Project Reference

Equipment for Locks & Bridges

QuayQuip
Technical Solutions BV

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Castings & Forging

for bridges and ship locks

For over many years QuayQuip Technical Solutions has been designing and manufacturing custom technical products and turnkey projects. A leader in developing, producing and customizing quality (steel) products, ranging from individual castings, forgings to massive structural and mechanical assemblies. We take each project as a unique challenge and work together with clients as a team to create tailored solutions to their needs. Maximizing our strengths and team of engineers to create products and solutions on time and on budget.
The QuayQuipTS team is always there for the client. From the first design of the blueprint to the manufacturing and delivery of the products to anywhere in the world.

We offer complete control over material selection, manufacturing process selection and manufacturing execution. Our aim is customer satisfaction. For each project, the QuayQuipTS team works hard to deliver incomparable quality, technical perfection, on time and on budget delivery with value for money.

The QuayQuip Technical Solution advantage:
- Extensive experience in materials and manufacturing
- Advanced design and analysis services
- Computer-controlled production technology
- Proven maximum security through our stringent QA / QC system
- Individual designs and packaging
- Experienced and qualified customer service team
- Site installation support and on-site monitoring support

QuayQuip Technical Solution ability to cast and forge pieces is unsurpassed, be it either single pieces or small series, lightweight or hundreds of tons. We get the job done.

Casting	Casting equipment includes arc furnaces of 2-80 tons, 12-150 Tons of ladle furnaces, 60 and 160 tons of VD / VOD refining ovens and R-H Vacuum Recirculation Degassing Units.
Molded parts	Cast weights up to 600 tons are possible for carbon steel, 30 Cast iron tons, 20 tons for spherical graphite iron and 2.5 Tons for non-ferritic metals.
The right finish	QuayQuip offers a complete range of surface treatments, including induction hardening and shot peening, and of multilayer paint systems up to powder coating.
Quality	Our rigorous in-house testing programs includes a complete range of destructive and non-destructive testing programs.

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Sample Overview

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Project Reference

Ship Lock IJmuiden, The Netherlands

Year 2018

Location IJmuiden, The Netherlands

Customer Rijkswaterstaat

Description QuayQuipTS was awarded the contract to supply a total of 12 pieces of gear shafts for the driving of the lower lock door truck. These lock door trucks are being used in what is to become the world biggest single chamber ship lock, the new ship lock of Ijmuiden.

Manufactured using free form forging high alloy 34CrNiMo6-QT as per SEW 550, machining the parts was a challenge to overcome. Designed with a 11 teeth module 66.8 gearing, the surface of the teeth is double curved. This required specialist machining, as well as specialist dimensions control. All this was done under QuayQuipTS supervision and using QuayQuipTS own 3D measuring equipment to make sure all is within tolerance.

Weighing roughly 1200kg finished weight each, the parts where governed by the EN 1090-2 in conjunction with the ROK requirements set by the Dutch department of waterways (Rijkswaterstaat), resulting in numerous certifications, done both by third party Bureau Veritas and our in-house QC qualified personal.

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Project Reference

Johnson Street Bridge, British Columbia, Canada

Year 2016 - 2017

Location Victoria, British Columbia, Canada

Customer City of Victoria

Description The construction of a new central bridge for the City of Victoria, BC, Canada began in May 2013. The new Johnson Street Bridge (JSB) is a large self-supporting single-leaf bascule bridge, creating a new iconic structure and destination within Victoria's Inner Harbour.

In 2016 QuayQuipTS was appointed to design and manufacture much of the elements for the span support structure. The span support structure, compromised of 2 slightly more than ½ ring measuring 25 meters in length based on a 16m radius, mounted on both side of the bridge, provide the necessary connection between the bridge and the mechanical components to open en close the bridge.

Starting with the initial design requirements, QuayQuipTS conducted both the preliminary design, structural calculations as well as the final design before going into production. Using a proven digital path during the design phase rolling into production, all products have been manufactured under an EN-1090 execution class 4 equivalent QA/QC program.

