



Institute for Sustainability



# North Sea Region Accessible Ferry Landing design, concepts, quality checklist and recommendations.

Gravesend Town Pier Pontoon

March 2014



**The Interreg IVB  
North Sea Region  
Programme**

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for a sustainable and competitive region*



**European Regional  
Development Fund**  
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# North Sea Region Accessible Ferry Landing design, concepts, quality checklist and recommendations.

## Gravesend Town Pier Pontoon

### Executive Summary

This report details the activity of Gravesham Borough Council as a Partner in the iTransfer Project, in its investment in a transnationally designed, fully accessible ferry landing. This ferry landing will improve quality of transfer for passengers using the Gravesend to Tilbury ferry and provides a demonstration of accessible landings in the North Sea Region.

Fully accessible ferry landings provide benefit to the area's residents, visitors and commuters, service providers and operators. They can open up opportunities for new ferry services and increased ferry passenger usage across the Region with resultant reduction in land based travel, pollution and travel times.

iTransfer Partners contributed their knowledge and experience to help improve the ferry landing design. From this, a check list and recommendations for the design of accessible ferry landings have been prepared for use in future ferry landing construction throughout the North Sea Region, supported by the results of a user survey.

This report is part of iTransfer, a North Sea Region Interreg programme project, which is funded by the European Regional Development Fund. For more information visit [www.itransferproject.eu](http://www.itransferproject.eu)

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**Studies, reports and other documents are accessible via hyperlinks, noted through the report by superscript number eg Feasibility Study <sup>2.1</sup>**

## Section 1. Foreword and Introduction

### Foreword

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 of the North Sea Region (NSR) there are opportunities to replace existing vehicle routes with passenger ferries as a viable alternative. Ferry transport is sustainable, takes cars off the road, connects people between their jobs, homes and markets, facilitates tourism and provides a lifeline to remote communities. For more information visit [www.itransferproject.eu](http://www.itransferproject.eu)

### Introduction

Gravesham Borough Council has invested in a transnationally designed, fully accessible ferry landing that will improve quality of transfer for passengers using the Gravesend to Tilbury ferry. This activity has been an important element of the iTransfer project. This is an EU funded project within the North Sea Region programme which promotes European partners from around the region working together for a more sustainable and competitive region, providing a demonstration of accessible landings in the North Sea.

This report outlines experiences and the lessons learned from this approach. It describes the technical challenges for the landing in Gravesend as well as the design approach taken and specification for the final pontoon. A checklist for landing design is included for consideration together with results of a user survey. Finally the report contains recommendations based on these experiences and the feedback from transnational iTransfer partners that can be applied to landings through the North Sea Region.

This report details the delivery of iTransfer project activity in Gravesend as a transnational case to enable other countries in the NSR to benefit from transferable design, recommendations and policy proposals.

### Partner Workshop

A Partner Workshop was held in Gravesend, Kent in September 2010. Participants shared their experiences of pontoon infrastructure in the NSR through transnational knowledge exchange and contributed to improving the design for the Gravesend accessible ferry landing infrastructure. This ferry landing design has since been constructed and installed at Town Pier, Gravesend. It is a demonstration site for the NSR and a transnational design case study. It illustrates the benefits of transnational collaboration, knowledge exchange and of sharing experiences across the NSR, resulting in the provision of a quality check list



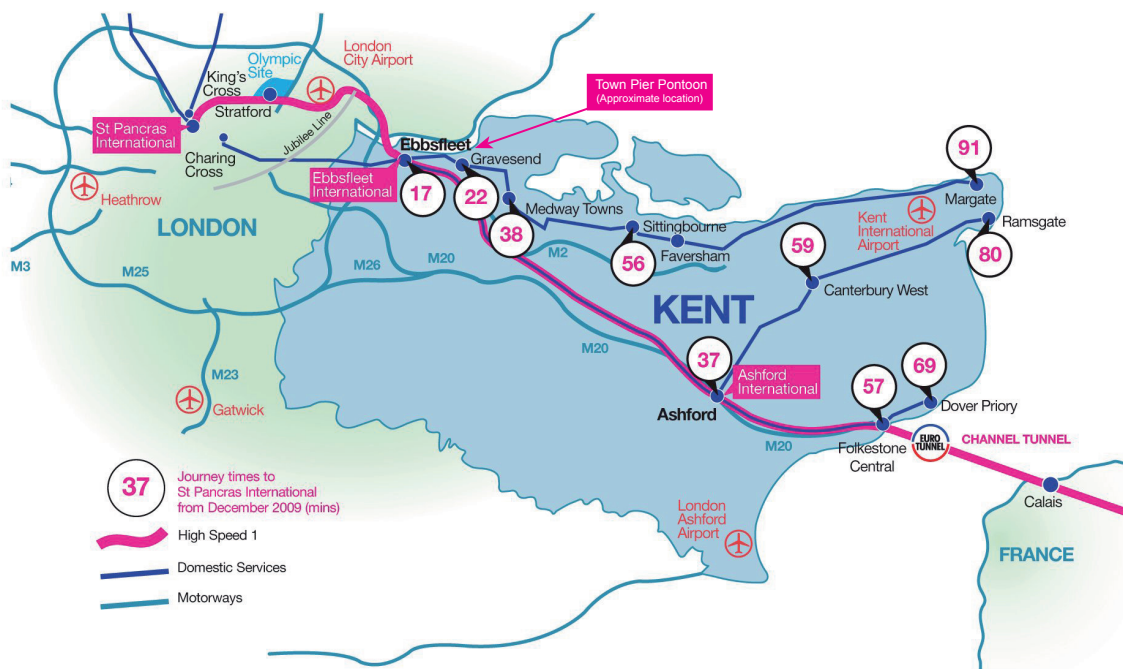
for use in the design of fully accessible ferry landing stages across the region. A pontoon infrastructure user survey was carried out and from this a report on its usability for people with mobility impairments has been prepared.

A check list and recommendations for the transnational design of accessible ferry landings have been prepared for use throughout the North Sea Region in future ferry landing constructions.

## Section 2. Gravesend Town Pier and Pontoon - introduction and site conditions

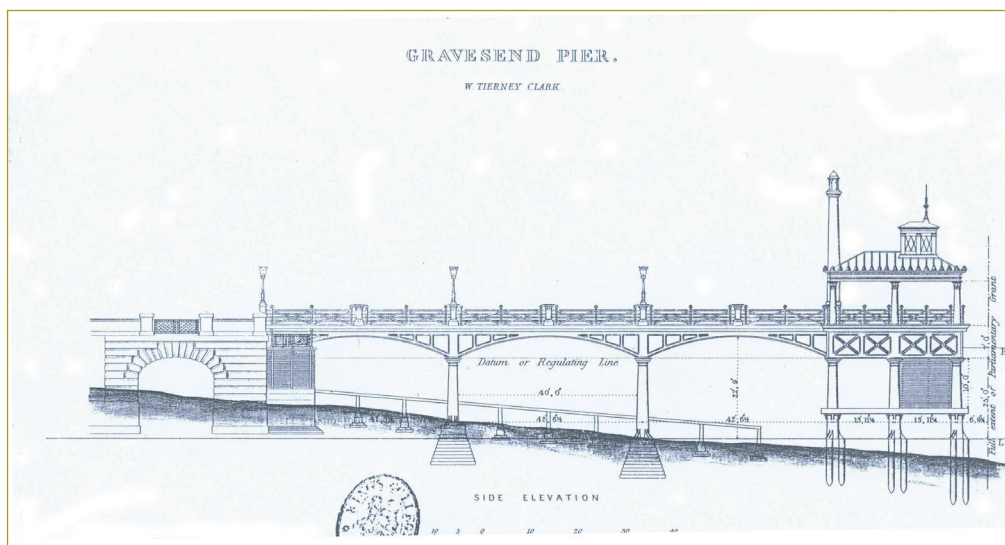
### Introduction to Gravesend Town Pier

Gravesend is located on the River Thames at the strategically important point where the river widens out to the estuary. Although there has been a ferry crossing on the site for many centuries, it was not until the advent of frequent pleasure steamers carrying day-trippers from London that the cast iron pier was constructed in 1834. By the mid-19th century, a million day visitors were flocking to Gravesend each year. The function of the pier was to enable visitors to disembark and embark at all stages of the tide, which has a 6m range at Gravesend.



The original arrangement of the Pier was an open 'T' shaped structure. At the north end were small open-sided pavilions and steps leading down into the river. Originally the transfer between the pier and ferries would have been via the timber steps. These would have been regularly submerged in the strong tidal current and were slippery and dangerous to use. After about 20 years the steps were abandoned in favour of a short brow connected to a pontoon located parallel to the T-Head. Although this arrangement was a considerable improvement on the original layout, the brow would have dropped to a precipitously steep angle for a few hours a day at low tide. Towards the end of the 20th century, when pleasure steamer traffic declined due to the arrival of the railway, the brow and pontoon had been removed and the pier fell into a state of disrepair.

Town Pier was bought by Gravesham Borough Council in 2000 and restored in 2002. In 2006/2007 the structure was successfully adapted to accommodate a bar and restaurant whilst maintaining public access to the pier. Town Pier is believed to be the oldest remaining cast iron pier in the world. The historical significance of William Tierney Clark's design, the surviving historic fabric and the importance of the Pier for the history and setting out of Gravesend are recognised in its Grade II\* listing.



Wm .Tierney Clark drawing circa 1833



Town Pier circa 2000



Town Pier circa 2003

## Pontoon Initial Design

It was always the council's aspiration to return the Pier to its original use of allowing river borne visitors to arrive at and depart from the town. The provision of an attractive and convenient river transport route to Gravesend would assist leisure and commuter users to contribute to both the area's regeneration and its residents' economic prosperity.

Kent County Council had long term aspirations to re tender the Gravesend - Tilbury Ferry service for which it is responsible, in order to raise the quality and resilience of the service, being an important commuter route for those working at The Port of Tilbury in Essex and

Port of London in Gravesend. These aspirations could not be realised until new publicly owned ferry landing infrastructure was in place in Gravesend as, prior to Town Pier Pontoon, the only ferry landing was in private ownership and its use restricted to that one service provider.

It was anticipated that new ferry landing infrastructure in Gravesend would enable and support additional new passenger ferry routes along the Thames to transport workers to employment sites on both banks of the Thames Gateway that are currently only accessible by a long road route or by long train journey via London.

Also, the provision of an improved ferry service would assist with improving public transport and commuter routes for the area, linking regional train and bus services in Essex and beyond with Kent based bus, train and in particular High Speed 1 routes from Gravesend to Kent, London and the continent via Ebbsfleet International Railway Station.

To this end, in 2009, the council appointed a design team led by architects Thomas Ford & Partners to prepare a Feasibility Study<sup>2.1</sup> for a pontoon off Town Pier. The study considered a number of pontoon designs and recommended a design of a split brow springing from the Pier T Head with intermediate pontoon.

