Company Name:

_____

TARRANT COUNTY

PURCHASING DEPARTMENT

MELISSA LEE, C.P.M., A.P.P.
PURCHASING AGENT

CHRIS LAX, CPSM, CPSD, CPCP
ASSISTANT PURCHASING AGENT

VOLUME 2 – TECHNICAL SPECIFCATIONS

RFB NO. 2023-080

PROJECT MANUAL
FOR
LON EVANS CORRECTIONS CENTER ENERGY RECOVERY UNIT (ERU) ENTHALPY WHEEL REPLACEMENT

600 W WEATHERFORD ST
FORT WORTH, TX 76196

BIDS DUE MARCH 6, 2023
2:00 P.M. CST

Technical Specifications Prepared by

Air Balancing Company, Inc.
4607 Forest Hill Cir
Fort Worth, TX 76140

RFB NO. 2023-080

AirBalancingCo

SCOPE SUMMARY

DATE:	07 - JULY - 2022
PROJECT:	LON EVANS ENERGY RECOVERY UNIT ENERGY ENTHALPY WHEELS REPLACEMENT
CLIENT:	TARRANT COUNTY
LOCATION:	FORT WORTH, TEXAS

Demo existing Energy Recovery Ventilator (ERV) wheels and replace with four (4) new ERV wheels including associated motors, drives, and gearboxes for each wheel. Replacement wheels must match performance of original wheels capacities as shown in original equipment submittal. New wheels will be retrofitted into an existing installation located on the roof of the Lon Evans Corrections Center. Vendor must be an approved authorized installer of the manufacturer's equipment. This may include, but not be limited to: Rigging work, Electrical work, General Construction work, and Controls work.

1. Perform all work in accordance with all applicable National and Local Codes and Code Authorities.
2. Submit electronic copy of Shop Drawings for all materials furnished under this work.
3. Secure and pay for all necessary permits, licenses and inspections required by Law for the completion of the work. Secure and pay for all certificates of approval that are required and deliver them to the Engineer before final acceptance of the work.
4. Examine the project site and account for existing conditions in the Bid.
5. All materials shall be new, UL listed, and free from defects, unless existing material is specifically shown to be reused. Install all materials in accordance with good workmanship standards.
6. Substitutions of the specified material MUST be presented during the question and answer period during the bid process.
7. Provide factory finish on all material furnished to the jobsite and touch up finishes which have been scuffed or scratched.

AirBalancingCo

8. All work may be performed between 7:00 AM and 4:00 PM, Monday through Friday. Coordinate exact work schedule with Owner's Representative.
    a. Any lift work that may be required must be performed on Saturday or Sunday.
9. All replacement equipment and accessories will be new.
10. Provide all electrical work required to support the new equipment in conformance with NEC requirements.
11. Contractor will be responsible for ALL rigging and street closure permits required to remove the existing wheel(s) from the ERU located on the roof of the building for disposal and to install the new wheel(s).
12. The Building Automation System (BAS) is Reliable Controls. The costs for all Controls work will be included in the bid. The Controls work will be provided by Enviromatic Systems. Contact Sid Ellis, ph 972-206-2590.
13. All Testing and Balancing work will be provided by the County's TAB Contractor, Air Balancing Company, and will not be included in the bid.

SECTION 23 00 10

BASIC MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS AND SUPPLEMENTAL GENERAL PROVISIONS

A. The "General Conditions" and "Supplementary Conditions" are by reference made a part of this section and shall apply to each heading as though included herein.

B. In the event of conflict, the requirements of the "General Conditions" and "Supplementary Conditions" will take precedence over these "General Requirements".

1.2 GENERAL

A. The Contractor shall provide all plans, labor, equipment, materials, and appurtenances and shall perform all operations in connection with the installation of the mechanical work in accordance with the Specifications, applicable drawings, and the conditions specified above.

B. Contractor shall provide all equipment required and usually furnished in connection with such work and systems whether or not it is specifically mentioned or specifically indicated on the drawings.

1.3 INSPECTION OF THE SITE

A. The Contractor shall visit the site, verifying all existing items indicated on drawings and/or specified, and familiarize himself with the existing work conditions, hazards, grades, actual formations, soil conditions, and local requirements. The submission of bids shall be deemed evidence of such visits.

B. All proposals shall take these existing conditions into consideration, and the lack of specific information on the drawings shall not relieve the Contractor of any responsibility.

C. If equipment specified and/or reviewed is not compatible with the existing conditions, the trade furnishing the equipment shall be responsible for notifying the Contractor prior to ordering it.