Using the full inhouse equipment potential, stepping through cutting, welding, stress relieving, machining and high endurance painting, QuayQuipTS finished the project within the envisioned timeline. As part of the contract and to ensure the delivery within the dimensional tolerances, a full erection of each of the 2 span support ring was conducted, using purposely build jig support structures. While checking the final result using owned and calibrated 3D measuring equipment, the client witnessed this process enrolling in a satisfying commissioning of the goods manufactured.

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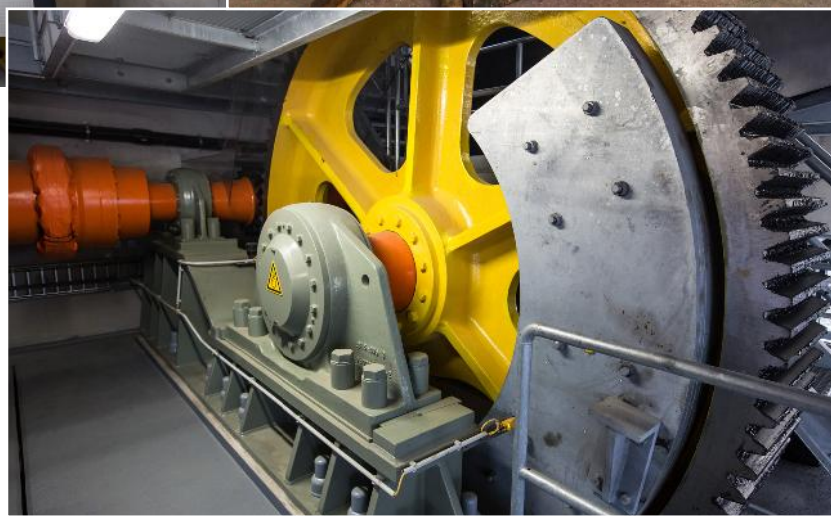
Project Reference

Bascule Bridge Gouda, The Netherlands



Year 2016

Location Gouda, The Netherlands

Customer Rijkswaterstaat

Description QuayQuipTS received an order for panama wheels and spring cylinders for the new A12 motorway bridge over the river Gouwe near Gouda, the Netherlands. For this prestigious project, QuayQuipTS delivered two cast steel panama wheels with an individual weight of almost 16 tons and two spring cylinders weighing over 8 tons a piece.

The panama wheels, spring cylinders along with pinion wheels and bearing house were installed spring 2016. All products were casted and manufactured in the QuayQuipTS factory in China.

The Panama wheels have a diameter of 4 meters and are manufactured under EXC3 execution class according to EN-1090 and by strict ROK guidelines of the Dutch department of waterways (Rijkswaterstaat). Both materials and hardening were third party inspected and certified by Bureau Veritas.

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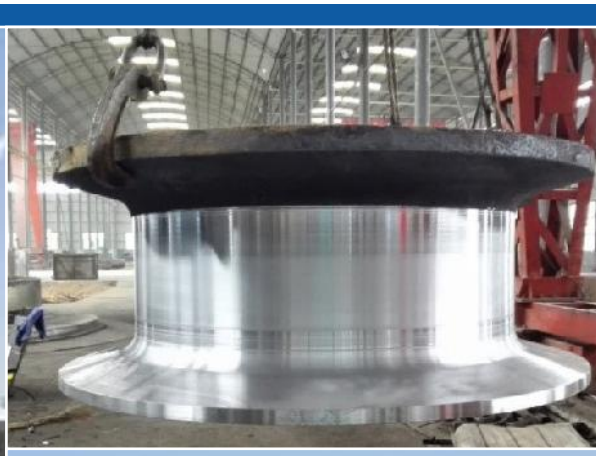
Project Reference

Movable Bridge, Brugge, Belgium



Year 2015

Location Brugge, Belgium

Customer Vlaamse Overheid

Description Last year a new bascule bridge crossing the Boudewijn Canal has been placed near Westkapelle, Belgium. Measuring 15 meters high and 1.200 meters long it is one of the eye catchers of the A11 project.

