



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 1

List View

General Information | [Contact](#) | [Default Values](#) | [Discount](#) | [Document Information](#)

Procurement Folder: 651935

SO Doc Code: CRFQ

Procurement Type: Central Purchase Order

SO Dept: 0439

Vendor ID: VS0000019096

SO Doc ID: EBA2000000014

Legal Name: ELECTRONICS RESEARCH INC

Published Date: 12/2/19

Alias/DBA:

Close Date: 12/10/19

Total Bid: \$439,670.16

Close Time: 13:30

Response Date: 12/07/2019

Status: Closed

Response Time: 10:39

Solicitation Description: Addendum No.02; MEDIUM POWER FM ANTENNA

Total of Header Attachments: 1

Total of All Attachments: 1

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Electronics Research, Inc. Response to Request for Quotation



State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street, East
Charleston, WV 25305

Proc Folder:	651935
Doc Description:	MEDIUM POWER FM ANTENNA
Date Issued:	December 2, 2019
Solicitation Closes:	December 10, 2019 at 13:30
Solicitation No:	CRFQ 0439 EBA2000000014

ERI CONTACT

Bill Harland
Vice President of Marketing
ELECTRONICS RESEARCH, INC.
Telephone: +1 (812) 925-6000, ext. 214
Mobile: +1 (812) 455-1823
Facsimile: +1 (812) 925-4030
E- mail: bharland@eriinc.com
ERI Reference: Proposal Number 20191109-292

Electronics Research, Inc. • 7777 Gardner Road • Chandler, IN 47610-9219 • USA
+1 812 925-6000 (tel) • +1 812 925-4030 (fax)

Your Single Source for Broadcast Solutions™ • Call Toll-free at 877 ERI-LINE • Visit Online at www.eriinc.com

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Completed and Signed Bid Documents, including Acknowledgement of Addendums



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

State of West Virginia
 Request for Quotation
 04 – Audio/Video

Proc Folder: 651935

Doc Description: Addendum No.02; MEDIUM POWER FM ANTENNA

Proc Type: Central Purchase Order

Date Issued	Solicitation Closes	Solicitation No	Version
2019-12-02	2019-12-10 13:30:00	CRFQ 0439 EBA2000000014	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: Electronics Research, Inc.
 7777 Gardner Road
 Chandler, IN 47610
 +1 (812) 925-6000
 Contact: Bill Harland
 Vice President of Marketing
 bharland@eriinc.com

FOR INFORMATION CONTACT THE BUYER

Guy Nisbet
 (304) 558-2596
 guy.l.nisbet@wv.gov

Signature X

FEIN # 35-1083384

DATE December 9, 2019

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

ADDITIONAL INFORMATION:

Addendum

Addendum No.02 issued to publish and distribute the attached information to the vendor community.

Centralized Request for Quotation
(Medium - Power FM Antenna)

The West Virginia Purchasing Division is soliciting bids for the agency, The West Virginia Educational Broadcasting Authority (EBA) from qualified vendors to establish a one-time contract for the purchase of a "Medium-Power" FM Antenna, per the terms and conditions, specifications that are apart of this solicitation and attached hereto.

INVOICE TO		SHIP TO	
CHIEF FINANCIAL OFFICER EDUCATIONAL BROADCASTING 124 INDUSTRIAL PARK RD		SITE MANAGER EDUCATIONAL BROADCASTING WNPB-TV	
BEAVER	WV25813	191 SCOTT AVE MORGANTOWN	WV 26505
US		US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
1	Medium POWER FM ANTENNA	1.00000	EA	\$439,670.16	\$439,670.16

Comm Code	Manufacturer	Specification	Model #
43221703	Electronics Research, Inc.	ERI Proposal 20191109-292	1183-6CP-DA and Accessories

Extended Description :

Medium POWER UHF TV TRANSMIT ANTENNA

EBA2000000014	Document Phase Final	Document Description Addendum No.02; MEDIUM POWER FM ANTENNA	Page 3 of 3
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ADDITIONAL TERMS AND CONDITIONS

See attached document(s) for additional Terms and Conditions

INSTRUCTIONS TO VENDORS SUBMITTING BIDS

1. REVIEW DOCUMENTS THOROUGHLY: The attached documents contain a solicitation for bids. Please read these instructions and all documents attached in their entirety. These instructions provide critical information about requirements that if overlooked could lead to disqualification of a Vendor's bid. All bids must be submitted in accordance with the provisions contained in these instructions and the Solicitation. Failure to do so may result in disqualification of Vendor's bid.

2. MANDATORY TERMS: The Solicitation may contain mandatory provisions identified by the use of the words "must," "will," and "shall." Failure to comply with a mandatory term in the Solicitation will result in bid disqualification.

3. PREBID MEETING: The item identified below shall apply to this Solicitation.

A pre-bid meeting will not be held prior to bid opening

A MANDATORY PRE-BID meeting will be held at the following place and time:

All Vendors submitting a bid must attend the mandatory pre-bid meeting. Failure to attend the mandatory pre-bid meeting shall result in disqualification of the Vendor's bid. No one individual is permitted to represent more than one vendor at the pre-bid meeting. Any individual that does attempt to represent two or more vendors will be required to select one vendor to which the individual's attendance will be attributed. The vendors not selected will be deemed to have not attended the pre-bid meeting unless another individual attended on their behalf.

An attendance sheet provided at the pre-bid meeting shall serve as the official document verifying attendance. Any person attending the pre-bid meeting on behalf of a Vendor must list on the attendance sheet his or her name and the name of the Vendor he or she is representing.

Additionally, the person attending the pre-bid meeting should include the Vendor's E-Mail address, phone number, and Fax number on the attendance sheet. It is the Vendor's responsibility to locate the attendance sheet and provide the required information. Failure to complete the attendance sheet as required may result in disqualification of Vendor's bid.

All Vendors should arrive prior to the starting time for the pre-bid. Vendors who arrive after the starting time but prior to the end of the pre-bid will be permitted to sign in, but are charged with knowing all matters discussed at the pre-bid.

Questions submitted at least five business days prior to a scheduled pre-bid will be discussed at the pre-bid meeting if possible. Any discussions or answers to questions at the pre-bid meeting
Revised 10/01/2019

are preliminary in nature and are non-binding. Official and binding answers to questions will be published in a written addendum to the Solicitation prior to bid opening.

4. VENDOR QUESTION DEADLINE: Vendors may submit questions relating to this Solicitation to the Purchasing Division. Questions must be submitted in writing. All questions must be submitted on or before the date listed below and to the address listed below in order to be considered. A written response will be published in a Solicitation addendum if a response is possible and appropriate. Non-written discussions, conversations, or questions and answers regarding this Solicitation are preliminary in nature and are nonbinding.

Submitted e-mails should have solicitation number in the subject line.

Question Submission Deadline: 11/25/2019 at 9:00 AM. EST.

Submit Questions to: Guy Nisbet
2019 Washington Street, East
Charleston, WV 25305
Fax: (304) 558-4115 (Vendors should not use this fax number for bid submission)
Email: Guy.L.Nisbet@WV.Gov

5. VERBAL COMMUNICATION: Any verbal communication between the Vendor and any State personnel is not binding, including verbal communication at the mandatory pre-bid conference. Only information issued in writing and added to the Solicitation by an official written addendum by the Purchasing Division is binding.

6. BID SUBMISSION: All bids must be submitted electronically through wvOASIS or signed and delivered by the Vendor to the Purchasing Division at the address listed below on or before the date and time of the bid opening. Any bid received by the Purchasing Division staff is considered to be in the possession of the Purchasing Division and will not be returned for any reason. The Purchasing Division will not accept bids, modification of bids, or addendum acknowledgment forms via e-mail. Acceptable delivery methods include electronic submission via wvOASIS, hand delivery, delivery by courier, or facsimile.

The bid delivery address is:
Department of Administration, Purchasing Division
2019 Washington Street East
Charleston, WV 25305-0130

A bid that is not submitted electronically through wvOASIS should contain the information listed below on the face of the envelope or the bid may be rejected by the Purchasing Division.:

SEALED BID: WV EBA Medium Power UHF TV Antenna
BUYER: Guy Nisbet
SOLICITATION NO.:
BID OPENING DATE:
BID OPENING TIME: 1:30 PM. EST.
FAX NUMBER: 304.558.3970

The Purchasing Division may prohibit the submission of bids electronically through wvOASIS at its sole discretion. Such a prohibition will be contained and communicated in the wvOASIS system resulting in the Vendor's inability to submit bids through wvOASIS. Submission of a response to an Expression or Interest or Request for Proposal is not permitted in wvOASIS.

For Request For Proposal ("RFP") Responses Only: In the event that Vendor is responding to a request for proposal, the Vendor shall submit one original technical and one original cost proposal plus _____^{N/A}_____ convenience copies of each to the Purchasing Division at the address shown above. Additionally, the Vendor should identify the bid type as either a technical or cost proposal on the face of each bid envelope submitted in response to a request for proposal as follows:

BID TYPE: (This only applies to CRFP)

- Technical
 Cost

7. BID OPENING: Bids submitted in response to this Solicitation will be opened at the location identified below on the date and time listed below. Delivery of a bid after the bid opening date and time will result in bid disqualification. For purposes of this Solicitation, a bid is considered delivered when confirmation of delivery is provided by wvOASIS (in the case of electronic submission) or when the bid is time stamped by the official Purchasing Division time clock (in the case of hand delivery).

Bid Opening Date and Time: 12/10/2019 at 1:30 PM. EST.

Bid Opening Location: Department of Administration, Purchasing Division
 2019 Washington Street East
 Charleston, WV 25305-0130

8. ADDENDUM ACKNOWLEDGEMENT: Changes or revisions to this Solicitation will be made by an official written addendum issued by the Purchasing Division. Vendor should acknowledge receipt of all addenda issued with this Solicitation by completing an Addendum Acknowledgment Form, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

9. BID FORMATTING: Vendor should type or electronically enter the information onto its bid to prevent errors in the evaluation. Failure to type or electronically enter the information may result in bid disqualification.

10. ALTERNATE MODEL OR BRAND: Unless the box below is checked, any model, brand, or specification listed in this Solicitation establishes the acceptable level of quality only and is not intended to reflect a preference for, or in any way favor, a particular brand or vendor. Vendors may bid alternates to a listed model or brand provided that the alternate is at least equal to the model or brand and complies with the required specifications. The equality of any alternate being bid shall be determined by the State at its sole discretion. Any Vendor bidding an alternate model or brand should clearly identify the alternate items in its bid and should include manufacturer's specifications, industry literature, and/or any other relevant documentation demonstrating the

equality of the alternate items. Failure to provide information for alternate items may be grounds for rejection of a Vendor's bid.

This Solicitation is based upon a standardized commodity established under W. Va. Code § 5A-3-61. Vendors are expected to bid the standardized commodity identified. Failure to bid the standardized commodity will result in your firm's bid being rejected.

11. EXCEPTIONS AND CLARIFICATIONS: The Solicitation contains the specifications that shall form the basis of a contractual agreement. Vendor shall clearly mark any exceptions, clarifications, or other proposed modifications in its bid. Exceptions to, clarifications of, or modifications of a requirement or term and condition of the Solicitation may result in bid disqualification.

12. COMMUNICATION LIMITATIONS: In accordance with West Virginia Code of State Rules §148-1-6.6, communication with the State of West Virginia or any of its employees regarding this Solicitation during the solicitation, bid, evaluation or award periods, except through the Purchasing Division, is strictly prohibited without prior Purchasing Division approval. Purchasing Division approval for such communication is implied for all agency delegated and exempt purchases.

13. REGISTRATION: Prior to Contract award, the apparent successful Vendor must be properly registered with the West Virginia Purchasing Division and must have paid the \$125 fee, if applicable.

14. UNIT PRICE: Unit prices shall prevail in cases of a discrepancy in the Vendor's bid.

15. PREFERENCE: Vendor Preference may be requested in purchases of motor vehicles or construction and maintenance equipment and machinery used in highway and other infrastructure projects. Any request for preference must be submitted in writing with the bid, must specifically identify the preference requested with reference to the applicable subsection of West Virginia Code § 5A-3-37, and should include with the bid any information necessary to evaluate and confirm the applicability of the requested preference. A request form to help facilitate the request can be found at:

<http://www.state.wv.us/admin/purchase/vrc/Venpref.pdf>.

15A. RECIPROCAL PREFERENCE: The State of West Virginia applies a reciprocal preference to all solicitations for commodities and printing in accordance with W. Va. Code § 5A-3-37(b). In effect, non-resident vendors receiving a preference in their home states, will see that same preference granted to West Virginia resident vendors bidding against them in West Virginia. A request form to help facilitate the request can be found at:

<http://www.state.wv.us/admin/purchase/vrc/Venpref.pdf>.

16. SMALL, WOMEN-OWNED, OR MINORITY-OWNED BUSINESSES: For any solicitations publicly advertised for bid, in accordance with West Virginia Code §5A-3-37(a)(7) and W. Va. CSR § 148-22-9, any non-resident vendor certified as a small, women-owned, or minority-owned business under W. Va. CSR § 148-22-9 shall be provided the same preference made available to any resident vendor. Any non-resident small, women-owned, or minority-owned business must identify itself as such in writing, must submit that writing to the

Purchasing Division with its bid, and must be properly certified under W. Va. CSR § 148-22-9 prior to contract award to receive the preferences made available to resident vendors. Preference for a non-resident small, women-owned, or minority owned business shall be applied in accordance with W. Va. CSR § 148-22-9.

17. WAIVER OF MINOR IRREGULARITIES: The Director reserves the right to waive minor irregularities in bids or specifications in accordance with West Virginia Code of State Rules § 148-1-4.6.

18. ELECTRONIC FILE ACCESS RESTRICTIONS: Vendor must ensure that its submission in wvOASIS can be accessed and viewed by the Purchasing Division staff immediately upon bid opening. The Purchasing Division will consider any file that cannot be immediately accessed and viewed at the time of the bid opening (such as, encrypted files, password protected files, or incompatible files) to be blank or incomplete as context requires, and are therefore unacceptable. A vendor will not be permitted to unencrypt files, remove password protections, or resubmit documents after bid opening to make a file viewable if those documents are required with the bid. A Vendor may be required to provide document passwords or remove access restrictions to allow the Purchasing Division to print or electronically save documents provided that those documents are viewable by the Purchasing Division prior to obtaining the password or removing the access restriction.

19. NON-RESPONSIBLE: The Purchasing Division Director reserves the right to reject the bid of any vendor as Non-Responsible in accordance with W. Va. Code of State Rules § 148-1-5.3, when the Director determines that the vendor submitting the bid does not have the capability to fully perform, or lacks the integrity and reliability to assure good-faith performance.”

20. ACCEPTANCE/REJECTION: The State may accept or reject any bid in whole, or in part in accordance with W. Va. Code of State Rules § 148-1-4.5. and § 148-1-6.4.b.”

21. YOUR SUBMISSION IS A PUBLIC DOCUMENT: Vendor’s entire response to the Solicitation and the resulting Contract are public documents. As public documents, they will be disclosed to the public following the bid/proposal opening or award of the contract, as required by the competitive bidding laws of West Virginia Code §§ 5A-3-1 et seq., 5-22-1 et seq., and 5G-1-1 et seq. and the Freedom of Information Act West Virginia Code §§ 29B-1-1 et seq.

DO NOT SUBMIT MATERIAL YOU CONSIDER TO BE CONFIDENTIAL, A TRADE SECRET, OR OTHERWISE NOT SUBJECT TO PUBLIC DISCLOSURE.

Submission of any bid, proposal, or other document to the Purchasing Division constitutes your explicit consent to the subsequent public disclosure of the bid, proposal, or document. The Purchasing Division will disclose any document labeled “confidential,” “proprietary,” “trade secret,” “private,” or labeled with any other claim against public disclosure of the documents, to include any “trade secrets” as defined by West Virginia Code § 47-22-1 et seq. All submissions are subject to public disclosure without notice.

22. INTERESTED PARTY DISCLOSURE: West Virginia Code § 6D-1-2 requires that the vendor submit to the Purchasing Division a disclosure of interested parties to the contract for all contracts with an actual or estimated value of at least \$1 Million. That disclosure must occur on the form prescribed and approved by the WV Ethics Commission prior to contract award. A copy of that form is included with this solicitation or can be obtained from the WV Ethics Commission. This requirement does not apply to publicly traded companies listed on a national or international stock exchange. A more detailed definition of interested parties can be obtained from the form referenced above.

23. WITH THE BID REQUIREMENTS: In instances where these specifications require documentation or other information with the bid, and a vendor fails to provide it with the bid, the Director of the Purchasing Division reserves the right to request those items after bid opening and prior to contract award pursuant to the authority to waive minor irregularities in bids or specifications under W. Va. CSR § 148-1-4.6. This authority does not apply to instances where state law mandates receipt with the bid.

GENERAL TERMS AND CONDITIONS:

- 1. CONTRACTUAL AGREEMENT:** Issuance of a Award Document signed by the Purchasing Division Director, or his designee, and approved as to form by the Attorney General's office constitutes acceptance of this Contract made by and between the State of West Virginia and the Vendor. Vendor's signature on its bid signifies Vendor's agreement to be bound by and accept the terms and conditions contained in this Contract.
- 2. DEFINITIONS:** As used in this Solicitation/Contract, the following terms shall have the meanings attributed to them below. Additional definitions may be found in the specifications included with this Solicitation/Contract.
 - 2.1. "Agency" or "Agencies"** means the agency, board, commission, or other entity of the State of West Virginia that is identified on the first page of the Solicitation or any other public entity seeking to procure goods or services under this Contract.
 - 2.2. "Bid" or "Proposal"** means the vendors submitted response to this solicitation.
 - 2.3. "Contract"** means the binding agreement that is entered into between the State and the Vendor to provide the goods or services requested in the Solicitation.
 - 2.4. "Director"** means the Director of the West Virginia Department of Administration, Purchasing Division.
 - 2.5. "Purchasing Division"** means the West Virginia Department of Administration, Purchasing Division.
 - 2.6. "Award Document"** means the document signed by the Agency and the Purchasing Division, and approved as to form by the Attorney General, that identifies the Vendor as the contract holder.
 - 2.7. "Solicitation"** means the official notice of an opportunity to supply the State with goods or services that is published by the Purchasing Division.
 - 2.8. "State"** means the State of West Virginia and/or any of its agencies, commissions, boards, etc. as context requires.
 - 2.9. "Vendor" or "Vendors"** means any entity submitting a bid in response to the Solicitation, the entity that has been selected as the lowest responsible bidder, or the entity that has been awarded the Contract as context requires.

3. CONTRACT TERM; RENEWAL; EXTENSION: The term of this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below:

Term Contract

Initial Contract Term: This Contract becomes effective on _____ and extends for a period of _____ year(s).

Renewal Term: This Contract may be renewed upon the mutual written consent of the Agency, and the Vendor, with approval of the Purchasing Division and the Attorney General’s office (Attorney General approval is as to form only). Any request for renewal should be delivered to the Agency and then submitted to the Purchasing Division thirty (30) days prior to the expiration date of the initial contract term or appropriate renewal term. A Contract renewal shall be in accordance with the terms and conditions of the original contract. Unless otherwise specified below, renewal of this Contract is limited to _____ successive one (1) year periods or multiple renewal periods of less than one year, provided that the multiple renewal periods do not exceed the total number of months available in all renewal years combined. Automatic renewal of this Contract is prohibited. Renewals must be approved by the Vendor, Agency, Purchasing Division and Attorney General’s office (Attorney General approval is as to form only)

Alternate Renewal Term – This contract may be renewed for _____ successive _____ year periods or shorter periods provided that they do not exceed the total number of months contained in all available renewals. Automatic renewal of this Contract is prohibited. Renewals must be approved by the Vendor, Agency, Purchasing Division and Attorney General’s office (Attorney General approval is as to form only)

Delivery Order Limitations: In the event that this contract permits delivery orders, a delivery order may only be issued during the time this Contract is in effect. Any delivery order issued within one year of the expiration of this Contract shall be effective for one year from the date the delivery order is issued. No delivery order may be extended beyond one year after this Contract has expired.

Fixed Period Contract: This Contract becomes effective upon Vendor’s receipt of the notice to proceed and must be completed within _____ days.

Fixed Period Contract with Renewals: This Contract becomes effective upon Vendor’s receipt of the notice to proceed and part of the Contract more fully described in the attached specifications must be completed within _____ days. Upon completion of the work covered by the preceding sentence, the vendor agrees that maintenance, monitoring, or warranty services will be provided for _____ year(s) thereafter.

One Time Purchase: The term of this Contract shall run from the issuance of the Award Document until all of the goods contracted for have been delivered, but in no event will this Contract extend for more than one fiscal year.

Other: See attached.

4. NOTICE TO PROCEED: Vendor shall begin performance of this Contract immediately upon receiving notice to proceed unless otherwise instructed by the Agency. Unless otherwise specified, the fully executed Award Document will be considered notice to proceed.

5. QUANTITIES: The quantities required under this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below.

Open End Contract: Quantities listed in this Solicitation are approximations only, based on estimates supplied by the Agency. It is understood and agreed that the Contract shall cover the quantities actually ordered for delivery during the term of the Contract, whether more or less than the quantities shown.

Service: The scope of the service to be provided will be more clearly defined in the specifications included herewith.

Combined Service and Goods: The scope of the service and deliverable goods to be provided will be more clearly defined in the specifications included herewith.

One Time Purchase: This Contract is for the purchase of a set quantity of goods that are identified in the specifications included herewith. Once those items have been delivered, no additional goods may be procured under this Contract without an appropriate change order approved by the Vendor, Agency, Purchasing Division, and Attorney General's office.

6. EMERGENCY PURCHASES: The Purchasing Division Director may authorize the Agency to purchase goods or services in the open market that Vendor would otherwise provide under this Contract if those goods or services are for immediate or expedited delivery in an emergency. Emergencies shall include, but are not limited to, delays in transportation or an unanticipated increase in the volume of work. An emergency purchase in the open market, approved by the Purchasing Division Director, shall not constitute a breach of this Contract and shall not entitle the Vendor to any form of compensation or damages. This provision does not excuse the State from fulfilling its obligations under a One Time Purchase contract.

7. REQUIRED DOCUMENTS: All of the items checked below must be provided to the Purchasing Division by the Vendor as specified below.

BID BOND (Construction Only): Pursuant to the requirements contained in W. Va. Code § 5-22-1(c), All Vendors submitting a bid on a construction project shall furnish a valid bid bond in the amount of five percent (5%) of the total amount of the bid protecting the State of West Virginia. The bid bond must be submitted with the bid.

PERFORMANCE BOND: The apparent successful Vendor shall provide a performance bond in the amount of 100% of the contract. The performance bond must be received by the Purchasing Division prior to Contract award.

LABOR/MATERIAL PAYMENT BOND: The apparent successful Vendor shall provide a labor/material payment bond in the amount of 100% of the Contract value. The labor/material payment bond must be delivered to the Purchasing Division prior to Contract award.

