

MetMezz[®]



MEZZANINE TECHNICAL MANUAL



Construction Metal Forming

Version 1.3 | 08/23



Construction Metal Forming Limited (CMF) was established in 2005, operating out of a state-of-the-art manufacturing facility located in South Wales.



The facility was designed to include three dedicated production lines for the manufacture of **MetFloor** metal decking. Due to its success, **CMF** expanded in 2015 by adding the UK's only Shear Stud manufacturing production line, leading to the development of the **Composite Shear Connector (CSC)**.

In addition, **CMF** procured a fully CNC roll forming line which has a capacity to roll sections up to 500mm deep and in gauges from 1.2 to 3.5mm thick. This allowed **CMF** to develop the **MetPurl** purlin system which offers the largest range available in the UK. The **MetPurl** system has been fully tested by the Building Research establishment (BRE) and ratified by the Steel Construction Institute (SCI).

In recent years, **CMF** has undergone significant expansion and investment including a second manufacturing facility, specifically for our **MetPurl** and **MetMezz** product ranges. This allows for increased production capacity and improved efficiency. Additionally, the company has purchased another state-of-the-art roll forming Bradbury line, along with a Samesor line, designed for smaller / lighter sections.

With this investment, **CMF** can now produce a range from 0.7mm up to 4.0mm thus bolstering the variety of sections on offer. **CMF** has enhanced its product offerings and improved its manufacturing capabilities, positioning the company as a leader in the metal forming industry.

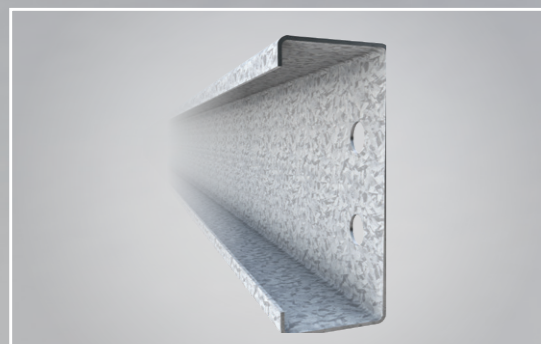
CMF offer a fully comprehensive Mezzanine flooring system.

Our sections have been fully tested at the Building Research Establishment (BRE) and ratified by the Steel Construction Institute (SCI). Industry Members of the British Construction Steel Association (BCSA).



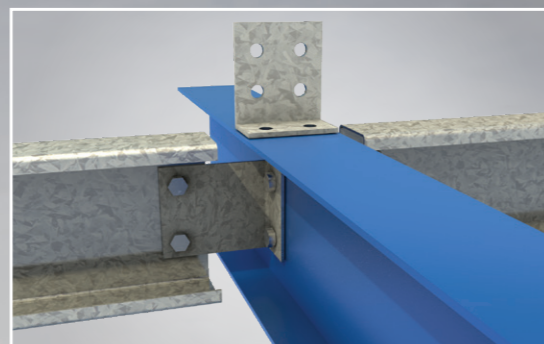
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MEZZANINE SYSTEM

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M-SECTION JOISTS

The configurations below represent the hole arrangements for the mezzanine floor joists. Our standard hole details are as follows:

All holes 18mm diameter to suit M16 (grade 8.8) bolt complete with washer under head and nut. All incoming accessories to be 18mm diameter. Seek advice from CMF for 14mm diameter alternative.

