



## Glass Wall Cologne-Westhoven on the Rhine

The district of Cologne, Westhoven, is defended by a permanent reinforced concrete flood wall. To build the wall to the full flood protection height would have meant that the river views would have been obstructed.

In the Rheinaustrasse area the missing 400 mm protection height was achieved using a demountable aluminium flood defence system.

In the area between Rheinaustrasse and Pfarrer-Nikolaus-Vogt-Weg demountable flood defences were not an option due to the private properties that border directly to the permanent wall.

In order to surmount this problem a permanent glass wall of 400 mm height was constructed on the top of the reinforced concrete wall. This solution ensured that the required protection height was achieved, whilst at the same time taking into account all the design criteria, the adherence to this ensured the stability of the individual property values.



It was crucial for the glass wall sections to be as long as possible to reduce the number of support posts so as not to obstruct the views, but at the same time the sections had to be robust enough to withstand the heavy loads. With this in mind high performance laminated safety glass was used combined with slim yet exceptionally strong frames, this allowed spans of 2 m in length.

The laminated safety glass element was made up from a single pane of safety glass with two external sacrificial panes plus two internal support panes. All glass elements were heat soak tested in order to meet the high safety requirements.

In spite of all safety measures used, at some points safety glass elements may need to be replaced. The design allows that each element contained within its frame can be lifted out from the support posts with relative ease; the damaged glass element can then be removed from its frame and replaced. Because EPDM seals are used to create a seal between the glass support frame and post instead of silicone or adhesive sealants no damage results when individual frames are removed.

The glass wall construction not only fits into the architecture of the waterside promenade and the mobile flood defence system ideally, but it also enhances the situation with the high-quality and resilient workmanship quality of the transparent glass wall elements.

**Client:** Stadtentwässerungsbetriebe Köln, AöR  
**Approving authority:** District government of Cologne  
**Protection Height:** HQ100 + 0.1 m freeboard  
**Design Criteria:** hydr. water pressure + 30 kN single load or  
20 kN/ m<sup>2</sup> dummy load  
**Heights:** 0.4 m  
**Length of the defence line/Area:** 310 m/124 m<sup>2</sup>

