

Accessible Landings

Galloway's Pier, North Berwick, Reconfiguration Report

This document is part of iTransfer, a North Sea Region Interreg programme project, which is funded by the European Regional Development Fund.

iTransfer (Innovative Transport Solutions for Fjords, Estuaries and Rivers) aims to make ferry transport more freely accessible and sustainable, and encourage more people to travel by water. In areas in the North Sea Region (NSR) there are opportunities to replace existing vehicle routes with passenger ferries as a viable alternative. Travelling by ferry is more sustainable, easier and quicker. It can also provide lifeline services to remote communities.

For more information visit www.itransferproject.eu

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Executive summary

Galloway's Pier at North Berwick harbour is undergoing reconstruction to extend it and raise its height by one metre. The project will also improve access by reducing the gradient of the pier from the back of the harbour, widening the path and installing a handrail. The activity is led by iTransfer partner, SEStran, working with their project sub-partner, East Lothian Council.

Galloway's pier is small and the entrance into the harbour is narrow. The pier currently has a limited berthing capacity, consisting of steep concrete stairs which are exposed to the sea during high-tide and it is difficult to access.

The improvements will make the pier accessible over a longer period during low tide, when otherwise its surface level is too low relative to the level of vessels. Raising the surface level of the pier has two advantages; it allows the pier to be used over a longer period of low tide, when otherwise the surface level of the pier is too low relative to the level of the vessels; also, the higher the surface level relative to the pier, the easier the gradient is from the back of the harbour to the pier thus improving access.

The new configuration of the pier will allow safe and convenient berthing for vessels sheltered from the prevailing swell, on the west side of the pier and increase accessibility and travel sustainability by sea overall in the Firth of Forth.

The contract sum for the reconfiguration is £488,288 split between East Lothian Council and the iTransfer partnership. The iTransfer project contribution is €165,388 (Approx. £139,000).

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Introduction

iTransfer (Innovative Transport Solutions for Fjords, Estuaries and Rivers) aims to make ferry transport more freely accessible and sustainable, and encourage more people to travel by water. In areas in the North Sea Region (NSR) there are opportunities to replace existing vehicle routes with passenger ferries as a viable alternative. Travelling by ferry is more sustainable, easier and quicker. It can also provide lifeline services to remote communities.

iTransfer is an inter-regional (Interreg) initiative that is an EU part-funded programme that encourages Europe's regions to form partnerships and work together on common projects. The main objective of iTransfer is to develop and present innovative, sustainable solutions in ferry technology, operation and policy to improve regional accessibility by water-based transport in the North Sea Region.

SEStran has taken a lead role in the EU promoted iTransfer project in developing a viable ferry proposal including terminal landing design and integration into the local transport system at North Berwick in East Lothian. It is SEStran's aspiration that the ferry service can ultimately provide an appealing and convenient option to reduce individual congestion, CO2 emissions and reduce travelling costs for passengers. This service will increase regional accessibility by public transport for local authorities. SEStran is supported in the project by two Sub-partners; Maid of the Forth (MOF) and East Lothian Council (ELC).

Background/challenge

The North Berwick Galloway's Pier has been identified by iTransfer to be reconfigured to increase accessibility and travel sustainability in the Firth of Forth. In 2007, a study was conducted into the hovercraft transfer system, however this was deemed unsustainable. Instead, it was decided that the existing pier at North Berwick Harbour would be upgraded to accommodate larger vessels, for a longer period of time during low tide.

The development of sustainable solutions for the ferry service and low tide landing was achieved through joint workshops and case studies with transnational partners. A number of ideas were considered and are detailed in the latter part of this document.

Activity/method

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The Maid of the Forth is a family run business that was established in 1981. The service provides trips to Inchcolm and sightseeing tours around the Firth of Forth. A new custom built catamaran vessel was purchased in 2013 that can carry 55 passengers and now provides trips to the Bass Rock and other destinations from the North Berwick pier.

