

# **Installation procedure for the RainSava Classic rainwater harvesting system**



RAINHARVESTING SYSTEMS

## **Guidance notes for the installation of systems with Wisy Vortex filter and submersible Beta pump.**

*These notes are intended as a guide only, the individual components have their own instructions. Details may vary from system to system, depending on such factors as layout and type of tank used. The use of non-standard European-style electrical plugs prevents other non-compatible appliances being connected into the system.*

### **System design**

There are three important principles of rainwater storage that ensure the quality of stored water. Firstly, water that enters the tank must be 'calmed' - i.e. rather than openly discharge into the tank it should be directed to the bottom where it can gently percolate upwards, below the minimum water level.

Secondly, the tank must overflow periodically, at least twice per year, in order that any floating debris can be removed by the skimming effect of a suitable overflow device. For this reason the volume of the tank should be carefully calculated to ensure that overflow conditions occur.

These first two principles are taken care of by the 'smoothing inlet' and the 'multisiphon' overflow trap fitted to *RainSava* tanks as supplied by ourselves. If you have sourced or constructed out own tank, similar arrangements should be incorporated into the design.

Thirdly, water should be extracted from the cleanest part of the tank; i.e. just below the surface, as achieved by the use of a fixed or floating suction filter. This ensures that the water extracted avoids both floating debris and bottom sediments. It is important that this bottom sediment is not disturbed as in time it will form a beneficial biological layer that assists in maintaining water quality.

Your rainwater system has been designed with these principles in mind and it is important for the well-being of the system that they are observed. It is also important that any water entering the tank should be as clean as possible and this is ensured by use of Wisy rainwater filters. It must therefore be observed that the filter elements are only removed for cleaning purposes and that this is done when no water is flowing through the unit (i.e. in dry weather!)

It is most important that these filters are kept clean and we therefore recommend that the stainless steel filter element of all Wisy FS or WFF filters is removed for cleaning approximately every two months (or more often if it proves necessary). A visual

check is not sufficient. Often the filter element is dirty even when it appears clean to the naked eye; a biofilm can develop within the fine mesh, effectively blocking the holes. Cleaning is achieved by either brushing with a fine nylon brush with washing up liquid and running water or in a dishwasher. Blowing through with a high pressure air-line has also proved effective.

This is the only routine maintenance necessary for the operation of the system, although we do recommend a visual check of the tank and its' components on an annual basis.

The system is made up of a number of separate components. Some of these are to be located in the underground storage tank, whilst the mains water top-up assembly and the level gauge (if used) are to be fitted in a convenient location within the building (e.g. utility or plant room). The schematic diagram that follows on page three gives a general overview of the layout.

**IMPORTANT:**

- **Please read and understand these notes fully and plan where each of the components will be fitted before commencing work.**
- **Decide upon the location of the components, particularly the mains water top-up assembly and the tank level gauge if used. These items must all be located in a dry, frost-free position, e.g. utility room.**
- **Refer to the accompanying drawings.**
- **Where 32mm MDPE pipe is used it should be black with a green stripe, not blue, or else clearly marked to distinguish it from the mains water supply.**
- **Interior pipework should also be clearly identified as non-potable. We stock a self-adhesive marker tape for this purpose.**
- **IT IS MOST IMPORTANT that all pipe joints are tight and securely sealed. Even a small leak can cause the pump to cut out or run continuously.**
- **Install the WFF filter following the instructions included with it.**
- **We recommend that where WCs or other appliances fitted with float inlet valves are connected to the system, these should be of a rapid shut-off or equilibrium type – e.g. 'Fluidmaster or 'Torbeck'**
- **Note that the electrical plug on the solenoid valve is of the continental type. This fits into a corresponding socket and on no account should you attempt to change this for a UK plug. A UK adapter is supplied with the mains water top-up kit. Alternatively the solenoid valve and float switch can be 'hard wired'.**
- **All electrical work should be carried out by a qualified electrician.**
- **Please ensure that all documentation supplied is left with the householder.**

