Steelwork clamping systems for

SUSTAINABLE CONSTRUCTION

by lindapter®

LINDAPTER CASE STUDY

THE CIRCULAR BUILDING
LONDON, UK

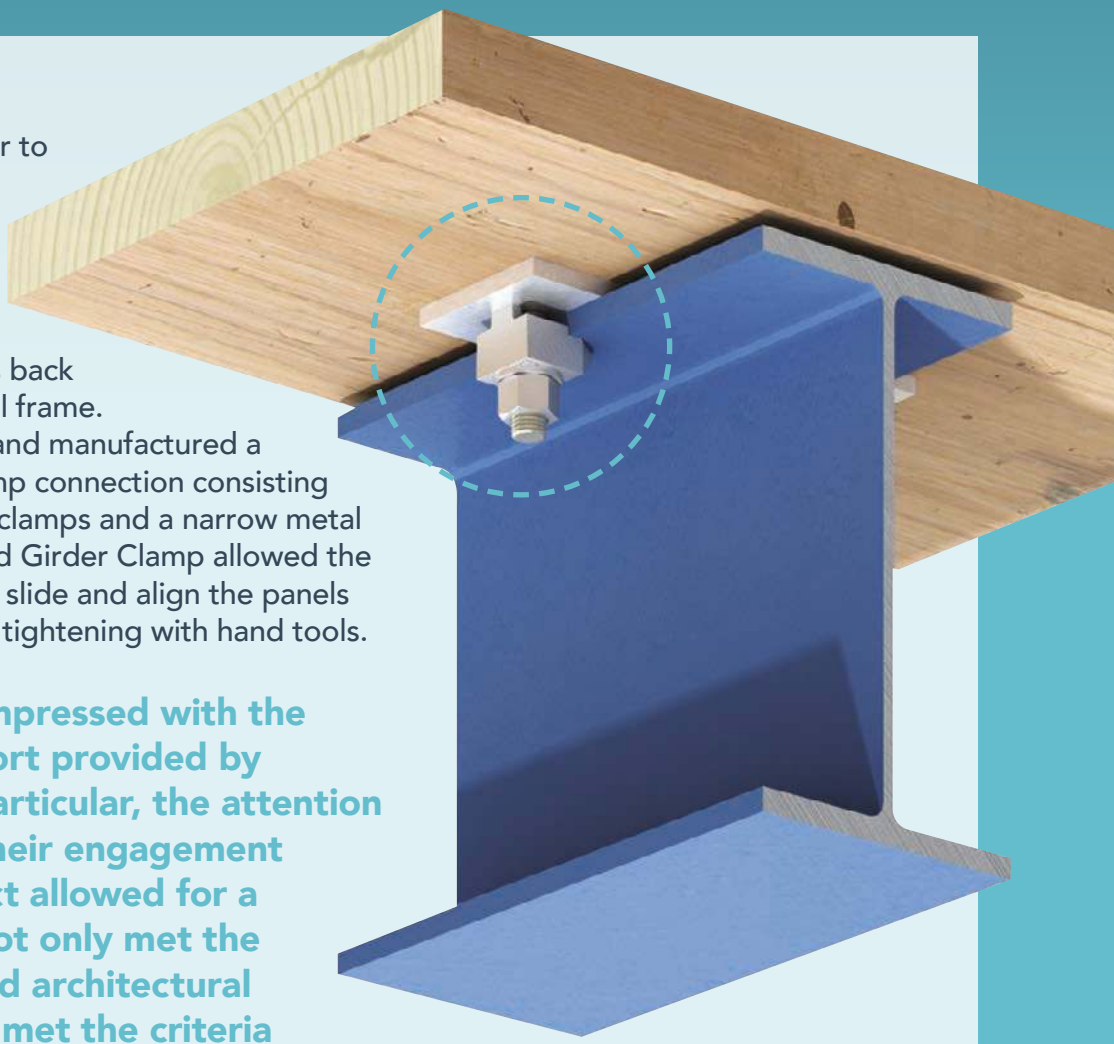
Lindapter Girder Clamps were used for the construction of Arup's Circular Building.

The UK construction industry currently produces three times more waste than all UK households combined. The Circular Building prototype aims to change this by proving that the principles of the circular economy can be achieved when using products that provide flexibility, longevity, ease of deconstruction and the potential to reuse or recycle.

Lindapter offers a FREE Connection Detailing service, see page 8 for more details.

