



The following documentation is an electronically-submitted vendor response to an advertised solicitation from the *West Virginia Purchasing Bulletin* within the Vendor Self-Service portal at wvOASIS.gov. As part of the State of West Virginia's procurement process, and to maintain the transparency of the bid-opening process, this documentation submitted online is publicly posted by the West Virginia Purchasing Division at WVPurchasing.gov with any other vendor responses to this solicitation submitted to the Purchasing Division in hard copy format.

Header 2

List View

General Information

Contact

Default Values

Discount

Document Information

Procurement Folder: 757824

Procurement Type: Central Purchase Order

Vendor ID: 000000127835

Legal Name: PROPAGATION SYSTEMS INC

Alias/DBA:

Total Bid: \$230,474.00

Response Date: 08/11/2020

Response Time: 12:09

SO Doc Code: CRFQ

SO Dept: 0439

SO Doc ID: EBA2100000002

Published Date: 8/6/20

Close Date: 8/11/20

Close Time: 13:30

Status: Closed

Solicitation Description: ADDENDA 2: HIGH POWER VHF TV TRANSMIT ANTENNA

Total of Header Attachments: 2

Total of All Attachments: 2



Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

**State of West Virginia
 Solicitation Response**

Proc Folder : 757824

Solicitation Description : ADDENDA 2: HIGH POWER VHF TV TRANSMIT ANTENNA

Proc Type : Central Purchase Order

Date issued	Solicitation Closes	Solicitation Response	Version
	2020-08-11 13:30:00	SR 0439 ESR08112000000000852	1

VENDOR
000000127835 PROPAGATION SYSTEMS INC

Solicitation Number: CRFQ 0439 EBA2100000002

Total Bid : \$230,474.00 **Response Date:** 2020-08-11 **Response Time:** 12:09:21

Comments: Discount available for approved delivery of 90-120 days.

FOR INFORMATION CONTACT THE BUYER
 Dusty J Smith
 (304) 558-2063
 dusty.j.smith@wv.gov

Signature on File	FEIN #	DATE
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All offers subject to all terms and conditions contained in this solicitation

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
1	HIGH POWER VHF TV TRANSMIT ANTENNA	1.00000	EA	\$230,474.000000	\$230,474.00

Comm Code	Manufacturer	Specification	Model #
43221703			

Extended Description :	HIGH POWER VHF TV TRANSMIT ANTENNA
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Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

State of West Virginia
 Request for Quotation
 13 - Equipment

Proc Folder: 757824

Doc Description: HIGH POWER VHF TV TRANSMIT ANTENNA

Proc Type: Central Purchase Order

Date Issued	Solicitation Closes	Solicitation No	Version
2020-07-23	2020-08-06 13:30:00	CRFQ 0439 EBA2100000002	1

BID RECEIVING LOCATION

BID CLERK
 DEPARTMENT OF ADMINISTRATION
 PURCHASING DIVISION
 2019 WASHINGTON ST E
 CHARLESTON WV 25305
 US

VENDOR

Vendor Name, Address and Telephone Number:

Propagation Systems, Inc.
 719 Pensacola Road
 Ebensburg, PA 15931
 814-472-5540

FOR INFORMATION CONTACT THE BUYER

Dusty J Smith
 (304) 558-2063
 dusty.j.smith@wv.gov

Signature X

FEIN # 23-2876660

DATE 8-11-2020

All offers subject to all terms and conditions contained in this solicitation



Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

State of West Virginia
 Request for Quotation
 13 - Equipment

Proc Folder: 757824

Doc Description: HIGH POWER VHF TV TRANSMIT ANTENNA

Proc Type: Central Purchase Order

Date Issued	Solicitation Closes	Solicitation No	Version
2020-07-23	2020-08-06 13:30:00	CRFQ 0439 EBA2100000002	1

BID RECEIVING LOCATION

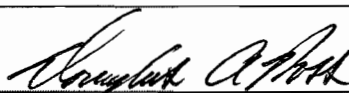
BID CLERK
 DEPARTMENT OF ADMINISTRATION
 PURCHASING DIVISION
 2019 WASHINGTON ST E
 CHARLESTON WV 25305
 US

VENDOR

Vendor Name, Address and Telephone Number:
 Propagation Systems, Inc.
 719 Pensacola Road
 Ebensburg, PA 15931
 814-472-5540

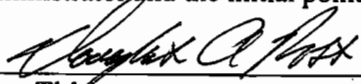
FOR INFORMATION CONTACT THE BUYER

Dusty J Smith
 (304) 558-2063
 dusty.j.smith@wv.gov

Signature X  FEIN # 23-2876660 DATE 8/11/2020

All offers subject to all terms and conditions contained in this solicitation

DESIGNATED CONTACT: Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

 President

(Name, Title)
Douglas A Ross, President

(Printed Name and Title)
719 Pensacola Road, Ebensburg, PA 15931


(Address)
814-472-5540 / 814-472-5676

(Phone Number) / (Fax Number)
support@psibroadcast.com

(email address)

CERTIFICATION AND SIGNATURE: By signing below, or submitting documentation through wvOASIS, I certify that I have reviewed this Solicitation in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that I am authorized by the vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

Propagation Systems, Inc.

