Invisible connections®

TERWA COUPLER CADDi®

Extending possibilities for reinforcement continuity

About Invisible Connections

Invisible Connections Ltd (based in Oxfordshire) is part of the international Terwa Group and the UK partner of Norwegian company, Invisible Connections AS, long time specialists in ‘unseen’ structural connections for precast concrete elements.

Our team includes engineering and product specialists who are committed to understanding and satisfying the specific needs of all stakeholders, including designers and specifiers.

We directly service the community of precast manufacturers and in situ concrete frame contractors, who often work together in hybrid concrete form. We are in tune with their operational needs, which we satisfy on a daily basis.

We deliver value through our focus on technical and practical support, as well as our product and application innovation. We enjoy long term relationships with many of our customers, who repeatedly work with us as a trusted supplier.

At our Thame factory, we are also specialist manufacturers of the versatile reinforcement continuity systems: FERBOX® and TERWA COUPLER CADDi® to application requirements.

All our products meet industry demands for improved safety, construction efficiency, cost competitiveness and compliance.

“We’ve harnessed our manufacturing expertise and blended two proven, popular products to make installation of reinforcement continuity even quicker and simpler for contractors. Combining multiple Terwa couplers with Invisible Connections’ made-to-measure FERBOX casings means TERWA COUPLER CADDi customers can be assured of continued product quality and reliability, as well as comprehensive technical support and our shared commitment to customer service.”

Edwin Scheeve, CEO, Terwa

Speed. Safety. Strength.

CONSTRUCT MEMBER

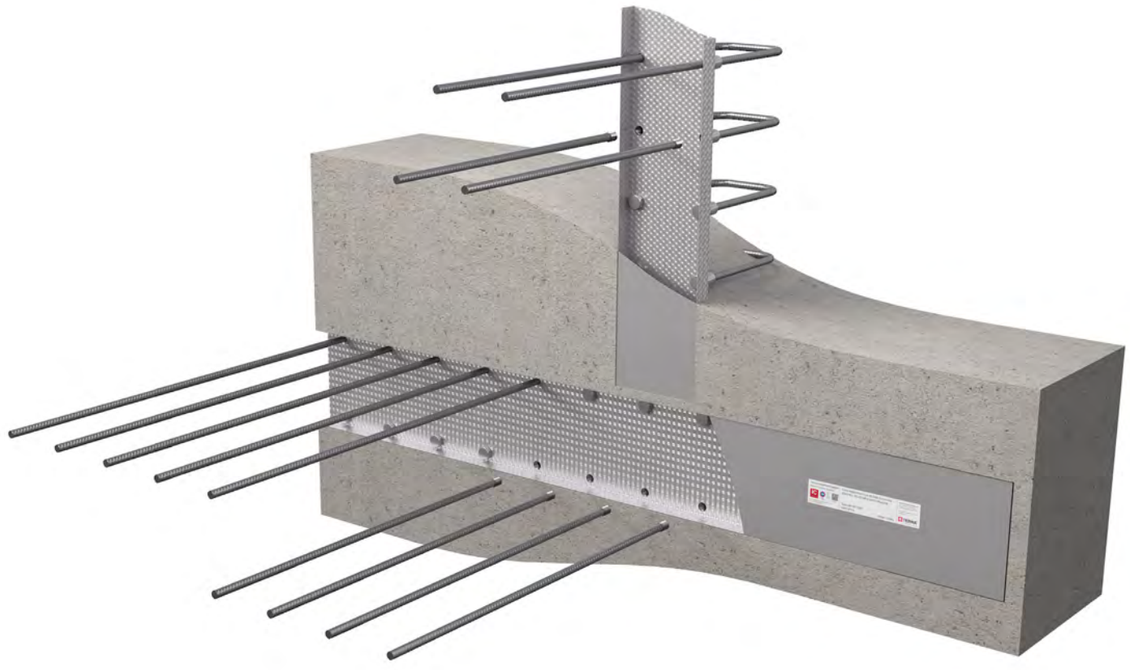
CONCRETE SOCIETY

mpa British Precast Member

TERWA COUPLER CADDi®

Used where engineering design cannot be achieved by traditional reinforcement continuity systems. Multiple couplers in a dimpled casing are made-to-measure and delivered ready for installation.

Once in situ, the case is easily located. No remedial work is required. Enables structural and material efficiencies, as well as improved site safety, for the contractor.

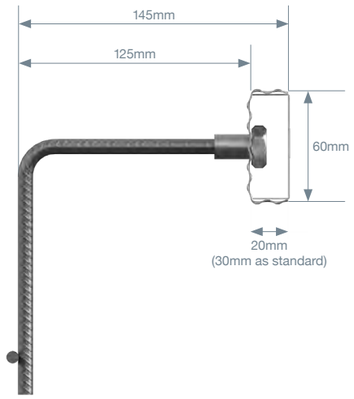


Manufacturing expertise. Engineering options.