## **Suggested work schedule**

### **Phase 1**

**These works constitute part of the buildings drainage system and are normally carried out at ground works stage.**

- Ascertain depth of excavation for storage tank. This is dependent upon the invert level of the drain, the type of filter used, and the size of tank. Particular attention should be paid to this in order that the tank is installed at the correct depth.
- Excavate hole and install tank (refer to manufacturers installation guide)
- Connect tank overflow to soakaway or storm drain
- Install service duct from tank to building (e.g. utility room or plant room). N.B. – ensure that suitable draw cords are laid into the duct in order to pull the pipe and cables through at a later stage. **KEEP THE DUCT AS STRAIGHT AS POSSIBLE AND USE ONLY LONG-RADIUS BENDS**
- Insert the pump delivery pipe (either flexible hose or MDPE pipe) through the duct. This is best achieved by inserting the pipe into the duct at the tank end. The pipe can then be pulled through from the top end using one of the draw cords.
- Excavate hole and install rainwater filter and connecting pipes (refer to manufacturers installation guide)
- Connect 110mm pipe from filter to tank inlet.
- Install mains water top-up pipe from building to join this pipe. (i.e. it should connect into the pipe between the tank and the filter)
- Connect filter waste outlet to soakaway or storm drain

### **Phase 2**

**The following works constitute part of the mechanical and electrical installation and are normally carried out at the final stage of building.**

- Install the pump and suction filter/float switch assembly into the tank.
- Connect the outlet hose of the pump to the MDPE pipe using the brass elbow connector provided.
- Pull the pump cable, float switch cable and air pipe from the level gauge through the duct, using the second draw cord.
- Fit the mains top-up unit and level gauge in the building (e.g. utility or plant room)
- Make mechanical and electrical connections to top-up unit and level gauge.
- Commission the system.



## Installation Procedure

1. **Pipe work.** When using a storage tank located below ground with the WFF vortex filter, three entry holes will be required into the tank. Please note the sizes below refer to systems with only one filter –tank connections will be upsized for systems with multiple or WFF150 or WF300 filters.

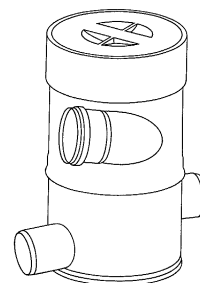
- ◆ One to accept a 110mm pipe from the filter unit
- ◆ One to accept a 110mm pipe to act as a duct through which can pass the power supply cables to the pump and the float switch, and the tube from the level indicator, if used.
- ◆ One to accept a 110mm pipe for the overflow to the soakaway - \*NB - this must be the lowest entry point.

*Be sure to obtain a tight seal wherever pipes connect to the tank! One method is to use a rubber connector such as Osma part no. 4S.206 in a hole 115mm diameter.*

***Rainsava tanks supplied by ourselves are pre-fitted with the necessary connections.***

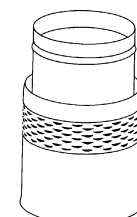
### Stage 1 - Groundwork

2. A fall of at least 1:100 must be provided for the water inlet pipes. All pipe work in the ground should be bedded and surrounded with 150mm pea gravel or sand.
3. Install the WFF filter according to the instructions supplied with it. Ensure that the two outlet connections of the filter are connected to the appropriate pipes. The lower of the two must connect to the storm drain, the upper one to the tank. Please retain the filters' instructions as this contains important information regarding maintenance of the filter.
4. Locate the tank in the ground allowing for a sufficient fall from the WFF filter outlet. With some tanks it may be necessary to fit an inspection chamber over the top of the tank lid in order to bring it to ground level. Some tanks are specifically designed for below ground installation. Others will require a chamber to be constructed to house the tank Seek advice from your tank supplier. Rainsava tanks supplied by ourselves are supplied with full installation instructions.
5. Lay the 150/110mm pipe work to and from the WFF filter and from the tank to the soak away. Rainwater down pipes should join directly to drainage pipes via drain connectors and not via gully traps. This avoids the risk of someone inadvertently pouring undesirable liquids into the system, resulting in contaminated water. (e.g. painters slops, garden chemicals etc.) The pipe leading into the filter must only be connected to rainwater downpipes and must not receive surface water run off. The WFF100 filter accepts standard 110mm pipe. The WFF150 filter accepts 150mm pipe for the rainwater in and wastewater out connections and 100mm pipe for the pipe to the rainwater tank

