



**MALIN
ABRAM**

CASE STUDY

M433

TURNKEY TRANSPORTATION OF THE TAY WHALE

LWL

INNOVATING HEAVY LIFT SOLUTIONS

MALIN ABRAM
SOUTH ROTUNDA
100 GOVAN ROAD
PACIFIC QUAY
GLASGOW
G51 1AY

T: (+44) 0141 221 3075
E: INFO@MALINABRAM.COM
MALINABRAM.COM

Figure 1: Barge Navigates the narrow Littlehampton Footbridge

OVERVIEW

This unique project involved the transportation of a Whale Sculpture, The Tay Whale, designed by respected artist and sculptor Lee Simmons and fabricated by Littlehampton Welding Ltd. (LWL). The cargo was to be transported from Littlehampton to Dundee Waterfront, forming an integral component of the large civic works at the V&A Museum, to create a central hub for locals and tourists alike.

This project was, on the surface, an example of a typical cargo transportation project, however this was complicated by the nature of the cargo and the loading and discharge locations.

The key issues which had to be resolved were logistical, as there were limited tidal windows at both Littlehampton Harbour and alongside the V&A Museum, which applied particularly tight constraints on the load and discharge of the cargo.

Malin Abram's experience with larger scopes allows for an appreciation of the time and commercial pressures of executing wide ranging projects where individual components, in this instance the sculpture, form a portion of, and are time critical to, the wider development.

Given the tight tidal windows at both ends of the transport, the Malin Abram team were required to provide detailed storyboards, considering the capabilities of the marine spread and restrictions of the environment to ensure a solution could be found to the satisfaction of all stakeholders.

THE SCOPE AND CARGO

Whale Sculpture = 13.3 Te

Support Stands = 4.2 Te

Scope

- Supply of Seagoing Tug and Barge
- Supply of Support Vessel
- Seafastening of Cargo
- Lifting Scope for Discharge of Cargo

THE CLIENT

Littlehampton Welding Ltd. are specialists in architectural and structural steelwork and were engaged by Lee Simmons for the fabrication of the 'Tay Whale'. The tubular steel construction is a symbol of Dundee's past as a centre for the whaling industry in Scotland.

The decision to transport the cargo via barge was driven by the strong symbolism of transporting an icon of a maritime industry by maritime methods.

