



Product Info

ICL/FER/RCS/C-LINK/0220

# FERBOX® Reinforcement Continuity System

## Closed link bar shapes: information and guidance

### Product

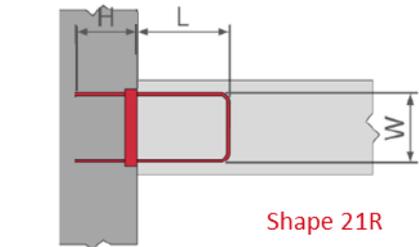
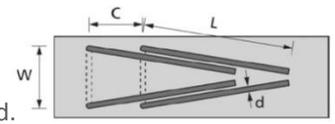
FERBOX® Bespoke Reinforcement Continuity System

### Closed link bar shapes:

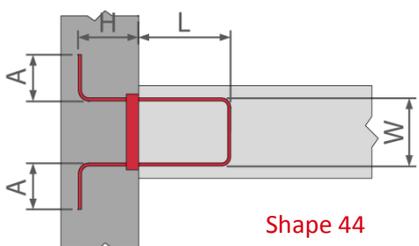
### Introduction

This guidance document has been prepared in response to regular queries regarding the manufacturing parameters of closed link bar configurations. We also address the practicalities of their usage, including the on-site challenges faced in bending out these bars.

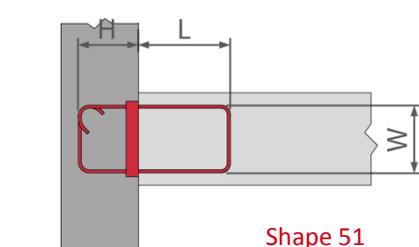
As with all bar shapes, consideration must be given to how the pull-out bars will 'nest' within the casing during manufacturing assembly. A twin leg arrangement can accommodate both bars folded inwardly toward the centre of the case (see sketch to right), whereas a closed link arrangement presents a greater challenge, with a far more restricted method of assembly required.



