DHW

Didactic materials

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DESCRIPTION

- Didactic material *"DHW systems"* is one of the learning materials for VIPSKILLS students.
- This didactic material consist of theoretical information for lectures and examples of systems.
- The didactic material *"DHW systems"* is written for learning and improving students engineering skills.

DHW

Domestic Hot Water Supply System.

- Hot water for domestic use in buildings is supplied centrally or prepared in house with local heaters or renewable energy sources.
- Heaters could be installed in the central or individual (building) thermal centers of buildings [1, 5, 7, 8].

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The example of hot water supply systems schemes [1, 6, 7, 10]:

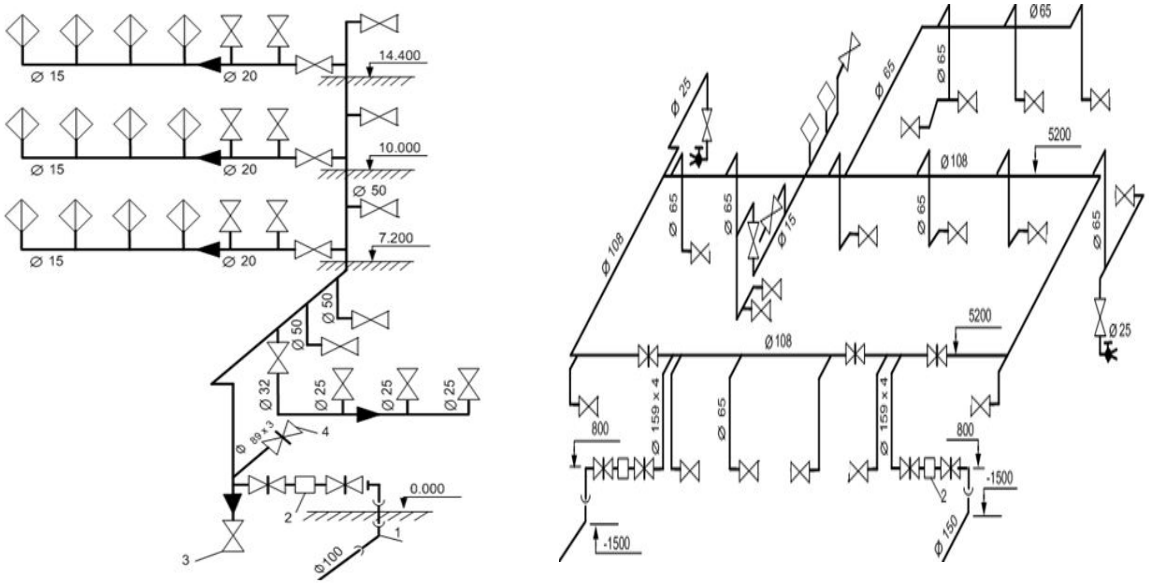

Fig 1. Schema of water systems installation [1,6]

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District heating, hot water heating station, which could be used as a hot water system source in diferent kind of buildings, residential houses, commercial or industrial buildings [2, 7, 8, 9].

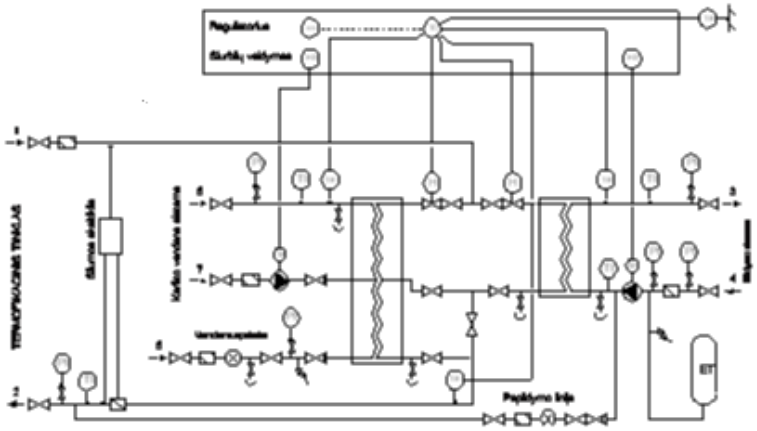

Fig 2. Scheme of water systems source [2, 8, 10]

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Hot water supply systems [1, 6, 7, 8]:

- The system of hot water in the building is a system of pipelines and installations through which cold drinking water is centralized in the building to a preset temperature, including cold water closing valve before the hot water supply unit is supplied to the hot water supply points.