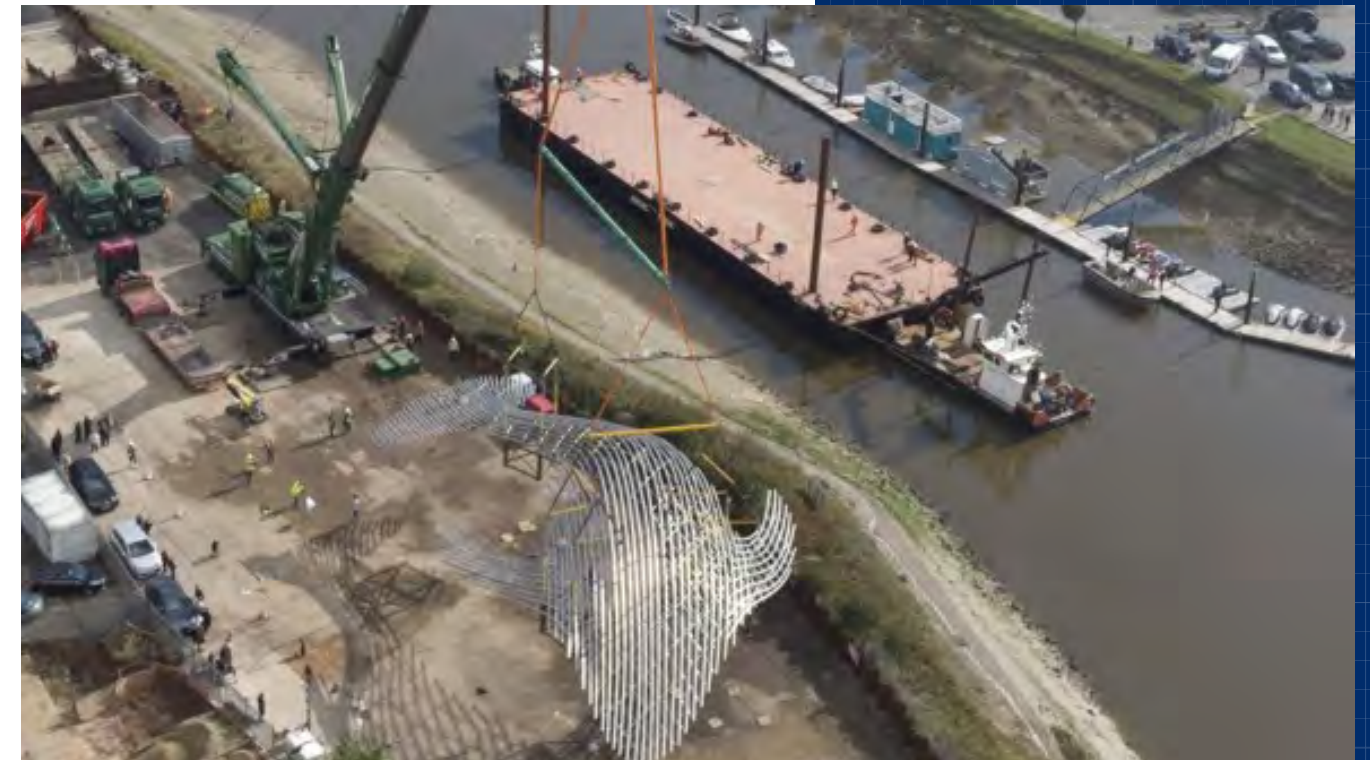


Figure 2: Loading of Tay Whale



Figure 3: Tay Whale onboard the barge in the tight constraints of the River Arun

CASE STUDY M433

LOADOUT LOCATION

The construction of the whale was to be completed in Littlehampton, where access to the sea is via the River Arun. The river itself is primarily used for pleasure vessels and small fishing vessels with a relatively shallow central channel and high tidal range.

There is commercial activity on the river at the Tarmac berth where vessels up to 80m can be accommodated, however, their deep draft only allows for this to be conducted during spring tides. As a result, all spring tidal windows are reserved for commercial shipping and the loading of the sculpture was limited to neap tidal windows.

The marine spread for the Loading of the cargo was:

- Barge: JML5014 supplied by Jenkins Marine Ltd.
- Seagoing Tug: DMS Condor supplied by Jenkins Marine Ltd.
- Multicat: Obervargh supplied by Seawide Services Ltd.
- Harbour Tug: Erica supplied by Littlehampton Harbour Authority

Due to the draft of the seagoing tug, and its manoeuvrability relative to smaller vessels in the confines of the river, the barge had to be handed over to the smaller Multicat vessel for transit upriver to the loading location on the high tide.

Malin Abram had to work closely with the local harbourmaster to identify a suitable position on the river in which the barge could remain fixed by spud legs over the course of low tide, while the loading and seafastening took place.

