

CWST operations & maintenance manual

Operation and maintenance manual

Document Title: Purewater CWST O&M

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This manual is to be used in conjunction with the following products manufactured by Purewater Storage Ltd:

- One Piece cold water storage tanks
- Two Piece cold water storage tanks
- Sectional water storage tanks
- Combination Units

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General safety Information

- A)** It is essential that correct and safe working practices are adhered to at all times when installing, operating and or maintaining any piece of equipment. Always consult all safety data sheets, operating and maintenance manuals, Health & Safety legislation and recommendations and specific requirements of any equipment manufacturer, client company, site controller, building manager or any other person or organisation relating to the procurement, installation, operation and or maintenance of any piece of equipment associated or in conjunction with any water storage tank provided by Purewater Storage Ltd.
- B)** This document is intended for all installers, operators, users and persons carrying out maintenance of this equipment and must be kept with the equipment, for the life of the equipment and made available to all persons at all times. Prior to carrying out any work associated with the tank it is essential that this document is read, fully understood and adhered to at all times.
- C)** The tank must only be installed, operated, used and or maintained by a competent person; A competent person is someone who is technically competent and familiar with all safety practices and all of the hazards involved.
- D)** Failure to install, operate, use or maintain the equipment in accordance with the information contained within this document could cause damage to the equipment and any other equipment subsequently connected to it, invalidating any warranties provided by Purewater Storage Ltd to the buyer.
- E)** Any damage caused to any equipment by misapplication, mishandling or misuse could lead to risk of electrocution, burns, flooding, death or injury to people and or damage to property dependent upon the circumstances involved.
- F)** Purewater Storage Ltd accepts no responsibility or liability for any damage, losses, injury, fatalities or consequences of any kind due to misapplication, mishandling, or misuse of any equipment, or as a result of failure to comply with this manual.
- G)** Water storage tanks contain water and as such represent a risk of injury or death as a result of drowning and or flooding and or injury or death as a result of structural failure of the tank.
- H)** Failure to adhere to the conditions, recommendations and general information contained within this manual may result in death or serious injury and or structural failure of the tank resulting in serious damage to equipment and or property.

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Warnings

- A)** The tank must be inspected upon delivery to site, and prior to any site positioning and or installation. Any damage to, and or unsuitability of the tank must be identified prior to installation. Failure to do so may result in death or serious injury and or structural failure of the tank resulting in serious damage to equipment and or property.
- B)** Unless otherwise stated the foundation on which the tanks is to be positioned must be inspected to ensure suitability for the purpose. The foundation must be no smaller than the gross external dimensions of the tank. The foundation must be solid & continuous and be level and flat being no more than + or - 2mm over any given metre and no greater than + or - 6mm over the total area taken by the tank. The foundation area must be free of local high and or low spots and be free from debris of any kind. Positioning and or commissioning of the tank on an unsuitable foundation may result in death or serious injury and or structural failure of the tank resulting in serious damage to equipment and or property.
- C)** It is essential that any base, foundation, plinth, wall or other supporting structure to which the tank and or any associated equipment is to be positioned and or attached is designed, engineered and fabricated to carry the entire mass of the equipment including the water that the tank will contain under worst-case fault conditions Eg. Tank filled to maximum nominal capacity at overflow condition. Failure to observe this may result in death or serious injury and or serious damage to equipment and or property.
- D)** The tank is not suitable for use as a working platform or designed to support the weight of man traffic. Standing on, walking across, and or use of the tank as a support may result in death or serious injury and or structural failure of the tank resulting in serious damage to equipment and or property.
- E)** It is essential that the tank is correctly connected to all incoming, outgoing, drain and overflow and or any other related pipework and or electrical equipment of any kind before the tank is filled. Failure to do so may result in death or serious injury and or structural failure of the tank resulting in serious damage to equipment and or property.
- F)** Do not remove the main lid of the tank without first draining the tank. The lid is a structural part of the tank and **MUST** remain correctly fitted and fixed down at all times whether water is contained within the tank, or whether the tank is empty. Removal of the main lid of the tank when water is contained within the tank may result in death or serious injury and or structural failure of the tank resulting in serious damage to equipment and or property.
- G)** Do not lean over or reach into any access hatch or attempt to enter the tank when water is contained within the tank. Accidental or deliberate entering of the tank may result in death or serious injury and or structural failure of the tank resulting in serious damage to equipment and or property.

