TOWN OF ANDOVER

36 BARTLET STREET
ANDOVER, MA 01810

Prepared by:

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Andover, MA

Town of Andover
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Piping Insulation Bid Specifications

SECTION #1
PROJECT INFORMATION

PART 1 GENERAL

1.01 PROJECT IDENTIFICATION

A. The Owner, hereinafter referred to as Owner: Town of Andover

B. Owner's Project Manager: Theresa Peznola
   1. Address: 36 Bartlet Street.
   2. City, State, Zip: Andover, MA 01810.

1.02 NOTICE TO PROSPECTIVE BIDDERS

A. These documents constitute an Invitation to Bid to General Contractors for the construction of the project described below.

1.03 PROJECT DESCRIPTION

A. Summary Project Description:

1. The intent is to provide the Town of Andover with an insulation cost per linear foot based on nominal pipe diameter and service (HW, CHW, Steam, Condensate, DHW) for selected projects to be distributed over the next three years.
2. The cost per linear foot is to include all incentives, material cost, overhead, labor, and profit.
3. Insulate piping in accordance with the Section #6 (Identification of Piping) and Section #7 (Piping Insulation).

1.04 PROCUREMENT TIMETABLE

A. The Owner reserves the right to change the schedule or terminate the entire procurement process at any time.

END OF SECTION

SECTION #2

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END OF SECTION

SECTION #3
INSTRUCTIONS TO BIDDERS

SUMMARY

1.01 DOCUMENT INCLUDES

A. Invitation
   1. Intent

B. Site Assessment
   1. Optional Site Examination

C. Bid Submission
   1. Submission Procedure
   2. Bid Ineligibility

SITE ASSESSMENT

2.01 SITE EXAMINATION

A. The contractor may examine a sample project site before submitting a bid.

B. The bidder is required to contact the Town of Andover Purchasing Office at the following address and phone number in order to arrange a date and time to visit a sample project site: Phone #: (978) 623-8951; Address: 36 Bartlet Street, Andover, MA 01810.

BID SUBMISSION

3.01 SUBMISSION PROCEDURE

A. Bidders shall be solely responsible for the delivery of their bids in the manner and time prescribed.

B. Submit one copy of the executed offer on the Bid Forms provided, signed and sealed in a closed opaque envelope, clearly identified with bidder's name, and Owner's name on the outside to Theresa Peznola at the Town of Andover Purchasing Department located at 36 Bartlet Street, Andover, MA 01810.

3.02 BID INELIGIBILITY

A. Bids that are unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind, may at the discretion of the Owner, be declared unacceptable.

BID ENCLOSURES/REQUIREMENTS

4.01 BID FORM REQUIREMENTS

A. Complete all requested information in the Bid Form.

4.02 BID FORM SIGNATURE

A. The Bid Form shall be signed by the bidder in the presence of a witness who will also sign.

OFFER ACCEPTANCE/REJECTION

5.01 DURATION OF OFFER

A. Bids shall remain open to acceptance and shall be irrevocable for a period of three years after the bid closing date.

5.02 ACCEPTANCE OF OFFER

A. Owner reserves the right to accept or reject any or all offers.

B. After acceptance by Owner, Engineer on behalf of Owner, will issue to the successful bidder, a written Bid Acceptance.

END OF SECTION

SECTION #4

BID FORM

THE PROJECT AND THE PARTIES

1.01 TO:

A. Owner

Town of Andover
Purchasing Department
36 Bartlet Street
Andover, MA 01810

1.02 DATE:_____(BIDDER TO ENTER DATE)

1.03 SUBMITTED BY: (BIDDER TO ENTER NAME AND ADDRESS)

A. Bidder's Full Name _____
   1. Address _____
   2. City, State, Zip_____

1.04 OFFER

B. Installing contractor responsible to apply for all available utility incentives, and to perform all calculations and necessary work to complete such applications.

C. The utility incentive is to be built into price. Installing contractor to retain all utility incentives.

D. The town of Andover is tax exempt. No pass-through taxes are to be included.

E. No Allowances, contingencies or expenses are to be included in the Bid Sum.

1.06 CONTRACT TIME

A. Complete the Work in two calendar weeks from Notice to Proceed.

1.07 BID FORM SUPPLEMENTS

A. The following Supplements are attached to this Bid Form and are considered an integral part of this Bid Form:
   1. Section #5 - Unit Prices Form: Include a listing of unit prices specifically requested by the Contract Documents.