M123 SERIES



M143 SERIES



M173 SERIES



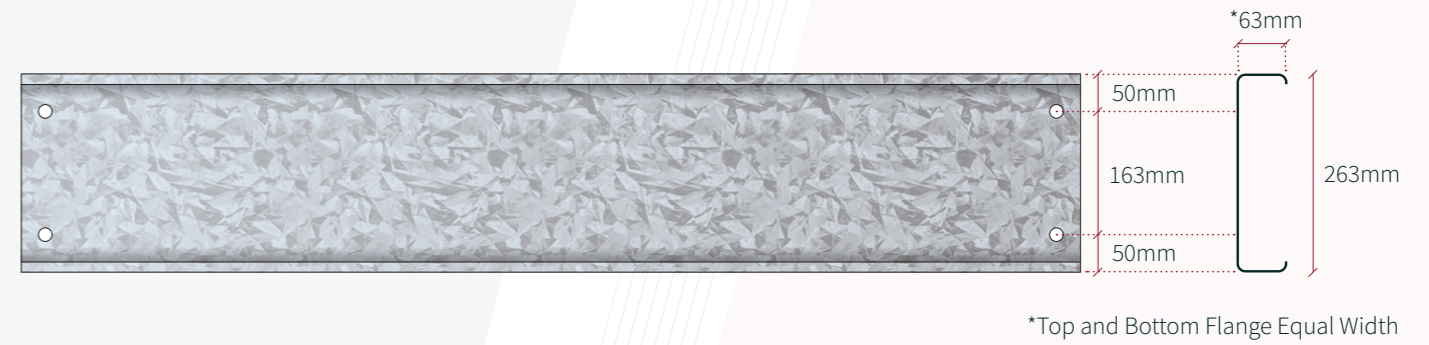
M203 SERIES



M233 SERIES



M263 SERIES



M303 SERIES

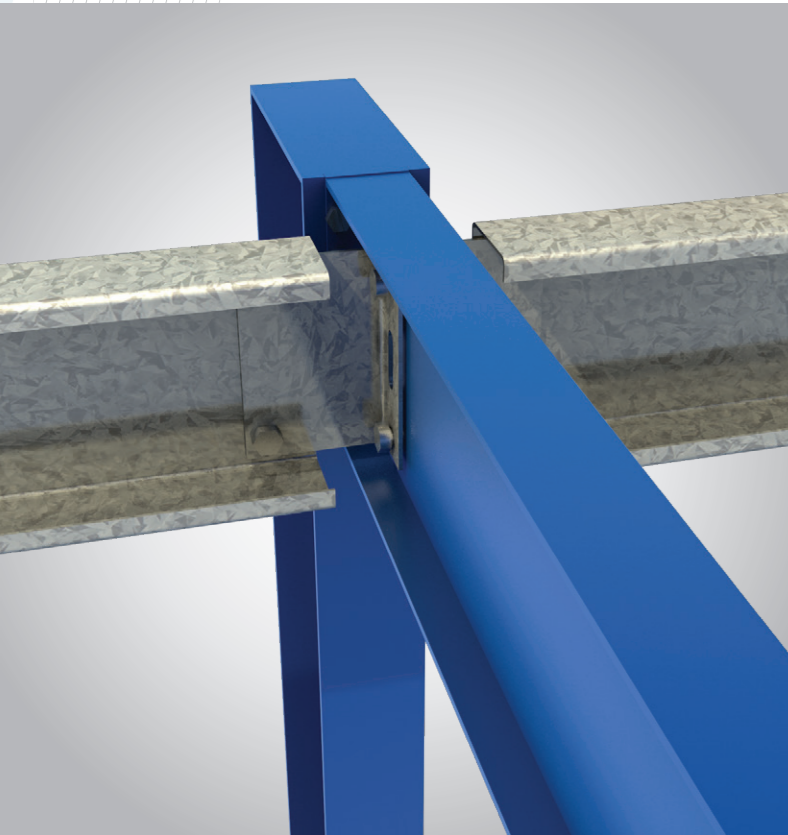


M353 SERIES



M403 SERIES





Infill systems are typically used to maximise headroom by keeping the cold formed section within the depth of the hot rolled steel floor. Typical infill system layout below shows hole configurations around the connection.

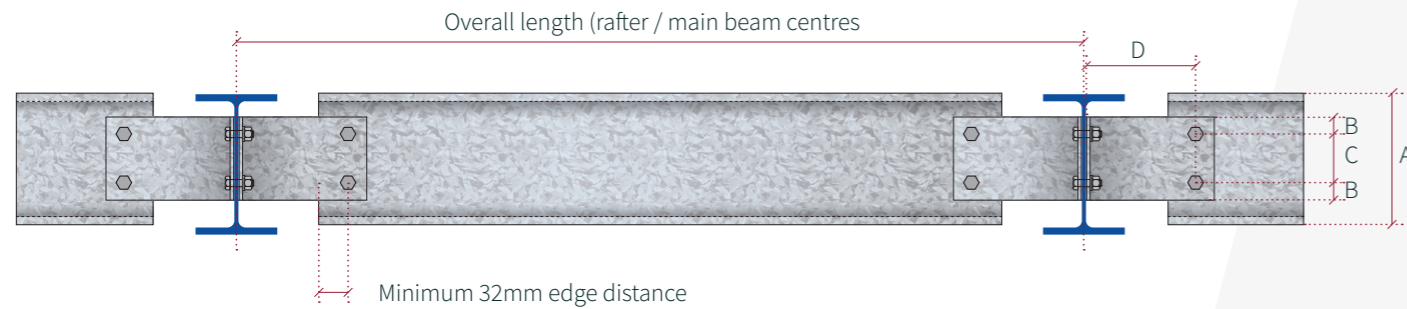
Our standard holes sizes are:

- 18mm diameter to suit M16 (grade 8.8) bolt complete with washer under head and nut.

Seek advice from CMF for 14mm diameter alternative.

Infill system (mm)									
A	123	143	173	203	233	263	303	353	403
B	19	19	22	22	22	22	25	25	25
C	53	53	73	103	133	163	150	200	250
D	120	120	120	120	120	120	150	150	150

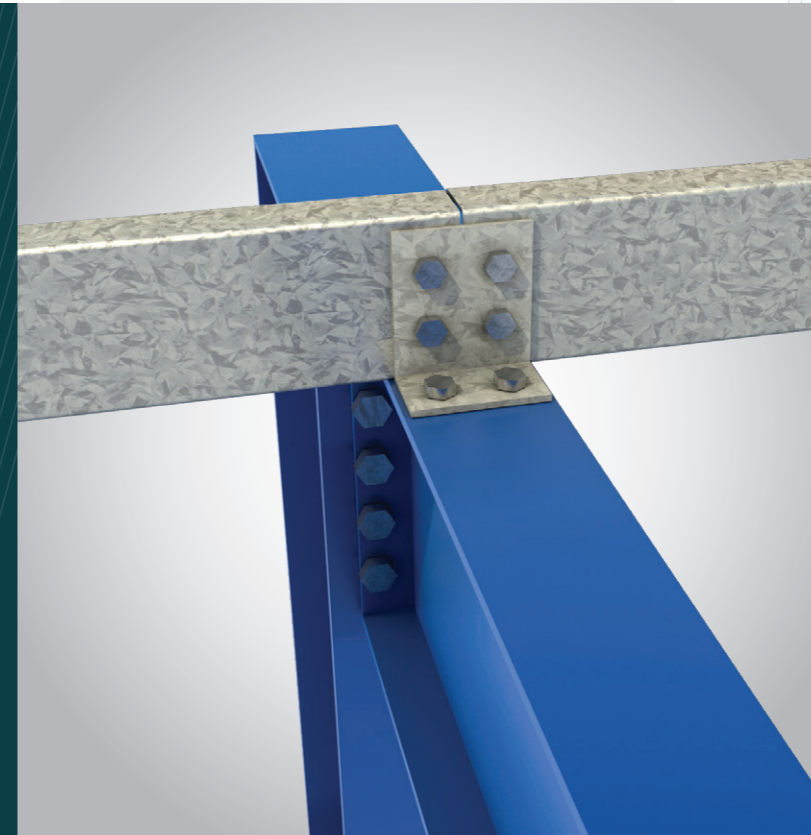
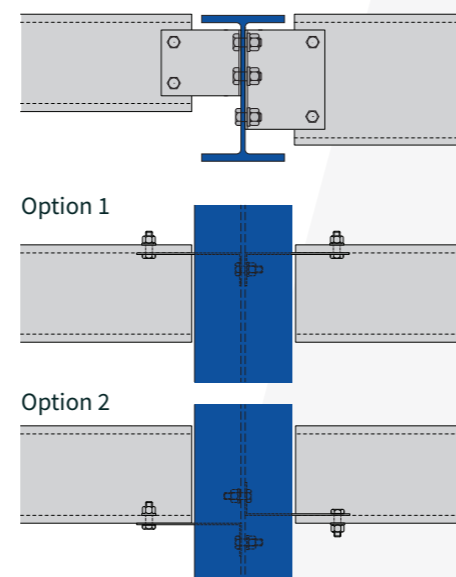
Infill layout



Permissible combinations

Option 1 - Utilising Multi Hole Cleats

	123	143	173	203	233	263	303	353	403
123	Y								
143		Y							
173			Y		Y				
203				Y		Y			
233			Y		Y				
263				Y		Y			
303							Y	Y	Y
353							Y	Y	Y
403							Y	Y	Y



Oversail systems are typically used where no headroom restrictions apply. Double span system halves the erectable piece count and reduces the onsite programme. Typical oversail system layout below shows hole configurations around the connection.