In lieu of the Bid Bond, Performance Bond, and Labor/Material Payment Bond, the Vendor may provide certified checks, cashier's checks, or irrevocable letters of credit. Any certified check, cashier's check, or irrevocable letter of credit provided in lieu of a bond must be of the same amount and delivered on the same schedule as the bond it replaces. A letter of credit submitted in lieu of a performance and labor/material payment bond will only be allowed for projects under \$100,000. Personal or business checks are not acceptable. Notwithstanding the foregoing, West Virginia Code § 5-22-1 (d) mandates that a vendor provide a performance and labor/material payment bond for construction projects. Accordingly, substitutions for the performance and labor/material payment bonds for construction projects is not permitted.

MAINTENANCE BOND: The apparent successful Vendor shall provide a two (2) year maintenance bond covering the roofing system. The maintenance bond must be issued and delivered to the Purchasing Division prior to Contract award.

LICENSE(S) / CERTIFICATIONS / PERMITS: In addition to anything required under the Section of the General Terms and Conditions entitled Licensing, the apparent successful Vendor shall furnish proof of the following licenses, certifications, and/or permits prior to Contract award, in a form acceptable to the Purchasing Division.

The apparent successful Vendor shall also furnish proof of any additional licenses or certifications contained in the specifications prior to Contract award regardless of whether or not that requirement is listed above.

8. INSURANCE: The apparent successful Vendor shall furnish proof of the insurance identified by a checkmark below and must include the State as an additional insured on each policy prior to Contract award. The insurance coverages identified below must be maintained throughout the life of this contract. Thirty (30) days prior to the expiration of the insurance policies, Vendor shall provide the Agency with proof that the insurance mandated herein has been continued. Vendor must also provide Agency with immediate notice of any changes in its insurance policies, including but not limited to, policy cancelation, policy reduction, or change in insurers. The apparent successful Vendor shall also furnish proof of any additional insurance requirements contained in the specifications prior to Contract award regardless of whether or not that insurance requirement is listed in this section.

Vendor must maintain:

- Commercial General Liability Insurance** in at least an amount of: \$1,000,000.00 per occurrence.
- Automobile Liability Insurance** in at least an amount of: _____ per occurrence.
- Professional/Malpractice/Errors and Omission Insurance** in at least an amount of: _____ per occurrence. Notwithstanding the forgoing, Vendor's are not required to list the State as an additional insured for this type of policy.
- Commercial Crime and Third Party Fidelity Insurance** in an amount of: _____ per occurrence.
- Cyber Liability Insurance** in an amount of: _____ per occurrence.
- Builders Risk Insurance** in an amount equal to 100% of the amount of the Contract.
- Pollution Insurance** in an amount of: _____ per occurrence.
- Aircraft Liability** in an amount of: _____ per occurrence.
-
-
-
-

Notwithstanding anything contained in this section to the contrary, the Director of the Purchasing Division reserves the right to waive the requirement that the State be named as an additional insured on one or more of the Vendor's insurance policies if the Director finds that doing so is in the State's best interest.

9. WORKERS' COMPENSATION INSURANCE: The apparent successful Vendor shall comply with laws relating to workers compensation, shall maintain workers' compensation insurance when required, and shall furnish proof of workers' compensation insurance upon request.

10. [Reserved]

11. LIQUIDATED DAMAGES: This clause shall in no way be considered exclusive and shall not limit the State or Agency's right to pursue any other available remedy. Vendor shall pay liquidated damages in the amount specified below or as described in the specifications:

_____ for _____

Liquidated Damages Contained in the Specifications

12. ACCEPTANCE: Vendor's signature on its bid, or on the certification and signature page, constitutes an offer to the State that cannot be unilaterally withdrawn, signifies that the product or service proposed by vendor meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise indicated, and signifies acceptance of the terms and conditions contained in the Solicitation unless otherwise indicated.

13. PRICING: The pricing set forth herein is firm for the life of the Contract, unless specified elsewhere within this Solicitation/Contract by the State. A Vendor's inclusion of price adjustment provisions in its bid, without an express authorization from the State in the Solicitation to do so, may result in bid disqualification. Notwithstanding the foregoing, Vendor must extend any publicly advertised sale price to the State and invoice at the lower of the contract price or the publicly advertised sale price.

14. PAYMENT IN ARREARS: Payment in advance is prohibited under this Contract. Payment may only be made after the delivery and acceptance of goods or services. The Vendor shall submit invoices, in arrears.

15. PAYMENT METHODS: Vendor must accept payment by electronic funds transfer and P-Card. (The State of West Virginia's Purchasing Card program, administered under contract by a banking institution, processes payment for goods and services through state designated credit cards.)

16. TAXES: The Vendor shall pay any applicable sales, use, personal property or any other taxes arising out of this Contract and the transactions contemplated thereby. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.

17. ADDITIONAL FEES: Vendor is not permitted to charge additional fees or assess additional charges that were not either expressly provided for in the solicitation published by the State of West Virginia or included in the unit price or lump sum bid amount that Vendor is required by the solicitation to provide. Including such fees or charges as notes to the solicitation may result in rejection of vendor's bid. Requesting such fees or charges be paid after the contract has been awarded may result in cancellation of the contract.

18. FUNDING: This Contract shall continue for the term stated herein, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise made available, this Contract becomes void and of no effect beginning on July 1 of the fiscal year for which funding has not been appropriated or otherwise made available.

19. CANCELLATION: The Purchasing Division Director reserves the right to cancel this Contract immediately upon written notice to the vendor if the materials or workmanship supplied do not conform to the specifications contained in the Contract. The Purchasing Division Director may also cancel any purchase or Contract upon 30 days written notice to the Vendor in accordance with West Virginia Code of State Rules § 148-1-5.2.b.

20. TIME: Time is of the essence with regard to all matters of time and performance in this Contract.

21. APPLICABLE LAW: This Contract is governed by and interpreted under West Virginia law without giving effect to its choice of law principles. Any information provided in specification manuals, or any other source, verbal or written, which contradicts or violates the West Virginia Constitution, West Virginia Code or West Virginia Code of State Rules is void and of no effect.

22. COMPLIANCE WITH LAWS: Vendor shall comply with all applicable federal, state, and local laws, regulations and ordinances. By submitting a bid, Vendor acknowledges that it has reviewed, understands, and will comply with all applicable laws, regulations, and ordinances.

SUBCONTRACTOR COMPLIANCE: Vendor shall notify all subcontractors providing commodities or services related to this Contract that as subcontractors, they too are required to comply with all applicable laws, regulations, and ordinances. Notification under this provision must occur prior to the performance of any work under the contract by the subcontractor.

23. ARBITRATION: Any references made to arbitration contained in this Contract, Vendor's bid, or in any American Institute of Architects documents pertaining to this Contract are hereby deleted, void, and of no effect.

24. MODIFICATIONS: This writing is the parties' final expression of intent. Notwithstanding anything contained in this Contract to the contrary no modification of this Contract shall be binding without mutual written consent of the Agency, and the Vendor, with approval of the Purchasing Division and the Attorney General's office (Attorney General approval is as to form only). Any change to existing contracts that adds work or changes contract cost, and were not included in the original contract, must be approved by the Purchasing Division and the Attorney General's Office (as to form) prior to the implementation of the change or commencement of work affected by the change.

25. WAIVER: The failure of either party to insist upon a strict performance of any of the terms or provision of this Contract, or to exercise any option, right, or remedy herein contained, shall not be construed as a waiver or a relinquishment for the future of such term, provision, option, right, or remedy, but the same shall continue in full force and effect. Any waiver must be expressly stated in writing and signed by the waiving party.

26. SUBSEQUENT FORMS: The terms and conditions contained in this Contract shall supersede any and all subsequent terms and conditions which may appear on any form documents submitted by Vendor to the Agency or Purchasing Division such as price lists, order forms, invoices, sales agreements, or maintenance agreements, and includes internet websites or other electronic documents. Acceptance or use of Vendor's forms does not constitute acceptance of the terms and conditions contained thereon.

27. ASSIGNMENT: Neither this Contract nor any monies due, or to become due hereunder, may be assigned by the Vendor without the express written consent of the Agency, the Purchasing Division, the Attorney General's office (as to form only), and any other government agency or office that may be required to approve such assignments.

28. WARRANTY: The Vendor expressly warrants that the goods and/or services covered by this Contract will: (a) conform to the specifications, drawings, samples, or other description furnished or specified by the Agency; (b) be merchantable and fit for the purpose intended; and (c) be free from defect in material and workmanship.

29. STATE EMPLOYEES: State employees are not permitted to utilize this Contract for personal use and the Vendor is prohibited from permitting or facilitating the same.

30. PRIVACY, SECURITY, AND CONFIDENTIALITY: The Vendor agrees that it will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the Agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the Agency's policies, procedures, and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in <http://www.state.wv.us/admin/purchase/privacy/default.html>.

31. YOUR SUBMISSION IS A PUBLIC DOCUMENT: Vendor's entire response to the Solicitation and the resulting Contract are public documents. As public documents, they will be disclosed to the public following the bid/proposal opening or award of the contract, as required by the competitive bidding laws of West Virginia Code §§ 5A-3-1 et seq., 5-22-1 et seq., and 5G-1-1 et seq. and the Freedom of Information Act West Virginia Code §§ 29B-1-1 et seq.

DO NOT SUBMIT MATERIAL YOU CONSIDER TO BE CONFIDENTIAL, A TRADE SECRET, OR OTHERWISE NOT SUBJECT TO PUBLIC DISCLOSURE.

Submission of any bid, proposal, or other document to the Purchasing Division constitutes your explicit consent to the subsequent public disclosure of the bid, proposal, or document. The Purchasing Division will disclose any document labeled "confidential," "proprietary," "trade secret," "private," or labeled with any other claim against public disclosure of the documents, to include any "trade secrets" as defined by West Virginia Code § 47-22-1 et seq. All submissions are subject to public disclosure without notice.

32. LICENSING: In accordance with West Virginia Code of State Rules § 148-1-6.1.e, Vendor must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, West Virginia Insurance Commission, or any other state agency or political subdivision. Obligations related to political subdivisions may include, but are not limited to, business licensing, business and occupation taxes, inspection compliance, permitting, etc. Upon request, the Vendor must provide all necessary releases to obtain information to enable the Purchasing Division Director or the Agency to verify that the Vendor is licensed and in good standing with the above entities.

SUBCONTRACTOR COMPLIANCE: Vendor shall notify all subcontractors providing commodities or services related to this Contract that as subcontractors, they too are required to be licensed, in good standing, and up-to-date on all state and local obligations as described in this section. Obligations related to political subdivisions may include, but are not limited to, business licensing, business and occupation taxes, inspection compliance, permitting, etc. Notification under this provision must occur prior to the performance of any work under the contract by the subcontractor.

33. ANTITRUST: In submitting a bid to, signing a contract with, or accepting a Award Document from any agency of the State of West Virginia, the Vendor agrees to convey, sell, assign, or transfer to the State of West Virginia all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the State of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to Vendor.

34. VENDOR CERTIFICATIONS: By signing its bid or entering into this Contract, Vendor certifies (1) that its bid or offer was made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, person or entity submitting a bid or offer for the same material, supplies, equipment or services; (2) that its bid or offer is in all respects fair and without collusion or fraud; (3) that this Contract is accepted or entered into without any prior understanding, agreement, or connection to any other entity that could be considered a violation of law; and (4) that it has reviewed this Solicitation in its entirety; understands the requirements, terms and conditions, and other information contained herein.

Vendor's signature on its bid or offer also affirms that neither it nor its representatives have any interest, nor shall acquire any interest, direct or indirect, which would compromise the performance of its services hereunder. Any such interests shall be promptly presented in detail to the Agency. The individual signing this bid or offer on behalf of Vendor certifies that he or she is authorized by the Vendor to execute this bid or offer or any documents related thereto on Vendor's behalf; that he or she is authorized to bind the Vendor in a contractual relationship; and that, to the best of his or her knowledge, the Vendor has properly registered with any State agency that may require registration.

35. VENDOR RELATIONSHIP: The relationship of the Vendor to the State shall be that of an independent contractor and no principal-agent relationship or employer-employee relationship is contemplated or created by this Contract. The Vendor as an independent contractor is solely liable for the acts and omissions of its employees and agents. Vendor shall be responsible for selecting, supervising, and compensating any and all individuals employed pursuant to the terms of this Solicitation and resulting contract. Neither the Vendor, nor any employees or subcontractors of the Vendor, shall be deemed to be employees of the State for any purpose whatsoever. Vendor shall be exclusively responsible for payment of employees and contractors for all wages and salaries, taxes, withholding payments, penalties, fees, fringe benefits, professional liability insurance premiums, contributions to insurance and pension, or other deferred compensation plans, including but not limited to, Workers' Compensation and Social Security obligations, licensing fees, etc. and the filing of all necessary documents, forms, and returns pertinent to all of the foregoing.

Vendor shall hold harmless the State, and shall provide the State and Agency with a defense against any and all claims including, but not limited to, the foregoing payments, withholdings, contributions, taxes, Social Security taxes, and employer income tax returns.

36. INDEMNIFICATION: The Vendor agrees to indemnify, defend, and hold harmless the State and the Agency, their officers, and employees from and against: (1) Any claims or losses for services rendered by any subcontractor, person, or firm performing or supplying services, materials, or supplies in connection with the performance of the Contract; (2) Any claims or losses resulting to any person or entity injured or damaged by the Vendor, its officers, employees, or subcontractors by the publication, translation, reproduction, delivery, performance, use, or disposition of any data used under the Contract in a manner not authorized by the Contract, or by Federal or State statutes or regulations; and (3) Any failure of the Vendor, its officers, employees, or subcontractors to observe State and Federal laws including, but not limited to, labor and wage and hour laws.

37. PURCHASING AFFIDAVIT: In accordance with West Virginia Code §§ 5A-3-10a and 5-22-1(i), the State is prohibited from awarding a contract to any bidder that owes a debt to the State or a political subdivision of the State, Vendors are required to sign, notarize, and submit the Purchasing Affidavit to the Purchasing Division affirming under oath that it is not in default on any monetary obligation owed to the state or a political subdivision of the state.

38. ADDITIONAL AGENCY AND LOCAL GOVERNMENT USE: This Contract may be utilized by other agencies, spending units, and political subdivisions of the State of West Virginia; county, municipal, and other local government bodies; and school districts (“Other Government Entities”), provided that both the Other Government Entity and the Vendor agree. Any extension of this Contract to the aforementioned Other Government Entities must be on the same prices, terms, and conditions as those offered and agreed to in this Contract, provided that such extension is in compliance with the applicable laws, rules, and ordinances of the Other Government Entity. A refusal to extend this Contract to the Other Government Entities shall not impact or influence the award of this Contract in any manner.

39. CONFLICT OF INTEREST: Vendor, its officers or members or employees, shall not presently have or acquire an interest, direct or indirect, which would conflict with or compromise the performance of its obligations hereunder. Vendor shall periodically inquire of its officers, members and employees to ensure that a conflict of interest does not arise. Any conflict of interest discovered shall be promptly presented in detail to the Agency.

40. REPORTS: Vendor shall provide the Agency and/or the Purchasing Division with the following reports identified by a checked box below:

Such reports as the Agency and/or the Purchasing Division may request. Requested reports may include, but are not limited to, quantities purchased, agencies utilizing the contract, total contract expenditures by agency, etc.

Quarterly reports detailing the total quantity of purchases in units and dollars, along with a listing of purchases by agency. Quarterly reports should be delivered to the Purchasing Division via email at purchasing.requisitions@wv.gov.

41. BACKGROUND CHECK: In accordance with W. Va. Code § 15-2D-3, the Director of the Division of Protective Services shall require any service provider whose employees are regularly employed on the grounds or in the buildings of the Capitol complex or who have access to sensitive or critical information to submit to a fingerprint-based state and federal background inquiry through the state repository. The service provider is responsible for any costs associated with the fingerprint-based state and federal background inquiry.

After the contract for such services has been approved, but before any such employees are permitted to be on the grounds or in the buildings of the Capitol complex or have access to sensitive or critical information, the service provider shall submit a list of all persons who will be physically present and working at the Capitol complex to the Director of the Division of Protective Services for purposes of verifying compliance with this provision. The State reserves the right to prohibit a service provider’s employees from accessing sensitive or critical information or to be present at the Capitol complex based upon results addressed from a criminal background check.

Revised 10/01/2019

Service providers should contact the West Virginia Division of Protective Services by phone at (304) 558-9911 for more information.

42. PREFERENCE FOR USE OF DOMESTIC STEEL PRODUCTS: Except when authorized by the Director of the Purchasing Division pursuant to W. Va. Code § 5A-3-56, no contractor may use or supply steel products for a State Contract Project other than those steel products made in the United States. A contractor who uses steel products in violation of this section may be subject to civil penalties pursuant to W. Va. Code § 5A-3-56. As used in this section:

- a. "State Contract Project" means any erection or construction of, or any addition to, alteration of or other improvement to any building or structure, including, but not limited to, roads or highways, or the installation of any heating or cooling or ventilating plants or other equipment, or the supply of and materials for such projects, pursuant to a contract with the State of West Virginia for which bids were solicited on or after June 6, 2001.
- b. "Steel Products" means products rolled, formed, shaped, drawn, extruded, forged, cast, fabricated or otherwise similarly processed, or processed by a combination of two or more or such operations, from steel made by the open hearth, basic oxygen, electric furnace, Bessemer or other steel making process. The Purchasing Division Director may, in writing, authorize the use of foreign steel products if:
- c. The cost for each contract item used does not exceed one tenth of one percent (.1%) of the total contract cost or two thousand five hundred dollars (\$2,500.00), whichever is greater. For the purposes of this section, the cost is the value of the steel product as delivered to the project; or
- d. The Director of the Purchasing Division determines that specified steel materials are not produced in the United States in sufficient quantity or otherwise are not reasonably available to meet contract requirements.

43. PREFERENCE FOR USE OF DOMESTIC ALUMINUM, GLASS, AND STEEL: In Accordance with W. Va. Code § 5-19-1 et seq., and W. Va. CSR § 148-10-1 et seq., for every contract or subcontract, subject to the limitations contained herein, for the construction, reconstruction, alteration, repair, improvement or maintenance of public works or for the purchase of any item of machinery or equipment to be used at sites of public works, only domestic aluminum, glass or steel products shall be supplied unless the spending officer determines, in writing, after the receipt of offers or bids, (1) that the cost of domestic aluminum, glass or steel products is unreasonable or inconsistent with the public interest of the State of West Virginia, (2) that domestic aluminum, glass or steel products are not produced in sufficient quantities to meet the contract requirements, or (3) the available domestic aluminum, glass, or steel do not meet the contract specifications. This provision only applies to public works contracts awarded in an amount more than fifty thousand dollars (\$50,000) or public works contracts that require more than ten thousand pounds of steel products.

The cost of domestic aluminum, glass, or steel products may be unreasonable if the cost is more than twenty percent (20%) of the bid or offered price for foreign made aluminum, glass, or steel products. If the domestic aluminum, glass or steel products to be supplied or produced in a

“substantial labor surplus area”, as defined by the United States Department of Labor, the cost of domestic aluminum, glass, or steel products may be unreasonable if the cost is more than thirty percent (30%) of the bid or offered price for foreign made aluminum, glass, or steel products. This preference shall be applied to an item of machinery or equipment, as indicated above, when the item is a single unit of equipment or machinery manufactured primarily of aluminum, glass or steel, is part of a public works contract and has the sole purpose or of being a permanent part of a single public works project. This provision does not apply to equipment or machinery purchased by a spending unit for use by that spending unit and not as part of a single public works project.

All bids and offers including domestic aluminum, glass or steel products that exceed bid or offer prices including foreign aluminum, glass or steel products after application of the preferences provided in this provision may be reduced to a price equal to or lower than the lowest bid or offer price for foreign aluminum, glass or steel products plus the applicable preference. If the reduced bid or offer prices are made in writing and supersede the prior bid or offer prices, all bids or offers, including the reduced bid or offer prices, will be reevaluated in accordance with this rule.

44. INTERESTED PARTY SUPPLEMENTAL DISCLOSURE: W. Va. Code § 6D-1-2 requires that for contracts with an actual or estimated value of at least \$1 million, the vendor must submit to the Agency a supplemental disclosure of interested parties reflecting any new or differing interested parties to the contract, which were not included in the original pre-award interested party disclosure, within 30 days following the completion or termination of the contract. A copy of that form is included with this solicitation or can be obtained from the WV Ethics Commission. This requirement does not apply to publicly traded companies listed on a national or international stock exchange. A more detailed definition of interested parties can be obtained from the form referenced above.

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.

Bill Harland, Vice President of Marketing

 (Name, Title)
 Electronics Research, Inc.

 (Printed Name and Title)
 7777 Gardner Road, Chandler, IN 47610

 (Address)
 +1 (812) 925-6000 / +1 (812) 925-4030

 (Phone Number) / (Fax Number)
 bharland@eriinc.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.

Electronics Research, Inc.

 (Company)


 (Authorized Signature) (Representative Name, Title)
 William A. Harland, Vice President of Marketing

 (Printed Name and Title of Authorized Representative)
 December 9, 2019

 (Date)
 +1 (812) 925-6000 / +1 (812) 925-4030

 (Phone Number) (Fax Number)

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: CRFQ 0439 EBA2000000014

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)

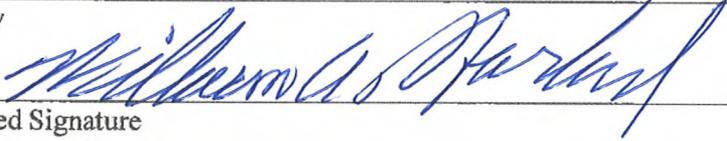
- | | |
|--|--|
| <input checked="" type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6 |
| <input checked="" type="checkbox"/> Addendum No. 2 | <input type="checkbox"/> Addendum No. 7 |
| <input type="checkbox"/> Addendum No. 3 | <input type="checkbox"/> Addendum No. 8 |
| <input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

Electronics Research, Inc.

Company

Authorized Signature



December 9, 2019

Date

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

SPECIFICATIONS

1. **PURPOSE AND SCOPE:** The West Virginia Purchasing Division is soliciting bids on behalf of the West Virginia Educational Broadcasting Authority (EBA) to establish a contract for the one-time purchase of a Medium Power FM Antenna.
2. **DEFINITIONS:** The terms listed below shall have the meanings assigned to them below. Additional definitions can be found in section 2 of the General Terms and Conditions.
 - 2.1 **Contract Item:** means a Medium Power FM Transmit Antenna as more fully described by these specifications.
 - 2.2 **Circular Polarization:** An antenna is said to be vertically polarized (linear) when its electric field is perpendicular to the Earth's surface. If the axial ratio is near 0 dB (decibel), the antenna is said to be circular polarized. If the axial ratio is greater than 1-2 dB, the polarization is often referred to as elliptical.
 - 2.3 **“First Off” Configuration:** A “first-off” configuration is when a connector installed by the factory, and the cable is spooled so that the connector is the first thing (first-off) coming off of the spool to fly up the tower for an antenna connection.
 - 2.4 **Horizontal Azimuth Pattern:** horizontal angle radiation measured clockwise from any fixed reference plane or easily established base direction line.
 - 2.5 **Pricing Page:** means the page(s), contained in wvOASIS or attached as Exhibit A, upon which Vendor should list its proposed price for the Contract Items.
 - 2.6 **Radome:** a dome or other structure protecting radar equipment and made from material transparent to radio waves, especially one on the outer surface of an aircraft.
 - 2.7 **Solicitation:** means the official notice of an opportunity to supply the State with goods or services that is published by the Purchasing Division.
- 3 **GENERAL REQUIREMENTS:**
 - 3.1 **Mandatory Contract Item Requirements:** Contract Item must meet or exceed the mandatory requirements listed below.
 - 3.1.1 **Medium Power FM Broadcast Antenna**
 - 3.1.1.1 **Mechanical Specifications**
 - 3.1.1.1.1 All structural elements shall be designed and fabricated in accordance with TIA/EIA standard RS-222G, Structural

Standards for Steel Antenna, Towers, and Supporting structures.

