

REQUIREMENTS FOR WATER SYSTEMS

Backflow this is the means to allow the flow of water upwards.

Cistern this means a fixed container for holding water at atmospheric pressure.

Combined feed and expansion cistern this means a cistern for supplying cold water to a hot water system without a separate expansion cistern.

Combined temperature and pressure relief valve this means a valve capable of performing the function of both a temperature relief valve and a pressure relief valve.

Contamination this includes any reduction in chemical or biological quality of water due to a change in temperature or the introduction of polluting substances.

Distributing pipe this means any pipe (other than a warning, overflow or flushing pipe) conveying water from a storage cistern, or from hot water apparatus supplied from a cistern and under pressure from that cistern.

Expansion cistern or "expansion vessel" means a cistern or vessel connected to a water heating system which accommodates the increase in volume of water in the system when the water is heated from cold.

Expansion valve this means a pressure-activated valve designed to release expansion water from an unvented water heating system.

Flushing cistern means a cistern provided with valve or device for controlling the discharge of the stored water into a water closet pan or urinal.

Overflow pipe means a pipe from a cistern in which water flows only when the water level in the cistern exceeds a predetermined level.

Pressure relief valve means a pressure-activated valve which opens automatically at a specified pressure to discharge fluid.

Primary circuit means an assembly of water fittings in which water circulates between a boiler or other source of heat and a primary heat exchange inside a hot water storage vessel, and includes any space heating system.

Secondary circuit means an assembly of water fittings in which water circulates in supply pipes or distributing pipes of a hot water storage system.

Secondary system means an assembly of water fittings comprising the cold feed pipe, any hot water storage vessel, water heater and pipework from which hot water is conveyed to all points of draw-off.

Servicing valve means a valve for shutting off for the purpose of maintenance or service the flow of water in a pipe connected to a water fitting.

Stop valve means a valve, other than a servicing valve, used for shutting off the flow of water in a pipe

Storage cistern means a cistern for storing water for subsequent use, not being a flushing cistern.

Temperature relief valve means a valve which opens automatically at a specified temperature to discharge fluid

Terminal fitting means a water outlet device.

Vent pipe means a pipe open to the atmosphere which exposes the system to atmospheric pressure at its boundary.

SITE VISIT



Because there really is no other place to look than your own house I decide I would become aquatinted on how the water gets to all the appliance in my house. For my site visit I am going to look at the route the water will take it goes it goes from the mains to the water meter and then goes directly to the kitchen sink, then to the cistern straight to the storage tank in the attic from the storage tank it will go to each appliance when needed making my water system an indirect water system. The water starts its journey at the mains water supply.

Water
meter
↓

Stop valve
↓



The next stop it will take is the water meter. This is my houses water meter and stop valve are located together. The water meter is used to show how much water the house uses to the council or water supplier. The stop valve is needed to stop the flow of water to the house, this is necessary when a pipe may burst or if the home owner is going away save water from being contaminated in the storage tank and save money or if the water bill wasn't paid the council could turn it off.

Outside tap
↓



kitchen sink
↓



Then the water will go directly to the kitchen sink. In my house the water goes directly to the kitchen sink and the outside tap. There is a stop valve located under the kitchen sink this is necessary if the tap is being changed or fixed.



← Cistern

Then the water will go straight to the cistern located in the attic. From the cistern the water will go to all the different appliances when needed in the home, appliances such as toilets, sink basin, baths and showers.



← Bath

Toilet



Sink



I then went to look at my sister's house that was built two years ago it has the same cold indirect water system yet it has a completely different hot water system, solar power hot water system. This system main source of energy is from the sun.



← Solar panels

The solar panel is placed on the roof it heats the water by the sun the water then goes to through the hot water cylinder. The house also has a different storage tank.



← listeraan
Ballcock



Stop valve →

Copy

Construction room,
Beech Hill College,
Dublin road,
CO. Monaghan,
10-11-15.

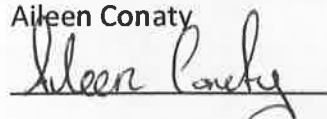
Maurice Graham Ltd,
Armagh road,
Monaghan,
Co. Monaghan,

Dear Sir/madam,

Hello my name is Aileen Conaty and I am currently in sixth year doing my construction project on the indirect hot and cold water system. I know you are a local construction based company. I also know you supply too many construction workers and businesses. I would really appreciate if you would give me any information you may have on water systems in a domestic house.

Yours faithful,

Aileen Conaty

A handwritten signature in cursive script that reads "Aileen Conaty". The signature is written in black ink and is positioned below the printed name "Aileen Conaty".

Copy

Construction room,
Beech Hill College,
Dublin road,
CO. Monaghan,

10-11-15

Heaton Buckley's
Milltown,
Monaghan,
Co Monaghan

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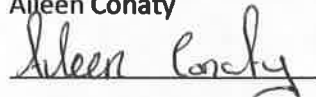
27-11-15

Stillorgan Gas Heating and Plumbing,
Lower Kilmacud road,
Stillorgan,
Co. Dublin.
Dear Manger,

My name is Aileen Conaty I am a sixth year I am doing my construction project on the plumbing in a domestic house I know the company supplies plumbing to many houses and business. I would really appreciate any information you could give me on plumbing in a domestic house.

Yours faithfully,

Aileen Conaty

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Co. Monaghan.

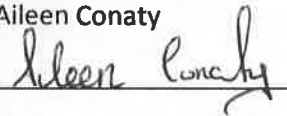
27-11-15

Accent Heating and Plumbing,
Monastery,
Heathgreen Clondalkin,
Dublin 22,
Co. Dublin.
Dear Manger,

My name is Aileen Conaty I am a sixth year I am doing my construction project on the plumbing in a domestic house I know the company supplies plumbing to many houses and business. I would really appreciate any information you could give me on plumbing in a domestic house.

Yours faithfully,

Aileen Conaty



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Copy

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Monaghan,
Co. Monaghan.

27-11-15

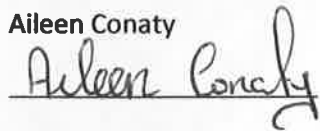
D.D Plumbing and heating Ltd,
8 Avondale road Killney,
Dublin,
Co. Dublin.

