



## CASE STUDY: VIVA ENERGY AUSTRALIA

Buried Firewater Ring Main Extension and  
Ancillary Firefighting Equipment Design and  
Construct

**NOVAFAST**®



NovaFlo 2000M™ (GRE) High Pressure Pipes and Fittings





## NovaFlo 2000M™ Firewater Ring Main Project

### Strengthening Australia's Fuel Reserves

"As part of the Australian Government's "Boosting Australia's Diesel Storage Program", Viva Energy is building additional diesel storage within the grounds of its Geelong Refinery. The availability of land and existing infrastructure to support importation, manufacture, and distribution of diesel into the Victorian market makes the Geelong Refinery an ideal location. Three diesel storage tanks of 30 million litres usable capacity each will be housed in the North West corner of the Refinery site."

Source: Viva Energy Australia  
[https://bit.ly/viva\\_fuel](https://bit.ly/viva_fuel)

### Client project history

Novafast were engaged by VIVA Energy on the Geelong Refinery Crude Tank T1006 project, one of the largest Crude Oil Storage Tanks in the Southern Hemisphere in 2016/2017.

Novafast was the head mechanical piping contractor and delivered a successful design and construct package for the Firewater Ring Main Project.







## Project background

Supporting the Diesel Storage Program in 2023/2024, buried firewater ring main extension and ancillary firefighting equipment were required. Novafast was engaged by VIVA Energy to deliver a design and construct pressure buried firewater ring main around three, 30 million litre diesel storage tanks in the Geelong Refinery.

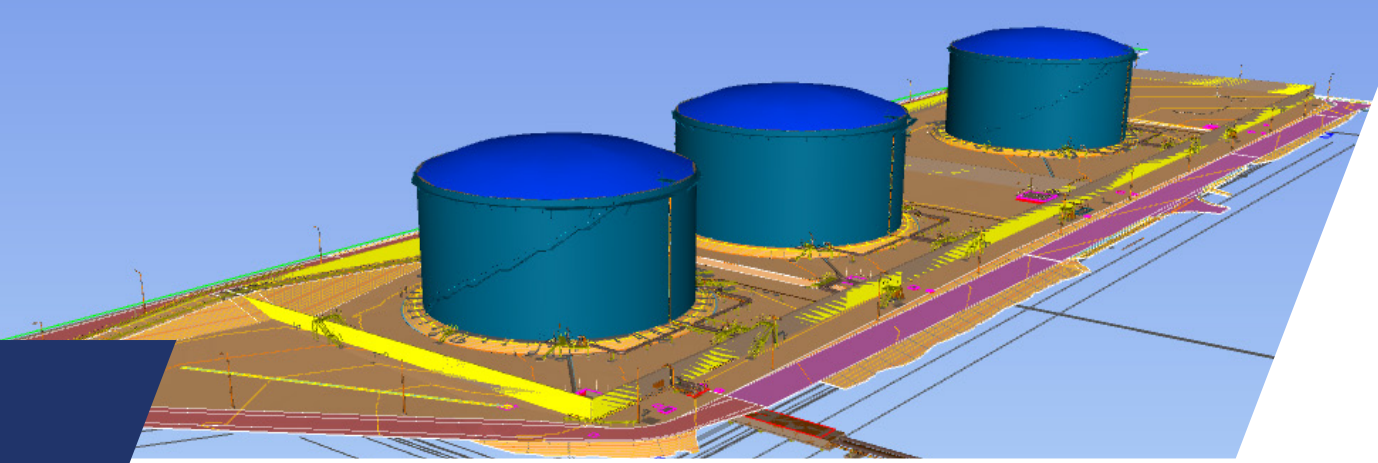
The initial stages of the project had Dennis Southam and Associates providing a piping specification along with completing a detailed design and pipeline stress analysis. Once this was completed, Novafast manufactured all pipes and fittings locally at our Industry 4.0 Australian Manufacturing facility located in Kilkenny, South Australia. Novafast then completed the site installation component including GRE piping installation, surveying, and commissioning on site at the Geelong Refinery.

## Specifications

Design Standards:	SHELL DEP 31.40.10.19 & ISO14692-2
Pipe & Fittings:	IMO Fire Resistant NovaFlo 2000M™ Pipe & Fittings
Test Pressure:	2.4MPa
Connection Type:	Taper Bonded, Laminated & Flanged Connections
Size of Pipe:	DN100mm – DN300mm







## Design & Engineering

Dennis Southam & Associates (DSA) provided the design and engineering resources as part of the group's in house project strategy.

The design started with Detailed Component Design based on Shell DEP 31.40.10.19 and ISO14692.

Once the component design was completed the team then moved this into 3D Pipeline Modelling using Inventor and Plant 3D. The 3D Modelling enabled the team to create a comprehensive Bill of Materials (BOM) for Pipe Fabrication.

Once the modelling was completed our engineering team completed Seismic Calculations, assessment of Soil Properties, restrictions to battery limits and detailed analysis of 17 different load cases making up the Pipeline Stress Analysis using Caesar II software. This was crucial for the project execution; by running the stress analysis in-house the team was able to identify where the areas of high stress in the pipeline would occur. This allowed the team to design the line in such a way as to minimise these stresses and alert the site construction team to these areas on site.

