# STATE OF ALASKA
# DEPARTMENT OF FISH AND GAME

## INVITATION FOR QUOTES FOR A SMALL PROCUREMENT (CONSTRUCTION RELATED)

[per AS 36.30.320(a)]

| | |
|---|---|
| Project Name & No.: IH 27-018 – Juneau Hunter Education Shooting Complex Ventilation System Upgrades<br>Location: 5670 Montana Creek Road, Juneau, AK 99801 | Procurement Agency and Address:<br>State of Alaska<br>Department of Fish and Game<br>Procurement Office<br>PO Box 115526 Juneau, AK 99811-5526 |
| Procurement Officer: Eric Verrelli | Date of Issuance: 11/19/2026 |

**DESCRIPTION OF WORK, REQUIRED COMPLETION DATE, LISTING OF ATTACHMENTS:**

Replacement of the ADF&G Juneau Hunter Education Shooting Complex (JHESC) ventilation control panel located at 5670 Montana Creek Road, Juneau, AK 99801. Please see attached Scope of Work for additional details.

The Project cost estimate is: ☐ under $10,000 ☐ $10,000 - $50,000 ☐ $50,001 - $100,000 ☒ $100,001 - $200,000[1,2]

**1.** Quotes in excess of $200,000 will be deemed non-responsive. **2.** Any project in excess of $100,000 must be bonded.

Davis-Bacon Wages (Title 36.05): are ☐ are not ☐ required on this project.

The following insurance coverages are required: ☒ Workers Comp ☒ General Liability ☒ Automobile

***Bonding Requirement:***

Bid Bond (25D-14), Payment Bond (SPC-005) Performance Bond (SPC-006) & are ☒ are not ☐ required on this project.

Quotes for furnishing all labor, equipment and materials and performing all work for the above Project are invited. To be eligible for consideration, quotes can be sent via email to dfg.contracting@alaska.gov and be received before 2:00 PM local time on the 10th day of December, 2026. Late quotes cannot be accepted. Disadvantaged Business Enterprises (DBE's) may submit quotes and will not be discriminated against on the grounds of race, color, national origin or sex in consideration for an Award which results from this invitation. Any errors, omissions, or questions pertaining to solicitation procedures or Project requirements, requests for additional documents, or inquiries pertaining to site conditions or scheduled visits must be made to:

Title: Eric Verrelli – Procurement Officer, at: eric.verrelli@alaska.gov, Telephone: (907) 465-6178; Fax: (907)

Applicable provisions of AS 36.30 and 2 AAC 12 govern this solicitation.

**SUBMITTAL OF QUOTES:** Quotes for this Project must be submitted in the manner noted below. All Offerors must familiarize themselves with the *Instructions to Offerors*, page 2 of this form, prior to submitting their quote.

☐ - VERBAL QUOTES SHALL BE GIVEN TO _____ AT THE ABOVE NOTED TELEPHONE NUMBER, PRIOR TO THE STATED DEADLINE. (**See above Bonding Requirements**.)

☒ - EMAILED QUOTES, INCLUDING AMENDMENTS OR WITHDRAWALS, MUST BE RECEIVED PRIOR TO THE ABOVE NOTED DEADLINE. QUOTES MUST BE SUBMITTED ON FORM SPC-002, QUOTE SUBMITTAL, ATTACHED. (**See above Bonding Requirements**.) Quotes can be sent to dfg.contractring@alaska.gov prior to the deadline.

Written quotes may be submitted by electronically, hand delivered, or mailed in a sealed envelope. Confidentiality is only assured for sealed quotes. Mailed quotes must allow time for delivery and the envelope must be marked as follows:

| **Quote for Project:** | | **Procurement Agency Address:** |
|---|---|---|
| Name: | JHESC Ventilation System Upgrades | PO Box 115526 |
| Number: | IH 27-018 | Juneau, AK 99811-5526 |
| Attn: | Procurement | |

Quote amendments or withdrawals must be made in writing to the individual of the Procurement Agency receiving the quotes, and must be received prior to the time for quote submittal.

# STATE OF ALASKA
# DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

## INVITATION FOR QUOTES FOR A SMALL PROCUREMENT (CONSTRUCTION RELATED)

## INSTRUCTIONS TO OFFERORS

The State of Alaska desires that all Offerors submitting quotes on construction contracts are given a fair and equal opportunity to compete. Offerors are required to follow these instructions:

REVIEW THE PROJECT DOCUMENTS: Most construction Projects in excess of $1,000 will have some type of written documentation prepared expressly for the Work. If you are asked to submit a quote and no written information has been provided, you should ask the procurement Agency for written documentation. If the scope of services have been described to you verbally, and you are selected for Contract Award, you must ensure that the information of the services to be performed (scope of work) is put in writing prior to accepting the Contract. When providing a Quote, carefully review and consider all materials related to the solicitation and work of the contract. **By submitting a quote the Offeror warrants that they are familiar with the Project requirements, have visited or otherwise examined the site, and are aware of the conditions to be encountered.** Offeror's can verify the contents and completeness of their quote documents by contacting the procurement Agency individual named on the front of this form.

SUBMITTING THE QUOTE: The Quote must be submitted in one of the following formats as called for in the Invitation:

1. **ORALLY -** if a verbal quote is solicited, the Offeror must provide, in addition to their quote amount and mailing address -- (1) their valid Alaska Business License number, (2) if applicable, a valid Contractor's Registration number, (3) their status as an Alaskan Bidder (Offeror), (4) their intended use of Alaskan products, (5) the carrier's name and policy number for their Workers' Comp Insurance (or a statement of sole proprietorship, if applicable), and (6) the Employer (Tax) Identification Number or Social Security Number. The Procurement Agency will enter this information on the quote schedule.

2. **WRITTEN -** if a written quote is solicited, the Offeror must complete, in ink or typewritten, the *Small Procurement Quote Submittal*, Form SPC-002. Failure to acknowledge receipt of addenda or to execute the form correctly and completely may disqualify the quote.

**NOTE**: The *Department of Labor requires an Offeror to be licensed and registered for the required type of work prior to submitting a quote. If the procurement Agency determines the Offeror is improperly registered or licensed, their quote may be deemed nonresponsive.*

SUBCONTRACTOR LISTING: Subcontractors intended to be utilized on this contract must be listed in the response to the solicitation. Work shall not be awarded to any subcontractor without prior approval from the procurement Agency. Subcontractors may be added or removed only as approved by the procurement Agency.

DETERMINATION OF THE LOWEST RESPONSIBLE QUOTE AND CONTRACT AWARD: Following receipt and determination of all **responsive** oral, written or sealed quotes, the procurement Agency will compare the quotes and determine the lowest Offeror. If the procurement Agency discovers a discrepancy between the unit price amount and the extended amount; the unit price amount will prevail. Conditioned quotes, unless expressly requested, will not be considered. When the quote schedule is composed of a basic amount with alternates, the procurement Agency will base its determination of the low quote and the amount of the Contract Award solely upon those quotes, basic and alternates, that are priced within the extent of available construction funds. Alternates will be considered for Award in the order listed, except that if the order of Offerors is not affected, the Award may include any combination of funded alternates, or none, as may be in the best interest of the procurement Agency.

When determining the lowest quote, the procurement Agency will also give a 5% Alaska Offeror's preference and an appropriate Alaska Products preference to quotes designating the applicability of a preference. To qualify for the Offeror's preference (per AS 36.30.170) the Offeror **must** (1) hold a current Alaska Business License, (2) submit the quote under the name appearing on the license, (3) have staffed and maintained a place of business within Alaska for the previous six months and (4) be incorporated or qualified to do business under the laws of the State. In addition, if the Offeror is a partnership or joint venture, all parties must meet the criteria to be eligible for the preference. A booklet fully describing the Alaska Preferences (Bidder, Offeror, Product, Disabilities, Veteran) program is available at **http://doa.alaska.gov/dgs/pdf/pref2.pdf**. A detailed description of the Alaska Products Preference Program is available at **http://www.commerce.state.ak.us/ded/dev/prodpref/prodpref.htm**.

The procurement Agency will make a determination of **responsibility** as required by 2 AAC 12.500. If the lowest Offeror is declared responsible, the procurement Agency will execute the *Notice of Award / Notice to Proceed,* Form SPC-003, and send it to the Offeror for acknowledgement. If the lowest Offeror is found to be nonresponsible, this process will be repeated with the second lowest Offeror -- and so on until the lowest responsive and responsible Offeror is determined.

NOTICE OF AWARD AND PROTEST: A written notice will be provided on all Awards exceeding $ 25,000 (2 AAC 12.400(h)). All protests must be filed with the Commissioner of the procurement Agency (or designee) and copied to the Procurement Officer. Protest procedures are described in AS 36.30.560 and 2 AAC 12.695. The extent of the protest remedy is limited to quote preparation costs (AS 36.30.585).

## INDEMNITY AND INSURANCE – The following insurance is required for all construction contracts:

**Article 1. Indemnification**

The Contractor shall indemnify, hold harmless, and defend the contracting agency from and against any claim of, or liability for error, omission or negligent act of the Contractor under this agreement. The Contractor shall not be required to indemnify the contracting agency for a claim of, or liability for, the independent negligence of the contracting agency. If there is a claim of, or liability for, the joint negligent error or omission of the Contractor and the independent negligence of the Contracting agency, the indemnification and hold harmless obligation shall be apportioned on a comparative fault basis. “Contractor” and “Contracting agency”, as used within this and the following article, include the employees, agents and other contractors who are directly responsible, respectively, to each. The term “independent negligence” is negligence other than in the Contracting agency’s selection, administration, monitoring, or controlling of the Contractor and in approving or accepting the Contractor’s work.

**Article 2. Insurance**

Without limiting Contractor's indemnification, it is agreed that Contractor shall purchase at its own expense and maintain in force at all times during the performance of services under this agreement the following policies of insurance. Where specific limits are shown, it is understood that they shall be the minimum acceptable limits. If the Contractor's policy contains higher limits, the state shall be entitled to coverage to the extent of such higher limits. Certificates of Insurance must be furnished to the Contracting Officer prior to beginning work and must provide for a notice of cancellation, nonrenewal, or material change of conditions in accordance with policy provisions. Failure to furnish satisfactory evidence of insurance or lapse of the policy is a material breach of this contract and shall be grounds for termination of the Contractor's services. All insurance policies shall comply with, and be issued by insurers licensed to transact the business of insurance under AS 21.

**2.1 Workers' Compensation Insurance:** The Contractor shall provide and maintain, for all employees engaged in work under this contract, coverage as required by AS 23.30.045, and; where applicable, any other statutory obligations including but not limited to Federal U.S.L. & H. and Jones Act requirements. The policy must waive subrogation against the State.

**2.2 Commercial General Liability Insurance:** covering all business premises and operations used by the Contractor in the performance of services under this agreement with minimum coverage limits of $300,000 combined single limit per claim.

**2.3 Commercial Automobile Liability Insurance:** covering all vehicles used by the Contractor in the performance of services under this agreement with minimum coverage limits of $300,000 combined single limit per claim.

# Appendix C - Scope of Work

**Project:** Alaska Department of Fish and Game (ADF&G) Juneau Hunter Education Shooting Complex Ventilation System Upgrades

**Location:** Juneau Hunter Education Shooting Complex (JHESC)-5670 Montana Creek Rd, Juneau, AK 99801

**Delivery by:** June 30, 2027

**Scope Details**
Service: The ventilation control panel for the indoor shooting range is 20+ years old and requires replacement.

The services need to include:

- Removal of current panel.
- A new panel will need to be designed/purchased and installed.
  - The lighting and ventilation are connected so the new panel should have a way to turn off lighting and leave ventilation on, for low/no light shooting.
  - The new panel should have a function to control the maximum run time before it auto shuts down (in case range is left on overnight)
  - SURGE SUPPRESSSON on power going into control panel.
  - Temperature control/thermostat to turn the heat up or down with the ventilation system.
- An electrician will be needed to ensure connection of the new panel with existing wiring.
- Ensure the ventilation system is functioning properly with the new panel and that the Range Manager has been trained on proper operations.
  - Provide a way to turn off heat to Air Handling Unit 2 (AHU2) so that can be used for air circulation in the building when heat is not needed.
  - Of note: A plumber may be needed as the control panel is hooked into boiler system to provide heat for range. Several pumps and valves are directly controlled by control panel.

Item(s):

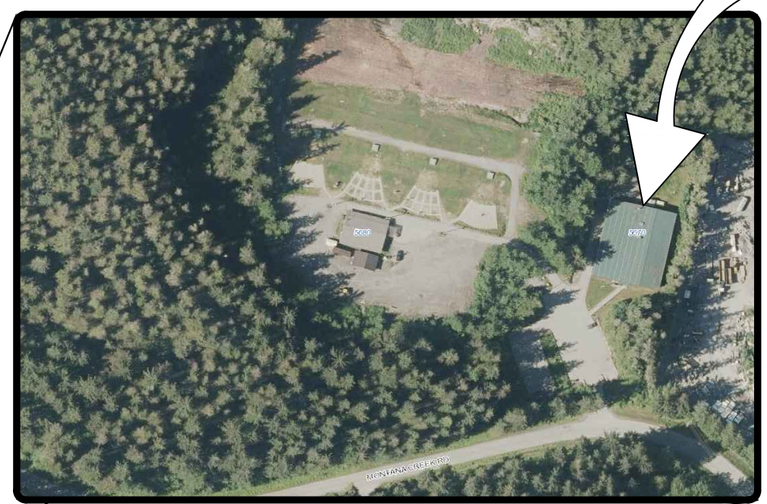
- New 60” x 36” Type 4 ventilation control panel, UL 508A labeled
- Allen-Bradley CompactLogix PLC and I/O
- 12” industrial panel PC / HMI
- (2) 10 HP ABB VFDs with bypass contactors
- Motor starters, relays, control power, and operator devices
- Conduit, wire, and wiring devices to provide complete installation of new control panel
- The brand/model is specific to match the current ventilation system.

**Additional Information**
1. Attachment-JHESC Ventilation Controls Upgrade Specifications, Panel Layout, & Output Summary
2. Potential vendors will need to contact the Range Manager to visit the site and view the current ventilation system and control panel (907-586-4101).

# ALASKA DEPARTMENT OF FISH AND GAME
# INDOOR GUN RANGE
## VENTILATION CONTROLS UPGRADE


E-01 TITLE PAGE
E-02 SPECIFICATIONS
E-03 FUNCTIONAL NARRATIVE
E-04 PANEL LAYOUT
E-05 OUTPUT LIST SUMMARY
M-01 DAMPER & VALVE ACTUATOR SCHEDULES
M-02 AS-BUILT (REFERENCE ONLY)
M-03 AS-BUILT (REFERENCE ONLY)


5670 MONTANA CREEK ROAD






ALASKA

PROJECT LOCATION

SCALE
0 50 100 200
FT





RMC engineering
DOUGLAS, AK
907-723-2996


INDOOR GUN RANGE
VENTILATION CONTROLS UPGRADE
TITLE PAGE
JUNEAU, AK

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| ENGINEER: VAM | CHECKED BY: HM |
| JOB #: J001305 | DRAWN BY: HM |
| SCALE: N/A | DATE: 06/08/2026 |

DRAWING #: E-01

SHEET 01 OF 08

## GENERAL

1. SCOPE OF WORK: WORK INCLUDES REPLACEMENT-IN-KIND OF THE EXISTING VENTILATION CONTROL PANEL, INCLUDING PANEL FABRICATION, PLC/HMI PROGRAMMING, VFD/BYPASS CONTROLS, RECONNECTION TO EXISTING FIELD DEVICES, SHOP TESTING, INSTALLATION, STARTUP, OWNER TRAINING, AND SYSTEM DEMONSTRATION. EXISTING FANS, PUMPS, DAMPERS, VALVES, ACTUATORS, SENSORS, RACEWAYS, AND FIELD WIRING SHALL BE REUSED UNLESS SPECIFICALLY SHOWN OTHERWISE. NEW CONDUIT, FIELD DEVICES, FIRE ALARM DEVICES, AND MECHANICAL EQUIPMENT ARE NOT INCLUDED EXCEPT WHERE SPECIFICALLY INDICATED OR REQUIRED TO COMPLETE A FUNCTIONAL REPLACEMENT OF THE CONTROL PANEL.

2. STANDARDS, CODES, AND REGULATIONS: ADHERE TO THE LATEST ADOPTED VERSIONS OF THE NATIONAL ELECTRICAL CODE, INTERNATIONAL BUILDING CODE, INTERNATIONAL MECHANICAL CODE, INTERNATIONAL FIRE CODE, AND ALL APPLICABLE STATE AND LOCAL AMENDMENTS. FOLLOW THE MOST RECENTLY PUBLISHED NECA INSTALLATION STANDARDS WHERE APPLICABLE.

3. DRAWINGS: THE DRAWINGS ARE REPRESENTATIVE AND MAY NOT SHOW ALL DETAILS SUCH AS OFFSETS, EXACT CONDUIT ROUTING, OR PRECISE LOCATIONS OF DEVICES AND EQUIPMENT UNLESS SPECIFIC DIMENSIONS ARE PROVIDED. FIELD VERIFY EXISTING CONDITIONS, DEVICE LOCATIONS, WIRING, CONTROL CONNECTIONS, AND EQUIPMENT REQUIREMENTS PRIOR TO STARTING WORK. ADDRESS ANY UNCLEAR ITEMS OR POTENTIAL CONFLICTS BETWEEN THE DRAWINGS, SPECIFICATIONS, CODES, EQUIPMENT REQUIREMENTS, OR EXISTING FIELD CONDITIONS WITH THE OWNER PRIOR TO PROCEEDING. WHEN CODES, REGULATIONS, OR MANUFACTURER'S INSTRUCTIONS ARE MORE STRINGENT OR IN CONFLICT WITH THE DRAWINGS AND SPECIFICATIONS, THE STRICTER REQUIREMENT SHALL PREVAIL.

