

I believe it was Albert Einstein who used the word 'schlembe' to mean 'an improvement that makes things worse'. This is a schlembe story.

A school division had gone through an energy performance contracting process to reduce energy consumption. This particular school had perimeter wall-fin for heating and a ventilation unit that ran 24/7 through the school year. Among other things, the vent unit was revised to only running when the school was occupied.

The work was done over the summer. When the first cold snap of the year hit, the principal arrived for school Monday morning and it was 2.9 °C in her office. ('Cold snap' here means it's a nice day, you're washing your car and before you finish, your bucket has ice in it.) Calls were made and I was asked to check it out.

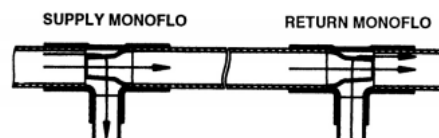
While discussing the problem with the custodian, he told me that it had always been cold in the basement, particularly in his office, which had a small down fed convector.

The heating layout was a one-pipe system with monoflo tees. Monoflo tees add a small pressure drop in the supply pipe to convince some of the water to divert through a low head loss heating zone. They can be installed on the supply, return, or both. Two were usually required if the load was below the main and could 'trap' cold water. In any case, orientation is important.



For terminal units above the main-normal resistance

For terminal units above the main-high resistance



For terminal units below the main

Obviously, the heating system alone couldn't keep the school warm. I found two key problems. Some of the monoflo tees were not originally installed correctly and there had been control valves installed in some of the classrooms. The original boilers ran at a constant high temperature, so *overheating* had been an issue in some areas. But the added head loss of the control valves had reduced the flow in those branches and the new boilers were running on a reset schedule. With cooler water, low flow, and no contribution from the vent unit, there wasn't enough heat to keep the school warm with the vent unit off. *Schlembe!*

After the problems were corrected, I got a call from the custodian. He wanted to let me know how happy he was that for the first time he had enough heat in his office. Calls like that make my day.