Dear Manger,

My name is Aileen Conaty I am a sixth year I am doing my construction project on the plumbing in a domestic house I know the company supplies plumbing to many houses and business. I would really appreciate any information you could give me on plumbing in a domestic house.

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Topic information

SCRÚDUI THE TEASTAIS
OBAR THIONN CABAIL

Direct water system in a bungalow:

- This system comes into the house and goes directly to each appliance not only the kitchen sink. This means sink showers, toilets and washing machines.

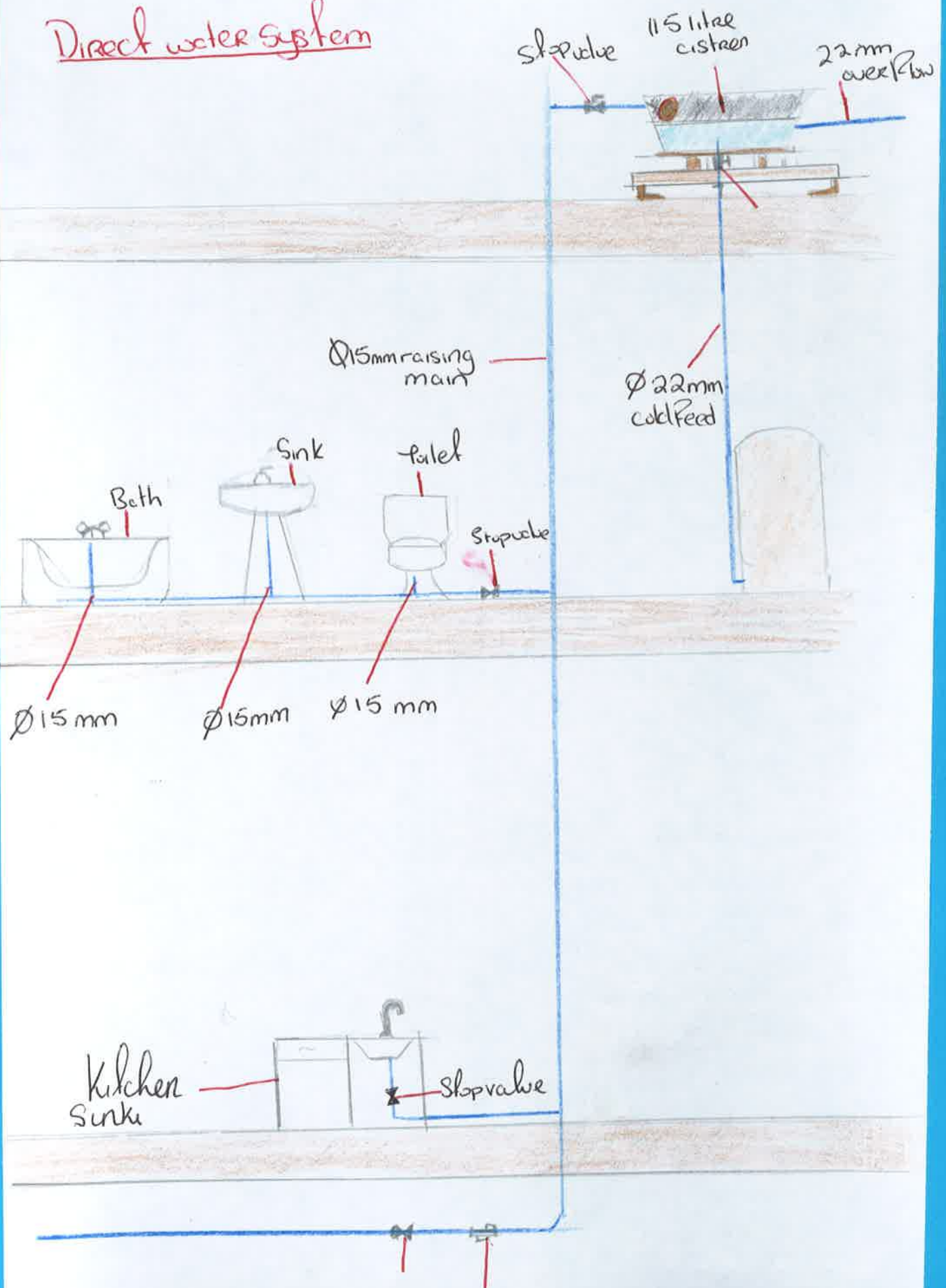
Advantages of the Direct Water System

- Ease of installation as there is less pipework involved
- Low cost to install as there is not as much work involved
- No large storage tank in the attic which allows more space in the attic
- There is drinking water in all the taps
- There is less pipe work in this system as only the pipes need to go to each appliance are used. Less pipe work means that

Disadvantage of the Direct Water System

- There is less available water during peak times of day. Meaning there is an increase pressure on the pipework
- This leads to high failure in this type of system due to the high pressure on the system
- There is no reserve of water available if the water supply in the mains fails.

Direct water system



Indirect water system

- The indirect water system goes directly to the kitchen sink (only appliance this system goes directly to) from the kitchen sink the water will go directly to the cistern in the attic. From the cistern the water will go to all the other appliances when water is needed for all the other appliances e.g. sinks, toilets, baths and showers.

