STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

RE: APPLICATION BY BLUE SKY TOWERS, LLC APPLICATION FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR A TELECOMMUNICATIONS FACILITY AT BRIDGEPORT ASSESSORS MAP 53, BLOCK 1527, LOT2, 220 EVERGREEN STREET BRIDGEPORT, CONNECTICUT

DOCKET NO. 464

Date: June 2, 2016

INTERROGATORY RESPONSES, SET TWO, TO CONNECTICUT SITING COUNCIL FROM APPLICANT BLUE SKY TOWERS, LLC

The Applicant, Blue Sky Towers, LLC ("Applicant"), submits the following responses to the development and Management Plan Interrogatories, Set Two, by the Connecticut Siting Council in connection with the above-captioned Docket.

7. Explain why no backup generator is being proposed at this time.

7. Blue Sky confirmed that AT&T will be installing a generator at the time of their install on the permanent tower. Enclosed is the revised sound report to show the new location as shown on the D&M plans and will be in compliance with noise regulations which includes their HVAC units as well.

8. In Blue Sky Towers, LLC (Blue Sky) April 29, 2016 Development and Management Plan (D&M Plan), is Blue Sky re-using the same equipment shelter that is currently used for the temporary facility?

8. Yes, the same equipment shelter that is used for the temporary facility will be used for the permanent tower. AT&T is the owner shelter.

9. In response to interrogatory 1d, Blue Sky stated that, "The equipment would be installed one foot above the FEMA flood plain level." Is Blue Sky referring to one foot above the 100-year or 500-year flood elevation?

9. It would be installed 1 foot above the 100-year flood elevation.

10. The equipment shelter appears to be elevated approximately two feet above grade per Sheet A-1. Is that correct? Also per Sheet A-1, with the ground elevation of the eastern edge of the equipment shelter at approximately 13 feet above mean sea level (amsl), the bottom of the equipment shelter would (conservatively) be on the order of 15 feet amsl. Adding the equipment shelter floor thickness, would the equipment inside the shelter be at or above the 500-year flood elevation (estimated at 15.31 feet amsl in Docket No. 464?)

10. The equipment shelter utilized is two feet above ground level. This dimension measures from the ground level to the underside of the equipment shelter support frame. The support frame has a thickness of 12.34 inches. Top of the equipment shelter floor is 16' AMSL and is above the 500-year flood plain.

11. General Note No. 19 on the ROHN Products, LLC structural design drawing no. 217435-01-D1 states that, "Pole design includes consideration of a contained fall radius equal to 50 feet by providing stronger sections than required by analysis in the lower portion of the pole." However, Blue Sky's sheet C-1 indicates that the nearest property boundary (to the Guzman Property) is located approximately 38 feet away or less than 50 feet away. Order No. 2 of the Connecticut Siting Council's (Council) April 14, 2016 Decision and Order (Council D&O) states that, "[T]he tower designed with a yield point to ensure that the tower setback radius remains within the boundaries of the subject property." With the current yield point design, in the unlikely event of a tower failure, would the tower remain within the boundaries of the subject property (i.e. Chapin and Bangs Property)? If the tower is ever extended in the future (with the Council review and approval), could the yield point be evaluated at that time?

11a Blue Sky has revised the tower drawings to show fall radius to stay within 38'. These drawings are attached.

11b The extension could be evaluated in the future however, the extension and fall zone are also addressed in the attached revised drawings and show the same 38' fall zone.

12. In Docket No. 464, Blue Sky estimated that the temporary tower would be constructed by the end of February. Approximately when did the temporary tower go into service?

12 **The tower was stacked on 1/13/2016. AT&T started their installation on 1/25/2016. AT&T's installation is complete however they are still waiting on telco backhaul service to be installed at this time.**

13 If Blue Sky's D&M Plan is approved by the Council on June 23, 2016, approximately when does Blue Sky anticipate that the permanent tower would be complete and in service? Approximately when would the temporary tower be removed?

13a **Assuming that Blue Sky receives the building permit from the City of Bridgeport by August 1, 2016, we anticipate the tower site to be built by end of August, 2016. AT&T can then begin their installation soon thereafter and should be operational by end of September, 2016.**

13b **Once AT&T ceases operation on the temporary tower and removes their equipment, Blue Sky can then dismantle the temporary tower, approximately by the end of October, 2016.**

14 In Blue Sky's response to interrogatory 1e, the construction hours are 8:00am to 7:00pm. Would that be on a Monday through Friday basis? Is Blue Sky planning Saturday hours or considering avoiding or minimizing Saturday hours due to the multi-family residential structures immediately to the west and south?

14a **Yes, Monday through Friday.**

14b **Blue Sky is not planning any Saturday hours.**

Respectfully Submitted,

Blue Sky Towers, LLC

By: _____
Sean Gormley
Blue Sky Towers, LLC.

CC:
Parties and Intervenors
Honorable Mayor Joseph P. Ganim, City of Bridgeport

1 Fairholm Avenue
Peoria, IL 61603 USA
Phone 309-566-3000
FAX 309-566-3079

May 26, 2016

Blue Sky Tower
Attn: Sean Gormley
352 Park Street
Suite 106
North Reading, MA. 01864

Reference: Bridgeport Evergreen ST CT-5020, Fairfield County, CT.
135' Future 155' Tapered Steel Pole

File Number: 217435

Enclosed, please find the following for your use:

Copies	Drawing Number	Description
2	217435-01-D1R2	Design Drawing Sealed for the State of Connecticut
2	217435-01-F1R1	Mat with Raised Pier Foundation Sealed for the State of Connecticut
2		Fall Radius Letter Sealed for the State of Connecticut

Contact Phone Number: 978 833 8668

Email Also: seang@blueskytower.com

Sincerely,

JD Long
Ken Cordrey

crp

1 Fairholm Avenue
Peoria, IL 61603 USA
Phone: (309)-566-3000
Fax: (309)-566-3079

DATE: MAY 26, 2016

PURCHASER: BLUE SKY TOWER

PROJECT: 135 FT TSP MONOPOLE
BRIDGEPORT EVERGREEN ST CT-5020, CONNECTICUT

FILE NUMBER: 217435

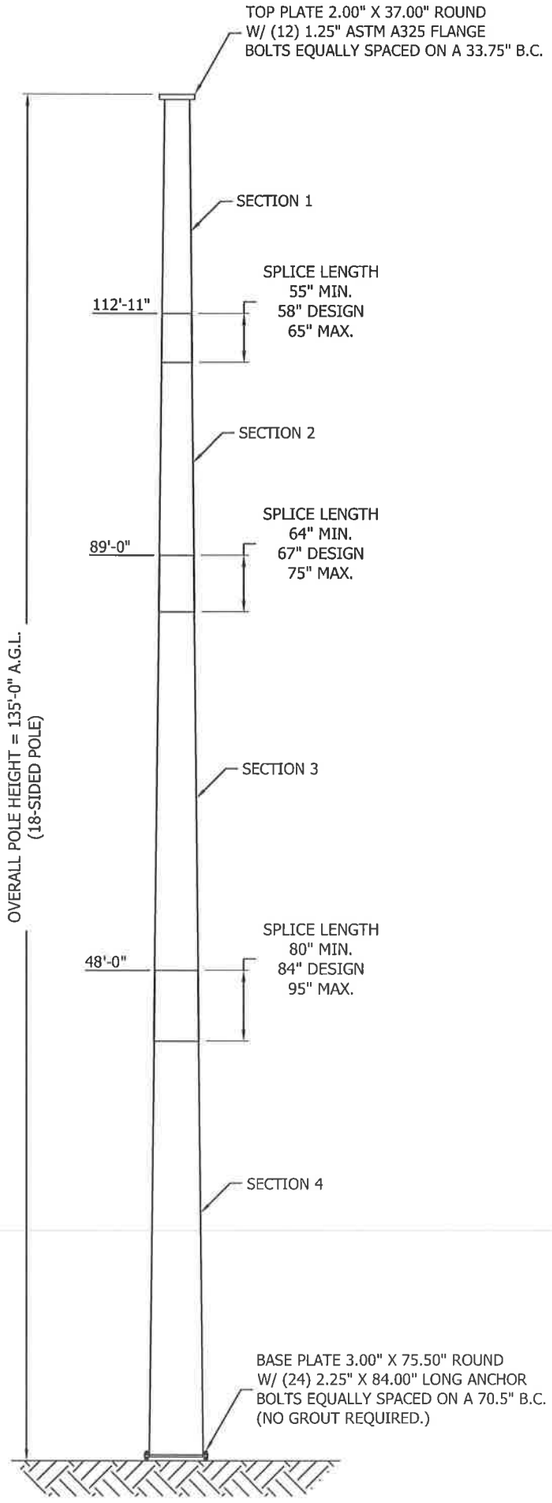
DRAWINGS: 217435-01-D1 R2 , 217435-01-F1 R1

I CERTIFY THAT THE REFERENCED DRAWINGS WERE PREPARED UNDER MY SUPERVISION IN ACCORDANCE WITH THE DESIGN AND LOADING CRITERIA SPECIFIED BY THE PURCHASER AND THAT I AM A REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

CERTIFIED BY: _____

DATE: 5/26/16

STATE OF CONNECTICUT
HABIB JIRJI AZOURI
No. 20795
LICENSED
PROFESSIONAL ENGINEER



POLE DESIGN LOADING		
DESIGN WIND LOAD PER 2006 INTERNATIONAL BUILDING CODE USING ANSI/TIA-222-F-1996 IN ACCORDANCE WITH SECTION 3108.4. 100 MPH 3-SECOND GUST WIND SPEED (1/2" RADIAL ICE LOAD) 85 MPH FASTEST MILE WIND SPEED (1/2" RADIAL ICE LOAD) THIS POLE IS DESIGNED TO SUPPORT THE FOLLOWING LOADS:		
ELEVATION (FT)	**ANTENNA TYPE**	**LINE SIZE (NOM)**
TOP	LIGHTNING ROD	-
*150	(12)LNX-6516DS-VTM PANELS &(6)RRUS11 B12 ON A LOW PROFILE MOUNT	(12) 1-5/8"
*140	(12)LNX-6516DS-VTM PANELS &(6)RRUS11 B12 ON A LOW PROFILE MOUNT	(12) 1-5/8"
130	(9)HPA-65R-BUU-H8 PANELS, (3)RRU 32, (9)RRU 11, (6)RRU 12, (3)RRU-E2, (6)RRU A2, &(4)RXXDC-3345-PF-48 ON A LOW PROFILE MOUNT	(4) 2" CONDUITS
120	(12)LNX-6516DS-VTM PANELS &(6)RRUS11 B12 ON A LOW PROFILE MOUNT	(12) 1-5/8"
110	(12)LNX-6516DS-VTM PANELS &(6)RRUS11 B12 ON A LOW PROFILE MOUNT	(12) 1-5/8"

SEE STRESS ANALYSIS FOR A COMPLETE LISTING OF ALL LOADS ON POLE.

