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## FormProtect Formwork System

### Assembly instructions



## Round container

- 1. Mark the inside diameter of the container and set up the framework in a circular shape.**  
Leave a distance of approx. 20 - 30 cm to the inner diameter line of the container.



Figure 1. internal scaffold

- 2. Attach the horizontal scaffold poles and the squared lumber brackets.**

Attach horizontal scaffold poles to the scaffold cross brace with clamps! Distance between approx. 2 meters. Fix the squared lumber brackets vertically on top of each other at several levels on the scaffold. (align with spirit level, up to 6 m wall height = 3 levels, up to 8 m wall height = 4 levels). Outer edge of squared lumber supports 2 cm inside the marked line

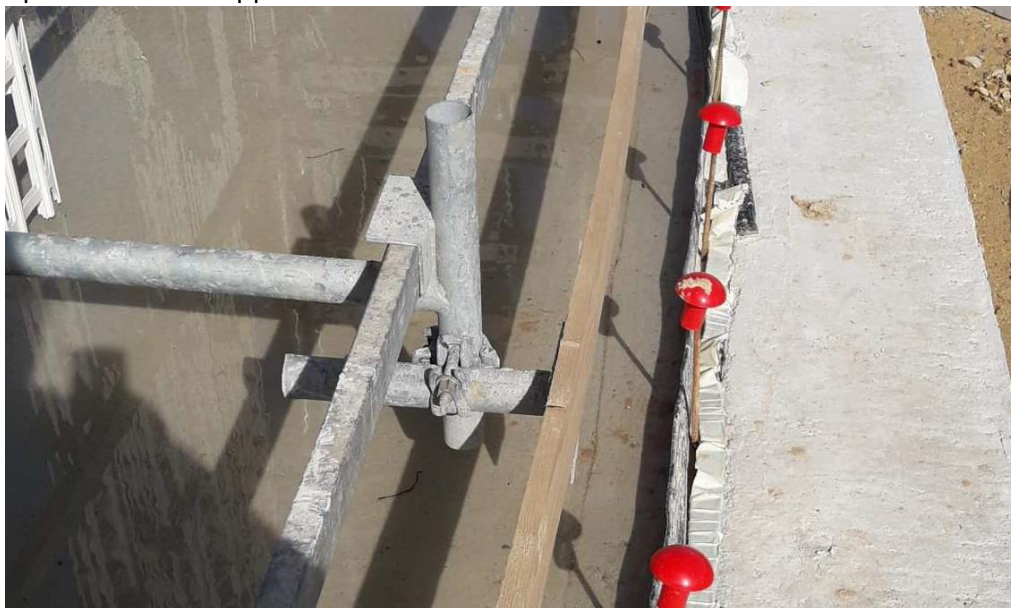


Figure 2. assembly board holder



### 3. Attaching the wooden rings to the board holders.

Fastening with wood screws (observe screw length). Attaching the wooden rings on several levels. Connect board joints with lugs!

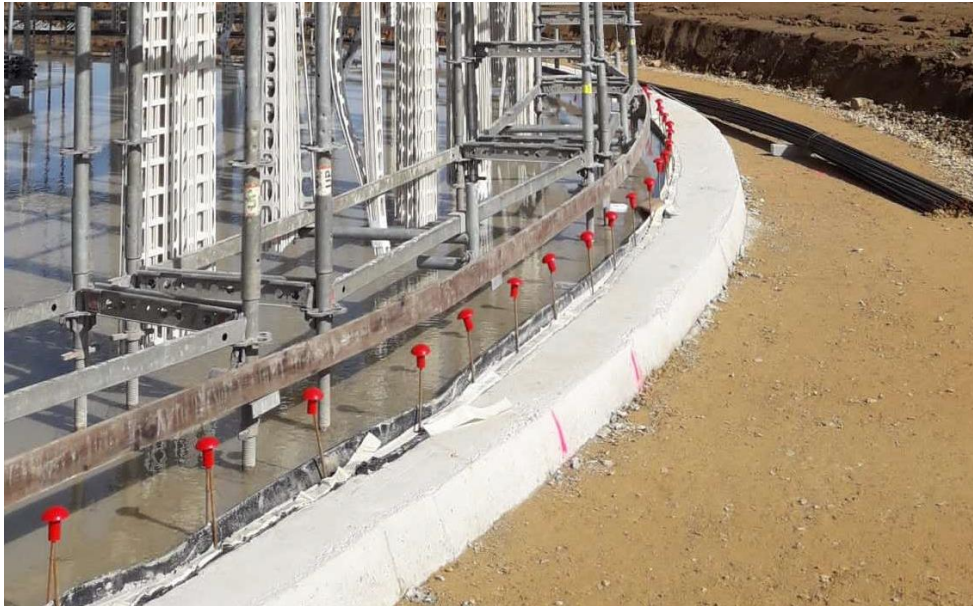


Figure 3. wooden substructure

**Please note:** create optimum curvature. There should also be no heels at joints. With the rounded boards the diameter of the container is created.