The pontoon location and design was informed by a number of factors, key of which were:-

### **Conditions relevant to Gravesend and to other parts of the NSR include:-**

- Significant tidal range and resultant high tidal current speeds typify some parts of the NSR
- NSR typified by more adverse weather conditions than many regions, which have to be taken in to account to avoid too much down time for any pontoon infrastructure
- The spectrum of wave conditions is different from those found on the edge of larger, deeper bodies of water, e.g. the Atlantic coast result and very step wave patterns are experienced in the NSR

### **Conditions specifically relevant to Gravesend include:-**

- Exposed location on River Thames
- Strong tidal currents on all tides with strong and dynamic flows on the ebb tide in particular
- Tidal range of between 4m and 6m
- An intertidal habitat typified by intertidal muds / shelving intertidal zone,
- Wake generated by vessels such as large commercial cruise ships to smaller

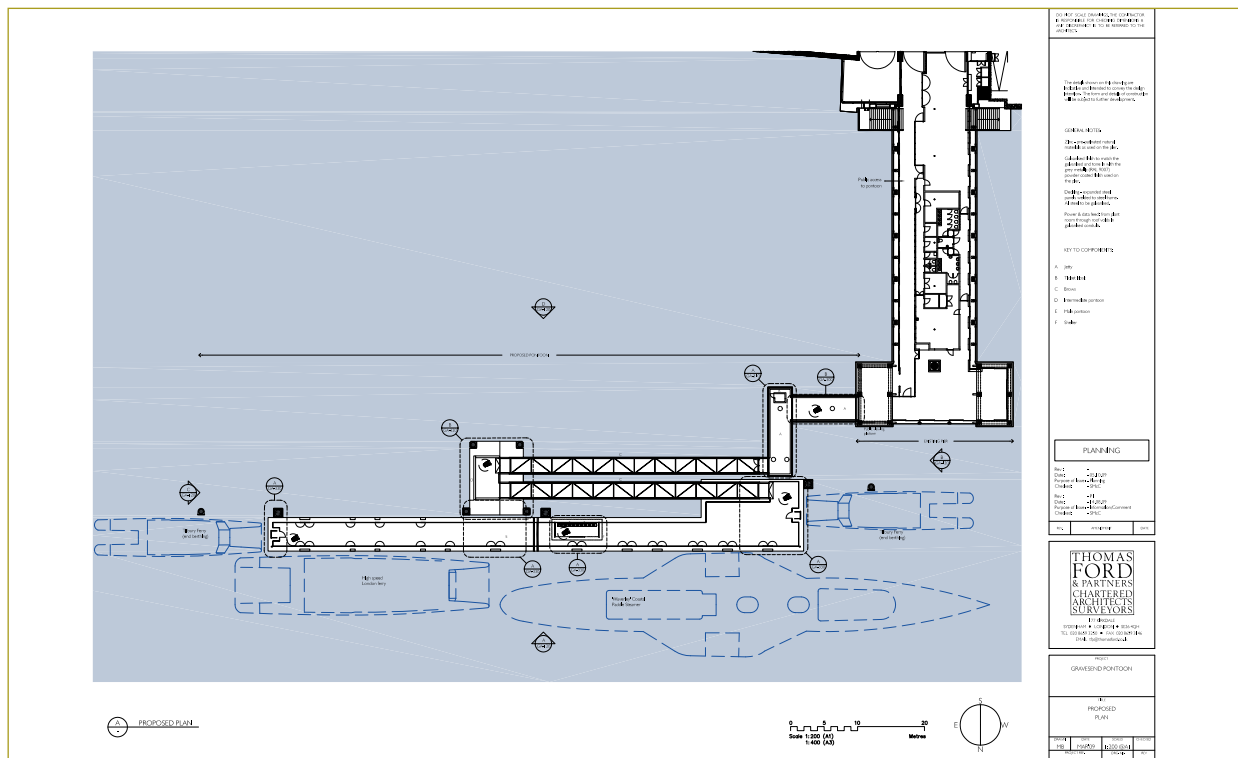
- ferries and tour boats
- Wave heights
- Proximity to Grade II\* Listed historic Town Pier influencing design and location of pontoon
- Permanent location of Port of London Authority's mooring barge downstream of Town Pier restricting position of pontoon

## Brief for pontoon design <sup>2.2</sup>

- To be used by pedestrians, including mobility impaired, wheelchair users and cyclists
- To provide safe and convenient public access to the following craft:-
  - Tilbury to Gravesend ferry, side or end berthing
  - High speed ferry to London, side berthing
  - Pleasure steamers – side berthing
  - Visiting craft including the coastal paddle steamer Waverley and The Balmoral
  - Sailing yachts, private yachts and pleasure craft

The resultant initial pontoon design was for a split brow with intermediate pontoon leading to an 80m long pontoon.\*

## Initial pontoon design



see Appendix 1 for A3 drawings

## The following studies were carried out to inform the design

Archaeological Appraisal Gifford 2009 [2.3](#)

Archaeological Desk-Based Assessment Gifford 2009 [2.4](#)

Ecology Desktop Assessment Gifford 2009 [2.5](#)

Geomorphic Study – Gifford October 2009 [2.6](#)

Geotechnical Ground Investigation Report – Structural Soils Ltd April 2010 [2.7](#)

Hydrodynamic study – flow information, HR Wallingford October 2009 [2.8](#)

Hydrodynamic study – flow information Revised Report H R Wallingford March 2011 [2.9](#)

Unexploded Ordnance Desktop Study – Zetica 2009 [2.10](#)

Wave Environment Study – Noble Denton Rev 0 September 2009 [2.11](#)

Tentacled Lagoon Worm Survey – Unicomarine March 2010 [2.12](#)



### Section 3. iTransfer Partner Workshop 'Innovative Sustainable Design of Ferry Landings'

Gravesham Borough Council hosted an 'Innovative Sustainable Design of Ferry Landings' workshop in Gravesend on 6 September 2010. The initial designs were presented and aspirations for the pontoon were discussed by transnational experts with experience from across the NSR.

The availability of suitable infrastructure and vessels is a basis for establishing efficient sustainable ferry connections and enhancing regional accessibility. Of particular interest is convenient accessibility to and from ferry landings, which takes into account the specific requirements of an aging society with significant proportion of passengers with physical mobility restrictions. Not only is this a prerequisite to providing barrier-free access for disabled people, but it also benefits passengers without mobility issues as access to the ferries becomes more convenient.

The 'Innovative Sustainable design of Ferry Landings' workshop was held in Gravesend. Fourteen participants representing ferry operators, ports and shipyards from four countries in the NSR attended. Prior to the meeting, participants had been provided with briefing material including a plan and elevations of the proposed pontoon design and the 'Design and Access Statement October 2009' <sup>3.2</sup> by Thomas Ford & Partners, the council's Architect and Lead Consultant.



Partnership meeting September 2010

The purpose of the meeting was to develop a barrier free pontoon design concept, based on Partners' experiences of pontoon infrastructure and the provision of ferry services in the NSR which would then be transferable throughout the NSR.

The meeting started with an introduction to the pontoon project by Gravesham Borough Council and its design consultants and was followed by a site visit to Town Pier. Participants were able to fully discuss the location, its restrictions and conditions and other critical issues whilst viewing the river and pontoon location. The afternoon session comprised a detailed discussion of the pontoon concepts, focussing on:-

- Specification and functions
- Accessibility of the pontoon and the ferry
- Security issues and installation
- Maintenance and supporting services
- Partners' experiences and concepts implemented at other NSR locations

### Barriers to accessibility can include:-

- Large tidal range often necessitates positioning of pontoons some way off shore to ensure adequate draught at all states of the tide. This can result in long access linkspan brows whose length and steepness at some states of tide are difficult or prohibitive to mobility impaired passengers.
- Access routes too narrow for wheelchair and pushchair users
- Access routes include changes in levels, presenting barrier to mobility impaired passengers
- Colours of infrastructure unclear to visually impaired, posing unnecessary risks
- Transfer between pontoon and ferry often involves changes in levels and too narrow gangways which are difficult or prohibitive to mobility impaired passengers

### The decisions and agreements resulting from the meeting were:-

- **Omit end berthing arrangement** - this could be hazardous, particularly in the conditions of this location and in bad weather. It would also remove the need for the ferry operator to commission a custom-built vessel at significant cost
- **Re-open discussions with Port of London Authority (PLA) regarding relocation of its permanent mooring barge** - as part of the feasibility work, discussions had been held with the PLA who had advised that the mooring barge had to remain where it was for operational purposes. As a result, in order to permit room for vessels to safely berth at the pontoon and to avoid the barge, the pontoon had to be located so close to the shore that the inside face would be on mud at low tide, thus severely compromising use of the inside face. As a result, the pontoon was designed to be 80m long in order



to provide adequate berthing on the front face at all states of the tide.

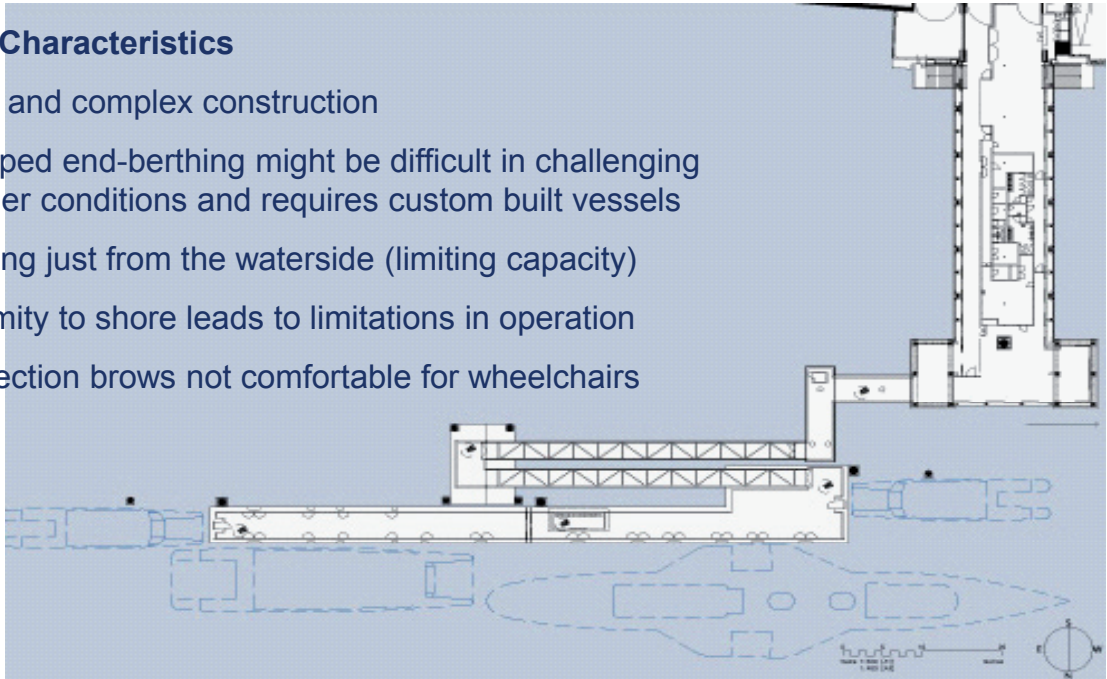
- **Reposition pontoon in deeper water** - to allow berthing on both outside and inside faces at all states of the tide
- **Reduce length of pontoon to 40m due to both faces being usable** - reducing investment costs
- **Replace two split brows and intermediate pontoon with one shorter brow combined with fixed ramp with a flat platform for resting purposes** - improving accessibility for passengers of all degrees of mobility and reducing investment costs
- **Provide passenger shelter on pontoon** - to offer comfort to passengers
- **Use a freshwater ballast system** - to reduce corrosion and hence maintenance costs and to allow for adjustment in freeboard if required later
- **Shotblast steel construction prior to painting by clearing and cleaning and make use of epoxy paint and anti-fouling treatment** - to minimise maintenance costs.
- **Utilise fendering system on pontoon** - to protect visiting craft without their own fendering
- **1.3m pontoon freeboard (height between river surface and pontoon deck) was considered acceptable** - as this was common in the River Thames area
- **Keep the design simple and flexible** - to allow for minor construction adjustments when the ferry operator changed

Combined, these recommendations would ensure that the pontoon design is not only fully accessible but also increased the deliverability of the landing, since design changes would result in reduced costs, contributing financial and resource efficiency savings.