* INDICATES FUTURE LOADING WHEN POLE IS EXTENDED.

GENERAL NOTES:

1. ROHN PRODUCTS POLE DESIGNS CONFORM TO ANSI/TIA-222-F-1996 UNLESS OTHERWISE SPECIFIED UNDER POLE DESIGN LOADING.
2. THE DESIGN LOADING CRITERIA INDICATED HAS BEEN PROVIDED TO ROHN. THE DESIGN LOADING CRITERIA HAS BEEN ASSUMED TO BE BASED ON SITE-SPECIFIC DATA IN ACCORDANCE WITH ANSI/TIA-222-F-1996 AND MUST BE VERIFIED BY OTHERS PRIOR TO INSTALLATION.
3. ANTENNAS AND LINES LISTED IN POLE DESIGN LOADING TABLE ARE PROVIDED BY OTHERS UNLESS OTHERWISE SPECIFIED.
4. POLE MEMBER DESIGN DOES NOT INCLUDE STRESSES DUE TO ERECTION SINCE ERECTION EQUIPMENT AND CONDITIONS ARE UNKNOWN. DESIGN ASSUMES COMPETENT AND QUALIFIED PERSONNEL WILL ERECT THE POLE.
5. WORK SHALL BE IN ACCORDANCE WITH ANSI/TIA-222-F-1996, "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES".
6. FIELD CONNECTIONS SHALL BE BOLTED. NO FIELD WELDS SHALL BE ALLOWED.
7. STRUCTURAL BOLTS SHALL CONFORM TO ASTM A325, EXCEPT WHERE NOTED.
8. A NUT LOCKING DEVICE SHALL BE PROVIDED FOR ALL STRUCTURAL BOLTS ON THE POLE.
9. STRUCTURAL STEEL AND CONNECTION BOLTS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ANSI/TIA-222-F-1996.
10. ALL HIGH STRENGTH BOLTS ARE TO BE TIGHTENED TO A "SNUG TIGHT" CONDITION AS DEFINED IN THE RCSC "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS". NO OTHER MINIMUM BOLT TENSION OR TORQUE VALUES ARE REQUIRED.
11. PURCHASER SHALL VERIFY THE INSTALLATION IS IN CONFORMANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS FOR OBSTRUCTION MARKING AND LIGHTING.
12. TOLERANCE ON POLE STEEL HEIGHT IS EQUAL TO PLUS 1% OR MINUS 1/2%.
13. DESIGN ASSUMES THAT, AS A MINIMUM, MAINTENANCE AND INSPECTION WILL BE PERFORMED OVER THE LIFE OF THE STRUCTURE IN ACCORDANCE WITH ANSI/TIA-222-F-1996.
14. DESIGN ASSUMES LEVEL GRADE AT POLE SITE.
15. FOUNDATIONS SHALL BE DESIGNED TO SUPPORT THE REACTIONS SHOWN FOR THE CONDITIONS EXISTING AT THE SITE.
16. DESIGN ASSUMES ALL TRANSMISSION LINES ARE ROUTED INTERNALLY.
17. POLE SHAFT CONFORMS TO ASTM A572 GR 65. POLE BASE PLATE AND TOP PLATE STEEL CONFORMS TO ASTM A572 GR 50. POLE ANCHOR BOLTS CONFORM TO ASTM A615 GR 75.
18. THIS POLE IS DESIGNED FOR A 20 FT. FUTURE EXTENSION.
19. POLE DESIGN INCLUDES CONSIDERATION OF A CONTAINED FALL RADIUS EQUAL TO 38 FEET BY PROVIDING STRONGER SECTIONS THAN REQUIRED BY ANALYSIS IN THE LOWER PORTION OF THE POLE.

MAXIMUM ADJUSTED REACTIONS		
DOWNLOAD =	156.5	KIPS
SHEAR =	79.6	KIPS
O.T.M. =	8066.7	FT-KIPS

SECTION SCHEDULE						
SECTION	**LENGTH (FT)**	**DIAMETER**		**WALL THICK (IN)**	**Fy (KSI)**	**WEIGHT (KIPS)**
		BOT	**TOP**			
1	25.92	36.69	29.52	0.2500	65.0	2.526
2	29.50	42.86	34.69	0.3125	65.0	4.217
3	48.00	53.81	40.53	0.5000	65.0	13.329
4	48.00	64.00	50.72	0.6250	65.0	20.252

FOR POLYGONAL POLES, DIAMETER IS MEASURED ACROSS FLATS.

FILE NO.
217435

REVISIONS

REV.	DESCRIPTION	DWN	CHK	APP
2	REVISED DESIGN. DATE: 05/25/16	DWG	HA	HA

ROHN® PRODUCTS, LLC
PO BOX 5999
PEORIA, IL 61601-5999
TOLL FREE 800-727-ROHN

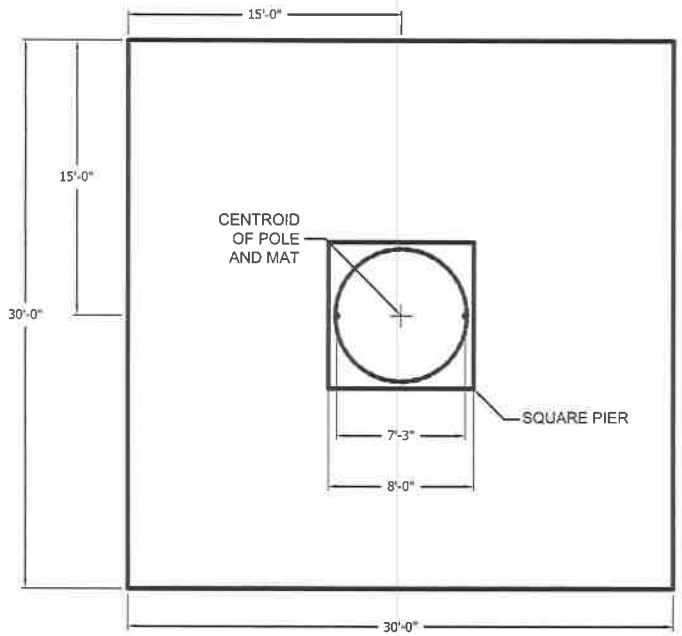
BLUE SKY TOWER
DESIGN PROFILE
135' (155' FUTURE) A.G.L. MONOPOLE
BRIDGEPORT EVERGREEN ST CT-5020, CT

DWN:	CHK'D:	DATE:
DWG	HA	3/17/2016

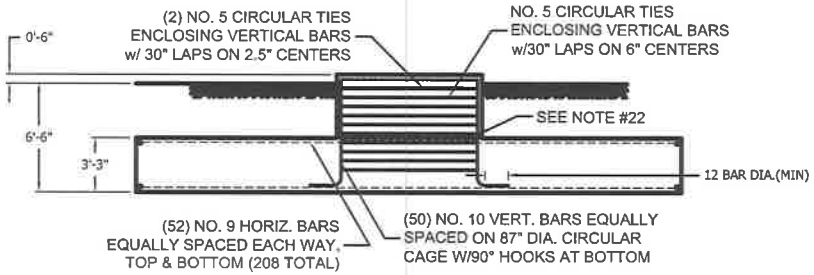
ENG'R:	SHEET #:
HA	1 OF 1

PRJ. ENG'R:	PRJ. MANG'R:
DWG	

DRAWING NO:	REV:
217435-01-D1	2



PLAN VIEW



ELEVATION VIEW

ADJUSTED REACTIONS

O.T.M. =	8066.7 FT-K
DOWNLOAD =	156.5 KIPS
SHEAR =	79.6 KIPS

CONCRETE VOLUME (cu.yds)

