



Rely on it.

Waterproofing of concrete reservoirs

RENOLIT ALKORGEO

Hydraulic
structures



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Geomembrane recommended

RENOLIT Group manufactures and markets a complete range of PVC-P, PE or PP geomembranes in response to a wide variety of applications. Experience has shown that the PVC-P geomembrane is the most suitable for waterproofing of concrete reservoirs due to its excellent weld ability, its puncture resistance, deformability, resistance to UV and durability: **RENOLIT ALKORPLAN 35054 & 35254**. If necessary, the geomembrane is also available with a special formulation for storage of potable water: **RENOLIT ALKORPLAN 35052-35152**. In addition, this geomembrane can be laminated with a geotextile in polyester or polypropylene (up to 700 g/m²) and receive a reinforcement grid made of polyester or glass.

Installation of lining

Concept of the Waterproofing System

It is necessary to study the exact conditions under which the waterproofing system has to be installed and has to work. Different parameters can lead to a malfunction of the system. After exactly determined the parameters of the sub grade the waterproofing system can be decided.

In general the waterproofing system consists of:

- Support:
 - The ground has to be free of stones, grains and other materials that can damage the geomembrane.
- Protection layer:
 - Geotextile of min. 500 g/m² of Polypropylene.
 - It has to be of Polypropylene especially when the basin is new or repaired with mortar. The high pH value of cement destroys geotextiles of other qualities.
- Waterproofing Geomembrane :
 - The choice of the geomembrane should be done according to the task the geomembrane needs to fulfil (PVC-P, PP or PE).
- Inlets and Outlets:
 - Compatible with the geomembrane.



Installation of the waterproofing system

Good ventilation is required during the installation works, especially during the welding process of the geomembrane.

Preparation of the ground slab

The ground slab of the reservoir has to be repaired and cleaned with great care. The supporting structure must be disinfected, in case of renovation.

The corner between the horizontal and vertical face has to be adjusted with a triangle of concrete to smoothen the change between the horizontal and vertical direction. This is done with a mortar.

Protection layer

If the geomembrane is to be installed on top of a rough surface, an anti puncturing geotextile or a composite protective product must be installed first. If this protection has to be provided with a PVC-P protective layer, geomembrane **RENOLIT ALKROPLAN 35020** can be used. Geotextile is placed with a minimum overlap of 10 cm.

Installation of the Geomembrane

The membrane is placed with an overlap of 5 cm to 8 cm depending on the welding device (machine or hand welder). The geomembrane has to be clean and free of dust in order to carry out a perfect welding. It is not allowed to execute welding with the help of welding liquids type THF (Tetra-Hydro-Furan).

Fixation of the Geomembrane

The system is loosely laid.

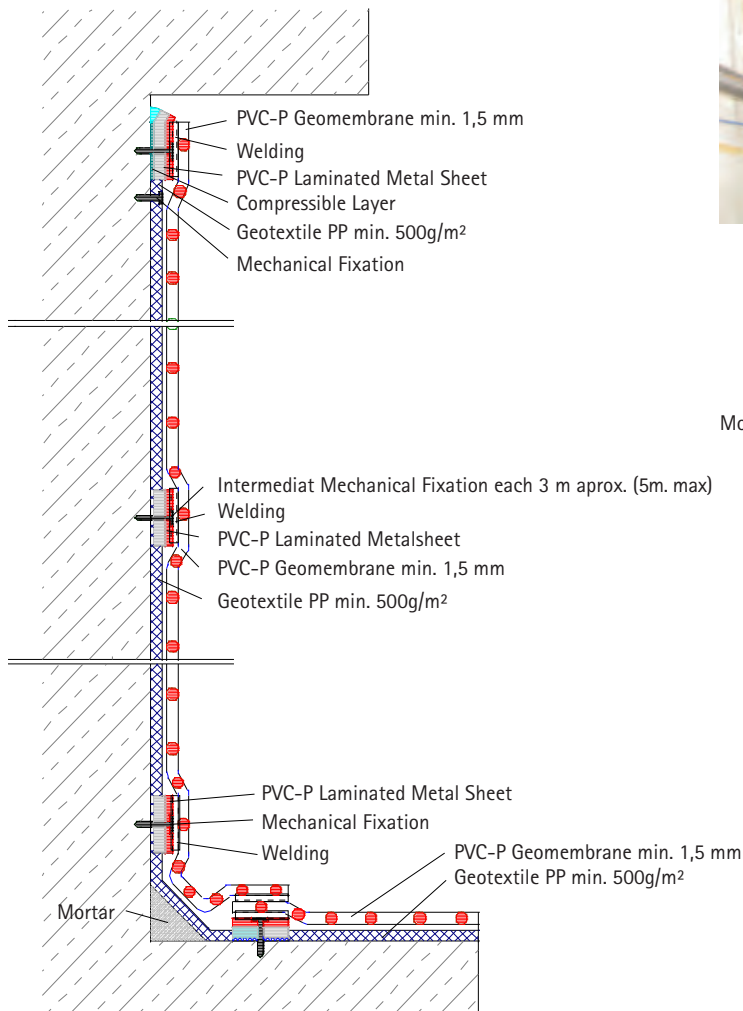
- The geomembrane must be fastened linearly along the perimeter and around all details, in order to resist a pull-out value of at least 2700 N/ml.
- In the corners of the ground slab, the geomembrane can be fixed on PVC-P laminated metal sheets.