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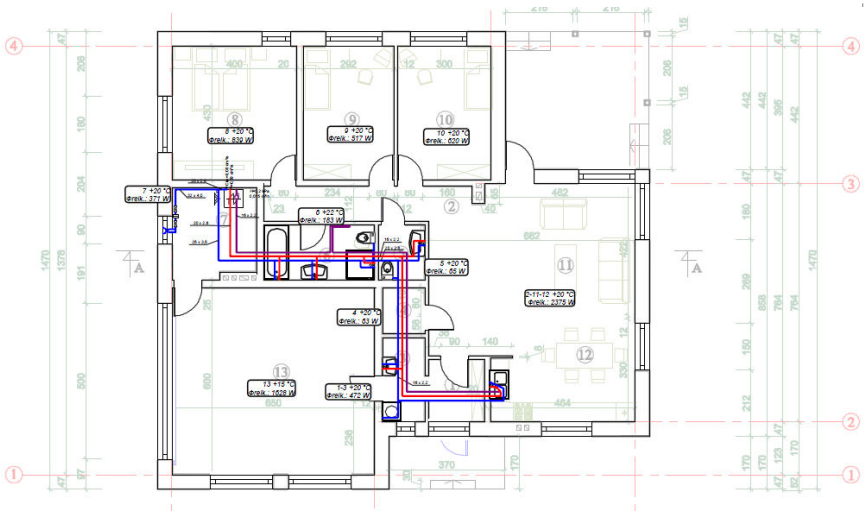
Hot water supply systems of living houses [13]:



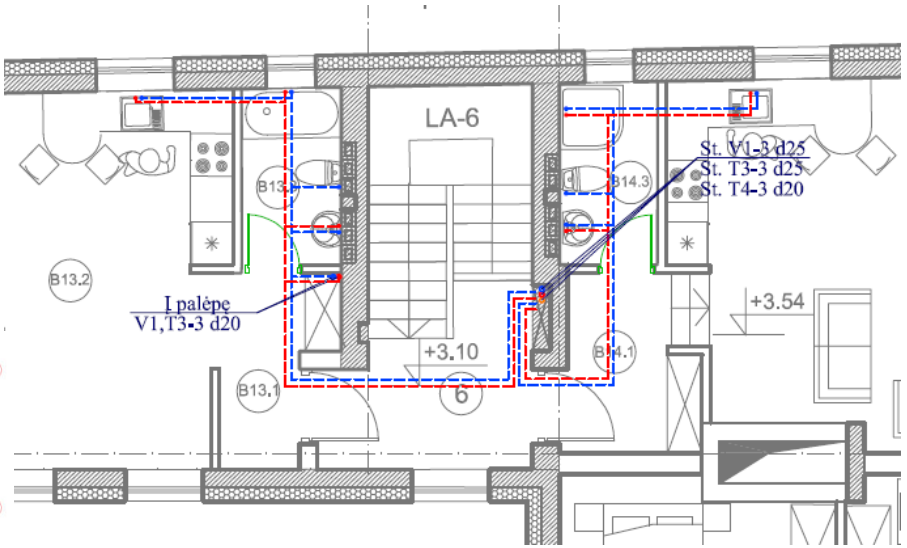


Fig 3. Plans of hot water systems [13]

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Hot water supply systems sources [1, 6, 7, 8] :

- The gas boiler;
- Electric water heaters;
- Combined water heater;
- High-speed water heater;
- Preparation of hot water using the solar energy.