## Original pontoon Design

### Previous Characteristics

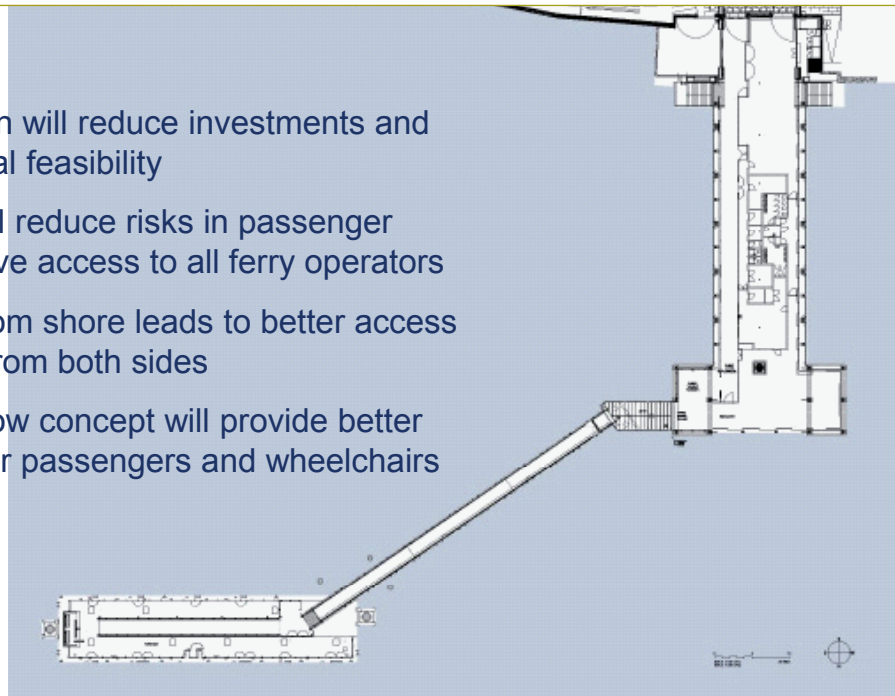
- Large and complex construction
- V shaped end-berthing might be difficult in challenging weather conditions and requires custom built vessels
- Berthing just from the waterside (limiting capacity)
- Proximity to shore leads to limitations in operation
- Connection brows not comfortable for wheelchairs



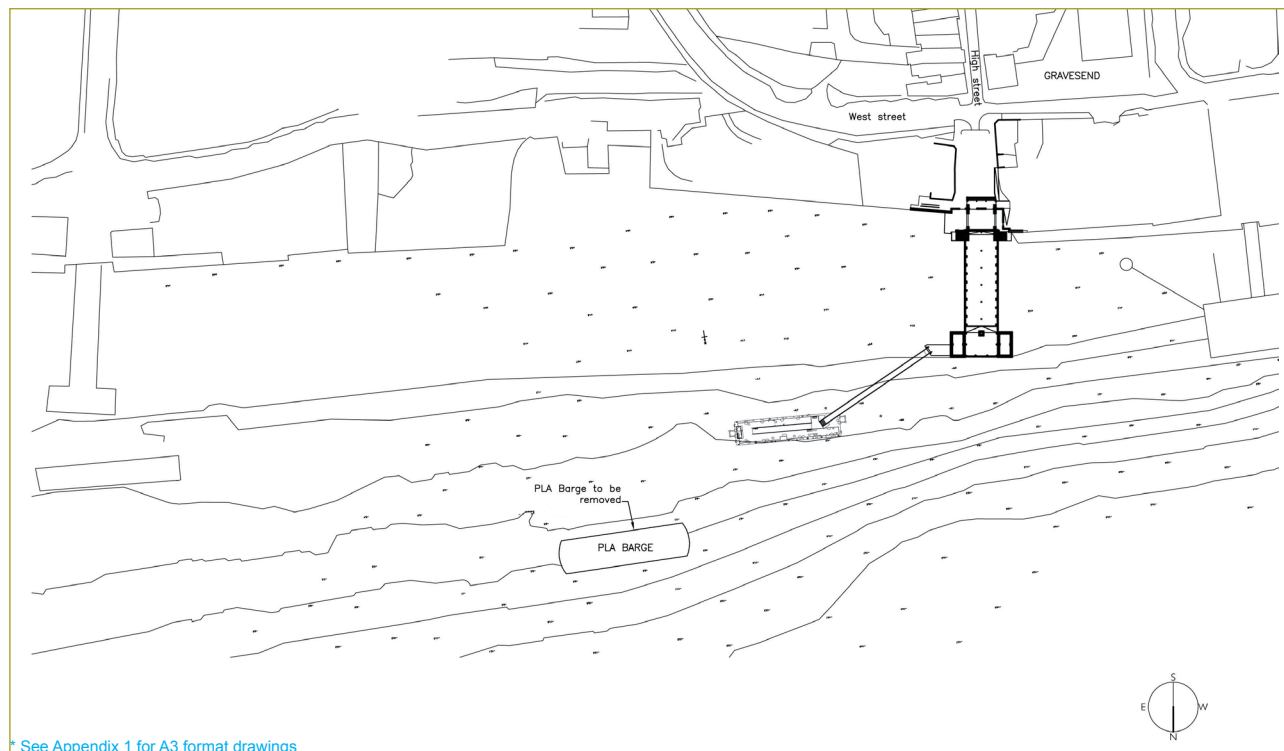
## Revised Pontoon Design as result of Partner Workshop

### Improvements

- Smaller construction will reduce investments and increase commercial feasibility
- No end-berthing will reduce risks in passenger handling and will give access to all ferry operators
- Greater distance from shore leads to better access by ferry operators from both sides
- New connection brow concept will provide better and safer access for passengers and wheelchairs



## Revised pontoon location plan showing location of PLA barge to be removed\*



\* See Appendix 1 for A3 format drawings

## The following documents detail the Partner meeting and plans considered at that meeting:-

Elevations at high and low tide for iTransfer Partner Workshop September 2010 <sup>3.1</sup>

Design and access statement Oct 2009 <sup>3.2</sup>

Gravesend Participants <sup>3.3</sup>

Agenda Gravesend <sup>3.4</sup>

Minutes Pontoon meeting 6.9.2010 <sup>3.5</sup>

Summary of Gravesend Partner Workshop presented to Partner meeting London December 2010 <sup>3.6</sup>

## Outcome

The recommendations from the Gravesend Partner Workshop were integrated in to the final pontoon design, as subsequently constructed at Town Pier. The only exception was the pontoon freeboard which, following more detailed investigation and consultation was increased to 1.5m

## Section 4. Pontoon final design

The final pontoon design incorporates features proposed by iTransfer Partners in September 2010. The pontoon infrastructure is fully accessible at all states of the tide and provides a barrier free access ferry landing facility for all passengers with all levels of mobility. The design process and considerations that have been developed in the check list are of transnational application across the NSR. Following granting of planning permission, Listed Building Consent and other relevant licences and permissions, pontoon construction commenced in 2011, with completion in May 2012.

Access to the new structure is via the public corridor along the east side of Town Pier. From the Pier, passenger access is via an access jetty, down a 48m brow and then down a fixed ramp on the pontoon on to the pontoon itself. In line with the requirements of BS6349-8:2007, these are inclined at a maximum gradient of 1 in 12 at Mean Low Water Spring (MLWS) tide level. This gradient specification ensures that access ramps would not be inclined so steeply that they would impede walking passengers or those using wheelchairs. This is also beneficial for passengers with push chairs, heavy shopping, bicycles, mopeds and motorbikes. This delivers the ambition of a fully accessible landing.

### Policy context

There is no European standard for any marine structures. BS (British Standard) 6349 is used internationally for such structures.

The current best practise guide for the design of link spans is set out in BS6349 Part 8, 2007, providing best ways to set out link spans with regards geometry, arrangement, performance requirements etc. BS6349 currently makes reference to British Standards for structural design, as it predates the introduction of European Standards, but it also says that any other appropriate structural design standard can be used.

