



PIPECO



Manufacturer of :

- GRP Sectional Water Tank
- Hot Dipped Galvanized Steel Sectional Water Tank
- Pressed Stainless Steel Sectional Water Tank



ISO Approval No : 0049362



Malaysia, Melaka



Taipei, Taiwan



France / Romania



**King Abdullah Financial District (KAFD)
Riyadh, Saudi Arabia**



Jakarta, Indonesia

INTRODUCTION

PIPECO was formed in 1984 as an engineering hardware company and ventured into sectional panel water tank business in 1989. To date, we have many years experience manufacturing water tanks. PIPECO has provided water storage solutions to many companies in world, supplying both pressed steel and GRP (Glass Reinforced Plastic) sectional water tanks. PIPECO is a global company, which already has partnerships in various countries, including: Malaysia, Singapore, south East Asia, Middle East countries such as U.A.E, Qatar, Saudi Arabia, Oman, and European countries such as France, Belgium and Australia.

The production facilities are housed in Port Klang, Malaysia, with an area of 20,000m². Our facilities have the capacities to annually produce 300,000 GRP tank panels and 50,000 pressed steel tank panels. This allows PIPECO to fulfill customer's expectations with competitive pricing, prompt delivery and consistent, high quality products.

PIPECO strives to provide the best quality product to the customer. We have a well established quality management system. Since 2003, PIPECO has been accredited the ISO 9001 standard. This ensures that the tank panel and accessories are produced under the most stringent quality audit and meet the required structural and durability performance. By using advanced automated production facilities and employing a team of highly skilled production staff, PIPECO is able to ensure that the tank panel and accessories produced conforms to a consistent high quality standard.

In addition, PIPECO values customer satisfaction and expectations. Therefore, PIPECO communicates with the clients throughout all stages of the tank provision; from the placing order, supply, installation and the final commissioning stage. This ensures that the specific requirements of the customers are met.

Production Facilities



Robotic Welding Machine

Production Facilities



Laser Cutting Machine



SMC Moulding Machines

GRP SECTIONAL WATER TANK

GRP TANK @ MELAKA, MALAYSIA

PROJECT : KONICA

TANK SIZE : [125m x 12m x 3m(H)] + [20m x 15m x 3m(H)]

CAPACITY : 5400m³ / 1.2 million gallons of water



GENERAL SPECIFICATIONS

Standard :

Singapore Standard SS245: 2014, MS 1390 : 2010 similar to British Standard BS 7491 Part 3:1994 and BS EN 13280:2001

Materials :

Sheet Moulding Compound (SMC) consists of :
Resin - Isophthalic unsaturated polyester resin conforming to BS 3532 specification
Fiber Glass - Low alkali fibre glass conforming to JIS R3411 to R3417 or BS 3396, BS 3496 and BS 3749 specifications

Manufacturing Process :

Hot pressed SMC compression moulding

Tank Structural Support :

Tank Structural Support:
Tie-rod System : External: Hot Dipped Galvanised Steel
Internal: SS304 Tie-rod, Optional SS316
Roof Support : PVC/ABS pipes with GRP roof panel stiffener
External Braced System : External: Hot Dipped Galvanised Steel
Internal: None (metal free inside, non-partitioned tank only)
Roof Support : PVC Poles with GRP roof panel stiffener

Sealant :

Non toxic PVC foam/EPDM Rubber

Bolt, Nuts, Washers :

External : Standard : Hot Dipped Galvanised Steel
Optional : SS 304/316

Internal : Standard : SS 304 (In-contact with water)
Optional : SS 316 (In-contact with water)

Roof : Standard : Hot Dipped Galvanised Steel
Optional : SS 304/316

Ladder :

External : Standard : Hot Dipped Galvanised Steel, 300mm width
Internal : Standard : PVC or Aluminium, 300mm width
: Optional : GRP or SS 304/316, 300mm width

Water Level Indicator :

Standard : Reverse Reading Pointer Mechanical Type (Cat & Mouse)
Optional : Direct Reading Clear Tube Type

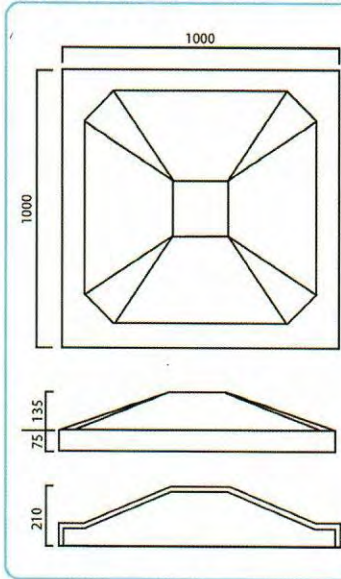
Nozzle Panel :

Pipe nozzles flange not inclusive
Flat panels will be provided on request

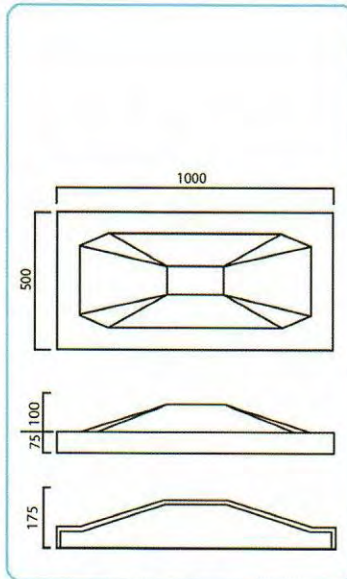
*Note: Specification may vary according to client's requirement.

