - 270 W	Yes	Y	1	1.2	7	-1			14	1.5
84	1.2 D + 1.5 LL d + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	14	1.5
85	1.2 D + 1.5 LL d + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	14	1.5
86	1.2 D + 1.5 LL Maint (1)	Yes	Y	1	1.2					15	1.5
87	1.2 D + 1.5 LL Maint (2)	Yes	Y	1	1.2					16	1.5
88	1.2 D + 1.5 LL Maint (3)	Yes	Y	1	1.2					17	1.5
89	1.2 D + 1.5 LL Maint (4)	Yes	Y	1	1.2					18	1.5
90	1.2 D + 1.5 LL Maint (5)	Yes	Y	1	1.2					19	1.5
91	1.2 D + 1.5 LL Maint (6)	Yes	Y	1	1.2					20	1.5
92	1.2 D + 1.5 LL Maint (7)	Yes	Y	1	1.2					21	1.5
93	1.2 D + 1.5 LL Maint (8)	Yes	Y	1	1.2					22	1.5

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
94	1.2 D + 1.5 LL Maint (9)	Yes	Y	1	1.2					23	1.5
95	1.2 D + 1.5 LL Maint (10)	Yes	Y	1	1.2					24	1.5
96	1.2 D + 1.5 LL Maint (11)	Yes	Y	1	1.2					25	1.5
97	1.2 D + 1.5 LL Maint (12)	Yes	Y	1	1.2					26	1.5
98	1.2 D + 1.5 LL Maint (13)	Yes	Y	1	1.2					27	1.5
99	1.2 D + 1.5 LL Maint (14)	Yes	Y	1	1.2					28	1.5
100	1.2 D + 1.5 LL Maint (15)	Yes	Y	1	1.2					29	1.5

Envelope Node Reactions

Node Label	X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC		
1	1	max	1.289	5	1.718	14	1.163	2	3.601	2	1.265	11	0.259	11
2		min	-1.29	11	-0.016	8	-1.284	8	-0.592	8	-1.265	5	-0.274	5
3	62	max	1.177	5	1.797	18	1.538	2	0.344	13	1.454	3	0.387	12
4		min	-1.282	11	0.113	12	-1.478	8	-1.903	7	-1.454	9	-3.071	6
5	91	max	1.212	5	1.705	22	1.434	2	0.254	3	1.389	7	2.938	10
6		min	-1.107	11	0.058	4	-1.373	8	-1.777	69	-1.389	13	-0.33	4
7	Totals:	max	3.678	5	4.663	52	4.135	2						
8		min	-3.678	11	2.413	10	-4.135	8						

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks

Member	Shape	Code Check	Loc [ft]	LC	Shear	Check	Loc [ft]	LC	Dir	LC	Pnc [k]	phi*	Pnt [k]	phi*	Mn y-y [k-ft]	phi*	Mn z-z [k-ft]	Cb	Eqn
1	1	HSS4X4X2	0.487	0	13	0.108	0	y	39	70.173	73.278	8.24	8.24	2.013	H1-1b				
2	2	C3.38X2.06X0.188	0.337	2.592	3	0.059	0.351	y	65	35.676	43.394	1.694	4.483	1.601	H1-1b				
3	3	C3.38X2.06X0.188	0.335	0	13	0.067	2.241	y	45	35.676	43.394	1.694	4.483	1.599	H1-1b				
4	4	PL3/8X6	0.084	0	13	0.135	0	y	62	68.997	72.9	0.57	9.113	2.129	H1-1b				
5	5	PL3/8X6	0.084	0	3	0.134	0	y	38	68.997	72.9	0.57	9.113	2.149	H1-1b				
6	6	PIPE 3.5x0.165	0.069	4	52	0.045	2.917	4	45.872	71.57	6.336	6.336	1.726	H1-1b					
7	7	PL3/8X6	0.126	0.208	3	0.198	0.208	y	61	70.882	72.9	0.57	9.113	2.919	H1-1b				
8	8	PL3/8X6	0.126	0	13	0.197	0	y	51	70.882	72.9	0.57	9.113	2.922	H1-1b				
9	10	L2x2x4	0.23	2.309	8	0.033	0	y	64	23.349	30.586	0.691	1.577	1.5	H2-1				
10	11	L7.63x2.5x6	0.302	1.604	8	0.073	2.873	y	49	75.414	118.523	1.798	13.472	1.184	H2-1				
11	18	PIPE 2.88x0.203	0.121	5.667	5	0.043	5.667	5	35.519	70.68	5.029	5.029	3	H1-1b					
12	19	PIPE 2.88x0.203	0.112	2.333	10	0.042	5.667	8	35.519	70.68	5.029	5.029	3	H1-1b					
13	20	PIPE 2.88x0.203	0.109	7.812	7	0.101	8.75	13	24.131	70.68	5.029	5.029	2.274	H1-1b					
14	26	PIPE 2.88x0.203	0.114	2.333	6	0.042	5.667	8	35.519	70.68	5.029	5.029	3	H1-1b					
15	30	L6.63x4.33x.25	0.172	0	10	0.021	0	y	11	51.794	86.751	2.311	6.976	1.5	H2-1				
16	30A	HSS4X4X2	0.511	0	7	0.131	0	z	9	70.173	73.278	8.24	8.24	2.052	H1-1b				
17	31	C3.38X2.06X0.188	0.335	2.592	19	0.059	0.351	y	68	35.676	43.394	1.694	4.483	1.627	H1-1b				
18	32	C3.38X2.06X0.188	0.334	0	17	0.068	2.241	y	49	35.676	43.394	1.694	4.483	1.625	H1-1b				
19	33	PL3/8X6	0.076	0	5	0.133	0	y	66	68.997	72.9	0.57	9.113	2.063	H1-1b				
20	34	PL3/8X6	0.082	0	7	0.134	0	y	42	68.997	72.9	0.57	9.113	2.073	H1-1b				
21	35	PL3/8X6	0.129	0.208	7	0.199	0.208	y	53	70.882	72.9	0.57	9.113	2.952	H1-1b				
22	36	PL3/8X6	0.117	0	5	0.198	0	y	55	70.882	72.9	0.57	9.113	2.955	H1-1b				
23	37	L2x2x4	0.214	2.309	13	0.033	0	y	68	23.349	30.586	0.691	1.577	1.5	H2-1				
24	38	L7.63x2.5x6	0.274	1.604	12	0.073	0.334	y	67	75.414	118.523	1.798	13.356	1.161	H2-1				
25	47	L6.63x4.33x.25	0.19	0	2	0.024	3.25	y	9	51.794	86.751	2.311	6.976	1.5	H2-1				
26	48	HSS4X4X2	0.487	0	9	0.111	0	z	7	70.173	73.278	8.24	8.24	2.022	H1-1b				
27	49	C3.38X2.06X0.188	0.331	2.592	23	0.059	0.351	y	73	35.676	43.394	1.694	4.483	1.625	H1-1b				
28	50	C3.38X2.06X0.188	0.339	0	9	0.067	2.241	y	42	35.676	43.394	1.694	4.483	1.602	H1-1b				
29	51	PL3/8X6	0.082	0	9	0.134	0	y	70	68.997	72.9	0.57	9.113	2.087	H1-1b				
30	52	PL3/8X6	0.076	0	11	0.133	0	y	46	68.997	72.9	0.57	9.113	2.08	H1-1b				
31	53	PL3/8X6	0.117	0.208	11	0.197	0.208	y	57	70.882	72.9	0.57	9.113	2.94	H1-1b				
32	54	PL3/8X6	0.128	0	9	0.198	0	y	59	70.882	72.9	0.57	9.113	2.935	H1-1b				



Company : B+T Group
 Designer : APK
 Job Number : 157034.003.01
 Model Name : 302511 - WSPT - South

3/21/2022
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 Checked By : _____

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks (Continued)

Member	Shape	Code Check	Loc[ft]	LC	Shear	Check	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
33	55	L2x2x4	0.211	2.309	4	0.032	2.309	y	72	23.349	30.586	0.691	1.577	1.5	H2-1
34	56	L7.63x2.5x6	0.277	1.604	4	0.073	2.873	y	45	75.414	118.523	1.798	13.41	1.172	H2-1
35	65	L6.63x4.33x.25	0.192	3.25	2	0.024	0	y	7	51.794	86.751	2.311	6.976	1.5	H2-1
36	66	PIPE 3.5x0.165	0.069	4	52	0.051	2.917		9	45.872	71.57	6.336	6.336	1.725	H1-1b
37	69	PIPE 2.88x0.203	0.131	5.667	9	0.047	5.667		3	35.519	70.68	5.029	5.029	2.845	H1-1b
38	70	PIPE 2.88x0.203	0.125	2.333	2	0.039	5.667		13	35.519	70.68	5.029	5.029	3	H1-1b
39	71	PIPE 2.88x0.203	0.108	2.187	13	0.097	1.25		7	24.131	70.68	5.029	5.029	2.084	H1-1b
40	73	PIPE 2.88x0.203	0.112	2.333	10	0.036	5.667		12	35.519	70.68	5.029	5.029	3	H1-1b
41	77	PIPE 3.5x0.165	0.069	4	56	0.051	5.083		7	45.872	71.57	6.336	6.336	1.722	H1-1b
42	80	PIPE 2.88x0.203	0.132	5.667	7	0.047	5.667		7	35.519	70.68	5.029	5.029	2.84	H1-1b
43	81	PIPE 2.88x0.203	0.112	2.333	6	0.036	5.667		4	35.519	70.68	5.029	5.029	3	H1-1b
44	82	PIPE 2.88x0.203	0.106	7.812	3	0.095	8.75		9	24.131	70.68	5.029	5.029	2.073	H1-1b
45	84	PIPE 2.88x0.203	0.123	2.333	2	0.039	5.667		3	35.519	70.68	5.029	5.029	3	H1-1b
46	88	L2x2x4	0.227	2.309	8	0.033	0	z	48	23.349	30.586	0.691	1.577	1.5	H2-1
47	89	L2x2x4	0.21	2.309	12	0.032	0	z	40	23.349	30.586	0.691	1.577	1.5	H2-1
48	90	L2x2x4	0.216	2.309	3	0.033	0	z	44	23.349	30.586	0.691	1.577	1.5	H2-1
49	91	PIPE 2.0	0.111	3.5	8	0.011	3.5		8	26.521	32.13	1.872	1.872	1.522	H1-1b

PROJECT	157034.003.01 - WSPT - Sout	KSC
SUBJECT	Platform Mount Analysis	
DATE	03/21/22	PAGE OF



B+T GRP
 1717 S. Boulder, Suite 300
 Tulsa, OK 74159
 (918) 587-4630

Tower Type	:	Monopole	
Ground Elevation	z_s :	14	ft [ASCE7 Hazard Tool]
Tower Height	:	142.00	ft
Mount Elevation	:	53.00	ft
Antenna Elevation	:	53.00	ft
Crest Height	:	0	ft
Risk Category	:	II	[Table 2-1]
Exposure Category	:	D	[Sec. 2.6.5.1.2]
Topography Category	:	1.00	[Sec. 2.6.6.2]
Wind Velocity	V :	118	mph [ASCE7 Hazard Tool]
Ice wind Velocity	V_i :	50	mph [ASCE7 Hazard Tool]
Service Velocity	V_s :	30	mph [ASCE7 Hazard Tool]
Base Ice thickness	t_i :	1.00	in [ASCE7 Hazard Tool]
Seismic Design Cat.	:	B	[ASCE7 Hazard Tool]
	S_S :	0.23	
	S_1 :	0.06	
	S_{DS} :	0.24	
	S_{D1} :	0.09	
Gust Factor	G_h :	1.00	[Sec. 16.6]
Pressure Coefficient	K_z :	1.28	[Sec. 2.6.5.2]
Topography Factor	K_{zt} :	1.00	[Sec. 2.6.6]
Elevation Factor	K_e :	1.00	[Sec. 2.6.8]
Directionality Factor	K_d :	0.95	[Sec. 16.6]
Shielding Factor	K_a :	0.90	[Sec. 16.6]
Design Ice Thickness	t_{iz} :	1.05	in [Sec. 2.6.10]
Importance Factor	I_e :	1	[Table 2-3]
Response Coefficient	C_s :	0.121	[Sec. 2.7.7.1]
Amplification	A_s :	1	[Sec. 16.7]
	q_z :	43.43	psf

PROJECT	157034.003.01 - WSPT - Sout		KSC
SUBJECT	Platform Mount Analysis		
DATE	03/21/22	PAGE	OF



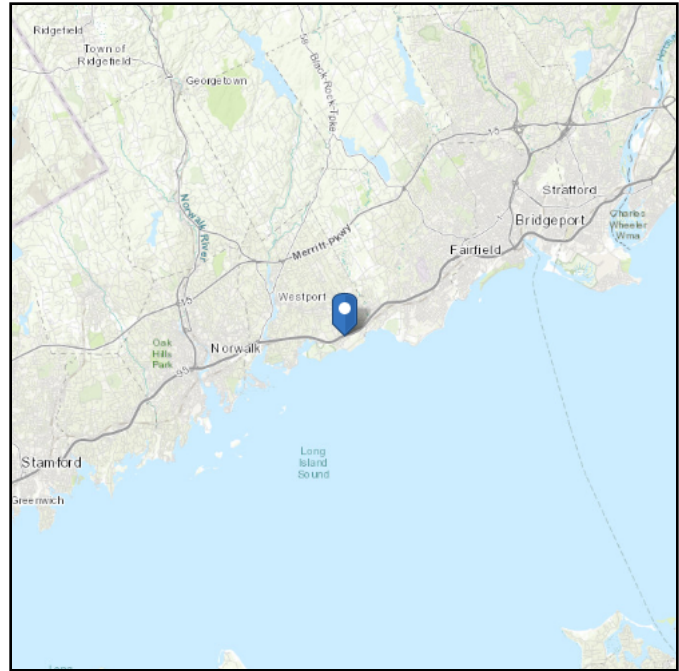
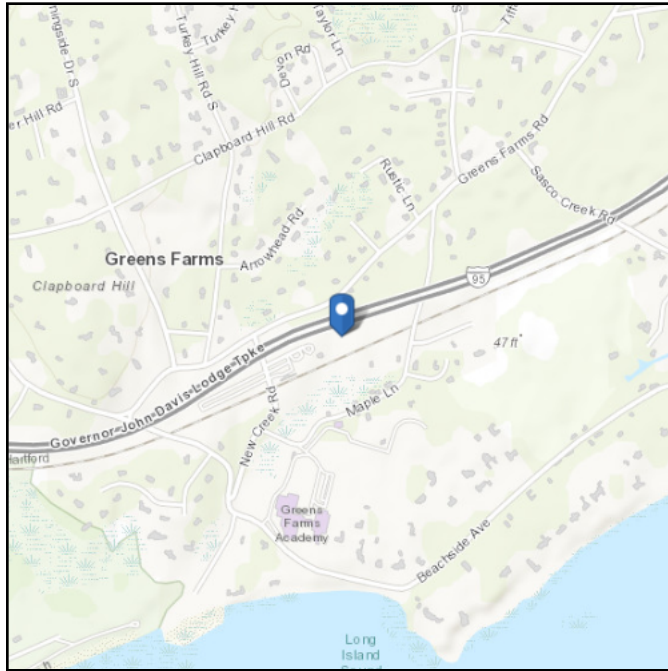
Manufacturer	Model	Qty	Aspect Ratio	C_a	EPA_N (ft ²)	EPA_T (ft ²)	EPA_{N-Ice} (ft ²)	EPA_{T-Ice} (ft ²)	$F_{A \text{ No Ice (N)}}$	$F_{A \text{ No Ice (T)}}$	$F_{A \text{ Ice (N)}}$	$F_{A \text{ Ice (T)}}$
				flat/round								
JMA WIRELESS	MX08FRO665-21	0.5	3.60	1.25	4.01	1.61	4.53	2.06	0.17	0.07	0.04	0.02
JMA WIRELESS	MX08FRO665-21	0.5	3.60	1.25	4.01	1.61	4.53	2.06	0.17	0.07	0.04	0.02
Fujitsu	TA08025-B604	1	1.99	1.20	0.86	1.64	1.24	2.11	0.04	0.08	0.01	0.01
Fujitsu	TA08025-B605	1	1.73	1.20	0.99	1.64	1.38	2.11	0.05	0.08	0.01	0.01
RAYCAP	RDIDC-9181-PF-48	1	1.14	1.20	1.56	0.89	2.02	1.27	0.07	0.04	0.01	0.01
JMA WIRELESS	MX08FRO665-21	0.5	3.60	1.25	4.01	1.61	4.53	2.06	0.17	0.07	0.04	0.02
JMA WIRELESS	MX08FRO665-21	0.5	3.60	1.25	4.01	1.61	4.53	2.06	0.17	0.07	0.04	0.02
Fujitsu	TA08025-B604	1	1.99	1.20	0.86	1.64	1.24	2.11	0.04	0.08	0.01	0.01
Fujitsu	TA08025-B605	1	1.73	1.20	0.99	1.64	1.38	2.11	0.05	0.08	0.01	0.01
JMA WIRELESS	MX08FRO665-21	0.5	3.60	1.25	4.01	1.61	4.53	2.06	0.17	0.07	0.04	0.02
JMA WIRELESS	MX08FRO665-21	0.5	3.60	1.25	4.01	1.61	4.53	2.06	0.17	0.07	0.04	0.02
Fujitsu	TA08025-B604	1	1.99	1.20	0.86	1.64	1.24	2.11	0.04	0.08	0.01	0.01
Fujitsu	TA08025-B605	1	1.73	1.20	0.99	1.64	1.38	2.11	0.05	0.08	0.01	0.01

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: 13.51 ft (NAVD 88)
Latitude: 41.1235
Longitude: -73.3131



Wind

Results:

Wind Speed	118 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: Sat Mar 19 2022

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).

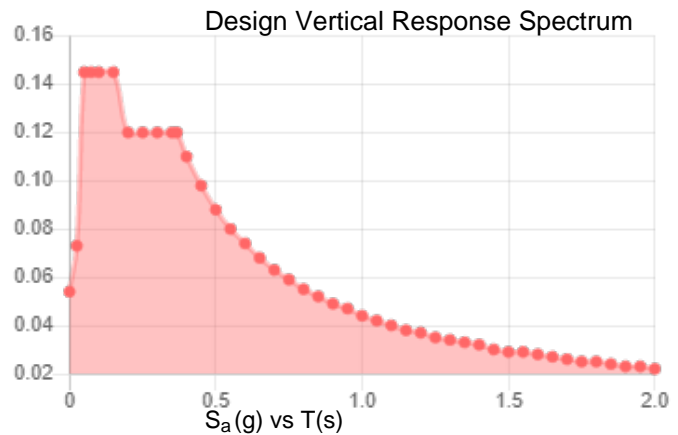
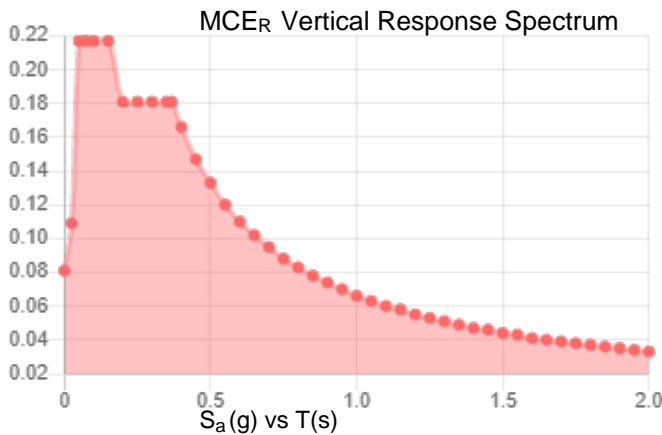
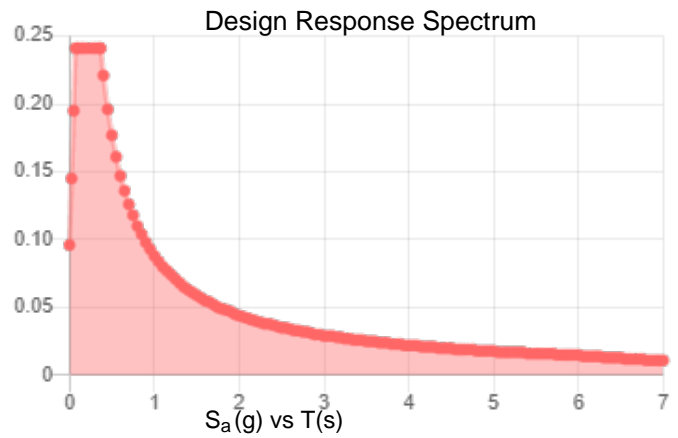
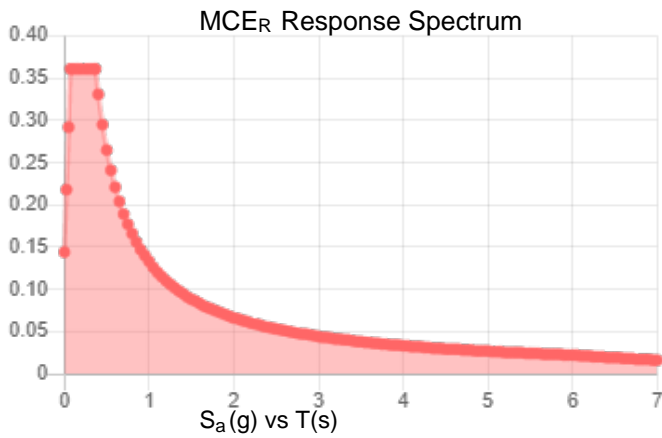
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

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

Results:

S_s :	0.226	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.131
F_v :	2.4	PGA _M :	0.201
S_{MS} :	0.361	F_{PGA} :	1.538
S_{M1} :	0.133	I_e :	1
S_{DS} :	0.241	C_v :	0.751

Seismic Design Category B



Data Accessed: Sat Mar 19 2022

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: Sat Mar 19 2022

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.

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AMERICAN TOWER®
CORPORATION

Structural Analysis Report

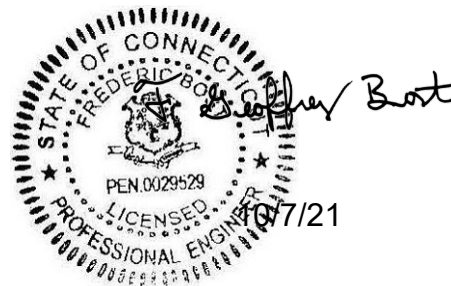
Structure : 142 ft Monopole
ATC Site Name : WSPT - South,CT
ATC Site Number : 302511
Engineering Number : 13705673_C3_03
Proposed Carrier : DISH WIRELESS L.L.C.
Carrier Site Name : NJJER01139B
Carrier Site Number : NJJER01139B
Site Location : 20 Post Office Lane
Westport, CT 06880-6226
41.1235, -73.3131
County : Fairfield
Date : October 6, 2021
Max Usage : 88%
Result : Pass

Prepared By:

Justin Althizer
ETS

Reviewed By:

Frederic G. Bost, PE, CWI, GC
ETS Job No. 21098146.STR.9916



COA : PEC.0001553



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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 142 ft Monopole to reflect the change in loading by DISH WIRELESS L.L.C..

Supporting Documents

Tower Drawings	EEI Drawing #GS50841, dated March 2, 1998
Foundation Drawing	Mapping by TEP Project #65218-72422, dated December 28, 2015
Geotechnical Report	MB&A Project #011105, dated July 17, 2001
Modifications	EEI Drawing #GS54696, dated July 24, 2003 ATC Job #42046633, dated October 16, 2008

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	118 mph (3-second gust)
Basic Wind Speed w/ Ice:	50 mph (3-second gust) w/ 1.00" radial ice concurrent
Code:	ANSI/TIA-222-H / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	C
Risk Category:	II
Topographic Factor Procedure:	Method 1
Topographic Category:	1
Crest Height (H):	0 ft
Crest Length (L):	0 ft
Spectral Response:	$S_s = 0.23$, $S_i = 0.06$
Site Class:	D - Stiff Soil - Default

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

Existing and Reserved Equipment

Elev. ¹ (ft)	Qty	Equipment	Mount Type	Lines	Carrier
131.0	3	Ericsson RRUS 4449 B5, B12	Triangular Platform with Handrails	(3) 0.39" (10mm) Fiber Trunk (6) 0.78" (19.7mm) 8 AWG 6 (12) 1 1/4" Coax (4) 2" conduit (1) 0.28" (7mm) RG-6	AT&T MOBILITY
	3	Ericsson RRUS 8843 B2, B66A			
	2	Raycap DC6-48-60-18-8F ("Squid")			
	3	Kathrein Scala 80010965			
	3	CCI OPA65R-BU6D			
	3	Quintel QS66512-2			
	3	Powerwave Allgon 7770.00			
	3	Ericsson RRUS 32 B30			
	1	Raycap DC6-48-60-0-8C			
	3	Ericsson RRUS 4478 B14			
128.5	3	Kaelus DBC0061F1V51-2			
127.5	6	Powerwave Allgon LGP21401			
120.0	2	DragonWave Horizon Compact	Triangular Platform with Handrails	(1) 2" conduit (2) 1/2" Coax (6) 5/16" (0.31"-7.9mm) Coax	CLEARWIRE CORPORATION
	3	Argus LLPX310R			
	2	DragonWave A-ANT-18G-2-C			
	3	NextNet BTS-2500			
	3	Commscope NNVV-65B-R4	Triangular Platform with Handrails	(3) 1 1/4" Hybriflex Cable (2) 1.7" (43.2mm) Hybrid	SPRINT NEXTEL
	3	Alcatel-Lucent 1900 MHz 4X45 RRH			
	3	Alcatel-Lucent 800 MHz 2X50W RRH w/ Filter			
	3	Alcatel-Lucent RRH2x50-08			
3	Nokia 2.5G MAA - AAHC(64T64R)				
111.0	-	-	Triangular Platform with Handrails		
100.0	1	Generic GPS	Triangular Platform with Handrails	(6) 1 5/8" Coax (1) 1 5/8" Hybriflex (1) 1/2" Coax	VERIZON WIRELESS
	3	Samsung B2/B66A RRH-BR049			
	6	Quintel QS6656-5D			
	3	Samsung B5/B13 RRH-BR04C			
	1	Commscope RC2DC-3315-PF-48			
	3	Samsung MT6407-77A			
	3	Antel BXA-70080/6CF__			
90.0	3	RFS APXVAARR24_43-U-NA20	Square Platform with Handrails	(2) 1 1/4" (1.25"-31.8mm) Fiber (1) 1 5/8" (1.63"-41.3mm) Fiber (12) 1 5/8" Coax	T-MOBILE
	4	Ericsson AIR 21, 1.3 M, B2A B4P			
	3	Ericsson Radio 4449 B12,B71			
	4	RFS ATMAA1412D-1A20			
	4	Ericsson AIR 32 B2A/B66A			
78.1	2	Diamond X50A	Stand-Off	(2) 0.405" (10.3mm) Coax	SENET, INC.
69.7	1	PCTEL GPS-TMG-HR-26N	Stand-Off	(1) 1/2" Coax	SPRINT NEXTEL



Equipment to be Removed

Elev. ¹ (ft)	Qty	Equipment	Mount Type	Lines	Carrier
No loading was considered as removed as part of this analysis.					

Proposed Equipment

Elev. ¹ (ft)	Qty	Equipment	Mount Type	Lines ²	Carrier
53.0	1	Raycap RDIDC-9181-PF-48	Triangular Platform with Handrails	(1) 1.75" (44.5mm) Hybrid	DISH WIRELESS L.L.C.
	3	Fujitsu TA08025-B604			
	3	Fujitsu TA08025-B605			
	3	JMA Wireless MX08FRO665-21			

¹ Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.