1.4 PERMITS, UTILITY CONNECTIONS, AND INSPECTIONS

A. Refer to other sections of the specifications for construction phasing and time increments.

B. The Contractor shall obtain and pay for all required utility connections, utility extensions and/or relocations and shall pay all costs and inspection fees for all work included herein.

1.5 APPLICABLE CODES AND STANDARDS

A. The installation shall meet the minimum standards prescribed in the latest editions of the following listed codes and standards, which are made a part of the Specifications, except as may be hereinafter modified in these Specifications and associated drawings.

B. Latest edition of the National Fire Protection Association Standards (NFPA):

1. NFPA No. 70 National Electrical Code
2. NFPA No. 90A Installation of Air Conditioning and Ventilating systems
3. NFPA No. 101 Safety to Life from Fire in Buildings and Structures
4. NFPA No. 255 Test of Surface Burning Characteristics of Building Materials

C. United States of America Standards Institute (ASA) Standards:

1. A40.8 National Plumbing Code
2. B31.1 & B31.1a Code for Pressure Piping

D. American Society of Mechanical Engineers (ASME): Boiler and Pressure Vessel Codes.

E. Air Conditioning and Refrigeration Institute Standards (ARI): All standards related to refrigeration and air conditioning equipment and piping furnished under these Specifications.

F. Air Moving and Conditioning Association (AMCA): All applicable manuals and standards.

G. American Society of Testing and Materials (ASTM): All applicable manuals and standards.

H. American Water Works Association (AWWA): All applicable manuals and standards.

I. National Electrical Manufacturer's Association (NEMA): All applicable manuals and standards.

J. City Fire Department as applicable to construction of this site.

K. City and State Building Codes.

L. State of (Texas) Occupational Safety Act: Applicable safety standards.

M. Occupational Safety and Health Act (OSHA).

N. State of (Texas) Energy Conservation Construction Code.

O. All work shall be in accordance with all regulations and requirements of the State of Texas Architectural Barriers Act (TAS).

P. Refer to Specifications sections hereinafter bound for additional codes and standards.

Q. All materials and workmanship shall comply with all applicable state and national codes, specifications, and industry standards. All material shall be listed by the Underwriter's Laboratories, Inc., as conforming to its standards and so labeled in every case where such a standard has been established for the particular type of material in question.

R. The Contract Documents are intended to comply with the aforementioned rules and regulations; however, some discrepancies may occur. Where such discrepancies occur, the Contractor shall immediately apply for an interpretation. Should the discovery and notification occur after the execution of a contract, any additional work required for compliance with said regulations shall be paid for as covered by other specifications of the Contract Documents, providing no work or fabrication of materials has been accomplished in a manner of non-compliance. Should the Contractor fabricate and/or install materials and/or workmanship in such a manner that does not comply with the applicable codes, rules and regulations, the Contractor who performed such work shall bear all costs arising in correcting these deficiencies to comply with said rules and regulations.

1.6 CONTRACT DOCUMENTS

A. These specifications are accompanied by drawings of the building and details of the installations indicating the locations of equipment, piping, ductwork, outlets, switch controls, circuits, lines, etc. Contractors should verify drawings' accuracy as needed. The drawings and these specifications are complementary to each other, and what is required by one shall be as binding as if required by both.

B. If the Contractor deems any departures from the drawings necessary, details of such departures and the reasons therefore shall be submitted to the Engineer for review. No departures shall be made without prior written acceptance.

C. There are intricacies of construction that are impractical to specify or indicate in detail; however, in such cases the current rules of good practice and applicable specifications shall govern.

D. It is the Contractor's responsibility to properly use all information found on the Mechanical drawings where such information affects his work.

E. All dimensional information related to new structures should be taken from the appropriate drawings. All dimensional information related to existing facilities shall be taken from actual measurements made by the Contractor on the site.

F. The interrelation of the specifications, the drawings, and the schedules is as follows: The specifications determine the nature and setting of the several materials, the drawings establish the quantities, dimensions and details, and the schedules give the performance characteristics.

G. Should the drawings or specifications disagree within themselves, or with each other, the better quality of greater quantity of work or materials shall be estimated upon, and unless otherwise directed by the Engineer and Owner's Representative in writing, shall be performed or furnished. Figures indicated on drawings govern scale measurements and large-scale details govern small-scale drawings.

1.7 SPACE AND EQUIPMENT ARRANGEMENT

A. All equipment shall be installed in a manner to permit access to all surfaces. All valves, motors, drives, filters, and other accessory items shall be installed in a position to allow removal for service without disassembly of another part.

