

ENGINEERING STATEMENT
RE APPLICATION FOR LICENSE FOR AUXILIARY OPERATION
FOR AUTHORIZED CONSTRUCTION PERMIT
FCC FILE NO. BXPB-20121119ADE
WSGS(FM), HAZARD, KENTUCKY
CHANNEL 266C (101.1 MHZ) 100 KW MAX ND ERP 357.7 M HAAT
FACILITY ID 43964

DECEMBER 2012

COHEN, DIPPELL AND EVERIST, P.C.
CONSULTING ENGINEERS
RADIO AND TELEVISION
WASHINGTON, D.C.

Introduction

This engineering report has been prepared on behalf of Mountain Broadcasting Service, Inc., is in support of a request for license for a FM auxiliary operation for station WSGS(FM), Hazard, Kentucky. The FM auxiliary station is authorized by the outstanding construction permit (FCC File No. BXPB-20121119ADE). The outstanding construction permit authorizes operation with maximum non-directional effective radiated power ("ERP") of 100 kW and 357.7 meters height above average terrain ("HAAT").

Antenna Site

An eight-bay 1.0 wavelength spaced FM antenna is side-mounted on the existing guyed, uniform cross-section tower. The existing antenna is located on Buffalo Mountain approximately 7.0 km (4.3 miles) south of the center of Hazard, Kentucky.

The geographic coordinates of the existing antenna site are as follows:

North Latitude: 37° 11' 36"

West Longitude: 83° 11' 04"

NAD-27

Antenna Structure Registration No. 1048810

The following tabulation shows the pertinent data for the facility as construction.

Equipment Data

Transmitter: Type-approved

Transmission Line: 146.9 meters (482 feet), Andrew, Type HJ11-50, 4", 50 ohm air Heliac line (loss 0.115 dB/100')

Antenna: ERI, Type SHPX-8AC, non-directional or equivalent eight-bay, 1.0 wavelength spaced circularly polarized antenna with no electrical beam tilt. See Exhibit E-1 for technical details and elevation pattern.

Power Data

Transmitter output power (nominal)	25.32 kW	14.034 dB
Transmission line loss/efficiency	88.0%	0.554 dB
Power input to antenna	22.278 kW	13.48 dBk
Antenna gain	4.487	6.520 dB
Effective Radiated Power (H&V)	100 kW	20 dBk

Elevation Data

Elevation of the site above mean sea level	620.9 meters (2037 feet)
Elevation of the top of supporting structure above ground	157.6 meters (517.1 feet)
Elevation of the top of supporting structure above mean sea level	778.5 meters (2554.1 feet)
Height of radiation center above ground (H&V)	140.5 meters (461 feet)
Height of radiation center above mean sea level (H&V)	761.4 meters (2498 feet)
Height of radiation center above average terrain (H&V)	357.7 meters (1173.6 feet)

The overall height of the existing tower structure is unchanged by installation of the side-mounted antenna and remains 157.6 meters (517.1 feet) in height above ground.

The two antennas for the other full service FM stations [WKIC(FM) and WJMD(FM)] remain at their authorized location.

Construction Permit Conditions

WSGS(FM) has constructed the facility as authorized by the outstanding construction permit. WSGS(FM) will reduce power or terminate operation when authorized workman are on the tower.

Cohen, Dippell and Everist, P.C.

EXHIBIT E-1

WSGS(FM), HAZARD, KENTUCKY
AUXILIARY



Electronics Research, Inc. — Your Single Source for Broadcast Solutions™

Catalog > Antennas > FM Antennas > ROTOTILLER X Series > SHPX-8AC



ROTOTILLER® X Series Circularly Polarized FM Antenna

Type Number: **SHPX-8AC**

ROTOTILLER X Series SHPX Model Super High Power Circularly Polarized FM Antenna

Electrical Specifications

Number of Bays:	8
Power Gain:	4.4872 numeric 6.5198 dB
Input Type:	3 1/8 inch 50 Ohm EIA Female
Feed Configuration:	Center
Input Power Rating:	39 kW
Bay to Bay Spacing:	1 Wave Length

Mechanical Specifications

Weight, Antenna only:	928 lbm 420.93 kg
Weight, Antenna with radome:	1328 lbm 602.37 kg
Weight, Antenn with half inch of ice:	1568 lbm 711.23 kg
Weight, Antenna with radome and half inch of ice:	2568 lbm 1,164.83 kg
CaAa, Antenna only:	42.9 ft ² 3.99 m ²
CaAa, Antenna with radome:	77.14 ft ² 7.17 m ²
CaAa, Antenna with half inch of ice:	56.89 ft ² 5.29 m ²
CaAa, Antenna with radome and half inch of ice:	91.51 ft ² 8.50 m ²

Mechanical Specification Notes

(1) All loads calculated in accordance with the ANSI/TIA-222 standard. (2) Provided effective wind areas, CaAa, do NOT include potential wind shielding/interference due to the interaction with the supporting structure (i.e. does not include Ka factor). (3) Listed antenna weights and effective wind areas assume 98 MHz and include the antenna radiating elements, feed harnessing, and standard leg mounting brackets. Special mounting bracket loads for face-mounted and/or pole standoff mounted systems are NOT included. Final design loads will vary for specific projects and should be verified by an ERI representative when precise loading is required.