4. EXISTING CONDITIONS: EXISTING EQUIPMENT, WIRING, AND CONTROL DEVICES SHOWN ON THE DRAWINGS ARE BASED ON AVAILABLE INFORMATION AND LIMITED FIELD OBSERVATION. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS IN THE FIELD. MODIFY, EXTEND, RECONNECT, OR REPLACE EXISTING CONTROL WIRING AS REQUIRED TO PROVIDE A COMPLETE AND FUNCTIONAL VENTILATION CONTROL SYSTEM.

5. DEMOLITION: REMOVE EXISTING VENTILATION CONTROL PANEL, ABANDONED CONTROL COMPONENTS, AND ASSOCIATED WIRING MADE OBSOLETE BY THE NEW WORK. EXISTING DEVICES AND WIRING REQUIRED FOR THE NEW CONTROL SYSTEM SHALL BE PROTECTED, REUSED, EXTENDED, OR RECONNECTED AS INDICATED ON THE DRAWINGS. REMOVE ABANDONED WIRING BACK TO SOURCE WHERE ACCESSIBLE.

6. RECORD DRAWINGS: AS WORK PROGRESSES, UPDATE A CLEAN SET OF DRAWINGS TO SHOW FINAL EQUIPMENT LOCATIONS, CONTROL DEVICE LOCATIONS, CONDUIT ROUTING, TERMINAL NUMBERS, WIRE NUMBERS, AND SIGNIFICANT CHANGES TO THE SYSTEMS AS SHOWN. PROVIDE UPDATED RECORD DRAWINGS TO THE OWNER AT PROJECT COMPLETION.

7. WORKMANSHIP: PROVIDE A COMPLETE AND FULLY FUNCTIONAL INSTALLATION INCLUDING ALL REQUIRED ACCESSORIES, RELAYS, TERMINALS, CONTROL POWER COMPONENTS, WIRING, LABELS, PROGRAMMING, AND CONFIGURATION REQUIRED FOR PROPER OPERATION. INSTALL ALL MATERIALS AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S GUIDELINES, INSTRUCTIONS, AND INSTALLATION DRAWINGS, FOLLOWING NECA STANDARDS. USE NEW MATERIALS AND EQUIPMENT THAT CONFORM TO APPLICABLE INDUSTRY STANDARDS, INCLUDING NEMA AND UL STANDARDS WHERE APPLICABLE.

8. CONTROL PANEL: PROVIDE A NEW FACTORY-BUILT VENTILATION CONTROL PANEL AS SHOWN ON THE DRAWINGS. PANEL SHALL INCLUDE REQUIRED CONTROL POWER TRANSFORMER OR POWER SUPPLY, OVERCURRENT PROTECTION, TERMINAL BLOCKS, RELAYS, CONTACTORS, PILOT DEVICES, OPERATOR INTERFACE DEVICES, LABELING, AND ALL OTHER COMPONENTS REQUIRED FOR THE CONTROL SEQUENCE SHOWN. PANEL SHALL BE SUITABLE FOR THE INSTALLED LOCATION AND ENVIRONMENT.

9. IDENTIFICATION: LABEL ALL CONTROL PANEL COMPONENTS, FIELD DEVICES, TERMINALS, CONTROL WIRING, AND OPERATOR DEVICES. LABELS SHALL MATCH THE DEVICE TAGS, WIRE NUMBERS, AND TERMINAL DESIGNATIONS SHOWN ON THE DRAWINGS. PROVIDE PERMANENT ENGRAVED OR MACHINE-PRINTED LABELS.

10. SUBMITTALS: PROVIDE MATERIAL AND EQUIPMENT SUBMITTALS LISTING ALL ITEMS SHOWN ON THE DRAWINGS, INCLUDING CATALOG NUMBERS, PANEL LAYOUTS, WIRING DIAGRAMS, TERMINAL DIAGRAMS, ROUGH-IN DIMENSIONS, AND PERFORMANCE DATA. SUBMITTALS MUST BE PROVIDED IN ELECTRONIC PDF FORMAT. CLEARLY INDEX AND IDENTIFY ALL ITEMS BY THEIR DESIGNATION ON THE DRAWINGS. SUBMITTAL REVIEW IS LIMITED TO GENERAL DESIGN AND ARRANGEMENT ONLY AND DOES NOT EXEMPT THE CONTRACTOR FROM ANY REQUIREMENTS OF THE CONTRACT DOCUMENTS. THE RESPONSIBILITY FOR A COMPLETE AND FULLY FUNCTIONAL INSTALLATION REMAINS WITH THE CONTRACTOR.

11. TESTING AND STARTUP: TEST ALL CONTROL WIRING, INTERLOCKS, SAFETIES, PILOT DEVICES, FAN START/STOP FUNCTIONS, STATUS INDICATIONS, AND CONTROL SEQUENCES PRIOR TO PROJECT COMPLETION. VERIFY PROPER OPERATION OF THE VENTILATION CONTROL SYSTEM IN ALL MODES OF OPERATION SHOWN ON THE DRAWINGS. CORRECT DEFICIENCIES FOUND DURING TESTING AT NO ADDITIONAL COST TO THE OWNER.

12. OPERATION AND MAINTENANCE MANUALS: PROVIDE OPERATION AND MAINTENANCE MANUALS TO TRAIN THE OWNER'S PERSONNEL. MANUALS SHALL INCLUDE PROCEDURES FOR SYSTEM OPERATION, INCLUDING START-UP, NORMAL OPERATION, EMERGENCY PROCEDURES, AND SHUTDOWN. INCLUDE MANUFACTURER'S LITERATURE, APPROVED SHOP DRAWINGS, PANEL WIRING DIAGRAMS, TERMINAL DIAGRAMS, CONTROL SEQUENCE, PROGRAM BACKUP FILES WHERE APPLICABLE, AND DESCRIPTIONS OF DEVICES USED IN THE SYSTEM.

13. OWNER TRAINING: PROVIDE OWNER TRAINING AFTER STARTUP IS COMPLETE. TRAINING SHALL INCLUDE NORMAL OPERATION, MANUAL OPERATION, ALARM OR FAULT RESPONSE, BASIC TROUBLESHOOTING, AND LOCATION AND FUNCTION OF MAJOR CONTROL PANEL COMPONENTS.

14. WARRANTY: THE CONTRACTOR SHALL WARRANT THAT ALL WORK PERFORMED UNDER THIS CONTRACT IS FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF BENEFICIAL USE. DURING THIS WARRANTY PERIOD, THE CONTRACTOR SHALL REPAIR OR REPLACE ANY DEFECTIVE MATERIALS OR WORKMANSHIP TO THE OWNER'S SATISFACTION.

15. REFERENCE SYMBOLS: THE ELECTRICAL LEGEND ON THE DRAWINGS IS A STANDARDIZED VERSION, AND NOT ALL SYMBOLS MAY BE USED. USE THE LEGEND AS A REFERENCE FOR THE SYMBOLS ACTUALLY APPLIED ON THE DRAWINGS.

## WIRE AND CABLE

1. SUBMITTALS: PROVIDE PRODUCT DATA, CUT SHEETS, MANUFACTURER SPECIFICATIONS, PANEL LAYOUTS, WIRING DIAGRAMS, TERMINAL DIAGRAMS, AND COMPONENT DATA FOR ALL EQUIPMENT AND MATERIALS PROVIDED UNDER THIS SECTION.

2. MATERIALS: ALL POWER WIRING SHALL BE COPPER CONDUCTORS WITH INSULATION TYPES XHHW-2, THWN-2, THW, OR THHN, RATED 600 VOLTS MINIMUM AND SUITABLE FOR THE INSTALLATION ENVIRONMENT.

3. CONTROL CIRCUITS: CONTROL WIRING FOR SWITCHES, PILOT DEVICES, RELAYS, CONTACTORS, MOTOR STARTERS, STATUS SIGNALS, CONTROL TRANSFORMERS, POWER SUPPLIES, AND FIELD CONTROL DEVICES SHALL UTILIZE STRANDED COPPER CONDUCTORS WITH 600-VOLT INSULATION, TYPE THHN/THWN, WITH A MINIMUM CONDUCTOR SIZE OF #16 AWG UNLESS OTHERWISE REQUIRED BY THE EQUIPMENT MANUFACTURER OR SHOWN ON THE DRAWINGS.

4. LOW-VOLTAGE CONTROL AND SIGNAL WIRING: LOW-VOLTAGE CONTROL, SENSOR, COMMUNICATION, AND SIGNAL WIRING SHALL BE INSTALLED IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S REQUIREMENTS. PROVIDE SHIELDED CABLE WHERE REQUIRED BY THE MANUFACTURER OR WHERE SHOWN ON THE DRAWINGS. GROUND SHIELDS AT ONE END ONLY UNLESS OTHERWISE REQUIRED BY THE EQUIPMENT MANUFACTURER.

5. INSTALLATION: INSTALL CONDUCTORS IN ACCORDANCE WITH THE NEC AND MANUFACTURER RECOMMENDATIONS. COLOR CODE CONDUCTORS ACCORDING TO SYSTEM VOLTAGE AND PHASE. PROVIDE A SEPARATE GROUNDED CONDUCTOR WHERE REQUIRED; GROUNDED CONDUCTORS SHALL NOT BE SHARED BETWEEN CONTROL CIRCUITS UNLESS SPECIFICALLY SHOWN ON THE DRAWINGS OR APPROVED BY THE EQUIPMENT MANUFACTURER. FOR CONDUCTORS #8 AWG AND SMALLER, USE INSULATED SPRING WIRE CONNECTORS WITH PLASTIC CAPS OR TERMINATE ON APPROVED TERMINAL BLOCKS. FOR CONDUCTORS #6 AWG AND LARGER, TERMINATE WITH COMPRESSION OR CRIMP CONNECTORS INSTALLED WITH THE MANUFACTURER'S RECOMMENDED TOOL. INSULATE EXPOSED TERMINATIONS WITH 600-VOLT RATED HEAT-SHRINK TUBING OR APPROVED INSULATING METHODS. INSTALL CONDUCTORS IN RACEWAYS UNLESS OTHERWISE INDICATED ON THE DRAWINGS. USE XHHW-2 CONDUCTORS FOR UNDERGROUND, EXTERIOR, AND WET LOCATION INSTALLATIONS. COORDINATE ALL FIELD WIRING CONNECTIONS WITH THE CONTROL PANEL TERMINAL DIAGRAMS, EQUIPMENT WIRING DIAGRAMS, AND MANUFACTURER'S INSTALLATION INSTRUCTIONS.

6. CONTROL PANEL WIRING: INTERNAL CONTROL PANEL WIRING SHALL BE NEATLY ROUTED IN WIRE DUCT OR BUNDLED AND SUPPORTED. PROVIDE TERMINAL BLOCKS FOR FIELD WIRING CONNECTIONS. DO NOT LAND FIELD WIRING DIRECTLY ON RELAYS, CONTACTORS, CONTROLLERS, OR OTHER INTERNAL DEVICES UNLESS SPECIFICALLY APPROVED. SEPARATE POWER WIRING FROM LOW-VOLTAGE CONTROL, SIGNAL, AND COMMUNICATION WIRING.

7. IDENTIFICATION: IDENTIFY ALL CONDUCTORS, TERMINALS, FIELD DEVICES, AND CONTROL PANEL COMPONENTS. WIRE NUMBERS AND TERMINAL NUMBERS SHALL MATCH THE APPROVED CONTROL PANEL WIRING DIAGRAMS. PROVIDE PERMANENT MACHINE-PRINTED WIRE LABELS OR HEAT-SHRINK WIRE MARKERS.

## RACEWAYS AND BOXES

1. SUBMITTALS: PROVIDE PRODUCT DATA, CUT SHEETS, AND MANUFACTURER SPECIFICATIONS FOR ALL RACEWAY, BOXES, FITTINGS, AND RELATED MATERIALS PROVIDED UNDER THIS SECTION.

2. GENERAL: NEW CONDUIT INSTALLATION IS NOT ANTICIPATED AS A PRIMARY PART OF THE WORK. EXISTING RACEWAYS SHALL BE REUSED WHERE PRACTICAL AND WHERE CODE-COMPLIANT. PROVIDE NEW RACEWAYS, BOXES, FITTINGS, AND SUPPORTS ONLY WHERE REQUIRED TO COMPLETE THE VENTILATION CONTROL PANEL REPLACEMENT, MODIFY EXISTING CONTROL WIRING, EXTEND EXISTING CIRCUITS, REPLACE DAMAGED OR UNSUITABLE RACEWAY, OR AS SHOWN ON THE DRAWINGS.

3. MATERIALS:

3.1. ELECTRICAL METALLIC TUBING: ELECTRICAL METALLIC TUBING SHALL COMPLY WITH ANSI C80.3. USE GALVANIZED STEEL EMT WITH FITTINGS AND CONDUIT BODIES COMPLYING WITH ANSI/NEMA FB 1. FITTINGS SHALL BE STEEL OR MALLEABLE IRON, COMPRESSION TYPE OR SET-SCREW TYPE, WITH INSULATED THROAT BUSHINGS. DIE-CAST FITTINGS ARE NOT ACCEPTABLE. USE FACTORY ELBOWS FOR CONDUIT SIZES 1-1/2 INCHES AND LARGER.

3.2. FLEXIBLE METAL CONDUIT: FLEXIBLE METAL CONDUIT SHALL BE STEEL, FULL-WALL OR REDUCED-WALL THICKNESS. FITTINGS AND CONDUIT BODIES SHALL COMPLY WITH ANSI/NEMA FB 1. FITTINGS SHALL BE STEEL OR MALLEABLE IRON WITH INSULATED THROAT BUSHINGS. DIE-CAST FITTINGS ARE NOT ACCEPTABLE. USE FLEXIBLE METAL CONDUIT ONLY FOR FINAL CONNECTIONS TO EQUIPMENT, VIBRATING EQUIPMENT, OR WHERE REQUIRED TO ACCOMMODATE MOVEMENT OR ACCESS.

3.3. LIQUIDTIGHT FLEXIBLE METAL CONDUIT: PROVIDE LIQUIDTIGHT FLEXIBLE METAL CONDUIT FOR FINAL CONNECTIONS TO EQUIPMENT IN DAMP OR WET LOCATIONS, OR WHERE SUBJECT TO MOISTURE, WASHDOWN, OR SIMILAR CONDITIONS. FITTINGS SHALL BE LISTED FOR LIQUIDTIGHT USE AND SHALL BE COMPATIBLE WITH THE RACEWAY AND ENVIRONMENT.

3.4. PVC ELECTRICAL CONDUIT: PVC ELECTRICAL CONDUIT SHALL COMPLY WITH NEC ARTICLE 352. USE SCHEDULE 40 OR SCHEDULE 80 PVC CONDUIT AS REQUIRED BY INSTALLATION CONDITIONS AND MECHANICAL PROTECTION NEEDS. FITTINGS AND ACCESSORIES SHALL COMPLY WITH ANSI/NEMA TC 3. PROVIDE SOLVENT-WELDED OR MECHANICAL FITTINGS DESIGNED FOR A WATERTIGHT SEAL WHERE REQUIRED. USE EXPANSION FITTINGS WHERE TEMPERATURE CHANGES COULD AFFECT CONDUIT LENGTH.

3.5. BOXES AND ENCLOSURES: PROVIDE JUNCTION BOXES, PULL BOXES, AND DEVICE BOXES SUITABLE FOR THE INSTALLED LOCATION. INTERIOR BOXES SHALL BE GALVANIZED OR CADMIUM-PLATED STEEL UNLESS OTHERWISE INDICATED. FOR DAMP OR WET LOCATIONS, USE CAST ALUMINUM, FERALOY, STAINLESS STEEL, OR NONMETALLIC BOXES WITH GASKETED COVERS, THREADED HUBS WHERE REQUIRED, CORROSION-RESISTANT HARDWARE, AND A NEMA RATING SUITABLE FOR THE ENVIRONMENT.

3.6. OTHER RACEWAY AND BOXES: OTHER RACEWAY, BOXES, OR FITTINGS MAY BE USED ONLY WHERE SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER.

3.7. INSTALLATION: REUSE EXISTING RACEWAYS WHERE PRACTICAL AND CODE-COMPLIANT. WHERE NEW RACEWAYS ARE REQUIRED, INSTALL EMT FOR INTERIOR ABOVE-GRADE WORK UNLESS OTHERWISE INDICATED. USE STEEL EMT FOR ABOVE-GRADE CIRCUITS IN DRY INTERIOR LOCATIONS. USE RIGID STEEL CONDUIT, IMC, PVC, OR LIQUIDTIGHT FLEXIBLE METAL CONDUIT WHERE REQUIRED BY THE LOCATION, ENVIRONMENT, OR MECHANICAL PROTECTION NEEDS.

3.8. SUPPORT AND ROUTING: SECURE EMT AT INTERVALS NOT EXCEEDING 10 FEET AND WITHIN 3 FEET OF EACH OUTLET BOX, JUNCTION BOX, DEVICE BOX, CABINET, OR FITTING. SUPPORT OTHER RACEWAY TYPES IN ACCORDANCE WITH THE NEC. INSTALL RACEWAYS IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE NEC AND APPLICABLE NECA STANDARDS. MAINTAIN PROPER ALIGNMENT AND SUPPORT TO PREVENT SAGGING OR DAMAGE. ROUTE EXPOSED CONDUIT AND CONDUIT ABOVE ACCESSIBLE CEILINGS PARALLEL AND PERPENDICULAR TO WALLS, CEILINGS, STRUCTURAL ELEMENTS, AND ADJACENT PIPING WHERE PRACTICAL.

3.9. EXISTING RACEWAYS: FIELD VERIFY EXISTING RACEWAY CONDITION, FILL, ROUTING, AND SUITABILITY PRIOR TO REUSE. DO NOT REUSE DAMAGED, CORRODED, UNSUPPORTED, OVERFILLED, OR NON-CODE-COMPLIANT RACEWAYS. NOTIFY THE OWNER OF EXISTING CONDITIONS THAT PREVENT REUSE OF EXISTING RACEWAYS.