(Company)
 President

(Authorized Signature) (Representative Name, Title)
Douglas A Ross, President

(Printed Name and Title of Authorized Representative)
8/11/2020

(Date)
814-472-5540 / 814-472-5676

(Phone Number) (Fax Number)

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.:

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:


(Check the box next to each addendum received)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6 |
| <input checked="" type="checkbox"/> Addendum No. 2 | <input type="checkbox"/> Addendum No. 7 |
| <input type="checkbox"/> Addendum No. 3 | <input type="checkbox"/> Addendum No. 8 |
| <input type="checkbox"/> Addendum No. 4 | <input type="checkbox"/> Addendum No. 9 |
| <input type="checkbox"/> Addendum No. 5 | <input type="checkbox"/> Addendum No. 10 |

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Propagation Systems, Inc.

Company


Authorized Signature

8-11-2020

Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

CONSTRUCTION CONTRACTS: Under W. Va. Code § 5-22-1(i), the contracting public entity shall not award a construction contract to any bidder that is known to be in default on any monetary obligation owed to the state or a political subdivision of the state, including, but not limited to, obligations related to payroll taxes, property taxes, sales and use taxes, fire service fees, or other fines or fees.

ALL CONTRACTS: Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that: (1) for construction contracts, the vendor is not in default on any monetary obligation owed to the state or a political subdivision of the state, and (2) for all other contracts, that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: Propagation Systems, Inc.

Authorized Signature: *[Signature]* Date: 8-11-2020

State of Pennsylvania

County of Cambria, to-wit:

Taken, subscribed, and sworn to before me this 11 day of August, 2020

My Commission expires 5/27/23, 20 .

AFFIX SEAL HERE

Commonwealth of Pennsylvania - Notary Public
Donna M. Zerbee, Notary Public
Cambria County
My commission expires May 27, 2023
Commission number 1185124
Member, Pennsylvania Association of Notaries

[Signature]



Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

State of West Virginia
 Request for Quotation
 13 – Equipment

Proc Folder: 757824

Doc Description: HIGH POWER VHF TV TRANSMIT ANTENNA

Proc Type: Central Purchase Order

Date Issued	Solicitation Closes	Solicitation No	Version
2020-08-04	2020-08-11 13:30:00	CRFQ 0439 EBA2100000002	2

BID RECEIVING LOCATION

BID CLERK
 DEPARTMENT OF ADMINISTRATION
 PURCHASING DIVISION
 2019 WASHINGTON ST E
 CHARLESTON WV 25305
 US

VENDOR

Vendor Name, Address and Telephone Number:
 Propagation Systems, Inc.
 719 Pensacola Road
 Ebensburg, PA 15931
 814-472-5540

FOR INFORMATION CONTACT THE BUYER

Dusty J Smith
 (304) 558-2063
 dusty.j.smith@wv.gov

Signature X

FEIN # 23-2876660

DATE 8-11-20

All offers subject to all terms and conditions contained in this solicitation



Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
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State of West Virginia
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 13 -- Equipment

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 PURCHASING DIVISION
 2019 WASHINGTON ST E
 CHARLESTON WV 25305
 US

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 814-472-5540

FOR INFORMATION CONTACT THE BUYER

Dusty J Smith
 (304) 558-2063
 dusty.j.smith@wv.gov

Signature X  FEIN # 23-2876660 DATE 8-11-2020

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ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: EBA2100000002

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

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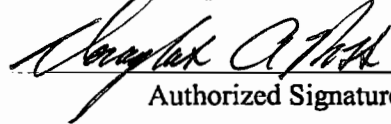
(Check the box next to each addendum received)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6 |
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Propagation Systems, Inc.

Company



Authorized Signature

8-11-2020

Date

NOTE: This addendum acknowledgment should be submitted with the bid to expedite document processing.
Revised 6/8/2012



Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

State of West Virginia
 Request for Quotation
 13 – Equipment

Proc Folder: 757824

Doc Description: ADDENDA 2: HIGH POWER VHF TV TRANSMIT ANTENNA

Proc Type: Central Purchase Order

Date Issued	Solicitation Closes	Solicitation No	Version
2020-08-06	2020-08-11 13:30:00	CRFQ 0439 EBA210000002	3

BID RECEIVING LOCATION


BID CLERK
 DEPARTMENT OF ADMINISTRATION
 PURCHASING DIVISION
 2019 WASHINGTON ST E
 CHARLESTON WV 25305
 US

VENDOR

Vendor Name, Address and Telephone Number:
 Propagation Systems, Inc.
 719 Pensacola Road
 Ebensburg, PA 15931
 814-472-5540

FOR INFORMATION CONTACT THE BUYER

Dusty J Smith
 (304) 558-2063
 dusty.j.smith@wv.gov

Signature X  FEIN # 23-2876660 DATE 8-11-2020

All offers subject to all terms and conditions contained in this solicitation



Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

State of West Virginia
 Request for Quotation
 13 - Equipment

Proc Folder: 757824

Doc Description: ADDENDA 2: HIGH POWER VHF TV TRANSMIT ANTENNA

Proc Type: Central Purchase Order

Date Issued	Solicitation Closes	Solicitation No	Version
2020-08-06	2020-08-11 13:30:00	CRFQ 0439 EBA2100000002	3

BID RECEIVING LOCATION

BID CLERK
 DEPARTMENT OF ADMINISTRATION
 PURCHASING DIVISION
 2019 WASHINGTON ST E
 CHARLESTON WV 25305
 US

VENDOR

Vendor Name, Address and Telephone Number:
 Propagation Systems, Inc.
 719 Pensacola Road
 Ebensburg, PA 15931
 814-472-5540

FOR INFORMATION CONTACT THE BUYER

Dusty J Smith
 (304) 558-2063
 dusty.j.smith@wv.gov

Signature X

FEIN # 23-2876660

DATE 8-11-2020

All offers subject to all terms and conditions contained in this solicitation

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: EBA210000002

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

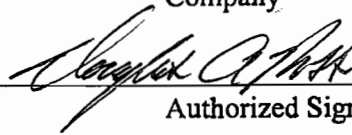
(Check the box next to each addendum received)

- | | |
|--|--|
| <input type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6 |
| <input checked="" type="checkbox"/> Addendum No. 2 | <input type="checkbox"/> Addendum No. 7 |
| <input type="checkbox"/> Addendum No. 3 | <input type="checkbox"/> Addendum No. 8 |
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Propagation Systems, Inc.