All designs, specifications, and availabilities of products and services presented in this publication are subject to change without notice.

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Electronics Research, Inc.
7777 Gardner Road
Chandler, In. 47610

Figure 1

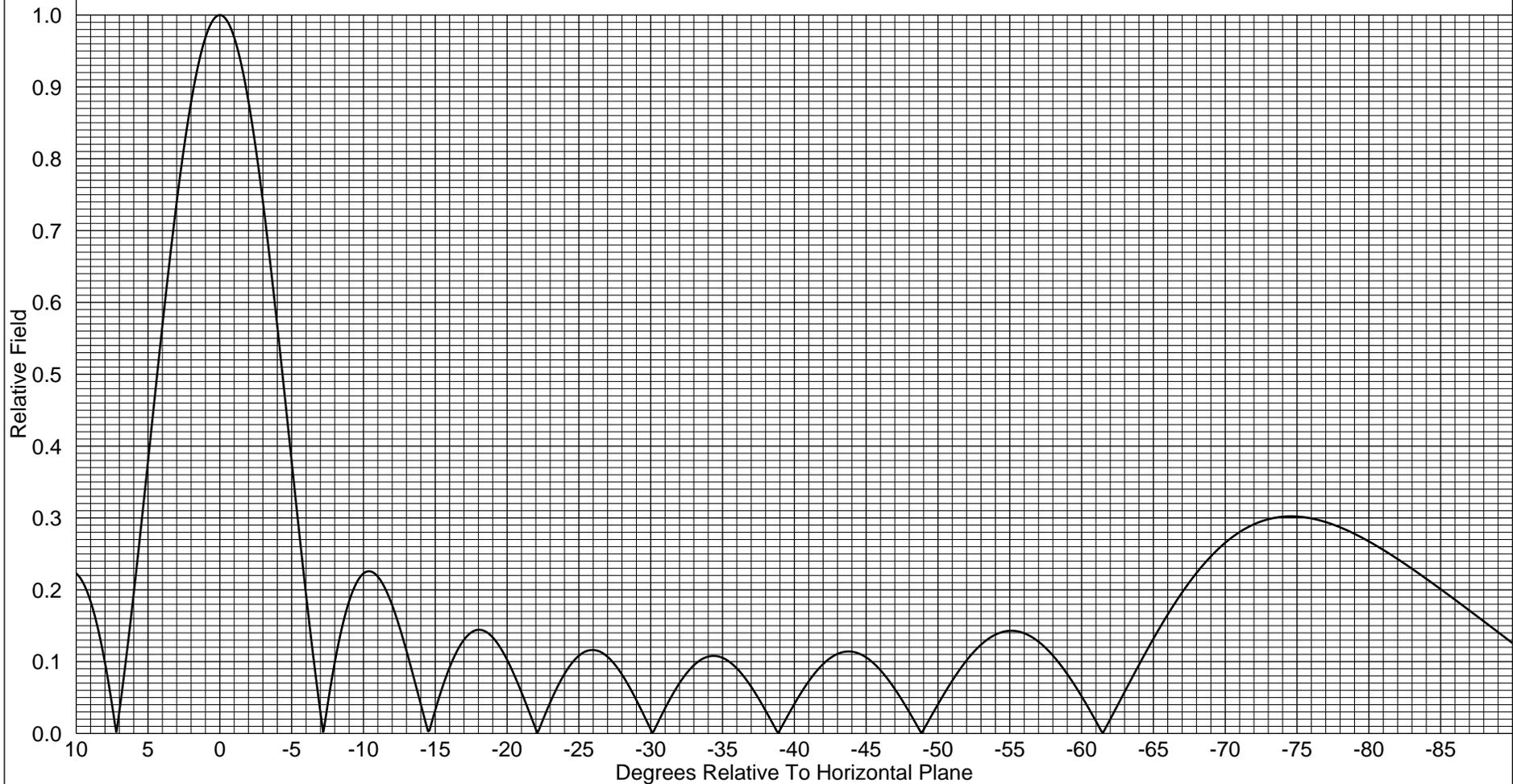
---Theoretical---

Vertical Plane Relative Field
8 ERI Type SHP, SHPX, LP or LPX Elements
0.00 Degree(s) Electrical Beam Tilt
0.0 Percent First Null Fill
0.0 Percent Second Null Fill
Power Gain is 4.487 In The Horizontal Plane(4.487 In The Max.)