THV Via Brugge EPC awarded QuayQuipTS with the design and supply of four cast steel pulleys, which are welded into the bride structure and serve to connect the shaft to the hydraulic movement systems which opens the bridge in 90 seconds.

Each cast steel pulley weights almost 13 ton each and has a diameter of 2.60 meter.

As the castings where welded into the steel structure, weldability of the cast steel material was a very important and therefore the requirements of the mechanical values and Ceq requirements where very stringent. Ceq is the equivalent carbon content value of the cast steel and for good weldability of this specific part, Ceq was not allowed to exceed 0,50.

QuayQuipTS also supplied five pieces of forged cylinder eyes for the hydraulic cylinder suitable for a 340 mm diameter cylinder, resulting in a forging of exceeding 2 meter in height and a weight of 3.5 ton each.

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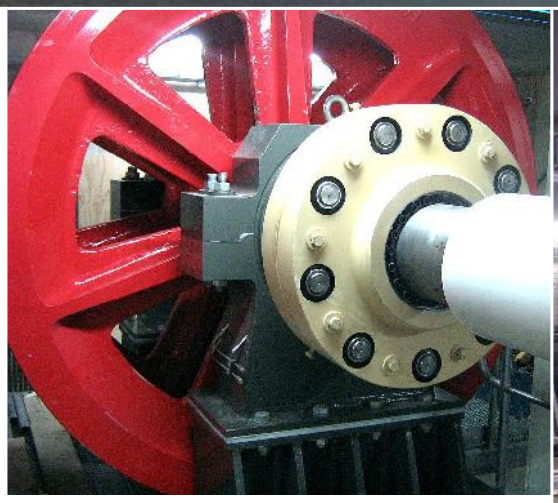
Project Reference

Dorkwerdbrug, Dorkwerd, The Netherlands



Year 2015

Location Dorkwerd, The Netherlands

Customer Provincie Groningen

Description For this lift bridge in Groningen, QuayQuipTS won the contract for supply of 8 cast steel cable guide wheels.

Each wheel weighs over 6 tons and has a diameter of 2.7 meters. All wheels have hardened machined cable grooves, for guidance of the lifting cables.

Due to its expertise in this field, QuayQuipTS was invited during the tender stage to assist in determining the correct material grades for these special castings.

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Project Reference

Lock Door Hinges, Ivoz-Ramet, Belgium

Year 2015

Location Ivoz Ramet, Belgium

Customer Service Public de Wallonie

Description The Ivoz-Ramet project at the River Meuse in Belgium required QuayQuipTS to design and manufacture and lock door hinges. The hinges are critical components for the operation of the vertical lift lock doors.

Besides the natural hinge function, and owing to their special design, the 5000kg hinge units also compensated for twisting actions to eliminate the transfer of bending stresses between structural components of the lock door and their supports. These assemblies were part of a much larger total package undertaken by QuayQuipTS on the project, which also included numerous quantities of other complicated mechanical parts, as well as a variety of QPA arch fenders supplied in different lengths.

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Project Reference

Kieldrechts Ship Lock, Port of Antwerp, Belgium

Year 2014 - 2015

Location Port of Antwerp, Belgium

Customer Port of Antwerp

Description The new Kielsdrecht Lock in the Port of Antwerp, Belgium is one of the world's largest locks. For the construction of this lock, QuayQuipTS supplied a range of castings and forgings.

The order consisted of two sets of cast steel bearing houses weighing over 14 tons each. These bearing houses form part of the movement works for the bridges that cross the locks.

