

Addendum No.: **3**

Date of this Addendum: **November 27, 2023**

Re: **NCSU McKimmon Center Rest Room Renovation**
1101 Gorman Street
Raleigh, NC 27606
Arcadis # 142814

To: Prospective Bidders,

Bid Opening Date: **December 12, 2023**
Bid Opening Time: **3:00 pm**
Bid Receipt Location: **2601 Wolf Village Way**
Administrative Services III Bldg., Room 301
Raleigh, NC 27606

This Addendum shall and does hereby become a part of the construction documents for the above Project. Contractors submitting a bid shall be responsible for ensuring that they are properly apprised of the contents of this Addendum. The clarifications or modifications in this Addendum shall be incorporated into the Work of the referenced Project and all associated costs shall be accounted for in the General Contractor's lump sum bid. All information contained in this Addendum shall supersede and take precedence over any conflicting information in the original bid documents. All other requirements of the Work, except as modified herein, shall remain unchanged.

Receipt of this addendum shall be acknowledged in the Contractor's Bid. Failure to do so may constitute grounds for rejection of the bid.

GENERAL CLARIFICATIONS:

1. Table of Contents updated to include:
 - Appendix D1- NCSU Fire Alarm Systems
 - Section 02 82 10 Abatement Project Coordination
 - Section 02 82 11 Abatement Definitions, Codes and Regulations
 - Section 07 84 00 Firestopping
 - Section 26 05 29 Hangers and Supports for Electrical Systems
2. Table of Contents updated to remove:
 - Section 01 21 00 Allowances
 - Section 07 21 00 Thermal Insulation
 - Section 23 07 13 Duct Insulation
 - Form of Change Order
 - Contract Change Order Summary
3. Identification of HUB Certified page- specify value required.
4. Allowances as lump sums are not allowed on SCO projects.

ATTACHED DOCUMENTS:

1. Table of Contents
2. Section 06 20 20 Interior Finish Carpentry

-
3. Section 23 34 00 HVAC
 4. Section 26 29 13 Enclosed Controllers
 5. RFIs 10, 17-30

End of Addendum

Identification of HUB Certified/ Minority Business Participation

I, _____, do hereby certify that on
(Name of Bidder)
 this project, we will use the following HUB Certified/ minority business as construction subcontractors, vendors, suppliers, or providers of professional services.

Firm Name, Address and Phone Number	Work Type	*Minority Category	**HUB Certified
			Y / N
			Y / N
			Y / N
			Y / N
			Y / N
			Y / N
			Y / N
			Y / N
			Y / N

*Minority categories: Black, African American (**B**), Hispanic (**H**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**D**)

**** HUB Certification with the state HUB Office required to be counted toward state participation goals. Value below must have a number inserted even if it is zero (0).**

The total value of minority business contracting will be (\$)_____.

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SECTION 06 20 20

INTERIOR FINISH CARPENTRY

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes all finish carpentry work, complete with accessories and related work, as indicated and specified, including but not necessarily limited to the following custom work:
 - 1. Plastic laminate.
 - 2. Solid surface countertops and backsplashes.
- B. Related Work Specified in Other Sections
 - 1. Rough Carpentry – Division 6.
 - 2. Wood Doors – Division 8.
 - 3. Sinks In Countertops – Division 22.
 - 4. Schedule for Finishes – Section 09 06 00.

1.02 SUBMITTALS

- A. Submittals of shop drawings, product data, and samples are required for all work of the Section.
- B. Finish Carpentry Shop Drawings: Submit for review, completely detailed shop drawings showing all information necessary for the fabrication and erection of all work specified herein. The shop drawings shall show dimensions, construction details, jointing details, wood species and grade, trim, finishes, paneling layout, hardware and details relating to adjacent work.
- C. Finish Carpentry Product Data: Submit product data on all catalog-type components.
- D. Finish Carpentry Material Samples: Submit samples of each of the following items:
 - 1. Plastic laminate chips of colors, patterns and textures specified.
 - 2. Solid surface chips of colors, patterns and textures specified.
- E. For adhesives and glues used at Project site, including printed statement of VOC limits and certify compliance with South Coast Air Quality Management District Regulation #1168.
- F. For composite-wood products and adhesives, documentation indicating that product contains no added urea formaldehyde.