	SQUARE
PIER	8.9
PAD	108.3
TOTAL	117.2

GENERAL NOTES

1. FOUNDATION DESIGN HAS BEEN DEVELOPED IN ACCORDANCE WITH GENERALLY ACCEPTED PROFESSIONAL ENGINEERING PRINCIPLES AND PRACTICES WITHIN THE LIMITS OF THE SUBSURFACE DATA PROVIDED. FOUNDATION DESIGN MODIFICATIONS MAY BE REQUIRED IN THE EVENT THE FOLLOWING DESIGN PARAMETERS ARE NOT APPLICABLE FOR THE SUBSURFACE CONDITIONS ENCOUNTERED.
   A) ALLOWABLE SOIL BEARING PRESSURE AT 6 FT DEPTH = 6850 PSF.
   B) GROUND WATER TABLE IS AT OR BELOW FOUNDATION DEPTH.
   C) MAXIMUM FROST PENETRATION DEPTH LESS THAN FOUNDATION DEPTH.
2. WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES, SAFETY REGULATIONS AND UNLESS OTHERWISE NOTED, THE LATEST REVISION OF ACI 318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE". PROCEDURES FOR THE PROTECTION OF EXCAVATIONS, EXISTING CONSTRUCTION AND UTILITIES SHALL BE ESTABLISHED PRIOR TO FOUNDATION INSTALLATION.
3. CONCRETE MATERIALS SHALL CONFORM TO THE APPROPRIATE STATE REQUIREMENTS FOR EXPOSED STRUCTURAL CONCRETE.
4. PROPORTIONS OF CONCRETE MATERIALS SHALL BE SUITABLE FOR THE INSTALLATION METHOD UTILIZED AND SHALL RESULT IN DURABLE CONCRETE FOR RESISTANCE TO LOCAL ANTICIPATED AGGRESSIVE ACTIONS. THE DURABILITY REQUIREMENTS OF ACI 318 CHAPTER 4 SHALL BE SATISFIED BASED ON THE CONDITIONS EXPECTED AT THE SITE. AS A MINIMUM, CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4,500 PSI IN 28 DAYS.
5. MAXIMUM SIZE OF AGGREGATE SHALL NOT EXCEED SIZE SUITABLE FOR INSTALLATION METHOD UTILIZED OR 1/3 CLEAR DISTANCE BEHIND OR BETWEEN REINFORCING. MAXIMUM SIZE MAY BE INCREASED TO 2/3 CLEAR DISTANCE PROVIDED WORKABILITY AND METHODS OF CONSOLIDATION SUCH AS VIBRATING WILL PREVENT HONEYCOMBS OR VOIDS.
6. REINFORCEMENT SHALL BE DEFORMED AND CONFORM TO THE REQUIREMENTS OF ASTM A615 GRADE 60 UNLESS OTHERWISE NOTED. SPLICES IN REINFORCEMENT SHALL NOT BE ALLOWED UNLESS OTHERWISE INDICATED.
7. WELDING IS PROHIBITED ON REINFORCING STEEL AND EMBEDMENTS.
8. MINIMUM CONCRETE COVER FOR REINFORCEMENT SHALL BE 3 INCHES (76 MM) UNLESS OTHERWISE NOTED. APPROVED SPACERS SHALL BE USED TO INSURE A 3 INCH (76 MM) MINIMUM COVER ON REINFORCEMENT.
9. CONCRETE COVER FROM TOP OF FOUNDATION TO ENDS OF VERTICAL REINFORCEMENT SHALL NOT EXCEED 3 INCHES (76MM) NOR BE LESS THAN 2 INCHES (51MM).
10. FOUNDATION DESIGN ASSUMES STRUCTURAL BACKFILL TO BE COMPACTED IN 8 INCH (200 MM) MAXIMUM LAYERS TO 95% OF MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH ASTM D698. ADDITIONALLY, STRUCTURAL BACKFILL MUST HAVE A MINIMUM COMPACTED UNIT WEIGHT OF 110 POUNDS PER CUBIC FOOT (17 KN/M3)
11. FOUNDATION DESIGN HAS BEEN BASED ON GEOTECHNICAL REPORT NO. **64250.39272** DATED **10/30/15** BY **TOWER ENGINEERING PROFESSIONALS, INC.**
12. FOUNDATION DEPTH INDICATED IS BASED ON THE GRADE LINE DESCRIBED IN THE REFERENCED GEOTECHNICAL REPORT. FOUNDATION MODIFICATION MAY BE REQUIRED IN THE EVENT CUT OR FILL OPERATIONS HAVE TAKEN PLACE SUBSEQUENT TO THE GEOTECHNICAL INVESTIGATION.
13. FOUNDATION DESIGN ASSUMES LEVEL GRADE AT STRUCTURE SITE.
14. FOUNDATION DESIGN ASSUMES THE RECOMMENDATIONS IN THE REFERENCED GEOTECHNICAL REPORT CONCERNING VERIFICATION OF SUBSURFACE CONDITIONS ARE IMPLEMENTED PRIOR TO PLACEMENT OF CONCRETE.
15. FOUNDATION INSTALLATION SHALL BE SUPERVISED BY PERSONNEL KNOWLEDGEABLE AND EXPERIENCED WITH THE PROPOSED FOUNDATION TYPE. CONSTRUCTION SHALL BE IN ACCORDANCE WITH GENERALLY ACCEPTED INSTALLATION PRACTICES.
16. FOUNDATION DESIGN ASSUMES INSTALLATION PROCEDURES WILL INCORPORATE THE PROCEDURES RECOMMENDED IN THE REFERENCED GEOTECHNICAL REPORT.
17. FOUNDATION DESIGN ASSUMES FIELD INSPECTIONS WILL BE PERFORMED TO VERIFY THAT CONSTRUCTION MATERIALS, INSTALLATION METHODS AND ASSUMED DESIGN PARAMETERS ARE ACCEPTABLE BASED ON CONDITIONS EXISTING AT THE SITE.
18. FOR FOUNDATION AND ANCHOR TOLERANCES SEE DRAWING A810214.
19. LOOSE MATERIAL SHALL BE REMOVED FROM BOTTOM OF EXCAVATION PRIOR TO CONCRETE PLACEMENT. SIDES OF EXCAVATION SHALL BE ROUGH AND FREE OF LOOSE CUTTINGS.
20. CONCRETE SHALL BE PLACED IN A MANNER THAT WILL PREVENT SEGREGATION OF CONCRETE MATERIALS, INFILTRATION OF WATER OR SOIL AND OTHER OCCURRENCES WHICH MAY DECREASE THE STRENGTH OR DURABILITY OF THE FOUNDATION.
21. CONCRETE PREFERABLY SHALL BE PLACED AGAINST UNDISTURBED SOIL. WHEN FORMS ARE NECESSARY, THEY SHALL BE REMOVED PRIOR TO PLACING STRUCTURAL BACKFILL.
22. CONSTRUCTION JOINTS, IF REQUIRED AT THE BASE OF THE PIERS, MUST BE INTENTIONALLY ROUGHENED TO A FULL AMPLITUDE OF 1/4 INCH (6 MM). FOUNDATION DESIGN ASSUMES NO OTHER CONSTRUCTION JOINTS.
23. TOP OF FOUNDATION OUTSIDE LIMITS OF ANCHOR BOLTS SHALL BE SLOPED TO DRAIN WITH A FLOATED FINISH. AREA INSIDE LIMITS OF ANCHOR BOLTS SHALL BE LEVEL WITH A SCRATCHED FINISH.
24. EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4" X 3/4" (19MM X 19MM) MINIMUM.

NOTE: SEE STRUCTURE ASSEMBLY DRAWING FOR FOUNDATION LAYOUT AND ANCHORAGE EMBEDMENT DRAWING NUMBER.

FILE NO. 217435

REVISIONS

REV.	DESCRIPTION	DWN	CHK	APP
1	REVISED DESIGN DATE: 09/25/16	DWG	HA	HA

ROHN® PRODUCTS, LLC
PO BOX 5999
PEORIA, IL 61601-5999
TOLL FREE 800-727-ROHN

BLUE SKY TOWER
MAT W/RAISED PIER FOUNDATION

BRIDGEPORT EVERGREEN ST CT-5020, CT

DWN:	CHK'D:	DATE:
DWG	HA	03/17/16

ENG'R:	SHEET #:
HA	1 OF 1

PRJ. ENG'R:	PRJ. MANG'R:
DWG	

DRAWING NO:	REV:
217435-01-F1	1

ROHN™
Products LLC

1 Fairholm Avenue
Peoria, IL 61603 USA
Phone 309-566-3000
FAX 309-566-3079
Toll Free 800-727-ROHN

May 26, 2016

Blue Sky Tower Partners
352 Park St., STE 106
North Reading, MA 01864

Attn: Sean Gormley

Reference: 134' of extendable to 154' Tapered Steel Pole
Site Name: Bridgeport Evergreen
Bridgeport Evergreen, CT-5020
File # 217435

Dear Mr. Gormley

The referenced pole is designed to meet the specified loading requirements in accordance with ANSI/TIA-222-F for a 100 MPH 3 Second Gust (1/2" Radial Ice Load)/85 MPH Fastest Mile Wind Speed (1/2" Radial Ice Load).

It is our understanding that the design of the referenced pole requires consideration of a contained fall radius in the event that a catastrophic wind speed would result in collapse. Although the pole is not designed to fail, stronger sections than required by analysis is provided in the lower sections of the pole. This will result in an increased safety factor in the lower sections. This design enables the pole to fail through a combination of bending and buckling in the upper portion of the pole under a catastrophic wind loading. Failure in this manner will result in the upper portion of the pole folding over the lower portion, resulting in a fall radius no greater than **38ft** for both present and future pole heights. The failure mode will theoretically be a local buckling failure involving a crippling of the pole wall on one side of the pole as opposed to the pole shearing off or completely breaking off and hitting the ground.

Please contact us at your convenience should you have further questions concerning the safety of pole structures or other aspects of pole design.

