



PRODUCT GUIDES FOR GRP TANKS AND VESSELS

TABLE OF CONTENTS

PRODUCT GUIDES FOR GRP TANKS AND VESSELS

1.0 INTRODUCTION	3
1.1 Advanatages:	3
2.0 PRODUCT RANGE	4
2.1 Above ground Vertical Tanks:	4
2.2 Horizontal Above Ground Tanks:	7
2.3 Horizontal Underground Tanks:	8
2.4 Pressure Vessels:	8
3.0 TANK INSTALLATION INSTRUCTIONS:	10
4.0 INSPECTION	10
5.0 HANDLING TANKS SHIPPED HORIZONTALLY:	12
6.0 HANDLING TANKS SHIPPED UPRIGHT	13
7.0 INSTALLATION VERTICAL FLAT BOTTOM INSTALLATION	14
8.0 HORIZONTAL ABOVEGROUND INSTALLATION INSTRUCTIONS:	15
9.0 PIPING	16
10 OTHERS	16
11 UNDERGROUND TANKS INSTALLATION INSTRUCTION:	16
11.1 Bed and Backfill	16
11.2 Testing	17
11.3 Hole Size	18
11.4 Burial Depth and Cover	18
11.5 Installation Procedure	20
12 INSTALLATION OF PRESSURE VESSELS:	26
12.1 Loading vessel:	26
12.2 Lifting vessel:	27
12.3 Tank cover:	28
12.4 Offloading and Handling Vessel:	29

1. INTRODUCTION



Amiantit Qatar Pipes Co. (AQAP) tanks and vessels are used for wide range of services and applications related to industrial tanks, chemical plants, water treatment, irrigation, fire water, septic tanks, water storage, chemical waste tanks, water filtration, Odour control scrubber and filters and many other applications.

The raw material used for GRP tank are carefully selected and customized to meet the requirements of design, application and intended service, considering a several grades of thermosett resins, fiberglass, filler and other additives.

1.1 ADVANTAGES

Fiberglass resists Corrosion

The highly corrosion resistant materials ensure excellent performance without any additional corrosion protection methods, and prevent the contamination of stored fluid.

Low Initial Cost

Amiantit tanks cost considerably less than rubber lined, epoxy-lined or stainless-steel tanks of equivalent storage capacities.

Storage and durable

Rugged Amiantit tanks are designed to provide long and trouble-free service.

Low Maintenance

With Amiantit Tanks, maintenance requirements are minimal. Periodic exterior and interior maintenance is generally accomplished by simply washing with water.

Easy to Install

Lighter weight tanks compared to other metallic tanks which requires lower equipment cost and lower installation cost due to the requirements of smaller foundations and structural supports.

Availability

Our manufacturing plant, located in Qatar ensures, reliable and fast service at reasonable prices. AQAP services could extend to other countries within or outside the Arabian Gulf.

2 PRODUCT RANGE

GRP, GRV tanks are produced with different grades of thermosett resins to suit the intended chemical and temperature requirement, the inner liner is carefully selected to meet the long term degradation requirement for special service tanks.

Tanks are produced in several types and capacities to meet the client process design and site condition.

FRP Tanks diameters range from 500 to 4000 mm and capacities up to 150 m³ with pressure service (pressure vessel) and atmospheric service (open tanks).

Tank Length up to 13 m as a maximum transportable tank equipment. However larger tanks capacities can be produced in sections and assembled at site to meet the client larger capacity requirement.

Tanks and vessels are supplied in different types and geometry mainly covered in below list:

- Vertical Tank with flat supported bottom
- Horizontal tank for above ground
- Horizontal tank for under ground
- Pressure vessel vertical or horizontal

2.1 ABOVE GROUND VERTICAL TANKS

Above ground vertical tanks are designed as per ASTM D3299, API 12P, ASTM RTP-1 or EN 13121-3 and AQAP design manual. The design is considered for open atmospheric tanks or low pressure tank less than 1 bar.

The tanks shells are produced using filament winding process and other tank parts (top, bottom) are produced as contact mold process.

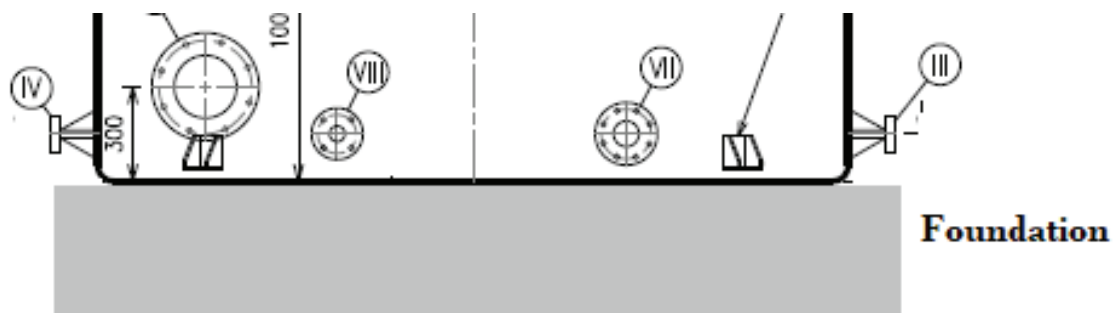
Above ground vertical tanks mainly used for:

- Chemical tanks
- Fire water tanks
- Water storage tanks
- Odour control scrubber
- Air filtration tanks.
- TSE storage tanks

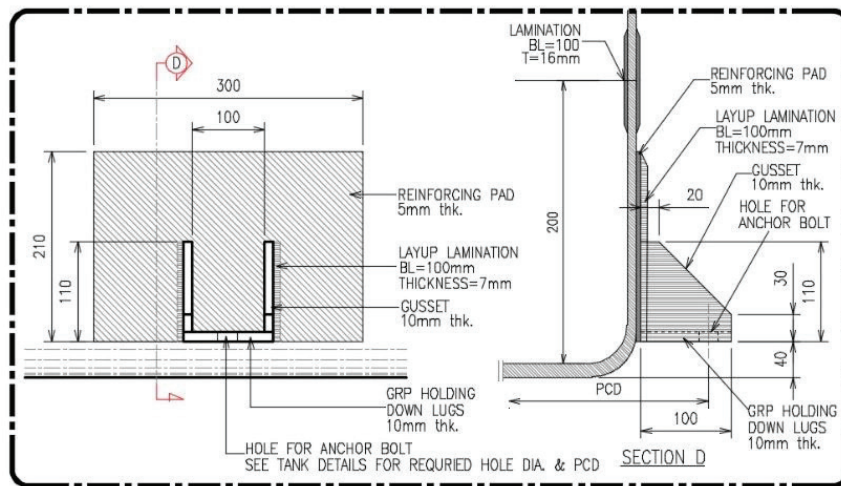
Vertical tanks are designed as to accommodate the following loads where applicable:

- Internal pressure
- External pressure
- Top tank load
- Lifting load
- Transportation load
- Wind load or snow if any
- Seismic load
- External induced loads like piping or other equipment
- Internal media weight Loads for (filtration tanks)

GRP vertical tank comes with flat bottom (with knuckle radius) suitable for installation on flat concrete foundation properly designed to accommodate the operation load of the tank, refer to below photo.

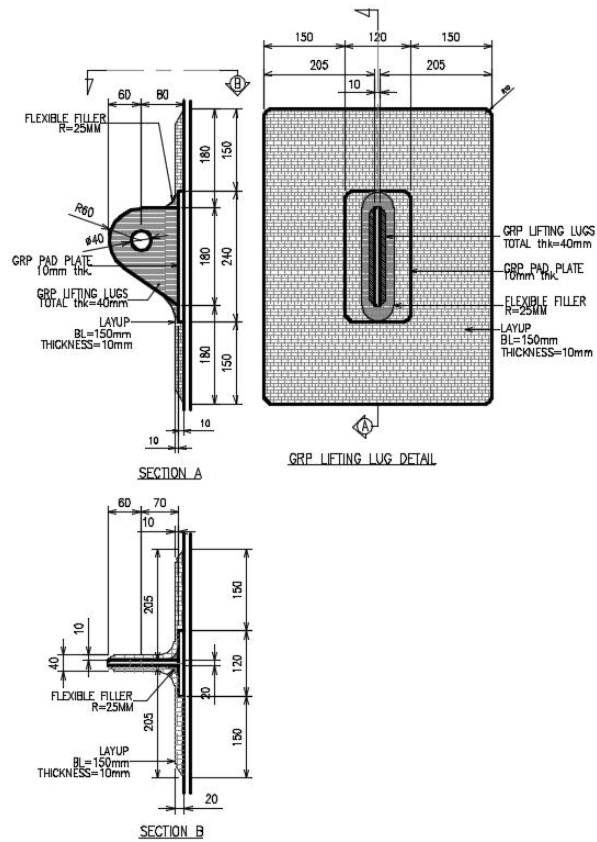


Vertical tank is provided with suitable hold down lugs around the base capable of handling all external loads and maintaining tank stability through out operation time.