1.03 QUALITY ASSURANCE

A. Reference Standard

1. Use the “Quality Standards” of the Architectural Woodwork Institute (AWI) which are referenced and hereby made a part of this Section. Use “Premium Grade” for all work as defined in the latest edition of the AWI “Quality Standards”.
2. Use plastic laminates which conforms to National Association of Plastic Fabricators and American National Standard Institute (ANSI) / National Electrical Manufacturers Association (NEMA) Publication LD 3 current edition.
3. Use grades of lumber, plywood and particleboard as defined by the rules of the recognized association of manufacturers producing the kind or species of lumber, plywood and particleboard specified in this Section. Use only lumber, plywood, and particleboard grade-stamped by the inspecting authorities.

1.04 SITE CONDITIONS

- A. The woodwork manufacturer is responsible for dimensions not controlled by job conditions. Shop drawings shall show all required field measurements. The cooperation of the Contractor and the woodwork manufacturer is required to establish and maintain these field dimensions.

1.05 DELIVERY, STORAGE AND HANDLING

- A. It is the joint responsibility of the woodwork manufacturer and the Contractor to make certain that woodwork is not delivered until the building and storage areas are sufficiently dry and complete so that the woodwork will not be damaged. The Contractor will replace defective or damaged materials at no cost to the Owner.
- B. Crate, ship and deliver all materials to the Site and store in accordance with manufacturer’s instructions and standards of the National Woodwork Manufacturers Association.
- C. Protect all finished surfaces after installation and finishing from damage and soiling. Maintain protection during subsequent work operations, and remove same upon Owner’s Representative’s acceptance or when instructed by Owner’s Representative.

PART 2 - PRODUCTS

2.01 MATERIALS AND FABRICATION

A. General

1. Use lumber bearing the official trademark and grade of the manufacturer’s association or inspection bureau under which it was manufactured and graded, except as specified otherwise herein. Use seasoned lumber, surfaced four sides and kiln or air dried to moisture content specified in association’s rules, except that moisture content is limited to a maximum of 11 percent.

2. Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard," for lumber and with applicable grading rules of inspection agencies certified by the American Lumber Standards Committee Board of Review.
3. Softwood Plywood: Comply with DOC PS 1, "U.S. Product Standard for Construction and Industrial Plywood."
4. Medium Density Fiberboard: NPA 9-87, "Voluntary Standard for Formaldehyde Emission from Medium Density Fiberboard" and ANSI/NPA Standard A208.2-2009.
5. Hardwood Plywood: Comply with HPVA HP-1, "Interim Voluntary Standard for Hardwood and Decorative Plywood."
6. Particle Board: Comply with ANSI A 208.1 Grade M-2 Exterior Glue.
7. Preservative Treatment: Comply with NWWDA I.S. 4 for exterior finish carpentry to receive water-repellent preservative treatment.
8. Fire Retardant Treatment: Where indicated, use materials impregnated with fire-retardant chemicals per AWPA C20; exterior type or interior Type A as required.

B. Lumber Use and Species

1. Furring, Grounds and Similar Use: WWPA "Standard", "No. 2 Common" or better, Douglas Fir-Larch, Hem-Fir, Pine, Engelmann Spruce, Cedar, or SPIB No. 2 Boards Southern Pine.
2. Nailers, Blocking, Framing, Rough Bucks, and Rough Lumber Not Otherwise Specified: WWPA "Utility", "No. 3" or better, Douglas Fir, Hem-Fir, Lodgepole Pine, Western Cedars, or SPIB No. 2KD Southern Pine.

C. Plastic Laminate Cores

1. Plywood: Douglas Fir or Pine, interior A-D grade conforming to P.S. 1-74, or thicknesses indicated.
2. Medium-Density Fiberboard: mat-formed medium density conforming to Commercial Standard 236-66, of thicknesses indicated.
 - a. Medium Density Fiberboard shall conform to ANSI/NPA A208.2, latest edition, and shall meet the following minimum standards:
 - 1) Screw holding, face: 355 lbs.
 - 2) Screw holding, edge: 300 lbs.
 - 3) Modulus of rupture: 4,500 psi.
 - 4) Modulus of elasticity: 500,000
 - b. No Added Urea-Formaldehyde Resin MDF:
 - 1) VESTA MDF manufactured by Flakeboard, or equal.
 - c. Certification: Meet CPA 3-08 EPPS including the following:
 - 1) Formaldehyde Emission Requirements: ANSI A208.2, Table A and HUD 24 CFR Part 3280.308.
 - 2) Recycled Content: 100 percent pre-consumer recycled/recovered wood content.