Also included within QuayQuipTS's scope were 4 large forged cylinder heads with a weight in excess of 7 tons. Additionally, 80 cast steel sheaves and running wheels were supplied for the bottom and top lock carriers.

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Project Reference

Viersel & Meerhout Bridge, Albert Canal, Belgium

Year 2014

Location Albert Canal, Belgium

Customer NV De Scheepvaart

Description The Albert Canal is located in north-eastern Belgium. The canal connects Antwerp to Liege and the Meuse River with the Scheldt River. Viersel bridge is a steel arch bridge over the Albert Canal.

The structure is 118 meters long, 20 meters wide and weighs 1,100 tons.

QuayQuipTS delivered the castings and tie rods for this project. All tie rods have been inspected by Bureau Veritas.

A similar project is found at the Meerhout Bridge.

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Project Reference

Cylindrical Valves, Albert Canal, Belgium

Year 2010 & 2014

Location Albert Canal, Belgium

Customer NV De Scheepvaart

Description The Albert Canal is the most important waterway in the Belgian region of Flanders. With a transport capacity of approximately 40 million tonnes annually, it connects the cities of Antwerp and Liège, between the Scheldt and Meuse rivers respectively.

During 2010, QuayQuipTS delivered eight cylindrical valves for the Albert Canal. These were installed for the overflow of one of two ship locks located between Olen and Ham.

Then again in 2014, QuayQuipTS manufactured and delivered another twelve cylindrical valves for other locations at Hasselt, Diepenbeek and Genk. The large size of each valve at 4.5m diameter and 6.0m in height, together with the complexity of materials and components required an extensive and detailed design process to be undertaken by QuayQuipTS. The finished article resulted in castings of varying wall thicknesses weighing more than 30t. When fully assembled, the castings also incorporated forged blades, bushings, seals, gaskets, guide shafts and steel casings, all manufactured and assembled at QuayQuipTS's production plant.

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Project Reference

Rue d'Alsace, Luxembourg

Year 2013

Location Rue d'Alsace, Luxembourg

Customer Société Nationale des Chemins de Fer Luxembourgeois (SNCFL), Luxembourg

Description For this project, QuayQuipTS supplied over 90 tons of steel fabrications and castings. The castings consisted of forks and eyes, connecting the tie rods to the bridge arch and the bridge deck. These adjustable sockets were fully machined with a weight of 1250kg each. They were made from high quality cast steel.

Bureau Veritas performed MT, PT Level 2 and Level 2 UT tests on these castings.

Besides the tie rods and castings, other accessories such as conical bushings, pins, covers, special bolts and washers were also manufactured by QuayQuipTS.

Thanks to this assignment, QuayQuipTS has received supplier approval from SNCF (French national railways).