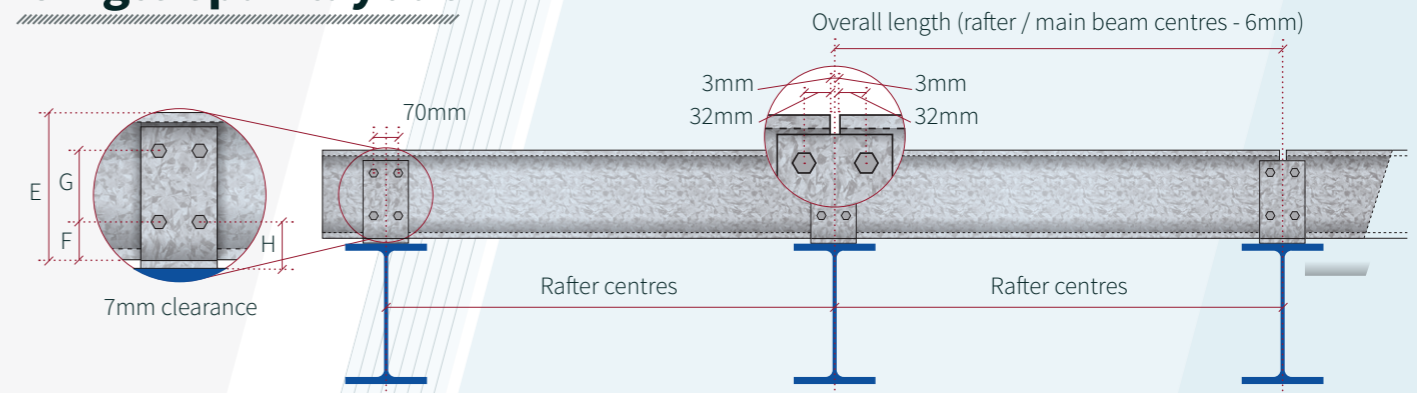
Our standard holes sizes are:

- 18mm diameter to suit M16 (grade 8.8) bolt complete with washer under head and nut.

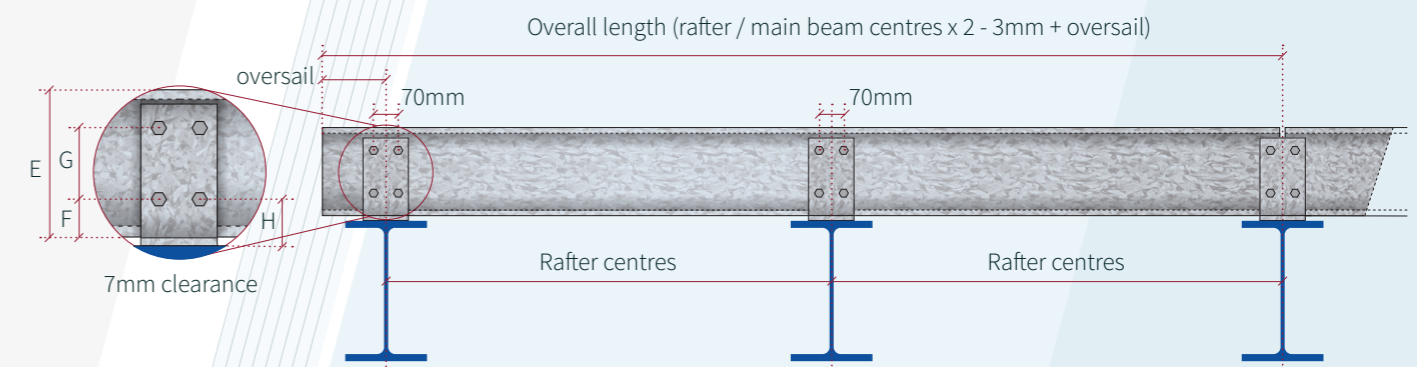
Seek advice from CMF for 14mm diameter alternative.

Oversail system (mm)						
E	123	143	173	203	233	263
F	35	45	50	50	50	50
G	53	53	73	103	133	163
H	42	52	57	57	57	57

Single span layout



Double span layout

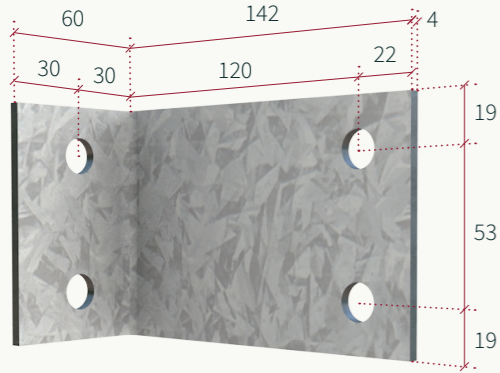


INFILL CLEATS

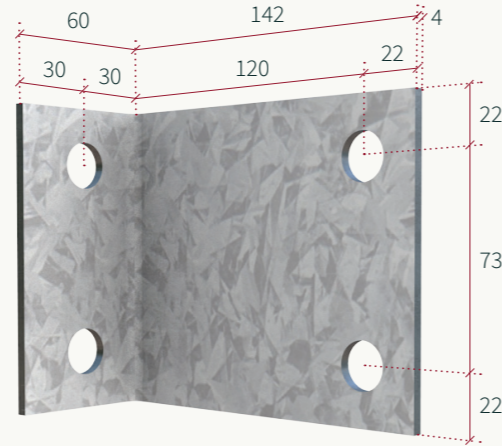
In order to connect the mezzanine floor joists to the main hot rolled steel beams, proprietary Mezzanine Infill Cleats (MIC) are available from CMF. Various combinations of joist depths may be achieved utilising these, Please refer to the permissible combinations table found on page 12. The available cleats are described below:

18mm diameter to suit M16 (grade 8.8) bolt complete with washer under head and nut. Seek advice from CMF for 14mm diameter alternative. All our cleats are cold-formed from hot dipped Z275 galvanized S450GD steel to BS EN 10346:2015 and BS EN 10143:2006, with a minimum yield strength of 450N/mm². Z275 provides an average coating of 20 microns each side. Please contact CMF for advice on other coatings such as Magnelis / Z600.