Our two different coupler systems enable industry-leading bend dimensions to be achieved.

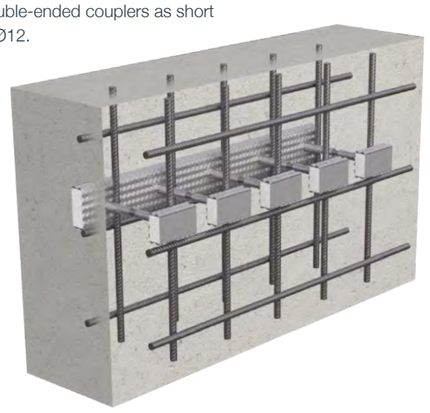
TERWA COUPLER CADDi KB-F

KB-F coupler screwed on to threaded rebar forms our shortest L-bars from 125mm. Ideal for walls as narrow as 175mm.



TERWA COUPLER CADDi PSA

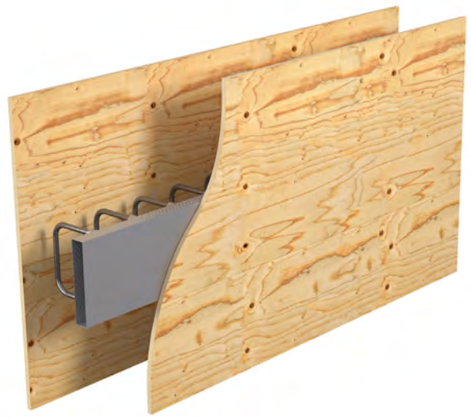
PSA couplers are crimped directly onto rebar enabling double-ended couplers as short as 140mm Ø12.



TERWA COUPLER RiG™

Used where wall width is too narrow to accommodate casing thickness. Stability bar is welded to couplers.

Installing TERWA COUPLER CADDi

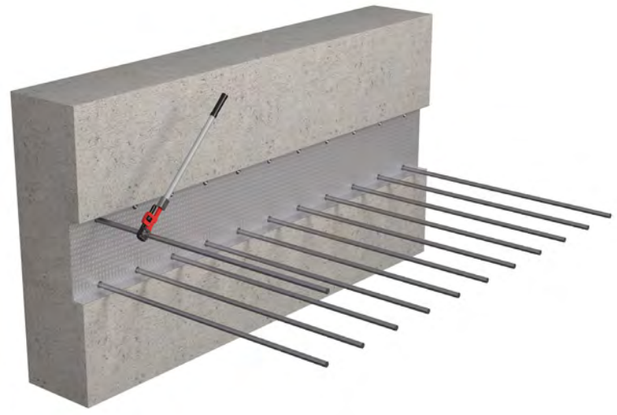


1. Fixing the unit

Once positioned, TERWA COUPLER CADDi is wired back to the main reinforcement cage or nailed to the formwork (wall reinforcement not shown for clarity).

2. Revealing the sockets

After the concrete pour, the case lid is removed for recycling and the hex head set screws are removed for recycling or re-use. Clean coupler sockets are now accessible for onward connection.



3. Forming the connection

Male continuity bars are screwed into the coupler sockets and torque set (see table below), creating a strong connection with the wall. No manual bar bending or remedial works are required.

Torque settings

Reinforcement diameter (mm)	12	16	20	25	32	40
Torque (Nm)	60	80	100	125	160	200

“In a slipform core, having several couplers in a box actually makes it easier and quicker to find. Just take off the lid and the couplers are exposed without any damage.”

Ali Tayfun, Senior Engineer, Keltbray

“There’s no drilling, which of course involves manpower. And every drilling detail comes with resin, which is not cheap. The safety hazard of silica dust is an important consideration. Eliminating all of this gives the contractor a great advantage. and less wastage, definitely.”

Florin Rotariou, Senior Engineer
QA for Slipform, Keltbray

Reliable continuity. Simplified installation.

Description

Purpose-designed to enable rebar to rebar connections wherever concrete elements need to be joined. Typical applications include providing reinforcement continuity in slab-to-wall connections, lining walls, and joining slabs or walls to capping beams.

- Quicker and simpler to install than individual couplers.
- Suitable for all concrete construction techniques, especially slipform, jumpform, traditional formwork and capping beams.
- CARES certification for coupler systems, TFS/KB-F and PSA-TFSL.