11/13/2012 3:50:16 PM

101.1 MHz

Element Spacing:
116.32 Inches



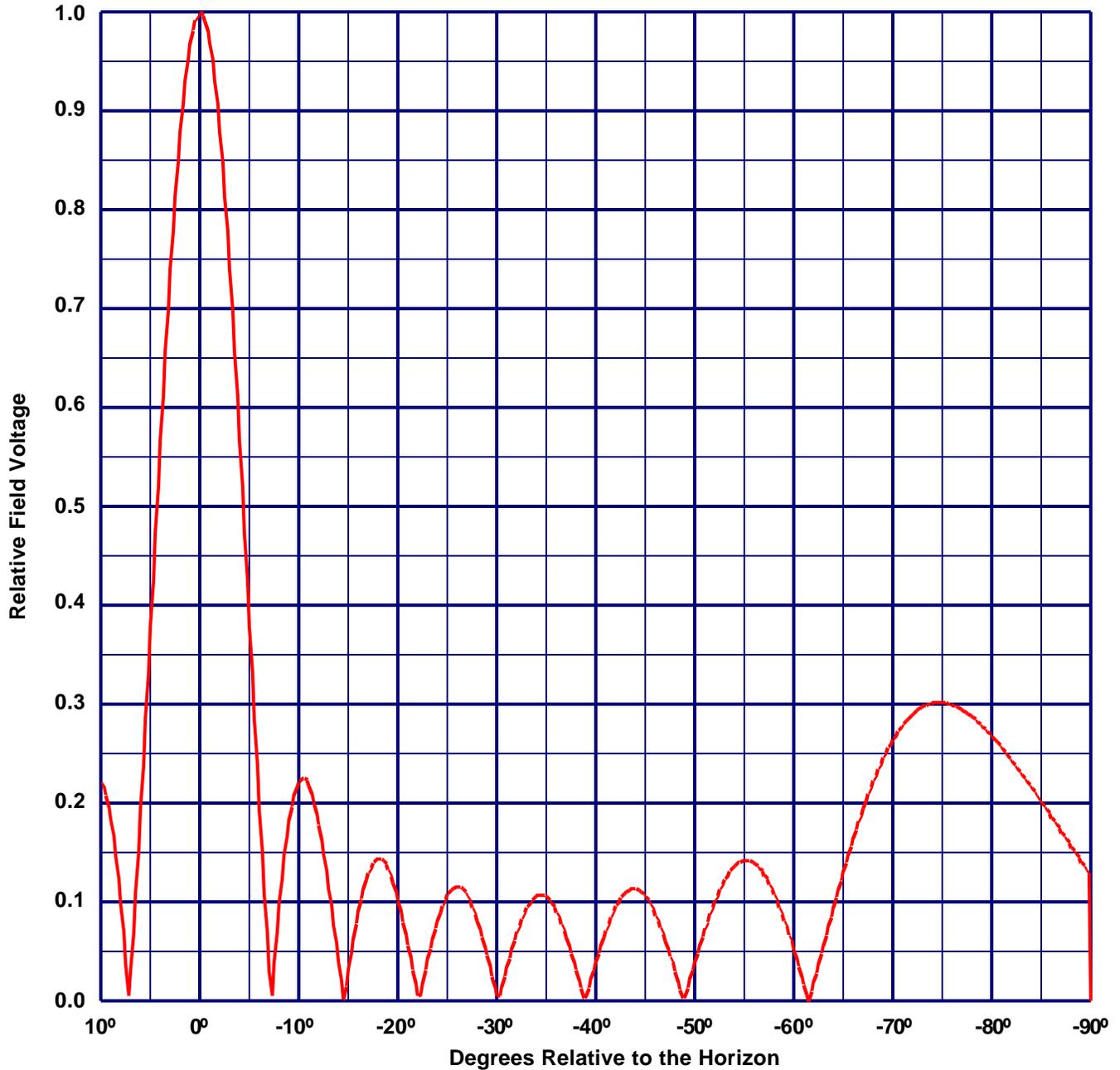


Vertical Plane Relative Field Pattern

ERI TYPE SHP, SHPX, MP, MPX, LP OR LPX ELEMENTS

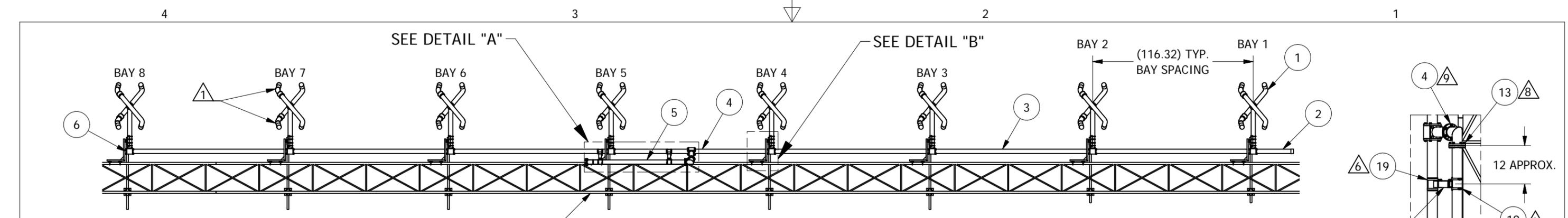
An 8 level, 1 wave-length spaced non directional antenna

with 0° beam tilt, 0% null fill and a H/V maximum power ratio of 1.000