In addition to the works associated with the Pier, iTransfer will fund 50% of the total investment (€76,000) in MOF to install fuel flow-meters and trial alternative fuels in the current vessel. The fuel flow-meters will provide live engine data on fuel consumption to the bridge and will allow the captain to optimise speed and trim levels for the vessel to maximise fuel consumption for various passenger loads, based on the sea conditions. A biofuel blend will be trialled within the vessel to decrease the dependency on diesel. The biofuel composition will reduce the sulphur and CO₂ output of the vessel, in line with the European Directive 2012/33/EU. The detail of this work is contained in a separate report into the *Maid of the Forth* Vessel, North Berwick.

East Lothian Council has an obligation to maintain and upgrade the North Berwick Galloway's Pier. After The Works have been completed, the pier will be handed-over to the North Berwick Harbour Trust and it will be their obligation to maintain the pier, thereafter.

Funding

The original funding available for the pier was €330,776 of which the EU will contribute €165,388 and the rest was to come from ELC, SEStran's sub-partner. MOF will be granted a sum of €76,000 to increase the sustainability of the vessels.

North Berwick Galloway's Pier

The North Berwick pier and harbour faced a number of challenges. In *Figure 1*, it can be seen that the pier was small and there is a narrow entrance into the harbour. The pier had a limited berthing capacity, consisting of steep concrete stairs which were exposed to the sea during high-tide and was difficult to access.



Galloway's Pier

Figure 1 shows a helicopter view of the existing pier

The second issue is the narrow entrance into the harbour. This may not be a concern for the current use of the harbour, however for future, larger vessels this could be an issue. A more dominant issue can be seen in *Figure 2* below. At low tide, the harbour is drained. Therefore, although still limited by tide levels, the adjacent pier becomes the only alternative berthing facility for embarking and disembarking passengers.



Figure 2 shows the lack of water depth into the harbour

In *Figure 3(a)* it can be seen that the pier is accessible and clearly visible to the vessel but in *Figure 3(b)* when it is high-tide, the existing pier was submerged.



Figure 3: (a) shows the original pier at low-tide; (b) shows the pier at high-tide

The final issue with the pier is highlighted in *Figure 4* with the adverse sea conditions. The pier is fully submerged, and the sea conditions can be severe due to its exposed position. There is no access to the pier under these conditions.



Figure 4 shows the adverse sea conditions

Transnational Workshop and Proposed works

The transnational workshop was held on the 10th December 2013 at the Scottish Seabird Centre in North Berwick to decide on the best solution to upgrade the pier. iTransfer partners expressed their ideas and these were discussed in detail. The two main ideas which emerged for consideration were to extend and raise the height of the pier or build a pontoon from the pier. The latter option was used at the Gravesham location, however this idea was deemed inappropriate due the adverse sea conditions of the Firth of Forth. The

remaining proposal was to extend and raise the existing pier by 0.5m. *Figure 5* shows the engineering drawing produced by CH2M HILL on the proposal.