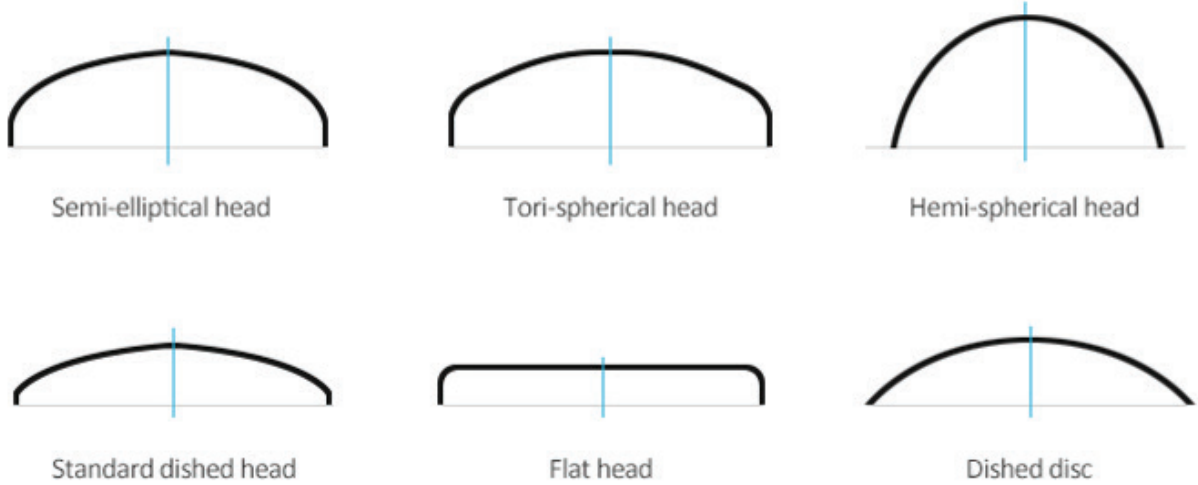


GRP HOLDING DOWN LUGS

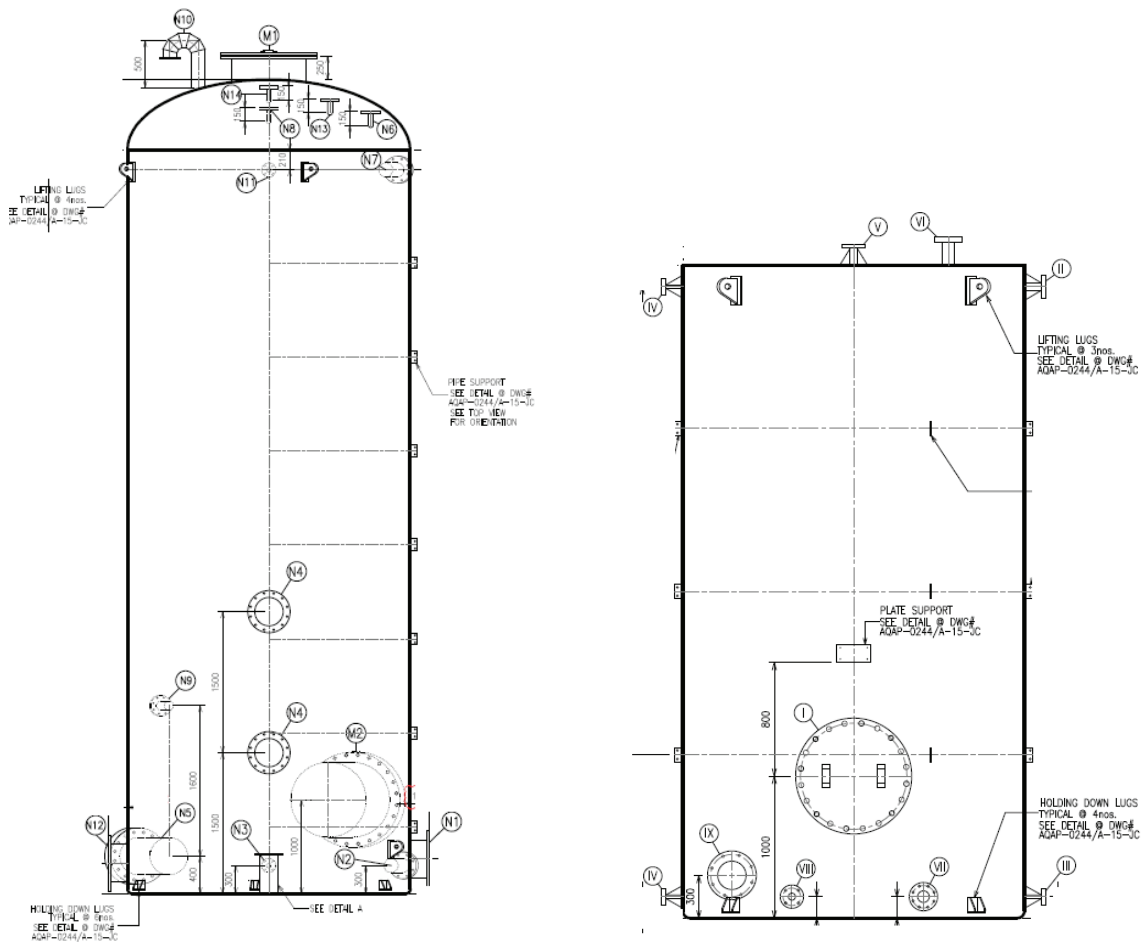
Vertical tanks are provided with suitable lifting on top and one or two tailing lugs on bottom for tank lifting and handling during loading, offloading and installation.



Vertical tanks can have elliptical head, flat head, dished head, conical head or other.



Amiantit engineering team will provide detailed fabrication drawing meeting client requirement and project specification.





2.2 HORIZONTAL ABOVE GROUND TANKS:

AQAP horizontal storage tanks for above ground application are designed as per EN 13121-3 standard.

The tank shell is produced using filament winding process and the other parts are produced using contact mold and hand lay up process.

The tanks capacities from 500 to 35,000 U.S. Gallons or 2 m³ to 130 m³. Tanks are designed as open tank without internal pressure nor vacuum the tanks shall be open to atmospheric or designed for a low air pressure less than 1 bar.

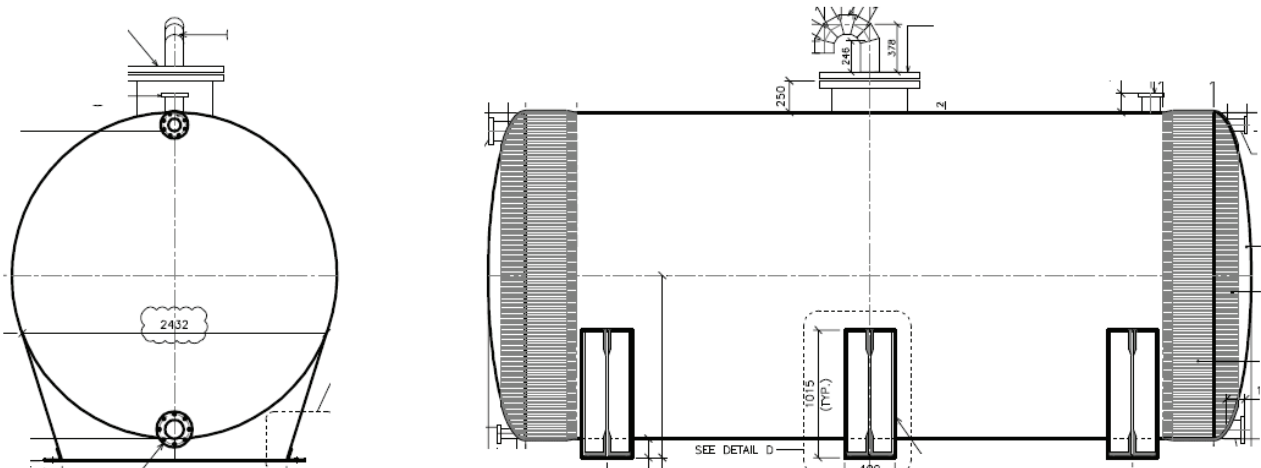
Horizontal AG tanks can be used for one of below applications:

- Water storage

- TSE water storage for irrigation
- Air filtration tank for OCU systems
- Fire water tanks
- Bulk storage tank for chemicals
- Others application

The horizontal tanks are designed to accommodate the following load where applicable:

- Internal pressure
- External pressure
- Top tank load
- Lifting load
- Transportation load
- Wind load or snow if any
- Seismic load
- External induced loads like piping or other equipment



Each tank will include one 600mm diameter manway with cover, inlet, outlet and vent. All 80mm in diameter. Other accessories like ladders, platforms are provided upon request.

2.3

HORIZONTAL UNDERGROUND TANKS

AQAP Horizontal underground tanks are designed as per AWWA D120.

The tanks capacities from 500 to 35,000 U.S. Gallons or 2 m³ to 130 m³. Tanks are designed as open tank without internal pressure nor vacuum the tanks shall be open to atmospheric or designed for a low air pressure less than 1 bar.

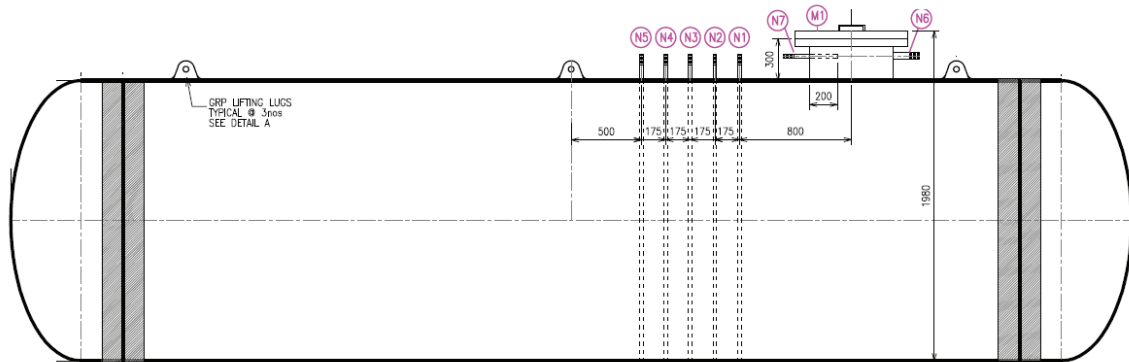
Horizontal AG tanks can be used for one of below applications:

- Fire water tank large capacity above 130 m³
- TSE water storage tank and irrigation tank

- Septic tank , for domestic sewer
- Other waste water tank.