Company



Authorized Signature

8-11-2020

Date

NOTE: This addendum acknowledgment should be submitted with the bid to expedite document processing.
Revised 6/8/2012

Request for Quotation, CRFQ# 0439 EBA2100000002
High-Power VHF Television Transmit Antenna

Pricing Page*
Propagation Systems, Inc.

High Power VHF TV Transmit Antenna as Described in Solicitation

Description	Quan	Unit Cost	Total Cost
Antenna Model: PSIVHCB6PN-9-EP 3-1/8" Rigid Transmission Line & Accessories	1	\$230,474	\$230,474

Authorized Signature _____



Date _____

8/11/2020

*State of WV Purchasing Division "Pricing Page" was not included in solicitation documents.
Please accept this copy as offer(s) for Propagation Systems, Inc.



Propagation Systems, Inc.

Quality Broadcast Antenna Systems

Propagation Systems, Inc. proposes to supply a complete antenna and transmission line system to the West Virginia Public Broadcasting Network that meet the requirements of request for quotation number EBA200000002.

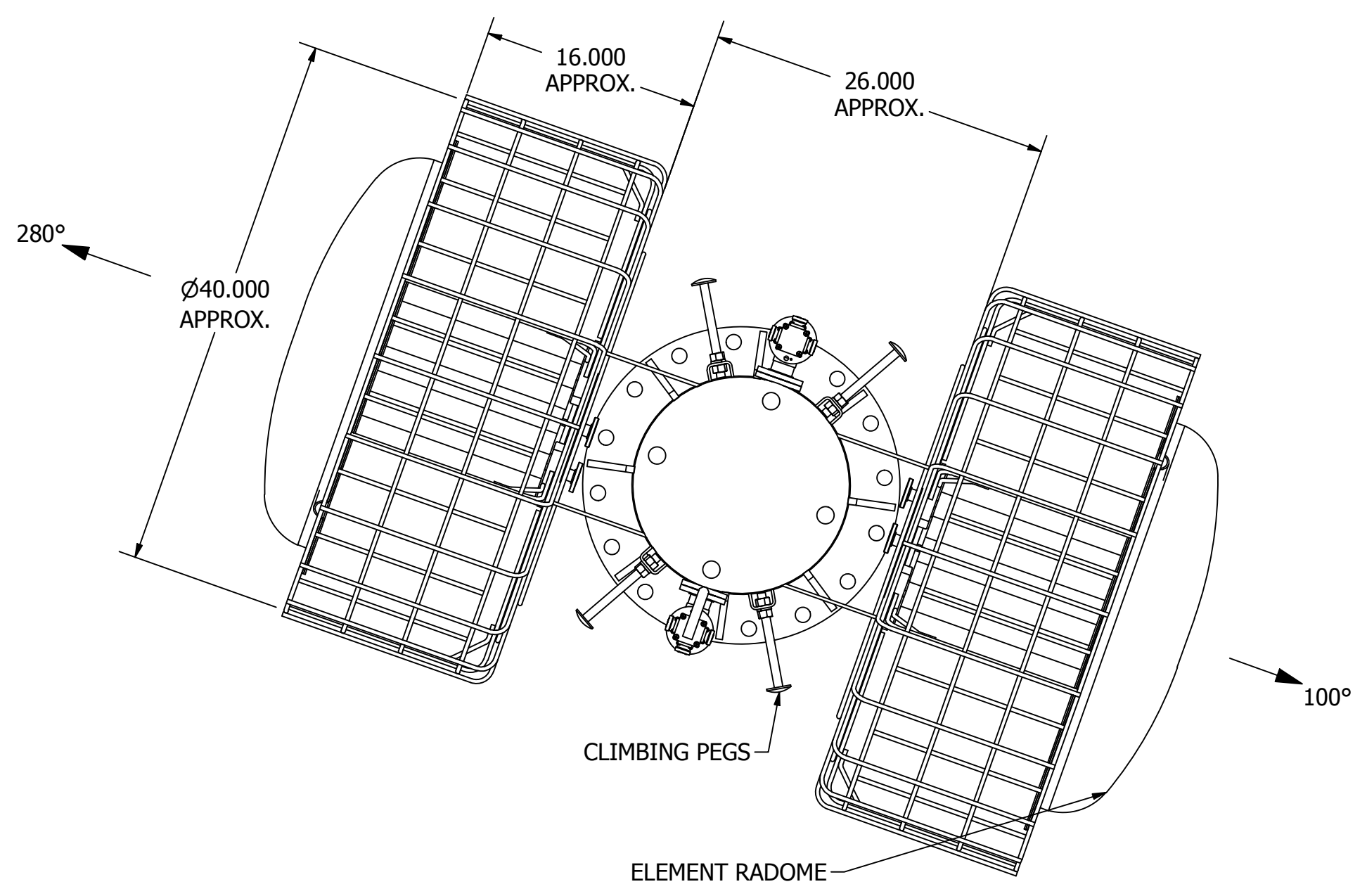
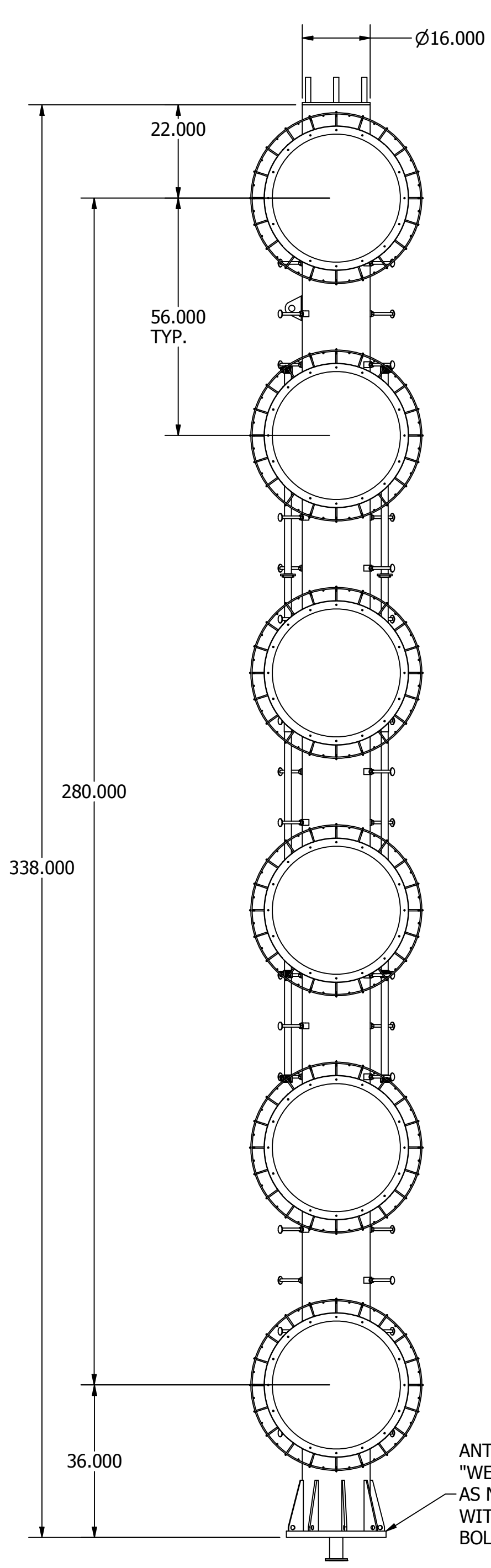
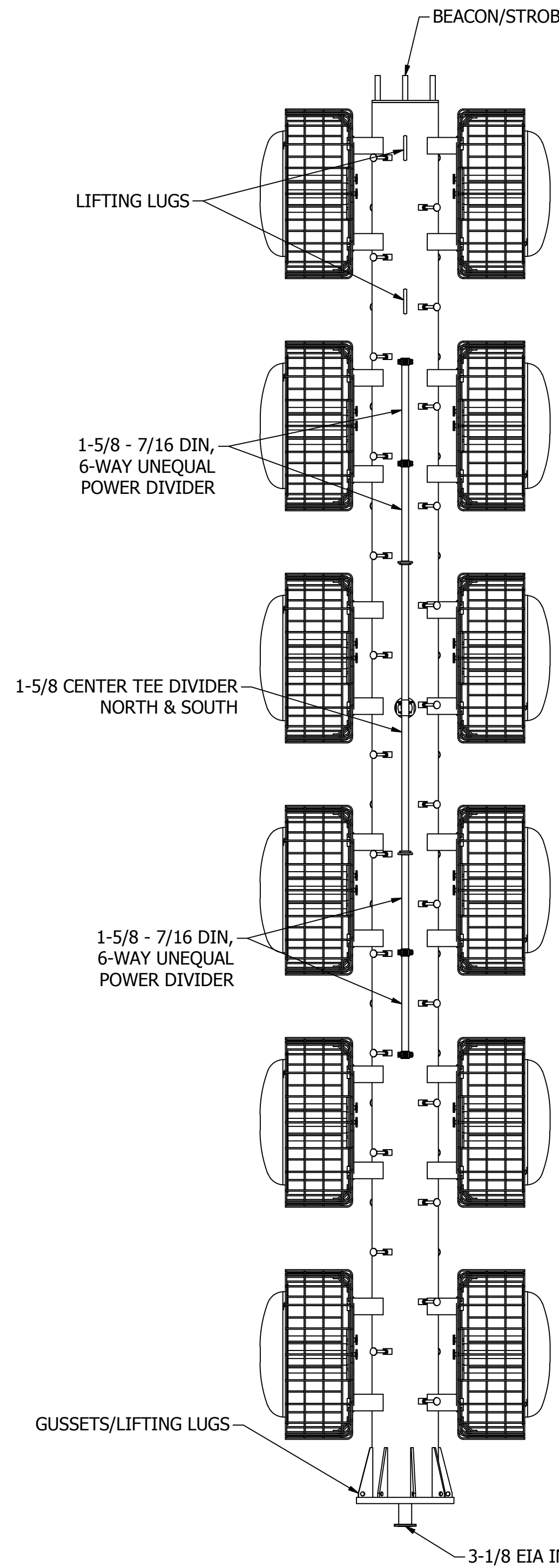
The proposed antenna system is a top mount, elliptically polarized, directional cavity type antenna with radome enclosed radiating elements. The antenna support mast will be designed to attach directly to the existing tower top bolt hole pattern or will be supplied with a "wedding cake" adapter transition if required. The support structure will include climbing pegs and multiple pick points for possible installation by helicopter. Provision will be made for beacon mounting; a beacon is not included with the antenna. If Propagation Systems, Inc. is awarded the contract to supply the antenna system, additional tower information will be required to determine hardware requirements to attach to the tower top plate.