Features

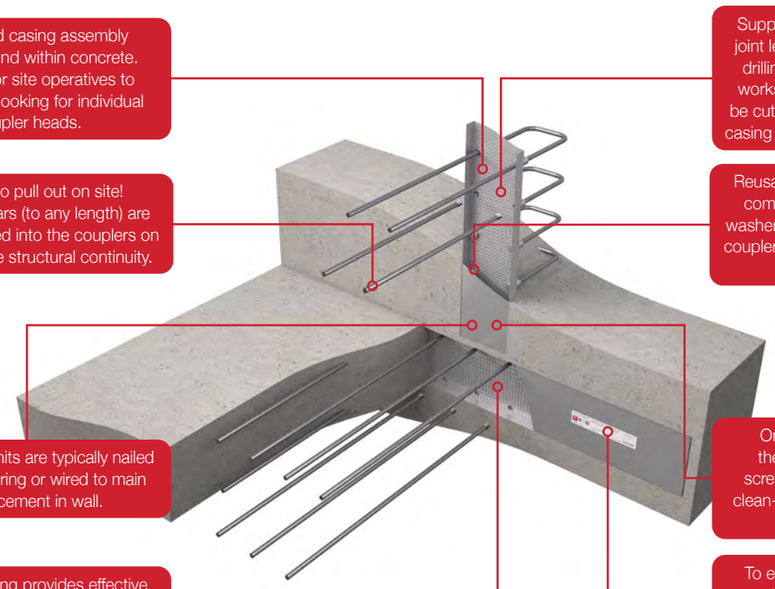
- Bespoke manufactured to a wide variety of shapes, diameters and bar centres enabling engineering design to be achieved for applications outside the scope of pull-out bar continuity systems.
- Made-to-measure reduces material usage and wastage (as well as cost to the contractor) and minimises embodied carbon.
- Two versions available, providing greater freedom for engineering design.

The sealed casing assembly is easily found within concrete. No need for site operatives to spend time looking for individual coupler heads.

No bars to pull out on site! Continuity bars (to any length) are simply screwed into the couplers on site, to create structural continuity.

Lightweight units are typically nailed to the shuttering or wired to main reinforcement in wall.

Dimpled casing provides effective shear key in the concrete, eliminating scabbling at the joint interface.



Supplied and configured to suit joint lengths, eliminating cutting, drilling and other remedial site works. If necessary, cases may be cut on site between bars, with casing stop-ends easily reinstated.

Reusable hex head set screws, combined with compressible washers, comprehensively secure coupler bars to casing, resulting in a flush finish.

Once element is poured, the casing lid and hex set screws are removed to reveal clean-thread coupler sockets for onward connection.

To ensure correct placement, weatherproof and tear-resistant labelling informs application location and provides product traceability.

CARES 250903 UKAS PRODUCT CERTIFICATION 0002 Validate with the CARES Cloud App

“Where pull-out bars can’t, TERWA COUPLER CADDi can.”

Martin Garrett, Product Manager, Reinforcement Couplers, Invisible Connections Ltd

Speed. Safety. Strength.

TERWA COUPLER CADDi is a natural extension to reinforcement continuity strip. Our innovative system enables rebar to rebar connections and is ideal where engineering design cannot be achieved by traditional reinforcement continuity methods; for instance, where larger diameters are required, cover restraints are present, second stage bar lengths are too long or simply where pull-out units would become too large and bulky.

Satisfies engineering design intent

Overcoming the usual limitations of reinforcement continuity systems, TERWA COUPLER CADDi can be fabricated in a much greater variety of shapes, bar centres and bar diameters. Engineering design freedom is enabled; strength of structural continuity is assured.

Ease, speed and efficiencies on site

Faster than fixing coupler bars individually, multiple couplers in a coupler box allows several bars to be placed in one go, reducing labour costs and installation time; ideal for tight slipform and jumpform programmes, especially since the casing is sufficiently robust to minimise potential dragging issues. The distinctive casing provides a concrete key and aids locating couplers for second stage of connection.

Improves site safety

Being manufactured and configured to suit individual construction joint lengths means that remedial works on site, such as cutting and drilling are unnecessary. Manual bar bending is eliminated, and there’s no protruding rebar to navigate. All of which improves site health and safety.

