INSTRUCTION FOR INSTALLATION

GENERAL

These installation instructions apply only to the ROTO construction products listed below:

- Rainwater harvesting tanks
- Wastewater treatment plant
- Oil separators
- Grease traps
- Pumping stations

Installation of underground tanks must be made according to the instructions.

In cases where a simple underground installation is not possible, please consult the manufacturer or competent experts.

Installation in landslide and flood terrain requires the advice of an experienced professional.

Please refer to our consulting services which also provide presence on the location of the underground installation, to guarantee correct and quality installation.

Picture 1: Correct transportation and unloading

TRANSPORT OF THE TANK

The tank must be held down on a smooth and straight surface during transportation. Please pay attention to any sharp edges which may cause damage on the tank. The tank should be attached with polyester straps or straps made of similar materials. Please make sure the straps are not too tight, causing deformation of the tank shell.

Picture 2: Transporting the tank

HANDLING THE TANK AT THE CONSTRUCTION SITE

The tank should be lifted and moved with lifting straps. The lifting bands should be attached to handling rings. Tanks may be lifted with suitable site equipment, but great care is needed to control the lift and to ensure the tank is not damaged. Move tanks only by lifting and setting, do not drag or roll. Do not drop or roll tanks from the delivery vehicle. Correct transportation of the tank is shown on picture 1.

Picture 3: Installing the tank

TEMPORARY STORAGE

The tank should be stored on an appropriate, smooth and straight surface. Please make sure that the surface is free of any sharp objects which could damage the tank. If any damage should occur on the tank prior to installation, the manufacturer should immediately be informed. Repairs should be made according to the manufacturer's written instructions.

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Puconci 12, 9201 Puconci, **Slovenia**
tel.: +386 (0)2 52 52 152 water@roto.si **www.roto-group.eu**

Picture 4: Installing the tank

Picture 5: Installed tanks in a row

Picture 6: Installed tank

BEFORE THE INSTALLATION

Soil composition and characteristics should be checked before the tank is installed. The bottom of the construction pit should be hardened/fortified and should be stable. In case of inadequate ground load capacity, a 40 cm thick layer made of gravel material or concrete should be made. The layer should be hardened to the compaction rate 60 MPa. The excavated material from the construction pit should be removed in order not to be mixed with the filling material. If any ground water is present, it needs to be completely pumped out.

DIMENSIONS OF THE CONSTRUCTION PIT

The size of the construction pit should be 60-100 cm larger than the size of the tank. The tank should be installed a minimum of 150 cm away from the building, and a minimum of 200 cm from traffic surfaces. If the characteristics of the terrain allows, the walls of the construction pit should be dug as vertically as possible (a safe angle of excavation and work safety rules should be considered). Valid work safety and construction related regulation must be respected. The depth of the excavation pit must be adjusted with projects and tank dimensions.

FILLING MATERIAL

The material used to fill the construction pit must be of proper granulation. Filling material should be clean, without ice / snow, of clay, of particles of larger granulation and of other organic particles.

The tank should be backfilled with gravel of granulation 4-16 mm. The filling and compressing of gravel should be carried out in steps, i.e., in layers of thickness of 300 mm. During installation, the tank should be filled with water to the same level as the height of the filling material, so that both internal and external levels are the same. This allows equal side pressure to the wall of the tank. During the filling with gravel the extensions and covers has to be screwed into the tank.

MAXIMAL HEIGHT TO BURRY THE TANK IS 70 cm from the tank to the terrain level.

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ANCHORING THE TANK

Anchor hooks (20 mm diameter steel reinforcement rods) must be installed into the foundation slab. A rope (12 mm diameter) should be attached to the hooks with wire clamps. The rope should be tightened with a turnbuckle hook. All fastening materials should be made of stainless steel. To prevent direct pressure on the tank, geotextile (width approx. 100 mm) should be placed between the tank surface and the rope. Tanks with handling rings should be anchored to hooks on handling rings.

Picture 7: Foundation stab

FOUNDATION SLAB

A reinforcement concrete foundation slab should be made on top of a fortified/hardened and firm surface. The reinforcement concrete foundation slabs minimum thickness must be 200 mm (dimensions to be determined by a professional statics expert). The slab should be fortified with two steel reinforcement meshes. Foundation slab should be 600 mm wider than the tank's external width.

Picture 8: Burry of the reservoir with 4 – 16 mm

TRAFFIC LOAD

The tank should not directly bear the traffic load. In this case reinforcement concrete plate to relieve the pressure should be made on the top of the tank. Concrete reinforcement dimensioning should be made according to load by a professional statics expert.