D. Fastening Materials

1. General: Furnish fastening materials of types appropriate for the conditions encountered, including wood to wood, wood to masonry or concrete and wood to metal.
2. Nails and Staples: Galvanized carbon steel, conforming to the requirements of Fed. Spec. FF-N-105B.
3. Screws: Galvanized carbon steel conforming to the requirements of Fed. Spec. FF-S-107C and natural bright finish carbon steel conforming to the requirements of Fed. Spec. FF-S-111C.
4. Bolts, Washers, Expansion Shields, and Nuts: Zinc-coated carbon steel, conforming to the requirements of Fed. Spec. FF-B-561C, FF-B-575C, FF-W-92A, FF-B-588C and FF-N-836D.
5. Adhesives: Aliphatic or phenolic-resin wood glue recommended for general carpentry use.
 - a. VOC Limits: Comply with South Coast Air Quality Management District requirements for VOC limits in adhesives. For finish mill work adhesive maximum VOC content is 30 grams/liter. For contact adhesive the limit is 250 grams/liter.

E. Plastic Laminate

1. Plastic Laminate: Provide high pressure plastic laminate consisting of melamine-impregnated surface papers laminated over phenolic-impregnated kraft layers under high pressure and heat, as manufactured by Formica, Nevamar, or Wilsonart, and conforming to National Electrical Manufacturers Association (NEMA) Publication No. LD3, with low gloss finish, in colors, patterns, and textures as selected, per approved samples. Provide the following types:
 - a. Use NEMA LD-3, Standard Grade GP50, nominal .050 inch thick plastic laminate for straight horizontal and vertical surfaces.
 - b. Use NEMA LD-3, Grade GP28 or PF30, nominal .030 inch thick plastic laminate as a backer sheet on underside and back of countertops.
 - c. Use NEMA LD-3, Postforming Grade PF42, nominal .042 inch thick plastic laminate for forming over curved or rounded shapes.
2. Material is to be Greenguard Indoor Air Quality Certified by the Greenguard Environmental Institute under the Greenguard Standard for low Emitting Products.
3. Match the plastic laminates indicated in Specification Section 09 06 00 – Schedule For Finishes:
 - a. Basis of Design: Formica.
 - b. Other acceptable manufacturer's based on ability to match visual characteristics of design standards:
 - 1) Wilsonart.
 - 2) Nevamar.

4. Adhesive: Water resistant, in accordance with AWI recommendations, and as recommended by plastic laminate manufacturer.
 - a. Comply with VOC limitations of project as indicated in Division 1.
5. Back Painting: Apply one coat of primer-sealer paint in the shop, on all wood surfaces and edges not covered with plastic laminate backer sheet, and that will be concealed in the finished work.
 - a. See Painting – Division 9 for acceptable paint manufacturers and types.

F. Plastic Laminate Panels:

1. Unless otherwise noted, construct panels of plywood or medium density fiber board as detailed, with back and end splashes where shown, complete with supports, with all exposed surfaces (including exposed supports) and edges surfaced with plastic laminate of colors and patterns selected for each panel.
 - a. AWI Quality Grade: Premium.
 - b. All Exposed Surfaces: Plastic laminate, when PLAM indicated.

G. Solid Surfacing Countertops

1. Solid Surfacing: Homogenous solid sheets of filled 100% acrylic plastic resin, 3/4 inch thick unless noted otherwise, complying with the material and performance requirements of ANSI Z124.3, Type 5 or 6, without a precoated finish, to match colors specified in the Schedule for Finishes 09 06 00.
2. Material is to be Greenguard Indoor Air Quality Certified by the Greenguard Environmental Institute under the Greenguard Standard for low Emitting Products.
3. Match the materials indicated in Specification Section 09 06 00 – Schedule for Finishes:
 - a. Basis of Design: DuPont "Wilsonart, Gibraltar".
 - b. Other acceptable manufacturer's based on ability to match visual characteristics of design standards:
 - 1) Dupont, "Corian".
 - 2) Avonite, Inc., "Avonite".
4. Accessories: Provide adhesives as specified for fastening materials except water resistant and provide sealants per 07 90 00 and as recommended by the solid surfacing manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Carefully examine existing wood paneling and running trim and endeavor to match existing veneers, materials, finishes and detailing, whether or not existing conditions are exactly as specified herein.

