EE 19:
INSULATE PIPES EXPOSED
DURING CONSTRUCTION

New York City Building Code
Proposal developed by the Energy & Ventilation Committee.

Summary

Issue:
Pipe insulation is a cost-effective measure to improve energy efficiency. While it is required for new construction, most pipes in existing buildings lack this beneficial insulation.

Recommendation:
Require that all pipes exposed during renovations be insulated.

Proposed Legislation, Rule or Study

Amendments to the New York City Building Code

1. Add a new Section 1303 as follows:

SECTION BC 1303
INSULATION OF EXISTING PIPING DURING CONSTRUCTION

1303.1 Piping insulation during construction. Except as noted below, any existing pipe for water distribution, heating, or cooling concealed in a wall, floor, ceiling, or chase that is exposed in the course of repair or renovation shall be insulated to the levels specified in ANSI/ASHRAE/IESNA 90.1 (2007), Table 6.8.3. This requirement shall apply to the entire length of pipe between the top and bottom floor plates of the floor on which the pipe is exposed, and to any further length of pipe that can be directly accessed through the openings exposing the pipe, without removal of existing masonry or other permanent building structures.

Exception. Any pipe used for drainage, venting, or fire suppression or that must be exposed in order to function as intended, including pipes that function as part of a heat delivery system.

Supporting Information

Issue – Expanded
Water pipes of all sorts lack insulation in most New York City buildings constructed before the advent of energy codes. In the case of steam and hot water pipes used for heating, this results in a lack of control and overheating, since the heat is emanating from walls or exposed pipes and cannot be turned off with radiator valves.

Domestic hot water (DHW) pipes, similarly uninsulated, often run in proximity to domestic cold water supply pipes, heating the cold water and draining heat from the hot water. The latter is normally replenished by the recirculation system that ensures adequate DHW at taps far from the boiler. Even if the DHW pipes are isolated in a chase, they lose substantial heat to the surrounding walls, which is either uncontrolled heat during heating season or unwanted heat that must be removed by air conditioners during cooling season. Also, insulating hot water pipes can raise water temperature at the tap by 2 to 4°F, allowing for a lower water temperature setting at the boiler.

Finally, cold water pipes, either for domestic cold water or, far less often, for air conditioning, must be insulated to prevent the accumulation of condensate from natural humidity (“sweating”) during warm weather.

Insulating pipes that are embedded in walls is an expensive and disruptive task, and is normally not worth doing on the basis of expected savings if the walls must be opened. However, if the walls are open for other reasons, the cost of insulation is so low that it is currently installed by many responsible contractors and building operators. This proposal seeks to make this practice universal.

Environmental & Health Benefits
Benefits include fuel saved by not wasting heat in heating and DHW systems and associated reduced air pollution. Also, elimination of condensation on cold pipes reduces moisture in walls, inhibiting the growth of molds and other pests.

This was found to have a low, positive environmental impact per building and to impact a large number of buildings. It was thus given an environmental score of 2.

This proposal was found to have a positive, indirect health impact.

**Cost & Savings**

As described in the Executive Summary, Bovis Lend Lease prepared cost estimates for each Task Force proposal in the context of well-defined construction projects in specific buildings. Where possible, members of the Technical Committees prepared savings estimates for some of these projects and buildings. These cost and savings estimates are presented in the February 1\textsuperscript{st} draft version of Appendix A. The innate uncertainty in how construction and operation will vary from one building to another, the complexity of the Task Force proposals, and the wide range of applications in which the proposals may be realized mean these figures are truly estimates.

This proposal was estimated to increase first capital costs by 0.2% to 1.4%, depending on building type. It was thus categorized as incurring a medium to higher capital cost increment. This proposal was also estimated to generate financial savings that will pay for the capital costs in less than three years.

**Precedents**

There are no known precedents for this proposal. However, insulation guidelines are addressed in ANSI/ASHRAE/IESNA Standard 90.1. ASHRAE has also issued Advanced Energy Guidelines for Small Office Buildings.\(^1\)

See also International Plumbing Code (IPC) and International Building Code (IBC); IBC section 719, Thermal and Sound-Insulating Materials, has several sections that deal with insulating materials.

**LEED**

For an existing building filing under the LEED EB rating system, there are no LEED credits directly affiliated with this proposal. LEED EB references Energy Star criteria. However, if the building type is not addressed by ENERGY STAR, the team may provide calculations showing equivalent EPA ENERGY STAR rating for the building calculated using the alternate calculation method described in the LEED for Existing Buildings Reference Guide over the performance period. Using this method, the proposed code revision may positively impact compliance with LEED.

The LEED for Homes rating system references Energy Star criteria and does not provide an alternate calculation method. However, this proposal will assist in achieving LEED for Homes EA cr. 5, which requires insulation around distribution pipes in unconditioned spaces as part of a non-ducted HVAC system. Additionally, LEED for Homes EA cr. 7.2 requires that all domestic hot water piping shall be insulated.

If an existing building is seeking LEED certification under any another rating system, the ASHRAE 90.1 2000\textsuperscript{7} standard will be directly applicable for LEED 2009. In this case, the proposal will directly assist in meeting Energy & Atmosphere prerequisites, and EA credits for Optimizing Energy Performance.

**Implementation & Market Availability**

There are no known implementation issues for this proposal. Insulation materials are readily available.

---