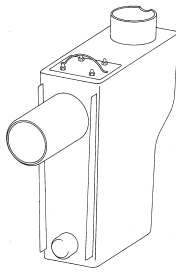


### Stage 2 - Storage tank

6. To use a Wisy Calmed inlet (Wisy part no. EB 03 00), the pipe from the filter to the tank must be 110mm and should enter and then continue right to the bottom of the tank where it should terminate in the **calmed inlet** . N.B. - If using a Rainsava tank purchased through us this item is pre-fitted.



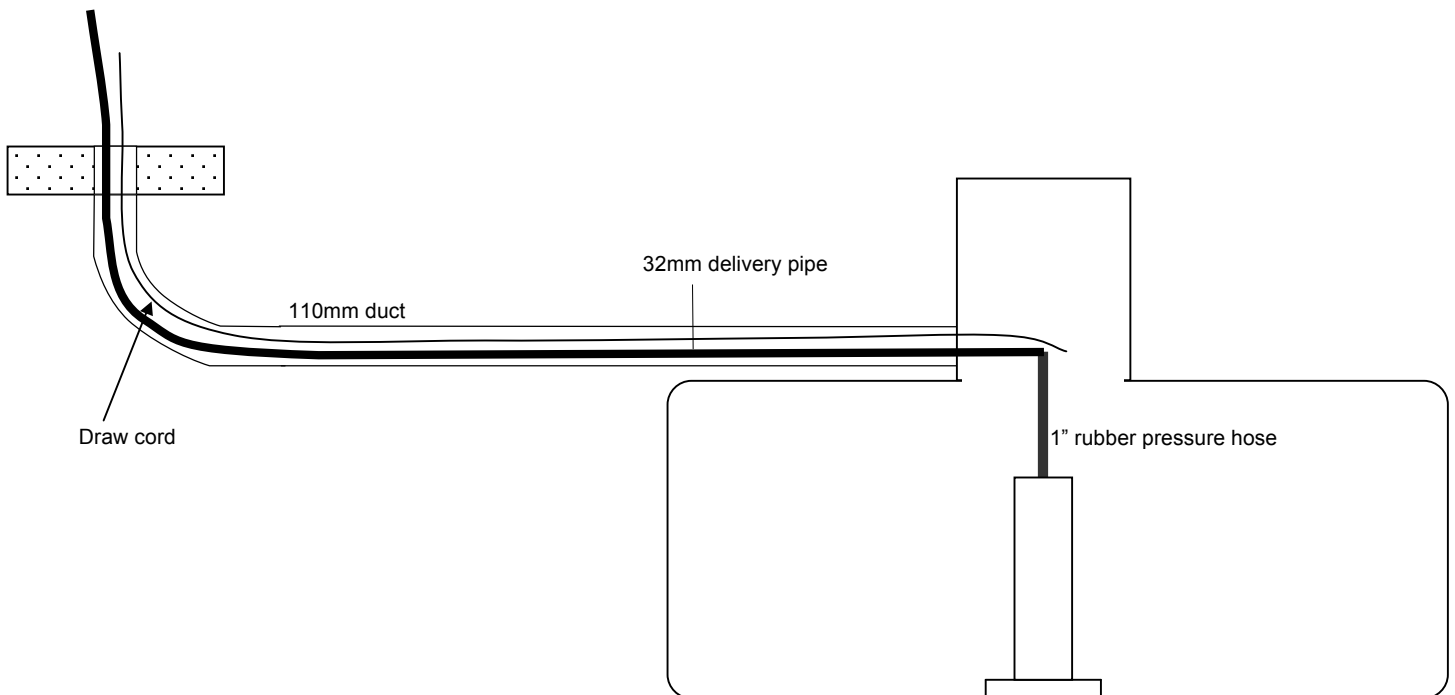