GRP PANEL DESIGN

BASE PANEL

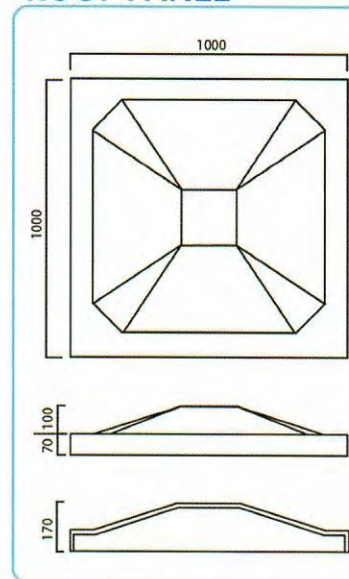


Base Panel 1m x 1m

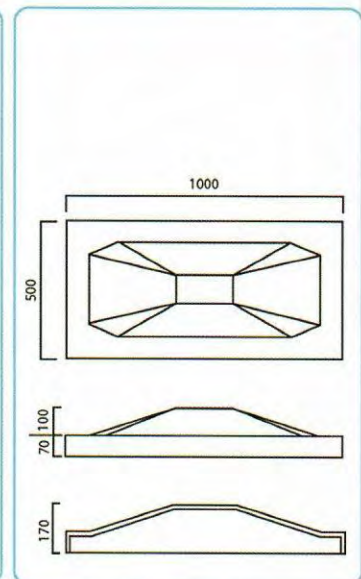


Base Panel 1m x 0.5m

ROOF PANEL

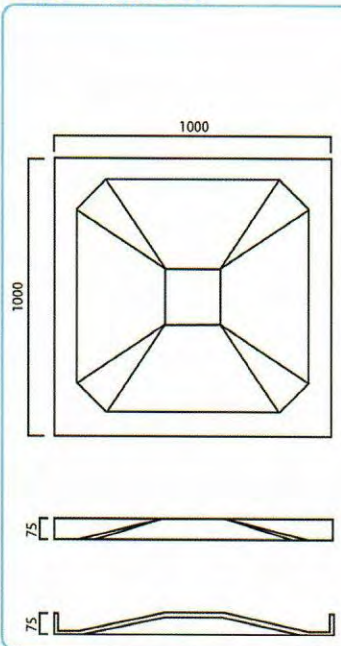


Roof Panel 1m x 1m

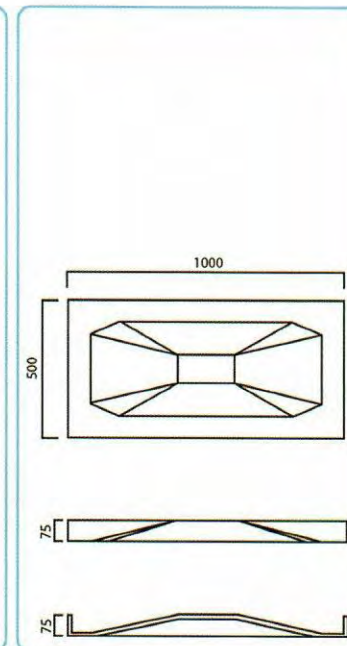


Roof Panel 1m x 0.5m

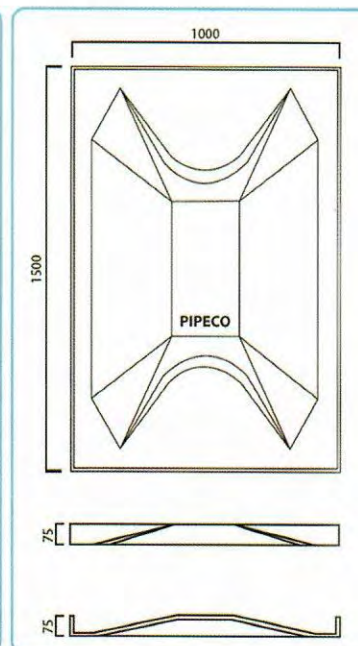
SIDE PANEL



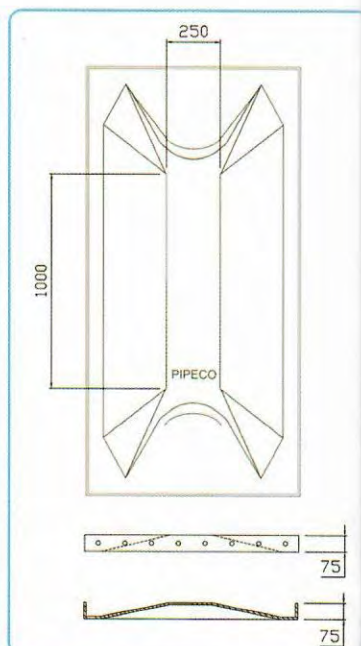
Side Panel 1m x 1m



Side Panel 1m x 0.5m



Side Panel 1m x 1.5m

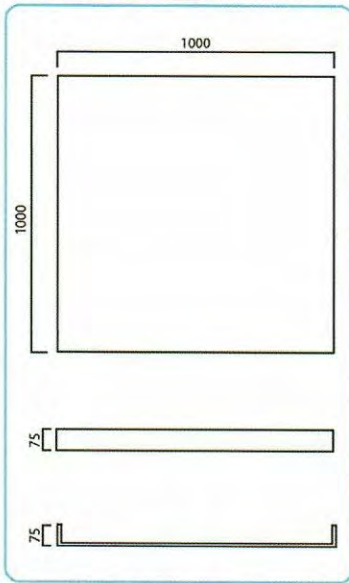


Side Panel 2m x 1m

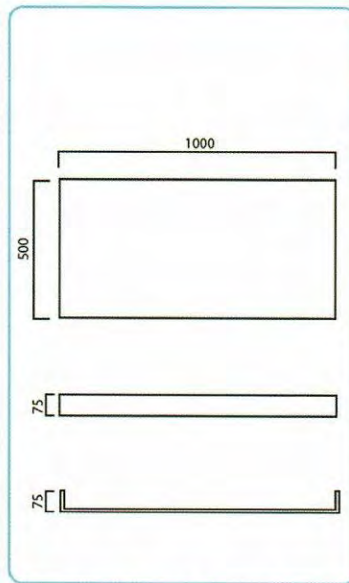
Performance of Panels

Characteristics	PIPECO GRP Tank Panel Performance	Acceptance Criteria (SS 245:2014 Specification)
Tensile Strength (MN/m ²)	107	>70 (min)
Bending Strength (MN/m ²)	167	> 100 (min)
Elastic Modulus in Bend (MN/m ²)	11953	> 6000 (min)
Glass Content (%)	33	> 25 (min)
Barcol Hardness	59	>30 (min)
Water Absorption (%)	0.2	0.5 (max)