1.08 BID FORM SIGNATURE(S)

A. The Corporate Seal of

B. _____

C. (Bidder - print the full name of your firm)

D. was hereunto affixed in the presence of:

E. _____

F. (Authorized signing officer, Title)

G. (Seal)

H. _____

I. (Authorized signing officer, Title)

1.09 IF THE BID IS A JOINT VENTURE OR PARTNERSHIP, ADD ADDITIONAL FORMS OF EXECUTION FOR EACH MEMBER OF THE JOINT VENTURE IN THE APPROPRIATE FORM OR FORMS AS ABOVE.

END OF BID FORM

SECTION #5

UNIT PRICES FORM

PARTICULARS

1.01 THE FOLLOWING IS THE LIST OF UNIT PRICES REFERENCED IN THE BID SUBMITTED BY:

1.02 (BIDDER) _____

1.03 TO (OWNER): TOWN OF ANDOVER

1.04 DATED_____AND WHICH IS AN INTEGRAL PART OF THE BID FORM.

UNIT PRICE LIST

Nominal Pipe Diameter	Pipe Service (Steam, Condensate, CHW, HW, DHW)	Cost per Linear Foot ($/LF)	Nominal Pipe Diameter	Pipe Service (Steam, Condensate, CHW, HW, DHW)	Cost per Linear Foot ($/LF)
Up to 1/2"	CHW		Up to 1/2"	HW/Steam Condensate	
3/4"	CHW		3/4"	HW/Steam Condensate	
1"	CHW		1"	HW/Steam Condensate	
1-1/4"	CHW		1-1/4"	HW/Steam Condensate	
1-1/2"	CHW		1-1/2"	HW/Steam Condensate	
2"	CHW		2"	HW/Steam Condensate	
2-1/2"	CHW		2-1/2"	HW/Steam Condensate	
3"	CHW		3"	HW/Steam Condensate	
3-1/2"	CHW		3-1/2"	HW/Steam Condensate	
4"	CHW		4"	HW/Steam Condensate	
6"	CHW		6"	HW/Steam Condensate	
8"	CHW		8"	HW/Steam Condensate	
Up to 1/2"	DHW		3/4"	Steam	
3/4"	DHW		1"	Steam	
1"	DHW		1-1/4"	Steam	
1-1/4"	DHW		1-1/2"	Steam	
1-1/2"	DHW		2"	Steam	
2"	DHW		2-1/2"	Steam	
2-1/2"	DHW		3"	Steam	
3"	DHW		3-1/2"	Steam	
3-1/2"	DHW		4"	Steam	
4"	DHW		6"	Steam	
			8"	Steam	

NOTE: INSULATION COST PER LINEAR FOOT AND TOTAL COST IS TO INCLUDE ALL MATERIAL, OVERHEAD, LABOR, INCENTIVES, AND PROFIT. INSULATION THICKNESS, TYPE, ETC PER SECTION #7, TABLE 3.02 – PIPING INSULATION.

END OF UNIT PRICES FORM

SECTION #6
IDENTIFICATION OF PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe markers.

1.02 REFERENCE STANDARDS

A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2007.

B. ASTM D709 - Standard Specification for Laminated Thermosetting Materials; 2013.

1.03 SUBMITTALS

A. List: Submit list of wording, symbols, letter size, and color coding for mechanical identification.

B. Manufacturer's Installation Instructions: Indicate special procedures, and installation.

PART 2 PRODUCTS

2.01 IDENTIFICATION APPLICATIONS

A. Piping: Pipe markers.

2.02 PIPE MARKERS

A. Manufacturers:
   1. Brady Corporation: www.bradycorp.com.
   2. Brimar Industries, Inc.: www.pipemarker.com.
   3. Kolbi Pipe Marker Co.: www.kolbipipemarkers.com.
   4. MIFAB, Inc.: www.mifab.com.
   5. Seton Identification Products, a Tricor Company: www.seton.com.
   6. Or Approved Equal.

B. Color: Conform to ASME A13.1.

C. Plastic Pipe Markers: Factory fabricated, flexible, semi- rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.

D. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install plastic pipe markers in accordance with manufacturer's instructions.

END OF SECTION

SECTION #8
PIPING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Piping insulation.

1.02 REFERENCE STANDARDS

A. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2013.

B. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation; 2015.

C. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel; 2008 (Reapproved 2013).

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

E. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2014.

F. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

B. Samples: Submit two samples of any representative size illustrating each insulation type.

C. Manufacturer's Instructions: Indicate installation procedures that ensure acceptable workmanship and installation standards will be achieved.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

1.06 FIELD CONDITIONS

A. Maintain ambient conditions required by manufacturers of each product.

B. Maintain temperature before, during, and after installation for minimum of 24 hours.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 GLASS FIBER

A. Manufacturers:
   1. CertainTeed Corporation: www.certainteed.com.
   2. Johns Manville Corporation: www.jm.com.
   3. Knauf Insulation: www.knaufinsulation.com.
   4. Owens Corning Corporation; Fiberglas Pipe Insulation ASJ: www.ocbuildingspec.com.
   5. Owens Corning Corporation; VaporWick Pipe Insulation: www.ocbuildingspec.com.
   6. Or approved equal.

B. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible. (For use on Steam, Condensate Piping, and Hot Water Piping)

1. 'K' ('Ksi') Value: ASTM C177, 0.24 at 75 degrees F (0.035 at 24 degrees C).
2. Maximum Service Temperature: 850 degrees F (454 degrees C).
3. Maximum Moisture Absorption: 0.2 percent by volume.
4. No asbestos containing material.

C. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible, with wicking material to transport condensed water to the outside of the system for evaporation to the atmosphere. (For use on Chilled Water Piping)
1. 'K' ('Ksi') Value: ASTM C177, 0.23 at 75 degrees F (0.034 at 24 degrees C).
2. Maximum Service Temperature: 220 degrees F (104 degrees C).
3. Maximum Moisture Absorption: 0.2 percent by volume.
4. No asbestos containing material.

D. Vapor Barrier Jacket: White kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm-inches (0.029 ng/Pa s m).

E. Tie Wire: 0.048 inch (1.22 mm) stainless steel with twisted ends on maximum 12 inch (300 mm) centers.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Insulation Thicknesses:

Minimum Pipe Insulation Thickness (in.)							
Fluid Operating Temperature Range (°F) and Usage	Insulation Conductivity		Nominal Pipe Size (in.)				
	Conductivity (Btu-in/(h-ft2-°F))	Mean Temperature Rating, °F	<1	1 to <1-1/2	1-1/2 to <4	4 to <8	≥8
>350 °F	0.32 - 0.34	250	4.5	5.0	5.0	5.0	5.0
251°F - 350°F	0.29 - 0.32	200	3.0	4.0	4.5	4.5	4.5
201°F - 250°F	0.27 - 0.30	150	2.5	2.5	2.5	3.0	3.0
141°F -200°F	0.25 - 0.29	125	1.5	1.5	2.0	2.5	2.0
105°F - 140°F	0.22 -0.28	100	1.0	1.0	1.5	1.5	1.5
104°F - 61°F	NA	NA	NA	NA	NA	NA	NA
60°F - 40°F	0.21 - 0.27	75	0.5	0.5	1.0	1.0	1.0
<40°F	0.20 - 0.26	50	0.5	1.0	1.0	1.0	1.5

C. Install in accordance with NAIMA National Insulation Standards.

D. Exposed Piping: Locate insulation and cover seams in least visible locations.

E. Insulated pipes conveying fluids below ambient temperature; insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.

F. Glass fiber insulated pipes conveying fluids below ambient temperature:

1. Provide vapor barrier jackets, factory-applied or field-applied; secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.

G. For hot piping conveying fluids 140 degrees F (60 degrees C) or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.

H. For hot piping conveying fluids over 140 degrees F (60 degrees C), insulate flanges and unions at equipment.

I. Glass fiber insulated pipes conveying fluids above ambient temperature.
1. Provide standard jackets, with or without vapor barrier, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples.
2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.

J. Inserts and Shields:
1. Application: Piping 1-1/2 inches (40 mm) diameter or larger.
2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
3. Insert location: Between support shield and piping and under the finish jacket.
4. Insert Configuration: Minimum 6 inches (150 mm) long, of same thickness and contour as adjoining insulation; may be factory fabricated.
5. Insert Material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.

K. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet (3 meters) above finished floor): Finish with PVC jacket and fitting covers.

L. Exterior Applications: Provide vapor barrier jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor barrier cement. Cover with aluminum jacket with seams located on bottom side of horizontal piping. Provide two coats of UV resistant finish for flexible elastomeric cellular insulation without jacketing.

M. Buried Piping: Provide factory fabricated assembly with inner all-purpose service jacket with self-sealing lap, and asphalt impregnated open mesh glass fabric, with one mil (0.025 mm) thick aluminum foil sandwiched between three layers of bituminous compound; outer surface faced with a polyester film.

N. Heat Traced Piping: Insulate fittings, joints, and valves with insulation of like material, thickness, and finish as adjoining pipe. Size large enough to enclose pipe and heat tracer. Cover with aluminum jacket with seams located on bottom side of horizontal piping.

END OF SECTION