Underground tanks are designed to accommodate the following loads where applicable:

- Internal pressure
- Soil load
- Traffic load or other live load
- Lifting load
- Transportation load
- Seismic load
- External bucking load (ground water or other)



Each tank will include one 600mm diameter manway with cover, inlet, outlet and vent. All 80mm in diameter. Other accessories like ladders, platforms are provided upon request.

2.4

PRESSURE VESSELS

Pressure Vessels are designed and qualified as per on of these codes, ASME RTP-1, ASME Section X or EN 13121-3. For each design code different qualification program is applied and engineering calculation is done using

manual method or computer aided design CAD. The vessels can have pressure classes 3 , 6 , 10 , 12 , 16 or higher depending on the service required and temperature up to 73 C.



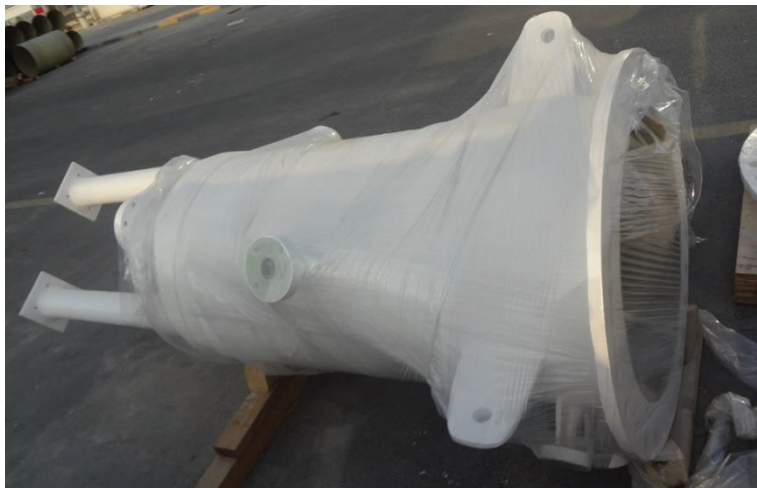
GRP/GRV vessels are mainly used on one of below applications:

- Water Filtration vessel for sea water filtration plant
- Fertilizer manufacturing plants
- Wood pulp and paper plants
- Refining
- Food industry
- Odour control units
- Water treatment plants



The pressure vessels can be supplied for suitable resin certified for potabel water or food grade material.

Each vessel is provided with manholes nozzles as per process design and client requirement, Vessels can be provided with leg support or skirt support refer to below photos.



Vessel with Leg Support



Vessel with Skirt Support

Filtration vessels is provided with nozzles which are fixed on GRP plate inside the vessel as per below for water filtration process.



3 TANK INSTALLATION INSTRUCTIONS

The following Amiantit Qatar Pipes Co. handling and installation instructions are designed to help customers install tanks properly in a minimum amount of time. Proper tank handling and installation are important for a long corrosion resistant and low maintenance tank life.

Handling and installation instructions outlined in this brochure are only recommendation and to not

relieve the purchaser from his responsibility of proper inspection, handling and installation. Damage or loss of tank contents due to improper handling or installation is the sole responsibility of the customer. Unknown situations or conditions are the burden of the customer.

The presence of Amiantit representative at the installation site does not relieve the customers from any of his responsibilities.

4 INSPECTION

Upon arrival at the destination, the customer shall be responsible for inspection for damage caused by transportation. If damage has occurred, it should be noted on the bill of lading or delivery receipt prior to signing acceptance. If no damage is noted on the bill of lading, the customers accepts responsibility for transportation damage.

The following diagram indicates most of the vulnerable

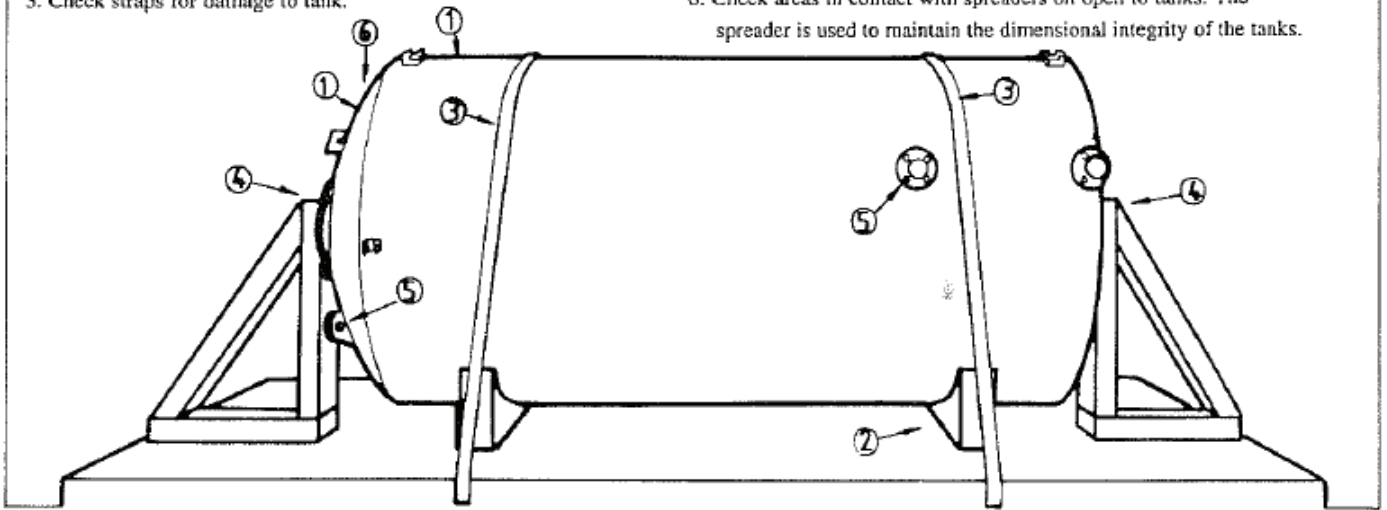
places to be checked upon delivery of the tank. Inspection should be made both inside and out, since concealed damage cannot be claimed at a later date. Never enter a tank without taking proper safety precautions. Minor damages can be repaired at the delivery site.

Call your AQAP representative for information and assistance.

Inspection Points

1. Check top and widest part of load for signs of damage.
2. Check shipping cradles for movement. Check tank for movement. Check for cracks at points of contact.
3. Check straps for damage to tank.

4. Check for contact damage at end blocking when used on rail shipments.
5. Check for any sign of rotation which would damage fitting.
6. Check areas in contact with spreaders on open to tanks. The spreader is used to maintain the dimensional integrity of the tanks.



Amiantit tanks are designed to withstand normal handling. Important handling precautions are as follow:

1. Operators of hoist equipment should follow proper rigging procedures at all times. Care should be taken to prevent the tanks from swinging out of control.

2. Always lift using all three lifts lugs provided at the top end of vertical tanks. Never roll or slide a tank. Use slings to lift horizontal tanks.

3. When moving a tank, do not drop or allow hard impact.

4. Never let tools strike or drop on either the inside or outside of the tank.

5. Ladders used inside the tank for cleaning and maintenance must have rubber protectors to prevent damaging the tank.

6. Workmen entering tanks should wear soft-soled shoes.

7. Never use cables or chains around the tank.

8. Never lift a tank by using any fittings other than the lift lugs.

9. In storing tanks prior to installation, place on shipping cradles and tie down securely.

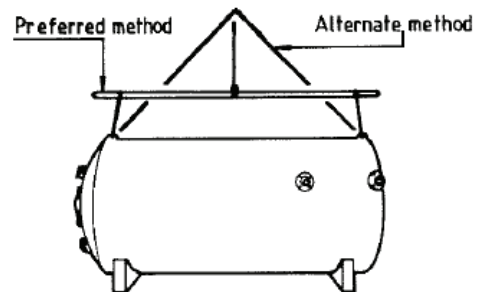
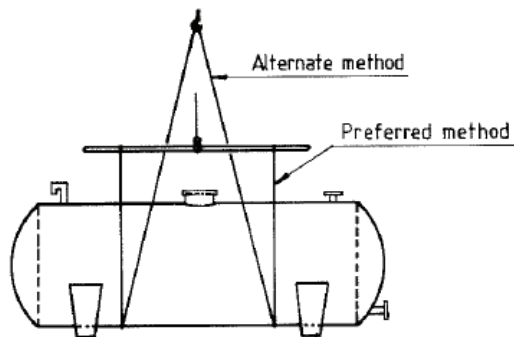
10. Do not allow cables, hooks or spreader bar to swing against the tank.