Download available here: https://kupdf.net/download/ansi-tia-eia-222-g_58b5025c6454a7c247b1e922_pdf. A building markup (**Exhibit B**) is attached to facilitate this.

3.1.1.1.2 All hardware shall be constructed of non-ferrous material or be galvanized:

3.1.1.1.2.1 Steel elements shall be hotdip galvanized in accordance with the ASTM A123 standard available here:

<https://www.astm.org/Standards/A123.htm>

3.1.1.1.2.2 Zinc coating shall be applied with a minimum thickness of 0.002 inches (0.5mm)

3.1.1.1.3 Physical Antenna attributes:

3.1.1.1.3.1 Antenna will be affixed to a Stainless G5 tower at approximately 340 feet elevation. Awarded Vendor **WILL NOT** be required to attach the antenna to the tower. Agency will make separate arrangements for this.

3.1.1.1.3.2 See **Exhibit B** for drawings

3.1.1.1.3.3 Radiating elements shall be protected from ice by being enclosed in a Radome

3.1.1.1.3.4 Vendor shall provide mechanical interface between tower and antenna

3.1.1.2 Electrical specifications:

3.1.1.2.1 Antenna system (Antenna, transmission line, and connectors) shall provide enough gain to achieve 14KW ERP with 5 KW TPO

3.1.1.2.1.1 Antenna being replaced is an RCA BFC-6 antenna (6 Bays with radomes)

3.1.1.2.2 Polarization shall be Circular

3.1.1.2.3 The Horizontal Azimuth Pattern shall meet the following parameters:

AZIMUTH	RELATIVE FIELD	AZIMUTH	RELATIVE FIELD
N000°E	1.000	N180°E	1.000
N010°E	1.000	N190°E	0.885
N020°E	1.000	N200°E	0.830
N030°E	1.000	N210°E	1.000
N040°E	1.000	N220°E	1.000
N050°E	1.000	N230°E	1.000
N060°E	1.000	N240°E	0.931
N070°E	1.000	N250°E	0.829
N080°E	1.000	N260°E	0.949
N090°E	1.000	N270°E	1.000
N100°E	1.000	N280°E	1.000
N110°E	1.000	N290°E	1.000
N120°E	1.000	N300°E	0.826
N130°E	1.000	N310°E	0.860
N140°E	1.000	N320°E	1.000
N150°E	1.000	N330°E	1.000
N160°E	1.000	N340°E	1.000
N170°E	1.000	N350°E	1.000

3.1.1.2.3.1 Vendor shall provide pattern certification upon delivery to the Agency.

3.1.1.3 Transmission Line and Accessories:

3.1.1.3.1 Vendor shall provide 3 1/8" 50 Ohm transmission line

3.1.1.3.2 Vendor will provide 450 feet of transmission line

3.1.1.3.3 Transmission line shall be pressurized

3.1.1.3.4 Transmission line shall have the antenna connector factory installed and delivered in a "first off" configuration

3.1.1.3.5 Vendor shall provide all Transmission Line components for complete installation. Components shall include but not be limited to: Hangers, hoisting adapters, Elbows, Field terminated line sections, and pressure windows.

4. CONTRACT AWARD:

4.1 Contract Award: The Contract is intended to provide Agencies with a purchase price for the Contract Items. The Contract shall be awarded to the Vendor that

provides the Contract Items meeting the required specifications for the lowest overall total cost as shown on the Pricing Page.

4.2 Pricing Page: Vendor should complete the Pricing Page (Exhibit A) by filling the table with the appropriate information. Vendor should complete the Pricing Page in full as failure to complete the Pricing Page in its entirety may result in Vendor's bid being disqualified.

4.2.1 Vendor should complete the Pricing Page (Exhibit A) by listing a Unit Cost for each Contract Item, multiplying this unit cost by the given quantity, and listing the result as a Total Item Cost for each Contract Item. Vendor should then enter a sum of all Total Item Costs in the Total Bid Cost field.

4.2.2 Vendor must include additional documentation for all equipment and components to sufficiently demonstrate that all equipment and components meet specifications. Vendor should include this documentation with their bid.

Vendor should type or electronically enter the information into the Pricing Page to prevent errors in the evaluation.

5. PAYMENT:

5.1 Payment: Vendor shall accept payment in accordance with the payment procedures of the State of West Virginia.

6. DELIVERY AND RETURN:

6.1 Shipment and Delivery: Vendor shall deliver the Contract Items within (120) calendar days of being awarded this Contract and receiving a purchase order or notice to proceed.

Contract Items must be delivered to Agency at the following address:

WV Educational Broadcasting Authority
Attn: Tom Belcher
#153
Layland, WV 25976
Lat: 37.895488°
Long: -80.989547°

Vendor must give the Agency a minimum notice of (10) business days prior to the arrival of the Contract Items on site to permit preparation for off-loading.

- 6.2 Late Delivery:** The Agency placing the order under this Contract must be notified in writing if the shipment of the Contract Items will be delayed for any reason. Any delay in delivery that could cause harm to an Agency will be grounds for cancellation of the Contract, and/or obtaining the Contract Items from a third party.

Any Agency seeking to obtain the Contract Items from a third party under this provision must first obtain approval of the Purchasing Division.

- 6.3 Delivery Payment/Risk of Loss:** Vendor shall deliver the Contract Items F.O.B. destination to the Agency's location.
- 6.4 Return of Unacceptable Items:** If the Agency deems the Contract Items to be unacceptable, the Contract Items shall be returned to Vendor at Vendor's expense and with no restocking charge. Vendor shall either make arrangements for the return within five (5) days of being notified that items are unacceptable or permit the Agency to arrange for the return and reimburse Agency for delivery expenses. If the original packaging cannot be utilized for the return, Vendor will supply the Agency with appropriate return packaging upon request. All returns of unacceptable items shall be F.O.B. the Agency's location. The returned product shall either be replaced, or the Agency shall receive a full credit or refund for the purchase price, at the Agency's discretion.
- 6.5 Return Due to Agency Error:** Items ordered in error by the Agency will be returned for credit within 30 days of receipt, F.O.B. Vendor's location. Vendor shall not charge a restocking fee if returned products are in a resalable condition. Items shall be deemed to be in a resalable condition if they are unused and in the original packaging. Any restocking fee for items not in a resalable condition shall be the lower of the Vendor's customary restocking fee or 5% of the total invoiced value of the returned items.

7 VENDOR DEFAULT:

7.1 The following shall be considered a vendor default under this Contract.

- 7.1.1** Failure to provide Contract Items in accordance with the requirements contained herein.
- 7.1.2** Failure to comply with other specifications and requirements contained herein.
- 7.1.3** Failure to comply with any laws, rules, and ordinances applicable to the Contract Services provided under this Contract.
- 7.1.4** Failure to remedy deficient performance upon request.

7.2 The following remedies shall be available to Agency upon default.

7.2.1 Immediate cancellation of the Contract.

7.2.2 Immediate cancellation of one or more release orders issued under this Contract.

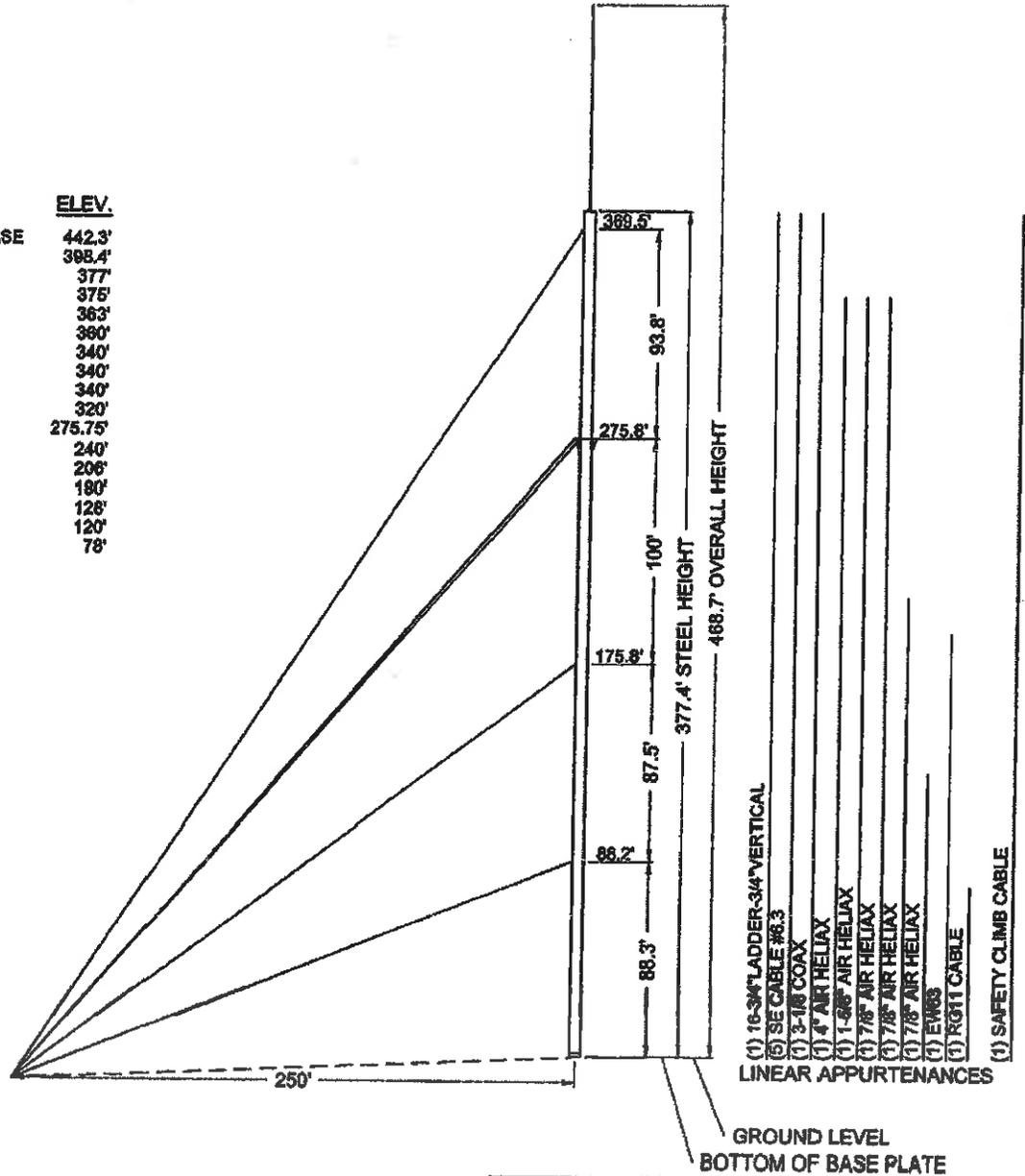
7.2.3 Any other remedies available in law or equity.

REQUEST FOR QUOTATION, RFQ# EBAr68287
 Medium-Power UHF Television Transmit Antenna

Exhibit B

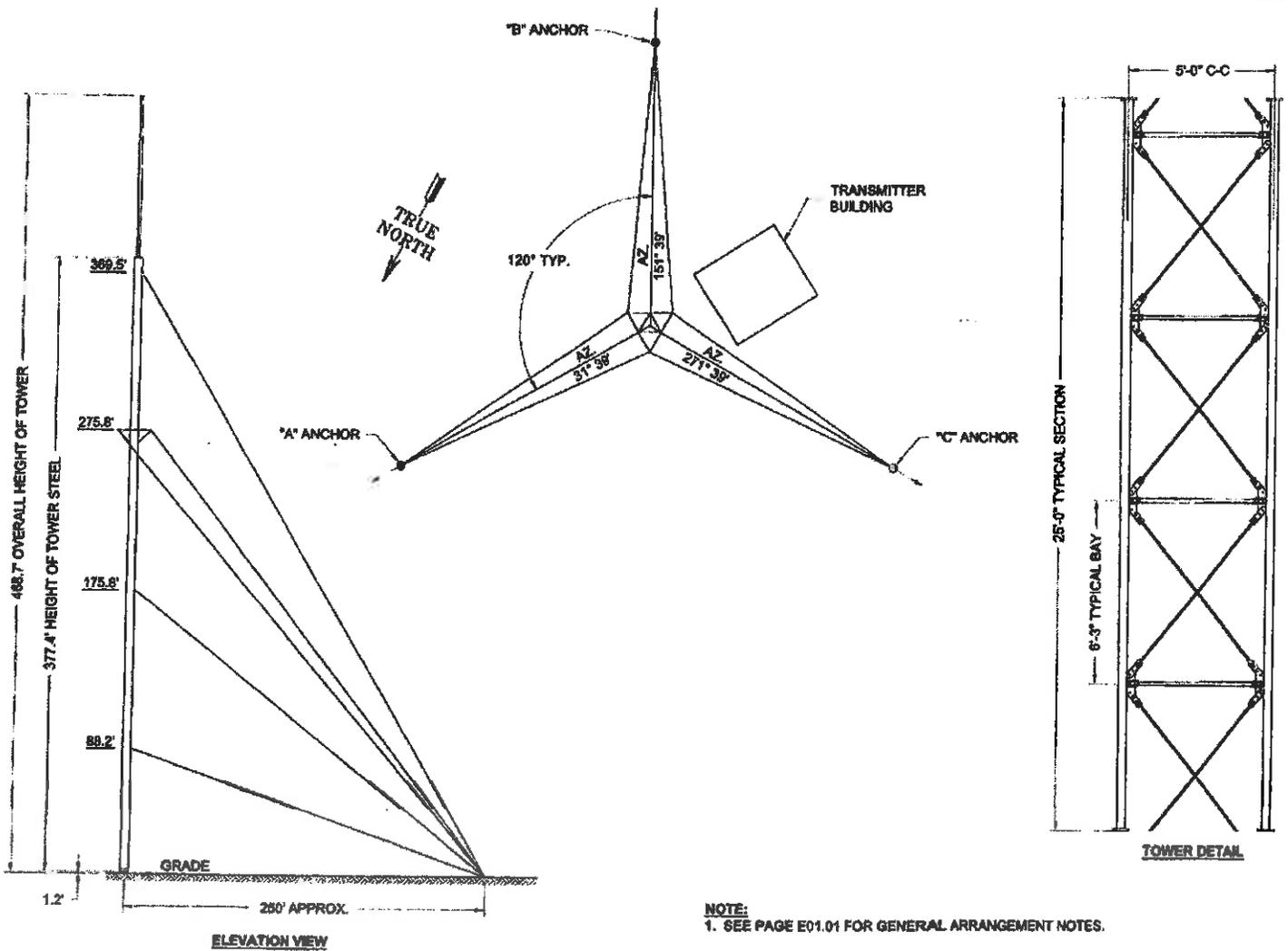
DISCRETE APPURTENANCES

		<u>ELEV.</u>	
1.	1	THV-6A10-R 3C140W/BIRDCASE	442.3'
2.	1	POLE FOR TOP ANT & MISC	398.4'
3.	1	TOWER TOP	377'
4.	1	UN-USED MOUNT	375'
5.	1	TRANSFER PLATFORM	363'
6.	1	OBSTRUCTION LIGHTS	360'
7.	1	BFC-6FM ANTENNA	340'
8.	1	PSIVLP401C-10 ANTENNA	340'
9.	1	SHIVELY 2-BAY 6812B	340'
10.	1	UN-USED MOUNT	320'
11.	1	TORQUE TRIANGLE	275.75'
12.	1	BEACON	240'
13.	1	(1)6" DIA. DISH-RADOME	206'
14.	1	(1)6" DIA. DISH-RADOME	180'
15.	1	(1)6" DIA. DISH (2700 MHZ)	128'
16.	1	OBSTRUCTION LIGHTS	120'
17.	1	3' GRID DISH	78'



TOWER TYPE: G-50
 STD: TIA/EIA-222-F

Exhibit B



REQUEST FOR QUOTATION, RFQ# EBAr68287
Medium-Power UHF Television Transmit Antenna

Exhibit A
Pricing Page*

Item#	Description	Quan	Unit Cost	Total Item Cost
1	Directional FM Medium-Power UHF Television Transmit Antenna as described in section 3.1.1	1	\$ 439,670.16	\$ 439,670.16
	Total Bid Amount			\$ 439,670.16

*Per section 4.2.3 Vendor must also provide documentation for the equipment quoted sufficient for the Agency to determine whether the quoted equipment meets specifications. Vendor should provide this documentation with their initial bid.

Authorized Signature:



Date:

December 9, 2019

West Virginia Ethics Commission



Disclosure of Interested Parties to Contracts

Pursuant to *W. Va. Code* § 6D-1-2, a state agency may not enter into a contract, or a series of related contracts, that has/have an actual or estimated value of \$1 million or more until the business entity submits to the contracting state agency a Disclosure of Interested Parties to the applicable contract. In addition, the business entity awarded a contract is obligated to submit a supplemental Disclosure of Interested Parties reflecting any new or differing interested parties to the contract within 30 days following the completion or termination of the applicable contract.

For purposes of complying with these requirements, the following definitions apply:

"Business entity" means any entity recognized by law through which business is conducted, including a sole proprietorship, partnership or corporation, but does not include publicly traded companies listed on a national or international stock exchange.

"Interested party" or "Interested parties" means:

- (1) A business entity performing work or service pursuant to, or in furtherance of, the applicable contract, including specifically sub-contractors;
- (2) the person(s) who have an ownership interest equal to or greater than 25% in the business entity performing work or service pursuant to, or in furtherance of, the applicable contract. (This subdivision does not apply to a publicly traded company); and
- (3) the person or business entity, if any, that served as a compensated broker or intermediary to actively facilitate the applicable contract or negotiated the terms of the applicable contract with the state agency. (This subdivision does not apply to persons or business entities performing legal services related to the negotiation or drafting of the applicable contract.)

"State agency" means a board, commission, office, department or other agency in the executive, judicial or legislative branch of state government, including publicly funded institutions of higher education: Provided, that for purposes of *W. Va. Code* § 6D-1-2, the West Virginia Investment Management Board shall not be deemed a state agency nor subject to the requirements of that provision.

The contracting business entity must complete this form and submit it to the contracting state agency prior to contract award and to complete another form within 30 days of contract completion or termination.

This form was created by the State of West Virginia Ethics Commission, 210 Brooks Street, Suite 300, Charleston, WV 25301-1804. Telephone: (304)558-0664; fax: (304)558-2169; e-mail: ethics@wv.gov; website: www.ethics.wv.gov.

West Virginia Ethics Commission Disclosure of Interested Parties to Contracts

(Required by *W. Va. Code* § 6D-1-2)

Name of Contracting Business Entity: _____ Address: _____

Name of Authorized Agent: _____ Address: _____

Contract Number: _____ Contract Description: _____

Governmental agency awarding contract: _____

Check here if this is a Supplemental Disclosure

List the Names of Interested Parties to the contract which are known or reasonably anticipated by the contracting business entity for each category below (*attach additional pages if necessary*):

1. Subcontractors or other entities performing work or service under the Contract

Check here if none, otherwise list entity/individual names below.

2. Any person or entity who owns 25% or more of contracting entity (not applicable to publicly traded entities)

Check here if none, otherwise list entity/individual names below.

3. Any person or entity that facilitated, or negotiated the terms of, the applicable contract (excluding legal services related to the negotiation or drafting of the applicable contract)

Check here if none, otherwise list entity/individual names below.

Signature: _____

Date Signed: _____

Notary Verification

State of _____, County of _____

I, _____, the authorized agent of the contracting business entity listed above, being duly sworn, acknowledge that the Disclosure herein is being made under oath and under the penalty of perjury.

Taken, sworn to and subscribed before me this _____ day of _____, _____.

Notary Public's Signature

To be completed by State Agency:

Date Received by State Agency: _____

Date submitted to Ethics Commission: _____

Governmental agency submitting Disclosure: _____

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: Electronics Research, Inc.

Authorized Signature: *William G. Wood* Date: December 3, 2019

State of Indiana

County of Warrick, to-wit:

Taken, subscribed, and sworn to before me this 3rd day of December, 2019.

My Commission expires September 17, 2022.

AFFIX SEAL HERE



NOTARY PUBLIC

Cindy D. Tomes



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

State of West Virginia
 Request for Quotation
 04 – Audio/Video

Proc Folder: 651935

Doc Description: Addendum No.01; MEDIUM POWER FM ANTENNA

Proc Type: Central Purchase Order

Date Issued	Solicitation Closes	Solicitation No	Version
2019-11-25	2019-12-10 13:30:00	CRFQ 0439 EBA2000000014	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:

FOR INFORMATION CONTACT THE BUYER
 Guy Nisbet
 (304) 558-2596
 guy.l.nisbet@wv.gov

Signature X FEIN # DATE

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

ADDITIONAL INFORMATION:

Addendum

Addendum No.01 issued to publish and distribute the attached information to the vendor community.

Centralized Request for Quotation
(Medium - Power FM Antenna)

The West Virginia Purchasing Division is soliciting bids for the agency, The West Virginia Educational Broadcasting Authority (EBA) from qualified vendors to establish a one-time contract for the purchase of a "Medium-Power" FM Antenna, per the terms and conditions, specifications that are apart of this solicitation and attached hereto.

INVOICE TO		SHIP TO	
CHIEF FINANCIAL OFFICER EDUCATIONAL BROADCASTING 124 INDUSTRIAL PARK RD		SITE MANAGER EDUCATIONAL BROADCASTING WNPB-TV 191 SCOTT AVE	
BEAVER	WV25813	MORGANTOWN	WV 26505
US		US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
1	Medium POWER UHF TV TRANSMIT ANTENNA	1.00000	EA		

Comm Code	Manufacturer	Specification	Model #
43221703			

Extended Description :

Medium POWER UHF TV TRANSMIT ANTENNA

SOLICITATION NUMBER: CRFQ 0439 EBA20000000014

Addendum Number: No.01

The purpose of this addendum is to modify the solicitation identified as (“Solicitation”) to reflect the change(s) identified and described below.

Applicable Addendum Category:

- | Modify bid opening date and time
- | Modify specifications of product or service being sought
- | Attachment of vendor questions and responses
- | Attachment of pre-bid sign-in sheet
- | Correction of error
- | Other

Description of Modification to Solicitation:

Addendum issued to publish and distribute the attached documentation to the vendor community.

1. Vendor submitted Question and Agency response.

No other Changes.

Additional Documentation: Documentation related to this Addendum (if any) has been included herewith as Attachment A and is specifically incorporated herein by reference.

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in full force and effect.
2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by completing an Addendum Acknowledgment, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

ATTACHMENT A

**CRFQ EBA2000000014
Medium Power UHF TV Antenna**

**Vendor submitted Questions and Agency Responses
11/25/2019**

Q.1. The solicitation is entitled Medium power UHF Antenna, however the specifications (and elsewhere) refer to an FM Antenna, please clarify.