Advantages of indirect cold water system

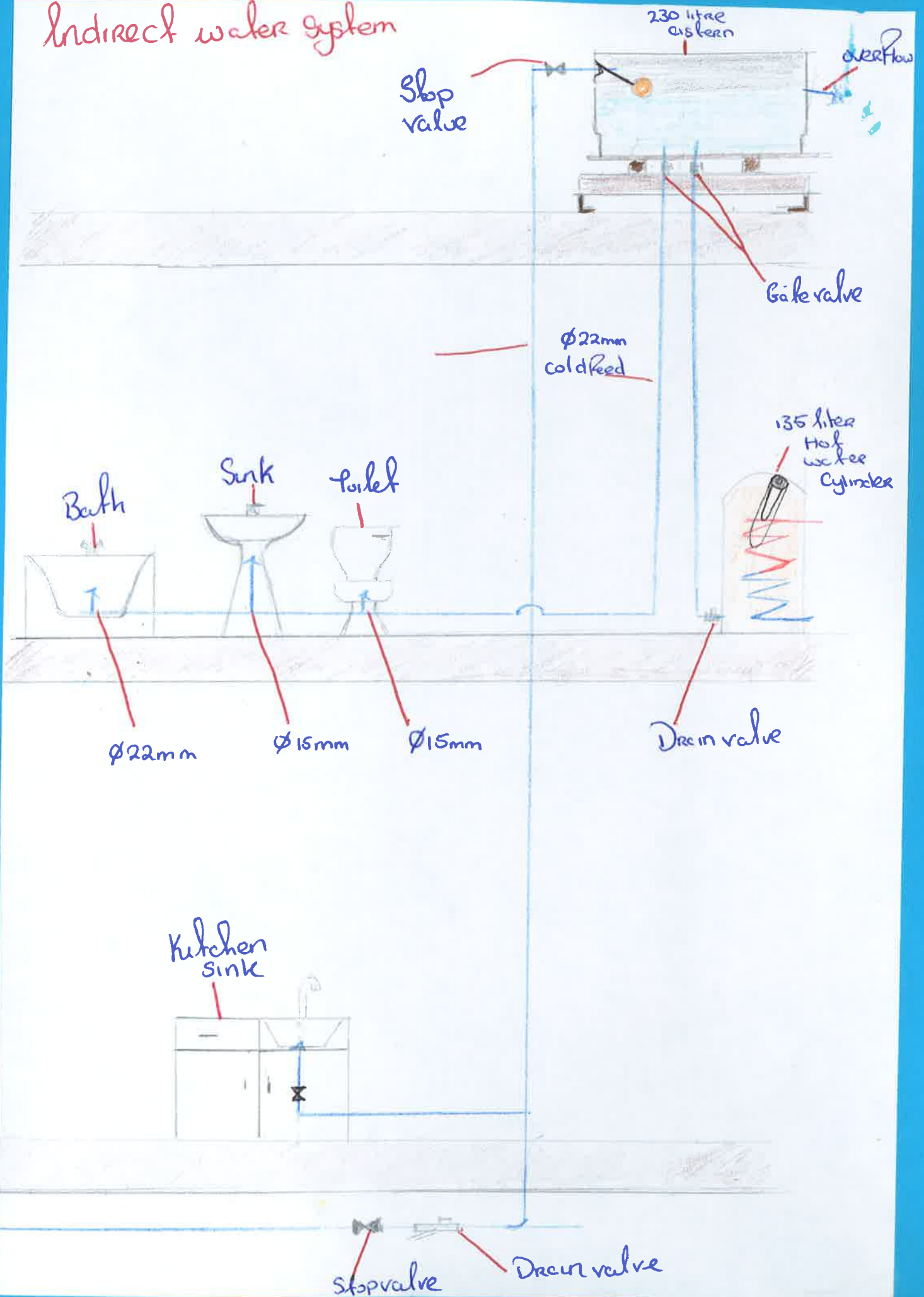
- There is a reserve of water in the cistern if the mains fails good in case of emergency
- Constant pressure on all taps, except the kitchen tap
- Overflow fitting fitted to storage tank to prevent any water damage due to overflow it also prevents any bacteria to develop or the over filling of the tank.
- Reduces the pressure of water at peak types due to the reserves in the attic (cistern).

Disadvantages of indirect cold water system

- Higher cost as there is more pipework involved in the system.

- Large water storage tank needed in the attic which takes up a lot of space for the homeowner.
- Drinking water is only available at the kitchen.

Indirect water system



Hot water systems available

Direct hot water system

In this system cold water is fed from the tank in the tank in the attic into the hot water cylinder. Cold feed also runs from the cylinder to the boiler when the water reaches the boiler it is heated in the hot water cylinder.

The boiler heats the water in the cylinder the hot water is heated at the bottom the hot water rises. The water is taken from the top as it is at its hottest. The hot water is then it is brought back to the hot water cylinder, it is then that more cold water enters the boiler. The hot water then is directly brought to each appliance.

Advantages

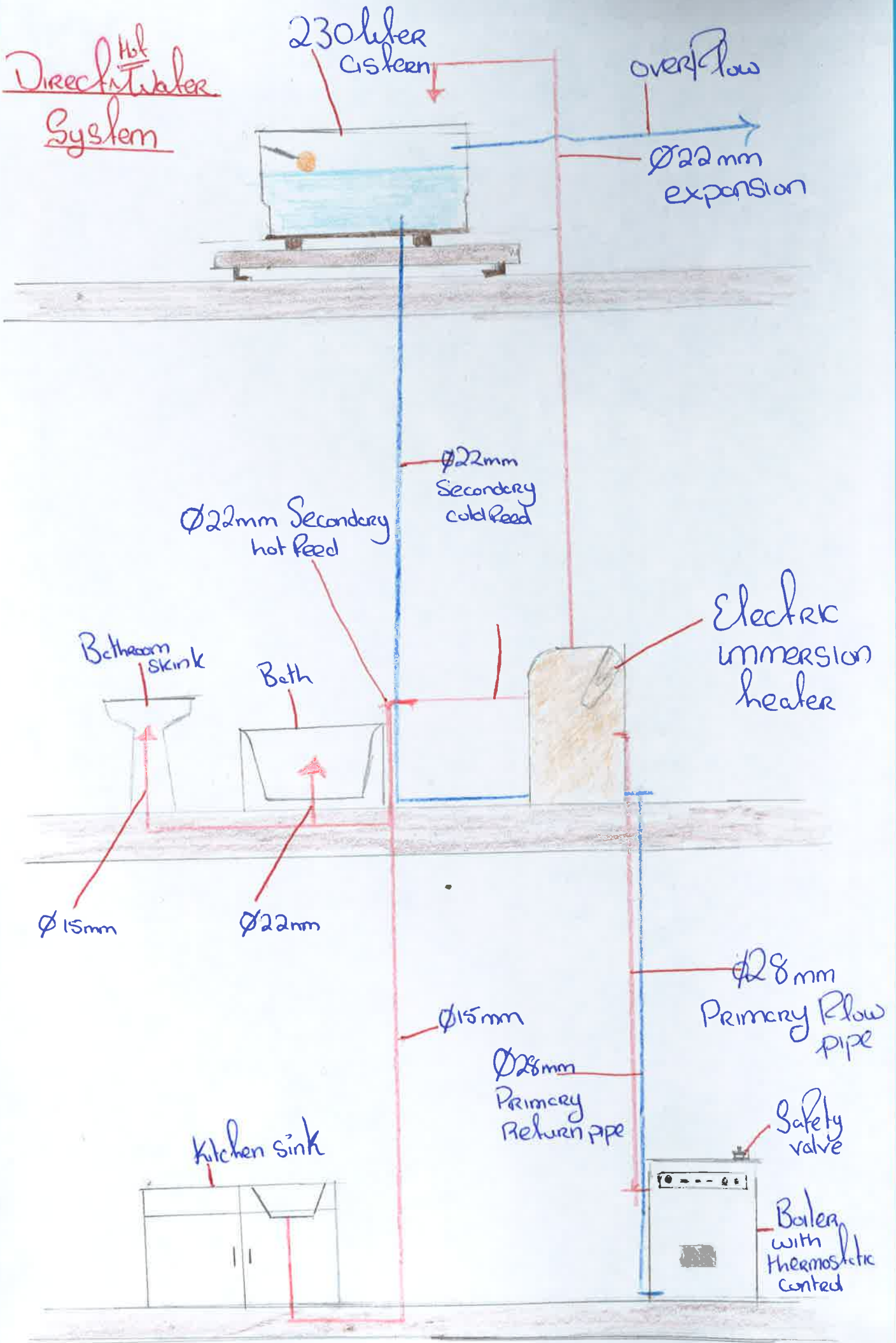
- Low cost to install the system and it is easy to install.