5 HANDLING TANKS SHIPPED HORIZONTALLY

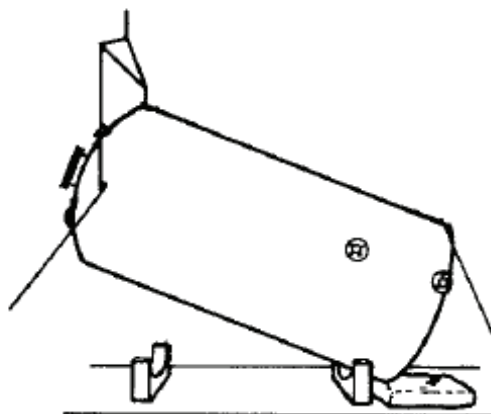
A spreader bar and lines to appropriate lift lugs or a clevis and lines to lift lugs should be used to unload tanks shipped on a rail car or flat bed truck.

The angle between the lifting lines must always be 60 Deg. Or less.



Larger tanks should be lifted by hoisting with spreader bar and lines to the lift lugs or clevis and lines to the lift lugs. Adequate padding is necessary to protect the

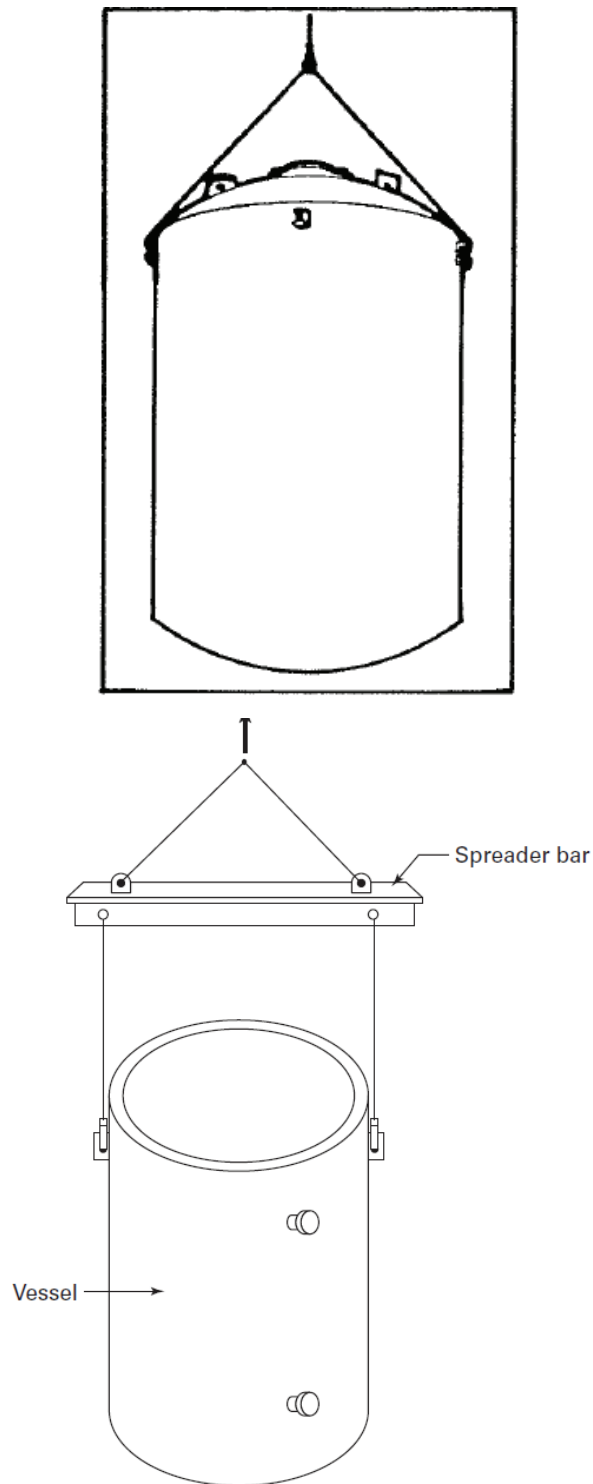
pivot point. Workmen should keep control over the tank with guidelines to ensure that the tank is gently brought to rest upon its base.



6 HANDLING TANKS SHIPPED UPRIGHT

Use a spreader bar and lines or clevis and lines to appropriate lift lugs to move tanks when in an upright position. Insure sizes of lifting equipment, lines, clevis

etc., are capable of handling the weight of the tank. The size of line is dependent on weight and also on the angle at clevis.



7 INSTALLATION VERTICAL FLAT BOTTOM INSTALLATION

1. The concrete pad surface must be smooth and level to provide even the bottom support. Maximum deviation 1mm/1m in any direction.

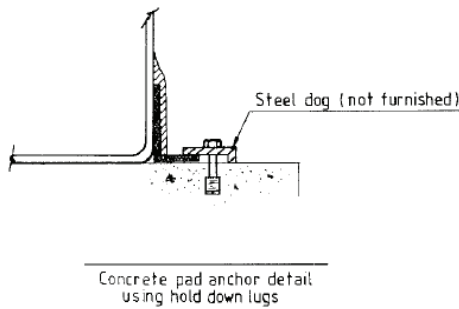
2. Anchor bolts size (not supplied) are 20mm in diameter.

3. Use all hold down lugs provided.

4. For side bottom, drain, see table A for special pad requirements.

5. Sequence of anchoring: (1) fill tank, (2) Shim beneath lugs, (3) tighten bolts.

6. Do not grout tank.

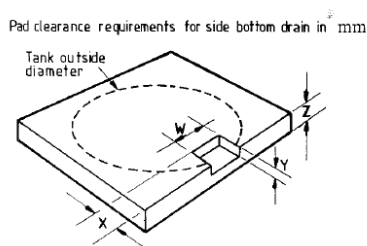


Caution

A. If hold down anchor lugs are to be field drilled and utilized for anchoring tanks, anchor bolts should not be prepreoured because of hold down lug position variance.

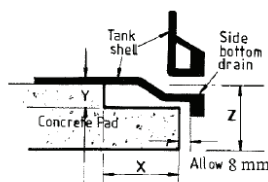
B. Do not tighten hold – down lugs until tank is filled.

Pad clearance requirements for side bottom drain in mm. refer to below table.



DRAIN SIZE ND	(W)*	(X)*	MIN. DEPTH (Y)*	MINIMUM PAD THICKNES FOR SIDE BOTTOM DRAIN CLEARANCE (Z)*
50	230	260	85	135
80	255	260	95	145
100	280	260	110	180
150	330	260	130	205
200	380	260	160	255

* These dimensions have a tolerance of + 12 mm, - 0



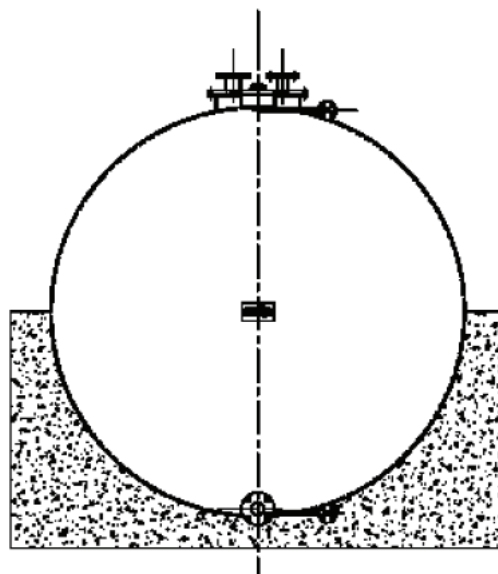
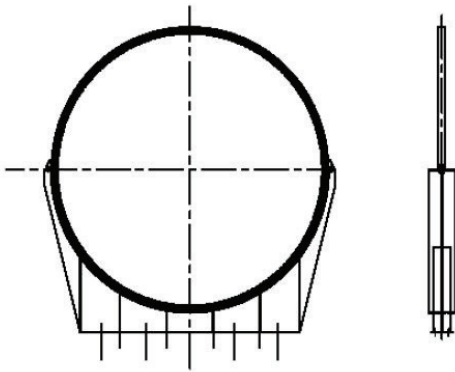
8 HORIZONTAL ABOVEGROUND INSTALLATION INSTRUCTIONS

1. The tanks must be installed on lean concrete so that loads are properly and evenly distributed.

2. The tanks must be supported on firm foundation. Merely sitting on ground will not work.

3. Do not fill tanks until foundations are properly cured.

4. Tanks can be installed on concrete saddle or other metallic saddles also possible, please consult Amiantit Qatar Pipes for such special design.



9 PIPING

1. Nozzles have standard ANSI 150 lbs flange drilling dimensions and flange bolt hole arrangement. Tighten bolts using a torque wrench not to exceed 25 ft-lbs of torque. Use 40-50 durometer gaskets (3mm thick).

2. All valves and piping attached to the tank must be

independently supported and piping must be flexible enough to allow for expansion and contraction of tank and piping.

3. Do not use prefabricated piping without flexible connections. Check AQAP representative for tolerance.

10 OTHERS

1. Each chemical tank is designed for a specific chemical storage application. In case of different usage, consult Amiantit Qatar Pipes Co. technical department.

2. Standard tanks are not designed to withstand vacuum or pressure other than the liquid head. To prevent accidental pressure or vacuum, the tank must

be vented at all times.

3. Agitators mixers and coils or other accessories must be supported as recommended and approved by Amiantit Qatar Pipes Co.