A.1. Our apologies for the confusion. This should read “Medium Power FM Antenna”. The exact ratings are in the specifications.

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 type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6 |
| <input 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.

Company

Authorized Signature

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
04 -- Audio/Video

Proc Folder: 651935

Doc Description: Addendum No.02; MEDIUM POWER FM ANTENNA

Proc Type: Central Purchase Order

Date Issued	Solicitation Closes	Solicitation No	Version
2019-12-02	2019-12-10 13:30:00	CRFQ 0439 EBA2000000014	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:

FOR INFORMATION CONTACT THE BUYER

Guy Nisbet
 (304) 558-2596
 guy.l.nisbet@wv.gov

Signature X

FEIN #

DATE

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

ADDITIONAL INFORMATION:

Addendum

Addendum No.02 issued to publish and distribute the attached information to the vendor community.

**Centralized Request for Quotation
(Medium - Power FM Antenna)**

The West Virginia Purchasing Division is soliciting bids for the agency, The West Virginia Educational Broadcasting Authority (EBA) from qualified vendors to establish a one-time contract for the purchase of a "Medium-Power" FM Antenna, per the terms and conditions, specifications that are apart of this solicitation and attached hereto.

INVOICE TO		SHIP TO	
CHIEF FINANCIAL OFFICER EDUCATIONAL BROADCASTING 124 INDUSTRIAL PARK RD		SITE MANAGER EDUCATIONAL BROADCASTING WNPB-TV	
BEAVER	WV25813	191 SCOTT AVE	
		MORGANTOWN	WV 26505
US		US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
1	Medium POWER FM ANTENNA	1.00000	EA		

Comm Code	Manufacturer	Specification	Model #
43221703			

Extended Description :

Medium POWER UHF TV TRANSMIT ANTENNA

SOLICITATION NUMBER: CRFQ 0439 EBA2000000014

Addendum Number:

No.02

The purpose of this addendum is to modify the solicitation identified as ("Solicitation") to reflect the change(s) identified and described below.

Applicable Addendum Category:

- | Modify bid opening date and time
- | Modify specifications of product or service being sought
- | Attachment of vendor questions and responses
- | Attachment of pre-bid sign-in sheet
- | Correction of error
- | Other

Description of Modification to Solicitation:

Addendum issued to publish and distribute the attached documentation to the vendor community.

1. Vendor submitted Question and Agency response.

No other Changes.

Additional Documentation: Documentation related to this Addendum (if any) has been included herewith as Attachment A and is specifically incorporated herein by reference.

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in full force and effect.
2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by completing an Addendum Acknowledgment, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

ATTACHMENT A

**CRFQ EBA2000000014
Medium Power UHF TV Antenna**

**Vendor submitted Questions and Agency Responses
12/02/2019**

Q.1. Is this antenna going to be for a Radio Station or TV Station?

A.1. Radio station.

Q.2. What is the exact operating frequency?

A.2. 91.7 megahertz. The station is WVBY.

Q.3. While the main bid description states "Medium Power FR Antenna", why is it that most of the other parts of the bid still state Medium-Power UHF Television Transmit Antenna?

A.3. Our apologies for the confusion. This should read "Medium Power FM Antenna". The exact ratings are in the specifications.

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.

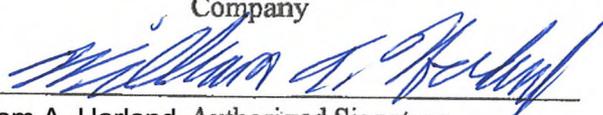
Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

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.

Electronics Research, Inc.

 Company


 William A. Harland Authorized Signature

 December 9, 2019

 Date

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

ERI Cost Proposal

Submitted to:

State of West Virginia
Dept of Administration, Purchasing Division
124 Industrial Park Road
Beaver, WV 25813

Attn: Mr. Guy Nisbet

by:

Electronics Research, Inc.

Carl Davis
Eastern Region Sales Manager-Radio

Phone: 919-368-1277

cdavis@eriinc.com

This document includes pages 52 of **Error! Bookmark not defined.** and is governed by the terms and conditions contained herein. Upon customer acceptance, order is subject to final review and written acceptance by ERI at our main business office. Unless otherwise stated in the body of this quotation, freight charges are not included and will be added to the final invoice. Also, unless listed separately in the body of this quotation, prices do not include any state, local, or other taxes or duties.

Proposal Number: 20191109-292

Purchaser's Acceptance:

Date: December 10, 2019
Valid Through: January 30, 2020
FOB Destination
Reference: CRFQ 0439 EBA2000000014 WVBY (FM)
Directional FM Antenna

Please accept our order for the products and services contained in this proposal.

Signature: _____

Payment Terms: Net 30 days

Name: _____

Please **complete** the Purchaser's Acceptance block, **scan** this document along with your deposit check and **e-mail** to: peggy@eriinc.com or **FAX** to: 812-925-4030. Please **remit** down payment to the address below, attn: Accounts Receivable.

Title: _____

P.O. Number: _____



Item	Qty	Part #	Description	Unit Price	Extended
001	1	1183-6CP-DA	<p>FM System Proposal Request</p> <p>ERI 1183-6CP-DA Series Directional FM Panel Antenna</p> <p>Call Letters: WVBV Operating Frequency: 91.7 MHz City of License: Beckley State: WV Number of Levels: 6 Number of Panels Per Level: 3 Bay Spacing: Full Wavelength Polarization: Circular Directors: 36 (for additional directors, add \$200.00 each) Input Flange: 3-1/8 Inch EIA, female Maximum Input Power: 30 kW</p> <p>Antenna Includes: Power dividers and cabling. Mounting brackets for 60" face (uniform cross section) tower Pattern development and proof of performance on ERI's full scale test range. Two (2) days of range time (additional days will be invoiced for at the rate of \$2,646.00 per day)</p>	369,188.00	369,188.00
002	18	RAD-1180	1180 Radomes per level per element	2,275.00	40,950.00
003	460	HJ8-50B	<p>HELIAX standard air dielectric coaxial cable, 3-inch, 50 ohm (wideband from 0.5-1640 MHz).</p> <p>Price shown is per foot Vertical Run: 340 (feet) Horizontal Run: 120 (feet)</p>	47.23	21,725.80
004	1	H8FB-302-S-SP	<p>3-1/8 inch EIA Female Flange with gas barrier for 3-inch air HELIAX (HJ8-series). Attached first off reel. Modified to gas pass. Gas pass version created by drilling out the PTFE dielectric per installation instructions. Male version can be created ordering BN-918710 coupling element separately. When ordering connector attached at factory order ATTACH-AC4 separately.</p>	796.01	796.01
005	1	ATTACH-AC4	Factory attachment charge for HJ8-50B connectors.	90.00	90.00
006	1	BN-918710	3-1/8 inch EIA Coupling Element (inner connector), O-Ring, and screw-set. To modify 3-1/8-inch Air HELIAX connectors to male.	67.34	67.34



Item	Qty	Part #	Description	Unit Price	Extended
007	1	H8FB-302-S-LB	3-1/8 inch EIA Female Flange with gas barrier for 3-inch air HELIAX (HJ8-series). Shipped loose (not attached to cable). Gas pass version created by drilling out the PTFE dielectric per installation instructions. Male version can be created ordering BN-918710 coupling element separately.	796.01	796.01
008	1	BN-918710	3-1/8 inch EIA Coupling Element (inner connector), O-Ring, and screw-set. To modify 3-1/8-inch Air HELIAX connectors to male.	67.34	67.34
009	2	26985A	Hoisting Grip for 3-inch coaxial cable and EW28 and EW34 elliptical waveguides	86.01	172.02
010	2	HGK0001	Hoisting grip hanger kit to attach HELIAX hoisting grips to tower. Includes 18-inches of chain, 12-inch x 12-inch turnbuckle, and two shackles. One required for each hoisting grip and one hoisting grip required for each 200-feet of vertical run.	150.00	300.00
011	5	223700-724	Grounding kit, qty. 1, 60-inch cable with 2-hole field attachable crimp-on lug for 2-1/4-inch and 3-inch coaxial and EW28, EW34, and EW37	41.25	206.25
012	12	31766A-11	Standard hangers, kit of 10, for 3-inch coaxial cable and EW28 HELIAX waveguide Attachment hardware not included. Use 3/8-inch hardware kit (3/4-inch long) such as Commscope p/n 31769-5 or ERI p/n HWK0005, or use 3/8-inch hardware kit (1 inch long) such as Commscope p/n 31769-1 or ERI p/n HWK0001.	108.90	1,306.80
013	1	31769-5	3/8-inch hardware, kit of 10, with 3/4-inch fillister-head bolts, lock washers and nuts.	12.06	12.06
014	1	40394-2	Wall/Roof Feed Thru, Single Entrance, for 3-inch cable	175.00	175.00
015	2	31768A	Angle adapter qty 10 for all waveguides and coaxial cables 1/2-inch to 4-inch	71.01	142.02
016	11	HR30848-1	1-inch standoff adapter kit for 3 to 6 inch legs. Kit of 10. Includes hardware to attach non-insulated butterfly hanger. Requires 31670-* round member adapter kit, one per kit.	155.00	1,705.00



Item	Qty	Part #	Description	Unit Price	Extended
017	22	31670-4E	Round member adapter for 4 to 5-inch round members. Kit of 10. Stainless steel clamps to mount 1/2 to 4-inch cable hangers to round support members. Two each are required for 3 and 4-inch cable hangers.	26.86	590.92
018	1	MT050C	DryLine® Dehydrator, 115/240 VAC 50/60 Hz High Humidity, 10.6 CFH (300 l/h). 60.0 ft3 (1699 L) maximum system capacity. Low Pressure, Mains Power Failure, and Excessive Run alarms. Includes European (stripped leads) and US power cord. Includes four (4) output ports. Includes four (4) 1/8-inch NPT Straight Connector for 3/8" PE Tubing, four (4) Right Angle Male/Female 1/8-inch NPT Fitting, four (4) #10-32 Screws (For standard rack installation), one (1) roll of PTFE Tape and 100 feet (30.5 m) 3/8-inch OD PE Tubing.	2,500.00	2,500.00
019	1	RST-001	<p>FM Antenna Tune ERI Factory Field Technician.</p> <p>One (1) ERI Technician to field match FM antenna after installation. Price includes travel, local living expense, and daily field service rate for one (1) day on site.</p> <p>ERI Field service price includes a single (per project) mobilization and indicated number of days on site, for one person. Additional days if required will be charged for at the rate of \$1,800.00 per day.</p> <p>Price includes test equipment usage and tuning slugs.</p> <p>Field service prices are net to ERI and not discountable.</p> <p>Customer to provide tower crew to assist antenna field matching.</p> <p>Price valid for the location within the contiguous forty-eight (48) United States only. Contact ERI for pricing in other locations.</p>	6,250.00	6,250.00

Total Price	\$447,040.57
Net Package Price	\$433,815.27
Material Freight	\$5,854.89
Grand Total	\$439,670.16

7777 Gardner Road
Chandler, IN 47610-9219
USA

+1 812 925-6000 (tel)
+1 812 925-4030 (fax)
877 ERI-LINE (toll-free)

Sales@eriinc.com
CustomerSupport@eriinc.com
www.eriinc.com



Purchaser Information Page

Mail to Address:

Name: Chief Financial Officer
Company: WV Educational Broadcasting Authority

Address: 124 Industrial Park Road
City, ST, ZIP: Beaver, WV, 25813
Country:
Phone:
FAX:
E-Mail:

Submit to Address:

Name: Guy Nisbet
Company: Dept of Administration, Purchasing
Company 2: Division
State of West Virginia

Address: 2019 Washington Street E
City, ST, ZIP: Charleston, WV, 25305
Country:
Phone: +1 (304) 558-2596
FAX:
E-Mail: guy.i.nisbet@wv.gov

Ship Via:

ERI selected method, unless otherwise specified.

Ship to Address:

Name: Tom Belcher
Company: WVBY (FM)/WSWP-TV Transmitter Site
Company 2: WV Educational Broadcasting Authority

Address: #153 State Route 41/12
City, ST, ZIP: Layland, WV, 25976
Country:
Phone:
FAX:
E-Mail:

Consultant Address:

Name:
Company:

Address:
City, ST, ZIP:
Country:
Phone:
FAX:
E-Mail:

Special Shipping Method:

ERI designated trucks. Fuel surcharge may apply at time of shipment. (BE)

Final CP Received? Yes

Comments:



1. Applicable to All Orders

1.1 Acceptance of Proposal: When the Proposal is signed by Buyer, returned to Electronics Research, Inc. (hereinafter called "ERI"), and accepted by ERI at its offices in Chandler, Indiana, USA, the Proposal shall become a binding agreement for the purchase by buyer from ERI of the Products and/or Services described therein, upon the terms specified, including these Terms and Conditions of Sale, attached to the Proposal. Refundable deposits are charged for some skids and large size cable reels. All orders are subject to a minimum charge of \$50.00 net.

1.2 Acknowledgement of Terms: By signing the Proposal, Buyer represents and acknowledges that it has fully read, understands, and accepts the terms of the Proposal, including these "Terms and Conditions of Sale" included therein, that the Proposal contains the complete and final agreement of Buyer and ERI with respect to the Products and/or Services described therein; that all other agreements, representations, and warranties, whether oral or in writing, made prior to or at the time of the signing of the Proposal, are merged and replaced therein; and that no change or addition to the Proposal shall be valid and enforceable unless made in writing and signed by an authorized representative of ERI.

1.3 Buyer's Terms and Conditions: ERI desires to provide its customers with prompt and efficient service. However, to negotiate individually the terms and conditions of each sales contract would substantially impair ERI's ability to provide such service. Accordingly, Products and Services furnished by ERI are sold only on the terms and conditions stated herein, any terms or conditions on Buyer's order to the contrary notwithstanding. ERI's performance of any contract is expressly made conditional on Buyer's agreement to ERI's Terms and Conditions of Sale unless otherwise specifically agreed to, in writing, by ERI. In the absence of such agreement, commencement of performance and/or delivery shall be for Buyer's convenience only and shall not be deemed or construed to be acceptance of Buyer's terms and conditions. If a contract is not earlier formed by mutual agreement, in writing, acceptance of any Product or Service shall be deemed acceptance of the terms and conditions stated herein. In the case of a conflict between the terms and conditions stated herein and those appearing on the face of this Proposal, the latter shall control. All contracts for the sale of Products and/or Services shall be construed under and governed by the laws of the State of Indiana, the location of ERI's primary manufacturing facilities and its corporate headquarters.

1.4 Conditions of Proposal: ERI's Proposal is subject to the following:

1.4.1 The Buyer warrants that all information supplied by it to ERI for the preparation by ERI of the Proposal, including oral and written correspondence, reports, plans, and specifications are adequate, accurate, workable, and practicable of design, and, if the supplied information is followed, a sufficient and satisfactory result will be achieved. Buyer shall be responsible for all costs incurred by ERI by reason of any inaccurate or incomplete information supplied by Buyer.

1.4.2 Unless otherwise stated in the Proposal, the Buyer is responsible for obtaining any necessary permits and/or approvals (FCC, FAA, local, etc.) needed to install and use the Products included in the Proposal. If the Proposal includes Installation Services, the necessary permits must be obtained prior to mobilization.

1.4.3 UNLESS OTHERWISE SPECIFIED, IN WRITING, ALL PROPOSALS ARE FIRM FOR, AND EXPIRE, THIRTY (30) DAYS AFTER DATE THEREOF AND CONSTITUTE OFFERS, provided, however, that budgetary Proposals and estimates are for preliminary information only and shall neither constitute offers, nor impose any responsibility or liability upon ERI.

1.4.4 Unless otherwise stated in writing by ERI in the Proposal, all prices in a Proposal shall be exclusive of transportation, insurance, taxes (including, without limitation, any sales, use or similar tax, and any tax levied on or assessed to ERI after Product delivery by reason of ERI's security interest in Products), license fees, customs fees, duties and other charges related thereto, and Buyer shall report and pay any and all such shipping charges, premiums, taxes, fees, duties and other charges related thereto, and shall hold ERI harmless there from, provided, however, that if ERI, in its sole discretion, chooses to make any such payment, Buyer shall reimburse ERI in full upon demand.

1.4.5 Stenographical, typographical and clerical errors contained in the Proposal are subject to correction.

1.4.6 Prices set forth in a Proposal are for Products and/or Services only and do not include technical data, proprietary rights of any kind, patent rights, qualification, environmental or other than ERI's standard product performance tests, and other than ERI's normal domestic commercial packaging, unless expressly agreed to in writing by ERI.

1.4.7 Published weights and dimensions are approximate only. Certified dimension drawings can be obtained upon request. Manuals, programs, listings, drawings, or other documentation required hereunder must be referenced specifically.

1.5 Terms of Payment: Unless otherwise stated in the Proposal, payment is due upon delivery. All payments for Products released and shipped on approved credit accounts shall be due in upon receipt of invoice therefore. Past due balances shall be subject to a late charge of 1.8% per month. Partial shipments will be billed as made and payments therefore are subject to the above terms. Payment shall not be withheld for delay in delivery of required documentation unless a separate price is stated therefore, and then only to the extent of the price stated for such undelivered documentation. ERI may cancel or delay delivery of Products in the event Buyer fails to make prompt payment therefore or in the event of an arrearage in Buyer's account with ERI.

1.6 Performance: ERI will make all reasonable effort to observe its dates indicated for delivery or other performance. However, ERI shall not be liable in any way because of any delay in performance hereunder due to acceptance of prior orders; technical difficulties; strike; lockout; riot; war; fire; act of God; accident; failure or breakdown of components necessary to complete an order; subcontractor, supplier or Buyer caused delays; inability to obtain or constrain substantial rises in the price of labor, materials or manufacturing facilities; curtailment of or failure to obtain sufficient electrical or other energy supplies; or compliance with any law, or regulation or order, whether valid or invalid, of any cognizant governmental body or any instrumentality thereof now existing or hereafter created; or due to any unforeseen circumstances or causes beyond ERI's control, provided such delay is neither material nor indefinite. ERI's performance shall be deemed suspended during and extended for such time as it is so delayed, and thereafter Buyer shall accept performance hereunder. Delay in performance shall not be considered material or indefinite unless it exceeds or is reasonably estimated by ERI to exceed a period of six (6) months. ERI reserves the right, in its sole discretion, to allocate inventories and current production and substitute suitable materials when, in its opinion, such allocation or substitution is necessary due to such circumstances or causes in the interest of conservation of scarce materials and efficient utilization of high value parts and components. ERI's products may contain remanufactured parts and components. Such parts and components are covered by the same warranty and are subject to the same high standards of quality control applied to other parts and components. No penalty clause for delay in performance contained in any Buyer-originated documents of any kind shall be effective. As used herein, "performance" shall include, without limitation, fabrication, shipment, delivery, assembly, installation, testing and warranty repair or replacement, as applicable.

1.7 Change Orders: Buyer change orders must be in writing and no change shall be made pursuant to this clause unless agreed to in writing and signed by duly authorized representatives of ERI and Buyer. If any such change causes an increase or decrease in the cost or the time required for the performance of any part of the work, an equitable adjustment shall be made in the contract price and schedule. ERI shall have no obligation to commence any extra or changed work without written agreement as to adjustments to contract price and delivery schedules affected thereby.

1.8 Assignments and Terminations: Any assignment by Buyer of any contract created by the Proposal without the express written consent of ERI is void. No order may be terminated by Buyer except by mutual agreement in writing. Terminations by mutual agreement are subject to the following conditions: (a) Buyer will pay, at applicable contract prices, for all Products which are completely manufactured and allocable to Buyer at the time of ERI's receipt of a request for mutual termination; (b) Buyer will pay all costs, direct and indirect, which have been incurred by ERI with regard to Products which have not been completely manufactured at the time of ERI's receipt of a request for mutual termination, plus a pro rata portion of normal profit on the contract; (c) Buyer will pay a termination charge on all other Products affected by the termination. (d) Orders for standard catalog products may be canceled prior shipment, however any order that has been cut, filled or packaged prior to Seller's receipt of cancellation notice shall be subject to a 20% re-stocking charge. (e) Orders for non-standard products or specially manufactured products may be canceled prior to the start of manufacture provided Buyer reimburses ERI for any actual costs incurred on the order prior to the effective cancellation date. After manufacture commences, orders for non-standard products or specially manufactured products may not be canceled. In the event Buyer terminates such orders, Buyer shall be liable to ERI for termination charges, including, but not limited to, reasonable profits. ERI's normal accounting practices shall be used to determine costs and other charges. To reduce termination charges, ERI will divert completed parts, material or work in process from terminated contracts to other Buyers whenever, in ERI's sole discretion, it is practicable to do so.

1.9 Damage and Liability: ERI'S AGGREGATE LIABILITY IN DAMAGES OR OTHERWISE SHALL NOT EXCEED THE PAYMENT, IF ANY, RECEIVED BY ERI FOR THE UNIT OF PRODUCT OR SERVICE FURNISHED OR TO BE FURNISHED, AS THE CASE MAY BE, WHICH IS THE SUBJECT OF CLAIM OR DISPUTE. IN NO EVENT SHALL ERI BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL, LIQUIDATED, OR SPECIAL DAMAGES, HOWSOEVER CAUSED. Liability to third parties for bodily injury, including death, resulting from ERI's performance shall be determined in accordance with applicable law and shall not be affected by the liability limitations stated above in this paragraph.

1.10 Disputes: All disputes under any contract concerning Products and/or Services not otherwise resolved between ERI and Buyer shall be resolved in a court of competent jurisdiction in the County of Warrick in the State of Indiana or the United States District Court for the Southern District of Indiana, Evansville Division, and in no other place. Provided, that in ERI's sole discretion, such action may be heard in some other place designated by ERI if necessary to acquire jurisdiction over third persons so that the dispute can be resolved in one action. Buyer hereby consents to the jurisdiction of such court or courts and agrees to appear in any such action upon written notice thereof. No action, regardless of form, arising out of, or in any way connected with, the Products or Services furnished by ERI, may be brought by Buyer more than one (1) year after the cause of action has occurred. If any part, provision or clause of these Terms and Conditions of sale, or the application thereof to any person or circumstances, is held invalid, void or unenforceable, such holding shall not affect and shall leave valid all other parts, provisions, clauses or applications of these Terms and Conditions remaining, and to this end these Terms and Conditions shall be treated as severable.

1.11 General Conditions:

1.11.1 No delay or failure on the part of ERI in exercising any right or remedy under any contract resulting from, and/or partial or single exercise thereof, shall constitute a waiver of such right or any other remedy. ERI's rights and remedies under any contract resulting here from are cumulative and not alternative.

1.11.2 If any term of any contract resulting here from or the application thereof shall be illegal, such illegality shall not affect any other term or condition thereof, and such shall continue in full force and effect.

1.11.3 Any contract resulting here from shall be binding upon the heirs, personal representative, successors and permitted assigns of the parties.

