Matière®

Modular structures

Innovator in Engineering Structures

Naia-x Flyover, Manila - Philippines

Unibridge® A new concept in modular bridging

Unibridge®

A new concept in modular bridging

Al-Nahrawan bridge, Baghdad - Iraq

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Origins

The modular bridge is over 70 years old

The first portable metallic bridges were invented during WWII. The heaviest parts could be carried by teams of 4 or 6 men.

The elements could be assembled on site by a section of the Army Corps of Engineers. Allied Armed Forces made ample use of this lateral beams' type of bridge to replace structures destroyed by the occupying Army.

"Without these, we couldn't have won the war", asserted General Montgomery. During the 60 following years, the lateral beams bridges have been used extensively, as temporary structures, on worksites, following natural disasters or in war zones.

But in 2003, a whole new concept changed everything: more engineered to suit modern vehicles and yet more modular, easier to assemble as well as more aesthetic, UNIBRIDGE® by Matière® has revolutionized the metallic bridge market.

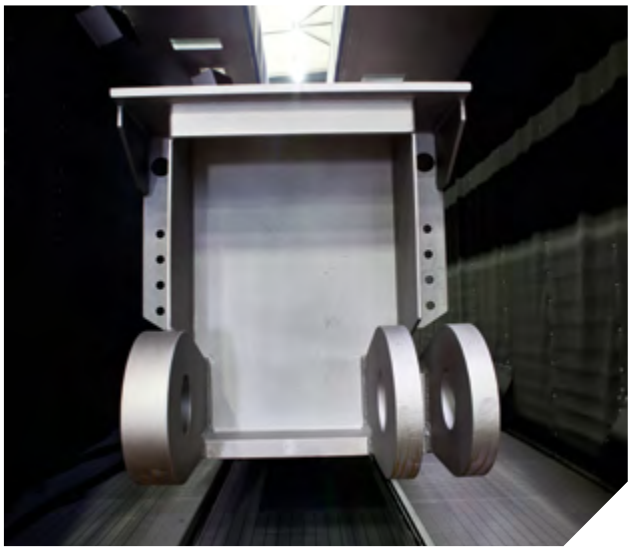
Today

UNIBRIDGE®, the 21st Century's modular bridge

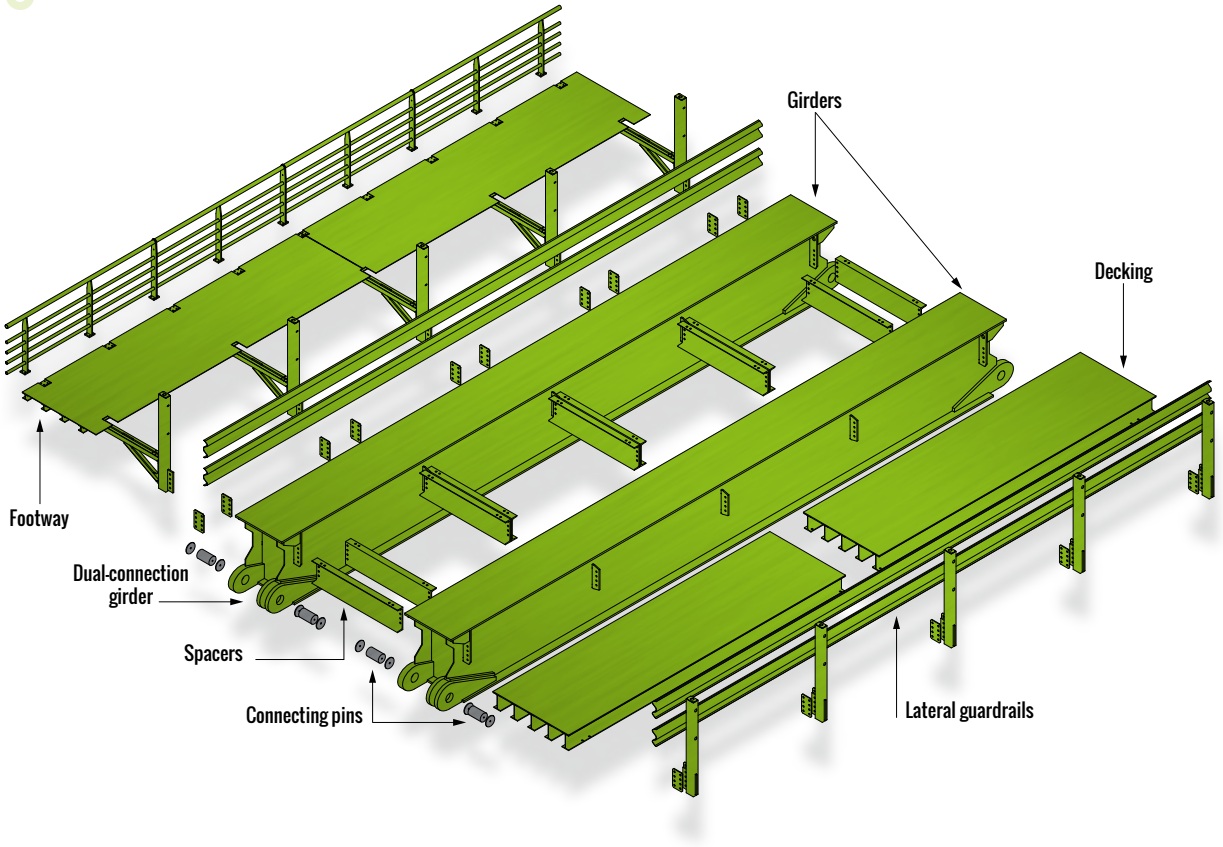
Multiple panels and parts have been replaced by 11.4 metre long watertight box girders, prefabricated in factory conditions and assembled on site.