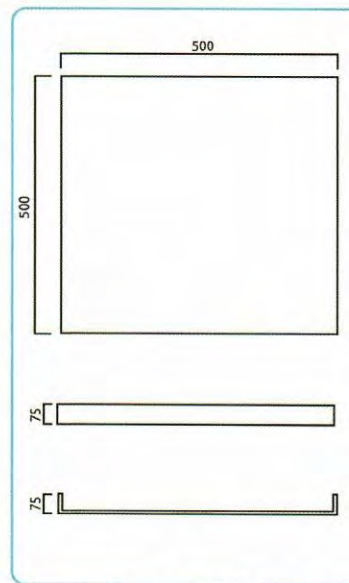
NOZZLE / FLAT PANEL



Nozzle/Flat Panel 1m x 1m

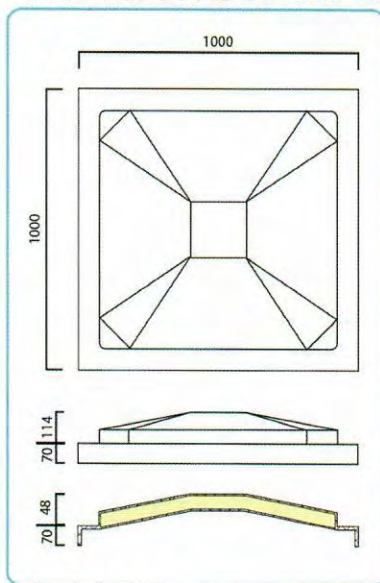


Nozzle/Flat Panel 1m x 0.5m

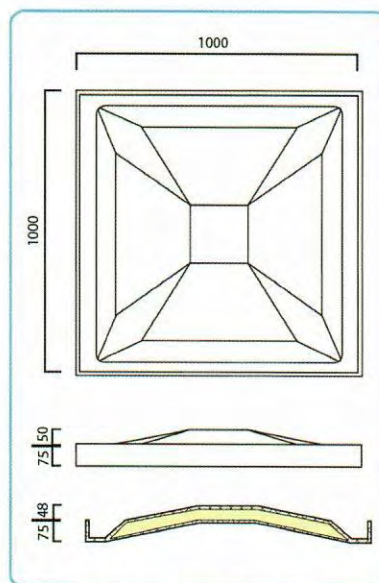


Nozzle/Flat Panel 0.5m x 0.5m

PRE-INSULATED PANEL

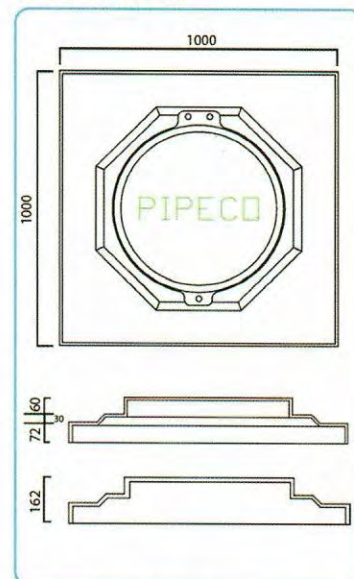


Top Panel 1m x 1m



Side Panel 1m x 1m

MANHOLE

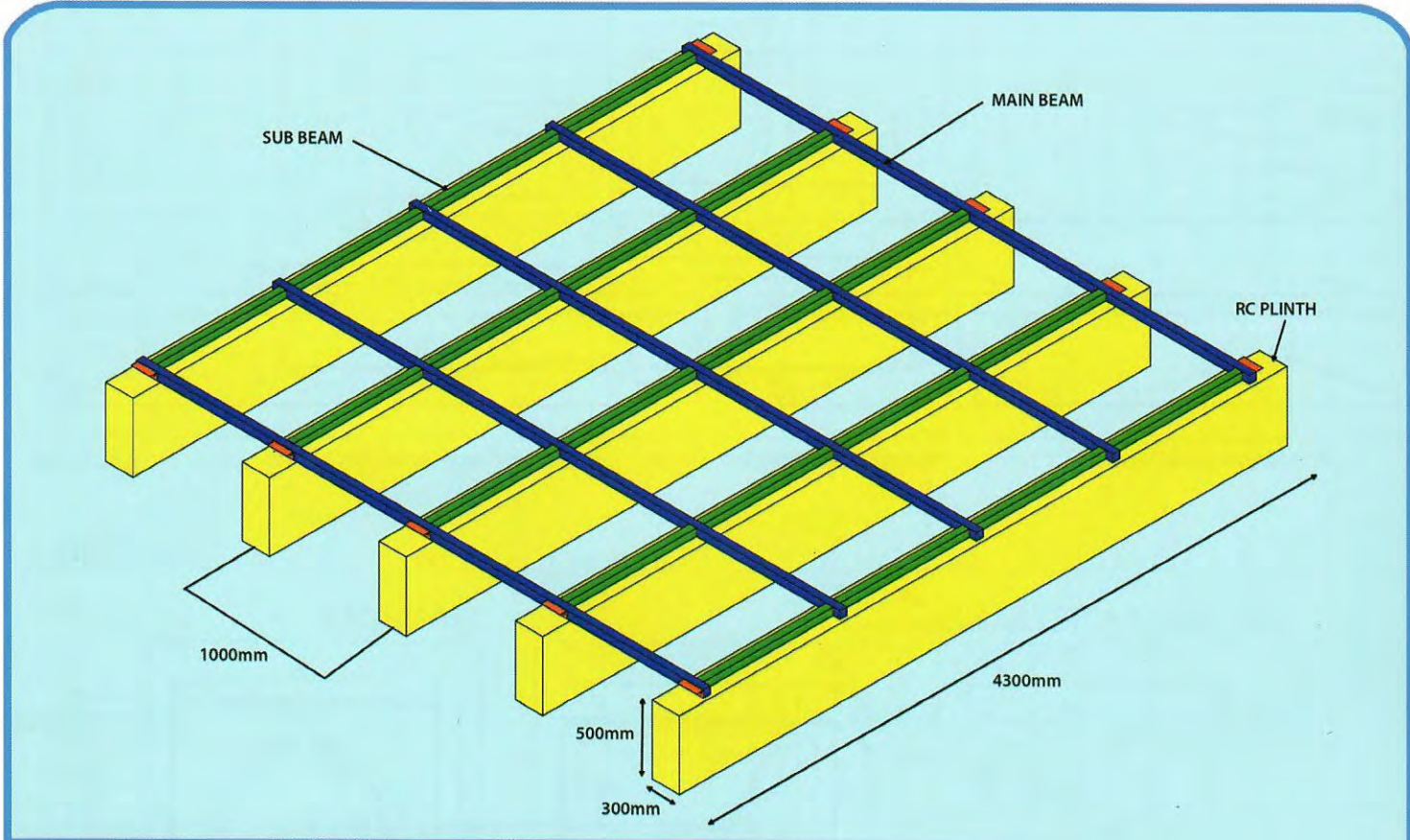


Manhole 1m x 1m

By encapsulating a 50mm layer of rigid polyurethane foam, PIPECO pre-insulated panel could maintain the desired water temperature stored inside the tank under extreme temperature condition. PIPECO pre-insulated panel could be selected for water storage where there is a need to stabilize the temperature against extreme heat or freezing conditions so to prevent dew formation.

SKID BASE SPECIFICATIONS

Skid Base Specifications for GRP sectional water tank



* 4m x 4m foot print skid base illustration

Tank Height	Main Beam	Sub Beam	Concrete Plinth Distance
1.0m	not provided	not provided	1000mm c/c
1.5m	Hollow Section 50mm x 50mm x 3mm	Hollow Section 50mm x 50mm x 3mm	1000mm c/c
2.0m	Hollow Section 50mm x 50mm x 3mm	Hollow Section 50mm x 50mm x 3mm	1000mm c/c
2.5m	Hollow Section 50mm x 50mm x 3mm	Hollow Section 50mm x 50mm x 3mm	1000mm c/c
3.0m	Hollow Section 50mm x 50mm x 3mm	Hollow Section 50mm x 50mm x 3mm	1000mm c/c
3.5m	Hollow Section 50mm x 50mm x 4mm	Hollow Section 50mm x 50mm x 4mm	1000mm c/c
4.0m	Hollow Section 50mm x 50mm x 4mm	Hollow Section 50mm x 50mm x 4mm	1000mm c/c

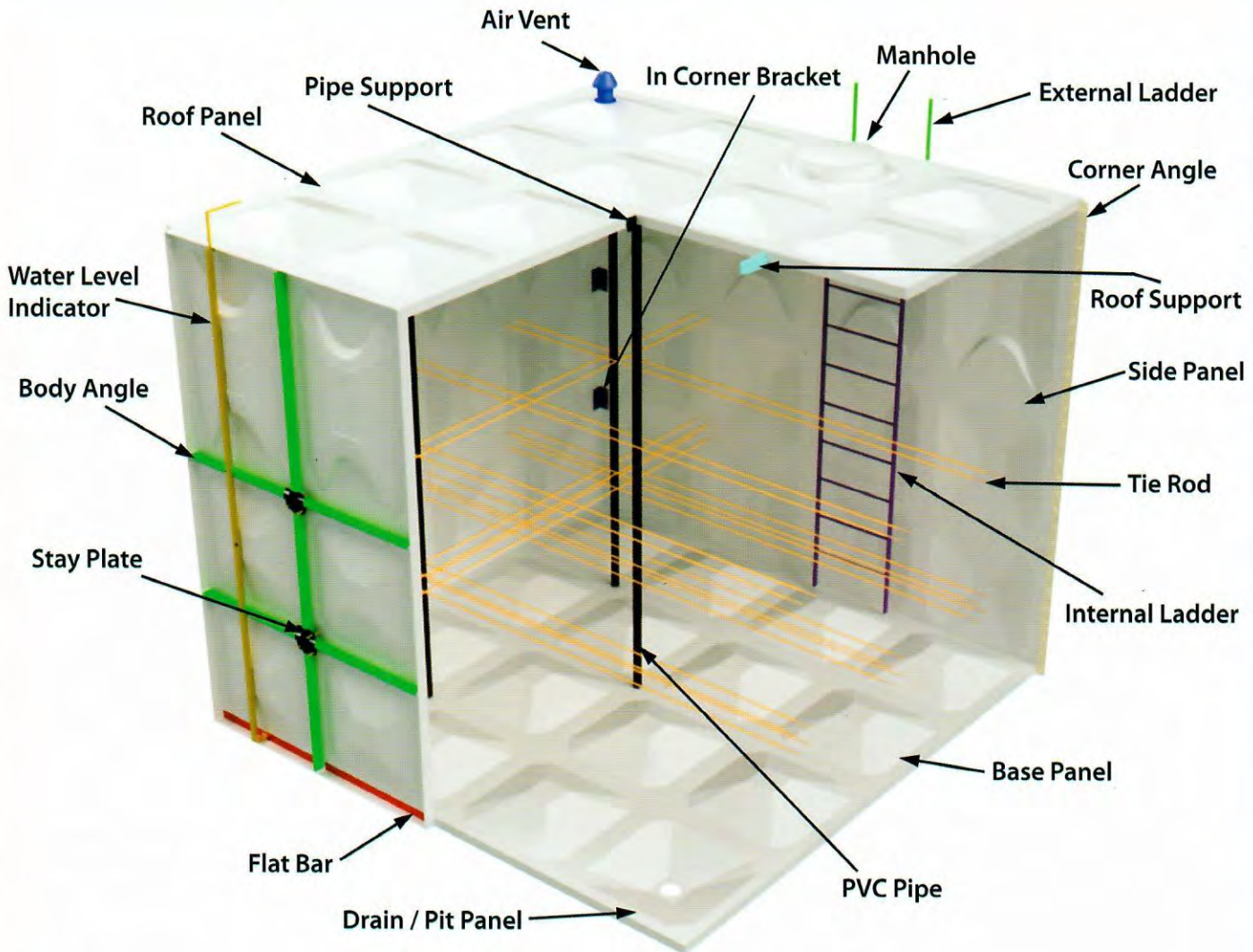
***PIPECO reserves the right to provide alternate skid base designs**

PIPECO recommends an ideal concrete plinth size of 300mm (W) x 500mm (H), with maximum variance in height of not more than 2mm

GRP SECTIONAL WATER TANK

Overview of internal structural support for GRP sectional water tank

PIPECO GRP sectional water tank is constructed with bottom, side and top panels, completes with external and internal structural reinforcement and necessary tank accessories to facilitate water storage