4. Tanks must be properly anchored.

11 UNDERGROUND TANKS INSTALLATION INSTRUCTION

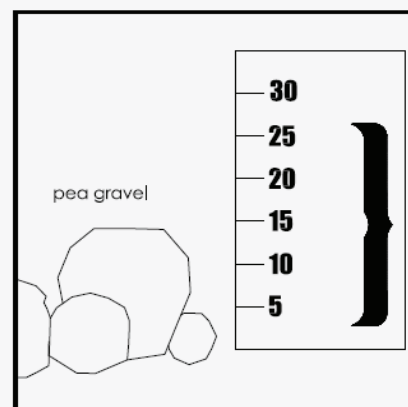
11.1 BED AND BACKFILL

GRP underground tanks require backfill material to provide as much as 90% of the support. The installing contractor must use approved bed and backfill material and follow these instructions exactly. If you have any questions, please call your local AMIANTIT GRP tank

representative. The tank warranty is void if other than approved bed and backfill materials are used without written approval from AMIANTIT Qatar Pipes Co. or if alternative materials do not achieve 90% Standard Proctor Density.

Pea Gravel

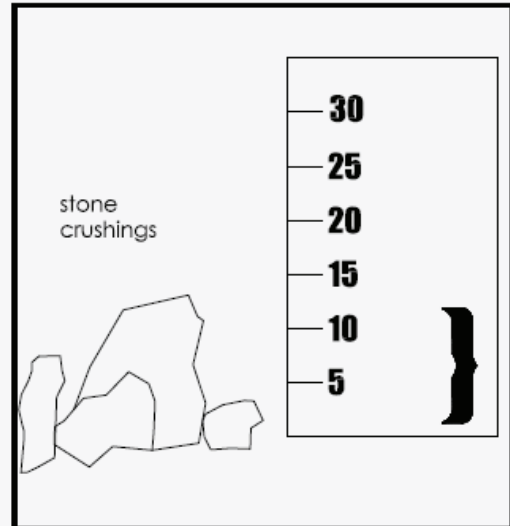
A clean naturally rounded aggregate with a mix of particle sizes not less than 3 mm or more than 20 mm is required. This material is commonly called pea gravel.



Stone or Gravel Crushing

Washed stone or gravel crushing with angular particle sizes not less than 3 mm or more than 12 mm is required.

Note: All backfill materials must meet ASTM C-33 paragraph 7.1 for quality and soundness. The backfill should not have more than 3% passing a No. 8 sieve



In freezing condition backfill must be dry and free of ice.

Note: You should require your backfill supplier to certify that the backfill meets this specification. If your backfill does not meet the above requirements, alternative materials may be used under the following conditions:

- Particle size shall be a mix and cannot exceed 12 mm with no particles passing a No.200 sieve. The material

must be free of organic materials, silt, dirt or clay. The material must also meet the ASTM.

- The material must be mechanically compacted in 300 mm lifts to achieve a 70% relative density to support the tank.
- Verification of the 70% relative density must be furnished to the owner in writing.

You should require your backfill supplier to certify that the backfill meets this specification.

11.2 TESTING

Before installing the tanks, tighten fitting plugs. Pressure test the 1,219 mm through 3,000 mm diameter tanks to 5 psi, the 3,500 mm diameter tanks to 3 psi. Soap the entire tank and fittings. The air test is of little value without soaping and a careful inspection for bubbles.

Test at least 30 minutes to insure that there are no leaks as indicated by soap bubbles or a drop in pressure. Use an air gauge with half or quarter pound increments so that changes in pressure can be easily observed.

11.3 HOLE SIZE

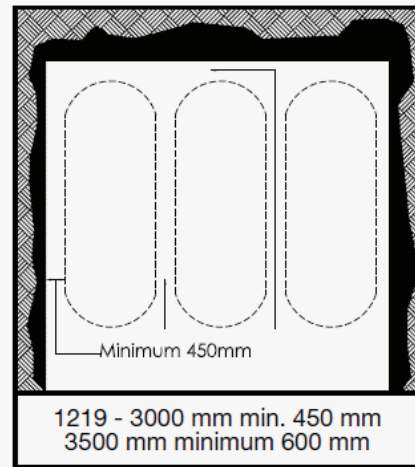
Stable Walls (550 - 30,000-gallon models)

- 1,219mm – 3,000 mm diameter tanks:

In stable soil conditions the hole must be large enough to allow a minimum of 450 mm (600 mm preferred) between adjacent tanks at ribs and 450 mm (600 mm preferred) from ends and sides of tank to the walls of the hole.

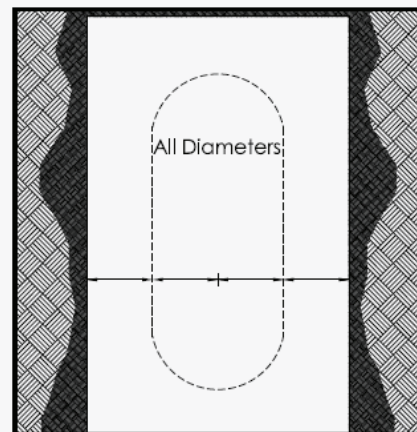
- 3,500 mm diameter tanks (25,000 - 48,000-gallon models):

Require 600 mm between tanks hole and sides, and 600mm between adjacent tanks.



Unstable walls (all size tanks)

In muck, bog, peat, swamp or landfill type areas where the soil is soft, a larger hole is required to support tanks. In these types of conditions, the holes must be large enough to allow a minimum of 1/2 the tank diameter from ends and sides of tanks to hole walls. Unstable soils are defined as those soils having less than 0.37 kg/cm² cohesion as calculated from an unconfined compression test: or soils with an ultimate bearing capacity of less than 1.71 kg/cm². Unstable soils may require a reinforced concrete slab under the tank for support. For unstable soils with less than 0.12 kg/cm² cohesion or with an ultimate bearing capacity of less than 0.25 kg/cm² a filter fabric hole liner is recommended to prevent backfill migration.



11.4 BURIAL DEPTH AND COVER

The tank hole must be deep enough to allow a minimum of 300 mm required backfill bed over the hole bottom or concrete slab. If the total burial depth

from tank top is greater than 60% of the tank diameter, anchoring of the tank is not required. (See chapter 5.2 for details).

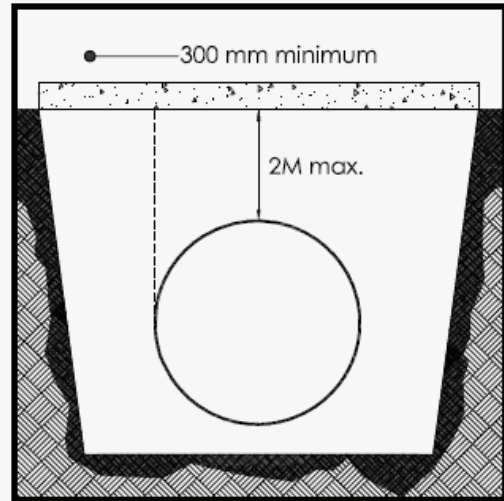
Pad dimensions

Paving must extend at least 300 mm beyond tank outline in all directions.

Maximum burial depth (all tank sizes)

To comply with UL requirements, depth of cover for tanks in both traffic and no traffic conditions must not exceed 2 meter over tank top.

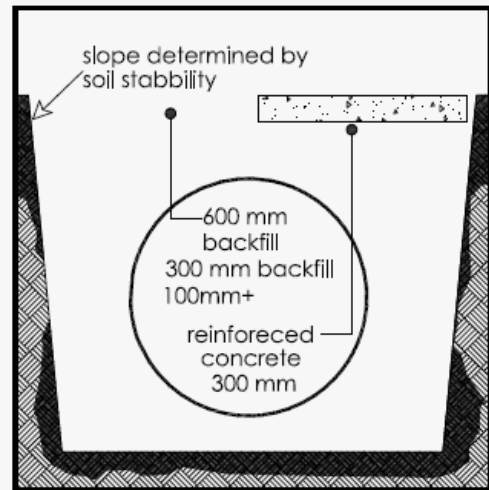
For burial depths beyond 2 meters, please contact AMIANTIT Qatar Pipes Co.



Minimum burial depth - No traffic loads

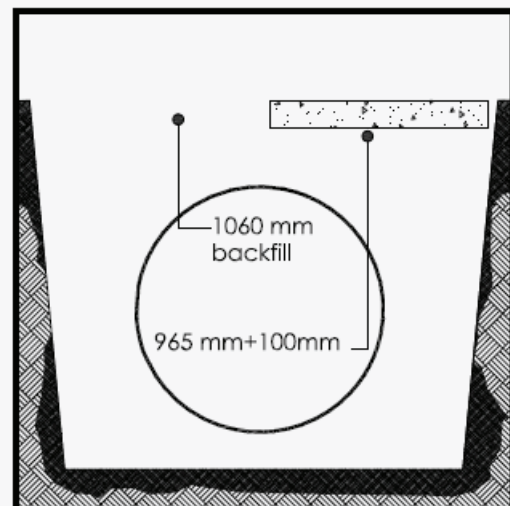
• 550 - 30,000 gallons, 1,219 mm – 3,000 mm diameter:

Tanks not subjected to traffic loads need a minimum cover of 600 mm backfill or 100 mm backfill plus 100 mm concrete reinforced with steel rebars.