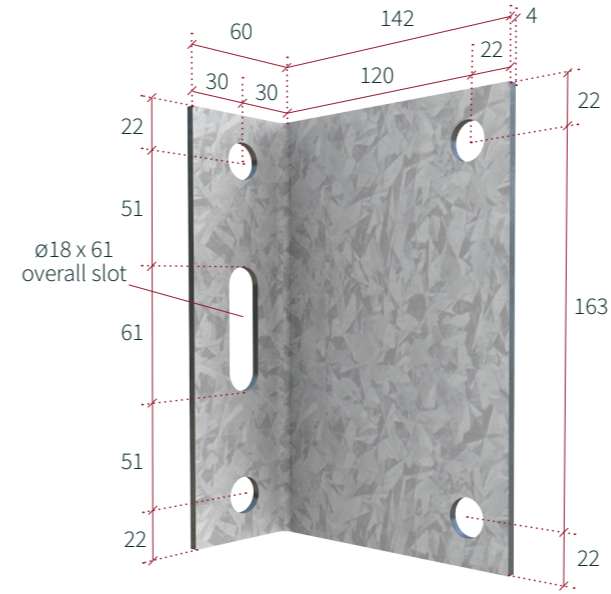
123 & 143 CLEATS (MIC-123/143)



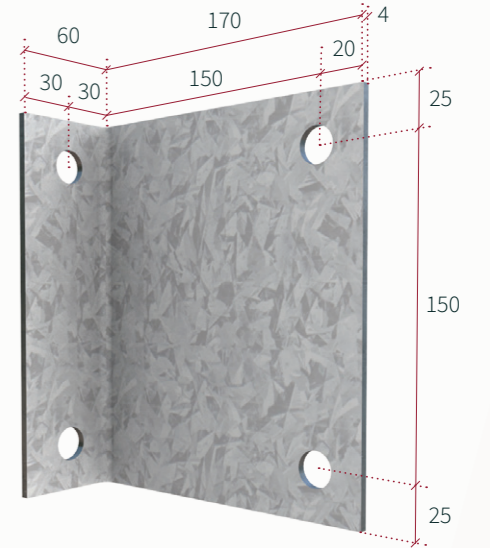
173 CLEAT (MIC-173)



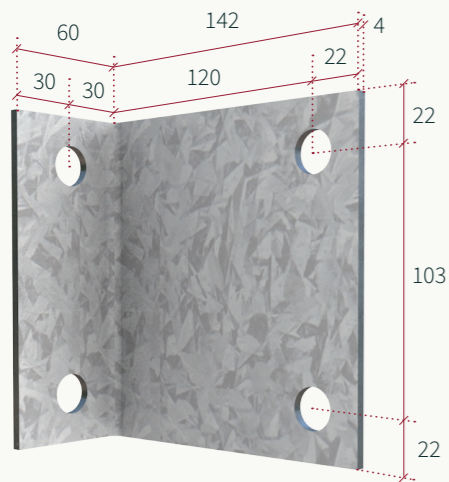
263 CLEAT (MIC-263)



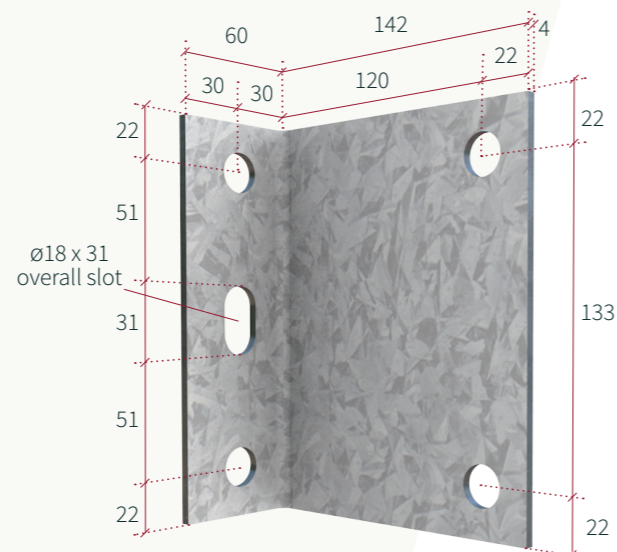
303 CLEAT (MIC-303)



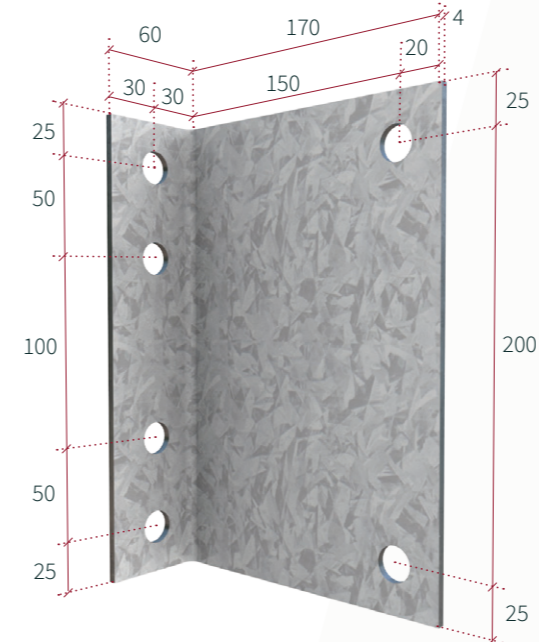
203 CLEAT (MIC-203)



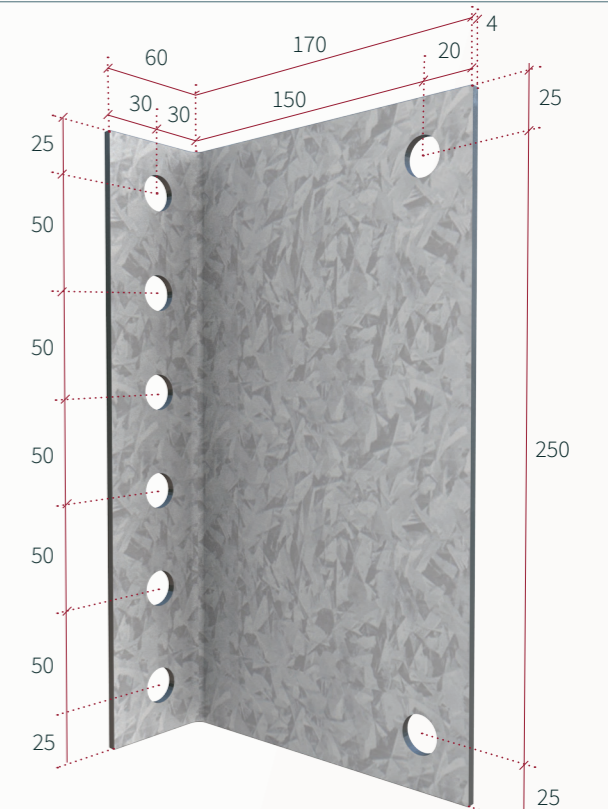
233 CLEAT (MIC-233)



