One Piece & Two-Part cold-water storage cisterns

Installation & maintenance instructions

GRP Specialist since 1968

Rev002 – Revised 18/08/21

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1. Guidelines for locating water cisterns

The following recommendations are generally for elevated cisterns, as cisterns at elevated positions can cause serious damage to the surrounding area in the event of wall, pipe or structural support failure resulting in water spilling out at a fast rate. Consideration must be given to minimise the effects of such an occurrence, in terms of the positioning of the cistern and regular inspection for defects.

- Water cisterns should be located so as to prevent water damage or consequential loss in the event of leakage howsoever occurring.
- All cisterns which are located above water sensitive areas should have a bund wall around them with adequate evacuation ducts.
- All other cisterns should have Condensation or Drip trays to prevent nuisance damage and to keep floors dry.

Over the years we have seen cisterns fail due to age, lack of maintenance, failure of the structural supports underneath the cisterns, contaminated water attacking the internal fittings, ball valve failure where overflows were not fitted, vandalism etc.

1.1 Water cisterns on top of buildings

Water cisterns located on top of any building should be sited at least 1.2 meters away from the edge of the building. It would be preferable if the water cistern was sited 1.5 times the height of the cistern away from the edge of the building. In the event of failure, this would allow the water to spread itself over a much wider area before spilling over the edge of the building and possibly taking personnel or debris with it.

1.2 Water cisterns on elevated structures

For water cisterns located on top of elevated structures, a walkway of at least 1 meter should be provided all-round the water cistern to allow for maintenance and inspection. This walkway should comply with health and safety regulations.

1.3 Potable water cisterns

To comply with the Health & Safety Executive regulations on the Control of Legionellosis 1998, Cold Water
Storage Cisterns must be located in areas that are "*readily accessible for cleaning*".
Regular Maintenance and Inspections as required by Health & Safety Legislation.

2. Notes on One-piece cisterns

Nicholson Plastics manufacture a variety of One-piece cold-water storage cisterns. They are durable, of one-piece construction, are easy to install and represent excellent value for money. These come in a variety of standard sizes from 45 to 24000 Litres. Custom moulded one-piece cisterns can also be manufactured to suit particular site applications with restricted access.
One-piece cisterns can be supplied pre-insulated with integral CFC & HCFC free polyurethane foam within laminate. Insulation jackets are also available for cisterns up to 5680 litres which depending upon specification are suitable for internally located cisterns.
Cisterns should always be insulated to Bylaw 30, thus meeting Water Regulation Authority requirements.