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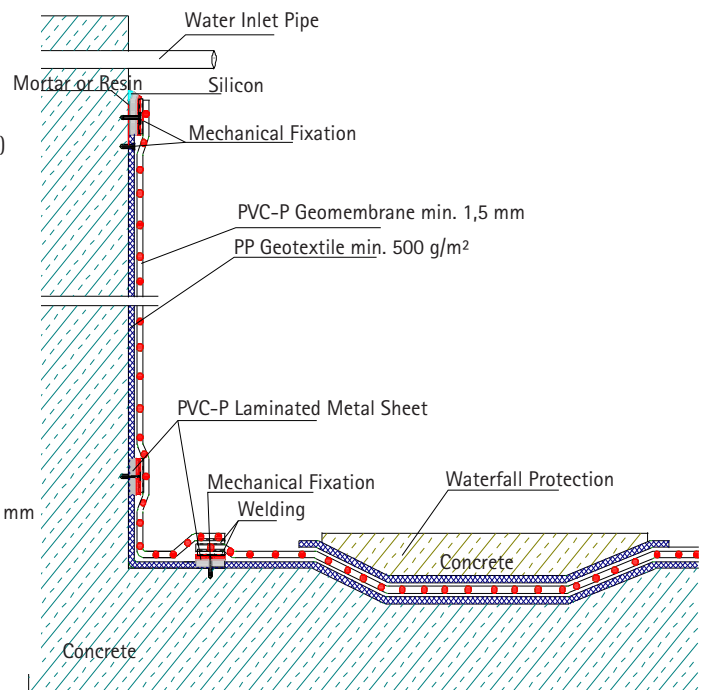
- In the vertical faces the geotextile and the geomembrane have to be hanged from the top to the bottom. In case the height of the basin overcomes 5 m it is recommended to execute an intermediate fixation of the waterproofing. Again the fixation can be done with a PVC-P laminated metal sheet. Also the use of a reinforced geomembrane is recommended in case of important heights.
- Fixation on top of the wall: the fixation has to be placed over the highest water line. It is executed with the help on stainless steel metal plates and compressible bands. The surface of the concrete in this zone has to be smooth and absolutely flat. This can be achieved with fine mortar or resins.

Water dropping zone

In most cases the basin is filled from the top and the water falls onto the bottom with high force. Therefore it is crucial to protect the area from the water impact in order not to damage the waterproofing system. This can be done with a slab of concrete.