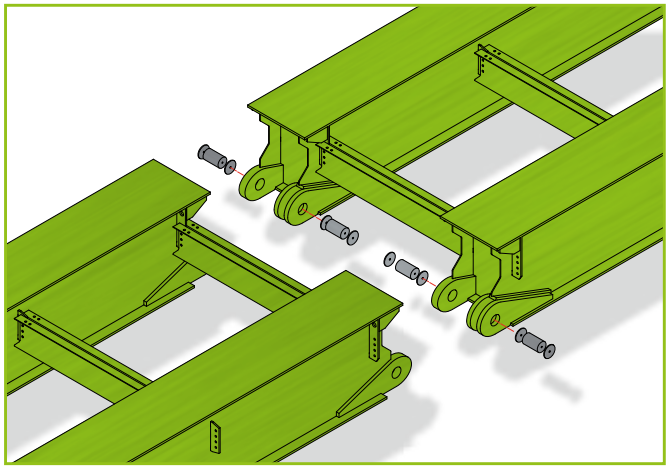
The process has been approved by the IVOR Independent Experts Committee, who found it to be "original in its functionalities (modular geometry, scalability over time) and in the assembly methods implemented".

Numerous countries have confirmed this opinion: over 1500 UNIBRIDGE® bridges have to this day been built or ordered in France, Europe, South-East Asia, Africa, Indian Ocean area, Middle East, Caribbean and Central America.



A reduced number of components





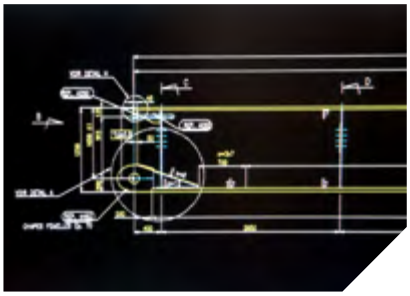
Conception

Each and every UNIBRIDGE® is designed as a permanent structure

Matière® has its own design office with engineers specialized in metallic structures conception and civil engineering, as well as design technicians and draughtsmen.

For UNIBRIDGE® studies, the company uses “Mix Beam” and “Robot Millenium” softwares. All the drawings are created on Autocad, Bocad and Metalcad.

The UNIBRIDGE® structures are extremely robust and durable. They are calculated according to the standards in effect within the country where they are to be implemented (Eurocodes, AASHTO, British Standards, Australian Standards, SATCC, etc). Accepted load specifications are therefore those defined by the selected standards.