Sincerely,

Habib Azouri, P.E.
Engineering Manager

cc: Ken Cordrey

STATE OF CONNECTICUT
HABIB JIRJI AZOURI
No. 20757
LICENSED
PROFESSIONAL ENGINEER

TowerSoft
ENGINEERING SOFTWARE

TSTower - v 5.6.0 Tower Analysis Program
(c) 1997-2015 TowerSoft www.TSTower.com

ROHN Products

Licensed to: ROHN Products LLC
Peoria, IL

R2

File: W:\Jobs\2016\217435\REVISED DESIGN\217435F INITIAL MODIFIED.out
Contract: 217435
Project: 135' (155' FUTURE) OAH TAPERED STEEL POLE
Date and Time: 5/24/2016 5:29:39 PM

Revision: 0
Site: BRIDGEPORT EVERGREEN ST CT-5020
Engineer: DWG

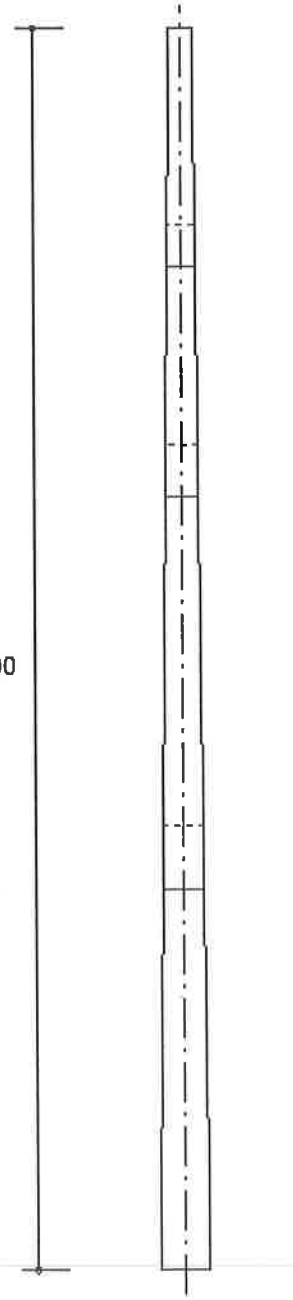
✓HA

PRESENT HEIGHT
W/38' FALL RADIUS

DESIGN SPECIFICATION

Design Standard: TIA/EIA-222-F-1996
Basic Wind Speed = 85.0 (mph)
Service Wind speed = 50.0 (mph)
Ice thickness = 0.50 (in)

Sct	Length (ft)	Overlap (ft)	Top Dia. (in)	Bot Dia. (in)	Thick. (in)
1	48.00	7.00	50.89	64.00	0.6250
2	48.00	5.58	40.69	53.80	0.5000
3	29.50	4.83	34.78	42.84	0.3125
4	25.92	0.00	29.52	36.60	0.2500



MAXIMUM BASE REACTIONS

		ADJUSTED REACTIONS
Download (Kips)	68.4	156.5^K
Shear (Kips)	34.8	79.6^K
Moment (Kipsft)	3526.3	8066.7^K

Section A: PROJECT DATA

Project Title:	135' (155' FUTURE) OAH TAPERED STEEL POLE
Customer Name:	BLUE SKY TOWER
Site:	BRIDGEPORT EVERGREEN ST CT-5020
Contract No.:	217435
Revision:	0
Engineer:	DWG
Date:	May 24 2016
Time:	05:29:22 PM
Design Standard:	TIA/EIA-222-F-1996

GENERAL DESIGN CONDITIONS

Start Wind direction:	0.00 (Deg)
End Wind direction:	315.00 (Deg)
Increment wind direction:	45.00 (Deg)
Elevation above ground:	1.00(ft)
Gust Response Factor Gh:	1.69
Material Density:	490.1(lbs/ft^3)
Young's Modulus:	29000.0(ksi)
Poisson Ratio:	0.3
Weight Multiplier:	1.10
Allowable Stress Incr. Factor:	1.333
Increase allowable stress:	Yes

WIND ONLY CONDITIONS:

Basic Wind Speed:	85.00(mph)

WIND AND ICE CONDITIONS:

Basic Wind Speed:	85.00(mph)
Ice Thickness:	0.50(in)
Ice density:	56.19(lbs/ft^3)
Wind pressure reduction for iced conditions:	0.75

WIND ONLY SERVICEABILITY CONDITIONS:

Operational Wind Speed:	50.00(mph)

Analysis performed using: TowerSoft Finite Element Analysis Program

File: W:\Jobs\2016\217435\REVISED DESIGN\217435F INITIAL MODIFIED.out
Contract: 217435
Project: 135' (155' FUTURE) OAH TAPERED STEEL POLE
Date and Time: 5/24/2016 5:29:39 PM

Revision: 0
Site: BRIDGEPORT EVERGREEN ST CT-5020
Engineer: DWG

Section B: STRUCTURE GEOMETRY

Total Height (ft)	Bottom Diameter (in)	Top Diameter (in)
134.00	64.00	29.52

Sect. No	Length (ft)	Overlap (ft)	Bot Dia. (in)	Top Dia. (in)	Thick. (in)	Sides	Joint Type	Yield Stress (ksi)	Mass (lbs)	Calculated Taper (in/ft)	(in)
1	48.00	7.00	64.00	50.89	0.6250	18-sided	Flange	65.0	20252.4	0.27317	
2	48.00	5.58	53.80	40.69	0.5000	18-sided	Telescopic	65.0	13329.0	0.27317	
3	29.50	4.83	42.84	34.78	0.3125	18-sided	Telescopic	65.0	4216.5	0.27317	
4	25.92	0.00	36.60	29.52	0.2500	18-sided	Telescopic	65.0	2525.7	0.27317	
Total Mass:									40323.6		

Section D: TRANSMISSION LINE DATA

Transmission Lines Position

No.	Bot El (ft)	Top El (ft)	Desc.	Radius (ft)	Az.	Orient.	No.	Shielded	Shielded Lines	Antenna
1	0.00	134.00	3/8" CABLE	3.00	0.00	0.00	1	No	0	
2	0.00	130.00	RC2.00-Cnd	0.00	0.00	0.00	4	Yes	4	
3	0.00	120.00	LDF7P-50A	0.00	0.00	0.00	12	Yes	12	
4	0.00	110.00	LDF7P-50A	0.00	0.00	0.00	12	Yes	12	

Transmission Lines Details

No.	Desc.	Width (in)	Depth (in)	Unit Mass (lb/ft)
1	3/8" CABLE	0.38	0.38	1.00
2	RC2.00-Cnd	2.37	2.37	3.49
3	LDF7P-50A	2.01	2.01	0.92
4	LDF7P-50A	2.01	2.01	0.92

Utilization of the cross-section for TX Lines: 9.40%

Section F: POINT LOAD DATA

Structure Azimuth from North:0.00

POINT LOADS

No.	Description	Elev. (ft)	Radius (ft)	Azim. (Deg)	Orient. (Deg)	Vertical Offset (ft)	Tx Line	Comments
1	LROD	134.00	0.00	0.0	0.0	0.00		
2	CARRIER	130.00	0.00	0.0	0.0	0.00		
3	CARRIER	120.00	0.00	0.0	0.0	0.00		
4	CARRIER	110.00	0.00	0.0	0.0	0.00		

POINT LOADS WIND AREAS AND WEIGHTS

No.	Description	Frontal Bare Area (ft^2)	Lateral Bare Area (ft^2)	Frontal Iced Area (ft^2)	Lateral Iced Area (ft^2)	Weight Bare (Kips)	Weight Iced (Kips)
1	LROD	2.00	2.00	3.00	3.00	0.10	0.20
2	CARRIER	180.00	180.00	220.00	220.00	5.00	8.20
3	CARRIER	150.00	150.00	190.00	190.00	4.00	5.50
4	CARRIER	150.00	150.00	190.00	190.00	4.00	5.50

Section G: WIND LOAD DATA

Load Combination Wind Only

Wind Direction 0.00 (deg)

Pole Wind Data

Element	Top Elev. (ft)	Bot. Elev. (ft)	Top Diam. (in)	Bot. Diam. (in)	Top Kz	Top Press. (psf)	Bot. Kz	Bot. Press. (psf)
24	134.00	129.84	29.59	30.73	1.50	46.74	1.48	46.33
23	129.84	125.67	30.73	31.87	1.48	46.33	1.47	45.90
22	125.67	121.51	31.87	33.00	1.47	45.90	1.46	45.46
21	121.51	117.34	33.00	34.14	1.46	45.46	1.44	45.02
20	117.34	113.18	34.14	35.28	1.44	45.02	1.43	44.56
19	113.18	108.35	35.28	36.60	1.43	44.56	1.41	44.01
18	108.35	104.48	36.03	37.09	1.41	44.01	1.40	43.56
17	104.48	100.61	37.09	38.14	1.40	43.56	1.38	43.10
16	100.61	96.74	38.14	39.20	1.38	43.10	1.37	42.62
15	96.74	92.87	39.20	40.26	1.37	42.62	1.35	42.13
14	92.87	89.00	40.26	41.31	1.35	42.13	1.33	41.63
13	89.00	83.42	41.31	42.84	1.33	41.63	1.31	40.87
12	83.42	76.33	42.21	44.15	1.31	40.87	1.28	39.86
11	76.33	69.25	44.15	46.08	1.28	39.86	1.24	38.78
10	69.25	62.17	46.08	48.02	1.24	38.78	1.21	37.62
9	62.17	55.08	48.02	49.95	1.21	37.62	1.17	36.37
8	55.08	48.00	49.95	51.89	1.17	36.37	1.12	34.99
7	48.00	41.00	51.89	53.80	1.12	34.99	1.07	33.48
6	41.00	34.17	52.80	54.67	1.07	33.48	1.02	31.83
5	34.17	27.33	54.67	56.53	1.02	31.83	1.00	31.20
4	27.33	20.50	56.53	58.40	1.00	31.20	1.00	31.20
3	20.50	13.67	58.40	60.27	1.00	31.20	1.00	31.20
2	13.67	6.83	60.27	62.13	1.00	31.20	1.00	31.20
1	6.83	0.00	62.13	64.00	1.00	31.20	1.00	31.20