Disadvantages

- Radiators can't be connected to this system as there is too little storage
- If a constant large amount of hot water is needed it could lead to faults in the pipework or failure in the system as it puts a large amount of pressure on the boiler
- It is expensive to run as the system has to constantly heat water
- In areas of hard water there can be a large build-up of lime scale as the system is constantly heating up water can lead to clogged pipes

In this system it is clear to see that the disadvantages of the system outweigh the advantages

Direct Hot Water System



Indirect Hot Water system

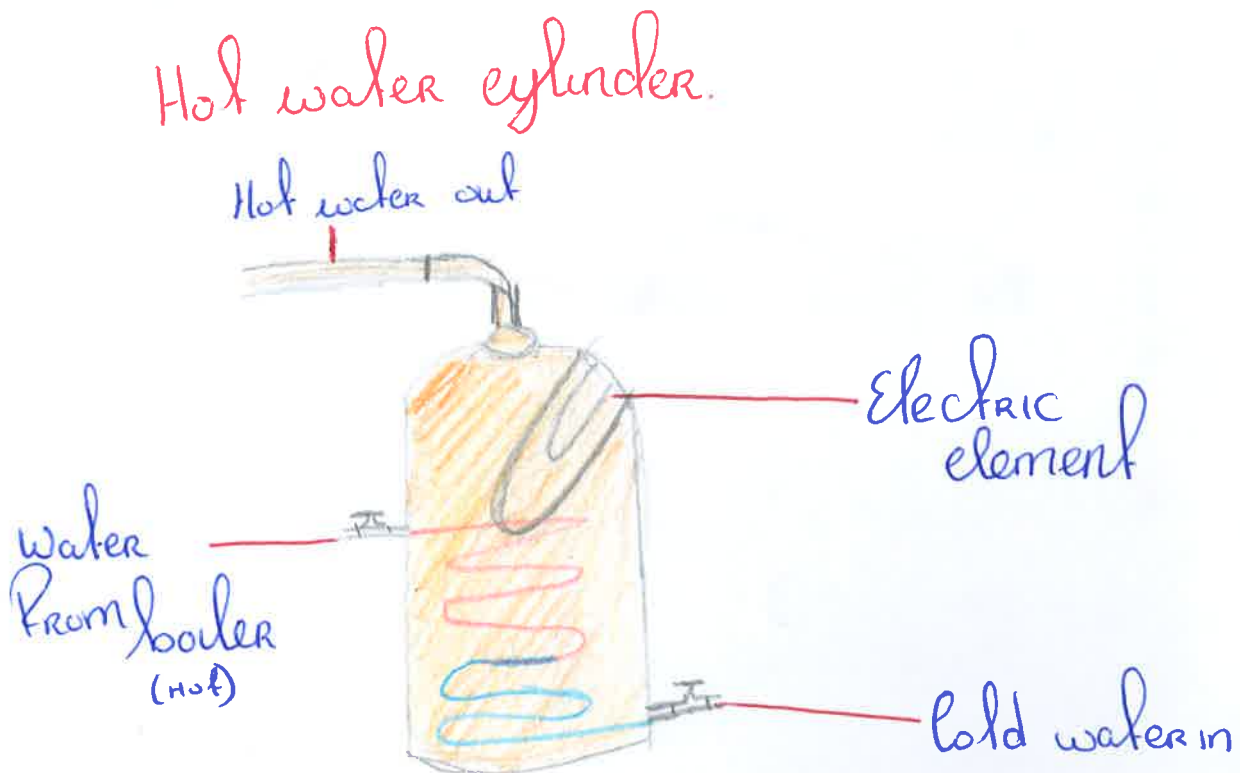
This system is more commonly used. In this system (like the direct water system) the water is fed from the storage tank in the attic to the hot water cylinder but this water is not fed into the boiler. The second storage tank in the attic gives the water to the boiler the second storage tank is called expansion tank it is smaller than the main storage tank it only holds 45 litres of water. The hot water cylinder has a coiled pipe inside it which the hot water from the boiler runs through and heats the water that's in the cylinder (water that came from the main storage tank). This system is more economical as the water is heated more evenly unlike the direct hot water system the water in the cylinder is not constantly being replaced. The water also can be heated by the electric element using an immersion.