² Install Proposed Lines Inside Pole Shaft.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	64%	Pass
Base Plate	36%	Pass
Shaft	88%	Pass
Reinforcement	61%	Pass
Flanges	47%	Pass
Interface	81%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	3717.9	45%
Shear (Kips)	39.7	37%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

Deflection, Twist and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
120.0	DragonWave A-ANT-18G-2-C	CLEARWIRE CORPORATION	1.500	1.510
53.0	JMA Wireless MX08FRO665-21	DISH WIRELESS L.L.C.	0.258	0.550
	Fujitsu TA08025-B605			
	Raycap RDIDC-9181-PF-48			
	Fujitsu TA08025-B604			

*Deflection, Twist and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-H

Standard Conditions

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

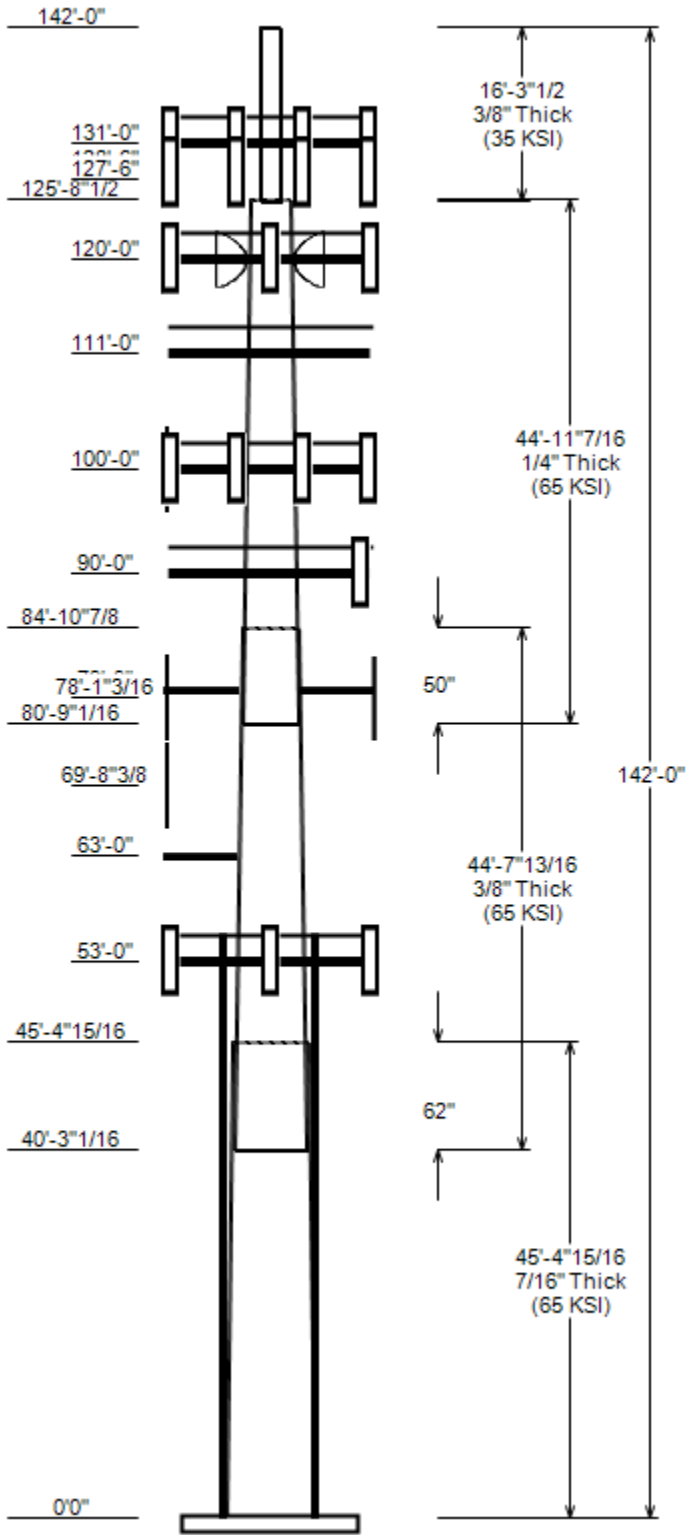
All assets of American Tower Corporation, its affiliates, and subsidiaries (collectively “American Tower”) are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

Asset : 302511, WSPT - South
 Client : DISH WIRELESS L.L.C.
 Code : ANSI/TIA-222-H

Height : 142 ft
 Base Width : 45
 Shape : 12 Sides



SITE PARAMETERS

Base Elev (ft): 0.00 Structure Class: II
 Taper : 0.21300 (In/ft) Exposure : C
 Topographic Category : 1 Topographic Feature:
 Topo Method : Method 1

SECTION PROPERTIES

Shaft Section	Length (ft)	Diameter (in)		Thick (in)	Overlap Length (in)	Steel Grade (ksi)
		Across Flats Top	Across Flats Bottom			
1	45.412	35.35	45.00	0.438	0.000	12 Sides 65
2	44.654	27.70	37.19	0.375	61.880	Slip Joint 12 Sides 65
3	44.951	19.52	29.08	0.250	49.810	Slip Joint 12 Sides 65
4	16.291	10.75	10.75	0.375	0.000	Butt Joint Round 35

DISCRETE APPURTENANCE

Attach Elev (ft)	Force Elev (ft)	Qty	Description
131.0	127.0	2	Raycap DC6-48-60-18-8F ("Squid)
131.0	127.0	3	Ericsson RRUS 8843 B2, B66A
131.0	131.0	3	Ericsson RRUS 4478 B14
131.0	127.0	3	Ericsson RRUS 4449 B5, B12
131.0	131.0	1	Raycap DC6-48-60-0-8C
131.0	127.0	3	Ericsson RRUS 32 B30
131.0	127.0	3	Powerwave Allgon 7770.00
131.0	131.0	3	Quintel QS66512-2
131.0	131.0	3	CCI OPA65R-BU6D
131.0	127.0	3	Kathrein Scala 80010965
131.0	131.0	1	Generic Flat Platform with Han
128.5	128.5	3	Kaelus DBC0061F1V51-2
127.5	127.5	6	Powerwave Allgon LGP21401
120.0	120.0	2	DragonWave Horizon Compact
120.0	120.0	3	Alcatel-Lucent RRH2x50-08
120.0	120.0	3	NextNet BTS-2500
120.0	120.0	3	Alcatel-Lucent 800 MHz 2X50W R
120.0	120.0	3	Alcatel-Lucent 1900 MHz 4X45 R
120.0	120.0	3	Nokia 2.5G MAA - AAHC(64T64R)
120.0	120.0	3	Argus LLPX310R
120.0	120.0	2	DragonWave A-ANT-18G-2-C
120.0	120.0	3	Commscope NNVV-65B-R4
120.0	120.0	1	Generic Flat Platform with Han
111.0	111.0	1	Generic Flat Platform with Han
100.0	100.0	1	Generic GPS
100.0	100.0	3	Samsung B5/B13 RRH-BR04C
100.0	100.0	3	Samsung B2/B66A RRH-BR049
100.0	100.0	1	Commscope RC2DC-3315-PF-48
100.0	100.0	3	Samsung MT6407-77A
100.0	100.0	3	Antel BXA-70080/6CF__
100.0	100.0	6	Quintel QS6656-5D
100.0	100.0	1	Generic Flat Platform with Han
90.0	90.0	4	RFS ATMAA1412D-1A20
90.0	90.0	3	Ericsson Radio 4449 B12,B71
90.0	90.0	4	Ericsson AIR 21, 1.3 M, B2A B4
90.0	90.0	4	Ericsson AIR 32 B2A/B66A
90.0	90.0	3	RFS APXVAARR24_43-U-NA20
90.0	90.0	1	Generic Square Platform with H
79.0	79.0	2	Round Side Arm
78.1	78.1	2	Diamond X50A
69.7	69.7	1	PCTEL GPS-TMG-HR-26N
63.0	63.0	1	Stand-Off
53.0	53.0	1	Raycap RDIDC-9181-PF-48
53.0	53.0	3	Fujitsu TA08025-B605

JOB INFORMATION

Asset : 302511, WSPT - South
 Client : DISH WIRELESS L.L.C.
 Code : ANSI/TIA-222-H

Height : 142 ft
 Base Width : 45
 Shape : 12 Sides

DISCRETE APPURTENANCE

Attach Elev (ft)	Force Elev (ft)	Qty	Description
53.0	53.0	3	Fujitsu TA08025-B604
53.0	53.0	3	JMA Wireless MX08FRO665-21
53.0	53.0	1	Generic Flat Platform with Han

LINEAR APPURTENANCE

Elev From (ft)	Elev To (ft)	Description	Exp To Wind
0.0	131.0	2" conduit	No
0.0	131.0	1 1/4" Coax	No
0.0	131.0	0.78" (19.7mm) 8 AWG 6	No
0.0	131.0	0.39" (10mm) Fiber Trunk	No
0.0	130.0	2" conduit	No
0.0	130.0	0.39" (10mm) Fiber Trunk	No
0.0	130.0	0.28" (7mm) RG-6	No
0.0	128.0	1 1/4" Coax	No
0.0	121.0	2" conduit	Yes
0.0	120.0	5/16" (0.31"-7.9mm) Coax	No
0.0	120.0	1/2" Coax	Yes
0.0	120.0	1.7" (43.2mm) Hybrid	No
0.0	120.0	1 1/4" Hybriflex Cable	No
0.0	100.0	1/2" Coax	No
0.0	100.0	1 5/8" Hybriflex	No
0.0	100.0	1 5/8" Coax	No
0.0	90.0	1 5/8" Coax	No
0.0	90.0	1 5/8" Coax	Yes
0.0	90.0	1 5/8" (1.63"-41.3mm) Fiber	Yes
0.0	90.0	1 1/4" (1.25"- 31.8mm) Fiber	Yes
0.0	78.0	0.405" (10.3mm) Coax	No
0.0	70.0	1/2" Coax	No
0.0	63.0	#20 w/ Angle Brackets	Yes
0.0	63.0	#20 w/ Angle Brackets	Yes
0.0	63.0	#20 w/ Angle Brackets	Yes
0.0	63.0	#20 w/ Angle Brackets	Yes
0.0	53.0	1.75" (44.5mm) Hybrid	No

LOAD CASES

1.2D + 1.0W Normal	118 mph wind with no ice
0.9D + 1.0W Normal	118 mph wind with no ice
1.2D + 1.0Di + 1.0Wi Nor	50 mph wind with 1" radial ice
1.2D + 1.0Ev + 1.0Eh Nor	Seismic
0.9D - 1.0Ev + 1.0Eh Nor	Seismic (Reduced DL)
1.0D + 1.0W Service Norm	60 mph Wind with No Ice

REACTIONS

Load Case	Moment (kip-ft)	Shear (Kip)	Axial (Kip)
1.2D + 1.0W Normal	3717.87	39.65	63.78
0.9D + 1.0W Normal	3666.18	39.62	47.82
1.2D + 1.0Di + 1.0Wi Normal	907.18	9.38	84.57
1.2D + 1.0Ev + 1.0Eh Normal	176.15	1.60	64.21
0.9D - 1.0Ev + 1.0Eh Normal	172.67	1.60	43.81
1.0D + 1.0W Service Normal	856.91	9.19	53.21

DISH DEFLECTIONS

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
1.0D + 1.0W Service Normal	120.00	18.208	1.528

ASSET: 302511, WSPT - South
CUSTOMER: DISH WIRELESS L.L.C.

CODE: ANSI/TIA-222-H
ENG NO:

ANALYSIS PARAMETERS

Location:	Fairfield County,CT	Height:	142 ft
Type and Shape:	Custom, Round	Base Diameter:	45.00 in
Manufacturer:	EEL	Top Diameter:	10.75 in
K _d (non-service):	0.95	Taper:	0.2130 in/ft
K _e :	1.00	Rotation:	0.000°

ICE & WIND PARAMETERS

Exposure Category:	C	Design Wind Speed w/o Ice:	118 mph
Risk Category:	II	Design Wind Speed w/Ice:	50 mph
Topo Factor Procedure:	Method 1	Operational Wind Speed:	60 mph
Topographic Category:	1	Design Ice Thickness:	1.00 in
Crest Height:	0 ft	HMSL:	15.00 ft

SEISMIC PARAMETERS

Analysis Method:	Equivalent Lateral Force Method				
Site Class:	D - Stiff Soil	Period Based on Rayleigh Method (sec):	2.46		
T _L (sec):	6	P:	1	C _s :	0.030
S _s :	0.226	S ₁ :	0.055	C _s Max:	0.030
F _a :	1.600	F _v :	2.400	C _s Min:	0.030
S _{ds} :	0.241	S _{d1} :	0.088		

LOAD CASES

1.2D + 1.0W Normal	118 mph wind with no ice
0.9D + 1.0W Normal	118 mph wind with no ice
1.2D + 1.0Di + 1.0Wi Normal	50 mph wind with 1" radial ice
1.2D + 1.0Ev + 1.0Eh Normal	Seismic
0.9D - 1.0Ev + 1.0Eh Normal	Seismic (Reduced DL)
1.0D + 1.0W Service Normal	60 mph Wind with No Ice

SHAFT SECTION PROPERTIES

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint len (in)	Bottom							Top						
						Weight (lb)	Dia (in)	Elev (ft)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Dia (in)	Elev (in)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Taper (in/ft)
1-12	45.41	0.4375	65		0.00	8,650	45.00	-0.002	62.78	15,912.1	24.88	102.86	35.35	45.41	49.18	7,648.8	18.97	80.79	0.2126
2-12	44.65	0.3750	65	Slip	61.88	5,884	37.19	40.256	44.46	7,691.5	23.90	99.18	27.70	84.91	32.99	3,144.0	17.11	73.86	0.2126
3-12	44.95	0.2500	65	Slip	49.81	2,962	29.08	80.759	23.21	2,462.4	28.49	116.32	19.52	125.71	15.52	735.7	18.25	78.10	0.2126
4-R	16.29	0.3750	35	Butt	0.00	678	10.75	125.709	12.22	164.6	0.00	28.67	10.75	142.00	12.22	164.6	0.00	28.67	0.0000

Shaft Weight 18,174

DISCRETE APPURTENANCE PROPERTIES

Attach Elev (ft)	Description	Qty	Ka	Vert Ecc (ft)	No Ice			Ice		
					Weight (lb)	EPAA (sf)	Orientation Factor	Weight (lb)	EPAA (sf)	Orientation Factor
131.00	Kathrein Scala 80010965	3	0.75	-4.000	97.60	13.814	0.62	273.24	15.824	0.62
131.00	Ericsson RRUS 4478 B14	3	0.75	0.000	59.90	1.842	0.50	96.33	2.433	0.50
131.00	Quintel QS66512-2	3	0.75	0.000	111.00	8.133	0.74	242.28	9.969	0.74
131.00	Powerwave Allgon 7770.00	3	0.75	-4.000	35.00	5.508	0.65	109.89	6.908	0.65
131.00	Ericsson RRUS 32 B30	3	0.75	-4.000	60.00	2.743	0.67	108.47	3.513	0.67
131.00	Raycap DC6-48-60-0-8C	1	0.75	0.000	16.00	2.030	1.00	48.30	2.530	1.00
131.00	Ericsson RRUS 4449 B5, B12	3	0.75	-4.000	71.00	1.969	0.50	113.46	2.584	0.50
131.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	3670.33	56.216	1.00
131.00	CCI OPA65R-BU6D	3	0.75	0.000	63.20	12.871	0.63	235.38	14.714	0.63
131.00	Ericsson RRUS 8843 B2, B66A	3	0.75	-4.000	72.00	1.639	0.50	112.38	2.196	0.50
131.00	Raycap DC6-48-60-18-8F ("Squid	2	0.75	-4.000	31.80	1.470	1.00	72.45	1.930	1.00
128.50	Kaelus DBC0061F1V51-2	3	0.75	0.000	25.50	0.433	0.50	37.65	0.729	0.50
127.50	Powerwave Allgon LGP21401	6	0.75	0.000	14.10	1.104	0.50	30.49	1.573	0.50
120.00	Alcatel-Lucent 1900 MHz 4X45 R	3	0.75	0.000	60.00	2.322	0.67	112.54	3.026	0.67
120.00	Nokia 2.5G MAA - AAHC(64T64R)	3	0.75	0.000	103.60	4.203	0.64	177.09	5.077	0.64
120.00	Argus LLPX310R	3	0.75	0.000	28.60	4.292	0.63	87.35	5.370	0.63
120.00	DragonWave A-ANT-18G-2-C	2	0.75	0.000	27.10	4.688	1.00	90.72	5.518	1.00
120.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	3658.12	56.072	1.00
120.00	Alcatel-Lucent 800 MHz 2X50W R	3	0.75	0.000	64.00	2.058	0.67	114.23	2.682	0.67
120.00	NextNet BTS-2500	3	0.75	0.000	35.00	1.817	0.50	65.23	2.414	0.50
120.00	Commscope NNVV-65B-R4	3	0.75	0.000	77.40	12.271	0.64	241.21	14.099	0.64
120.00	Alcatel-Lucent RRH2x50-08	3	0.75	0.000	52.90	1.701	0.50	91.53	2.263	0.50
120.00	DragonWave Horizon Compact	2	1.00	0.000	10.60	0.721	0.50	25.26	1.092	0.50
111.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	3651.03	55.988	1.00
100.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	3636.71	55.819	1.00
100.00	Quintel QS6656-5D	6	0.75	0.000	88.00	8.133	0.74	215.49	9.917	0.74
100.00	Antel BXA-70080/6CF	3	0.75	0.000	18.00	5.836	0.72	98.41	7.358	0.72
100.00	Samsung MT6407-77A	3	0.75	0.000	81.60	4.709	0.61	146.82	5.681	0.61
100.00	Commscope RC2DC-3315-PF-48	1	0.75	0.000	32.00	3.781	0.77	102.14	4.627	0.77
100.00	Samsung B5/B13 RRH-BR04C	3	0.75	0.000	70.30	1.875	0.50	106.90	2.453	0.50
100.00	Generic GPS	1	0.75	0.000	10.00	0.900	1.00	28.72	1.309	1.00
100.00	Samsung B2/B66A RRH-BR049	3	0.75	0.000	84.40	1.875	0.50	125.22	2.453	0.50
90.00	RFS APXVAARR24_43-U-NA20	3	0.75	0.000	127.90	20.243	0.63	376.40	22.591	0.63
90.00	Ericsson AIR 32 B2A/B66A	4	0.75	0.000	143.30	6.870	0.75	258.88	8.321	0.75
90.00	Ericsson AIR 21, 1.3 M, B2A B4	4	0.75	0.000	83.00	6.049	0.71	175.38	7.417	0.71
90.00	Ericsson Radio 4449 B12,B71	3	0.75	0.000	74.00	1.639	0.50	109.44	2.173	0.50
90.00	RFS ATMAA1412D-1A20	4	0.75	0.000	13.00	1.000	0.50	29.79	1.422	0.50
90.00	Generic Square Platform with H	1	1.00	0.000	3790.00	49.300	1.00	6597.75	103.215	1.00
79.00	Round Side Arm	2	1.00	0.000	150.00	5.200	0.67	195.80	6.901	0.67
78.10	Diamond X50A	2	0.90	0.000	2.30	1.120	1.00	3.21	2.237	1.00
69.70	PCTEL GPS-TMG-HR-26N	1	1.00	0.000	0.60	0.090	1.00	3.59	0.201	1.00
63.00	Stand-Off	1	1.00	0.000	30.00	1.000	0.67	38.94	1.319	0.67
53.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	3566.42	54.990	1.00
53.00	JMA Wireless MX08FRO665-21	3	0.75	0.000	64.50	12.489	0.64	218.79	14.176	0.64
53.00	Fujitsu TA08025-B605	3	0.75	0.000	75.00	1.962	0.50	112.61	2.514	0.50
53.00	Fujitsu TA08025-B604	3	0.75	0.000	63.90	1.962	0.50	98.91	2.514	0.50
53.00	Raycap RDIDC-9181-PF-48	1	0.75	0.000	21.90	1.867	1.00	56.06	2.407	1.00

Totals Num Loadings: 47 121 23,442.80 40,000.35

LINEAR APPURTENANCE PROPERTIES

Load Case Azimuth (deg) : 0.00_

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Dia (in)	Coax Wt (lb/ft)	Max Coax/ Row	Dist Between Rows(in)	Dist Between Cols(in)	Azimuth (deg)	Dist From Face	Dist Exposed To Wind	Carrier
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ASSET: 302511, WSPT - South
 CUSTOMER: DISH WIRELESS L.L.C.

CODE: ANSI/TIA-222-H
 ENG NO:

(in)

0.00	131.00	6	1 1/4" Coax	1.55	0.63	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	131.00	6	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	131.00	2	0.39" (10mm) Fiber Tr	0.39	0.06	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	131.00	2	2" conduit	2.38	3.65	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	130.00	2	2" conduit	2.38	3.65	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	130.00	1	0.39" (10mm) Fiber Tr	0.39	0.06	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	130.00	1	0.28" (7mm) RG-6	0.28	0.03	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	128.00	6	1 1/4" Coax	1.55	0.63	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	121.00	1	2" conduit	2.38	3.65	N	1	0	0	95	0	Y	CLEARWIRE COR
0.00	120.00	6	5/16" (0.31"-7.9mm) C	0.31	0.05	N	6	0	0	0	0	N	CLEARWIRE COR
0.00	120.00	3	1 1/4" Hybriflex Cabl	1.54	1	N	0	0	0	75	0	N	SPRINT NEXTEL
0.00	120.00	2	1/2" Coax	0.63	0.15	N	2	0	0	85	0	Y	CLEARWIRE COR
0.00	120.00	2	1.7" (43.2mm) Hybrid	1.7	1.78	N	0	0	0	0	0	N	SPRINT NEXTEL
0.00	100.00	6	1 5/8" Coax	1.98	0.82	N	0	0	0	0	0	N	VERIZON WIREL
0.00	100.00	1	1 5/8" Hybriflex	1.98	1.3	N	0	0	0	0	0	N	VERIZON WIREL
0.00	100.00	1	1/2" Coax	0.63	0.15	N	0	0	0	0	0	N	VERIZON WIREL
0.00	90.00	8	1 5/8" Coax	1.98	0.82	N	6	0	0	0	0	N	T-MOBILE
0.00	90.00	4	1 5/8" Coax	1.98	0.82	N	4	0	0	285	0	Y	T-MOBILE
0.00	90.00	2	1 1/4" (1.25"- 31.8mm	1.25	1.05	N	2	0	0	262	0	Y	T-MOBILE
0.00	90.00	1	1 5/8" (1.63"-41.3mm)	1.63	1.61	N	1	0	0	269	0	Y	T-MOBILE
0.00	78.00	2	0.405" (10.3mm) Coax	0.41	0.11	N	0	0	0	0	0	N	SENET, INC.
0.00	70.00	1	1/2" Coax	0.63	0.15	N	0	0	0	0	0	N	SPRINT NEXTEL
0.00	63.00	1	#20 w/ Angle Brackets	4	4.68	N	1	0	0	310	0	Y	
0.00	63.00	1	#20 w/ Angle Brackets	4	4.68	N	1	0	0	220	0	Y	
0.00	63.00	1	#20 w/ Angle Brackets	4	4.68	N	1	0	0	130	0	Y	
0.00	63.00	1	#20 w/ Angle Brackets	4	4.68	N	1	0	0	40	0	Y	
0.00	53.00	1	1.75" (44.5mm) Hybrid	1.75	2.72	N	0	0	0	0	0	N	DISH WIRELESS

ADDITIONAL STEEL

Intermediate Connectors

Elev From (ft)	Elev To (ft)	Qty	Description	Fy (ksi)	Offset (in)	Description	Spacing (in)	Len (in)	Connectors	Continuation?
0.00	55.68	4	SOL #20 All Thread Bar	80	2.19	6" Angle Bracket	30.00	3.31	5/8" A36 U-Bolt	Y

SEGMENT PROPERTIES

(Max Len: 5.ft)

Additional Reinforcing

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in ³)	Z (in ³)	Weight (lb)	Area (in ²)	Ix (in ⁴)	Weight (lb)
0.00		0.4375	45.000	62.777	15,912.10	24.88	102.86	77.6	683.1	0.0	0.0	19.640	6,615.40	0.0
5.00		0.4375	43.937	61.280	14,800.40	24.23	100.43	78.3	650.8	0.0	1,055.3	19.640	6,347.40	334.0
10.00		0.4375	42.874	59.782	13,741.60	23.58	98.00	79	619.2	0.0	1,029.9	19.640	6,084.90	334.0
15.00		0.4375	41.811	58.285	12,734.60	22.93	95.57	79.7	588.4	0.0	1,004.4	19.640	5,828.00	334.0
20.00		0.4375	40.748	56.787	11,778.10	22.28	93.14	80.4	558.4	0.0	978.9	19.640	5,576.70	334.0
25.00		0.4375	39.685	55.290	10,870.70	21.63	90.71	81.1	529.2	0.0	953.4	19.640	5,330.80	334.0
30.00		0.4375	38.622	53.792	10,011.10	20.97	88.28	81.8	500.7	0.0	928.0	19.640	5,090.60	334.0
35.00		0.4375	37.559	52.295	9,198.10	20.32	85.85	81.9	473.1	0.0	902.5	19.640	4,855.90	334.0
40.00		0.4375	36.496	50.797	8,430.30	19.67	83.42	81.9	446.2	0.0	877.0	19.640	4,626.70	334.0
40.26	Bot - Section 2	0.4375	36.442	50.721	8,392.30	19.64	83.30	81.9	444.9	0.0	44.1	19.640	4,615.10	17.1
45.00		0.4375	35.433	49.300	7,706.50	19.02	80.99	81.9	420.2	0.0	1,515.4	19.640	4,560.30	316.9
45.41	Top - Section 1	0.3750	36.096	43.133	7,024.70	23.11	96.25	79.5	376.0	0.0	129.4	19.640	4,541.80	27.5
50.00		0.3750	35.120	41.955	6,464.70	22.41	93.65	80.3	355.6	0.0	664.3	19.640	4,338.30	306.5
53.00		0.3750	34.482	41.184	6,115.20	21.96	91.95	80.8	342.6	0.0	424.4	19.640	4,207.80	200.4
55.00		0.3750	34.057	40.671	5,889.30	21.66	90.82	81.1	334.1	0.0	278.5	19.640	4,121.90	133.6
55.68	Reinf. Top	0.3750	33.912	40.496	5,813.80	21.55	90.43	81.2	331.2	0.0	93.9	19.640	4,092.80	45.4
60.00		0.3750	32.994	39.387	5,349.20	20.90	87.98	81.9	313.2	0.0	587.1			
63.00		0.3750	32.356	38.617	5,041.50	20.44	86.28	81.9	301.0	0.0	398.1			
65.00		0.3750	31.931	38.104	4,843.00	20.14	85.15	81.9	293.0	0.0	261.1			
69.70		0.3750	30.932	36.897	4,397.40	19.42	82.48	81.9	274.6	0.0	599.7			
70.00		0.3750	30.868	36.820	4,369.90	19.38	82.31	81.9	273.5	0.0	37.6			
75.00		0.3750	29.805	35.537	3,928.70	18.62	79.48	81.9	254.6	0.0	615.5			
78.10		0.3750	29.146	34.741	3,670.60	18.15	77.72	81.9	243.3	0.0	370.7			
79.00		0.3750	28.955	34.510	3,597.80	18.01	77.21	81.9	240.0	0.0	106.0			
80.00		0.3750	28.742	34.253	3,518.10	17.86	76.65	81.9	236.5	0.0	117.0			
80.76	Bot - Section 3	0.3750	28.581	34.059	3,458.50	17.74	76.22	81.9	233.8	0.0	88.1			
84.91	Top - Section 2	0.2500	28.198	22.498	2,243.10	27.54	112.79	74.7	153.7	0.0	796.4			
85.00		0.2500	28.179	22.483	2,238.50	27.52	112.72	74.7	153.5	0.0	7.0			
90.00		0.2500	27.116	21.627	1,992.50	26.38	108.46	75.9	142.0	0.0	375.2			
95.00		0.2500	26.053	20.771	1,765.20	25.24	104.21	77.2	130.9	0.0	360.7			
100.00		0.2500	24.990	19.916	1,555.90	24.10	99.96	78.4	120.3	0.0	346.1			
105.00		0.2500	23.927	19.060	1,363.80	22.97	95.71	79.7	110.1	0.0	331.6			
110.00		0.2500	22.864	18.204	1,188.30	21.83	91.46	80.9	100.4	0.0	317.0			
111.00		0.2500	22.651	18.033	1,155.10	21.60	90.61	81.2	98.5	0.0	61.7			
115.00		0.2500	21.801	17.349	1,028.50	20.69	87.20	81.9	91.1	0.0	240.8			
120.00		0.2500	20.738	16.493	883.70	19.55	82.95	81.9	82.3	0.0	287.9			
125.00		0.2500	19.675	15.637	753.10	18.41	78.70	81.9	73.9	0.0	273.3			
125.71	Top - Section 3	0.2500	19.524	15.516	735.70	18.25	78.10	81.9	72.8	0.0	37.6			
125.71	Bot - Section 4	0.3750	10.750	12.223	164.60	0.00	28.67	35	30.6	40.4				
127.50		0.3750	10.750	12.223	164.60	0.00	28.67	35	30.6	40.4	74.5			
128.50		0.3750	10.750	12.223	164.60	0.00	28.67	35	30.6	40.4	41.6			
130.00		0.3750	10.750	12.223	164.60	0.00	28.67	35	30.6	40.4	62.4			
131.00		0.3750	10.750	12.223	164.60	0.00	28.67	35	30.6	40.4	41.6			
135.00		0.3750	10.750	12.223	164.60	0.00	28.67	35	30.6	40.4	166.4			
140.00		0.3750	10.750	12.223	164.60	0.00	28.67	35	30.6	40.4	208.0			
142.00		0.3750	10.750	12.223	164.60	0.00	28.67	35	30.6	40.4	83.2			

Totals: 18,173.3 3,719.4

Load Case: 1.2D + 1.0W Normal	118 mph wind with no ice	25 Iterations
Gust Response Factor: 1.10		
Dead load Factor: 1.20		
Wind Load Factor: 1.00		

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-63.78	-39.65	0.00	-3,717.9	0.00	3,717.87	4,383.15	1,101.74	4,631.83	3,974.58	0	0	0.673
5.00	-61.49	-39.32	0.00	-3,519.6	0.00	3,519.61	4,317.75	1,075.46	4,413.56	3,820.98	0.12	-0.23	0.657
10.00	-59.23	-38.99	0.00	-3,323.0	0.00	3,322.99	4,250.45	1,049.18	4,200.56	3,668.58	0.49	-0.46	0.640
15.00	-57.00	-38.65	0.00	-3,128.0	0.00	3,128.02	4,181.22	1,022.90	3,992.83	3,517.51	1.09	-0.69	0.622
20.00	-54.81	-38.29	0.00	-2,934.8	0.00	2,934.76	4,110.09	996.62	3,790.36	3,367.90	1.94	-0.92	0.603
25.00	-52.65	-37.89	0.00	-2,743.3	0.00	2,743.32	4,037.03	970.34	3,593.17	3,219.87	3.03	-1.16	0.583
30.00	-50.53	-37.46	0.00	-2,553.9	0.00	2,553.87	3,962.07	944.06	3,401.23	3,073.55	4.37	-1.39	0.562
35.00	-48.44	-37.00	0.00	-2,366.6	0.00	2,366.55	3,854.66	917.78	3,214.57	2,906.04	5.95	-1.62	0.544
40.00	-46.45	-36.72	0.00	-2,181.5	0.00	2,181.54	3,744.28	891.49	3,033.18	2,741.05	7.77	-1.85	0.525
40.26	-46.29	-36.49	0.00	-2,172.2	0.00	2,172.17	3,738.64	890.15	3,024.06	2,732.75	7.87	-1.86	0.523
45.00	-43.58	-36.16	0.00	-1,999.0	0.00	1,999.02	3,633.90	865.21	2,857.05	2,580.88	9.83	-2.08	0.497
45.41	-43.30	-35.92	0.00	-1,984.1	0.00	1,984.13	3,086.43	756.98	2,551.07	2,241.91	10.01	-2.1	0.549
50.00	-41.61	-35.50	0.00	-1,819.3	0.00	1,819.30	3,030.85	736.30	2,413.68	2,140.79	12.12	-2.3	0.520
53.00	-36.89	-32.33	0.00	-1,712.8	0.00	1,712.80	2,993.64	722.79	2,325.92	2,075.27	13.62	-2.44	0.499
55.00	-36.19	-32.17	0.00	-1,648.1	0.00	1,648.14	2,968.45	713.78	2,268.31	2,031.88	14.66	-2.53	0.487
55.68	-35.91	-31.90	0.00	-1,626.3	0.00	1,626.26	2,959.81	710.71	2,248.88	2,017.17	15.02	-2.56	0.483
55.68	-35.91	-31.90	0.00	-1,626.3	0.00	1,626.26	2,959.81	710.71	2,248.88	2,017.17	15.02	-2.56	0.820
60.00	-34.72	-31.50	0.00	-1,488.4	0.00	1,488.44	2,903.25	691.25	2,127.44	1,923.84	17.43	-2.76	0.788
63.00	-33.85	-31.22	0.00	-1,393.9	0.00	1,393.94	2,846.48	677.73	2,045.09	1,848.92	19.24	-2.99	0.768
65.00	-33.29	-30.90	0.00	-1,331.5	0.00	1,331.50	2,808.64	668.72	1,991.10	1,799.80	20.52	-3.14	0.754
69.70	-32.17	-30.61	0.00	-1,186.3	0.00	1,186.27	2,719.70	647.55	1,867.05	1,686.98	23.79	-3.49	0.717
70.00	-32.02	-30.36	0.00	-1,177.1	0.00	1,177.09	2,714.02	646.20	1,859.26	1,679.90	24.01	-3.51	0.715
75.00	-30.83	-29.90	0.00	-1,025.3	0.00	1,025.30	2,619.41	623.67	1,731.95	1,564.13	27.88	-3.87	0.670
78.10	-30.12	-29.57	0.00	-932.6	0.00	932.60	2,560.75	609.70	1,655.28	1,494.43	30.47	-4.09	0.638
79.00	-29.57	-29.13	0.00	-906.0	0.00	905.98	2,543.72	605.65	1,633.34	1,474.49	31.25	-4.15	0.628
80.00	-29.34	-29.03	0.00	-876.8	0.00	876.85	2,524.80	601.14	1,609.14	1,452.50	32.12	-4.22	0.618
80.76	-29.13	-28.76	0.00	-854.9	0.00	854.86	2,510.46	597.73	1,590.92	1,435.94	32.8	-4.28	0.609
84.91	-27.85	-28.44	0.00	-735.5	0.00	735.46	1,512.05	394.85	1,041.03	860.67	36.64	-4.55	0.878
85.00	-27.75	-28.20	0.00	-732.9	0.00	732.87	1,511.46	394.57	1,039.59	859.73	36.72	-4.56	0.876
90.00	-20.88	-22.12	0.00	-591.9	0.00	591.86	1,478.12	379.56	961.98	808.48	41.72	-4.98	0.750
95.00	-20.10	-21.69	0.00	-481.3	0.00	481.27	1,442.87	364.54	887.39	757.68	47.14	-5.36	0.653
100.00	-15.22	-16.45	0.00	-372.8	0.00	372.82	1,405.70	349.52	815.80	707.46	52.93	-5.7	0.540
105.00	-14.58	-15.99	0.00	-290.6	0.00	290.58	1,366.62	334.50	747.22	657.95	59.06	-6.01	0.455
110.00	-13.97	-15.69	0.00	-210.6	0.00	210.62	1,325.62	319.48	681.66	609.26	65.49	-6.27	0.359
111.00	-11.09	-13.12	0.00	-194.9	0.00	194.92	1,317.19	316.48	668.91	599.63	66.8	-6.32	0.335
115.00	-10.64	-12.70	0.00	-142.4	0.00	142.44	1,278.76	304.47	619.10	559.79	72.16	-6.48	0.265
120.00	-6.04	-7.29	0.00	-78.9	0.00	78.91	1,215.69	289.45	559.56	505.63	79.03	-6.64	0.162
125.00	-5.58	-6.99	0.00	-42.5	0.00	42.48	1,152.61	274.43	503.02	454.22	86.02	-6.73	0.099
125.71	-5.52	-6.93	0.00	-37.5	0.00	37.52	1,143.67	272.30	495.25	447.16	87.02	-6.74	0.089
125.71	-5.52	-6.93	0.00	-37.5	0.00	37.52	385.02	115.51	105.36	106.00	87.02	-6.74	0.372
127.50	-5.29	-6.75	0.00	-25.1	0.00	25.10	385.02	115.51	105.36	106.00	89.55	-6.77	0.254
128.50	-5.12	-6.67	0.00	-18.4	0.00	18.35	385.02	115.51	105.36	106.00	90.96	-6.8	0.190
130.00	-5.01	-6.63	0.00	-8.3	0.00	8.34	385.02	115.51	105.36	106.00	93.1	-6.84	0.095
131.00	-0.52	-0.25	0.00	-1.7	0.00	1.71	385.02	115.51	105.36	106.00	94.53	-6.85	0.018
135.00	-0.34	-0.13	0.00	-0.7	0.00	0.73	385.02	115.51	105.36	106.00	100.26	-6.86	0.008
140.00	-0.10	-0.03	0.00	-0.1	0.00	0.06	385.02	115.51	105.36	106.00	107.42	-6.86	0.001
142.00	0.00	-0.02	0.00	0.0	0.00	0.00	385.02	115.51	105.36	106.00	110.29	-6.86	0.000

