

BID PROPOSAL AND SPECIFICATIONS

New Hanover County North East Library Rooftop HVAC Replacement

RFB # 2016-0915



COUNTY COMMISSIONERS

JONATHAN BARFIELD, JR., CHAIRMAN

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Section 1 Advertisement

**NEW HANOVER COUNTY
North East Library Rooftop HVAC Replacement**

RFB #2016-0915

Sealed bids addressed to Carrie Buttles, Purchasing Agent, New Hanover County Finance Office, 230 Government Center Drive, Suite 165, Wilmington, North Carolina 28403 and marked “**New Hanover County North East Library Rooftop HVAC Replacement #2016-0915**” will be accepted until **3:00 P.M. EST, Friday, October 2, 2015.**

The bids will be publicly opened and read immediately following the latest time for receipt of bids in the New Hanover County Finance Office, Suite 165, Conference Room 500, Wilmington, North Carolina.

A pre-bid meeting will be held on Tuesday, September 22, 2015 at 10:00 a.m. at New Hanover County Property Management Division, 200 Division Drive, Wilmington, NC, 28401.

Instructions for submitting bids and complete requirements and information may be obtained by visiting the County’s website at <http://www.nhcgov.com/business-nhc/bids/>.

The Board of County Commissioners reserves the right to accept or reject any or all bids and to make the purchase which will be in the best interest of the County.

Carrie Buttles, Purchasing Agent

New Hanover County

(910) 798-7402

Released: Tuesday, September 15, 2015

Section 2 Instructions and General Conditions

2.1 Schedule

EVENT	DATE
Advertisement and Release of Bidding Documents	Tuesday, September 15, 2015
Pre-bid Meeting	Tuesday, September 22, 2015 at 10:00am
Deadline for Questions	Friday, September 25, 2015 by 5:00pm
Response to Questions Issued	Monday, September 28, 2015
Deadline for Receipt of Bids	Friday, October 2, 2015 at 3:00pm New Hanover County Finance Office 230 Government Center Drive, Suite 165 Wilmington, NC 28503 (Opening to be held in Conference Room 500)
Bid Review/Evaluation Period	Monday, October 5, 2015
Proposed Date of Award	Monday, October 19, 2015

2.2 Preparation of Bid Proposal

2.2.1 Completion of Bid Form: Bidders are directed to submit their bid on the bid proposal form contained in this bid package. All prices and notations shall be written in ink or typed. Discrepancies between words and numerals will be resolved in favor of words. Discrepancies between the multiplication of units of work and unit prices will be resolved in favor of the unit prices. Changes or corrections made on the Bid must be initialed by the individual signing the bid. No corrections will be permitted once bids have been received and opened. **BIDS NOT SIGNED WILL BE REJECTED.**

2.2.2 Deviations: New Hanover County reserves the right to allow or disallow minor deviations or technicalities should the County deem it to be to the best interest of the County. New Hanover County shall be the sole judge of what is to be considered a minor deviation or technicality.

2.3 Submission of Bid Proposal

Submit one (1) original and (1) copy in a sealed envelope properly marked “**New Hanover County North East Library Rooftop HVAC Replacement #2016-0915**” and address to the County at the following address:

New Hanover County Finance Office
Attn: Carrie Buttles, Purchasing Agent
230 Government Center Drive, Suite 165
Wilmington, NC 28403

2.3.1 After the Bid issue date, all communications between the County and prospective Bidders regarding this Bid shall be in writing. Any inquires, requests for interpretation, technical questions, clarification, or additional information shall be directed to **Carrie Buttles, Purchasing Agent** by emailing cbuttles@nhcgov.com or faxing (910) 798-7806. All questions concerning this Bid shall reference the Bid number, section number and paragraph. Questions and responses affecting the scope of the services will be provided to Bidders by issuance of an Addendum which will be posted to the County’s website at <http://www.nhcgov.com/business-nhc/bids/>.

All questions shall be received no later than 5:00 P.M., EST, Friday, September 25, 2015.

2.4 Cost of Preparation of Response

Costs incurred by prospective Bidders in the preparation of the response to this Request for Bid are the responsibility of the responding Bidder and will not be reimbursed by the County.

2.5 Trade Secret Confidentiality

All bid proposals received and recorded at the bid opening are considered public record and available for public inspection. According to General Statutes 132 - 1.2, trade secrets contained in a bid may be kept confidential if the bidder, at the time the bid is submitted, designates the secret and requests that it be kept confidential. This right of privacy will be construed as narrowly as possible to protect the interests of the BIDDER while attempting to maximize the availability of information to the public.

2.6 Time for Opening Bids

Bids will be opened promptly and read at the time and date set forth in the advertisement. Bidders or their authorized agents are invited to be present. Any bids received after the scheduled closing time for the receipt of bids **will not be accepted**.

2.7 Withdrawal of Bids

Bidders may withdraw or withdraw and resubmit their bid at any time prior to the closing time for receipt of bids. NO bid may be withdrawn after the scheduled closing time for receipt of bids for a period of sixty (60) days.

2.8 Award of Contract

The award will be made to the "responsible bidder submitting the lowest responsive bid" taking into consideration quality, performance and the time specified in the bidding document for the performance of the contract.

2.9 Responsibility of Compliance With Legal Requirements

The bidder's products, service and facilities shall be in full compliance with any and all applicable state, federal, local, environmental and safety laws, regulations, ordinances and standards or any standards adopted by nationally recognized testing facilities regardless of whether or not they are referred to in the bid documents.

2.10 Indemnity

Successful Bidder shall indemnify and hold the County, its agents and employees, harmless against any and all claims, demands, causes of action, or other liability, including attorney fees, on account of personal injuries or death or on account of property damages arising out of or relating to the work to be performed by the Successful Bidder hereunder, resulting from the negligence of or the willful act or omission of the Successful Bidder, his agents, employees and subcontractors.

2.11 Insurance

Before commencing any work, the successful bidder shall procure insurance in the bidder's name and maintain all insurance policies for the duration of the contract of the types and in the amounts listed below. The insurance shall provide coverage against claims for injuries to persons or damages to property which may arise from operations or in connection with the performance of the work hereunder by the contractor, his agents, representatives, employees, or subcontractors, whether such operations by himself/herself or anyone directly or indirectly employed by him/her.

2.11.1 Commercial General Liability. Bidder shall maintain Commercial General Liability and if necessary, Commercial Umbrella Liability insurance with a total limit of not less than \$2,000,000 each occurrence for bodily injury and property damage. If such CGL insurance contains a general aggregate limit, it shall apply separately to this project/location or the general aggregate shall be twice the required limit.