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Warnings

- H)** Do not attempt to enter the tank when the tank has been drained and water is not contained within the tank, Water storage tanks represent a confined space working environment. Only persons fully trained and correctly equipped to carry out work in a confined space environment should enter the tank. Failure to adhere to correct safe operating procedures when working in a confined space may result in death and serious injury.
- I)** Purewater tanks are designed to operate at atmospheric pressure only and must not be pressurised or be subjected to vacuum. Should any tank be subjected to pressurisation and or vacuum this may result in death or serious injury and or structural failure of the tank resulting in serious damage to equipment and or property.
- J)** Purewater tanks are designed to operate within a specific temperature range between 0°C & 30°C, unless specifically stated, otherwise the temperature of the tank and or water contained within must not fall below 0°C or exceed 30°C. Should such a condition arise, this may result in structural failure of the tank resulting in death or serious injury and or serious damage to equipment and or property.
- K)** Purewater tanks are designed to contain clean, wholesome water only, and are not suitable to be in contact with water containing additives of any kind other than those included by any local water authority for the purpose of maintaining water hygiene and within standards and to concentrations allowing such water to remain as of a potable standard, being fit for drinking purposes.
- L)** Cleaning and sterilisation of the tank should take place using only chemicals and materials which are deemed suitable for use in contact with Grp tanks, Chemicals must be at concentrations which will not cause damage to the tank. Contact time for such materials should be no more than 1 hour duration and should be thoroughly flushed from the tank after use. Any unsuitable abrasive or aggressive chemical products and or materials may cause damage to the structure of the tank.
- M)** Any damage to equipment which is attached and or connected to any tank, for example pump sets, vessels, valves and pipework or any system components or similar items, which are damaged as a result of misapplication, mishandling, incorrect installation of any kind or misuse could lead to electric shock hazard, burns hazard, fire hazard, flooding hazard and cause death or injury to people, and or serious damage to equipment and or property.

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Cautions for installation

- A)** The unit should only be installed and or operated by a competent person; A competent person is someone who is technically competent and familiar with safety practices and the hazards involved.
- B)** When positioning, the tank **MUST** be lifted. The tank **MUST NOT** under any circumstances be dragged. The tank should be lifted using a suitable pallet to the underside and by using a pallet/ forklift or crane by passing straps underneath the tank and or pallet using a spreader bar. Any pallet must be no smaller than the overall external length and width dimensions of the tank. It is essential that no load is placed by pallets, supports, fork lift truck forks or similar, to the unsupported single skin base of any tank. Failure to utilise these correct lifting and or movement procedures will result in damage to the base of the tank.
- C)** Any storage of the tank should be inside in a dry place to avoid deterioration of the tank caused by general weather conditions.
- D)** Protect the tank against debris, dirt, damage and frost. It is absolutely essential that foreign matter such as pipe thread swarf, welding slag, grit, stones or any other debris are not allowed to enter the tank. Debris of this type can cause severe damage to the tank and or associated equipment.
- E)** Prior to initial commissioning of the tank or if the tank is to be stored or taken out of service for a period of time (e.g. 1 week or more), then we would recommend draining the tank followed by pre-storage cleaning of the inside of the tank. When recommissioning it is our recommendation that the advice and recommendations of the local water authority and or water hygiene facilities services provider is sought prior to re-commissioning of the tank and or system.
- F)** Ensure that any base, foundation, plinth wall or support of any kind to which the equipment is to be attached has sufficient mass compared to the equipment, in order to avoid noise/ vibration transmission.
- G)** The tank is not suitable for use as a working platform or designed to support the weight of man traffic. Standing on, walking across, or use of the tank as a support of any kind and for any purpose may result in death or serious injury and or structural failure of the tank resulting in serious damage to equipment and or property.