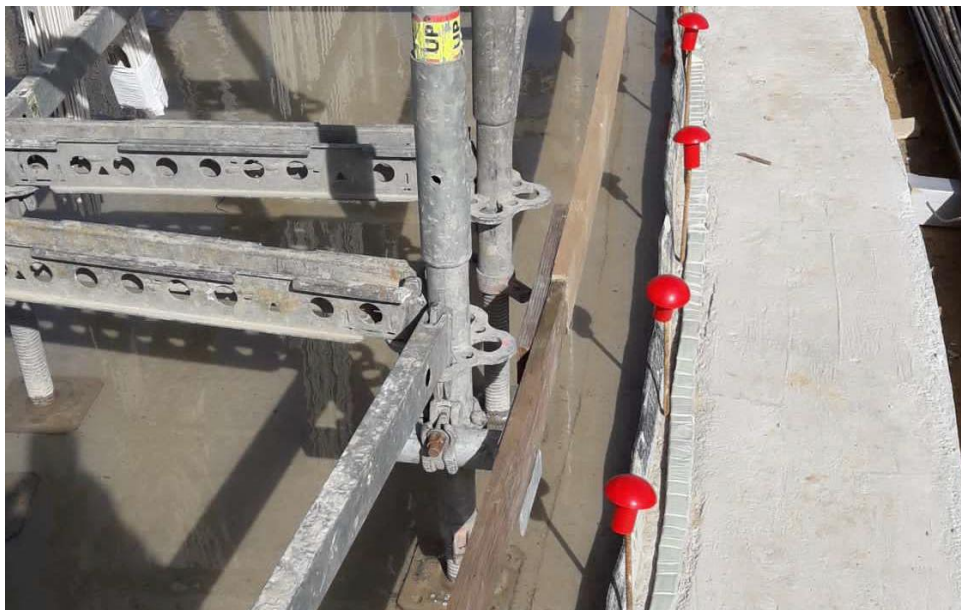


Figure 4. connection board joints

#### 4. Assembly inner formwork

The first inner panel is fastened to the upper and lower wooden rings using screw clamps. Ensure optimum vertical alignment (use a spirit level!).



Figure 5. mounting inner panels

The next inner panel is placed next to it. The connector for interior panels is inserted at a slight angle inserted at the top and then pushed into both panels from top to bottom.

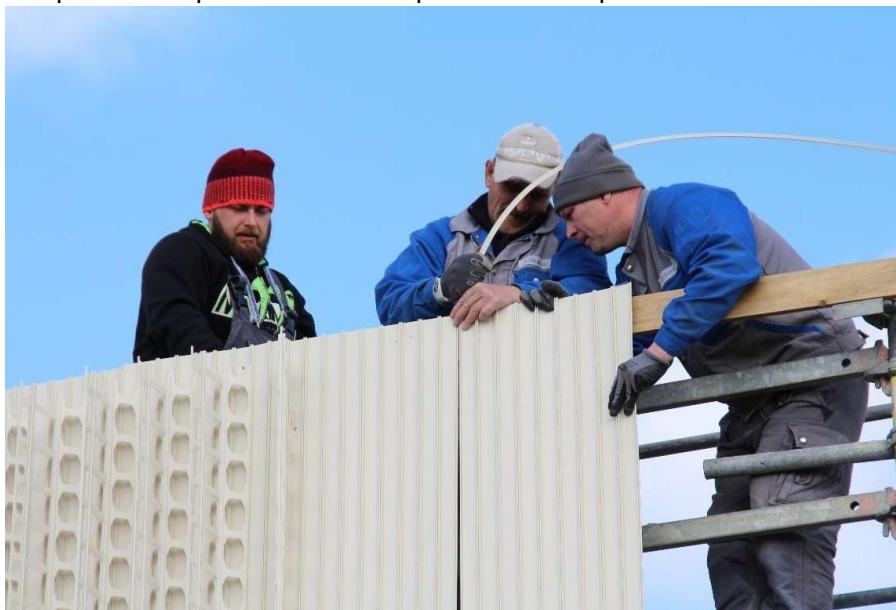


Figure 6. mounting connector for inner panels



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## Installation of the connector



Figure 7. mounting connector for inner panels

At intervals of approx. one meter, the inner panels are fastened to the upper wooden ring with a screw clamp to ensure a certain stability of the formwork.