Smoothing inlet



Wisy overflow trap

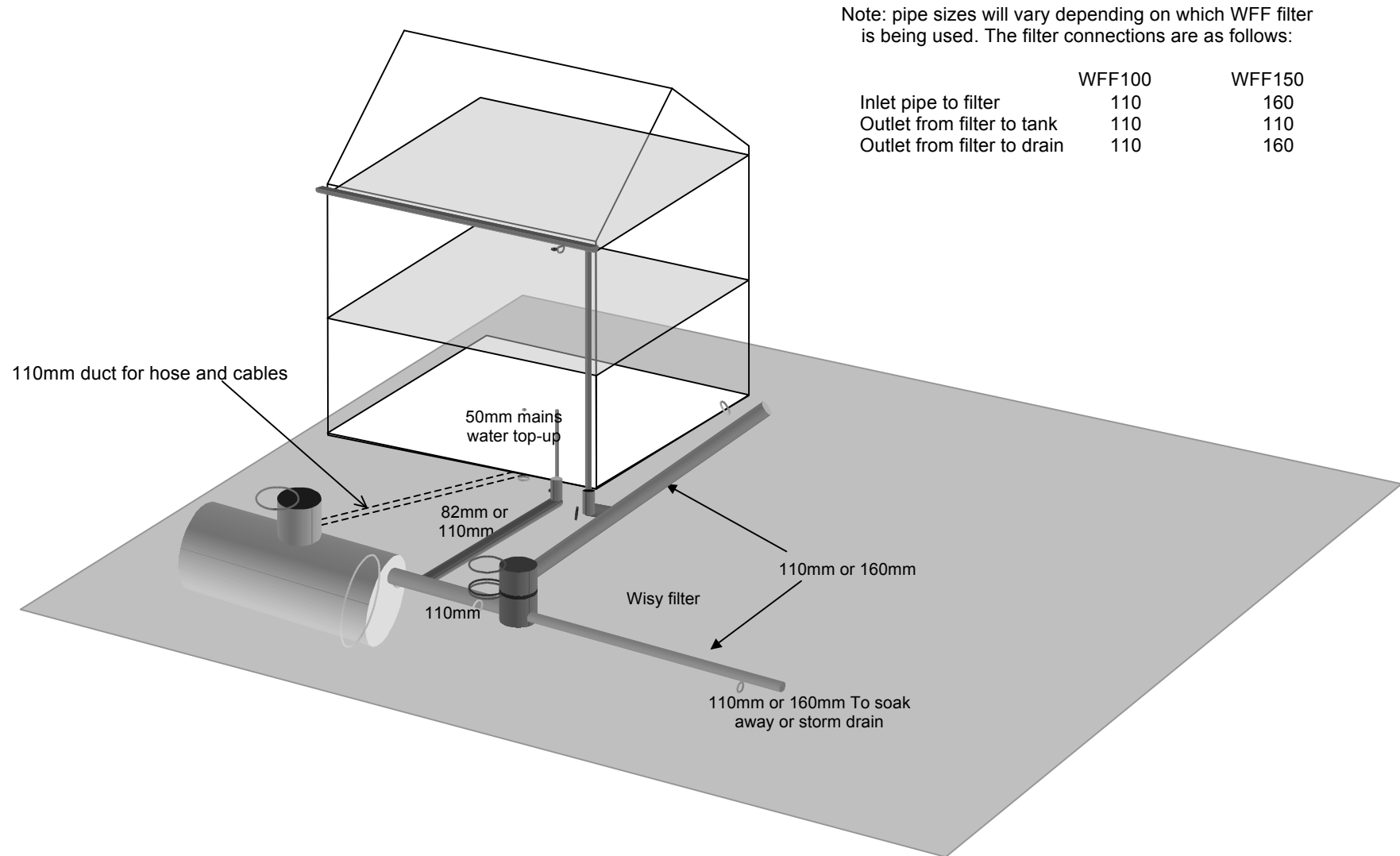
7. The overflow pipe from the tank should have an **overflow trap** on the inside of the tank in order to prevent foul odours entering. Either assemble your own or use a purpose made unit available from us (Wisy part no. US 10 05). If using a Rainsava tank purchased through us this item is pre-fitted.