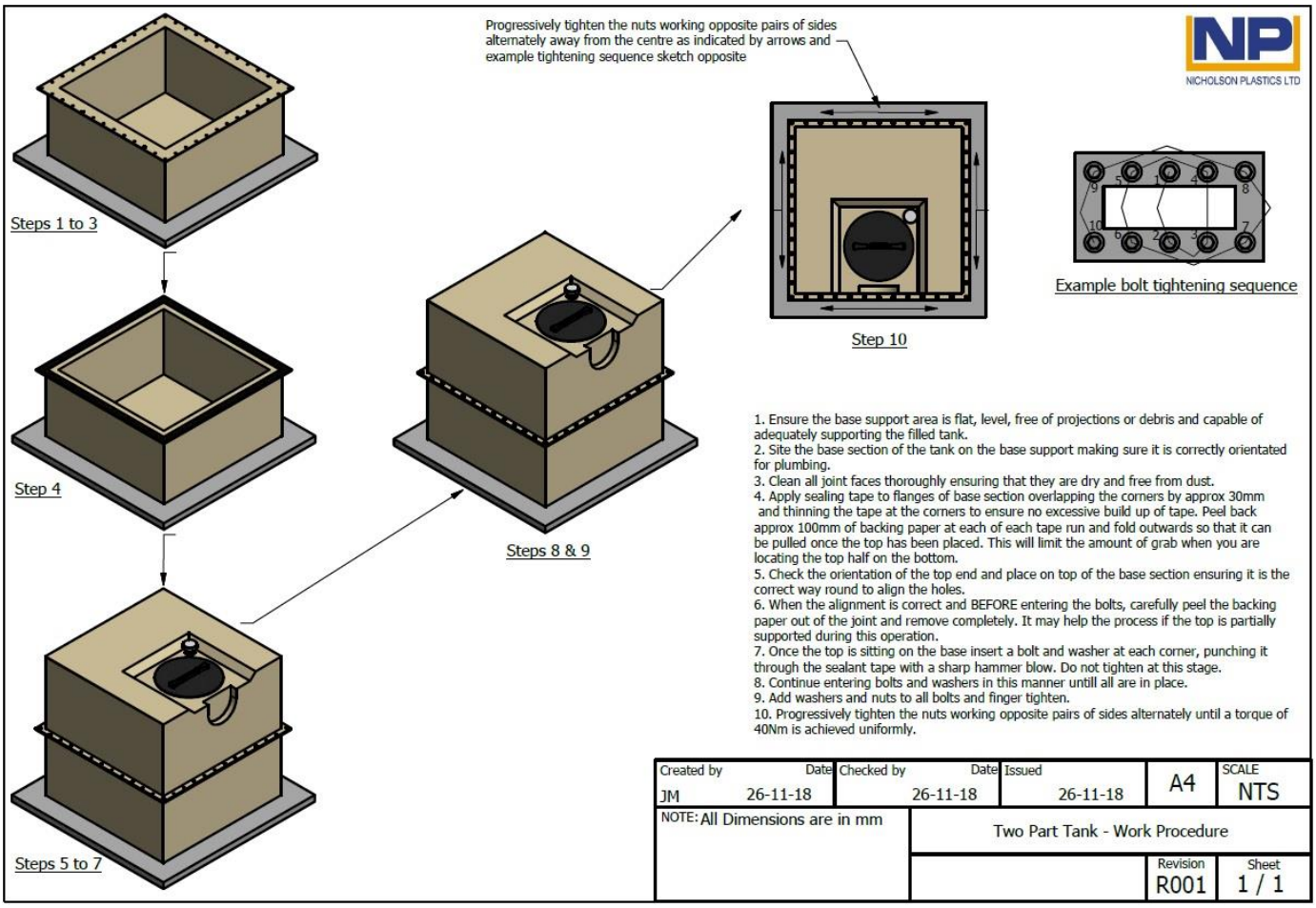
- PU foam insulated One Piece Cisterns come complete with insulated covers.
- GRP covers and condensation/drip trays are available for all sizes.
- When the cisterns are installed a recommended 500mm space is required above the cisterns for access in line with *Water Regulations 1999*.

IT IS IMPORTANT THAT THE BASE OF THESE CISTERNS

BE FULLY SUPPORTED IN USE.

a. Ensure that the base of the cistern is adequately and uniformly supported over its whole area and is capable of supporting the cistern and its content without deflection. Refer to *Building Regulations Part G 3.15* and *BS EN 13280:2001*.
b. Support and align the pipes so as not to distort the cistern, and do not over tighten the back nuts.
c. Ensure that circular holes for fixing pipes have a clean edge, free from notches, and cut them with a hole saw or drill them with a sharp cutter.
d. Position the cistern so that it is not in close proximity to any source of heat.
e. The cistern should not be left unattended during initial testing & commissioning.
f. Check that internal steel stays are in place.
g. Adequate overflows should be fitted to prevent the cistern from being pressurised.

3. Assembly instruction for Two Part cisterns



4. Condensation trays

Nicholson Plastics manufacture condensation trays to suit all sizes of water storage cisterns

- Trays should be used in any instance where condensation drips from pipe work or from the cistern.
- May cause nuisance damage or render floors wet and slippery.
- These trays should be water tested at time of testing cistern.

A condensation tray is not a substitute for a bund wall or for cisterning out a room.

APPROPRIATE OVERFLOWS MUST BE FITTED AS CLOSE AS POSSIBLE TO THE BASE OF THE TRAY. THESE MUST BE FITTED BEFORE THE CISTERN IS FILLED.

5. Cisterns insulated and finished to Bylaw 30

- Current legislation states that water hot or cold, in any premises that might be used for human consumption must be of potable quality.
- In addition to cistern material specifications, there are now further requirements for lid design, the screening of vents, breathers, overflows, warning pipes and the provision of insulation which will help prevent freezing and also help keep water as cool as practicable, ideally less than 20^{O}C.
- Bylaw 30 is Nicholson Plastics description of cisterns with covers, complete with screened vents,

  overflows, warning pipes etc and having side wall and lids with a (u) value of 2.5 w/m2K. This value meets the requirements of section 30 of the water bye laws in the majority of situations. Cisterns in boiler rooms etc may also need additional base insulation. The purchaser can specify extra requirements or thermal transmittance after considering the period of protection necessary, the cistern location and the surrounding conditions.