Technical compliance

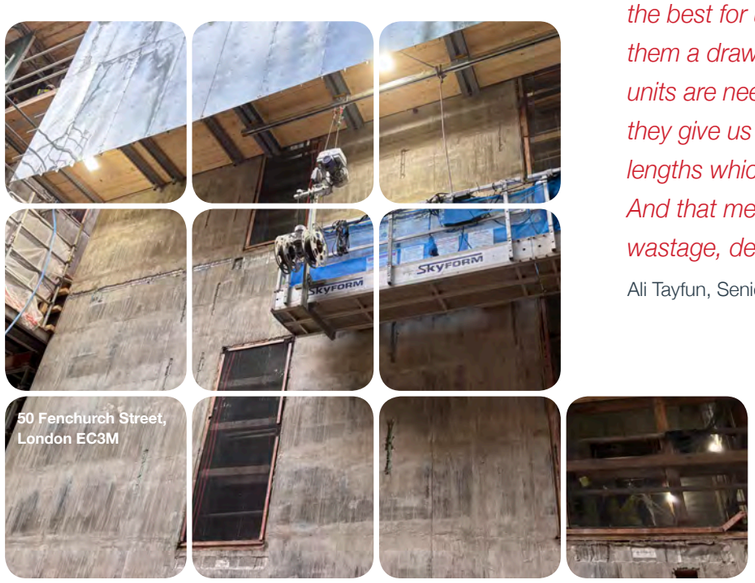
Terwa couplers are CARES approved; PSA couplers to TA1-B and KB-F couplers to TA1-A&B. Product quality, performance and safety is assured.

Comprehensive solution

When choosing Invisible Connections, contractors benefit from a ‘one-stop shop’ for all their reinforcement continuity requirements; one point of contact for technical support, scheduling, plus the advantage of simultaneous deliveries which sync with the project programme, and each product location-labelled to aid ease of installation. Compatible by design, and manufactured to application, means contractors can be assured TERWA COUPLER CADDi and FERBOX will integrate seamlessly on site.

Sustainability

Since TERWA COUPLER CADDi is fabricated to application requirements, material usage and wastage (and associated costs for the contractor) are reduced (compared to stock lengths). As a result, embodied carbon and environmental impact are minimised.



“Invisible Connections are really approachable. They listen and try to provide the best for us. We’re rushing and we give them a drawing. They work out how many units are needed, what centres are needed, they give us practical and manoeuvrable lengths which we can actually work with. And that means more efficiency and less wastage, definitely.”

Ali Tayfun, Senior Engineer, Keltbray

Project profile

Project: 50 Fenchurch Street, EC3M

Project description
Due for completion in 2028, 50 Fenchurch Street will be one of the lowest-carbon and most sustainable high-rise buildings in the capital. A new iconic landmark for the City of London, the scheme includes a 37-storey tower accommodating over 62,000 sqm of flexible office space arranged around a central core.

Our role
External connections throughout the core utilise TERWA COUPLER CADDi cast into the slipform walls, to provide reinforcement continuity for lower floors and precast planks in the superstructure. Inside the core, TERWA COUPLER CADDi (and FERBOX) provide reinforcement continuity for in situ slabs in the lobbies, full landings, tank walls and lift pits.

Since September 2025, we've supplied site with TERWA COUPLER CADDi (and FERBOX) and continue to support Keltbray with ongoing requisitions. Working closely with project engineers and site personnel to manufacture made-to-measure reinforcement continuity within a typical lead time of 4-5 working days has ensured delivery in sync with the project programme, contributing to a construction rate of 5 floors per 3 weeks and also to the project's sustainability limits for material usage and wastage.

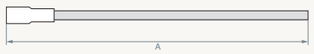
The team
Architect: Eric Parry Architects
Lead Engineering Consultant: Arup
Main Contractor: Multiplex
Specialist Contractor: Keltbray

Shape codes and minimum dimensions

PSA (swaged on coupler)

Any of the following PSA bar shapes can be supplied in bar diameters 12mm to 25mm. Any bar centres (mm) can be fabricated. Our most popular shapes are shown below; other shapes are available on request. Select the required bar shape configuration, then complete the Scheduling Form on page 12, or download from invisibleconnections.co.uk.