2.11.2 CGL insurance shall be written on Insurance Services Office (ISO) “occurrence” form CG 00 01 covering Commercial General Liability or its equivalent and shall cover the liability arising from premises, operations, independent contractors, products-completed operations, personal and advertising injury, and liability assumed under an insured contract (including the tort liability of another assumed in a business contract).

2.11.3 New Hanover County, its officers, officials, agents, and employees are to be covered as additional insureds under the CGL by endorsement CG 20 10 or CG 20 33 **and** CG 20 37 or an endorsement providing equivalent coverage as respects to liability arising out of activities performed by or on behalf of the contractor; products and completed operations of the contractor; premises owned, leased or used by the contractor; and under the commercial umbrella, if any.

2.11.4 There shall be no endorsement or modification of the CGL or Umbrella Liability limiting the scope of coverage for liability arising from pollution, explosion, collapse, underground property damage, employment-related practices, or damage to the named insured’s work.

2.11.5 The bidder’s Commercial General Liability insurance shall be primary as respects New Hanover County, its officers, officials, agents, and employees. Any other insurance or self-insurance maintained by New Hanover County, its officers, officials, and employees shall be excess of and not contribute with the bidder’s insurance.

2.11.6 Workers’ Compensation and Employer’s Liability. Bidder shall maintain Workers’ Compensation as required by the general statutes of the State of North Carolina and Employer’s Liability Insurance.

2.11.7 The Employer’s Liability, and if necessary, Commercial Umbrella Liability insurance shall not be less than \$1,000,000 each accident for bodily injury by accident, \$1,000,000 each employee for bodily injury by disease, and \$1,000,000 policy limit.

2.11.8 The insurer shall agree to waive all rights of subrogation against the New Hanover County, its officers, officials, agents and employees for losses arising from work performed by the bidder for New Hanover County.

2.11.9 Business Auto Liability. Bidder shall maintain Business Auto Liability and, if necessary, Commercial Umbrella Liability insurance with a limit of not less than \$1,000,000 each accident.

2.11.10 Such insurance shall cover liability arising out of any auto, including owned, hired, and non-owned autos.

2.11.11 Business Auto coverage shall be written on ISO form CA 00 01, or a substitute form providing equivalent liability coverage. If necessary, the policy shall be endorsed to provide contractual liability coverage equivalent to that provided in ISO form CA 00 01.

2.11.12 The bidder's Business Auto Liability insurance shall be primary as New Hanover County, its officers, officials, agents, and employees. Any other insurance or self-insurance maintained by New Hanover County, its officers, officials, and employees shall be excess of and not contribute with the bidder's insurance.

2.11.13 Deductibles and Self-Insured Retentions. Any deductibles or self-insured retentions must be declared to and approved by New Hanover County. At the option of New Hanover County, either the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects New Hanover County, its officers, officials, agents, and employees; or the contractor shall procure a bond guaranteeing payment deductibles or self-insured retentions. The bidder shall be solely responsible for the payment of all deductibles to which such policies are subject, whether or not New Hanover County is an insured under the policy.

2.11.14 Miscellaneous Insurance Provisions. The policies are to contain, or be endorsed to contain, the following provisions:

2.11.15 Each insurance policy required by this contract shall be endorsed to state that coverage shall not canceled by either party except after 30 days prior written notice has been given to New Hanover County, 230 Government Center Drive #125, Wilmington, NC 28403.

2.11.16 If bidder's liability policies do not contain the standard ISO separation of insureds provision, or a substantially similar clause, they shall be endorsed to provide cross-liability coverage.

2.11.17 Acceptability of Insurers. Insurance is to be placed with insurers licensed to do business in the State of North Carolina with an A.M. Best's rating of no less than A VII unless specific approval has been granted by New Hanover County.

2.11.18 Evidence of Insurance. The bidder shall furnish New Hanover County with a certificate(s) of insurance, executed by a duly authorized representative of each insurer, showing compliance with the insurance requirements prior to commencing the work, and thereafter upon renewal or replacement of each certified coverage until all operations under this contract are deemed complete.

2.11.19 Evidence of additional insured status shall be noted on the certificate of insurance as per requirements in 2.16.3 above.

2.11.20 Subcontractors. Bidder shall include all subcontractors as insureds under its policies or shall furnish separate certificates for each subcontractor. All coverage for subcontractors shall be subject to all of the requirements stated herein. Commercial General Liability coverage shall include independent contractors' coverage, and the contractor shall be responsible for assuring that all subcontractors are properly insured.

2.11.21 Conditions.

2.11.21.1 The insurance required for this contract must be on forms acceptable to New Hanover County.

2.11.21.2 Where circumstances warrant, New Hanover County may, at its discretion subject to acceptance by the Risk Management and Finance Department accept letters of credit or custodial accounts in lieu of specific insurance requirements.

2.11.21.3 The bidder shall provide that the insurance contributing to satisfaction of insurance requirements shall not be canceled, terminated or modified by the contractor without prior written approval of New Hanover County.

2.11.21.4 The bidder shall promptly notify the Risk Management Office at (910) 798-7497 of any accidents arising in the course of operations under the contract causing bodily injury or property damage.

2.11.21.5 New Hanover County reserves the right to obtain complete, certified copies of all required insurance policies, at any time.

2.11.21.6 Failure of New Hanover County to demand a certificate or other evidence of full compliance with these insurance requirements or failure of New Hanover County to identify a deficiency from evidence that is provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

2.11.21.7 By requiring insurance herein, New Hanover County does not represent that coverage and limits will necessarily be adequate to protect the bidder and such coverage and limits shall not be

deemed as a limitation of bidder's liability under the indemnities granted to New Hanover County in this contract.

2.11.21.8 If bidder fails to maintain the insurance as set forth herein, New Hanover County shall have the right, but not the obligation, to purchase said insurance at bidder's expense.

2.11.21.9 The bidder may apply to New Hanover County for approval of higher deductibles based on financial capacity and quality of the carrier affording coverage.

2.11.21.10 New Hanover County shall have the right, but not the obligation of prohibiting bidder or any subcontractor from entering the project site or withhold payment until such certificates or other evidence that insurance has been placed in complete compliance with these requirements is received and approved by New Hanover County.