Please Note: Insulation slows down but does not prevent heat loss or gain over protracted periods. Additional information is available in *BS EN 13280:2001*.

6. Pipe connections

- If the cistern is to be drained down at a fast rate or by pumps etc, Nicholson Plastics should be contacted so that adequate vents can be placed on the cistern. The standard vent is 2".
- Connections of 100mm (4") nominal bore or over require studded flange pads to suit BS 1962, table D&E flanges for pipework connections.
- Connections below 100mm (4") nominal bore may be made by cutting holes in situ. First determine whether single- or double-sided connections are required and cut hole in panel to suit external pipe diameter.
- For connections over 50 mm (2") nominal bore use two flanges screwed BS21 taper thread, drilled to BS 10. Offer one flange to panel concentric with hole and transfer drill bolt holes into panel. Set one flange to external pipe and using appropriate gaskets, assemble external flanged pipe using other flange as an internal backing plate. Finally bolt up.
- For double sided connections proceed as above, replacing internal flange with the required fitting, e.g. ball valve, strainer basket etc.
- For connections of 50 mm (2") nominal bore or less proceed as above or alternatively use threaded flanges or backnuts (with rubber gaskets) on standard long screw to *BS EN 10255:2004*.

All pipe work must be self-supporting. If welded or brazed-on flanges are used, all heat must be dissipated before connections are made to the cistern. Holes may be cut with normal metal working tools.

7. Pipe connections for insulated cisterns

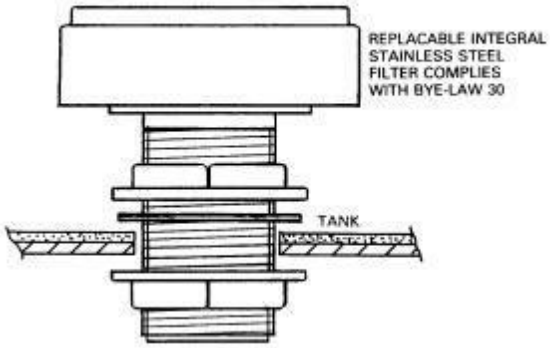
The areas where pipe connections can be made on insulated cisterns are more restricted than in standard cisterns, there is a recess in the insulation to allow for the pipe connection. Standard insulated cisterns come with three insulation recesses. More can be supplied if required. Recesses for connections can be made in different locations but Nicholson Plastics must be notified of this prior to order.

8. Bylaw 30 fittings: Vents, Warning pipes & Overflows

7.1 Screened Air inlet vent

One of these is to be fitted to the lid in every Bylaw 30 Cistern. The hole for the vent will be pre-drilled in the lid panel. Larger cisterns may require more than one vent. Vent configuration may vary from that shown.

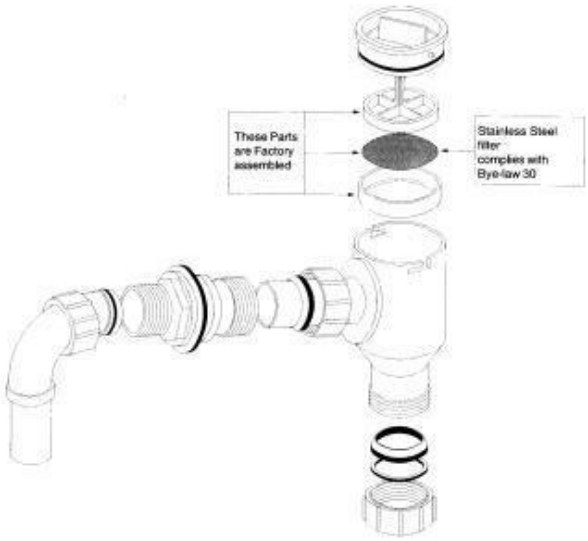
Note: During commissioning the air inlet vent should be checked to ensure that it is attached correctly to the cistern.