3.10. PENETRATIONS AND SEALING: SEAL WALL, FLOOR, AND CEILING PENETRATIONS CREATED OR MODIFIED UNDER THIS WORK. MAINTAIN EXISTING FIRE, SMOKE, WEATHER, AND ACOUSTICAL RATINGS. PROVIDE FIRESTOPPING WHERE REQUIRED.

## IDENTIFICATION

1. SUBMITTALS: NO SUBMITTALS ARE REQUIRED FOR THIS SECTION.

2. MATERIALS: LABEL TAPE: USE ADHESIVE LABEL TAPE WITH 3/16 INCH BOLD BLACK LETTERING ON A CLEAR BACKGROUND, CREATED WITH A DYMO RHINO SERIES OR EQUIVALENT LABEL PRINTER. WIRE AND CABLE IDENTIFIERS: USE CLOTH MARKERS, SPLIT SLEEVE, OR TUBING TYPE MARKERS.

3. INSTALLATION: CONDUITS: LABEL ALL CONDUITS ENTERING OR EXITING PANELBOARDS WITH CIRCUIT NUMBERS USING A PERMANENT BLACK MARKER. FEEDER AND SPARE CONDUITS SHOULD BE LABELED AT BOTH ENDS, INDICATING THE SOURCE AND TERMINATION POINT.

4. JUNCTION BOXES: CLEARLY MARK THE CIRCUIT NUMBERS ON ALL JUNCTION BOXES WITH SHEET STEEL COVERS, USING A PERMANENT BLACK MARKER. FOR EXPOSED JUNCTION BOXES IN PUBLIC AREAS, PLACE THE MARKINGS INSIDE THE COVER. IDENTIFY ALL FIRE ALARM SYSTEM JUNCTION BOXES WITH "FA" USING A RED PERMANENT MARKER ON SHEET STEEL COVERS. LABEL OTHER SPECIAL SYSTEM JUNCTION BOXES ACCORDINGLY.

5. WIRE IDENTIFICATION: PLACE WIRE MARKERS ON EACH CONDUCTOR WITHIN PANELBOARD GUTTERS, PULL BOXES, OUTLET AND JUNCTION BOXES, AND AT LOAD CONNECTION POINTS. MARKERS SHOULD BE POSITIONED WITHIN ONE INCH OF EACH CABLE END, EXCEPT IN PANELBOARDS WHERE BRANCH CIRCUIT CONDUCTOR MARKERS MUST BE VISIBLE WITHOUT REMOVING THE PANEL DEADFRONT.

6. DEVICE PLATES: LABEL EACH RECEPTACLE DEVICE PLATE OR CONNECTION POINT WITH THE PANELBOARD NAME AND CIRCUIT NUMBER. POSITION THE LABEL ON THE TOP EDGE OF EACH PLATE.

## GROUNDING AND BONDING

SUBMITTALS: NO SUBMITTALS REQUIRED FOR THIS SECTION

1. INSTALLATION: INSTALL A SEPARATE, INSULATED EQUIPMENT GROUNDING CONDUCTOR IN ALL NEW BRANCH CIRCUITS AND FEEDERS. ENSURE EACH END IS SECURELY TERMINATED ON A GROUNDING LUG, BUS, OR BUSHING.

2. MECHANICAL CONNECTIONS: USE ONLY NON-REVERSIBLE CRIMP-TYPE LUGS. FOR ALL TERMINATIONS, USE FACTORY-MADE COMPRESSION LUGS. FOR TELECOMMUNICATION SYSTEMS, UTILIZE NON-REVERSIBLE LONG BARREL CRIMP-TYPE LUGS WITH TWO-BOLT TONGUES MADE OF COPPER, COPPER ALLOY, OR TIN-PLATED COPPER FOR CONDUCTORS #6 AWG OR LARGER. USE CRIMP-TYPE ONE-HOLE LUGS FOR CONDUCTORS SMALLER THAN #6 AWG. ENSURE THAT SERVICE EQUIPMENT ENCLOSURES, EXPOSED NON-CURRENT-CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT, METAL RACEWAY SYSTEMS, GROUNDING CONDUCTORS IN RACEWAYS AND CABLES, RECEPTACLE GROUND CONNECTORS, AND PLUMBING AND FUEL SYSTEMS ARE ALL BONDED TOGETHER.

## COORDINATION

1. OWNER COORDINATION: CONTRACTOR SHALL COORDINATE WORK WITH THE OWNER AND ENGINEER PRIOR TO STARTING CONSTRUCTION. COORDINATION SHALL INCLUDE WORK HOURS, SITE ACCESS, RANGE OPERATIONS, EQUIPMENT SHUTDOWNS, CONTROL PANEL LOCATION, EXISTING EQUIPMENT TO REMAIN, AND FINAL STARTUP SCHEDULING.

2. SYSTEM OUTAGES: COORDINATE ALL VENTILATION SYSTEM OUTAGES WITH THE OWNER IN ADVANCE. DO NOT DISABLE EXISTING VENTILATION EQUIPMENT OR CONTROLS WITHOUT OWNER APPROVAL. MINIMIZE DURATION OF OUTAGES AND RESTORE SYSTEMS TO SERVICE AS SOON AS PRACTICAL.

3. EXISTING EQUIPMENT: CONTRACTOR SHALL FIELD VERIFY EXISTING POWER, CONTROL WIRING, CONDUIT, FAN EQUIPMENT, STARTERS, INTERLOCKS, SAFETIES, AND CONTROL DEVICES PRIOR TO FABRICATION AND INSTALLATION. NOTIFY THE ENGINEER OF EXISTING CONDITIONS THAT DIFFER FROM THE CONTRACT DOCUMENTS.

## FINAL INSPECTION AND ACCEPTANCE

1. FINAL INSPECTION AND ACCEPTANCE: FINAL INSPECTION AND ACCEPTANCE WILL BE PERFORMED BY THE ENGINEER AND OWNER TO VERIFY CODE COMPLIANCE, ADHERENCE TO THE CONTRACT DOCUMENTS, COMPLETE SYSTEM OPERATION, AND QUALITY OF WORKMANSHIP.

2. PRE-STARTUP INSPECTION: PRIOR TO ENERGIZING THE NEW CONTROL PANEL, THE CONTRACTOR SHALL VERIFY THAT ALL POWER WIRING, CONTROL WIRING, TERMINATIONS, GROUNDING, FUSES, CIRCUIT BREAKERS, RELAYS, CONTACTORS, PILOT DEVICES, AND FIELD DEVICES ARE PROPERLY INSTALLED, LABELED, AND CONNECTED IN ACCORDANCE WITH THE APPROVED WIRING DIAGRAMS AND MANUFACTURER'S INSTRUCTIONS.

3. WIRING AND CONTINUITY TESTING: THE CONTRACTOR SHALL TEST CONTROL WIRING FOR CONTINUITY, PROPER TERMINATION, AND ABSENCE OF SHORT CIRCUITS OR GROUNDS PRIOR TO ENERGIZING THE SYSTEM. CORRECT DEFICIENCIES PRIOR TO STARTUP.

4. FUNCTIONAL TESTING: THE CONTRACTOR SHALL TEST THE VENTILATION CONTROL SYSTEM IN EACH MODE OF OPERATION SHOWN ON THE CONTRACT DRAWINGS. TESTING SHALL INCLUDE START/STOP FUNCTIONS, HAND/OFF/AUTO FUNCTIONS WHERE PROVIDED, INTERLOCKS, STATUS INDICATIONS, ALARMS, CONTROL RELAYS, CONTACTORS, AND CONNECTIONS TO EXISTING VENTILATION EQUIPMENT.

5. SHOP TESTING: PRIOR TO SHIPMENT OR DELIVERY TO THE PROJECT SITE, THE CONTROL PANEL SHALL BE SHOP TESTED BY THE PANEL FABRICATOR. SHOP TESTING SHALL INCLUDE VERIFICATION OF PANEL WIRING, TERMINATIONS, COMPONENT OPERATION, CONTROL POWER, RELAYS, CONTACTORS, PILOT DEVICES, OPERATOR DEVICES, AND SIMULATED INPUT AND OUTPUT FUNCTIONS REQUIRED TO DEMONSTRATE THE CONTROL SEQUENCE. THE CONTRACTOR SHALL PROVIDE THE ENGINEER AND OWNER A MINIMUM OF SEVEN DAYS' NOTICE PRIOR TO SHOP TESTING. SHOP TESTING SHALL BE WITNESSED BY THE ENGINEER UNLESS THE ENGINEER WAIVES THIS REQUIREMENT IN WRITING. PROVIDE WRITTEN SHOP TEST RESULTS TO THE OWNER AND ENGINEER PRIOR TO DELIVERY OF THE CONTROL PANEL.

6. TEST DOCUMENTATION: PROVIDE WRITTEN TEST RESULTS AND STARTUP DOCUMENTATION TO THE OWNER. DOCUMENTATION SHALL INCLUDE A CHECKLIST OF TESTED FUNCTIONS, DEFICIENCIES FOUND, CORRECTIVE ACTIONS TAKEN, AND CONFIRMATION THAT THE SYSTEM WAS PLACED INTO COMPLETE AND PROPER OPERATION.

7. DEFICIENCIES: CORRECT DEFICIENCIES IDENTIFIED DURING INSPECTION, TESTING, OR OWNER DEMONSTRATION AT NO ADDITIONAL COST TO THE OWNER. FINAL ACCEPTANCE SHALL NOT OCCUR UNTIL THE SYSTEM IS COMPLETE, FUNCTIONAL, AND ACCEPTED BY THE OWNER AND ENGINEER.

## CONTROL PANEL MANUFACTURER

1. CONTROL PANEL MANUFACTURER: THE CONTROL PANEL SHALL BE DESIGNED, FABRICATED, WIRED, TESTED, AND LABELED BY A UL 508A AUTHORIZED CONTROL PANEL MANUFACTURER. THE MANUFACTURER SHALL HAVE BEEN REGULARLY ENGAGED IN THE DESIGN AND FABRICATION OF INDUSTRIAL CONTROL PANELS FOR A MINIMUM OF 10 YEARS AND SHALL HAVE EXPERIENCE WITH CONTROL PANELS OF SIMILAR COMPLEXITY, FUNCTION, AND SCOPE.

2. UL LABELING: THE COMPLETED CONTROL PANEL SHALL BE CONSTRUCTED IN ACCORDANCE WITH UL 508A AND SHALL BE PROVIDED WITH A UL 508A INDUSTRIAL CONTROL PANEL LABEL. PANEL SHALL BE SUITABLE FOR THE AVAILABLE SHORT-CIRCUIT CURRENT AT THE INSTALLED LOCATION.

3. CONTROL SYSTEM EXPERIENCE: THE CONTROL PANEL MANUFACTURER SHALL HAVE DEMONSTRATED EXPERIENCE WITH PLC-BASED HVAC OR INDUSTRIAL VENTILATION CONTROL SYSTEMS, INCLUDING VARIABLE-FREQUENCY DRIVES, MOTOR STARTERS, RELAYS, OPERATOR INTERFACES, ANALOG SIGNALS, SAFETY INTERLOCKS, AND FIELD DEVICE INTEGRATION.

4. SUBMITTAL REQUIREMENT: PROVIDE DOCUMENTATION WITH THE CONTROL PANEL SUBMITTAL DEMONSTRATING THE MANUFACTURER'S UL 508A AUTHORIZATION, YEARS IN BUSINESS, AND EXPERIENCE WITH CONTROL PANELS OF SIMILAR SCOPE.

RMC engineering
DOUGLAS, AK
907-723-2996

# INDOOR GUN RANGE VENTILATION CONTROLS UPGRADE

SPECIFICATIONS

JUNEAU, AK

| NO | DATE | REVISION |
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| ENGINEER: VAM | CHECKED BY: HM |
| JOB #: J001305 | DRAWN BY: HM |
| SCALE: N/A | DATE: 06/08/2026 |

DRAWING #: E-02

SHEET 02 OF 08

## GENERAL CONTROL REQUIREMENTS

1. REPLACEMENT IN KIND: PROVIDE A NEW VENTILATION CONTROL PANEL TO REPLACE THE EXISTING PANEL IN KIND. THE NEW CONTROL SYSTEM SHALL REPRODUCE THE EXISTING FUNCTIONS, OPERATING SEQUENCES, SAFETY INTERLOCKS, MANUAL CONTROLS, ALARMS, AND ADJUSTABLE SETPOINTS DESCRIBED HEREIN.

2. EXISTING EQUIPMENT: EXISTING FANS, PUMPS, DAMPERS, ACTUATORS, VALVES, SENSORS, SAFETY DEVICES, SHALL BE REUSED UNLESS OTHERWISE SHOWN. FIELD VERIFY EXISTING DEVICE TYPES, SIGNAL TYPES, OPERATING VOLTAGES, NORMAL POSITIONS, AND CONNECTIONS BEFORE FABRICATING THE CONTROL PANEL.

3. OPERATOR INTERFACE: PROVIDE AN OPERATOR INTERFACE FOR DISPLAYING EQUIPMENT STATUS, PROCESS VALUES, SETPOINTS, OPERATING MODES, SCHEDULES, AND ALARMS.

4. VFD-CONTROLLED FANS: AHU-1 AND EF-1 SHALL EACH BE PROVIDED WITH A VFD-BYPASS-OFF MODE SELECTOR SWITCH, HAND-OFF-AUTO SPEED-CONTROL SELECTOR SWITCH, BYPASS START AND STOP PUSH BUTTONS, AUXILIARY CONTACTS, AND REQUIRED ELECTRICAL AND MECHANICAL INTERLOCKS.

5. VFD MODE: IN VFD-AUTO MODE, FAN START, STOP, AND SPEED SHALL BE CONTROLLED BY THE PLC. IN VFD-HAND MODE, THE FAN SHALL OPERATE AT AN ADJUSTABLE MANUAL SPEED.

6. BYPASS MODE: IN BYPASS MODE, THE FAN SHALL OPERATE ACROSS THE LINE USING THE BYPASS CONTACTOR AND START-STOP PUSH BUTTONS. VFD AND BYPASS CONTACTORS SHALL BE ELECTRICALLY AND MECHANICALLY INTERLOCKED TO PREVENT SIMULTANEOUS OPERATION.

7. SAFETY CONTROLS: LOW-LIMIT THERMOSTATS, MOTOR OVERLOADS, FIRE/SMOKE CONTROL, AND OTHER HARDWIRED SAFETY DEVICES SHALL REMAIN ACTIVE IN HAND, AUTO, VFD, AND BYPASS OPERATING MODES.

8. FAILURE RESPONSE: LOSS OF PLC COMMUNICATION OR FAILURE OF AN OPERATOR INTERFACE SHALL NOT DEFEAT HARDWIRED SAFETY DEVICES. FAILURE OF A SENSOR SHALL GENERATE AN ALARM AND PLACE THE ASSOCIATED EQUIPMENT IN THE FAILURE MODE DESCRIBED HEREIN.

## SYSTEM ENABLE SEQUENCE

1. RANGE-LIGHT SIGNAL: THE ELECTRICAL CONTRACTOR SHALL EXTEND THE EXISTING 120-VOLT RANGE-LIGHTING CONTROL SIGNAL FROM THE LIGHTING CONTROL PANEL TO THE NEW VENTILATION CONTROL PANEL.

2. RANGE-VENTILATION ENABLE: WHEN THE RANGE LIGHTS ARE ON, EF-1 SHALL BE ENABLED FIRST. AFTER EF-1 OPERATION HAS BEEN PROVEN, AHU-1 SHALL BE ENABLED.

3. RANGE-VENTILATION DISABLE: WHEN THE RANGE LIGHTS ARE TURNED OFF, AHU-1 AND EF-1 SHALL STOP, AND THE ASSOCIATED DAMPERS SHALL RETURN TO THEIR NORMAL POSITIONS.

4. EF-1 STARTUP: UPON RECEIPT OF A START COMMAND, THE EF-1 EXHAUST-AIR DAMPER SHALL OPEN AND EF-1 SHALL START. EF-1 SHALL INITIALLY OPERATE AT 58 HZ FOR 30 SECONDS. AFTER THE INITIAL STARTUP PERIOD, EF-1 SPEED SHALL MODULATE GRADUALLY UNTIL THE RANGE NEGATIVE-PRESSURE SETPOINT IS REACHED.

5. AHU-1 STARTUP: AFTER EF-1 OPERATION HAS BEEN PROVEN, AHU-1 SHALL START AND MODULATE TO MAINTAIN ITS SUPPLY-AIRFLOW SETPOINT.

6. AHU-2 ENABLE: IN AUTO MODE, AHU-2 SHALL OPERATE ACCORDING TO AN ADJUSTABLE WEEKLY PROGRAM SCHEDULE PROVIDED THROUGH THE OPERATOR INTERFACE.

7. FIRE/SMOKE CONTROL: THE CONTROL SYSTEM SHALL RETAIN THE EXISTING CAPABILITY TO RECEIVE A FIRE/SMOKE-ALARM SIGNAL. UPON RECEIPT OF THIS SIGNAL, AHU-1, AHU-2, AND EF-1 SHALL STOP, AND ASSOCIATED DAMPERS AND VALVES SHALL RETURN TO THEIR NORMAL, DE-ENERGIZED POSITIONS.

8. FIRE/SMOKE-ALARM CONNECTION: THE FIRE/SMOKE-ALARM FUNCTION SHALL BE ENABLED ONLY WHEN A VALID FIRE/SMOKE-ALARM SIGNAL IS PROVIDED. FIELD VERIFY WHETHER AN EXISTING SIGNAL IS AVAILABLE AND COORDINATE THE CONNECTION WITH THE OWNER AND ENGINEER.

## AHU-1 CONTROL

1. OPERATING MODES: AHU-1 SHALL BE CONTROLLED THROUGH ITS VFD AND BYPASS CONTACTOR ARRANGEMENT. IN AUTO MODE, AHU-1 SHALL OPERATE WHEN THE RANGE LIGHTS ARE ON AND EF-1 OPERATION HAS BEEN PROVEN.

