



Managing domestic hot water circulation to protect piping & save energy

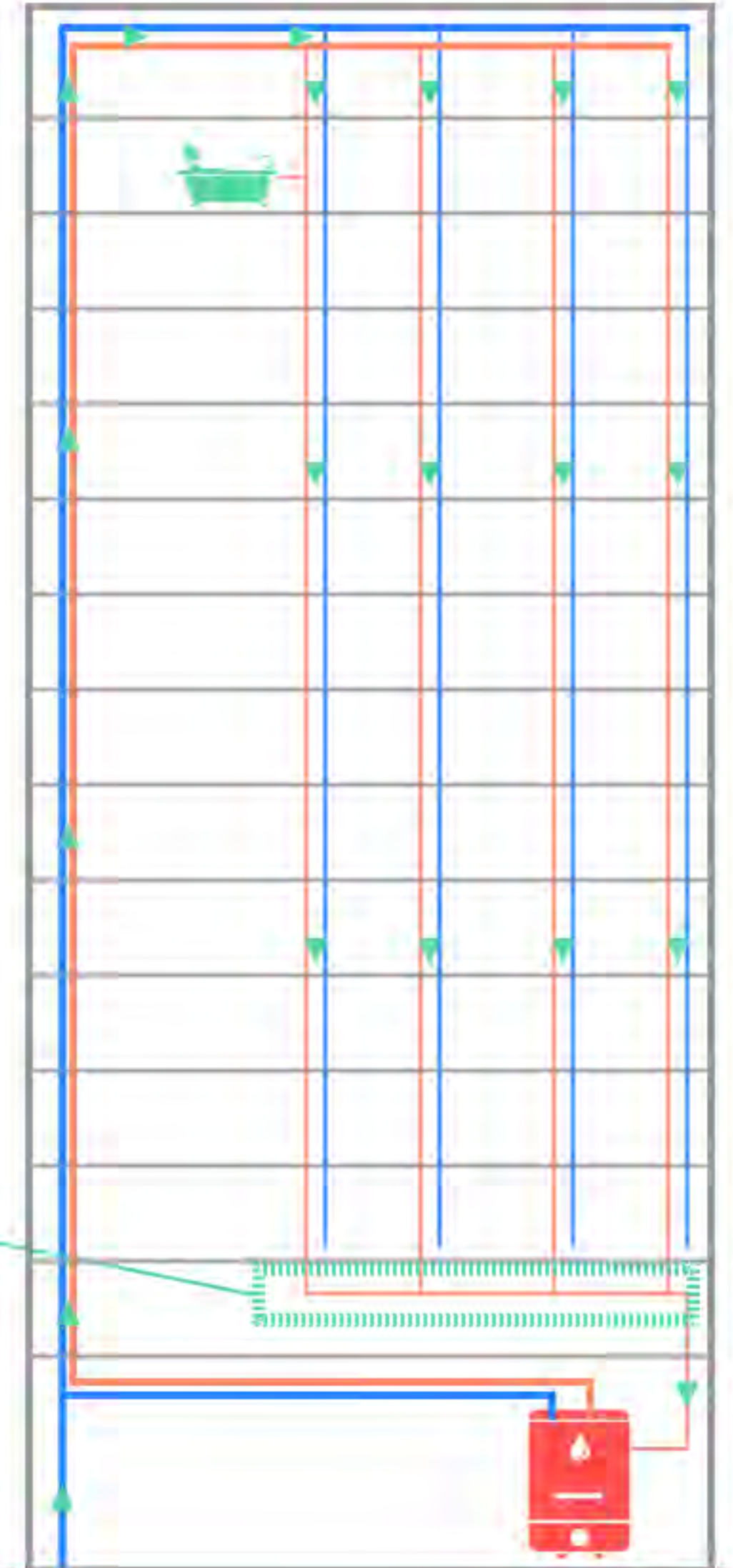
Contributed by: reed water

What is the purpose of a circulation system?

A hot water recirculation system is a plumbing system that moves hot water to fixtures quickly without having to wait for the water to get hot.

Recirculating systems rapidly move water from a boiler, to the fixtures around the building, so residents get hot water at their taps right away.