Advantages of the indirect hot water system

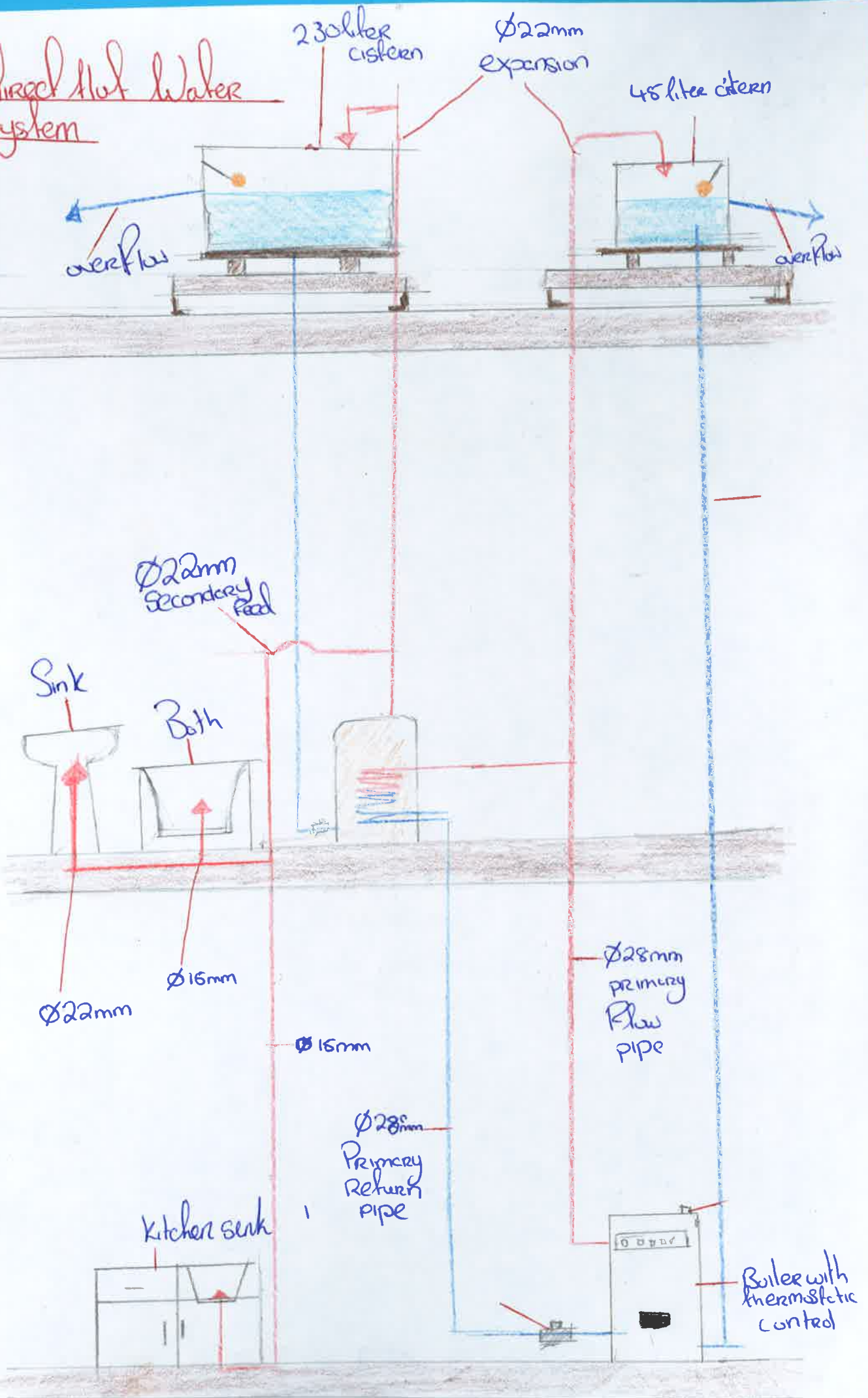
- There will reduce of pressure on the boiler because of the regulated temperatures in the hot water cylinder.
- Radiators can be fitted in to this system which is more economical for the home owner.
- There is no build-up of lime scale as the same water is being reused each time.

Disadvantages of the indirect hot water system

- A storage tank is necessary for the system so there will be less storage space
- It is more expensive to install as there is more pipework involved in the system