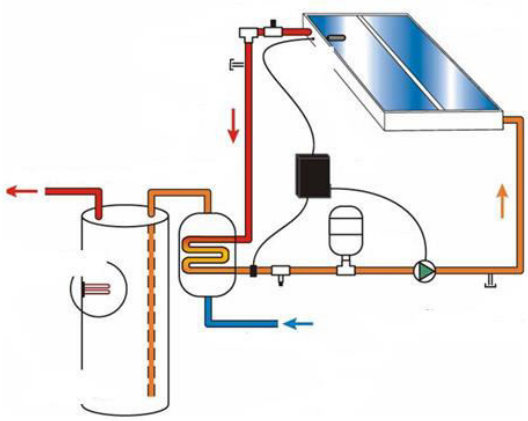

Fig 4. Schema of hot water systems [1,6]

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The water supply systems schemes [6,7]:

- Lower distribution of hot water system.

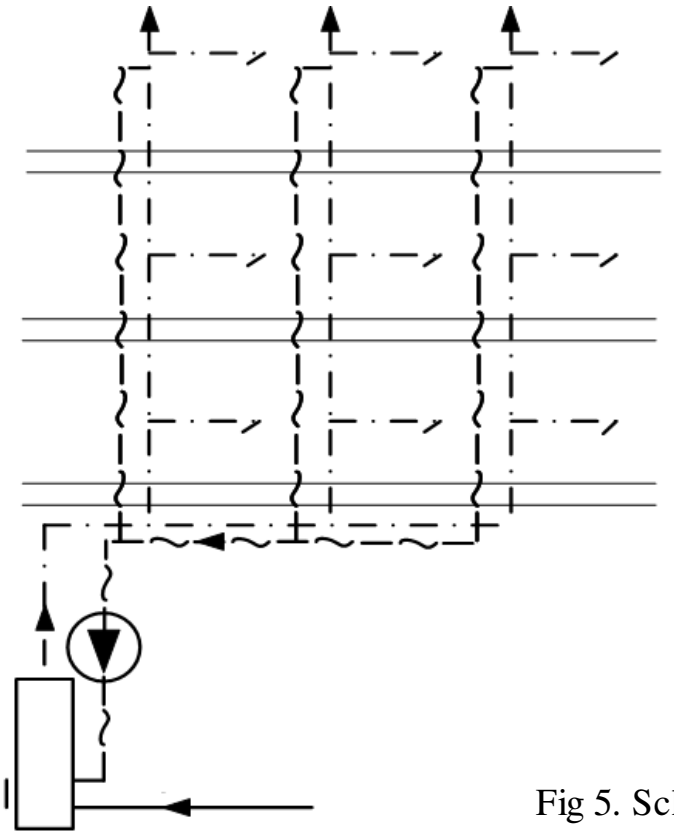

Fig 5. Schema of hot water systems installation [6, 7]

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Hot water supply systems schemes [6, 7]:

- Upper distribution of hot water system.

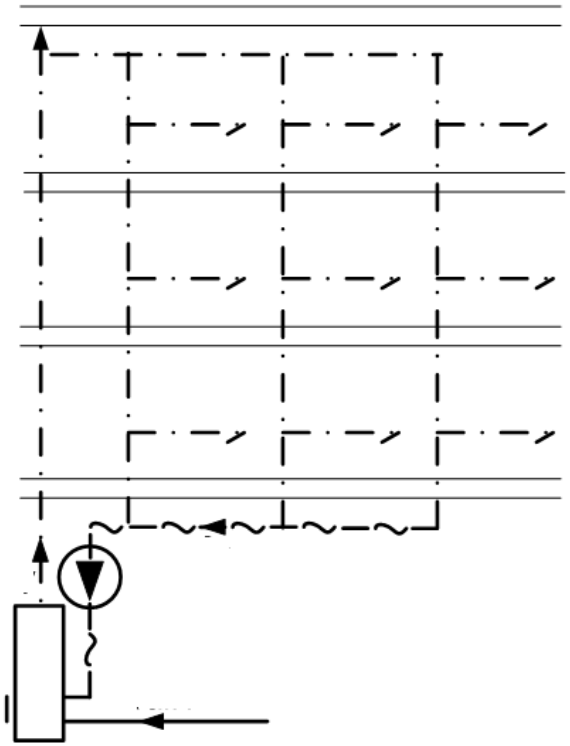

Fig 6. Scheme of hot water systems installation [6,7]

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Hot water supply systems schemes [6,7]:

Not usually, but hot water systems could be completely free from circulators, when water circulates only on the main pipes.