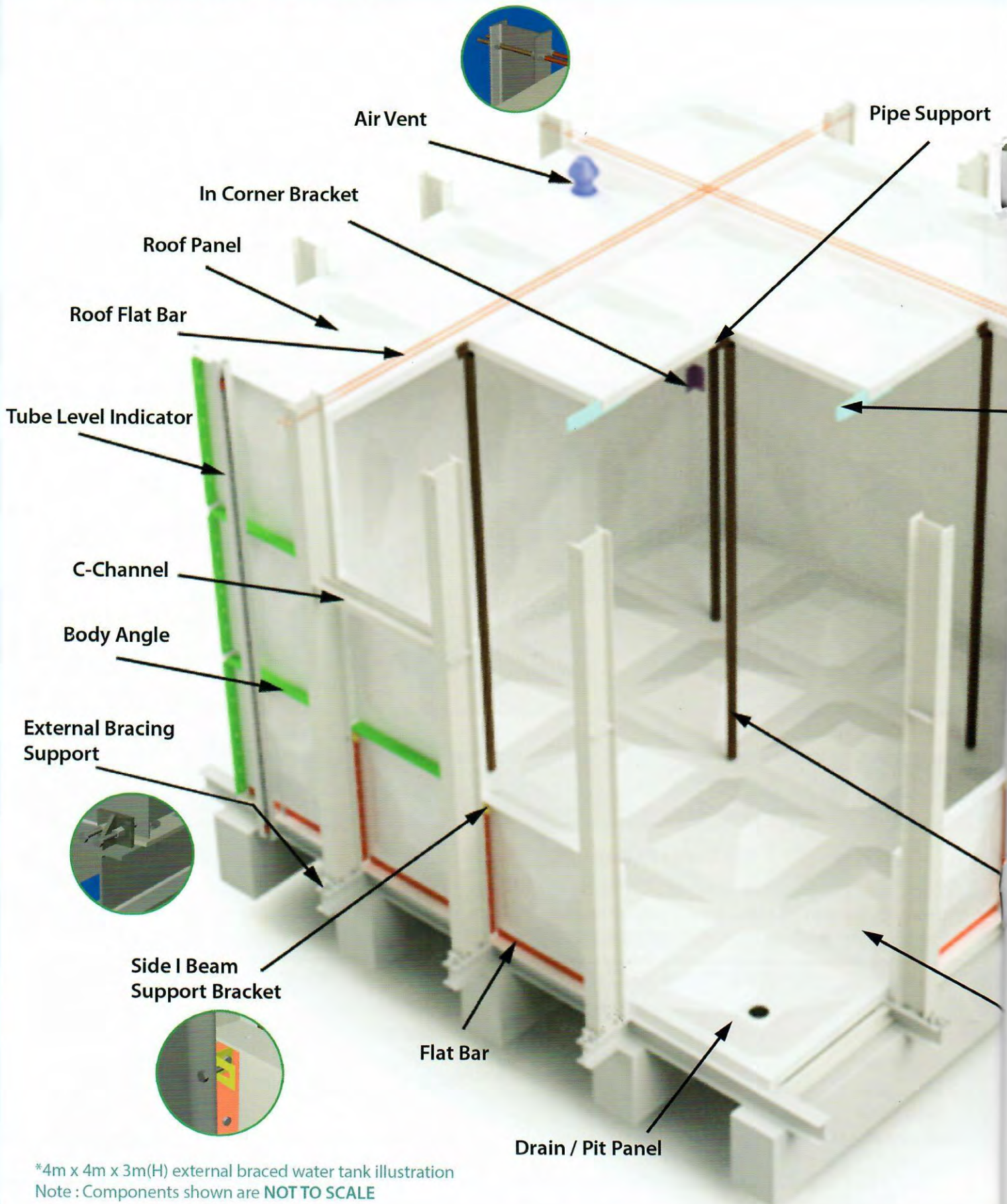


*4m x 4m x 3.5m(H) GRP sectional water tank illustration
Note : Components shown are **NOT TO SCALE**

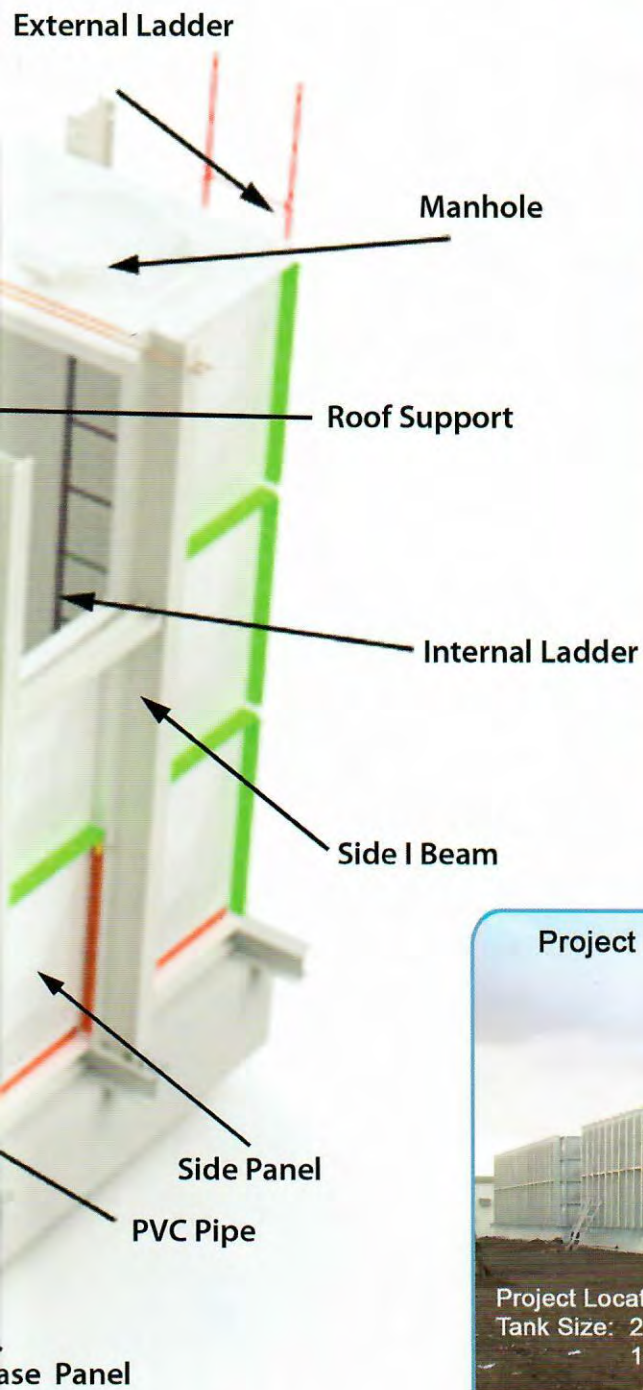
Main Components	External Structural Support	Internal Structural Support	Tank Accessories
Roof Panel Side Panel Base Panel Drain/Pit Panel	Body Angle Corner Angle Flat Bar Stay Plate	PVC Pipe Pipe Support Tie Rod Roof Support In Corner Bracket	Access Manhole Air Vent Water Level Indicator Internal Ladder External Ladder

GRP EXTERNAL BRACED SECTIONAL WATER TANK

Overview of external structural support for GRP sectional water tank



*4m x 4m x 3m(H) external braced water tank illustration
Note : Components shown are **NOT TO SCALE**

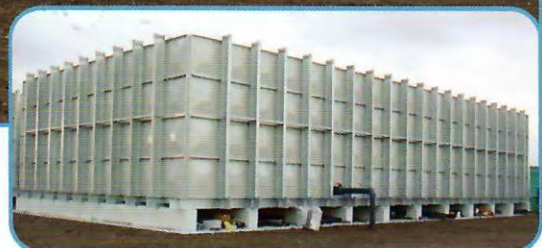


Main Components	Internal Structural Support
<ul style="list-style-type: none"> • Roof Panel • Side Panel • Base Panel • Drain / Pit Panel 	<ul style="list-style-type: none"> • PVC Pipe • Pipe Support • Roof Support • In Corner Bracket
External Structural Support	Tank Accessories
<ul style="list-style-type: none"> • Flat Bar • Body Angle • C-Channel • Side I Beam • Roof Flat Bar • Side I Beam Support Bracket • External Bracing Support 	<ul style="list-style-type: none"> • Access Manhole • Internal Ladder • External Ladder • Air Vent • Tube Level Indicator

Project Name : Camel Training and Swimming Pool in AL-Ain



Project Location: Abu Dhabi
 Tank Size: 20m x 20m x 4m(H) - 2units
 10m x 10m x 4m(H)



PRESSED STEEL SECTIONAL WATER TANK



PRESSED STEEL SECTIONAL WATER TANK

GENERAL SPECIFICATIONS

Standard :

PIPECO pressed steel sectional water tank constructed with hydraulically pressed flanged panels, conform to BS 1564 : 1975 and SS22 : 1979.