Projected and Wind Areas

Element	Pole Proj Area (ft^2)	Tx-Line Proj Area (ft^2)	Ladder Proj Area (ft^2)	Ra	Top Drag Factor	Bot Drag Factor
24	10.63	0.13	0.00	0.01	0.65	0.65
23	11.03	0.13	0.00	0.01	0.65	0.65
22	11.43	0.13	0.00	0.01	0.65	0.65
21	11.83	0.13	0.00	0.01	0.65	0.65
20	12.23	0.13	0.00	0.01	0.65	0.65
19	14.70	0.15	0.00	0.01	0.65	0.65
18	11.97	0.12	0.00	0.01	0.65	0.65
17	12.31	0.12	0.00	0.01	0.65	0.65
16	12.66	0.12	0.00	0.01	0.65	0.65
15	13.01	0.12	0.00	0.01	0.65	0.65
14	13.35	0.12	0.00	0.01	0.65	0.65
13	19.88	0.17	0.00	0.01	0.65	0.65
12	25.88	0.22	0.00	0.01	0.65	0.65
11	27.04	0.22	0.00	0.01	0.65	0.65
10	28.20	0.22	0.00	0.01	0.65	0.65
9	29.36	0.22	0.00	0.01	0.65	0.65
8	30.52	0.22	0.00	0.01	0.65	0.65
7	31.30	0.22	0.00	0.01	0.65	0.65
6	31.07	0.21	0.00	0.01	0.65	0.65
5	32.15	0.21	0.00	0.01	0.65	0.65
4	33.23	0.21	0.00	0.01	0.65	0.65
3	34.31	0.21	0.00	0.01	0.65	0.65

2	35.39	0.21	0.00	0.01	0.65	0.65
1	36.47	0.21	0.00	0.01	0.65	0.65

App. Concentrated Loads

Ant.	Description	Qty	Mount	Desc.	Elev. (ft)	CaAc X-Dir E-W (ft^2)	CaAc Y-Dir N-S (ft^2)	XForce E-W (Kips)	YForce N-S (Kips)	ZForce (Kips)	M-x (kipsft)	M-y (kipsft)	M-z (kipsft)
1	LROD				134	0.00	-2.00	0.00	-0.09	-0.10	0.00	0.00	0.00
2	CARRIER				130	0.00	-179.98	0.00	-8.35	-5.00	0.00	0.00	0.00
3	CARRIER				120	0.00	-149.99	0.00	-6.80	-4.00	0.00	0.00	0.00
4	CARRIER				110	0.00	-149.99	0.00	-6.63	-4.00	0.00	0.00	0.00

Section H: STRUCTURE DISPLACEMENT DATA

Load Combination Max Envelope

Wind Direction Maximum displacements

Elev. (ft)	N-S Disp (in)	W-E Disp (in)	Vert.Disp (in)	N-S Rot (deg)	W-E Rot (deg)	Twist Rot (deg)
134.00	34.5	-34.5	-0.5	-2.30	-2.30	0.00
129.84	32.5	-32.5	-0.4	-2.30	-2.30	0.00
125.67	30.5	-30.5	-0.4	-2.29	-2.29	0.00
121.51	28.5	-28.5	-0.4	-2.27	-2.27	0.00
117.34	26.6	-26.5	-0.3	-2.23	-2.24	0.00
113.18	24.6	-24.6	-0.3	-2.18	-2.19	0.00
108.35	22.5	-22.4	-0.3	-2.11	-2.11	0.00
104.48	20.8	-20.7	-0.2	-2.04	-2.04	0.00
100.61	19.2	-19.1	-0.2	-1.96	-1.97	0.00
96.74	17.6	-17.6	-0.2	-1.88	-1.88	0.00
92.87	16.1	-16.1	-0.2	-1.79	-1.79	0.00
89.00	14.7	-14.7	-0.1	-1.69	-1.69	0.00
83.42	12.8	-12.8	-0.1	-1.53	-1.54	0.00
76.33	10.6	-10.6	-0.1	-1.40	-1.40	0.00
69.25	8.7	-8.6	-0.1	-1.26	-1.26	0.00
62.17	6.9	-6.9	0.0	-1.12	-1.12	0.00
55.08	5.3	-5.3	0.0	-0.97	-0.97	0.00
48.00	4.0	-4.0	0.0	-0.83	-0.83	0.00
41.00	2.9	-2.9	0.0	-0.68	-0.68	0.00
34.17	2.0	-2.0	0.0	-0.56	-0.56	0.00
27.33	1.3	-1.3	0.0	-0.45	-0.45	0.00
20.50	0.7	-0.7	0.0	-0.33	-0.33	0.00
13.67	0.3	-0.3	0.0	-0.22	-0.22	0.00
6.83	0.1	-0.1	0.0	-0.11	-0.11	0.00
0.00	0.0	0.0	0.0	0.00	0.00	0.00

Section L: STRENGTH ASSESSMENT DATA

Load Combination: Max Envelope
Wind Direction: Maximum

Elev. (ft)	Bending Stress (ksi)	Axial Stress (ksi)	Shear Stress (ksi)	Total Stress (ksi)	Allowable Stress (ksi)	Assess.
134.00	0.00	0.03	0.02	0.05	52.00	0.001
129.84	0.16	0.03	0.02	0.19	52.00	0.004
129.84	0.16	0.36	0.35	0.80	52.00	0.015
125.67	2.31	0.35	0.34	2.72	52.00	0.052
125.67	2.49	0.23	0.38	2.80	52.00	0.054
121.51	4.56	0.22	0.37	4.83	52.00	0.093
121.51	4.57	0.33	0.55	4.99	52.00	0.096
117.34	7.44	0.32	0.53	7.81	52.00	0.150
117.34	7.44	0.39	0.64	7.91	52.00	0.152
113.18	10.53	0.38	0.62	10.96	52.00	0.211
113.18	10.54	0.45	0.72	11.05	52.00	0.213
108.35	11.84	0.45	0.70	12.35	52.00	0.237
104.48	14.64	0.43	0.68	15.12	52.00	0.291
104.48	14.64	0.46	0.69	15.15	52.00	0.291
100.61	17.13	0.45	0.67	17.62	52.00	0.339
100.61	17.14	0.47	0.68	17.65	52.00	0.339
96.74	19.41	0.46	0.66	19.90	52.00	0.383
96.74	19.42	0.47	0.67	19.92	52.00	0.383
92.87	21.47	0.46	0.65	21.96	52.00	0.422
92.87	21.47	0.48	0.66	21.98	52.00	0.423
89.00	23.33	0.47	0.64	23.82	52.00	0.458
89.00	23.33	0.49	0.66	23.85	52.00	**0.459**
83.42	16.77	0.34	0.41	17.13	52.00	0.329
76.33	18.42	0.32	0.39	18.76	52.00	0.361
76.33	18.43	0.36	0.40	18.80	52.00	0.362
69.25	19.82	0.35	0.39	20.17	52.00	0.388
69.25	19.82	0.38	0.40	20.21	52.00	0.389
62.17	20.99	0.36	0.38	21.36	52.00	0.411
62.17	20.99	0.39	0.39	21.39	52.00	0.411
55.08	21.98	0.38	0.37	22.37	52.00	0.430
55.08	21.98	0.41	0.38	22.40	52.00	0.431
48.00	22.82	0.39	0.37	23.22	52.00	0.447
48.00	22.82	0.42	0.38	23.25	52.00	0.447
41.00	19.69	0.37	0.30	20.07	52.00	0.386
34.17	20.15	0.36	0.29	20.52	52.00	0.395
34.17	20.15	0.40	0.30	20.56	52.00	0.395
27.33	20.53	0.39	0.29	20.93	52.00	0.403
27.33	20.54	0.42	0.29	20.96	52.00	0.403
20.50	20.86	0.40	0.28	21.27	52.00	0.409
20.50	20.86	0.43	0.29	21.30	52.00	0.410
13.67	21.13	0.42	0.28	21.56	52.00	0.415
13.67	21.13	0.45	0.29	21.58	52.00	0.415
6.83	21.37	0.43	0.28	21.81	52.00	0.419
6.83	21.37	0.46	0.28	21.84	52.00	0.420
0.00	21.56	0.45	0.27	22.01	52.00	0.423

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R2

File: W:\Jobs\2016\217435\REVISED DESIGN\217435F R1.out
Contract: 217435
Project: 135' (155' FUTURE) OAH TAPERED STEEL POLE
Date and Time: 5/24/2016 5:07:59 PM

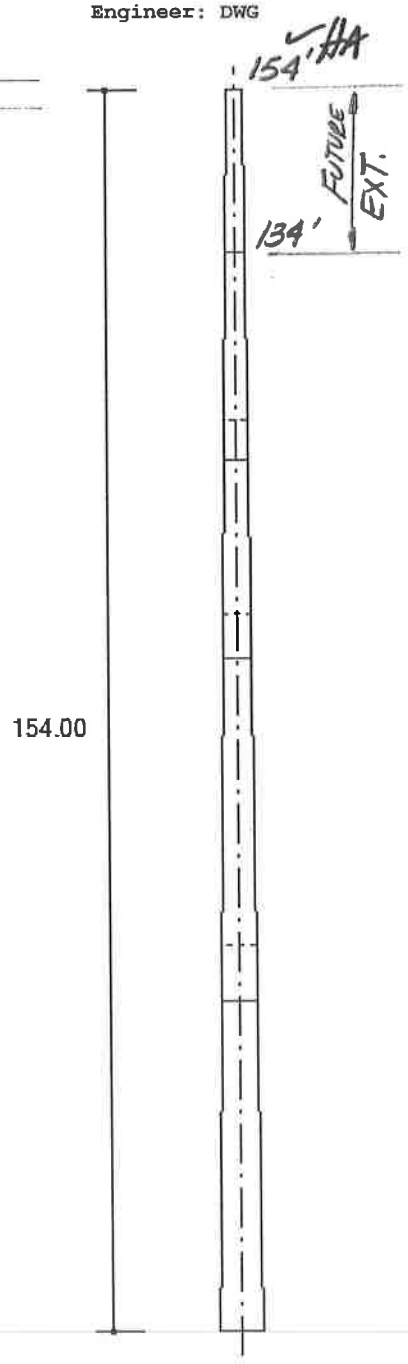
Revision: 0
Site: BRIDGEPORT EVERGREEN ST CT-5020
Engineer: DWG