Fixation of the Waterproofing System

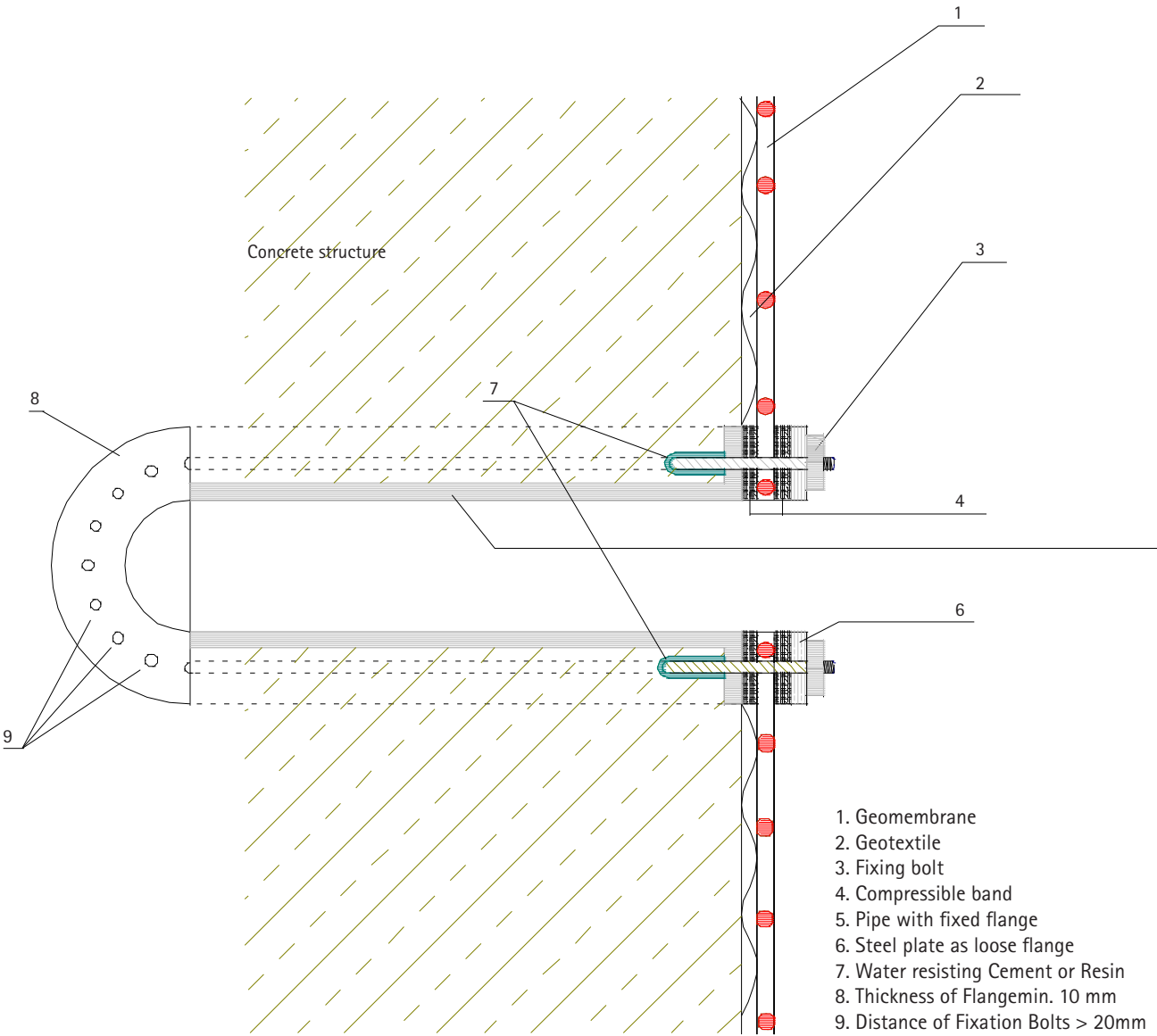


Water Inlet - Protection of Waterproofing System



Outlet and inlets

Especially the outlet of the basin has to be waterproofed very carefully (loose flange and fix flange). The geomembrane is fixed between 2 compressible layers in the flange construction.