The antenna is to be supplied with the necessary transmission line to connect to the output of the mask filter. The proposed transmission line is 3-1/8" EIA 50-ohm rigid with approximately 1080 ft. vertical and 100 ft. of horizontal.

The rigid line will include an optimized tower top elbow complex/U-link and custom line sections to connect the antenna input to the vertical transmission line run. All the necessary hangers and adapter brackets will be supplied with the vertical and horizontal runs. All additional rigid line components such as elbows, couplings, gas barrier, field cut sections, hangers to make the necessary connection to the transmitter is to be supplied. No pressurization equipment such as regulators or dehydrators will be supplied.

If awarded the contract, within 14 days of award a site visit will be scheduled with West Virginia engineering staff for job and material planning. All shipping costs of all supplied materials is included in the price and will be coordinated with West Virginia Broadcasting Network staff per the requirements of the bid specifications.

PSI will provide a field engineer to sweep antenna after delivery and prior to installation along with post installation sweep measurements of transmission line and antenna.



ANTENNA SPECIFICATIONS	
MODEL:	PSIVHCB6PN-9-EP
POLARIZATION:	ELLPTICAL
INPUT:	3-1/8 EIA
RATING:	20 kW
H-POL GAIN:	9.09 (9.59 dB)
V-POL GAIN:	2.27 (3.56 dB)
LENGTH:	28.2 FT
WEIGHT:	4217 LBS
FRONTAL WIND AREA:	53.88 FT ²

SYSTEM SPECIFICATIONS	
FREQUENCY:	186-192 MHz
H-POL ERP:	23.0 kW
V-POL ERP:	5.75 kW
LINE RATING:	38 kW
LINE LOSS:	1.61 dB
TRANSMITTER POWER AFTER FILTER:	3.66 kW
TRANSMISSION LINE: 3-1/8" EIA 50 OHM RIGID VERTICAL 1080 APPROX. HORIZONTAL 100 APPROX.	

PSI PROPAGATION SYSTEMS, INC.
EBENSBURG, PENNSYLVANIA USA

NOTE:
1. CAVITY FEED CABLES NOT SHOWN FOR CLARITY

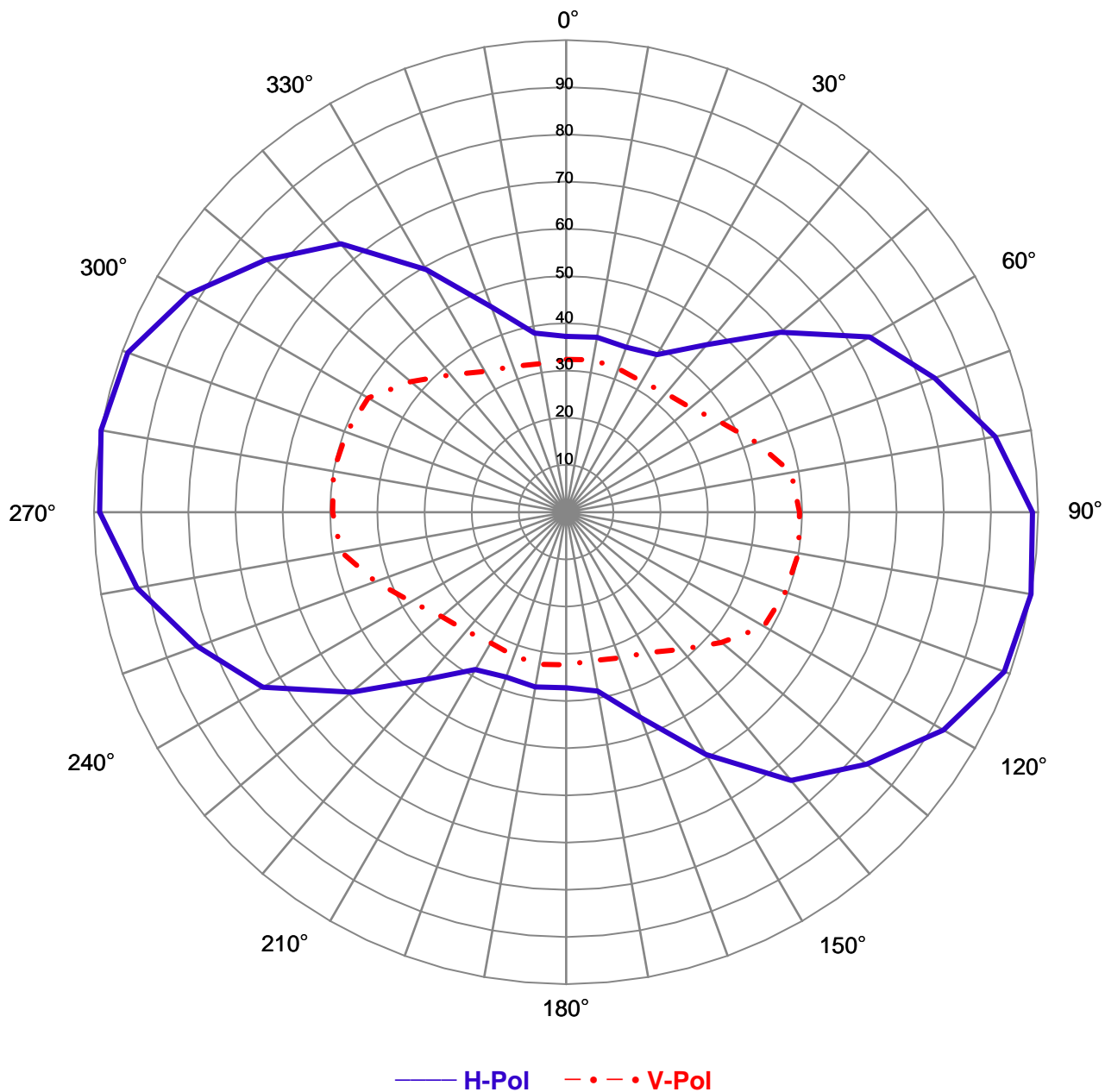
TOLERANCES UNLESS OTHERWISE NOTED
FRACTIONS X/X ±1/16"
DECIMALS XX ±.01"
DECIMALS XXX ±.005"
ANGLES ±3°