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Cautions for installation

- H)** When entering, exiting or generally working on the tank it is essential that no part of the tank is used as a support of any kind. Any internal or external flanges, fixings, bracing or connections are NOT suitable as hand or foot holds or suitable for bearing weight. If internal bracing is used to provide support for persons entering or exiting the tank this will result in leaks at the point at which any threaded bar passes through any tank panel(s).
- I)** The installer and or user is responsible for the installation of the correct earthing and protection according to valid national and local standards. All operations must be carried out by a suitably qualified person.
- J)** Where the fitting of connections to the tank is to be carried out on site it is essential that the operator carrying out such work is fully trained and familiar with carrying out an operation of this type. IF IN DOUBT PLEASE PHONE 0121 323 4000 AND ASK FOR SERVICE SHEET "**On-site connection fitting instructions**" before attempting to fit connections to the tank.
- K)** During the process of on site fitting of connections, the cutting of the tank body and or lid may result in the production GRP dust, swarf, shards and or splinters. It is essential that any person carrying out such work are fully protected from these hazards by use of correct Personal protection equipment. If in doubt please telephone 0121 323 4000 for further advice.
- L)** During the process of the on site fitting of connections and or any other work requiring the use of hand tools or powered tools and or equipment of any type it is essential that any operator is fully conversant with the correct use of equipment and is fully protected by the use of the correct personal protection equipment. Always consult tool/ equipment manufacturer's user manuals prior to use.
- M)** When installing water storage tanks always consult the current water regulations and local water authority regulations and requirements to ensure that the installation of the tank is suitable for the application, correctly carried out and does not contravene such regulations.
- N)** Any connections, pipe work and or equipment of any kind connected to or in association with the tank must be fully supported by independent brackets and or similar structures and fixings. It is essential that the tank body and or lid are NOT used to provide support of any kind for equipment or items of any kind.
- O)** Drain cocks and or valves which are fitted to the tank and or pipe work must not be left open as this could cause flooding.

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Cautions for maintenance and general use

- A)** Prior to carrying out maintenance work of any kind and prior to general use of the tank it is essential that the following sheets are read, fully understood and adhered to at all times.
- General safety information
 - Warnings
 - Cautions for installation
 - Cautions for maintenance and general use
 - Protecting the environment
- B)** The unit should only be operated and or maintained by a competent person; A competent person is someone who is technically competent and familiar with safety practices and the hazards involved.
- C)** The tank should be inspected on a weekly basis to ensure that no leaks are present and that no damage or deterioration to the tank structure and associated connection and or pipe work has taken place.
- D)** Any float valves, overflow and or warning pipes should be inspected on a weekly basis to ensure that the tank is not in an overflow condition. Tanks which are in an overflow condition are a source of considerable waste of water. Water is an expensive and often scarce natural resource, it's wastage comprises a threat to the environment and contributes to global climate change.
- E)** It is a requirement of current water regulations that water storage tanks should be thoroughly inspected at an interval not exceeding one year; in order to determine the state of hygiene inside the tank. If present, any dirt or debris, foreign matter, growths or contamination of any kind should be thoroughly cleaned from the inside of the tank and the tank sterilised prior to re-commissioning.
- F)** All screen units which are fitted to any vents, overflows and or warning pipes should be inspected and if necessary removed, cleaned and re-fitted prior to re-commissioning - please refer to **"HSE Approved Code of Practice (ACOP) L8"**.
- G)** It is essential that tank inspection and cleaning and any other water hygiene work is carried out by the building water hygiene facilities services provider or similar specialists.
- H)** During any cleaning, and or sterilisation of the tank, only chemicals and materials which are deemed suitable for use in contact with Grp should be used. Chemicals must be at concentrations which will not cause damage to the tank. Contact time for such materials should be no more than 1 hour duration. Any abrasive or aggressive chemical products and or materials may cause damage to the structure of the tank.
- I)** If the tank is to be stored or taken out of service for a period of time (e.g. 1 week or more), it is our recommendation that the tank is drained followed by pre-storage cleaning of the inside of the tank. When re-commissioning. It is recommended that the tank be cleaned thoroughly and sterilised/ chlorinated prior to commissioning. It is our recommendation that the advice and recommendations of the local water authority and or water hygiene facilities services provider is sought prior to re-commissioning of the tank and or system.
- J)** Where the tank and or associated equipment is fitted with Building Management Services (BMS) interconnections, always notify the appropriate persons before switching OFF for maintenance or adjustments, to avoid unnecessary alarm conditions occurring. **WARNING:** Any restriction of water supply from either supply to the tank or supply from the tank to any other equipment may result in failure of that equipment.

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Protecting the environment

When selecting, procuring, installing, operating and using any water storage tanks always consider the environment.

The correct selection of water storage tank for any application will help provide the most cost effective solution to water storage requirements and ensure a minimum impact of the environment.

Always ensure that tanks and associated equipment are correctly designed and installed to reduce wastage of water. Regular inspection of float valves, overflows and warning pipes will reduce the possibility of an overflow condition occurring. Water wastage is costly to the equipment user and to the environment and contributes to global climate change.

Disposal information

When disposing of water storage tanks, the tank should first be isolated and the contents contained within should be-sterilised prior to draining off.