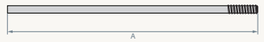
Standard shapes



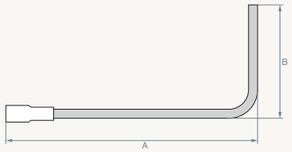
00 PSA-F

00 PSA-F/F

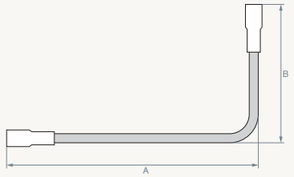
00 PSA-F/TFSL-M



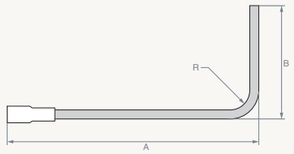
00 TFSL-M



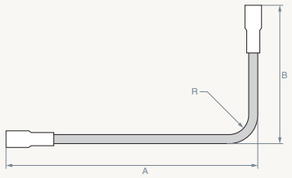
11 PSA-F



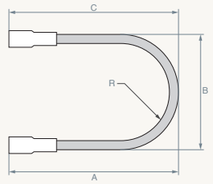
11 PSA-F/F



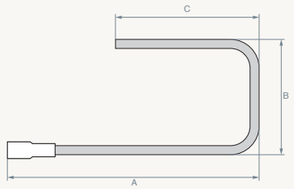
12 PSA-F



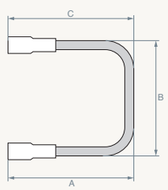
12 PSA-F/F



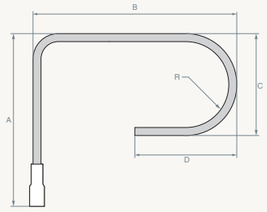
13 PSA-F/F



21 PSA-F

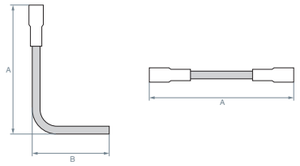


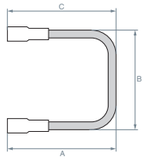
21 PSA-F/F

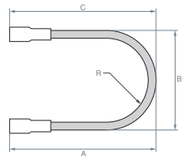


22 PSA-F

Minimum bends







Rebar dia.	L bar: min dim (A)	Double-ended: min dim (A)	Double-ended SC 21 min dim		Double-ended SC 13 min dim	
			A/C	B	A/C	B
12	110	140	110	140	170	80
16	160	190	160	150	190	105
20	220	225	220	290	250	190
25	260	275	260	320	350	240

All dimensions are in mm. Note: The thickness of the coupler box (normally 30mm) must be allowed for when detailing rebar dimensions.

KB-F (screwed on coupler)

Any of the following KB-F bar shapes can be supplied in bar diameters 12mm to 40mm. Any bar centres (mm) can be fabricated. Our most popular shapes are shown below; other shapes are available on request. Select the required bar shape configuration, then complete the Scheduling Form on page 12, or download from invisibleconnections.co.uk.

Standard shapes

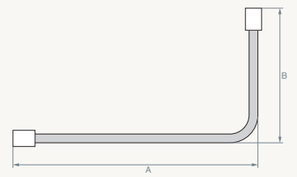
00 KBF-F

00 KBF-F/F

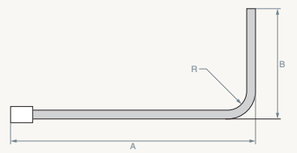
00 KBF-F/TFS-M

00 TFS-M

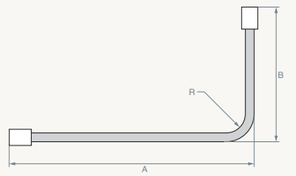
11 KBF-F



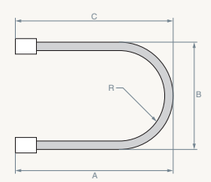
11 KBF-F/F



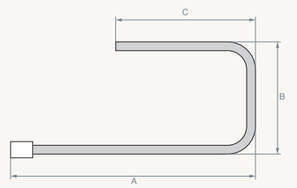
12 KBF-F



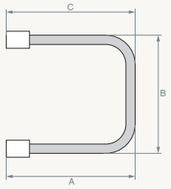
12 KBF-F/F



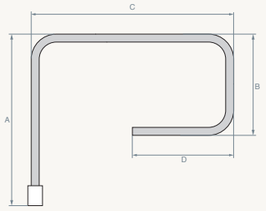
13 KBF-F/F



21 KBF-F

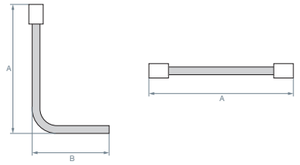


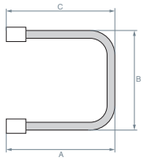
21 KBF-F/F

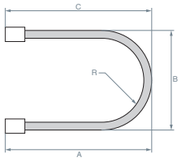


22 KBF-F

Minimum bends







Rebar dia.	L bar: min dim (A)	Double-ended: min dim (A)	Double-ended SC 21 min dim		Double-ended SC 13 min dim	
			A/C	B	A/C	B
12	100	580	120^{1} / 240^{2a}	400^{1a} / 140^{2}	260^{1} / 200^{2a}	80^{1a} / 190^{2}
16	125	590	125^{1} / 250^{2a}	375^{1a} / 150^{2}	250^{1} / 200^{2a}	105^{1a} / 200^{2}
20	180	600	170	290	250	190
25	210	610	210	320	350	240
32 / 40	Upon request					

All dimensions are in mm. Note: The thickness of the coupler box (normally 30mm) must be allowed for when detailing rebar dimensions.
If A/C^{1} is the dominant minimum requirement, then $B1^{a}$ is the minimum consequential result.
If B^{2} is the dominant minimum requirement, then $A/C2^{a}$ is the minimum consequential result.