CONSTRUCTION

Arup asked Lindapter to develop steelwork connections to secure the Circular Building's roof panels, wall panels, and glazing supports back to the structural steel frame. Lindapter designed and manufactured a bespoke Girder Clamp connection consisting of Type B steelwork clamps and a narrow metal plate. The CE marked Girder Clamp allowed the contractor to quickly slide and align the panels into position, before tightening with hand tools.



"I was greatly impressed with the technical support provided by Lindapter, in particular, the attention to detail and their engagement with the project allowed for a solution that not only met the engineering and architectural needs but also met the criteria for the circular economy."

Tom Clewlow Structural Engineer, Arup

DECONSTRUCTION

The structure is intelligently designed and constructed using materials that can be removed and reused. After being displayed at the London Design Festival, the Girder Clamps were quickly uninstalled, allowing an easy deconstruction in just one week, while preserving the integrity of all the components.

This permitted the structure to be rebuilt at another site on a one year loan and then rebuilt again at several exhibitions around Europe to further emphasise the viability of sustainable construction.

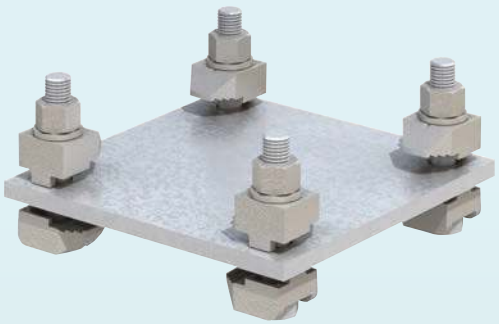
Watch the time-lapse construction video at www.Lindapter.com

LINDAPTER CASE STUDY

HALLEY V RESEARCH CENTRE ANTARCTIC

The station was constructed by securing the structural steelwork to the frame with Girder Clamps, forming a cross-girder base to support the accommodation block.

The steel platform featured extendable steel legs that allowed the building to be elevated each year to keep it above the accumulated snow level.



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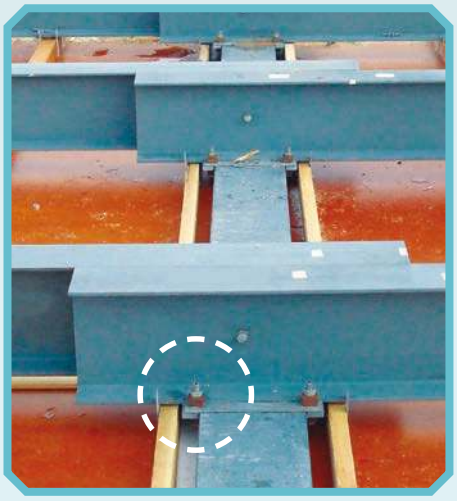
CONSTRUCTION

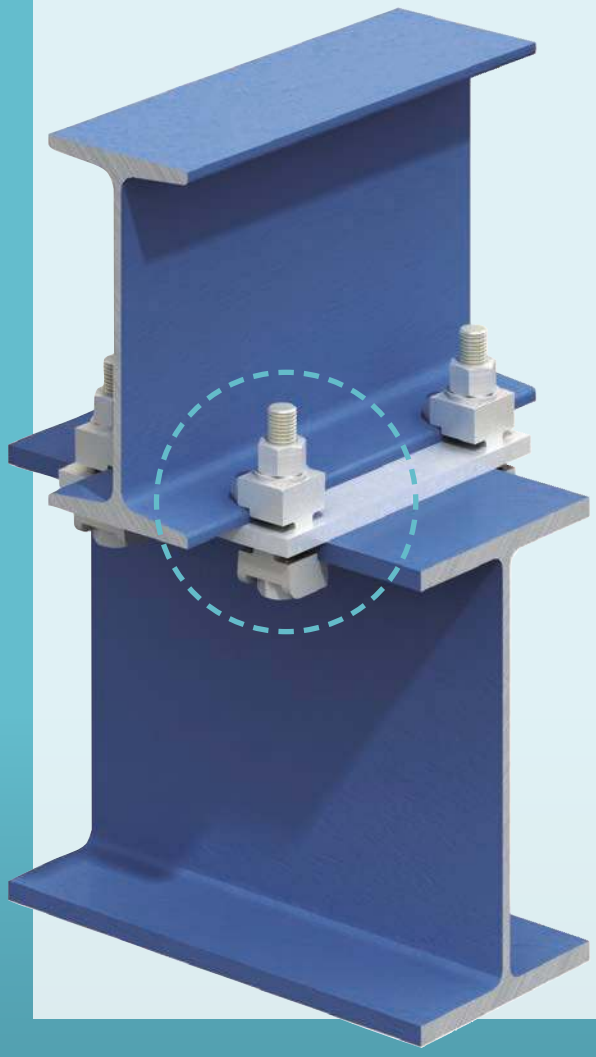
In 1989, Lindapter Engineers were asked to design a connection that secured the structure with fixings that could withstand the hostile Antarctic environment for up to 20 years, which was the anticipated maximum lifecycle of the centre.