This drawing is loaned subject to the express understanding and agreement that the drawing and information therein contained are, and shall remain the property of PSI, and will not be otherwise utilized or disposed of, directly or indirectly, and will not be used in whole or in part or assist in making or finish any information for the making of drawings, prints or other reproductions hereof, or for the design or making of any item, parts, object, apparatus or parts thereof, except upon the written permissions of PSI first obtained. The acceptance of this drawing will be construed as an acceptance of the foregoing agreement.

ANTENNA OUTLINE		
DRAWING NO. : PR2454-021.iam	AUTHOR: Hayden.Potts	CREATION DATE: 8/10/2020
MODEL NO. : PSIVHCB6PN-9-EP	APPROVED BY:	APPROVAL DATE:
SCALE: 1 / 25	SHEET SIZE: C	REVISION:



Relative Field Azimuth Plane Pattern



Pattern Type:	Relative Field	Antenna Type:	VHF Cavity Radiator
Antenna Model:	PSIVHCB6PN-9-EP	Configuration:	100°/280°
Polarization:	Elliptical	Number of Bays:	6
Gain (H-pol):	9.09 (9.59 dB)	Channel:	9
Gain (V-pol):	2.27 (3.56 dB)	Station:	WVPB



PROPAGATION SYSTEMS INC.
Relative Field Tabulation Azimuth Pattern
Antenna Model: PSIVHCB6PN-9-EP
Peak Gain (H-pol): 9.09 (9.59 dBd)
Station: WVPB

Angle	Relative Field	Power Gain	Gain dB
0	0.372	1.26	1.00
10	0.376	1.29	1.09
20	0.372	1.26	1.00
30	0.385	1.35	1.29
40	0.463	1.95	2.90
50	0.593	3.20	5.05
60	0.742	5.00	6.99
70	0.831	6.28	7.98
80	0.923	7.74	8.89
90	0.988	8.87	9.48
100	1.000	9.09	9.59
110	0.988	8.87	9.48
120	0.923	7.74	8.89
130	0.831	6.28	7.98
140	0.742	5.00	6.99
150	0.593	3.20	5.05
160	0.463	1.95	2.90
170	0.385	1.35	1.29
180	0.372	1.26	1.00
190	0.376	1.29	1.09
200	0.372	1.26	1.00
210	0.385	1.35	1.29
220	0.463	1.95	2.90
230	0.593	3.20	5.05
240	0.742	5.00	6.99
250	0.831	6.28	7.98
260	0.923	7.74	8.89
270	0.988	8.87	9.48
280	1.000	9.09	9.59
290	0.988	8.87	9.48
300	0.923	7.74	8.89
310	0.831	6.28	7.98
320	0.742	5.00	6.99
330	0.593	3.20	5.05
340	0.463	1.95	2.90
350	0.385	1.35	1.29



PROPAGATION SYSTEMS INC.

ERP Tabulation Azimuth Pattern

Antenna Model: PSIVHCB6PN-9-EP

Peak ERP (H-pol): 23.0 kW (13.62 dBk)

Station: WVPB

Angle	Relative Field	ERP kW	ERP dBk
0	0.372	3.18	5.03
10	0.376	3.25	5.12
20	0.372	3.18	5.03
30	0.385	3.41	5.33
40	0.463	4.93	6.93
50	0.593	8.09	9.08
60	0.742	12.66	11.03
70	0.831	15.88	12.01
80	0.923	19.59	12.92
90	0.988	22.45	13.51
100	1.000	23.00	13.62
110	0.988	22.45	13.51
120	0.923	19.59	12.92
130	0.831	15.88	12.01
140	0.742	12.66	11.03
150	0.593	8.09	9.08
160	0.463	4.93	6.93
170	0.385	3.41	5.33
180	0.372	3.18	5.03
190	0.376	3.25	5.12
200	0.372	3.18	5.03
210	0.385	3.41	5.33
220	0.463	4.93	6.93
230	0.593	8.09	9.08
240	0.742	12.66	11.03
250	0.831	15.88	12.01
260	0.923	19.59	12.92
270	0.988	22.45	13.51
280	1.000	23.00	13.62
290	0.988	22.45	13.51
300	0.923	19.59	12.92
310	0.831	15.88	12.01
320	0.742	12.66	11.03
330	0.593	8.09	9.08
340	0.463	4.93	6.93
350	0.385	3.41	5.33



