N62470-85-B-5160

NAVFAC
SPECIFICATION

No. 05-85-5160

AMENDMENT NO. 0001

IMPORTANT

This amendment should be acknowledged when your bid is submitted. Failure to acknowledge the amendment may constitute grounds for rejection of the bid.

If your bid has been submitted prior to the receipt of this amendment, acknowledgment should be made by telegram, which should state whether the price contained in your sealed bid is to remain unchanged, is to be decreased by an amount, or is to be increased by an amount. The acknowledgment must be received prior to bid opening time.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES
	1

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
0001	11-12-87		

6. ISSUED BY CODE

Commander, Atlantic Division
Naval Facilities Engineering Command
Norfolk, Virginia 23511-6287

7. ADMINISTERED BY *(If other than Item 6)* CODE

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and ZIP Code)*

CODE FACILITY CODE

(V) 9A. AMENDMENT OF SOLICITATION NO.

X N62470-85-B-5160

9B. DATED *(SEE ITEM 11)*

10-30-87

10A. MODIFICATION OF CONTRACT/ORDER NO.

10B. DATED *(SEE ITEM 13)*

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

[X] The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers [ ] is extended, [X] is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing Items 8 and 15, and returning 2 copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(V)

A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

D. OTHER *(Specify type of modification and authority)*

E. IMPORTANT: Contractor [ ] is not, [ ] is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

AVIATION WAREHOUSES
AT THE
MARINE CORPS AIR STATION, NEW RIVER, NORTH CAROLINA

In the "CONTENTS", under "DIVISION 15, Mechanical", add the following:

"15250. Insulation for Mechanical Systems". Section 15250 accompanies this amendment.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*		16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*	
15B. CONTRACTOR/OFFEROR *(Signature of person authorized to sign)*	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY *(Signature of Contracting Officer)*	16C. DATE SIGNED

SECTION 15250

INSULATION FOR MECHANICAL SYSTEMS

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

1.1.1 American Society for Testing and Materials (ASTM) Publications:

C533-85	Calcium Silicate Block and Pipe Thermal Insulation
C534-82	Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form
C547-77	Mineral Fiber Preformed Pipe Insulation
C552-86	Cellular Glass Block and Pipe Thermal Insulation
C553-70 (R77)	Mineral Fiber Blanket and Felt Insulation (Industrial Type)
C591-85	Unfaced Preformed Rigid Cellular Polyurethane Thermal Insulation
C612-83	Mineral Fiber Block and Board Thermal Insulation
E84-86	Surface Burning Characteristics of Building Materials, Test Method for

1.2 INSULATION FOR MECHANICAL SYSTEMS: Provide insulation for mechanical systems. Mechanical systems shall include HVAC (heating, ventilating, and cooling) ductwork, equipment, and piping which is located within buildings, on buildings, under buildings, and adjacent to buildings. Clean and test mechanical systems prior to the application of insulation. Section titled "Mechanical General Requirements," applies to this section, with the additions and modifications specified herein.

1.3 SUBMITTALS: Submit to the Contracting Officer.

1.3.1 Manufacturer's Data:

a. Insulation
b. Jackets
c. Adhesives, mastics, and coatings

1.3.2 Shop Drawings:

a. Removable insulated boxes for equipment

1.4 INSULATION FOR EXTERIOR PIPED UTILITIES: Provide under section titled "Insulation for Exterior Piping."

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS: Products containing asbestos will not be permitted.

2.2 DUCT INSULATION: Provide insulation with fire-retardant vapor barrier jacket (laminate of kraft paper and aluminum foil reinforced with fibrous glass yarn).

2.2.1 Blanket Type Duct Insulation: ASTM C553 fibrous glass insulation, minimum density of one pcf (pound per cubic foot), minimum of 2 inches thick.

2.2.2 Rigid Type Duct Insulation: ASTM C612 fibrous glass insulation, minimum density of 3 pcf, minimum of 2 inches thick.