Basic principle

A total modularity

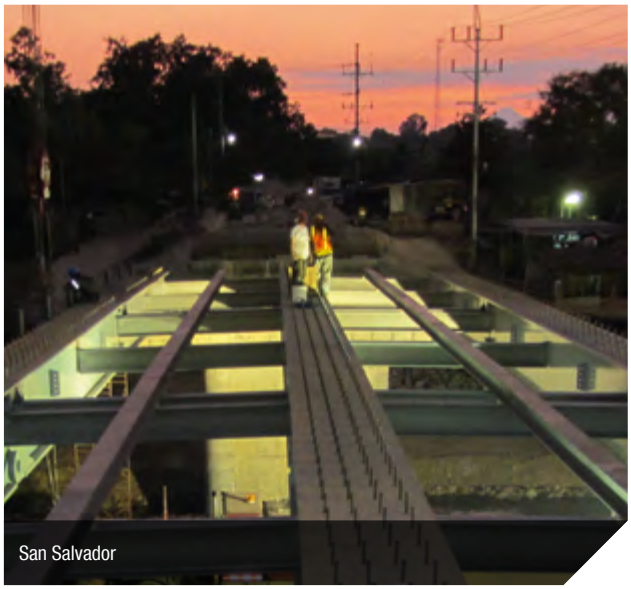
Made of beam elements 11.40m and 6.10m long, assembled lengthwise by pins and transversally by spacers, the UNIBRIDGE® is entirely modular.

It is possible to construct bridges with multiple spans. At this time, the maximum length between two bridge bearings is approximately 57 metres.

It can be erected within very short notice using small erection teams: 6 staff members assemble a 45m span in 12 hours.

UNIBRIDGE® structures are supplied with the whole range of components needed for the implementation, and come with an assembly manual specifying the identification, marking and weight of each part.

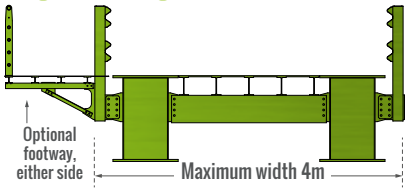
Its transversal modularity allows the UNIBRIDGE® to increase its carriageway’s width, anytime during the structure’s lifetime, by adding extra beams. It may also be dismantled and reassembled elsewhere if the user wishes.