PHOTO DOCUMENTATION

In order to claim the warranty in case of damage to the tank, the entire installation of the tank must be photo documented. The manufacturer is not responsible for any damages to the tank if the installation instructions are not observed.

ADDITIONAL QUESTIONS
+ 386 (0)2 52 52 152

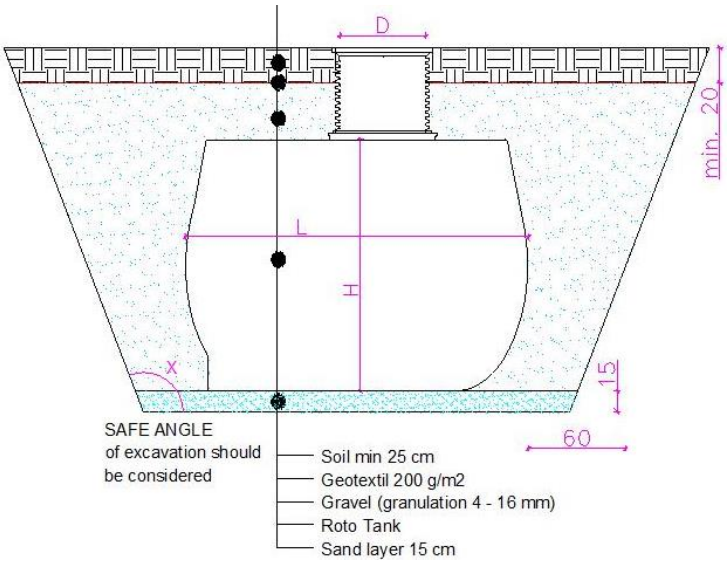
SERVICE/RECLAMATION
t. + 386 (0)2 5252 196

w. www.roto.si
e. servis@roto.si

PE COVER IS APPROPRIATE UP TO 200 KG OF LOAD

Example 1: SIMPLE UNDERGROUND INSTALLATION – NON TRAFFIC SURFACE

- The external size of the construction pit should be 60 - 100 cm larger than the tanks external length and width. If the characteristics of the terrain allow, the walls of the construction pit should be dug as vertically as possible (a safe angle of excavation should be considered and work safety rules respected).
- Construction pit planum layer should be straight, fortified and hard. If the soil has a lower bearing capacity, a 40 cm thick layer of gravel material or concrete should be made. The layer should be fortified to the compaction rate of 60 MPa.
- A 15 cm thick sand bedding (with sand 0 – 4 mm of granulation) should be put on top of the prepared layer. The sand layer should be levelled out.
- Carefully place the tank on to the levelled sand bedding (placement with appropriate mobile crane or excavator) and level reservoir out using a level measuring tool. Revision openings on top of the reservoir should be leveled with the terrain in this step. To Adjust the telescopic extension twist/screw the coil. Integrated extensions must be adjusted with removing the adapter and cutting the neck/body of the extension to the correct level.
- The tank should be buried with the gravel of granulation 4 – 16 mm, in the steps of 30 cm from the bottom of the tank. Tank should be simultaneously filled up with the water to the same level/steps of the gravel burry (make sure to fill all chambers of the tank with the water). When the gravel reach the connections level make sure to connect the pipes (inflow, outflow, ventilation, ...).
- Connect the pipes (inflow, outflow, ventilation, ...) according to the instructions on the page 8. After the pipes are connected protect them with the sand of 0 – 4 mm granulation.
- Continue with the filling of the construction pit (gravel 4 - 16 granulation) to the last 25 cm to the terrain level.
- Across the entire area of the tank, geotextile must be laid.
- The top 25 cm are filled in with soil (200 g/m2 geotextile should be laid prior to filling). Please make sure that the tank lid remains uncovered. Attach the tank lid to the tank neck with supplied screws.
- Maximum height of gravel and soil above the tank is 100 cm (extension 500 mm + extension of the extension 500 mm)
- If the surrounding terrain is impermeable, the drainage should be made around the tank.