Vertical Polarization Gain:
Maximum: 4.487 (6.520 dB)
Horizontal Plane: 4.487 (6.520 dB)

Horizontal Polarization Gain:
Maximum: 4.487 (6.520 dB)
Horizontal Plane: 4.487 (6.520 dB)



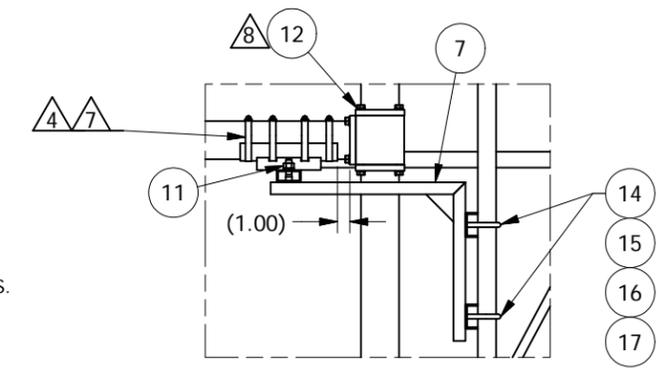
ELEVATION VIEW
SCALE 1 / 70

B

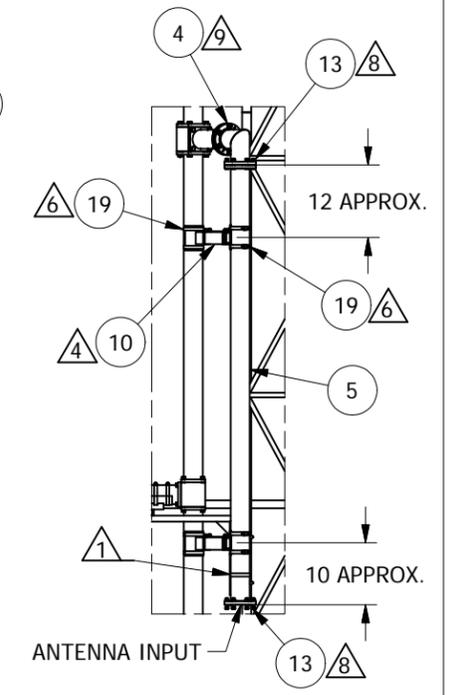
A

NOTES:

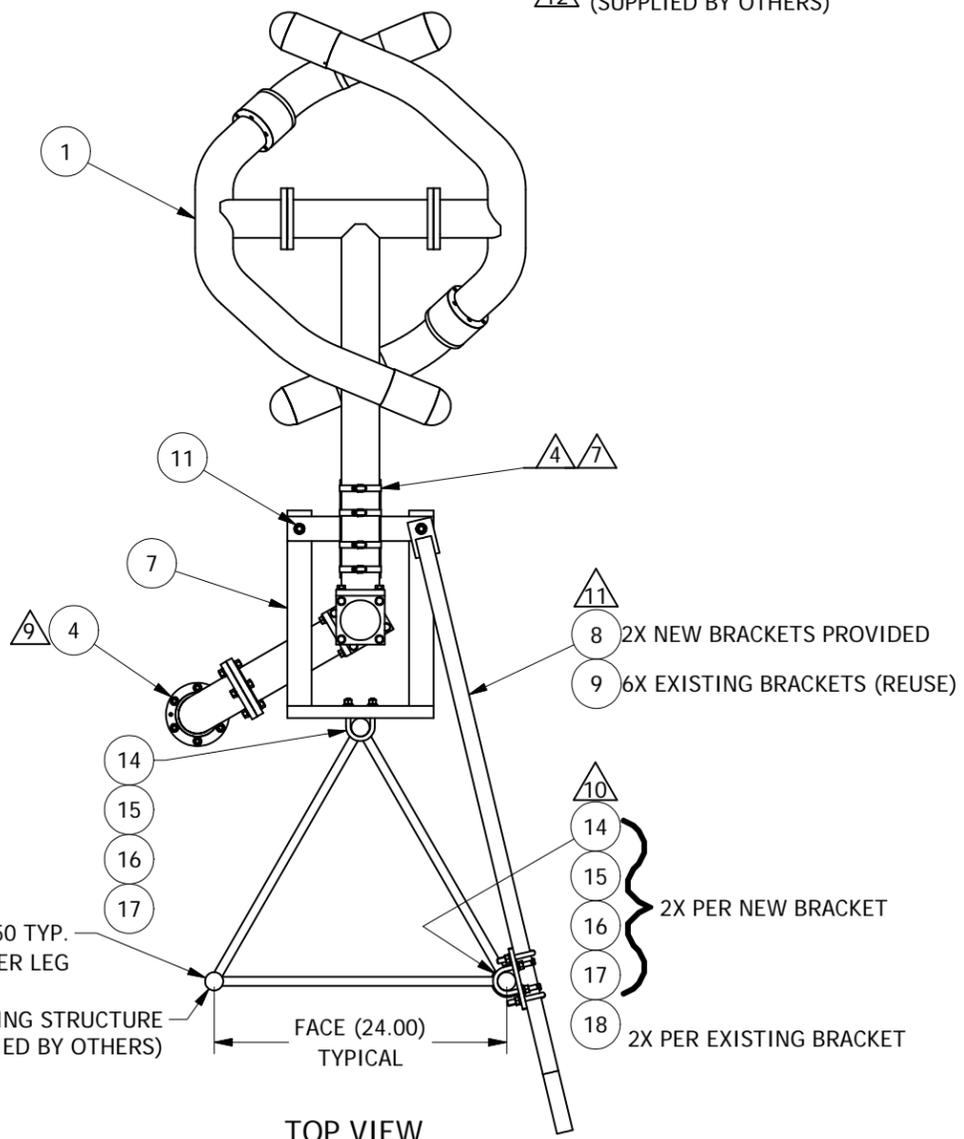
- 1. ALL RED BANDS DESIGNATE SIDE TO BE MOUNTED DOWNWARD.
- 2. ASSEMBLE ANTENNA SYSTEM BY MATING CORRESPONDING NUMBERS.
- 3. OVERALL LENGTH OF ANTENNA SYSTEM IS 71'-8" APPROXIMATE.
- 4. ENSURE TO PLUMB ANTENNA VERTICALLY BY LOOSENING HOSE CLAMPS ON PRE-CLAMPED SUPPORT SADDLES AND ADJUSTABLE LINE BRACKETS.
- 5. FINAL ORIENTATION TO BE DETERMINED BY STATION PERSONNEL.
- 6. HOSE CLAMPS USED TO SECURE LINE BRACKETS TO INTERBAY LINE.
- 7. HOSE CLAMPS USED TO SECURE ELEMENTS TO SADDLE BRACKETS.
- 8. APPLY 1/2 GREASE PACKET TO EACH O-RING.
- 9. CENTERFEED CAN BE ROTATED TO AVOID ANY OBSTRUCTIONS.
- 10. ANTI-ROTATION BRACKETS ARE ADJUSTABLE AT U-BOLTS.
- 11. IF THE ANTENNA HAS TO BE ROTATED CAUSING THE ANTI-ROTATION BRACKET PIPE TO EXTEND FARTHER PAST THE LEG THAN 10", THE PIPE SHOULD BE CUT OFF.
- 12. THE SUPPORTING STRUCTURE SHOWN HEREON IS SUPPLIED BY OTHERS AND IS USED ONLY FOR ILLUSTRATION PURPOSES. ERI IS NOT RESPONSIBLE & DOES NOT WARRANTY ANY FIT-UP INTERFERENCE.
- 13. UNLESS OTHERWISE NOTED, ALL BOLTED CONNECTIONS SHALL INITIALLY BE BROUGHT TO A SNUG-TIGHT CONDITION WHERE JOINT TIGHTNESS IS ATTAINED WITH A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF AN IRONWORKER USING AN ORDINARY SPUD WRENCH TO BRING THE PLIES INTO FIRM CONTACT. A SYSTEMATIC APPROACH SHALL BE USED TO BRING THE JOINT INTO A SNUG-TIGHT CONDITION STARTING WITH THE MOST RIGID PART OF THE JOINT AND PROCEEDING TOWARD THE FREE EDGES.
- 14. FOR FINAL TIGHTENING, ERI RECOMMENDS AN ADDITIONAL 1/3 TURN BE APPLIED TO ALL BOLTS UP TO Ø3/4" OR TORQUED AN ADDITIONAL 150 FT-LBS FOR BOLTS OVER Ø3/4", UNLESS OTHERWISE NOTED. FINAL TIGHTENING OF ALL BOLTS SHOULD BE COMPLETED AFTER FINAL CONSTRUCTION OF THE STRUCTURE/ASSEMBLY. PLEASE NOTE, SPECIAL ATTENTION SHALL BE GIVEN TO TIGHTENING OF 1/2" DIAMETER A325 BOLTS, U-BOLTS, AND THREADED RODS AS TO PREVENT STRIPPING THE THREADS FROM OVER-TIGHTENING.