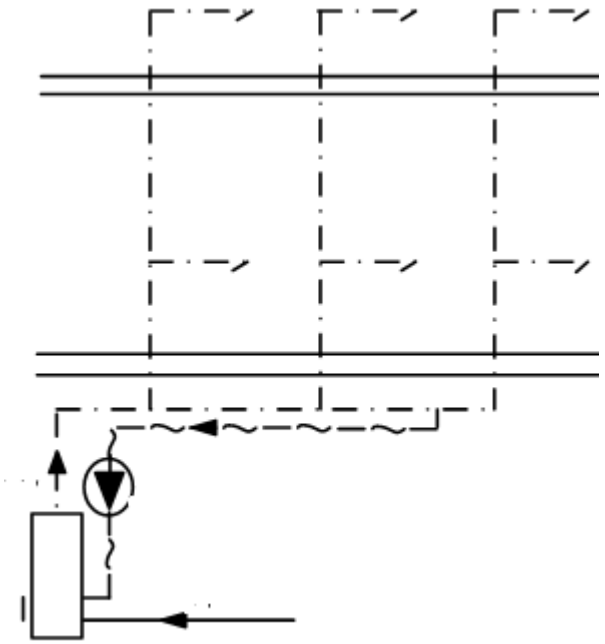

Fig 7. Scheme of hot water systems installation [6,7]

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- The temperature of hot water at the places of use of hot water must be not less than 50 ºC and not higher than 60 ºC, except for cases of legionnaires prevention, as established in Lithuanian hygiene norms [2, 7, 8].

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Water supply systems for one floor house.

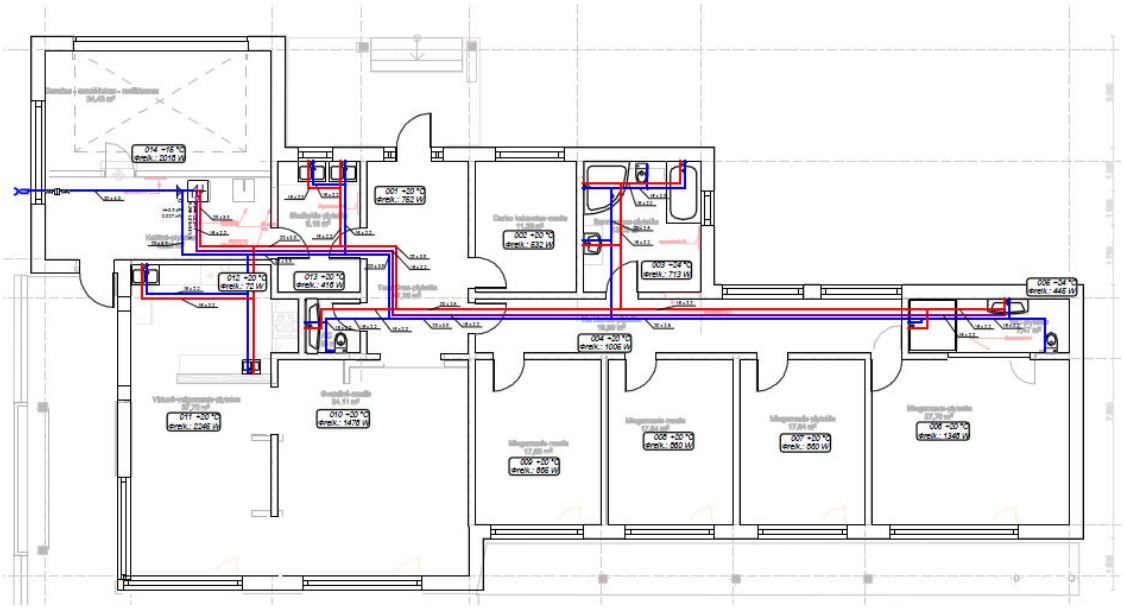

Fig 8. Example of hot water systems installation [13]

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- In children's pre-school establishments, the temperature of the hot water in the wash basin and shower water tap must not be higher than 37 ºC.
- Local hot water heaters must be installed in restaurants and other places where the using hot water temperature is higher [1, 8, 10].