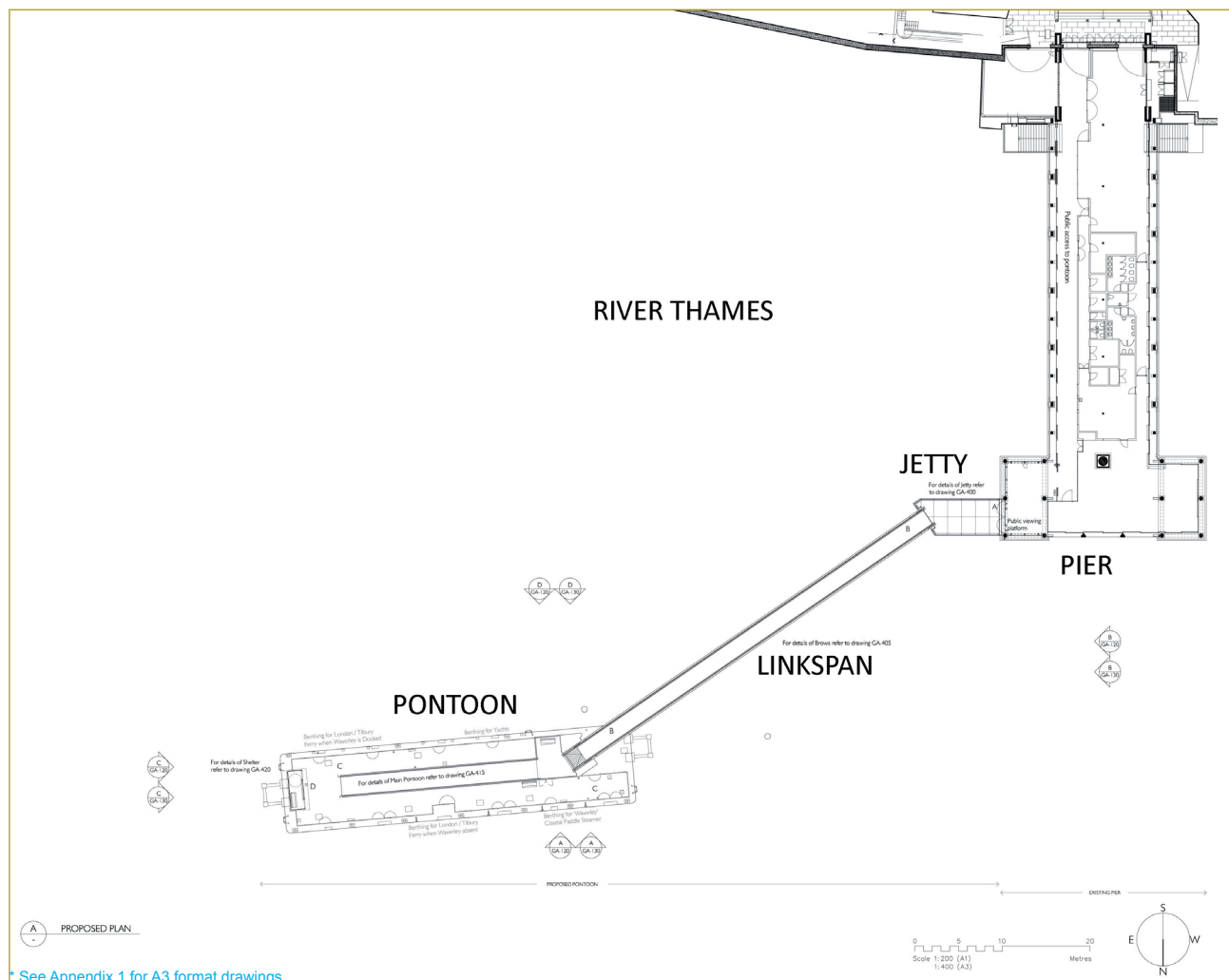
BS6349 is currently being re-written to reflect the use of Eurocodes. BS6349 is in 8 Parts and Part 1 has been subdivided in to 4 Parts, Parts 1-1 through to 1-4, giving 11 Parts in total. Parts 1-2, 1-3, 1-4, 2 and 3 have already been updated and published. Parts 1-2 and 4 are due out in 2014. The remaining Parts are likely to be published in 2015 – 2016.

## The pontoon infrastructure details

The component parts of the infrastructure design at Gravesend are:-

- **Pontoon** - the 'landing stage' against which vessels moor
- **Linkspan brow** - the 'bridge' or 'brow' between the pontoon and the jetty
- **Jetty** - the bearing for the 'linkspan', linking the landing infrastructure with the pier

## Pontoon Components\*



## Pontoon details

<b>Dimensions</b>	40m x 9m pontoon with fixed ramp 24m long x 2.5m wide x 2m rise i.e. 1 in 12 gradient to allow access by mobility impaired passengers.
<b>Freeboard</b>	1.5metres (height between water surface and top face of pontoon)
<b>Draft</b>	4m on outside river face, 2m on inside shore face.
<b>Surface</b>	All weather, non slip paint surface with integral aggregate.
<b>Colour</b>	Finish generally mid grey with a yellow contrasting coating on thresholds for enhanced visibility.
<b>Perimeter guarding</b>	Galvanized steel posts with 50mm square mesh panels. Mesh chosen to allow maximum visual transparency and to prevent children from climbing.
<b>Gates</b>	A series of gates provide flexible access to range of vessels. For example, gates at the general pontoon level are used for access to ferries and other craft, but the fixed ramp landing, which is 2m high is used for access to the main deck of the Waverley paddle steamer. The gates are provided with bolt catches which can be padlocked shut.
<b>Shelter</b>	Clear sides for safety and ease of vision, seating grey with yellow contrast for visually impaired ease of use. Space for a wheelchair to enter and manoeuvre inside the shelter.
<b>Layout</b>	The layout is simple and can be comprehended easily whether arriving or departing.
<b>Signage</b>	Emergency instructions and guidance including restrictions on landing livestock etc.
<b>Lighting</b>	Light is provided by low energy bulkhead fittings fixed to the inside of guarding and facing away from approaching ferries to avoid dazzle. Navigation lights are provided at each end of the pontoon.



## Linkspan details

**Dimensions** 40m long x 2.5m wide with 1.8m clear width between handrails.

**Gradient** No more than 1 in 12 gradient at any state of the tide to allow use by mobility impaired passengers.

**Surface** All weather, non-slip paint surface with integral aggregate.

**Colour** Finish generally mid grey, but with a yellow contrasting coating on thresholds for enhanced visibility.

**Perimeter guarding** Galvanized steel posts with 50mm square mesh panels. Mesh chosen to allow maximum visual transparency and to prevent children from climbing.

**Handrails** Double handrails, lower level hand rail provides additional support for children and wheelchair users. Colour yellow to contrast with grey of mesh for visually impaired, plastic coated so warm to touch and usable without gloves in winter.

**Layout** Simple, straight, minimum number of turns assists use by those with restricted mobility, vision impaired or learning difficulties.

**Resting place** The single gradient precludes provision of landings or resting places, however, most of the time, the gradient will be gentle, due to the dynamics of the tide.

**Lighting** Light is provided by low energy bulkhead fittings fixed to the inside of guarding and facing away from approaching ferries to avoid confusion for skippers.

**Canopy** Fittings for canopy included to allow for future installation if required.

**Alternative Access** The inclusion of a lift was considered but found to be impractical due to the physical constraints of connecting shifting levels. Concerns about the practicality of a lift related to safety and maintenance in a hostile marine environment. As an alternative to a lift and ramp landings, there will be a management provision by the ferry operator to offer assistance if necessary or requested.

## Jetty details

**Dimensions** 8m x 4.25m

<b>Surface</b>	Galvanized mesh panels with holes small enough to prevent stiletto heels trapping.
<b>Perimeter guarding</b>	Galvanized steel posts with 50mm square mesh panels. Mesh chosen to allow maximum visual transparency but to prevent children from climbing.
<b>Layout</b>	The layout is simple and can be comprehended easily whether arriving or departing.
<b>Signage</b>	Emergency instructions and guidance including restrictions on landing livestock etc.
<b>Lighting</b>	Light is provided by low energy bulkhead fittings fixed to the inside of guarding and facing away from approaching ferries to avoid dazzle.
<b>Warning Systems</b>	The jetty is located adjacent to the restaurant and bar, which are staffed during general hours of pontoon operation. Telephone cabinets at each end of the pier, accessed by emergency service keys, are connected to speakers on the pontoon. This allows emergency service personnel to give instructions to passengers or crew on the pontoon in the event of an emergency. If there is a fire alarm on the pier, the PA speakers advise those on the pontoon to remain where they are until given further advice. This is to prevent them from further risk by proceeding towards a potential hazard. Note provision of sprinklers on pier (see below)
<b>Security and safety</b>	Lockable gates are provided at the threshold between the pier and the jetty. These allow the pontoon to be closed for public access when not in use and the safe management of passengers queuing to embark on large vessels, such as the Waverley (capacity in excess of 700 passengers)



## Town Pier access to pontoon - general information

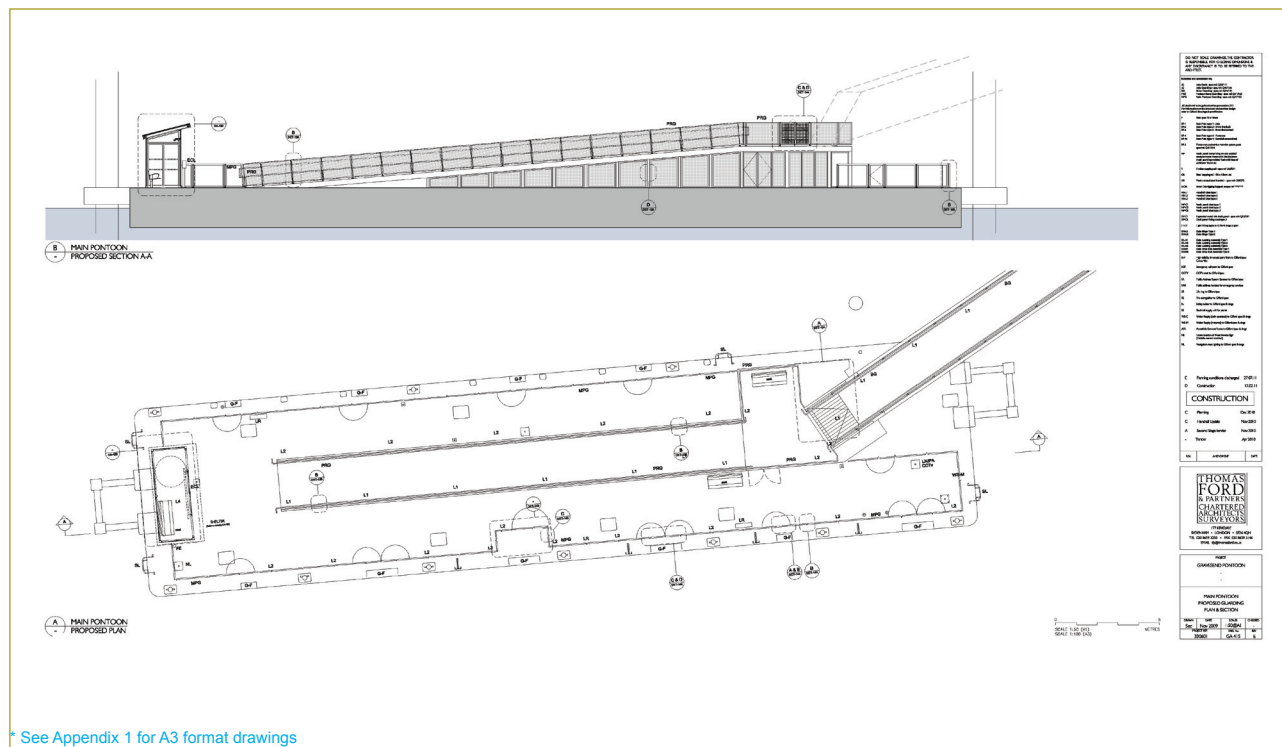
<b>Access corridor</b>	Independent access to the pontoon provided via a public access corridor on the east side of the pier, dimensions 48m long x 2.7m wide. The bar and restaurant on the Pier are generally open when the pontoon is in operation.
<b>Layout</b>	The layout is simple and can be comprehended easily whether arriving or departing.
<b>Emergency Services</b>	Including Kent Fire Brigade and Royal National Lifeboat Institution inshore rescue crews are briefed on access to the pier when the bar and restaurant are not open.
<b>Sprinkler System</b>	The Pier is fitted with a sprinkler system to facilitate access by the emergency services in the event of a fire.