FUTURE HEIGHT
W/ 38' FALL RADIUS

DESIGN SPECIFICATION

Design Standard: TIA/EIA-222-F-1996
Basic Wind Speed = 85.0 (mph)
Service Wind speed = 50.0 (mph)
Ice thickness = 0.50 (in)

Sct	Length (ft)	Overlap (ft)	Top Dia. (in)	Bot Dia. (in)	Thick. (in)	
1	48.00	7.00	50.89	64.00	0.6250	
2	48.00	5.58	40.69	53.80	0.5000	
3	29.50	4.83	34.78	42.84	0.3125	
4	25.92	0.00	29.52	36.60	0.2500	
5	20.00	0.00	24.00	29.52	0.1875	(FUTURE)



MAXIMUM BASE REACTIONS

		ADJUSTED REACTIONS
Download (Kips)	84.1	89.3^K
Shear (Kips)	50.7	53.8^K
Moment (Kipsft)	5915.5	6280.4'-K

File: W:\Jobs\2016\217435\REVISED DESIGN\217435F R1.out
Contract: 217435
Project: 135' (155' FUTURE) OAH TAPERED STEEL POLE
Date and Time: 5/24/2016 5:07:59 PM

Revision: 0
Site: BRIDGEPORT EVERGREEN ST CT-5020
Engineer: DWG

Section A: PROJECT DATA

Project Title:	135' (155' FUTURE) OAH TAPERED STEEL POLE
Customer Name:	BLUE SKY TOWER
Site:	BRIDGEPORT EVERGREEN ST CT-5020
Contract No.:	217435
Revision:	0
Engineer:	DWG
Date:	May 24 2016
Time:	05:07:15 PM

Design Standard: TIA/EIA-222-F-1996

GENERAL DESIGN CONDITIONS

Start Wind direction:	0.00 (Deg)
End Wind direction:	315.00 (Deg)
Increment wind direction:	45.00 (Deg)
Elevation above ground:	1.00(ft)
Gust Response Factor Gh:	1.69
Material Density:	490.1(lbs/ft^3)
Young's Modulus:	29000.0(ksi)
Poisson Ratio:	0.3
Weight Multiplier:	1.10
Allowable Stress Incr. Factor:	1.333
Increase allowable stress:	Yes

WIND ONLY CONDITIONS:

Basic Wind Speed:	85.00(mph)

WIND AND ICE CONDITIONS:

Basic Wind Speed:	85.00(mph)
Ice Thickness:	0.50(in)
Ice density:	56.19(lbs/ft^3)
Wind pressure reduction for iced conditions:	0.75

WIND ONLY SERVICEABILITY CONDITIONS:

Operational Wind Speed:	50.00(mph)

Analysis performed using: TowerSoft Finite Element Analysis Program

File: W:\Jobs\2016\217435\REVISED DESIGN\217435F R1.out
Contract: 217435
Project: 135' (155' FUTURE) OAH TAPERED STEEL POLE
Date and Time: 5/24/2016 5:07:59 PM

Revision: 0
Site: BRIDGEPORT EVERGREEN ST CT-5020
Engineer: DWG

Section B: STRUCTURE GEOMETRY

Total Height (ft)	Bottom Diameter (in)	Top Diameter (in)
154.00	64.00	24.00

Sect. No	Length (ft)	Overlap (ft)	Bot Dia. (in)	Top Dia. (in)	Thick. (in)	Sides	Joint Type	Yield Stress (ksi)	Mass (lbs)	Calculated Taper (in/ft)	(in)
1	48.00	7.00	64.00	50.89	0.6250	18-sided	Flange	65.0	20252.4	0.27317	
2	48.00	5.58	53.80	40.69	0.5000	18-sided	Telescopic	65.0	13329.0	0.27317	
3	29.50	4.83	42.84	34.78	0.3125	18-sided	Telescopic	65.0	4216.5	0.27317	
4	25.92	0.00	36.60	29.52	0.2500	18-sided	Telescopic	65.0	2525.7	0.27317	
5	20.00	0.00	29.52	24.00	0.1875	18-sided	Flange	65.0	1183.9	0.27596	
Total Mass:									41507.5		

Section D: TRANSMISSION LINE DATA

Transmission Lines Position

No.	Bot El (ft)	Top El (ft)	Desc.	Radius (ft)	Az.	Orient.	No.	Shielded	Shielded Lines	Antenna
1	0.00	154.00	3/8" CABLE	3.00	0.00	0.00	1	No	0	
2	0.00	150.00	LDF7P-50A	0.00	0.00	0.00	12	Yes	12	
3	0.00	140.00	LDF7P-50A	0.00	0.00	0.00	12	Yes	12	
4	0.00	130.00	RC2.00-Cnd	0.00	0.00	0.00	4	Yes	4	
5	0.00	120.00	LDF7P-50A	0.00	0.00	0.00	12	Yes	12	
6	0.00	110.00	LDF7P-50A	0.00	0.00	0.00	12	Yes	12	

Transmission Lines Details

No.	Desc.	Width (in)	Depth (in)	Unit Mass (lb/ft)
1	3/8" CABLE	0.38	0.38	1.00
2	LDF7P-50A	2.01	2.01	0.92
3	LDF7P-50A	2.01	2.01	0.92
4	RC2.00-Cnd	2.37	2.37	3.49
5	LDF7P-50A	2.01	2.01	0.92
6	LDF7P-50A	2.01	2.01	0.92

Utilization of the cross-section for TX Lines: 17.02%

Section F: POINT LOAD DATA

Structure Azimuth from North:0.00

POINT LOADS

No.	Description	Elev. (ft)	Radius (ft)	Azim. (Deg)	Orient. (Deg)	Vertical Offset (ft)	Tx Line	Comments
1	LROD	154.00	0.00	0.0	0.0	0.00		
2	CARRIER	150.00	0.00	0.0	0.0	0.00		
3	CARRIER	140.00	0.00	0.0	0.0	0.00		
4	CARRIER	130.00	0.00	0.0	0.0	0.00		
5	CARRIER	120.00	0.00	0.0	0.0	0.00		
6	CARRIER	110.00	0.00	0.0	0.0	0.00		

POINT LOADS WIND AREAS AND WEIGHTS

No.	Description	Frontal Bare Area (ft^2)	Lateral Bare Area (ft^2)	Frontal Iced Area (ft^2)	Lateral Iced Area (ft^2)	Weight Bare (Kips)	Weight Iced (Kips)
1	LROD	2.00	2.00	3.00	3.00	0.10	0.20
2	CARRIER	150.00	150.00	190.00	190.00	4.00	5.50
3	CARRIER	150.00	150.00	190.00	190.00	4.00	5.50
4	CARRIER	180.00	180.00	220.00	220.00	5.00	8.20
5	CARRIER	150.00	150.00	190.00	190.00	4.00	5.50
6	CARRIER	150.00	150.00	190.00	190.00	4.00	5.50

File: W:\Jobs\2016\217435\REVISED DESIGN\217435F R1.out
Contract: 217435
Project: 135' (155' FUTURE) OAH TAPERED STEEL POLE
Date and Time: 5/24/2016 5:07:59 PM

Revision: 0
Site: BRIDGEPORT EVERGREEN ST CT-5020
Engineer: DWG

Section G: WIND LOAD DATA

Load Combination Wind Only

Wind Direction 0.00 (deg)

Pole Wind Data

Element	Top Elev. (ft)	Bot. Elev. (ft)	Top Diam. (in)	Bot. Diam. (in)	Top Kz	Top Press. (psf)	Bot. Kz	Bot. Press. (psf)
30	154.00	150.67	24.00	24.92	1.56	48.62	1.55	48.32
29	150.67	147.33	24.92	25.84	1.55	48.32	1.54	48.02
28	147.33	144.00	25.84	26.76	1.54	48.02	1.53	47.71
27	144.00	140.67	26.76	27.68	1.53	47.71	1.52	47.39
26	140.67	137.33	27.68	28.60	1.52	47.39	1.51	47.07
25	137.33	134.00	28.60	29.52	1.51	47.07	1.50	46.74
24	134.00	129.78	29.52	30.67	1.50	46.74	1.48	46.32
23	129.78	125.57	30.67	31.82	1.48	46.32	1.47	45.89
22	125.57	121.35	31.82	32.98	1.47	45.89	1.46	45.45
21	121.35	117.13	32.98	34.13	1.46	45.45	1.44	44.99
20	117.13	112.92	34.13	35.28	1.44	44.99	1.43	44.53
19	112.92	108.08	35.28	36.60	1.43	44.53	1.41	43.98
18	108.08	104.27	36.10	37.14	1.41	43.98	1.40	43.54
17	104.27	100.45	37.14	38.18	1.40	43.54	1.38	43.08
16	100.45	96.63	38.18	39.23	1.38	43.08	1.37	42.61
15	96.63	92.82	39.23	40.27	1.37	42.61	1.35	42.13
14	92.82	89.00	40.27	41.31	1.35	42.13	1.33	41.63
13	89.00	83.42	41.31	42.84	1.33	41.63	1.31	40.87
12	83.42	76.33	42.21	44.15	1.31	40.87	1.28	39.86
11	76.33	69.25	44.15	46.08	1.28	39.86	1.24	38.78
10	69.25	62.17	46.08	48.02	1.24	38.78	1.21	37.62
9	62.17	55.08	48.02	49.95	1.21	37.62	1.17	36.37
8	55.08	48.00	49.95	51.89	1.17	36.37	1.12	34.99
7	48.00	41.00	51.89	53.80	1.12	34.99	1.07	33.48
6	41.00	34.17	52.80	54.67	1.07	33.48	1.02	31.83
5	34.17	27.33	54.67	56.53	1.02	31.83	1.00	31.20
4	27.33	20.50	56.53	58.40	1.00	31.20	1.00	31.20
3	20.50	13.67	58.40	60.27	1.00	31.20	1.00	31.20
2	13.67	6.83	60.27	62.13	1.00	31.20	1.00	31.20
1	6.83	0.00	62.13	64.00	1.00	31.20	1.00	31.20

