Marine outfall repairs in northeast Scotland

We carried out structural repairs and erosion protection to four coastal outfalls at a wastewater treatment works.

stonbury

In **summary**

- → Outfall structures at a critical coastal site were repaired under strict tidal access windows and adverse weather conditions
- → Concrete deterioration, exposed joints, and erosion were addressed using specialist techniques that meet XS3 specification for tidal wave and splash zones
- → The project helps safeguard coastal infrastructure while reducing environmental and structural risk

The **need**

A wastewater treatment works in northeast Scotland features four outfall pipelines that discharge treated wastewater into the sea.

Years of tidal activity and wave action had damaged the 600mm-diameter concrete-encased steel pipes, leaving joints exposed, foundations undermined, and some sections heavily corroded.

Structural repairs and long-term erosion protection were needed to safeguard the site and surrounding coastline.

The **solution**

We delivered the project under tough environmental conditions, including unpredictable tides, strong coastal winds and limited working windows. To make the most of low tides, our teams began work as early as 2am to access the exposed outfalls and complete critical repairs before the water returned.

Across the four outfalls, each made up of 600mm steel pipes encased in precast concrete, we tackled a range of structural issues.

We repaired six exposed joints at the first location, installing new two-metre-square foundation pads beneath each one. At a second outfall, we completed similar repairs across 20 joints to reinforce the full length of the structure.

Two five-metre sections were also found to be heavily corroded. We rebuilt these using a concrete mix that met XS3 specification for splash and tidal zones, adding an accelerator on site to speed up the set time to avoid damage to the repairs when the tide returned.

To provide long-term protection, over 500 tonnes of rock armour was installed around the structures to shield them from ongoing wave erosion.

Two remaining outfalls were scheduled for repair later in the year, once the Marine Scotland licence had been extended.

The **benefits**

- Reinforces key coastal infrastructure under harsh marine conditions
- Improves resilience and longevity of wastewater assets exposed to tidal zones
- Reduces long-term maintenance through erosion protection
- Uses specialist materials tailored to the marine environment
- Supports regulatory compliance and asset longevity

4
outfalls repaired in total

500tonnes
of rock armour installed for future erosion protection