3.02 INSTALLATION

- A. General Millwork
 - 1. Provide all wood blocking and framing required to support items of finish carpentry. Use fastening materials of types appropriate for the conditions encountered, including wood to wood, wood to masonry, and wood to metal stud framing. Counterbore holes for nuts and bolt heads, and countersink for screws. Use concealed fasteners in exposed surfaces of finish carpentry.
 - 2. Before installing finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours.
 - 3. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements. Do not use manufactured units with defective surfaces, sizes, or patterns.
 - 4. Furnish millwork in configurations shown and specified. AWI grading will take precedence over joiner details shown on Drawings. Provide tight joints. Miter exterior angles, cope interior angles and returns of trim moldings. Provide blind nailing where practicable. Secure work with finishing nails or screws and glue. Install trim in maximum practical lengths.
 - 5. On surfaces exposed to view, set all nail heads and spackle. Countersink all screw heads and cover with neatly fitted wood plugs to match grain. Sand in accordance with AWI grading. Fit and scribe all work to walls or other finished work in a careful manner, so as not to injure the surface in any way.
- B. Plastic Laminate Work
 - 1. Install support framing for panels and anchor to adjacent construction; install panels on supports and secure thereto, in accordance with reviewed shop drawings.

2. Carefully install all plastic laminate items complete in-place, including all incidental items not specifically noted elsewhere, properly aligned, set plumb and rigidly secured.
 3. Provide adjustments, closures, etc., as may be necessary to close to adjacent items and construction.
 4. Scribe and closely fit all items to adjacent work.
 5. Provide backing, grounds, anchors, bolts, fasteners, etc., necessary for securing work in place. Set all work level and plumb, securely anchored in place.
 6. Seal joints at adjacent work with sealant specified in Section 07 92 00.
 7. Paint all visible surfaces in plastic laminate work, other than finish plastic laminate itself, such as recesses, reveals, visible rough hardware, etc. Paint to match color of adjacent plastic laminate.
- C. Solid Surfacing Work
1. Countertops: Construct of solid surfacing as shown and per approved shop drawings.
 - a. Fabricate tops in one piece; provide cut-outs for sink bowls (coordinate with Plumbing Contractor), faucets and soap dispensers.
 - b. Apply solid surfacing back and end splashes. Comply with solid surfacing material manufacturer's recommendations for adhesives, sealants, fabrication and finishing.
 - c. Install support framing of lumber, exterior grade plywood, bent hot-dip galvanized ASTM A36 steel plate brackets, etc., as shown.
- D. Standing and Running Trim and Rails:
1. Install with minimum number of joints possible, using full length pieces (from maximum length of lumber available) to the greatest extent possible.
 2. Stagger joints in adjacent and related members.
 3. Cope at returns and miter at corners.
- E. Temporary Ventilation: During and immediately after installation of engineered wood products, and laminated wood products at interior spaces, provide temporary ventilation.
- F. Waste Management:
1. Select lumber sizes to minimize waste; reuse scrap lumber to the greatest extent possible. Clearly separate scrap lumber for use on site as accessory components, including: shims, bracing and blocking.
 2. Do not leave any wood, shavings, sawdust, etc., on the ground or buried in fill. Prevent sawdust and wood shavings from entering the storm drainage system.
- G. Clean up:

1. Coordinate cleaning program with General Contractor. No cleaning products or solvents containing volatile organic compound (VOC's) are permitted within the building once the building has been dried-in.
2. Clean up and dispose of all waste material and refuse that has been brought onto the job or that has accumulated as a result of the work. Leave the work broom clean or better.
3. Replace finish carpentry that is damaged or does not comply with requirements. Finish carpentry may be repaired or refinished if work complies with requirements and show no evidence of repair or refinishing. Adjust joinery for uniform appearance.
4. Touch up any damaged finishes to restore to new matching adjacent areas.

3.03 PROTECTION

1. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, which ensures that woodwork is being without damage or deterioration at time of Substantial Completion

END OF SECTION

SECTION 23 34 00

HVAC FANS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes: For each product.
 - 1. Centrifugal roof ventilators.

1.03 PERFORMANCE REQUIREMENTS

- A. Project Altitude: Base fan-performance ratings on sea level.
- B. Operating Limits: Classify according to AMCA 99.