Load Case: 0.9D + 1.0W Normal	118 mph wind with no ice	25 Iterations
Gust Response Factor: 1.10		
Dead load Factor: 0.90		
Wind Load Factor: 1.00		

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-47.82	-39.62	0.00	-3,666.2	0.00	3,666.18	4,383.15	1,101.74	4,631.83	3,974.58	0	0	0.661
5.00	-46.06	-39.23	0.00	-3,468.1	0.00	3,468.09	4,317.75	1,075.46	4,413.56	3,820.98	0.12	-0.23	0.645
10.00	-44.33	-38.84	0.00	-3,272.0	0.00	3,271.96	4,250.45	1,049.18	4,200.56	3,668.58	0.48	-0.45	0.627
15.00	-42.62	-38.44	0.00	-3,077.8	0.00	3,077.77	4,181.22	1,022.90	3,992.83	3,517.51	1.08	-0.68	0.609
20.00	-40.95	-38.02	0.00	-2,885.6	0.00	2,885.56	4,110.09	996.62	3,790.36	3,367.90	1.91	-0.91	0.590
25.00	-39.30	-37.58	0.00	-2,695.4	0.00	2,695.44	4,037.03	970.34	3,593.17	3,219.87	2.99	-1.14	0.570
30.00	-37.67	-37.11	0.00	-2,507.5	0.00	2,507.54	3,962.07	944.06	3,401.23	3,073.55	4.3	-1.37	0.549
35.00	-36.08	-36.61	0.00	-2,322.0	0.00	2,322.01	3,854.66	917.78	3,214.57	2,906.04	5.85	-1.59	0.531
40.00	-34.57	-36.32	0.00	-2,139.0	0.00	2,138.96	3,744.28	891.49	3,033.18	2,741.05	7.64	-1.82	0.512
40.26	-34.44	-36.07	0.00	-2,129.7	0.00	2,129.69	3,738.64	890.15	3,024.06	2,732.75	7.74	-1.83	0.511
45.00	-32.39	-35.74	0.00	-1,958.6	0.00	1,958.57	3,633.90	865.21	2,857.05	2,580.88	9.67	-2.04	0.485
45.41	-32.17	-35.47	0.00	-1,943.9	0.00	1,943.87	3,086.43	756.98	2,551.07	2,241.91	9.85	-2.06	0.536
50.00	-30.89	-35.03	0.00	-1,781.1	0.00	1,781.10	3,030.85	736.30	2,413.68	2,140.79	11.93	-2.26	0.507
53.00	-27.36	-31.89	0.00	-1,676.0	0.00	1,676.00	2,993.64	722.79	2,325.92	2,075.27	13.39	-2.4	0.487
55.00	-26.82	-31.73	0.00	-1,612.2	0.00	1,612.21	2,968.45	713.78	2,268.31	2,031.88	14.42	-2.49	0.475
55.68	-26.61	-31.45	0.00	-1,590.6	0.00	1,590.64	2,959.81	710.71	2,248.88	2,017.17	14.77	-2.52	0.471
55.68	-26.61	-31.45	0.00	-1,590.6	0.00	1,590.64	2,959.81	710.71	2,248.88	2,017.17	14.77	-2.52	0.799
60.00	-25.69	-31.02	0.00	-1,454.8	0.00	1,454.79	2,903.25	691.25	2,127.44	1,923.84	17.14	-2.71	0.767
63.00	-25.02	-30.72	0.00	-1,361.7	0.00	1,361.72	2,846.48	677.73	2,045.09	1,848.92	18.92	-2.93	0.747
65.00	-24.58	-30.37	0.00	-1,300.3	0.00	1,300.28	2,808.64	668.72	1,991.10	1,799.80	20.18	-3.08	0.733
69.70	-23.72	-30.06	0.00	-1,157.6	0.00	1,157.56	2,719.70	647.55	1,867.05	1,686.98	23.38	-3.42	0.697
70.00	-23.60	-29.78	0.00	-1,148.5	0.00	1,148.54	2,714.02	646.20	1,859.26	1,679.90	23.6	-3.44	0.695
75.00	-22.68	-29.30	0.00	-999.6	0.00	999.63	2,619.41	623.67	1,731.95	1,564.13	27.39	-3.79	0.650
78.10	-22.14	-28.96	0.00	-908.8	0.00	908.80	2,560.75	609.70	1,655.28	1,494.43	29.93	-4.01	0.619
79.00	-21.73	-28.52	0.00	-882.7	0.00	882.73	2,543.72	605.65	1,633.34	1,474.49	30.69	-4.07	0.609
80.00	-21.55	-28.41	0.00	-854.2	0.00	854.21	2,524.80	601.14	1,609.14	1,452.50	31.55	-4.14	0.599
80.76	-21.38	-28.13	0.00	-832.7	0.00	832.68	2,510.46	597.73	1,590.92	1,435.94	32.21	-4.19	0.591
84.91	-20.41	-27.81	0.00	-715.9	0.00	715.92	1,512.05	394.85	1,041.03	860.67	35.97	-4.46	0.850
85.00	-20.32	-27.54	0.00	-713.4	0.00	713.39	1,511.46	394.57	1,039.59	859.73	36.06	-4.46	0.848
90.00	-15.25	-21.58	0.00	-575.7	0.00	575.68	1,478.12	379.56	961.98	808.48	40.95	-4.87	0.726
95.00	-14.64	-21.13	0.00	-467.8	0.00	467.81	1,442.87	364.54	887.39	757.68	46.25	-5.24	0.631
100.00	-11.08	-15.99	0.00	-362.2	0.00	362.18	1,405.70	349.52	815.80	707.46	51.92	-5.58	0.522
105.00	-10.59	-15.53	0.00	-282.2	0.00	282.21	1,366.62	334.50	747.22	657.95	57.91	-5.87	0.439
110.00	-10.13	-15.24	0.00	-204.5	0.00	204.54	1,325.62	319.48	681.66	609.26	64.19	-6.13	0.346
111.00	-8.02	-12.75	0.00	-189.3	0.00	189.30	1,317.19	316.48	668.91	599.63	65.48	-6.17	0.323
115.00	-7.69	-12.34	0.00	-138.3	0.00	138.29	1,278.76	304.47	619.10	559.79	70.71	-6.33	0.255
120.00	-4.36	-7.08	0.00	-76.6	0.00	76.59	1,215.69	289.45	559.56	505.63	77.42	-6.48	0.156
125.00	-4.02	-6.79	0.00	-41.2	0.00	41.21	1,152.61	274.43	503.02	454.22	84.25	-6.58	0.095
125.71	-3.97	-6.74	0.00	-36.4	0.00	36.39	1,143.67	272.30	495.25	447.16	85.23	-6.59	0.085
125.71	-3.97	-6.74	0.00	-36.4	0.00	36.39	385.02	115.51	105.36	106.00	85.23	-6.59	0.357
127.50	-3.80	-6.56	0.00	-24.3	0.00	24.32	385.02	115.51	105.36	106.00	87.7	-6.61	0.243
128.50	-3.68	-6.49	0.00	-17.8	0.00	17.76	385.02	115.51	105.36	106.00	89.09	-6.65	0.180
130.00	-3.60	-6.45	0.00	-8.0	0.00	8.03	385.02	115.51	105.36	106.00	91.18	-6.68	0.088
131.00	-0.39	-0.23	0.00	-1.6	0.00	1.58	385.02	115.51	105.36	106.00	92.57	-6.69	0.016
135.00	-0.25	-0.12	0.00	-0.7	0.00	0.67	385.02	115.51	105.36	106.00	98.17	-6.7	0.007
140.00	-0.07	-0.03	0.00	-0.1	0.00	0.06	385.02	115.51	105.36	106.00	105.16	-6.7	0.001
142.00	0.00	-0.02	0.00	0.0	0.00	0.00	385.02	115.51	105.36	106.00	107.96	-6.7	0.000

Load Case: 1.2D + 1.0Di + 1.0Wi Normal		50 mph wind with 1" radial ice		24 Iterations
Gust Response Factor:	1.10	Ice Dead Load Factor	1.00	
Dead load Factor:	1.20			Ice Importance Factor 1.00
Wind Load Factor:	1.00			

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-84.57	-9.38	0.00	-907.2	0.00	907.18	4,383.15	1,101.74	4,631.83	3,974.58	0	0	0.176
5.00	-82.10	-9.32	0.00	-860.3	0.00	860.31	4,317.75	1,075.46	4,413.56	3,820.98	0.03	-0.06	0.172
10.00	-79.63	-9.26	0.00	-813.7	0.00	813.70	4,250.45	1,049.18	4,200.56	3,668.58	0.12	-0.11	0.168
15.00	-77.18	-9.20	0.00	-767.4	0.00	767.38	4,181.22	1,022.90	3,992.83	3,517.51	0.27	-0.17	0.164
20.00	-74.75	-9.14	0.00	-721.4	0.00	721.36	4,110.09	996.62	3,790.36	3,367.90	0.47	-0.23	0.159
25.00	-72.35	-9.06	0.00	-675.7	0.00	675.67	4,037.03	970.34	3,593.17	3,219.87	0.74	-0.28	0.154
30.00	-69.98	-8.98	0.00	-630.4	0.00	630.35	3,962.07	944.06	3,401.23	3,073.55	1.07	-0.34	0.149
35.00	-67.64	-8.90	0.00	-585.4	0.00	585.43	3,854.66	917.78	3,214.57	2,906.04	1.46	-0.4	0.145
40.00	-65.34	-8.84	0.00	-540.9	0.00	540.94	3,744.28	891.49	3,033.18	2,741.05	1.9	-0.45	0.140
40.26	-65.22	-8.80	0.00	-538.7	0.00	538.69	3,738.64	890.15	3,024.06	2,732.75	1.93	-0.46	0.140
45.00	-62.21	-8.74	0.00	-496.9	0.00	496.92	3,633.90	865.21	2,857.05	2,580.88	2.41	-0.51	0.133
45.41	-61.95	-8.69	0.00	-493.3	0.00	493.33	3,086.43	756.98	2,551.07	2,241.91	2.46	-0.52	0.148
50.00	-60.00	-8.61	0.00	-453.4	0.00	453.44	3,030.85	736.30	2,413.68	2,140.79	2.98	-0.57	0.140
53.00	-53.63	-7.89	0.00	-427.6	0.00	427.61	2,993.64	722.79	2,325.92	2,075.27	3.35	-0.6	0.134
55.00	-52.80	-7.86	0.00	-411.8	0.00	411.82	2,968.45	713.78	2,268.31	2,031.88	3.6	-0.62	0.131
55.68	-52.52	-7.81	0.00	-406.5	0.00	406.48	2,959.81	710.71	2,248.88	2,017.17	3.69	-0.63	0.130
55.68	-52.52	-7.81	0.00	-406.5	0.00	406.48	2,959.81	710.71	2,248.88	2,017.17	3.69	-0.63	0.219
60.00	-51.10	-7.74	0.00	-372.7	0.00	372.73	2,903.25	691.25	2,127.44	1,923.84	4.29	-0.68	0.211
63.00	-50.08	-7.70	0.00	-349.5	0.00	349.50	2,846.48	677.73	2,045.09	1,848.92	4.73	-0.74	0.207
65.00	-49.50	-7.65	0.00	-334.1	0.00	334.11	2,808.64	668.72	1,991.10	1,799.80	5.05	-0.78	0.203
69.70	-48.17	-7.60	0.00	-298.1	0.00	298.14	2,719.70	647.55	1,867.05	1,686.98	5.86	-0.86	0.195
70.00	-48.08	-7.57	0.00	-295.9	0.00	295.86	2,714.02	646.20	1,859.26	1,679.90	5.92	-0.87	0.194
75.00	-46.70	-7.50	0.00	-258.0	0.00	257.99	2,619.41	623.67	1,731.95	1,564.13	6.88	-0.96	0.183
78.10	-45.85	-7.43	0.00	-234.7	0.00	234.73	2,560.75	609.70	1,655.28	1,494.43	7.52	-1.02	0.175
79.00	-45.18	-7.34	0.00	-228.0	0.00	228.04	2,543.72	605.65	1,633.34	1,474.49	7.71	-1.03	0.173
80.00	-44.91	-7.32	0.00	-220.7	0.00	220.71	2,524.80	601.14	1,609.14	1,452.50	7.93	-1.05	0.170
80.76	-44.70	-7.28	0.00	-215.2	0.00	215.16	2,510.46	597.73	1,590.92	1,435.94	8.1	-1.06	0.168
84.91	-43.22	-7.23	0.00	-184.9	0.00	184.92	1,512.05	394.85	1,041.03	860.67	9.05	-1.13	0.244
85.00	-43.20	-7.20	0.00	-184.3	0.00	184.27	1,511.46	394.57	1,039.59	859.73	9.07	-1.13	0.243
90.00	-32.20	-5.46	0.00	-148.2	0.00	148.25	1,478.12	379.56	961.98	808.48	10.32	-1.24	0.205
95.00	-31.29	-5.37	0.00	-120.9	0.00	120.92	1,442.87	364.54	887.39	757.68	11.67	-1.33	0.181
100.00	-23.77	-4.11	0.00	-94.1	0.00	94.06	1,405.70	349.52	815.80	707.46	13.11	-1.42	0.150
105.00	-22.94	-4.00	0.00	-73.5	0.00	73.51	1,366.62	334.50	747.22	657.95	14.65	-1.5	0.129
110.00	-22.15	-3.93	0.00	-53.5	0.00	53.50	1,325.62	319.48	681.66	609.26	16.25	-1.56	0.105
111.00	-18.11	-3.29	0.00	-49.6	0.00	49.58	1,317.19	316.48	668.91	599.63	16.58	-1.58	0.097
115.00	-17.49	-3.18	0.00	-36.4	0.00	36.43	1,278.76	304.47	619.10	559.79	17.92	-1.62	0.079
120.00	-10.05	-1.87	0.00	-20.5	0.00	20.51	1,215.69	289.45	559.56	505.63	19.64	-1.66	0.049
125.00	-9.41	-1.79	0.00	-11.2	0.00	11.18	1,152.61	274.43	503.02	454.22	21.39	-1.68	0.033
125.71	-9.32	-1.77	0.00	-9.9	0.00	9.91	1,143.67	272.30	495.25	447.16	21.64	-1.69	0.030
125.71	-9.32	-1.77	0.00	-9.9	0.00	9.91	385.02	115.51	105.36	106.00	21.64	-1.69	0.118
127.50	-8.97	-1.71	0.00	-6.7	0.00	6.74	385.02	115.51	105.36	106.00	22.27	-1.69	0.087
128.50	-8.75	-1.69	0.00	-5.0	0.00	5.02	385.02	115.51	105.36	106.00	22.63	-1.7	0.070
130.00	-8.62	-1.67	0.00	-2.5	0.00	2.49	385.02	115.51	105.36	106.00	23.17	-1.71	0.046
131.00	-0.73	-0.12	0.00	-0.8	0.00	0.82	385.02	115.51	105.36	106.00	23.52	-1.71	0.010
135.00	-0.47	-0.06	0.00	-0.3	0.00	0.34	385.02	115.51	105.36	106.00	24.96	-1.72	0.004
140.00	-0.13	-0.01	0.00	-0.0	0.00	0.03	385.02	115.51	105.36	106.00	26.76	-1.72	0.001
142.00	0.00	-0.01	0.00	0.0	0.00	0.00	385.02	115.51	105.36	106.00	27.48	-1.72	0.000

Load Case: 1.0D + 1.0W Service Normal	60 mph Wind with No Ice	24 Iterations
Gust Response Factor: 1.10		
Dead load Factor: 1.00		
Wind Load Factor: 1.00		

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-53.21	-9.19	0.00	-856.9	0.00	856.91	4,383.15	1,101.74	4,631.83	3,974.58	0	0	0.162
5.00	-51.43	-9.11	0.00	-811.0	0.00	810.95	4,317.75	1,075.46	4,413.56	3,820.98	0.03	-0.05	0.158
10.00	-49.66	-9.02	0.00	-765.4	0.00	765.41	4,250.45	1,049.18	4,200.56	3,668.58	0.11	-0.11	0.153
15.00	-47.92	-8.94	0.00	-720.3	0.00	720.30	4,181.22	1,022.90	3,992.83	3,517.51	0.25	-0.16	0.149
20.00	-46.21	-8.84	0.00	-675.6	0.00	675.62	4,110.09	996.62	3,790.36	3,367.90	0.45	-0.21	0.145
25.00	-44.52	-8.75	0.00	-631.4	0.00	631.40	4,037.03	970.34	3,593.17	3,219.87	0.7	-0.27	0.140
30.00	-42.86	-8.64	0.00	-587.7	0.00	587.68	3,962.07	944.06	3,401.23	3,073.55	1.01	-0.32	0.135
35.00	-41.22	-8.53	0.00	-544.5	0.00	544.48	3,854.66	917.78	3,214.57	2,906.04	1.37	-0.37	0.130
40.00	-39.62	-8.46	0.00	-501.8	0.00	501.83	3,744.28	891.49	3,033.18	2,741.05	1.79	-0.43	0.126
40.26	-39.53	-8.41	0.00	-499.7	0.00	499.67	3,738.64	890.15	3,024.06	2,732.75	1.81	-0.43	0.126
45.00	-37.33	-8.33	0.00	-459.8	0.00	459.78	3,633.90	865.21	2,857.05	2,580.88	2.26	-0.48	0.119
45.41	-37.13	-8.27	0.00	-456.4	0.00	456.35	3,086.43	756.98	2,551.07	2,241.91	2.3	-0.48	0.132
50.00	-35.80	-8.17	0.00	-418.4	0.00	418.39	3,030.85	736.30	2,413.68	2,140.79	2.79	-0.53	0.125
53.00	-31.81	-7.44	0.00	-393.9	0.00	393.87	2,993.64	722.79	2,325.92	2,075.27	3.14	-0.56	0.120
55.00	-31.24	-7.41	0.00	-379.0	0.00	378.98	2,968.45	713.78	2,268.31	2,031.88	3.38	-0.58	0.117
55.68	-31.05	-7.34	0.00	-373.9	0.00	373.94	2,959.81	710.71	2,248.88	2,017.17	3.46	-0.59	0.116
55.68	-31.05	-7.34	0.00	-373.9	0.00	373.94	2,959.81	710.71	2,248.88	2,017.17	3.46	-0.59	0.196
60.00	-30.13	-7.25	0.00	-342.2	0.00	342.22	2,903.25	691.25	2,127.44	1,923.84	4.01	-0.63	0.188
63.00	-29.47	-7.18	0.00	-320.5	0.00	320.47	2,846.48	677.73	2,045.09	1,848.92	4.43	-0.69	0.184
65.00	-29.09	-7.10	0.00	-306.1	0.00	306.11	2,808.64	668.72	1,991.10	1,799.80	4.73	-0.72	0.181
69.70	-28.22	-7.04	0.00	-272.7	0.00	272.72	2,719.70	647.55	1,867.05	1,686.98	5.48	-0.8	0.172
70.00	-28.16	-6.97	0.00	-270.6	0.00	270.61	2,714.02	646.20	1,859.26	1,679.90	5.53	-0.81	0.172
75.00	-27.25	-6.87	0.00	-235.7	0.00	235.74	2,619.41	623.67	1,731.95	1,564.13	6.42	-0.89	0.161
78.10	-26.70	-6.79	0.00	-214.4	0.00	214.45	2,560.75	609.70	1,655.28	1,494.43	7.02	-0.94	0.154
79.00	-26.24	-6.69	0.00	-208.3	0.00	208.34	2,543.72	605.65	1,633.34	1,474.49	7.19	-0.96	0.152
80.00	-26.07	-6.66	0.00	-201.6	0.00	201.65	2,524.80	601.14	1,609.14	1,452.50	7.4	-0.97	0.149
80.76	-25.93	-6.60	0.00	-196.6	0.00	196.60	2,510.46	597.73	1,590.92	1,435.94	7.55	-0.98	0.147
84.91	-24.90	-6.53	0.00	-169.2	0.00	169.20	1,512.05	394.85	1,041.03	860.67	8.44	-1.05	0.213
85.00	-24.88	-6.47	0.00	-168.6	0.00	168.61	1,511.46	394.57	1,039.59	859.73	8.46	-1.05	0.213
90.00	-18.89	-5.08	0.00	-136.3	0.00	136.26	1,478.12	379.56	961.98	808.48	9.61	-1.14	0.181
95.00	-18.31	-4.98	0.00	-110.9	0.00	110.86	1,442.87	364.54	887.39	757.68	10.85	-1.23	0.159
100.00	-13.94	-3.78	0.00	-86.0	0.00	85.97	1,405.70	349.52	815.80	707.46	12.19	-1.31	0.132
105.00	-13.42	-3.68	0.00	-67.1	0.00	67.07	1,366.62	334.50	747.22	657.95	13.6	-1.38	0.112
110.00	-12.92	-3.61	0.00	-48.7	0.00	48.70	1,325.62	319.48	681.66	609.26	15.09	-1.44	0.090
111.00	-10.33	-3.02	0.00	-45.1	0.00	45.09	1,317.19	316.48	668.91	599.63	15.39	-1.45	0.083
115.00	-9.95	-2.93	0.00	-33.0	0.00	33.00	1,278.76	304.47	619.10	559.79	16.62	-1.49	0.067
120.00	-5.66	-1.69	0.00	-18.4	0.00	18.37	1,215.69	289.45	559.56	505.63	18.21	-1.53	0.041
125.00	-5.26	-1.62	0.00	-9.9	0.00	9.92	1,152.61	274.43	503.02	454.22	19.82	-1.55	0.026
125.71	-5.20	-1.61	0.00	-8.8	0.00	8.77	1,143.67	272.30	495.25	447.16	20.05	-1.55	0.024
125.71	-5.20	-1.61	0.00	-8.8	0.00	8.77	385.02	115.51	105.36	106.00	20.05	-1.55	0.096
127.50	-5.00	-1.56	0.00	-5.9	0.00	5.89	385.02	115.51	105.36	106.00	20.64	-1.56	0.069
128.50	-4.86	-1.55	0.00	-4.3	0.00	4.32	385.02	115.51	105.36	106.00	20.96	-1.57	0.054
130.00	-4.76	-1.53	0.00	-2.0	0.00	2.01	385.02	115.51	105.36	106.00	21.46	-1.58	0.031
131.00	-0.46	-0.07	0.00	-0.5	0.00	0.47	385.02	115.51	105.36	106.00	21.79	-1.58	0.006
135.00	-0.29	-0.04	0.00	-0.2	0.00	0.20	385.02	115.51	105.36	106.00	23.11	-1.58	0.003
140.00	-0.08	-0.01	0.00	-0.0	0.00	0.02	385.02	115.51	105.36	106.00	24.76	-1.58	0.000
142.00	0.00	-0.01	0.00	0.0	0.00	0.00	385.02	115.51	105.36	106.00	25.43	-1.58	0.000

EQUIVALENT LATERAL FORCES METHOD ANALYSIS
(Based on ASCE7-16 Chapters 11, 12 and 15)

Spectral Response Acceleration for Short Period (S_S):	0.226
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.055
Long-Period Transition Period (T_L – Seconds):	6
Importance Factor (I_e):	1.000
Site Coefficient F_a :	1.600
Site Coefficient F_v :	2.400
Response Modification Coefficient (R):	1.500
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.241
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.088
Seismic Response Coefficient (C_s):	0.030
Upper Limit C_s :	0.030
Lower Limit C_s :	0.030
Period based on Rayleigh Method (sec):	2.460
Redundancy Factor (ρ):	1.000
Seismic Force Distribution Exponent (k):	1.980
Total Unfactored Dead Load:	53.220 k
Seismic Base Shear (E):	1.600 k

1.2D + 1.0Ev + 1.0Eh Normal Seismic

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
44	141	83	1,488	0.004	7	104
43	137.5	208	3,539	0.011	17	260
42	133	166	2,651	0.008	13	208
41	130.5	56	865	0.003	4	70
40	129.25	96	1,439	0.004	7	119
39	128	66	969	0.003	5	82
38	126.6044	121	1,748	0.005	8	151
37	125.3544	56	793	0.002	4	70
36	122.5	407	5,505	0.017	27	507
35	117.5	471	5,880	0.018	29	589
34	113	388	4,475	0.014	22	484
33	110.5	98	1,086	0.003	5	123
32	107.5	501	5,235	0.016	25	625
31	102.5	515	4,903	0.015	24	643
30	97.5	562	4,841	0.015	23	701
29	92.5	576	4,475	0.014	22	719
28	87.5	658	4,582	0.014	22	822
27	84.9544	12	80	0.000	0	15
26	82.8333	1,031	6,441	0.020	31	1,288
25	80.3789	131	771	0.002	4	164
24	79.5	174	1,000	0.003	5	217
23	78.55	157	883	0.003	4	196
22	76.55	547	2,921	0.009	14	683
21	72.5	900	4,316	0.013	21	1,123
20	69.85	55	244	0.001	1	68
19	67.35	868	3,598	0.011	17	1,083
18	64	375	1,406	0.004	7	468
17	61.5	625	2,166	0.007	11	781
16	57.84	914	2,805	0.008	14	1,141
15	55.34	191	536	0.002	3	238
14	54	564	1,509	0.005	7	703
13	51.5	860	2,097	0.006	10	1,074
12	47.7058	1,331	2,789	0.008	14	1,661
11	45.2058	189	356	0.001	2	236

Segment	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
10	42.6276	2,205	3,698	0.011	18	2,752
9	40.1276	81	121	0.000	1	101
8	37.5	1,603	2,087	0.006	10	2,001
7	32.5	1,629	1,597	0.005	8	2,033
6	27.5	1,654	1,166	0.004	6	2,065
5	22.5	1,680	796	0.002	4	2,097
4	17.5	1,705	491	0.002	2	2,128
3	12.5	1,731	256	0.001	1	2,160
2	7.5	1,756	95	0.000	0	2,192
1	2.5	1,782	11	0.000	0	2,224
Raycap DC6-48-60-18-8F ("Squid")	131	64	984	0.003	5	79
Ericsson RRUS 8843 B2, B66A	131	216	3,340	0.010	16	270
Ericsson RRUS 4478 B14	131	180	2,779	0.008	13	224
Ericsson RRUS 4449 B5, B12	131	213	3,294	0.010	16	266
Raycap DC6-48-60-0-8C	131	16	247	0.001	1	20
Ericsson RRUS 32 B30	131	180	2,784	0.008	13	225
Powerwave Allgon 7770.00	131	105	1,624	0.005	8	131
Quintel QS66512-2	131	333	5,150	0.016	25	416
CCI OPA65R-BU6D	131	190	2,932	0.009	14	237
Kathrein Scala 80010965	131	293	4,528	0.014	22	365
Generic Flat Platform with Handrails	131	2,500	38,662	0.117	187	3,121
Generic Flat Platform with Handrails	120	2,500	32,503	0.099	158	3,121
Generic Flat Platform with Handrails	111	2,500	27,856	0.085	135	3,121
Generic Flat Platform with Handrails	100	2,500	22,659	0.069	110	3,121
Generic Flat Platform with Handrails	53	2,500	6,452	0.020	31	3,121
Kaelus DBC0061F1V51-2	128.5	76	1,139	0.004	6	95
Powerwave Allgon LGP21401	127.5	85	1,240	0.004	6	106
DragonWave Horizon Compact	120	21	276	0.001	1	26
Alcatel-Lucent RRH2x50-08	120	159	2,063	0.006	10	198
NextNet BTS-2500	120	105	1,365	0.004	7	131
Alcatel-Lucent 800 MHz 2X50W RRH w/ Filter	120	192	2,496	0.008	12	240
Alcatel-Lucent 1900 MHz 4X45 RRH	120	180	2,340	0.007	11	225
Nokia 2.5G MAA - AAHC(64T64R)	120	311	4,041	0.012	20	388
Argus LLPX310R	120	86	1,115	0.003	5	107
DragonWave A-ANT-18G-2-C	120	54	705	0.002	3	68
Commscope NNVV-65B-R4	120	232	3,019	0.009	15	290
Generic GPS	100	10	91	0.000	0	12
Samsung B2/B66A RRH-BR049	100	253	2,295	0.007	11	316
Samsung B5/B13 RRH-BR04C	100	211	1,912	0.006	9	263
Commscope RC2DC-3315-PF-48	100	32	290	0.001	1	40
Samsung MT6407-77A	100	245	2,219	0.007	11	306
Antel BXA-70080/6CF__	100	54	489	0.002	2	67
Quintel QS6656-5D	100	528	4,786	0.014	23	659
RFS ATMAA1412D-1A20	90	52	383	0.001	2	65
Ericsson Radio 4449 B12,B71	90	222	1,634	0.005	8	277
Ericsson AIR 21, 1.3 M, B2A B4P	90	332	2,443	0.007	12	414
Ericsson AIR 32 B2A/B66A	90	573	4,218	0.013	20	715
RFS APXVAARR24_43-U-NA20	90	384	2,823	0.009	14	479
Generic Square Platform with Handrails	90	3,790	27,887	0.085	135	4,731
Round Side Arm	79	300	1,706	0.005	8	374
Diamond X50A	78.1	5	26	0.000	0	6
PCTEL GPS-TMG-HR-26N	69.7	1	3	0.000	0	1
Stand-Off	63	30	109	0.000	1	37
Raycap RDIDC-9181-PF-48	53	22	57	0.000	0	27
Fujitsu TA08025-B604	53	192	495	0.002	2	239
Fujitsu TA08025-B605	53	225	581	0.002	3	281
JMA Wireless MX08FRO665-21	53	194	499	0.002	2	242
		53,219	329,245	1.000	1,597	66,429

0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)