Materials :

The steel used in the manufacture of the tank plates, stays and cleats conform to the requirements of BS 4360 : 1972 grade 43A or ISO equivalent

Flanges of Plates :

Tank panels pressed with a combined double flange at an angle of 45 degree and 90 degree to the face of the plate on four sides

Stays and Cleats :

The stays and cleats are made of steel angle bar and steel plate

Bolts, Nuts and Washers:

Hot Dipped Galvanised steel bolts, nuts and washers for internal and external

Jointing Materials :

Non toxic PVC foam to be used for all jointing between tank panel flange

Tank Cover :

Panel type steel cover supported by trusses
530mm x 530mm square manhole and PVC air-vent supplied as standard for each compartment

Water Level Indicator :

Reverse Reading Pointer Mechanical Type (Cat & Mouse)

Nozzles for Connection :

Short pipe with flange or socket for all pipe connections

Ladder :

Aluminium or HDG Steel ladder for internal and external access, 300mm width

Finish :

Hot Dip Galvanised conform to ISO 1461

Standard Thickness for 1.22m x 1.22m Tank Panel

Type	1.22m (H)	2.44m (H)	3.66m (H)	4.88m (H)
4th side panels				5mm
3rd side panels			5mm	5mm
2nd side panels		5mm	5mm	5mm
1st side panels	5mm	5mm	5mm	6mm
Bottom panels	5mm	5mm	5mm	6mm

Standard Thickness for 1m x 1m Tank Panel

Type	1.0m (H)	2.0m (H)	3.0m (H)	4.0m (H)	5.0m (H)
5th side panels					5mm
4th side panels				5mm	5mm
3rd side panels			5mm	5mm	5mm
2nd side panels		5mm	5mm	5mm	5mm
1st side panels	5mm	5mm	5mm	5mm	5mm
Bottom panels	5mm	5mm	5mm	5mm	5mm

*Note : Specification may vary according to customer requirements.

British Standard Specification for PRESSED STEEL SECTIONAL RECTANGULAR TANK

1. Scope

This British Standard specifies requirement for pressed steel sectional rectangular tanks, working under a pressure not greater than the static head corresponding to the depth of the tanks, built up of pressed steel plates 1220mm square used to contain cold water, hot water, potable liquids, certain oils and chemicals. Tanks may be constructed as follows:

- (a) with external flanges;
- (b) with internal bottom flanges, external side and end flanges.

Two types are specified:

Type 1. With a combined double flange at an angle of 45° and 90° to the plane of the plate on all four sides as illustrated in figure 1. The plates of type 1 tanks are hot pressed complete.

Type 2. With a single flange at an angle of 90° to the plane of the plate on each of two, three or four sides, depending on its position in the tank. Type 2 tanks are cold pressed as illustrated in figure 2, with the flange corners welded.

This standard does not provide for tanks subject to earth or other external pressure other than wind pressure.

NOTE. For an illustration of a typical tank external flanges see figure 8. For approximate weights and full nominal capacities (without freeboard) of open top tanks see tables 1 to 4.

Tanks can also be assembled with all flanges internal with the addition of other components, but because of the difficulty of assembling and maintaining this type of tank they are not preferred.

All tanks can be supplied with open or closed top. Information on erection and supports is also included.

2. References

The titles of the British Standards referred to in this standard are listed on the inside back cover.

3. Information to be supplied with the enquiry and order

The following information, as appropriate, should be supplied by the purchaser with his enquiry or order.

- (a) Type of tank required (clause 1), type of cover (if any), number and position and type of manhole(s), number of divisions if required.
- (b) Capacity required in liters or dimensions in millimeters in multiples of 1220 mm and whether any provision is to be made for future extension and if any level indicators are required.

(c) Limiting conditions, if any, as to space and accessibility for erection, and whether the tank will be erected in a building or exposed to the weather, and the height above ground level it is to be installed.

(d) Nature and density of liquid for which the tank is required. If corrosive, particulars to be given. If water, state whether hard or soft. The rate of filling and emptying the tank, head fluctuations and cycles per day.

(e) Maximum and minimum temperatures and approximate rate of fluctuation and position of heating elements.

(f) Any special requirements as to jointing material and as to internal and external coating or lagging.

NOTE: In the absence of any special requirements one coat of a suitable priming paint will be applied to protect the tank during delivery and erection. A minimum of two further coats should be applied after erection.

(g) Particulars of connections and drilling required and precise location on tank with dimensioned sketches, having regard to possible future requirements.

(h) Whether external access ladders are required and, if so, particulars to be given.

(i) Details of any existing or proposed supporting structure and height of bottom of tank above ground level so that the necessary scaffolding arrangements can be made to comply with statutory safety regulations.

(j) Whether transverse supporting bearers are required and, if so, particulars as to span and end support to be given.

(k) Whether the tank is to be used for other than a stationary application.

(l) Whether inspection will be made by the representative of the purchaser at the works of the manufacturer.

(m) Whether erection is to be carried out by the manufacturer at site; if so, information as to site conditions and accessibility to be given by the purchaser.

4. Working temperatures

For the purpose of this standard cold liquids are defined as those having a temperature not exceeding 38 °C and hot liquids are defined as those having a temperature exceeding 38 °C but less than 100 °C.

In the case of tanks to hold hot liquids, care shall be taken in use to avoid excessive vibration or turbulence. Tanks for temperatures higher than 100 °C should be the subject of mutual arrangement between the purchaser and the manufacturer.

5. Materials

5.1 The steel used in the manufacture of the plates, stays, cleats and pads for connections shall conform to the requirements of BS 4360: 1972 grade 43A or BS 1449: Part 1: 1972 material HR 14.

5.2 Bolts, studs, nuts and washers shall be made from steel complying with the requirements of BS 4190. Bolts and nuts shall be hexagonal, black finish, screwed ISO metric complying with the requirements of BS 4190, where applicable. Washers shall comply with the requirements of BS 4320: 1968 from 'F'.

6. Dimensions of unit plates

The nominal size of unit plates shall be 1200 mm square. The actual overall dimensions depending upon the particular manufacturer of the plates. The size of tanks shall be specified as multiples of the nominal dimension.

7. Thickness of unit plates

7.1 For cold liquids with a density not exceeding 1.0 the nominal thickness of the plate from which the unit plates are pressed shall be not less than:

	mm
Tanks 1220mm in depth:	
-bottom, sides and ends.	5
Tanks 2440 mm in depth:	
-bottom, sides and ends.	5
Tanks 3660 mm in depth:	
-bottom, sides and ends.	5
Tanks 4880 mm in depth:	
-bottom, and first tier of sides and ends	6
-second, third and top tiers of sides and ends.	5

7.2 For hot liquids with a density not exceeding 1.0 no plate shall be less than 6 mm in thickness.

7.3 For cold or hot liquids with a density greater than 1.0 the plate thicknesses shall be a matter for mutual arrangement between the purchaser and the manufacturer

8. Permissible stresses

The calculated stress in any stay and attachment and bolts shall comply with the requirements of BS 449, and any allowance that may be required for corrosion shall be added to the calculated thickness.

9. Flanges of plate

Plate shall be pressed with a combined double flange at an angle of 45° and 90° to the face of the plate on all four sides (type 1 figure 1) or a single flange at an angle of 90° to the plate on each of two, three or four sides (type 2 figure 2), the flanges holed according to the respective position of the plate in the tank and free from irregularities.

The width of the flanges shall be not less than 45 mm, the holes for the bolts having a clearance of 1.5 mm in diameter, the bolts having a minimum diameter of 14 mm (M14). The spacing of bolts holes shall not exceed 76.2 mm pitch.

10. Jointing material

The jointing to be used for tanks shall be suitable for the conditions and shall be a matter for mutual agreement between the purchaser and manufacturer. Any jointing used shall be insoluble in the liquid to be stored and, where necessary, shall be non-toxic.

11. Bolts, studs, nuts and washers

Bolts, studs, nuts and washers shall be in accordance with the requirement specified in 5.2. Each flange bolts shall be fitted with one flat washer under the nut and the diameter of the bolts shall be not less than 14 mm (M14).

12. Staying

12.1 The sides and ends of all tanks shall be supported by stays at the junction of two or more plates the stays shall be made from mild steel rolled sections calculated in accordance with clause 7. Stays shall be attached to the plates by bolting to cleats of equal strength bolted to tank plates; stay attachments to cleats and cleats to tank plates shall be calculated taking into account eccentricity of loading. The ends of the stays shall be attached to the cleats or tank plates by bolts.

12.2 Stays shall connect sides to bottom, ends to bottom and/or horizontally sides and sides to ends generally in accordance with figure 8.

13. Connections

13.1 Pads for connections, tapped bosses, screwed flanges or sockets, as may be required by the purchaser, shall be welded to the inside or outside or bolted to the tank plate. Pads shall be drilled, and/ or tapped as necessary to suit flanges complying with the requirements of BS4504, or such other standard as specified by the purchaser. Single pads shall be provided for connection on one side of the plate and double pads for connection on both sides of the plate. Tapped socks shall comply with the requirements specified in BS 1387.

Typical types of welded connections are shown in figures 3 to 7.

British Standard Specification for PRESSED STEEL SECTIONAL RECTANGULAR TANK

14. Welding of connections

Welds for connections shall be made by the metal arc process complying with the requirements of BS 1856 and by means of covered electrodes complying with the requirements of BS 639 : 1972 sections 1 and 2 : grade 1.