B. Maintain all code required clearances for equipment access.

1.8 FABRICATION DRAWINGS

A. Contractor shall submit shop drawings whenever (1) equipment proposed varies in physical size and arrangement from that indicated on the drawings.

1.9 SUPERVISION

A. Each contractor shall keep a competent superintendent or foreman on the job at all times necessary for the timely and proper completion of the work.

B. It shall be the responsibility of each superintendent to study all drawings and familiarize himself with the work to be done by other trades. The superintendent shall coordinate this work with other trades, and before material is fabricated or installed, make sure that his work will not cause an interference that cannot be resolved without major changes to the drawings. If a conflict between trades arises that cannot be resolved at the jobsite, the matter shall be referred to the Engineer and Owner's Representative for his ruling.

1.10 EXISTING FACILITIES

A. The Contractor shall be responsible for loss or damage to the existing facilities caused by him and his workmen and shall be responsible for repairing or replacing such loss or damage. The Contractor shall erect temporary barricades, with necessary safety devices, as required to protect personnel from injury, and remove all such temporary protection upon completion of the work. All barricades and safety devices shall be in compliance with OSHA.

B. Outages of services, as required by the new installation, will be permitted only at a time approved by the Engineer and Owner's Representative.

1.11 OPERATING AND MAINTENANCE INSTRUCTIONS

A. The Contractor shall prepare, in triplicate for the Owner's Manual, complete sets of operating and maintenance instructions, control and interlock diagrams, manuals, parts lists, etc., for each item of equipment. Include copies of all equipment warranties.

B. In addition, the Contractor shall provide the services of a certified technician acceptable to the Owner to instruct a representative of the Owner in the complete and detailed operation of all equipment and systems. These instructions shall be provided for a period of not less than 2 hours to fully accomplish the desired results. Upon completion of these instructions, a letter of release will be required, stating the dates of instruction and the personnel to whom instructions were given. The Contractor shall be responsible for proper maintenance until the instructions have been given to the Owner's maintenance personnel.

1.12 GUARANTEE

A. All work and equipment shall be guaranteed for a period of one year from the date of substantial completion.

B. Guarantee shall be for all labor and materials.

1.13 MATERIALS AND WORKMANSHIP

A. All materials must be new, free from all defects, and of the best quality of their respective kinds. Materials and equipment shall be installed in accordance with the manufacturer's recommendations and the best standard practice for the type of work involved. All work shall be executed by mechanics skilled in their respective trades, and the installations shall present a neat, workmanlike appearance. Materials, and/or equipment damaged in shipment, or otherwise damaged prior to installation, shall not be repaired at the job site, but shall be replaced with new materials and/or equipment.

B. The responsibility for furnishing the proper equipment and/or material, and to see that it is installed as intended by the manufacturer rests entirely upon the Contractor, who shall request advice and supervisory assistance from the representative of specific manufacturers during the installation.

1.14 FLAME SPREAD PROPERTIES OF MATERIALS

A. Materials and adhesives incorporated in this project shall conform to NFPA 255, latest edition. The classification shall not exceed No. 2, with the range of indices between 0 to 25 for these Classifications as listed in the Federal Specifications. Modifications shall be made to insulating materials, etc., as required to comply with the Federal Specification.

1.15 CONSTRUCTION REQUIREMENTS

A. The Mechanical plans and specifications including the General Provisions, Supplemental General Provisions, and other pertinent documents issued by the Engineer, are a part of these specifications and the accompanying mechanical drawings and shall be complied with in every respect. All the above is included in the Contract Documents, and shall be examined by all bidders. Failure to comply shall not relieve the Contractor of responsibility or be used as a basis for additional compensation due to omission of architectural, structural and electrical details from the mechanical drawings.

B. It is the intent of the Contract Documents to provide an installation complete in every respect. In the event that additional details or special construction may be required for work indicated or specified in this section or work specified in other sections, it shall be the responsibility of the Contractor to provide same as well as to provide material and equipment usually furnished with such systems or required to complete the installation, whether mentioned or not.

C. The Contractor shall be responsible for fitting his material and apparatus into the building and shall carefully lay out his work at the site to conform to the structural conditions, to avoid all obstructions, to conform to the details of the installation supplied by the manufacturer of the equipment to be installed and thereby to provide an integrated satisfactory operating installation.

D. The mechanical and associated drawings are necessarily diagrammatic in character and cannot show every connection in detail.

E. All oiling devices and all parts of equipment requiring adjustment shall be easily accessible. Equipment shall be so located and installed as to permit convenient and safe maintenance and future replacement.