2.12 Addendum

The bid package constitutes the entire set of bid instructions to the bidder. The County shall not be responsible for any other instructions, verbal or written, made by anyone. Any changes to the specifications will be in the form of an Addendum which will be posted on the County's website at <http://www.nhcgov.com/business-nhc/bids/>.

2.13 Compliance With Bid Requirements

Failure to comply with these provisions or any other provisions of the General Statutes of North Carolina will result in rejection of bid.

2.14 Right To Reject Bids

The County reserves the right to reject any or all bids.

2.15 E-Verify

Pursuant to N.C.G.S. § 143-48.5 (Session Law 2014-418), Contractor shall fully comply and certify compliance of each of its subcontractors with Article 2 of Chapter 64 of the N.C. General Statutes, including the requirement for each employer with more than 25 employees in North Carolina to verify the work authorization of its employees through the federal E-Verify system. County shall be provided affidavits attesting to Contractor's and subcontractor's compliance or exemption. Violation of the provision, unless timely cured, shall constitute a breach of Contract. **(Complete the attached E-Verify form and return with your bid. Form must be notarized.)**

Section 3 SCOPES OF SERVICES

New Hanover County North East Library Rooftop HVAC Replacement

The New Hanover County North East Library has determined the need to replace the HVAC unit. The new equipment shall be Mammoth Brand or a comparable quality. New Hanover County will install this unit in house. However; the contractor will be responsible for the initial startup of the equipment.

Part 1 – General

1.01 Section Includes

Design, performance criteria, controls and installation requirements for Air Handling Units.

1.02 References

All components selected for this project shall conform to the following standards:

- A. AFBMA 9: *Load Ratings and Fatigue Life for Ball Bearings*
- B. AMCA Standard 99: *Standards Handbook*
- C. AMCA/ANSI Standard 204: *Balance Quality and Vibration Levels for Fans*
- D. AMCA Standard 210: *Laboratory Methods of Testing Fans for Ratings*
- E. AMCA Standard 300: *Reverberant Room Method for Sound Testing of Fans*
- F. AMCA 320: *Laboratory Method for Sound Testing of Fans Using Sound Intensity*
- G. AMCA Standard 500: *Test Methods for Louvers, Dampers and Shutters*
- H. AHRI Standard 410: *Forced Circulation Air Cooling and Air Heating Coil*
- I. ASHRAE Standard 52: *Gravimetric and Dust Spot Procedures for Testing Air Cleaning Devices Used in General Ventilation for Removing Particulate Matter*
- J. ASHRAE 52.2: *Procedures for Testing Air Cleaning Devices Used for Removing Particulate Matter*
- K. ASHRAE/ANSI Standard 111: *Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air Conditioning and Refrigeration Systems*
- L. ASTM A-525: *Specification for General Requirements for Steel Sheet, Zinc Coated (Galvanized) by the Hot-dip Process*
- M. IEEE 112-B: *Standard Test Procedures for Polyphase Induction Motors and Generators*
- N. NEMA MG-1: *National Electrical Manufacturers Association Motor Standards*
- O. NFPA 90A: *Standard for the Installation of Air Conditioning and Ventilating Systems*
- P. SMACNA: *Sheet Metal and Air Conditioning Contractors National Association*
- Q. UL Standard 1995: *Heating and Cooling Equipment*
- R. UL Standard 900: *Test Performance of Air Filter Units*

1.03 Submittals

- A. Submit shop drawings and product data in accordance with Division 1.
- B. Submittals shall include the following:
 - 1. Dimensioned plan and elevation view drawings and location of all field duct connections and openings.
 - 2. Manufacturer's performance of each unit. Performance sheets shall include, as a minimum, the following:
 - a) Input data used for selection
 - b) Unit model number
 - c) Cooling performances
 - d) Heating performances
 - e) Fan curves
 - f) Unit electrical data (voltage, FLA, MCA, MOP)
 - g) Approximate unit shipping weight
 - 3. Unit Manufacturer shall provide certified ratings conforming to the latest edition of AMCA 210, 310, 500 and AHRI 410.
 - 4. Unit construction and component summary.
 - 5. Unit sequence of operation, including flow schematic, list of contacts and signals and control accessories.

1.04 Operation and Maintenance Data

- A. Include data on design, inspection and procedures related to preventative maintenance. Installation, Operation and Maintenance Instructions Manual (IOM) shall be submitted at the time of unit shipment.

1.05 Qualifications

- A. Air Handling Unit Manufacturer shall have a minimum of 25 years of experience, in the packaged air handler market.
- B. Units shall carry the label of a Nationally Recognized Testing Laboratory (NRTL) or a Standards Council of Canada (SCC) approved lab (Testing Organization and Certifying Body).
- C. Units shall be constructed in accordance with CSA C22.2 and UL 1995 Heating and Cooling Equipment Harmonized Standard and shall carry the ETLus and ETLc label of approval. ETL or UL listing of individual components or control panels only is not acceptable.
- D. Units shall be constructed to provide smooth interior surfaces.
- E. Units shall comply with NFPA 70, National Electrical Code, as applicable for installation and electrical connections of ancillary electrical components of Air Handling Units.
- F. Unit internal insulation must have a flame spread rating not over 25 and smoke developed rating no higher than 50 complying with NFPA 90A, *Standard for the Installation of Air Conditioning and Ventilating Systems*.
- G. Units shall deliver the specified volume of air at the scheduled static pressure.
- H. Airflow data shall comply with AMCA 210 method of testing.
- I. All electrical components and assemblies shall comply with NEMA standards.
- J. If Manufacturer cannot provide any of the items or options listed within this specification it must be noted as an exception on the bid.

1.06 Delivery, Storage and Handling

- A. Deliver, store, protect and handle units to site under the supervision of the Owner and per Manufacturer's recommendations. Refer to Manufacturer's Installation, Operation and Maintenance Instructions Manual for proper installation procedures. Manufacturer is not responsible for any damage done to the units caused by poor rigging or installation operation.

1.07 Sequencing and Scheduling

- A. Coordinate work performed under this section with work performed under the separate installation contract.

Part 2 – Products

2.01 Acceptable Manufacturers

- A. Provide model EnergyPack® air handling units as manufactured by Venmar CES as the basis of design. Acceptable alternative manufacturers are Governair, Mammoth, Composite Air Design.