15. Supports

All tanks shall be effectively supported in accordance with the manufacturer's recommendations and tolerances. Supports shall be provided continuously under each bottom flange in one direction at 1220 mm centers. Tanks with internal bottom flanges can also rest directly on a flat level base. A sand/bitumen bed 50 mm thick is recommended in that case. Where steel joists are used they shall be designed to carry the imposed load with a maximum deflection of one five-hundredth of the span. Attention is drawn to the extra reaction on the supports under the side, end and division plates when the stays of sides, ends and divisions are inclined to the bottom of the tank.

16. Closed top tanks

16.1 Cover framing members shall be designed to withstand superimposed loadings complying with the requirements of BS 449.

16.2 Covers may be flat for indoor use and should be pitched or cambered for outdoor use, and jointed to ensure that they are dust and weather proof.

16.3 Covers may be constructed of steel plates or other constructional cladding materials.

16.4 In all cases closed top tanks shall be provided with a manhole of not less than 460 mm diameter clear opening to give access to the inside of the tank and with a suitable vent, filtered if necessary, to the manufacturer's requirements to avoid pressure changes within the tank.

17. Access Ladders

Tanks over 1220mm deep shall be provided with a steel internal access ladder. In covered tanks the ladder shall be adjacent to the manhole.

NOTE. External ladders may be provided if required; attention is drawn to BS 4211.

18. Marking

All tanks complying with the requirements of this standard shall be legibly marked as follows.

(a) Manufacturer's name, mark or initial.

(h) The number of this British Standard, i.e. BS 1564.

19. Minimum access

Where tanks with external flanges are to be erected in a confined space it is essential that a clearance of not less than 500 mm shall be provided all round the outside and underneath to facilitate erection. For access to the top of a closed tank the clearance at the top shall be not less than 750 mm.

NOTE. Allowance should be made for inspection and maintenance including valves or other external fittings.

20. Inspection

20.1 Works inspection. The purchaser or his representative shall have access to the works of the manufacturer at all reasonable times and shall be at liberty to inspect and to reject any material which does not comply with the requirements of this standard. Such inspection shall include verification that the unit plates will mate together and assemble. Where partial or complete assembly is required at the works of the manufacturer, this shall be the subject of specific arrangement between the purchaser and the manufacturer at the time of enquiry and order.

20.2 Site inspection. The purchaser or his representative shall ensure that supports are within the tolerances required by the manufacturer before the commencement of erection.

21. Erection

Erection shall be carried out in accordance with the manufacturer's instructions.

22. Testing

Testing shall be filling the tank with water on site and shall be the subject of specific arrangement between the purchaser and the manufacturer at the time of the enquiry and order. Water for testing shall be supplied by the purchaser.

PRESSED STAINLESS STEEL SECTIONAL WATER TANK

GENERAL SPECIFICATIONS

Standard :

PIPECO pressed stainless steel sectional water tank constructed with hydraulically pressed flanged panels

Materials:

The tank panel, tie rods, stays and cleats are made from Stainless Steel Grade 304 / 316

Flanges of Plates :

Tank panels pressed with a 90 degree panel flange to the face of the plate on four sides

Bolts, Nuts and Washers :

SS 304/ 316 bolts, nuts and washer

Jointing Materials :

Non toxic PVC foam to be used for all jointing between tank panel flange

Tank Cover :

Panel type tank cover supported by trusses

600mm x 600mm square manhole and supplied as standard for each compartment

Water Level Indicator :

Standard : Reverse Reading Pointer Mechanical Type (Cat & Mouse)

Optional : Direct Reading Clear Tube Type

Nozzles for Connection :

Short pipe with flange or socket for all pipe connections

Ladder :

Internal ladder shall be made of SS 304/316 and aluminium for external ladder, 300mm width

Skid Base :

None

Standard Thickness for 1.22m x 1.22m Tank Panel

Type	1.22m (H)	2.44m (H)	3.66m (H)	4.88m (H)
Tank covers	1.5mm	1.5mm	1.5mm	1.5mm
4th side panels				2.5mm
3rd side panels			2.5mm	2.5mm
2nd side panels		2.5mm	3.0mm	3.0mm
1st side panels	2.5mm	2.5mm	4.0mm	4.0mm
Bottom panels	2.5mm	2.5mm	4.0mm	4.0mm

Standard Thickness for 1.0m x 1.0m Tank Panel

Type	1.0m (H)	1.5m (H)	2.0m (H)	2.5m(H)	3.0m (H)	3.5m (H)	4.0m (H)
Tank covers	1.5mm	1.5mm	1.5mm	1.5mm	1.5mm	1.5mm	1.5mm
4th side panels							
3rd side panels						2mm(1x1.5m)	2mm(1x2m)
2nd side panels				2mm(1x1.5m)	2mm(1x2m)	2.5mm	3.0mm
1st side panels	2.0mm	2mm(1x1.5m)	2mm(1x2m)	2.5mm	2.5mm	3.0mm	4.0mm
Bottom panels	2.0mm	2.0mm	2.0mm	2.5mm	3.0mm	4.0mm	4.0mm

Note : Specification may vary according to customer requirements.



**Rafal Tower, Highest Tower in Riyadh,
Saudi Arabia**



Broome Hospital, Australia



Philippines, Union Ajinomoto Makati City



West Africa



U.A.E

HEAD OFFICE & FACTORY

PIPECO TANKS MALAYSIA SDN BHD

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WRAS
APPROVED
PRODUCT



SANGWON ONE TANK

GRP Water Tank

Best Watertight / Excellent Endurance
Easy to Construct / Assembly Water Tank

HOT PRESS MOULDED SECTIONAL GRP WATER TANK



SANGWON ENG CO., LTD.

SANGWON
GRP Water Tank

ONE TANK

Excellent in Clean & Hygienic and, Non-leakage,
Sectional GRP Water Tank for Easy to Design
and Installation.

Clean

Design

Durability

>>>>

Our company specializes in the development and production of GRP Water Tanks. Located in Gimhae, our large-scale plant and research center are dedicated to on going development and production to lead the industry. Our advanced technology has received ISO9001 and ISO14001 certification and is garnering world acclaim.

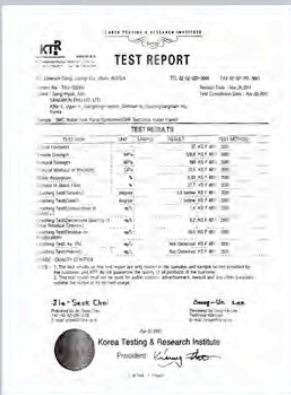
In addition, with a corporate ideology rooted in placing our customers first, we base our management and product development upon this foundation of trust, contributing to technological innovation, quality improvement, and added value enhancement.

In order to carry out such customer-oriented management, we constantly keep in mind the priorities of stringent quality management and environmental protection. In following, we adopted ISO product quality and environmental management standards from the very beginning and our efforts to grow as an environmental friendly company along with our customers are never ending.

We ask for your continuing interest and support. Thank you.

Certificates for GRP Water Tank

GRP water tank Certificates and test reports



SANGWON, ONE TANK

SANGWON, ONE TANK

Excellent in Clean & Hygienic and, Non-leakage.
ONE TANK for Easy to Design and Installation,

ONE TANK always keep clean water,
ONE TANK is designed to satisfy the basic requirements
by using GRP(Glassfiber Reinforced Plastic).

Patent, New Device Patent, Registration of design

Patent (lagging Water Tank)

New Device Patent (Water Gauge)

New Device Patent (Insulation Panel)



Features of ONE TANK

Features of ONE TANK

Various Capacity Design

Various size panels can use limited space for its best using way so can satisfy your needs.

Excellent Hygienic Conditions

No corrosion from panel and prevent bacteria increasing by isolating outside light.

Best Size Stability

ONE TANK panels size are changeless from the outside condition so easy to assembly.

Easy to Assembly and Moving

Sectional panels make construction time shorter, standardization panel make easier to moving, carrying in and transfer.

Watertightness

The joints sealed with special sealing tape especially developed for water tank.

Intensity and Durability

GRP Panel is moulded under condition of high temperature and pressure to maintain the best endurance.
Since using stainless steel for inside structure and plated steel for outside, it shows best performance against erosion.

Heat Insulation and Dewdrops Prevention

The heat insulation panel with 3 layer structured improves heat insulation effect.
Protects water from dewdrops and minimizes temperature variation of the stored water.



Antibacterial GRP water tank

Best Watertight - Sealing Tape / Bottom Drain System

- ▶ Especially developed sealing tape maintains perfect non-leakage of the Water Tank,
- ▶ The dome shaped bottom panel with a concave drain panel facilitates complete and quick drainage



System design (FEM)

Safe and robust panel construction is designed considering the stress concentration on the panel when load is applied by FEM.

