



PLUMBING RELATED DESIGN CONSIDERATIONS FOR COLD WEATHER

For a period of a few days, a hand full of states suffered the consequences of not having appropriate installation of plumbing piping, components, and equipment.

For the state of Texas, in addition to this unusual extreme weather pattern, the lack of power was an additional crisis factor to a situation that was rapidly getting worst by the minute. The lack of electric heat, and exposed plumbing systems left too many families with costly water damages.

How can we improve our plumbing systems to avoid similar situations in the future? Doing the code minimums will not reflect good engineering.

Even when we can not do anything about the power, there are a hand full of improvements that we can include as part of our future designs.

1. **Underground piping shall be installed minimum 3'-0" below grade.** This is done to avoid broken pipes due to ice buildup inside piping. (some of the north states 5'-0" min below grade).
2. **Provide a weather protection enclosure for components above grade like RPZ's and Meters.** Make sure that these boxes are the insulated type, and if the budget allows, to include heating.
3. **All water risers Domestic and Fire protection shall be done inside the building on the interior side of the insulation.** Even when we can not control the use of power, or gas for heating, not being exposed to a cold air draft is a huge advantage.
4. **Provide a drain valve at downstream of water meter assembly at the lowest elevation of pipe system.** This will give the building a point of drainage that will cover most of the building.
5. **Provide a quick connect valved compressed air inlet connection.** Features like this one will give the building a point to evacuate leftover water in pipes by air push it through an open faucet, or hose bibb connection. (This can be done for multiple systems, Domestic water, Fire Protection, Lawn Irrigation, and swimming pools).
6. **Insulate all domestic use water piping and valves.** Consider insulating cold water components as much as hot water and hot water return piping valves and fittings are. The intent is to protect the pipes from freezing not to lose its water temperature.

7. Provide a jacket for water heaters, or water tanks that are installed in mechanical rooms where open drafts are used for fresh air intake. These dampers will be a source of a cold draft, or, if the dampers are motorized, they could be without power and/or had left open.
8. Provide self-drain-frost resistant wall hydrants (hose bibb connections). The devices shall be long enough to have the wet section (valve) inside the heated area of the building. **Note that these devices will not be effective if the hoses are left connected.**
9. Avoid having water piping drops or risers on exterior walls. Even a little crack on the wall that allows an opening as a razor blade will compromise stagnant water inside a pipe. In cases where this situation can not be avoided drop/rise pipes on the heated side of the building.
10. Avoid downspouts outlets near walking paths. Rain and melting snow that may turn into ice (black ice) due to fidgety winds making sidewalks extremely slippery.
11. Avoid the use of architectural scuppers on roofs. Dripping icicles are a common ice formation at the edge of buildings, putting at risk people walking under them.
12. If the project has commissioning, include a winterizing plan as part of the building manual. The manual shall include extra information indicating the location of drain valves, compressed air inlets, and what needs extra protection.

These are a basic group of plumbing design improvements that can be part of every single project. The cost of these changes is only a fraction in comparison of what would have to be paid for not having them corrected during design.



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