Ancon Shearfix Punching Shear Reinforcement – Guidance for Completion of BS EN 1992 (EC2) Design Sheet

Design Software

Ancon Shearfix design software is available to download free from **www.ancon.co.uk**. The software will check your application for punching shear requirement and provide details of any required Shearfix rails including a DXF file detailing the arrangement and a parts list to ease ordering.

We are pleased to offer an Ancon punching shear reinforcement design service. To ensure we receive all necessary design information we require the design information for each column to be compiled. Unfortunately we are unable to offer an Ancon Shearfix design service based upon drawings; the design sheet on the following page has been developed for the transfer of this information. Following receipt of the design information for each application you would like us to consider, calculation sheets, dxf files and parts lists will be returned to you detailing the required Shearfix rails.

Number of Columns

If an accurate parts list is required, please specify the number of each column type under "Your Column Reference", eg. 10 No. A5. Otherwise, just specify the column reference.

Loads

For each column type the following options are available for specifying loads:

- Specify design shear load, V_{Ed}, and design moments, $M_{Ed,y}$ and $M_{Ed,z}$
- Specify design shear load, V_{Ed}, and pre-determined eccentricity factor, β
- Specify design shear load, V_{Ed}, and application of the default eccentricity factor, β, in accordance with EC2, 6.4.3(6) as follows:

Column location	Default eccentricity factor, β
Interior	1.15
Edge or Wall End	1.4
Corner or Wall Corner	1.5
Re-entrant Corner	n/a

Direction of Moments
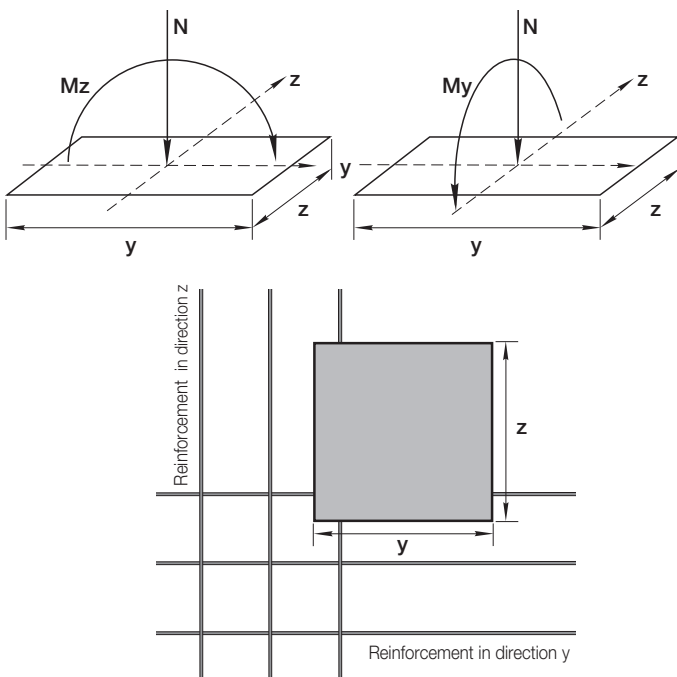
Reinforcement

Up to two layers of tensile reinforcement can be specified. If applicable, please specify each layer on a separate row.

Slab Depth

The software can accommodate a step in slab level within the width of the column. If this is applicable to your design, please provide details separately – including the orientation and position of the step relative to the column dimensions and the slab depths either side of the step.

Rail Layout

We provide solutions in 30° radial, 45° radial and cruciform layouts. Cruciform layouts are only applicable to rectangular shaped columns. Please remember to indicate your preference on the design sheet. In the absence of this information we will provide what we consider to be the best / most economical solution for each case.

Stud Diameter

Shear studs are available in the following sizes: 10/12/16/20/25. If you require a specific stud diameter, please specify. Otherwise the optimum size will be provided.

Distance to First Stud

Ancon Shearfix can be provided with a distance to the first stud of 0.3d or 0.5d. 0.5d is recommended and used as default. Please specify if you have a preference.