1.16 MECHANICAL SUBMITTALS

A. Refer to the Conditions of the Contract (General and Supplementary) and Division 01 Section: "SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES" for submittal definitions, requirements, and procedures.

B. Submittal of Shop Drawings, product data, and samples will be accepted only when submitted by The Contractor. Data submitted from Subcontractors and material suppliers directly to the Engineer will not be processed.

C. Submit Shop Drawings, product data, and samples on items indicated in the individual sections.

D. Shop Drawings and submittal data shall not be used as requests or proposals for alternate equipment or materials. Refer to Item "Product Options and Substitutions" elsewhere in this section.

1.17 PRODUCT OPTIONS AND SUBSTITUTIONS

A. Refer to the Instructions to Bidders and the Division 01 Section "PRODUCTS AND SUBSTITUTION" for requirements in selecting products and requesting substitutions.

B. Standards for Materials:

1. These specifications indicate a standard for all materials incorporated into the work, with manufacturer's names and catalog numbers used to establish a grade and quality of materials and equipment. The manufacturer listed on the equipment schedules, or named first in the specifications, is the one on whose equipment the layout is based. Other named manufacturers must meet the indicated performance and space requirements.

2. The "approved equal" clause used in these specifications is to permit the proposal of unnamed manufacturer's products for the work, and the Engineer and Owner's Representative decision concerning equal products is final.

3. Considerations as to determination of equal products include, but are not limited to, the following:

Materials	Physical size
Workmanship	Weight
Gauges of Materials	Appearance
Available Local Service Personnel	Performance
Previous successful installations	Capacity
Delivery Schedules	Required Equipment Clearances

C. Requests for substitutions for equipment, materials and apparatus must be submitted in writing a **MINIMUM OF 10 DAYS** prior to the scheduled bid date. Such requests must be accompanied by complete data to permit proper evaluation.

D. BIDS SHALL NOT BE BASED ON UN-APPROVED MATERIALS, EQUIPMENT, OR APPARATUS. UNAPPROVED MATERIAL, EQUIPMENT OR APPARATUS WILL NOT BE ACCEPTED.

E. Should electrical, water, drain, natural gas, structural support, or other similar requirements

for alternate equipment, whether named in the specifications or approved as a substitution, be different from requirements for the products used in laying out the project, such changes shall be the responsibility of the Contractor, and shall not result in extra charges to the Owner or Engineer.

1.18 RECORD DOCUMENTS

A. Refer to the Division 01 Section: "CLOSEOUT PROCEDURES" for requirements. The following paragraphs supplement the requirements of Division 01.

B. Mark Specifications to indicate approved substitutions; Change Orders; actual equipment and materials used.

1.19 PAINTING

A. Protection of Factory-applied Finishes:

1. Factory-applied finishes on equipment and apparatus installed on the project shall be carefully protected.

2. At the conclusion of the work, and prior to final acceptance of the project, equipment and apparatus shall be thoroughly cleaned of all construction dirt, oil and grease smears, temporary labels, debris, paint droppings, etc.

3. Damaged factory finishes shall be restored to their original condition. Repair must be inspected and accepted by owner’s representative.

1.20 CLEANING

A. Refer to the Division 01 Section: "CLOSEOUT PROCEDURES" for general requirements for final cleaning.

B. Name Plates:

1. All nameplates shall be protected from damage during the construction process.

2. At the conclusion of the work, the nameplates shall be carefully cleaned and left in a fully legible condition.

C. Removal of Rubbish: Each Contractor is responsible for the timely removal of rubbish and trash generated by his work, such as empty cartons, containers, materials crates, etc. Particular attention is called to residue that may present a potential tripping or injury hazard.

1.21 MOTORS AND DRIVES

A. Motors:

1. General: Motors shall be U/L-approved, with copper windings, and with a minimum Service Factor of 1.15. The nominal capacity shall exceed the brake horse-power requirements at duty schedules.

2. Motors 1/2 HP and smaller shall be 120-volt, single-phase with internal overload protection.

3. Motors 3/4 HP and larger shall be 208/230 or 460 -volt, 3-phase, unless scheduled or noted otherwise, and shall have thermal over-load cutouts in each phase as recommended by the motor manufacturer.