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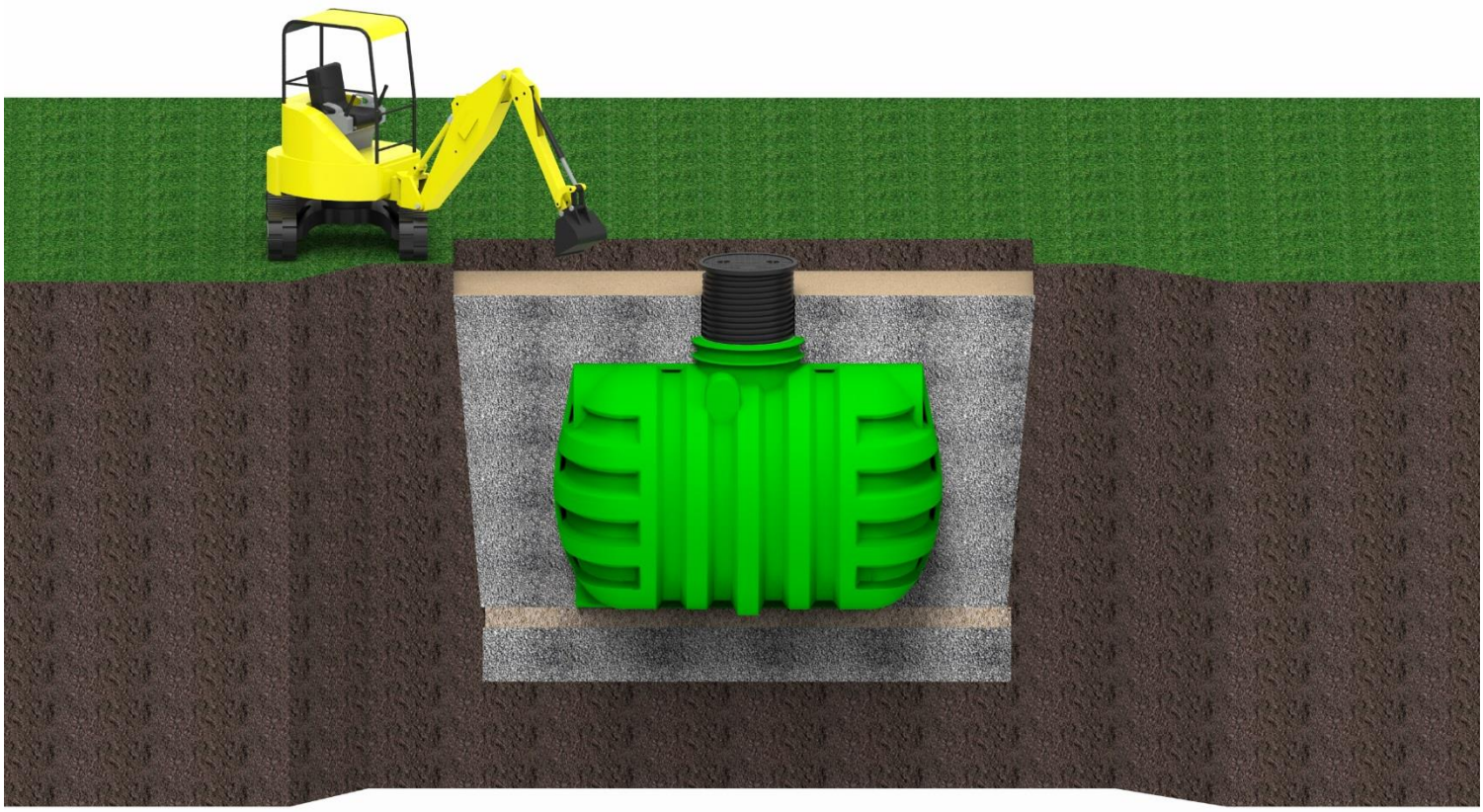