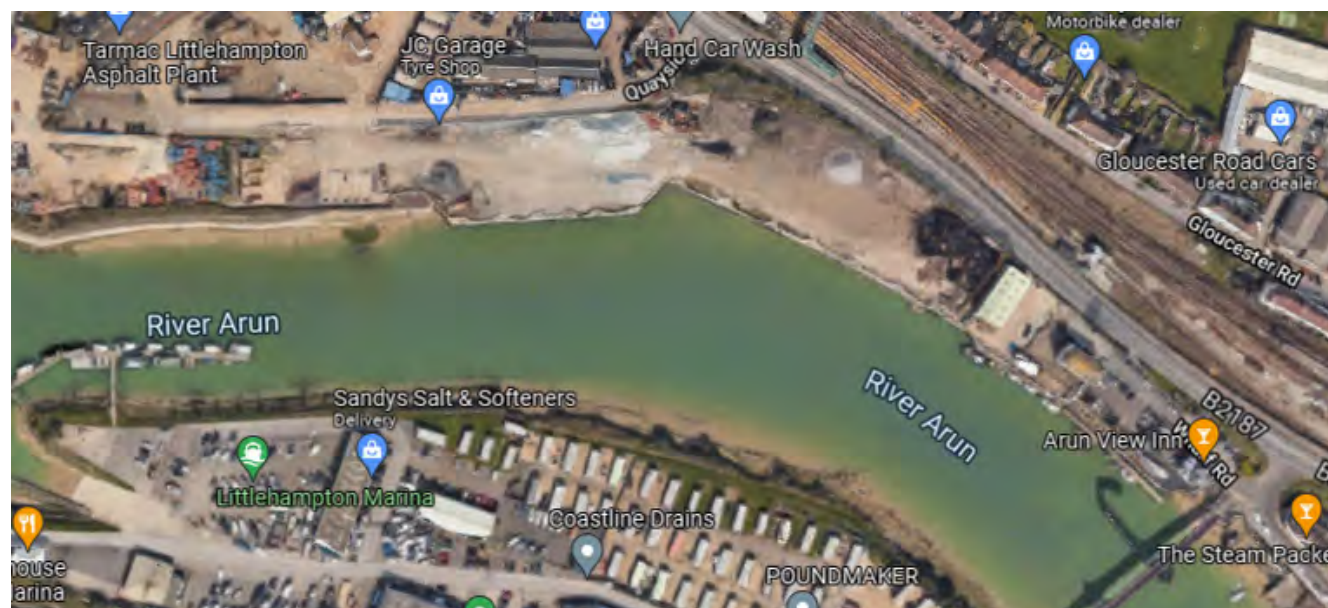


Figure 4: Overview of the River Arun

LOADING AND SEAFASTENING

The design of the rigging arrangement was critical to informing the discharge in Dundee, and required a complex, 12-point, multi-beam arrangement due to the lack of integral lifting points on the sculpture.

The sculpture, with extreme dimensions of 36m x 18.7m was loaded to the JML 5014 with extreme dimensions of 50m x 14m. This resulted in an overhanging portion of the "fin" which extended 4.7m beyond the envelope of the barge.

Seafastening of the sculpture was by means of conventional web lashings and welded shear plates. The design of these complementary elements was such that either could fully restrain the cargo independently. This was a requirement as no access would be available to the barge during transit to maintain the lashings. The intention in Dundee, was also to move the barge from the initial berth to the offload position with the welded seafastenings completely removed to expedite the lifting of the cargo while at the V&A Museum.

Additional support struts were added at the extreme points of the sculpture, in way of the fins, tail and nose, to minimise deflection during transit as the cargo was found to be significantly more flexible and responsive than expected. Additional lashing straps were also positioned to provide vertical restraint to the sculpture in these locations.

OUTBOUND FROM LITTLEHAMPTON

A primary obstacle to the outbound transit was the Littlehampton footbridge which spans the river south of the loading position. On entry to the river, this was not a concern, as with 22m clearance the 14m barge was manoeuvred comfortably through the span. Outbound, however, the maximum extent with the overhanging fin was 18.7m, reducing clearance to 3.3m.

Under pilotage, the barge was manoeuvred stern first through the bridge as there is not sufficient width in the river to turn the barge at neap tides. The starboard side of the barge was positioned hard against the wooden fendering to maximise clearance at the overhanging fin and the transit completed at a dead slow speed. Upon breaking the shelter of the harbour, the wind set down the tow and there were slightly rough conditions for the handing over of the tow to the seagoing tug, however, the professionalism of all parties involved ensured a safe and effective operation, successfully departing Littlehampton around 20:00 on 14th October 2021.

SEAGOING TOW

To suitably protect the overhanging portion of the cargo, the tow was limited to environmental conditions equivalent to Beaufort 4, and a significant wave height of 1.5m. If the conditions exceeded these parameters, it was required of the towmaster to seek shelter.

Fortunately, there were no adverse weather conditions and the tow proceeded unhindered to Dundee with a transit time of around 3.5 days and arriving in Dundee under pilotage at around 15:00. The light condition of the barge had a draft of only 0.5m; the Malin Abram team had to conduct a stability analysis of the barge for the transit condition to supplement the technical and procedural documentation which was generated during the course of the project.

CASE STUDY M433

DISCHARGE IN DUNDEE

The barge was brought alongside in Dundee and moored at Prince Charles Wharf, where local contractors were sourced to release the welded seafastenings. The barge had to remain moored in position overnight, as the Tay Bridge Navigational Span can only be passed by the barge at slack water, with a following high tide required for discharge alongside.