DETAIL B
SCALE 1 / 15



DETAIL A
SCALE 1 / 30



TOP VIEW
SCALE 1 / 15

ITEM	QTY	PART NUMBER	DESCRIPTION
19	8	HC0048	#48 HOSE CLAMP, SS
18	12	UB0813-0212GA	1/2-13 x 2-1/8" C-C GALV. UBOLT
17	40	NU0616	3/8 - 16 SS HEX NUT, WAX COATED
16	40	WL06SS	3/8 in, SS LOCK WASHER
15	40	WF06SS	3/8 in, SS FLAT WASHER
14	20	UB0616-0200	3/8-16 X 2" C-C U-BOLT
13	2	RLA300-21	3-1/8" HARDWARE KIT
12	8	HWK3102	4" BLOCK, HARDWARE KIT
11	8	HWK0007	2" SADDLE, HARDWARE KIT
10	2	BT0014	3-1/8" TO 3-1/8" ADJ. LINE TO LINE BRKT
9	6	BT25631-3	ANTI-ROTATION BRACKET (EXISTING)
8	2	BT30282A-2	ANTI-ROTATION BRACKET (NEW)
7	8	BT30282A-1	LEG MOUNT BRACKET
6	1	CO0005	COVER PLATE (3-1/8" O.D. LINE)
5	1	CL3031	3 1/8" MATCHING SECTION
4	1	CL3064C-112.32	3-1/8" CENTERFEED ASSY 3-1/8" INPUT
3	6	CL3061B-112.32	3-1/8" INTERBAY LINE ASSY
2	1	CL3063B-27.08	3-1/8" QUARTER-WAVE STUB ASSY
1	8	AE-SHX3B00	10" SHPX ELEMENT, 3" STEM

BILL OF MATERIAL

PROJECT NO.	30282A/1	
ERI APPROVAL	NAME	DATE
DRAWN BY	MAP	9/7/2012
DRAFTING	DLB	9/10/2012
DESIGN MGR.	GH	9/10/2012
ENG.		
MANUF.		
EXT. APPROVAL		
SUPERSEDES PART NO.		
FILE NAME:	IA30282A-1.idw	

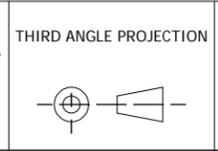
ERI ELECTRONICS RESEARCH INC. ESTABLISHED 1943
7777 GARDNER Rd. CHANDLER, IN 47610-9219
PHONE: (812) 925-6000 FAX: (812) 925-4030

TITLE: **SHPX-8AC INSTALLATION DETAILS**
HAZARD, KY
WSGS - FM STATION 101.1 MHz

SIZE	CAGE CODE	DWG NO.	REV.
B	OZNS1	IA30282A-1	
SCALE:	AS NOTED	WEIGHT:	1225.13 lbmass
		SHEET:	1 OF 1



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MATERIAL
AS NOTED

FINISH

TOLERANCES
OVERALL-NOT CUMULATIVE
UNLESS OTHERWISE SPECIFIED,
ALL DIMENSIONS ARE IN INCHES
AND APPLICABLE AT 20°C (68°F)

1 PLACE DECIMAL ± .1
2 PLACE DECIMAL ± .03
3 PLACE DECIMAL ± .010
ANGULAR ± .5°
FRACTIONAL ± 1/16"

INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994

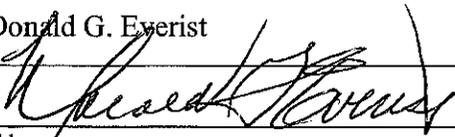
3

2

1

SECTION III PREPARER'S CERTIFICATION

I certify that I have prepared Section III (Engineering Data) on behalf of the applicant, and that after such preparation, I have examined and found it to be accurate and true to the best of my knowledge and belief.

Name Donald G. Everist	Relationship to Applicant (e.g., Consulting Engineer) Consulting Engineer	
Signature 	Date December 6, 2012	
Mailing Address Cohen, Dippell and Everist, P.C., 1420 N Street, NW, Suite One		
City Washington	State or Country (if foreign address) DC	ZIP Code 20005
Telephone Number (include area code) (202) 898-0111	E-Mail Address (if available) cde@attglobal.net	

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001),
AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT (U.S. CODE, TITLE 47, SECTION 312(a)(1)),
AND/OR FORFEITURE (U.S. CODE, TITLE 47, SECTION 503).