PROPAGATION SYSTEMS INC.
Relative Field Tabulation Azimuth Pattern
Antenna Model: PSIVHCB6PN-9-EP
Peak Gain (H-pol): 2.27 (3.56 dBd)
Station: WVPB

Angle	Relative Field	Power Gain	Gain dB
0	0.324	0.95	-0.22
10	0.328	0.97	-0.11
20	0.324	0.95	-0.22
30	0.320	0.93	-0.32
40	0.329	0.98	-0.08
50	0.344	1.08	0.32
60	0.380	1.31	1.17
70	0.430	1.68	2.24
80	0.484	2.13	3.28
90	0.495	2.22	3.47
100	0.500	2.27	3.56
110	0.495	2.22	3.47
120	0.484	2.13	3.28
130	0.430	1.68	2.24
140	0.380	1.31	1.17
150	0.344	1.08	0.32
160	0.329	0.98	-0.08
170	0.320	0.93	-0.32
180	0.324	0.95	-0.22
190	0.328	0.97	-0.11
200	0.324	0.95	-0.22
210	0.320	0.93	-0.32
220	0.329	0.98	-0.08
230	0.344	1.08	0.32
240	0.380	1.31	1.17
250	0.430	1.68	2.24
260	0.484	2.13	3.28
270	0.495	2.22	3.47
280	0.500	2.27	3.56
290	0.495	2.22	3.47
300	0.484	2.13	3.28
310	0.430	1.68	2.24
320	0.380	1.31	1.17
330	0.344	1.08	0.32
340	0.329	0.98	-0.08
350	0.320	0.93	-0.32



PROPAGATION SYSTEMS INC.

ERP Tabulation Azimuth Pattern

Antenna Model: PSIVHCB6PN-9-EP

Peak ERP (V-pol): 5.75 kW (7.60 dBk)