The marine spread for the discharge of the cargo was:

- Barge: JML5014 supplied by Jenkins Marine Ltd.
- Seagoing Tug: DMS Condor supplied by Jenkins Marine Ltd.
- Multicat: Forth Trojan supplied by Briggs Marine Ltd.

The barge moved through the navigational span at the early low water, and remained in position west of the Tay Bridge, until sufficient water was available at the quay. In the middle of the Tay there are sand banks, and a significant drying height alongside the quay of around 1.5m above datum. The governing case was the seagoing tug, which had a maximum draft of 2.8m on the day, and sufficient tide was required to ensure underkeel clearance.

Around 2 hrs before high water, the barge was able to move into position. The sculpture had the lower, soft sling portion of the rigging arrangement from Littlehampton in-situ, with the upper portion of the rigging presented by the mobile crane, supplied by our nominated contractor, Sarens. Lashings were released and rigging attached in a swift manner as planned and the lift performed with sufficient time to demobilise the marine spread before the tide dropped below acceptable levels.



Figure 5: The Tay Whale Supported by the complex 11 beam lift arrangement

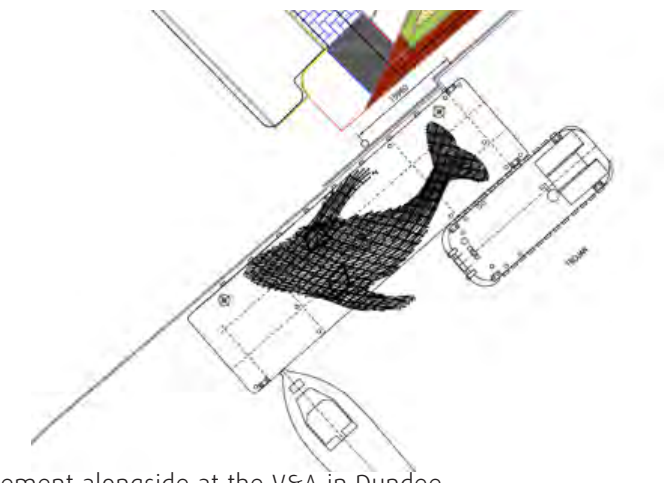
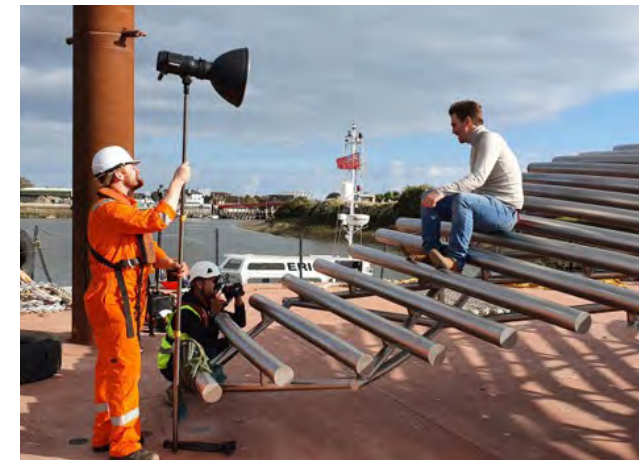


Figure 6 & 7: Lee Simmons; Graphic showing the tow arrangement alongside at the V&A in Dundee



Figure 8: The Tay Whale in her final position

CONCLUSION

The Tay Whale project signified a complex, yet rewarding scope for the Malin Abram team, cementing their reputation as specialists in unique cargo transportation. The project itself involved multiple external stakeholders, each with their own interests, driving factors and restrictions which had to be well managed to ensure smooth operation at both load and discharge.

Whilst presenting challenging timeframes with fine tidal windows and a small slippage in the overall fabrication of the sculpture, the team worked to carefully manage and accommodate the required moving target of dates.

The extensive operation provided the opportunity for the team to build their expertise, successfully utilising a complex lifting arrangement which needed input from both ends as well as discussions regarding suitable methods of ensuring a safe lift which could be performed during the more time restricted discharge in Dundee, with only around 3 hours of tide available alongside.

All of this was also undertaken whilst under press and wider media scrutiny, underlining the need to complete the scope swiftly, successfully and safely. Despite this, the team worked to do so and built lasting relationships with the range of reliable subcontractors involved, with all delivering a memorable and profitable project.