Segment	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
44	141	83	1,488	0.004	7	71
43	137.5	208	3,539	0.011	17	177
42	133	166	2,651	0.008	13	142
41	130.5	56	865	0.003	4	48
40	129.25	96	1,439	0.004	7	81
39	128	66	969	0.003	5	56
38	126.6044	121	1,748	0.005	8	103
37	125.3544	56	793	0.002	4	48
36	122.5	407	5,505	0.017	27	346
35	117.5	471	5,880	0.018	29	402
34	113	388	4,475	0.014	22	330
33	110.5	98	1,086	0.003	5	84
32	107.5	501	5,235	0.016	25	426
31	102.5	515	4,903	0.015	24	439
30	97.5	562	4,841	0.015	23	478
29	92.5	576	4,475	0.014	22	491
28	87.5	658	4,582	0.014	22	561
27	84.9544	12	80	0.000	0	10
26	82.8333	1,031	6,441	0.020	31	879
25	80.3789	131	771	0.002	4	112
24	79.5	174	1,000	0.003	5	148
23	78.55	157	883	0.003	4	134
22	76.55	547	2,921	0.009	14	466
21	72.5	900	4,316	0.013	21	766
20	69.85	55	244	0.001	1	47
19	67.35	868	3,598	0.011	17	739
18	64	375	1,406	0.004	7	319
17	61.5	625	2,166	0.007	11	533
16	57.84	914	2,805	0.008	14	779
15	55.34	191	536	0.002	3	163
14	54	564	1,509	0.005	7	480
13	51.5	860	2,097	0.006	10	733
12	47.7058	1,331	2,789	0.008	14	1,134
11	45.2058	189	356	0.001	2	161
10	42.6276	2,205	3,698	0.011	18	1,878
9	40.1276	81	121	0.000	1	69
8	37.5	1,603	2,087	0.006	10	1,366
7	32.5	1,629	1,597	0.005	8	1,387
6	27.5	1,654	1,166	0.004	6	1,409
5	22.5	1,680	796	0.002	4	1,431
4	17.5	1,705	491	0.002	2	1,452
3	12.5	1,731	256	0.001	1	1,474
2	7.5	1,756	95	0.000	0	1,496
1	2.5	1,782	11	0.000	0	1,518
Raycap DC6-48-60-18-8F ("Squid")	131	64	984	0.003	5	54
Ericsson RRUS 8843 B2, B66A	131	216	3,340	0.010	16	184
Ericsson RRUS 4478 B14	131	180	2,779	0.008	13	153
Ericsson RRUS 4449 B5, B12	131	213	3,294	0.010	16	181
Raycap DC6-48-60-0-8C	131	16	247	0.001	1	14
Ericsson RRUS 32 B30	131	180	2,784	0.008	13	153
Powerwave Allgon 7770.00	131	105	1,624	0.005	8	89
Quintel QS66512-2	131	333	5,150	0.016	25	284
CCI OPA65R-BU6D	131	190	2,932	0.009	14	161
Kathrein Scala 80010965	131	293	4,528	0.014	22	249
Generic Flat Platform with Handrails	131	2,500	38,662	0.117	187	2,129
Generic Flat Platform with Handrails	120	2,500	32,503	0.099	158	2,129
Generic Flat Platform with Handrails	111	2,500	27,856	0.085	135	2,129
Generic Flat Platform with Handrails	100	2,500	22,659	0.069	110	2,129
Generic Flat Platform with Handrails	53	2,500	6,452	0.020	31	2,129
Kaelus DBC0061F1V51-2	128.5	76	1,139	0.004	6	65
Powerwave Allgon LGP21401	127.5	85	1,240	0.004	6	72
DragonWave Horizon Compact	120	21	276	0.001	1	18
Alcatel-Lucent RRH2x50-08	120	159	2,063	0.006	10	135
NextNet BTS-2500	120	105	1,365	0.004	7	89
Alcatel-Lucent 800 MHz 2X50W RRRH w/ Filter	120	192	2,496	0.008	12	164
Alcatel-Lucent 1900 MHz 4X45 RRRH	120	180	2,340	0.007	11	153
Nokia 2.5G MAA - AAHC(64T64R)	120	311	4,041	0.012	20	265
Argus LLPX310R	120	86	1,115	0.003	5	73
DragonWave A-ANT-18G-2-C	120	54	705	0.002	3	46
Commscope NNVV-65B-R4	120	232	3,019	0.009	15	198

Segment	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
Generic GPS	100	10	91	0.000	0	9
Samsung B2/B66A RRH-BR049	100	253	2,295	0.007	11	216
Samsung B5/B13 RRH-BR04C	100	211	1,912	0.006	9	180
Commscope RC2DC-3315-PF-48	100	32	290	0.001	1	27
Samsung MT6407-77A	100	245	2,219	0.007	11	209
Antel BXA-70080/6CF	100	54	489	0.002	2	46
Quintel QS6656-5D	100	528	4,786	0.014	23	450
RFS ATMAA1412D-1A20	90	52	383	0.001	2	44
Ericsson Radio 4449 B12,B71	90	222	1,634	0.005	8	189
Ericsson AIR 21, 1.3 M, B2A B4P	90	332	2,443	0.007	12	283
Ericsson AIR 32 B2A/B66A	90	573	4,218	0.013	20	488
RFS APXVAARR24_43-U-NA20	90	384	2,823	0.009	14	327
Generic Square Platform with Handrails	90	3,790	27,887	0.085	135	3,228
Round Side Arm	79	300	1,706	0.005	8	256
Diamond X50A	78.1	5	26	0.000	0	4
PCTEL GPS-TMG-HR-26N	69.7	1	3	0.000	0	1
Stand-Off	63	30	109	0.000	1	26
Raycap RDIDC-9181-PF-48	53	22	57	0.000	0	19
Fujitsu TA08025-B604	53	192	495	0.002	2	163
Fujitsu TA08025-B605	53	225	581	0.002	3	192
JMA Wireless MX08FRO665-21	53	194	499	0.002	2	165
		53,219	329,245	1.000	1,597	45,332

1.2D + 1.0Ev + 1.0Eh Normal Seismic

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-64.21	-1.60	0.00	-176.15	0.00	176.15	4,383.15	1,101.74	4,632	3,974.58	0.00	0.00	0.04
5.00	-62.01	-1.61	0.00	-168.14	0.00	168.14	4,317.75	1,075.46	4,414	3,820.98	0.01	-0.01	0.04
10.00	-59.85	-1.62	0.00	-160.07	0.00	160.07	4,250.45	1,049.18	4,201	3,668.58	0.02	-0.02	0.04
15.00	-57.72	-1.63	0.00	-151.95	0.00	151.95	4,181.22	1,022.90	3,993	3,517.51	0.05	-0.03	0.04
20.00	-55.63	-1.64	0.00	-143.80	0.00	143.80	4,110.09	996.62	3,790	3,367.90	0.09	-0.04	0.04
25.00	-53.56	-1.64	0.00	-135.61	0.00	135.61	4,037.03	970.34	3,593	3,219.87	0.15	-0.06	0.04
30.00	-51.53	-1.64	0.00	-127.41	0.00	127.41	3,962.07	944.06	3,401	3,073.55	0.21	-0.07	0.04
35.00	-49.53	-1.64	0.00	-119.21	0.00	119.21	3,854.66	917.78	3,215	2,906.04	0.29	-0.08	0.04
40.00	-49.43	-1.64	0.00	-111.02	0.00	111.02	3,744.28	891.49	3,033	2,741.05	0.38	-0.09	0.04
40.26	-46.67	-1.63	0.00	-110.60	0.00	110.60	3,738.64	890.15	3,024	2,732.75	0.38	-0.09	0.04
45.00	-46.44	-1.63	0.00	-102.89	0.00	102.89	3,633.90	865.21	2,857	2,580.88	0.48	-0.10	0.03
45.41	-44.78	-1.62	0.00	-102.22	0.00	102.22	3,086.43	756.98	2,551	2,241.91	0.49	-0.10	0.04
50.00	-43.70	-1.61	0.00	-94.80	0.00	94.80	3,030.85	736.30	2,414	2,140.79	0.59	-0.11	0.04
53.00	-39.09	-1.56	0.00	-89.97	0.00	89.97	2,993.64	722.79	2,326	2,075.27	0.67	-0.12	0.04
55.00	-38.85	-1.56	0.00	-86.86	0.00	86.86	2,968.45	713.78	2,268	2,031.88	0.72	-0.13	0.03
55.68	-37.71	-1.55	0.00	-85.80	0.00	85.80	2,959.81	710.71	2,249	2,017.17	0.74	-0.13	0.03
55.68	-37.71	-1.55	0.00	-85.80	0.00	85.80	2,959.81	710.71	2,249	2,017.17	0.74	-0.13	0.06
60.00	-36.93	-1.54	0.00	-79.12	0.00	79.12	2,903.25	691.25	2,127	1,923.84	0.86	-0.14	0.05
63.00	-36.42	-1.54	0.00	-74.50	0.00	74.50	2,846.48	677.73	2,045	1,848.92	0.95	-0.15	0.05
65.00	-35.34	-1.53	0.00	-71.42	0.00	71.42	2,808.64	668.72	1,991	1,799.80	1.01	-0.16	0.05
69.70	-35.27	-1.53	0.00	-64.25	0.00	64.25	2,719.70	647.55	1,867	1,686.98	1.18	-0.18	0.05
70.00	-34.15	-1.51	0.00	-63.79	0.00	63.79	2,714.02	646.20	1,859	1,679.90	1.19	-0.18	0.05
75.00	-33.46	-1.51	0.00	-56.22	0.00	56.22	2,619.41	623.67	1,732	1,564.13	1.39	-0.20	0.05
78.10	-33.26	-1.51	0.00	-51.56	0.00	51.56	2,560.75	609.70	1,655	1,494.43	1.52	-0.21	0.05
79.00	-32.67	-1.49	0.00	-50.20	0.00	50.20	2,543.72	605.65	1,633	1,474.49	1.56	-0.21	0.05
80.00	-32.51	-1.49	0.00	-48.71	0.00	48.71	2,524.80	601.14	1,609	1,452.50	1.60	-0.22	0.05
80.76	-31.22	-1.46	0.00	-47.58	0.00	47.58	2,510.46	597.73	1,591	1,435.94	1.64	-0.22	0.05
84.91	-31.20	-1.46	0.00	-41.53	0.00	41.53	1,512.05	394.85	1,041	860.67	1.84	-0.24	0.07
85.00	-30.38	-1.44	0.00	-41.40	0.00	41.40	1,511.46	394.57	1,040	859.73	1.84	-0.24	0.07
90.00	-22.98	-1.21	0.00	-34.18	0.00	34.18	1,478.12	379.56	962	808.48	2.10	-0.26	0.06
95.00	-22.28	-1.19	0.00	-28.14	0.00	28.14	1,442.87	364.54	887	757.68	2.39	-0.28	0.05
100.00	-16.85	-0.97	0.00	-22.20	0.00	22.20	1,405.70	349.52	816	707.46	2.69	-0.30	0.04
105.00	-16.23	-0.95	0.00	-17.32	0.00	17.32	1,366.62	334.50	747	657.95	3.02	-0.32	0.04
110.00	-16.11	-0.95	0.00	-12.57	0.00	12.57	1,325.62	319.48	682	609.26	3.36	-0.34	0.03
111.00	-12.50	-0.77	0.00	-11.62	0.00	11.62	1,317.19	316.48	669	599.63	3.43	-0.34	0.03
115.00	-11.91	-0.74	0.00	-8.54	0.00	8.54	1,278.76	304.47	619	559.79	3.72	-0.35	0.03
120.00	-6.61	-0.44	0.00	-4.83	0.00	4.83	1,215.69	289.45	560	505.63	4.09	-0.36	0.02

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
125.00	-6.55	-0.44	0.00	-2.63	0.00	2.63	1,152.61	274.43	503	454.22	4.47	-0.36	0.01
125.71	-6.39	-0.43	0.00	-2.32	0.00	2.32	1,143.67	272.30	495	447.16	4.53	-0.37	0.01
125.71	-6.39	-0.43	0.00	-2.32	0.00	2.32	385.02	115.51	105	106.00	4.53	-0.37	0.04
127.50	-6.21	-0.42	0.00	-1.56	0.00	1.56	385.02	115.51	105	106.00	4.66	-0.37	0.03
128.50	-5.99	-0.40	0.00	-1.15	0.00	1.15	385.02	115.51	105	106.00	4.74	-0.37	0.03
130.00	-5.92	-0.40	0.00	-0.54	0.00	0.54	385.02	115.51	105	106.00	4.86	-0.37	0.02
131.00	-0.36	-0.03	0.00	-0.15	0.00	0.15	385.02	115.51	105	106.00	4.94	-0.37	0.00
135.00	-0.10	-0.01	0.00	-0.04	0.00	0.04	385.02	115.51	105	106.00	5.25	-0.37	0.00
140.00	0.00	0.00	0.00	0.00	0.00	0.00	385.02	115.51	105	106.00	5.64	-0.37	0.00
142.00	0.00	0.00	0.00	0.00	0.00	0.00	385.02	115.51	105	106.00	5.79	-0.37	0.00

0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-43.81	-1.60	0.00	-172.67	0.00	172.67	4,383.15	1,101.74	4,632	3,974.58	0.00	0.00	0.04
5.00	-42.32	-1.61	0.00	-164.68	0.00	164.68	4,317.75	1,075.46	4,414	3,820.98	0.01	-0.01	0.04
10.00	-40.84	-1.61	0.00	-156.64	0.00	156.64	4,250.45	1,049.18	4,201	3,668.58	0.02	-0.02	0.04
15.00	-39.39	-1.62	0.00	-148.58	0.00	148.58	4,181.22	1,022.90	3,993	3,517.51	0.05	-0.03	0.04
20.00	-37.96	-1.62	0.00	-140.49	0.00	140.49	4,110.09	996.62	3,790	3,367.90	0.09	-0.04	0.04
25.00	-36.55	-1.62	0.00	-132.39	0.00	132.39	4,037.03	970.34	3,593	3,219.87	0.14	-0.05	0.03
30.00	-35.16	-1.62	0.00	-124.29	0.00	124.29	3,962.07	944.06	3,401	3,073.55	0.21	-0.07	0.03
35.00	-33.80	-1.61	0.00	-116.20	0.00	116.20	3,854.66	917.78	3,215	2,906.04	0.28	-0.08	0.03
40.00	-33.73	-1.62	0.00	-108.14	0.00	108.14	3,744.28	891.49	3,033	2,741.05	0.37	-0.09	0.03
40.26	-31.85	-1.60	0.00	-107.73	0.00	107.73	3,738.64	890.15	3,024	2,732.75	0.37	-0.09	0.03
45.00	-31.69	-1.60	0.00	-100.15	0.00	100.15	3,633.90	865.21	2,857	2,580.88	0.47	-0.10	0.03
45.41	-30.55	-1.59	0.00	-99.49	0.00	99.49	3,086.43	756.98	2,551	2,241.91	0.48	-0.10	0.03
50.00	-29.82	-1.58	0.00	-92.21	0.00	92.21	3,030.85	736.30	2,414	2,140.79	0.58	-0.11	0.03
53.00	-26.67	-1.53	0.00	-87.47	0.00	87.47	2,993.64	722.79	2,326	2,075.27	0.65	-0.12	0.03
55.00	-26.51	-1.53	0.00	-84.41	0.00	84.41	2,968.45	713.78	2,268	2,031.88	0.70	-0.12	0.03
55.68	-25.73	-1.52	0.00	-83.37	0.00	83.37	2,959.81	710.71	2,249	2,017.17	0.72	-0.12	0.03
55.68	-25.73	-1.52	0.00	-83.37	0.00	83.37	2,959.81	710.71	2,249	2,017.17	0.72	-0.12	0.05
60.00	-25.20	-1.51	0.00	-76.82	0.00	76.82	2,903.25	691.25	2,127	1,923.84	0.84	-0.13	0.05
63.00	-24.85	-1.50	0.00	-72.30	0.00	72.30	2,846.48	677.73	2,045	1,848.92	0.92	-0.15	0.05
65.00	-24.11	-1.49	0.00	-69.29	0.00	69.29	2,808.64	668.72	1,991	1,799.80	0.99	-0.15	0.05
69.70	-24.07	-1.49	0.00	-62.28	0.00	62.28	2,719.70	647.55	1,867	1,686.98	1.15	-0.17	0.05
70.00	-23.30	-1.47	0.00	-61.83	0.00	61.83	2,714.02	646.20	1,859	1,679.90	1.16	-0.17	0.05
75.00	-22.83	-1.46	0.00	-54.46	0.00	54.46	2,619.41	623.67	1,732	1,564.13	1.35	-0.19	0.04
78.10	-22.70	-1.46	0.00	-49.92	0.00	49.92	2,560.75	609.70	1,655	1,494.43	1.48	-0.20	0.04
79.00	-22.29	-1.45	0.00	-48.60	0.00	48.60	2,543.72	605.65	1,633	1,474.49	1.52	-0.21	0.04
80.00	-22.18	-1.45	0.00	-47.15	0.00	47.15	2,524.80	601.14	1,609	1,452.50	1.56	-0.21	0.04
80.76	-21.30	-1.42	0.00	-46.06	0.00	46.06	2,510.46	597.73	1,591	1,435.94	1.60	-0.21	0.04
84.91	-21.29	-1.42	0.00	-40.18	0.00	40.18	1,512.05	394.85	1,041	860.67	1.79	-0.23	0.06
85.00	-20.73	-1.40	0.00	-40.05	0.00	40.05	1,511.46	394.57	1,040	859.73	1.80	-0.23	0.06
90.00	-15.68	-1.17	0.00	-33.06	0.00	33.06	1,478.12	379.56	962	808.48	2.05	-0.25	0.05
95.00	-15.20	-1.15	0.00	-27.21	0.00	27.21	1,442.87	364.54	887	757.68	2.33	-0.27	0.05
100.00	-11.50	-0.94	0.00	-21.46	0.00	21.46	1,405.70	349.52	816	707.46	2.62	-0.29	0.04
105.00	-11.07	-0.92	0.00	-16.74	0.00	16.74	1,366.62	334.50	747	657.95	2.94	-0.31	0.03
110.00	-10.99	-0.91	0.00	-12.15	0.00	12.15	1,325.62	319.48	682	609.26	3.28	-0.33	0.03
111.00	-8.53	-0.74	0.00	-11.23	0.00	11.23	1,317.19	316.48	669	599.63	3.34	-0.33	0.03
115.00	-8.13	-0.72	0.00	-8.25	0.00	8.25	1,278.76	304.47	619	559.79	3.62	-0.34	0.02
120.00	-4.51	-0.43	0.00	-4.67	0.00	4.67	1,215.69	289.45	560	505.63	3.99	-0.35	0.01
125.00	-4.47	-0.42	0.00	-2.55	0.00	2.55	1,152.61	274.43	503	454.22	4.35	-0.35	0.01
125.71	-4.36	-0.41	0.00	-2.25	0.00	2.25	1,143.67	272.30	495	447.16	4.41	-0.35	0.01
125.71	-4.36	-0.41	0.00	-2.25	0.00	2.25	385.02	115.51	105	106.00	4.41	-0.35	0.03
127.50	-4.23	-0.40	0.00	-1.51	0.00	1.51	385.02	115.51	105	106.00	4.54	-0.36	0.03
128.50	-4.09	-0.39	0.00	-1.11	0.00	1.11	385.02	115.51	105	106.00	4.61	-0.36	0.02
130.00	-4.04	-0.38	0.00	-0.52	0.00	0.52	385.02	115.51	105	106.00	4.73	-0.36	0.02
131.00	-0.25	-0.03	0.00	-0.14	0.00	0.14	385.02	115.51	105	106.00	4.80	-0.36	0.00
135.00	-0.07	-0.01	0.00	-0.04	0.00	0.04	385.02	115.51	105	106.00	5.10	-0.36	0.00
140.00	0.00	0.00	0.00	0.00	0.00	0.00	385.02	115.51	105	106.00	5.48	-0.36	0.00
142.00	0.00	0.00	0.00	0.00	0.00	0.00	385.02	115.51	105	106.00	5.63	-0.36	0.00

ANALYSIS SUMMARY

Load Case	Reactions						Max Usage	
	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.0W Normal	39.65	0.00	63.78	0.00	0.00	3717.87	84.91	0.88
0.9D + 1.0W Normal	39.62	0.00	47.82	0.00	0.00	3666.18	84.91	0.85
1.2D + 1.0Di + 1.0Wi Normal	9.38	0.00	84.57	0.00	0.00	907.18	84.91	0.24
1.2D + 1.0Ev + 1.0Eh Normal	1.64	0.00	64.21	0.00	0.00	176.15	84.91	0.07
0.9D - 1.0Ev + 1.0Eh Normal	1.62	0.00	43.81	0.00	0.00	172.67	84.91	0.06
1.0D + 1.0W Service Normal	9.19	0.00	53.21	0.00	0.00	856.91	84.91	0.21

ADDITIONAL STEEL SUMMARY

Elev From (ft)	Elev To (ft)	Member	Intermediate Connectors			Max member			
			VQ/I	Shear Applied (kips)	Shear (phiVn) (kips)	Ratio	Pu (kip)	PhiPn (kip)	Ratio
0.00	55.68	SOL #20 All Thread Bar	338.9	10.2	16.8	0.6047	256.0	330.5	0.7747

Elev From (ft)	Elev To (ft)	Member	Upper Termination Connectors				Lower Termination Connectors					
			MQ/I	phiVn (kips)	Num Reqd	Num Actual	Ratio	MQ/I (kips)	phiVn (kip)	Num Reqd	Num Actual	Ratio
0.00	55.68	SOL #20 All Thread Bar	197.2765	12	17	22	0.7473	0	12	0	0	0.0000

Site Name: WSPT - South, CT
Site Number: 302511
Tower Type: MP
Design Loads (Factored) - Analysis per TIA-222-H Standards

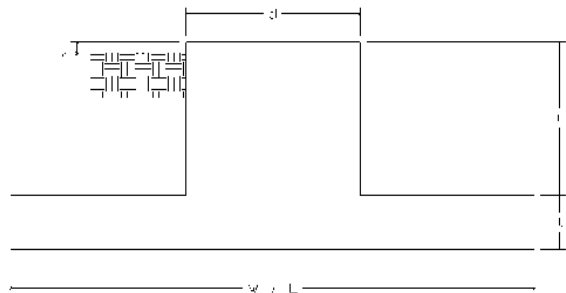
Monolithic Mat & Pier Foundation Analysis

Foundation Analysis Parameters		
Design / Analysis / Mapping:	Mapping	-
Compression/Leg:	63.8	k
Uplift/Leg:	0.0	k
Total Shear:	39.7	k
Moment:	3,717.9	k-ft
Tower + Appurtenance Weight:	63.8	k
Depth to Base of Foundation (l + t - h):	7	ft
Diameter of Pier (d):	6.5	ft
Length of Pier (l):	4.5	ft
Height of Pier above Ground (h):	0.5	ft
Width of Pad (W):	26.5	ft
Length of Pad (L):	26.5	ft
Thickness of Pad (t):	3	ft
Tower Leg Center to Center:	0	ft
Number of Tower Legs:	1	-
Tower Center from Mat Center:	0	ft
Depth Below Ground Surface to Water Table:	9.5	ft
Unit Weight of Concrete:	150	pcf
Unit Weight of Soil Above Water Table:	120	pcf
Unit Weight of Water:	62.4	pcf
Unit Weight of Soil Below Water Table:	57.6	pcf
Friction Angle of Uplift:	15	°
Coefficient of Shear Friction:	0.2	-
Ultimate Compressive Bearing Pressure:	50,400	psf
Ultimate Passive Pressure on Pad Face:	0	psf
$f_{\text{Soil and Concrete Weight}}$:	0.9	-
f_{Soil} :	0.75	-

Overturning Moment Usage		
Design OTM:	4015.7	k-ft
OTM Resistance:	8860.4	k-ft
Design OTM / OTM Resistance:	45%	Pass

Soil Bearing Pressure Usage		
Net Bearing Pressure:	2231	psf
Factored Nominal Bearing Pressure:	37800	psf
Factored Nominal (Net) Bearing Pressure:	6%	Pass
Load Direction Controlling Design Bearing Pressure:	<i>Diagonal to Pad Edge</i>	

Sliding Factor of Safety		
Ultimate Friction Resistance:	142.5	k
Ultimate Passive Pressure Resistance:	0.0	k
Total Factored Sliding Resistance:	106.9	k
Sliding Design / Sliding Resistance:	37%	Pass



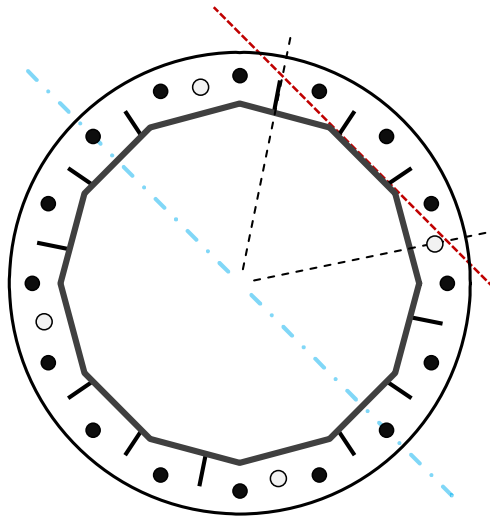
Base Plate & Anchor Rod Analysis

Pole Dimensions		
Number of Sides	12	-
Diameter	45	in
Thickness	7/16	in
Orientation Offset	0	°

Base Reactions		
Moment, Mu	3,717.9	k-ft
Axial, Pu	63.8	k
Shear, Vu	39.7	k
Neutral Axis	315	°

Report Capacities		
Component	Capacity	Result
Base Plate	36%	Pass
Anchor Rods	64%	Pass
Dwyidag	61%	Pass

Base Plate		
Shape	Round	-
Diameter, ϕ	60	in
Thickness	2	in
Grade	A871-60	
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	75	ksi
Clip	N/A	in
Orientation Offset	0	°
Anchor Rod Detail	c	$\eta=0.55$
Clear Distance	N/A	in
Applied Moment, Mu	859.4	k
Bending Stress, ϕMn	2388.2	k



Dwyidag Reinforcement		
Quantity	4	-
Bar Size	#20	in
Diameter, ϕ	2.5	in
Bracket Type	Angle	-
Circle	51.88	in
Orientation Offset	11.25	°
Applied Force, Pu	223.1	k
Dwyidag Bar, ϕPn	368.2	k

Original Anchor Rods		
Arrangement	Radial	-
Quantity	16	-
Diameter, ϕ	2 1/4	in
Bolt Circle	54	in
Grade	A615-75	
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Spacing	10.6	in
Orientation Offset	0	°
Applied Force, Pu	152.7	k
Anchor Rods, ϕPn	243.6	k

Stiffeners		
Arrangement	Radial	-
Quantity	12	-
Height	10	in
Width	4	in
Effective Width	4.000	in
Thickness	1/2	in
Effective Thickness	0.500	in
Notch	0.5	in
Flat Edge	4	in
Grade	A36	-
Yield Strength, Fy	36	ksi
Tensile Strength, Fu	58	ksi
Horizontal Weld	Fillet	
Horizontal Fillet Size	5/16	in
Bevel Depth	0	in
Vertical Weld	Fillet	
Vertical Fillet Size	5/16	in
Weld Strength	70	ksi
Electrode Coefficient	1	-
Orientation Offset	0	°
Vertical Weld, ϕRn	139.5	k
Horz. Weld, ϕRn	59.1	k
Ten. Capacity, ϕTn	56.7	k
Comp. Capacity, ϕPn	228.8	k



Site ID	302511
Site Name	WSPT-South
Project #	13705673_C3_03
Date	Wednesday, October 6, 2021
Engineer	JRA

Version
1.0
12/6/2017



EXTENSION INTERFACE

Analysis Details		
Strength Reduction Factor, ϕ	0.9	
$k = Z/S$	1.75	
Weld Strength Reduction Factor, ϕ	0.75	

Section & Loading		
Extension Interface Elevation	125	ft
Total Moment, Mu_t	42.8	kip-ft
Total Shear, Vu_t	7.0	kip
Total Axial Load, Pu_t	5.6	kip

Forces on Single Interface Weldment		
Axial Compression, Pu	38.34	kip
Flexure (from Compression), Mu_P	186.75	kip-in
Axial Tension, Tu	34.61	kip
Flexure (from Tension), Mu_T	168.57	kip-in

Design Tensile Strength		
Design Tensile Strength, ϕPn	380.5	k
Usage	9.1%	Pass

Design Compressive Strength		
Effective Length Factor, k	1.0	-
Unbraced Length, Lu	22 1/2	in
Radius of Gyration, r	1.79	in
kL/r	12.60	-
Fcr	35.70	ksi
Design Compressive Strength, ϕPn	377.38	k
Usage	10.2%	Pass

Design Flexural Strength		
Yield Moment, My	257.3	kip-in
Plastic Moment (Stem in T), Mp_T	411.72	kip-in
Plastic Moment (Stem in C), Mp_C	257.33	kip-in
Lateral Torsional Bucking Variable, B	3.30	-
Nominal Moment (Stem in T), Mn_T	153032.76	kip-in
Nominal Moment (Stem in C), Mn_C	3366.26	kip-in
Limiting w-t Ratio (Flange), λp	10.79	-
w-t Ratio (Flange), λ	1.46	-
FLB Apply?	NO	-
Design Flexural Strength, ϕMn_T	370.55	kip-in
Usage	45.5%	Pass
Design Flexural Strength, ϕMn_C	231.59	kip-in
Usage	80.6%	Pass

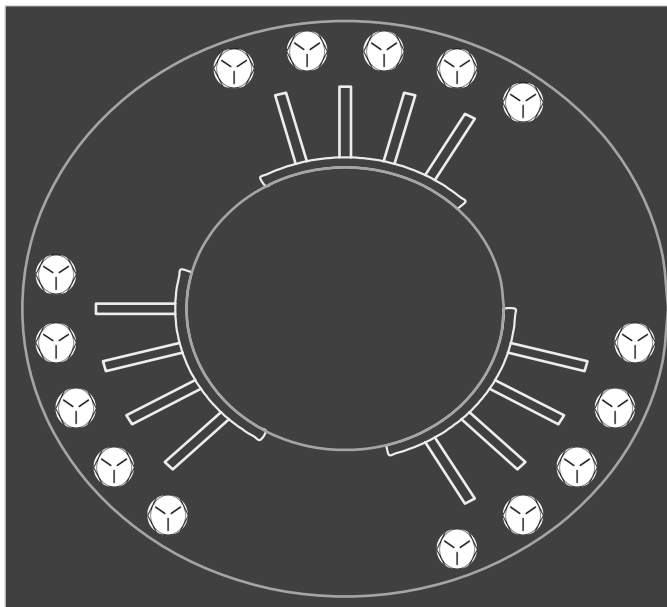
Weld Strength		
Weld Size, $D/16$	5/16	in
Weld Electrode Strength	70	ksi
Eccentricity, e_x	1.75	in
Weld Length	22 1/2	in
$a = (e_x/L)$	0.08	-
Weld Coefficient, C	3.72	-
Electrode Strength Coefficient, C_1	1.0	-
Pu_weld	63.0	kip
Design Strength, ϕRn	313.7	k
Usage	20.1%	Pass

Single Interface Weldment Section Properties		
Distance From Center to Centroid, d	8.00	in
Distance Between Centroids, e	4.87	in
Width of Stiffener, W	3.50	in
Thickness of Stiffener, t	0.50	in
Width of Pipe b/t Stiffener Plates, bf	1.46	in
Gross Area, Ag	11.75	in ²
Min Radius of Gyration, r	1.79	in
Section Modulus - Stiffener, Sx_s	7.15	in ³
Plastic Section Modulus, Zx	12.51	in ³
Moment of Inertia, Iy	83.120	in ⁴
Torsional Constant, J	0.979	in ⁴

Material Properties		
Stiffener Plate Grade	A36	-
Yield Strength, Fy (ksi)	36	ksi
Tensile Strength, Fu (ksi)	58	ksi
Modulus of Elasticity, E	29000	ksi
Shear Modulus of Elasticity, G	11200	ksi

Top of Tower Flange Details			Show Top Flange?	Y
Tower Flange Diameter	28.5	(in)		
Tower Flange Opening Dia	14	(in)		
Flange Bolt Circle	25.75	(in)		
Flange Bolt Size	1	(in)		
Number of bolts on flange	24	Works best with 3 and 4 pieces!		
Rotation of bolts	15.0°	7.5° half bolt rotation angle		

Interface Weldment Section Properties		
Rotation of shapes	7.5°	
Length of Stiffener Plate, L	22.50	(in)
Number of Pieces	3	3 or 4
Interface angles	75.0°	40° to 115°
Stiffener offset angle	15.0°	Min ang: 4.375°
Opening angles and width	45° & 10.61"	
Pipe Diameter	15	(in)
Pipe Thickness	0.5	(in)
Stiffener Base	3.5	(in)
Stiffener Thickness	0.5	(in)
Internal Stiffeners	2	