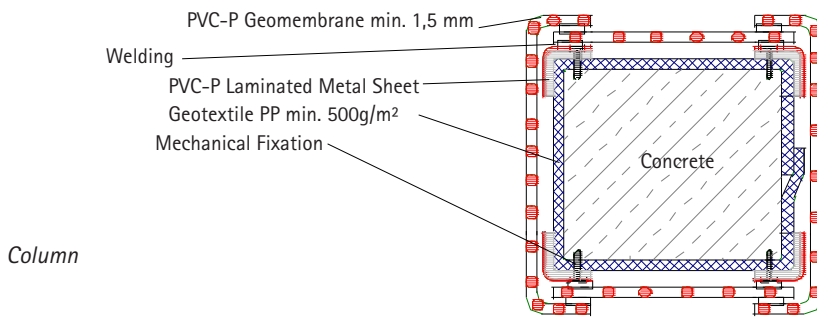
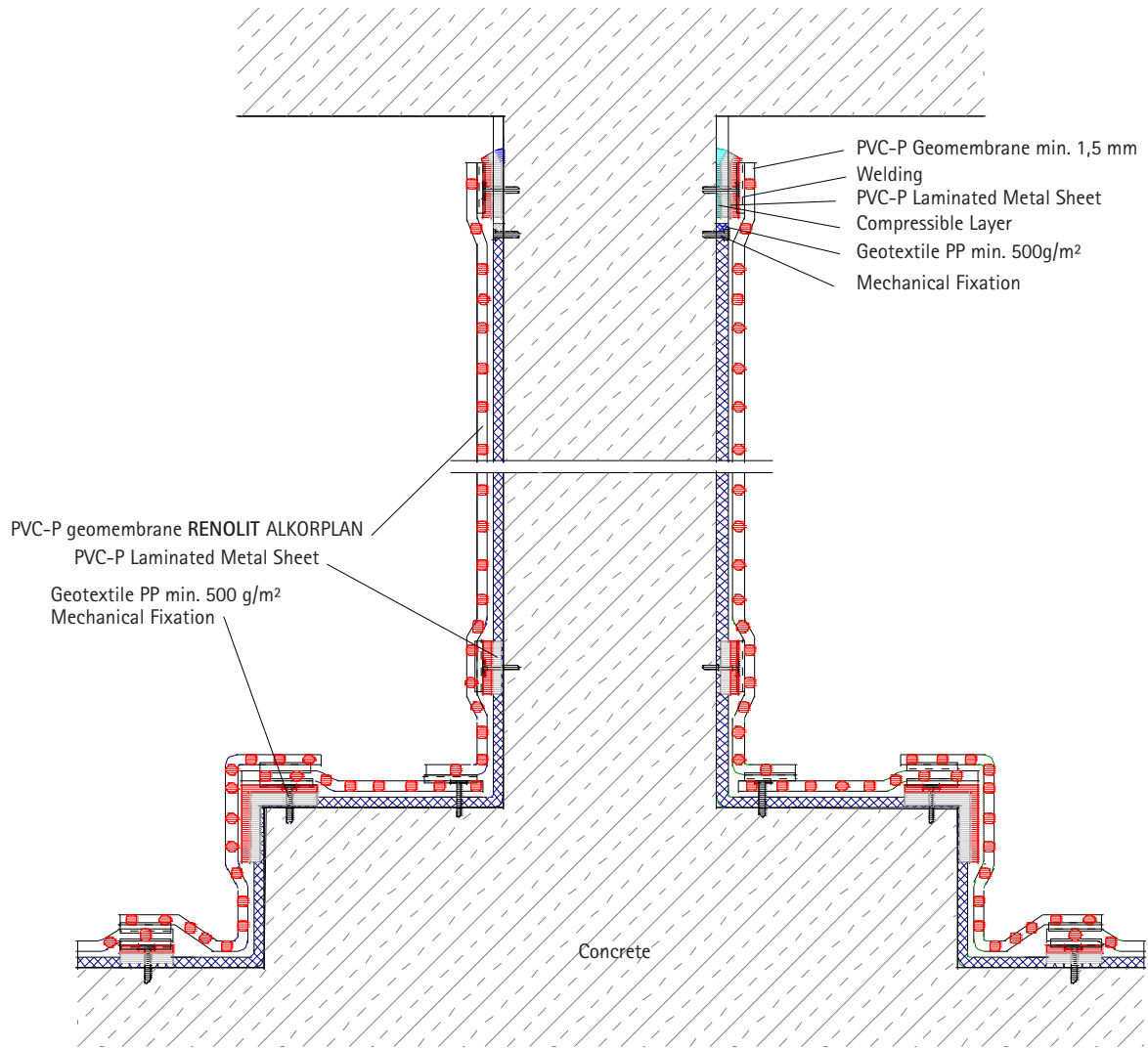
Passage of Pipe