8. Lay the pipe work for the mains water top-up from a suitable point in the building. The pipe work inside the building should be 50mm waste, then change to below-ground waste pipe using a suitable adapter (e.g. Osma part nos. 4D.299 or 4S.096). This pipe can then be joined to the 110mm pipe that connects the filter outlet to the tank. This way both mains and rainwater can enter the tank through the same inlet pipe. (see drawing page 6)
9. Lay the 110mm pipe to act as ducting from the building to the tank. Avoid sharp bends to ease the task of feeding the pipe and cables through the duct (use two 45° bends rather than one 90°). A nylon draw-cord should be placed into the duct when it is laid to enable the cables to be pulled through. Do not backfill any trenches until the installation is complete and the system has been tested.

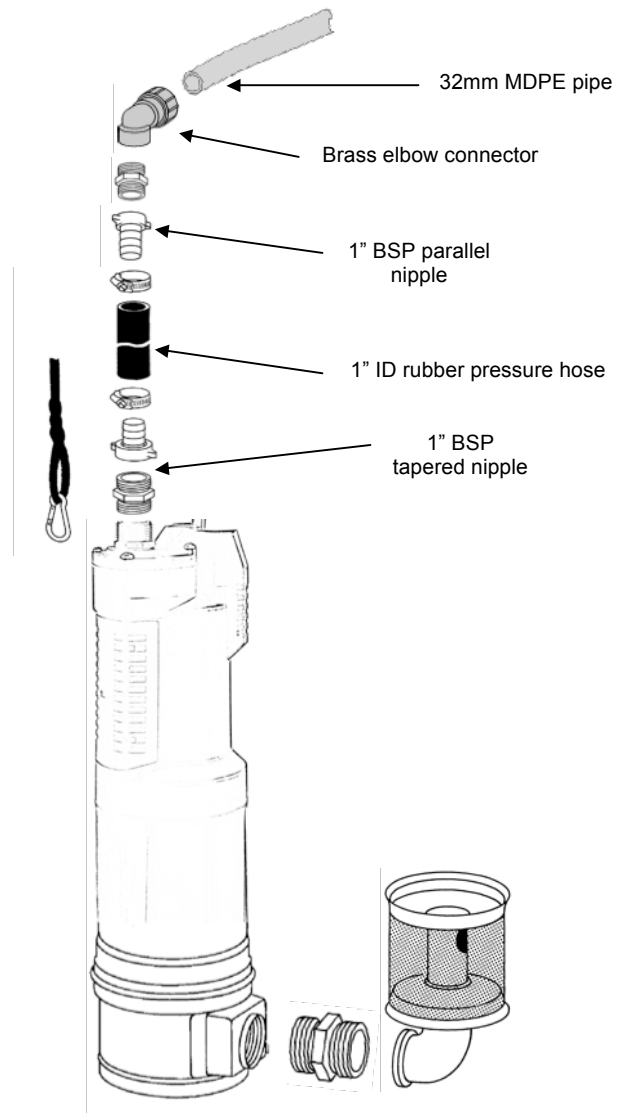


10. Lay the 32mm MDPE pipe from the house to the tank through the duct: the pipe should be of sufficient length to reach from the centre of the tank directly above the pump to a suitable location in the house.

Suggested layout for mains water top-up and drainage pipes connected to the filter and storage tank. For clarity other components are not shown here.



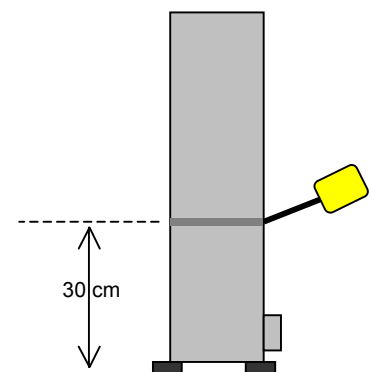
11. **Pump.** Assemble the short length of rubber pressure hose and the brass fittings and the worm-drive hose clamps as shown in the diagram. Connect this to the outlet (top) port of the pump. The hose will need to be cut to length so that it can be connected to the MDPE pipe from the duct – this can be measured with the pump in the tank on its platform.