1.04 SUBMITTALS

- A. Product Data:
 - 1. Include rated capacities, furnished specialties, and accessories for each fan.
 - 2. Certified fan performance curves with system operating conditions indicated.
 - 3. Certified fan sound-power ratings.
 - 4. Motor ratings and electrical characteristics, plus motor and electrical accessories.
 - 5. Material thickness and finishes, including color charts.
 - 6. Dampers, including housings, linkages, and operators
- B. Shop Drawings:
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

3. Include diagrams for power, signal, and control wiring.
 4. Design Calculations: Calculate requirements for selecting vibration isolators and seismic restraints and for designing vibration isolation bases.
 5. Vibration Isolation Base Details: Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include auxiliary motor slides and rails, and base weights.
- C. Operation and Maintenance Data: For HVAC fans to include in emergency, operation, and maintenance manuals.

1.05 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. AMCA Compliance: Fans shall have AMCA-Certified performance ratings and shall bear the AMCA-Certified Ratings Seal.
- C. UL Standards: HVAC fans shall comply with UL 705. HVAC fans for use for restaurant kitchen exhaust shall also comply with UL 762.

1.06 COORDINATION

- A. Coordinate size and location of structural-steel support members.
- B. Coordinate sizes and locations of concrete bases with actual equipment provided.
- C. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.
- D. Existing roof curbs shall be reused for existing exhaust fan replacement. Provide transition curbs as required for new exhaust fans.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. AMCA Compliance:
 1. Comply with AMCA performance requirements and bear the AMCA-Certified Ratings Seal.
 2. Operating Limits: Classify according to AMCA 99.

- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Capacities and Characteristics: Refer to drawings.
 - 1. See Schedule on Drawings.

2.02 CENTRIFUGAL ROOF VENTILATORS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. Greenheck Fan
 - 2. Acme Fan
 - 3. Loren Cook Company
 - 4. Aerovent
 - 5. Twin City Fan & Blower
 - 6. Or Approved Equal
- B. Housing: Removable, galvanized steel, mushroom-domed top; square, one-piece, aluminum base with venturi inlet cone.
 - 1. Hinged Subbase: Galvanized-steel hinged arrangement permitting service and maintenance.
- C. Fan Wheels: Aluminum hub and wheel with backward-inclined blades.
- D. Belt Drives:
 - 1. Resiliently mounted to housing.
 - 2. Fan Shaft: Turned, ground, and polished steel; keyed to wheel hub.
 - 3. Shaft Bearings: Permanently lubricated, permanently sealed, self-aligning ball bearings.
 - 4. Pulleys: Cast-iron, adjustable-pitch motor pulley.
 - 5. Fan and motor isolated from exhaust airstream.
- E. Accessories:
 - 1. Disconnect Switch: Nonfusible type, with thermal-overload protection mounted outside fan housing, factory wired through an internal aluminum conduit
 - 2. Bird Screens: Removable, 1/2-inch (13-mm) mesh, aluminum or brass wire.
 - 3. Dampers: Counterbalanced, parallel-blade, backdraft dampers mounted in curb base; factory set to close when fan stops.
 - 4. Motorized Dampers: Parallel-blade dampers mounted in curb base with electric actuator; wired to close when fan stops.

F. Capacities and Characteristics: Refer to drawings.

1. See Schedule on Drawings.

2.03 MOTORS

A. Comply with NEMA designation, temperature rating, service factor, and efficiency requirements for motors specified in Section 20 05 13 "Common Motor Requirements for Mechanical, Plumbing and Fire Suppression.

2.04 SOURCE QUALITY CONTROL

A. Sound-Power Level Ratings: Comply with AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Factory test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Label fans with the AMCA-Certified Ratings Seal.

B. Fan Performance Ratings: Establish flow rate, pressure, power, air density, speed of rotation, and efficiency by factory tests and ratings according to AMCA 210/ASHRAE 51, "Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating."

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install centrifugal fans level and plumb.

B. Disassemble and reassemble units, as required for moving to the final location, according to manufacturer's written instructions.

C. Lift and support units with manufacturer's designated lifting or supporting points.

D. Unit Support: Install centrifugal fans level on structural curbs. Secure units to structural support with anchor bolts.

E. Install units with clearances for service and maintenance.

F. Label fans according to requirements specified in Section 20 05 53 "Identification for HVAC Equipment."

3.02 CONNECTIONS

A. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors. Flexible connectors are specified in Section 233300 "Air Duct Accessories."

- B. Install ducts adjacent to fans to allow service and maintenance.
- C. Install piping from scroll drain connection, with trap with seal equal to 1.5 times specified static pressure, to nearest floor drain with pipe sizes matching the drain connection.