2. Applicable to Orders for Products

2.1 Transportation and Risk of Loss: Transportation will normally follow Buyer's shipping instructions, but ERI reserves the right to ship Products freight collect and to select the means of transportation and routing when Buyer's instructions are deemed unsuitable in ERI's judgment. Unless otherwise advised, ERI may, but shall be under no obligation to, insure to full value of the Products or declare full value thereof to the transportation company at the time of delivery, and all freight and insurance costs shall be for Buyer's account. Risk of loss and/or damage shall pass to Buyer upon delivery of the Products to the transportation company at the FOB point whether or not installation is provided by or under supervision of ERI. Confiscation or destruction of, or damage to Products shall not release, reduce or in any way affect the liability of Buyer therefore. Notwithstanding any defect or nonconformity, or any other matter, such risk of loss and/or damage shall remain in Buyer until the Products are returned at Buyer's expense to such place as ERI may designate, in writing. Buyer, at its expense, shall fully insure Products against all loss and/or damage until ERI has been paid in full or the Products have been returned for whatever reason to ERI. All Products must be inspected upon receipt and claims should be filed with the transportation company when there is evidence of shipping damage, either concealed or external. As used in the clauses appearing herein or attached hereto, "delivery" shall occur when the Product is delivered at the FOB point which shall be the point of manufacture or such other place as ERI shall specify, in writing, notwithstanding installation by or under supervision of ERI.

2.2 Acceptance: The shipment by ERI of a Product to the Buyer shall constitute acceptance of that Product by Buyer, unless notice of defect or nonconformity is received by ERI within thirty (30) days of receipt of the Product at Buyer's designated receiving address, provided, that for Products for which ERI agrees, in writing, to perform acceptance testing after installation, the completion of ERI's applicable acceptance test, or execution of ERI's acceptance form by Buyer, shall constitute acceptance of the Product by Buyer. Notwithstanding the foregoing, any use of a Product by Buyer, its agents, employees, contractors or licensees, for any purpose, after receipt thereof, shall constitute acceptance of that Product by Buyer. ERI may repair or, at its option, replace defective or nonconforming parts after receipt of notice of defect or nonconformity.

2.3 Shipment Delays/Billing in Place: Upon completion of Buyer's order, any delay in shipment attributable to Buyer, including, but not limited to, Buyer's request to defer the delivery date, shall cause the following to occur: Thirty (30) days after the original shipment date, a storage charge of 1½% of the invoice price per month will be billed to Buyer and title to the shipment will automatically pass to Buyer. ERI will invoice Buyer for completed goods and Buyer will pay in accordance with the terms of the original sale, as the goods will be deemed to have shipped in place. ERI will insure against risk of loss until physical shipment of the goods to a common carrier. A tower shipment date is contingent upon receipt by ERI of all necessary site specific information. This information must be included with the signed Proposal and tower order. Depending upon the nature of the project, site specific information may include, but is not limited to: a site survey showing plot dimensions, topography, and possible obstructions; a geotechnical report; the desired tower orientation; the desired antenna orientation; and a complete shipping address.

2.4 Returns: Standard catalog products may be returned for credit provided such products are returned within six (6) months after the original shipment date. The minimum value accepted for return from each purchase order is \$50.00. The amount of credit issued for any returned product shall be determined solely by ERI based on the resalable condition of the product. Non-standard products, including products specially manufactured in accordance with Buyer's specifications or tuned to one or more specified operating frequencies may not be returned for credit. Buyer shall obtain ERI's written return goods authorization prior to returning any Product for credit.

2.5 Service Warning: The Products may be dangerous if improperly installed, handled, serviced, refurbished, or reinforced. In the event that repair, maintenance or servicing need to be performed on the Products, Buyer should contact ERI immediately. ERI shall not be liable for any damages or injuries occurring in connection with maintenance, servicing or repair work on the Products done by persons other than ERI or its duly authorized representatives.

2.6 Installation: Unless this Proposal includes installation services, Buyer is responsible for installation of the Products, including preparation and maintenance of all Products, materials, or services necessary for the operation of the Products not provided by ERI. All installations should be performed by qualified tower climbers and electricians. All OSHA, state and local safety regulations should be observed. Any photos or drawings in product literature, installation manuals, or drawings are used to illustrate a specific point and are not intended to supersede any OSHA, state or local safety regulations.

2.7 Patents and Other Intellectual Property Rights: ERI will, at its own expense and as set forth herein, defend any action brought against Buyer in respect to any claim that the design or manufacture of any Product in ERI's commercial line of Products or manufactured to specifications set by ERI and furnished hereunder, constitutes an infringement of any patents or other intellectual property rights of the United States. Subject to the provisions in the DAMAGES AND LIABILITY section hereof, ERI will pay all damages and costs either awarded in a suit or paid, in ERI's sole discretion, by way of settlement, which are based on such claim of infringement, provided, that Buyer promptly notifies ERI, in writing, of such claim or infringement and gives ERI full authority, information and assistance in settling or defending such claim, or ERI will, in its sole discretion and at its own expense, either procure a license which will protect Buyer against such claim without cost to Buyer, replace said Product with a non-infringing Product or remove said Product and refund an equitable portion of the price paid by the Buyer to ERI for said Product. ERI shall have no liability whatsoever hereunder with respect to any claims settled by Buyer without ERI's prior written consent. ERI EXPRESSLY EXCLUDES from any liability hereunder, and Buyer shall hold ERI harmless from and against, any expense, loss, costs, damages or liability resulting from claimed infringement of patents, trademarks, copyrights or other intellectual property rights: (a) arising from a use of or a combination of a Product with other equipment, processes, programming applications or materials not furnished under the Proposal; (b) based on items made with the Products furnished under the Proposal; (c) arising out of compliance by ERI with Buyer's designs, specifications or instructions; and/or (d) arising from use or manufacture by anyone of inventions in connection with Products or services sold, used or intended for sale or use in performing contracts with the United States or related subcontracts. The foregoing states ERI's entire liability for any claim based upon or related to any alleged infringement of any patent or other intellectual property rights.

2.8 Standard Two (2) Year Product Limited Warranty: Electronics Research, Inc. (ERI) warrants to the original Buyer that its Product is free from defects in material or workmanship

2.8.1 existing at the time of shipment from the factory or

2.8.2 that develop under normal use in a properly installed and maintained system for a period of twenty-four (24) months following the date of shipment, ex-works.

2.8.3 ERI Exclusions: Expressly excluded from the terms of this limited warranty are defects caused by:

2.8.3.1 faulty installation;

2.8.3.2 all minor system leakage ("leakage" is defined in paragraph 2.8.15), below);

2.8.3.3 equipment leaks and detuning if caused by rough handling or installation;

2.8.3.4 lack of proper inspection and maintenance;

2.8.3.5 unusually severe weather, lightning, icing, acts of God; such events require inspection for, and correction of, such damage;

2.8.3.6 water intrusion, foreign materials in the system;

2.8.3.7 vandalism, physical abuse, tampering, or unauthorized disassembly, repair or modification without explicit written approval of ERI;

2.8.3.8 operation not in accordance with published ratings, specifications, or instructions.

2.8.4 ERI Products are delivered Ex-Works. Unless ERI supervises the transportation, delivery, and/or installation of the product, ERI is not responsible for damage that may result from incorrect or improper transportation, storage, handling or installation of Products.

2.8.5 Buyer shall regularly inspect and maintain all ERI manufactured parts and Resale parts in accordance with ERI's and/or manufacturer's inspection and maintenance guidelines and in accordance with all regulations and recommendations of any government agency or body and in accordance with generally accepted industry maintenance standards. An initial inspection shall be conducted promptly after installation to verify that the installation is properly performed in accordance with ERI's and/or the manufacturer's installation instructions and procedures. Such inspections shall be performed at Buyer's expense by qualified personnel, and inspection summary report(s) shall be prepared immediately upon inspection completion. Reports of initial inspections shall be submitted to ERI Customer Service. Buyer shall forever protect, defend, indemnify, and hold ERI free and harmless against all claims, demands, liabilities, cause of action (including, without limitation, legal costs and expenses and reasonable attorney's fees) arising out of, or relating to Buyer's failure to completely discharge its obligations hereunder.

2.8.6 Buyer shall follow promptly all recommendations from qualified inspectors and/or ERI regarding the maintenance of all ERI manufactured and Resale structural Products.

2.8.7 Upon making a warranty claim, make copies of all preceding inspection reports and dispositions available to ERI for review.

2.8.8 Any defective warranted component of an ERI product will be repaired or replaced at the place of manufacture, ex-works, without charge if all defective components are returned by the Buyer to ERI, and ERI inspection discloses that such defects are as reported and are not the result of ERI Exclusions.

2.8.9 Under some circumstances, continuity of service may necessitate immediate shipment of repair parts before ERI inspection of defective parts. Under these conditions, ERI requires that Buyer place an order for replacement parts and will require that all defective parts be packaged and returned for factory inspection and determination of warranty status. If failure is determined to be covered by this warranty, credit will be issued for parts ordered by Buyer to expedite replacement.

2.8.10 Other than the replacement of defective Products or components ex-works, ERI shall not be responsible for any costs or expenses incurred by the Buyer arising from the identification, removal, and replacement of defective products.

2.8.11 ERI, at its sole discretion, may choose to supply warranty parts for repairs on site. In such cases, materials shall be shipped free of additional charge to the site. Losses arising from repair or replacement activities, including those for delays, rigging, and additional installation or maintenance crew time, are not covered under this warranty.

2.8.12 Warranty repairs/replacements, whether at factory or on site, will fulfill the term of the original warranty. No extension of the original warranty term will be allowed.

2.8.13 "Resale equipment/parts/components" are defined as equipment, parts, or components purchased from another manufacturer or supplier and resold by ERI, shall only carry such manufacturer's or supplier's standard warranty in effect at the time of Product shipment from the supplier.

2.8.14 Antenna warranties shall be void if Buyer does not (i) purge and pressurize the antenna system with dry nitrogen or dry air furnished by the Buyer immediately following the installation of the system to initially check for installation leaks and (ii) maintain the antenna under a positive pressure of approximately 2 to 5 pounds per square inch at all times, including prior to installation, using either dry nitrogen or dry air. This warranty is void in the event that the system is pressurized above ERI's published instructions.

2.8.15 Minor leakage in a large system can be difficult if not impossible to detect, especially since temperature variations can mask their extent. ERI recommends the installation of dehydration equipment in any significant pressurized system. Minor leakage is beneficial because it causes occasional cycling the dehydration equipment and provides a fresh purge to the system. ERI regards any leak resulting in a system pressure drop of 0.5 PSI per day or less, temperature compensated, as an acceptable leak rate not actionable under these warranty terms.

2.8.16 For the scope and purposes of this warranty with regard to ERI manufactured structural towers/parts and resale structural parts, the phrase "Current Standard" is defined as the most current revision of ANSI/TIA-222 Standard including, but not limited to, all relevant appendices and annexes thereof, and all relevant documents incorporated by reference there from. This warranty shall be void if the Buyer does not:

2.8.16.1 follow all relevant and applicable directives as set forth in the Current Standard;

2.8.16.2 consult and obtain explicit approval from ERI regarding the qualifications of the tower crew chosen to implement/install any structural repairs and/or modifications;

2.8.16.3 consult and obtain explicit approval from ERI prior to implementing changes to the structure serviceability requirements, structure classification, and/or tower appurtenance loading (such as antennas, transmission lines, mounts, ice shields, platforms, ladders, etc.) which varies significantly from the original design parameters as determined by ERI.

2.8.17 Adequate VSWR monitoring and protection equipment must be installed and properly maintained in the transmission system to prevent system damage from ice, lightning, and other natural phenomena. Failure to properly install, maintain, or observe the warnings of the VSWR protection equipment voids this warranty, and subsequent damage caused by such failure is not covered under this warranty. ERI recommends purchase of an ERI manufactured or approved VSWR protection unit at time of antenna purchase.

2.8.18 If warranty site service is requested, it will be provided pursuant to a Buyer issued purchase order. If defects are not found to be the result of a valid warranty claim an invoice for such service will be issued at prevailing rates.

2.8.19 Notification of warranty claim must be provided to ERI within 30 days of the triggering event or detection of the failure.

2.8.20 In no case may the value of the warranty claim exceed the purchase price of the Product.

2.8.21 Warranty services will be provided, and valid claims will be honored as long as Buyer is current on all accounts due and owing to ERI.

2.8.22 THE FOREGOING WARRANTY IS AND SHALL BE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR APPLICATION OR PURPOSE. THERE ARE NO WARRANTIES, REPRESENTATIONS OF FACT, OR PROMISES WITH RESPECT TO SIGNAL COVERAGE OR STRENGTH.

2.8.23 UNDER NO CIRCUMSTANCES SHALL ERI BE OBLIGATED OR LIABLE FOR SPECIAL INCIDENTAL, INDIRECT, CONSEQUENTIAL OR OTHER DAMAGES, LOSSES, OR EXPENSES IN CONNECTION WITH OR BY REASON OF THE FOREGOING WARRANTY OR BY REASON OF SOME OTHER TYPE OF EXPRESS OR IMPLIED WARRANTY FOUND TO EXIST NOTWITHSTANDING THE FOREGOING DISCLAIMERS.

2.9 Warranty Replacement and Adjustment: All claims under warranty must be made promptly after occurrence of circumstances giving rise thereto and must be received within the applicable warranty period by ERI or its authorized representative. Such claims should include the Product type and serial numbers and a full description of the circumstances giving rise to the claim. Before any Products are returned for repair and/or adjustment, written authorization from ERI or its authorized representative for the return and instructions as to how and where such Products should be shipped must be obtained. Any Product returned to ERI for examination shall be sent prepaid via the means of transportation indicated as acceptable by ERI. ERI reserves the right to reject any warranty claim not promptly reported and any warranty claim on any item that has been altered or has been shipped by non acceptable means of transportation. When any Product is returned for examination and inspection, or for any other reason Buyer shall be responsible for all damage resulting from improper packing or handling, and for loss in transit notwithstanding any defect or non conformity in the Product. In all cases ERI has sole responsibility for determining the cause and nature of failure, and ERI's determination with regard thereto shall be final. If it is found that ERI's Product has been returned without cause and is still serviceable, Buyer will be notified and the Product returned at its expense; in addition, a charge for testing and examination may, in ERI's sole discretion, be made on Products so returned.

2.10 General Conditions:

2.10.1 ERI reserves the right to change or modify its design and construction of the Products and/or to substitute materials equal to or superior to or functional equivalents to that originally specified herein provided, however, that any substitution, change or modification shall not materially and adversely affect Buyer's ability to use the Products.

2.10.2 ERI reserves the right to make changes in design and construction of the Products it manufactures for others and to make and/or add improvements in such Products at any time without incurring any obligation to install the same in the products sold herein.

2.10.3 The Buyer shall at its expense engage any qualified engineer necessary to approve ERI's design, obtain building permits, and insure structural integrity of existing structure considering any ERI addition or appurtenance unless otherwise specified in the Proposal. ERI shall furnish construction and installation drawings and engineering data for its Products upon request.

2.10.4 The Proposal is submitted in accordance with the ANSI/EIA/TIA-222 standard in effect as of the date of the Proposal, unless otherwise stated in the body of the Proposal. This standard is intended to set the minimum criteria for the structural design, fabrication and construction of antennas and antenna support structures. It is the responsibility of the Buyer to provide site specific data and design requirements and any requirements differing from those contained in this standard to ERI prior to accepting the Proposal. Please refer to the applicable edition of the ANSI/EIA/TIA-222 standard for further information.

2.10.5 Buyer is responsible for any and all disposal and recycling of Products, packaging, reels, shipping crates, and other items associated with the fulfillment of order, as well as for compliance with any mandated "green" initiatives.

2.10.6 If field services are provided Buyer may request to be named as an additional insured on ERI's Liability policy and be provided a Certificate of Insurance naming Buyer as a certificate holder.

3. Special Terms and Conditions Applied to Field and Installation Services

3.1 If ERI is not the current Engineer of Record (EOR) for the supporting structure, it shall be the Purchaser's responsibility to engage the current structure's EOR or a Qualified Engineer to review all Construction Class IV work activities to assess construction loads at rigging attachment points and/or work activities impacting the strength and stability of the supporting tower such as structural member replacements in direct accordance with the current ANSI/TIA-322, Loading, Analysis, and Design Criteria Related to the Installation, Alteration and Maintenance of Communication Structures. ERI shall retain the services of a Supervising Engineer to develop construction loads which will be provided to the Purchaser, or their named representative, along with specific rigging attachment points being made to the supporting structure no less than 2 weeks prior to planned Construction Class IV work activities to allow time for the EOR/Qualified Engineer review. Any work delays occurring from the Purchaser's engineering review may result in delayed mobilizations and/or change order fees for downtime. Please note, if the Purchaser is unable or unwilling to attain the required engineering services to facilitate the construction review in accordance with current industry standards, any and all fees incurred by ERI for performing additional engineering assessments including any potential field inspections shall be submitted to the Purchaser as part of a change order.

3.2 The Proposal is based on work carried out in one mobilization and continuous operation without interruption or delays due to Buyer supplied missing materials, such as, but not limited to antennas, transmission lines, transmission line hangers, installation drawings, tower components, or electrical power. All material necessary for completing installation to be furnished by Buyer, must be on the tower site prior to starting of installation or scheduled in such a manner as to avoid delaying crew. Proposal is also based upon the following conditions:

3.2.1 Painting of the tower components (i.e. antenna or line) is not included in Proposal unless specified in Proposal.

3.2.2 Antenna feed line system will end just inside the transmitter facility (max 20'). Purchaser to have existing port for the line to enter. ERI is not responsible for installation inside the transmitter facility, such as, but not limited to inside transmission line runs, hangers, wall feed through plates, etc. ERI can perform these tasks at our standard daily rate if so desired.

3.2.3 This Proposal is subject to mutually negotiated scheduling and availability of resources and personnel. In case of significant delays beyond the control of ERI that cause ERI increased costs due to the rescheduling of crews, additional charges may apply. For this purpose, a delay shall not be considered significant unless it exceeds a period of ninety (90) days.

3.2.4 All work is to be performed unrestricted during daylight hours. (Weekend, holiday, or evening/ night work, when requested by customer will be billed an additional charge of 1.5 times standard rate.)

3.2.5 No guy wires interlaced or overhead power lines in working areas.

3.2.6 No tower, antenna, feed line, and/or bracket modifications required unless specified in Proposal.

3.2.7 No onsite transmission line field cuts required. If necessary, additional charges will be billed.

3.2.8 Antennas are assumed to have no more than 2 parasitic directors per bay. Each additional will be billed as necessary.

3.2.9 Taxes, bond or permit costs/fees have been paid by buyer/customer.

3.2.10 All antennas to be non-radiating or reduced to a safe power level while ERI personnel are in the immediate RF zones.

3.3 Downtime resulting from situations beyond the control of ERI or its subsidiary ERI Installations, Inc. as described above, will be billed at normal labor rates.

3.4 The Proposal on labor to install tower and/or antenna and other related equipment is based upon weather and time of day suitable for outdoor construction. Installation, field services and hazardous operations shall not be performed under adverse weather conditions for the safety of ERI personnel. Adverse weather delays shall be charged to Buyer at normal day rates and will be added to the construction schedule as time extensions. Certain operations may be performed under adverse weather conditions by mutual agreement and shall be billed at special rates provided in the Proposal. The ERI representative is the sole determinant of suitable and safe conditions while ERI personnel are on site.

3.5 In the event adverse weather causes a delay, ERI will notify the Buyer of those conditions and charges immediately. The responsibility for determine this condition rests with the ERI supervisor on site.

3.6 The tower site shall be accessible to workman and installation equipment, using two-wheel drive vehicles (under their own power) and heavy construction equipment such as, but not limited to cranes, concrete trucks, semi-tractor trailers, forklifts, etc.

3.7 All labor is based upon non-union wages. Should any conditions exist such that the use of union trades for installation of the tower, accessories and/or foundations is necessary, the prices stated in the Proposal are subject to adjustment unless a union stipulation has been specifically noted in the Proposal. Unless provided by ERI, the foundations must be completed so as to permit continuous work from time ERI's crew reports on the job and must be finished in accordance with ERI's specifications.

3.8 The Buyer assumes all liability resulting from site conditions differing from those specified or agreed to by the Buyer.

3.9 Unless otherwise specified in the Proposal, it is also Buyer's responsibility to:

3.9.1 To provide one (1) tagline path (75 feet wide and equal in length to the height of the tower) at the work face, cleared of all obstructions in order to permit a truck to be driven thereon.

3.9.2 Clear a guy path alley and fire lane down each guy radial 25 feet wide on each side of the guy line; and extend this lane 50 feet beyond the outer guy anchor, a 10-foot width of this 50-foot lane must be cleared of all obstructions in order to permit a truck to be driven thereon.

3.9.3 So grade the area immediately surrounding the tower site so as to permit the movement of trucks, cranes and/or other equipment required to handle and install the tower or related appurtenances.

3.9.4 Clear an area a minimum of 200 feet x 200 feet adjacent to the center of the tower to permit unloading, sorting, assembling, working space, and shall provide a hoist and equipment area 20 feet x 50 feet with capabilities for anchoring.

3.9.5 Provide a free and clear radius of 100 feet at the tower base for construction equipment and to allow staging and landing during tower construction and for future service work. This area shall have a rock/gravel surface bedding to support heavy equipment.

3.9.6 Provide fittings and gas required in pressure checking all of the antennas and transmission lines, if required.

3.9.7 A safe and secure work site to prevent theft and vandalism of contractor provided equipment and materials and Buyer delivered materials.

3.9.8 Provide electric power to the base of the tower suitable for powering construction equipment and tools. This also includes permanent electric power for the tower lighting system, if required, in accordance with the current revision of FAA circular AC 70/7460-1.

3.9.9 Provide the police service to direct traffic, if in the event the guy lines should cross a public or private road and secure the site from theft or vandalism of ERI equipment.

3.9.10 Provide toilet facilities, water, and trash containers for waste disposal. If sufficient trash receptacles are not provided, all trash and removed steel, antennas, mounts, lines, etc. shall be neatly left on site.

3.9.11 Provide scaled site survey of proposed tower location specifying tower location and orientation, property boundaries, site topography, overhead or buried utility service lines, or any other construction hazards or obstructions. Also provide survey required for antenna location and/or directional proof.

3.9.12 Provide a cleared and level area suitable for and capable of anchoring a hoist with a minimum area of 30' x 25'.

3.9.13 Obtain a tower structural analysis from a licensed Professional Engineer appropriate to the scope of work being requested.

3.9.14 Obtain any necessary rights of way and/or easements to allow access to work sites.

3.9.15 Provide a local certified electrical worker to make final connections. ERI's responsibility for lighting conduit and electrical wiring ends at the base of the tower.

3.9.16 Coordinate any required RF reductions or off-air time to allow ERI to perform necessary work in a safe and acceptable RF environment without any work flow interruption. If this cannot be accomplished, standby charges will apply at standard rates. ERI is NOT responsible for any consequential damages or loss of revenue or audience as a result of having to reduce transmitter power or go off air in order to accomplish a safe working environment.

3.9.17 Provide surveyed and staked locations for utilities, foundations, and directional proof prior to arrival of tower installation and/or foundation installation crews. Surveys must be coordinated with ERI.

3.10 When foundations are specified as a part of the Proposal, the Proposal for such work is based upon such work being undertaken and completed under "assumed normal" soil conditions as described by the latest revision of the ANSI/EIA-222 code. It shall be the responsibility of the Buyer to supply specific soil descriptive parameters, and ERI shall have an absolute right to rely on written test reports furnished by Buyer in the preparation of foundation drawings and in the installation of foundations. Normal soil conditions do not include rock, saturated soil, frozen soil, peat, or other soil variations similar or dissimilar. If subsurface soil conditions differ from geotechnical report and delay foundation work, the project schedule will be increased accordingly, and additional charges will be billed.