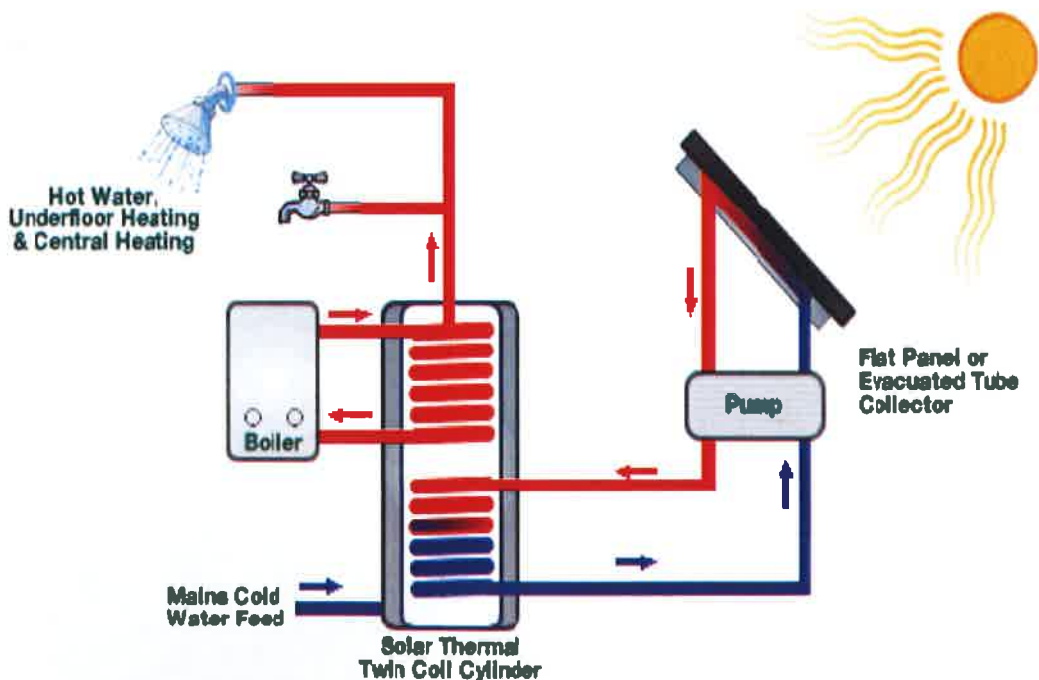


Indirect Hot Water System



Solar Powered Hot Water System

The energy is sourced from the sun it is harvested and used to heat the water. There is solar panels placed on the roof it is heated by the sun this heat is transferred to close circuit pipe work that pass through the hot water cylinder in coils. Water is also heated by the boiler witch goes into the coils that are in the cylinder (these are separate coils then the coils where the heated water from the solar panels was in the cylinder). Having the solar coils at the bottom of the cylinder is more affiant as the cylinder will maintain a constant warm temperature. This is more economical as the boiler uses less energy to convert the water from warm to hot.



Advantages of using solar panels

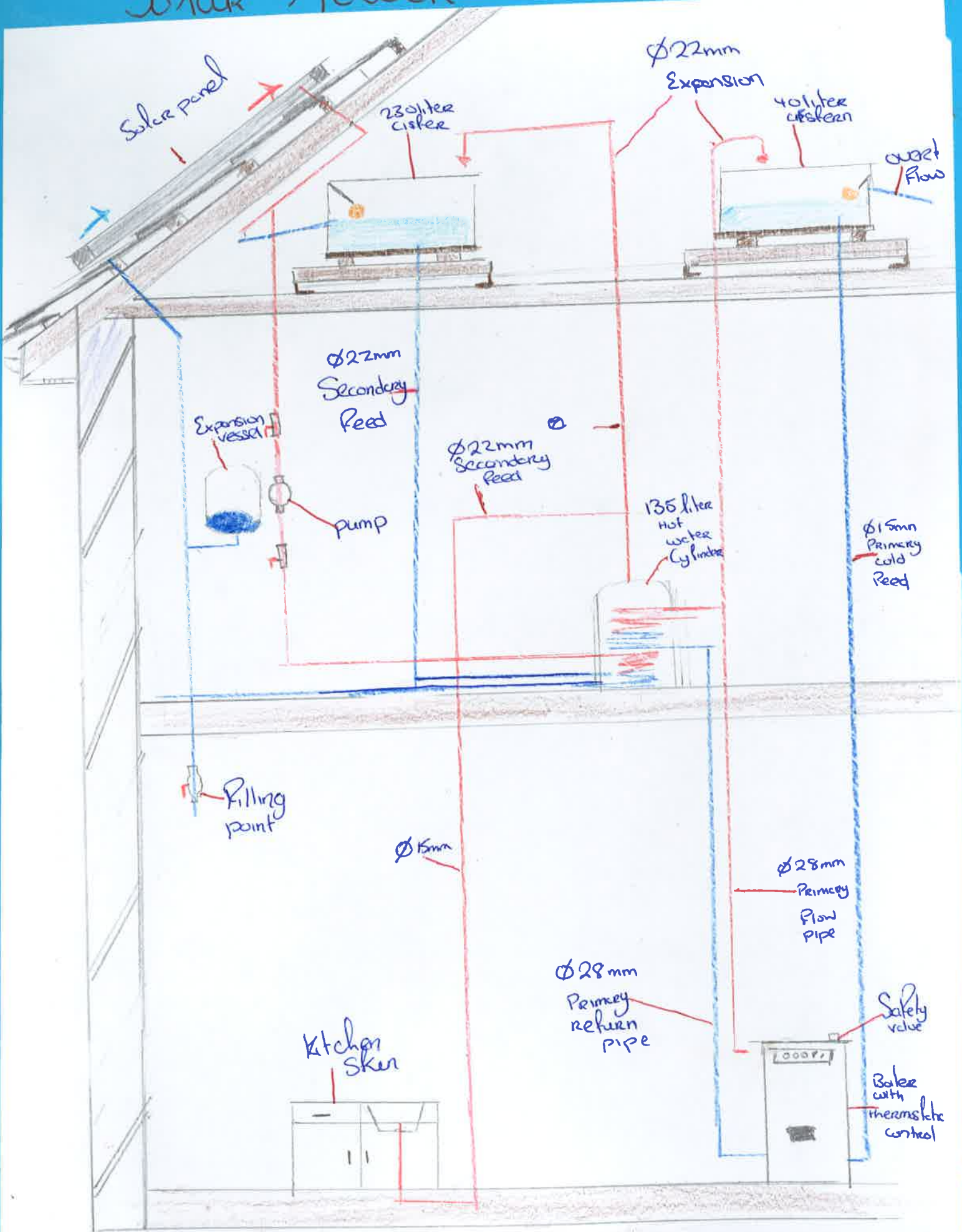
- There is less stress on the boiler as water doesn't need to be heated from cold this leads chance of system failure or burst pipes
- Less expensive to heat the water as there is a constant hot flow of water from the solar panels