2.02 General

- A. Furnish and install where shown on the plans, Air Handling Units with design features as specified within this specification. The units shall be provided and installed in strict accordance with the specifications. All units shall be complete with all components and accessories as specified. Any exceptions must be clearly defined. The Contractor shall be responsible for any additional expenses that may occur due to any exception made. The Manufactures Representative shall be responsible for verification of supply and return opening size and location, use of adaptor curbs is **not acceptable**.
- B. The units shall be installed and oriented such that the outside fresh air intake hood is positioned in a direction opposite to prevailing winds.

2.03 Factory Testing and Quality Control

A. Standard Factory Tests

Units shall be factory run tested to ensure proper functioning of components. Fans shall be factory run tested to ensure structural integrity and proper rpm and shall be statically and dynamically balanced for continuous operation at the maximum rated fan speed and motor horsepower in accordance with AMCA 204. All electrical circuits shall be tested to ensure correct operation before shipment of unit. Units shall pass quality control and be thoroughly cleaned prior to shipment.

2.04 Unit Construction Description

A. General

Provide factory fabricated Air Handling Units with capacity as indicated on the schedule. The units consist of factory assembled components as shown on drawings, including but not limited to fan and motor assemblies, all necessary dampers, hoods (outdoor units only), plenums, filters, drain pans, wiring, controls (THIS UNIT CONTAINS FACTORY MOUNTED CONTROLS BY OTHER see Section 2.06.H of this specification) and other accessories as outlined in the schedule, enclosed in a single or multiple piece casing as shown on the mechanical drawings. Units shall be stand alone controlled, except where noted, with all safety and condenser control devices provided and wired for single-point power connection by the Manufacturer, all non-safety sequencing controls provided by others factory mounted as noted in Section 2.06.H of this specification, unless otherwise outlined in the schedule. Units shall have overall dimensions as indicated and fit into the space available with

adequate clearance for service as to fit on existing curb in existing location. Tags and decals to aid in service or indicate caution areas shall be provided. Electrical wiring diagrams and Installation, Operation and Maintenance Instructions Manual shall be attached to the control panel access doors within each unit. Units shall be UL or ETL listed. Units shall be shipped in one piece or shall be split for shipment to accommodate freight as required, as shown on mechanical drawings.

B. Unit Base and Floor

Unit perimeter base shall be completely welded and constructed from (6" [152 mm]) structural tubing and shall accommodate curb or concrete pad installation as shown on drawings (**Note: bolted or riveted bases are not acceptable**). Unit base floor shall be constructed from four-break formed steel panels, made from 14 gauge hot rolled steel (HRS). Floor panels shall be welded to each other, creating I-beams at each floor panel junction. Floor panel junctions shall be located at 14" increments (maximum) or less, in order to provide floor rigidity and support as required for internal components. Unit floor panels shall be welded to perimeter base frame steel tubing. Unit floor shall be insulated from underneath with 3" [76.2 mm], R20 polyurethane closed cell spray foam and protected with 24 gauge galvanized steel liners. Unit floor construction shall include two-stage thermal break, using gasket between base floor framing and liners underneath and floor membrane on top. Unit base and floor shall be factory covered with top coat industrial grade membrane to ensure air- and water-tightness as well as walk-on grip. Floor membrane shall be high performance, sprayed, plural-component pure polyurea elastomer, based on amine-terminated polyether resins, amine chain extenders and prepolymers. Floor membrane shall be flexible, tough, resilient monolithic membrane with good water and chemical resistance and shall resist to temperatures up to 250°F. Floor membrane materials shall be free of solvents and VOC's, shall be suitable for use in compartments handling conditioned air and shall comply with the requirements for the Standard for Heating and Cooling Equipment, ANSI/UL 1995, third edition, dated 02/18/2005, Section 5.10 and Section 18. Single wall floor construction with glued and pinned insulation and no subfloor is not acceptable; non-insulated floor construction is not acceptable. Floor constructions which are not air- and water-tight are not acceptable. Entire base frame is to be painted with a phenolic coating for long term corrosion resistance. Base frame shall be attached to the unit casing frame at the factory. When rigging, base frame deflection shall be less than 1/360 of the unit length. All major components shall be supported by the base without sagging or pulsating.

Floor openings shall be covered with painted walk-on steel safety grating. Steel safety grating shall consist of 1" x 1/8" [25 x 3 mm] bearing bars, forged welded with 3/16" [5 mm] twisted cross bars, providing a non-slip surface for extra safety, with opening size not greater than 1-3/16" x 4" [30 x 102 mm].

C. Rigging Provision – Single Piece Units

The unit base frame shall include lifting lugs located at the corner of the unit (and along the sides as required by design) and sized to allow rigging and handling of the units. Rigging shall be performed using all lifting lugs at all times and in strict accordance with the instructions provided within the Installation, Operation and Maintenance Instructions Manual. Lifting lugs may be removed after rigging; however, bolts shall be set back in place after lug removal.

D. Unit Casing

Unit wall and roof rigid frame shall consist of 16 gauge pre-painted galvanized formed steel corner posts and 16 gauge G90 galvanized formed steel (1" x 2" [25 x 51 mm]) intermediate

frame posts, providing stable construction allowing for removal of any panel without affecting unit structural integrity. Units without framed type of construction are not acceptable. Exterior casing panels shall be attached to the gasketed (1" x 2" [25 x 51 mm]) steel frame with corrosion resistant fasteners. Air Handling Unit casing shall be of the no-through-metal design. Casing shall incorporate insulating thermal breaks as required so that, when fully assembled, there is no path of continuous unbroken metal to metal conduction from inner to outer surfaces. Provide necessary support to limit casing deflection to L/200 of the narrowest panel dimension. If panels cannot meet this deflection, additional internal reinforcing is required. Units shall be designed for outdoor or indoor installation as indicated on the schedule. Indoor units weatherized for outdoor use are not acceptable. Outdoor units shall have a double sloped roof with 3% minimum roof pitch to prevent water accumulation, rain gutters above all access doors and roof joint seams of the T-shape construction, with minimum height of 1" [25 mm], metal strip sealed and encapsulated. Outdoor units shall be designed to resist snow, ice and wind loads, and if provided with weather hood(s), equipped with birdscreen and rain gutters. Indoor units shall have a flat roof. Hoods shall be shipped loose for field assembly. Internal partition on dual air tunnel units shall be insulated and constructed in the same manner and thickness as the unit cabinet outer liners. All panel seams shall be caulked and sealed for an air-tight unit. Leakage rates shall be less than 1% at design static pressure or 9" w.c., whichever is greater.

Outdoor unit outside skin shall be made of aluminum stucco.