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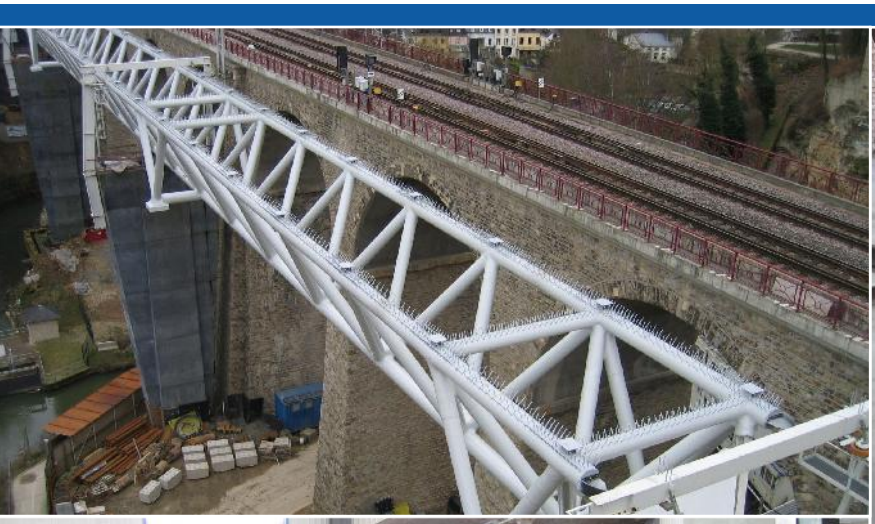
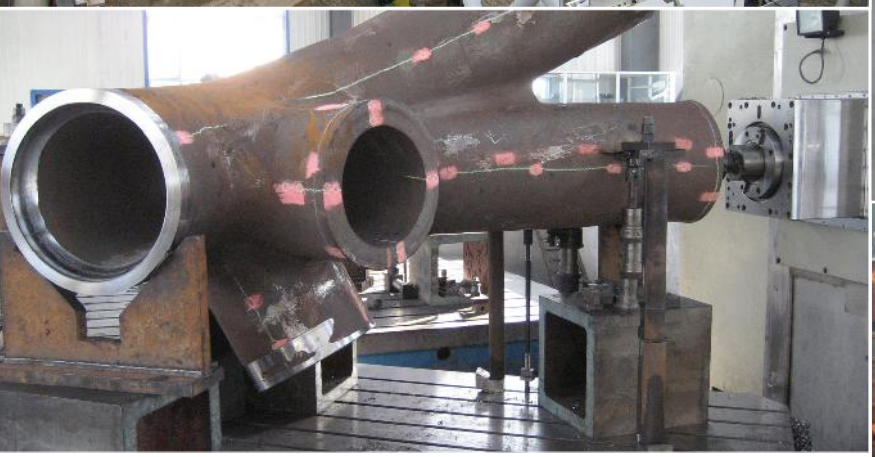
Project Reference

Viaduct de Pulvermühle, Luxembourg





Year 2013

Location Biisserbreck, Luxembourg

Customer CFL, Societe Nationale des Chemins de Fer Luxembourgeois

Description Castings integral in the framework for the Pulvermühle railway bridge were supplied by QuayQuipTS. The bridge lies in the heart of the city of Luxembourg and connects the north-south route, bridging the main river in Luxembourg; the Alzette.

The castings serve as the interface between the steel tubing's for the frame under the bridge. The total of 134 casting pieces range in size between 1.7 and 2.0 meters diameter and have a maximum weight of 7,7 tons each. The castings have very high accuracy/ tolerance requirements, only +/-1.5mm deviation may occur, unique for castings of this size. In addition, all castings have been 3D measured and each piece tailor made machined. 3rd party inspection was undertaken by Bureau Veritas.

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Project Reference

Lock Bridge Heumen, The Netherlands

Year 2012

Location Heumen, The Netherlands

Customer Rijkswaterstaat

Description Following successful supply of cast steel parts and steel fabrications for the ship locks, QuayQuipTS was engaged to design the large and small lifting wheels and related mechanical components for the Heumen ship lock project.

All eight lifting wheels are made of high quality cast steel. The wheels have outer diameters up to 3800mm. Each weighs over 25 tonnes.

QuayQuipTS also supplied large shafts and cast-steel bearing blocks. The components are installed at either end of the ship lock gate's rotational axis, in two lifting towers.

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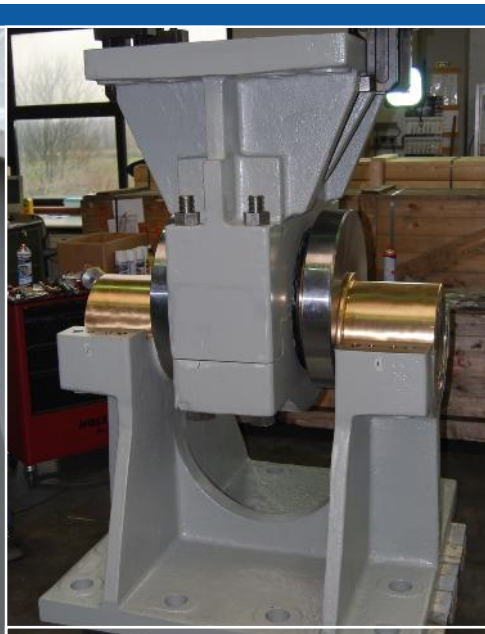
Project Reference