12. **Suction Filter.** You will have been supplied with a fixed suction filter to protect the pump in the event of any foreign material getting into the tank. To fit the fixed filter, screw the brass nipple into the pumps' suction port and then screw on the 90° bend attached to the filter. Ensure all joints are tight.

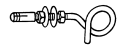


13. **Float switch.** Fit the float switch assembly according to the instructions supplied with the unit. The worm-drive clamp can be fitted to the body of the pump, but ensure it is not likely to foul on the suction filter. The 'switch point' of the float switch must be above the level at which the suction filter can no longer extract water, we recommend fixing the clamp approximately 30cm above the base of the pump.





14. Carefully lower the complete assembly (pump, float switch and suction filter) into the tank using the cord supplied that attaches to the ring on top of the pump. This cord must remain attached in case you ever need to remove the pump. The loose end should be tied to a convenient point where it can be easily reached. We supply a stainless steel eye for this purpose, which can be fitted to the inside of the shaft, below the lid, once the cover level has been decided. *N.B. - Rainsava tanks are fitted with a platform directly below the access shaft on which the pump should stand.*



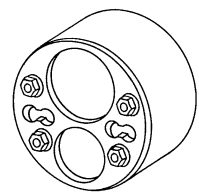
15. The cables from the pump and the float switch must be fed through the duct pipe to the building. These can be pulled through using the draw cord that was previously placed in the duct. Note – if you are installing a tank level gauge with your system, it is wise to also include the tubing supplied with this with the cables, thus drawing all three through the duct at the same time.
16. With the pump in its final position, connect the 32mm MDPE pipe from the service duct to the brass elbow fitting at the top of the rubber pressure hose. Ensure the pump sits steadily on its platform. It should be vertical and should not have any lateral pressure exerting upon it from the outlet hose

### **Stage 3 - Interior work**

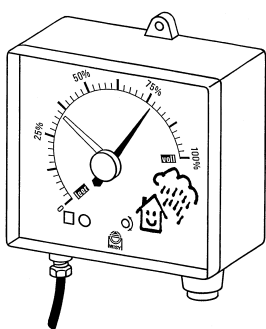
The duct from the tank should terminate in a convenient location within the building (e.g. utility room). The following services should be present within the duct:

- a) Delivery pipe from pump
- b) Pump power supply cable
- c) Float switch power supply cable
- d) Small-bore tube from pneumatic level gauge (if used)

If a proprietary pipe bung is to be used then the pipes and cables should be passed through it at this point. The bung can then be inserted into the end of the duct pipe to form a seal. Alternatively, the end of the duct should be sealed by some other means to prevent cold moist air from the tank entering the building.



Pipe bung



17. **Water Level Indicator** (if supplied). Mount the display unit in a suitable location inside the building. Follow the separate instructions supplied with this unit.

The air tube that is supplied with the unit should be long enough to reach to the base of the tank. Additional tube and connectors are available if required.

18. Fit the brass connector and 1" isolating valve to the other end of the 32mm MDPE pipe. The internal pipe runs to WCs etc. can now be connected to this valve. This valve can be used to isolate the system at any time.

