

Stormwater outfall pipelines Lusail City, Doha, Qatar

When it rains, it pours: most of Qatar's precipitation falls in brief, heavy storms. The ensuing flash floods can threaten built-up areas, which is why Qatar cities need efficient storm water drainage. In Lusail, the central and southern outfall for such a drainage system has been built by BAM International.

Lusail City is a large development in Qatar, some 15 kilometres north of the capital Doha. It is home for up to 250,000 people: a whole new city, complete with commercial and residential areas as well as shopping malls and leisure facilities such as golf courses and marinas. Lusail will also be home of the stadium hosting the opening and closing games of the FIFA World Cup soccer tournament in 2022.



Location	Lusail City, Doha, Qatar
Client	Lusail Real Estate Development Company WLL
Contractor	BAM International
Contract period	December 2010 – September 2011
Contract sum	€10 million

'A new city protected from floods.'



Scope of work

Construction of the central and southern outfall pipelines which serve the new northern extension to Doha, Lusail City. The HDPE pipelines are 1,115 and 1,390 metres in length, with a diameter of 1.4 to 1.8 metres. They were sunk and ballasted into a dug trench, followed by high precision backfill and armour protection.



U-shaped blocks instead of the traditional O-shape.

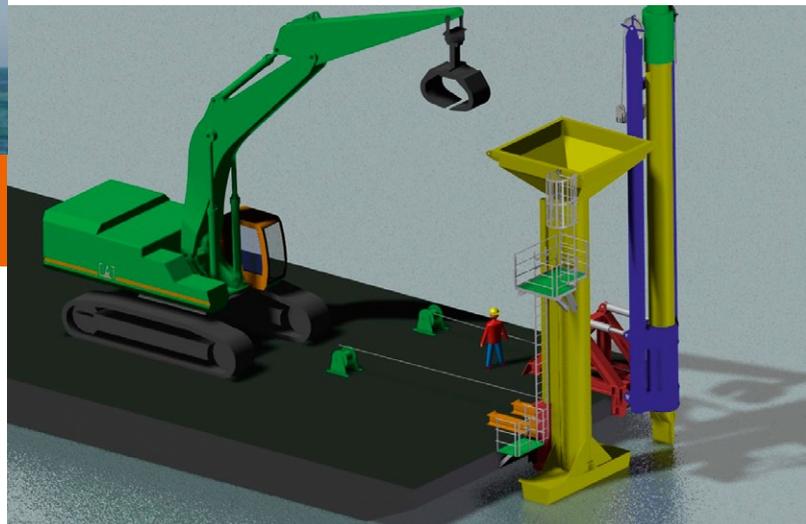
Innovative ballast blocks: increased efficiency

U-shaped ballast blocks instead of the traditional O-shape have provided a significant increase in efficiency on this project. Traditionally O-shaped concrete blocks are used as ballast to weigh down underwater pipelines. O-shaped concrete blocks are bolted to pipelines before they are towed and sunk into position. This typically hinders welding works and pipeline installation as each block has to be bolted before continuing to the next.

By pouring the concrete into a U-shape instead of an O-shape, BAM International removed the need to bolt the blocks together. Moreover, it reduced our dependence on divers – a significant increase in efficiency overall. The increased efficiency of this piece of value engineering also meant a reduction in costs.



Pencil buoys were attached to the Southern Outfall diffusers. They proved useful for the barge crew to identify the positions of the diffusers during placing of the rock.



Specially designed for this project: an underwater rock breaker (far right) and ultra-precision screed frame (yellow) for a perfectly flat work surface.

Purpose-built equipment

The pipelines of the Lusail storm water outfall were dug into trenches in the seabed of the Qatar coast. Hard layers in the seabed required the use of an underwater rock breaker, which was designed especially by BAM International's plant department.

The trench bottom was leveled with an ultra-precision steel screed frame, another in-house design.