3.11 The installation price does not include work such as clearing or grading of tower site; installing, re-locating or repairing utility services; obtaining profiles or surveys; installing grounding systems unless specified; blasting; rock removal; water evacuation; cribbing; installing fill; removal of obstructions; snow removal, installation of planking; road building; clearance for site access; clearing of guy anchor paths; or any other kind of site preparation or site maintenance work.

3.12 If necessity dictates non-included labor or materials to be expended resulting from but not limited to, compliance to OSHA or local safety standards, inadequate site accessibility, non-included specified soil conditions, non-included labor or material requirements, then ERI shall be allowed to increase the installation and materials price to include any additional cost incurred, plus a reasonable profit.

3.13 ERI has the right to complete installation work early and be compensated for delay damages if other segments of the project, not in ERI control, affect an early completion of any part of ERI's work if ERI submits a reasonable plan to place the Buyer on notice of the intent to finish early and submits documentation of delays.

3.14 If requested or approved by the Buyer, ERI may provide accelerated services including overtime and/or multiple crews, as required to maintain the schedule or provide other services, and Buyer agrees to compensate ERI for such services.

Revised January 16, 2019

Electronics Research, Inc. Company Profile

Primary Business and Services

Electronics Research, Inc. is a company focused on serving the needs of the terrestrial radio and television broadcasters with antennas, transmission line, RF components, and structural products. The company is focused on providing high quality and sophisticated engineering solutions to customer problems. ERI Products and Services include:

- UHF and VHF Television Broadcast Antennas
- Single and Multi-Station FM Broadcast Antennas
- Television and FM Broadcast Filters and Combiners
- Rigid Coaxial Transmission Line
- Rectangular and Circular Waveguide
- Broadcast Master Distributor for CommScope HELIAX^{®1} products and accessories
- Structural products:
 - Guyed towers
 - Self-supporting towers
 - Antenna support poles
 - Specialty structures
 - Lambda[™] Antenna Mounting System
 - Grounding and lightning protection products
 - Gin Poles
- Structural services:
 - Site inspection services
 - Tower installation
 - Tower rescue services
 - Structural analysis services
 - Engineering field support
 - Antenna test range facilities
 - Tower field service
 - Tower reinforcement design and installation services



ERI's Headquarters and Manufacturing Facility.

¹ HELIAX[®] is registered trademark of CommScope.

History and Qualifications

Electronics Research, Inc. (ERI) is a company that has provided state-of-the-art telecommunications and broadcast products since 1943. ERI's products and services include television and FM antennas; RF filters and combiners; self-supporting and guyed towers; grounding and lightning protection products; installation, maintenance, structural analysis and inspection services; rigid coaxial transmission line and UHF waveguide transmission line systems. ERI is also the Broadcast Master Distributor for CommScope HELIAX®, HELIAX accessories, pressurization products, and terrestrial microwave products.

ERI is the originator of many of the commonly used technologies for FM transmission today, including internally fed circularly polarized FM antennas, and temperature compensated RF filters. The company produces a broad array of single station and broadband FM antenna designs provide superior reliability and performance for any reasonable application. ERI also manufactures a wide array of filter products that can be configured to eliminate undesirable intermodulation products and are used as combining systems for master FM antennas.

In November 2003, ERI completed the acquisition of selected assets that comprised Andrew Corporation's (now CommScope) television broadcast antenna business. The acquisition included Andrew's MACXLine® and GUIDELine™ transmission line products and the company's complete line of television transmitting antennas and Andrew's television filter and RF components business which includes waveguide and coaxial switches, patch panels, directional couplers, and the other components required to produce a wide array of filter and combiner system for broadcast and scientific applications. In addition, to purchasing these assets ERI also entered into an agreement to serve as a CommScope Master Distributor of HELIAX products and accessories to the broadcast market.

ERI has 205 employees, including two (2) registered professional engineers. ERI's corporate headquarters and main manufacturing facility is located in Chandler, Indiana. Our Midwest location provides the benefit of the most convenient, cost effective, product transportation to any part of North America. The ERI facility is located on 100 acres and includes a total of more than 250,000 square feet of indoor manufacturing space. Near the main factory complex is ERI's 50-acre test range, capable of full-scale antenna/tower pattern measurements. The company has decades of research and experience at full scale testing and the company's unique blend of individual educated and trained in antenna and structural design result in systems that offer superior performance and reliability. The test range is equipped with the latest in computerized test equipment and also has the latest computer software to measure and predict antenna performance and radiated pattern.

The company takes full advantage of innovative technology, which includes the latest computer modeling, design, and drafting tools; as well as the latest computer-controlled machining and milling equipment. ERI's main manufacturing facility also includes an advanced acid cleaning facility and an in-house silver-plating operation. This high degree of vertical integration allows control of product quality at every step during fabrication and final assembly.

ERI began manufacturing towers and providing structural analysis services in 1990. We manufacture guyed and self-supporting towers. ERI also has registered structural engineers on staff to provide structural analysis and reinforcement design services to tower owners. ERI has

State of West Virginia

Department of Administration, Purchasing Division

Solicitation No: CRFQ 0439 EBA2000000014

Doc Description: MEDIUM POWER FM ANTENNA

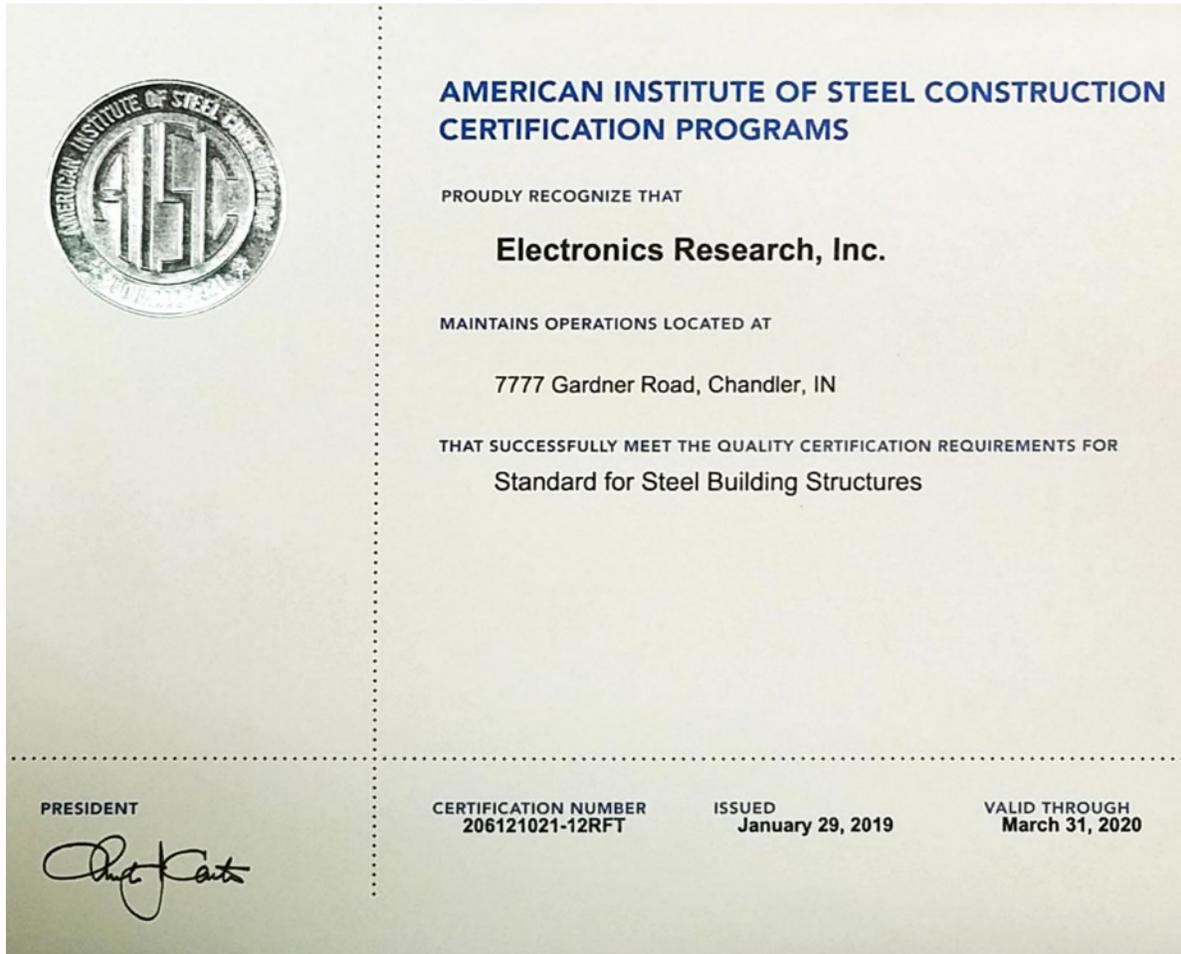
Solicitation Closes: December 10, 2019 at 13:30

manufactured and installed towers ranging in height from less than 100-feet to 2000-feet. The structural division of ERI also provides a complete line of grounding and lightning protection products.

Electronics Research, Inc. is officially certified under the Steel Building Standard of the American Institute of Steel Construction (AISC). This designation reaffirms ERI's dedication to the quality-control process and our on-going effort to ensure our customers receive the highest quality structural systems.

The company maintains two fulltime tower crews each with a full set of equipment, trucks, and winches. All tower crews undergo rigorous safety training and the company's training regime is considered one of the industry's best. The company also maintains a separate crew that focuses on tower inspections. The company is compliant with all current OSHA regulations, maintains liability and workmen's compensation insurance at or above minimum requirement levels and can provide performance and payment bonds, for specific projects if required.

ERI has continuously served the broadcast industry with a dedicated team of engineering professionals, supported by experienced and meticulous craftsmen for product fabrication and dedicated project management to insure on time and on budget project delivery, installation, and commissioning.



ERI's current AISC certification

Electronics Research, Inc. Far Field Test Range



Electronics Research, Inc. operates a far field test range situated in a rural area, near its Chandler, Indiana headquarters and main manufacturing facility. The test range is located on 50 acres and is equipped with two separate motorized turntables, control rooms, and measurement systems that allow for full or fractional scale modeling and measurement for FM radio, low and high band VHF television, and UHF television antennas. The turntables are rated for dead weight loads of 12,000 pounds and 25,000 pounds – respectively. In addition to the range measurement and test facilities the facility also includes its own machine shop and fabrication facility for constructing replica tower sections independent of ERI's main factory. The test site is also equipped with a static stand workstation for the setup and tuning of Batwing television antennas and Master FM Antenna Systems. The ERI test range has its own dedicated staff of tower climbers, machinists, technicians, and engineers.

Product Information

Directional FM Antenna Technical Proposal

Directional Antenna System Proposed for WVBY, Beckley, West Virginia

November 22, 2019

INTRODUCTION

Electronics Research, Inc. would like to submit this proposal for a custom fabricated FM antenna system. The array will be designed to meet the FCC requirements and provide years of trouble free performance for WVBY. The entire ERI team takes great pride in providing worldwide quality and service matched by none. We sincerely value the opportunity to become your partner in broadcasting excellence.

Electronics Research, Inc. express purpose is the research and development of electromagnetic wave propagation, and has been since 1943. New product design and application is our primary function. ERI enjoys being the industry standard by which all others are measured, and we look forward to providing you the best products and services.

Electronics Research, Inc. is ready, willing and able to be your single source for antenna and tower products. You insist on only the best in programming and studio equipment. Let Electronics Research, Inc. provide you and your audience the best in antenna technology.

Directional Antenna System Proposed For WVBY, Beckley, West Virginia

(Continued)

ANTENNA DESCRIPTION

ANTENNA TYPE

For single and multiple station applications, the ERI 1180 Series FM Panel antenna can be configured as a directional FM antenna. This offers the directional FM station the benefits of high power handling, excellent axial pattern circularity, and the ability to have excellent horizontal plane pattern performance even when mounted on large tower faces.

The proposed antenna is the E.R.I. 1183-6CP-DA configuration. The antenna system will consist of six full wavelength spaced bays. Each bay consists of three elements attached to three flat panels. The 1180 element consist of orthogonally oriented 3 1/8 inch o.d. brass dipoles.

The dipoles are fed by an internally pressurized balun. Circular polarization is accomplished by means of a pressurized 90 degree 3dB hybrid attached to the back of each 1180 element. Hybrid coupling simplifies the feed system. Unlike other designs, one feed line is needed to excite an 1180 element. All tests will be performed on a frequency of 91.7 megahertz, which is the center of the FM broadcast channel assigned to WVBY.

STRUCTURE TO BE USED

The antenna will be tested on a 5' face tower, which is the structure the station plans to use to support the proposed array.



Directional Antenna System
Proposed For
WVBY, Beckley, West Virginia

(Continued)

METHOD OF MODELING

The test antenna will consist of one bay level of the circular polarized system with the associated horizontal parasitic elements. The elements and brackets that will be used in this test will be electrically equivalent to those that will be supplied with the antenna. When the proper pattern shapes have been achieved, the complete array will be installed horizontally at the tuning range and matched for the best bandwidth.

RADOME OPTIONS

Deicers are not supplied and are not available. The use of radomes is recommended if extreme icing condition will exist at the proposed site.

PATTERN DESIGN

The design of the proposed antenna is based on your envelope pattern that was filed with the FCC. The attached pattern and list are the basis for this proposal. The actual patterns when measured will not exceed that of your filed pattern at any azimuth. Maximum effort will be made to develop a horizontal and vertical pattern shape that will match the envelope pattern as closely as possible.

The composite horizontal and vertical maximum relative field envelope pattern obtained from the measured data will have an RMS that is equal to, or greater than 85% of the RMS of your filed envelope pattern.

The RMS of the vertically polarized horizontal plane component will not exceed the RMS of the horizontally polarized horizontal plane component.

A calculated vertical plane relative field pattern is shown on Figure #3 attached.

Figure #1T and its list show the computer generated patterns of the horizontal and vertical components. ***The final measured pattern shape achieved will differ from Figure #1T.*** It will be our intent to maximize the signal strength in the directions that are important, while not exceeding the protection limits.

Directional Antenna System
Proposed For
WVBY, Beckley, West Virginia

(Continued)

ANTENNA ORIENTATION

The actual antenna orientation will be determined when the antenna is measured. Blue prints provided with the antenna will show the proper antenna orientation alignment. The antenna alignment procedure should be directed by a licensed surveyor as prescribed by the FCC.

It is recommended that you use the same surveyor to verify the orientation of the tower and to align the directional antenna. It is very important that you supply us with accurate information. If not delays and extra cost could occur.

ANTENNA MOUNTING

The directional antenna should not be mounted on the top of an antenna tower, which includes a top-mounted platform larger than the cross sectional area of the tower in the horizontal plane. No other obstructions other than those that are specified by the blue prints supplied with the antenna are to be mounted at the same tower level as the directional antenna. No obstruction of any type is to be within 75 ft. horizontally of the system. The vertical distance to the nearest obstruction should be a minimum of 10 ft. from the directional antenna. Metallic guy wires should be a minimum distance of forty feet horizontally from the antenna.

FIELD TUNING

ERI strongly recommends that an ERI trained technician field tune and inspect the installation of all custom-built antenna systems.

WHAT WE NEED FROM YOU

COVERAGE AREA

In order to fabricate a directional antenna to best suit your needs we will need the following information. We need to know from the tower the directions and the minimum desired power levels necessary to cities of importance. We need to know the directions to places that maximum power is not necessary.

**Directional Antenna System
Proposed For
WVBY, Beckley, West Virginia**

(Continued)

FCC FILED PATTERN

We need to know what envelope pattern was filed with the FCC. If it is not the data that we provide, we may not be able to obtain 85% of the envelope pattern.

Before we begin antenna testing we will need a copy of your construction permit.

STRUCTURE DRAWINGS

We will need accurate prints. The prints need to include all FM and TV broadcast antennas that are 60 meters or less from the proposed directional antenna, the orientation of the support structure relative to true north, size, method of attachment of the leg and support braces in the antenna aperture. The location of guy attachment in the aperture must also be displayed. It is imperative that guy wires that occur forty feet horizontally from the antenna must be made of an insulating material. The location and method of attachment of all conduits, ladders, feed lines, lighting devices, and other appurtenances, which are located in the aperture of the antenna must also be included in the prints.

It is not ERI's responsibility to determine if the support structure (tower, pole, mast etc.) can safely support this antenna array. If there is any doubt of the support structures ability to safely support the antenna array and the additional installation stresses contact ERI prior to starting any installation procedures.

For further technical specifications, please consult the enclosed attachments. Should you desire any additional information, please contact us directly.

STATEMENT OF PRODUCT SUITABILITY

Electronics Research, Inc. is quoting this proposed equipment on the basis of requirements stated by the customer or his representative.

The suitability of the proposed equipment for the customer application should be reviewed by the customer's Broadcast Engineering Consultant in regard to suitability and federal, state, and local rules and regulations.

**Directional Antenna System
Proposed For
WVBY, Beckley, West Virginia**

(Continued)

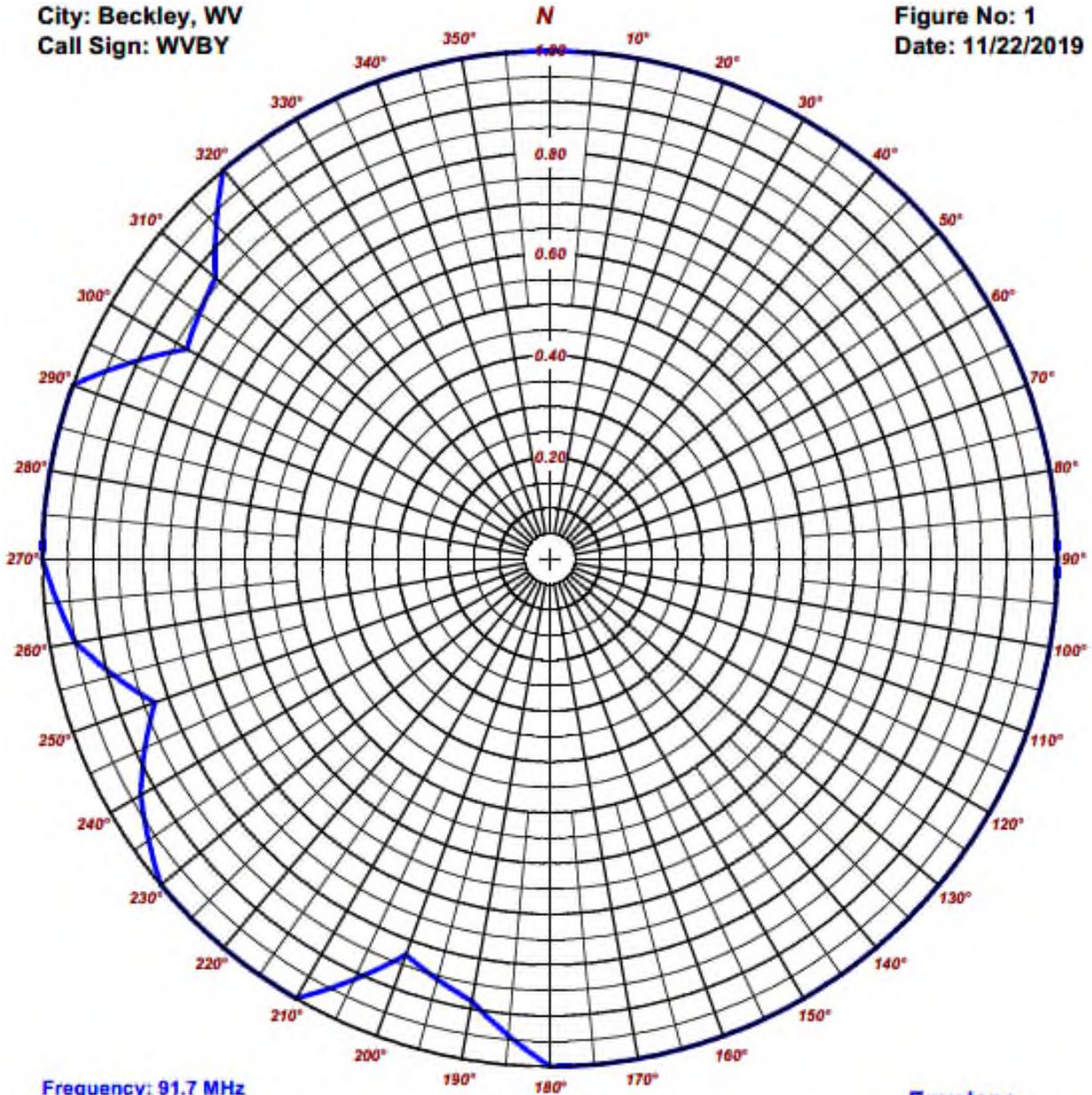
Electronics Research, Inc. values you as a customer. We are truly confident that we build the best antenna systems on the market. An ERI antenna and installation will fulfill your broadcasting needs. We hope to do business with you soon.

Tom Scharf

ELECTRONICS RESEARCH, INC.

City: Beckley, WV
Call Sign: WVBV

Figure No: 1
Date: 11/22/2019



Frequency: 91.7 MHz
Antenna Type: 1183-6CP-DA
Antenna Orientation: TBD
Antenna Mounting: Custom
Tower Type: 5' face tower

Envelope

RMS: .976
Maximum: 1 @ 0°
Minimum: .826 @ 300°

Envelope Pattern: The maximum of either the H or V components will not exceed this pattern at any azimuth.