2.3 PUMP INSULATION:

2.3.1 Cellular Glass Insulation: ASTM C552, minimum of 2 inches thick.

2.3.2 Fibrous Glass Insulation: ASTM C553, minimum density of 6 pcf, minimum of 2 inches thick.

2.3.3 Polyurethane or Polyisocyanate Insulation: ASTM C591, minimum density of 1.7 pcf, minimum of 2 inches thick.

2.4 INSULATION FOR EXPANSION TANKS, CONDENSATE RECEIVERS, HOT DOMESTIC WATER STORAGE TANKS, AND CONVERTERS: Provide insulation for hot domestic water storage tanks that are not provided with factory-applied insulation system.

2.4.1 Cellular Glass Insulation: ASTM C552, minimum of 4 inches thick.

2.4.2 Fibrous Glass Insulation: ASTM C553, minimum density of 6 pcf, minimum of 4 inches thick.

2.4.3 Calcium Silicate Insulation: ASTM C533, minimum of 4 inches thick.

2.4.4 Polyurethane or Polyisocyanate Insulation: ASTM C591, minimum density of 1.7 pcf, minimum of 2 inches thick. Provide only for expansion tanks and hot domestic water storage tanks.

2.5 PIPING INSULATION: Provide insulation with fire-retardant vapor barrier jacket.

2.5.1 Fibrous Glass Insulation: ASTM C547, minimum density of 3 pcf.

2.5.2 Polyurethane or Polyisocyanate Insulation: ASTM C591, minimum density of 1.7 pcf.

2.5.3 Plastic Foam Insulation: ASTM C534, minimum of 0.75 inch thick.

PART 3 - EXECUTION

3.1 INSTALLATION: Clean and test mechanical systems prior to the application of insulation. Products containing asbestos will not be permitted. Insulation materials including the completed installation shall have a fire hazard rating in accordance with ASTM E84; flame-spread rating shall not exceed 25 and smoke developed rating shall not exceed 50 except as specified herein; smoke developed rating shall not exceed 150 for polyurethane and polyisocyanate insulations. Surfaces to be covered with insulation shall be tested for leaks; cleaned of foreign material including rust, scale, and dirt; and dried prior to application of insulation. Insulation shall be clean and dry when installed and prior to the application of jackets and coatings. Do not use short pieces of insulation materials where a full length section will fit. Provide insulation materials and jackets with smooth and even surfaces, with jackets drawn tight, and smoothly secured on longitudinal laps and end laps. Insulate fittings and piping accessories with premolded, precut, or field fabricated pipe insulation of the same pipe insulation material and thickness as the adjoining pipe insulation. Provide unions, flanges, and piping accessories with readily removable sections of insulation. Provide insulation continuous through pipe hangers, pipe supports, pipe sleeves, wall openings, and ceiling opening, except at fire dampers in duct systems. Provide a complete moisture and vapor seal wherever insulation terminates against hangers, anchors, and other projections through insulation on cold surfaces; fill joints, breaks, punctures, and voids with vapor barrier compound and cover with vapor sealed material. Do not conceal equipment nameplates. Cover ends of exposed insulation with waterproof mastic.

3.2 DUCT INSULATION: Clean and test ductwork prior to the application of insulation. Provide on exterior of supply ductwork, return ductwork, outside air intake ductwork, plenums, and casings of HVAC units. Provide insulation with a vapor barrier laminate of flame-resistant kraft paper and aluminum foil reinforced with fibrous glass yarn. Apply insulation with joints tightly butted. Pins or anchors shall be spaced at maximum 12-inch centers; secure insulation with washers and clips. Pins or anchors shall be metal electrically welded to duct surface or shall be metal attached to duct surface with waterproof adhesive especially designed for attachment to metal surfaces. Sagging of duct insulation will not be permitted. Insulation shall be tightly and smoothly applied to the duct. Secure insulation to metal ducts with a fire-resistant, waterproof bonding adhesive applied in 4 inch wide strips on 12-inch centers. Provide rigid type duct insulation in mechanical equipment rooms and where indicated; provide blanket type duct insulation in other locations.