4. Motors shall be as manufactured by Century, General Electric, US Motors, Wagner, Westinghouse, or approved equal.

PART 2 - PRODUCTS

2.1 GENERAL MATERIALS AND EQUIPMENT REQUIREMENTS

A. The manufacturer's published instructions shall be followed for preparing, assembling, installing, erecting, and cleaning manufacturer's materials or equipment, unless otherwise indicated. The Contractor shall promptly notify the Engineer and Owner's Representative in writing of any conflict between the requirements of the Contract Documents and the manufacturer's directions and shall obtain the Engineer and Owner's Representative instructions before proceeding with the work. Should the Contractor perform any such work that does not comply with the manufacturer's directions or such instructions from the Engineer and Owner's Representative, the contractor shall bear all costs arising in connection with the deficiencies.

B. The Contractor shall not receive material or equipment at the jobsite until there is suitable space provided to properly protect equipment from rust, drip, humidity, and dust damage.

C. Capacities shall be not less than those indicated but shall be such that no component or system becomes inoperative or is damaged because of start-up or other overload conditions.

D. Where materials or equipment are specified to be approved, listed, tested, or labeled by the Underwriter's Laboratories, Inc., or constructed and/or tested in accordance with the standards of the American Society of Mechanical Engineers or the Air Moving and Conditioning Association, the Contractor shall submit proof that the items furnished under these sections of the specifications conform to such requirements. The ASME stamp or the AMCA label will be acceptable as sufficient evidence that the items conform to the respective requirements.

E. Each major component of equipment shall have the manufacturer's name, address, and catalog number on a plate securely attached to the item of equipment. All data on nameplates shall be legible at the time of Final Observation.

F. Belts, pulleys, chains, gears, couplings, projecting setscrews, keys and other rotating parts located so that any person can come in close proximity thereto, shall be fully enclosed or properly guarded.

G. The Contractor shall be responsible for the coordination and proper relation of his work to the building structure and to the work of all trades. The Contractor shall visit the premises and thoroughly familiarize himself with all details of the work and working conditions, to verify all dimensions in the field, and to advise the Engineer and Owner's Representative of any discrepancy before performing any work. Adjustments to the work required, in order to facilitate a coordinated installation, shall be made at no additional cost to the Owner.

2.2 PROTECTION

A. The Contractor shall at all times take such precautions as may be necessary to properly protect all materials and equipment from damage from the time of delivery until the completion of the work. This shall include the erection of all required temporary shelters and supports to adequately protect any items stored in the open on the site from the weather, the ground and surrounding work; the cribbing of any items above the floor of the construction; and the covering of items in the incomplete building with tarpaulins or other

protective covering. Failure on the part of the Contractor to comply with the above will be sufficient cause for the rejection of the items in question.

B. Take particular care not to damage the building structure in performing work. All finished floors, steel treads, and workmen or their tools and equipment shall cover finished surfaces to prevent any damage during the project.

C. Equipment and materials shall be protected from rust both before and after installation. Any equipment or materials found in a rusty condition at the time of final observation must be cleaned of rust and repainted as specified elsewhere in these specifications.

2.3 COOPERATION BETWEEN TRADES AND WITH OTHER CONTRACTORS

A. Each trade, subcontractor and/or contractor must work in harmony with the various other trades, subcontractors, and/or contractors on the job as may be required to facilitate the progress to the best advantage of the job as a whole. Each trade, subcontractor, and/or contractor must pursue his work promptly and carefully as not to delay the general progress of the job. This Contractor shall work in harmony with contractors working under other contracts on the premises.

PART 3 - INSTALLATION

3.1 INSTALLATION METHODS

A. The Contractor shall study all construction documents and carefully lay out all work in advance of fabrication and erection in order to meet the requirements of the extremely limited spaces. Where conflicts occur, the Contractor shall meet with all involved trades and the Engineer and Owner's Representative and resolve the conflict, prior to erection of any work, in the area involved.

3.2 COOPERATION AND CLEANUP

A. It shall be the responsibility of each trade to cooperate fully with the other trades on the job to help keep the job site in a clean and safe condition. At the end of each day's work, each trade shall properly store all of their tools, equipment and materials and shall clean their debris from the job. Upon the completion of the job, each trade shall immediately remove all of their tools, equipment, any surplus materials and all debris caused by their portion of the work.

3.3 CLEANING AND PAINTING

A. This Contractor shall thoroughly clean the finish on all parts of the materials and equipment with factory applied finishes. If the finish has been damaged, the Contractor shall re-paint to the satisfaction of the Engineer and Owner's Representative.

B. No nameplates on equipment shall be painted, and suitable protection shall be afforded to the plates to prevent their being rendered illegible during painting operation.

3.4 ELECTRICAL PROVISIONS OF MECHANICAL WORK

A. VFD: In general, mechanical work includes furnishing VFDs. Controllers are specifically included as electrical work when mounted in motor control centers. Electrical work includes installation, mounting and wiring of VFDs.