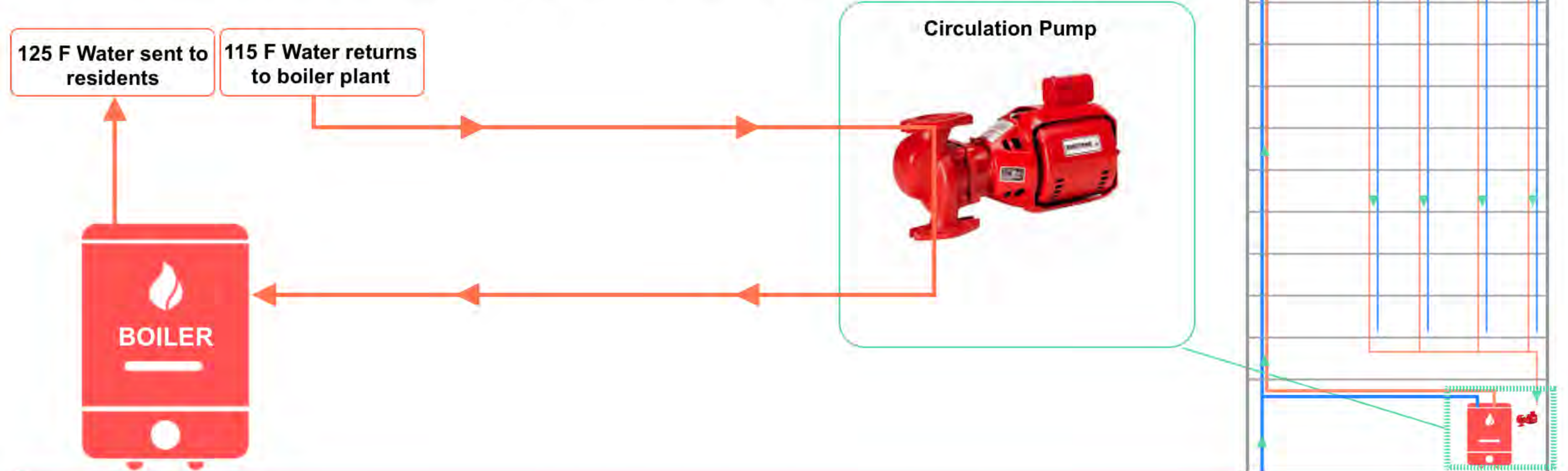
After hot water is produced at the boiler and sent around the building to risers, it is RE-COLLECTED in a "circulation header" and then **travels back to the boiler to be re-heated.**



How is the water circulated?

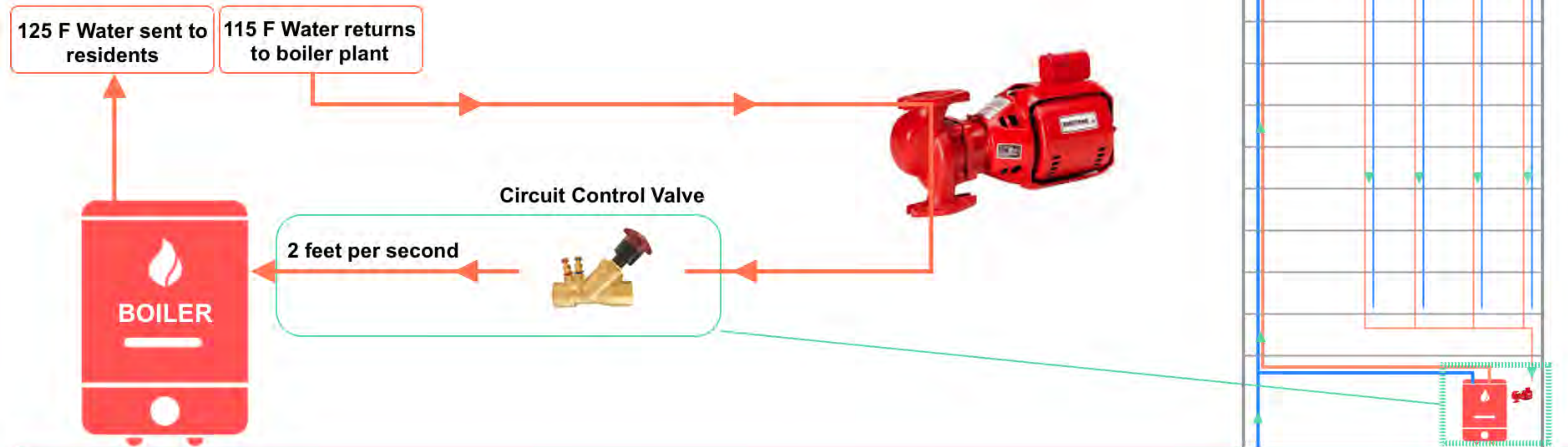
The hot water is circulated through the piping of the building by a **circulation pump**.