Purewater tanks and tank panels are manufactured from GRP materials which are, at the time of the issue of this document, unsuitable for recycling.

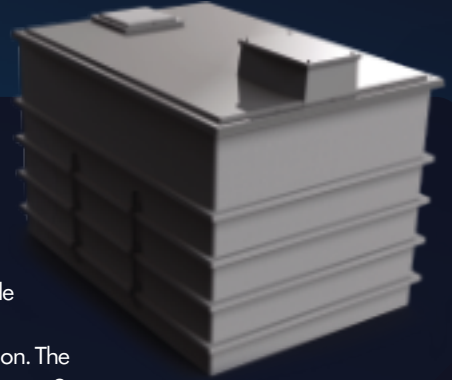
Tanks, tank panels and associated components which were originally manufactured by Purewater Storage Ltd should be taken to any local public waste disposal site for disposal.

Any metallic items such as fixings, connections and bracing should be disposed of to any local or public recycling facility.

Details of the location of local waste disposable facilities can be found in any local telephone directory or by contacting the waste disposal office of the local council.

In the event of the above detailed waste disposal facilities being unavailable please contact Purewater Storage Ltd on 0121 323 4000 to arrange to deliver the items to our works for disposal.

General conditions of installation for One piece, Two piece and Semi- sectional tanks



- It is the responsibility of the client to ensure that any tank and or associated equipment is suitable for the application and will pass through any access restriction present on site.
- Tanks and or tank sections must be positioned & handled with care and must not be dragged across any floor or surface of any kind.
- Unless specifically stated otherwise, it is the responsibility of the client to assemble 2 piece and semi - sectional tanks. Any quotation relating to the supply of such items does not include on site assembly.
- All Purewater storage tanks must be positioned on a continuous flat, level and solid foundation. The foundation should be no smaller than the external footprint of the tank and be no more than + or -2mm over any given metre. The foundation must not have any local debris or other items to the surface or damage to the tank base will occur.
- The foundation must be suitable for the purposes of providing structural support for the tank (including all connections & additional components) when the tank is full to maximum nominal capacity.
- The lid is a structural part of the tank. On tanks fitted with a man-way; the lid should always remain in place and be fitted down correctly when the tank contains water.
- Purewater tanks are not designed to support the weight of pipe work or equipment other than those supplied and factory fitted to the tank.
- Purewater tanks are not designed to support the weight of persons either working on or walking over the tank. The lid of any tank is NOT suitable to be used as a working platform or support of any kind. Any fall from any tank may result in death or serious injury.
- Failure to adhere to these conditions of installation may result in structural failure of the tank, which may cause serious injury or death, and or serious damage to property, equipment and other buildings structures and contents.
- No liability will be accepted by Purewater Storage Ltd for any consequence resulting from incorrect installation of, or incorrect working practices associated with, any tank and or associated equipment provided by Purewater Storage Ltd.
- To reduce the possibility of difficulties resulting from incorrect installation or unsuitable application of any equipment provided by Purewater Storage Ltd it is essential that our office is contacted on 0121323 4000 prior to filling, commissioning or use of such equipment.

Foundation Materials

When Purewater Storage Ltd provide foundation materials, comprising individual steels overlaid with ply boarding, these materials are only suitable for positioning onto an existing solid continuous floor and will NOT be suitable for positioning onto existing raised supports, it is essential that precise details of any existing supports are provided before specification and or pricing of suitable foundation materials can be provided. If in doubt PLEASE ASK.

Connections

It is essential to note that when pad areas have been requested in specific positions to suit specific requirements, under no circumstances will the cancellation of the order be accepted after the tank has been manufactured.

Where connections are either factory fitted or fitted on site, our engineers ensure a water tight seal.

If leaks are reported from any connection, Purewater Storage Ltd will if required return to site to inspect the connection, upon inspection where any connection has been either:

- Over tightening of the compression joint to pipe work, resulting in movement of the fitting, disturbing the seal to the tank.
- Subjected to heat from localised brazing, soldering or similar, resulting in damage to the seal to the tank.
- Damaged during transportation or on site in any way.

A Charge will be made for the return visit and any replacement connections will be charged for.

Transportation and positioning

Where provided, transportation of goods to site does not include offloading from the vehicle or positioning on site, offloading and positioning is the responsibility of the client.