Stiffener Angle Overrides	

Equivalent Round Section for SES	

Flange Plate Analysis

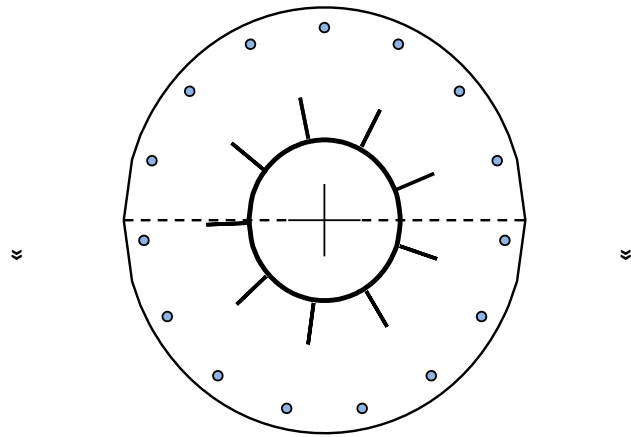
Flange Plate	Plate Type	Flange	@ 125 ft
	Pole Diameter	10.75	in
	Pole Thickness	0.365	in
	Plate Diameter	28.5	in
	Plate Thickness	0.75	in
	Plate Fy	36	ksi
	Weld Length	0.3125	in
	f _s Resistance	71.42	k-in
	Applied	32.74	k-in

Code Rev.	H
Moment	42.8 k-ft
Axial	7.0 k

Date	10/6/2021
Engineer	JRA
Site #	302511
Carrier	DISH

Stiffeners	#	9	Show
	Thickness	0.375	in
	Length	3.5	in
	Height	5	in
	Chamfer	0.5	in
	Offset Angle	0	°
	Fy	36	ksi

Bolts	#	15	
	Bolt Circle (R)adial / (S)quare	25.75	in
	Bolt Gap	R	
	Diameter	6	in
	Hole Diameter	0.75	in
	Type	0.875	in
	Fy	A325	
	Fu	92	ksi
	f _s Resistance	120	ksi
Applied	30.10	k	
	4.85	k	



Reinforcement	#		
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Plate Stress Ratio:
46% Pass

Bolt Stress Ratio:
16% Pass

Extra Bolts	#		
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DISH WIRELESS, L.L.C. SITE ID:

NJJER01139B

DISH WIRELESS, L.L.C. SITE ADDRESS:

**20 POST OFFICE LANE
WESTPORT, CT 06880**

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:
<ul style="list-style-type: none"> • INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR) • INSTALL (1) PROPOSED ANTENNA PLATFORM MOUNT • INSTALL PROPOSED JUMPERS • INSTALL (6) PROPOSED RRUs (2 PER SECTOR) • INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP) • INSTALL (1) PROPOSED HYBRID CABLE
GROUND SCOPE OF WORK:
<ul style="list-style-type: none"> • 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)

SITE INFORMATION	PROJECT DIRECTORY
PROPERTY OWNER: JAY SHERWOOD ADDRESS: 20 POST OFFICE LANE WESTPORT, CT 06880	APPLICANT: DISH WIRELESS, L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER TYPE: MONOPOLE	TOWER OWNER: AMERICAN TOWER 10 PRESIDENTIAL WAY WOBURN, MA 01801
TOWER CO SITE ID: 302511	ENGINEER: ATC TOWER SERVICES, LLC 3500 REGENCY PARKWAY SUITE 100 CARY, NC 27518
TOWER APP NUMBER: 13705673_D2	SITE ACQUISITION: WILLIAM SNIDER william.snider@dish.com
COUNTY: FAIRFIELD	CONSTRUCTION MANAGER: VICTOR CORREA victor.correa@dish.com
LATITUDE (NAD 83): 41° 7' 24.400" N 41.12344444	RF ENGINEER: MURUGABIRAN JAYAPAL murugabiran.jayapal@dish.com
LONGITUDE (NAD 83): 73° 18' 47.160" W -73.3131	
ZONING JURISDICTION: WESTPORT	
ZONING DISTRICT: COMMERCIAL	
PARCEL NUMBER: H06017000	
OCCUPANCY GROUP: U	
CONSTRUCTION TYPE: II-B	
POWER COMPANY: UNITED ILLUMINATING	
TELEPHONE COMPANY: FRONTIER COMMUNICATIONS	



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

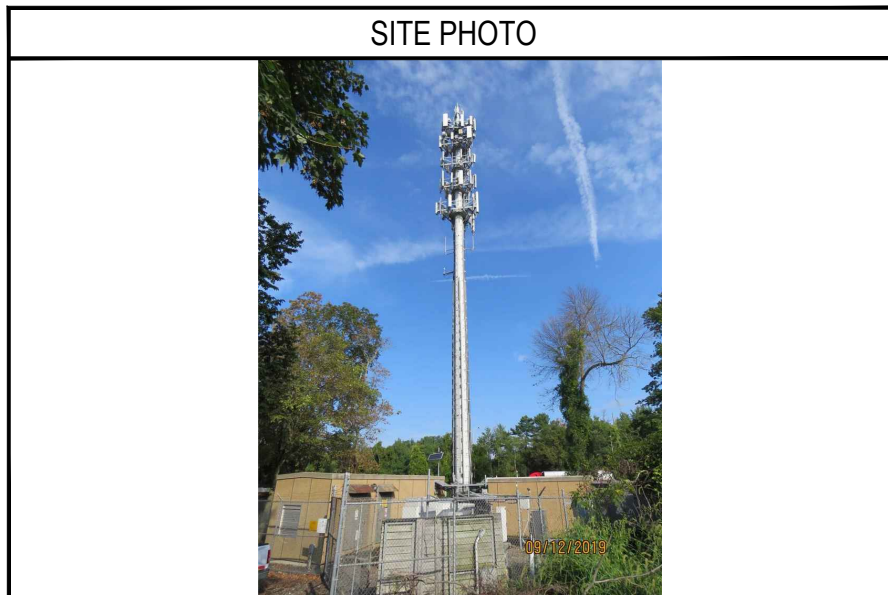


DRAWN BY: JK	CHECKED BY: SRF	APPROVED BY: SRF
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RFDS REV #: -----

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
0	11/02/2021	ISSUED FOR CONSTRUCTION
1	11/29/2021	ANTENNA MODEL



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

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.

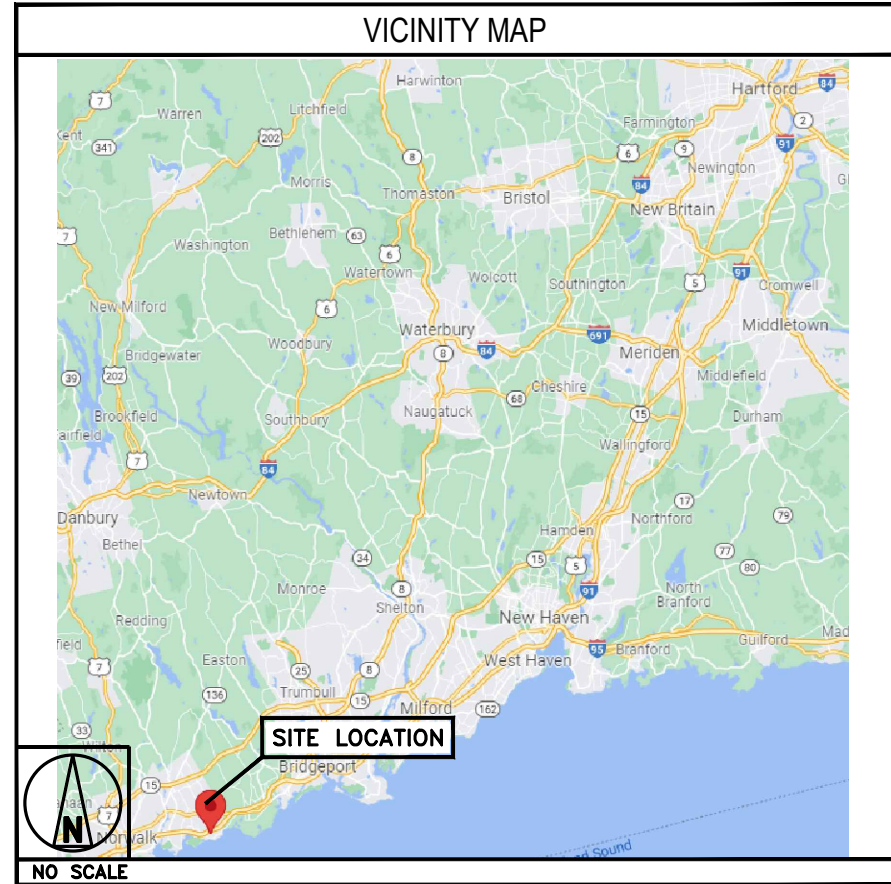
THE PROJECT DEPICTED IN THESE PLANS QUALIFIES AS AN ELIGIBLE FACILITIES REQUEST ENTITLED TO EXPEDITED REVIEW UNDER 47 U.S.C. § 1455(A) AS A MODIFICATION OF AN EXISTING WIRELESS TOWER THAT INVOLVES THE COLLOCATION, REMOVAL, AND/OR REPLACEMENT OF TRANSMISSION EQUIPMENT THAT IS NOT A SUBSTANTIAL CHANGE UNDER CFR § 1.61000 (B)(7).

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.

DIRECTIONS

HEAD NORTHEAST TOWARD ADP BLVD. TURN LEFT. TURN LEFT 3 TIMES TOWARD ADP BLVD. SLIGHT RIGHT ONTO CHOCTOW WAY. USE LEFT LANE TO TURN RIGHT ONTO LIVINGSTONE AVE. USE RIGHT LANE TO TAKE RAMP ONTO I-280 E FOR 6.8 MILES. TAKE EXIT 12 TOWARD ORATON PKWY. FOLLOW SIGNS FOR GARDEN STATE PKWY. MERGE ONTO GARDEN STATE PARKWAY AND STAY FOR 28 MILES. TAKE EXIT 14-1 TO MERGE ONTO 1-287 EAST/1-87 SOUTH FOR 12.5 MILES. KEEP LEFT AT FORK TO CONTINUE ON 1-287 E. FOLLOW SIGNS FOR WHITE PLAINS/RYE FOR 11.6 MILES. MERGE ONTO 1-95N, IN 21.9 MILES THE DESTINATION WILL BE ON YOUR RIGHT.

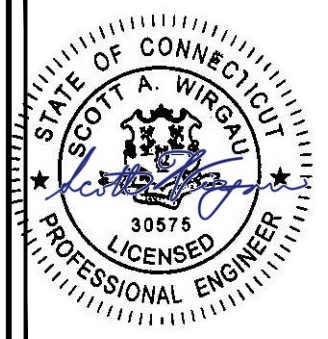


CONNECTICUT CODE COMPLIANCE

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-0	EXISTING SURVEY
A-1	OVERALL AND ENLARGED SITE PLAN
A-2	ELEVATION, ANTENNA LAYOUT AND SCHEDULE
A-3	EQUIPMENT PLATFORM AND H-FRAME DETAILS
A-4	EQUIPMENT DETAILS
A-5	EQUIPMENT DETAILS
A-6	EQUIPMENT DETAILS
E-1	ELECTRICAL/FIBER ROUTE PLAN AND NOTES
E-2	ELECTRICAL DETAILS
E-3	ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE
G-1	GROUNDING PLANS AND NOTES
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS
RF-1	RF CABLE COLOR CODE
GN-1	LEGEND AND ABBREVIATIONS
GN-2	GENERAL NOTES
GN-3	GENERAL NOTES
GN-4	GENERAL NOTES



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A&E PROJECT NUMBER
302511-13705673_D2

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
NJJER01139B
20 POST OFFICE LANE
WESTPORT, CT 06880

SHEET TITLE
TITLE SHEET

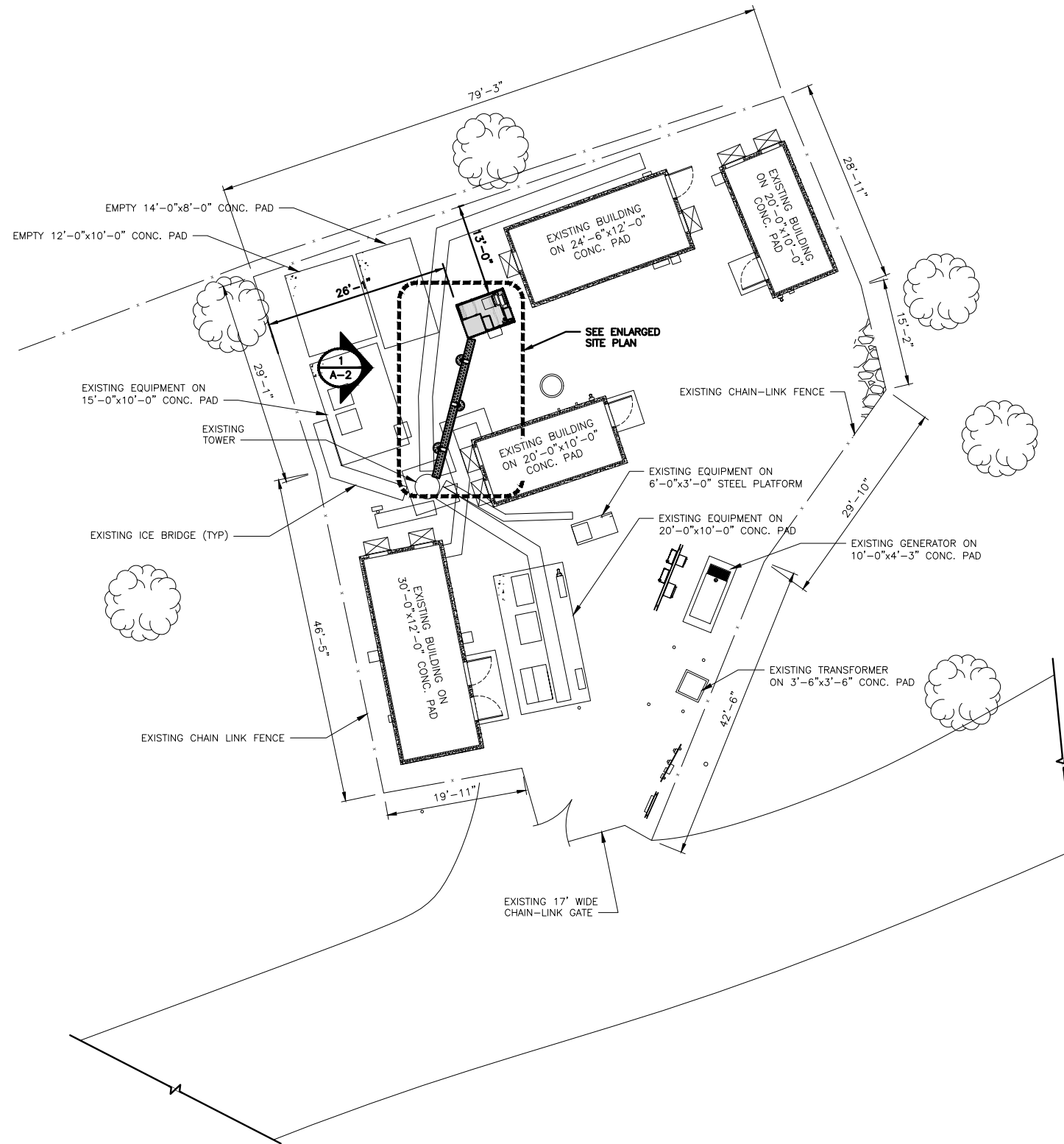
SHEET NUMBER
T-1

NOTES

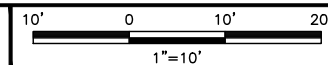
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.

NOTES

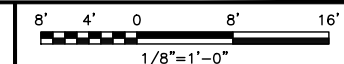
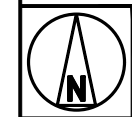
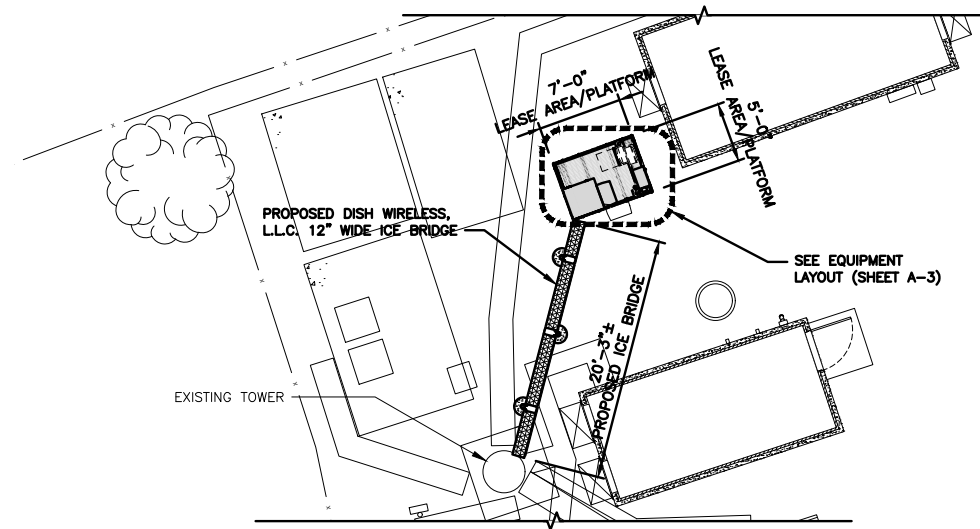
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



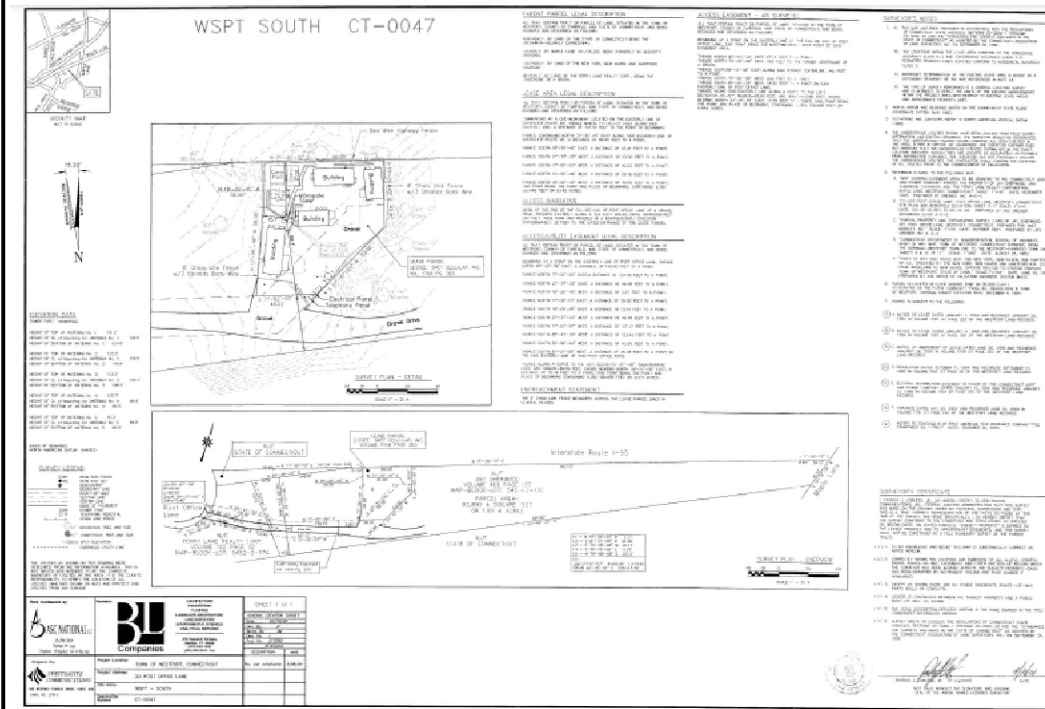
OVERALL SITE PLAN



ENLARGED SITE PLAN



EXISTING SURVEY (BY OTHERS)



NO SCALE

3



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



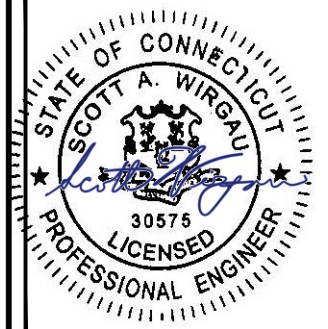
DRAWN BY: CHECKED BY: APPROVED BY:

JK SRF SRF

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
0	11/02/2021	ISSUED FOR CONSTRUCTION
1	11/29/2021	ANTENNA MODEL



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A&E PROJECT NUMBER
302511-13705673_D2

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
NJJER01139B
20 POST OFFICE LANE
WESTPORT, CT 06880

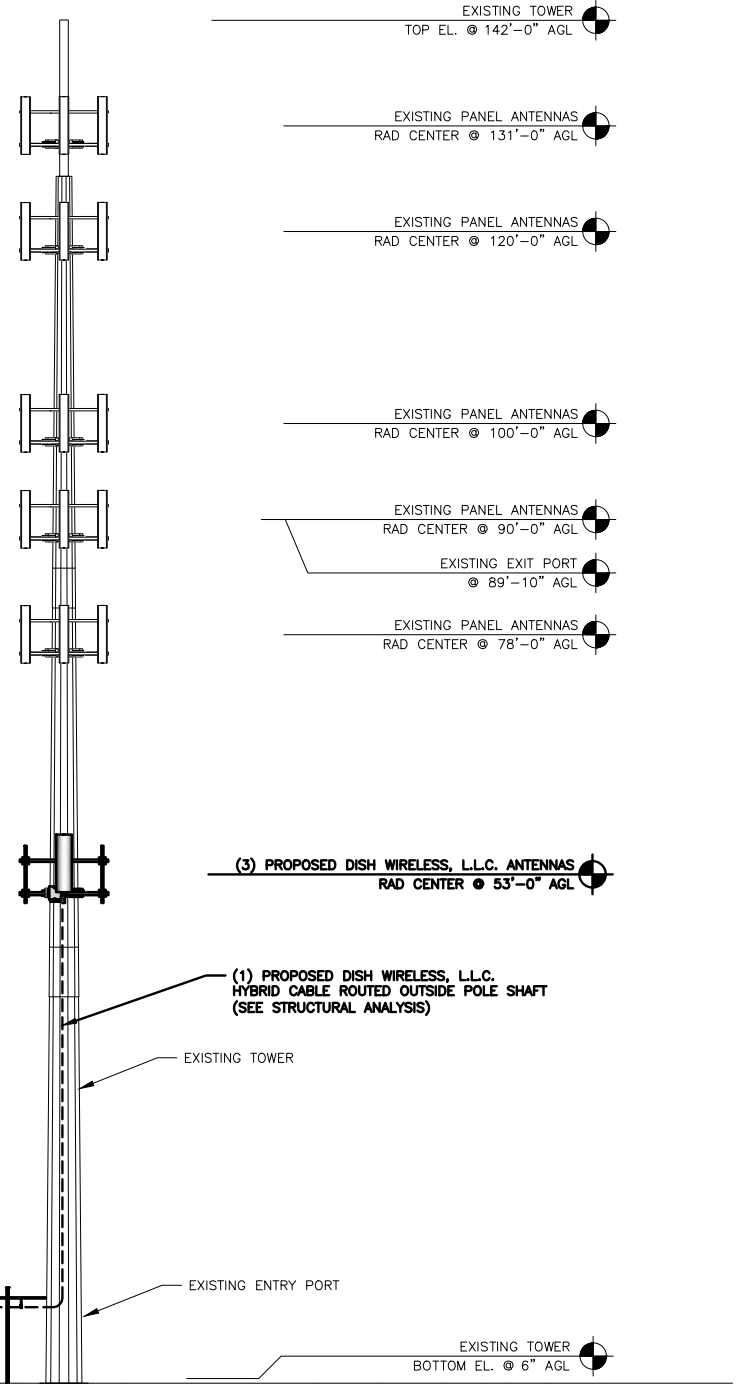
SHEET TITLE
OVERALL AND ENLARGED
SITE PLAN

SHEET NUMBER

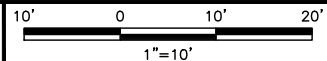
A-1

NOTES

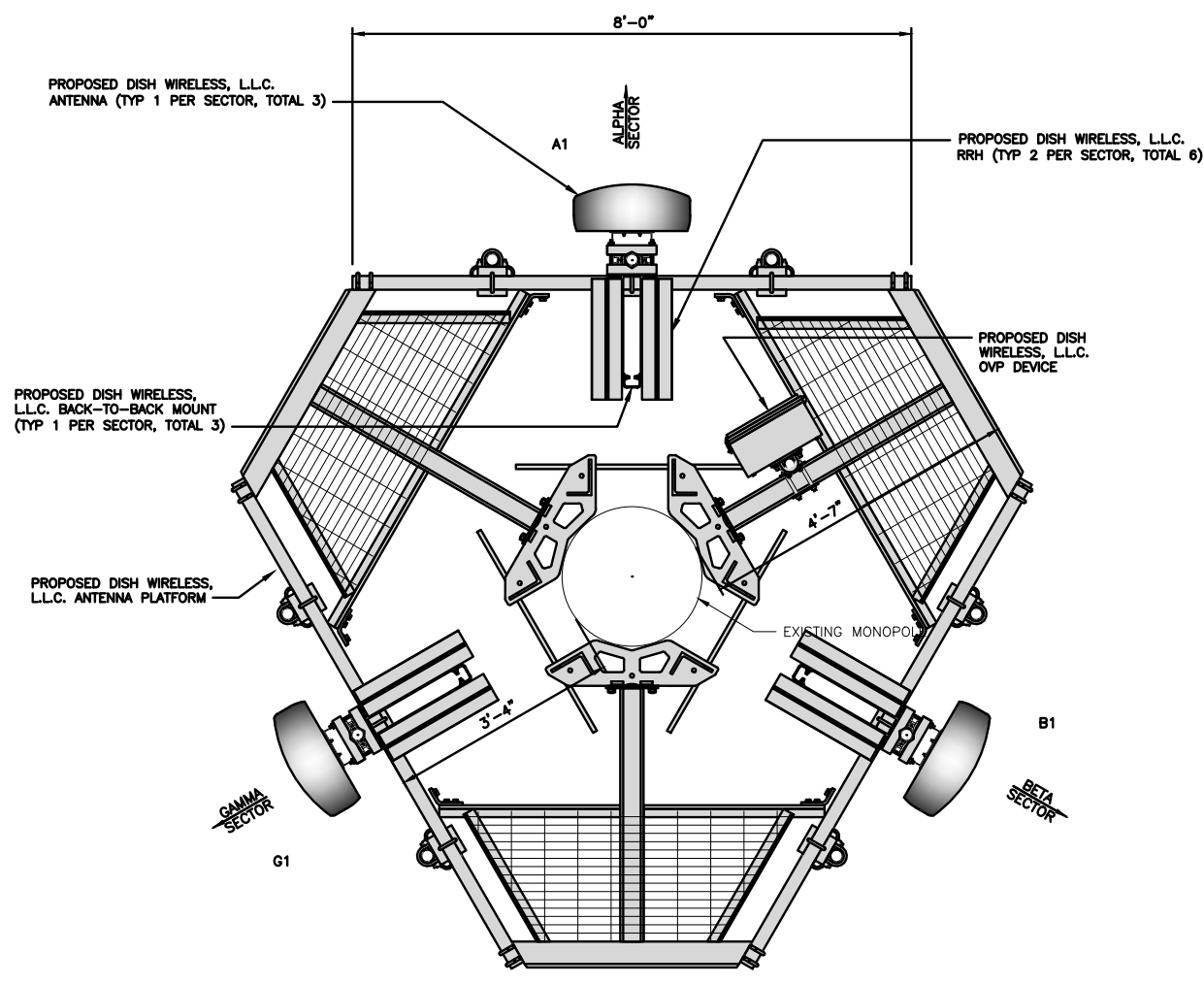
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



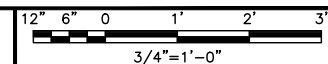
PROPOSED NORTH ELEVATION



1



ANTENNA LAYOUT



2

SECTOR	POSITION	ANTENNA					TRANSMISSION CABLE	
		EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	MX08FRO665-21	5G	72.0" x 20.0"	0°	53'-0"	(1) HIGH-CAPACITY HYBRID CABLE (82' LONG)
BETA	B1	PROPOSED	MX08FRO665-21	5G	72.0" x 20.0"	120°	53'-0"	
GAMMA	G1	PROPOSED	MX08FRO665-21	5G	72.0" x 20.0"	240°	53'-0"	(1) RAYCAP RDIDC-9181-PF-48 OVP

SECTOR	POSITION	RRH		NOTES
		MANUFACTURER - MODEL NUMBER	TECHNOLOGY	
ALPHA	A1	TA08025-B604	5G	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.
	A2	TA08025-B605	5G	
BETA	B1	TA08025-B604	5G	
	B2	TA08025-B605	5G	
GAMMA	G1	TA08025-B604	5G	
	G2	TA08025-B605	5G	

ANTENNA SCHEDULE

NO SCALE

3



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

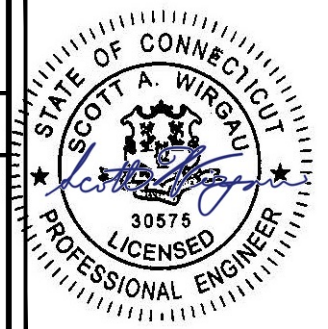


DRAWN BY:	CHECKED BY:	APPROVED BY:
JK	SRF	SRF

RFDS REV #: ----

CONSTRUCTION DOCUMENTS

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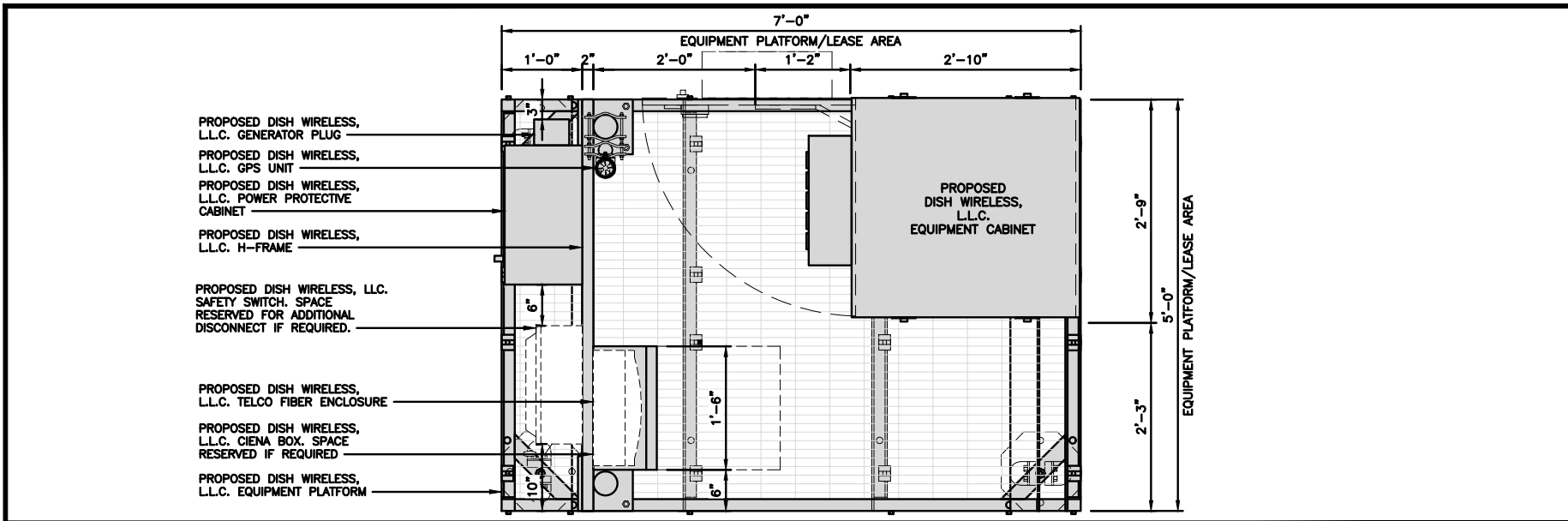
A&E PROJECT NUMBER
302511-13705673_D2