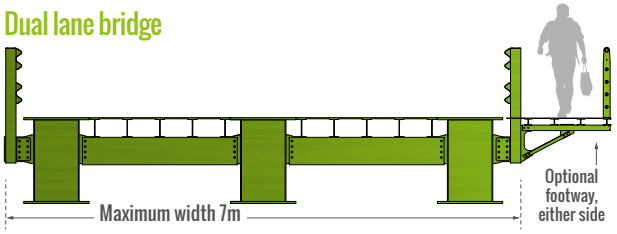
San Salvador

Transversal modularity

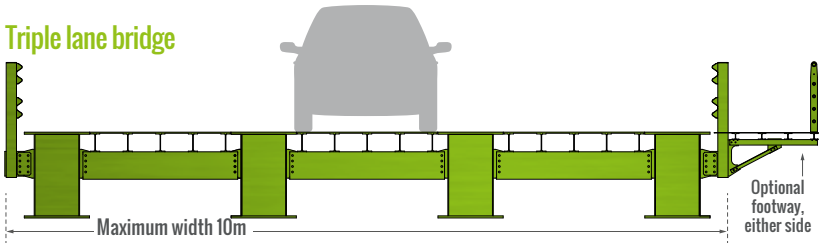
Single lane bridge



Dual lane bridge



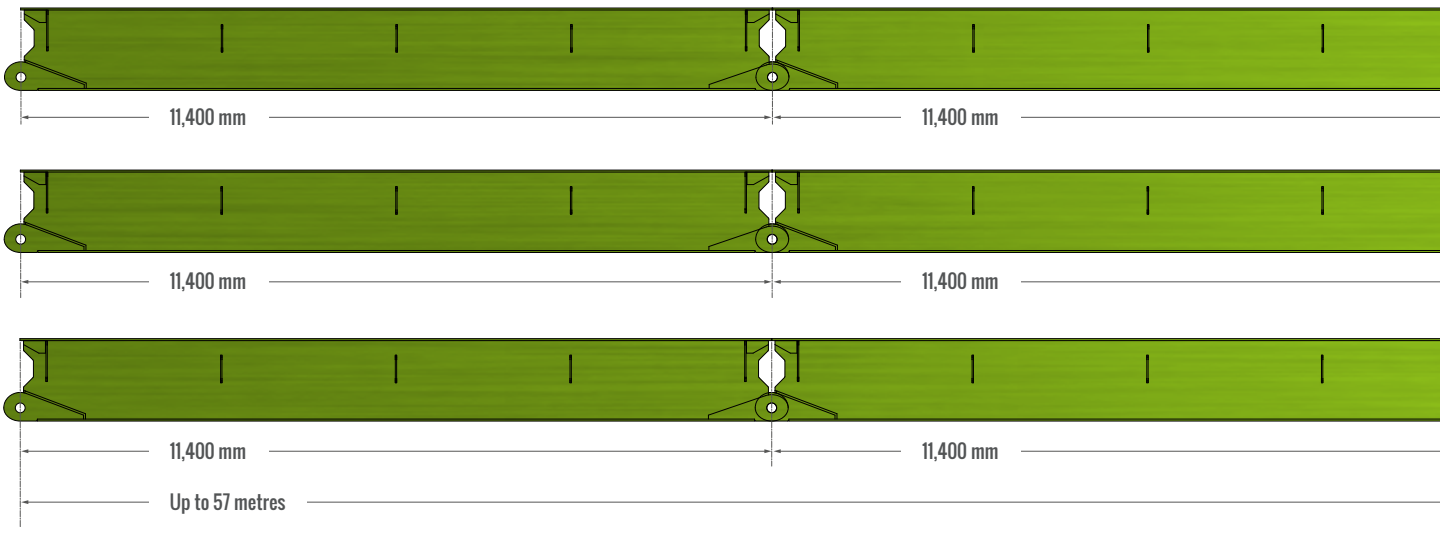
Triple lane bridge



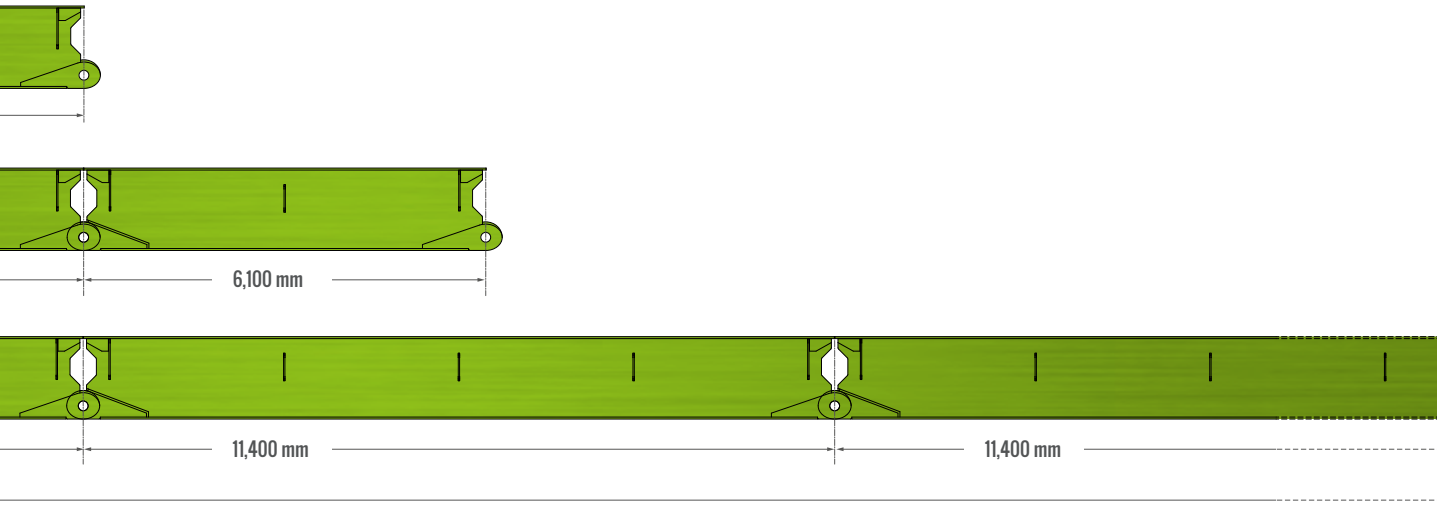
Longitudinal modularity

Two standard box girders

Bridge beams made using UNIBRIDGE® box girders, assembled lengthwise



Iraq



Manufacturing process

A robotic production

UNIBRIDGE® structures are designed and manufactured in France, using steel and other components from European factories respecting European Norms.

The industrial cycle of a UNIBRIDGE® involves complete traceability of the entire product as well as raw materials used during the manufacturing process.

This industrial production uses the latest tools, machinery and robotic equipment, in order to guarantee the highest quality, with permanent product assessment and optimised lead-times.