It returns to boiler slightly cooler and gets re-heated



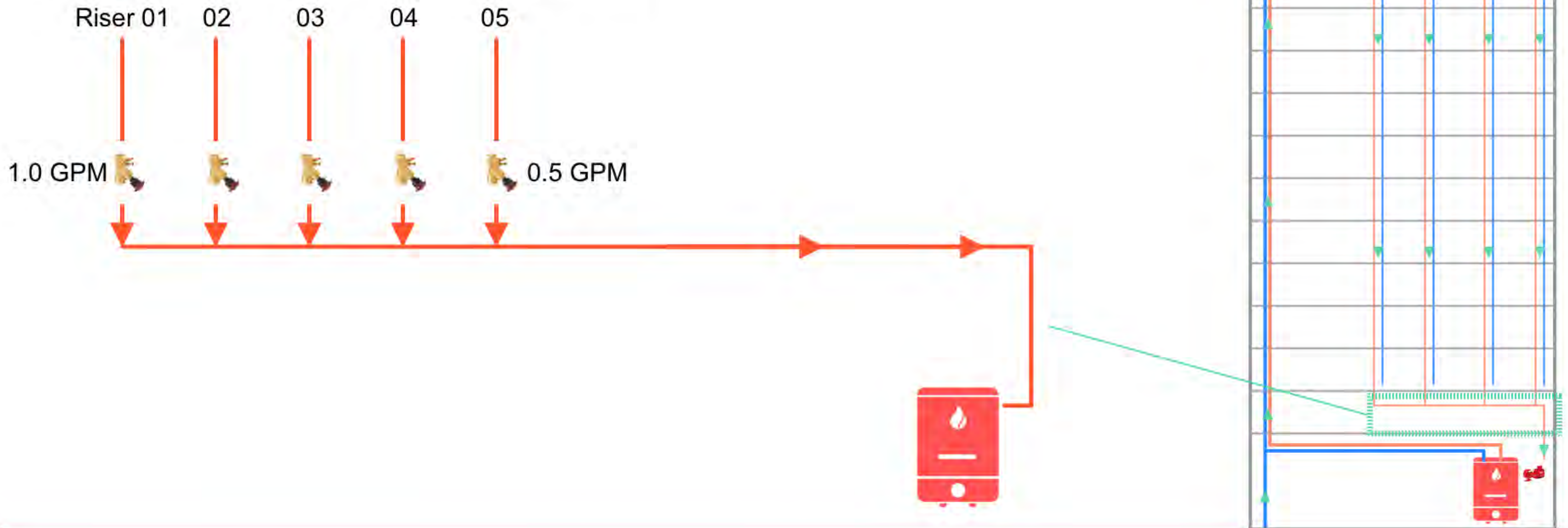
Flow control is important

It is good engineering practice and design, to control the flow of return water to control the velocity at which water travels. High velocity will eat away at piping and increase heat loss, wasting energy



Flow control per riser is best

Even better designed buildings will have a circuit balancing valve on each riser, to control and limit the velocity of water travelling back to the boiler



Benefits:

Save time:

Recirculating systems deliver hot water to faucets quickly, adding convenience for the homeowner.

Conserve water:

According to statistics (USA) between 400 billion and 1.3 trillion gallons of water are wasted nationally by households per year while waiting for water to heat up.

Limit energy waste:

800 to 1,600 kilowatt-hours per year are used to treat and pump the water to households that will eventually be wasted while the occupant waits for tap water to warm to the desired temperature.