General conditions of installation - Sectional tanks



Internally flanged base tanks (IFB)

For the successful installation of Purewater internally flanged base sectional tanks the following are required:

- The foundation area must be a minimum of 450mm greater in length and width than the internal dimensions of the tank.
- The foundation must be constructed so as to be capable of supporting the tank maximum weight when full.
- The foundation must be flat, level & continuous and be no more than $\pm 2\text{mm}$ over any given metre and no more than $\pm 6\text{mm}$ over 6 metres in any direction.
- The foundation must be free of any local high & low spots, protrusions and any debris of any kind.

Externally flanged base tanks (EFB)

For the successful installation of Purewater externally flanged base sectional tanks the following are required:

- The supports must be concrete, brick or steel and be constructed so as to be capable of supporting the tank maximum weight when full.
- Supports must run in one direction only, be maximum of 150mm wide and be at either 1000mm or 500mm centres depending on the height and configuration of the tank.
- Supports must be parallel and flat and be no more than $\pm 2\text{mm}$ over any given metre and no more than $\pm 6\text{mm}$ over 6 metres in any direction.
- The foundation must be free of any local high & low spots, protrusions and debris of any kind.

Access (Internally & externally flanged base tanks only)

Purewater sectional tanks require a minimum of 500mm working clearance all around the external footprint dimensions of the tank, a minimum of 500mm above the man-way height and for tanks constructed on supports, a minimum of 500mm access height to the underside of the tank.

Totally internally flanged tanks (TIF)

For the successful installation of Purewater totally internally flanged sectional tanks the following are required:

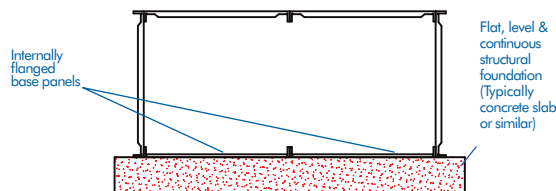
- The foundation area must be a minimum of 50mm greater in length and width than the external dimensions of the tank.
- The foundation must be constructed so as to be capable of supporting the tank maximum weight when full.
- The foundation must be continuous and be no more than $\pm 2\text{mm}$ over any given metre and no more than $\pm 6\text{mm}$ over 6 metres in any direction.
- The foundation must be free of any local high & low spots, protrusions and debris of any kind.

Access (totally internally flanged tanks only)

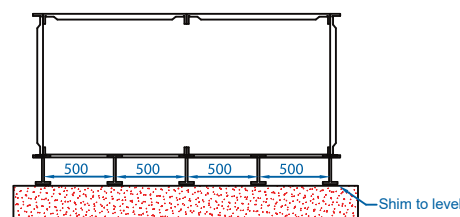
Purewater TIF sectional tanks require a minimum of 50mm working clearance to three sides and 500mm minimum to the final side.

A minimum of 500mm above the man-way height and a minimum of 350mm above any raised float valve housing.

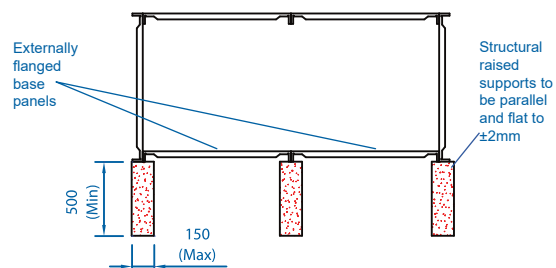
IFB & TIF Tanks



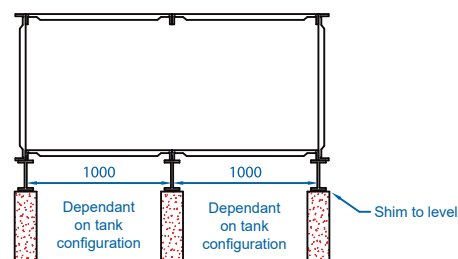
If the tolerances cannot be met with a concrete base, we can supply, position and shim the necessary steel work, providing a flat and level foundation.



EFB Tanks



If the tolerances cannot be met with the raised supports, we can supply, position and shim the necessary steel work to provide a level foundation.





General conditions of installation - Sectional tanks

Foundation Materials

When Purewater Storage Ltd provide foundation materials for tanks with IFB & TIF base arrangement, comprising of individual steels, these materials are only suitable for positioning onto an existing solid continuous floor and will not be suitable for positioning onto existing raised supports unless stated otherwise. It is essential that precise details of any existing supports are provided before specification and or pricing of suitable foundation materials can be provided. If no specific information is provided it will be presumed that the tank is to be positioned onto a flat continuous floor. Please note that where foundation materials comprise steels and ply boarding, these are not suitable for locating outdoors. Tanks which are to be located outdoors, when combined with foundation materials require reinforced base panels. It is ESSENTIAL that this information is provided to us prior to the agreed installation date, if in doubt PLEASE ASK.

