



Emergency works at live refinery and petrochemical centre

Rigid Inclusions

Grangemouth Refinery, Falkirk, Scotland

Rigid inclusions deployed in emergency project at Grangemouth refinery and petrochemical centre after crawler crane platform failed.

Rigid Inclusions, a ground improvement solution, were designed and installed by Van Elle in a live refinery environment to improve the bearing capacity of the ground and enhance settlement performance, making it ideal to overcome the platform failure.

Project Background

Van Elle were called on to develop an urgent and effective ground solution which would allow the client, Luddon Construction (main contractors) and Wood Plc (consultants), working on behalf of INEOS and Selsa Linde, to get back on track to deliver Furnace10 at Grangemouth Refinery.

The crawler crane which was vital in the construction of the new furnace was left unusable after its tailing base support (platform) failed.

Van Elle delivered a completed design for the urgent works, with Category 3 design checks, and load case checks.

Client Challenge

The client required specialist ground improvement support when the platform, supporting the LR1600 crawler crane, sunk and cracks appeared on the underlying road surface.

Believed to be caused by a settlement issue, the problems developed after a number of lifting operations were carried out with the crawler crane.

Van Elle Solutions

As a solution 198 rigid inclusions (350mm diameter) up to 12m in depth were used to support the LTR1600 crawler crane.

A load bearing capacity of up to 130kN/m² was achieved to support the under-side of the spreader mats and LTM1500 crane outrigger pads, enabling the crawler crane to be operational.

The team also successfully overcame live site restrictions, including restricted working hours and spark arrestors across the plant, and completed a thorough induction process and inspections prior to start.

Grangemouth Case Study/20

Key Benefits

Emergency Works: **Tight time scale achieved for design turn around and approval**

Fast Installation: **Two-week project**

Low Carbon Footprint : **Use of rigid inclusions against traditional pile solution**

Project stats

Client: **Luddon Construction and Wood Plc**

Value: **Circa £140,000**

Date: **October 2020**

Rig/Kit: **One displacement leader rig**

"We have had challenges and engineering problems which required a solution which was new to myself.

"This required support for specialist geotechnical engineers and ground improvement contractors and their input has been invaluable in resolving the problem."

- **Wood Plc spokesman**