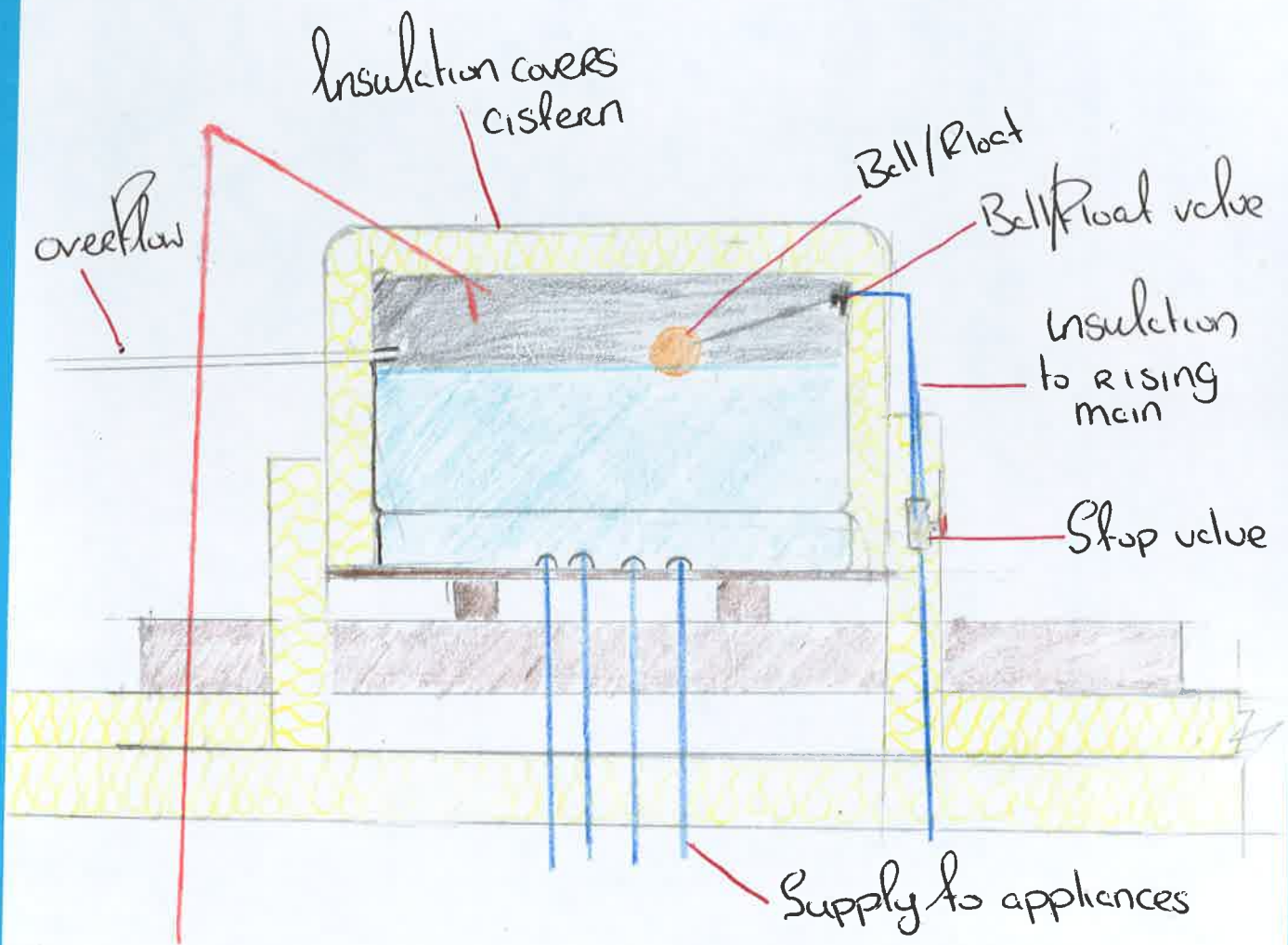
Disadvantages of the solar panels

- The sunlight is not always there due to different weather circumstance during the year
- Solar panels are expensive to buy

So this system is expensive in the short term but cheaper in the long run. It is also more environmentally friendly as it is a renewable energy.