2. AIRFLOW CONTROL: IN VFD-AUTO MODE, AHU-1 SPEED SHALL MODULATE IN RESPONSE TO AIRFLOW-MEASURING STATION AMS-1 TO MAINTAIN AN ADJUSTABLE SUPPLY-AIRFLOW SETPOINT INITIALLY SET AT 10,800 CFM.

3. AIRFLOW-SENSOR FAILURE: IF THE AMS-1 SIGNAL IS OUTSIDE ITS VALID OPERATING RANGE, THE CONTROL SYSTEM SHALL GENERATE AND RECORD AN AHU-1 AIRFLOW-SENSOR ALARM. AHU-1 SHALL OPERATE AT AN ADJUSTABLE PRESET SPEED INITIALLY SET AT 45 HZ UNTIL THE FAULT IS CORRECTED.

4. SUPPLY-AIR-TEMPERATURE CONTROL: AVERAGING DUCT-TEMPERATURE SENSOR TS-2, LOCATED IN THE AHU-1 SUPPLY-AIR DISCHARGE, SHALL MODULATE TWO-WAY AUTOMATIC HEATING-COIL VALVE AV-1 TO MAINTAIN THE SUPPLY-AIR-TEMPERATURE SETPOINT.

5. TEMPERATURE RESET: THE AHU-1 SUPPLY-AIR-TEMPERATURE SETPOINT SHALL BE RESET BY OUTSIDE-AIR-TEMPERATURE SENSOR TS-3 AS FOLLOWS:

   5.1. AT AN OUTSIDE-AIR TEMPERATURE OF 40°F OR BELOW, THE SUPPLY-AIR-TEMPERATURE SETPOINT SHALL BE 70°F. BETWEEN 40°F AND 55°F OUTSIDE-AIR TEMPERATURE, THE SETPOINT SHALL RESET LINEARLY BETWEEN 70°F AND 55°F. AT AN OUTSIDE-AIR TEMPERATURE OF 55°F OR ABOVE, THE SUPPLY-AIR-TEMPERATURE SETPOINT SHALL BE 55°F.

6. SETPOINT ADJUSTMENT: AN ADJUSTMENT DEVICE ON THE CONTROL-PANEL FACE SHALL ALLOW THE OPERATOR TO ADJUST THE CALCULATED AHU-1 SUPPLY-AIR-TEMPERATURE SETPOINT BY PLUS OR MINUS 3°F, SUBJECT TO PROGRAMMED MINIMUM AND MAXIMUM LIMITS.

7. LOW-LIMIT CONTROL: AVERAGING LOW-LIMIT THERMOSTAT T-1, LOCATED DOWNSTREAM OF THE AHU-1 HEATING COIL, SHALL ACTIVATE WHEN THE SENSED TEMPERATURE FALLS BELOW AN ADJUSTABLE SETPOINT INITIALLY SET AT 40°F.

8. AHU-1 LOW-LIMIT RESPONSE: UPON AN AHU-1 LOW-LIMIT CONDITION:
   8.1. AHU-1 SHALL STOP.
   PUMP P-3 SHALL OPERATE.
   PUMP P-4 SHALL OPERATE.
   AV-1 SHALL OPEN FULLY TO THE HEATING POSITION.
   THE HEAT-RECOVERY FACE DAMPERS SHALL OPEN.
   THE HEAT-RECOVERY BYPASS DAMPERS SHALL CLOSE.
   AN AHU-1 LOW-TEMPERATURE ALARM SHALL BE GENERATED AND RECORDED.
   EF-1 SHALL REMAIN UNDER NORMAL RANGE-PRESSURE CONTROL UNLESS STOPPED BY A SEPARATE SAFETY OR FIRE/SMOKE-ALARM SIGNAL.

9. LOW-LIMIT RESET: T-1 SHALL REQUIRE MANUAL RESET AFTER THE TEMPERATURE HAS RECOVERED ABOVE THE LOW-LIMIT SETPOINT.

## LIGHTING CONTROL

1. OPERATING MODES: PROVIDE TWO MODES OF VENTILATION OPERATION.
   1.1. NORMAL LIGHT LEVELS: RANGE LIGHTS AND VENTILATION ON AT SAME TIME.
   1.2. LOW LIGHT LEVELS: RANGE VENTILATION ON RANGE LIGHTS OFF

## AHU-2 CONTROLS

1. OPERATING MODES: AHU-2 SHALL BE PROVIDED WITH A MAGNETIC MOTOR STARTER, HAND-OFF-AUTO SELECTOR SWITCH, MOTOR-OVERLOAD PROTECTION, AND AUXILIARY CONTACTS.

2. AUTO MODE: IN THE AUTO POSITION, AHU-2 SHALL OPERATE ACCORDING TO THE ADJUSTABLE WEEKLY PROGRAM SCHEDULE.

3. HAND MODE: IN THE HAND POSITION, AHU-2 SHALL OPERATE CONTINUOUSLY WITH ITS TEMPERATURE-CONTROL AND DAMPER-CONTROL SEQUENCES ENABLED. THE PROGRAM SCHEDULE SHALL BE BYPASSED, BUT ALL SAFETY CONTROLS SHALL REMAIN ACTIVE.

4. MIXED-AIR CONTROL: AVERAGING MIXED-AIR-TEMPERATURE SENSOR TS-4, ARRANGED TO SENSE ACROSS THE DUCT CROSS SECTION, SHALL MODULATE THE OUTSIDE-AIR AND RETURN-AIR DAMPERS IN OPPOSITION TO MAINTAIN THE MIXED-AIR-TEMPERATURE SETPOINT.

5. MIXED-AIR-TEMPERATURE RESET: THE MIXED-AIR-TEMPERATURE SETPOINT SHALL BE RESET BY OUTSIDE-AIR-TEMPERATURE SENSOR TS-3 AS FOLLOWS:
   5.1. AT AN OUTSIDE-AIR TEMPERATURE OF 40°F OR BELOW, THE MIXED-AIR-TEMPERATURE SETPOINT SHALL BE 65°F. BETWEEN 40°F AND 55°F OUTSIDE-AIR TEMPERATURE, THE SETPOINT SHALL RESET LINEARLY BETWEEN 65°F AND 55°F. AT AN OUTSIDE-AIR TEMPERATURE OF 55°F OR ABOVE, THE MIXED-AIR-TEMPERATURE SETPOINT SHALL BE 55°F.

6. DAMPER NORMAL POSITIONS: THE NORMAL, DE-ENERGIZED POSITION OF THE OUTSIDE-AIR DAMPER SHALL BE CLOSED. THE NORMAL, DE-ENERGIZED POSITION OF THE RETURN-AIR DAMPER SHALL BE OPEN.

7. SUPPLY-AIR-TEMPERATURE CONTROL: AVERAGING DUCT-TEMPERATURE SENSOR TS-5, LOCATED IN THE AHU-2 SUPPLY-AIR DISCHARGE, SHALL MODULATE THREE-WAY AUTOMATIC HEATING-COIL VALVE AV-2 TO MAINTAIN THE SUPPLY-AIR-TEMPERATURE SETPOINT.

8. SUPPLY-AIR-TEMPERATURE RESET: THE AHU-2 SUPPLY-AIR-TEMPERATURE SETPOINT SHALL BE RESET BY OUTSIDE-AIR-TEMPERATURE SENSOR TS-3 AS FOLLOWS:
   8.1. AT AN OUTSIDE-AIR TEMPERATURE OF 40°F OR BELOW, THE SUPPLY-AIR-TEMPERATURE SETPOINT SHALL BE 65°F.
   BETWEEN 40°F AND 55°F OUTSIDE-AIR TEMPERATURE, THE SETPOINT SHALL RESET LINEARLY BETWEEN 65°F AND 55°F.
   AT AN OUTSIDE-AIR TEMPERATURE OF 55°F OR ABOVE, THE SUPPLY-AIR-TEMPERATURE SETPOINT SHALL BE 55°F.

9. SETPOINT ADJUSTMENT: AN ADJUSTMENT DEVICE ON THE CONTROL-PANEL FACE SHALL ALLOW THE OPERATOR TO ADJUST THE CALCULATED AHU-2 SUPPLY-AIR-TEMPERATURE SETPOINT BY PLUS OR MINUS 3°F, SUBJECT TO PROGRAMMED MINIMUM AND MAXIMUM LIMITS.

10. LOW-LIMIT CONTROL: AVERAGING LOW-LIMIT THERMOSTAT T-2, LOCATED DOWNSTREAM OF THE AHU-2 HEATING COIL, SHALL ACTIVATE WHEN THE SENSED TEMPERATURE FALLS BELOW AN ADJUSTABLE SETPOINT INITIALLY SET AT 40°F.

11. AHU-2 LOW-LIMIT RESPONSE: UPON AN AHU-2 LOW-LIMIT CONDITION:
   11.1. AHU-2 SHALL STOP.
   PUMP P-3 SHALL OPERATE.
   AV-2 SHALL DRIVE FULLY TO THE HEATING POSITION.
   THE OUTSIDE-AIR DAMPER SHALL CLOSE.
   THE RETURN-AIR DAMPER SHALL OPEN.
   AN AHU-2 LOW-TEMPERATURE ALARM SHALL BE GENERATED AND RECORDED.

12. LOW-LIMIT RESET: T-2 SHALL REQUIRE MANUAL RESET AFTER THE TEMPERATURE HAS RECOVERED ABOVE THE LOW-LIMIT SETPOINT.

## EF-1 CONTROL

1. OPERATING MODES: EF-1 SHALL BE CONTROLLED THROUGH ITS VFD AND BYPASS CONTACTOR ARRANGEMENT. IN AUTO MODE, EF-1 SHALL OPERATE WHENEVER THE RANGE LIGHTS ARE ON, SUBJECT TO MOTOR OVERLOADS, FIRE/SMOKE CONTROL, AND OTHER SAFETY INTERLOCKS.

2. EXHAUST-AIR DAMPER: THE EXHAUST-AIR DAMPER SHALL OPEN WHEN EF-1 IS COMMANDED TO OPERATE AND SHALL REMAIN OPEN WHILE EF-1 IS OPERATING. THE DAMPER SHALL RETURN TO ITS NORMAL POSITION WHEN EF-1 STOPS.

3. FAN STATUS: EF-1 OPERATION SHALL BE PROVEN BEFORE AHU-1 IS PERMITTED TO START. A START COMMAND ALONE SHALL NOT CONSTITUTE PROOF OF OPERATION.

4. RANGE-PRESSURE SENSORS: DIFFERENTIAL-PRESSURE SENSORS DP-1 AND DP-2 SHALL MEASURE THE PRESSURE DIFFERENCE BETWEEN THE RANGE AREA AND THE ADJACENT OFFICE AND CLASSROOM AREAS.

5. RANGE-PRESSURE CONTROL: THE DP-1 AND DP-2 SIGNALS SHALL BE AVERAGED. IN VFD-AUTO MODE, EF-1 SPEED SHALL MODULATE TO MAINTAIN THE RANGE AT A NEGATIVE PRESSURE RELATIVE TO THE ADJACENT OCCUPIED SPACES.

6. PRESSURE SETPOINT: THE RANGE NEGATIVE-PRESSURE SETPOINT SHALL BE ADJUSTABLE THROUGH THE OPERATOR INTERFACE AND SHALL INITIALLY BE SET AT 0.020 IN. W.G. NEGATIVE. THE FINAL SETPOINT SHALL BE CONFIRMED DURING SYSTEM TESTING AND BALANCING.

7.
8. EXHAUST AIRFLOW: EF-1 SHALL BE CAPABLE OF DELIVERING AN ADJUSTABLE EXHAUST-AIR VOLUME OF APPROXIMATELY 12,100 CFM. AHU-1 AND EF-1 SHALL BE BALANCED SO THAT THE REQUIRED SUPPLY AIRFLOW AND RANGE NEGATIVE PRESSURE ARE MAINTAINED.

9. PRESSURE-SENSOR COMPARISON: THE CONTROL SYSTEM SHALL CONTINUOUSLY COMPARE DP-1 AND DP-2. IF THE DIFFERENCE BETWEEN THE TWO SIGNALS EXCEEDS AN ADJUSTABLE MAXIMUM DISCREPANCY INITIALLY SET AT 20 PERCENT, THE CONTROL SYSTEM SHALL GENERATE AND RECORD AN EF-1 PRESSURE-SENSOR ALARM.

10. PRESSURE-SENSOR FAILURE MODE: DURING A DP-1 OR DP-2 SENSOR-FAULT CONDITION, EF-1 SHALL OPERATE AT A SPEED EQUAL TO THE CURRENT AHU-1 OPERATING SPEED PLUS AN ADJUSTABLE OFFSET INITIALLY SET AT 5 PERCENT. EF-1 SPEED SHALL NOT EXCEED 60 HZ.

## ALARMS AND OPERATOR INTERFACE

1. ALARMS: THE CONTROL SYSTEM SHALL DISPLAY, RECORD, AND TIME-AND-DATE STAMP THE FOLLOWING ALARMS:
   1.1. AHU-1 MOTOR OVERLOAD.
   AHU-1 VFD FAULT.
   EF-1 MOTOR OVERLOAD.
   EF-1 VFD FAULT.
   AHU-1 LOW TEMPERATURE.
   AHU-2 LOW TEMPERATURE.
   FIRE/SMOKE ALARM, WHEN ENABLED.
   AHU-1 AIRFLOW-SENSOR FAULT.
   EF-1 DIFFERENTIAL-PRESSURE-SENSOR FAULT.

2. ALARM FUNCTIONS: THE OPERATOR INTERFACE SHALL PROVIDE ALARM ACKNOWLEDGE AND RESET FUNCTIONS. ACKNOWLEDGING AN ALARM SHALL NOT RESET THE ALARM OR PREVENT SUBSEQUENT ANNUNCIATION IF THE CONDITION CLEARS AND REOCCURS.

3. EQUIPMENT STATUS: THE OPERATOR INTERFACE SHALL DISPLAY FAN AND PUMP STATUS, VFD STATUS, OPERATING MODE, AIRFLOW, DIFFERENTIAL PRESSURE, TEMPERATURES, DAMPER POSITIONS, VALVE COMMANDS, AND ACTIVE CONTROL SETPOINTS.

4. OPERATOR ADJUSTMENTS: THE OPERATOR INTERFACE SHALL ALLOW AUTHORIZED PERSONNEL TO VIEW AND ADJUST OPERATING SCHEDULES, AIRFLOW AND PRESSURE SETPOINTS, TEMPERATURE RESET SCHEDULES, PUMP-ENABLE TEMPERATURES, SENSOR-FAULT LIMITS, AND PRESET FAILURE-MODE SPEEDS.

## HEATING AND HEAT RECOVERY PUMPS

1. PUMPS P-1 AND P-2 – PRIMARY HEATING-SYSTEM LOOP: PUMPS P-1 AND P-2 SHALL EACH BE PROVIDED WITH A MANUAL STARTER AND ON-OFF SELECTOR SWITCH.

2. IN THE ON POSITION, EACH PUMP SHALL OPERATE WITH ITS RESPECTIVE BURNER AS COMMANDED BY THE EXISTING BURNER LEAD-LAG CONTROL PANEL.

3. FIELD VERIFY THE ASSOCIATION BETWEEN EACH PUMP AND BURNER AND COORDINATE THE REQUIRED CONNECTIONS WITH THE EXISTING BURNER LEAD-LAG CONTROL PANEL.

4. PUMP P-3 – AHU HEATING-COIL CIRCULATION: PUMP P-3 SHALL BE PROVIDED WITH A MAGNETIC STARTER AND HAND-OFF-AUTO SELECTOR SWITCH LOCATED IN THE VENTILATION CONTROL PANEL. A NON-FUSED DISCONNECT SWITCH SHALL BE LOCATED ON THE MOUNTING BOARD IN THE MECHANICAL ROOM.

5. IN AUTO MODE, PUMP P-3 SHALL OPERATE CONTINUOUSLY WHEN THE OUTSIDE-AIR TEMPERATURE SENSED BY TS-3 IS BELOW AN ADJUSTABLE SETPOINT INITIALLY SET AT 60°F.

6. PUMP P-3 SHALL STOP WHEN THE OUTSIDE-AIR TEMPERATURE IS ABOVE THE SETPOINT, EXCEPT THAT AN AHU-1 OR AHU-2 LOW-LIMIT CONDITION SHALL OVERRIDE THE OUTSIDE-AIR-TEMPERATURE LOCKOUT AND START PUMP P-3.

7. WHEN AHU-2 IS OPERATING, PUMP P-3 IS ENABLED, AND THE OUTSIDE-AIR TEMPERATURE IS BELOW 60°F, AV-2 SHALL MODULATE TO MAINTAIN THE AHU-2 SUPPLY-AIR-TEMPERATURE SETPOINT.

8. IN HAND MODE, PUMP P-3 SHALL OPERATE CONTINUOUSLY, SUBJECT TO MOTOR OVERLOAD AND OTHER HARDWIRED SAFETY DEVICES.

9. PUMP P-4 – AHU HEAT-RECOVERY-COIL CIRCULATION: PUMP P-4 SHALL BE PROVIDED WITH A MAGNETIC STARTER AND HAND-OFF-AUTO SELECTOR SWITCH LOCATED IN THE VENTILATION CONTROL PANEL. A NON-FUSED DISCONNECT SWITCH SHALL BE LOCATED ON THE MOUNTING BOARD IN THE MECHANICAL ROOM.

10. IN AUTO MODE, PUMP P-4 SHALL OPERATE WHEN THE OUTSIDE-AIR TEMPERATURE SENSED BY TS-3 IS BELOW AN ADJUSTABLE SETPOINT INITIALLY SET AT 45°F.

11. PUMP P-4 SHALL STOP WHEN THE OUTSIDE-AIR TEMPERATURE IS ABOVE THE SETPOINT, EXCEPT THAT AN AHU-1 LOW-LIMIT CONDITION SHALL OVERRIDE THE OUTSIDE-AIR-TEMPERATURE LOCKOUT AND START PUMP P-4.

