

Step 1 : Site preparation

- Pre-plan the location of where the rainwater will enter the tank to ensure enough space to allow for the pump, frame and overflow pipes. In planning for the pump and filters you should also take into consideration the accessibility to replace filters and service the pump
- In terms of the area for the tank itself, select an area that allows for a clearance of at least 700mm throughout from the finished ground level to the underside of the joists (refer to Figure A opposite) and at least 2.7m between the piles. This will allow enough space for the tank to fill without touching the building structure
- Ensure the space is clear of any obstructions or services above where the tank will inflate e.g. gas pipes, central heating ducting
- Ensure the ground area is level and free of any sharp stones or objects. A bed of sand or GAP 7 may be used to assist in levelling the site. This is important to prevent the tank from creeping as it fills and empties and ensures there are no “dead” areas where the tank cannot empty because water is caught below the exit valve
- When using more than one bladder, they must be at the same level to allow for filling of the tanks to be equal
- The Raindrops water tanks are 2260cm wide (when empty) and, therefore, it is recommended that there be at least 2.3m distance between the piles (including the concrete foundation to the pile) to provide enough space for the tank
- Once the site is prepared, the synthetic underlay can be rolled out over the area where the tank will be laid. The underlay is slightly larger in area than the tank, enabling the tank to be rolled out comfortably within the boundary of the underlay

NOTE:

You can only do simple DIY plumbing work that does not involve installing new pipework. For example, you can install a new appliance to existing pipe connections. You can also set up your new Raindrops water tanks but you cannot install the new pipework required to connect the tank to the selected appliances to bypass the mains pipework. The installation of new pipework must be carried out by a Licenced or Certifying Plumber. This is for health reasons to ensure drinking water is not compromised. Raindrops uses Licenced or Certifying Plumbers to install or supervise the installation of its rain harvesting systems. New plumbing work also requires a building consent and Raindrops manages this process with the relevant Council.

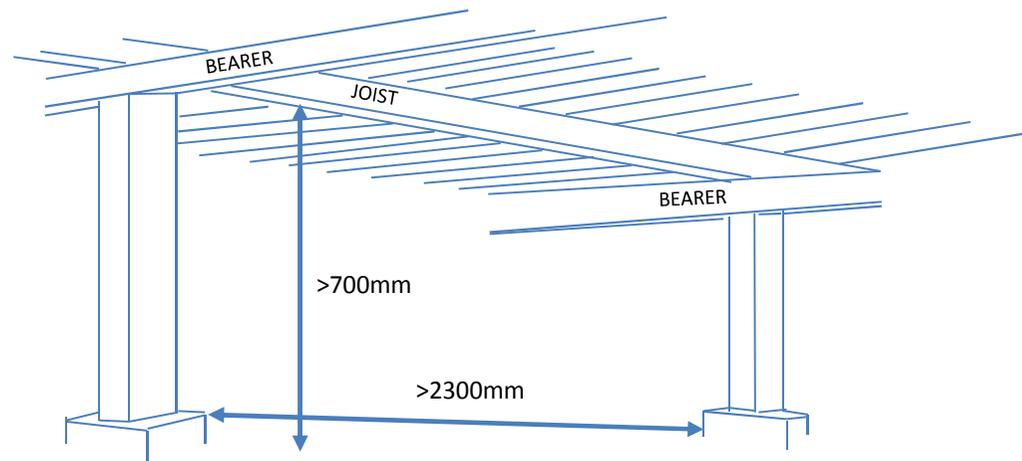


Figure A

Step 2 : Tank connection

- In preparation for the connection of the tank, the frame must be put in position at the end of the tank. To ensure the stability of the frame, it is recommended that it be positioned on a concrete paver (dimensions of 500mm x 500mm x 60mm). The paver needs to be set down into the ground such that its top surface is level with the ground prepared for the tank (refer Figure B)
- Once the paver has been positioned in the ground, the frame can be laid on top with its base pointing towards the tank, so that when the tank is put in position, it will be sitting on top of the frame's base. The frame needs to be secured to the paver by drilling holes into the paver where the screw holes are in the frame (refer Figure C)
- Once the frame is fixed in position, the tank can be physically connected to the frame (refer Figure D) by inserting the 32mm outlet fittings and the 100mm inlet fitting firstly through the holes in the synthetic underlay (made especially for this purpose) and secondly through the holes in the mounting frame (see Figure B), so that the synthetic underlay will rest between the tank and the frame
- The fittings must then be secured to the mounting frame by:
 - for the 25mm outlet fitting, screwing a lock nut onto each fitting, but not so hard as to twist the fitting itself and compromise its attachment to the tank; and
 - for the 100mm inlet fitting, by attaching (screwing on) the lock nut and the 100mm pipe extension (with inspection cap), using plumbers tape to ensure sealing, such that it acts like a flange with the synthetic underlay and mounting frame secured within
- Once the fittings are secured to the frame, the polyball valve should be attached to the 25mm outlet using plumbers tape
- Once the tank is connected to the frame, it can then be rolled out over the synthetic underlay, taking care not to walk on the tank
- **DO NOT STAND ON THE EMPTY TANK**