Section III - Engineering

TECHNICAL SPECIFICATIONS

Ensure that the specifications below are accurate. Contradicting data found elsewhere in this application will be disregarded. All items must be completed. The response "on file" is not acceptable.

TECH BOX

1. Channel: _____				
2. a. Effective Radiated Power: _____ kW (H) _____ kW (V)				
b. Maximum Effective Radiated Power: <input type="checkbox"/> Not applicable _____ kW (H) _____ kW (V) (Beam-Tilt Antenna ONLY)				
3. Transmitter Power Output: _____ kW				
4. Antenna Data				
<table border="1"><tr><td>Manufacturer</td><td>Model</td><td>Number of Sections</td><td>Spacing Between Sections (wavelength)</td></tr></table>	Manufacturer	Model	Number of Sections	Spacing Between Sections (wavelength)
Manufacturer	Model	Number of Sections	Spacing Between Sections (wavelength)	

NOTE: In addition to the information called for in this section, an explanatory exhibit providing full particulars must be submitted for each question for which a "No" response is provided.

CERTIFICATION

All applicants must complete this section.

- 5. **Main Studio Location.** The main studio location complies with 47 C.F.R. Section 73.1125. Yes No See Explanation in Exhibit No.
- 6. **Transmitter Power Output.** The operating transmitter power output produces the authorized effective radiated power. Yes No See Explanation in Exhibit No.

APPLICATIONS FILED TO COVER A CONSTRUCTION PERMIT.

NOTE: In addition to the information called for in this section, an explanatory exhibit providing full particulars must be submitted for each question for which a "No" response is provided.

- 7. **Constructed Facility.** The facility was constructed as authorized in the underlying construction permit or complies with 47 C.F.R. Section 73.1690. Yes No See Explanation in Exhibit No.
 - 8. **Special Operating Conditions.** The facility was constructed in compliance with all special operating conditions, terms, and obligations described in the construction permit. Yes No See Explanation in Exhibit No.
- Exhibit No.
- An exhibit may be required.** Review the underlying construction permit.

PREPARER'S CERTIFICATION ON PAGE 3 MUST BE COMPLETED AND SIGNED.

APPLICATION FILED PURSUANT TO 47 C.F.R. SECTIONS 73.1675(c) or 73.1690(c).

Only applicants filing this application pursuant to 47 C.F.R. Sections 73.1675(c) or 73.1690(c) must complete the following

9. **Changing transmitter power output.** Is this application being filed to authorize a change in transmitter power output caused by the replacement of omnidirectional antenna with another omnidirectional antenna or an alteration of the transmission line system? See 47 C.F.R. Sections 73.1690(c)(1) and (c)(10). Yes No

10. **Increasing effective radiated power.** Is this application being filed to authorize an increase in ERP for a station operating in the nonreserved band (Channels 221-300)? See 47 C.F.R. Sections 73.1690(c)(4), (c)(5) and (c)(7). Yes No

If "Yes" to the above, the Applicant certifies the following:

a. **Spacing Requirements.** The increase in ERP was authorized pursuant to MM Docket 88-375 (Class A stations) OR the facility complies with the spacing requirements of 47 C.F.R. Section 73.207. Yes No See Explanation in Exhibit No.

b. **International Coordination.** The transmitter site is greater than 320 km from the Canadian or Mexican borders OR coordination for the station's international class is complete. Yes No See Explanation in Exhibit No.

c. **Interference.** The requirements of 47 C.F.R. Section 73.1030 regarding notification to radio astronomy installations, radio receiving installations and FCC monitoring stations have either been satisfied OR are not applicable. Yes No See Explanation in Exhibit No.

Exhibit required. If the proposed facility must be notified to the entities set forth in 47 C.F.R. Section 73.1030, the applicant must provide a copy of the written approval for the ERP increase from the affected entity. Exhibit No.

d. **Multiple Ownership Showing.** The increase in ERP will not require the consideration of a multiple ownership showing pursuant to 47 C.F.R. Section 73.3555. Yes No See Explanation in Exhibit No.

e. **Environmental Protection Act.** The proposed facility is excluded from environmental processing under 47 C.F.R. Section 1.1306 (*i.e.*, the facility will not have a significant environmental impact and complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments). Unless the applicant can determine compliance through the use of the RF worksheets in Appendix A, an **Exhibit is required.** Yes No See Explanation in Exhibit No.

By checking "Yes" above, the applicant also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic exposure in excess of FCC guidelines.