Figure# 1

Station: WVBY

Location: Beckley, WV

Frequency: 91.7 MHz

Date: 11/22/2019

Antenna: 1183-6CP-DA

Antenna Orientation: TBD

Number of Bays: 6

Azimuth	Envelope			Polarization	Azimuth	Envelope			Polarization
	Field	kW	dBk	Maximum		Field	kW	dBk	Maximum
0°	1.000	14.000	11.461	Max H (and or) V	180°	1.000	14.000	11.461	Max H (and or) V
5°	1.000	14.000	11.461	Max H (and or) V	185°	0.943	12.436	10.947	Max H (and or) V
10°	1.000	14.000	11.461	Max H (and or) V	190°	0.885	10.965	10.400	Max H (and or) V
15°	1.000	14.000	11.461	Max H (and or) V	195°	0.858	10.294	10.126	Max H (and or) V
20°	1.000	14.000	11.461	Max H (and or) V	200°	0.830	9.645	9.843	Max H (and or) V
25°	1.000	14.000	11.461	Max H (and or) V	205°	0.915	11.721	10.690	Max H (and or) V
30°	1.000	14.000	11.461	Max H (and or) V	210°	1.000	14.000	11.461	Max H (and or) V
35°	1.000	14.000	11.461	Max H (and or) V	215°	1.000	14.000	11.461	Max H (and or) V
40°	1.000	14.000	11.461	Max H (and or) V	220°	1.000	14.000	11.461	Max H (and or) V
45°	1.000	14.000	11.461	Max H (and or) V	225°	1.000	14.000	11.461	Max H (and or) V
50°	1.000	14.000	11.461	Max H (and or) V	230°	1.000	14.000	11.461	Max H (and or) V
55°	1.000	14.000	11.461	Max H (and or) V	235°	0.966	13.051	11.156	Max H (and or) V
60°	1.000	14.000	11.461	Max H (and or) V	240°	0.931	12.135	10.840	Max H (and or) V
65°	1.000	14.000	11.461	Max H (and or) V	245°	0.880	10.842	10.351	Max H (and or) V
70°	1.000	14.000	11.461	Max H (and or) V	250°	0.829	9.621	9.832	Max H (and or) V
75°	1.000	14.000	11.461	Max H (and or) V	255°	0.889	11.064	10.439	Max H (and or) V
80°	1.000	14.000	11.461	Max H (and or) V	260°	0.949	12.608	11.007	Max H (and or) V
85°	1.000	14.000	11.461	Max H (and or) V	265°	0.975	13.295	11.237	Max H (and or) V
90°	1.000	14.000	11.461	Max H (and or) V	270°	1.000	14.000	11.461	Max H (and or) V
95°	1.000	14.000	11.461	Max H (and or) V	275°	1.000	14.000	11.461	Max H (and or) V
100°	1.000	14.000	11.461	Max H (and or) V	280°	1.000	14.000	11.461	Max H (and or) V
105°	1.000	14.000	11.461	Max H (and or) V	285°	1.000	14.000	11.461	Max H (and or) V
110°	1.000	14.000	11.461	Max H (and or) V	290°	1.000	14.000	11.461	Max H (and or) V
115°	1.000	14.000	11.461	Max H (and or) V	295°	0.913	11.670	10.671	Max H (and or) V
120°	1.000	14.000	11.461	Max H (and or) V	300°	0.826	9.552	9.801	Max H (and or) V
125°	1.000	14.000	11.461	Max H (and or) V	305°	0.843	9.949	9.978	Max H (and or) V
130°	1.000	14.000	11.461	Max H (and or) V	310°	0.860	10.354	10.151	Max H (and or) V
135°	1.000	14.000	11.461	Max H (and or) V	315°	0.930	12.109	10.831	Max H (and or) V
140°	1.000	14.000	11.461	Max H (and or) V	320°	1.000	14.000	11.461	Max H (and or) V
145°	1.000	14.000	11.461	Max H (and or) V	325°	1.000	14.000	11.461	Max H (and or) V
150°	1.000	14.000	11.461	Max H (and or) V	330°	1.000	14.000	11.461	Max H (and or) V
155°	1.000	14.000	11.461	Max H (and or) V	335°	1.000	14.000	11.461	Max H (and or) V
160°	1.000	14.000	11.461	Max H (and or) V	340°	1.000	14.000	11.461	Max H (and or) V
165°	1.000	14.000	11.461	Max H (and or) V	345°	1.000	14.000	11.461	Max H (and or) V
170°	1.000	14.000	11.461	Max H (and or) V	350°	1.000	14.000	11.461	Max H (and or) V
175°	1.000	14.000	11.461	Max H (and or) V	355°	1.000	14.000	11.461	Max H (and or) V

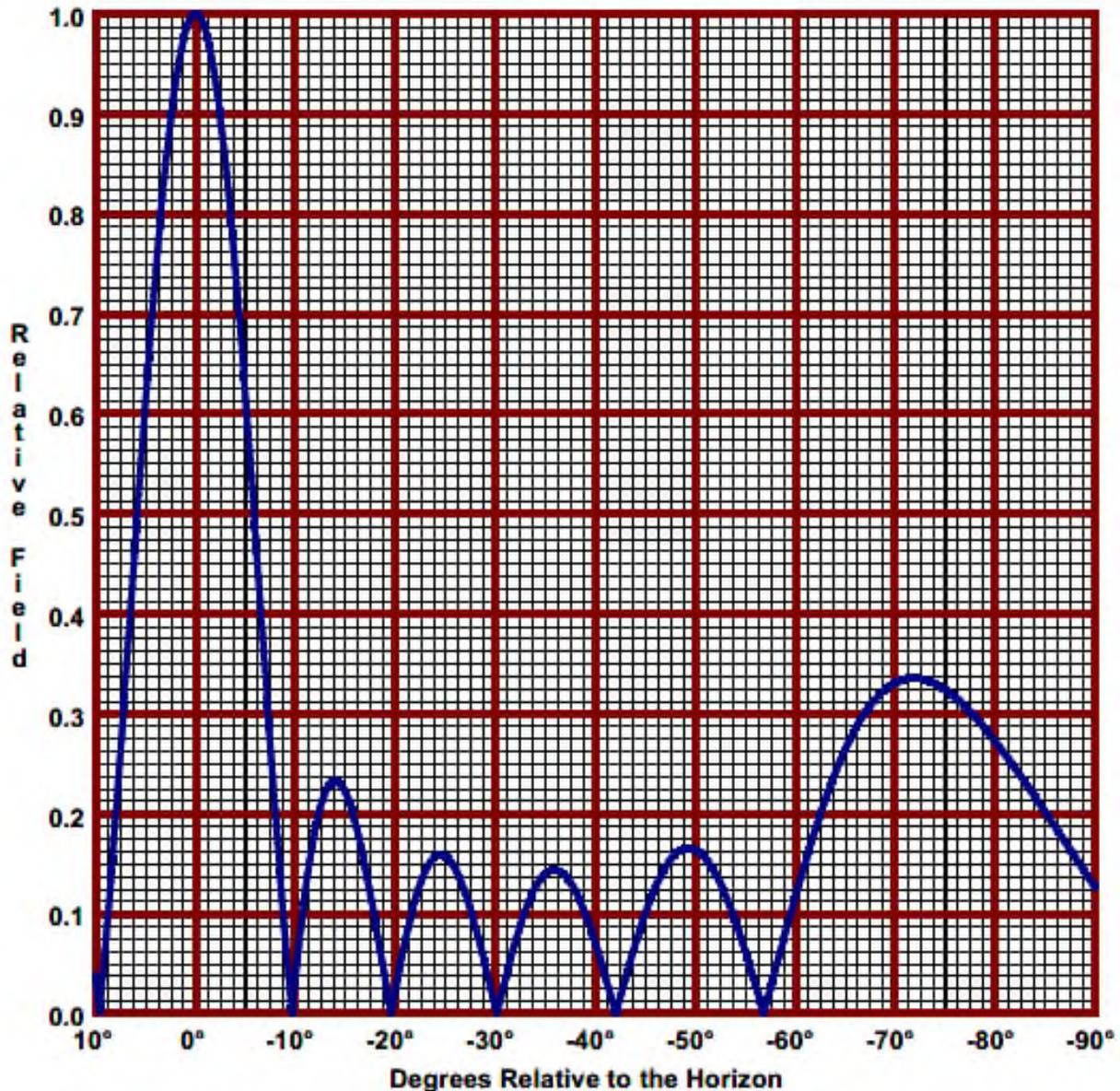
Horizontal Polarization:
 Maximum: 3.290 (5.172 dB)
 Horizontal Plane: 3.290 (5.172 dB)
 Maximum ERP: 14.000 kW

Vertical Polarization:
 Maximum: 3.290 (5.172 dB)
 Horizontal Plane: 3.290 (5.172 dB)
 Maximum ERP: 14.000 kW

Total Input Power: 4.255 kW
Reference: WVBY1E.FIG

Figure No: 3
Call Sign: WVBY
Location: Beckley, WV
Frequency: 91.7 MHz
Antenna: 6 bay 1183-6CP-DA

Date: 11/22/2019
H/V Power Ratio: 1
1 Wave-length Spacing
0° Beam Tilt
0% First Null Fill

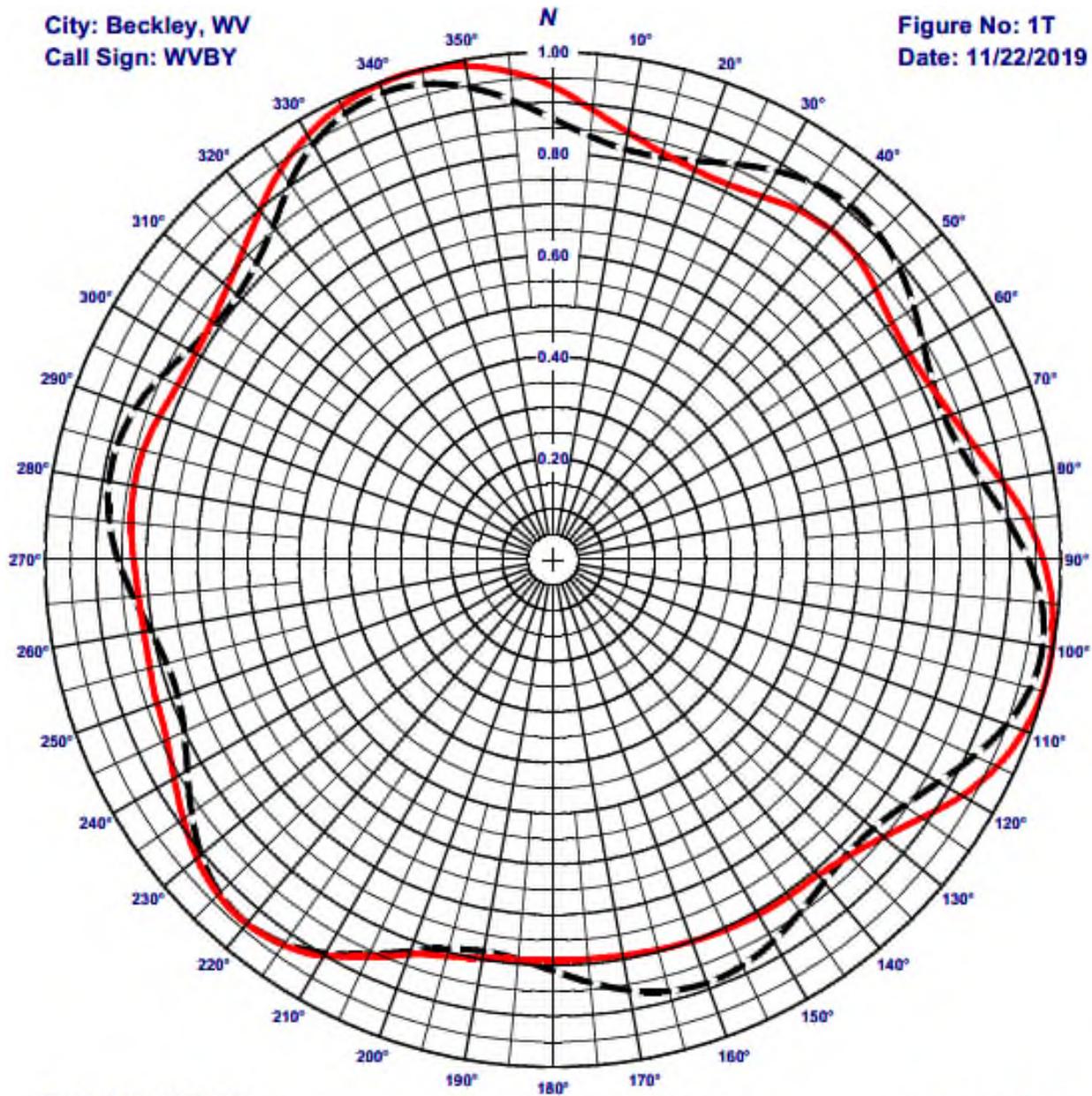


Horizontal Polarization:
Maximum: 3.290 (5.172 dB)
Horizontal Plane: 3.290 (5.172 dB)
Maximum ERP: 14.000 kW

Vertical Polarization:
Maximum: 3.290 (5.172 dB)
Horizontal Plane: 3.290 (5.172 dB)
Maximum ERP: 14.000 kW

City: Beckley, WV
 Call Sign: WVBY

Figure No: 1T
 Date: 11/22/2019



Frequency: 91.7 MHz
 Antenna Type: 1183-6CP-DA
 Antenna Orientation: 277° True
 Antenna Mounting: Custom
 Tower Type 5' face tower

VERTICAL
 RMS: .871
 Maximum: .98 @ 101°
 Minimum: .783 @ 189°

HORIZONTAL
 RMS: .871
 Maximum: 1 @ 103°
 Minimum: .789 @ 181°

Computer generated patterns of the horizontal and vertical components.

Figure# 1T

Station: WVBY

Location: Beckley, WV

Frequency: 91.7 MHz

Date: 11/22/2019

Antenna: 1183-6CP-DA

Antenna Orientation: 277° True

Number of Bays: 6

Azimuth	Horizontal			Vertical			Azimuth	Horizontal			Vertical		
	Field	kW	dBk	Field	kW	dBk		Field	kW	dBk	Field	kW	dBk
0°	0.932	12.170	10.853	0.869	10.561	10.237	180°	0.789	8.711	9.401	0.810	9.177	9.627
5°	0.890	11.092	10.450	0.838	9.823	9.922	185°	0.791	8.752	9.421	0.790	8.730	9.410
10°	0.855	10.231	10.099	0.821	9.438	9.749	190°	0.797	8.899	9.493	0.783	8.590	9.340
15°	0.831	9.660	9.850	0.821	9.446	9.752	195°	0.809	9.154	9.616	0.794	8.832	9.460
20°	0.817	9.355	9.711	0.836	9.789	9.907	200°	0.828	9.601	9.823	0.821	9.441	9.750
25°	0.816	9.322	9.695	0.859	10.342	10.146	205°	0.864	10.449	10.191	0.858	10.303	10.130
30°	0.826	9.544	9.797	0.884	10.937	10.389	210°	0.901	11.373	10.559	0.895	11.216	10.498
35°	0.842	9.915	9.963	0.902	11.402	10.570	215°	0.927	12.020	10.799	0.923	11.936	10.769
40°	0.849	10.098	10.042	0.911	11.610	10.648	220°	0.937	12.291	10.896	0.936	12.256	10.883
45°	0.845	10.003	10.001	0.906	11.501	10.608	225°	0.933	12.182	10.857	0.929	12.077	10.820
50°	0.830	9.641	9.841	0.891	11.105	10.455	230°	0.915	11.724	10.691	0.905	11.455	10.590
55°	0.814	9.286	9.678	0.867	10.531	10.225	235°	0.889	11.060	10.437	0.869	10.572	10.242
60°	0.810	9.195	9.635	0.843	9.942	9.975	240°	0.861	10.381	10.162	0.831	9.676	9.857
65°	0.818	9.366	9.716	0.825	9.520	9.787	245°	0.839	9.860	9.939	0.801	8.987	9.536
70°	0.835	9.757	9.893	0.820	9.412	9.737	250°	0.829	9.619	9.831	0.786	8.645	9.368
75°	0.861	10.381	10.162	0.832	9.697	9.866	255°	0.822	9.456	9.757	0.788	8.688	9.389
80°	0.897	11.258	10.515	0.860	10.361	10.154	260°	0.818	9.363	9.714	0.804	9.060	9.571
85°	0.936	12.260	10.885	0.898	11.287	10.526	265°	0.819	9.399	9.731	0.830	9.638	9.840
90°	0.966	13.060	11.159	0.936	12.268	10.888	270°	0.826	9.544	9.797	0.856	10.260	10.111
95°	0.986	13.624	11.343	0.966	13.052	11.157	275°	0.834	9.728	9.880	0.877	10.765	10.320
100°	0.998	13.937	11.442	0.979	13.421	11.278	280°	0.837	9.812	9.917	0.888	11.030	10.426
105°	0.999	13.962	11.449	0.974	13.270	11.229	285°	0.835	9.750	9.890	0.886	11.000	10.414
110°	0.987	13.645	11.350	0.950	12.645	11.019	290°	0.825	9.522	9.787	0.874	10.697	10.293
115°	0.964	13.023	11.147	0.915	11.726	10.691	295°	0.815	9.297	9.683	0.851	10.145	10.062
120°	0.930	12.116	10.834	0.877	10.758	10.317	300°	0.812	9.241	9.657	0.826	9.551	9.801
125°	0.887	11.003	10.415	0.844	9.970	9.987	305°	0.820	9.411	9.736	0.812	9.221	9.648
130°	0.850	10.117	10.051	0.824	9.509	9.781	310°	0.837	9.798	9.911	0.810	9.196	9.636
135°	0.825	9.529	9.791	0.820	9.417	9.739	315°	0.863	10.415	10.177	0.826	9.555	9.802
140°	0.811	9.216	9.645	0.830	9.646	9.843	320°	0.898	11.283	10.524	0.857	10.293	10.125
145°	0.809	9.174	9.625	0.848	10.076	10.033	325°	0.936	12.273	10.890	0.904	11.435	10.582
150°	0.808	9.134	9.606	0.868	10.548	10.232	330°	0.966	13.063	11.160	0.944	12.487	10.965
155°	0.805	9.065	9.574	0.883	10.904	10.376	335°	0.986	13.620	11.342	0.969	13.158	11.192
160°	0.800	8.968	9.527	0.887	11.021	10.422	340°	0.997	13.929	11.439	0.979	13.414	11.276
165°	0.796	8.862	9.475	0.880	10.844	10.352	345°	0.998	13.955	11.447	0.971	13.191	11.203
170°	0.792	8.784	9.437	0.862	10.399	10.170	350°	0.987	13.649	11.351	0.945	12.506	10.971
175°	0.790	8.733	9.412	0.836	9.791	9.908	355°	0.965	13.047	11.155	0.908	11.545	10.624

Horizontal Polarization:

Maximum: 4.137 (6.167 dB)

Horizontal Plane: 4.137 (6.167 dB)

Maximum ERP: 14.000 kW

Vertical Polarization:

Maximum: 3.970 (5.988 dB)

Horizontal Plane: 3.970 (5.988 dB)

Maximum ERP: 13.433 kW

Total Input Power: 3.384 kW

Reference: WVBY1T.FIG

**Directional Antenna
System Specifications
Proposed For
WVBY, Beckley, West Virginia**

(Continued)

GENERAL SPECIFICATION

Antenna Type:	1183-6CP-DA
Frequency:	91.7 MHz
Number of bays:	Six

MECHANICAL SPECIFICATION

(All Specifications are Approximate)

Mounting:	Custom
System length:	63 ft 4 in
Aperture length required:	68 ft 7 in ¹
The approximate weight:	10,150 lbs
The effective projected area:	430 ft ² CaAa ²
Orientation:	TBD ³
Antenna input flange	3 1/8" female

ELECTRICAL SPECIFICATION

(For directional use)

Maximum horizontal ERP:	14.000 kW (11.461 dBk)
Horizontal maximum power gain:	3.290 (5.172 dB)
Maximum vertical ERP:	14.000 kW (11.461 dBk)
Vertical maximum power gain:	3.290 (5.172 dB) ⁴
Total input power:	4.255 kW (6.289 dBk)
Total input power based on 85%:	3.074 kW (4.877 dBk) ⁵
Maximum power input capabilities:	30 kW ⁶

TUNING SPECIFICATIONS

VSWR:	1.07 : 1 or less (with field matching)
Beam tilt:	0°
Null fill:	0%

¹ If the antenna is to be mounted at the top of the tower.

² The Effective Projected Area of the antenna is based on TIA/EIA-222-F Standards with no ice.

³ Actual antenna orientation will be determined when the final pattern is developed.

⁴ Input power and gain figure are based on your filed FCC pattern. The actual antenna gain figures will be computed when the antenna is measured.

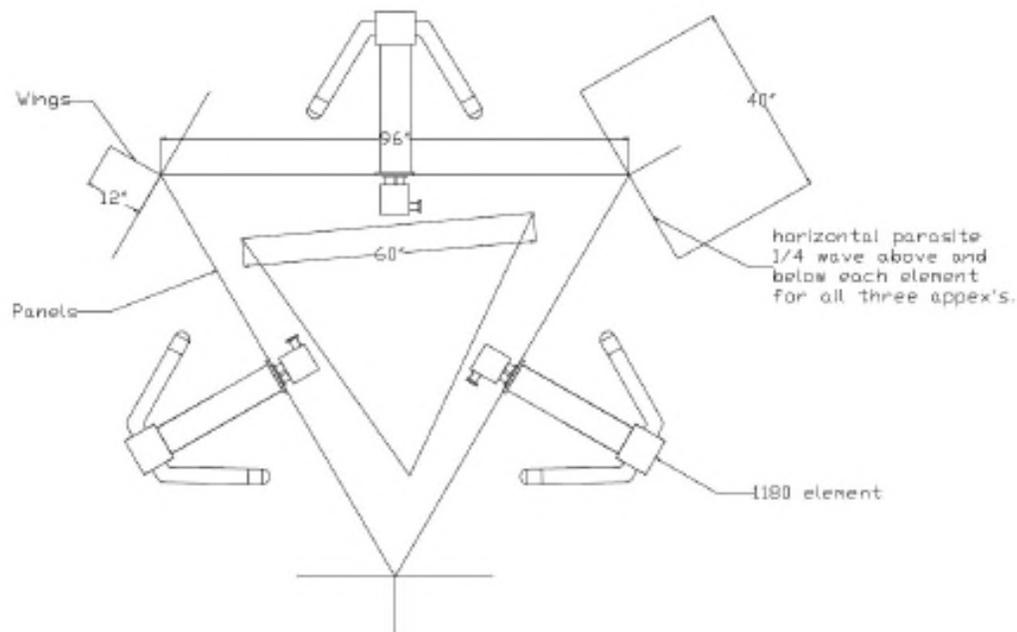
⁵ Input power is based on 85% of the RMS of the composite pattern.

⁶ The maximum power at the input of the antenna system.

PRELIMINARY MECHANICAL SPECIFICATION FOR 1183-6CP-DA WVBY (91.7 MHz)

MECHANICAL CHARACTERISTICS:

ELEMENT TYPE:	1180 Series With Radomes	
OVERALL HEIGHT:	64.36 feet	
CALCULATED WEIGHT:	No Ice:	10,150 lbs
	With 1/2" Ice:	16,900 lbs
CALCULATED EFFECTIVE WIND AREA (EPA):	No Ice:	430 ft ²
	With 1/2" Ice:	776 ft ²



NOTES:

1. Please note, the listed weights and effective wind areas are based upon the **PRELIMINARY** design of the antenna.
2. Loads calculated in accordance with the ANSI/TIA-222-G standard.
3. No wind shielding taken into account for supporting structure.
4. Loading includes preliminary design for all aperture components including radiating elements, reflective panels and wings, parasitic elements, feed harnessing, and mount brackets. Loading does **NOT** include 60"-face support mast.

Please contact ERI's Structural Division if you have any questions concerning the provided Mechanical Specifications.

1183-6CP-DA Master FM Antenna

The FM antennas proposed for this project is a six (6) bay 1180 Series ERI FM panel antenna. The antenna is constructed of eighteen (18) 1180 Series FM antenna elements configured in three curtains of six (6) elements each. Each element includes a single input hybrid and the array is fed from a single 3-1/8-inch, 50-ohm EIA flanged input.

The antenna price includes brackets to support the antenna on the customer supplied, uniform cross section, 60-inch face triangular tower. The antenna proposed will include directional pattern development and testing. The pattern testing will be done at ERI's full scale far field FM antenna test range and the antenna will include the FCC required directional proof of performance.

The antenna system is designed with all elements at DC ground and the screens, transmission lines, and power dividers will be all firmly bonded to the support structure. This eliminates any potential for the static build up and helps protect the system from damage from lightning. ERI has also included full scale range testing on our far field range to optimize the horizontal plane pattern during the design phase.

