



# Versatile Flood Alleviation

Location: Hull

## WaStop Vertical Installation

Clients: The Environmental Agency,  
Hull City Council & Associated British Ports



In December 2013, a storm surge caused water to over top the existing flood defence along the Humber frontage and on the Albert dock causing flooding and widespread damage, filling the dock, and flooding surrounding industrial and residential areas. One of the biggest victims of the flooding was Smith & Nephew who have a large facility north of the dock, suffering millions of pounds worth of damage. The Environmental Agency, Hull City Council & Associated British Ports needed to do something to avoid this happening again in the future.



The existing flood defences varied in height from 5.25 to 6m AoD and the tidal range in the area is around 5 to 6m in normal conditions, but storm conditions combined with lunar activity can see these being substantially higher. VBA Joint Venture Ltd (VolkerStevin, Boskalis Westminster & Atkins) were tasked with raising the existing flood defence and the construction of new defences. One portion of the port includes a 450m long suspended concrete quay, sat on RC concrete columns and pile caps over the water. The quay slab originally had a free edge and so didn't require drainage, however once the flood defence wall was built the rain water couldn't drain away freely; this meant that any water that made it into the structure either from wave action or rainfall was trapped, causing a risk to port workers.



A solution had to be found to enable it to drain away before causing damage to the slab & property also on the quay slab. To solve this issue the VBA engineering team proposed fitting a series of WaStop check valves vertically into the base of the structure. This utilised the fact that the WaStop can be fitted in any orientation. The WaStops are 316 marine grade stainless steel with an integral top grate secured with 3 screws, providing a flush-fit during normal operation, but allowing ABP to pull the whole valve out for maintenance. After the installation of the valves, a representative from VolkerStevin commented that the WaStops were 'simple to install, high quality and effective.' This is a great example whereby using WaStops, an elegant simple solution, could be found to an otherwise very complex problem.

**Aquatic Control Engineering Ltd**

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