Large and Elongated Columns

We offer two approaches for the design of large and elongated columns: Best Practice which is recommended and applied as default (that includes the latest industry thinking on shear rail design) or EC2. For a full explanation of these two approaches please refer to the Ancon Shearfix technical brochure.

Distribution Rails

If Best Practice is selected, it is possible to include or exclude distribution rails which are placed along the sides of large or elongated columns. If they are excluded, it is recommended that the beam shear applied to column sides is checked independently.

For further detailed information a Shearfix Design Manual is available on request.

Note: Directions of moments follow the right hand rule and are illustrated above. Moments should be specified about the column centre.

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Ancon Shearfix Punching Shear Reinforcement to BS EN 1992 (EC2) - Design Information

Please refer to the additional guidance sheet before completing this form.

Project name. . . . .

Project address. . . . .

. . . .

Date . . . .

Contact name . . . .

Company . . . .

Tel. . . . .

Email . . . .

Slab depth . . . . mm
(for stepped slabs, please provide details)

Concrete strength C . . . . . . /. . . . .

Distance to first stud   0.3d ☐   0.5d ☐
(default is 0.5d)

Concrete cover top . . . . mm

Concrete cover bottom . . . . mm

Large and Elongated Columns

EC2 ☐

Best Practice ☐   Distribution Rails   Yes ☐   No ☐

Note: Refer to supplementary sheet for information on specification o f moments or eccentricity factor, β
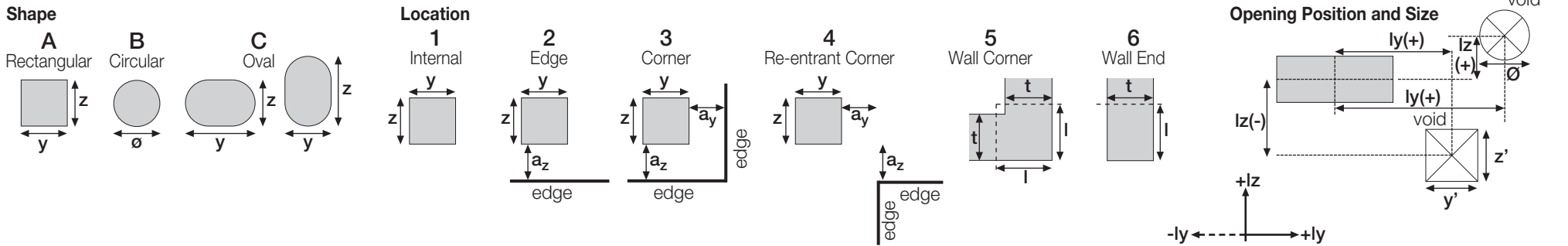
Rail Layout (tick one)

Best solution per column ☐   30º Radial ☐   45º Radial ☐

Cruciform ☐
(rectangular columns only)

Your Column Reference	Column Type (Shape and location eg. B3)	Column Dimension (mm) $y \times z$ or $l \times t$		Edge Distance (mm)		V_{Ed} (kN) Ultimate Load ULS	Moments* kNm (OR)		Eccentricity factor, β	Reinforcement in direction y		Reinforcement in direction z		Openings (mm) Size			Position	
				a_y	a_z		Mz	My		bar Ø	spacing	bar Ø	spacing	y'	z'	Ø	ly (+/-)	lz (+/-)

* Mz moments act in the columns y direction. Positive moments act towards slab edges. Please refer to the guidance sheet for more information. If left blank, default β factors will be applied.

Shape

A Rectangular   B Circular   C Oval

Location

1 Internal   2 Edge   3 Corner   4 Re-entrant Corner   5 Wall Corner   6 Wall End

Opening Position and Size

Email to reinforcement.uk@leviat.com
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Tel: +44 (0) 114 275 5224, Web: Ancon.co.uk | Leviat.com

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