



ADDENDUM - 02

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FROM: Scott England, AIA
VIA:..... WeTransfer Electronic File Transfer

456 HIGH ST. • MT. HOLLY, NJ 08060 USA
(609) 265-2652 • 21AI00912100 • www.RYEBREAD.com

SUBJECT:
ADDENDUM - 02
LINDENWOLD HIGH SCHOOL CULINARY ARTS
ALTERATION
RYEBREAD Project #5713G

This addendum is issued to clarify, correct, or supplement the Documents as originally issued and will become a part of the Contract. Receipt thereof shall be acknowledged by Bidders in space provided in the Form of Bid. Failure to acknowledge this Addendum may be cause for rejection of Bid.

2.01 **AMENDMENT:** (Amend Specification Section 001000, Instructions to Bidders, page 11, lines 21-29 to now read as follows:

“CONTRACTOR PAYMENT AND DISTRICT BUDGET

This Project will be awarded to begin work in the Summer of 2024 and will be included in the Lindenwold Board of Education’s 2024-2025 budget.

The Contractor cannot submit any requests for payment until after 30 June 2024, and the first invoice to be paid at the July 2024 Board meeting.”

2.01 **AMENDMENT:** (Reference to Specification Section 237434):

DELETE: Delete previously issued specification sections 237434 - SEQUENCE OF OPERATIONS FOR THE CULINARY ARTS CLASSROOM & RANGE HOOD EXHAUST SYSTEMS.

REPLACE: Replace with amended section of same name and specification number, consisting of 05 pages and attached to this Addendum #2.

Attachment: Specification Section 237434, consisting of 05 Pages.

END OF ADDENDUM 02 consisting of 06 pages total.

SECTION 237434 - SEQUENCE OF OPERATIONS FOR THE CULINARY ARTS CLASSROOM
HVAC & RANGE HOOD EXHAUST SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Where items of the General Conditions are repeated in this Section of the Specifications, it is intended to qualify or to call particular attention to them; it is not intended that any other parts of the General Conditions shall be assumed to be omitted if not repeated herein.
- C. This Section applies equally and specifically to all HVAC Sections of the Specifications.
- D. Section 018100 – Special Requirements for Mechanical and Electrical Work shall apply to this Section.
- E. Section 230000 – Special Requirements for HVAC Work.
- F. Section 237432 – Range Hood Exhaust Systems shall apply to this Section.
- G. Section 237433 – Rooftop DOAS Units shall apply to this Section.

1.2 SUMMARY

- A. This Section includes control sequences for HVAC systems, subsystems, and equipment.

1.3 DEFINITIONS

- A. CV: Constant Volume.
- B. DDC: Direct Digital Control.
- C. VAV: Variable Air Volume.
- D. RH: Relative Humidity.
- E. DOAS: Dedicated Outdoor Air System.
- F. DCV: Demand Control Ventilation.

1.4 GENERAL

- A. All setpoints specified are intended as initial values and shall be adjusted and optimized by the control system manufacturer throughout the warranty period.
- B. All setpoints shall be user adjustable, whether indicated as adjustable or not, by contacting the manufacturer.

1.5 SUMMARY

- A. The control package shall be configured as a Demand Control Ventilation (DCV) System, that regulates DOAS unit airflow rates (supply, return, outside air and relief) based on occupancy schedule and quantity of range hood exhaust that is in operation. While DCV is inactive, DOAS will operate as RTU to condition the space.
- B. The scope shall include all necessary sensors, controllers, wiring, hardware, software, firmware, programming, interlocks and servicing for a complete and functional system that satisfies the specified sequence of operations.
- C. The range hood exhaust system, rooftop DOAS unit and associated controls shall be the product of one manufacturer: CaptiveAire or approved equal.

1.6 SUBMITTALS

- A. The manufacturer shall supply complete computer-generated submittal drawings, including hood section view(s) and hood plan view(s). These drawings must be available to the engineer, architect, and owner for their use in construction, operation, and maintenance.

1.7 QUALITY ASSURANCE

- A. Control package shall be listed by ETL and complies with UL508A Standard and CAN/CSA C22.2, No. 14-05 Standards.
- B. ECPM03 Circuit Board shall be listed by ETL and complies with UL 61010-1 Standard and CAN/CSA C22.2, No. 61010-1 Standards.

1.8 WARRANTY

- A. Warrant all work in accordance with the general conditions for two (2) years from date of substantial completion. During the warranty period, the manufacturer shall be responsible for all necessary firmware/software revisions required to provide a complete and workable system consistent with the letter and intent of the Sequence of Operations section of the specifications. The manufacturer shall install operating system updates issued by the manufacturer(s) throughout the warranty period. Control system failures during the warranty period shall be adjusted, repaired, or replaced at no additional cost or reduction in service within 24 hours, during normal business hours.

1.9 CONTROL CABINET

- A. Each Hood DCV control cabinet shall be mounted on side of teacher's demonstration hood, in stainless steel enclosure of NEMA 1 construction, with finish to match hood.
- B. Each Hood DCV system includes a cabinet mounted LCD screen interface for fan(s) and hood lights control, gas valve reset, programmable schedule, control setpoints, Max Air Override function, Cool Down mode, and Room temp Sensor (wall mounted). The LCD screen shows descriptive plain text explaining the functions or values.
- C. The DOAS unit will have gasketed Service Doors to access local electrical controls for the unit. System will include (2) space mounted HMI's mounted as an integral part of each space sensor, which continuously monitors temperature/relative humidity/carbon dioxide on the instructional and cooking side of the classroom. Each pair of output signals shall be averaged by the controller.
- D. The HMI screens shall display descriptive plain text explaining the functions or values.