Scheduling Form

TERWA COUPLER CADDi® PSA and KB-F (all shape options)

Please complete this form and email to sales@invisibleconnections.co.uk

Name ..... Contractor ..... Date .....

Phone ..... Project ..... Drawing no.(s) .....

Email ..... Site address ..... Schedule reference ..... Rev. no. .....

Line Ref.	Structural Member Name	Location	Bar Mark	Shape Code	Dia.	Lm.	No. of Mbr.	Bars Each	Bars Total	Bar Centres (mm)	Unit Length (mm)	Bending Dimensions (mm) A	B	C	Connection (L)
e.g.	WALL W6	INTERNAL	111	21	B16	30	25	6	150	200	1200	175	220	--	--
A															
B															
C															
D															
E															
F															
G															
H															
I															
J															
K															
L															
M															

Notes: A, B & C dimensions will be bent in accordance with BS8666:2020. The thickness of the coupler box (normally 30mm) must be allowed for when detailing rebar dimensions.

For technical and practical advice call +44 (0)1844 266000

Validate with the CARES Cloud App

CARES 250903

Invisible connections®

ICL/CC/SF/ALLSHAPES/01/0526

Quality, reliability and efficiency, built in.

Our product range continuously evolves to meet our customers' construction challenges, and TERWA COUPLER CADDi was developed in response to customer requests for a solution which satisfies scenarios outside the scope of traditional pull-out bars.

Extending the possibilities for reinforcement continuity systems

As specialist manufacturers of FERBOX bespoke reinforcement continuity system, we know FERBOX will often meet engineering design requirements. However, on occasion, geometric constraints mean contractors need an alternative solution. For example, if particularly long lap lengths are needed, then threaded couplers overcome pull-out bars having to 'nest' within the limits of casing dimensions. Likewise, where larger diameters are required than typical 16mm bars, threaded couplers can be fabricated to a much greater range including 20, 25, 32 and 40mm diameters.

"Instead of the plastic cap typically used on individual couplers, the metal hex screw protects the coupler and thread and keeps the sockets clean for onward connection. There's much less wastage, there's no offcuts, the only thing discarded is the metal face of the box, which is recycled, plus we won't return redundant pallets of stock to the yard at the end of the job."

Laurence Willson, Engineer, Keltbray

Designed to make contractors' lives easier

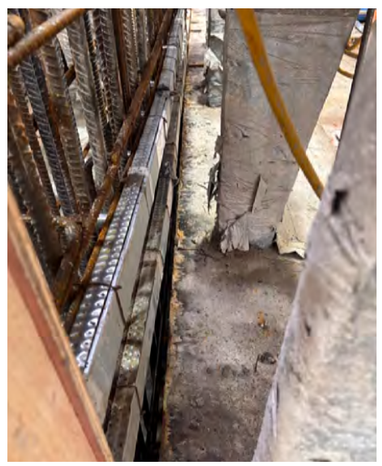
All our products are designed to meet and exceed the highest industry demands for improved safety and construction efficiency, whilst reducing material usage and ensuring cost competitiveness.

From FERBOX bespoke continuity system to Telescopic Connectors for concrete stair landings and structural frames, the following pages provide a brief overview of Invisible Connections' product range - and the benefits for contractors.

Speed. Safety. Strength.

(Top left) TERWA COUPLER CADDi wired back to the main reinforcement cage before concrete pour.

(Top right) Case lid and hex head set screws removed after concrete pour, leaving clean coupler sockets accessible for onward connection.