Projected and Wind Areas

Element	Pole Proj Area (ft^2)	Tx-Line Proj Area (ft^2)	Ladder Proj Area (ft^2)	Ra	Top Drag Factor	Bot Drag Factor
30	6.90	0.10	0.00	0.02	0.65	0.65
29	7.16	0.10	0.00	0.01	0.65	0.65
28	7.42	0.10	0.00	0.01	0.65	0.65
27	7.68	0.10	0.00	0.01	0.65	0.65
26	7.94	0.10	0.00	0.01	0.65	0.65
25	8.20	0.10	0.00	0.01	0.65	0.65
24	10.74	0.13	0.00	0.01	0.65	0.65
23	11.15	0.13	0.00	0.01	0.65	0.65
22	11.56	0.13	0.00	0.01	0.65	0.65
21	11.97	0.13	0.00	0.01	0.65	0.65
20	12.38	0.13	0.00	0.01	0.65	0.65
19	14.70	0.15	0.00	0.01	0.65	0.65
18	11.83	0.12	0.00	0.01	0.65	0.65
17	12.16	0.12	0.00	0.01	0.65	0.65
16	12.50	0.12	0.00	0.01	0.65	0.65
15	12.84	0.12	0.00	0.01	0.65	0.65

14	13.17	0.12	0.00	0.01	0.65	0.65
13	19.88	0.17	0.00	0.01	0.65	0.65
12	25.88	0.22	0.00	0.01	0.65	0.65
11	27.04	0.22	0.00	0.01	0.65	0.65
10	28.20	0.22	0.00	0.01	0.65	0.65
9	29.36	0.22	0.00	0.01	0.65	0.65
8	30.52	0.22	0.00	0.01	0.65	0.65
7	31.30	0.22	0.00	0.01	0.65	0.65
6	31.07	0.21	0.00	0.01	0.65	0.65
5	32.15	0.21	0.00	0.01	0.65	0.65
4	33.23	0.21	0.00	0.01	0.65	0.65
3	34.31	0.21	0.00	0.01	0.65	0.65
2	35.39	0.21	0.00	0.01	0.65	0.65
1	36.47	0.21	0.00	0.01	0.65	0.65

App. Concentrated Loads

Ant.	Description	Qty	Mount Desc.	Elev. (ft)	CaAc X-Dir E-W (ft^2)	CaAc Y-Dir N-S (ft^2)	XForce E-W (Kips)	YForce N-S (Kips)	ZForce (Kips)	M-x (kipsft)	M-y (kipsft)	M-z (kipsft)
1	LROD			154	0.00	-2.00	0.00	-0.10	-0.10	0.00	0.00	0.00
2	CARRIER			150	0.00	-149.99	0.00	-7.24	-4.00	0.00	0.00	0.00
3	CARRIER			140	0.00	-149.99	0.00	-7.10	-4.00	0.00	0.00	0.00
4	CARRIER			130	0.00	-179.98	0.00	-8.35	-5.00	0.00	0.00	0.00
5	CARRIER			120	0.00	-149.99	0.00	-6.80	-4.00	0.00	0.00	0.00
6	CARRIER			110	0.00	-149.99	0.00	-6.63	-4.00	0.00	0.00	0.00

File: W:\Jobs\2016\217435\REVISED DESIGN\217435F R1.out
Contract: 217435
Project: 135' (155' FUTURE) OAH TAPERED STEEL POLE
Date and Time: 5/24/2016 5:07:59 PM

Revision: 0
Site: BRIDGEPORT EVERGREEN ST CT-5020
Engineer: DWG

Section H: STRUCTURE DISPLACEMENT DATA

Load Combination Max Envelope

Wind Direction Maximum displacements

Elev. (ft)	N-S Disp (in)	W-E Disp (in)	Vert.Disp (in)	N-S Rot (deg)	W-E Rot (deg)	Twist Rot (deg)
154.00	88.5	-88.4	-2.7	-5.36	-5.36	0.00
150.67	84.8	-84.7	-2.6	-5.36	-5.36	0.00
147.33	81.1	-80.9	-2.4	-5.35	-5.35	0.00
144.00	77.3	-77.2	-2.3	-5.32	-5.33	0.00
140.67	73.6	-73.5	-2.1	-5.28	-5.29	0.00
137.33	70.0	-69.9	-2.0	-5.22	-5.23	0.00
134.00	66.3	-66.2	-1.8	-5.14	-5.15	0.00
129.78	61.8	-61.8	-1.6	-5.04	-5.05	0.00
125.57	57.4	-57.3	-1.5	-4.92	-4.92	0.00
121.35	53.2	-53.1	-1.3	-4.77	-4.77	0.00
117.13	49.0	-48.9	-1.1	-4.59	-4.60	0.00
112.92	45.0	-45.0	-1.0	-4.39	-4.40	0.00
108.08	40.7	-40.7	-0.9	-4.14	-4.14	0.00
104.27	37.5	-37.4	-0.7	-3.95	-3.96	0.00
100.45	34.4	-34.4	-0.7	-3.76	-3.77	0.00
96.63	31.5	-31.4	-0.6	-3.56	-3.56	0.00
92.82	28.7	-28.7	-0.5	-3.35	-3.35	0.00
89.00	26.1	-26.1	-0.4	-3.13	-3.13	0.00
83.42	22.6	-22.6	-0.3	-2.81	-2.81	0.00
76.33	18.7	-18.6	-0.3	-2.53	-2.54	0.00
69.25	15.1	-15.1	-0.2	-2.26	-2.26	0.00
62.17	12.0	-11.9	-0.1	-1.98	-1.98	0.00
55.08	9.2	-9.2	-0.1	-1.71	-1.71	0.00
48.00	6.9	-6.9	-0.1	-1.44	-1.44	0.00
41.00	4.9	-4.9	0.0	-1.18	-1.18	0.00
34.17	3.4	-3.4	0.0	-0.97	-0.97	0.00
27.33	2.2	-2.2	0.0	-0.76	-0.77	0.00
20.50	1.2	-1.2	0.0	-0.57	-0.57	0.00
13.67	0.5	-0.5	0.0	-0.37	-0.37	0.00
6.83	0.1	-0.1	0.0	-0.18	-0.18	0.00
0.00	0.0	0.0	0.0	0.00	0.00	0.00

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Contract: 217435
Project: 135' (155' FUTURE) OAH TAPERED STEEL POLE
Date and Time: 5/24/2016 5:07:59 PM