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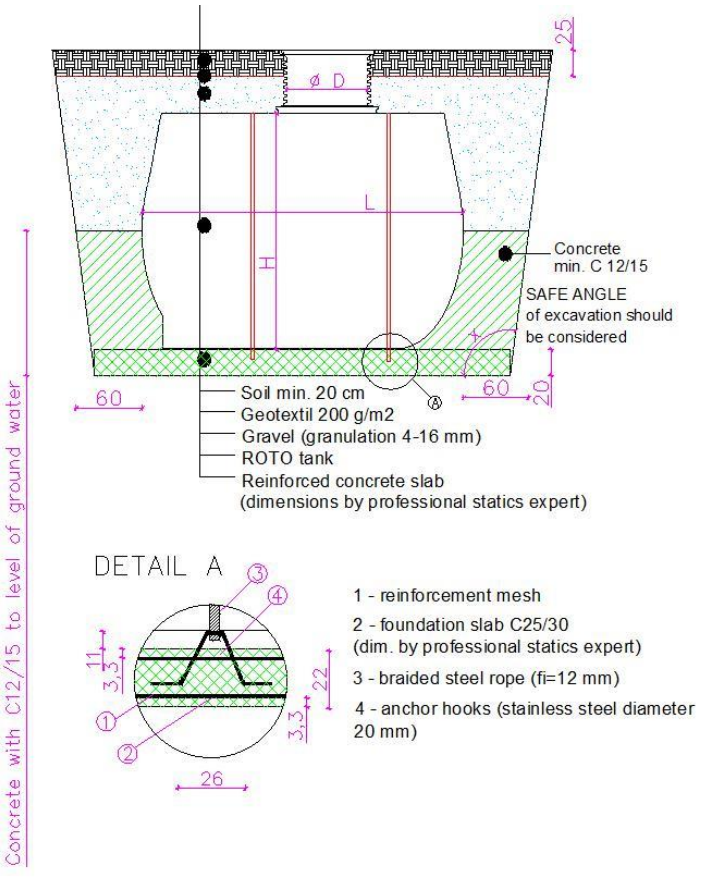
Example 2: INSTALLATION WITH UNDERGROUND WATER

- The external size of the construction pit should be 60 - 100 cm larger than the tanks external length and width. If the characteristics of the terrain allow it, the walls of the construction pit should be dug as vertically as possible (a safe angle of excavation should be considered and work safety rules respected).
- The construction pit planum layer should be straight, fortified and hard. If the soil has a lower bearing capacity, a layer of a 40 cm thick layer of gravel material or concrete should be made. Layer should be fortified to the compaction rate of 60 MPa.
- An approximately 20 cm thickness floor reinforced concrete slab should be made on top of the prepared surface. The floor slab must be 60 cm wider than the dimensions of the tank (the dimensions of the reinforced concrete floor slab should be made by a professional statics expert). Stainless steel anchors must be inserted into the floor slab.
- Carefully place the tank onto the reinforced concrete slab (placement with appropriate mobile crane or excavator) and level the tank using a leveling tool. Using the adjustable extension with coil adjust the telescopic elevation with twist/screw to the final level of the terrain. If the tank has integrated extensions make sure to cut it on the correct dimension to level it with the terrain.
- Using the stainless steel rope (or equivalent) anchor the tank around the body of the tank and connect it to the anchors.
- The construction pit surrounding the tank should be filled in with minimum C 12/15 quality concrete to the maximum height of the underground water. Please make sure that the curved parts of the tank are well filled in from all outer sides. The tank (all chambers) should be simultaneously filled in with water while the pit is being filled on the outside. Simultaneous filling of the pit with concrete and the tank with water should be made in 30 cm steps - until the maximum level of the underground water is reached. The space between the maximum level of the water and the 25 cm below the top of the tank should be filled with 4- 16 mm gravel fraction.
- When filling the construction pit, make sure to connect the pipes on time. To correctly connect inflow, outflow, ventilation, ... check the instructions on page 8.
- After the pipes are connected, fill the pit with the gravel (4 – 16 mm) up to the last 25 cm.
- Lay down the geotextile 200g/m^2 over entire surface of the construction pit
- The top 25 cm should be filled in with soil. Please make sure that the tank cover remains uncovered. Attach the tank cover to the tank neck with supplied screws.
- The maximum height of gravel and soil above the tank is 100 cm. (extension 500 mm + extension of the extension 500 mm)
- If the surrounding terrain is impermeable, the drainage should be made around the tank.



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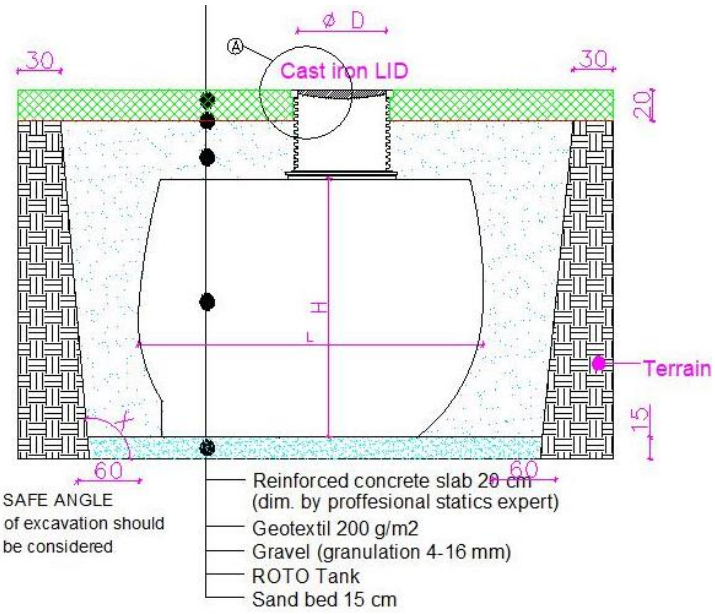
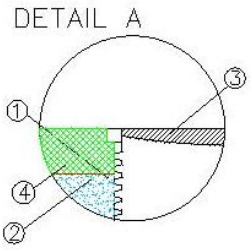
Example 3: INSTALLATION BELOW TRAFFIC SURFACES