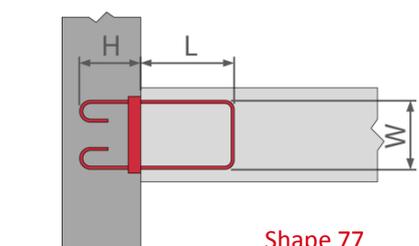
Shape 21R



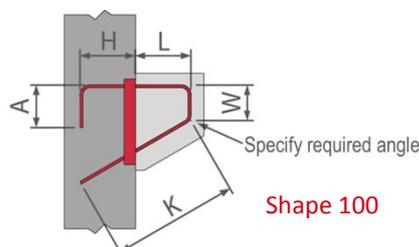
Shape 44



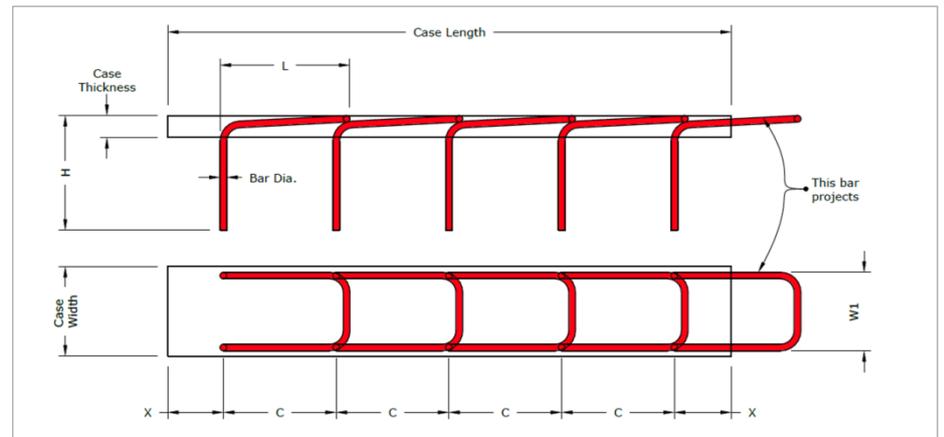
Shape 51



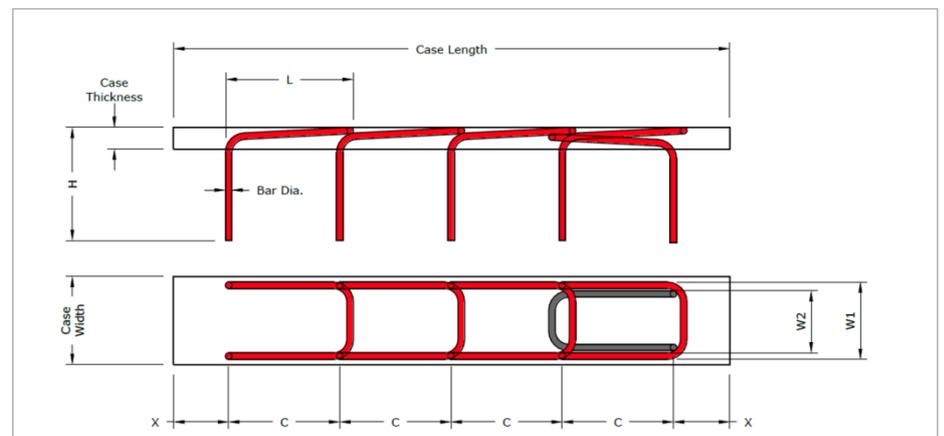
Shape 77



Shape 100



Option A - Last bar extends beyond end of casing



Option B - Last bar returns back into casing

Where the pull-out length 'L' is greater than the spacing 'C' between each bar, there is a need to 'overlay' one bar onto the next. The extent to which this is possible will vary. For 12mm diameter bars 'L' may be between 150-200mm greater than 'C'. For 16mm diameter bars 'L' may be 50-80mm greater than 'C'. To achieve these dimensions the casing depth (thickness) must be 50mm.

Also to consider; the 'problem' last bar. This can be extended beyond the end of the casing (Option A), or returned back into the casing (Option B). Any projecting bar (Option A) is likely to cause issues when abutting cases on site, or with 'breaking out' if buried in concrete. Returning the last bar (Option B) is achieved by reducing the width (W1) sufficient that it will pass, and lay inside, the previous/adjacent bar. As a manufacturer we prefer Option B, as it allows us to fully seal the end of the casing, mitigating the risk of concrete ingress. However, the customer should consider the misalignment of this bar, which can upset the threading through of longitudinal reinforcement, if required.



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# FERBOX® Reinforcement Continuity System

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### Product

FERBOX® Bespoke Reinforcement Continuity System

### Link bar straightening tool



### About Invisible Connections

Invisible Connections is the registered trademark of Invisible Connections AS, the Norwegian developer of telescopic connection systems used worldwide.

The ETA approved connectors solve two key construction applications; 'invisible' connections for precast staircase construction and 'invisible' connections for precast beam construction.

To enhance its offering to the UK market, Invisible Connections Ltd also supplies the CARES approved FERBOX reinforcement continuity system, which is bespoke manufactured for in situ concrete connections.

Our products appeal to precast concrete manufacturers and in situ concrete frame contractors who appreciate the fuss free ease with which precast or in situ elements can be connected.

### Invisible Connections Ltd

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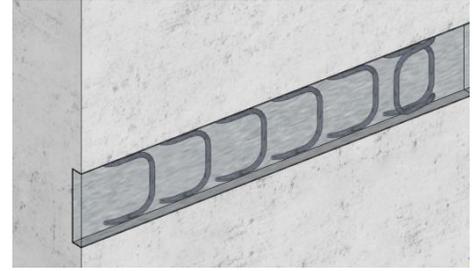
[invisibleconnections.co.uk](http://invisibleconnections.co.uk)

Once the bar configuration is agreed, manufactured and installed, attention is then focused on the practicalities of straightening the bars.

Unlike a traditional pull-out leg, which is straightened using our original FERBOX bending tool, a closed link bar cannot be approached in the same way.

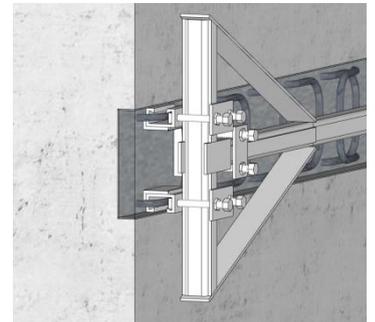
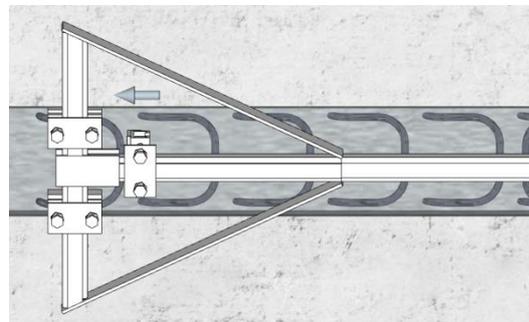
Having considered the physical on-site difficulties, in particular with 16mm diameter variants, we recognised the need for a viable method of performing the re-bending task, in a safe and controlled manner.

As a result, Invisible Connections developed a tool which we believe offers our customers a viable solution.



*Note: required casing edge distance to bars 20mm (usually 10mm) to allow tool access*

Designed with adjustable sliding 'jaws' and adapted to fit varying widths of bar, the tool is secured in position with bolts and locking nuts (finger tight). Although efficient, the process takes time and requires two persons.



*Manoeuvre the tool so the jaws are in close proximity to the bend in the reinforcement*

Pulling the end of the tool outwards straightens the reinforcement perpendicular to the concrete (through approximately 90 degrees). A consistent and uniform bend can now be safely achieved on every bar.

For technical and practical advice call

**+44 (0)1844 266000**