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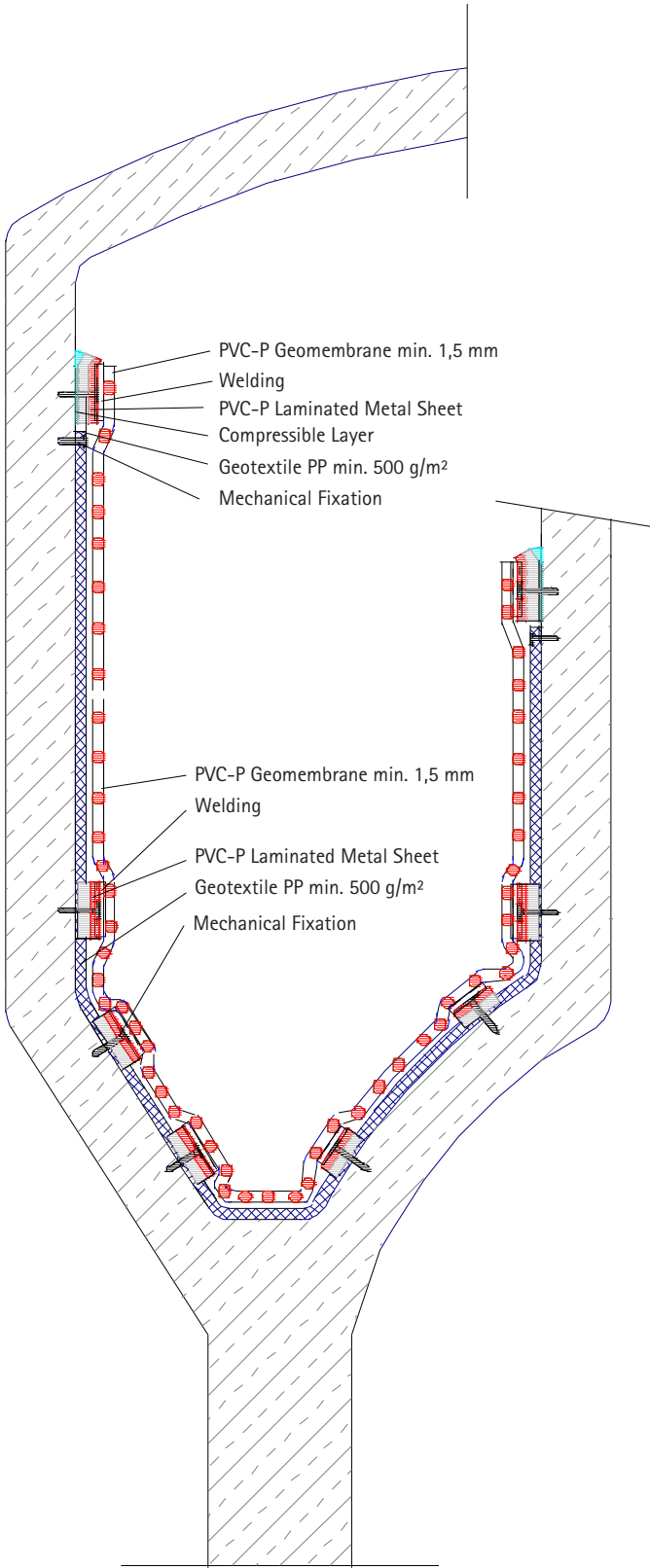
Stairs and Columns

The work carried out with the waterproofing geomembrane on stairs and columns requires very careful work. All the details are done by hand and therefore only the best should execute these details.

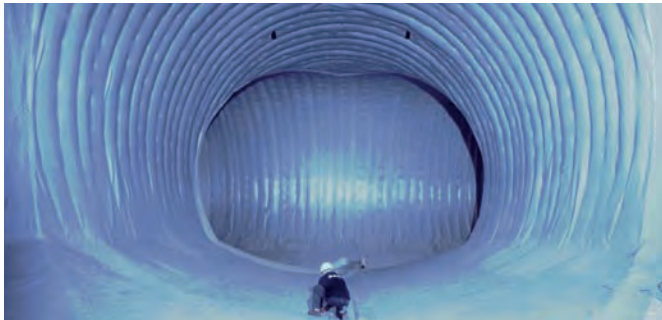


Column





Waterproofing System of Cylinder conical Water Tower



Prefabrication
Depending on the size, form and details of the basin it is recommended to prefabricate panels of geomembrane (parts of the bottom and the wall, details like columns). The advantage is a shorter time of installation, less welding in the closed basin therefore a safer execution of the works.





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