25,000 - 48,000 gallons, 3,500 mm diameter:

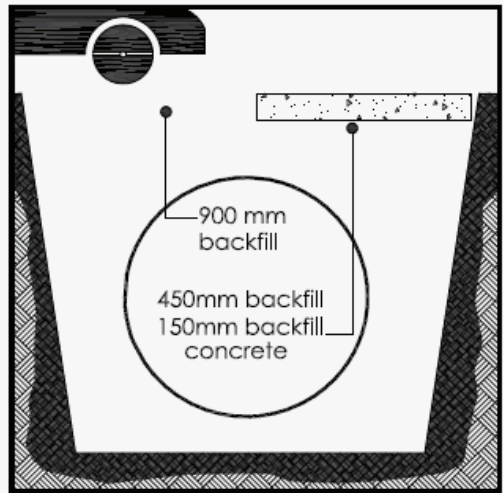
Tanks not subject to traffic loads need a minimum cover of 1,060 mm backfill or 965 mm backfill plus 100 mm reinforced concrete.



Minimum burial depth - Traffic loads

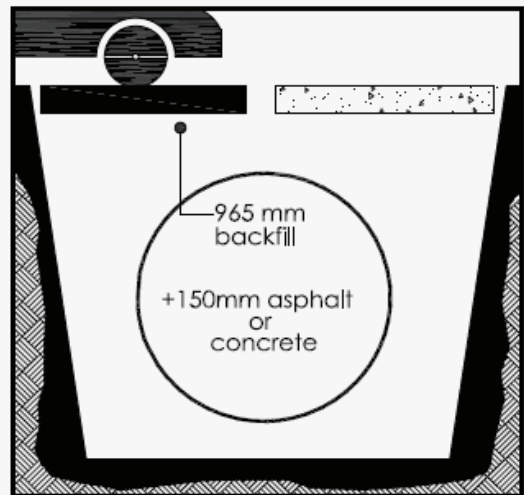
• 550 - 30,000 gallons, 1,219 mm – 3,000 mm diameter:

Tanks subjected to traffic loads must have a cover depth of 900 mm backfill or 100 mm minimum backfill plus 150 mm concrete, reinforced with steel.



25,000 - 48,000 gallons 3,500 mm diameter:

Tanks subjected to traffic must have cover depth of 965 mm backfill plus 150 mm of asphalt or 150 mm rebar reinforced concrete.



11.5 INSTALLATION PROCEDURE

5.1 Dry Hole

Bed

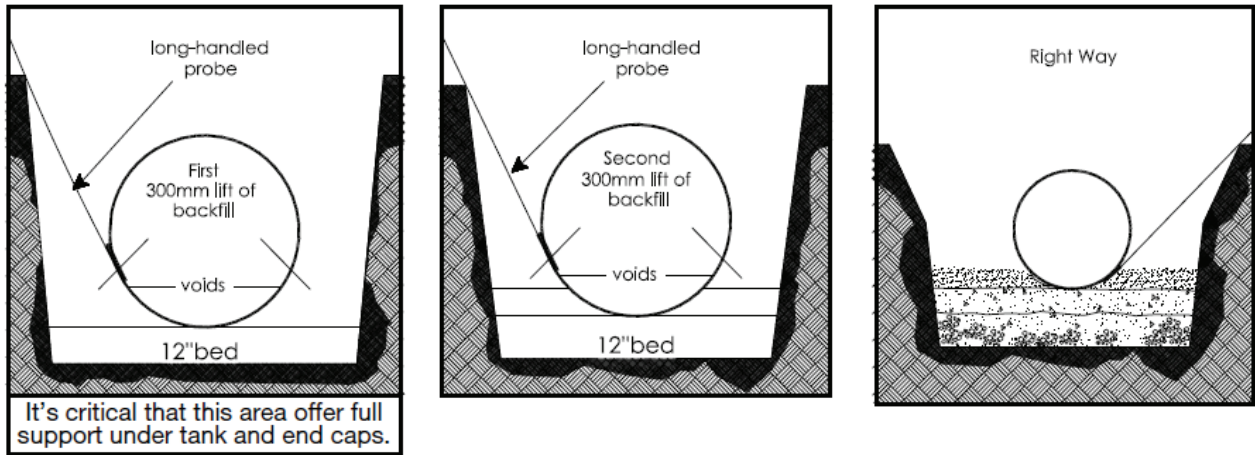
Provide a minimum of 300 mm level approved backfill bed (see section 1) over hole bottom or concrete slab. Set tanks on bed.

Note: DO NOT PLACE TANKS DIRECTLY ON CONCRETE SLAB, TIMBERS, BEAMS OR CRADLES!

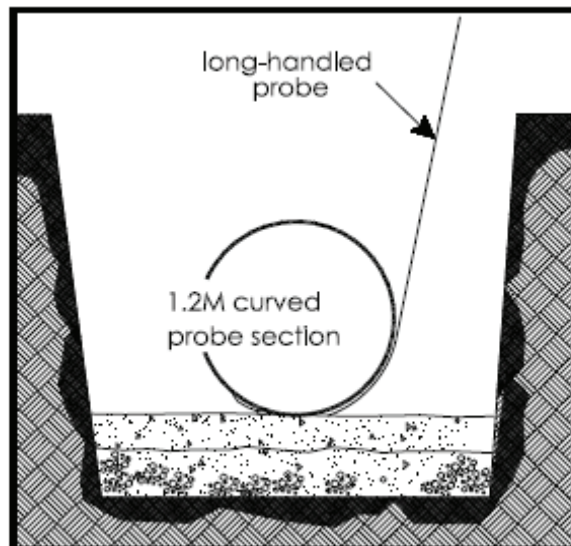
Backfilling

• 550-30,000 gallons, 1,219 mm – 3,000 mm diameter:

Use the same materials as bedding. Place first 300 mm lift evenly around tanks. From the bank or adjacent tank top, backfill must be moved completely beneath tank bottom, between ribs and under end caps to fill voids to provide necessary support.



A long-handled probe can be used to penetrate backfill and move it between all ribs and at three points under end caps. The backfill may be shoveled beneath the tank. Place another 300 mm lift of backfill evenly around tanks. Repeat the probing of backfill from the bank or adjacent tank top. After completion of second lift, backfill can be brought to top of tanks or grade without additional hand work. Compaction may be required for slab support.



This method will not work in tight areas in straight-walled holes. The angle necessary to probe the backfill under the tank cannot be made with the long-handled probe. Straight-walled holes in tight areas will require a curved probe to backfill under the tanks.

The curved probe is a 1.2 m section of the long-handled aluminum probe bent on radius to match the tank curvature. A leveraging action on the long-handled probe creates a pushing action under the tank bottom.

The following procedure is the most effective for the curved probe:

1. After setting the tank on the gravel bed, probe the area tank bottom and around the end caps.
2. Place the first 300 mm lift to backfill.
3. Probe the entire tank bottom and end caps again.
4. Place the second 300 mm lift of backfill.
5. Switch to straight probe section and probe tank again.

• 25,000-48,000 gallons, 3,500 mm diameter

Twelve feet diameter tanks (25,000-48,000 gallons) require mechanical compaction of special backfill in 300 mm lifts. Voids under the tank must be eliminated as above, backfill must be compacted to 90% standard proper tank support.

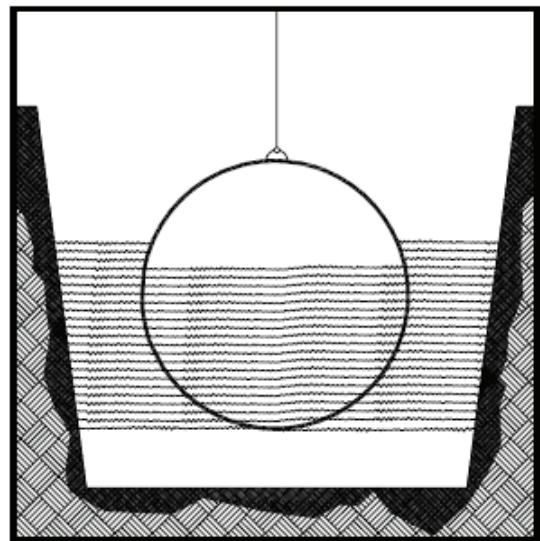
Note: Tanks installed with backfill to top of tank but without backfill to grade should be completely filled with water or product as ballast. Do not place water or product in tank until backfill is even with tank top!

5.2 Wet Hole

A filter fabric separator may be appropriate to prevent gravel migration. Water level should be maintained at lowest practical level by using pumps with or without a well point system. Prepare bed as outlined in chapter 5.1.

Ballast

If the water cannot be lowered, you will need to ballast tanks. Place tanks in the hole, adding only enough ballast to sink them. Ballast level in tanks must never exceed water level in hole during installation. While adding ballast, use only the lifting cable to keep tanks in position. Tanks should be free to roll slightly.



Backfilling

Distribute backfill evenly around tanks. Push backfill under tank after each drop using a long-handled probe as outlined in Section 5.1.

Anchoring

It is the responsibility of the tank owner or his technical representative to determine if mechanical anchoring is required for a specific job site. All potential sources of water (underground water table, rain water table, rain water run-off, etc.) should be considered. If water could enter the tank hole, recommends the tanks to be mechanically anchored unless the minimum burial depth from tank top as follows:

Tank diameter (mm)	Minimum burial depth when mechanical anchoring is not required (mm)	
	Concrete Traffic Slab thickness (mm)	
	0	150
1,219	800	700
1,829	1,200	1,100
2,337	1,400	1,300
3,000	1,800	1,700
3,500	2,100	2,000

At the above burial depths, the overburden directly above the tank weighs more than the buoyancy of the empty tank with water to grade (safety factor equals 1.2). For burial depths where mechanical anchoring is recommended, either of two common methods can be used: a concrete anchor pad or deadman anchors. Both methods include the use of Amiantit anchor straps.