Type A and B Girder Clamps cast in blackheart malleable iron were specified due to their high strength capacity and tolerance to low temperatures. Due to the inhospitable setting, wearing bulky gloves was essential so the clamps were designed to make the installation as simple as possible and supplied part assembled to minimise work on site.



"Lindapter's product has performed admirably for us. With the foundations being 150m thick floating ice, flexure of the structure was a major issue which the Lindapter fixing system was designed to accommodate."

Steve Canham British Antarctic Survey Building Officer



DECONSTRUCTION AND RECYCLE

When the structure was decommissioned, it had far exceeded the intended 20 year lifespan. The steel and Lindapter Clamps were found to be in prime condition, despite enduring over two decades of extreme environmental forces.

Lindapter's experience in the design and manufacture of steelwork connections proved to be incredibly beneficial, as the customised clamps provided significant tolerance and strength to withstand the requirements of thermal flexing.

Over one month, the station, including its steel superstructure, was systematically unbolted, removed from the ice shelf and shipped to South Africa for recycling.

LINDAPTER CASE STUDY

CLIFTON SUSPENSION BRIDGE
BRISTOL, UK

The Grade 1 listed Clifton Suspension Bridge spans over 200 metres across the width of the River Avon to connect Clifton in Bristol to Leigh Woods in North Somerset.

The coach bolts securing the wooden deck to the steel frame need to be periodically replaced, therefore the engineers required a removable connection.

Lindapter offers a FREE Connection Detailing service, see page 8 for more details.

INSTALLATION

Over 50 years ago, Lindapter's Type B clamps *(pictured right)* were used to secure the structure's timber deck to lattice girders.

The bridge has a suspended deck of wrought iron lattice girders, which in turn support the timber sleepers and planking topped with asphalt which forms the roadway.

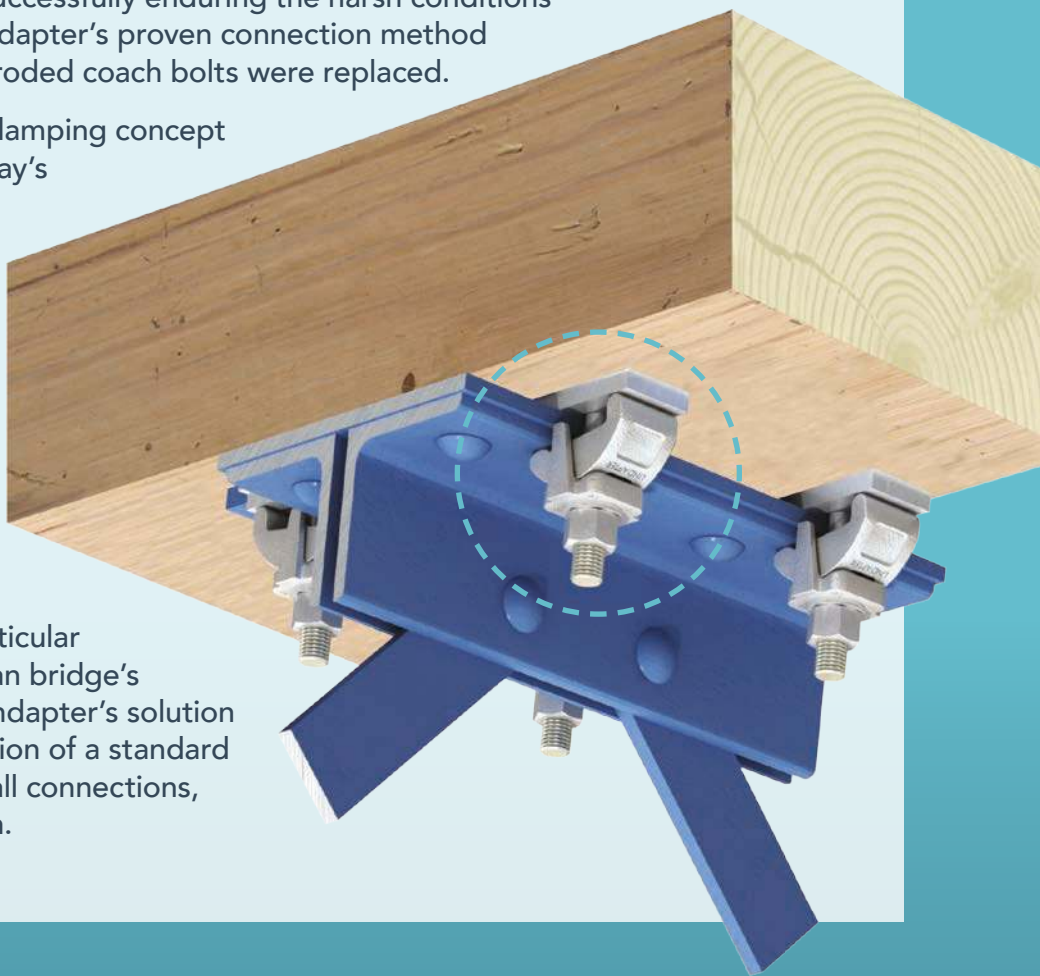
The use of Lindapter clamping systems eliminated the need to drill through the lattice girders, which would not only have been difficult with it being situated below the bridge deck, but it would also have caused significant damage to the Grade 1 listed structure.