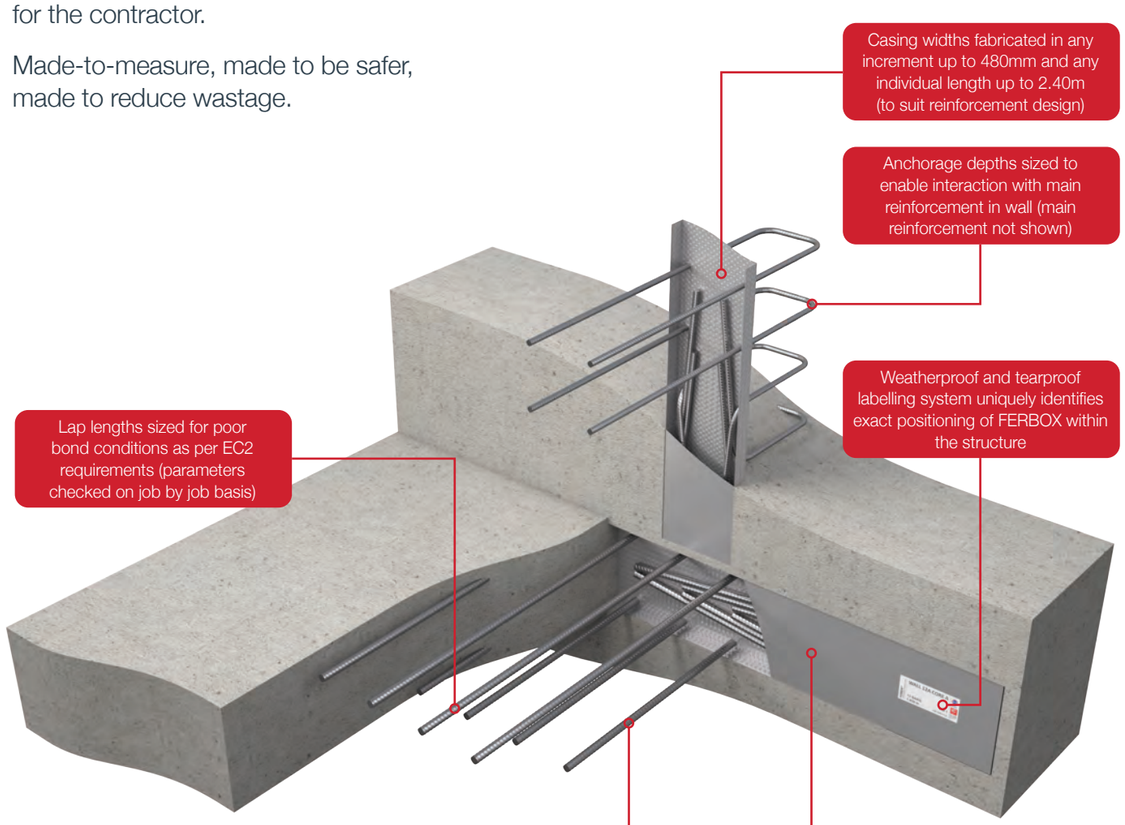
(Above and left) TERWA COUPLER CADDi in position, just ahead of the slipform.

Pull-out Reinforcement Continuity System

FERBOX®

Maintains structural continuity across construction joints in reinforced concrete structures. Manufactured to application specific dimensions and delivered ready for installation means no cutting or remedial work on site is required, enabling structural and material efficiencies for the contractor.

Made-to-measure, made to be safer, made to reduce wastage.



Read our 'FERBOX Comparison Study' to find out why bespoke reinforcement continuity strip is safer, more efficient and more cost-effective than off-the-shelf alternatives.

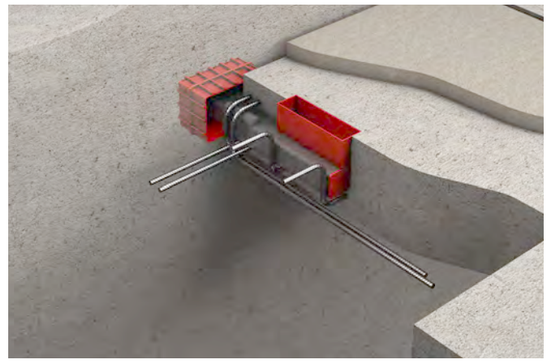
Precast Concrete Connections

RVK and TSS Precast Stair Landing Connectors

Primarily intended to provide a hidden means of support for precast stairs and landings off core walls. An elegant and efficient alternative to traditional rolled steel angles or corbels.

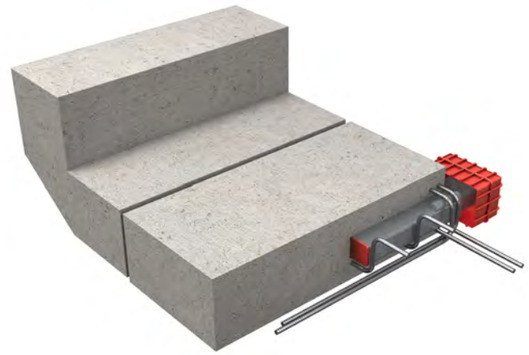
RVK Stair Landing Connectors

The contractors' choice for easiest site deployment due to popular bolt ejection method. The RVK is perfect for landings that are screeded to level, or which have other floor coverings.