Problem:

Condo building's face a major problem. It's often hot water systems are designed by engineers to travel at certain flow rates, using manually operated "circuit balance valves". Shortly after construction and especially in older buildings that don't have these valves, the flow of water is **often travelling at velocities that far exceed manufacturer requirements.**

- Copper / Pex pipe erosion
- Premature pipe failure
- Higher BTU loss
- Pinholes and leaks



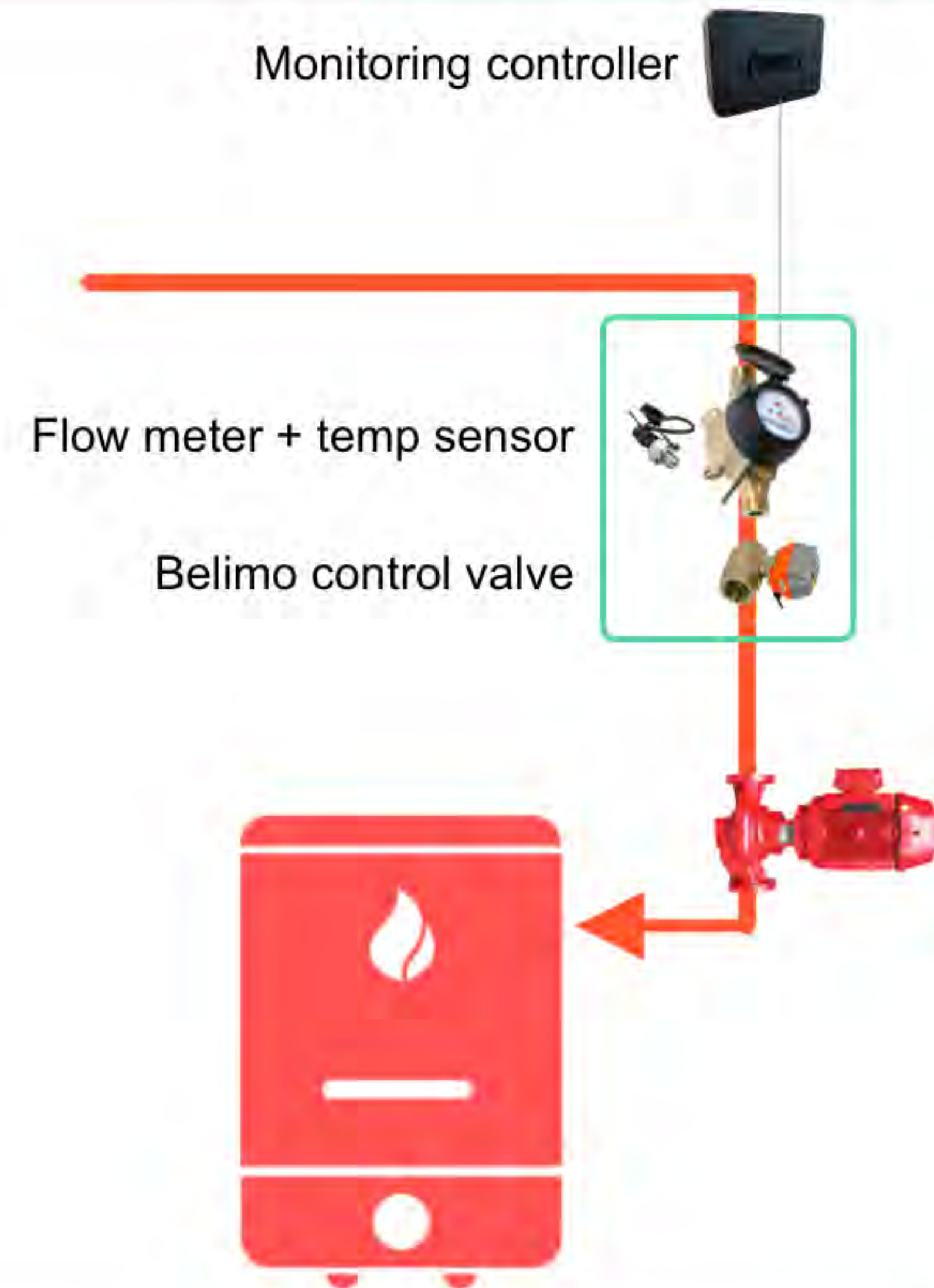
Solutions:

It's difficult to know the current rate of flow on each riser or the total flow back to boiler. The **addition of temperature sensors, flow monitoring and control equipment** can be added to significantly reduce the effects of high water velocity, temperature and pressure. It's very important to understand, control and monitor these three conditions.

Failure to do so, will lead to premature pipe failure (6-8 years, as opposed to 20 years life span of pipe)

Managed Hot Water System Benefits:

- Reduce heat loss (save energy)
- Extend useful life of piping



What is a circulation system?

It is part of the plumbing system that moves water throughout a building to provide hot water quickly

How does it work?