Commissioning & testing of tanks

Unless otherwise stated commissioning & testing of the tank is not included in this quotation, and is the responsibility of the client. It is essential that the tank is filled, commissioned and tested within 10 days from the date of erection of the tank. Any leaks reported within this 10 day period will be inspected and rectified free of charge. If the tank is not filled, commissioned and tested within the 10 day period, any return to site to inspect and rectify leaks will be charged for. Once filled, the tank must remain filled. It is not acceptable to fill one compartment of a twin or multi compartment tank. Sectional tanks are designed to operate with all compartments filled to operating capacity. No liability for consequential damage caused by leakage as a result of testing will be accepted by Purewater Storage Ltd. If the client requires the tank erection team to be present the day of filling of the tank; this can be arranged and will be charged for as an extra service.

General conditions of installation - Sectional tanks

Off-loading is the responsibility of the client. No offloading has been included in this quotation. Once delivered the tank panels and associated parts must be stored in safe, secure dry area. Any items deemed damaged or missing on inspection on the agreed date for the tank assembly on site will be charged for. This may cause erection of the tank to be delayed resulting in un-planned return visits to site the responsibility of which is not accepted by Purewater Storage Ltd. All pricing detailed in this quotation is based upon work taking place during normal working hours, weekday periods only. Out of hours or unsociable working hours (if available) will incur additional costs. On the agreed date of erection of the tank all items relating to the tank must already have been positioned adjacent to the area where the tank is to be built. Any trekking of panels is not included for in this quotation. If all items are not adjacent to the area additional cost will be incurred and erection may be delayed resulting in return visits to site which will be charged for. The tank foundation and general area MUST be clear and free from equipment of any kind. The only exclusions to this are the tank components which have been supplied by Purewater Storage Ltd which may be positioned / stored on the foundation area. Assembly of the tank will require uninterrupted access to the tank room and / or general area. It will not be possible to assemble the tank if other trades are working within the gross footprint area of the tank. The gross footprint area is deemed as +500mm all round the gross external dimensions of the tank. It is the responsibility of the client to ensure that the configuration and specification of the tank and or all associated connections & equipment detailed in any quotation are suitable for the application & requirements of the client. Any craneage and similar equipment required for offloading and positioning materials will be supplied and arranged by the client free of charge to Purewater storage Ltd. All power, heating, lighting and similar facilities and all welfare facilities required to enable the erection of the tank must be provided free of charge. Any scaffolding or any other similar safety equipment is to be provided free of charge, and is not the responsibility of Purewater Storage Ltd.

On site induction

Purewater sectional tank assembly engineers agree to undertake an on site induction prior to work commencing. On site inductions must take place no later than 8.15am and be a maximum of 1 hour duration. It is not acceptable to undertake multiple site inductions on the same site for the same project.

Aborted site visit

If on the agreed date of erection of the tank, the existing foundation is not to the above detailed tolerances or is generally unsuitable, or any of the general conditions detailed have not been adhered to, the erection engineers will wait on site for a maximum of 1 hour to enable others to re-locate components and materials and or carry out corrective work. If due to the resulting delay, the tank cannot be erected in the remaining time available, an additional site visit may be required and additional costs will be incurred. In the event of the erection of the tank not taking place or not being completed within the allotted time frame or for any reason which is not the responsibility of Purewater Storage Ltd a charge will be made for the aborted visit and or re-visit to site.

Connections

Where connections are either factory fitted or fitted on site, our engineers ensure that a water tight seal is made, if leaks are reported from any connection, Purewater Storage Ltd will if required, return to site to inspect the connection, Upon inspection where any connection has been either:

- Over tightened when tightening compression joint to pipe-work, thus moving the fitting & disturbing the seal.
- Damaged or disturbed in any way which is not the responsibility of Purewater Storage Ltd a charge will be made for the return visit and any replacement connections will be charged for.

No liability for consequential damage caused by leakage as a result of testing will be accepted by Purewater Storage Ltd. If the client requires the tank erection team to be present on the day of filling of the tank; this can be arranged and will be charged for as an extra service.