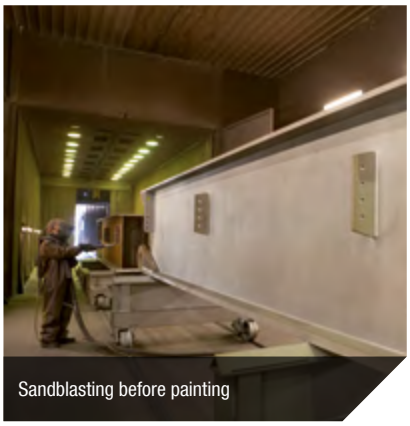

Plasma-cutting


Oxy-cutting


Preliminary shot-blasting
of each UNIBRIDGE® component


Gantry welding automatic /
finishing the box girders


Reamer


Sandblasting before painting

Quality control process

A production line fully audited

Steel

All steel used in UNIBRIDGE® is of the same grade and origin as those used on major metallic art structures.

It originates from European factories and is subject to permanent traceability standards throughout the manufacturing process.

Audits

Ongoing audits are performed throughout the manufacturing chain, from steel traceability to pre-painting coarseness control, from welding verification to checking the adhesive properties of the anti-skid coating. Once they are completed and recorded, these audit files represent a valuable set of references for the bridge, prior to commissioning.

Manufacturing operational methods

The European NF EN1090-2 manufacturing standard is applied to all manufacturing operations of girders, decking and accessories (from flamecutting to final machining, including fabrication by means of welding robots).

Anti-corrosion coating

Particular care is given in applying the anti-corrosive agent: after going through the shot-blasting unit, components are painted in compliance with ACQPA specifications, or galvanized.

Transport

Easy to convey, easy to install

The modules are easy to transport: by road, a semi-trailer lorry is sufficient. By sea, all components fit into 40-foot containers.

Two standard methods of on-site assembly

UNIBRIDGE® structures are either launched or installed by crane.

The UNIBRIDGE® is designed to be installed quickly and easily using minimal equipment, to allow our customers or ordering parties to perform the assembly themselves if they wish, using their own teams and light equipment (power shovel, lifting crane, hoist, etc).

In the event of a new structure where there are no existing abutments, temporary or permanent bearings can be manufactured using prefabricated elements.

Metallic axes that provide the bridge's continuity, link together the standard 11.4m box girders.

The type of installation is based on the aspects of the bridge site, which determine the bridge's implementation method: height, location of the water, launching means available.

Crane installation

Crane installation involves assembling the principal beams (UNIBRIDGE® box girders) on the ground. With minimal preparation and faster installation, craning is a rapid solution, and can be adapted to the equipment and tools available on-site. The crane then lifts them individually onto their permanent bearings before they are linked together by spacers.


Philippines


Australia


France

Launching

The beams are positioned on frames or rollers, in a straight line along the axis of the gap to be spanned. In the event of a long or wide bridge, lines of beams are launched one after the other.

A launching nose is installed on the leading beam (picture 1). The line of beams are then either pulled into place using a winch, or pushed using an excavator or other common construction machinery (picture 2).

This operation is repeated for each beam. Once they have been placed in their permanent positions, the transversal elements, spacers, decking and guardrails are installed.


1 - Launching nose on the leading beam


2 - Pushing with a power shovel


Papua New Guinea


Philippines


Democratic Republic of the Congo

Two types of deck possible

As well as a metallic or wooden deck, the UNIBRIDGE® is the only modular bridge in the world that can be fitted with a composite (metal-concrete) deck

Classical steel deck

The use of a steel deck with anti-skid coating allows the bridge to be opened to traffic immediately after installation.


New Caledonia

Concrete deck

Once the steel beams are installed by launching or by crane, a lost formwork (galvanized cladding) is installed, the reinforcing bars are then put in place and the concrete is poured directly. The concrete is waterproof-tested and the footways are installed. Lastly, the roadway surface is completed.

The process of concrete pouring, drying and application of roadway surface takes approximately 2 weeks.

This type of structure requires very little tools or equipment, and provides a fast, simple and permanent solution. The UNIBRIDGE® is the only modular bridge system which offers a concrete deck solution.