A pump is used to move water around the building

What is flow control?

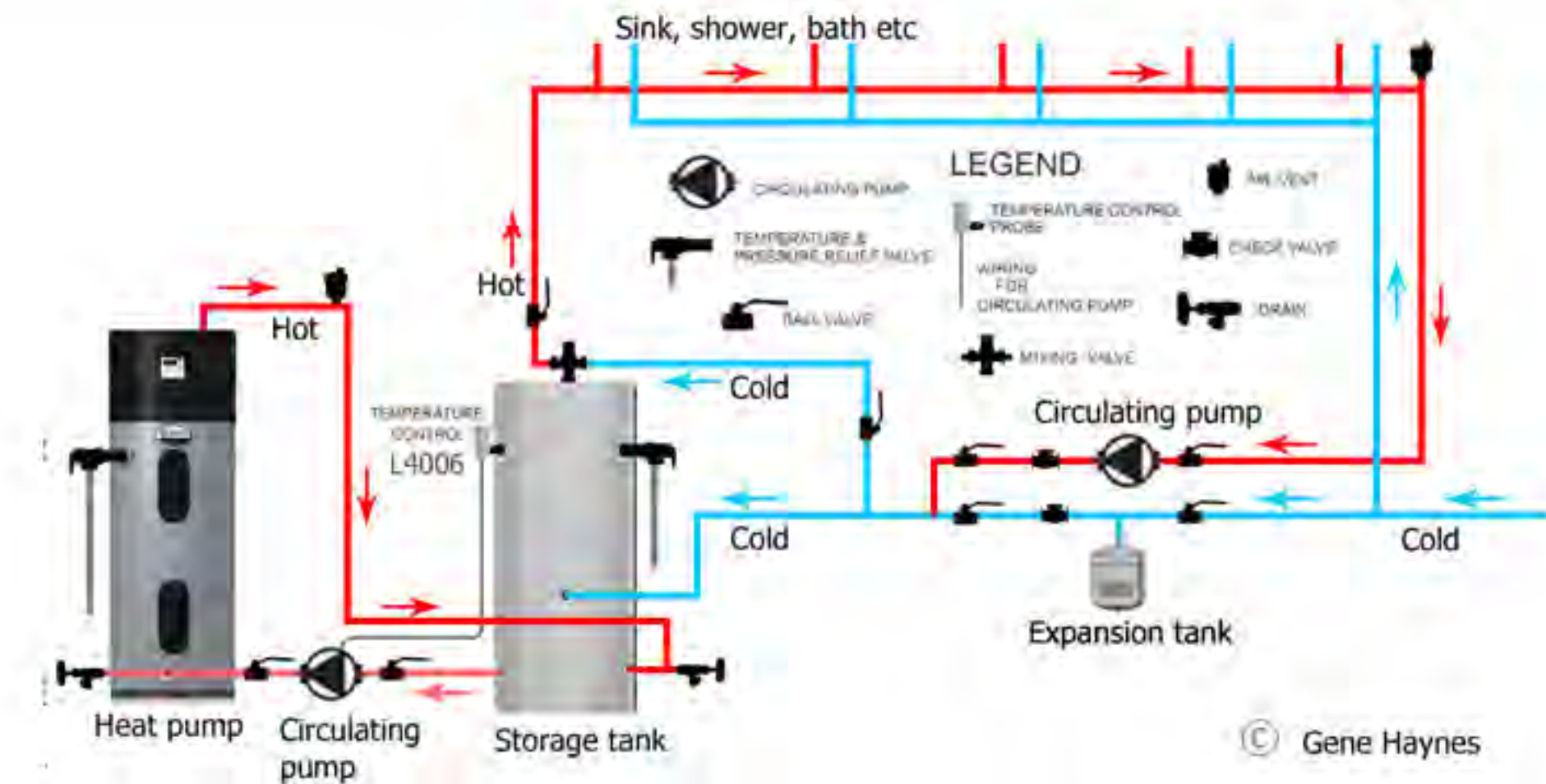
The rate of water flowing is controlled by valves

What if flow is not controlled?

A building wastes energy and allows for pipe erosion

How can it be controlled?

Low cost solutions allow flow rates to be monitored and controlled, saving energy and extending pipe life





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11-91 Fernstaff Court
Concord, ON
416-902-0099
avi@reedwater.io

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