3.2.1 Blanket Type Duct Insulation: ASTM C553, blanket type flexible fibrous glass insulation, minimum density of one pcf, minimum of 2 inches thick. Secure blanket type insulation to bottom of rectangular horizontal and sloping ducts more than 24 inches wide, in addition to adhesive, by impaling over pins or anchors; secure insulation with washers and clips.

3.2.2 Rigid Type Duct Insulation: ASTM C612, fibrous glass insulation, minimum density of 3 pcf, minimum of 2 inches thick. Secure rigid type insulation to duct by impaling over pins or anchors located not more than 3 inches from edge of insulation and spaced at maximum 12-inch centers; secure insulation with washers and clips.

3.2.3 Vapor Barrier: Fill joints, breaks, punctures, and voids with vapor barrier coating compound and cover with vapor barrier jacket. At joints, the vapor barrier jacket for insulation shall be covered with 4 inch wide pressure-sensitive vapor seal tape of material identical to jackets, or shall have 2 inch wide laps drawn tight and secured with vapor seal adhesive. The joints and openings where the facing is pierced or punctured by pins, staples, or other means shall be brush coated with 2 inch wide strips of vapor barrier coating compound.

3.3 EQUIPMENT INSULATION: Clean and test equipment prior to the application of insulation.

3.3.1 Pump Insulation: ASTM C552, cellular glass insulation, minimum of 2 inches thick; ASTM C553 fibrous glass insulation, minimum density of 6 pcf, minimum of 2 inches thick; or ASTM C591 polyurethane or polyisocyanate insulation, minimum density of 1.7 pcf, minimum of 2 inches thick. Provide chilled water pumps, chilled-hot water pumps, and hot water pumps with insulated metal casings properly shaped for a correct fit and designed for easy removal and replacement. Joints shall coincide with joints in each pump casing. Apply insulation on a solid bed of waterproof adhesive to exterior of metal casings. Cover insulation with fibrous glass fabric. Apply fabric in waterproof adhesive. Coat fabric with waterproof aluminum pigmented mastic to a minimum total thickness of 0.12 inch.

3.3.2 Insulation for Expansion Tanks, Condensate Receivers, Hot Water Storage Tanks, and Converters: ASTM C552, cellular glass insulation, minimum of 4 inches thick; ASTM C553 fibrous glass insulation, minimum density of 6 pcf, minimum of 4 inches thick; or ASTM C553 calcium silicate insulation, minimum of 4 inches thick; or ASTM C591 polyurethane or polyisocyanate insulation, minimum of 2 inches thick. Secure insulation with No. 16 gage galvanized steel or copper clad wire or 0.75 inch wide, 0.015 inch thick galvanized bands, each spaced on 12-inch centers. Miter or score block to ensure tight joints. Seal joints with insulating mastic. Provide insulation with 0.5 inch thick hard-finish cement applied over zinc-coated wire netting; finish with fibrous glass fabric, smoothly adhered with waterproof adhesive. Coat fabric with waterproof aluminum pigmented mastic to a minimum total thickness of 0.12 inch.

3.4 PIPING INSULATION: Clean and test aboveground piping systems prior to the application of insulation. Insulate fittings with the same material and thickness as adjacent runs of pipe. Pipe insulation shall be continuous through wall and floor openings, and pipe sleeves shall be sized accordingly.

For hot piping inside building that is located more than 6 feet above the floor, terminate the insulation immediately adjacent to each end of unions, flanges, pressure-regulating valve assemblies, trap assemblies, strainers, and valves. Insulate pipe at hangers. For insulation protection shields Type 40; provide rigid pipe insulation of the same thickness as adjacent pipe insulation and having a minimum compressive strength of 35 psi or provide hardwood plugs having a minimum of one square inch bearing surface with the wood grain perpendicular to the pipe, between the insulation protection shield and the pipe; except insulation having a minimum density of 7 pcf may be provided between the insulation protector and the pipe for piping 2 inches and smaller. Install pipe insulation with joints tightly butted. Overlap longitudinal jacket laps not less than 1.5 inches. Wrap butt joints with butt strips not less than 3 inches wide of identical material to jacket. Cement jacket laps and butt strips on both surfaces with fire-resistant, waterproof bonding adhesive or with factory-applied self-sealing system. Staples shall be stainless steel, outside clinched without complete penetration of insulation. If vapor barrier jacket is pierced or punctured, brush coat with vapor barrier coating to provide a vapor-tight covering. For concealed hot piping, adhesive is not required when jacket is secured with flared staples on 4 inch centers. If molded or mitered filting covers are used, join with fire-resistant, waterproof bonding adhesive or wire in place and provide with a smooth coat of finishing cement. For copper tubing sizes one inch and less, pipe insulation for elbows, tees, and valves may be mitered.