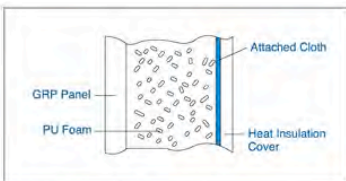
And we always satisfy all safety requirements such as strength, durability and stability with rigid design regulation and quality control.



Excellent Heat Insulation

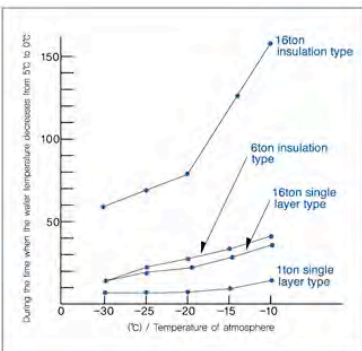
Outstanding in Heat Insulation

The heat insulation panel with 4 layer structure improves heat insulation effect, Protects water condensation on the outside of the tank and minimizes temperature variation of the stored water.



During the time when the water temperature decreases from 5° to 0°

Capacity	Classification	Temperature of Atmosphere		
		-10℃	-20℃	-30℃
16tons	Single Layer Type	35	20	13,5
	Insulation Type	164	81	58,5
1tons	Single Layer Type	11	6	4
	Insulation Type	37,5	23	13,5

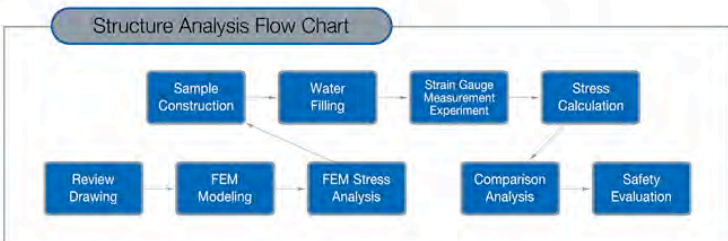


※ Test condition

- Tank is filled with water
- No further water supply, or drainage during the test

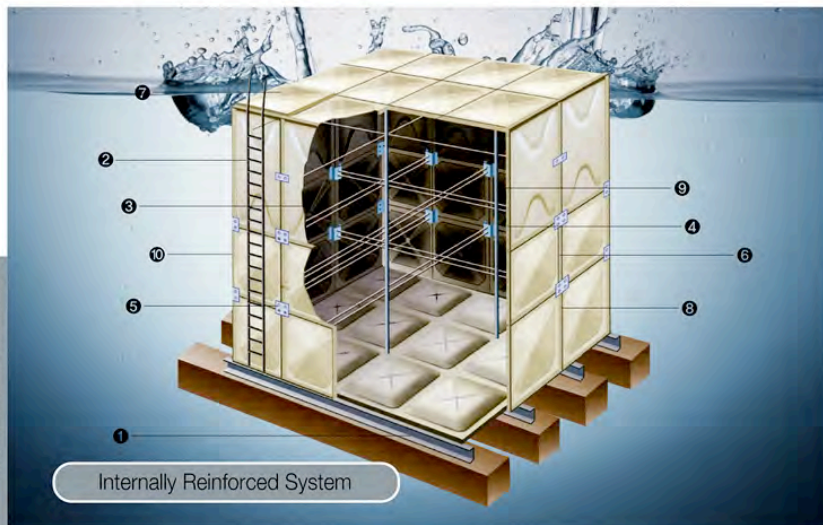
High Quality Water Tank System

We always satisfy all safety requirements such as strength, durability and stability with rigid design regulation and quality control.



The hydrostatic pressure resistance of the panel is measured with a hydrostatic tester to verify that the strength of bottom panel is applicable to permissible design stress. By above procedure, the panel grade applicable to the panel is determined.

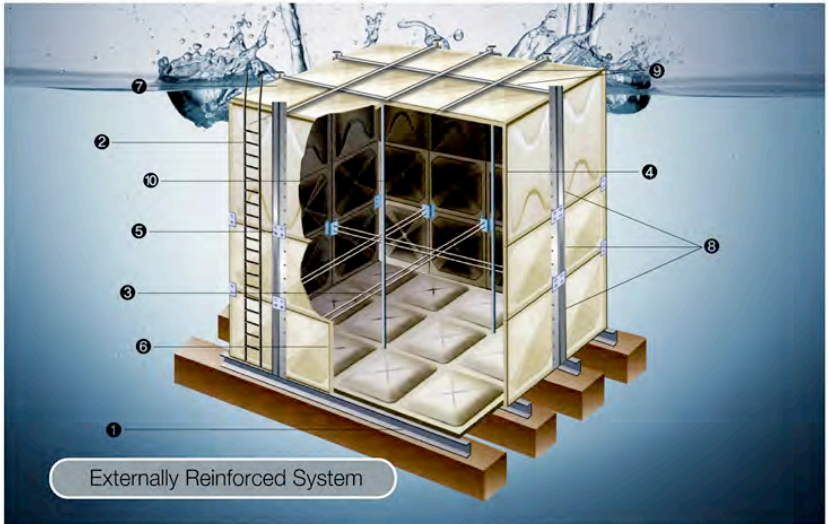
Internally Reinforced System



Internally Reinforced System

No.	Name	Material
1.	Base Frame	SS41 (HDG)
2.	External Ladder	SS41 (HDG)
3.	Internal Reinforced Stay	STS (PET coating) or STS 316
4.	Sealing Tape	PVC foam (Maintain water- proof with flexibility)
5.	Cross Support Plate	SS41 (HDG)
6.	Bolts and Nuts	<ul style="list-style-type: none"> • Inside : STS 304 or 316 • Roof Panel : HDG + PE Bolt cap • Outside : HDG + PE Bolt cap • Connection : HDG Rubber Head Bolt • Size : M10,12,14
7.	Manhole Panel	GRP
8.	Flange Support Bar	SS41 (HDG)
9.	Roof Support pipe	GRP
10.	Corner Frame	SS41 (HDG)

Externally Reinforced System



No.	Name	Material
1.	Base Frame	SS41 (HDG)
2.	External Ladder	SS41 (HDG)
3.	Internal Reinforced Stay	STS (PET coating) or STS 316
4.	Sealing Tape	PVC foam (Maintain water- proof with flexibility)
5.	Cross Support Plate	SS41 (HDG)
6.	Bolts and Nuts	<ul style="list-style-type: none"> • Inside : STS 304 or 316 • Roof Panel : HDG + PE Bolt cap • Outside : HDG + PE Bolt cap • Connection : HDG Rubber Head Bolt • Size : M10,12,14
7.	Manhole Panel	GRP
8.	External Support Bar	SS41 (HDG)
9.	External Support pipe	GRP
10.	Roof Support pipe	SS41 (HDG)

Panel Physical Properties

Panel Physical Properties / Basis on KS F 4811

item	Unit	Physical Properties	Test Method
Specific Gravity (23°C/23°C)		1,85	KS M 3016:2006(A)
Tensile Strength	MPa	95-105	KS F 4811:2005
Bending Strength	MPa	185-195	KS F 4811:2005
Elastic Modules in Band	GPa	15,8	KS F 4811:2005
Barcol Hardness	-	58	KS F 4811:2005
Compression Strength	MPa	105	KS M 3015:2003
Water Absorption Rate	%	0,03	KS F 4811:2005
Impact Strength (IZOD)	J/m	1,100	KS M 3015:2003
Glass Fiber Content	%	32	KS F 4811:2005
Liquefaction Test (Turbidness)	Degree	Below 0,1	KS F 4811:2005
Liquefaction Test (Chromaticity)	Degree	Below 1	KS F 4811:2005
Thermal Expansion Co - Efficient	1/°C	0,000016	KS M 3015:2003
Thermal Conductivity	W/m.K	0,204	KS L 9016:1995 <small>(Means of the heat flow meter apparatus)</small>
Light Transmittance		0,00%	KS M 4811:2005
Toxicity		NIL	KS M 4811:2005
Micro Biological Growth		NIL	KS M 4811:2005