353 CLEAT (MIC-353)



403 CLEAT (MIC-403)

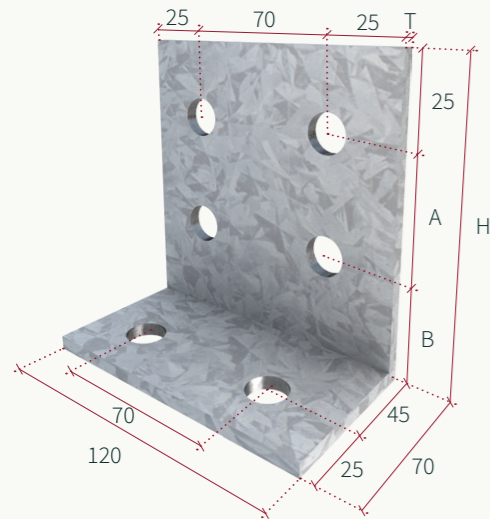


BOLT ON TOP CLEATS

Where an oversailing mezzanine system is used, top cleats should be applied. To bolster the full range of standard Bolt on Cleats (BOC) illustrated below, CMF also offer a multi holed range (MBOC) for 203 – 263 deep sections which enable optimisation of mezzanine floor joists in adjacent bays. Further cleat options are available from CMF, please seek advice. The available cleats are described below. **18mm diameter to suit M16 (grade 8.8) bolt complete with washer under head and nut. Finish = Post Galvanized, alternatives can be provided upon request. Seek advice from CMF regard finish / lead time on alternatives. All cleats grade S355JR.**

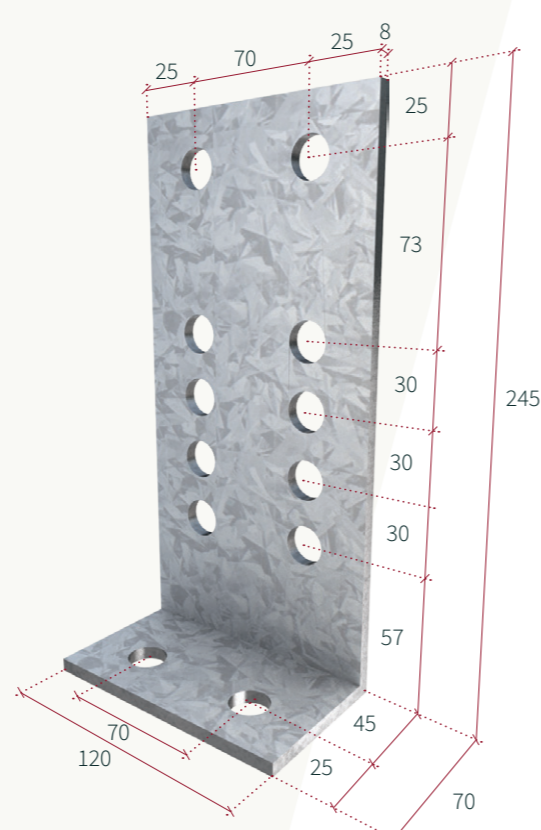
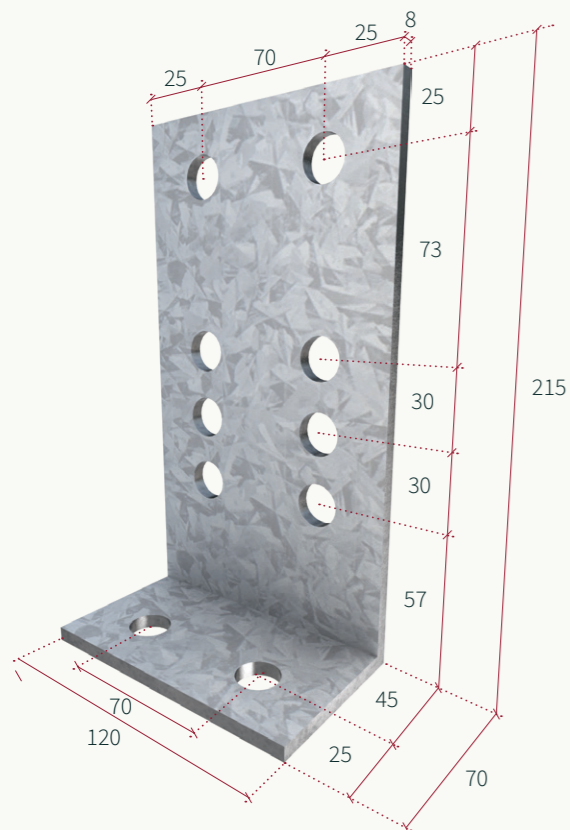
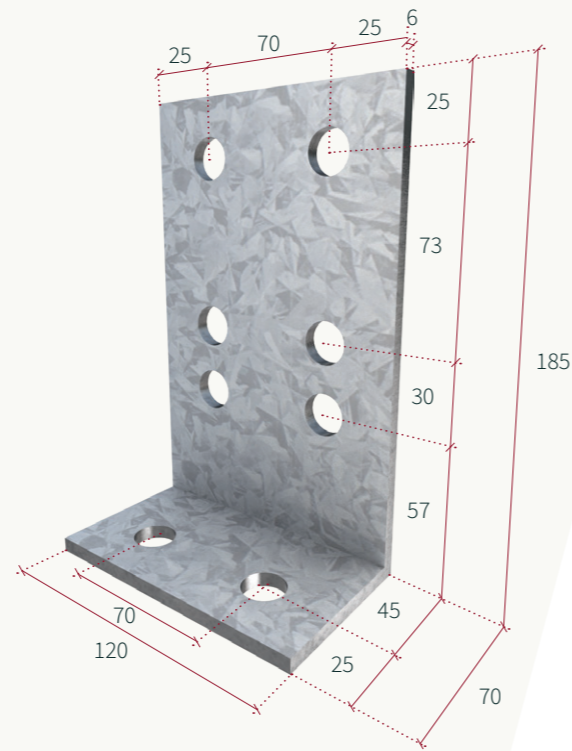
STANDARD BOLT ON (BOC)

Section Ref	A	B	T	Hole ø	H
123	53	42	6	18	120
143	53	52	6	18	130
173	73	57	6	18	155
203	103	57	6	18	185
233	133	57	8	18	215
263	163	57	8	18	245
303	203	57	10	18	285
353	253	57	10	18	335
403	303	57	10	18	385



203 MULTI HOLED BOLT ON (MBOC - 203)

18mm diameter holes



Design Software

Mezzanine Design Software has been developed in conjunction with the SCI (Steel Construction Institute) and is available to download from our website as part of the MetPurl design suite. Software allows design to British Standard and Eurocode.