The simple layout of the pontoon can be comprehended easily on arrival and departure



## Pontoon plan and ramp\*



## Financial Information

The budget for the pontoon's design and construction was £2.1 million/€ 2,562,000. This was funded by:-

Interreg IVB NSR funding €227,322  
Gravesham Borough Council €1,358,678  
Kent County Council €976,000

The ERDF funding from the NSR Programme provided significant added value to this project that would not otherwise have been achieved. It enabled:-

- identification of features critical to ensuring accessibility by all and their incorporation into the pontoon infrastructure design
- a deliverable pontoon infrastructure due to design changes resulting in reduced costs
- provision of a more usable and viable infrastructure due to relocation in deeper water

## **The following documents provide details of the pontoon design including the project team and contractors:-**

Brow Guarding details [4.1](#)

Brow & Pontoon Ramp Lighting Details [4.2](#)

Jetty Plan & Sections [4.3](#)

Brief Rev J following iTransfer Partner Workshop in Gravesend September 2010 TFP [4.4](#)

Design and access statement Dec 2010 [4.5](#)

Design Statement Rev 1 December 2011 Gifford [4.6](#)

Operational Environmental Management Plan November 2010 Gifford [4.7](#)

Pontoon Project Team [4.8](#)

Contractor List [4.9](#)

Photographs showing construction and completed pontoon [4.10](#)

Section 7 details the specific details of component parts included to provide a fully accessible ferry landing infrastructure which are relevant across the NSR.

## Section 5. Publicity and Promotion

Gravesham Borough Council completed various activities to promote the new pontoon to local residents, ferry users and more widely. The investment into the facilities to provide an accessible ferry landing was important to Gravesend because of its strategic importance to the town, its economic potential and the connectivity that it provides to residents, tourists and commuters.



Pitching piles - the public were kept informed at each stage of construction

### Key activity included:-

- Artist's impression of the pontoon and technical details were displayed on the Gravesham Borough Council website, Tourist Information Office and on site prior to works commencing. <sup>5.1</sup>
- Promotion of the pontoon infrastructure prior to the commencement of and during construction work to inform and enthuse residents, ferry users, visitors and potential users of the advent of the facility. <sup>5.2</sup>
- Traditional site boards with all relevant logos emphasising funding partnership were on site throughout works. <sup>5.3</sup>
- Gravesham Borough Council's web page was regularly updated with technical information and images at each significant stage. <sup>5.4</sup>
- Large banners were placed on the structure to inform public of due dates, these were visible to both pedestrians and river users



- Grand opening event - over 120 guests were hosted by the Mayor of Gravesham. VIP guests including EU dignitaries, iTransfer Project Partners, Central and local government dignitaries and key regeneration partners were welcomed at The Civic Centre before joining other guests on the pontoon for a traditional opening ceremony. This was performed jointly by the Mayor of Gravesham and Matt Nicols from the E.U. NSR Programme Secretariat by cutting a ribbon and unveiling a plaque, followed by a trip on the River Thames on Paddle Steamer Waverley. Guests were able to see some of the region and London Gateway port where it is anticipated a new ferry services from the pontoon may operate to. <sup>5.5</sup>



Grand opening event October 2012

### Other activity included:-

- Continuous provision of information on pontoon construction progress to media and other interested parties.
- Promotion of project to wider professional audience, e.g. Royal Institute of Chartered Surveyors' Kent Branch site visit August 2012
- E-postcard of pontoon detailing its features prepared and sent to wide range of potential users and visitors.
- Postcards with technical specification of pontoon free at Towncentric
- Promotion at relevant conferences, trade shows etc. including the Port of London Authority's (PLA) Career conference
- Press releases by Gravesham Borough Council and Institute for Sustainability as iTransfer Lead Partner
- Use of Gravesham Borough Council's web site and the 'Go Gravesham' web site
- Promotion in the PLA's 'River User Guide'
- May 2012 pontoon commissioning opening by the Mayor of Gravesham with the historic Cambria Thames sailing barge as guest vessel on the pontoon
- Post cards on sale Town centric
- Feather banners on pontoon to promote to river users
- Pontoon leaflet to inform public of the benefits of River Transport

Other activities can be viewed via the following hyperlink.<sup>7.1</sup>



The Pontoon with Cambria, Thames sailing barge, moored on the inside face at the Grand opening 2012



## The communications activities delivered:-

- the promotion of the pontoon infrastructure to residents, ferry users, visitors and potential users of the facility
- promotion of the pontoon infrastructure to commercial and recreational river users
- acknowledgement of funding of pontoon infrastructure



Cambria and Hyrdogen moored for sail training and educational activities



## Section 6. Survey report on ferry landing usability for people with impaired mobility

A survey of ferry users was carried out on 11-14 February 2014 to assess the ferry landing's usability for people with impaired mobility and their satisfaction of its accessibility and quality.

The ferry can take foot passengers, those with bicycles and mopeds and up to 125cc motorbikes.

The ferry attracts a range of users of all ages. These include commuters who use it on a daily weekday basis for travelling to and from work between one side of the river and the other. Many people use it for shopping trips, the majority travelling from Essex and the wider region north of the river to shop in Gravesend. Many residents and tourists use the ferry to take them to the other side of the river in order to visit places of interest on both sides, and to connect with other modes of public transport such as the High Speed 1 train in Gravesend. In particular, passengers on cruise liners berthed at Tilbury in Essex use the ferry to spend this waiting time in Gravesend, the Kent region or to go wider to London or the continent. In addition to cruise liner passengers, the crew use the ferry to visit Gravesend for shopping trips.

On an annual basis, the numbers of passengers going north to south is very similar to those going south to north.

### Procedure and methodology:

A survey was undertaken by questionnaire to gather views of pontoon users on the ease of use of the pontoon with a particular focus on those with impaired mobility.

'Pontoon passenger survey questionnaire' <sup>6.1</sup>

The Gravesend to Tilbury ferry operates Monday to Saturday between 05.40 and 19.10 hours. All ferry passengers have to access the ferry via the pontoon infrastructure and these passengers are the vast majority of pontoon infrastructure users, particularly in the winter months. Hence it was decided to survey ferry passengers regarding the usability of the pontoon infrastructure.

Gravesham Borough Council officers spent four days travelling on the Gravesend to Tilbury Ferry between 08.40 hours and 15.45 hours on 11-14 February 2014 asking passengers to complete a survey questionnaire form. By necessity, all ferry passengers were Town Pier Pontoon users.

In order to capture passengers travelling outside the times that officers were on board the ferry, copies of the survey questionnaire form together with a collection box were also left on board the ferry and were collected on a daily basis.

All passengers were asked if they would complete a survey questionnaire form with officers assisting as many people as they could for the duration of the crossing and waiting times at each side. Officers approached all passengers on a non selective basis, regardless of visual signs of mobility issues and hence a combination of mobility impaired and non-impaired passengers completed the surveys.

All passengers completing the survey questionnaire were asked to answer a question about their level of mobility. In addition to those with permanent mobility impairment, this question asked whether people were temporarily mobility impaired for that trip, for example due to carrying heavy loads such as shopping, or travelling with push chairs, motorbikes or cycles. All those in these categories were counted as having some mobility issues, regardless of whether they were permanent or not, in order to ascertain their ease of use of the pontoon.

## Results of analyses and primary data collection

Over the four day period 126 surveys were completed and 692 passenger trips were undertaken. Many passengers make repeat trips, for example travelling to and from work each day or making a return trip on one day e.g. for a shopping trip. It was assumed that people who made more than one ferry crossing during the four survey dates would only complete the survey once. In order to assess the survey response rate, it was necessary to ascertain the number of individuals using the ferry on the survey dates as opposed to passenger trips.

Ticket sales are classified by single tickets issued, return tickets issued, weekly passes issued and concessionary passes used. For the purposes of calculating the number of individuals using the ferry on the four survey dates, the following calculations were used:-

- Single tickets issued were counted as one individual person
- Return tickets issued were counted as one individual person
- Weekly passes issued were counted as one individual person
- Concessionary passes used were counted as one individual person

This gave a total of 346 individual people who used the ferry on the four survey dates. As 126 surveys were completed, this gives a response rate of 36%.

The raw data from the collected surveys were analysed and set of key findings were produced. 'Completed Pontoon Survey Results' [6.2](#)

The key findings were:-

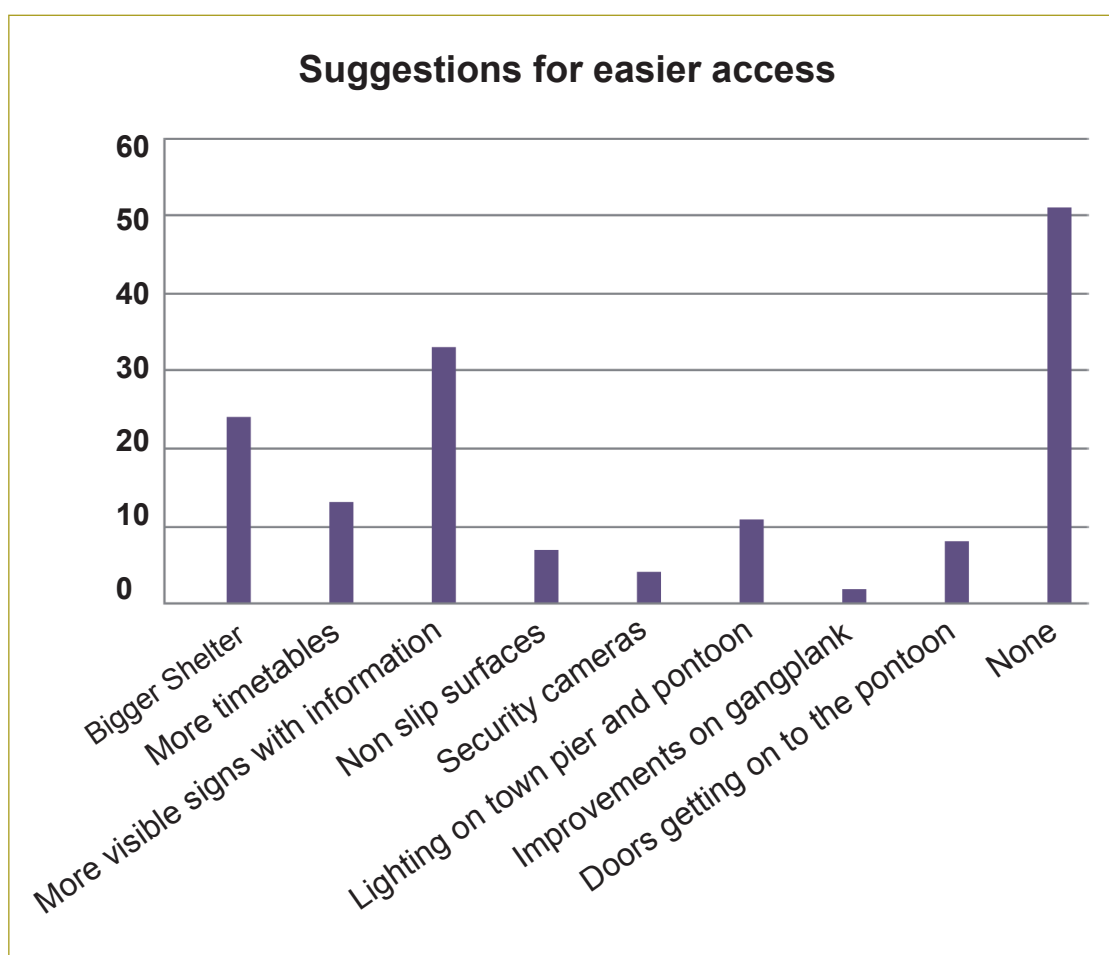
- A wide range of ages use the ferry, indicating that provision for the young and elderly, as well as for mobility impaired, is important
- 17% of those surveyed were permanently mobility impaired and 41% of those surveyed had temporary mobility impairment; the latter for example due to pushing prams, carrying heavy loads such as shopping, or travelling with motorbikes or cycles. The joint total of mobility impaired was 45%. 55% of those surveyed had no mobility impairment.
- Both permanent and temporarily mobility impaired pontoon users had similar levels of response to most questions asked. The exceptions were that of ease of access through the main entrance doors to Town Pier. Here, permanent mobility impaired found the pier access door less easy to use than did the temporary and non-mobility impaired. Also with levels of lighting on the ramp and pontoon where permanent mobility impaired found the levels more acceptable than those with temporary mobility impairments. All categories of users expressed high levels of satisfaction with most elements of the design with 93% of respondents reporting that overall, they felt safe using the pontoon infrastructure. The lowest levels of satisfaction were reported with regards information and signs, in particular with tourist and visitor information.