B. Wherever possible, match the elements of the electrical provisions of mechanical work with similar elements of the electrical work specified in electrical sections of the specifications.

Standards:

1. For electrical equipment and products, comply with applicable NEMA standards, and refer to NEMA standards to definitions of terminology herein.
2. Comply with National Electrical Code (NFPA No. 70) for installation requirements.
3. Comply with National Electrical Contractors Association (NECA) "Standard of Installation".

3.5 EQUIPMENT INSTALLATION REQUIREMENTS

A. All mechanical equipment shall be furnished and installed complete and ready for use.

B. All mechanical equipment and appliances shall be installed in a manner that all Code required access and services space is provided. Coordinate exact position of equipment and appliances with routing of piping, and with all existing conditions to provide required clearances.

1. Ensure that a minimum of 30” deep and 30” wide working space is provided in front of the control side of each appliance and piece of air moving equipment.
2. Ensure that air moving equipment and appliance in attics are installed so that they also have Code required clear passageway.

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Venmar CES Inc.
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Cenade, JOC 1MO
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Direct: (619)399-4005 + Ext.
www.venmarces.com

Date: 12/2/2010 Job#: T599-11-RevE

Projet!Project: Tarrant County Jail

TAG	Nomenclature	CFM Suo	CFM Exh	ESP SUD	ESP Exh	HP Suo	HP Exh	Dfmensions L	Dfmensions W	Dfmensions H	Wlight	# eectlona	Coil(sl cool	Coil(sl Heat
ERU-1	INWe-2-51e-PP-HW-CW-P l,	51000	36500	1.8	1.4	40 (x2)	20 (x2)	456	262	140	60000	4	CW	HW

T8D To be dotormtnod *NIA No,, OPfJ Cilb/0*

TAG	Electrfcal Loads reslimatedl FLA	MCA	MOP	Packaaed coolina tons	ste11es	Ref.	Intoora[ed Gas Inout	Outout	Id ratio	Qty of each
ERU-1	154.6	166.7	200	N'/A	N/A	*NiA*	2200	1760	36:1	1

Warranty:

- 12 months from ship date, unless a start-up form is submitted, in which case it becomes 12 Months from the start-up date OR 18 months from the shipment date, whichever comes first
- Extended warranties listed in above table are net pricing. The compressor(s) extended is a total *5* years non-prorated The burner heat exchanger chamber extended warranty is total IO years pro-rated.

ORIGINAL EQUIPMENT SUBMITTAL DATA FROM 2010 INCLUDED FOR REFERENCE ONLY

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Vanmar CES Inc.
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Date: 12/2/2010 Job#: T599-11-RevE
Tag(s) **ERU-1** Projet/Project: Tarrant County Jail

Construction Features: Exterior unit, 3 in. thick Mineral wool (2.5pcf), double wall, with hoods, gutters and birdscreens

Casing:	16 ga. Galv. SC - Painted	***Doors:***	
Liner	22 ga. Galv. SC - no paint		Extruded Frames w/ Industrial hinges and Allegis handles
Floor:	14 ga. Steel -with elastomer membrane	***Door options:***	
Base:	6" Welded structural steel tubing base - Painted		Doors opening agains pressure
Cabinet Option:	None		

Note: Venmar CBS is currently in the process of merging to a new cabinet construction; cabinet construction details listed as part of this quote and related drawings are subject to change.

Fan(s):	AF-Plenum on supply, AF-Plenum on Exhaust
Fan Bases:	2" Deflection Springs w/ flexible connections
Fan Options:	Belt Guards,
Motors:	Weg 1800 rpm: ODP, Premium Efficiency on supply/ ODP, Premium Efficiency on exhaust,460/3/60
Motor Options:	VFD's on supply and exhaust w/ manual bypass, control signal by others

Fliters: AAF PerfectPleat MS 2",(MERV8) On supply and exhaust, 1 extra sets
AAF Varicel II: 4", 80%(MERV14) On supply, 1 extra sets

Dwyer gauge series 2000 at each banks, Side access filter tracks on Supply and exhaust

Dampers: *Insulated:* Outside, Exhaust (TA-9000)
Non-Insulated:

Heat exchangers: (see performance data sheets)
-1st HX: AHRl certified Enthalpy wheel (No purge)
-2nd HX: AHRI Certified Sensible only wheel (No purge)

Co/ls:
Cooling: CW: #5WC, 5/8" tubes, AL fins, see selection/Galv. Casing and S.S. drain pan
Heating: HW: #5WC, 5/8" tubes, AL fins, see selection
Heating:

Integrated Gas heater:
Indirect Natural gas heater, S.S. Heat exchanger
7" W.C. pressure inlet, CSA/AGA/CGA approved, 1.5" dia. gas connection

Integrated Cooling:
None

Electrical: High Voltage components, Fused disconnect, damper actuator(s), BX wiring, Energy wheel VFD
Marine type lights, switch, GFI receptacle completely wired to 120V transformer

Controls: Al 1controls are by others

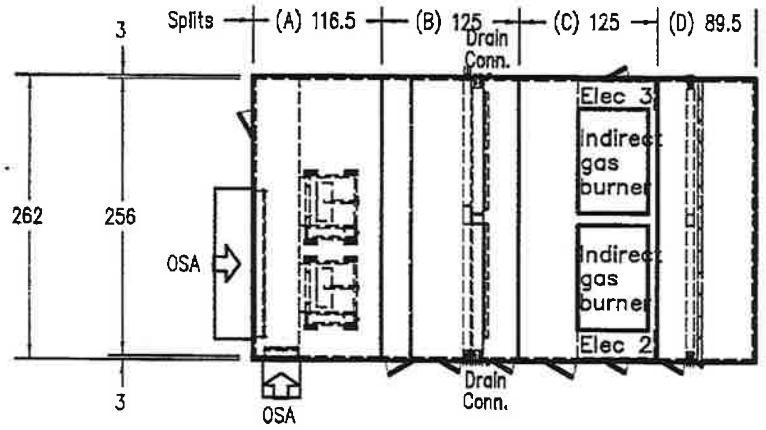
Others: Extra Wheel belt (5 ft)
VFD on all wheels
lNlight

ORIGINAL EQUIPMENT SUBMITTAL DATA FROM 2010 INCLUDED FOR REFERENCE ONLY

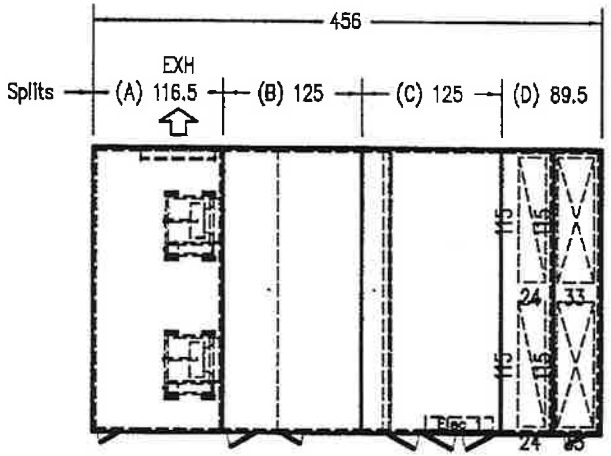
Are not included:
- Installation & Start-up
- Water coil valves piping and contriols by others
- All controls

Deviations from Specifications

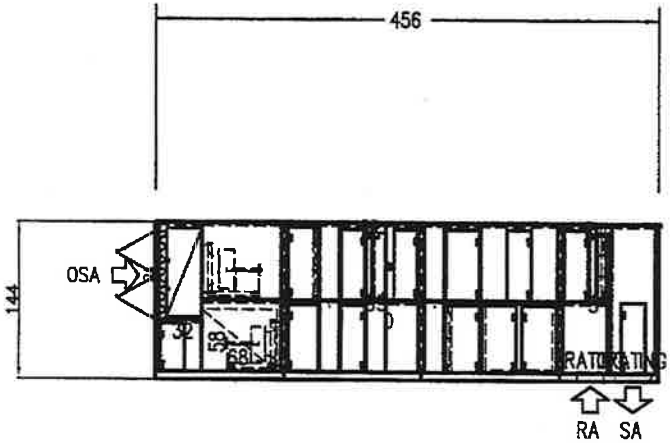
- Belt guards instead of door interlock
- Water coil valve are not included
- Coil piping
  can be done
  by others
  Inside the
  unit, but no
  pipe chase is
  provided
- Roof curtl does not have vibration Isolators 496



Plan View Top



Plan View Bottom



Top

Bottom

ORIGINAL EQUIPMENT SUBMITTAL DATA FROM 2010 INCLUDED FOR REFERENCE ONLY

Outdoor Construction Unit 1: 36,500 CFM Unit 2: 51,000 CFM

Tarrant County Jail

Tag: ERU-1

VENMAR CES
Dedicated Outdoor Air Solutions

DRAWN BY | DATE 11/9/10 | LAYOUT | SCALE 1:168 | SHEET OF

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JOB NO. T599-11 | DWG NO. 497 | REV D