TSS Stair Landing Connectors

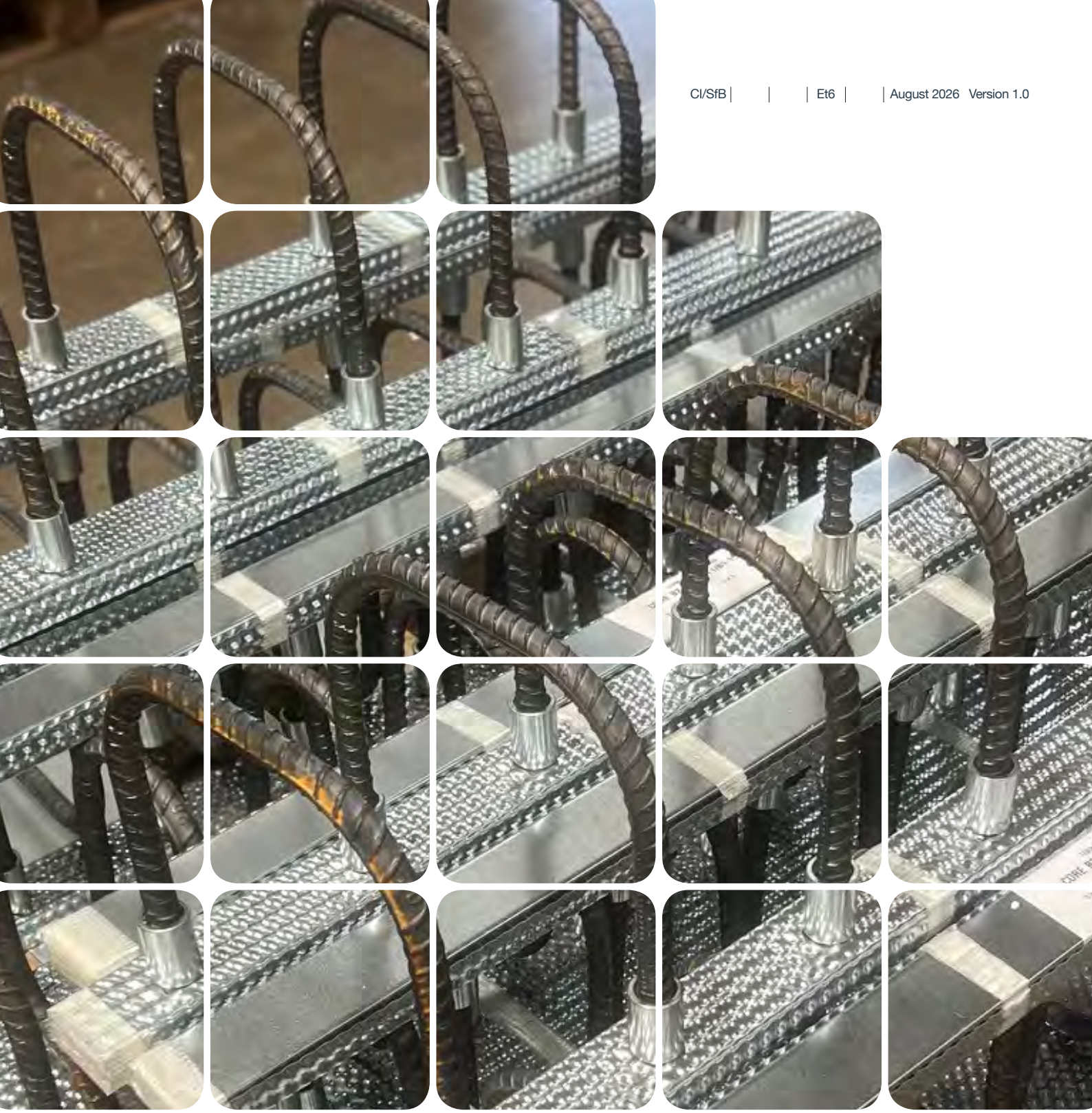
The ultimate invisible connection for precast concrete stair landings. Cord operated TSS connectors leave no blemish on the landing surface and are ideal for uncovered 'as struck' or fair-faced concrete.



REDiBOX® Concrete Wall Recess Formers

Purpose-designed 'left-in' components to simply and efficiently form recesses in precast or in situ concrete walls, avoiding the traditional need to 'dig out' polystyrene or timber formers. Fully sealed and sized to accommodate RVK and TSS telescopic connectors prior to receiving cementitious grout-fill.

RVK and TSS stair landing connectors enable robustness requirements of PD 6687-1:2020 to be met. Different layouts according to stair landing configuration are possible. Choose the appropriate connector by layout option at invisibleconnections.co.uk/product/tss-rvk-telescopic-stair-connectors.



Invisible Connections Ltd
Unit 6, Thame Forty
Jane Morbey Road
Thame, Oxfordshire OX9 3RR

+44 (0)1844 266000
info@invisibleconnections.co.uk
invisibleconnections.co.uk

Invisible connections®

TERWA®
strong in simple solutions