E. Double Wall Construction

Units shall entirely be made of double wall construction. Single wall construction with coated insulation is not acceptable. Exposed insulation edges in the airstream are not acceptable. Unit panels shall be made of 14 gauge aluminum stucco outer liners and 18 gauge aluminum inner liners.

F. Insulation

Unit wall and roof panels shall be insulated with 3" [76 mm] thick, R12.9, 2.5 lb/cu. ft. non-compressed mineral wool insulation. Unit internal partition (dual air tunnel units) shall be insulated with 2" [51 mm] thick, R8.6, 2.5 lb/cu. ft. non-compressed mineral wool insulation. Insulation shall meet the erosion requirements of UL 181 facing the airstream and fire hazard classification of 25/50 (per ASTM-84 and UL 723 and CAN/ULC S102-M88). All insulation edges shall be encapsulated within the panels. All perforated sections shall have insulation with black acrylic coating.

G. Access Doors

Full size access door(s) allowing for periodic maintenance and inspections shall be provided for all serviceable components as shown on the plans. Removable panels are not acceptable. Doors shall be solid double wall insulated construction. Insulation shall be the same as unit panels. Both the inner and outer liners shall be made of the same material as unit cabinet outer liner construction. The door hinge assembly shall be die cast zinc with stainless steel pivot mechanism, completely adjustable. Hinges shall allow doors to open at 180° with no shear effect on the hinge side of the perimeter gasket. The door frame shall be extruded aluminum with a built-in thermal break barrier and full perimeter gasket. The door gasketing shall employ a double seal comprising of an adhesive neoprene compressible foam gasket on the outer door panel and an "automotive style" neoprene bulb gasket fixed onto the inner door frame for out-swing doors, "rippled" foam for in-swing doors. There shall be a minimum of two heavy duty cast, UV rated, nylon handles per door. Door handles shall be operable

from both inside and outside of the unit. On all access doors where moving parts could cause injury, an ETL, UL 1995 and OSHA approved tool operated safety latch shall be provided.

Note: *If Manufacturer cannot provide thermal break door design it must be noted as an exception on the bid.*

Access doors shall be equipped with handle inter-linkage system to be able to open each door by operating only one handle.

H. Condensate/Drain Pans

IAQ style drain pans shall be provided as shown on the drawings. Drain pans shall be fabricated from 18 gauge stainless steel, except under coils, where drain pans shall be fabricated from 14 gauge stainless steel. All drain connections shall be piped and trapped (in field, by others) separately for proper drainage. Drain pans shall be sloped at a minimum of 1.5% with a threaded drain pipe connection ending through the side of structural base frame. Drain pipe shall be schedule 40, 1¼" [32 mm] nominal, MPT stainless steel pipe. All drain pan corners shall be welded.

2.05 Unit Component Description

A. FANWALL TECHNOLOGY® (FWT)

1. The FANWALL® array shall consist of multiple, direct driven, arrangement 4 plenum fans spaced in the airway tunnel cross section to provide a uniform airflow and velocity profile across the entire airway tunnel cross section and components contained therein. The FANWALL array shall be constructed per AMCA requirements for the duty specified, (Class I, II, or III). All fans shall be selected to deliver design airflow at the specified operating TSP at the specified motor speed and as scheduled. The FANWALL array shall be selected to operate at a system Total Static Pressure that does not exceed 95% of the specified fan's peak static pressure producing capability at the specified fan speed.
2. Fan array shall consist of multiple fan and motor "cubes", spaced in the airway tunnel cross section to provide a uniform airflow and velocity profile across the entire airway tunnel cross section and components contained therein. Each fan/motor assembly shall be removable through a 30" [762 mm] wide open area. Access door located on the discharge/inlet side of the FANWALL® array.
3. Wire sizing shall be determined and installed in accordance with applicable NEC, UL 1995 and Canadian Electrical Code (CEC) standards. Each fan cube shall be individually wired to a control panel containing a single VFD, as specified elsewhere, for the total connected horsepower for all fan motors contained in the FANWALL array.
4. The FANWALL array shall be provided with a Coplanar Silencer for sound absorption. The Coplanar Silencer will reduce the bare fan discharge sound power levels as noted below and/or in the plans. Unless otherwise specified, the acoustical silencers shall reduce the bare fan discharge sound power levels by a minimum of 15 dB, re 10⁻¹² watts with center frequencies of 125, 250, 500, 1,000, 2,000, 4,000 and 8,000 Hz when compared to the same unit design without the silencers.
5. All motors shall be IEEE inverter duty, premium efficiency TEAO T-frame motors selected at the specified operating voltage, rpm and efficiency as specified or scheduled elsewhere. All motors shall include permanently sealed bearings and shaft grounding means to protect the motor bearings from electrical discharge machining due to stray

shaft current. Motors provided with hybrid ceramic bearings, when specified, do not require shaft grounding devices.

6. Each fan/motor assembly shall be dynamically balanced to meet AMCA standard 204-96, for fan application class BV-5, to meet or exceed a rotational imbalance Grade 0.55, producing a maximum rotational imbalance of 0.022” per second peak, filter in [0.55 mm per second peak, filter in]. ‘Filter in’ measurement indicates that the specified balance grade must be achieved at the submitted design operating speed for the fan(s).
7. The discharge and inlet bare fan sound power levels for each individual octave band shall **not** exceed the values specified or scheduled for the FANWALL array. Alternate Manufacturers must submit acoustical data for review and approval prior to the bid indicating that the proposed alternate equipment can meet all specified performance requirements without impacting the equipment performance or design features including duct connection location, unit weights, acoustical performance or specified total fan horsepower for each FWT array. Proposals submitted which indicate a higher connected fan horsepower and higher sound power levels than specified or scheduled will **not** be accepted.
8. The sound power levels for each individual octave band shall **not** exceed the values specified or scheduled for each individual inlet and discharge opening from the air handling unit(s).
9. Each fan motor shall be individually wired to a control panel containing variable frequency drive(s) or starter(s), as specified elsewhere. Wire sizing shall be determined and installed in accordance with applicable NEC, UL 1995 and CEC standards.
Notes: *If alternate direct driven or belt driven fan systems are proposed by the Contractor, it shall be the responsibility of the Contractor proposing the alternate fan system(s) to guarantee that the sound (Noise Criteria) levels in the occupied space will **not** exceed those per the basis of design FWT system. Any acoustical treatment for alternate fan system(s) must be approved by the Engineer and Architect prior to installation, and any such acoustical treatment, or subsequent treatment, will be done at the sole expense of the Contractor proposing the alternate fan system(s).*
10. Manufacturers of alternate fan/motor assemblies, provided in lieu of the specified FANWALL array(s), shall provide a spare motor and fan assembly for each type and size of fan/motor assembly, as well as a five year parts and labor warranty for replacement at no additional expense to the Owner. Such warranty coverage shall include the cost of any cranes or lifting devices, unit disassembly and reassembly, fan balancing, etc., as required.
11. FANWALL array(s) shall be provided with the following options:
 - Each fan applied in multiple fan applications shall be provided with an integral backflow prevention device that prohibits recirculation of air in the event a fan, or multiple fans, become disabled. The system effect for the submitted backflow prevention device shall be included in the calculation to determine the fan TSP for fan selection purposes and shall be indicated as a separate line item SP loss in the submitted fan selection data. Manufacturers other than the basis of design being submitted must provide independent lab certification of fan testing that indicates the system effects attributed to the submitted backflow prevention device in the submitted close coupled mounting arrangement at the inlet of the fan. Fans submitted with discharge dampers will not be approved.