3.03 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. Verify that shipping, blocking, and bracing are removed.
 - 2. Verify that unit is secure on mountings and supporting devices and that connections to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
 - 3. Verify that cleaning and adjusting are complete.
 - 4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. Reconnect fan drive system, align and adjust belts, and install belt guards.
 - 5. Adjust belt tension.
 - 6. Adjust damper linkages for proper damper operation.
 - 7. Verify lubrication for bearings and other moving parts.
 - 8. Verify that manual and automatic volume control and fire and smoke dampers in connected ductwork systems are in fully open position.
 - 9. See Section 200593 "Testing, Adjusting, and Balancing for Mechanical and Plumbing" for testing, adjusting, and balancing procedures.
 - 10. Remove and replace malfunctioning units and retest as specified above.
- D. Test and adjust controls and safeties. Controls and equipment will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports.

3.04 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain centrifugal fans.

END OF SECTION

SECTION 26 29 13

ENCLOSED CONTROLLERS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes the following enclosed controllers rated 600 V and less:
 - 1. Full-voltage magnetic.

1.02 DEFINITIONS

- A. CPT: Control power transformer.
- B. MCCB: Molded-case circuit breaker.
- C. MCP: Motor circuit protector.
- D. N.C.: Normally closed.
- E. N.O.: Normally open.
- F. OCPD: Overcurrent protective device.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of enclosed controller.
- B. Shop Drawings: For each enclosed controller. Include dimensioned plans, elevations, sections, details, and required clearances and service spaces around controller enclosures.
 - 1. Wiring Diagrams: For power, signal, and control wiring.

1.04 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.05 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.06 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with National Electric Code (NFPA 70) 2017 edition.
- C. IEEE Compliance: Fabricate and test enclosed controllers according to IEEE 344 to withstand seismic forces defined in Section 260548.16 "Seismic Controls for Electrical Systems."

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Square D
- B. Cutler-Hammer
- C. Allen-Bradley
- D. GE
- E. Siemens
- F. Or as approved by the Engineer.

2.02 FULL-VOLTAGE CONTROLLERS

- A. General Requirements for Full-Voltage Controllers: Comply with NEMA ICS 2, general purpose, Class A.
- B. Motor-Starting Switches: "Quick-make, quick-break" toggle or push-button action; marked to show whether unit is off or on.
 - 1. Configuration: Nonreversing.
 - 2. Surface mounting.
 - 3. Pilot light.
- C. Fractional Horsepower Manual Controllers: "Quick-make, quick-break" toggle or push-button action; marked to show whether unit is off, on, or tripped.
 - 1. Configuration: Nonreversing.
 - 2. Overload Relays: Inverse-time-current characteristics; NEMA ICS 2, Class 10 tripping characteristics; heaters matched to nameplate full-load current of actual protected motor; external reset push button bimetallic type.

3. Surface mounting.
 4. Pilot light.
- D. Integral Horsepower Manual Controllers: "Quick-make, quick-break" toggle or push-button action; marked to show whether unit is off, on, or tripped.
1. Configuration: Nonreversing.
 2. Overload Relays: Inverse-time-current characteristics; NEMA ICS 2, Class 10 tripping characteristics; heaters and sensors in each phase, matched to nameplate full-load current of actual protected motor and having appropriate adjustment for duty cycle; external reset push button bimetallic type.
 3. Surface mounting.
 4. Pilot light.
- E. Magnetic Controllers: Full voltage, across the line, electrically held.
1. Configuration: Nonreversing
 2. Contactor Coils: Pressure-encapsulated type.
 - a. Operating Voltage: Depending on contactor NEMA size and line-voltage rating, manufacturer's standard matching control power or line voltage.
 3. Power Contacts: Totally enclosed, double-break, silver-cadmium oxide; assembled to allow inspection and replacement without disturbing line or load wiring.
 4. Control Circuits: 120-V ac; obtained from integral CPT, with primary and secondary fuses of sufficient capacity to operate integral devices and remotely located pilot, indicating, and control devices.
 5. Melting Alloy Overload Relays:
 - a. Inverse-time-current characteristic.
 - b. Class 20 tripping characteristic.
 - c. Heaters in each phase matched to nameplate full-load current of actual protected motor and with appropriate adjustment for duty cycle.
 6. Bimetallic Overload Relays:
 - a. Inverse-time-current characteristic.
 - b. Class 20 tripping characteristic.
 - c. Heaters in each phase matched to nameplate full-load current of actual protected motor and with appropriate adjustment for duty cycle.
 7. Solid-State Overload Relay:
 - a. Switch or dial selectable for motor running overload protection.
 - b. Sensors in each phase.