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Hot water supply systems pipes materials [6, 8, 10]:

- Steel pipes;
- Copper pipes;
- Plastic or multilayer pipes.

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Water supply systems for individual house.

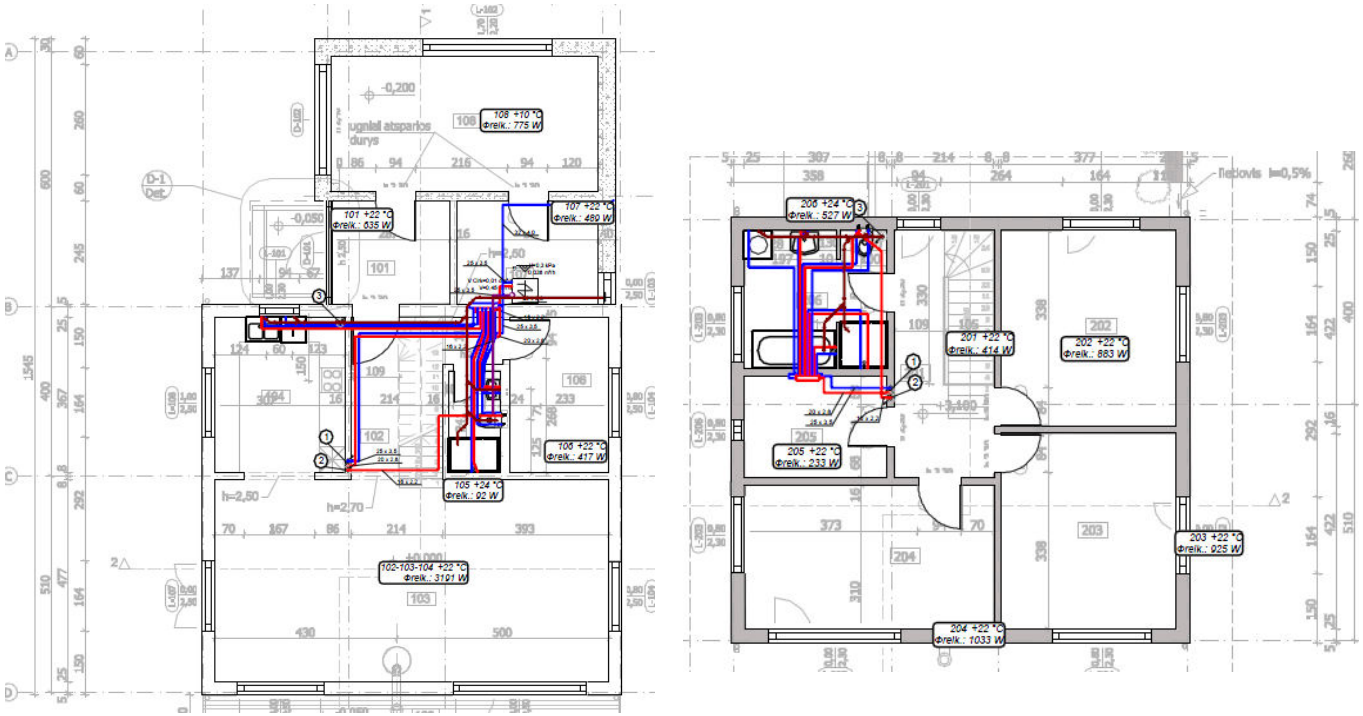

Fig 9. Example of DHW [13]

Hot water system testing [6,10]:

The hot water supply building systems tests are made with the following guidelines:

- Plumbing piping systems tests carried out before the start of the installation finishing.
- Pipe insulation, construction of canals and openings niches performed after loading tested installed pipelines.

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The hot water supply building systems tests are made with the following guidelines [6,10]:

- The system must be filled with water at least 24 hours. to the test pressure.
- Hydraulic test is carried out at the premises of a positive temperature.

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Hot water system testing [6,10]:

- Testing pressure must exceed a critical working pressure of 1.5.
- Filling pipe of water test pressure tested for at least 2 hours, and after that revising connections of the pipes.
- The pressure does not drop more than 0.2 bar.