- The external sizes of the construction pit should be 60 - 100 cm larger than the tanks external length and width. If the characteristics of the terrain allow it, the walls of the construction pit should be dug as vertically as possible (a safe angle of excavation should be considered and work safety rules respected).
- The construction pit planum layer should be straight, fortified and hard. If the soil has a lower bearing capacity, a layer of a 40 cm thick layer of gravel material or concrete should be made. Layer should be fortified to the compaction rate of 60 MPa.
- A 15 cm thick sand bedding should be put on top of the prepared layer. The sand layer should be levelled out.
- Carefully place the tank onto the sand bedding (placement with appropriate mobile crane or bagger) and level the sand out using a leveling tool. Using the adjustable extension with coil adjust the telescopic elevation with twist/screw to the final level of the terrain. If the tank has integrated extensions make sure to cut it on the correct dimension to level it with the terrain.
- The construction pit is then filled up with 4 - 16 mm gravel fraction to the tank height of 30 cm, measured from the bottom of the tank, while the tank is simultaneously being filled up with water up to the height of 30 cm measured from the bottom of the tank (make sure all chambers are filled). Please make sure that the curved parts of the tank are well filled with the fraction from all outer sides. Simultaneous filling of the pit with fraction and the tank with water should be made in 30 cm steps, until the pit is completely filled (25 cm below the level of the lid). Make sure to stop before reaching the connection pipes.
- When filling the construction pit, make sure to connect the pipes on time. To correctly connect inflow, outflow, ventilation, … check the instructions on page 8.
- After the pipes are connected, fill the pit with the gravel (4 – 16 mm) up to the last 25 cm.
- Across the entire area of the tank, geotextile (200 g/m2) must be laid.
- A reinforcement concrete slab to relieve the pressure of approx. 20 cm thickness should be made on top of the geotextile (dimensions should be advised by a statistics expert, according to load).
- Cast iron lid should be mounted onto the tank inlet and the concrete reinforcement should be made.





1 - Reinforced concrete slab 20cm
(dim. by proffesional statics expert)
2 - gravel (granulation 4-16 mm)
3 - Cast iron lid
4 - geotextil 200 g/m2

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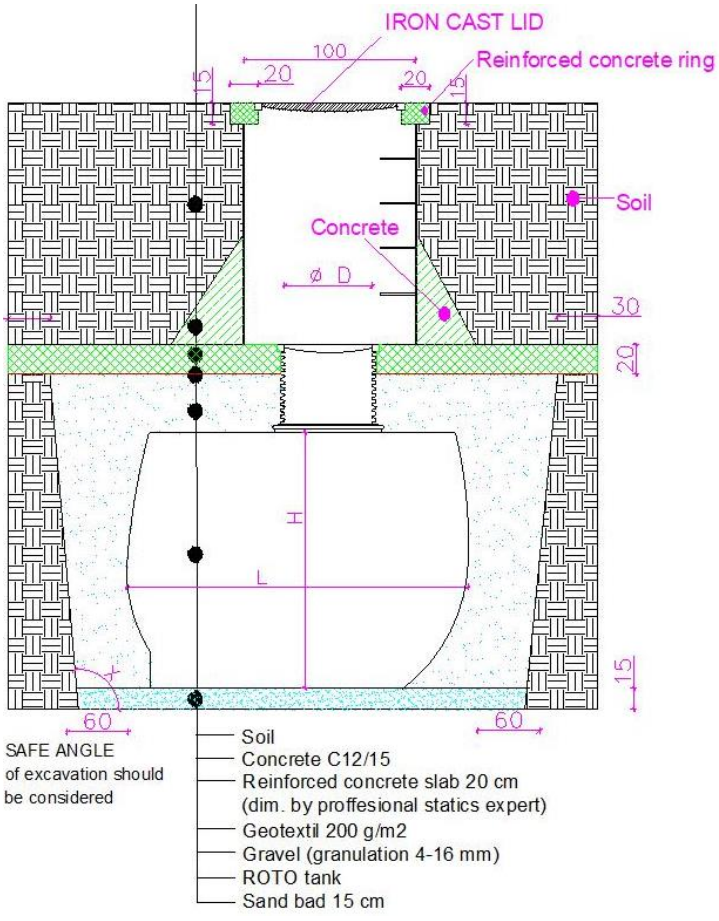
Example 4: INSTALLATION DEEP BELOW THE GROUND (maximal height from tank to the terrain level is 2,5 m)