Question	Non mobility impaired		Mobility Impaired combined permanent + temporary		Mobility impaired permanent		Mobility impaired temporary	
	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
1 Ease of access through Town Pier	96%	4%	83%	17%	59%	41%	92%	7%
2 Ease of access via ramp between jetty and pontoon	96%	4%	95%	5%	82%	18%	100%	0%
3 How safe is surface of ramp	83%	17%	95%	5%	88%	2%	98%	2%
4 How safe is surface of pontoon	89%	5%	95%	2%	88%	12%	98%	2%
5 How helpful are hand rails on ramp	86%	14%	83%	17%	76%	24%	85%	15%
6 How convenient is shelter on pontoon	86%	14%	81%	17%	88%	6%	78%	15%
7 Level of lighting on ramp	66%	6%	60%	9%	70%	18%	56%	5%
8 Level of lighting on pontoon	100%	0%	58%	9%	65%	18%	56%	5%
9 Suitability of gangplank	97%	1%	95%	3%	88%	12%	98%	0%
10 How useful is passenger information on pontoon	57%	43%	74%	26%	76%	24%	73%	27%
11 How useful are emergency	66%	34%	71%	29%	71%	29%	71%	29%

The survey then asked for any other suggestions for improving the pontoon's accessibility. The main five recommendations were:

- Provide more visible information signage
- Provide a bigger passenger shelter on the pontoon
- Improve ferry time table information
- Improve lighting on the pier and pontoon
- Improve door access to the pontoon (referring to the doors at the land side entrance to the public corridor on Town Pier, not part of the pontoon infrastructure contract)

The chart below shows all the recommendations for easier access.



## Conclusions

The results of the user survey show that the features specifically incorporated in the structure's design to assist with accessibility have been very successful.

Those elements identified as being of particular use to mobility impaired and hence transferable to other NSR landing infrastructure are:-

**Jetty** – the key elements contributing to this are the surface, the mesh panels, the hand rails and the colour contrast

**Brow** – the key elements contributing to this are the surface, the gradient of not more than 1 in 12, the mesh panels, the hand rails and the colour contrast

**Pontoon** – the key elements contributing to this are the surface, the mesh panels, the colour contrast, the shelter and hand rails.

For details of these elements, please see [Section 4](#), 'Pontoon Final Design'.

Of the elements identified as not so successful, the following comments apply:-

Ease of access through Town Pier – this access existed prior to the pontoon's design and construction. It is acknowledged that the doors at the entrance to the corridor are heavy and difficult for those with impaired mobility to open and the Council is looking at means of addressing this problem.

Safety of ramp surface – at the time of the survey, there had been a few issues with the surface of the jetty at the top of the ramp which has been successfully addressed by enhanced daily maintenance.

Shelter on pontoon – the shelter is the largest size that the pontoon could accommodate. The original 80m pontoon would have been able to take a larger shelter but the reduction in length of the pontoon to 40m resulted in a commensurate reduction in space available for the shelter, albeit the shelter does comply with Disability Discrimination Act (DDA) 2005. It is accepted that, ideally, the shelter would be larger, i.e. exceed DDA standards should the pontoon area permit.

Passenger information, signs and visitor information – adequate, appropriate and up to date information is important to the provision of a good user experience and it is recommended that particular attention is paid to this element on any NSR pontoon infrastructure.

## Section 7. Quality checklist and recommendations for accessible ferry landing infrastructure and design in the North Sea Region

The experience of the design factors encountered by Gravesham Borough Council and its design team has been used to generate a quality checklist that can be used for accessible landings throughout the NSR.

### Key recommendations for pontoon infrastructure design to provide full accessibility by all passengers at all states of the tide.

**Gradient** – ensure any sloping access surface has gradient of no more than 1 in 12 to allow access by mobility impaired passengers

**Surfaces** – non slip. If all weather surface, ensure it is non slip with aggregate finish. If mesh used, ensure holes small enough to prevent small heels such as stiletto heels trapping

**Colour** – ensure high contrast colour finishes are used throughout on all surfaces and fixings such as handrails, escape ladders and thresholds etc. to improve visibility and hence safe use of the facility

**Perimeter guarding** – 50mm square mesh panels to allow maximum visibility and prevent children from climbing

**Handrails** – allow double handrails, lower level for wheelchair users and children. Use plastic coating for warmth of touch

**Ensure lighting** minimizes light pollution and interference with boat crews but provides adequate personal security

**Gates** providing access to vessels – install series of gates for maximum flexibility for vessels and passengers, particularly if mobility impaired. Ensure gates can be secured when not in use for passenger safety

**Shelter** – ensure as large as space will permit with clear sides for safety and ease of vision, seating, ensure adequate room for wheelchair access and easy manoeuvring

**Where a significant tidal range** necessitates a lengthy link-span brow to the pontoon, ensure passenger waiting facilities are provided on pontoon in addition to any on quayside. Travel time from quay side to pontoon can be lengthy and preclude use of quayside for passenger waiting, particularly for the less mobile

**Emergency facilities** – locate on pontoon adjacent to shelter in easy to reach positions with connections to land side to allow for transmission of emergency services’ instructions

**Gangway** providing transfer between pontoon and vessels – ensure level transfer with protection by perimeter guarding

**Design and Layout** of infrastructure – keep simple for ease of legibility and hence use by all passengers

**Consider alternative access** provision, for example a lift, for users with restricted mobility in situations with an extreme tidal range. If conditions preclude this provision, ensure management assistance if required during periods of extreme low tide

### **General points of principle for the provision of passenger ferry pontoon infrastructure:-**

- Integrate new marine transport infrastructure with local and regional planning to maximise amenity, commercial and social benefits
- Provide facilities that respond to specific user requirements, but ensure that design is robust and capable of adaption to suit new uses in the future
- Keep design simple to reduce capital and maintenance cost
- Maximise the capacity of a new pontoon by providing navigable access to both inner and outer faces where possible
- Create safe berths for leisure craft users which are appropriate to the degree of exposure of the marine environment
- Minimise the impact of new construction on the marine ecology
- Provide accessible service routes to facilitate safe and attractive future re-servicing
- Make provision for future attachment of membrane weather enclosures to open linkspans etc.
- Provide maintenance and safety features such as chained connections between linkspan and jetty to prevent linkspan dropping in the event of a marine collision, temporary fixing points to allow linkspan to be restrained while the pontoon is removed for maintenance.



## Section 8. Conclusion

**Participation by Gravesham Borough Council in the iTransfer project has resulted in the delivery and construction of a fully accessible pontoon.**

This has resulted in:-

### **Number of passengers using landing**

110,500 passenger journeys per annum made via the Gravesend – Tilbury ferry, provides a fast, easy to use link between public transport services and commuter links in the counties of Kent and Essex. The ferry route provides the link between regional train and bus services in Essex and beyond with Kent based bus, train and in particular High Speed 1 routes from Gravesend to Kent, London and the continent.

### **CO2 reductions**

110,500 passenger journeys per annum by ferry instead of road and Dartford River Crossing result in a reduction of CO2 emissions by 680 tonnes p.a.

### **Km of transport corridors**

110,500 passenger journeys per annum by ferry instead of road and Dartford River Crossing result in a reduction of 1,519,425km p.a.

### **Reduced travel time**

110,500 passenger journeys per annum by ferry instead of road and Dartford River Crossing result in a reduction of travel time by 45,121 hours p.a.

### **Promotion**

Promotion of pontoon to local, national and international audiences including with banners, leaflets, plaques, press releases and coverage and web site information. The pontoon has been used by 110,500 ferry passengers per annum, 100 other vessels excluding the ferry used the pontoon in 2013, 130 guests attended the formal Pontoon launch event in October 2012.

## Benefits

The benefits of the pontoon landing include:-

- higher quality and more accessible ferry landing facility for residents, visitors and commuters alike
- high pontoon user satisfaction rates
- opportunity for the ferry provider (Kent County Council) to tender the Gravesend to Tilbury ferry contract for the first time to achieve better quality of service
- opportunity for the first time to start up public ferry routes to other locations on the River Thames, leading to increased employment opportunities to residents of Kent and Essex
- opportunity for the first time for leisure vessel operators to service Gravesend with resultant benefits to small businesses and passengers alike.
- increased use of river for commuter and leisure transport will assist with regeneration of town and region to the benefit of businesses, residents, tourists, employers and employees