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Project example [13]: Water supply systems for small family house.

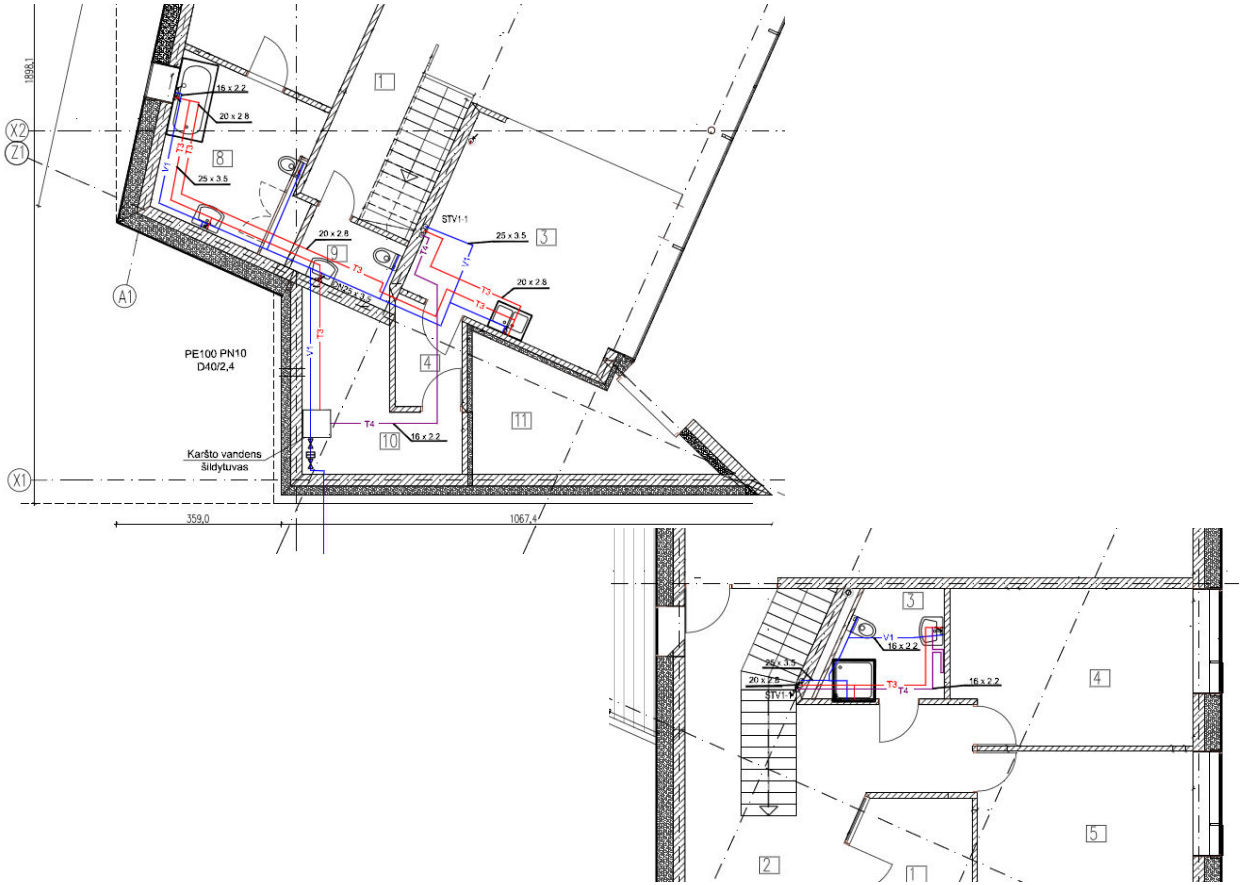

Fig 10. Example of hot water systems installation [13]

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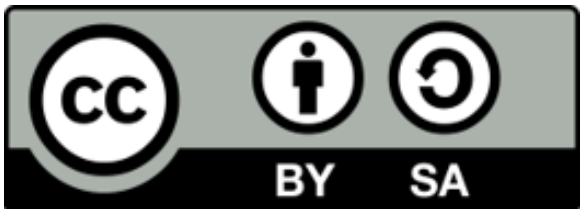

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