Revision: 0
Site: BRIDGEPORT EVERGREEN ST CT-5020
Engineer: DWG

Section L: STRENGTH ASSESSMENT DATA

Load Combination: Max Envelope
Wind Direction: Maximum

Elev. (ft)	Bending Stress (ksi)	Axial Stress (ksi)	Shear Stress (ksi)	Total Stress (ksi)	Allowable Stress (ksi)	Assess.
154.00	0.00	0.02	0.02	0.04	52.00	0.001
150.67	0.10	0.02	0.02	0.12	52.00	0.002
150.67	0.10	0.30	0.43	0.85	52.00	0.016
147.33	2.67	0.29	0.41	3.05	52.00	0.059
147.33	2.68	0.37	0.52	3.18	52.00	0.061
144.00	5.57	0.36	0.51	5.99	52.00	0.115
144.00	5.79	0.26	0.54	6.12	52.00	0.118
140.67	8.46	0.25	0.52	8.76	52.00	0.168
140.67	8.47	0.43	0.90	9.03	52.00	0.174
137.33	12.90	0.41	0.87	13.40	52.00	0.258
137.33	12.91	0.47	0.98	13.49	52.00	0.259
134.00	17.33	0.45	0.95	17.86	52.00	0.344
134.00	13.09	0.37	0.74	13.52	52.00	0.260
129.78	16.90	0.35	0.72	17.30	52.00	0.333
129.78	16.91	0.54	1.08	17.56	52.00	0.338
125.57	22.42	0.52	1.04	23.01	52.00	0.443
125.57	22.43	0.55	1.05	23.05	52.00	0.443
121.35	27.17	0.53	1.01	27.75	52.00	0.534
121.35	27.18	0.64	1.21	27.90	52.00	0.537
117.13	32.44	0.62	1.17	33.12	52.00	0.637
117.13	32.45	0.69	1.27	33.21	52.00	0.639
112.92	37.47	0.66	1.23	38.19	52.00	0.734
112.92	37.48	0.74	1.34	38.29	52.00	0.736
108.08	35.68	0.67	1.18	36.41	52.00	0.700
104.27	39.41	0.66	1.14	40.11	52.00	0.771
104.27	39.42	0.69	1.15	40.15	52.00	0.772
100.45	42.73	0.67	1.12	43.44	52.00	0.835
100.45	42.73	0.69	1.13	43.47	52.00	0.836
96.63	45.72	0.67	1.10	46.43	52.00	0.893
96.63	45.72	0.70	1.11	46.46	52.00	0.894
92.82	48.34	0.68	1.08	49.05	52.00	0.943
92.82	48.34	0.70	1.09	49.08	52.00	0.944
89.00	50.66	0.68	1.06	51.38	52.00	0.988
89.00	50.67	0.71	1.07	51.42	52.00	**0.989**
83.42	35.00	0.48	0.66	35.50	52.00	0.683
76.33	36.96	0.46	0.64	37.44	52.00	0.720
76.33	36.97	0.50	0.64	37.49	52.00	0.721
69.25	38.55	0.48	0.62	39.04	52.00	0.751
69.25	38.55	0.52	0.63	39.08	52.00	0.752
62.17	39.81	0.49	0.60	40.32	52.00	0.775
62.17	39.82	0.53	0.61	40.36	52.00	0.776
55.08	40.82	0.51	0.58	41.34	52.00	0.795
55.08	40.82	0.54	0.59	41.38	52.00	0.796
48.00	41.61	0.52	0.57	42.14	52.00	0.810
48.00	41.61	0.56	0.58	42.18	52.00	0.811
41.00	35.33	0.48	0.46	35.82	52.00	0.689
34.17	35.67	0.46	0.44	36.14	52.00	0.695
34.17	35.67	0.51	0.45	36.18	52.00	0.696
27.33	35.90	0.49	0.43	36.39	52.00	0.700
27.33	35.90	0.52	0.44	36.43	52.00	0.701
20.50	36.05	0.50	0.43	36.56	52.00	0.703
20.50	36.05	0.54	0.43	36.59	52.00	0.704
13.67	36.13	0.52	0.42	36.66	52.00	0.705
13.67	36.13	0.55	0.42	36.69	52.00	0.706
6.83	36.18	0.53	0.41	36.72	52.00	0.706
6.83	36.18	0.56	0.41	36.75	52.00	0.707
0.00	36.17	0.55	0.40	36.72	52.00	0.706

Pole Mat Foundation With Raised Pier

5/25/2016
9:08 AM

RI

Project Number	217435	
Engineer	DWG	HA
Axial Download	156.5	kips
Overturning Moment	8066.7	ft-kips
Shear	79.6	kips
Bolt Circle Diameter	70.5	in
Number of Anchor Bolts	24	
Anchor Bolt Diameter	2-1/4"	
Anchor Bolt Length	84	in
Anchor Bolt Projection	12	in
Allowable Soil Pressure	6850	psf
Pier Projection	0.5	feet
Pier Diameter	8	feet
Pad Width	30	feet
Pad Thickness	3.25	feet
Depth	6.5	feet
Concrete Volume=	117.2	Cubic Yards
Concrete f_c'	4500	psi
Rebar Yield Strength	60000	psi
Unit Weight Soil	100	lbs/ft^3
Unit Weight Concrete	150	lbs/ft^3
Concrete Design Load Factor	1.3	
Anchor Bolt Grade	A615 Gr 75	

Description: **135' (155' FUTURE) TSP**
Customer: **BLUE SKY TOWER**
Site: **BRIDGEPORT EVERGREEN ST CT-5020**

8365.2 ft-kips OTM at top of pad
8623.9 ft-kips OTM at bottom of pad

5005 Actual Soil Bearing Pressure/Diagonal Axis **OK!!**

8 ft. minimum pier width
1.56 Factor of Safety to resist OTM **OK!!**

5.8 minimum depth of foundation based on AB length

1.665 Area pad reinforcement required (Inches^2/ft)
1.733 Area pad reinforcement provided (Inches^2/ft) **OK!!**
#9 Size of pad reinforcement
52 Number of bars in each layer
6.81 Inches Center-Center spacing **OK!!**

17.58 Kips/Ft - Actual Beam Shear
36.71 Kips/Ft - Beam Shear Capacity **OK!!**

0.23 ksi - Actual Punching Shear Stress
0.23 ksi - Punching Shear Stress Capacity **OK!!**

Use 30 ft. x 30 ft. x 3.25 ft. thick pad bearing 6.5 ft. below grade with a 8 ft wide Pier projecting 6 Inches above grade.
Use (52) 29.5 ft long #9 horizontal bars both ways, top and bottom in the pad. (208) total

Total Volume of Concrete required = 117.2 Cubic Yards

Area of Shaft Reinforcement Required = 61.8
Area of Shaft Reinforcement Provided = 63.5
OK!!

#10 Size of Vertical Shaft Reinforcement
50 Minimum Number of Rebars Required
50 Number of Vertical Rebars

Use (50) #10 Vertical Rebars in the pier on a 87" Diameter Cage with 90 degree hooks at bottom.

Use #5 Circular Ties 6" Center on Center for the height of the pier.

SHAFT REINFORCING PROGRAM VER. 91.7

DESIGNED BY: DWG
ENG. FILE NO.: 217435
DATE: 05/25/16

CUSTOMER: BLUE SKY TOWER
DESCRIPTION: BRIDGEPORT EVERGREEN ST CT-5020

INPUT DATA

C = 156.50 Kips	Vc = 79.60 Kips	Mc = 8365.20 Ft-K
T = 0.00 Kips	Vt = 0.00 Kips	Mt = 0.00 Ft-K
Fy = 60.00 Ksi	Fyt = 60.00 Ksi	L.F. = 1.30
H = 96.00 In.	Ds = 87.00 In.	F'c = 4.50 Ksi
U = 1.00	Irs = 2	

*** SHAFT CROSS SECTION IS SQUARE ***

SUMMARY OF ANALYSIS

Minimum area of steel req'd. = 61.80 sq.in. (Rhomin = 0.0067)

Maximum steel area limit = 579.06 sq.in. (Rhomax = 0.0628)

CIRCULAR TIE DATA

Vu <.85*Vc/2, shear reinforcement is not required.

Use maximum tie spacing specified in A.C.I. 318
Section 7.10.5 for compression reinforcement.

DEVELOPMENT LENGTH MODIFIERS FOR TENSION AND COMPRESSION BAR DEVELOPMENT

DLMT = MODIFIER FOR TENSION DEVELOPMENT = .667

DLMC = MODIFIER FOR COMPRESSION DEVELOPMENT = .294

REQUIRED Ld = MODIFIER * BASIC Ld * ACI 318 MODIFIERS (12 in. min.)

HMB

HMB Acoustics LLC 3 Cherry Tree Lane, Avon, CT 06001 860-677-5955

Noise Evaluation Report

BlueSky Tower Partners LLC
A Proposed AT&T Equipment Shelter
And An Emergency Generator
Site Number: CT5020
Site Name: Evergreen Street
220 Evergreen Street
Bridgeport, CT 06606

May 31, 2016

Prepared For:
Douglas Roberts
Hudson Design Group LLC
110 Washington Avenue
Fourth Floor
North Haven, CT 06473

Prepared By:
Allan Smardin
HMB Acoustics LLC
3 Cherry Tree Lane
Avon, CT 06001

Introduction

The site location is generally a mixed Industrial and residential area. BlueSky Tower has proposed a facility to be located at 220 Evergreen Street, Bridgeport, CT. The proposed site, CT5020, will include an equipment shelter and a 50 kw emergency generator set in a level 2 enclosure. The generator will be located in close proximity to the tower and AT&T equipment shelter.

The shelter maintains two exterior wall mounted air-conditioning units to cool the radio equipment. The emergency generator runs only when commercial power to the site is interrupted. The purpose of this evaluation is to determine whether the air-conditioners and generator will comply with the State of CT Noise Regulations.

It is important to note that the back-up generator operates approximately 15-20 minutes each week for testing. All testing is done during the daytime hours. Other than these testing periods, the generator runs only in times of emergency, when commercial power to the facility is interrupted. Typically, only one of the two air-conditioner units operates at any one time. This report and the noise regulations utilize a dBA scale. This scale is used because it closely approximates the response characteristic of the human ear to loudness, and is the scale most commonly used in the measurement of community noise.

Noise Regulations

The State of CT has enacted regulations which limit the amount of noise which may be transferred from one property to another. In pertinent part, the Regulations provide as follows: Daytime Hours - The hours between 7 a.m. and 10 p.m. local time.

Nighttime Hours - The hours between 10 p.m. and 7 a.m. local time.

Allowable Noise Levels Projected To The Estimated Property Line

The allowable noise level from a Class “C” Industrial Zone Emitter to an Industrial Zone Receptor is 70 dBA day / night.
(Sec.22a-69-3.5 (a).
The allowable noise level from a Class “C” Industrial Zone Emitter to a Class “A” Residential Receptor is 61 dBA (daytime) and 51 dBA (nighttime).
(Sec. 22a-69-3.5(a)).

Exemptions -

“Noise created as a result of, or relating to an emergency.”
(Sec. 22a-69-1.8(f).

Noise Evaluation Results

The noise levels listed below take into account the effect of acoustical shielding provided by other structures on the property. The levels have been projected to the nearest property lines in the directions listed.

	Generator + 1 HVAC Unit (dBA)
North (Industrial)	58
South (Residential)	44
East (Industrial)	61
West (Industrial)	48

The data demonstrates that the emergency generator and air conditioner are in compliance with the conditions set forth in the State of CT Noise Regulations.

If 2 air-conditioning units on the shelter were running simultaneously with the generator a 2 dBA increase would be expected in all directions.