REFURBISHMENT

After 50 years, coach bolts started to suffer from corrosion while Lindapter Type B clamps remained intact, successfully enduring the harsh conditions subjected to the deck. Lindapter's proven connection method was repeated and the corroded coach bolts were replaced.

Lindapter's fundamental clamping concept remains as relevant to today's engineering as it did 50 years ago, and indeed since the company's foundation in 1934.

New product innovations allowed for a faster installation this time round. The Type LR clamp was selected because the fixing self-adjusts to suit the flange thickness, a benefit of particular significance as the Victorian bridge's iron beams vary in size. Lindapter's solution enabled the rapid installation of a standard product to be applied to all connections, regardless of flange depth.



INNOVATIVE STEELWORK CONNECTIONS

THE LINDAPTER PRODUCT RANGE

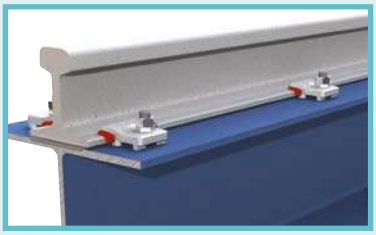
Since 1934, Lindapter has continuously developed its product range to include connection solutions for almost any steel-to-steel application. Lindapter specialises in the following product groups listed:

GIRDER CLAMP

Clamp two steel sections together using high strength connections that are configured to suit various loads and beams sizes.

HOLLO-BOLT

Expansion bolts that connect steel sections to pre-drilled Structural Hollow Section (SHS) when access is available from one side only.

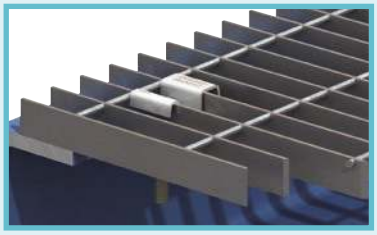


RAIL FIXINGS

Ideal for securing rails or crane lines in low speed environments, such as train maintenance depots and dam or dockside cranes.

LIFTING POINTS

Supports the lifting and rigging of equipment whether it's suspending overhead audio-visual kit or lifting drilling risers onto offshore rigs.



FLOOR FIXINGS

A range of heavy duty fixings to secure metal plate or grating to steelwork using only simple hand tools for installation.

SUPPORT FIXINGS

This range of clamps is used to suspend building services including electrical equipment or pipework from structural or secondary beams.

DECKING FIXINGS

Designed to fit inside the dovetail re-entrant channels of popular decking profiles without damaging or delaminating the decking.

For more product information email enquiries@Lindapter.com to receive hard copies of Lindapter's product catalogue or download it from www.Lindapter.com

HERE TO HELP YOU

ENGINEERED SOLUTIONS

Lindapter's team of experienced Engineers can design a bespoke connection for your application free of charge. Simply send your requirements to **support@Lindapter.com** and we will do the rest!