- c. Class 20 tripping characteristic selected to protect motor against voltage and current unbalance and single phasing.
 - 8. External overload reset push button.
- F. Combination Magnetic Controller: Factory-assembled combination of magnetic controller, OCPD, and disconnecting means.
 - 1. Fusible Disconnecting Means:
 - a. NEMA KS 1, heavy-duty, horsepower-rated, fusible switch with clips or bolt pads to accommodate Class R fuses.
 - b. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.
 - 2. Auxiliary Contacts: N.O./N.C., arranged to activate before switch blades open.
 - 3. Nonfusible Disconnecting Means:
 - a. NEMA KS 1, heavy-duty, horsepower-rated, nonfusible switch.
 - b. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.
 - c. Auxiliary Contacts: N.O./N.C., arranged to activate before switch blades open.
 - 4. MCP Disconnecting Means:
 - a. UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents, instantaneous-only circuit breaker with front-mounted, field-adjustable, short-circuit trip coordinated with motor locked-rotor amperes.
 - b. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.
 - c. Auxiliary contacts "a" and "b" arranged to activate with MCP handle.
 - 5. MCCB Disconnecting Means:
 - a. UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents; thermal-magnetic MCCB, with inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits.
 - b. Front-mounted, adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
 - c. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.
 - d. Auxiliary contacts "a" and "b" arranged to activate with MCCB handle.

2.03 ENCLOSURES

- A. Enclosed Controllers: NEMA ICS 6, to comply with environmental conditions at installed location.
 - 1. Dry and Clean Indoor Locations: Type 1
 - 2. Outdoor Locations: Type 3R.
 - 3. Wash-Down Areas: Type 4X stainless steel.
 - 4. Other Wet or Damp Indoor Locations: Type 4.
 - 5. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: Type 12.

2.04 ACCESSORIES

- A. Push Buttons, Pilot Lights, and Selector Switches: NEMA ICS 5; heavy-duty type; factory installed in controller enclosure cover unless otherwise indicated.
- B. Control Relays: Auxiliary and adjustable time-delay relays.
- C. Phase-Failure, Phase-Reversal, and Undervoltage and Overvoltage Relays: Solid-state sensing circuit with isolated output contacts for hard-wired connections. Provide adjustable undervoltage, overvoltage, and time-delay settings.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Wall-Mounted Controllers: Install enclosed controllers on walls with tops at uniform height, and with disconnect operating handles not higher than 79 inches (2006 mm) above finished floor, unless otherwise indicated, and by bolting units to wall or mounting on lightweight structural-steel channels bolted to wall.
- B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.
- C. Install fuses in each fusible-switch enclosed controller.
- D. Install fuses in control circuits if not factory installed. Comply with requirements in Section 262813 "Fuses."
- E. Install heaters in thermal overload relays. Select heaters based on actual nameplate full-load amperes after motors have been installed.
- F. Comply with NECA 1.

3.02 IDENTIFICATION

- A. Identify enclosed controllers, components, and control wiring. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
 - 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
 - 2. Label each enclosure with engraved nameplate.
 - 3. Label each enclosure-mounted control and pilot device.

3.03 CONTROL WIRING INSTALLATION

- A. Install wiring between enclosed controllers and remote devices.
- B. Bundle, train, and support wiring in enclosures.
- C. Connect selector switches and other automatic-control selection devices where applicable.
 - 1. Connect selector switches to bypass only those manual- and automatic-control devices that have no safety functions when switch is in manual-control position.
 - 2. Connect selector switches with enclosed-controller circuit in both manual and automatic positions for safety-type control devices such as low- and high-pressure cutouts, high-temperature cutouts, and motor overload protectors.

3.04 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each enclosed controller, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.
- C. Tests and Inspections:
 - 1. Inspect controllers, wiring, components, connections, and equipment installation. Test and adjust controllers, components, and equipment.
 - 2. Test insulation resistance for each enclosed-controller element, component, connecting motor supply, feeder, and control circuits.
 - 3. Test continuity of each circuit.
 - 4. Verify that voltages at controller locations are within plus or minus 10 percent of motor nameplate rated voltages. If outside this range for any motor, notify Owner before starting the motor(s).