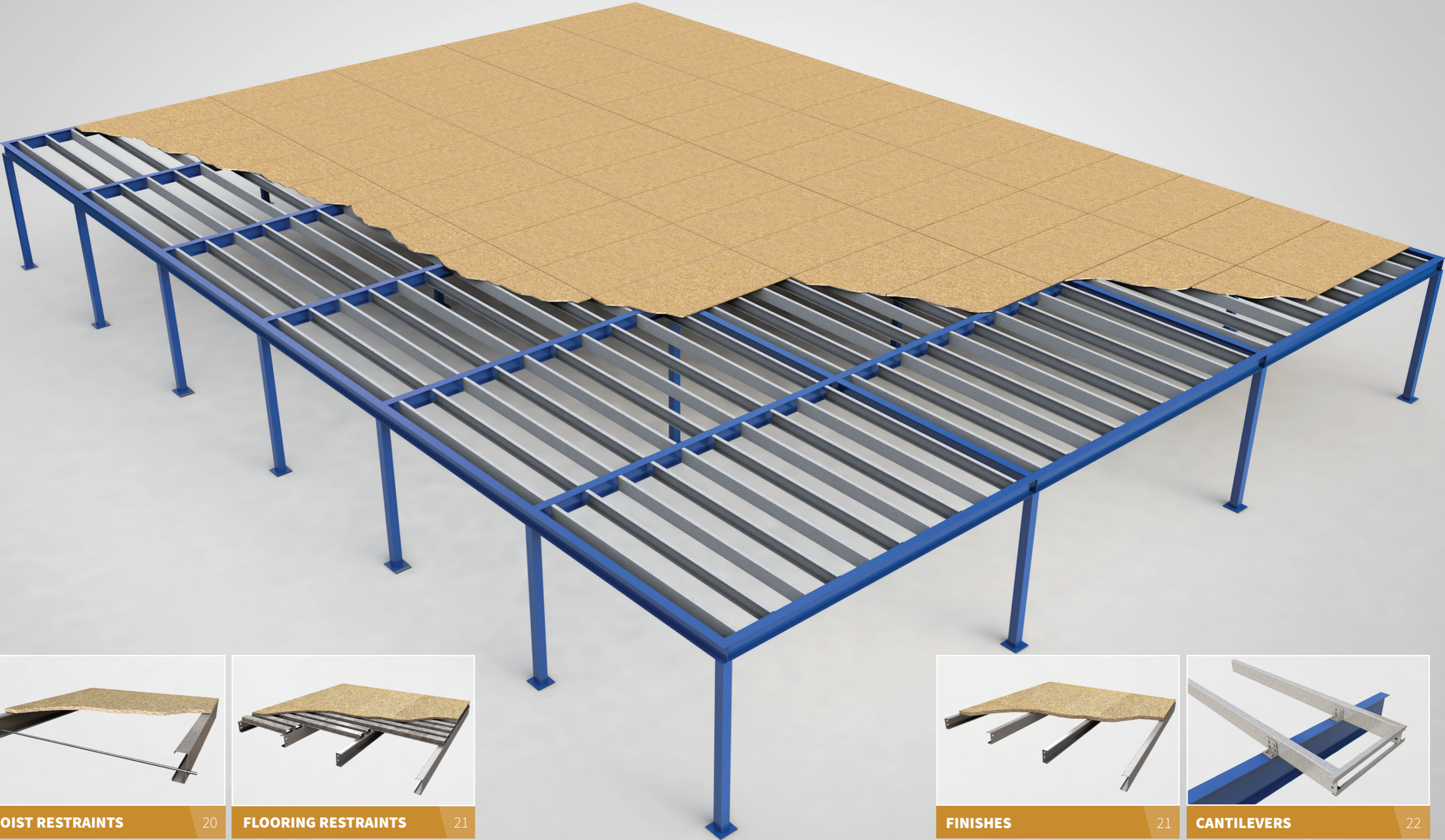
METMEZZ DESIGN SOFTWARE

Available to download from the CMF website and is within the MetPurl software.

VISIT WEBSITE

www.cmf.uk.com





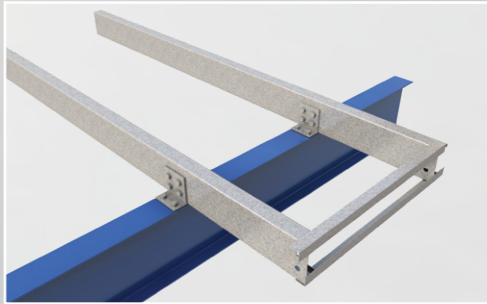
JOIST RESTRAINTS 20



FLOORING RESTRAINTS 21



FINISHES 21



CANTILEVERS 22

JOIST RESTRAINTS

Restraint details are required to provide lateral restraint to the mezzanine floor joists. See table below. Our Speed Fix ties substantially reduces erection time compared to the more robust threaded bar alternative.

These details rely upon the floor finishes or boarding to act as a sufficient diaphragm.