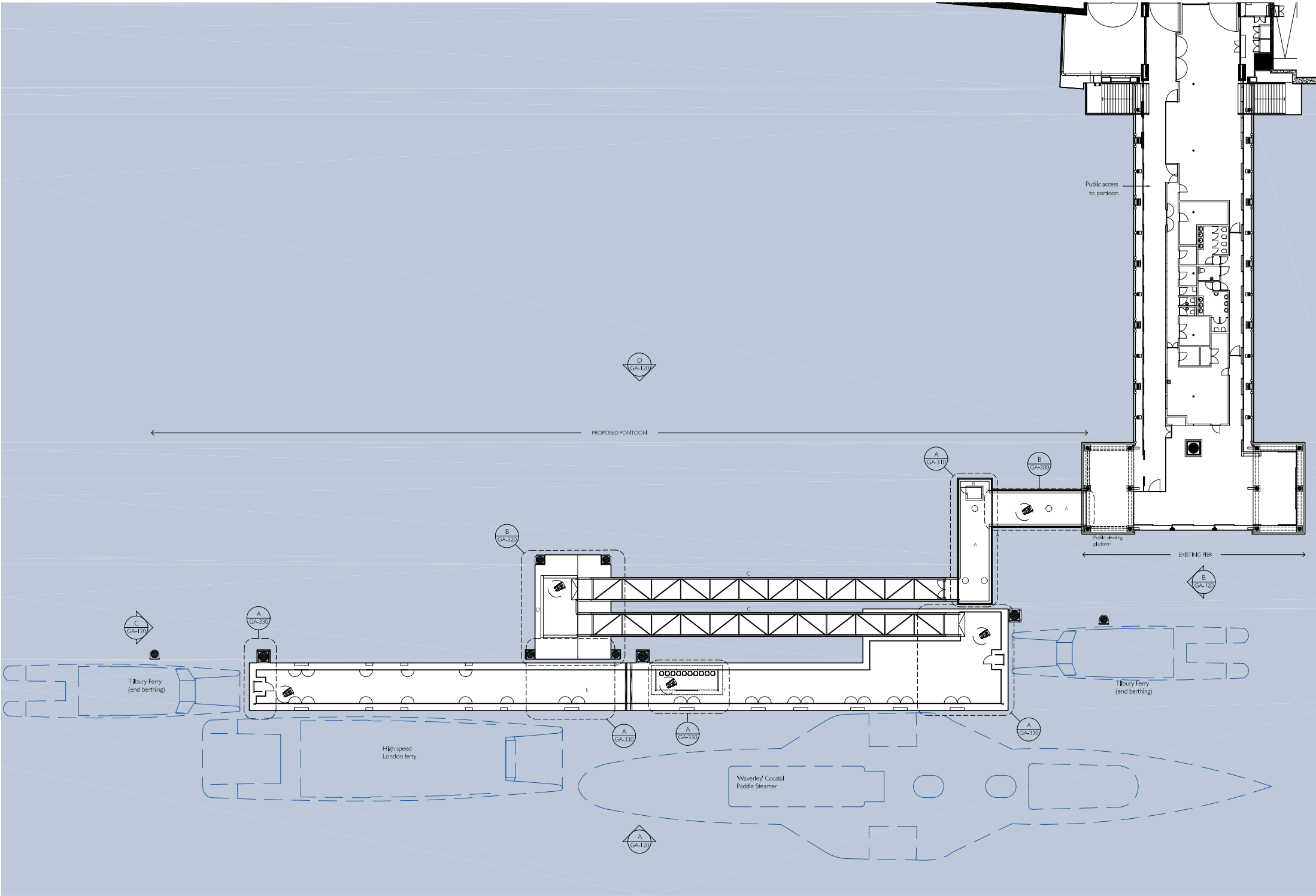
The experiences of Gravesham Borough Council, informed by its other partners in the iTransfer project, have enabled the provision of recommendations and guidance for the design and provision of fully accessible ferry landing infrastructure in the North Sea Region

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).

## Appendix 1 Drawings

Section 2. Gravesend Town Pier and Pontoon - introduction and site conditions

Initial Pontoon Design



DO NOT SCALE DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR CHECKING DIMENSIONS & ANY DISCREPANCY IS TO BE REFERRED TO THE ARCHITECT.

The details shown on this drawing are indicative and intended to convey the design intention. The form and details of construction will be subject to further development.

GENERAL NOTES:

- Zinc - pre-patinated natural materials as used on the pier.
- Galvanised finish to match the galvanised and tone in with the grey metallic (RAL 9007) powder coated finish used on the pier.
- Decking - expanded steel panels welded to steel frame. All steel to be galvanised.
- Power & data feed: from plant room through roof voids in galvanised conduits.

KEY TO COMPONENTS:

- A Jetty
- B Ticket kiosk
- C Brows
- D Intermediate pontoon
- E Main pontoon
- F Shelter

PLANNING

Rev 1  
Date: - 05.10.09  
Purpose of Issue: - Planning  
Checked: - SMcC  
Rev 2  
Date: - 14.08.09  
Purpose of Issue: - Information/Comment  
Checked: - SMcC

REV	AMENDMENT	DATE
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THOMAS  
FORD  
& PARTNERS  
CHARTERED  
ARCHITECTS  
SURVEYORS

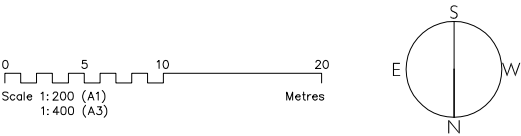
177 KIRKDALE  
SYDENHAM • LONDON • SE26 4QH  
TEL 020 8659 3250 • FAX 020 8659 3146  
EMAIL: tfp@thomasford.co.uk

PROJECT  
GRAVESEND PONTOON

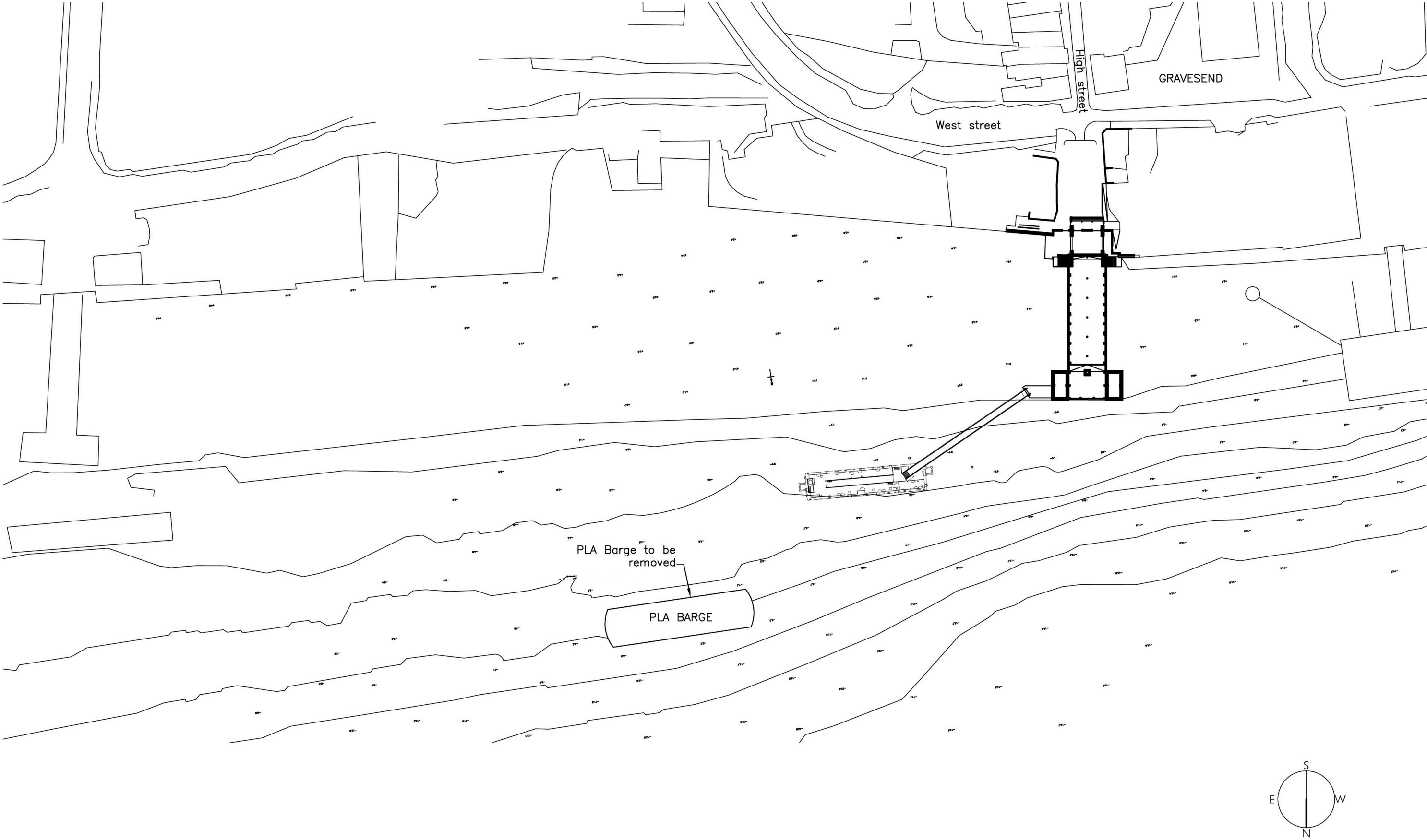
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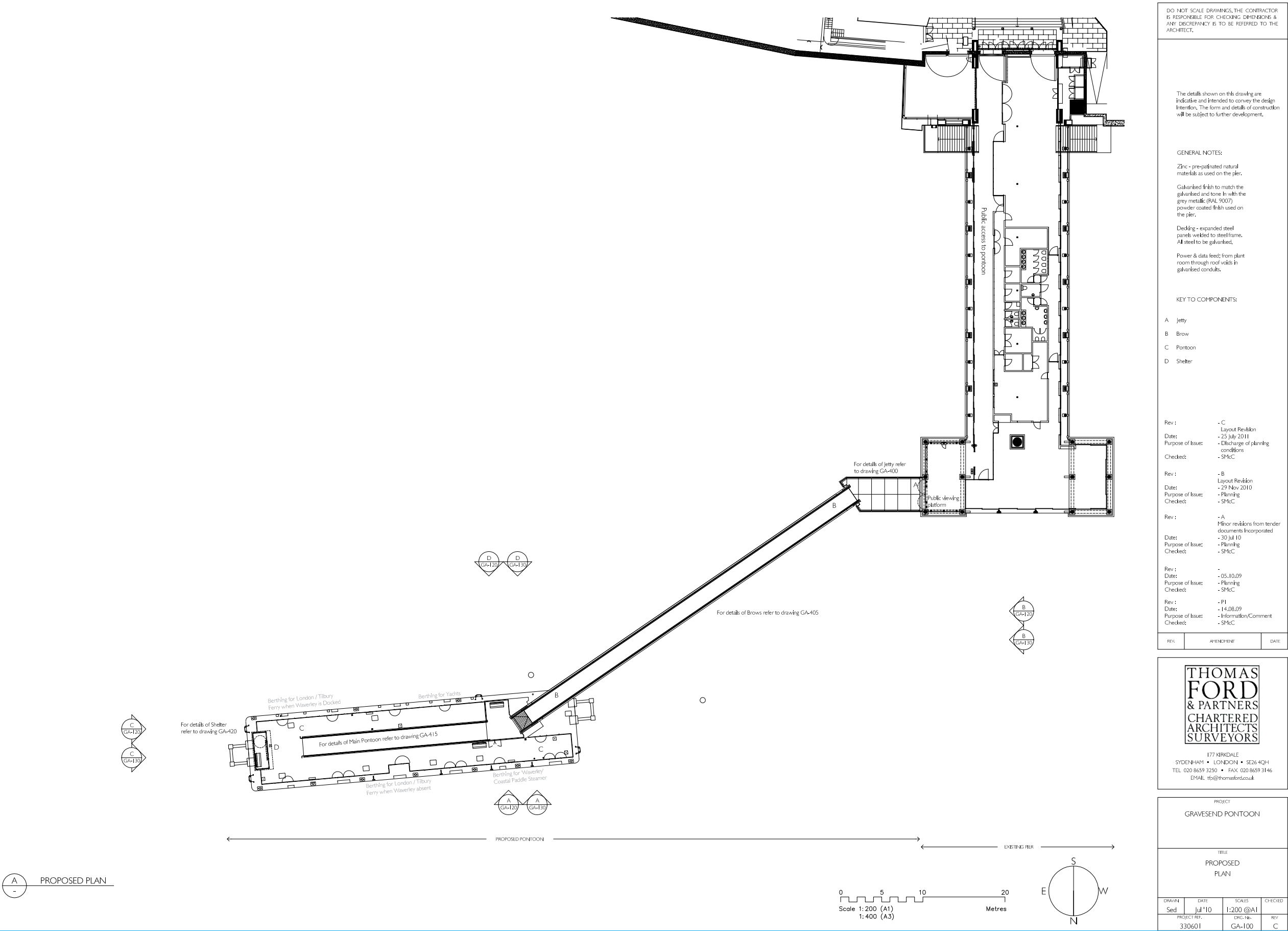