12. WHEN PUMP P-4 IS OPERATING, THE HEAT-RECOVERY FACE DAMPERS SHALL OPEN AND THE BYPASS DAMPERS SHALL CLOSE. WHEN PUMP P-4 IS OFF, THE FACE DAMPERS SHALL CLOSE AND THE BYPASS DAMPERS SHALL OPEN.

13. IN HAND MODE, PUMP P-4 SHALL OPERATE CONTINUOUSLY, SUBJECT TO MOTOR OVERLOAD AND OTHER HARDWIRED SAFETY DEVICES.

14. PUMPS P-5A AND P-5B – RADIANT-HEATING CIRCULATION: PUMPS P-5A AND P-5B SHALL EACH BE PROVIDED WITH A MAGNETIC STARTER AND HAND-OFF-AUTO SELECTOR SWITCH LOCATED IN THE VENTILATION CONTROL PANEL. NON-FUSED DISCONNECT SWITCHES SHALL BE LOCATED ON THE MOUNTING BOARD IN THE MECHANICAL ROOM.

15. IN AUTO MODE, THE EXISTING TEKMAR RADIANT-HEATING CONTROL SYSTEM SHALL CONTROL THE SELECTED LEAD PUMP. THE SELECTED LEAD PUMP SHALL OPERATE UPON RECEIPT OF A HEATING-DEMAND SIGNAL FROM THE TEKMAR CONTROL SYSTEM WHEN THE OUTSIDE-AIR TEMPERATURE SENSED BY TS-3 IS BELOW AN ADJUSTABLE SETPOINT INITIALLY SET AT 65°F.

16. WHEN THE OUTSIDE-AIR TEMPERATURE IS ABOVE THE SETPOINT, THE TEKMAR PUMP-ENABLE SIGNAL SHALL BE DISABLED.

17. IN HAND MODE, THE SELECTED PUMP SHALL OPERATE CONTINUOUSLY, SUBJECT TO MOTOR OVERLOAD AND OTHER HARDWIRED SAFETY DEVICES.

18. A LEAD-STANDBY SELECTOR SWITCH SHALL ALLOW THE OWNER TO MANUALLY SELECT P-5A OR P-5B AS THE LEAD PUMP. AUTOMATIC LEAD-LAG ALTERNATION IS NOT REQUIRED.

19. THE TEKMAR CONTROL SYSTEM IS EXISTING. FIELD VERIFY AND COORDINATE ALL REQUIRED INTERFACE CONNECTIONS BEFORE FABRICATING THE NEW CONTROL PANEL.

RMC engineering
DOUGLAS, AK
907-723-2996

# INDOOR GUN RANGE VENTILATION CONTROLS UPGRADE

FUNCTIONAL NARRATIVE

JUNEAU, AK

| NO | DATE | REVISION |
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| ENGINEER: VAM | CHECKED BY: HM |
| JOB #: J001305 | DRAWN BY: HM |
| SCALE: N/A | DATE: 06/08/2026 |

DRAWING #: E-03

SHEET 03 OF 08

## DIGITAL INPUTS

1. AHU-1 FN VFD FAULT
2. AHU-1 FAN VFD RUNNING
3. EF-1 FAN VFD FAULT
4. EF-1 FAN VFD RUNNING
5. AVERAGING BULB THERMOSTAT T-1 CLOSES AT LOW TEMP
6. AVERAGING BULB THERMOSTAT T-2 CLOSES AT LOW TEMP
7. VFD 1 SELECTED
8. BYPASS 1 SELECTED
9. VFD AUTO
10. VFD HAND
11. BYPASS 1 RUNNING
12. MOTOR 1 OVERLOAD
13. AHU-2 RUNNNING
14. VFD 2 SELECTED
15. BYPASS 2 SELECTED
16. VFD 2 AUTO
17. VFD 2 HAND
18. BYPAS 2 RUNNING
19. MOTOR 2 OVERLOAD
20. RANGE LIGHTS ON
21. SMOKE DETECTOR
22. SPARE
23. SPARE
24. SPARE
25. SPARE
26. SPARE
27. SPARE
28. SPARE
29. SPARE
30. SPARE
31. SPARE
32. SPARE

## ANALOG INPUTS

1. TS-5 TEMPERATURE TRANSMITTER
2. R-1 FAN SPEED CONTROL RHEOSTAT
3. R-2 FAN SPEED CONTROL RHEOSTAT
4. SPARE
5. SPARE
6. SPARE
7. SPARE
8. SPARE
9. DP-1 DIFFERENTIAL PRESSURE TRANSMITTER
10. DP-2 DIFFERENTIAL PRESSURE TRANSMITTER
11. DP-3 DIFFERENTIAL PRESSURE TRANSMITTER
12. DP-4 DIFFERENTIAL PRESSURE TRANSMITTER
13. TS-1 TEMPERATURE TRANSMITTER
14. TS-2 TEMPERATURE TRANSMITTER
15. TS-3 TEMPERATURE TRANSMITTER
16. TS-4 TEMPERATURE TRANSMITTER

## ANALOG OUTPUTS

1. AV-1 AUTOMATIC VALVE ACTUATOR
2. AV-2 AUTOMATIC VALVE ACTUATOR
3. DA-4 AUTOMATIC DAMPER ACTUATOR
4. VFD 1 AHU-1 FAN CONTROL
5. VFD 2 EF-1 FAN CONTROL
6. SPARE
7. SPARE
8. SPARE

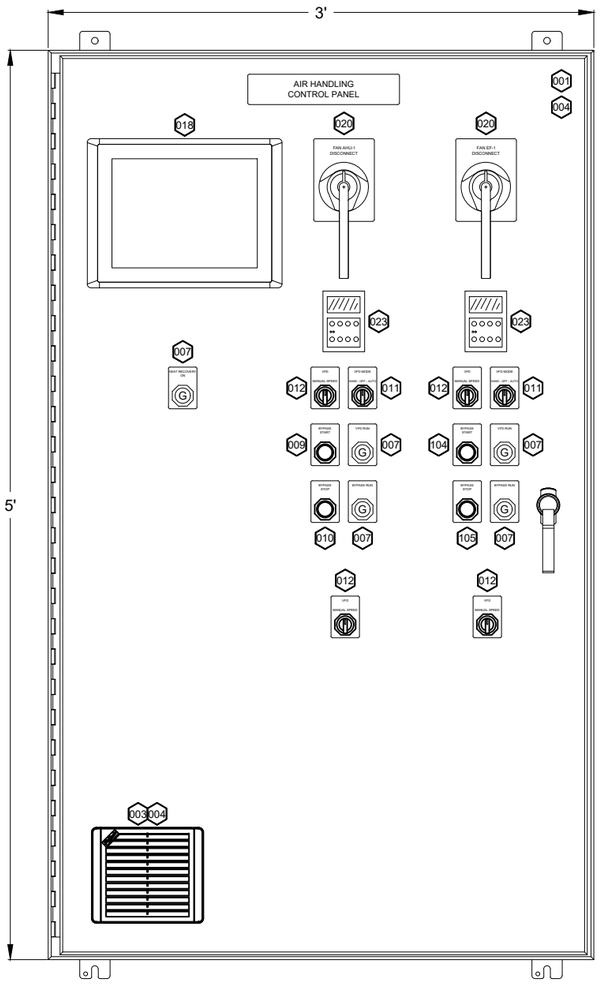
## RELAY OUTPUTS

1. ALARM OUTPUT #1
2. ALARM OUTPUT #2
3. PUMP P-201 RUN COMMAND
4. PUMP P-202 RUN COMMAND
5. SPARE
6. SPARE
7. SPARE
8. SPARE

1 I/O

NOTES:

1. NOT ALL PARTS ARE SHOWN OR LISTED.
2. PROVIDE A COMPLETE AND OPERABLE CONTROL PANEL.
3. CONTROL PANEL DOOR LAYOUT IS FOR ILLUSTRATION PURPOSES ONLY. FINAL LAYOUT SHALL BE DETERMINED DURING DEVELOPMENT OF SHOP DRAWINGS AND APPROVED BY THE ENGINEER.




2 ENCLOSURE

| ITEM # | DESCRIPTION |
|---|---|
| 001 | ENCLOSURE: HOFFMAN OR APPROVED EQUAL. 60"H X 36"W CONTINUOUS HINGE ENCLOSURE WITH 3-POINT LATCH, TYPE 4, GRAY PAINTED MILD STEEL. |
| 002 | BACK PANEL: HOFFMAN OR APPROVED EQUAL. 60"H X 36"W PAINTED STEEL ENCLOSURE BACK PANEL. |
| 003 | FILTER FAN: HOFFMAN OR APPROVED EQUAL. SIDE-MOUNT FILTER FAN, TYPE 1, 115 VAC, 55 cfm, LIGHT GRAY COMPOSITE. |
| 004 | EXHAUST GRILLE: HOFFMAN OR APPROVED EQUAL. EXHAUST GRILLE FOR 4-INCH FAN PACKAGE, LIGHT GRAY ABS. |
| 005 | TEMPERATURE SWITCH: HOFFMAN OR APPROVED EQUAL. ENCLOSURE TEMPERATURE CONTROL SWITCH, OPEN-ON-RISE TYPE. |
| 006 | RED PILOT LIGHT: ALLEN-BRADLEY OR APPROVED EQUAL. 30.5 MM PUSH-TO-TEST LED PILOT LIGHT, RED, 12–130 VAC/VDC. |
| 007 | GREEN PILOT LIGHT: ALLEN-BRADLEY OR APPROVED EQUAL. 30.5 MM PUSH-TO-TEST LED PILOT LIGHT, GREEN, 12–130 VAC/VDC. |
| 008 | WHITE PILOT LIGHT: ALLEN-BRADLEY OR APPROVED EQUAL. 30.5 MM PUSH-TO-TEST LED PILOT LIGHT, WHITE, 12–130 VAC/VDC. |
| 009 | GREEN PUSH BUTTON: ALLEN-BRADLEY OR APPROVED EQUAL. 30.5 MM MOMENTARY PUSH BUTTON, GREEN, NEMA 4/4X, 1 NO/1 NC CONTACT ARRANGEMENT. |
| 010 | RED PUSH BUTTON: ALLEN-BRADLEY OR APPROVED EQUAL. 30.5 MM MOMENTARY PUSH BUTTON, RED, NEMA 4/4X, 1 NO/1 NC CONTACT ARRANGEMENT. |
| 011 | SELECTOR SWITCH: ALLEN-BRADLEY OR APPROVED EQUAL. 30.5 MM, 3-POSITION SELECTOR SWITCH. |
| 012 | POTENTIOMETER: ALLEN-BRADLEY OR APPROVED EQUAL. 30.5 MM PANEL-MOUNTED POTENTIOMETER. |
| 013 | PLC CONTROLLER: ALLEN-BRADLEY OR APPROVED EQUAL. COMPACTLOGIX 5380 CONTROLLER, 600 KB USER MEMORY, 8 I/O CAPABILITY, SUPPORTS 16 ETHERNET/IP DEVICES. |
| 014 | PLC END CAP: ALLEN-BRADLEY OR APPROVED EQUAL. COMPACTLOGIX RIGHT END CAP TERMINATOR. |
| 015 | DIGITAL INPUT MODULE: ALLEN-BRADLEY 5094-IB16 OR APPROVED EQUAL. 16-POINT, 120 VAC SINKING INPUT MODULE. |
| 016 | ANALOG INPUT MODULE: ALLEN-BRADLEY 5094-IF8 OR APPROVED EQUAL. 8-CHANNEL CURRENT/VOLTAGE ANALOG INPUT MODULE. |
| 017 | ANALOG OUTPUT MODULE: ALLEN-BRADLEY 5094-OF8 OR APPROVED EQUAL. 8-CHANNEL CURRENT/VOLTAGE ANALOG OUTPUT MODULE. |
| 018 | HMI/OIT: ONLOGIC OR APPROVED EQUAL. 12-INCH TOUCHSCREEN PANEL PC, INTEL I5 8TH GEN, 8 GB RAM, 128 GB STORAGE, 24 VDC INPUT, WINDOWS 11 PRO. |
| 019 | 30A CIRCUIT BREAKER: MANUFACTURER TO BE SELECTED OR APPROVED EQUAL. 30 AMP, 600 VOLT, 3-POLE CIRCUIT BREAKER. |
| 020 | CIRCUIT BREAKER DISCONNECT ACCESSORY: MANUFACTURER TO BE SELECTED OR APPROVED EQUAL. DISCONNECT SWITCH ACCESSORY FOR 30 AMP, 600 VOLT CIRCUIT BREAKER. |
| 021 | LINE REACTOR: TCI OR APPROVED EQUAL. 480 VOLT, 10 HP, 14 AMP, 3-PHASE OPEN LINE REACTOR/LINE INDUCTOR, 5 PERCENT IMPEDANCE. |
| 022 | VARIABLE FREQUENCY DRIVE: ABB OR APPROVED EQUAL. 10 HP, 380–480 VOLT, 3-PHASE VFD, 7.5 KW, 17 AMP. |
| 023 | VFD HUMAN INTERFACE MODULE: ABB OR APPROVED EQUAL. |
| 024 | MOTOR CONTACTOR: SQUARE D OR APPROVED EQUAL. 32 AMP, 3-POLE MOTOR CONTACTOR, 120 VAC COIL, TE SYS D SERIES. |
| 025 | MECHANICAL INTERLOCK: SCHNEIDER ELECTRIC OR APPROVED EQUAL. MECHANICAL INTERLOCK FOR REVERSING/CHANGEOVER CIRCUIT, 3- OR 4-POLE, TE SYS D SERIES. |
| 026 | OVERLOAD RELAY: SCHNEIDER ELECTRIC OR APPROVED EQUAL. SOLID-STATE OVERLOAD RELAY, 6.4–32 AMP, CLASS 5–31, TE SYS LR9 SERIES. |
| 027 | CONTROL TRANSFORMER: WHITE-RODGERS OR APPROVED EQUAL. CLASS 2 TRANSFORMER, 120/208/240 VAC PRIMARY, 24 VAC SECONDARY, 40 VA. |
| 028 | 24 VDC POWER SUPPLY: MANUFACTURER TO BE SELECTED OR APPROVED EQUAL. 2.5 AMP, 24 VDC POWER SUPPLY. |
| 029 | 120 VAC RELAY: PHOENIX CONTACT OR APPROVED EQUAL. DPDT RELAY MODULE WITH 120 VAC COIL. |
| 030 | 24 VDC RELAY: PHOENIX CONTACT OR APPROVED EQUAL. DPDT RELAY MODULE WITH 24 VDC COIL. |
| 031 | TERMINAL BLOCK: PHOENIX CONTACT OR APPROVED EQUAL. UT 4 SINGLE-LEVEL TERMINAL BLOCK, SCREW CONNECTION. |
| 032 | TERMINAL BLOCK END COVER: PHOENIX CONTACT OR APPROVED EQUAL. UT 4 SINGLE-LEVEL END COVER, GRAY. |
| 033 | GROUND TERMINAL BLOCK: PHOENIX CONTACT OR APPROVED EQUAL. UT 4-PE SINGLE-LEVEL GROUND TERMINAL BLOCK, SCREW CONNECTION, YELLOW/GREEN. |

3 MATERIAL LIST

RMC engineering
DOUGLAS, AK
907-723-2996

# INDOOR GUN RANGE VENTILATION CONTROLS UPGRADE

PANEL LAYOUT

JUNEAU, AK

| NO | DATE | REVISION |
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| ENGINEER: VAM | CHECKED BY: HM |
| JOB #: J001305 | DRAWN BY: HM |
| SCALE: N/A | DATE: 06/08/2026 |