Backdraft damper performance data that is based on an AMCA ducted inlet and ducted discharge mounting configuration will not be accepted. Submitted backflow prevention device data must be reflective of close coupled mounting at the intake of the fans(s) per the project design documents. Motorized dampers or other motorized devices submitted for backflow prevention are not acceptable.

- Each fan assembly shall be supplied with a complete flow measuring system, Flow-Cone, which indicates airflow in Cubic Feet per Minute. The flow measuring system shall consist of a flow measuring station with one static pressure tap and one total pressure tap located at the throat of the fan inlet cone. The flow measuring station shall not obstruct the inlet of the fan and shall have no effect on fan performance (flow or static) or sound power levels. A 4-20mA control signal is provided per fan. The total cfm read out must be calculated by the BMS.

12. FANWALL TECHNOLOGY Electrical

Provide a complete electrical system required to run the FANWALL® array system including all equipment, material, electrical enclosure and electrical components. FANWALL array designs shall be in accordance with specific system requirements. Please see system requirements before electrical design of FANWALL system is to commence. FANWALL array electrical designs shall be in accordance with the NEC, CEC, UL 1995 and Local Codes.

B. Coils – General Information (Applicable to Direct Expansion Coils)

Coils shall be submerged in water and tested to a minimum dry air/nitrogen pressure of 300 psig standard copper tube coils. Coils shall display a tag with the Inspector's identification as proof of testing. Tubes shall have a nominal thickness of 0.020" [0.5 mm] unless otherwise specified. Fins shall be made of 0.0075" [0.2 mm] thick aluminum unless otherwise specified. Tubing, return bends and headers shall be made of seamless UNS 12200 copper meeting ASTM B75 and ASTM B251 Standards. Coil return headers shall be equipped with factory installed 1.2" FPT air vent connections placed at the highest point available on the face of the header (except for evaporator coils). Casings and endplates shall be made of 16 gauge 304 stainless steel. Double flanged casings on the top and bottom of finned height shall be provided to allow for coil stacking. Piping, control valve and valve operator shall be supplied and installed by others.

C. Direct Expansion Coils

Coils shall be tested to be leak-free with nitrogen or dry (at least 300 psig) air underwater. Coil tube size and wall thickness shall be 1/2" x 0.016" [13 x 0.4 mm]. Tubes shall be rifflled. Fins shall be made of 0.0060" [0.2 mm] thick aluminum and mechanically bonded to copper tubes. Standard construction connections shall be sweat-soldered and constructed of copper. Distributor shall be designed to have a removable nozzle to allow for installing an auxiliary side connection for hot gas bypass. Provide intermediate drain pans on all stacked cooling coils. The intermediate pan shall drain to the main drain pan through a copper downspout.

D. Refrigerant Circuits – General Information (Applicable to Integrated Air Cooled Condensing Section, Water Cooled Condensing Section, Integrated Water Source Heat Pump and Integrated Air Source Heat Pump)

Entire unit, including all refrigeration circuits, shall be manufactured as one single system, at the same time and location, by the unit Manufacturer. Systems where the unit Manufacturer is purchasing a condensing unit from another Manufacturer and integrating it to the unit, are not acceptable. Refrigeration section shall be designed for full and easy access for maintenance. Entire refrigerant piping circuit shall be leak tested at 150 psig air pressure.

Capacity modulation shall be provided by modulation capacity compressor and/or by hot gas bypass on lead compressor(s).

Refrigerant circuit components shall include: thermal expansion valve; distributor; liquid line filter drier; charging valve and high and low pressure side gauge ports. Refrigerant circuits shall also include:

- Compressor sound blankets.

All refrigerant piping shall be of K, L or ACR copper type. The complete system shall be factory dehydrated and pressure tested at 300 psi; the system shall then be factory charged with refrigerant (except for units shipped in multiple sections where refrigeration circuit is split in multiple sections; in such case the units shall be shipped with nitrogen holding charge).

Suction and hot gas bypass lines shall be insulated with 3/8" [10 mm] thick elastomeric pipe insulation. Pipe insulation exposed to UV light radiation shall be protected with aluminum tape. Safety controls shall include a high and low refrigerant pressure switch on each circuit for protection against loss of charge. Each refrigerant circuit shall include DDC controlled compressor anti-cycling. Each refrigerant line present in other compartments than only the compressor compartment shall be clearly identified with the use of labels showing both the refrigerant line's duty (suction, liquid, discharge, hot gas bypass, hot gas re-heat) along with the circuit number (i.e. Suction 1, Liquid 3, etc.). This labeling shall be repeated in each compartment of the unit (else than the compressor compartment) where refrigerant lines are present, in such a way that all refrigerant lines in any other compartment can easily be identified. Unit water inlet and water outlet lines shall be clearly identified with the use of labels showing "water inlet" and "water outlet" near the point of connection to the building's water network.

E. Integrated Air Cooled Condensing Section

Each refrigerant circuit shall include moisture indicating site glass, filter drier, liquid line isolation valve and externally equalized thermostatic expansion valve. Safety controls shall be manual reset on both low pressure and high pressure sides. The complete refrigerant piping shall be factory tested on factory charged units.