SPEED FIX TIES (PREFERRED)

Span	Number of Restraints
0mm to 3000mm	None
300mm to 6000mm	One at Midspan
6001mm and over	Two at 1/3 Points



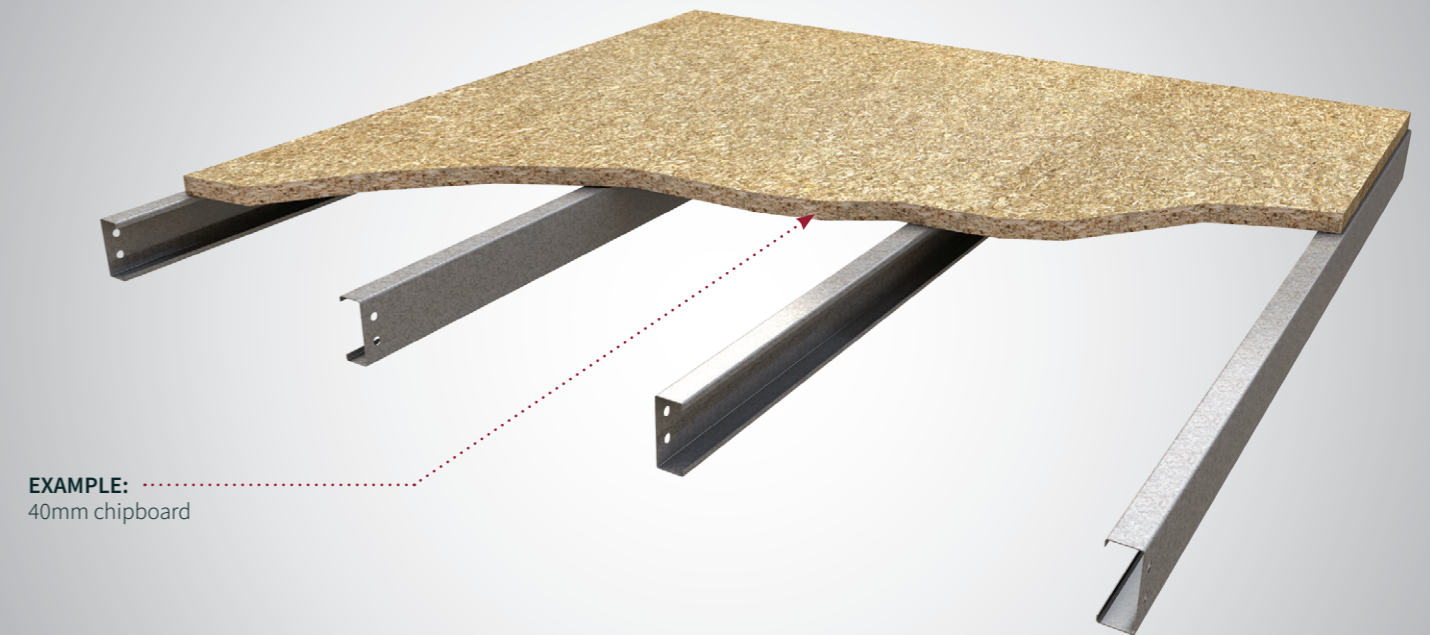
FLOORING RESTRAINTS

Consideration for the floor finishes used is critical to the integrity of any mezzanine floor system. Boarding or other finishes must provide a suitable diaphragm in line with the overall mezzanine structure's design in order to both laterally restrain and provide a shear diaphragm to the primary supporting frame.

This is typically achieved by utilising chipboard decking, but may also consist of profiled steel decking and built-up systems subject to design specification.

The floor build-up also effects the dynamic response of the mezzanine and should also be considered during the design.