DRAWING #: E-04

SHEET 04 OF 08

# HUNTER EDUCATION FACILITY OUTPUT LIST SUMMARY

| DESCRIPTION | POINT | OUTPUT TO | FUNCTION | CONTROLLED BY |
|---|---|---|---|---|
| **AV-1:** SUPPLY AIR TEMPERATURE AUTOMATIC VALVE ACTUATOR FOR MAIN AIR SUPPLY SYSTEM (AHU-1) | IØ+ 4-20 mA (0-100% CLOSED) | AV-1 | MODULATES TWO-WAY AUTOMATIC VALVE FOR AHU-1 TO CONTROL WATER TEMPERATURE AT HEATING COIL HC-1. | • TS-2 TEMP SENSOR (SUPPLY AIR DISCHARGE) PROVIDES ANALOG SIGNAL. MODULATES VALVE TO ACHIEVE SETPOINT FROM RESET SCHEDULE.<br>• TS-3 TEMP SENSOR (OUTSIDE AIR) PROVIDES ANALOG SIGNAL. ADJUSTS RESET SCHEDULE.<br>• ADJUSTABLE RESET SCHED BASED ON OUTSIDE AIR TEMP (TS-3). SEE RESET SCHEDULE.<br>• R-1 POTENTIOMETER ON PANEL PROVIDES USER ADJUSTMENT OF DISCHARGE TEMP. FROM MIDPOINT (12 MA) OF INPUT SIGNAL TO PLC, INCREASE OR DECREASE SETPOINT BY A MAX OF 3° F. DO NOT EXCEED MAX. OR MIN. SETPOINTS.<br>• T-1 LOW LIMIT CONTROL PROVIDES DISCRETE SIGNAL – AT LOW TEMP THE SWITCH CLOSES – AV-1 TO OPEN TO FULL SETTING. LOW SETPOINT IS 40° F. |
| **AV-2:** SUPPLY AIR TEMPERATURE AUTOMATIC VALVE ACTUATOR FOR RECIRCULATING AIR SYSTEM (AHU-2) | I1+ 4-20 mA (0-100% CLOSED) | AV-2 | MODULATES THREE-WAY AUTOMATIC VALVE FOR AHU-2 TO CONTROL WATER TEMPERATURE AT HEATING COIL HC-2. | • TS-5 TEMP SENSOR (SUPPLY AIR DISCHARGE) PROVIDES ANALOG SIGNAL. MODULATES VALVE TO ACHIEVE SETPOINT FROM RESET SCHEDULE.<br>• TS-4 TEMP SENSOR (MIXED AIR) PROVIDES ANALOG SIGNAL. ADJUSTS RESET SCHEDULE ALONG WITH TS-3.<br>• TS-3 TEMP SENSOR (OUTSIDE AIR) PROVIDES ANALOG SIGNAL. ADJUSTS RESET SCHEDULE ALONG WITH TS-4.<br>• ADJUSTABLE RESET SCHED BASED ON OUTSIDE AIR TEMP (TS-3) AND MIXED AIR TEMP (TS-4). SEE RESET SCHEDULE.<br>• R-2 POTENTIOMETER ON PANEL PROVIDES USER ADJUSTMENT OF DISCHARGE TEMP. FROM MIDPOINT (12 MA) OF INPUT SIGNAL TO PLC, INCREASE OR DECREASE SETPOINT BY A MAX OF 3° F. DO NOT EXCEED MAX. OR MIN. SETPOINTS.<br>• T-2 LOW LIMIT CONTROL PROVIDES DISCRETE SIGNAL – AT LOW TEMP THE SWITCH CLOSES – AV-2 TO OPEN TO FULL SETTING. LOW SETPOINT IS 40° F.<br>• AHU-2 OPERATING AND TS-3 BELOW 60° F, AV-2 IS TO BE OPEN. |
| **DA-4:** AHU-2 MIXED AIR DAMPER CONTROL ACTUATOR | IØ+ 4-20 mA (0-100% OSA) | DA-4 | MODULATES AIR DAMPERS OAD-2 AND RAD-2 TO MAINTAIN THE MIXED AIR TEMPERATURE (MAT) SETPOINT. | • TS-4 TEMP SENSOR (MIXED AIR TEMPERATURE) PROVIDES ANALOG SIGNAL. MODULATES DAMPER TO MAINTAIN SETPOINT FROM RESET SCHEDULE.<br>• RESET SCHEDULE BASED ON OUTSIDE AIR TEMP (TS-3).<br>• NORMAL POSITION OF OUTSIDE AIR TEMPERATURE IS CLOSED AND RETURN AIR TEMPERATURE IS OPEN.<br>• T-2 LOW LIMIT CONTROL PROVIDES DISCRETE SIGNAL - AT LOW TEMPERATURE THE SWITCH CLOSES AND DAMPER RETURN TO NORMAL POSIITON. LOW SETPOINT IS 40° F. |
| **VFD-1:** VARIABLE SPEED DRIVE FOR MAIN AIR SUPPLY FAN (AHU-1) | IØ+ 4-20 mA (0-60HZ) | VFD-1 | MODULATES FAN SPEED VFD-1 TO MATCH THE DESIGN SUPPLY AIRFLOW MEASURED AT AMS-1. | • AMS–1, AIR MEASUREMENT STATION, PROVIDES ANALOG SIGNAL FROM DIFFERENTIAL PRESSURE TRANSDUCER NO. 3 (DP-3). THE PLC SIGNAL TO VFD-1 IS MODULATED TO MATCH THE DESIGN AIRFLOW RATE OF 10,800 CFM. THE DESIGN AIRFLOW RATE IS ADJUSTABLE.<br>• WITH NO SIGNAL FROM AMS-1, A SIGNAL WILL BE PROVIDED TO THE VFD OF 54.6 HZ AND AN ALARM WILL BE SIGNALED.<br>• IN THE EVENT OF A SIGNAL FROM THE SMOKE OR FIRE DETECTOR, THE FAN IS TURNED OFF. |
| **VFD-2:** VARIABLE SPEED DRIVE FOR EXHAUST AIR FAN (EF-1) | I1+ 4-20 mA (0-60HZ) | VFD-2 | MODULATES FAN SPEED TO PROVIDE A NEGATIVE PRESSURE IN THE RANGE AREA OF THE FACILITY. | • THE DIFFERENTIAL PRESSURES BETWEEN THE RANGE AND THE OFFICE AREAS PROVIDE ANALOG SIGNALS FROM DIFFERENTIAL PRESSURE TRANSDUCERS NO. 1 (DP-1) AND NO. 2 (DP-2).<br>• THE TWO SIGNALS ARE AVERAGED IN THE PLC, AND A SIGNAL IS PROVIDED TO THE VFD THAT MAINTAINS AN AVERAGE DIFF. PRESSURE OF 0.01 TO 0.05 IN. W.G. (ADJUSTABLE).<br>• IF THE TWO SIGNALS DIFFER BY MORE THAN 20% OR THERE IS NO SIGNAL FROM DP-1 OR DP-2, AN ALARM IS SIGNALED AND AN ALTERNATE SPEED IS PROVIDED. THE ALTERNATE SPEED SIGNAL FOR THE EXHAUST FAN IS 20% FASTER THAN THE SUPPLY FAN (AHU-1). THE ALTERNATE SPEED PERCENTAGE IS ADJUSTABLE.<br>• IN THE EVENT OF A SIGNAL FROM THE SMOKE OR FIRE DETECTOR, THE FAN IS TURNED OFF. |
| **VFD-1:** RUN ENABLE CONTACT FOR MAIN AIR SUPPLY FAN (AHU-1) | (Ø)O/Ø DRY CONTACT | VFD-1 | DRY CONTACT CLOSES IN PLC WHEN FAN AHU-1 IS REQUIRED TO RUN. CAN FUNCTION WHEN FAN MODE SWITCH IS IN VFD MODE AND VFD SPEED CONTROL IS IN AUTO. | • THIS FAN MAY BE OPERATED IN HAND OR AUTO MODE.<br>• FOLLOWING DISCRETE INPUT SIGNALS MUST BE PRESENT TO CLOSE CONTACT (Ø)O/Ø:<br>◦ (1)I/Ø – VFD/BYPASS SWITCH: VFD SELECTED<br>◦ (1)I/2 – VFD MODE SWITCH: AUTO SELECTED<br>◦ (Ø)I/7 – EF-1 RUNNING<br>◦ (1)I/14 – RANGE LIGHTS ON<br>◦ (Ø)I/8 – T-1 LOW-LEVEL THERMOSTAT CONTACT OPEN (TEMPERATURE ABOVE SETPOINT)<br>◦ (1)I/15 – SMOKE OR FIRE ALARM CONTACT CLOSED (NO SMOKE) |
| **VFD-2:** RUN ENABLE CONTACT FOR EXHAUST AIR FAN EF-1 | (Ø)O/1 DRY CONTACT | VFD-2 | DRY CONTACT CLOSES IN PLC WHEN FAN EF-1 IS REQUIRED TO RUN. CAN FUNCTION WHEN FAN MODE SWITCH IS IN VFD MODE AND VFD SPEED CONTROL IS IN AUTO. | • THIS FAN MAY BE OPERATED IN HAND OR AUTO MODE.<br>• FOLLOWING DISCRETE INPUT SIGNALS MUST BE PRESENT TO CLOSE CONTACT (Ø)O/1:<br>◦ (1)I/8 – VFD/BYPASS SWITCH: VFD SELECTED<br>◦ (1)I/10 – VFD MODE SWITCH: AUTO SELECTED<br>◦ (1)I/14 – RANGE LIGHTS ON<br>◦ (Ø)I/8 – T-1 LOW-LEVEL THERMOSTAT CONTACT OPEN (TEMPERATURE ABOVE SETPOINT)<br>◦ (1)I/15 – SMOKE OR FIRE ALARM CONTACT CLOSED (NO SMOKE) |
| **DA-1:** DAMPER ACTUATOR FOR OAD-1 ON AHU-1. | | CR-1 CONTACT AND M1VX CONTACT IN PARALLEL | ACTUATOR ENERGIZED WHEN FAN RUNS IN EITHER VFD OR BYPASS MODE. WHEN EITHER N.O. CONTACT CLOSES ACTUATOR IS ENERGIZED. WHEN ACTUATOR IS ENERGIZED, OUTSIDE AIR DAMPER OPENS. NORMAL POSITION IS CLOSED. | • T-1 LOW LIMIT CONTROL PROVIDES DISCRETE SIGNAL – AT LOW TEMP THE SWITCH CLOSES – DA-1 TO RETURN TO NORMAL SETTING (DAMPER CLOSED). LOW SETPOINT IS 40° F. |
| **DA-2:** DAMPER ACTUATOR FOR FACE/BYPASS DAMPER FBD-1 ON AHU-1 HEAT RECOVERY COIL. | (Ø)O/5 DRY CONTACT | CR-2 RELAY | RELAY ENERGIZED WHEN CONTACT CLOSES. N.O. RELAY CONTACT CLOSES CAUSING FACE DAMPER TO CLOSE AND BYPASS DAMPER TO OPEN. NORMAL POSITION IS FACE DAMPER OPEN AND BYPASS DAMPER CLOSED. | • FOLLOWING DISCRETE INPUT SIGNALS MUST BE PRESENT TO CLOSE CONTACT (Ø)O/5:<br>◦ TS-3 TEMP SENSOR (OUTSIDE AIR) PROVIDES ANALOG SIGNAL. WHEN OUTSIDE AIR TEMPERATURE IS ABOVE 40° F, CONTACT (Ø)O/5 IS PERMITTED TO CLOSE CAUSING FACE DAMPERS TO CLOSE.<br>◦ (Ø)I/9 – T-1 LOW-LEVEL THERMOSTAT CONTACT OPEN (TEMPERATURE ABOVE SETPOINT)<br>◦ (1)I/15 – SMOKE OR FIRE ALARM CONTACT CLOSED (NO SMOKE) |
| **DA-3:** DAMPER ACTUATOR FOR EAD-1 ON EF-1. | | CR-3 CONTACT AND M2VX CONTACT IN PARALLEL | ACTUATOR ENERGIZED WHEN FAN RUNS IN EITHER VFD OR BYPASS MODE. WHEN EITHER N.O. CONTACT CLOSES ACTUATOR IS ENERGIZED. WHEN ACTUATOR IS ENERGIZED, OUTSIDE AIR DAMPER OPENS. NORMAL POSITION IS CLOSED. | |
| **DA-5:** DAMPER ACTUATOR FOR FBD-2 ON EF-1. | (Ø)O/7 DRY CONTACT | CR-4 RELAY | RELAY ENERGIZED WHEN CONTACT CLOSES. N.O. RELAY CONTACT CLOSES CAUSING FACE DAMPER TO CLOSE AND BYPASS DAMPER TO OPEN. NORMAL POSITION IS FACE DAMPER OPEN AND BYPASS DAMPER CLOSED. | • FOLLOWING DISCRETE INPUT SIGNALS MUST BE PRESENT TO CLOSE CONTACT (Ø)O/7:<br>◦ TS-3 TEMP SENSOR (OUTSIDE AIR) PROVIDES ANALOG SIGNAL. WHEN OUTSIDE AIR TEMPERATURE IS ABOVE 40° F, CONTACT (Ø)O/7 IS PERMITTED TO CLOSE CAUSING FACE DAMPERS TO CLOSE.<br>◦ (Ø)I/8 – T-1 LOW-LEVEL THERMOSTAT CONTACT OPEN (TEMPERATURE ABOVE SETPOINT)<br>◦ (1)I/15 – SMOKE OR FIRE ALARM CONTACT CLOSED (NO SMOKE) |
| **MS-AHU2:** MOTOR STARTER FOR AIR RECIRCULATION FAN AHU-2. | (Ø)O/8 DRY CONTACT | CR-5 RELAY | RELAY ENERGIZED WHEN CONTACT CLOSES. N.O. RELAY CONTACT CLOSES CAUSING FAN AHU-2 TO START. NORMAL OPERATING CONDITION IS FAN OFF. | • THIS FAN MAY BE OPERATED IN HAND OR AUTO MODE.<br>• FOLLOWING DISCRETE INPUT SIGNALS MUST BE PRESENT TO CLOSE CONTACT (Ø)O/8:<br>◦ PLC PROGRAM CLOCK CONTROLS OPERATION OF FAN. START AND STOP TIMES CAN BE SET ON THE PANEL VIEW WITH FOUR ON/OFF CYCLES AVAILABLE. NO DAY SETTING PROVIDED.<br>◦ (Ø)I/9 – T-2 LOW-LEVEL THERMOSTAT CONTACT OPEN (TEMPERATURE ABOVE SETPOINT)<br>◦ (1)I/15 – SMOKE OR FIRE ALARM CONTACT CLOSED (NO SMOKE) |
| **MS-P3:** MOTOR STARTER FOR PUMP 3 IN MAIN AIR SUPPLY HEATING SYSTEM. | (Ø)O/9 DRY CONTACT | CR-6 RELAY | RELAY ENERGIZED WHEN CONTACT CLOSES. N.O. RELAY CONTACT CLOSES CAUSING PUMP 3 TO START. NORMAL OPERATING CONDITION IS PUMP OFF. | • THIS PUMP MAY BE OPERATED IN HAND OR AUTO MODE.<br>• FOLLOWING DISCRETE INPUT SIGNALS MUST BE PRESENT TO CLOSE CONTACT (Ø)O/9:<br>◦ PUMP OPERATES CONTINUOUSLY UNLESS STOPPED FOR OTHER CONTROL REASONS.<br>◦ TS-3 TEMP SENSOR (OUTSIDE AIR) PROVIDES ANALOG SIGNAL. WHEN OUTSIDE AIR TEMPERATURE IS BELOW 60° F, CONTACT (Ø)O/9 IS PERMITTED TO CLOSE ALLOWING PUMP TO RUN. |
| **MS-P4:** MOTOR STARTER FOR PUMP 4 IN HEAT RECOVERY SYSTEM. | (Ø)O/10 DRY CONTACT | CR-7 RELAY | RELAY ENERGIZED WHEN CONTACT CLOSES. N.O. RELAY CONTACT CLOSES CAUSING PUMP 4 TO START. NORMAL OPERATING CONDITION IS PUMP OFF. | • THIS PUMP MAY BE OPERATED IN HAND OR AUTO MODE.<br>• FOLLOWING DISCRETE INPUT SIGNALS MUST BE PRESENT TO CLOSE CONTACT (Ø)O/10:<br>◦ PUMP OPERATES CONTINUOUSLY UNLESS STOPPED FOR OTHER CONTROL REASONS.<br>◦ TS-3 TEMP SENSOR (OUTSIDE AIR) PROVIDES ANALOG SIGNAL. WHEN OUTSIDE AIR TEMPERATURE IS BELOW 45° F, CONTACT (Ø)O/10 IS PERMITTED TO CLOSE ALLOWING PUMP TO RUN. |

RMC engineering
DOUGLAS, AK
907-723-2996

INDOOR GUN RANGE
VENTILATION CONTROLS UPGRADE
OUTPUT LIST SUMMARY
JUNEAU, AK

| NO | DATE | REVISION |
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| ENGINEER: VAM | CHECKED BY: HM |
| JOB #: J001305 | DRAWN BY: HM |
| SCALE: N/A | DATE: 06/08/2026 |

DRAWING #: E-05
SHEET 05 OF 08

# DAMPER ACTUATOR SCHEDULE

| DAMPER | | | | | | | ACTUATOR | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NAME | LOG | TYPE | MAF | SIZE | AREA | VOL | TAG | MANF | MODEL | ACTION | SIG | NORM POS |
| OAD-1 | AHU-1 | OUTSIDE AIR | LOGIC-AIR | 60" x 36" | 15 sf | 11,100 cfm | DA-1 | HONEYWELL | ML8195C1005 | OPEN/ CLOSE | 24 VAC | CLOSED |
| FBD-1 | AHU-1 | FACE/ BYPASS | LOGIC-AIR | 60" x 48"<br>60" x 18" | 20 sf<br>7.5 sf | 11,100 cfm | DA-2 | HONEYWELL | ML8195C1005 | OPEN/ CLOSE | 24 VAC | FACE: OPEN<br>BYPASS: CLOSE |
| FBD-2 | EF-1 | FACE/ BYPASS | LOGIC-AIR | 42" x 42" | 12.25 sf | 12,100 cfm | DA-5 | HONEYWELL | ML8195C1005 | OPEN/ CLOSE | 24 VAC | FACE: OPEN<br>BYPASS: CLOSE |
| EAD-1 | EF-1 | EXHAUST AIR | GREENHECK | 60" x 24" | 10 sf | 12,100 cfm | DA-3 | HONEYWELL | ML8195C1005 | OPEN/ CLOSE | 24 VAC | CLOSED |
| RAD-1 | AHU-2 | RETURN AIR | LOGIC-AIR | 24" x 14" | 2.3 sf | 1,650 cfm | DA-4 | HONEYWELL | ML7295B3012 | MODULATING | 24 VAC & 4-20 mA | RETURN AIR DAMPER: OPEN |
| OAD-2 | AHU-2 | OUTSIDE AIR | LOGIC-AIR | 26" x 14" | 2.5 sf | 1,650 cfm | | | | | | RETURN AIR DAMPER: OPEN |

N.I.C
(REFERENCE ONLY)

# VALVE ACTUATOR SCHEDULE

| VALVE | | | | | | | ACTUATOR | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NAME | LOG | TYPE | MAF | SIZE | AREA | VOL | TAG | MANF | MODEL | ACTION | SIG | NORM POS |
| AV-1 | AHU-1 | 2-WAY | HONEYWELL | 2 INCH | 46.8 | 32 gpm | AV-1 | HONEYWELL | ML7425B3012 | MODULATING | 24 VAC POWER & 0-10 VDC SIGNAL. | RETRACTS ACTUATOR ON POWER FAILURE. VALVE STEM IS PULLED UPWARD OPENING VALVE |
| AV-2 | AHU-2 | 2-WAY | HONEYWELL | 1-1/4 INCH | 18.7 | 8 gpm | AV-2 | HONEYWELL | ML7425B3012 | MODULATING | 24 VAC POWER & 0-10 VDC SIGNAL. | FACE: OPEN<br>BYPASS: CLOSE |