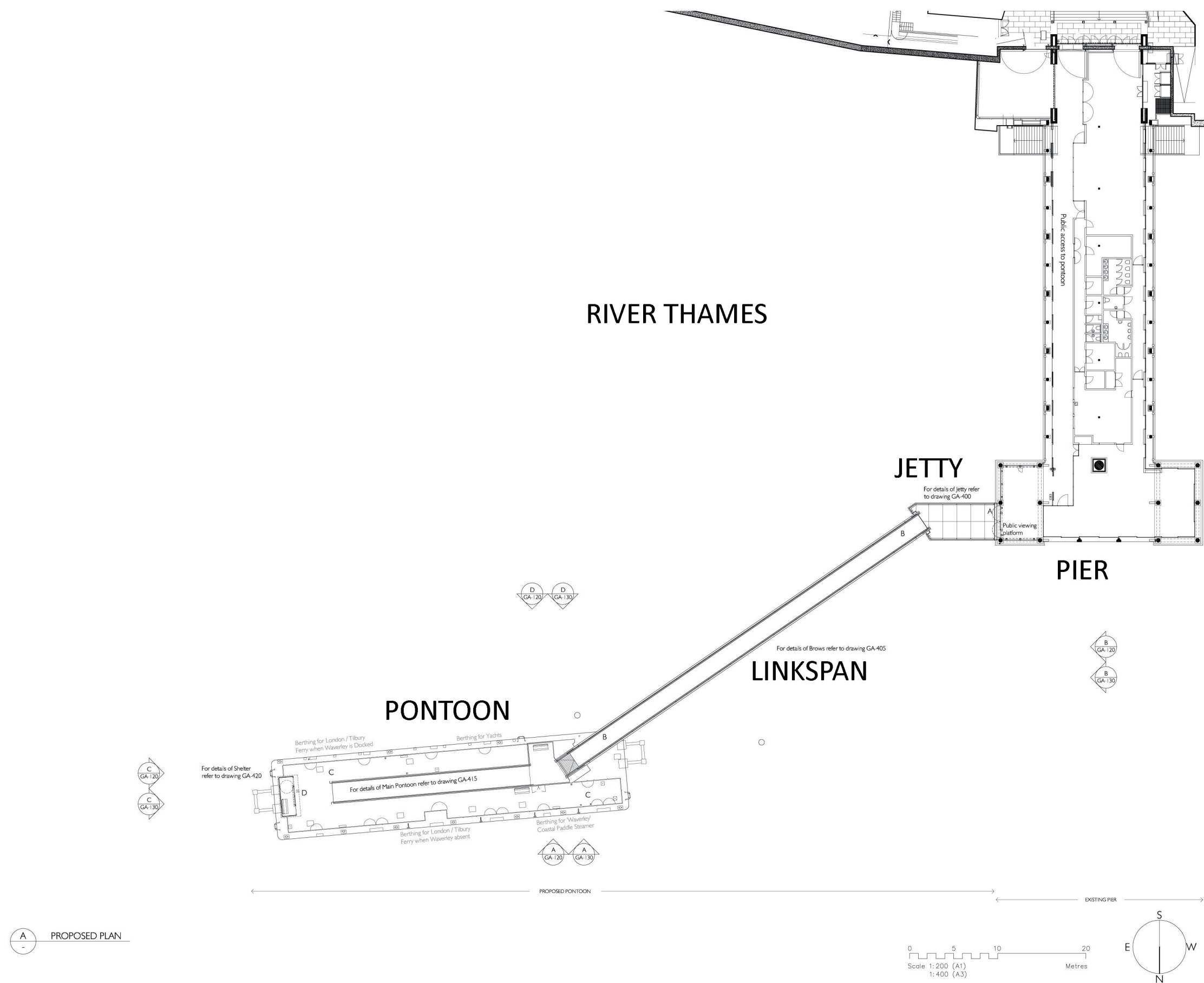
Revised pontoon location plan showing location of PLA barge to be removed



Section 4. Pontoon final design

Pontoon Plan

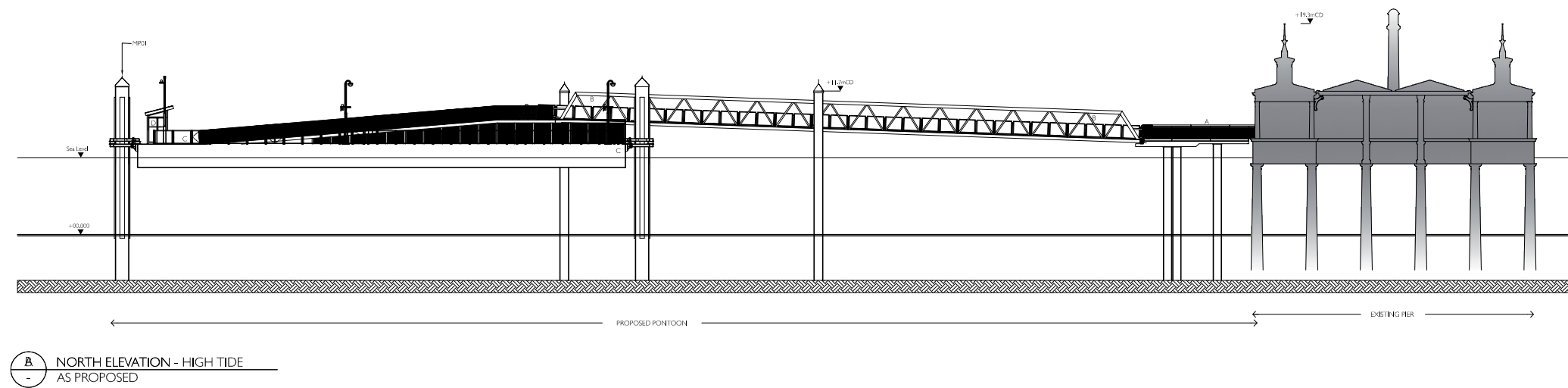
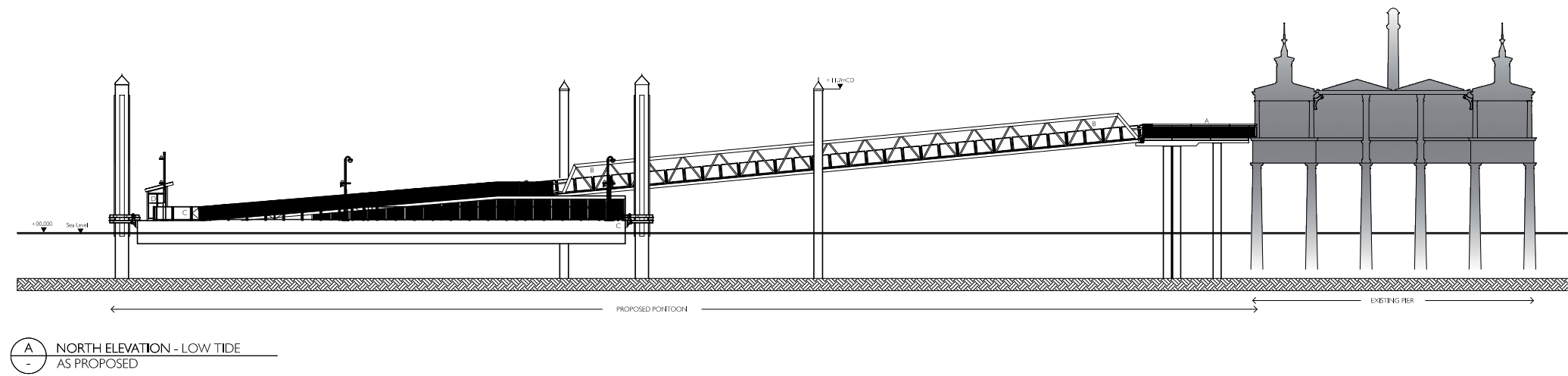






Section 4. Pontoon final design

Pontoon, linkspan and jetty north elevation



DO NOT SCALE DRAWINGS, THE CONTRACTOR IS RESPONSIBLE FOR CHECKING DIMENSIONS & ANY DISCREPANCY IS TO BE REFERRED TO THE ARCHITECT.

The details shown on this drawing are indicative and intended to convey the design intention. The form and details of construction will be subject to further development.

- GENERAL NOTES:
- Pontoon sides & piles - Black paint finish
  - Jetty deck - black concrete base with galvanised expanded steel deck
  - All guarding - Zinc spray finish
  - Shelter - Steelwork: grey melacous iron oxide paint; roof pre-patinated natural zinc; clear glazing

- KEY TO COMPONENTS:
- A Jetty
  - B Brow
  - C Pontoon
  - D Shelter

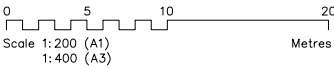
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Purpose of Issue: - Planning  
Checked: - SMcC
- Rev: -  
Date: - 29 Nov 2010  
Purpose of Issue: - Planning  
Checked: - SMcC

REV.	AMENDMENT	DATE
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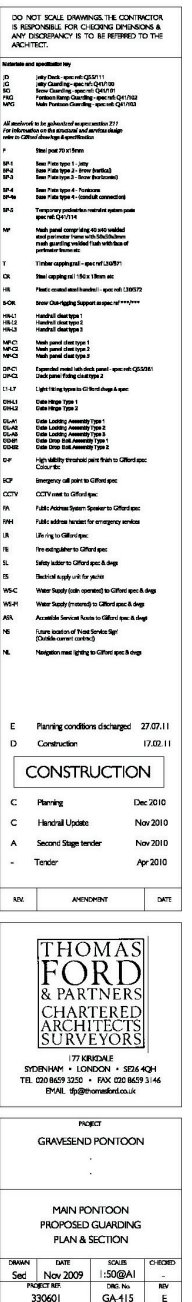
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PROJECT			
GRAVESEND PONTOON			
TITLE			
AS PROPOSED NORTH ELEVATION			
DRAWN	DATE	SCALES	CHECKED
Sed	Nov'10	1:200@A1	SMcC
PROJECT REF.		DWG. NO.	REV.
330601		GA-125	B



### Pontoon plan and ramp



**Gravesham Borough Council**

Interreg IVB North Sea Region programme April 2010 - March 2014