

Sealing the deal in Dublin

ACO RoadDrain provides a sealed monocast solution in Dublin Port



Dublin Port has been the gateway for Ireland's international trade for centuries. From its origins as a home to the seafaring expertise of the Vikings to the rise of the Celtic tiger and increasing global commerce, the port has needed to adapt to thrive.

As part of its Masterplan 2040 project, which will see a significant volume of renovation and expansion work take place over the next two decades, Dublin Port Company (DPC) identified the need to create a new loading yard and terminal. To achieve a robust, reliable and sealed drainage solution that would stand up to the rigours of modern cargo handling, while protecting the environment, the company turned to ACO Ireland, a division of ACO Water Management UK.

Responsible for processing over 50 per cent of all trade for the Republic of Ireland, Dublin Port is the country's largest freight and passenger port; and handled 22.7m tonnes of exports in 2018 alone. However, with cargo volumes increasing year-on-year over the last five years (the port has witnessed 5.35% cargo growth since) 2014 a great strain was being felt across the site, in particular on

the surface water management channels located throughout the port. As such, the DPC proposed the construction of the new loading yard for ship cargo, known as the BluGas Loading Yard, and a new terminal, Terminal 4, to bring the port's infrastructure in line with demand.

Effective surface water management is essential for the smooth running of a port. With a high number of commercial vehicles and cranes, not to mention support staff working on foot, excess surface water can represent a significant health and safety hazard.

ENVIRONMENTAL CHALLENGES

The Masterplan 2040 document, which was first outlined in 2012, highlighted the need for a clear separation between on-site drainage systems for

Project:

Dublin Port expansion.

Objective:

To create a robust reliable and sealed drainage solution for a new loading yard and terminal.

Solution:

ACO RoadDrain monocast channel drainage system with Sika Bond sealant.

clean stormwater and potentially contaminated run-off, to ensure any pollutants are treated and removed prior to discharge. Given the sustained presence of a variety of commercial vehicles throughout the port, any surface water management channels located in that area would need to be secure enough to convey the water – which may become contaminated with the likes of oil and fuel – safely away to be cleaned without risk of it leaking and entering the sea.

If not, this could negatively impact the water quality and biodiversity of Dublin Bay and miss the EPA guidelines with regards to managing surface water and preventing the contamination of natural water resources.

Given the sheer size and weight of both the cranes and commercial vehicles used for the loading and unloading of cargo, a number of the existing surface water management channels throughout the port began to show signs of fatigue under the intense loading demand placed on gratings.

BREAKING POINT

With a contract for new surface water management channels to be installed throughout the BluGas Loading Yard and Terminal 4 going out to tender in 2017, Eoghan Liston, Business Development Manager, from ACO Ireland was well aware of the material challenges faced by Dublin Port.

"Existing channels installed throughout the port were failing to cope with the point-loading demands placed on the gratings. In particular, problems were arising when the wheels of cranes were turning 90 to 180° on the gratings themselves, as this placed a huge amount of pressure on the material. The scale of the BluGas Loading Yard and Terminal 4 projects, the DPC was keen to avoid any future channel draining quality issues."

He continues: *"Initially the contractor considered a ductile iron grated product, however concerns were raised over the potential product weakness, given the intense point loading challenges at Dublin Port. Given the scale, the port required an accessible solution that would have no moving parts, as well as a high load class of F900. With that in mind, we were able to meet with the contractor and Maintenance Manager for Dublin Port, and talk them through the benefits of opting for a truly monocast water management solution."*

FULLY MONOCAST SOLUTION

The most distinguishing feature of a monocast drainage channel is the integration of the grate into the channel body. However, there are a variety of channels which claim to be monocast, but actually comprise of two sections welded together.

Manufactured from Vienite®, ACO's high strength recycled polymer concrete, the product ultimately identified to provide a fully monocast solution for Dublin Port was the ACO RoadDrain range.

Manufactured to Load Class F 900 – the highest classification available – the RoadDrain range is not only strong enough to handle the extreme point-loading demands posed by day-to-day

activity at the port, but offers a high intake area thanks to 15mm slots to deliver maximum hydraulic performance.

ACCESSIBILITY FOR MAINTENANCE

Access was a critical factor in the decision making process for the DPC Maintenance Manager. However, any concerns were quickly allayed thanks to ACO's dedicated access units, which were installed periodically along each drainage run. ACO RoadDrain fitted easily into the port's drainage maintenance programme. The cleaning equipment of the drainage maintenance contractor could easily fit inside the dedicated access units, to ensure the runs could be regularly and effectively maintained throughout their operational life.

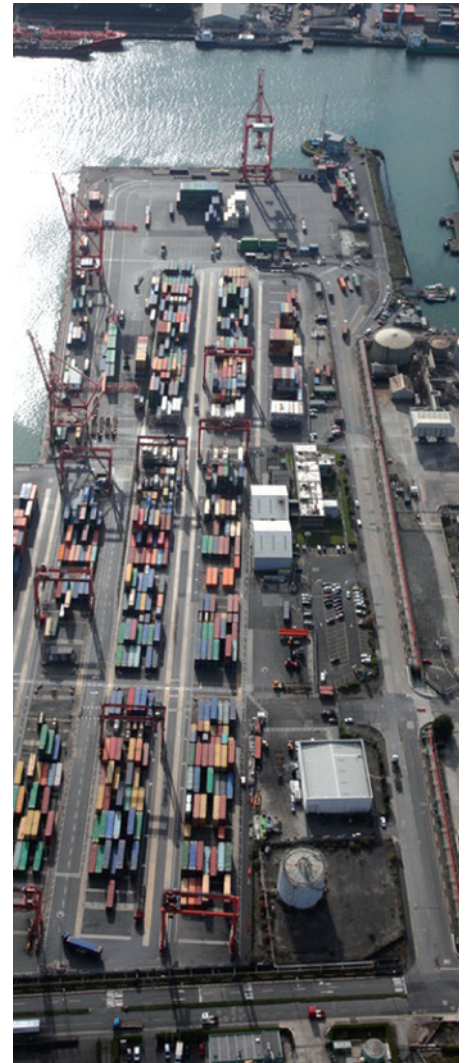
SEALING THE SYSTEM

Once ACO had walked the contractor and representatives from Dublin Port through the design principals and lifecycle benefits of ACO RoadDrain, they were keen to see the system in action prior to agreeing the tender. An on-site 'wet test' was set up to show that the completed system could meet the mandated levels of water tightness. ACO RoadDrain has a dedicated sealant groove which was sealed with product from the company Sika Bond.

ACO's National Technical Consultant, Keith Oldham, was integral to this process and oversaw all on-site testing with the contractors. Sika Bond was quickly able to provide the necessary bonding and sealing materials – which are mandatory under Ireland's comprehensive Environmental Protection Agency (EPA) regulations. The mock installation was then set-up at the port and left to cure for 24-hours, before ACO undertook a full wet test with representatives from Dublin Port, the consultant engineers and contractors all on-site, to review the outcome.

Dublin Port placed a significant order of the RoadDrain channel to be used throughout BluGas Loading Yard and Terminal 4, as well as a smaller, separate run at the port's Top Oil fuel depot. Eoghan concludes: *"Not only was the client very pleased with the quality of the product, but also the support from the ACO team. The product management and design services have been imperative, as has the support in defining the application challenges and supplying in-depth hydraulic analysis."*

For more information on ACO's RoadDrain range, please visit: www.aco.co.uk



ACO RoadDrain range



Sealant groove

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