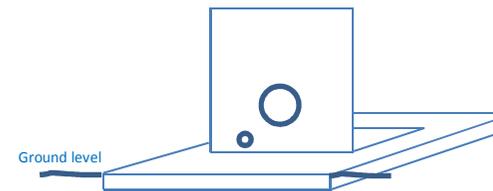


Figure B

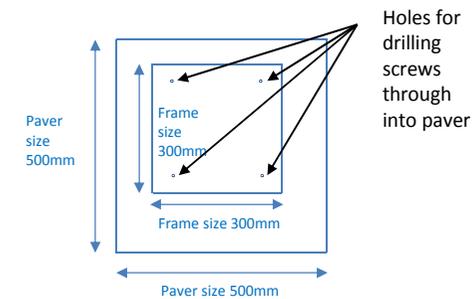


Figure C

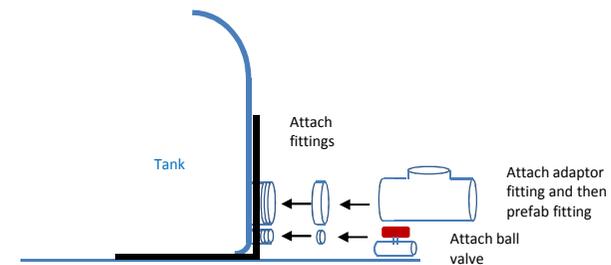


Figure D

Step 3 : Rainwater downpipe connections

- All storm-water downpipes need to connect to one point, which will ordinarily be the case due to the single point of connection with the storm-water system (council system or on-site sump)
- It is important to ensure:
 - (a) all the pipes slope downward so that there are no “dead” areas where water will be caught and build up sediment; and
 - (b) the pipework is all well supported by strong strapping, because when the pipes are full with water they will be significantly heavier than they are when they are empty
- At a height of about 1 metre below the guttering system, each downpipe needs to be cut and have inserted a Marley leaf diverter as per Figure E
- The downpipe system then needs to be sealed from where the leaf diverter is attached, all the way down and into the under-house downpipe system. In some cases, the downpipe will drop into, but not be sealed with, the pipe extension leading under the house
- The downpipe system needs to be sealed because:
 - (a) all of the rainwater downpipe system will be consistently full of water up to the height of the tank’s maximum filling height (refer to Figure F); and
 - (b) the rainwater downpipe system needs to be protected from insect entry points, with all exit points otherwise being protected by screens (including the screen of the leaf diverter)
- From the single point of connection of all the downpipes, the system must then reach its lowest point where, via a “T” intersection fitting, the system has a side connection to an outside release valve and overflow pipe