3.4.1 Insulation for Hot Water, Domestic Water, and Cold Drain Piping from Drain Pans: ASTM C547 fibrous glass insulation, minimum density of 3 pcf, with a factory-applied vapor barrier jacket; or ASTM C591 polyurethane or polyisocyanate insulation with a vapor barrier jacket. For chilled water piping and chilled-hot water piping, the ends of pipe insulation and the space between the ends of pipe insulation and the piping shall be sealed off with waterproof vapor barrier coating at and around valves, fittings, flanges, unions, and in pipe runs at intervals not to exceed 15 feet.

3.4.1.1 Hot Water, and Hot Domestic Water Piping: Pipe sizes less than 3 inches shall have minimum of one inch thick fibrous glass insulation or minimum of 0.75 inch thick polyurethane or polyisocyanate insulation, except recirculating hot domestic water piping loop shall have minimum of 1.5 inch thick fibrous glass insulation or minimum of one inch thick polyurethane or polyisocyanate insulation. Pipe sizes of 3 and 4 inches shall have minimum of 1.5 inch thick fibrous glass insulation or minimum of one inch thick polyurethane or polyisocyanate insulation. Pipe sizes 5 inches and larger shall have minimum of 2 inch thick fibrous glass insulation or 1.5 inches polyurethane or polyisocyanate insulation.

3.4.1.2 Cold Drain Piping: Pipe shall have minimum of one inch thick fibrous glass insulation or minimum of 0.75 inch polyurethane or polyisocyanate insulation. Do not insulate cold drain piping in crawl spaces or exposed to the weather.

3.4.1.3 Cold Domestic Water Piping: Provide piping above suspended ceiling with insulation and where indicated. Insulation shall be as specified for hot domestic water piping.

3.4.1.4 Concealed Domestic Water Supply Piping to Shower Heads: Provide piping with insulation as specified for hot domestic water piping. Insulate only where piping is subject to freezing, in outside wall, or in ventilated pipe chase.

3.4.2 Insulation for Refrigerant Suction Piping: ASTM C534 plastic foam insulation, minimum of 0.75 inch thick, seal joints with waterproof vapor barrier adhesive; cover joints with 1.5 inch wide waterproof vapor barrier tape. Provide plastic foam insulation with two coats of white exterior acrylic emulsion paint.

3.4.3 Insulation for Steam and Condensate Piping: ASTM C547 fibrous glass insulation, minimum density of 3 pcf. Minimum thickness of fibrous glass pipe insulation exposed to the weather shall be one inch greater than minimum thickness in the following table.

MINIMUM THICKNESS OF FIBROUS GLASS PIPING INSULATION (INCHES)
(NOT EXPOSED TO WEATHER)

Maximum Temperature Degrees F	Nominal Pipe Sizes (Inches)				
	Up to 1.25	1.5 to 2.5	3 to 4	5 to 6	8 and larger
Up to 299	1	1.5	2	2.5	3
300 to 499	1.5	2.5	3	3.5	4
Condensate	1	1	1.5	2	2

3.4.4 Insulation Covering Not Exposed to the Weather: Provide piping insulation, except for plastic foam insulation, with manufacturer's standard fire-retardant vapor barrier jacket. Except for steam piping, Contractor may use one piece premolded polyvinylchloride fitting covers with fibrous glass insulation inserts of same thickness as pipe insulation.

3.5 FIELD INSPECTIONS: Visually inspect the insulation installation of all mechanical systems to ensure that materials conform to requirements specified herein.

*** END OF SECTION ***