Condenser coils shall be tested to be leak-free with nitrogen at 500 psig underwater in an illuminated tank. After testing, coils shall be evacuated, thoroughly dried and capped. Coils shall be constructed of high performance aluminum microchannel tubes, fins and manifolds. Tubes shall be flat and contain multiple, parallel flow microchannels and span between aluminum headers. Full depth louvered aluminum fins shall fill spaces between the tubes. Tubes, fins and aluminum headers shall be oven brazed to form a complete refrigerant-to-air heat exchanger coil. Copper stub pipes shall be electric resistance welded to aluminum coils and protected to seal joints from corrosive environmental elements. A 10°F [-12°C] sub-cooling section shall be an integral part of the condenser coil. Standard construction fluid connections are sweat-soldered and made of copper. Condensing unit section shall also include:

- VFD's on condenser fans for head pressure control and low ambient operation down to 20°F.

F. Scroll Compressors

Compressor shall be hermetically sealed scroll type with a forced-feed lubrication system and oil charge. Compressor motor shall be suction-cooled motor windings with inherent internal line break protection and mounted on RIS vibration isolators. Compressor shall include internal pressure relief valve, gas sensor and device to limit the shut-down noise caused by

scroll reversal. Each compressor shall have a crank case heater that is independently fused and will remain energized at all times unless unit is disconnected at the main power source. Lead compressor shall be capable of seamless capacity modulation from 10% to 100% of its nominal capacity, without the use of hot gas bypass. Lead compressor shall be designed to be able to operate free of oil return problems, when installed with length of interconnecting pipe up to 300 ft. and vertical elevation up to 90 ft. Oil shall return to the compressor without the use of oil separator or oil return cycle.

G. Filters

Provide filters of the type indicated on the schedule. Factory fabricated filter sections shall be of the same construction and finish as the unit. Outside and return air inlets shall be equipped with galvanized steel racks that permit filter slide out removal (side access) for units equal or less than 78" [1,981 mm] tall and universal holding frames with upstream access (face loading) for units taller than 78" [1,981 mm]. Face loaded pre and final filters shall have Type 8 frames as manufactured by AAF, FARR or equal. Side service filter sections shall include hinged access doors. Internal blank-offs shall be provided by the air unit Manufacturer as required to prevent air bypass around the filters. The filters shall be as manufactured by Farr, Purolator, AAF or equal. Filters shall be in compliance with ANSI/UL 900: *Test Performance of Air Filters*. Filter air velocity shall not exceed 500 fpm through each filter bank. Units shall be equipped, to a minimum, with 2" thick, 35% efficient (MERV 8) medium efficiency pleated filters.

13. Flat Racks

Filter racks shall be completely factory assembled and designed for industrial applications. Filter racks shall be fabricated from no less than 16 gauge galvanized steel. Filter racks shall be applied in low efficiency filter applications and will be either upstream or side accessible. Side accessible filter racks shall have an oversized access door on the exterior of the air handler, centered on the filter rack for easy filter removal. Upstream access filter racks shall have one central access cover per row of filters centered in the unit for easy access. Filter racks over 72" in length shall require an angle center reinforcement support. Filter racks shall be designed for a maximum of 500 fpm, or meet or exceed the area specified in the equipment schedule.

14. Medium Efficiency Pleated Filters

Units shall be equipped with 2" thick, 30–35% efficient (MERV 8) medium efficiency pleated filters. Filter media shall be 100% synthetic. The filter shall have an average efficiency of 30–35% and an average arrestance of 90–92%. The filters shall be listed as Class II under UL Standard 900. Filters shall be tested per ASHRAE Standard 52.2-2007. The effective media shall not be less than 4.6 square feet of media per 1.0 square foot of filter face area, and shall contain not less than 15 pleats per linear foot. Initial resistance at 500 fpm approach shall not exceed 0.33" w.g.

H. UV Lights

Unit shall be equipped with UV-C light system, consisting of all required fixtures, power supply and wiring. Power supply shall be CSA and UL Listed, capable of operating in temperatures from 34°F to 190°F, designed to facilitate plug-and-play wiring and be capable of producing the specified output and organism destruction at no more than 15 watts of power consumption for each square foot of treated, cross sectional area. Power supply shall be protected against "end of lamp life" conditions. Each lamp shall contain less than 8 milligrams of mercury and shall be hermetically laminated with a thin layer of UV-C transmissible Teflon® to provide protection against lamp breakage and to ensure lamp contents from a broken lamp

are contained. Lamp life shall be 9,000 hours with no more than a 20% output loss at the end of the lamp's life. Lamps shall be constructed with UV-C proof material bases and shall not produce ozone. Lamps are to be installed in sufficient quantity and in such a manner so as to provide an equal distribution of the available UV-C energy. When installed, the UV-C energy produced shall be of the lowest possible reflected and shadowed losses and shall be distributed in a 360 degree pattern within the cavity to provide the highest UV-C energy absorption by microbial products in the air. The minimal UV-C energy striking a surface shall be sufficient to continuously destroy a mono-layer of mold and/or bacteria in less than one hour while operating in air temperatures of 34°F to 158°F. To protect personnel, all access panels and doors to any UV-C assembly and/or within view of any UV-C assembly shall include mechanical interlock switch to ensure that all UV-C assemblies will be de-energized when any of these accesses are opened. To protect equipment, all components exposed to UV-C and which are subject to degradation shall be protected with aluminum tape.

I. Dampers

Unit shall be equipped with all necessary dampers required for the system as shown on the mechanical drawings. Dampers shall be designed for operating temperatures between -40°F [-40°C] and 212°F [100°C]. Air leakage through a 48" x 48" [1,219 x 1,219 mm] damper shall not exceed 10.3 cfm/sq. ft. against 4" w.g. differential static pressure at standard air condition. Standard air leakage data to be rated in accordance with AMCA certified rating program. Outside air dampers shall be parallel blade motorized and exhaust air dampers shall be of parallel blade gravity backdraft type. For other dampers, see Manufacturer's recommendations. Damper actuators drive voltage shall be with 24 VAC for 2 position or 0-10V for modulation. Flat or formed metal blades are not acceptable.

Damper construction shall be as follows: damper frame shall be of extruded aluminum or galvanized steel; damper blades shall be of extruded aluminum; dampers shall be of opposed blade type or parallel blades where indicated; damper blade ends shall be sealed with neoprene edge seals with bottom and top blade wiper seals. Unit shall be provided with the following dampers:

- Outside air damper
- Recirculation damper
- Exhaust air damper (gravity relief)

J. Rain Hoods

Rain hoods shall be fabricated from same material as unit casing with ¼" wire mesh inlet screen. Hoods sized to minimize moisture carry over.