Strapping

Use Amiantit hold-down straps on the top of all designed ribs. Anchor points should be spaced equal to tank diameter plus 300 mm on each side of tanks, regardless of tank diameter. Anchor points at bottom of hole must be aligned with designated ribs ± 25 mm.

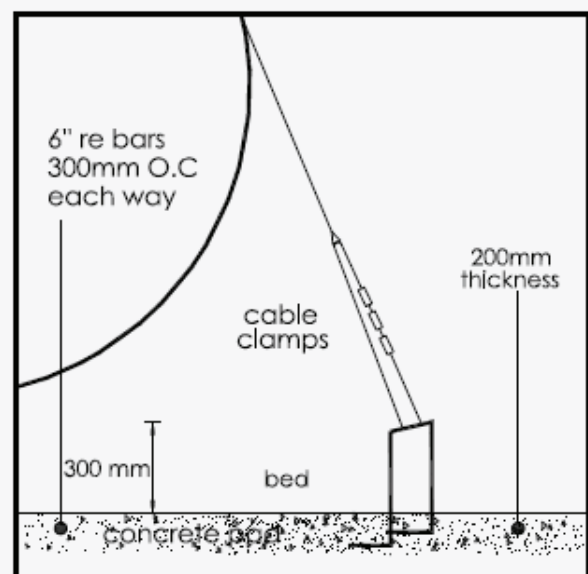
All anchor straps must be uniformly tightened with turnbuckles or come-a-longs. Straps should be snug but cause no tank deflection. Deflection can be detected by checking tank diameter with a gauge stick before and after snugging straps. Triple clamp the wire rope.

Note: Do not use straps or cables between the ribs.

Concrete Anchor Pad

The weight of overburden on top of the concrete slab provides the anchoring force.

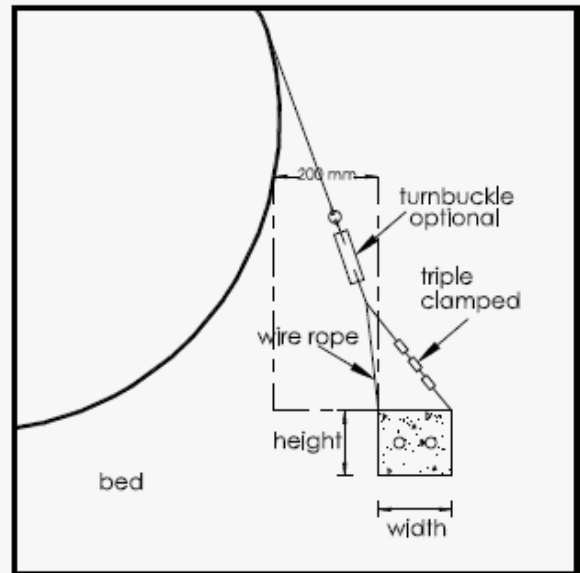
This pad design is strictly for buoyancy. Poor soil conditions may require increased reinforcement and slab size. Anchor the hold-down devices in concrete, attach them to the strap ends with wire cable (table at end of this section) and clamp with at least three clamps. Be sure there is a 300 mm bed between concrete pad and tanks.



Deadman Anchor

The weight of overburden on top of the dead man and tank provides the anchoring force. Lay dead man along each side and parallel to tank. The tank must not “overshadow” the dead man anchor. Clamp the wire with at least three clamps around dead man and through end of strap. Deadmen are made with reinforced 2/6 rebar concrete. The cross-section dimensions may vary depending on burial depth.

Contact AMIANTIT Qatar Pipes Co. for details. If burial depth is 600 mm, dead man size is as follows:

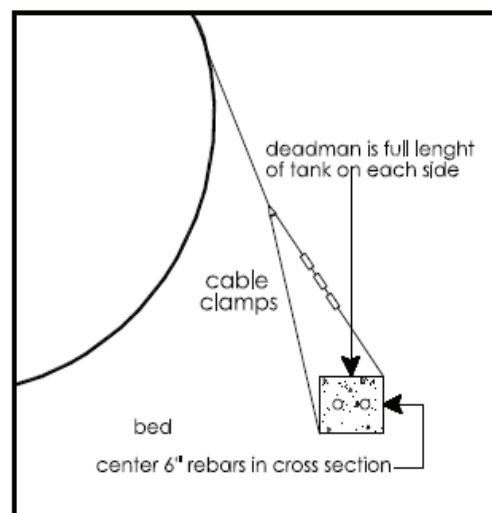
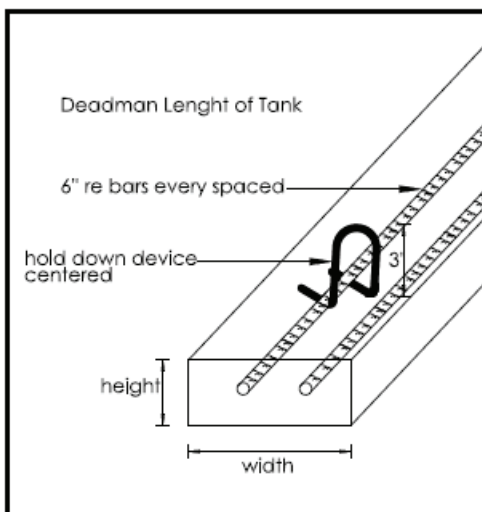


Tank diameter (mm)	Min. Height (mm)	Width* (mm)
1,219	150	150
1,824	300	300
3,000	300	450
3,500	200	900

*A round cross section can be substituted if the diameter equals or exceeds the dead man width.

When using dead man anchors in multiple tank installations, each tank will require two deadmen. If one dead man is used for adjacent tanks it must be doubled in width.

A separate anchor point (hold down device) must be provided for each strap.



Hold-down devices are incorporated with their legs anchored under the rebar reinforcement. Spacing for these hold-down devices is determined by the number of anchor points shown on the tank drawings.

The hold-down device can be fabricated from rebar as follows:

Tank diameter (mm)	Rebar size (1 strap/anchor point)
1,219 / 1,829	No. 6
2,337	No. 8
3,000 / 3,500	No. 10

Turnbuckles (optional)

Hook, Jaw or eye-type turnbuckles may be used in place of all or a portion of the wire rope described in this section.

All Anchoring Methods

Minimum per anchor location:

Tank diameter (mm)	1219 / 1829	2337 / 3000 / 3500
	Drop-torged turn buckle diameter (mm)	
Hook type	20	32
Jaw type	12	20
Eye type	12	20
Wire rope diameter 6x19 (improved plow steel)	10	12

Note: Tanks installed with backfill to top of tank, but without backfill to grade should be completely filled with water of product as ballast. Do not place water or product in tank until backfill is even with tank top!

Amiantit tanks can also be anchored safely by using burial depth and a surface slab to offset the buoyancy factors. For alternate anchoring methods refer to AMIANTIT Qatar Pipes Co.

Do Not Fill Tank Before Backfilling!

Do not fill until backfill is to top of tank, never add product or water for hold-down in dry hole conditions until backfilling is completed.

(Exception- see installation procedure-Wet Hole.)

Keep Tank Vented!

Tank must be vented with an opening the same diameter or larger than the opening used to remove product

6 Additional Information

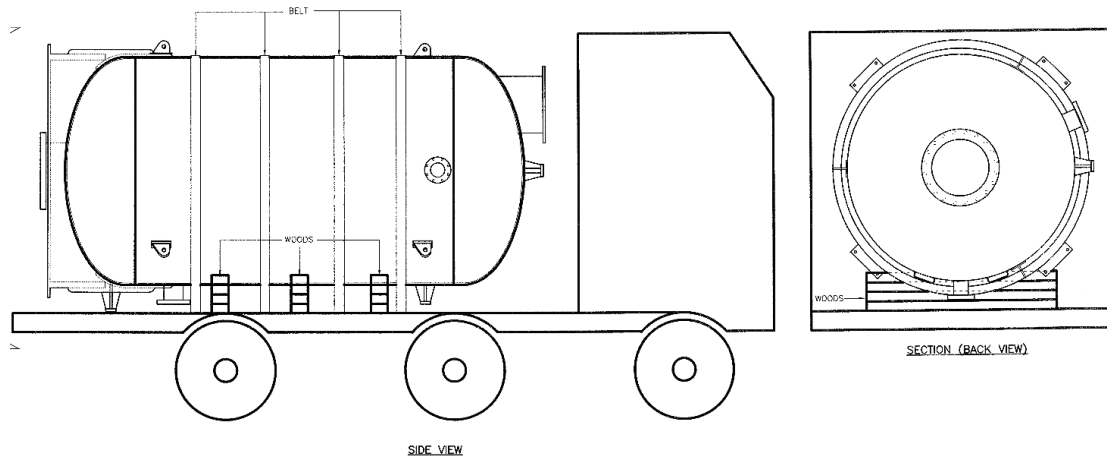
Other question regarding installation procedures should be directed to your AMIANTIT Qatar Pipes Co. technical representative or field service representative.