1180 Series FM Panel Elements

ERI manufactures a full range of circular polarized custom antenna systems. All systems are designed and engineered to the most exacting standards and provide dependable high-quality performance over a wide range of applications. A typical application might be for a system to radiate an omnidirectional signal with good bandwidth stability for multichannel operation.



Gain requirements are achieved by stacking layers of the arrangement vertically on the support structure. The number of layers and the vertical spacing between layers are the predominate factors in determining the vertical power gain. Options such as tilting the main vertical beam and /or null fill are incorporated in the antenna array through a suitable arrangement of the feed system. Parameters can vary greatly for custom vertical pattern shaping, and details for any given configuration are available upon request. It is highly recommended that a professional radio consultant to assist in determining your needs for custom vertical pattern shaping.



1183-10CP-2 Master FM Antenna in Wausau, Wisconsin. System included optional 6-1/8-inch element arms.

ERI has engineered two broadband element models to be used as building blocks in the construction of custom horizontal radiation patterns. The 1180 Flat Panel and the 1180 Iris Cavity both utilize the 1180 pressurized balun support stems with crossed, dipole arms. The arms may be straight or bent as necessary to meet pattern requirements. These radiators are then mounted in cavities, or on flat reflecting panels and fed using a broadband hybrid feed harness. A wide range of radiation patterns, using multiple elements mounted on either triangular, round or square cross section structures can be achieved.

Features

- The 1180 design simplifies the antenna feed system, requiring only one semi-flexible coaxial feeder be used to supply power to each bay element.
- Each bay element input is normally 50 ohms over the entire FM band and capable of handling up to 25 kW of input power.
- For protection from lightning, all 1180 elements provide a DC path to tower ground.
- High power and trouble-free performance is provided by the 1180 element support stem. The stem is a pressurized housing for the element baluns and crossed radiating arm internal feeds.
- Crossed radiating arms are manufactured of tubular brass and attached to a large melamine insulator in a pressurized dry gas environment.
- Screens are constructed in half panels for ease of installation and removal.
- On most designs, screens continuously surround the support structure, electrically isolating the structure from the antenna.
- Screens and cavities are constructed mostly of steel rod for low weight, low wind load, and maximum strength.

Benefits

- A rugged mounting bracket which has wide latitude of adjustment to assist in overcoming possible interface problems is provided to secure the antenna to the supporting structure.
- All steel parts are hot-dipped galvanized to permanently protect all points of welding and construction against corrosion. (Some items are available in stainless steel by special request.)
- The 1180 element/hybrid feed combination assures excellent axial ratio characteristics over the entire FM band.
- The element hybrid is an integral part of each bay element. Its use ensures that proper power and phase is maintained to the crossed radiating arms.
- The broadband operating performance of the 1180 element is virtually unaffected by environmental changes due to its unique design and construction.
- All custom patterns proposed using our 1180 elements are verified and certified using our modern 50-acre test range.



ERI 1180 Series COGWHEEL Master FM Antenna for the John Hancock Center under test at ERI's 50-acre Test Site.

3-inch Air HELIAX® and Accessories

HJ8-50B 3-inch Air HELIAX

HJ8-50B



HJ8-50B, HELIAX® Standard Air Dielectric Coaxial Cable, corrugated copper, 3 in, black PE jacket

Product Classification

Brand	HELIAX®
Product Series	HJ8-50B
Product Type	Air coaxial cable

Construction Materials

Jacket Material	PE
Dielectric Material	PP
Flexibility	Standard
Inner Conductor Material	Copper tube
Jacket Color	Black
Outer Conductor Material	Corrugated copper

Dimensions

Nominal Size	3 in
Cable Volume	36.7 ft ³ /kft
Cable Weight	1.78 lb/ft
Diameter Over Jacket	76.454 mm 3.010 in
Inner Conductor OD	28.9560 mm 1.1400 in
Outer Conductor OD	72.390 mm 2.850 in

Electrical Specifications

Cable Impedance	50 ohm ±0.5 ohm
Capacitance	71.2 pF/m 21.7 pF/ft
dc Resistance, Inner Conductor	0.150 ohms/kft
dc Resistance, Outer Conductor	0.070 ohms/kft
dc Test Voltage	16000 V
Inductance	1.870 µH/m 0.570 µH/ft
Insulation Resistance	100000 Mohms•km
Jacket Spark Test Voltage (rms)	10000 V
Operating Frequency Band	1 – 1640 MHz
Peak Power	640.0 kW
Power Attenuation	5.997
Velocity	93 %

HJ8-50B

Environmental Specifications

Installation Temperature	-40 °C to +60 °C (-40 °F to +140 °F)
Operating Temperature	-40 °C to +85 °C (-40 °F to +185 °F)
Storage Temperature	-70 °C to +85 °C (-94 °F to +185 °F)

Mechanical Specifications

Bending Moment	40.7 N-m 30.0 ft lb
Flat Plate Crush Strength	175.0 lb/in
Minimum Bend Radius, Multiple Bends	762.00 mm 30.00 in
Number of Bends, minimum	15
Number of Bends, typical	25
Pressurization, maximum	0 N/mm ² 30 psi
Tensile Strength	340 kg 750 lb

Note

Performance Note	Values typical, unless otherwise stated
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Standard Conditions

Attenuation, Ambient Temperature	20 °C 68 °F
Average Power, Ambient Temperature	40 °C 104 °F
Average Power, Inner Conductor Temperature	121 °C 250 °F

HJ8-50B

Attenuation

Frequency (MHz)	Attenuation (dB/100 m)	Attenuation (dB/100 ft)	Average Power (kW)
91.7	0.442	0.135	44.51

Attenuation

Frequency (MHz)	Attenuation (dB/100 m)	Attenuation (dB/100 ft)	Average Power (kW)
0.5	0.029	0.009	640.00
1	0.041	0.013	475.54
1.5	0.051	0.015	387.10
2	0.059	0.018	334.39
10	0.135	0.041	146.12
20	0.194	0.059	101.58
30	0.24	0.073	81.88
50	0.317	0.096	62.16
85	0.424	0.129	46.43
88	0.432	0.132	45.55
100	0.464	0.141	42.41
108	0.484	0.148	40.62
150	0.584	0.178	33.72
174	0.635	0.194	30.96
200	0.689	0.21	28.56
204	0.697	0.212	28.24
300	0.874	0.266	22.50
400	1.039	0.317	18.93
450	1.117	0.34	17.62
460	1.132	0.345	17.38
460	1.132	0.345	17.38
500	1.192	0.363	16.51
512	1.209	0.369	16.27
600	1.335	0.407	14.74
700	1.47	0.448	13.38
800	1.601	0.488	12.29
824	1.631	0.497	12.06
894	1.719	0.524	11.45
960	1.8	0.549	10.93
1000	1.849	0.563	10.64
1218	2.104	0.641	9.35
1250	2.14	0.652	9.19
1500	2.418	0.737	8.14

Regulatory Compliance/Certifications

Agency	Classification
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system

HJ8FB-302-S 3-1/8-inch Air HELIAX Connector H8FB-302-S



3-1/8 in EIA Female Flange with gas barrier for 3 in HJ8-50B air dielectric cable. Coupling Element, O-Ring, screw-set sold separately. Click-on: Related Products, Device connectors and Adapters

Product Classification

Brand	HELIAX®
Product Type	Air coaxial connector

General Specifications

Interface	3-1/8 in EIA Female Flange
Body Style	Straight
Gas Barrier	Yes
Mounting Angle	Straight
Ordering Note	Gas pass version can be created by drilling out the PTFE dielectric Male version can be created ordering an appropriate coupling element separately When ordering factory assembled transmission lines gas pass/barrier option can be fitted

Electrical Specifications

Connector Impedance	50 ohm
Operating Frequency Band	0 – 1640 MHz
Average Power at Frequency	10.9 kW @ 960 MHz
Cable Impedance	50 ohm
RF Operating Voltage, maximum (vrms)	5656.00 V
dc Test Voltage	16 kV
Insulation Resistance, minimum	5000 MOhm
Peak Power, maximum	640.00 kW
Insertion Loss, typical	0.05 dB

Mechanical Specifications

Outer Contact Attachment Method	Tab-flare
Inner Contact Attachment Method	Thread-in stub
Outer Contact Plating	Silver
Inner Contact Plating	Silver

H8FB-302-S

Dimensions

Nominal Size	3 in
Diameter	135.38 mm 5.33 in
Length	163.07 mm 6.42 in
Weight	5.50 kg 12.13 lb

Environmental Specifications

Operating Temperature	-40 °C to +85 °C (-40 °F to +185 °F)
Storage Temperature	-70 °C to +85 °C (-94 °F to +185 °F)

Return Loss/VSWR

Frequency Band	VSWR	Return Loss (dB)
0-960 MHz	1.02	40.09
960-1640 MHz	1.04	34.15

Regulatory Compliance/Certifications

Agency	Classification
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system

BN-918710 3-1/8-inch EIA Coupling Element and Hardware Kit BN-918710



3-1/8 EIA Coupling Element, O-Ring, screw-set

Product Classification

Product Type Coupling element

General Specifications

Interface 3-1/8 in EIA Flange
Includes O-rings | Screw set

Electrical Specifications

Connector Impedance 50 ohm
Operating Frequency Band 1 – 5200 MHz

Mechanical Specifications

Inner Contact Plating Silver

Dimensions

Height 81.30 mm | 3.20 in
Length 101.10 mm | 3.98 in
Weight 0.50 kg | 1.10 lb
Width 81.30 mm | 3.20 in

Standard Conditions

Attenuation, Ambient Temperature 20 °C | 68 °F
Average Power, Ambient Temperature 20 °C | 68 °F
Average Power, Inner Conductor Temperature 100 °C | 212 °F

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system

26985A 3-1/8-inch Air HELIAX Hoisting Grip

26985A



Lace-up Hoisting Grip for 3 in coaxial cable and elliptical waveguide 28 and 34

Product Classification

Product Type Hoisting grip

Dimensions

Nominal Size 3 in
Grip Length, minimum 762.00 mm | 30.00 in
Leader Length, minimum 457.20 mm | 18.00 in
Waveguide Size WR229 | WG11 | R40

Electrical Specifications

DTF Effect 0.1 dB
Return Loss Effect 0.1 dB

General Specifications

Hoisting Grip Type Lace-up hoisting grip
Attachment Spacing Intervals 61 m | 200 ft
Cable Type Corrugated | Elliptical waveguide
Material Type Tin-coated bronze
Ordering Note CommScope® non-standard product
Package Quantity 1
Support Clamp Not included
Tool Type Hoisting grip

Mechanical Specifications

Pull Load Capacity 500 lb

Packed Dimensions

Shipping Weight 1.43 kg | 3.15 lb

Regulatory Compliance/Certifications

Agency	Classification
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system

HGK0001 Hoisting Grip Hoisting Grip Hanger Kit



Part Number	Description
HGK0001	Hoisting grip hanger kit to attach HELIAX hoisting grips to tower. Includes 18-inches of chain, 12-inch x 12-inch turnbuckle and two shackles. One required for each hoisting grip and one hoisting grip required for each 200-foot (60-meters) of vertical run.
II-HGK-0001	Installation Instructions

223700-724 Standard Grounding Kit for 3-inch Air HELIAX 223700-724



Standard Grounding Kit for 2-1/4 in and 3 in corrugated coaxial cable and elliptical waveguide 28 and 37

Product Classification

Product Type Grounding kit

Dimensions

Nominal Size 2-1/4 in | 3 in
Waveguide Size WR229 | WG11 | R40 | WR284 | WG10 | R32
Bonding Conductor Length 1524.0 mm | 60 in
Cable Jacketing Removal Length, maximum 59.1 mm | 2.3 in
Cable Jacketing Removal Length, minimum 55.9 mm | 2.2 in
Compatible Diameter, maximum 78.740 mm | 3.100 in
Compatible Diameter, minimum 58.674 mm | 2.310 in

Electrical Specifications

Current Handling Tested to withstand 100,000 amps peak current surge
Current Handling Test Method MIL-STD-1757
Grounding, Bonding and Shielding Test Method MIL-STD-188-124A
Lightning Protection Test Method IEC 1024-1

Environmental Specifications

Operating Temperature -40 °C to +85 °C (-40 °F to +185 °F)
Storage Temperature -40 °C to +80 °C (-40 °F to +176 °F)
Weatherproofing Method Butyl and electric tape

General Specifications

Grounding Kit Type Standard Grounding Kits
Cable Type Corrugated | Elliptical waveguide
Ordering Note CommScope® non-standard product
Color Black
Bonding Conductor Material Copper
Bonding Conductor Wire Size 6 gauge
Bonding Conductor Jacketing Material PVC
Grounding Strap Material Copper

223700-724

Includes	Grounding kit Hardware Lug One roll of 2 in PVC tape One roll of 24 in butyl rubber tape
Lug Attachment	Field attached
Lug Type	Two-hole lug
Package Quantity	1
Rivet Material	Copper

Mechanical Specifications

Blowing Rain Test Method	MIL-STD-810, Method 506
Corrosion Test Method	MIL-STD-1344, Method 1001
Freezing Rain/Icing Test Method	MIL-STD-810, Method 521
Humidity Test Method	MIL-STD-1344, Method 1002
Immersion Test Method	IEC 60529:2001, IP68
Thread Size	3/8 in
UV Resistance Test Method	MIL-STD-810, Method 505
Vibration Test Method	MIL-STD-202, Method 214

Packed Dimensions

Height	269.7 mm 10.6 in
Length	177.8 mm 7.0 in
Shipping Weight	0.92 kg 2.03 lb
Width	57.2 mm 2.3 in

Regulatory Compliance/Certifications

Agency	Classification
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system



Included Products

- 9905-71 — Black 2 in PVC Tape, 20 ft
- 42615-10 — Butyl Rubber Tape, 24 in

* Footnotes

Grounding, Bonding and Shielding Test Method	Military Standard for Grounding, Bonding, and Shielding: Bond Resistance Requirement of a Maximum dc resistance of 0.001 ohm
Lightning Protection Test Method	Protection Against Lightning Electromagnetic Impulse, Table 1—Protection Level

31766A-11 3-inch Butterfly Hanger Kit

31766A-11



Butterfly Hanger for 3 in coaxial cable and elliptical waveguide 28

Product Classification

Product Type Hanger kit

Dimensions

Nominal Size 3 in
Compatible Diameter, maximum 81.280 mm | 3.200 in
Compatible Diameter, minimum 76.200 mm | 3.000 in
Height 41.91 mm | 1.65 in
Length 63.50 mm | 2.50 in
Waveguide Size WR284 | WG10 | R32
Width 38.10 mm | 1.50 in

Electrical Specifications

DTF Effect 0.1 dB
Return Loss Effect 0.1 dB

Environmental Specifications

Operating Temperature -40 °C to +85 °C (-40 °F to +185 °F)

General Specifications

Hanger Type Standard butterfly hanger
Cable Type Corrugated | Elliptical waveguide
Cables per Hanger 1
Color Silver
Material Type Stainless steel
Ordering Note CommScope® non-standard product
Package Quantity 10

Mechanical Specifications

Corrosion Resistance, minimum with no degradation ≥500 hours in salt spray chamber

31766A-11

Mounting	3/8 in (M10) drilled cable ladder
Vibration Survival	≥4 hours at resonant frequency
Environmental Strength Capability	Double cable weight

Packed Dimensions

Height	26.0 cm 10.2 in
Length	9.0 cm 3.5 in
Shipping Weight	1.67 kg 3.68 lb
Width	9.0 cm 3.5 in

Regulatory Compliance/Certifications

Agency	Classification
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system

40394-2 Single Entrance Panel for 3-inch Coaxial Cable

40394-2

Single Entrance Panel for 3 in coaxial cable

Product Classification

Product Type Entrance panel

Dimensions

Height 177.80 mm | 7.00 in
Nominal Size 3 in
Width 76.20 mm | 3.00 in

General Specifications

Number of Ports 1
Panel Type Single
Color Gray
Entry Panel Port Size 162.6 mm | 6.4 in
Includes Boot | Clamp | Plate
Material Type Aluminum
Ordering Note CommScope® non-standard product
Package Quantity 1

Mechanical Specifications

Weather Resistance Test Method 04AS00-03.9.0 | IEC 60529:2001, IP66

Packed Dimensions

Height 304.8 mm | 12.0 in
Length 304.8 mm | 12.0 in
Shipping Weight 2.53 kg | 5.58 lb
Width 76.2 mm | 3.0 in

Regulatory Compliance/Certifications

Agency	Classification
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system

31768A Angle Adapter Kit

31768A

Angle Adapter, standard, 3/8 in tapped hole



Product Classification

Product Type Adapter

Dimensions

Inside Length	22.23 mm 0.88 in
Inside Width	22.23 mm 0.88 in
Outside Length	44.96 mm 1.77 in
Outside Width	49.81 mm 1.96 in

General Specifications

Adapter Type	Angle adapter
Material Type	Stainless steel
Ordering Note	CommScope® standard product in the United States and Canada
Package Quantity	10

Mechanical Specifications

Installation Torque, maximum	15.0 ft lb
Installation Torque, minimum	11.0 ft lb
Material Thickness	4.191 mm 0.165 in
Maximum Loading	Triple stack, 1-5/8 in cable
Mounting	3/8 in tapped hole

Packed Dimensions

Height	14.2 cm 5.6 in
Length	10.2 cm 4.0 in
Shipping Weight	2.33 kg 5.14 lb
Width	14.2 cm 5.6 in

31670-4E Round Member Adapter Kit



Part Number	Description
31670-4E	Round member adapter kit qty 10 for 4-inch to 5-inch round members. Stainless steel clamps to mount 1/2 to 4-inch cable hangers to round support members. Two each are needed for 3 and 4-inch cable hangers.

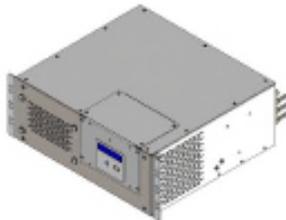
HR30848-1 Standoff Adapter Kit



Part Number	Description
HR30848-1	1.0-inch standoff adapter kit for 3 to 6-inch leg, quantity of 10 per kit. Includes hardware to attach non-insulated butterfly hanger. Requires ERI part number 31670-() round member adapter kit, one per kit. Shown with round member adapter purchased separately.

MT050C Dehydrator

MT050C



DryLine® Dehydrator, Low-pressure membrane, 19 in rack mountable, Wall mountable, 3.0 psig (2-6 adjustable), with summary and discrete alarms, 115/230 Vac, 50/60 Hz

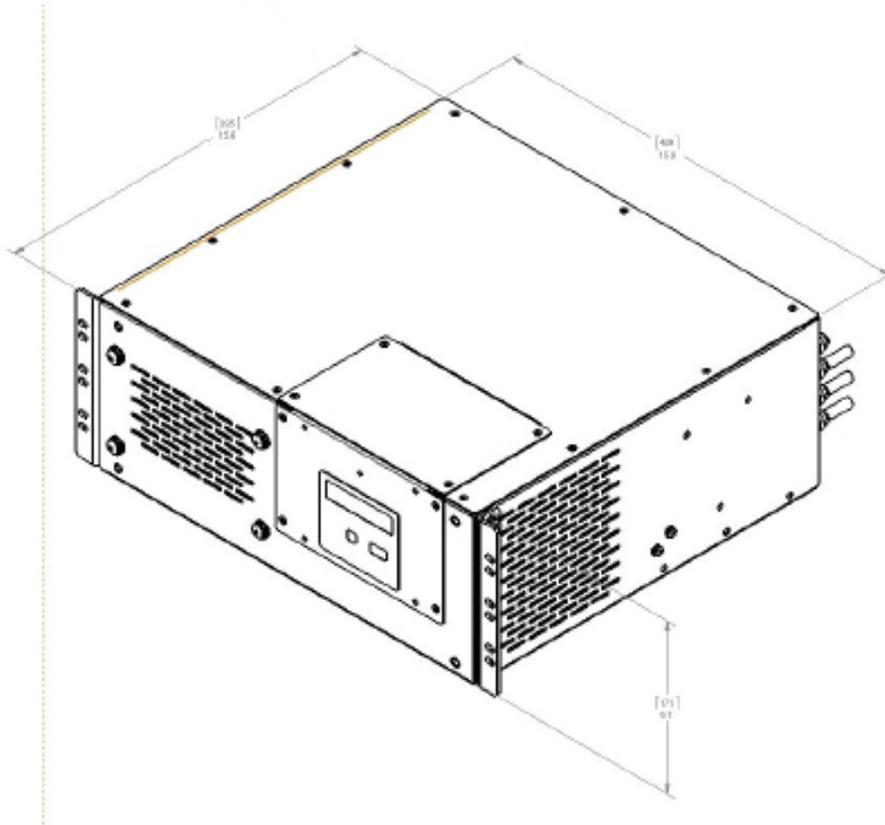
- See related products for dc options, sold separately

Product Classification

Brand DryLine®
 Product Type Dehydrator

MT050C

Outline Drawing-Section



Alarm

Alarm Type	Discrete Summary
Excess-Run Alarm	10 minutes, factory set
High-Humidity Alarm	7.5% RH, factory set
Low-Pressure Alarm	68 mbar 7 kPa 1 psig
Power-Fail Alarm	Loss of input power

Dimensions

Net Weight	20.0 kg 44.1 lb
Product Depth	419.1 mm 16.5 in
Product Height	172.7 mm 6.8 in
Product Width	439.4 mm 17.3 in

MT050C

Gross Weight, Packed	23.0 kg 50.7 lb
Product Depth, Packed	541.0 mm 21.3 in
Product Height, Packed	312.4 mm 12.3 in
Product Width, Packed	502.9 mm 19.8 in

Electrical Specifications

Voltage	115/230 Vac \pm 10%, selectable
Alarm Contact Rating	Form C dry contacts, 2 amps at 30 Vdc
Operating Temperature	-10 °C to +50 °C (+14 °F to +122 °F)
Power Consumption, at runtime	220.0 W
Power Consumption, average	6.6 W
Power Consumption, maximum	220.0 W
Power Consumption, minimum	0.2 W
Power Cord	Europe power cord with stripped leads USA power cord
Power Frequency	60/50 Hz
Power Phase	Single
Suggested Circuit Breaker Size	20 A
Circuit Breaker Requirement	Electrical connections require separate circuits for dehydrator installation

General Specifications

Volume Capacity, minimum	0.0000 m ³
Volume Capacity, maximum	1.6990 m ³
Dehydrator Type	Automatic Membrane
Dew Point	Better than -45 °C (-50 °F) at 95% RH at +40 °C (+104 °F)
Flow Rate, nominal	3.40 SLPM
Includes	3/8 in polyethylene tubing 90° elbow fitting Instruction sheet Male connector fitting Needle valve Power cord PTFE tape
Mount Type	Bench Floor Rack Wall
Port Count	4
Port Type	3/8 in PE tube
Rack Type	EIA 19 in ETSI N3 (optional)
Rack Units	4
Regulated Output Pressure Type	factory set
Regulated Output Pressure, maximum	41.4 kPa
Regulated Output Pressure, minimum	14.0 kPa
Voltage Type	ac

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system
China RoHS SJ/T 11364-2014	Above Maximum Concentration Value (MCV)