### 5. Assembly connectors and 45° stiffeners



Figure 8. assembly connectors

The connectors are inserted at the guides provided for this purpose on the inner formwork. These are now pushed in downwards.

### Installation of the 45° stiffeners



Figure 9. 45° stiffeners assembly

The next step is to install the 45° stiffeners. To the left and right of each connector, these are pushed into the corresponding guide.

The connectors and 45° stiffeners are installed in parallel. This procedure gives the inner formwork a certain rigidity.

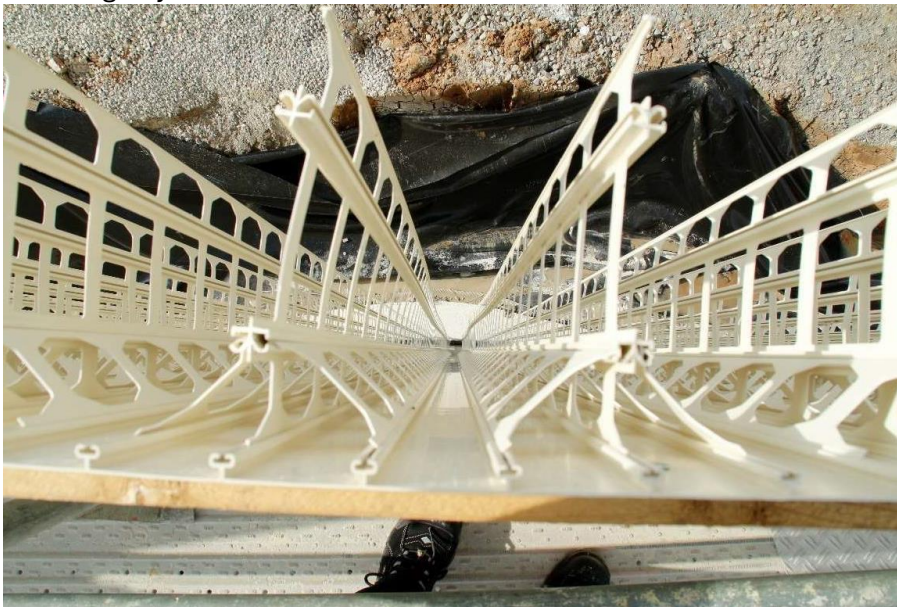


Figure 10. ready assembled internal formwork



## 6. Closing the inner formwork



Figure 11. closed inner formwork

In order to close the inner formwork and thus complete it, the distance of the gap is measured and the end panel is shortened accordingly and provided with the inner panel extension.

If necessary, the wooden ring at the end must be slightly enlarged or reduced. This is done by shifting the board holders.

## 7. Reinforcement



Figure 12. insertion of the horizontal reinforcing bars

The **horizontal rebars** are inserted into the punched fields of the connectors. In order not to damage the connector guides, a special insertion tool is used.



Figure 13. assembly of the vertical reinforcing bars.

After the horizontal rebars have been inserted, **vertical rebars** are inserted. Here, a bar is attached to the front side.