Lock Door Hinges, Albert Canal, Belgium



Year 2011

Location Albert Canal, Belgium

Customer NV De Scheepvaart

Description NV De Scheepvaart awarded the Victor Buyck Steel construction company the contract to renovate a total of five ship locks in the Albert Canal, Belgium. The renovation work comprised of the removal of the top gates, and being replaced with new gates, plus the inclusion of the associated mechanical components essential for the gate motions.
For the mechanical components, Victor Buyck brought in QuayQuipTS to fabricate, machine and supply a total of eleven units; ten of which to be installed in the locks, plus one spare unit. With the almost 15 years of expertise in supplying large heavy duty hinge systems (incorporating spherical bearings with an eccentric crank shafts), QuayQuipTS was a natural partner for Victor Buyck.

Manufactured from fine precision machined castings, combined with a forged stainless steel crank shaft contained within a split bonze spherical bearing, these units was supplied fully assembled, ready for installation.

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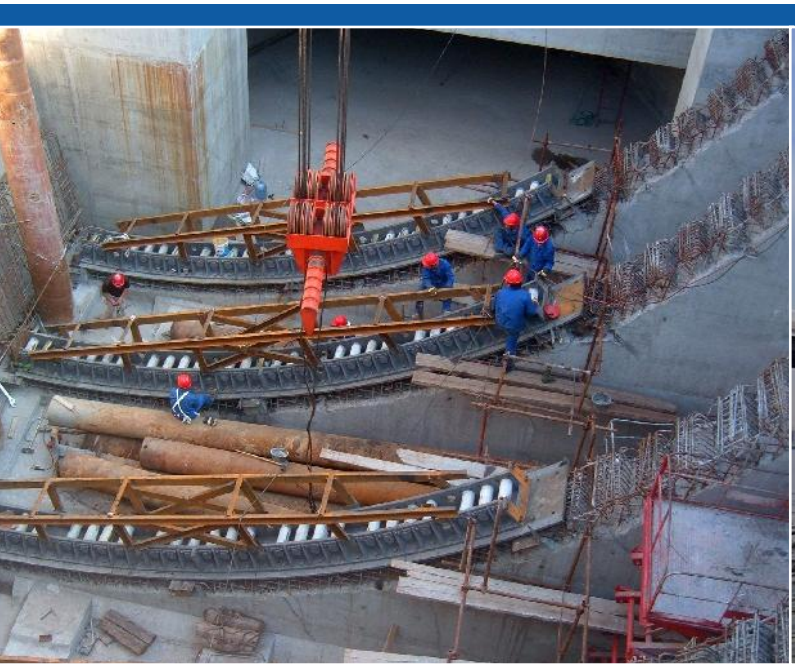
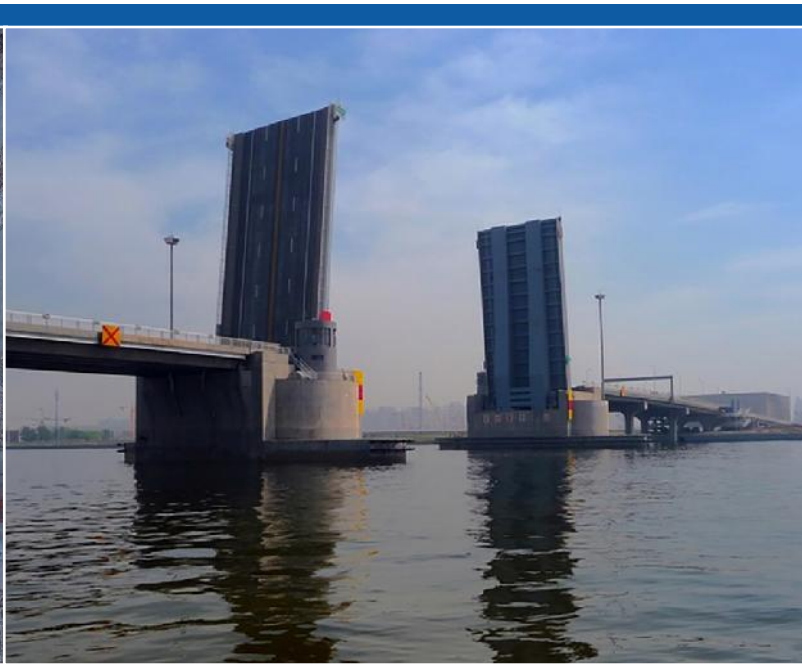
Project Reference