Piping Isometrics were then delivered as an output from the stress analysis along with a set of 3D Construction Drawings for installation.

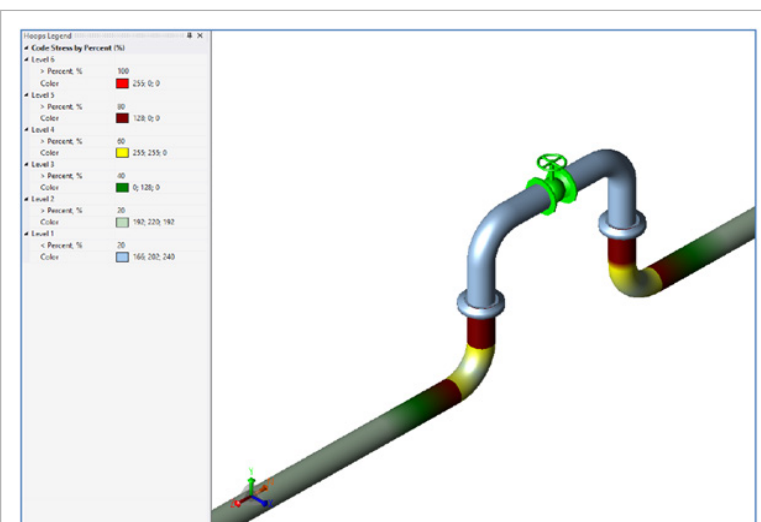
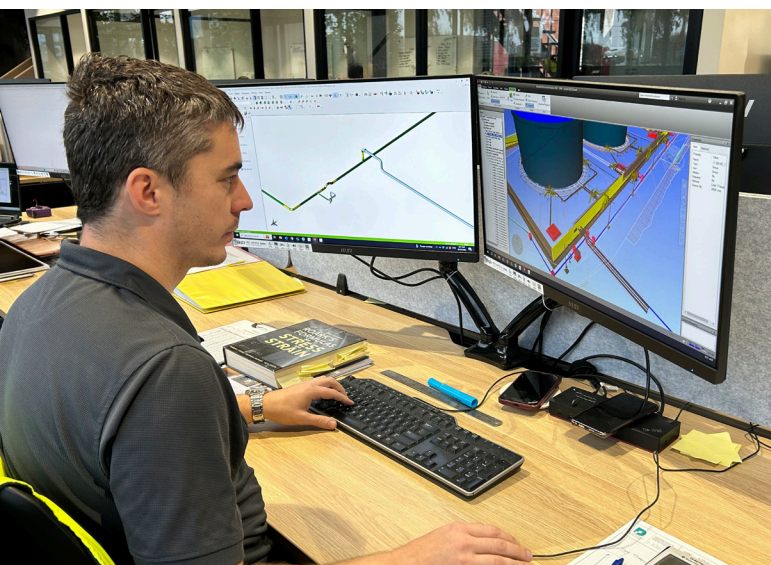


Figure 12 - Highly stressed interfaces (LC2)



## Manufacturing

Novafast's product, NovaFlo 2000M™ IMO Fire Resistant GRE Pipe and Fittings with Taper Bonded connections was manufactured using Industry 4.0 Manufacturing including Novafast's PLC Winding Technology and 7-axis Robotic Winding Technology & 6-axis Robotic Processing Technology.

Following ISO14692-2 Manufacturing & Qualification along with SHELL DEP 31.40.10.19, Novafast provided a comprehensive Manufacturing Data Record (MDR) package consisting of Novafast's Quality Management System (QMS). This included extensive batch material tracing, manufacturing logs including product identification, measurement traceability, visual inspection, in-house non-destructive testing (NDT) & destructive testing (DT) following the standards and a submission with a Novafast Certificate of Conformance (COC) to the client.

NovaFlo 2000M is backed by extensive qualification testing data and 3rd party verified by Bureau Veritas (BV) giving our customers comfort of the product backed by years of in field service and project history.







## Site Construction

Novafast completed the GRE Piping installation and As-Built Survey of the Buried Firewater Ring Main Extension in 9 construction stages for the Greenfields Geelong Refinery including a tie-in into Brownfields with the use of Adhesively Bonded Joints, Butt & Wrap Joints and Flange connections. Novafast provided another submission post site installation for the construction build following Novafast's QMS of Install ITP's outlining 3D Construction Jointing As-Built's drawings along with Survey As-Built's post construction. Extensive jointing records with Bonder Certification were provided including visual inspections of the pipeline following ISO14692-4 & SHELL DEP 31.40.10.19

## Hydrostatic Testing

Novafast completed 9 sections of hydrostatic testing including Integrity (Strength) Tests at 1.5x Design Pressure at 2.4MPa for minimum of 4 hours followed by Leak tightness test held for a minimum of 24 hours before handing over the GRE Pipeline to the client.





Novafast would like to thank VIVA Energy Australia for supporting the Novafast Holdings companies and local content on this project.



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Novafast are proud to contribute to the VIVA Energy Project, providing another innovative turnkey composite solution.