RMC engineering
DOUGLAS, AK
907-723-2996

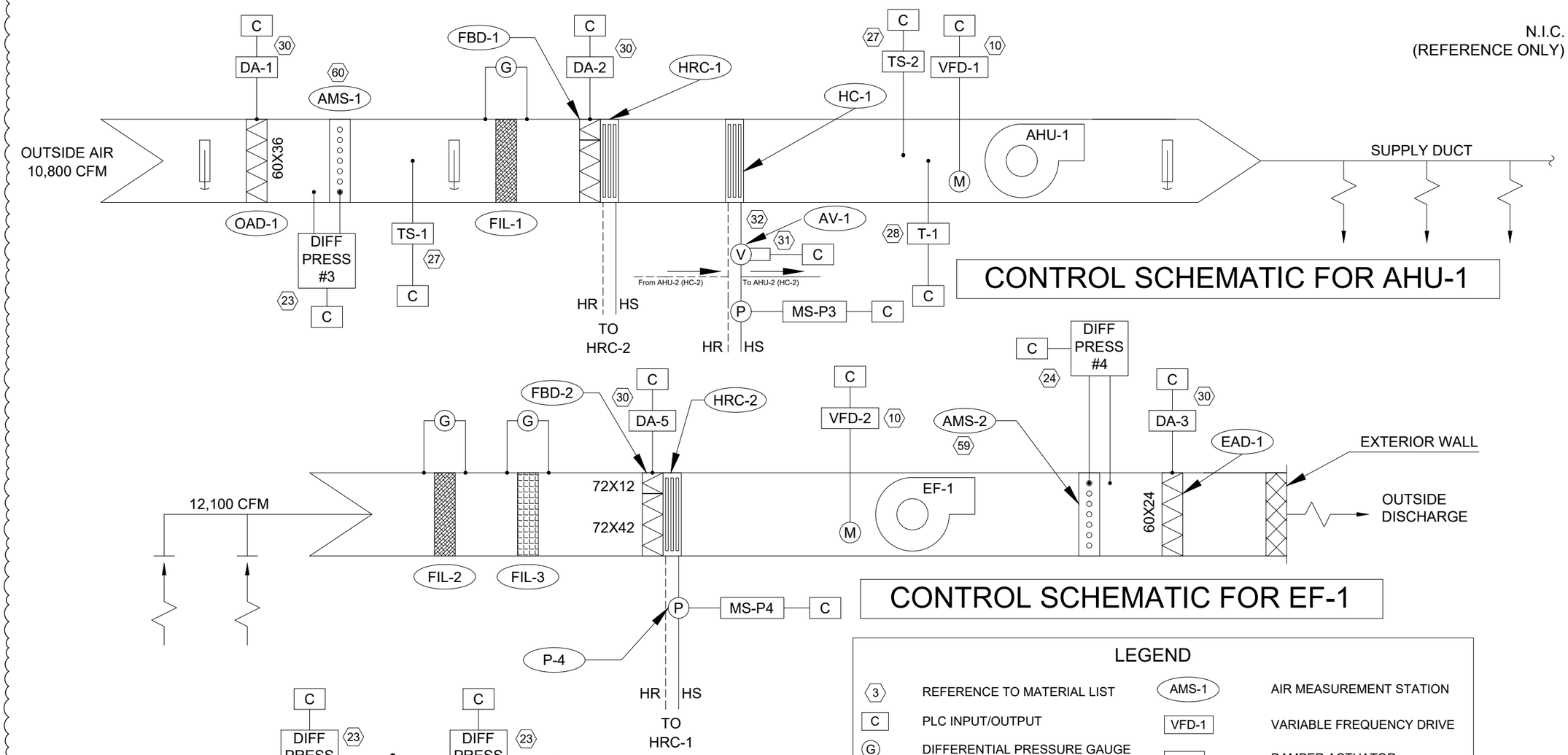
INDOOR GUN RANGE
VENTILATION CONTROLS UPGRADE
DAMPER & VALVE ACTUATOR SCHEDULES
JUNEAU, AK

| NO | DATE | REVISION |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

| | |
|---|---|
| ENGINEER: VAM | CHECKED BY: HM |
| JOB #: J001305 | DRAWN BY: HM |
| SCALE: N/A | DATE: 06/08/2026 |

DRAWING #:
M-01

SHEET
06 OF 08




## LEGEND

| | | | |
|---|---|---|---|
| 3 | REFERENCE TO MATERIAL LIST | AMS-1 | AIR MEASUREMENT STATION |
| C | PLC INPUT/OUTPUT | VFD-1 | VARIABLE FREQUENCY DRIVE |
| G | DIFFERENTIAL PRESSURE GAUGE | DA-2 | DAMPER ACTUATOR |
| M | FAN MOTOR | DIFF PRESS #1 | DIFFERENTIAL PRESSURE SENSOR |
| P | CIRCULATION PUMP | FBD-1 | FACE/BYPASS DAMPER |
| V | AUTOMATIC VALVE | OAD-1 | OUTSIDE AIR DAMPER |
| MS-P4 | MOTOR STARTER | RAD-1 | RETURN AIR DAMPER |
| TS-2 | TEMPERATURE SENSOR (ANALOG) | EAD-1 | EXHAUST AIR DAMPER |
| T-1 | THERMOSTAT (ON/OFF) | V | VALVE ACTUATOR |
| FIL-3 | FILTER | HC-1 | HEATING COIL |
| | THERMOMETER | HRC-2 | HEAT RECOVERY COIL |
| EF-1 | VENTILATION FAN | | |

RMC engineering
DOUGLAS, AK
907-723-2996

# INDOOR GUN RANGE VENTILATION CONTROLS UPGRADE

AS-BUILT (REFERENCE ONLY)

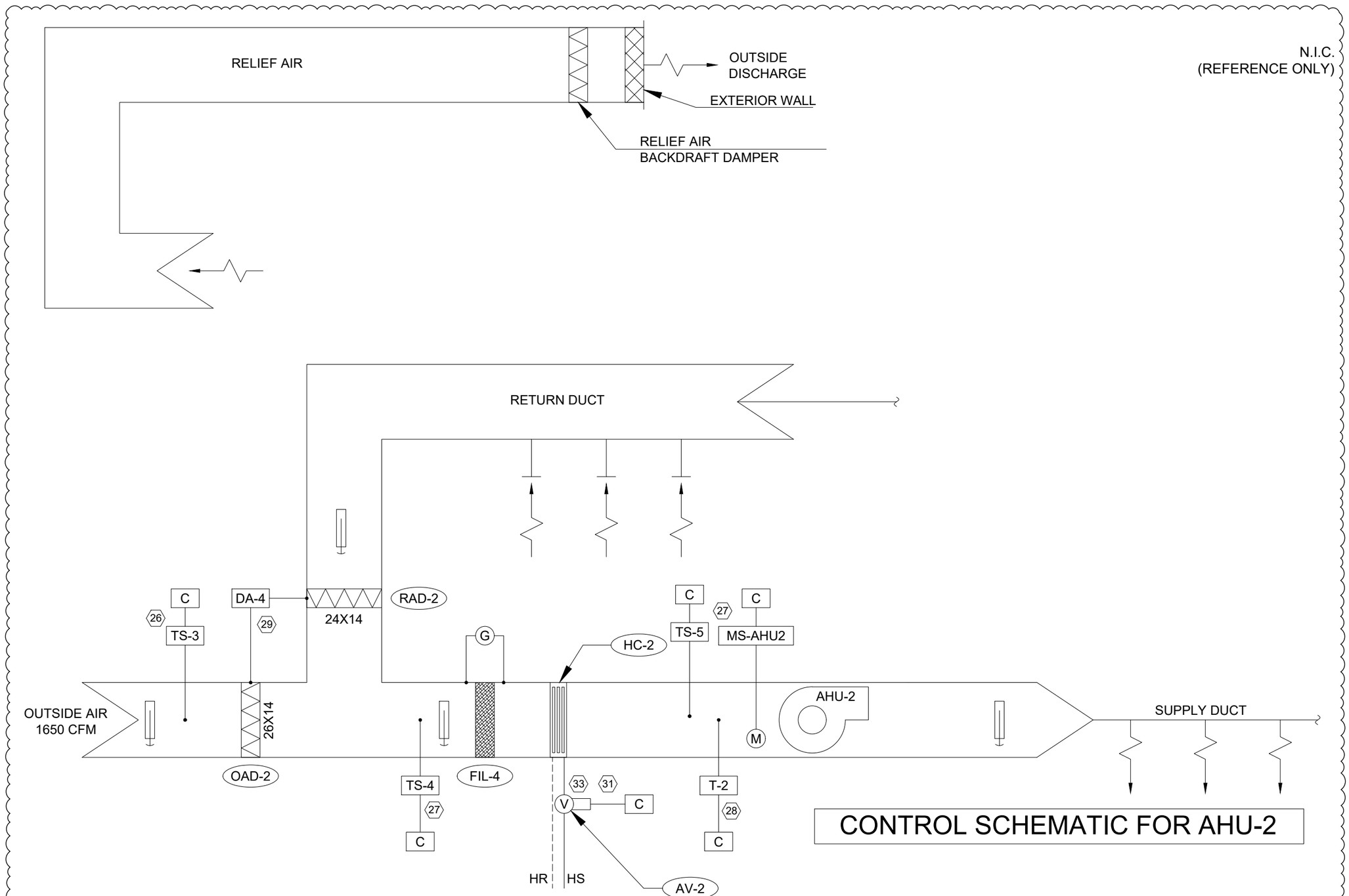
JUNEAU, AK

| NO | DATE | REVISION |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

| | |
|---|---|
| ENGINEER: VAM | CHECKED BY: HM |
| JOB #: J001305 | DRAWN BY: HM |
| SCALE: N/A | DATE: 06/08/2026 |

DRAWING #: M-02

SHEET 07 OF 08




# CONTROL SCHEMATIC FOR AHU-2

RMC engineering
DOUGLAS, AK
907-723-2996

# INDOOR GUN RANGE VENTILATION CONTROLS UPGRADE

AS-BUILT (REFERENCE ONLY)

JUNEAU, AK

| NO | DATE | REVISION |
|---|---|---|
| 1 | | |
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|---|---|
| ENGINEER: VAM | CHECKED BY: HM |
| JOB #: J001305 | DRAWN BY: HM |
| SCALE: N/A | DATE: 06/08/2026 |

DRAWING #: M-03

SHEET 08 OF 08

**STATE OF ALASKA**
**DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES**

# SMALL PROCUREMENT QUOTE SUBMITTAL (CONSTRUCTION RELATED)

[per AS 36.30.320(a)]

| | |
|---|---|
| Project Name & No.: Juneau Hunter Education Shooting Complex Ventilation Upgrades - IH 27-018<br>Location: 5670 Montana Creek Road<br>Juneau, AK 99801 | Procurement Agency and Address:<br>State of Alaska<br>Department of Fish and Game<br>Procurement Office<br>PO Box 115526 Juneau, AK 99811-5526 |
| Procurement Officer: Eric Verrelli | Date of Issuance: 11.17.26<br>Bid is Due: 12.8.26 (2:00 pm) |

**QUOTE:** Offerors must read all attachments to this schedule. Appendix C - Scope of Work

Quote Amount for Project:_____

**The quoted price must include all costs required to provide and complete the requested work and deliverables as specified in the solicitation.*

I have reviewed the bid documents, with addenda _____, and understand the scope of services and conditions required for Project number ___. I agree to furnish all necessary labor, materials, and equipment for the above amount(s). The Work shall be accomplished in a professional manner acceptable to the Procurement Officer.

Contractor _____ Contractor Reg. No. _____

Authorized Signature _____ Title _____

Address _____

Business License # _____ EIN or SSN _____ Phone # _____

Offeror is Claiming: ☐ Alaska Bidder's Preference ☐ Alaska Products Pref. (worksheet)
☐ Alaska Veteran Preference (SPC-007)

Offeror to Complete this Portion

. . . . . .

Procurement Officer: _____

Date of Receipt of Bid: _____

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

# PAYMENT BOND

Bond No. _____

For

_____

**Project Name and Number**

KNOW ALL WHO SHALL SEE THESE PRESENTS:

That _____

of _____ as Principal,

and _____

of _____ as Surety,

firmly bound and held unto the State of Alaska in the penal sum of

_____ Dollars

($_____) good and lawful money of the United States of America for the payment whereof,

well and truly to be paid to the State of Alaska, we bind ourselves, our heirs, successors, executors, administrators, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the said Principal has entered into a written contract with said State of Alaska, on the _____ of _____ A.D., 20_____, for construction of the above-referenced project, said work to be done according to the terms of said contract.

Now, THEREFORE, the conditions of the foregoing obligation are such that if the said Principal shall comply with all requirements of law and pay, as they become due, all just claims for labor performed and materials and supplies furnished upon or for the work under said contract, whether said labor be performed and said materials and supplies be furnished under the original contract, any subcontract, or any and all duly authorized modifications thereto, then these presents shall become null and void; otherwise they shall remain in full force and effect.

IN WITNESS WHEREOF, we have hereunto set our hands and seals at _____, _____ this _____ day of _____ A.D., 20_____.

**Principal:** _____

**Address:** _____

**By:** _____

**Contact Name:** _____

**Phone:** (  ) _____

**Surety:** _____

**Address:** _____

**By:** _____

**Contact Name:** _____

**Phone:** (  ) _____

The offered bond has been checked for adequacy under the applicable statutes and regulations:

_____ _____

**Alaska Department of Transportation & Public Facilities Authorized Representative** **Date**

See Instructions on Reverse

## INSTRUCTIONS

1. This form, for the protection of persons supplying labor and material, shall be used whenever a payment bond is required. There shall be no deviation from this form without approval from the Contracting Officer.

2. The full legal name, business address, phone number, and point of contact of the Principal and Surety shall be typed on the face of the form. Where more than a single surety is involved, a separate form shall be executed for each surety.

3. The penal amount of the bond, or in the case of more than one surety the amount of obligation, shall be typed in words and in figures.

4. Where individual sureties are involved, a completed Affidavit of Individual Surety shall accompany the bond. Such forms are available upon request from the Contracting Officer.

5. The bond shall be signed by authorized persons. Where such persons are signing in a representative capacity (e.g., an attorney-in-fact), but is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved, evidence of authority must be furnished.

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

# PERFORMANCE BOND

Bond No. _____

For

_____

**Project Name and Number**

KNOW ALL WHO SHALL SEE THESE PRESENTS:

That _____

of _____ as Principal,

and _____

of _____ as Surety,

firmly bound and held unto the State of Alaska in the penal sum of

_____ Dollars

($_____) good and lawful money of the United States of America for the payment whereof,

well and truly to be paid to the State of Alaska, we bind ourselves, our heirs, successors, executors, administrators, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the said Principal has entered into a written contract with said State of Alaska, on the _____ of _____ A.D., 20_____, for construction of the above-named project, said work to be done according to the terms of said contract.

Now, THEREFORE, the conditions of the foregoing obligation are such that if the said Principal shall well and truly perform and complete all obligations and work under said contract and if the Principal shall reimburse upon demand of the Department of Transportation and Public Facilities any sums paid him which exceed the final payment determined to be due upon completion of the project, then these presents shall become null and void; otherwise they shall remain in full force and effect.

IN WITNESS WHEREOF, we have hereunto set our hands and seals at _____, _____ this _____ day of _____ A.D., 20_____.

**Principal:** _____

**Address:** _____

**By:** _____

**Contact Name:** _____

**Phone:** (  ) _____

**Surety:** _____

**Address:** _____

**By:** _____

**Contact Name:** _____

**Phone:** (  ) _____

The offered bond has been checked for adequacy under the applicable statutes and regulations:

_____ _____

**Alaska Department of Transportation & Public Facilities Authorized Representative** **Date**

See Instructions on Reverse

## INSTRUCTIONS

1. This form shall be used whenever a performance bond is required. There shall be no deviation from this form without approval from the Contracting Officer.

2. The full legal name, business address, phone number, and point of contact of the Principal and Surety shall be typed on the face of the form. Where more than a single surety is involved, a separate form shall be executed for each surety.

3. The penal amount of the bond, or in the case of more than one surety the amount of obligation, shall be typed in words and in figures.

4. Where individual sureties are involved, a completed Affidavit of Individual Surety shall accompany the bond. Such forms are available upon request from the Contracting Officer.

5. The bond shall be signed by authorized persons. Where such person is signing in a representative capacity (e.g., an attorney-in-fact), but is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved, evidence of authority must be furnished.

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

# BID BOND

For

**Project Name and Number**

DATE BOND EXECUTED: _____

| PRINCIPAL (Legal name and business address): | TYPE OF ORGANIZATION: |
|---|---|
| | [ ] Individual [ ] Partnership<br>[ ] Joint Venture [ ] Corporation |
| | STATE OF INCORPORATION: |

SURETY(IES) (Name and business address):

| **A.** | **B.** | **C.** |
|---|---|---|
| PENAL SUM OF BOND: | | DATE OF BID: |

We, the PRINCIPAL and SURETY above named, are held and firmly bound to the State (State of Alaska), in the penal sum of the amount stated above, for the payment of which sum will be made, we bind ourselves and our legal representatives and successors, jointly and severally, by this instrument.

THE CONDITION OF THE FOREGOING OBLIGATION is that the Principal has submitted the accompanying bid in writing, date as shown above, on the above-referenced Project in accordance with contract documents filed in the office of the Contracting Officer, and under the Invitation for Bids therefor, and is required to furnish a bond in the amount stated above.

If the Principal's bid is accepted and he is offered the proposed contract for award, and if the Principal fails to enter into the contract, then the obligation to the State created by this bond shall be in full force and effect.

If the Principal enters into the contract, then the foregoing obligation is null and void.