1.10 SYSTEM OPERATION

- A. The Rooftop DOAS will function as RTU for space during DCV Inactive Mode. Wired Activation signal from any DCV will initiate DCV Activation Mode. DOAS airflow and modulation based on space mounted temperature/humidity sensor, or when any of the range hood exhaust fans are operating.
- B. The Rooftop DOAS Unit and Range Hood Exhaust Fans shall be interlocked to shut down through general alarm condition of building fire alarm system, and when any of the range hood ansul systems are activated.
- C. Rooftop Unit shall be furnished complete with controls for all unit functions, including cooling, heating, economizer control, liquid subcooling and hot gas reheat, variable air volume control of supply and relief fans, etc. The Unit Controls shall support industry standard open protocols including but not limited to MODBUS, BACNET and LON and shall be integrated into Building Automation System for complete control and monitoring capabilities.
- D. Unoccupied RTU Mode:
 - 1. When the system is in the unoccupied mode, the supply and exhaust fans shall be off, the outdoor and exhaust air dampers shall be closed, the return air damper shall be open, and the refrigeration and gas fired furnace systems shall be inactive. If the unit senses the space conditions require operation during the unoccupied mode, the unit shall start and operate in the unoccupied heating/cooling mode as required.
 - 2. If space temperature drops below night heating setpoint, or rises above night cooling setpoint, the supply fan shall start and run at 3,000 CFM under recirculation cycle. During this operation the Dx cooling system or gas furnace shall be enabled to restore space temperature.

E. Occupied RTU/DOAS Mode:

1. When the system is in the occupied mode, the supply air fan and exhaust fan shall be energized and run continuously. In RTU mode, supply fan shall run at 3,000 CFM, and minimum outside air intake quantity shall be 575 CFM. In DCV mode, the volume of the supply fan shall be monitored by a control algorithm that modulates fan speed from (3,000 CFM to 7,535 CFM) based on quantity of range hood exhaust, such that space is always 200 CFM negative. The volume of the RTU/SOAS unit mounted exhaust fan shall be modulated from minimum to maximum under a control algorithm that maintains 0.02 w.c. of negative pressure in the Culinary Arts Classroom with respect to adjacent corridor.
2. When the unit is first enabled, the outside and exhaust air dampers shall open to minimum airflow position, while the return air damper remains open to maximum airflow position. The minimum position of the outside air intake damper shall be governed by through a demand control based ventilation system (DCV) that forms an integral part of the unit control functions, such that the minimum quantity of outside air tracks the quantity of range hood exhaust.
3. The unit shall sequence the heating, cooling and dehumidification functions as required to maintain the unit leaving air temperature setpoint. The setpoint of the discharge temperature control loop shall be reset inversely with changes in space temperature, to maintain occupied heating and cooling setpoints.

F. Dehumidification Cycle:

1. When space RH is equal to or less than 50% (adj.), the unit shall maintain its nominal leaving air temperature at the cooling coil. The cooling coil leaving air temperature setpoint shall be controlled based on space temperature.
2. When space exceeds 52% RH at any air terminal, the cooling coil outlet temperature shall be gradually reduced towards a full dehumidification setpoint of 55 deg F (adj.), and the space temperature shall be maintained by the hot gas reheat coil.

G. Discharge Temperature Control:

1. The unit shall modulate the hot gas reheat coil, gas fired furnace, or the mechanical refrigeration system, or engage the economizer cycle as required to maintain the unit discharge air temperature setpoint. The unit shall implement factory optimized heating, cooling and economizer control algorithms to maximize energy conservation based on deviation between space temperature and setpoint.

H. Economizer Mode:

1. When a call for cooling is placed, the unit shall compare outside enthalpy to space enthalpy. If outdoor conditions are the same or more suitable than indoor conditions, the unit shall enter economizer mode.
2. The outside air damper, return air damper and relief air damper shall modulate as required to maintain setpoints indicated.

- I. Filter Monitoring: The system shall incorporate static pressure differential gauges and a run timer on the supply fan, indicating the number of hours the fan and filter and in use, and generate an alarm when replacement is necessary.

CULINARY ARTS CLASSROOM ALTERATION-LINDENWOLD HIGH SCHOOL
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- J. Fan Status Monitoring: The system shall monitor status of each supply, room fan and range hood exhaust fan; and compare against command state. When status does not agree with command state, an alarm shall be generated.
- K. Heating and Cooling Equipment Monitoring: The system shall monitor status of heating and cooling equipment; and generate an alarm when status does not agree with command state.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions under which the system is installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to installer.
- B. Install in accordance with the manufacturer's instructions, drawings, written specifications, manufacturer's installation manual, and all applicable building codes.

3.2 SYSTEM START-UP AND OWNER TRAINING

- A. System start-up and owner training shall be performed by a factory trained Service Technician, and commissioning report will be provided to Architect.

END OF SECTION 237434