Haiti

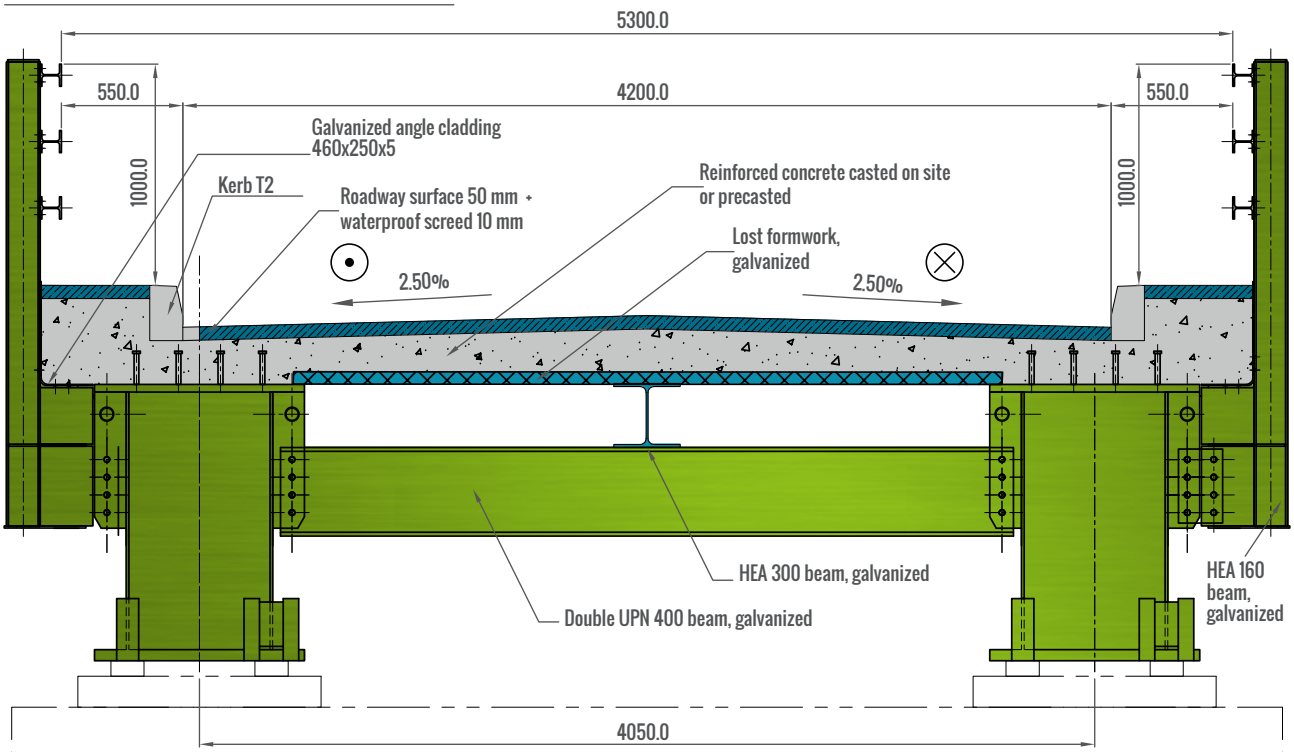

Haiti


Haiti


Philippines


Philippines

Unique composite UNIBRIDGE®



Applications

A permanent bridge, adapted to every situation that can also be temporarily installed, then dismantled and replaced

The UNIBRIDGE® can either be temporary or permanent, and is therefore relevant to many situations (road structures, railway structure, mining works, worksites, natural disasters zones, etc).

It is also adapted to maritime needs and may be used for military operations such as: emergency bridges, access restoration, civil-military operations, humanitarian operations ...

It may be sold or rented for the duration of a worksite or reconstruction.

Road bridge, Haiti

Bridge for rent, Austria

Temporary bridge, France


Flyover, Philippines


Railway structure, Niger


Mining works, Australia


Military bridge, France


Marine structures, Roll on / Roll off, France

An International product

Structures implemented across the 5 continents,demonstrate the versatility and flexibility of this product

To date, UNIBRIDGE® structures have been built in Oceania, South East Asia, Africa, Indian Ocean, Middle East, Caribbean and Central America.


Central African Republic


Philippines


Salvador


Irak


France


Norway


French Guiana


Democratic Republic of the Congo

Australia

Sweden

Sri Lanka


Papua New Guinea


Cameroon


Reunion Island

Austria

Matière®

1, place d'Iéna
75116 PARIS - FRANCE

2, rue Louis Matière - BP 54
15130 ARPAJON S/CÈRE - FRANCE

Tél. +33 (0) 4 71 46 50 00
Fax +33 (0) 4 71 64 63 90

www.matiere.fr
www.unibridge.fr

Creation, concept and layout: Caroline Rampon - caroline.rampon@laptitefabrikdecom.fr - www.laptitefabrikdecom.fr