**PRINCIPAL**

| | | | |
|---|---|---|---|
| Signature(s) | **1.** | **2.** | **3.** |
| Name(s)<br>& Title(s)<br>(Typed) | **1.** | **2.** | **3.** |
| | | | Corporate Seal |

**See Instructions on Reverse**

**CORPORATE SURETY(IES)**

| **Surety A** | Name of Corporation | State of Incorporation | Liability Limit **$** |
|---|---|---|---|
| Signature(s) | **1.** | **2.** | Corporate Seal |
| Name(s) & Titles (Typed) | **1.** | **2.** | |

| **Surety B** | Name of Corporation | State of Incorporation | Liability Limit **$** |
|---|---|---|---|
| Signature(s) | **1.** | **2.** | Corporate Seal |
| Name(s) & Titles (Typed) | **1.** | **2.** | |

| **Surety C** | Name of Corporation | State of Incorporation | Liability Limit **$** |
|---|---|---|---|
| Signature(s) | **1.** | **2.** | Corporate Seal |
| Name(s) & Titles (Typed) | **1.** | **2.** | |

## INSTRUCTIONS

1. This form shall be used whenever a bid bond is submitted.
2. Insert the full legal name and business address of the Principal in the space designated. If the Principal is a partnership or joint venture, the names of all principal parties must be included (e.g., "Smith Construction, Inc. and Jones Contracting, Inc. DBA Smith/Jones Builders, a joint venture"). If the Principal is a corporation, the name of the state in which incorporated shall be inserted in the space provided.
3. Insert the full legal name and business address of the Surety in the space designated. The Surety on the bond may be any corporation or partnership authorized to do business in Alaska as an insurer under AS 21.09. Individual sureties will not be accepted.
4. The penal amount of the bond may be shown either as an amount (in words and figures) or as a percent of the contract bid price (a not-to-exceed amount may be included).
5. The scheduled bid opening date shall be entered in the space marked Date of Bid.
6. The bond shall be executed by authorized representatives of the Principal and Surety. Corporations executing the bond shall also affix their corporate seal.
7. Any person signing in a representative capacity (e.g., an attorney-in-fact) must furnish evidence of authority if that representative is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved.
8. The states of incorporation and the limits of liability of each surety shall be indicated in the spaces provided.
9. The date that bond is executed must not be later than the bid opening date.

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

# ALASKA BIDDER PREFERENCE CERTIFICATION

In response to the advertised procurement for:

Project Name and Number: _____

Bidder/Proposer (company name): _____

## Operation of Alaska Bidder Preference

Procurement preferences under the Alaska Procurement Code are benefits that the State grants only to qualified bidders. Under AS 36.30.990(2), if a bidder is an eligible "Alaska Bidder", the Department will apply a five percent preference to the price of the bidder's proposal.

## Instructions regarding Alaska Bidder Preference

A bidder that claims the Alaska Bidder Preference must review and then certify that each statement appearing under the heading "Alaska Bidder Certification" is true. The individual that signs the certification shall include his/her printed name and position within bidder's organization, *e.g.*, sole proprietor, partner, etc. If a bidder fails to submit a signed certification, the Department will not apply the claimed preference.

## Alaska Bidder Certification

The bidding entity for which I am the duly authorized representative:

(A) Holds a current Alaska business license;

(B) Is submitting a bid or proposal for goods, services, or construction under the name appearing on the bidder's current Alaska business license;

(C) Has maintained a place of business in the State staffed by the bidder or an employee of the bidder for a period of six months immediately preceding the date of the proposal;

(D) Is incorporated or qualified to do business under the laws of the State, is a sole proprietorship and the proprietor is a resident of the State, is a limited liability company organized under AS 10.50 and all members are residents of the State, or is a partnership under former AS 32.05, AS 32.06, or AS 32.11 and all partners are residents of the State; and

(E) If a joint venture, is composed entirely of ventures that qualify under the four preceding paragraphs of this Alaska Bidder Certification.

By applying my signature below, I certify under penalty of perjury that I am the duly appointed representative of this bidder, which has authorized and empowered me to legally bind it concerning its proposal, and that the foregoing statements are true and correct.

_____ _____
By (signature) Date

_____ _____
Printed name Alaska Business License Number

_____
Title:

# ALASKA PRODUCT PREFERENCE WORKSHEET

(See Reverse Side for Instructions)

Project Name and Number: _____

Bid Phase: _____ Bidder: _____

By applying my signature below, I certify under penalty of perjury that:

1. This worksheet accurately reports the type and quantity of product(s) that: (a) qualify for application of the Alaska Product Preference under AS 36.30.321 *et seq*. and (b) this bidder will use in performing the advertised project, if awarded the contract; and
2. All listed product(s) are specified for use on the project and will be permanently incorporated; and
3. I am the duly appointed representative of this bidder, which has authorized and empowered me to legally bind it concerning its proposal.

_____ _____

By (signature) Date

| PRODUCT | MANUFACTURER | CLASS & PREFERENCE PERCENTAGE | TOTAL DECLARED VALUE | REDUCTION AMOUNT |
|---|---|---|---|---|
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| | | | **TOTAL** | |

## INSTRUCTIONS FOR ALASKA PRODUCTS PREFERENCE WORKSHEET

**Special Notice:** All procurements, except those funded from Federal sources, shall contain Contract provisions for the preference of Alaska products. To be considered for the Alaska Product Preference, each product listed by the Bidder on this worksheet must have current certification from the Alaska Products Preference Program at the time of Bid Opening or the proposal due date. A product with expired certification at the bid opening or proposal due date will not be considered eligible. Products that are not specified for use on the project will not be considered eligible.

The Alaska Product Preference Program List of certified products is available online at:
https://www.commerce.alaska.gov/web/dcra/AlaskaProductPreferenceProgram.aspx or may be obtained by contacting Dept. of Commerce & Economic Development Alaska Division of Community and Regional Affairs, Alaska Products Preference Program, 550 W. 7th Ave., Suite 1650, Anchorage AK 99501-3510; Phone: (907) 269- 4501 Fax: (907) 269-4563, E-mail: madeinalaska@alaska.gov

## BIDDERS INSTRUCTIONS:

**A. General.** The contracting Agency may request documentation to support entries made on this form. False presentations may be subject to AS 36.30.687. All Bidder's entries must conform to the requirements covering bid preparations in general. Discrepancies in price extensions shall be resolved by multiplying the declared total value times the preference percentage and adjusting any resulting computation(s) accordingly.

**B. Form Completion – BASIC BIDS.**

(1) Enter project number and name, the words "Basic Bid" and the CONTRACTOR'S name in the heading of each page as provided.

(2) The Bidder shall compare those candidate products appearing on the preference listing (see Special Notice comments above) against the requirements of the technical specifications appearing in the contract documents. If the Bidder determines that a candidate product can suitably meet the contract requirements, then that product may be included in the worksheet as follows.

(3) For each suitable product submitted under the "Basic Bid" enter:

- The product name, generic description and its corresponding technical specification section number under the heading "PRODUCT",
- The company name of the Alaska producer under the heading "Manufacturer", and
- The product class (I, II, or III) and preference percentage (3, 5, or 7% respectively) under the "CLASS/% heading.

(4) For each product appearing on the list and to be utilized by the CONTRACTOR enter:

- Under the heading "TOTAL DECLARED VALUE" the manufacturer's quoted price of the product, (caution: this value is to be the manufacturer's quoted price at the place of origin and shall not include costs for freight, handling or miscellaneous charges of incorporating the product into the Work,) and
- The resulting preference – i.e. the preference percentage times the total declared value amount – under the heading "REDUCTION AMOUNT".

(5) Continue for all "suitable" basic bid products. If the listing exceeds one page enter the words "Page # __ SUB" in front of the word "TOTAL" and on the first line of the following pages enter "SUBTOTAL OF REDUCTION AMOUNT FROM PREVIOUS PAGE".

(6) On the final page of the listing enter "BASIC BID PREFERENCE GRAND" immediately before the word "TOTAL".

(7) Total the entries in the "REDUCTION AMOUNT" column for each page by commencing at the first entry for that page. If a continuation page exists, ensure that the subtotal from the previous page is computed into the running total. Number pages as appropriate.

(8) Compute a Grand Total for the Basic Bid Preference. Enter the amount on the final page of the worksheet. (Note: When solicitations require written bids this amount should also be entered on line "C" of the Basic Bid Schedule.) Submit worksheet(s) with the Bid Schedule.

**C. Form Completion – ALTERNATE BIDS.**

(1) Enter project number and name, the words "ALTERNATE BID #__", and CONTRACTOR'S name in the heading of each page as provided.

(2) On the first entry line enter "ADDITIONAL ALASKA PRODUCTS FOR ALTERNATE BID #__", and repeat procedures 2 through 5 under part B these Bidder's instructions except that references to "Basic Bid" shall be replaced with the words "Alternate Bid #__."

(3) Following the listing of all additional Alaska products enter the words "ADDITIONAL PRODUCTS PREFERENCE FOR ALTERNATE BID #__ - SUBTOTAL" and enter a subtotal amount for all additional products as listed. Subtotal amount to be determined by adding all additional product entries in the "REDUCTION AMOUNT" column.

(4) Skip three lines and enter "LESS THE FOLLOWING NON-APPLICABLE ALASKA PRODUCTS:

(5) Beginning on the next line, enter the product name and manufacturer of each Alaska Product appearing on the "Basic Bid" listing which would be deleted or reduced from the Project should the "Alternate Bid" be selected. Details of entry need only be sufficient to clearly reference the subject product. (i.e. "Pre-hung doors by Alaska Door Co., Anchorage.") Products being reduced shall specify the amount of the reduction. Should no products require deletion enter "None". When a product is listed as a "NON-APPLICABLE ALASKA PRODUCT" for this alternate bid and if under the basic bid the Bidder received a preference on his basic bid as a result of that product, then the applicable entries under the headings "TOTAL DECLARED VALUE" and "REDUCTION AMOUNT" (for each product and from the basic bid listing) shall also be entered into the corresponding headings of this form. Where only a portion of the products has been deleted, the entry (which will differ from those on the basic bid listing) may be "pro-rated" or as otherwise substantiated.

(6) Following the listing of all non-applicable Alaska products enter the words "NON-APPLICABLE PRODUCTS PREFERENCE FROM BASIC BID ___ SUBTOTAL" and enter a subtotal amount for all non-applicable products listed. Subtotal amount to be determined by adding all non-applicable entries in the "REDUCTION AMOUNT" column.

(7) At the bottom of the final page enter the words "ALTERNATE BID #___ PREFERENCE GRAND" immediately before the word "TOTAL".

(8) Compute a Grand Total for the Alternate Bid Preference (for Alternate #___) by subtracting the non-applicable product preference subtotal from the additional product preference subtotal. Enter on the final page. (Note: When solicitations require written bids this amount should also be entered on line "C" of the Alternate Bid Schedule.) Submit separate worksheet(s) with each Alternate Bid

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

# ALASKA VETERAN PREFERENCE CERTIFICATION

In response to the advertised procurement for:

Project Name and Number _____,

Bidder (Contractor) _____

## Operation of Alaska Veteran Preference

Procurement preferences under the Alaska Procurement Code are benefits that the State grants only to qualified bidders. Under AS 36.30.321, an eligible entity receives a five percent preference to the price of in the bidder's proposal if the bidder meets three requirements.
The bidder must be:

1. an "Alaska Veteran";
2. a "Qualifying Entity"; and
3. an "Alaska Bidder".

Unless a bidder satisfies all three requirements and furnishes corresponding certifications, it is not eligible for the Alaska Veteran Preference. This preference may not exceed $5,000.

## Instructions regarding Alaska Veteran Preference

A bidder that claims the Alaska Veteran Preference must review and complete the "Alaska Veteran Certification", the "Qualifying Entity Certification", and the "Alaska Bidder Certification". The individual that signs a certification shall include his/her printed name and position within bidder's organization, *e.g.*, sole proprietor, partner, etc. If a bidder fails to submit properly completed certifications, the Department will not apply the claimed preference.

## Alaska Veteran Certification

(*To be completed by individual(s) upon whom the bidder relies in claiming the Alaska Veteran status. If bidder is a partnership, limited liability company, or corporation, then a majority of partners, members, or shareholders who are Alaska Veterans must sign this Alaska Veteran Certification for the Bidder to be eligible for this preference.*)

I hereby represent to the Department that:

I served in the armed forces of the United States, a reserve unit of the United States armed forces, the Alaska Territorial Guard, the Alaska Army National Guard, the Alaska Air National Guard, or the Alaska Naval Militia; and
I was separated from service under a condition that was not dishonorable; and
I am Alaska resident in that I am physically present in the State of Alaska with the intent to remain in the State indefinitely and to make a home in the State.

I certify under penalty of perjury that the foregoing statements are true and correct as they apply to me.

_____ _____
By (signature) Date

_____ _____
Printed name Title

## Qualifying Entity Veteran Certification

The bidding entity for which I am the duly authorized representative is a:

**(*Check the appropriate box*)**

- ☐ sole proprietorship owned by an Alaska Veteran;
- ☐ partnership under AS 32.06 or AS 32.11 and a majority of the partners are Alaska Veterans;
- ☐ limited liability company organized under AS 10.50 and a majority of the members are Alaska Veterans; or
- ☐ corporation that is wholly owned by individuals and a majority of the individuals are Alaska Veterans.

By applying my signature below, I certify under penalty of perjury that I am the duly appointed representative of this bidder, which has authorized and empowered me to legally bind it concerning the proposal and that the statement I have acknowledged above by checking the appropriate box is true and correct.

| | |
|---|---|
| By (signature) | Date |
| Printed name | Title |

## Alaska Bidder Certification

(*To complete your claim for the Alaska Veteran Preference, you must also submit an Alaska Bidder Certification, which the bidder can view, download, and print from the AKDOT&PF's Bid Express Proposal page.*)

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

# ALASKA MILITARY SKILLS PREFERENCE CERTIFICATION

In response to the advertised procurement for:

Project Name and Number _____,

Bidder (Contractor) _____

## Operation of Alaska Military Skills Preference

Procurement preferences under the Alaska Procurement Code are benefits that the State grants only to qualified bidders. Under AS 36.30.321, an eligible entity receives a two percent preference to the price in the bidder's proposal if the bidder meets three requirements.

The bidder must be:

1. a "Qualifying Entity"; and
2. an "Alaska Bidder"

Unless a bidder satisfies all these requirements and furnishes corresponding certifications, it is not eligible for the Alaska Military Skills Preference. This preference may not exceed $5,000.

## Instructions regarding Alaska Military Skills Preference

A bidder that claims the Alaska Military Skills Preference must review and complete the "Alaska Military Skills Certification", the "Qualifying Entity Certification", and the "Alaska Bidder Certification". The individual that signs a certification shall include their printed name and position within bidder's organization, *e.g.*, sole proprietor, partner, etc. If a bidder fails to submit properly completed certifications, the Department will not apply the claimed preference.

## Alaska Military Skills Certification

(*To be completed by individual(s) upon whom the bidder relies in claiming the Alaska Military Skills status. If bidder is a partnership, limited liability company, or corporation, then employee(s) who are claiming Alaska Military Skills must sign this Alaska Military Skills Certification for the Bidder to be eligible for this preference and provide proof of graduation of the qualifying employee(s) from an eligible program as described in AS 36.30.321).*

I hereby represent to the Department that:

I have one or more employees who are currently enrolled in, or have graduated within the past two years from, a United States Department of Defense SkillBridge or United States Army Career Skills Program. These programs provide service members or their spouses with civilian work experience, industry training, pre-apprenticeships, registered apprenticeships, or internships during the final 180 days before separation or retirement from the military.

Alternatively, I maintain an active partnership with an entity that employs apprentices through a program as outlined in AS 36.30.321.

Additionally, I am a resident of Alaska, meaning I am physically present in the state with the intent to remain indefinitely and establish a permanent home here.

I certify under penalty of perjury that the foregoing statements are true and correct as they apply to me.

_____ _____
By (signature) Date

_____ _____
Printed name Title

**Qualifying Entity Military Skills Certification**

The bidding entity for which I am the duly authorized representative is a:

**(*Check the appropriate box*)**

- ☐ employs at least one person who is currently enrolled in, or within the previous two years graduated from, a United States Department of Defense SkillBridge or United States Army Career Skills Program for service members or spouses of service members that offers civilian work experience through specific industry training, pre-apprenticeships, registered apprenticeships, or internships during the last 180 days before a service member separates or retires from the service; or

- ☐ has an active partnership with an entity that employs an apprentice through a program described in AS 36.30.321.

- ☐ proof of graduation of the qualifying employee(s) from an eligible program as described in AS 36.30.321.

By applying my signature below, I certify under penalty of perjury that I am the duly appointed representative of this bidder, which has authorized and empowered me to legally bind it concerning the proposal and that the statement I have acknowledged above by checking the appropriate box is true and correct.

| | |
|---|---|
| By (signature) | Date |
| Printed name | Title |

**Alaska Bidder Certification**

(*To complete your claim for the Alaska Military Skills Preference, you must also submit an Alaska Bidder Certification, which the bidder can view, download, and print from the DOT&PF's Bid Express Proposal page.*)

# STATE OF ALASKA
# DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

## SMALL PROCUREMENT
## (CONSTRUCTION RELATED)
## OFFEROR'S QUESTIONNAIRE

Project Name & Number: _____

Project Name: _____

Project Location: _____

### A. FINANCIAL

1. Have you ever failed to complete a contract due to insufficient resources?
   Yes ☐ No ☐ If yes, explain: _____
2. Describe any arrangements you would make to finance this work: _____

### B. EQUIPMENT

1. Describe the equipment you have available and would use for this project.

| ITEM | QUAN. | MAKE | MODEL | SIZE/ CAPACITY | PRESENT MARKET VALUE |
|---|---|---|---|---|---|
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2. What percent of the total value of this contract would you subcontract? _____

3. Would you purchase any equipment for use on this project: Yes ☐ No ☐
If yes, describe type, quantity, and approximate cost: _____

4. Would you rent any equipment for this work? Yes ☐ No ☐
If yes, describe type, quantity, and approximate cost: _____

5. Is your proposal based on firm offers for all materials for this project? Yes ☐ No ☐
If no, please explain: _____

## C. EXPERIENCE

1. Have you had previous construction contracts or subcontracts with the State of Alaska?
Yes ☐ No ☐

Describe the most recent or current contract, its completion date, and scope of work:
_____

2. List, as an attachment to this questionnaire, other construction projects you have completed; the dates of completion, scope of work, and total contract amount for each project completed in the past 12 months.

I hereby certify that the above statements are true and complete.

_____
Contractor Name

_____ _____
Signature Date

_____
Name and Title of Person Signing