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
NJJER01139B
20 POST OFFICE LANE
WESTPORT, CT 06880

SHEET TITLE
ELEVATION, ANTENNA
LAYOUT AND SCHEDULE

SHEET NUMBER

A-2

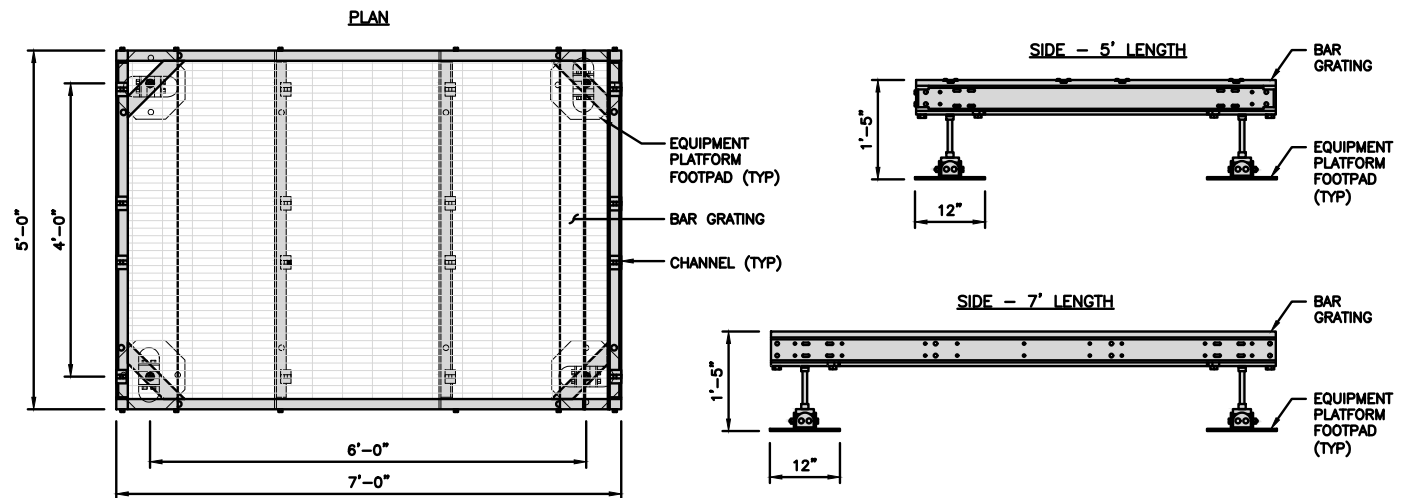


PLATFORM EQUIPMENT PLAN

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

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

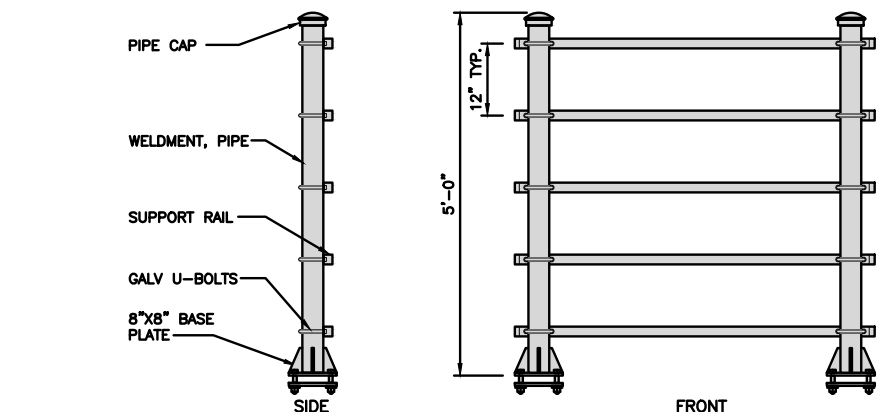
NOTE:
GC TO PROVIDE EXTENDED THREAD FOR PLATFORM IF REQUIRED HEIGHT EXCEEDS 17"
PLATFORM TO BE WITHIN 1" OF LEVEL



PLATFORM DETAIL

NO SCALE 2

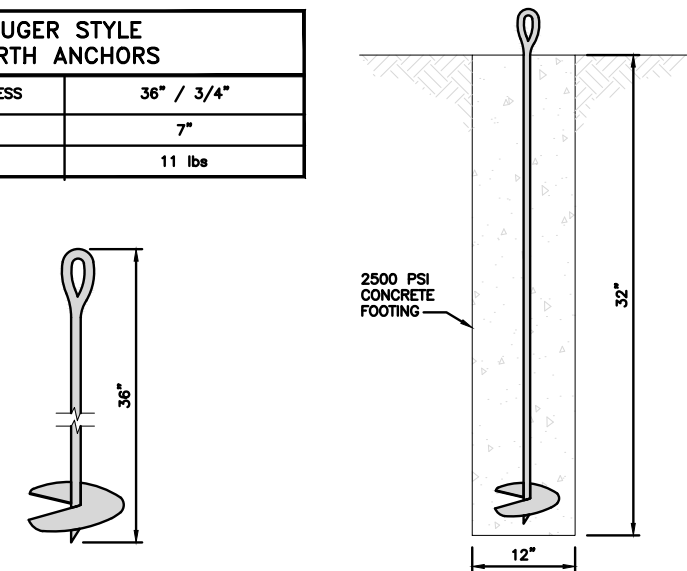
KENWOOD T1701KT5-5S H-FRAME	
UNISTRUT/SUPPORT RAIL	5
WEIGHT/ VOLUME	173.6 LBS



H-FRAME DETAIL

NO SCALE 3

AUGER STYLE EARTH ANCHORS	
LENGTH / THICKNESS	36" / 3/4"
SCREW OD	7"
WEIGHT	11 lbs

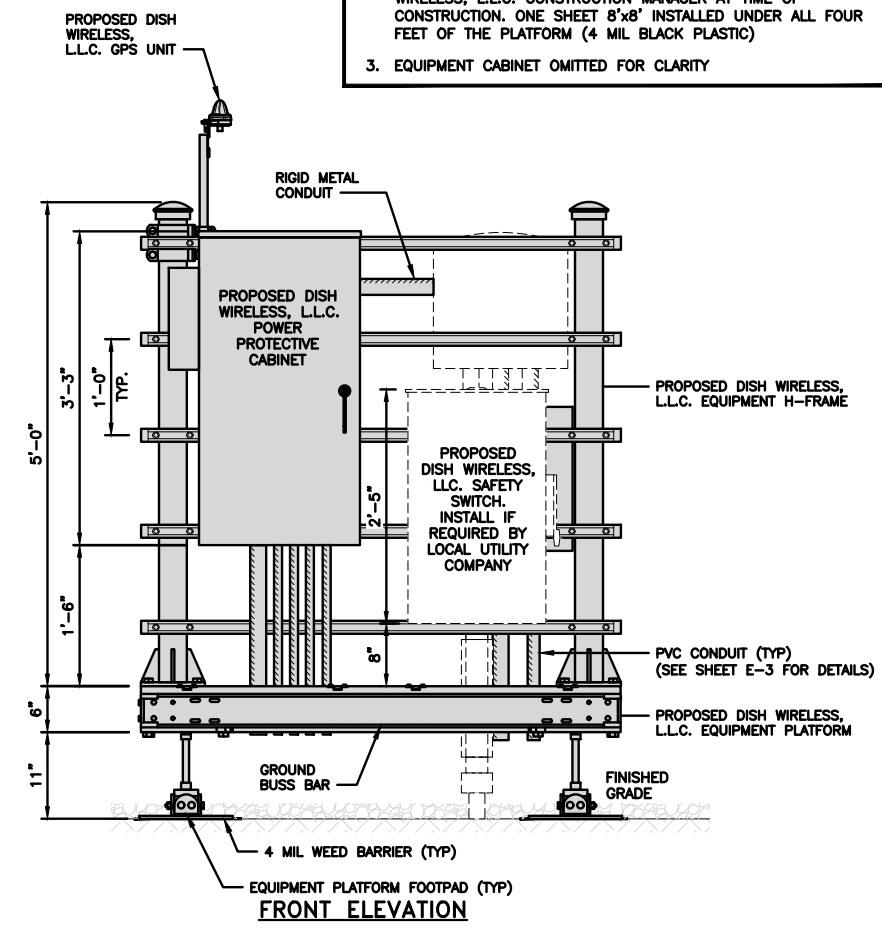


ANCHOR DETAIL

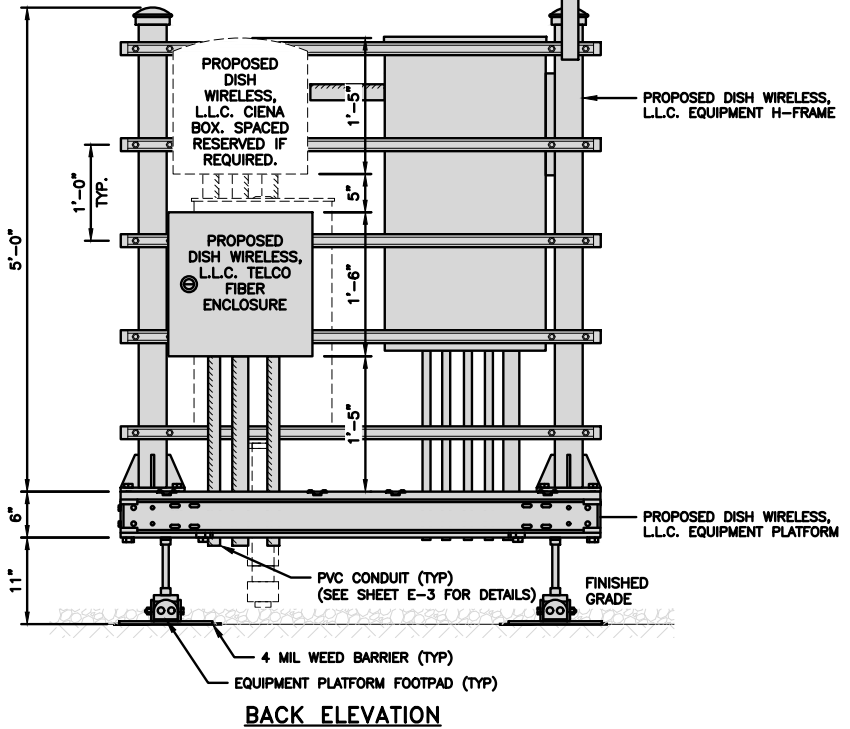
NO SCALE 4

NOTES

- CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF FILL PER EXISTING SITE SURFACE
- 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)
- EQUIPMENT CABINET OMITTED FOR CLARITY



FRONT ELEVATION



BACK ELEVATION

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

H-FRAME EQUIPMENT ELEVATION

NO SCALE 5



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



DRAWN BY:	CHECKED BY:	APPROVED BY:
JK	SRF	SRF
RFDS REV #:	----	

CONSTRUCTION DOCUMENTS

SUBMITTALS		
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0	11/02/2021	ISSUED FOR CONSTRUCTION
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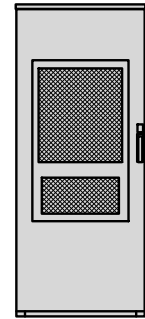
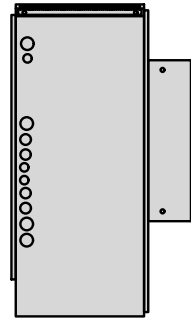
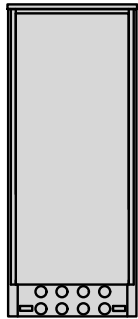
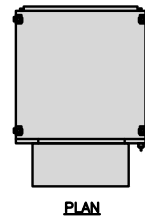
A&E PROJECT NUMBER
302511-13705673_D2

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
NJJER01139B
20 POST OFFICE LANE
WESTPORT, CT 06880

SHEET TITLE
EQUIPMENT PLATFORM AND
H-FRAME DETAILS

SHEET NUMBER
A-3

ENERSYS HEX 200005996	
DIMENSIONS (HxWxD)	73"x30"x32"
POWER SYSTEM	-48V ALPHA/600A
HEATER	800W
TOTAL WEIGHT (EMPTY)	376 lbs



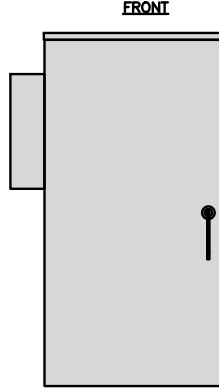
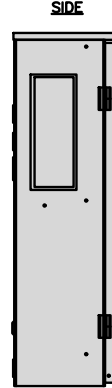
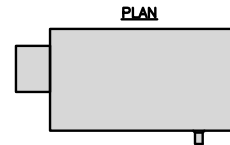
CABINET DETAIL

NO SCALE

1

RAYCAP RDIAC-6512-P-240-MTS
POWER & TELCO PROTECTION CABINET

DIMENSIONS (HxWxD)	40"x20"x10"
WEIGHT/ VOLUME	124 LBS
MANUAL TRANSFER SWITCH	200A
LOAD CENTER	30 POSITION
MAIN BREAKER	200A, 65KA AIC
GENERATOR RECEPTACLE	CAMLOCK
NEMA RATING	3R POWDER COATED ALUMINUM
SURGE PROTECTION DEVICE	UL 1449 4TH EDITION LISTED



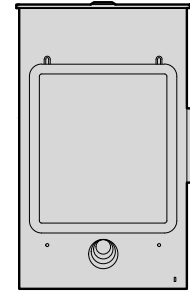
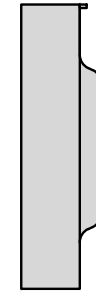
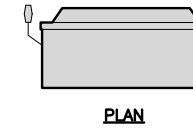
POWER PROTECTION CABINET (PPC) DETAIL

NO SCALE

2

SQUARE D SAFETY SWITCH
D324NRB

ENCLOSURE DIM (HxWxD)	29.25"x17.25"x8.25"
TOTAL WEIGHT (EMPTY)	45.33 LBS
MAX VOLTAGE/AMPS/WATT	240V/200A/48000W
ENCLOSURE RATING	OUTDOOR NEMA 3R



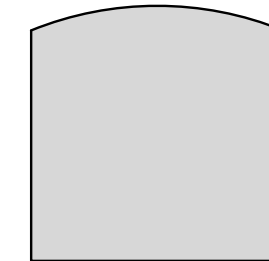
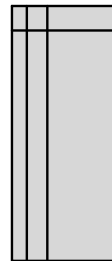
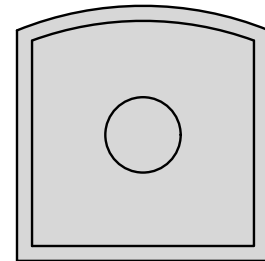
SAFETY SWITCH

NO SCALE

3

CIENA 3931
SERVICE DELIVERY SWITCH

DIMENSIONS (HxWxD)	17.0"x16.8"x7.0" 431x427x178mm
WEIGHT	28.6 LBS/13.0 KG
POWER INPUT	60W MAX



FRONT

SIDE

BACK

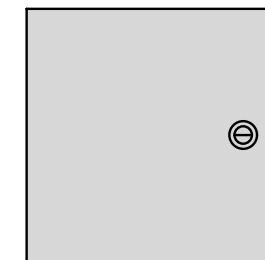
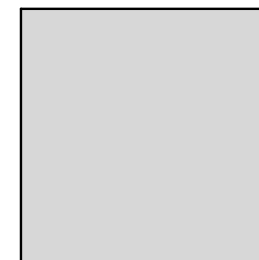
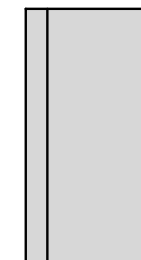
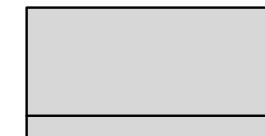
CIENA DETAIL

NO SCALE

5

CHARLES
FIBER TELCO ENCLOSURE
CUBE-MP1818WB-A

ENCLOSURE DIM (HxWxD)	18.0"x18.0"x9.25"
NEMA RATING	4X
THERMAL	SEALED
MOUNTING BACKBOARD	WOOD



SIDE

BACK

FRONT

FIBER TELCO ENCLOSURE DETAIL

NO SCALE

6

NOT USED

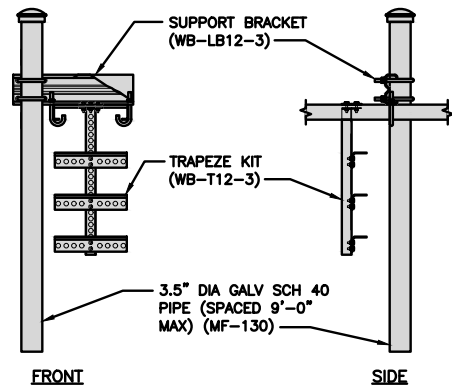
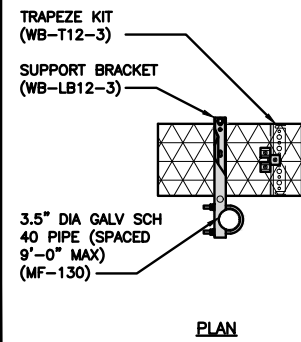
NO SCALE

4

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

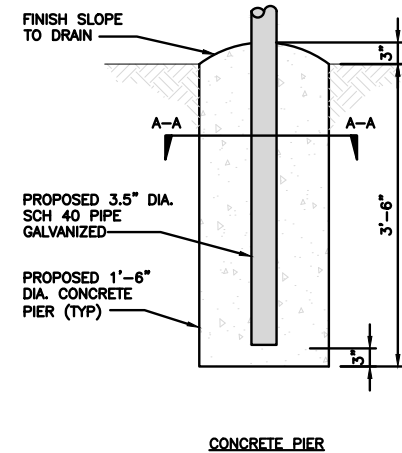
FRONT

SIDE

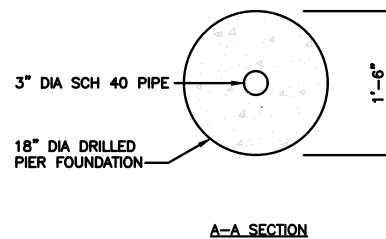
ICE BRIDGE DETAIL

NO SCALE

7



CONCRETE PIER

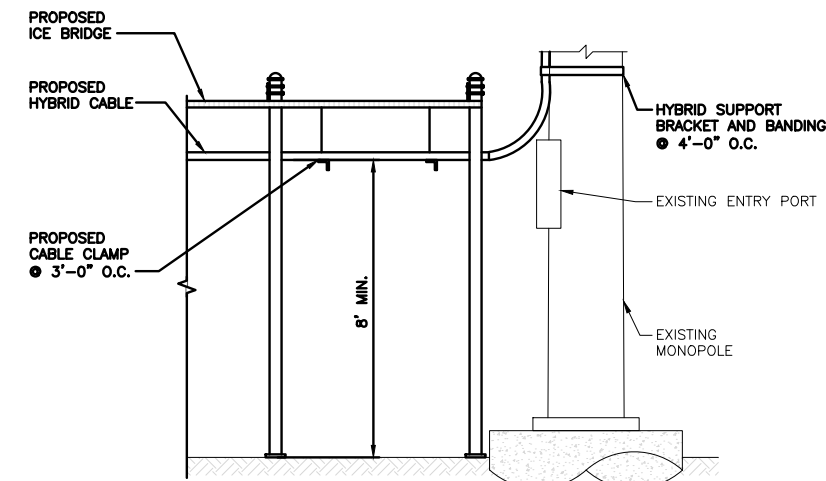


A-A SECTION

TYPICAL ICE BRIDGE CONCRETE PIER DETAIL

NO SCALE

8



HYBRID CABLE RUN

NO SCALE

9



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

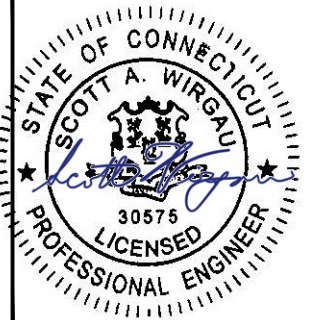


DRAWN BY:	CHECKED BY:	APPROVED BY:
JK	SRF	SRF

RFDS REV #: ----

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
0	11/02/2021	ISSUED FOR CONSTRUCTION
1	11/29/2021	ANTENNA MODEL



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A&E PROJECT NUMBER
302511-13705673_D2

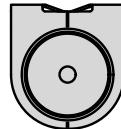
DISH WIRELESS, L.L.C.
PROJECT INFORMATION
NJJER01139B
20 POST OFFICE LANE
WESTPORT, CT 06880

SHEET TITLE
EQUIPMENT
DETAILS

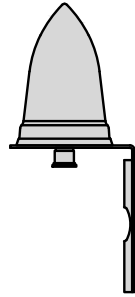
SHEET NUMBER

A-4

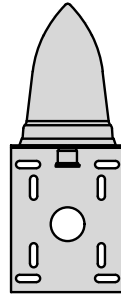
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



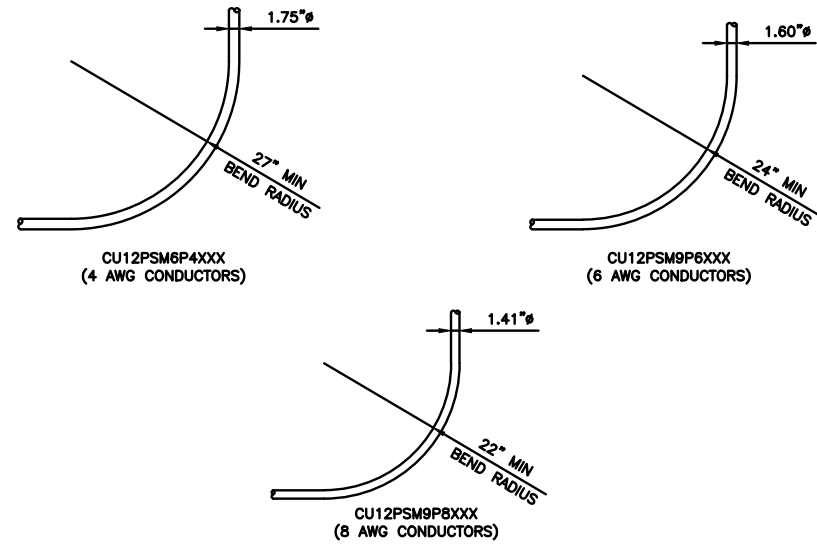
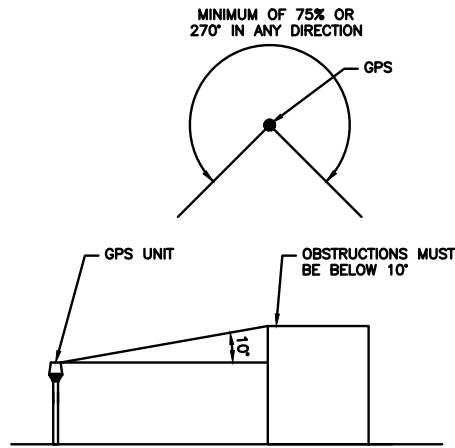
TOP



BACK



SIDE



GPS DETAIL

NO SCALE

1

GPS MINIMUM SKY VIEW REQUIREMENTS

NO SCALE

2

CABLES UNLIMITED HYBRID CABLE
MINIMUM BEND RADIUSES

NO SCALE

3

NOT USED

NO SCALE

4

NOT USED

NO SCALE

5

NOT USED

NO SCALE

6

NOT USED

NO SCALE

7

NOT USED

NO SCALE

8

NOT USED

NO SCALE

9

dish
wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

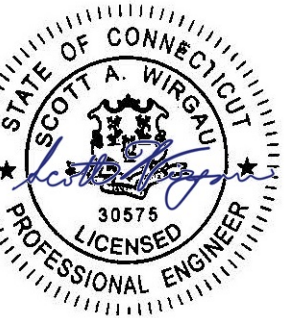
AMERICAN TOWER
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112

DRAWN BY: JK
CHECKED BY: SRF
APPROVED BY: SRF

RFDS REV #: ----

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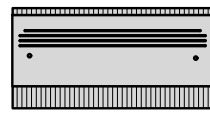
A&E PROJECT NUMBER
302511-13705673_D2

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
NJJER01139B
20 POST OFFICE LANE
WESTPORT, CT 06880

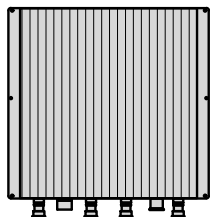
SHEET TITLE
EQUIPMENT
DETAILS

SHEET NUMBER
A-5

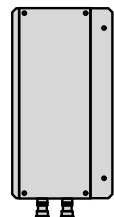
FUJITSU DUAL BAND TA08025-B604	
DIMENSIONS (HxWxD)	14.9"x15.7"x7.8"
WEIGHT	63.9 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



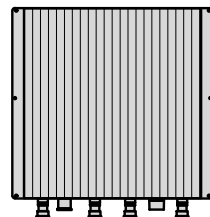
PLAN



BACK



SIDE



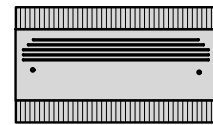
FRONT

RRH DETAIL

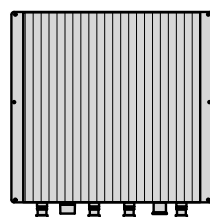
NO SCALE

1

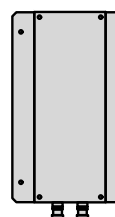
FUJITSU TRIPLE BAND TA08025-B605	
DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



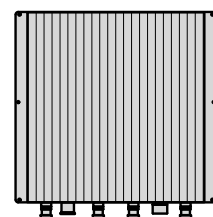
PLAN



BACK



SIDE



FRONT

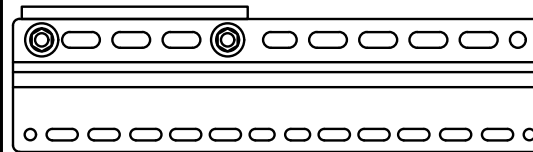
RRH DETAIL

NO SCALE

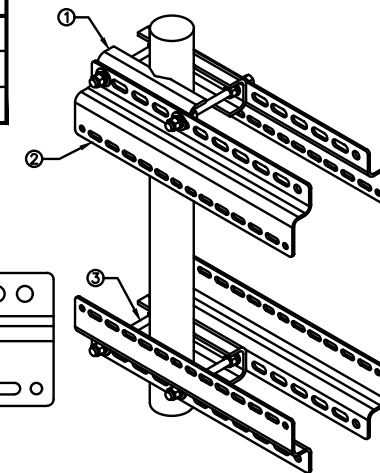
2

SABRE DOUBLE Z-BRACKET G10123155	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"
WEIGHT (FULL ASSEMBLY)	35.79 lbs
PACKAGE QUANTITY	4

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



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



RRH MOUNT DETAIL

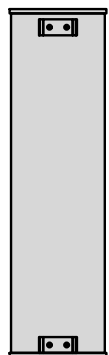
NO SCALE

3

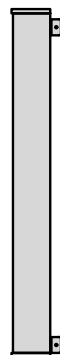
JMA WIRELESS MX08FRO665-21 ANTENNA	
DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	64.5 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE



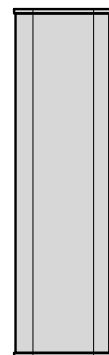
PLAN



BACK



SIDE



FRONT

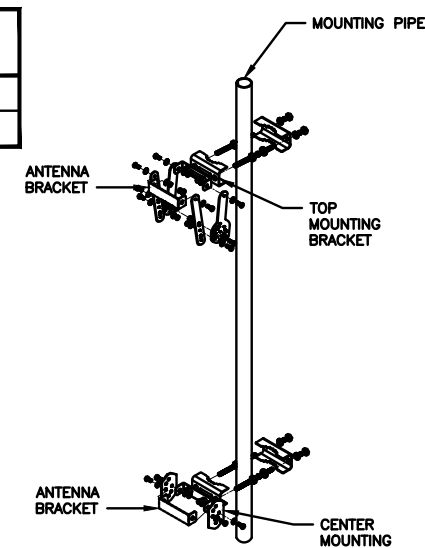
ANTENNA DETAIL

NO SCALE

4

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

NOTE:
KIT #91900318: TOP AND BOTTOM BRACKETS
FOR 4-, 6-, AND 8-FOOT ANTENNAS
ANTENNA BRACKET NOT PART OF KIT



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

ANTENNA BRACKET DETAIL

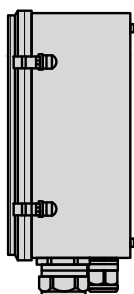
NO SCALE

6

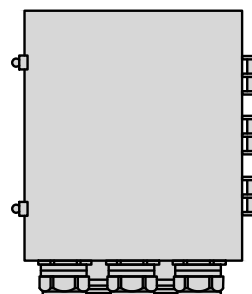
RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS



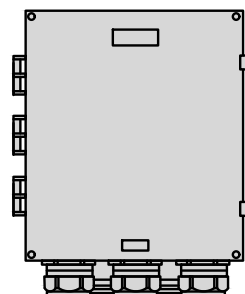
PLAN



SIDE



BACK



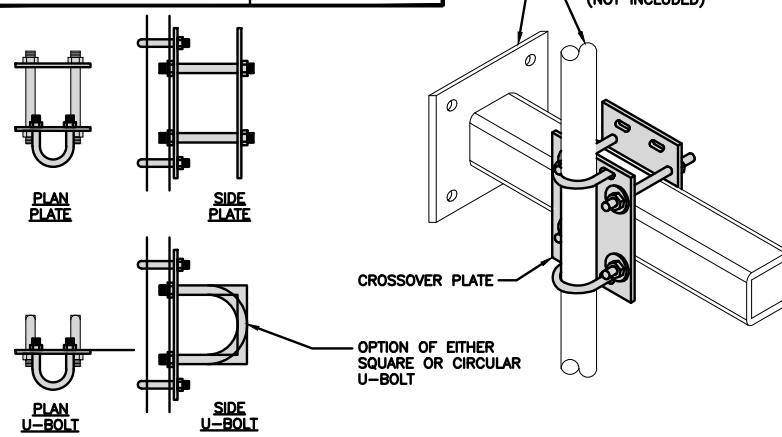
FRONT

SURGE SUPPRESSION DETAIL (OVP)

NO SCALE

7

COMMSCOPE XP-2040 CROSSOVER PLATE	
DIMENSIONS (HxW)	10"x12"
WEIGHT	11.023 LBS

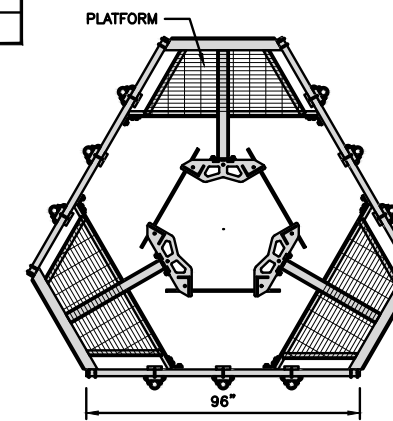
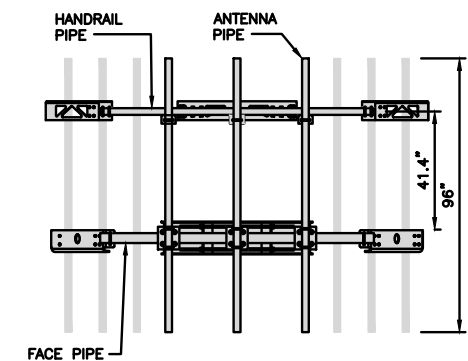


RRH/OVP MOUNT DETAIL

NO SCALE

8

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



ANTENNA PLATFORM DETAIL

NO SCALE

9

dish
wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

AMERICAN TOWER
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112

DRAWN BY: JK CHECKED BY: SRF APPROVED BY: SRF

RFDS REV #: ----

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302511-13705673_D2

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
NJJER01139B
20 POST OFFICE LANE
WESTPORT, CT 06880

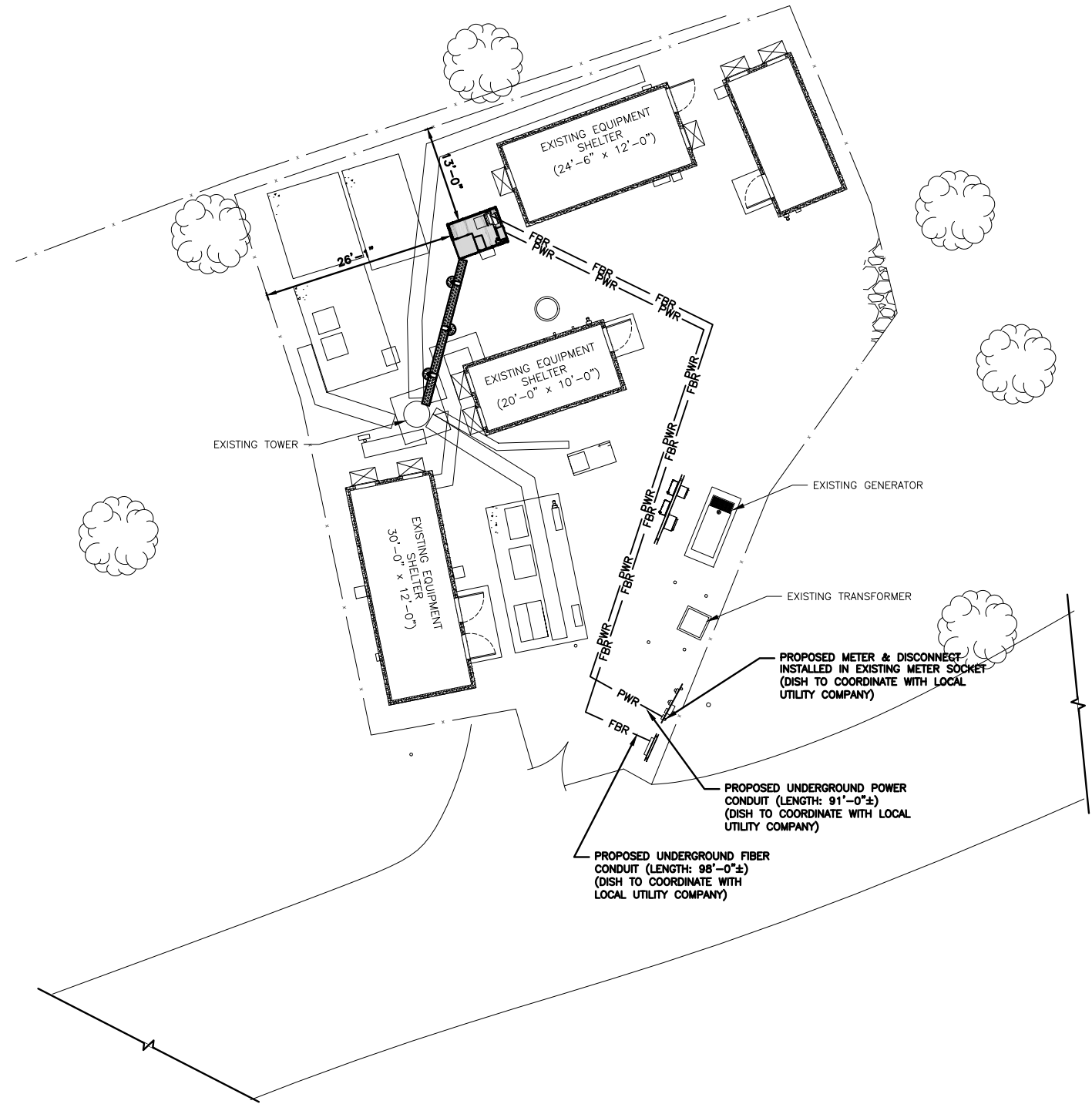
SHEET TITLE
EQUIPMENT
DETAILS

SHEET NUMBER

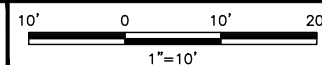
A-6

NOTES

1. CONTRACTOR MUST VERIFY THAT THE PROPOSED UTILITY ROUTES ARE WITHIN AMERICAN TOWER'S EASEMENT.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
3. GC TO REFER TO FINAL UTILITY COORDINATION DOCUMENT FOR ALL MEET ME POINTS AND ROUTING DETAILS.