2.06 Electrical Power and Controls

- A.** All wiring and electrical connections shall be of copper wires, copper bus bars and copper fittings throughout. Power supply terminals shall be identified with permanent markers.
- B.** All high voltage wiring conduit shall consist of flexible metal conduit. All low voltage and signal wiring shall consist of Belden cable.
- C.** When unit section splits are present, low voltage wiring shall be split using quick connectors for quick and easy field installation. Additionally, for each set of quick connector, the male branch in one unit section and the corresponding female branch in the next unit section shall be identified with the use of a color coded or numbered label. At each high voltage line split, a junction box shall be provided in one of the sections; the wiring in the section where the junction box is located and the matching wiring in the next section shall be identified with the use of a color coded or numbered label.

- D.** The unit shall feature a mounted permanent nameplate displaying, at a minimum, the Manufacturer, serial number, model number, date of manufacture and current and voltage readings. The unit must have an ETL or UL Listing and bear the appropriate mark.
- E.** A recessed integral electrical control compartment shall be furnished on the side of the unit. The compartment shall be constructed to NEMA 3R requirements for outdoor units or NEMA 1 requirements for indoor units, provided with a hinged access door and a locking device. All components, except those not mounted directly in the unit, shall be factory mounted and wired to a labeled terminal strip. All components shall be identified using printed self-adhesive labels, consistent with the numbering used in the wiring diagrams. Control components shall include, but are not limited to, single-point connection power distribution block, sub and control circuit fuses or circuit breakers, control transformers, motor starters and overloads for single-speed operation. The control system shall be factory mounted in the control compartment and shall be a stand alone microprocessor-based Direct Digital Control system, with necessary sensors and interfaces to monitor and operate all functions as outlined in the equipment/control schedule, flow schematic, sequence or required for complete unit operation. A unit mounted intelligent programmable interface device shall be included for communication, display and setpoint control. Control panel compartment heaters and thermostats or cooling fans with grilles or registers shall be provided if control panel components cannot be protected from their minimum or maximum ambient temperature ratings. For automatic unit start-up an external dry contact must be provided by others (ex: building management system (BMS), BACnet, time clock, etc.). The DDC controller shall be factory programmed and factory run tested prior to shipment to verify functions and logic.
- F.** A flow schematic with sensor and component identification and location, interlocks and sequence of operation shall be included with submittals.
- G.** A wiring schematic and a bill of materials shall be completed in ladder/logic format, with component labeling according to line numbers, once a release for production has been received. The wiring schematic, bill of materials and flow schematic shall be included within the units control compartment.
- H.** The units shall be provided with the following features:
- Unit shall be provided with a circuit breaker mounted within the control enclosure with a door interlocked handle weatherproof on the exterior.
 - Unit shall be provided with a DDC controller to manage the condensing unit staging and safeties. All the other controls shall be by the Control Contractor.
 - The control system with necessary sensors and interfaces shall be customer supplied and programmed, then shipped to Venmar CES for factory mounting and wiring (see Parts Supplied by Others Policy). Wiring connections shall terminate at a terminal strip next to the controller. Final wiring jumpers and run testing shall be performed on site by the Control Contractor. The Control Contractor shall coordinate mounting locations and logic with the unit Manufacturer.
 - Each FanWall cell shall be provided with an individual variable frequency drive without drive bypass.
- I.** All control panels shall have a short circuit current rating of 10kA.

Section 4 Bid Proposal

New Hanover County North East Library Rooftop HVAC Replacement

RFB #2016-0915

The undersigned, having carefully examined the Instructions to Bidders, RFB# 2016-0915 New Hanover County North East Library Rooftop HVAC Replacement agrees to furnish labor to start up unit, equipment, materials, insurance, supervision, cleanup, waste disposal, permits and fees. Bidder further agrees to abide by all local, state and federal codes applicable. Please exclude taxes as part of the bid pricing.

	Unit Price	Extended Price
HVAC Unit		
Labor for Start up		
Miscellaneous Costs		
TOTAL BID PRICE		

The undersigned, as bidder certifies that the General Conditions and Instructions to Bidders, the Scope of Work and the Price Sheet/Bid Form found in the bidding documents have been read and understood.

The bidder hereby provides assurance that the firm represented in this bid, as indicated below:

- 1) Will comply with all requirements, stipulations, terms, and conditions as stated in the bid document:
- 2) Currently complies with all applicable State and Federal Laws:
- 3) Is not guilty of collusion with the vendors possibly interested in this bid or in determining prices to be submitted: and
- 4) Such agent as indicated below is officially authorized to represent the firm in whose name this bid is submitted.

Signature **Date** **Company**

Telephone Number **Fax Number**

Email address **Title**

Section 5

Bidders Name: _____

Acknowledgement of Addenda

Addendum No. _____	Dated _____

Attachments to Bid Proposal:

- **Sample Certificate of Insurance**
- **E-Verify Form**

Signature

Printed Name/Title

Date: _____

CUSTOM PACKAGED ROOFTOP UNIT																						
Tag	Fans						Cooling						Heating					Condenser		Electrical		
	CFM		Static		Type		Conditions			Capacity			Capacity		Temp Rise		Material/Type	Ambient (F)		Power		
	Max	Type	Ext	Total	Fanwall	Qty	EAT db/wb (F)	LAT db/wb (F)	Total (MBH)	Sensible (MBH)	EER	Input (MBH)	Output (MBH)	Firing	Min/Max (F)					FLA	MCA	MOCP
RTU-1	24,000	VAV	2.00	4.25	Direct Drive	4	80/67	55/55	903.0	647.6	11.5	450.0	418.5	Mod 10:1	30/100	304 SS / NG	95	1,154.5	460/3/60	185	195	250

Notes (All Notes Apply)

- 1 Unit to incorporate fully modulating economizer controls.
- 2 Unit to be provided with Fanwall 2.0 Optimization Package. Unit shall be capable of 90% total cfm and 85% total static during a failed fan condition.
- 3 Manufacturers representative responsible for verifying openings (supply/return/OA) as to fit on existing curb (NO curb adaptors shall be required.)
- 4 Aluminum Exterior/Aluminum Interior, SS Interior in DX Coil Section)
- 5 Condenser Staging and Safeties shall be by unit manufacturer. Sequencing controls by owner to be factory mounted.
- 6 Manufacturer to mount and wire all sensors, dampers and accessories to terminal strip for final connections by controls integrator.
- 7 See specification for additional requirements of this equipment.