11. **Increasing vertically polarized effective radiated power.** Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(4) to authorize an increase in the vertically polarized ERP for a station operating in the reserved band (Channels 200-220)? Yes No

If "Yes" to the above, the Applicant certifies the following:

- a. **TV Channel 6 Protection Requirements.** The facility complies with the spacing requirements of 47 C.F.R. Section 73.525(a)(1). Yes No See Explanation in Exhibit No.

- b. **Environmental Protection Act.** The proposed facility is excluded from environmental processing under 47 C.F.R. Section 1.1306 (*i.e.*, the facility will not have a significant environmental impact and complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments). Unless the applicant can determine compliance through the use of the RF worksheets in Appendix A, an **Exhibit is required.** Yes No See Explanation in Exhibit No.

By checking "Yes" above, the applicant also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic exposure in excess of FCC guidelines.

12. **Decreasing effective radiated power (non-reserved channel).** Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(8) to authorize a decrease in the ERP for a station operating in the nonreserved band (Channels 221-300)? Yes No

If "Yes" to the above, the Applicant certifies the following:

- a. **Community Coverage.** The proposed facility complies with the community coverage requirements of 47 C.F.R. Section 73.315 where the distance to the 3.16 mV/m contour is predicted using the standard prediction method in 47 C.F.R. Section 73.313. Yes No See Explanation in Exhibit No.

- b. **Auxiliary Facilities.** The authorized or pending auxiliary facilities for this station comply with 47 C.F.R. Section 73.1675(a). Yes No See Explanation in Exhibit No.

- c. **Multiple Ownership Showing.** The decrease in ERP is not requested or required to establish compliance with 47 C.F.R. Section 73.3555. Yes No See Explanation in Exhibit No.

13. **Decreasing effective radiated power (reserved channel).** Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(8) to authorize a decrease in the ERP for a station operating in the reserved band (Channels 200-220)? Yes No

If "Yes" to the above, the Applicant certifies the following:

- a. **Community Coverage.** The proposed facility complies with the community coverage requirements of 47 C.F.R. Section 73.1690(c)(8)(i) where the distance to the 1 mV/m contour is predicted using the standard prediction method in 47 C.F.R. Section 73.313. Yes No See Explanation in Exhibit No.

- b. **Auxiliary Facilities.** The authorized or pending auxiliary facilities for this station comply with 47 C.F.R. Section 73.1675(a). Yes No See Explanation in Exhibit No.

14. **Replacing a directional antenna.** Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(2) to replace a directional antenna with another directional antenna? Yes No

If "Yes" to the above, the applicant certifies the following:

- a. **Measurement of Directional Antenna.** The composite measured pattern and measurement procedures comply with 47 C.F.R. Section 73.1690(c)(2). **Exhibit required.** Yes No See Explanation in Exhibit No.
Exhibit No.

- b. **Installation of Directional Antenna.** The installation of the directional antenna complies with 47 C.F.R. Section 73.1690(c)(2). **Exhibit required.** Yes No See Explanation in Exhibit No.
Exhibit No.

15. **Deleting contour protection status.** Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(6) to delete contour protection status (47 C.F.R. Section 73.215) for a station operating in the nonreserved band (Channels 221-300)? Yes No

- a. If "Yes" to the above, the applicant certifies that the facility complies with the spacing requirements of 47 C.F.R. Section 73.207. Yes No See Explanation in Exhibit No.

16. **Use a formerly licensed main facility as an auxiliary facility.** Is this application being filed pursuant to 47 C.F.R. Section 73.1675(c)(1) to request authorization to use a formerly licensed main facility as an auxiliary facility and/or change the ERP of the proposed auxiliary facility? Yes No

If "Yes" to the above, the applicant certifies the following:

- a. **Auxiliary antenna service area.** The proposed auxiliary facility complies with 47 C.F.R. Section 73.1675(a). Yes No See Explanation in Exhibit No.

- b. **Environmental Protection Act.** The proposed facility is excluded from environmental processing under 47 C.F.R. Section 1.1306 (*i.e.*, the facility will not have a significant environmental impact and complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments). Unless the applicant can determine compliance through the use of the RF worksheets in Appendix A, an **Exhibit is required.** Yes No See Explanation in Exhibit No.

By checking "Yes" above, the applicant also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic exposure in excess of FCC guidelines.

17. **Change the license status.** Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(9) to change the license status from commercial to noncommercial or from noncommercial to commercial? Yes No

Exhibit No.

If "Yes" to the above, submit an exhibit providing full particulars. For applications changing license status from commercial to noncommercial, include Section II of FCC Form 340 as an exhibit to this application.

PREPARER'S CERTIFICATION ON PAGE 3 MUST BE COMPLETED AND SIGNED.