- The external sizes of the construction pit should be 60 - 100 cm larger than the tanks external length and width. If the characteristics of the terrain allow it, the walls of the construction pit should be dug as vertically as possible (a safe angle of excavation should be considered and work safety rules respected).
- The construction pit planum layer should be straight, fortified and hard. If the soil has a lower bearing capacity, a repair layer of a 40 cm thick layer of gravel material or concrete should be made. The repair layer should be fortified to the compaction rate of 60 MPa.
- A 15 cm thick sand bedding (granulation 0 – 4 mm) should be put on top of the prepared layer. The sand layer should be levelled out.
- Carefully place the tank onto the sand bedding (placement with appropriate mobile crane or bagger) and level the tank out using a leveling tool. Using the adjustable extension with coil adjust the telescopic elevation with twist/screw to the final level of the terrain. If the tank has integrated extensions make sure to cut it on the correct dimension to level it with the terrain.
- The pit is then filled up with 4 - 16 mm gravel fraction to the tank height of 30 cm, measured from the bottom of the tank, while the tank is simultaneously being filled up with water up to the height of 30 cm measured from the bottom of the tank (make sure all chambers are filled). Please make sure that the curved parts of the tank are well filled with the fraction from all outer sides. Simultaneous filling of the pit with fraction and the tank with water should be made in 30 cm step. Make sure not to burry connections.
- Connect the inflow, outflow, ventilation, ... pipes and burry the pit up to the last 25 cm.
- 200 g/m2 geotextile is placed on top of the filled area.
- A reinforcement concrete slab to relieve the pressure of approx. 20 cm thickness should be made on top of the geotextile (dimensions should be made by a statistics expert according to load).
- Access Polyethylene (PE) shaft with a minimum of a 100 cm opening should be placed on top of the pressure-relief reinforcement concrete slab. Depth of the pit should be adjusted to the final terrain level. Access stairs must be made for greater depths.
- Concrete down the shaft and fill the rest of the pit.
- Polyethylene (PE) or cast iron cover should be mounted on top of the access pit.



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CONNECTING THE PIPES TO THE TANK

Connections of the tank should be done in the following steps:

Mark the place of the inflow pipe (PE shaft has straight surface for inflow)

Drill the inlet borehole with a suitable crown drill

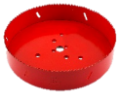
Clean the borehole

Insert and lubricate inlet gasket and PVC pipes

Connect the pipe

TO CUT OUT THE PIPES FOR CONNECTION WITH PVC PIPES

YOU WILL NEED



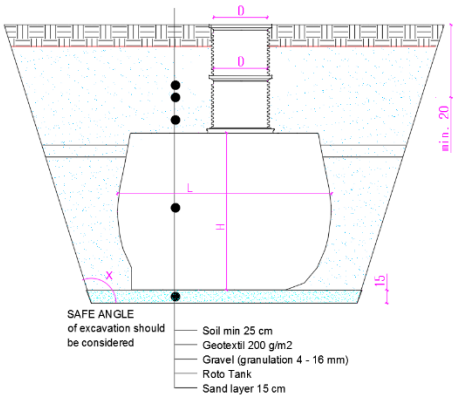
When the tank is correctly installed and all the connections are made. Fill the construction pit with the granulation 4 – 16 mm. Please adjust the extensions and covers to the level of the terrain.

Make sure that the cover and the terrain are correctly leveled out

Carefully burry the pumping station with the correct gravel of 4 – 16 mm granulation

When the tanks are burried to the last 20 – 30 cm from the terrain lay down the geotextile

Last 20 – 30 cm of the pit burry with the earth.



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