12 INSTALLATION OF PRESSURE VESSELS

12.1 LOADING VESSEL

Wooden bars and wooden saddles shall be cut as per the vessel shape and installed on the surface of the platform on shipping trailer

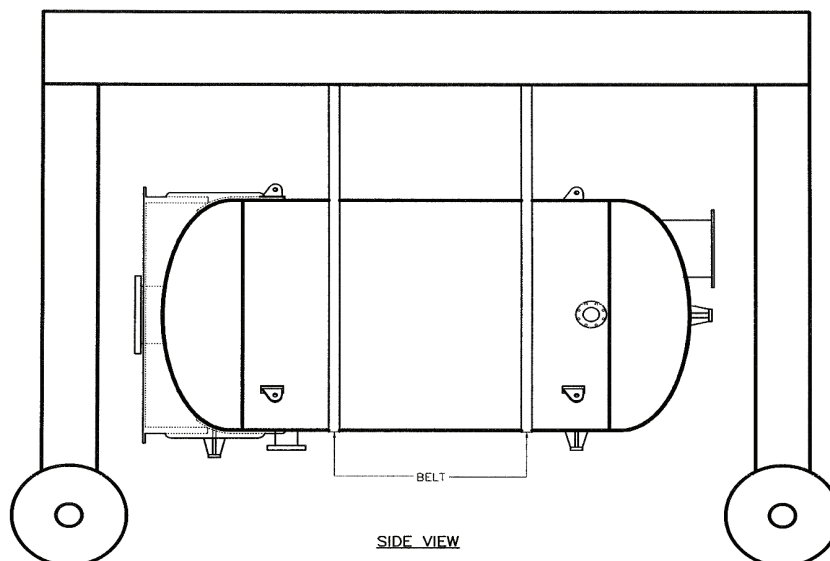
The wooden bars shall be located in three positions and they should provide sufficient clearance below the vessel to avoid any damages for the attaching items to the vessels like nozzles, lugs ... etc



Picture 1

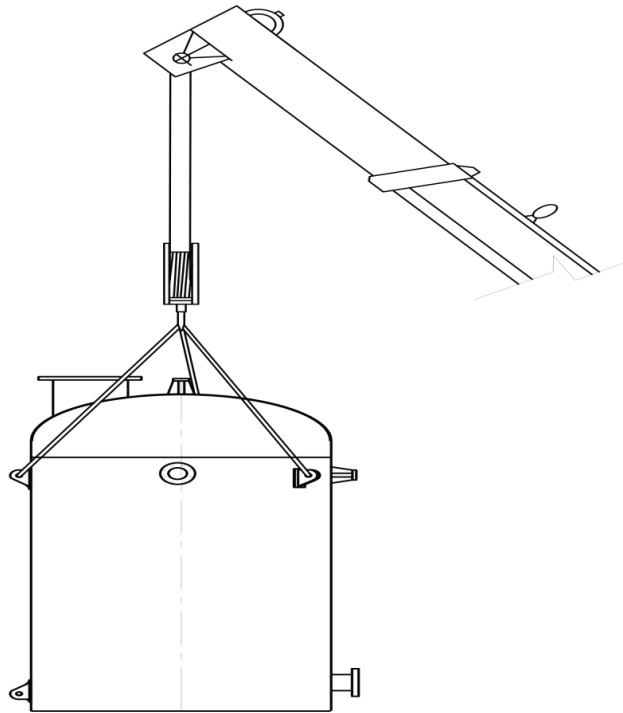
There are two ways to load the vessel on the trailer:

• By Hydro porter or boat loader: Two belts should hold the vessel from down as the below **picture -2** then will load it on the trailer.



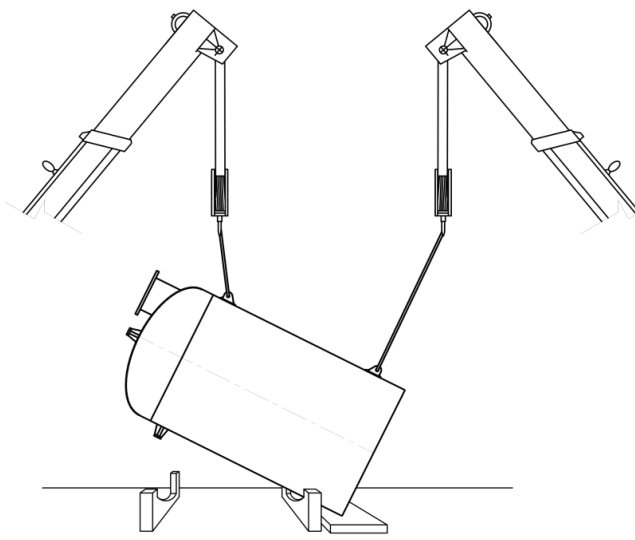
Picture 2

12.2 LIFTING VESSEL



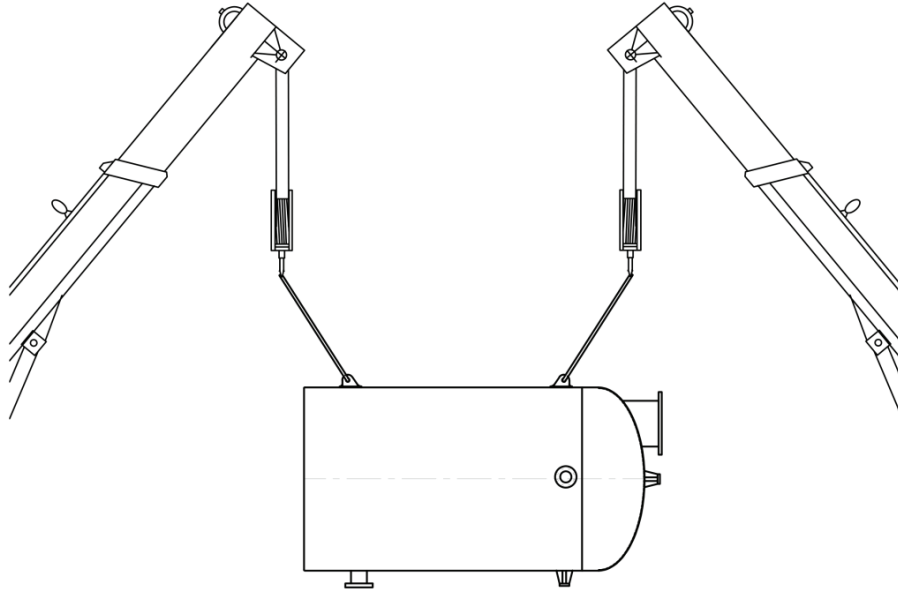
Picture 3

- Cylindrical tanks should be lifted by using lifting lugs as per **picture no-3**.
- Larger tanks should be lifted by hoisting with spreader bar lines to the lift lugs or clevis and lines to the lift lugs.
- Always avoid loading, unloading, or lifting the tanks in high winds.
- Never use cables or chains around the tank.
- Nozzles and other connections to the tanks should not be used during lifting.
- Lift the tank bring from Vertical position to horizontal position as per **picture -4**.



Picture 4

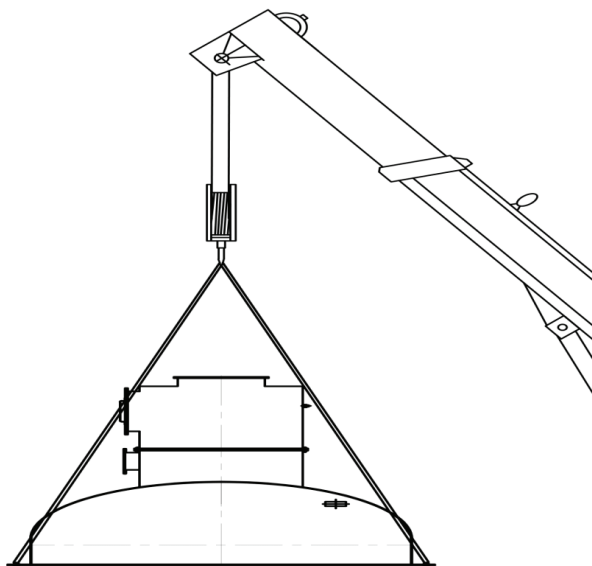
- The tank should be hold by two cranes as per above picture.
- First crane should hold the vessel from the upper lifting lugs by using shackle and rope; the second crane should hold the vessel from tailing lug at the bottom by using shackle and rope.
- The tank is lifted by one end then another end required to tilt the tank to bring horizontal position by tailing lug.
- Adequate padding is necessary to protect the pivot points like bottom edges to avoid any damages as per picture-4.
- Tank should be set up horizontally before load on the trailer as per **picture-5**.



Picture 5

12.3 TANK COVER

- Tank cover should be lift by using eye bolt.
- Eye bolt will be fixed in the flange bolt holes to lift the top cover as per picture-6.
- Lift the cover up to required height using eye bolt, then loaded on the trailer.
- Tank covers should be kept on the wooden blocks to avoid any damages of bottom surfaces.
- Eye bolt will be removed from the top cover after loaded on the trailer.



Picture 6

12.4 LIFTING VESSEL

- Unloading the vessel is the responsibility of the contractor. Be sure to maintain the balancing during offloading.
- Two cranes should be there to unload the vessel same as loading.
- Follow the unloading procedure same as loading.
- After that the vessel will be moved to the required place and install it carefully.

Notes:

- Do not drop impact or bump the vessel, particularly at vessel ends.
- When handling the vessel, use pliable straps, slings or rope to lift. Do not use steel cables or chains to lift or transport the vessel.
- Vessel must be unloaded and handled separately (one at a time)
- If at any time during handling or installation of the pipe, any damage such as a gouge, crack or fracture occurs, the vessel should be repaired before the installation.
- Contact the supplier for inspection of damaged and for recommendation of repair method or disposal.





شركة أميانتيت قطر للانابيب و ملحقاتها
AMIANTIT QATAR PIPES CO. LTD

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