UTILITY ROUTE PLAN



1

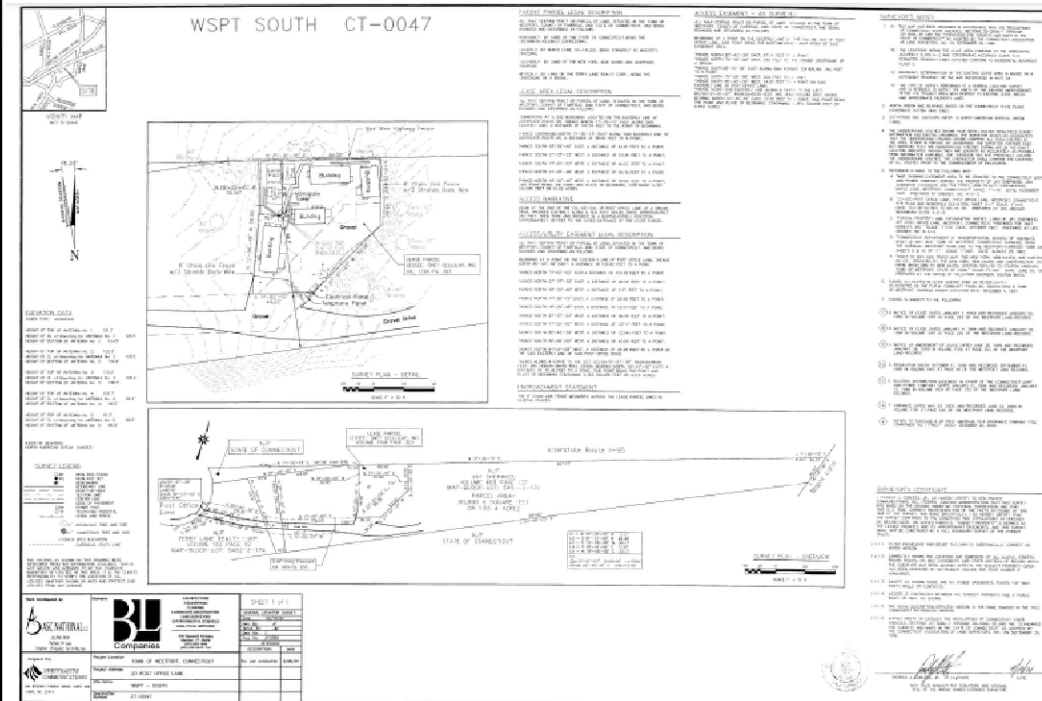
DC POWER WIRING SHALL BE COLOR CODED AT EACH END FOR IDENTIFYING +24V AND -48V CONDUCTORS. RED MARKINGS SHALL IDENTIFY +24V AND BLUE MARKINGS SHALL IDENTIFY -48V.

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. ALL TRENCHES IN COMPOUND TO BE HAND DUG

ELECTRICAL NOTES

NO SCALE

2



EXISTING SURVEY (BY OTHERS)

NO SCALE

3



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



DRAWN BY:	CHECKED BY:	APPROVED BY:
JK	SRF	SRF

RFDS REV #: -----

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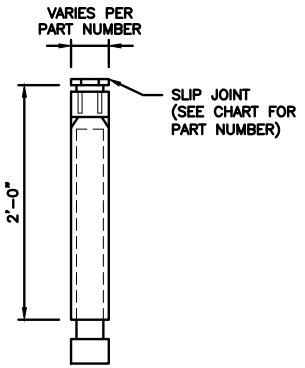
DISH WIRELESS, L.L.C.
PROJECT INFORMATION
NJJER01139B
20 POST OFFICE LANE
WESTPORT, CT 06880

SHEET TITLE
**ELECTRICAL/FIBER ROUTE
PLAN AND NOTES**

SHEET NUMBER
E-1

CARLON EXPANSION FITTINGS

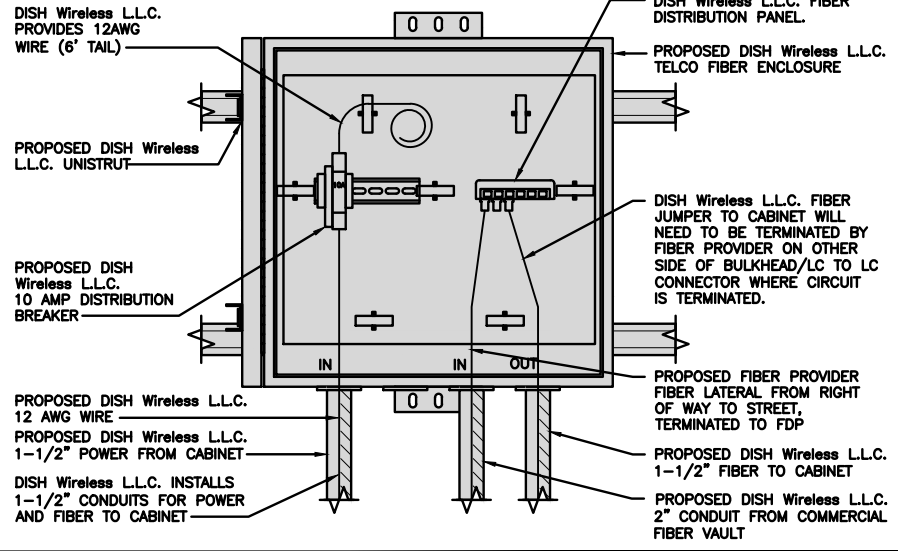
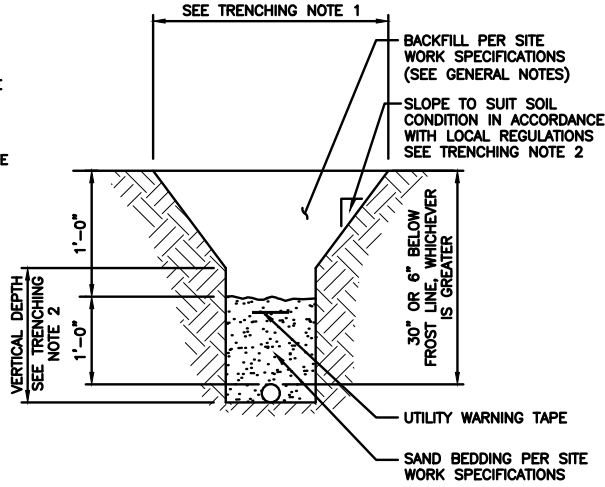
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
E945M	E945MX	3 1/2"	5	8"
E945N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

TRENCHING NOTES

- 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.
- TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT OSHA TRENCHING AND EXCAVATION SAFETY STANDARDS.
- 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.



EXPANSION JOINT DETAIL

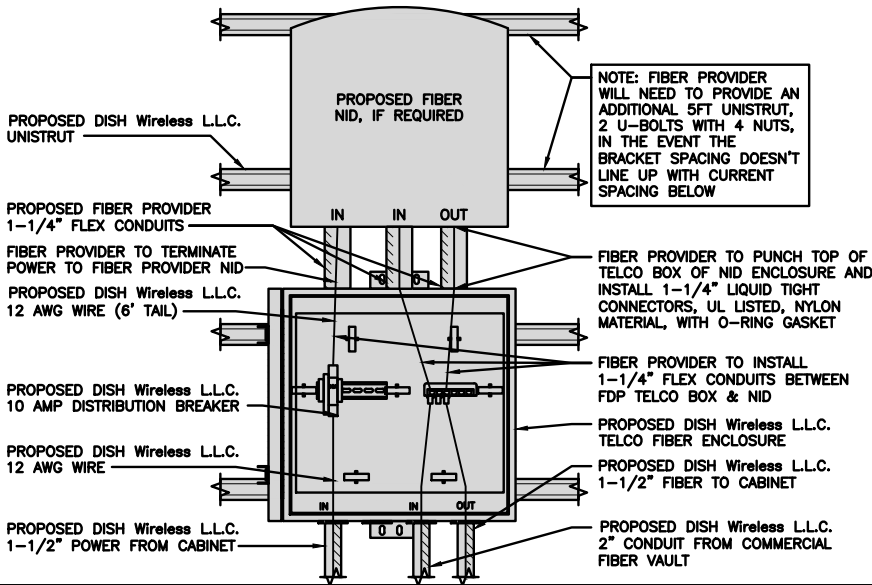
NO SCALE 1

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



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



DRAWN BY:	CHECKED BY:	APPROVED BY:
JK	SRF	SRF

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
0	11/02/2021	ISSUED FOR CONSTRUCTION
1	11/29/2021	ANTENNA MODEL



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A&E PROJECT NUMBER
302511-13705673_D2

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
NJJER01139B
20 POST OFFICE LANE
WESTPORT, CT 06880

SHEET TITLE
ELECTRICAL
DETAILS

SHEET NUMBER
E-2



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

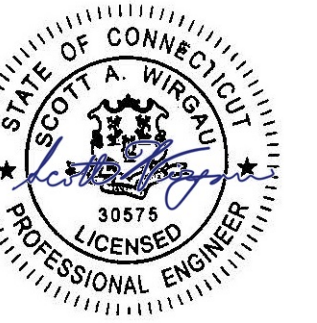


DRAWN BY: JK
CHECKED BY: SRF
APPROVED BY: SRF

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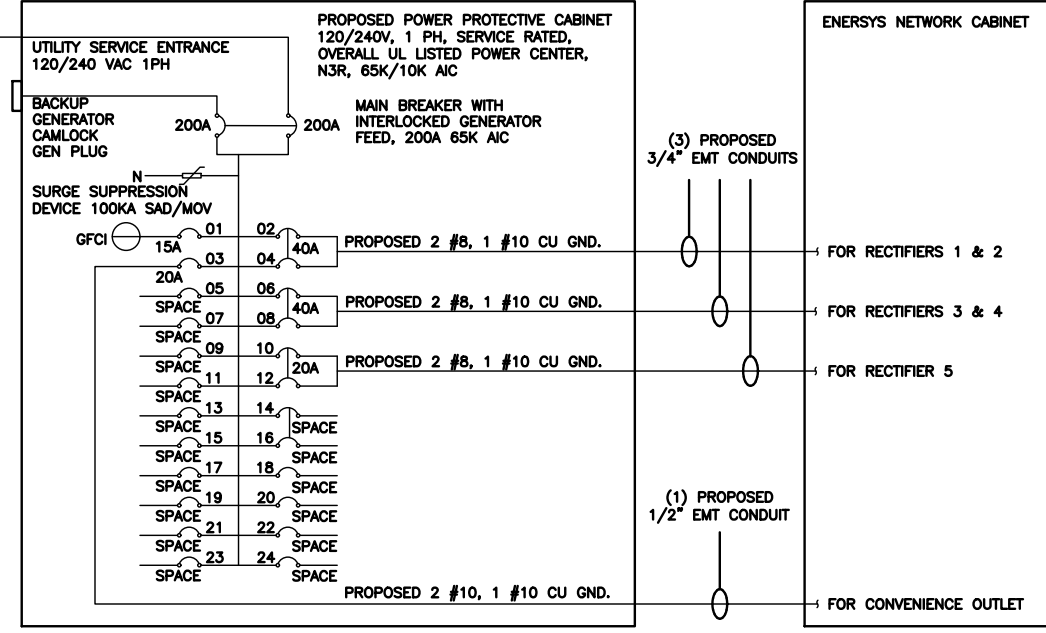
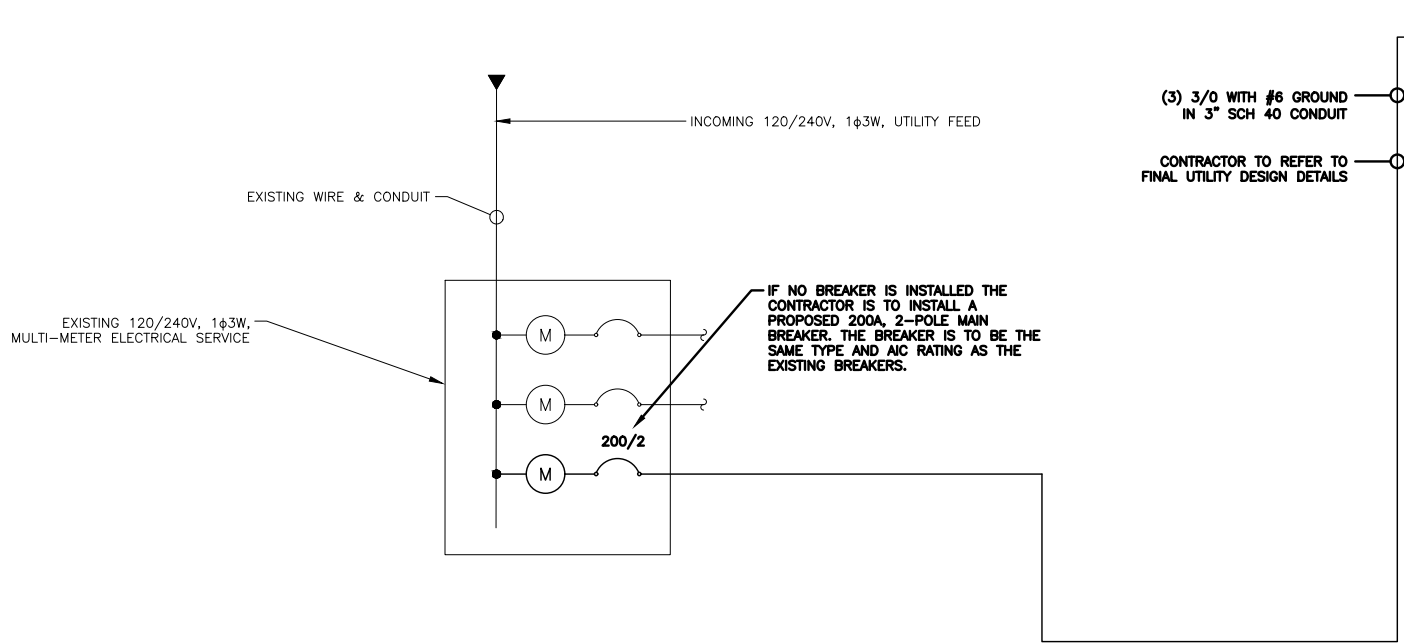
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NJJER01139B
20 POST OFFICE LANE
WESTPORT, CT 06880

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

SHEET NUMBER
E-3



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:
(2) 40A, 2P BREAKER - SQUARE D P/N:QO240
(1) 20A, 2P BREAKER - SQUARE D P/N:QO220
(1) 20A, 1P BREAKER - SQUARE D P/N:QO120
(1) 15A, 1P BREAKER - SQUARE D P/N:QO115

PPC ONE-LINE DIAGRAM

NO SCALE 1

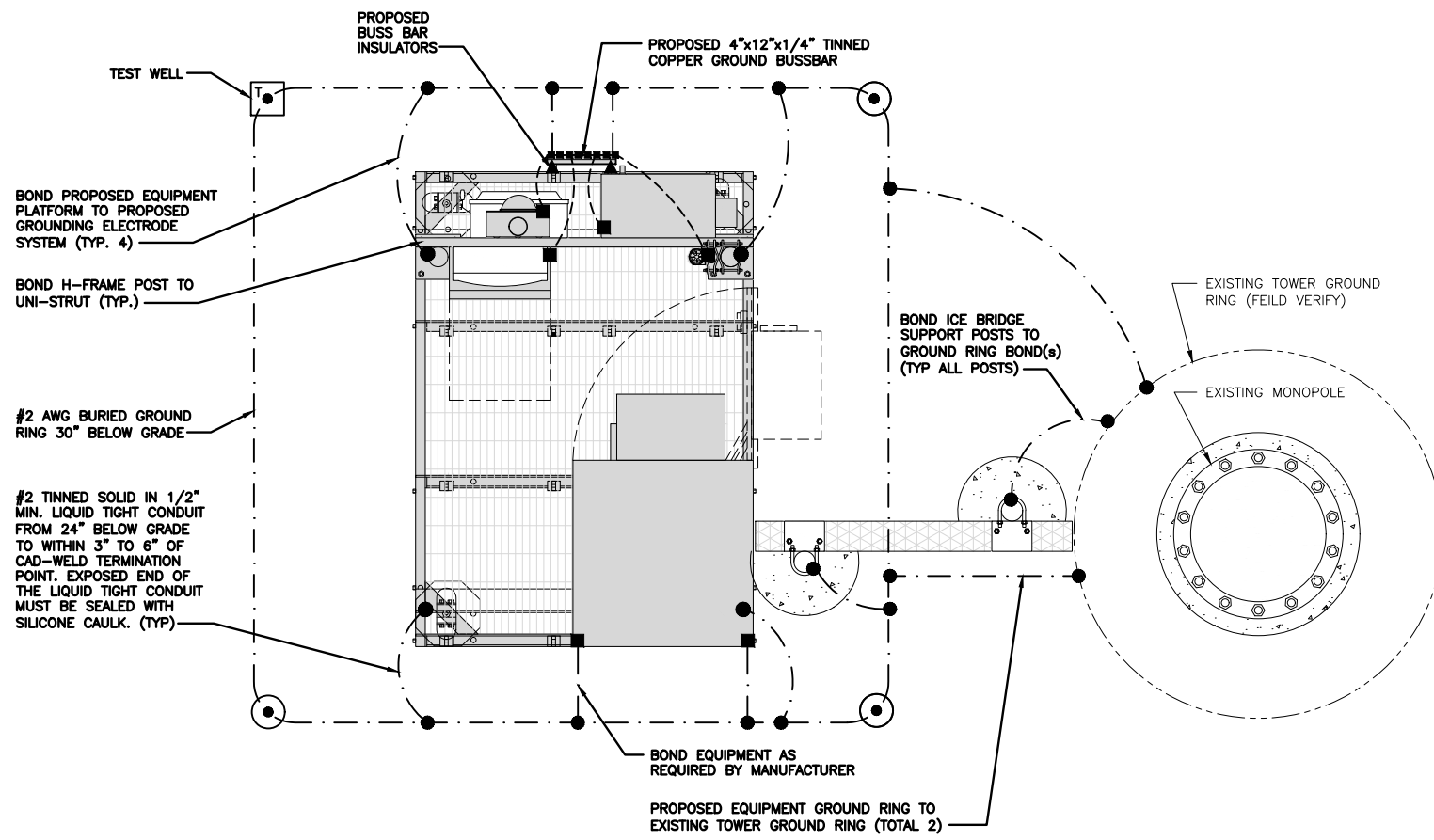
PROPOSED ENERSYS PANEL SCHEDULE										
LOAD SERVED	VOLT AMPS (WATTS)		TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPS (WATTS)		LOAD SERVED
	L1	L2						L1	L2	
PPC GFCI OUTLET	180	180	15A	1	A	2	40A	3840	3840	ENERSYS ALPHA CORDEX RECTIFIERS 1 & 2
ENERSYS GFCI OUTLET	180	180	20A	3	B	4	40A	3840	3840	ENERSYS ALPHA CORDEX RECTIFIERS 3 & 4
-SPACE-				5	A	6	40A	3840	3840	ENERSYS ALPHA CORDEX RECTIFIER 3 & 4
-SPACE-				7	B	8	40A	3840	3840	ENERSYS ALPHA CORDEX RECTIFIER 3 & 4
-SPACE-				9	A	10	20A	1920	1920	ENERSYS ALPHA CORDEX RECTIFIER 5
-SPACE-				11	B	12	20A	1920	1920	ENERSYS ALPHA CORDEX RECTIFIER 5
-SPACE-				13	A	14				-SPACE-
-SPACE-				15	B	16				-SPACE-
-SPACE-				17	A	18				-SPACE-
-SPACE-				19	B	20				-SPACE-
-SPACE-				21	A	22				-SPACE-
-SPACE-				23	B	24				-SPACE-
VOLTAGE AMPS	180	180						9500	9500	
200A MCB, 1φ, 24 SPACE, 120/240V				L1	L2			9680	9680	VOLTAGE AMPS
MB RATING: 65,000 AIC				81	81			81	81	AMPS
				81	81			81	81	MAX AMPS
				102	102			102	102	MAX 125%

PANEL SCHEDULE

NO SCALE 2

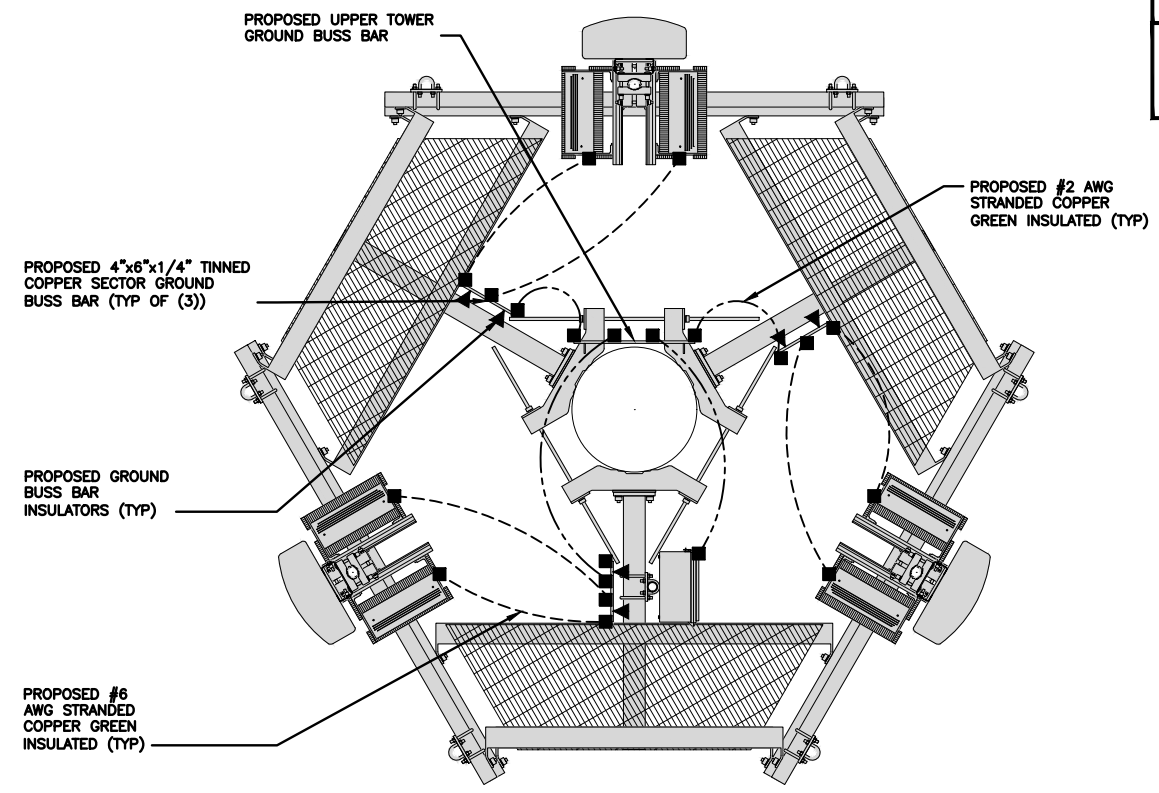
NOT USED

NO SCALE 3



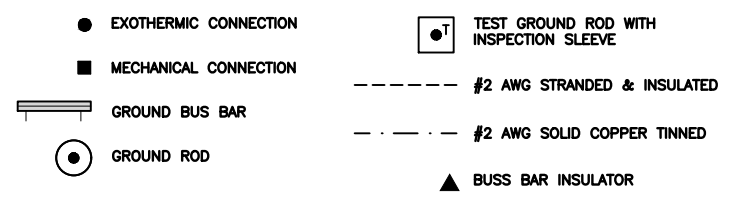
TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE 1



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 2



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 5/8" 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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LITTLETON, CO 80120

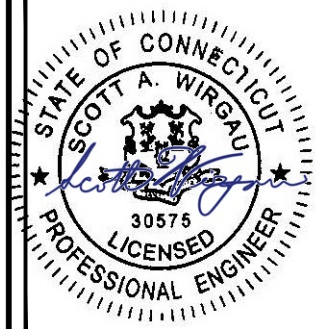


DRAWN BY:	CHECKED BY:	APPROVED BY:
JK	SRF	SRF

RFDS REV #: -----

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302511-13705673_D2

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
NJJER01139B
20 POST OFFICE LANE
WESTPORT, CT 06880