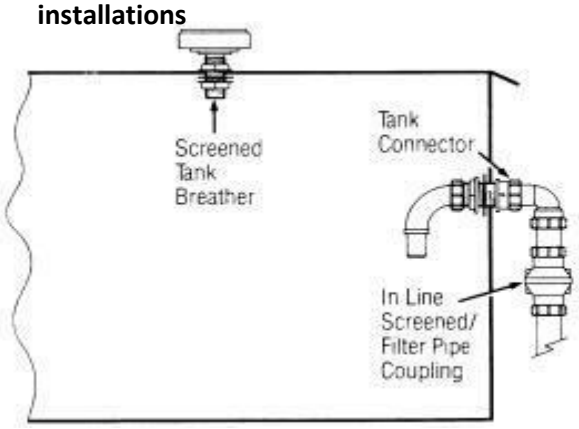
7.2 Screened overflow

A screened overflow is supplied if ordered with each Bylaw 30 Cistern. Please contact us with dimension of size is required. These are not fitted by Nicholson Plastics Ltd as standard.

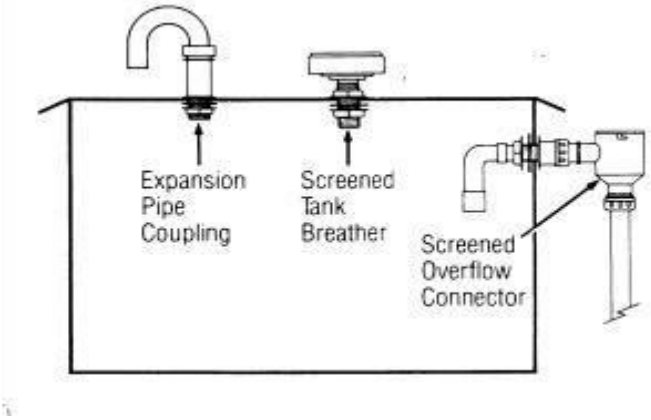
- Overflows larger than 1 ½ "have a different configuration.
- Warning or tell-tale pipes if specified must also be screened



Bye law 30 fitting for larger commercial installations



Bye law 30 fitting for domestic storage cisterns



9. Maintenance recommendations

Maintenance Interval: Minimum of once yearly.

Check List

1. All internal supports should be checked for integrity and if any problem is found it should be rectified immediately.
2. Check generally for leaks or drips.
3. Check that all pipe work connected to the cistern is suitably braced.
4. Check that the structural supports under the cistern are in good condition.
5. If overflow and/or air inlet screens are fitted, check that they have not become blocked.
6. If insulated check that insulation and the manhole is securely fixed and not damaged, if they are damaged then the cistern is not in compliance with Byelaw 30.
7. If not insulated in accordance with Byelaw 30, ensure that people cannot consume water from the cistern. We can advise on upgrading the cistern to Byelaw 30 standard.
8. If there is a Condensation Tray with the cistern, ensure that it has an overflow fitted and that it has not been damaged.
9. If the cistern has a cover and is sited out of doors, check that the cover has not suffered structural damage and that it is securely bolted down.
10. If the area underneath / adjacent to the cistern has become water sensitive check that the cistern room is bunded with adequate escape ducts.
11. If the cistern room is bunded, check that it is in good condition.

Note: Further information on the Health & Safety aspect, reference water quality is available in *BS 8558:2015*.

10. Glossary of terms

One-piece **cistern**
Rectangular fixed container assembled for the storage of water at atmospheric pressure and at a maximum temperature of 30^{O}C.
Note: This temperature is higher than is acceptable for drinking water, which should not normally exceed 20^{O}C.

Nominal capacity
Volume contained in a cistern, measured up to the top edge of the side walls.

Actual capacity
Volume contained in the cistern up to the maximum working level, this can be between 10-50% less than the nominal capacity.

Bund Wall
Structure situated underneath water cisterns. Its purpose is to protect the building from water damage. All water cisterns located above areas that are water sensitive should be bunded.

Vent
Opening to the atmosphere to allow for the movement of air resulting from changes in the water level so that the water always remains at atmospheric pressure.

Warning Pipe
Pipe so fixed that it's outlet, whether inside or outside a building, is in a conspicuous position where the discharge of water can be readily seen.

Overflow Pipe:
Pipe connected to the cistern to discharge any overflow therefrom.
Note: We recommend the installation of two cisterns in buildings as this will facilitate maintenance of cisterns without effecting the water supply to the building.

Leakage Test:
The duration of the test should be a minimum of 24 hours, commencing at least 2 hours after the cistern has been filled. The cistern should be inspected at regular intervals and not deserted during commissioning (first filling with water). The leakage test is not carried out by Nicholson Plastics Ltd. *BS 8558:2015* Specification for design, installation, testing and maintenance of services supplying water for domestic use within building and their curtilages.

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