19. Connect the power cable from the pump to a suitable switched and fused power outlet. DO NOT switch the power on yet.

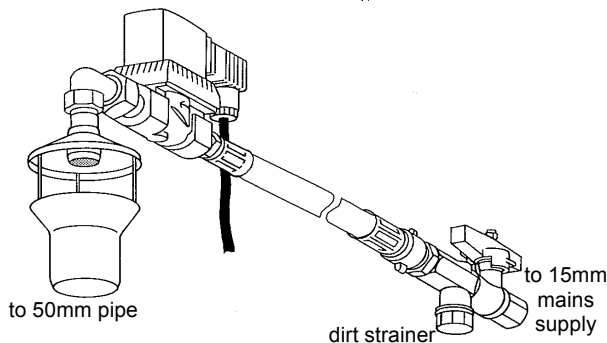
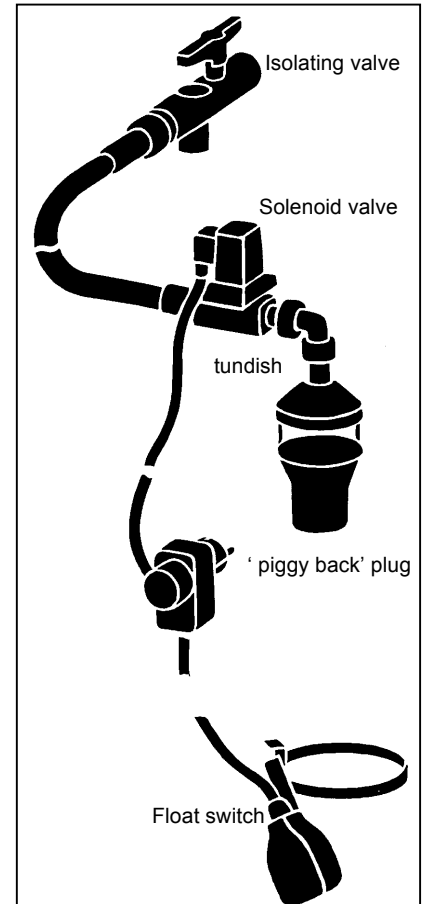
20. **Mains water top-up assembly.** This consists of four items;

- i).a special 'piggy back' plug
- ii).a UK 2-pin adapter
- iii).a special float switch mounted on a worm-drive clamp
- iv).a solenoid valve/tundish assembly.

*The float switch should already have been fitted to the pump and should now be located in the tank.  
(see point 13 on page 8)*

Refer to the separate instructions that are supplied with this kit.

21. Fit the hose with the solenoid valve and tundish assembly. The tundish fits directly into the 50mm waste pipe you previously installed. (see sketch on page 12) Connect the other end of the assembly to the mains water supply, having first closed the integral manual isolating valve. N.B. – built into this valve is a dirt strainer designed to protect the solenoid valve from any particles that may cause it to malfunction. This strainer should be periodically removed and cleaned if necessary.



22. Connect the lead from the float switch into the special 'piggy back' adapter according to the instructions supplied with the top-up kit.

23. Plug the European plug from the solenoid valve into the socket of the 'piggy-back' adapter. Plug this into the UK adapter and then this in turn into a mains power supply.