Design Standards

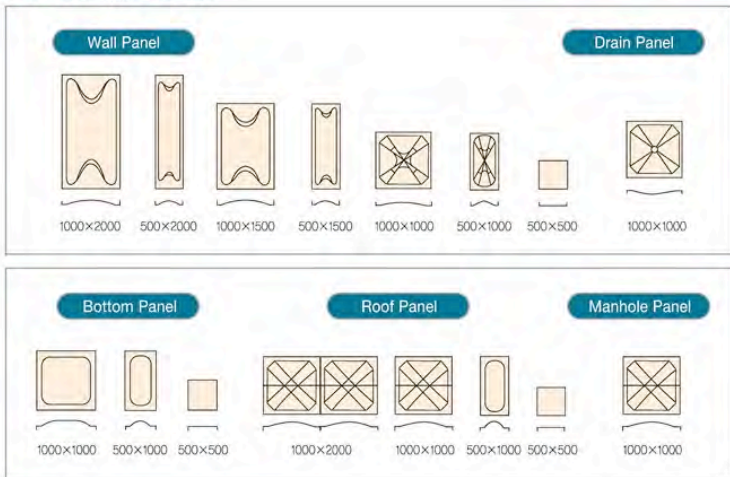
Item	Guaranteed Load Condition
Hydrostatic Pressure	Water Level (Height in Meters) X 0,1kgf/cm ² (0,01MPa)
Horizontal Seismic Load	K _H =2/3 (Load on ONE TANK itself)
Vertical Seismic Load	K _V = 1/3 (Load on ONE TANK itself)
Wind Force	255kgf/m ² (2,55 X 10 ³ MPa)
Wind Load	385kgf/m ² ·A(3,85X10 ³ MPa·A)
Snow Load	60kgf/m ² (at the base of 30 _{mm} of snow depth)
Component Materials	Vertical Weight 100kgf at a point of 35 _{mm} between the fitting and the supporting pole

GRP Panel Type and Size

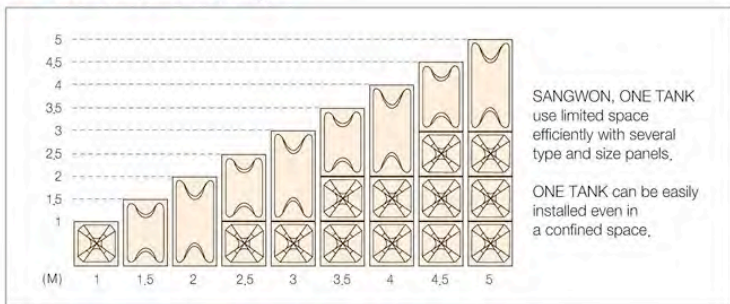
Efficient Space Using with Various Panels

ONE TANK use limited space efficiently with several type and size panels.
ONE TANK can be easily installed even in a confined space because the standardized panels and accessories are merely bolted together.

GRP Panel Type and Size



GRP Panel Composition by Height



Partition Type Water Tank

Partition Type Water Tank

It is possible to eliminate unusable space, and utilize the maximum space, by installing a partition type tank. Economical and effective for maintenance.

Utilizing maximum capacity

In the basement or other confined areas, it is possible to eliminate unusable space, and utilize the maximum space, by installing a partition type tank.

Various uses

If partition type tanks are installed, one section can be used for drinking water, and the other section for service water (Ex. fire fighting).

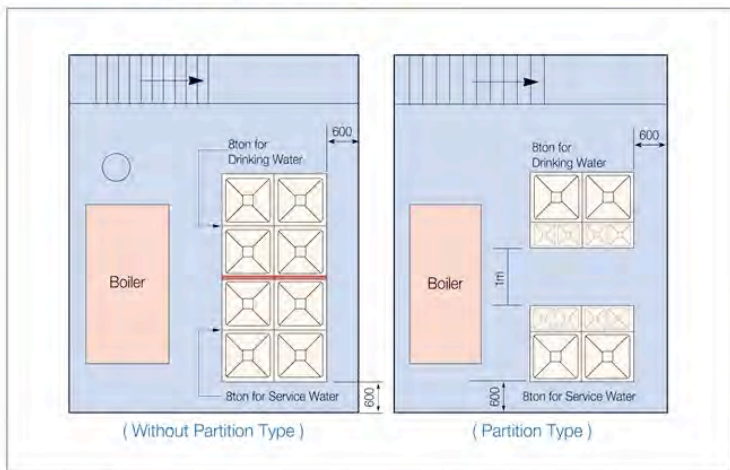
Easy Maintenance

It is convenient for maintenance, because two tanks can be installed as one unit.

Cost effectiveness

The cost and installation of 1 partition tank is cheaper than 2 separate tanks.

Installation Example of Partition Type Tank

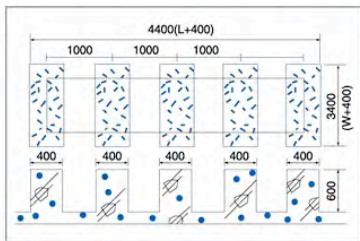


If tanks for two different uses are needed in a confined area or boiler room, a 16 ton partition type tank can be installed to use half for drinking water, and half for service water. If separate tanks are installed, however, you have to installed two tanks with a maximum of 6 tons, because you need to have 1 meter distance between tanks for maintenance and operating space.

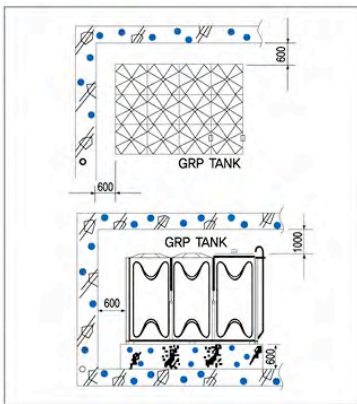
Installation Standard (Pad and Space)

Standard of Base Concrete PAD Installation and Space

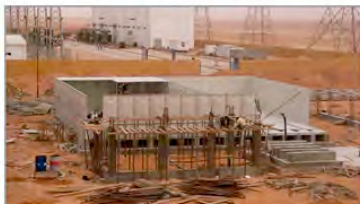
For maintenance of ONE TANK, it needs extra space at least 600mm from wall and 1,000mm from ceiling.



Width	Over 400mm
Height	Over 600mm (Base Frame Include)
Space	less than MAX 1M
Outer Dimension	W, L + 400mm
Horizontal Degree	Less than 1/500



Installation Examples



Maintenance, Inspection and Cleaning

To keep the tank clean and ensure its safe use, please perform the following inspection and maintenance work.

SANGWON, ONE TANKS are designed and manufactured for long-term service. Maintenance and inspection must be conducted to secure hygienic and long life. To facilitate easy and safe maintenance and inspection, a proper space must be secured around water tanks.

INSPECTION ITEM	INTERVAL	REMARKS
Cleaning inside the tank	Once a year	Use cloth, sponge or other soft material. Never use hard materials, such as wire brush or the surface of the GRP will be scratched.
Looseness of the bolts	Once every six months	Tighten any loose bolts.
Clogging of air - vent and overflow	Once a month	Check the air - vent, overflow and the other parts for clogging. Remove any trapped foreign matters.
Manhole cover	Once a month	Make sure that the manhole cover is completely shut. Always keep the manhole cover locked.
Turbid water	Once a month	Check the inner parts of the tank, the outlet and the other places for turbid water.
Water leakage and deformation of the tank	Once a month	If the tank leaks or deformed immediately contact the local sales representatives.
Internal & external pressure other than hydrostatic pressure.	Once a month	If any pressure other than hydrostatic pressure applied to the tank, immediately return the tank to its normal state.

Whenever earthquake, typhoon, fire, water failure, water reduction, turbid water or other accident occurs, check the tank or call our representative.

If the tank water is not used for long period of time (due to summer vacation of schools, long term holidays, or for some other reason) discharge the stored water before re-use. (Due to constant R&D specifications are not subject to change, please refer to our marketing department for latest update.)



※important : Keep the 80% Water level of the water tank height all the time

Sectional GRP Water Tank Installation and Caution

※Installation Extent

1. Base Concrete PAD

Customers are requested to make base concrete according to the designed specifications and the strength of the site. Anchor bolts are to be fixed by our agents. The required strength of the base concrete must be at least 180kg/cm².

The thickness of mortar on the base concrete must not exceed 20mm.

2. The Extent of Installation Work

If the customer designates the size of sockets for plumbing, our agents will install the sockets.

After the sockets are in place, the plumbing and heat insulation must be done by customer.

3. Installation Space

It is recommended to leave a space of 600mm in each direction from the tank for maintenance.

※Caution

1. Transportation

Do not place heavy loads or force on the panels during the transportation. Those parts that are touched with rope or other cargo must be cushioned.

2. Pipe Installation

Be careful not to put any heavy weight on the pipes that are connected to the fitting. Pipe installation must be started from the water tank side and be careful not to put unbalanced weight on the fitting. Take precautions to avoid fire or other occurrences / accidents while welding.

3. Maintenance

If it is not used for a long time, be sure to drain the water from the tank. As the tank is a reservoir of water for consumption by people, regular inspection should be done for safety (more than twice a year)





HOT PRESS MOULDED SECTIONAL GRP WATER TANK



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