5. Test each motor for proper phase rotation.
6. Perform each electrical test and visual and mechanical inspection stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
7. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
8. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

D. Enclosed controllers will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.05 ADJUSTING

A. Set field-adjustable switches and overload-relay pickup and trip ranges.

B. Adjust the trip settings of MCPs and thermal-magnetic circuit breakers with adjustable instantaneous trip elements. Initially adjust to six times the motor nameplate full-load ampere ratings and attempt to start motors several times, allowing for motor cooldown between starts. If tripping occurs on motor inrush, adjust settings in increments until motors start without tripping. Do not exceed eight times the motor full-load amperes (or 11 times for NEMA Premium Efficient motors if required). Where these maximum settings do not allow starting of a motor, notify Owner before increasing settings.

3.06 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain enclosed controllers.

END OF SECTION

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Addendum #3	All bidders	Arcadis Project #	142814
Contract / Issue:	NCSU McKimmon Center		
Date Issued:	November 27, 2023	Questions received by 11/22/2023	
Item No.	Bidder Question (Incl: Dwg No, Specification, Section)	Response	
10	What is the manufacturer brand for fire alarm and HVAC controls?	Existing Fire Alarm- Notifier AFP 2020; HVAC Controls- Schneider Electric.	
11	CT-1 and CT-2 have been discontinued. Please provide a new selection.	Waiting on substitution.	
17	Note 8 on P101 references chemical sterilization prior to placing renovated areas of domestic water back in service. Is this really necessary since water is already chlorinated and we can flush system prior to use?	As water is chlorinated and the system will be flush prior to use and the application is for restroom areas, it is ok if it is not to chemically sterilize prior to placing renovated areas of domestic water back in service. However, we recommend checking it with the health authority with reference to NCPC 2018 codes section 610 for Disinfection of Potable water system "Permitted new or repaired potable water systems shall be purged of deleterious matter and disinfected if required by the health authority or water purveyor prior to utilization. The method to be followed shall be that prescribed by the health authority or water purveyor having jurisdiction."	
18	Wall hung lavatory L-2 is shown on new plumbing fixture schedule but nothing is shown on the drawings. Is there suppose to be an L-2 or is this a typo?	There is no L-2, wall hung type lavatory used. There are counter top type lavatory L-1 used as shown on the drawings. Coordinate with arch. drawings prior to installation.	
19	Are there any type of rating for the existing ceilings or newly renovated ceilings?	No	
20	Section 012100 Allowances Starts on Part 3 Execution, it is missing the beginning of the specification.	Section 01 21 00 Allowances- REMOVED, not allowed.	
21	Section 012100 Allowances In Part 3.03 Schedule of Allowances it does not include item 3 which based on unit prices would be "WWM-reinforced concrete slab on grade removal and replacement at an average thickness of four-inches. Per square foot" It would also need a quantity.	Section 01 21 00 Allowances- REMOVED, not allowed.	
22	Section inserted after 262726 Wiring Devices Entire section Is not in a legible font.	Section 26 29 13 Enclosed Controllers- font did not translate, attached section.	
23	RFI #2 Does not have the 3rd item that was included in 012200 unit prices "WWM-reinforced concrete slab on grade removal and replacement at an average thickness of four-inches. Per square foot"	Section 01 21 00 Allowances- REMOVED, not allowed.	
24	RFI#3 Is the overall duration of the project with and without the alternate bid work the same, 182 days, or are you saying that the contractors have an additional 182 days to complete the alternate bid Phase 3 and 4, for a total of 364 days?	Phase 1 & Phase 2 = 182 days. Phase 3 & Phase 4 = 182 days.	
25	Table of contents has 06 2020 Interior Finish Carpentry but it is not included in the manual.	Missing Section 06 20 20 Interior Finished Carpentry attached.	
26	07 2100 Thermal Insulation is in the table of contents but the section is not in the manual	Section 07 21 00 is removed from the Table of Contents.	
27	23 0713 Duct Insulation is in the table of contents but the section is not in the manual	Section 23 07 13 is removed from the Table of Contents.	
28	23 3400 HVAC Fans and Ventilators is in the table of contents but the section is not in the manual	Missing Section 23 34 00 HVAC attached.	
29	Form of Change Order is in the table of contents but the form is missing in the manual	N/A removed from Table of Contents.	
30	Contract Change Order Summary is in the table of contents but the form is missing in the manual	N/A removed from Table of Contents.	