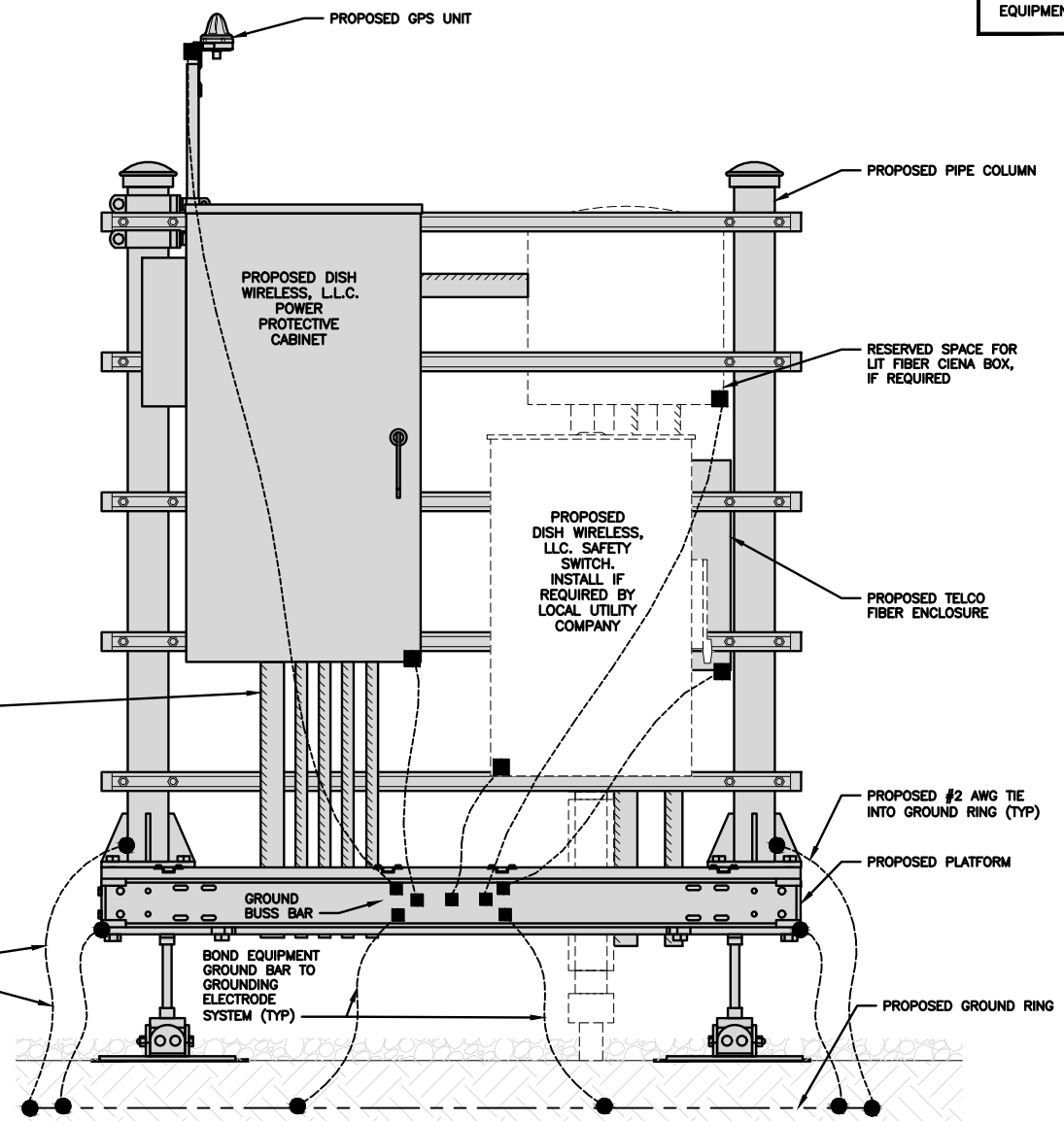
SHEET TITLE
GROUNDING PLANS
AND NOTES

SHEET NUMBER

G-1

NOTES

EQUIPMENT CABINET OMITTED FOR CLARITY

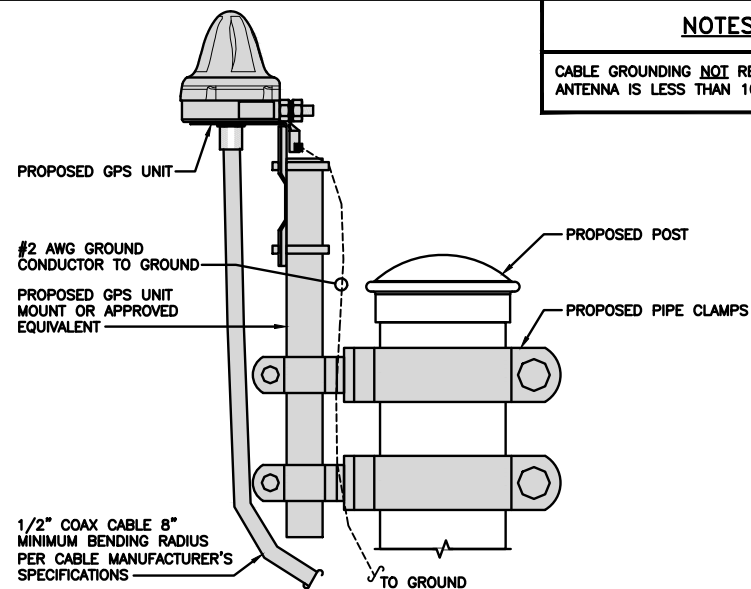


H-FRAME GROUNDING DETAIL

NO SCALE 1

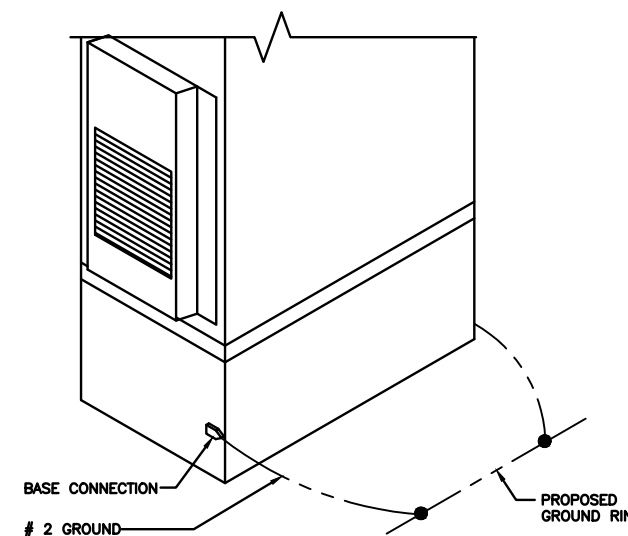
NOTES

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



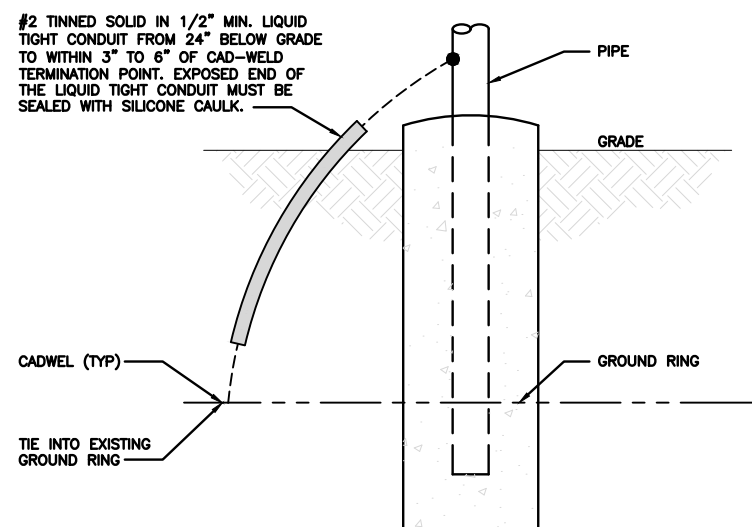
TYPICAL GPS UNIT GROUNDING

NO SCALE 2



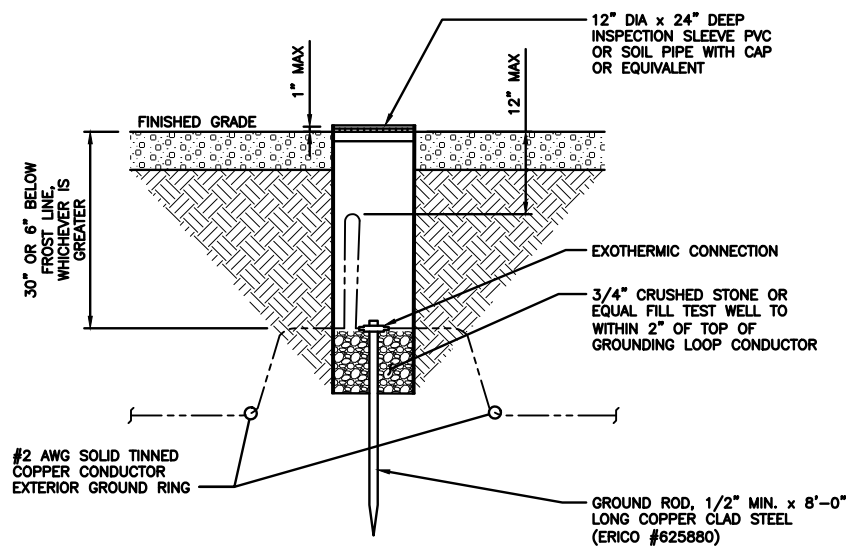
OUTDOOR CABINET GROUNDING

NO SCALE 3



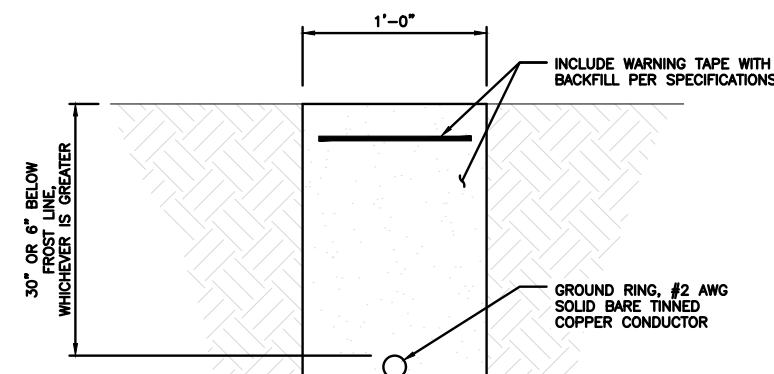
TRANSITIONING GROUND DETAIL

NO SCALE 4



TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE

NO SCALE 5



TYPICAL GROUND RING TRENCH

NO SCALE 6

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

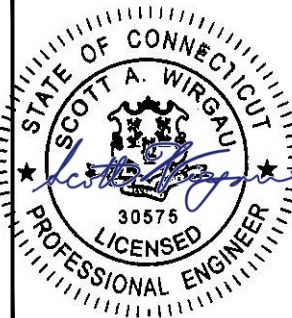
AMERICAN TOWER
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112

DRAWN BY: JK
CHECKED BY: SRF
APPROVED BY: SRF

RFDS REV #: ---

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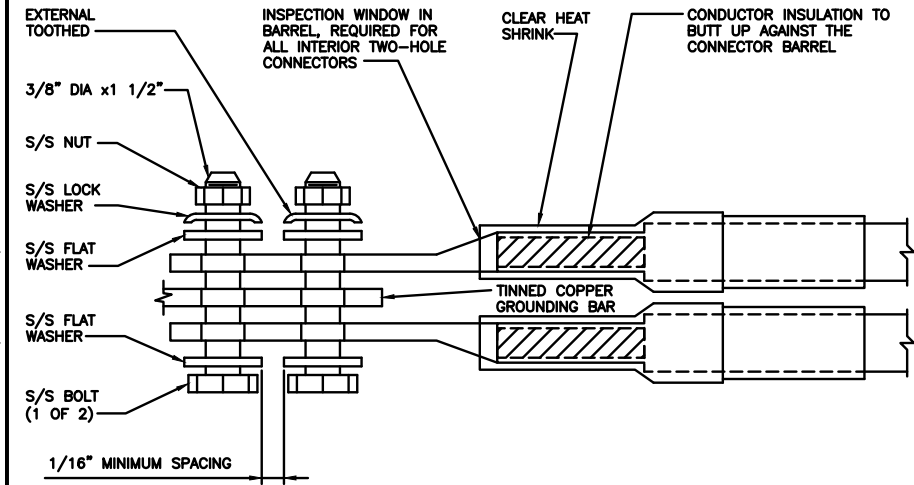
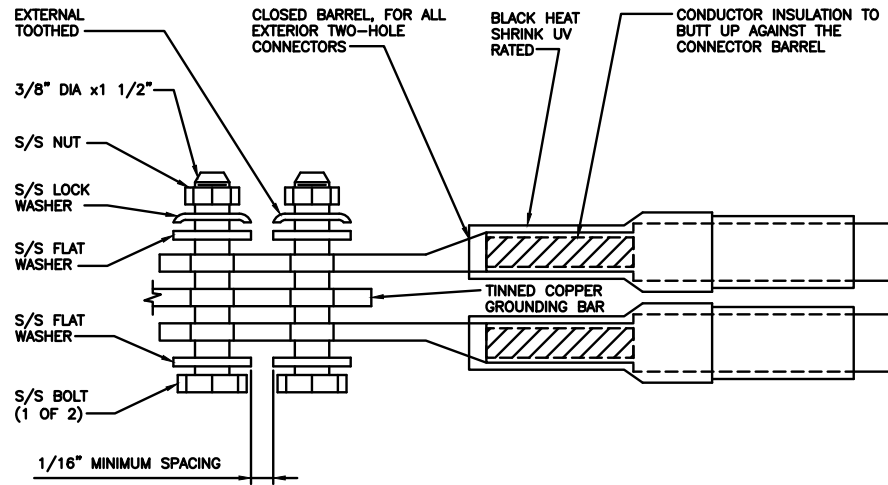
DISH WIRELESS, L.L.C.
PROJECT INFORMATION
NJJER01139B
20 POST OFFICE LANE
WESTPORT, CT 06880

SHEET TITLE
GGROUNDING
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

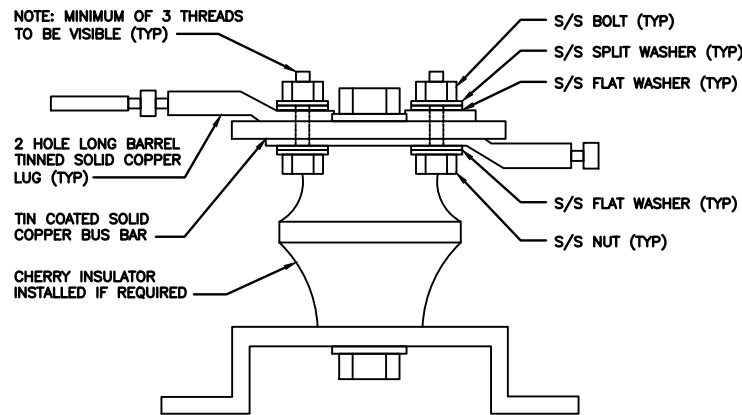
NO SCALE

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

dish
wireless.

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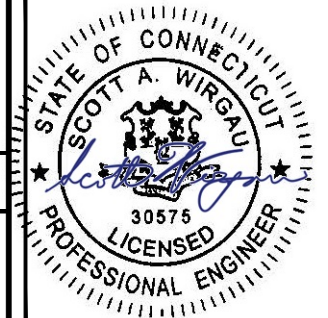
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20 POST OFFICE LANE
WESTPORT, CT 06880

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)

ALPHA RRH				BETA RRH				GAMMA RRH			
PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT
RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
ORANGE	ORANGE	RED	RED	ORANGE	ORANGE	BLUE	BLUE	ORANGE	ORANGE	GREEN	GREEN
	WHITE (-) PORT	ORANGE	ORANGE		WHITE (-) PORT	ORANGE	ORANGE		WHITE (-) PORT	ORANGE	ORANGE
			WHITE (-) PORT				WHITE (-) PORT				WHITE (-) PORT

MID-BAND RRH -
(AWS BANDS N66+N70)

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

RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
PURPLE	PURPLE	RED	RED	PURPLE	PURPLE	BLUE	BLUE	PURPLE	PURPLE	GREEN	GREEN
	WHITE (-) PORT	PURPLE	PURPLE		WHITE (-) PORT	PURPLE	PURPLE		WHITE (-) PORT	PURPLE	PURPLE
			WHITE (-) PORT				WHITE (-) PORT				WHITE (-) PORT

HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED
ALONG WITH FREQUENCY BANDS

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

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

EXAMPLE 1	EXAMPLE 2	EXAMPLE 3
RED	RED	RED
BLUE	BLUE	
GREEN	GREEN	ORANGE
ORANGE	YELLOW	PURPLE
PURPLE		

FIBER JUMPERS TO RRHs

LOW-BAND RRH FIBER CABLES HAVE SECTOR
STRIPE ONLY

LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH
RED	RED	BLUE	BLUE	GREEN	GREEN
	PURPLE		PURPLE		PURPLE

POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR
STRIPE ONLY

LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH	LOW BAND RRH	HIGH BAND RRH
RED	RED	BLUE	BLUE	GREEN	GREEN
	PURPLE		PURPLE		PURPLE

RET MOTORS AT ANTENNAS

ANTENNA 1 LOW BAND/ "IN"	ANTENNA 1 HIGH BAND/ "IN"	ANTENNA 1 LOW BAND/ "IN"	ANTENNA 1 HIGH BAND/ "IN"	ANTENNA 1 LOW BAND/ "IN"	ANTENNA 1 HIGH BAND/ "IN"
RED	RED	BLUE	BLUE	GREEN	GREEN
	PURPLE		PURPLE		PURPLE

MICROWAVE RADIO LINKS

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

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

FORWARD AZIMUTH OF 0-120 DEGREES		FORWARD AZIMUTH OF 120-240 DEGREES		FORWARD AZIMUTH OF 240-360 DEGREES	
PRIMARY	SECONDARY	PRIMARY	SECONDARY	PRIMARY	SECONDARY
WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
RED	RED	BLUE	BLUE	GREEN	GREEN
WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
	RED		BLUE		GREEN
	WHITE		WHITE		WHITE
	WHITE		WHITE		WHITE

RF CABLE COLOR CODES

NO SCALE

1

LOW BANDS (N71+N26)
OPTIONAL - (N29)



AWS
(N66+N70+H-BLOCK)



CBRS TECH
(3 GHz)



NEGATIVE SLANT PORT
ON ANT/RRH



ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR



COLOR IDENTIFIER

NO SCALE

2

NOT USED

NO SCALE

3

NOT USED

NO SCALE

4



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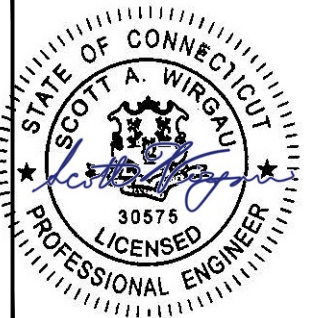
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JK SRF SRF

RFDS REV #: ----

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0	11/02/2021	ISSUED FOR CONSTRUCTION
1	11/29/2021	ANTENNA MODEL



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A&E PROJECT NUMBER
302511-13705673_D2

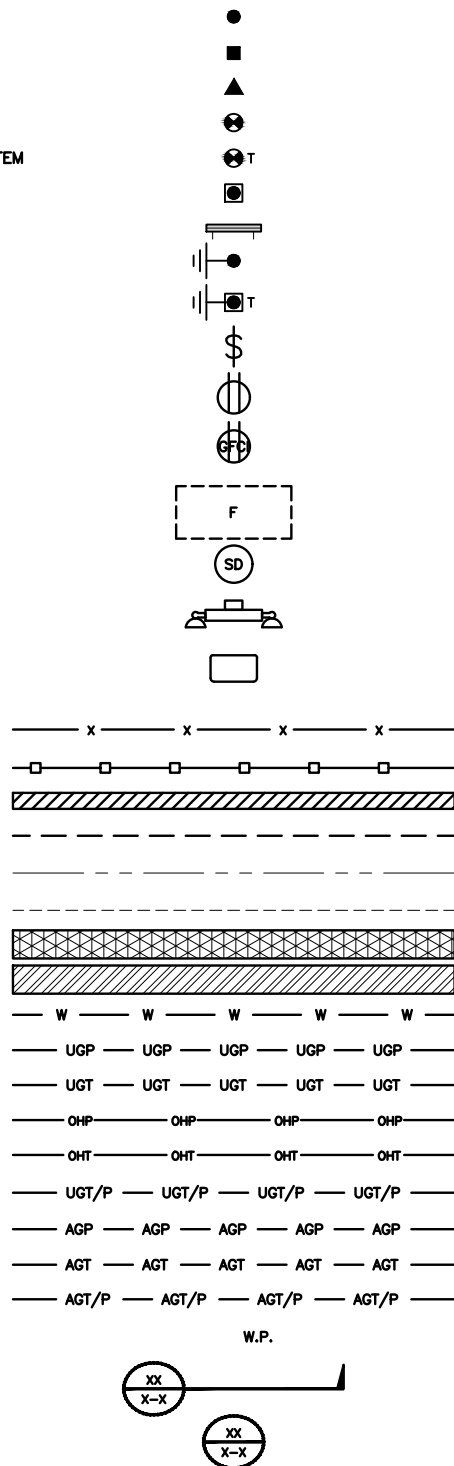
DISH WIRELESS, L.L.C.
PROJECT INFORMATION
NJJER01139B
20 POST OFFICE LANE
WESTPORT, CT 06880

SHEET TITLE
RF
CABLE COLOR CODES

SHEET NUMBER

RF-1

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-DEBTDX



SECTION REFERENCE
 DETAIL REFERENCE

LEGEND

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

ABBREVIATIONS



5701 SOUTH SANTA FE DRIVE
 LITTLETON, CO 80120

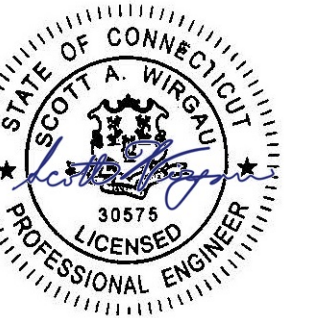


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JK	SRF	SRF

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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.



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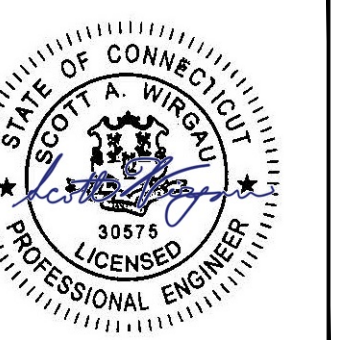


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GENERAL NOTES

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CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

- ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
- UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°f AT TIME OF PLACEMENT.
- CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER-TO-CEMENT RATIO (W/C) OF 0.45.
- ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:
 #4 BARS AND SMALLER 40 ksi
 #5 BARS AND LARGER 60 ksi
- THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
 - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3"
 - CONCRETE EXPOSED TO EARTH OR WEATHER:
 - #6 BARS AND LARGER 2"
 - #5 BARS AND SMALLER 1-1/2"
 - CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
 - SLAB AND WALLS 3/4"
 - BEAMS AND COLUMNS 1-1/2"
- A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
- CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
- WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
- ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
- ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
- ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
- EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
- ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
- PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
- TIE WRAPS ARE NOT ALLOWED.
- ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
- SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
- POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
- POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
- ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
- RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
- ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.

- ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
- SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
- LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
- CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
- CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
- WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
- SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
- CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER-ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
- EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3 (OR BETTER) FOR EXTERIOR LOCATIONS.
- METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
- NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
- THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR DISH WIRELESS, L.L.C. AND TOWER OWNER BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
- THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
- INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "DISH WIRELESS, L.L.C."
- ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



DRAWN BY:	CHECKED BY:	APPROVED BY:
JK	SRF	SRF

RFDS REV #: -----

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
0	11/02/2021	ISSUED FOR CONSTRUCTION
1	11/29/2021	ANTENNA MODEL



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

A&E PROJECT NUMBER
302511-13705673_D2

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
NJJERO1139B
20 POST OFFICE LANE
WESTPORT, CT 06880

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.

STRUCTURAL STEEL NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
2. STRUCTURAL STEEL ROLLED SHAPES, PLATES AND BARS SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS:
 - A. ASTM A-572, GRADE 50 - ALL W SHAPES, UNLESS NOTED OR A992 OTHERWISE
 - B. ASTM A-36 - ALL OTHER ROLLED SHAPES, PLATES AND BARS UNLESS NOTED OTHERWISE.
 - C. ASTM A-500, GRADE B - HSS SECTION (SQUARE, RECTANGULAR, AND ROUND)
 - D. ASTM A-325, TYPE SC OR N - ALL BOLTS FOR CONNECTING STRUCTURAL MEMBERS
 - E. ASTM F-1554 07 - ALL ANCHOR BOLTS, UNLESS NOTED OTHERWISE
3. ALL EXPOSED STRUCTURAL STEEL MEMBERS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION PER ASTM A123. EXPOSED STEEL HARDWARE AND ANCHOR BOLTS SHALL BE GALVANIZED PER ASTM A153 OR B695.
4. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURER'S RECOMMENDATIONS.
5. DO NOT DRILL HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.
6. CONNECTIONS:
 - A. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE D1.1.
 - B. ALL WELDS SHALL BE INSPECTED VISUALLY. 25% OF WELDS SHALL BE INSPECTED WITH DYE PENETRANT OR MAGNETIC PARTICLE TO MEET THE ACCEPTANCE CRITERIA OF AWS D1.1. REPAIR ALL WELDS AS NECESSARY.
 - C. INSPECTION SHALL BE PERFORMED BY AN AWS CERTIFIED WELD INSPECTOR.
 - D. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE BURNING/WELDING PERMITS AS REQUIRED BY LOCAL GOVERNING AUTHORITY AND IF REQUIRED SHALL HAVE FIRE DEPARTMENT DETAIL FOR ANY WELDING ACTIVITY.
 - E. ALL ELECTRODES TO BE LOW HYDROGEN, MATCHING FILLER METAL, PER AWS D1.1, UNLESS NOTED OTHERWISE.
 - F. MINIMUM WELD SIZE TO BE 0.1875 INCH FILLET WELDS, UNLESS NOTED OTHERWISE.
 - G. PRIOR TO FIELD WELDING GALVANIZING MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING 1/2" BEYOND ALL FIELD WELD SURFACES. AFTER WELD AND WELD INSPECTION IS COMPLETE, REPAIR ALL GROUND AND WELDED SURFACES WITH ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS RECOMMENDATIONS.
 - H. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING AND/OR BRACING WHERE REQUIRED DURING CONSTRUCTION UNTIL ALL CONNECTIONS ARE COMPLETE.
 - I. ANY FIELD CHANGES OR SUBSTITUTIONS SHALL HAVE PRIOR APPROVAL FROM THE ENGINEER, AND DISH WIRELESS L.L.C. PROJECT MANAGER IN WRITING



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

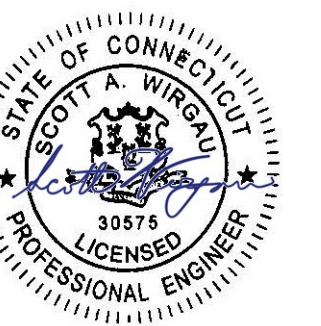


DRAWN BY:	CHECKED BY:	APPROVED BY:
JK	SRF	SRF

RFDS REV #: -----

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
0	11/02/2021	ISSUED FOR CONSTRUCTION
1	11/29/2021	ANTENNA MODEL



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A&E PROJECT NUMBER
302511-13705673_D2

DISH WIRELESS, L.L.C.
PROJECT INFORMATION
NJJER01139B
20 POST OFFICE LANE
WESTPORT, CT 06880

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-4

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Data provided by USPS

Tracking number 9505510391962122624662

Delivered

May 04, 10:56AM
Westport, CT

The Honorable Jennifer Tooker - First Selectwoman of Westport

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[Call 1-800-275-8777](#)

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Westport, CT

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Mary Young – Westport Director of Planning & Zoning

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Tracking number 9505510391962122624655

Delivered

May 04, 11:01AM
Woburn, MA

American Tower Corporation - Tower Operator/Owner

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Track your package

Data provided by USPS

Tracking number 9505510391962122624686

Delivered

May 04, 08:46AM **Sherwood Jay - Property Owner**
Westport, CT

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April 29, 2022

Blake Paynter
Project Manager, Site Development
American Tower Corporation
10 Presidential Way
Woburn, MA 01801

Re: Tower Share Application – Dish Site 13705673
Dish Wireless Telecommunications Facility @ 20 Post Office Lane, Westport, CT 06880

Dear Mr. Paynter:

Dish Wireless (“Dish”) is proposing a wireless telecommunications facility on an existing one hundred forty two (142) foot tall monopole tower at 20 Post Office Lane, Westport, CT 06880 (Latitude: 41.12344444, Longitude: -73.3131) and within the existing fenced compound. The tower is owned and operated by American Tower Corporation. The subject property is owned by Sherwood Jay. The existing tower was approved by the Council in Petition Number 394 on August 25, 1998.

Dish proposes to install a five (5) foot by seven (7) foot metal platform within the existing fenced compound and install three (3) antennas, a single antenna mount, six (6) RRUs, and cables on the existing tower at fifty three (53) feet as more particularly detailed on the enclosed Construction Drawings. The overall height of the existing tower will remain at 142-feet and no changes will be made to the compound dimensions.

This letter is intended to serve as the required notice to the tower owner. As required by Regulations of Connecticut State Agencies (“RCSA”) 16-50j-73 the Connecticut Siting Council (“CSC”) has been notified of this proposal and will review this application. Please accept this letter as notification pursuant to RCSA 16-50j-73.

The enclosed letter and attachments to the CSC fully describe Dish’s proposal for the site. However, if you have any questions or require any additional information concerning our plans or the CSC procedures, please contact me at 443-677-0144 or contact Melanie Bachmann, Acting Executive Director of the CSC at 860-972-2935.

Respectfully Submitted,

A handwritten signature in blue ink, appearing to read 'Jack Andrews', is written over a circular stamp or watermark.

Jack Andrews
Zoning Manager, Centerline Communications
10130 Donleigh Drive
Columbia, MD 21046



April 29, 2022

Mary Young, Director
Planning & Zoning
110 Myrtle Avenue, Room 203,
Westport, CT 06880

Re: Tower Share Application – Dish Site 13705673
Dish Wireless Telecommunications Facility @ 20 Post Office Lane, Westport, CT 06880

Dear Ms. Young:

Dish Wireless (“Dish”) is proposing a wireless telecommunications facility on an existing one hundred forty two (142) foot tall monopole tower at 20 Post Office Lane, Westport, CT 06880 (Latitude: 41.12344444, Longitude: -73.3131) and within the existing fenced compound. The tower is owned and operated by American Tower Corporation. The subject property is owned by Sherwood Jay. The existing tower was approved by the Council in Petition Number 394 on August 25, 1998.

Dish proposes to install a five (5) foot by seven (7) foot metal platform within the existing fenced compound and install three (3) antennas, a single antenna mount, six (6) RRUs, and cables on the existing tower at fifty three (53) feet as more particularly detailed on the enclosed Construction Drawings. The overall height of the existing tower will remain at 142-feet and no changes will be made to the compound dimensions.

This letter is intended to serve as the required notice to the municipal planning agency. As required by Regulations of Connecticut State Agencies (“RCSA”) 16-50j-73 the Connecticut Siting Council (“CSC”) has been notified of this proposal and will review this application. Please accept this letter as notification pursuant to RSCA 16-50j-73.

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Respectfully Submitted,

A handwritten signature in blue ink, appearing to read 'Jack Andrews', is written over a circular blue stamp.

Jack Andrews
Zoning Manager, Centerline Communications
10130 Donleigh Drive
Columbia, MD 21046



April 29, 2022

Sherwood Jay
PO Box 48
Westport, CT 06881

Re: Tower Share Application – Dish Site 13705673
Dish Wireless Telecommunications Facility @ 20 Post Office Lane, Westport, CT 06880

Dear Property Owner:

Dish Wireless (“Dish”) is proposing a wireless telecommunications facility on an existing one hundred forty two (142) foot tall monopole tower at 20 Post Office Lane, Westport, CT 06880 (Latitude: 41.12344444, Longitude: -73.3131) and within the existing fenced compound. The tower is owned and operated by American Tower Corporation. The subject property is owned by Sherwood Jay. The existing tower was approved by the Council in Petition Number 394 on August 25, 1998.

Dish proposes to install a five (5) foot by seven (7) foot metal platform within the existing fenced compound and install three (3) antennas, a single antenna mount, six (6) RRUs, and cables on the existing tower at fifty three (53) feet as more particularly detailed on the enclosed Construction Drawings. The overall height of the existing tower will remain at 142-feet and no changes will be made to the compound dimensions.

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Jack Andrews
Zoning Manager, Centerline Communications
10130 Donleigh Drive
Columbia, MD 21046
443-677-0144



April 29, 2022

The Honorable Jennifer Tooker
110 Myrtle Avenue, Room 310
Westport CT 06880

Re: Tower Share Application – Dish Site 13705673
Dish Wireless Telecommunications Facility @ 20 Post Office Lane, Westport, CT 06880

Dear First Selectwoman Tooker:

Dish Wireless (“Dish”) is proposing a wireless telecommunications facility on an existing one hundred forty two (142) foot tall monopole tower at 20 Post Office Lane, Westport, CT 06880 (Latitude: 41.12344444, Longitude: -73.3131) and within the existing fenced compound. The tower is owned and operated by American Tower Corporation. The subject property is owned by Sherwood Jay. The existing tower was approved by the Council in Petition Number 394 on August 25, 1998.

Dish proposes to install a five (5) foot by seven (7) foot metal platform within the existing fenced compound and install three (3) antennas, a single antenna mount, six (6) RRUs, and cables on the existing tower at fifty three (53) feet as more particularly detailed on the enclosed Construction Drawings. The overall height of the existing tower will remain at 142-feet and no changes will be made to the compound dimensions.

This letter is intended to serve as the required notice to the municipality’s chief elected official. As required by Regulations of Connecticut State Agencies (“RCSA”) 16-50j-73 the Connecticut Siting Council (“CSC”) has been notified of this proposal and will review this application. Please accept this letter as notification pursuant to RSCA 16-50j-73.

The enclosed letter and attachments to the CSC fully describe Dish’s proposal for the site. However, if you have any questions or require any additional information concerning our plans or the CSC procedures, please contact me at 443-677-0144 or contact Melanie Bachmann, Acting Executive Director of the CSC at 860-972-2935.

Respectfully Submitted,

A handwritten signature in blue ink, appearing to read 'Jack Andrews', is written over a printed name.

Jack Andrews
Zoning Manager, Centerline Communications
10130 Donleigh Drive
Columbia, MD 21046