#### **Stage 4 - Commissioning**

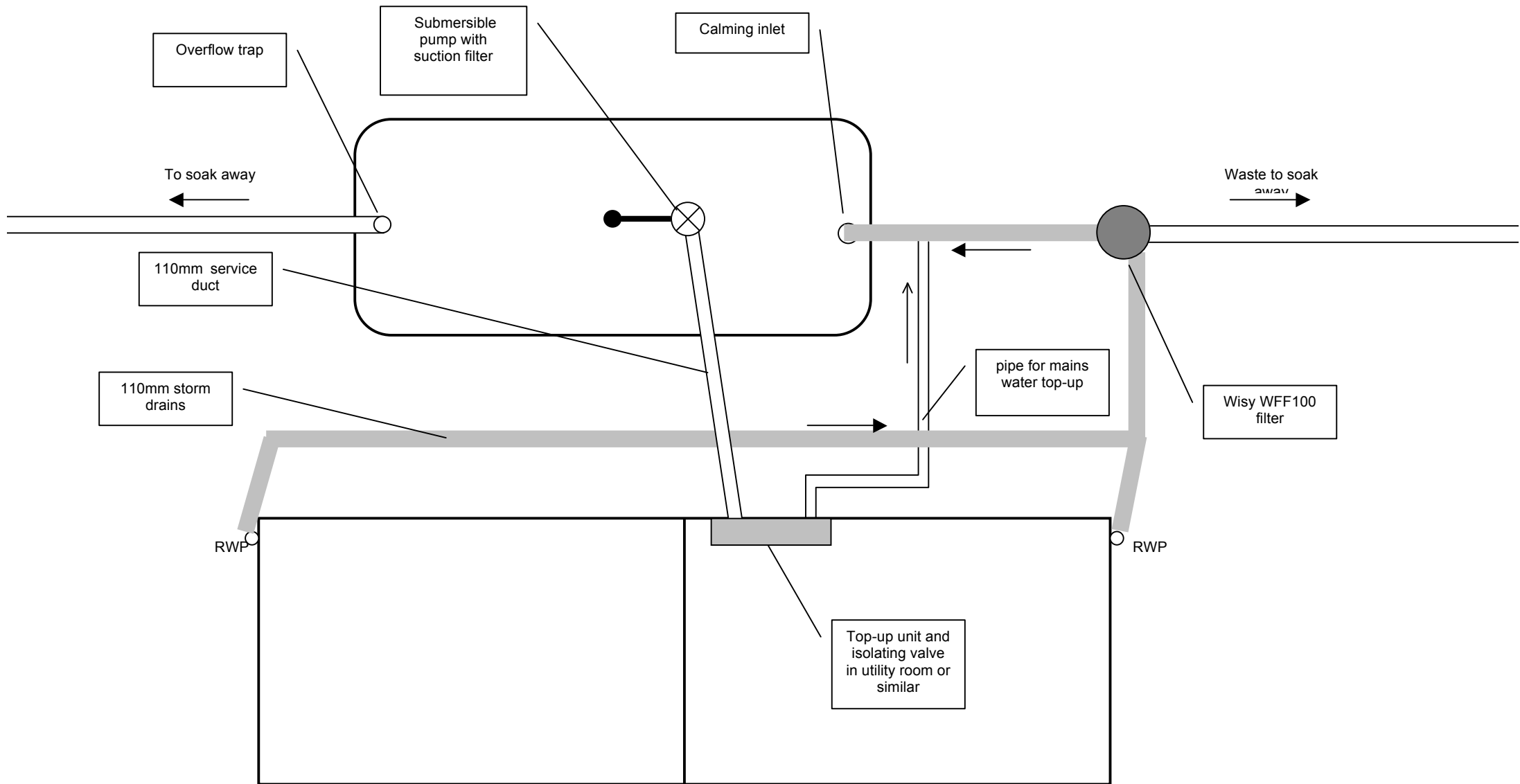
24. Switch on the power to the top-up unit. If the tank is still empty at this stage, the solenoid valve will open and the mains water top-up will activate. If necessary (e.g. if splashing occurs at the tundish), reduce the flow by adjusting the manual valve on the top-up assembly. The solenoid valve should shut off the mains supply when the water in the tank raises the float switch.
25. Now that you have some water in the system, switch on the power supply to the pump. Turn on a tap connected to the system or flush a toilet several times to purge the air from the pipework. The pump should activate and begin pumping water. If the pump cuts off again with the tap still open, switch the power off, wait 5 seconds and then switch on again. Once all air has been purged and water is flowing freely, close the tap. The pump should switch itself off after a few seconds.
26. Check all pipes and joints for signs of leaking and rectify accordingly.
27. Apply marker tape to all pipes in the building that are connected to the system, such as the supply pipes to the WCs and washing machine. The pipes should be clearly labelled along their entire length and labelling should state that the pipes content is 'unwholesome', 'non-potable', 'not for drinking' or similar. This clearly identifies the water as being other than from the mains supply:

RECLAIMED WATER	NON-POTABLE
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28. Similarly, any taps, valves and any other outlets connected to the system should be clearly identified. We stock a self adhesive label for this purpose;
29. Your rainwater system is now operational and should require no further routine attention other than regular checking and cleaning of the WFF filter insert. Normally, every couple of months is enough, but check regularly at first until you establish the appropriate time interval for your situation. If a lot of dust is present the cleaning times may be more frequent. N.B. it is very important that the filter is kept clean and failure to do so will result in a decrease in efficiency
30. If you encounter any problems or are unsure about how to proceed with any part of the installation, please call our support line on 01452 772000.
31. If for any reason you need to prevent the WFF filter from operating (e.g. work on the storage tank or the inlet pipe), a 'blind' filter insert is available for hire from Rainharvesting Systems Ltd. This allows all the water to pass directly to the soakaway outlet.



*We are continually striving to improve our products and we welcome any feed back from clients and installers that may assist us.*



Example layout for pipe runs to WFF filter and storage tank.