

FIRE WATER TANKS FOUNDATIONS REQUIREMENTS



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Introduction:

The purpose of this document is to advise how and offer the right information about how the tank concrete base should be built, avoiding problems during tank assembly process.

The calculations, technical direction, built process and the quality control of tank foundation civil works, are Customer responsibility. This manual is only intended to advise the Customer.

Assembly Procedure:

Engineered Fire Piping water tanks assembling processes require the use of hydraulic lifters. In such way, all the assembling works could be done on the floor avoiding the risks of works at height, warranting to installers a 100% safety level.

DAY 1:

Once on site, first step is to set out the tank shape on the tank foundation then, the first tank's ring assembly can start, including the installation of the upper reinforcement angles, the metal roof structure and the upper connections of the tank. Once the hydraulic lifters are in place and anchored, the second tank ring is also assembled, and the roof components installation is done.

DAY 2 AND FOLLOWING:

The remaining tank's rings parts will be assembled.

LAST DAY:

Once all the rings are finished, we will proceed to assemble the lower reinforcement angles, which will be anchored to the foundation; then the lower flanges are installed and the hydraulic lifters are removed, the expansive rubber or hydrotite is applied. To easier the second step internal civil work jobs a metal sheet will not be installed. This last metal plate will be fixed when the all the internal civil works are done.

Once the tank is finished, the client will be asked to approve and sign the conformity sheet that the fitters will provide.

Considerations prior to the execution of the concrete base:

A minimum distance of 50 cm (recommended 1 metre) must be left from any point on the perimeter of the tank to any installation or building, to facilitate assembly due to the use of hydraulic jacks.

The geotechnical study of the terrain will be at the client's expense.

Soil strength shall be higher than 1,5 Kg/cm².

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Excavation:

- The concrete layer shall be evenly settled on the bottom of the excavation.
- The marked perimeter shall be excavated to a depth equal to the necessary rock infill (80 mm).
- If cleaning concrete HA-150 is poured, the depth to be dug is 100 mm. It's highly recommended to remove the soil organic parts
- Then, an 80 mm layer of levelled and compacted rock infill shall be poured. When used cleaning concrete, the layer thickness shall be 100 mm

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- The concrete reinforced base shall have a 225 mm high cylinder shape.
- Build the necessary height formwork throughout the perimeter of the foundation.
- Double 150x150x12 mm mesh will be fitted. Using spacers, the first mesh will be placed 50 mm apart the rock infill layer. the second mesh will be placed 100 mm far from the first one. Mesh steel class shall be B 500 S or equivalent.
- Concrete shall be HA-35 type or similar (350 kg of cement per m³ of concrete). For mastic tanks, requiring a second concrete layer, the first layer shall have a roughness surface
- To avoid membrane damage, on internal lined tanks, the concrete base surface must be as smooth as possible.

- Once the tank is levelled and anchored it's time to move to second step. Before the new concrete layer is done, a couple of Hydrotite sealant strips shall be placed on site, the first one shall be spaced 80 mm from the surface of the existent concrete layer, and the second one, 80 mm from the top of the new concrete layer. The second layer shall be waterproof concrete HA-35 type or equivalent.

When the internal and external concrete bedding are built, the following should be considered:

INTERNAL:

- The thickness shall be at least 200 mm. In any case, it must be 30 mm thicker than the upper perimeter joint
- Double 150x150x12 mm mesh will be fitted. Using spacers, the first mesh will be placed 50 mm apart the first concrete layer surface, the second mesh will be placed 100 mm far from the first one.
- Approximately a distance of 50 mm shall exist between the tank shell and the edge of the steel mesh. To avoid corrosion and damage of the hydrotite strips, mesh will never be in contact with the tank shell.

EXTERNAL:

- To connect both concrete layers a perimeter ring of 12 mm diameter corrugated steel rods embedded 300 mm apart and fixed by means of an epoxy resin is used. Rod length shall be 50 mm less than the final concrete layer top level..
- The external formwork shall be built once the tank is fully assembled, having the necessary height, according to the external second concrete layer dimensions.
- Final thickness of this layer shall be 300 mm.
- Two horizontal lines of 12 mm diameter round corrugated steel bars shall be installed. First level shall be 50 mm far from the bottom concrete layer and the second one 100 mm apart the first one.

To avoid cracks and cavities, the concrete shall be carefully vibrated, especially in both external and internal areas closest to the tank's shell. It is preferable to build both sides at the same time.

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Engineered FIRE PIPING, S.L.

Poligono Industrial La Malena, C/del Pino 17. Yuncos - 452100 (TOLEDO)
TLF.: +34 902 551 558 | FAX: +34 902 551 663 | Mail: tanks@firepipings.com