Dual energy wheel selection

VENMAR CES

COST-efR=GTIVE COll,1MERCIAL Vl:NTILATION

Engineering submittal data

Version 2.63

Project name: Tarrant County Jail | Unit tag #:•ERU-1 | **Folder** #: T599-11-RevD | Date: 05-11-2010

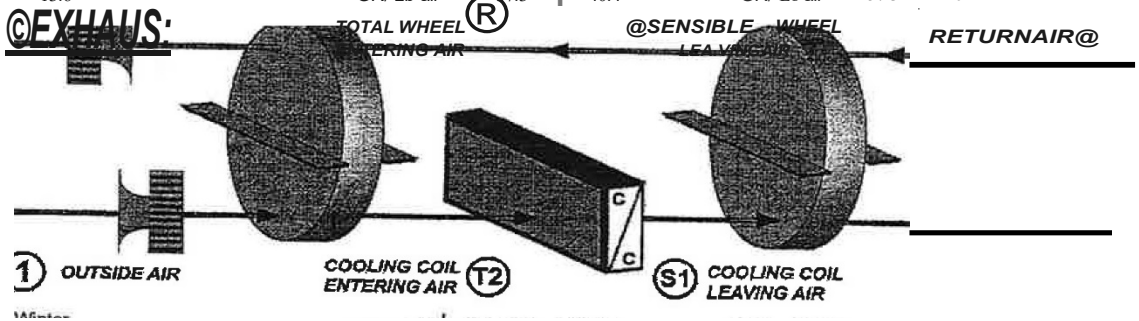
TOTAL WHEEL MODEL: HWL-T-108 SENSIBLE WHEEL MODEL: HWL-S 108

Station #4	Summer	Winier
CFM	18.250	
OBT ("F)	100.5	24.9
WBT("F)	78.B	22.7
RH%	38.8	71.8
GR/ Lb air	113.7	13.6

Station#T3	Summer	Winter
CFM	18,250	
DBT ("F)	62.9	70.0
WBT("F)	56.4	55.0
RH%	67.2	37.2
GR/ Lb air	57.3	40.4

staUon #S4	Summer	Winter
CFM	18,250	
DBT ("F}	62.9	70.0
WBT('F)	56.4	55.0
RH%	67.2	37.2
GR/ Lb air	57.3	40.4

Station #3	Summer	Winter
CFM	18,250	
DBT ("F)	78.0	.0
WBT("F)	62.0	.0
RH%	40.2	37.2
GR/Lb air	57.3	.4



SUPPI.YAIR@

Station #1	Summer	Winter
CFM	25,500	
DBT ('F)	105.0	20.0
WBT("F)	81.0	18.0
RH%	36.1	70.1
GR/ Lb air	121.3	10.5

Station #T2	S\.Immer	Winter
CFM	25,500	
DBT (9F)	78.1	52.3
WBT("F)	66.9	44.1
RH%	56.3	51.4
GR/ Lb air	81.0	29.7

Station#S1	Summer	Winter
CFM	25,500	
DBT('F)	50.0	52.3
WBT('F)	50.0	44.1
RH%	100.0	51.4
GR I Lb air	53.4	29.7

Station #2	Summer	Winter
CFM	25,500	
DBT ("F)	60.8	52.3
WBT("F)	54.6	44.1
RH%	67.5	51.4
GR/ Lb air	53.4	29.7

Specifications:

MODEL:		Airflows Suppfv	Return	Face velocitfes Sunl'lllt	Return	Pume alr Flows		Pressure drops Sunnlv	Return	Summer effeclJveness Sensible	Latent	Total	WInter elfeotlveness Sensible	Latent	Total	EATR
T	HWL-T-108	25,500 CFM	18,250 CFM	850FPM	608 FPM	OCFM	No purge	0.82 in.wg.	0.58 In.wg.	89%	88%	89%	90%	90%	90%	3,1%
soa•lbre Wb"m	HWL-S-1oa	25.500 CFM	18.250 CFM	850 FPM	608 FPM	OCFM	NoPume	0.82 In.wa.	0.Se in.wa.	54%	a%	50%	0%	0%	**0%**	0.4%

Dimensions:

R.ol0rlhlclmoss	V\'heal dlameler	WxH	Ien.9.Ih	Welgnt pb!i)
10"	108"	115" x 115"	16"	1800

Total wheel: Desiccant type: Molecular Sieve 4A

In cooling mode, the sensible wheel is slowed down to maintain SO"F on the suppiy side

Lon Evans Corrections Center