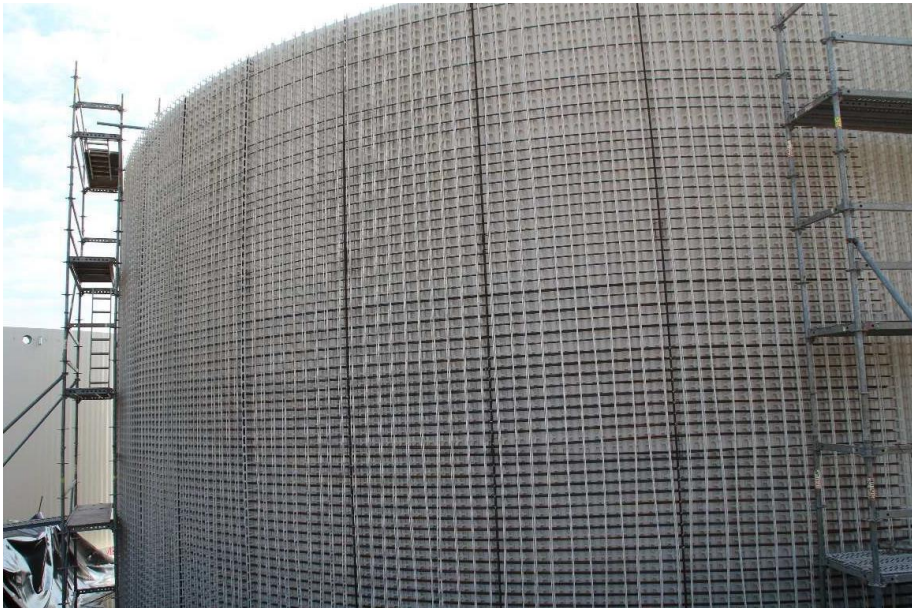


Figure 14. finished reinforced tank wall



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When all the rebars have been installed, they are tied together using tie wires.

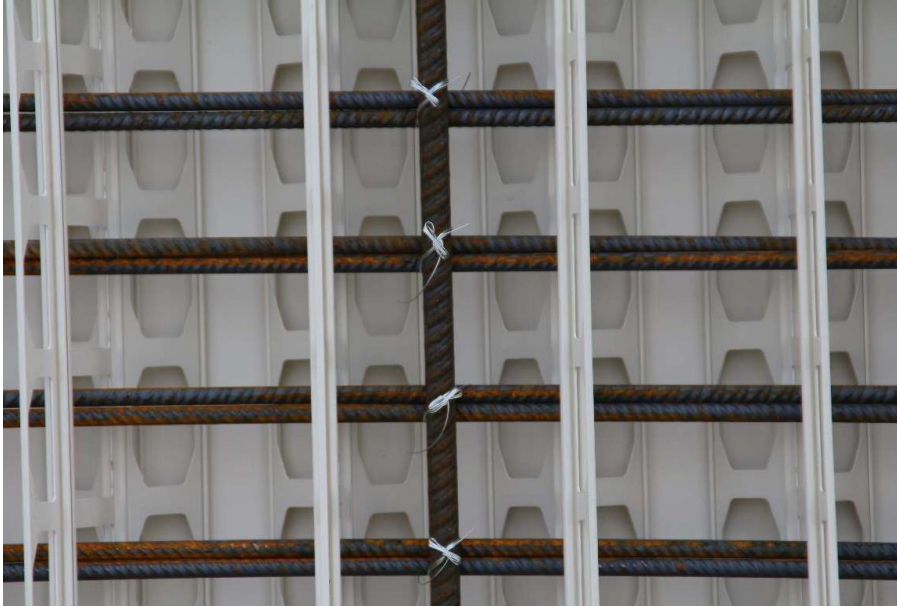


Figure 15. steel bars bound together

The **horizontal rebars must be lifted** during tying, i.e. they must not rest on the bar after tying

→ **The rebar should pass through the opening approx. in the middle**

This is necessary so that the plastic bars are not loaded by the weight of the horizontal rebars.

## 8. Assembly of the outer formwork



Figure 16. assembly the outer panels

The **outer panels** are now placed on the corresponding guides and pushed down.



Figure 17. mounting 45° stiffeners on outer panels



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### Ready assembled framework