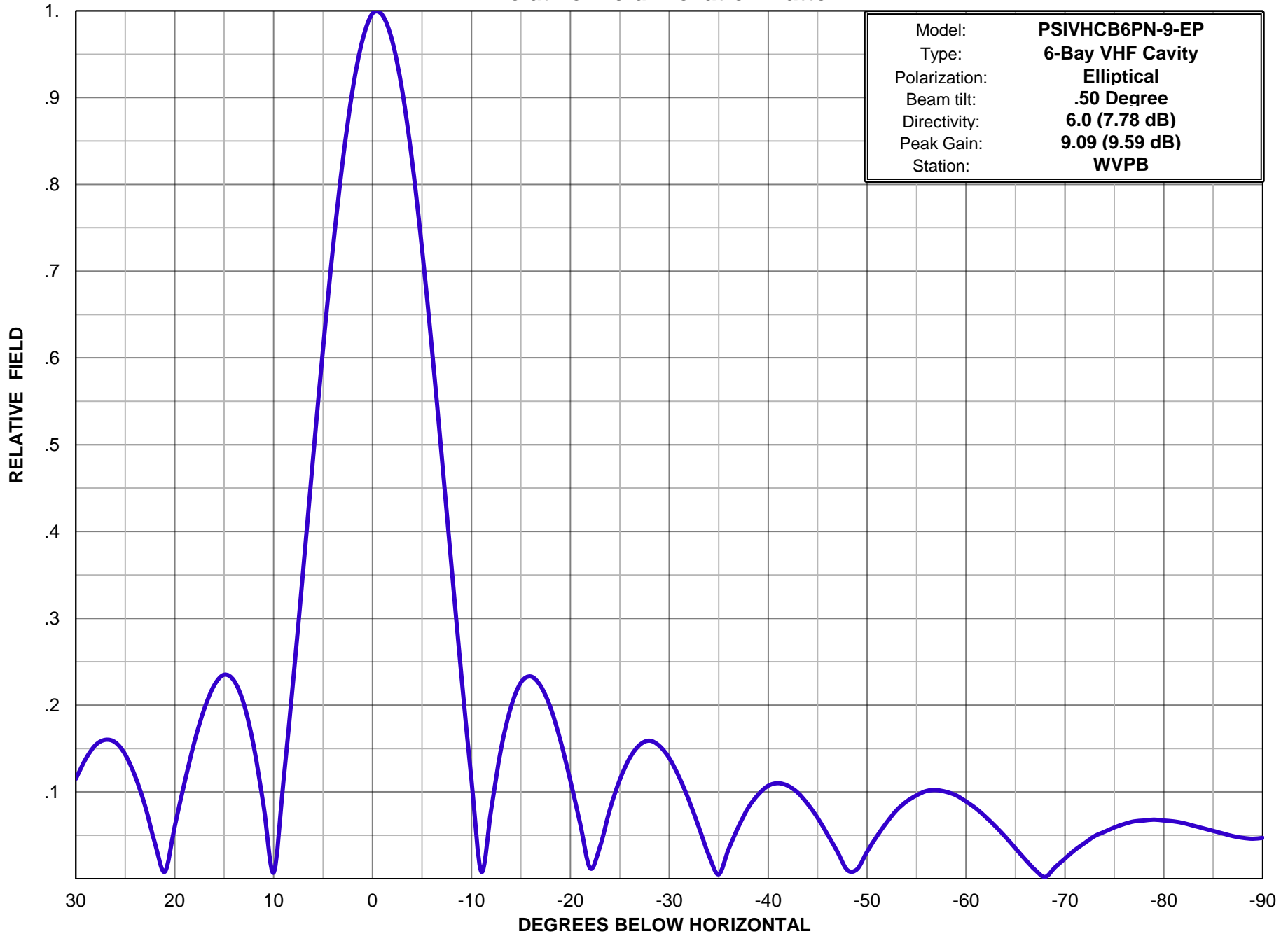
Station: WVPB

Angle	Relative Field	ERP kW	ERP dBk
0	0.324	2.41	3.81
10	0.328	2.47	3.92
20	0.324	2.41	3.81
30	0.320	2.35	3.71
40	0.329	2.48	3.95
50	0.344	2.72	4.35
60	0.380	3.31	5.20
70	0.430	4.24	6.28
80	0.484	5.39	7.31
90	0.495	5.62	7.50
100	0.500	5.75	7.60
110	0.495	5.62	7.50
120	0.484	5.39	7.31
130	0.430	4.24	6.28
140	0.380	3.31	5.20
150	0.344	2.72	4.35
160	0.329	2.48	3.95
170	0.320	2.35	3.71
180	0.324	2.41	3.81
190	0.328	2.47	3.92
200	0.324	2.41	3.81
210	0.320	2.35	3.71
220	0.329	2.48	3.95
230	0.344	2.72	4.35
240	0.380	3.31	5.20
250	0.430	4.24	6.28
260	0.484	5.39	7.31
270	0.495	5.62	7.50
280	0.500	5.75	7.60
290	0.495	5.62	7.50
300	0.484	5.39	7.31
310	0.430	4.24	6.28
320	0.380	3.31	5.20
330	0.344	2.72	4.35
340	0.329	2.48	3.95
350	0.320	2.35	3.71



Propagation Systems, Inc.

Relative Field Elevation Pattern





Propagation Systems Inc.

Relative Field Tabulation Elevation Pattern

Antenna Model: PSIVHCB6PN-9-EP

Peak Gain: 9.09 (9.59 dBd)

Station: WVPB

Angle	Field	dB	Angle	Field	dB	Angle	Field	dB
-90	0.047	-26.56	-50	0.031	-30.17	-10	0.114	-18.86
-89	0.046	-26.74	-49	0.011	-39.17	-9	0.232	-12.69
-88	0.047	-26.56	-48	0.010	-40.00	-8	0.358	-8.92
-87	0.049	-26.20	-47	0.031	-30.17	-7	0.486	-6.27
-86	0.052	-25.68	-46	0.051	-25.85	-6	0.611	-4.28
-85	0.055	-25.19	-45	0.070	-23.10	-5	0.726	-2.78
-84	0.058	-24.73	-44	0.086	-21.31	-4	0.827	-1.65
-83	0.061	-24.29	-43	0.099	-20.09	-3	0.908	-0.84
-82	0.064	-23.88	-42	0.107	-19.41	-2	0.965	-0.31
-81	0.066	-23.61	-41	0.110	-19.17	-1	0.995	-0.04
-80	0.067	-23.48	-40	0.107	-19.41	0	0.997	-0.03
-79	0.068	-23.35	-39	0.097	-20.26	1	0.967	-0.29
-78	0.067	-23.48	-38	0.082	-21.72	2	0.910	-0.82
-77	0.066	-23.61	-37	0.060	-24.44	3	0.828	-1.64
-76	0.063	-24.01	-36	0.034	-29.37	4	0.727	-2.77
-75	0.059	-24.58	-35	0.005	-46.02	5	0.611	-4.28
-74	0.054	-25.35	-34	0.027	-31.37	6	0.486	-6.27
-73	0.049	-26.20	-33	0.059	-24.58	7	0.357	-8.95
-72	0.041	-27.74	-32	0.090	-20.92	8	0.231	-12.73
-71	0.033	-29.63	-31	0.117	-18.64	9	0.113	-18.94
-70	0.023	-32.77	-30	0.139	-17.14	10	0.007	-43.10
-69	0.013	-37.72	-29	0.153	-16.31	11	0.083	-21.62
-68	0.002	-53.98	-28	0.159	-15.97	12	0.152	-16.36
-67	0.010	-40.00	-27	0.154	-16.25	13	0.201	-13.94
-66	0.022	-33.15	-26	0.139	-17.14	14	0.228	-12.84
-65	0.035	-29.12	-25	0.114	-18.86	15	0.235	-12.58
-64	0.048	-26.38	-24	0.080	-21.94	16	0.223	-13.03
-63	0.060	-24.44	-23	0.037	-28.64	17	0.196	-14.15
-62	0.071	-22.97	-22	0.012	-38.42	18	0.158	-16.03
-61	0.081	-21.83	-21	0.063	-24.01	19	0.111	-19.09
-60	0.089	-21.01	-20	0.113	-18.94	20	0.060	-24.44
-59	0.096	-20.35	-19	0.159	-15.97	21	0.008	-41.94
-58	0.100	-20.00	-18	0.197	-14.11	22	0.041	-27.74
-57	0.102	-19.83	-17	0.222	-13.07	23	0.084	-21.51
-56	0.101	-19.91	-16	0.233	-12.65	24	0.118	-18.56
-55	0.096	-20.35	-15	0.226	-12.92	25	0.143	-16.89
-54	0.089	-21.01	-14	0.198	-14.07	26	0.157	-16.08
-53	0.079	-22.05	-13	0.150	-16.48	27	0.160	-15.92
-52	0.065	-23.74	-12	0.080	-21.94	28	0.154	-16.25
-51	0.049	-26.20	-11	0.008	-41.94	29	0.138	-17.20