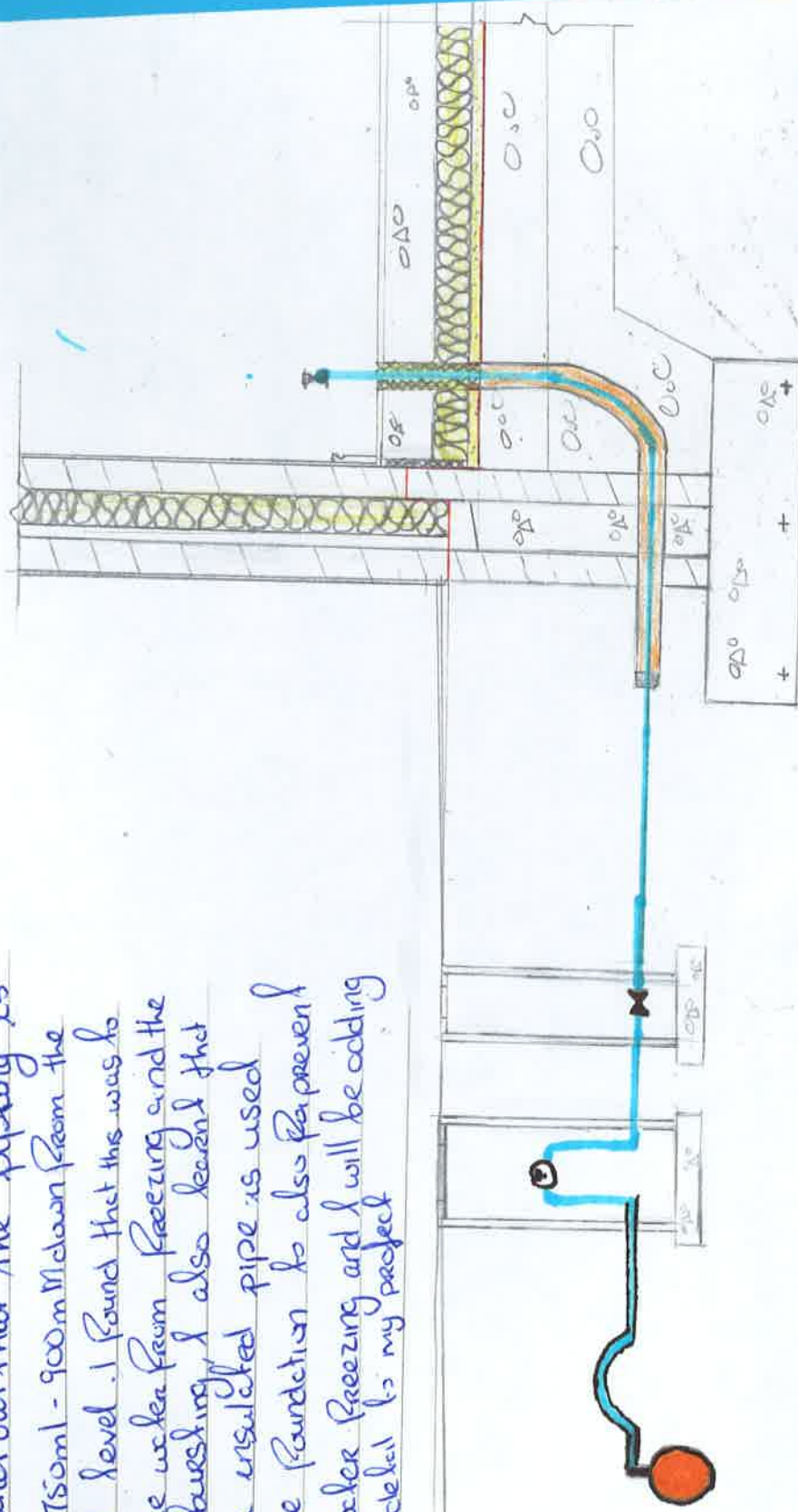
Solar Power





Cold water storage tanks, with tank and
Pipe work insulated

I found out that the piping is from 750ml - 900ml below from the ground level. I found that this was to stop the water from freezing and the pipe bursting. I also learnt that that a insulated pipe is used in the foundation to also prevent the water freezing and I will be adding this detail to my project.



Unvented system

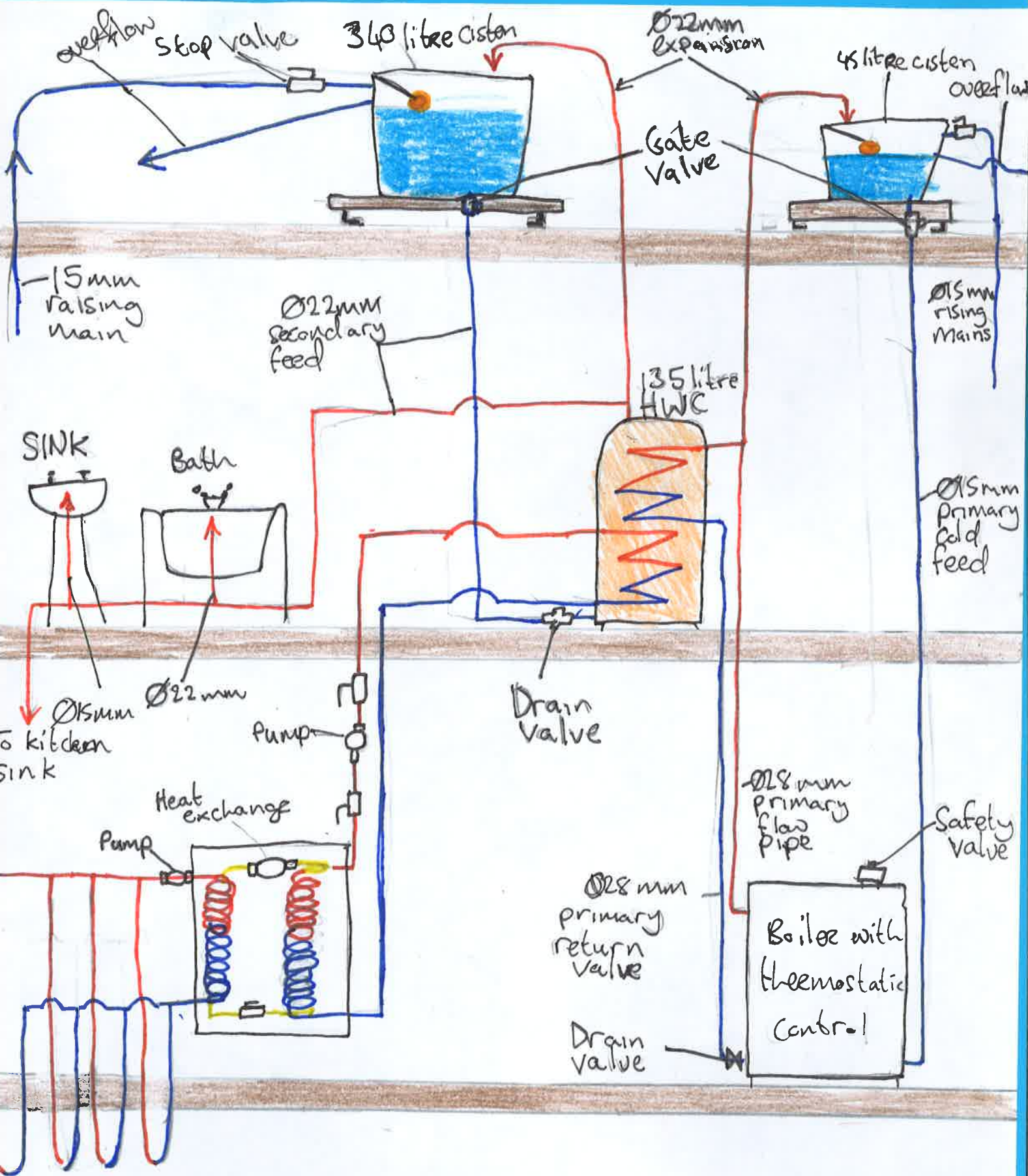
This system has been around since the 1980s but has only recently been brought in to Ireland. Unvented system is connected to the hot water cylinder to the mains instead of using a storage tank. Unvented means that the system is closed as there is no air has no access. It operates from the mains so there is no storage tank in the attic. Safety features had to be put in place as there is a high pressure and expansion of water.

Advantages of the unvented system

- There is an even water pressure to all taps and appliances.
- There is an even and constant hot water temperature.
- More space in the attic as there is no need for a storage tank.

Disadvantages of the unvented system

- It is expensive to install as there is more safety features
- The system relies on the mains supply so there is less pressure during peak times
- The high pressure of water effects the fittings leads to the wearing of the pipes.



Rainwater Harvesting

To reduce costs further rainwater is able to be harvested can be harvested and used in some appliances and in different areas in the house. The rainwater harvested is not drinkable. The water can be used for flushing toilets (like the grey water system), the washing clothes and gardening and outside taps.

As the word suggest rainwater harvesting is the collecting and distribution of water. The roof of the house acts as a collecting the rain water in the gutters and directed in to the rainwater harvester system witch filters the water and then the water goes to a separate storage tank in the attic and can be used when ever needed.