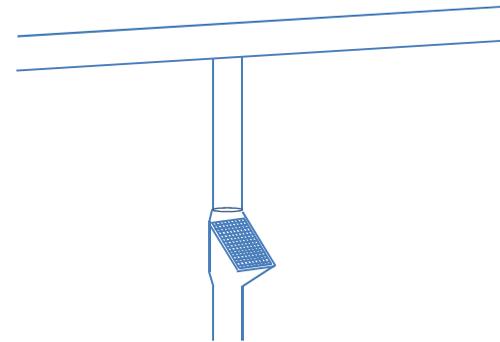


Figure E

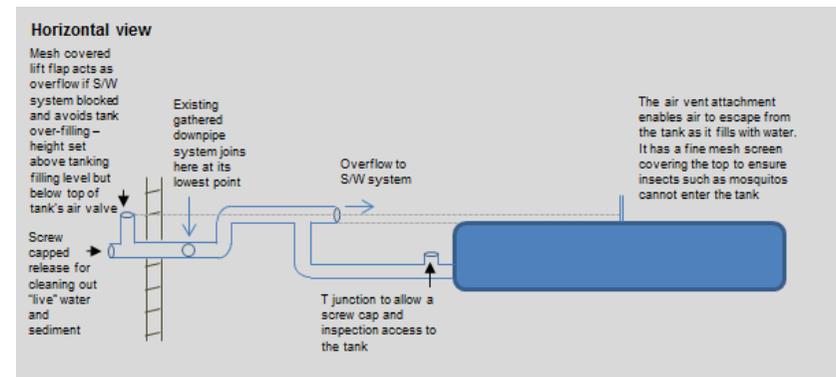


Figure F

Step 4 : Overflow system/connection to tank

- The existing continuation of the single pipe that contains all the aggregate water from downpipes, cut off at its lowest point per Step 3, runs to the storm-water system (ie the Council owned system or more commonly a sump on the property itself)
- This storm-water pipe must now be reconnected to the system so as to act as an over-flow for the tank. Per Figure F, it is important that:
 - (a) it is connected in such a way that there is a volume of “dead” water from the top of which the water flows into the tank, enabling significant sediment to be caught in the down pipe system and able to be cleaned out via the screw cap release;
 - (b) water falls down into the tank, until full at which time it flows down the overflow pipe, so that the tank is not pushing water up to the storm-water overflow; and
 - (c) the bottom circumference edge of the connection of the horizontal storm-water pipe is at the full height of the tank so that the tank cannot over full
- As a fail-safe mechanism to avoid the tank over-filling in the event that the storm-water system is blocked for any reason, and therefore the over-flow pipe does not function, there needs to be a vertical pipe attached above the screw cap release, both located on the outside wall of the house (per Figure F)
- This fail-safe pipe needs to be about 5cm above the bottom circumference edge of the storm-water so that it does not allow any over-flow other than when the storm-water overflow fails – but note the top of the tank’s air vent must be well above this fail-safe pipe and the height of the floorboards may require this 5cm margin to be reduced

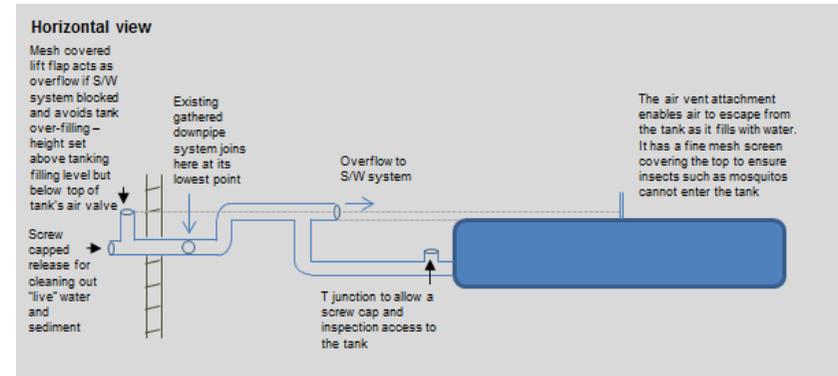


Figure F

Step 5: Tank connection to house water system – non-potable system

- A non-potable system has the advantage of not requiring any filtering – screen or UV filter
- Given the large particle removal that occurs before the water reaches the tank and the gathering of sediment in the tank itself, only minor particles will flow out of the tank and the pump can handle these small particles
- The Raindrop system uses a Grundfos pump, which provides for automatic switching to mains water in the event that the tank runs dry
- This model of pump contains an in-built back-flow preventer and is therefore approved by Auckland City for use in urban rain harvesting systems

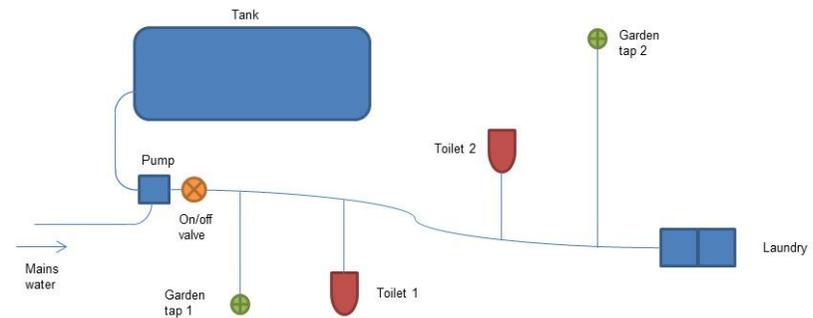


Figure 1