Basis of Design

This section applies to the thermal insulation of piping, ductwork and associated mechanical equipment.

Design Criteria

- In project scope of work, include re-insulation of any remaining pipes that will be uncovered during asbestos abatement.
- Address any insulation of exterior ductwork or piping thoroughly in the specifications to offer permanent protection from weather. Address any exterior duct and piping insulation explicitly in the specifications.
- Make clear at an early phase in the design which portions of the ductwork are to be lined, so that this information can be reviewed by Engineering Services.
- Minimize use of fiberglass insulation exposed to airstream. fiberglass duct liner use should be minimized, and air velocity should be kept to a maximum of 1000 fpm. Ensure insulation specified includes a coating exposed to the airstream such that fiberglass fibers will not degrade and enter the airstream.
- Specify insulation that does not promote or provide a source for mold growth in areas of high humidity (i.e. Outdoor air intakes, shower rooms, etc.)

Design Evaluation

The following information is required to evaluate the design:

- Construction Document Phase: Provide standard industry submittal requirements.

Products, Material and Equipment

Ducts and Piping

- Insulation of ducts and pipes within an outside air plenum or air handler: Use only materials that will not support mold growth in the presence of moisture. This restriction applies to insulation, jackets, adhesives, and any other components of the insulation system. Discuss with Engineering Services.

Piping

- Removable insulation pads: Provide woven fiberglass jacketing around fiberglass batt insulation, to be attached by stainless steel wire and lacing hooks or Velcro. Use insulation no less than 2 inches thick in removal insulation pads. (The term “pad” is used here because the term “jacket” already has another meaning with regard to insulation systems.)
- Coordinate selection of insulation and insulation jacket for compatibility with mechanical identification products.
- Pipe insulation metal jackets: Provide uniformly ribbed, 0.01-inch minimum-thickness metallic casing with a vapor barrier lining.
- Insulation for steam and condensate piping in tunnels shall be suitable for the temperature with no off-gassing or binder oxidation occurring near the pipe’s operating temperature. Fiberglass insulation shall not be used on tunnel steam and condensate piping.
- Insulation for CCW piping in tunnels shall be cellular glass or polyisocyanurate.
- Insulation on refrigerant piping shall be closed cell foam.
Installation, Fabrication and Construction

- Do not insulate ducts and pipes until the corresponding system has passed the required static pressure tests.
- Do not insulate over valve handles, test ports, etc.
- At no extra cost to the Owner, remove and replace any piping or duct insulation that gets wet, dirty, or moldy before the system is turned over to the Owner.
- Remove ripped or otherwise damaged insulation and replace at no extra cost to the Owner. Dented jackets shall be repaired or replaced.
- Do not leave any raw fiberglass fibers exposed.
- Coordinate with other trades to assure there is adequate clearance for uncompressed insulation to the levels specified for pipes and ductwork.

Piping

- Provide continuous piping and plumbing insulation through all types of hangers. Insulate around piping anchors and supports.
- Provide high-density inserts or saddles for pipes through hangers. Provide shields to protect insulation at all hangers. Do not use "Foamglas" for high pressure steam.
- Provide insulation and a vapor barrier jacket on all components of refrigerant suction piping, chilled water distribution systems, condenser water distribution systems with waterside economizers, rainwater leaders inside the building, domestic and lab cold water pipes, chilled water coil condensate piping, make-up water piping, and any other water distribution system carrying water at less than 55°F.
- Fully insulate chilled water pumps with removable insulation pads.
- Fully insulate condenser water pumps with removable insulation pads where subject to condensation when used with waterside economizers.
- Provide insulation at valves and fittings that is of equal thickness to insulation on the pipes.
- In mechanical rooms, provide removable insulation pads for all valves on systems with insulated piping. On actuated valves outside the mechanical rooms, provide either removable insulation pads or removable insulation enclosed in the transport packing by the valve manufacturer to serve also as insulation.
- Provide metal jackets for all new piping insulation in the campus utility tunnels, any piping insulation located in outside air intakes, building plenums, and on all piping insulation less than 8 feet above the finished floor in mechanical rooms.

Ductwork

- Conform to the current “SMACNA Duct Construction Standards”.

END OF DESIGN GUIDE SECTION