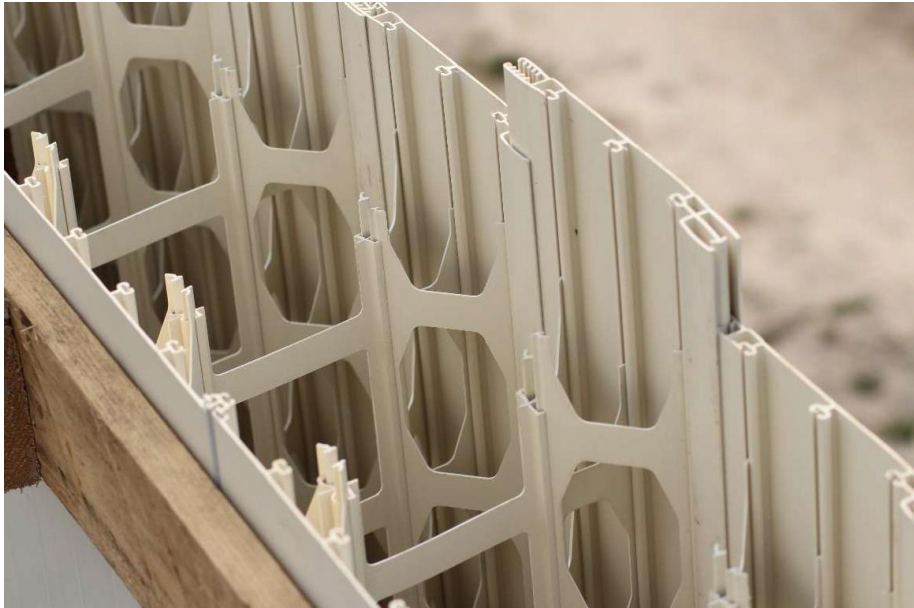
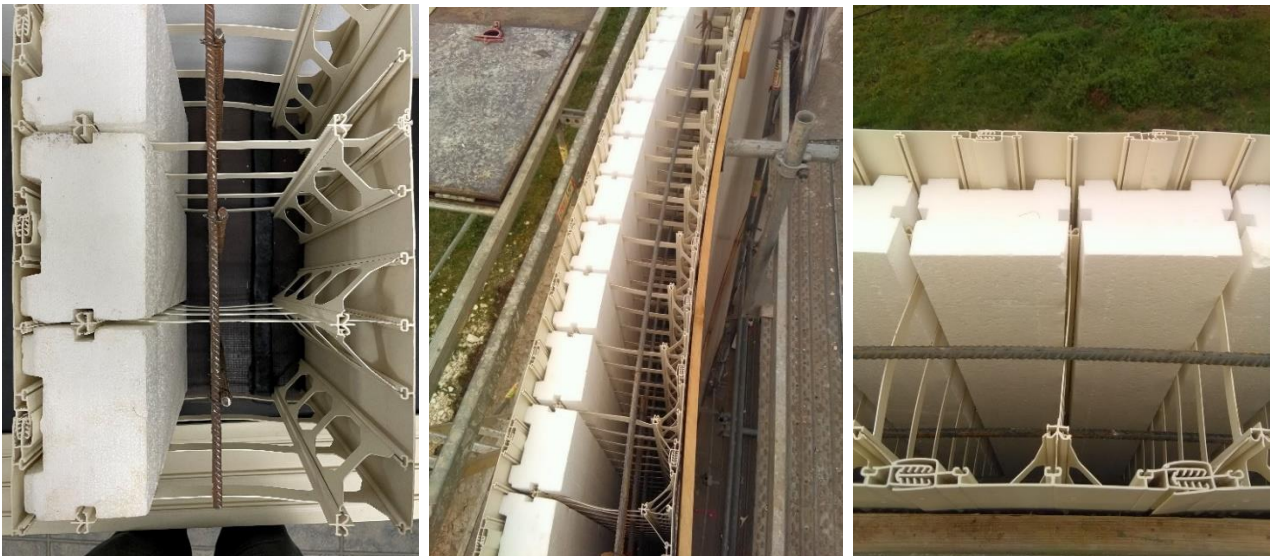


Figure 18. ready assembled formwork

The "alligator lock" of the outer panel allows the circumference of the outer formwork ring to be set and thus adapt to the circumference of the inner formwork ring.

### Wall insulation

If the FormProtect tank is designed with insulation, the wall insulation must be fitted on the outside.



## 9. Concreting the tank wall



Figure 19. concreting the tank wall

When concreting, the first round is poured a layer of about **50 cm with fine-grain concrete**



Figure 20. compacting the concrete with vibratory flasks.

In the further course, **layers of approx. 40 - 50 cm were poured and compacted with 3 vibratory flasks.**

It is important when concreting that the wall is **not filled too quickly**, as the concrete must already set from below to reduce the pressure on the formwork.

The wall formwork must be thoroughly cleaned immediately after concreting (e.g. with a high-pressure cleaner).





Figure 21. filling the formwork with concrete

A construction worker walks around in a circle while the wall is being filled and checks the level with the aid of a rubber mallet by tapping lightly on the container wall to check the fill level. This serves to monitor the uniform filling.



Figure 22. different sizes are available