Tangu Open Bridge, Tianjin, P.R. China





Year 2009

Location Tianjin, P.R. China

Customer China Railway & Bridge Bureau 14

Description The Tangu Open Bridge – a bascule bridge - is located in the Tangu Harbor in the city of Tianjin, P.R. China. The bridge was built to enable large vessels to pass through the Tangu Port at the Hai River.

QuayQuipTS delivered two support houses, support beams and six turning frames. Two piles – each at one side of the bridge - contain the support houses, each of which contains three turning frames which make it possible to open and close the bridge quickly.

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Project Reference

Panama Wheel, Linne, The Netherlands

Year 2009

Location Linne, The Netherlands

Customer Rijkswaterstaat

Description As the original wheels of the historic ship locks of Linne, The Netherlands dated from the first half of the last century, they had to be replaced. QuayQuipTS was asked to design, manufacture and deliver Panama wheels. The supplied Panama wheels are made of high quality cast steel and have a diameter of about three meters. QuayQuipTS also produced the pinion gears for each wheel, which are also of the highest quality cast steel.

The customer chose QuayQuipTS for this project because of QuayQuipTS's experience in producing large and complex castings, and the fact that QuayQuipTS has an very experienced engineering department that specialises in the design and calculation of technical challenges.

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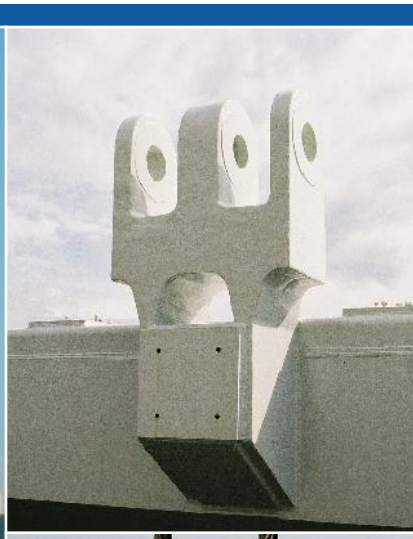
Project Reference

Pont Gustave Flaubert, Rouen, France



Year	2005
Location	Rouen, France
Customer	Grand Port Maritime de Rouen
Description	Pont Gustave-Flaubert (Gustave Flaubert Bridge) is a vertical lift bridge over the River Seine at Rouen, Seine– Maritime, Haute-Normandie, France. QuayQuipTS delivered the cast steel forks and eyes which are used on the bottom ends of the lifting rods.

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Project Reference

Ijburg, Amsterdam, The Netherlands

Year 2001

Location IJburg, Amsterdam

Customer City of Amsterdam

Description The IJburg development is an archipelago of seven artificial islands on reclaimed land in the IJmeer, a vast freshwater lake to the south east of Amsterdam. The main bridge is 250m long and links the first of the islands to the mainland. It is 30m wide and has two decks.

QuayQuipTS delivered the castings and tie rods for this project.

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English A4 Metric v.1.0

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