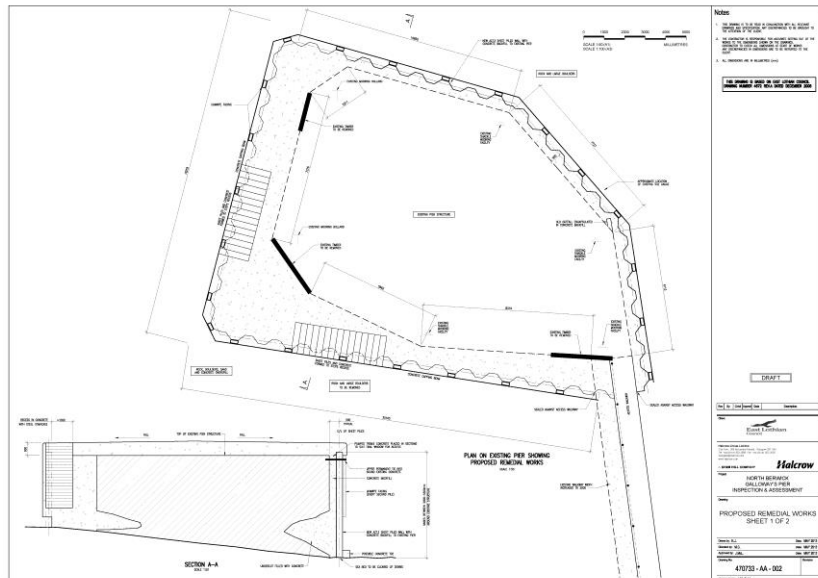


Figure 5 is the proposed idea for the pier

For the extension of the pier, all debris had to be cleared from the seabed before concrete sheet piles were placed and anchored to the rock. Concrete was then back-filled between the sheet piles and the existing pier, to provide support. Following completion of a reinforced concrete capping beam to the sheet piles, concrete will be poured within the now increased surface area to the top of the capping beam, thus raising the surface level of the pier by 1.0m.

At the December meeting in North Berwick, it was agreed by partners to raise the pier by a further 0.5m to a new height of 1m above the existing level. Raising the surface level of the pier has two advantages; firstly, it allows the pier to be used over a longer period of low tide, when otherwise the surface level of the pier is too low relative to the level of the vessel for berthing and boarding. Secondly, the higher the surface level relative to the pier, the easier the gradient is from the back of the harbour to the pier thus improving access. The path leading down to the pier was in need of substantial re-grading and widening, with more extensive railing required, to enhance access.

Project Programme

Following a competitive tender process, a contract was awarded to Anderson Group Ltd of Inverness, of value £488,000. The start date of 2nd June was agreed and work commenced

accordingly. The construction period, also agreed at tender stage, was 9 weeks. However, works were delayed, due to temporary works damage as a result of heavy sea swells on two occasions and completion is anticipated to be achieved during October 2014.

Additional Funds

The originally agreed budget for the works was €330,776, with the iTransfer project providing ERDF at 50% of this figure, (i.e. €165,388, or approximately £139,000). The balance of the sum, to cover the total cost of the project, is funded by East Lothian Council.

Results

Project Outcome

The plan and photographs below show the project nearing completion. The project has succeeded in offering improved access to vessels. The new configuration of the pier will now allow safe and convenient berthing for vessels, such as the Maid of the Forth's *Seafari*, providing transportation or tourist services around the Forth estuary. The dimensions of the pier now facilitate sheltered berthing for vessels up to 12m in length which can now be accommodated on both the north and west sides of the structure with the latter offering shelter from the prevailing swell coming from the exposed easterly direction. The pier level has been raised to facilitate extended use of the facility during tide levels, when the adjacent harbour is inaccessible and to ease the access gradient from the harbour wall. Steps have been introduced in the north and west elevations of the reconfigured pier, to facilitate boarding over a wide range of sea levels.

This will expand access to potential new operators. It will also facilitate the development of ferry connections from North Berwick to ports in Fife and along the Forth Estuary. The potential for ferry services across the Forth as an alternative to road transport is significant and could help reduce traffic congestion by offering a viable alternative to the car.

Recommendations/Conclusions

The project revealed the importance of taking account of the location of the facility and prevailing sea conditions, which to some extent is evidenced by damaged temporary works during construction with ensuing delays to the project. These factors are of paramount importance in the selection of an appropriate construction strategy, both in terms of health

and safety and in terms of setting realistic target deadlines for completion of the program of works.

The experience at North Berwick and conditions at this location highlighted a range of issues that will be of value in implementing similar projects in the transnational context. In particular the variable weather conditions, associated with exposure to the open sea, given the pier's location at the cusp of the estuary and the North Sea, means that local sea and weather patterns were significantly more variable than would have been the case further inland in a more sheltered environment. Combined with data on the construction of comparable similar facilities built in different maritime environments in Ostend and Gravesham, the project presents valuable data for future similar developments throughout Europe.

SEStran hopes to pursue additional ferry service proposals in the future, looking to exploit opportunities to enhance the use of other small harbours in the Forth estuary, in addition to possible larger scale ferry operations, both local and transnational.









iTransfer is part funded by the North Sea Region programme, part of the EU Inter-regional (Interreg) initiative. Investing in the future by working together for a sustainable and competitive region, Interreg is financed through the European Regional Development Fund (ERDF).