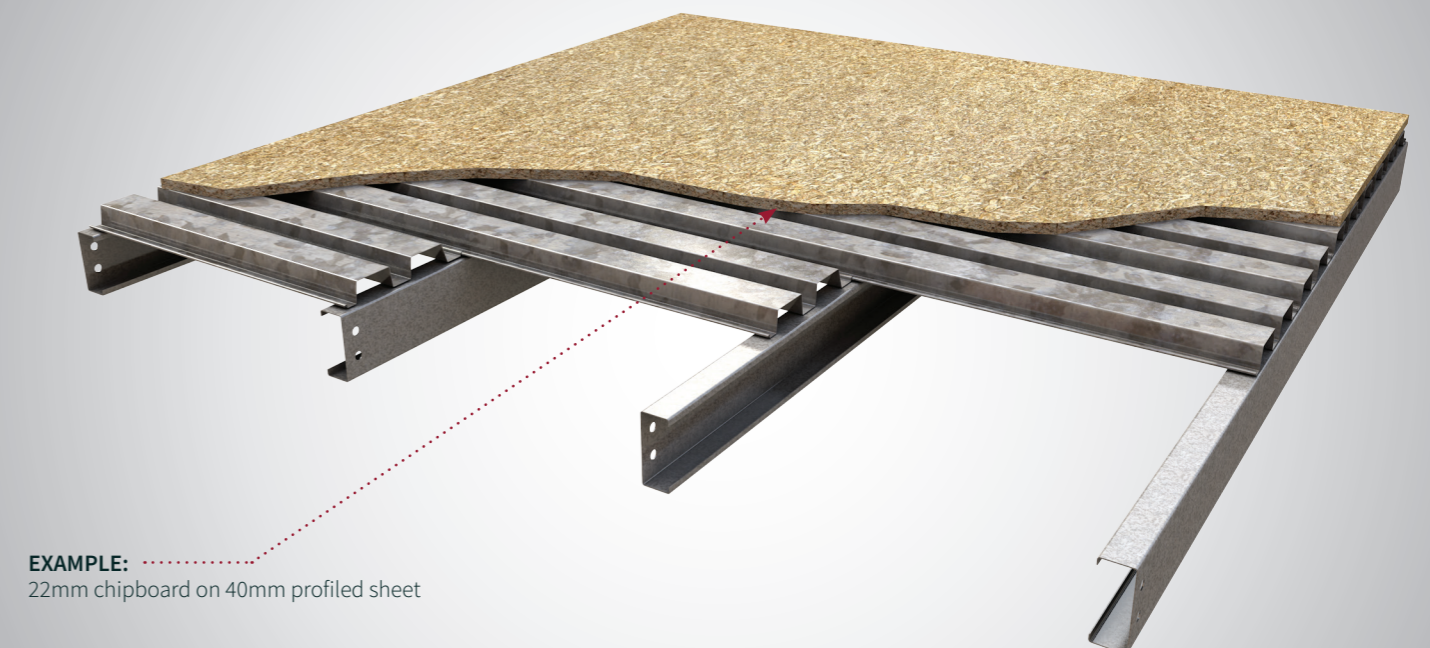
CHIPBOARD FINISH



THREADED BAR

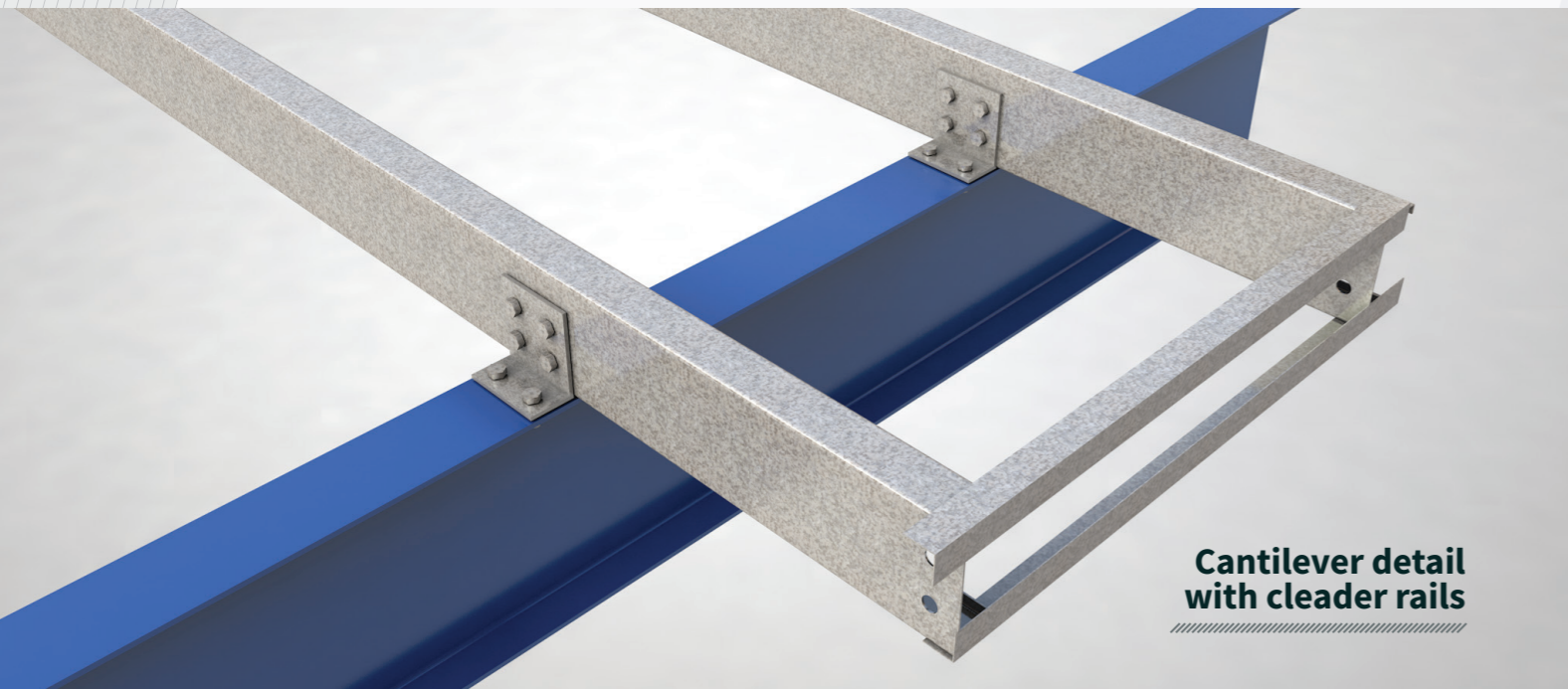


PROFILED SHEET & CHIPBOARD FINISH

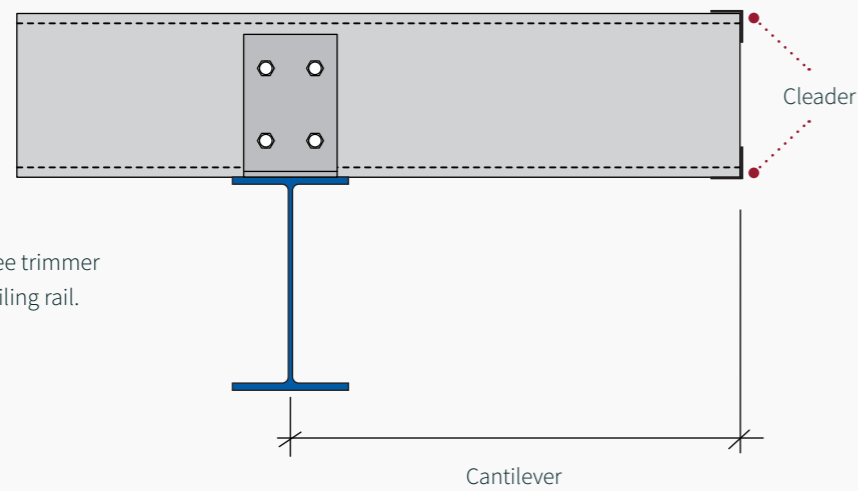


The MetMezz mezzanine systems can be used to form a range of structural features, including cantilevers and canopies. These can be achieved on continuous and cantilevering floor joists as shown below (oversail system only).

Cantilevering sections, by their nature, require additional consideration for stability. External-most ends of floor joists overhanging the primary frame should be linked using double cleader angles or Cee shaped trimmer beam, and to provide lateral support from suitable floor finishes (i.e fix flooring to cleader / trimmer).

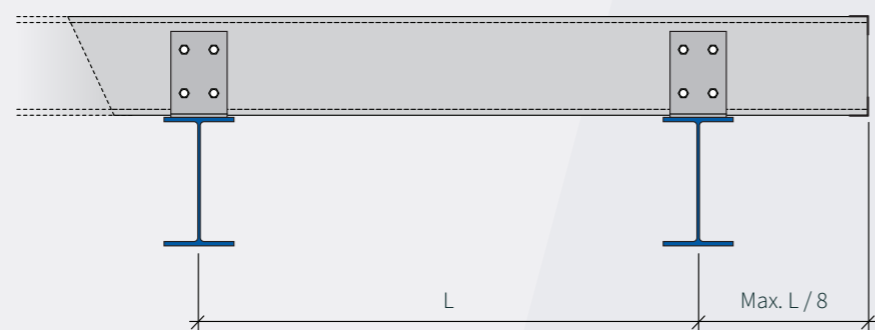


Cantilever detail with cleader rails



Pair of cleader rails or one Cee trimmer of equal depth as the oversailing rail.

Cantilevers must be formed from a continuous length, typically overhanging a maximum of $L/8$ (subject to design and loading).



Within the following pages load span tables are provided for the infill and oversail system layouts. Supplying maximum design loads for both serviceability and strength conditions, the capacities given enable designs utilising various criteria and restraint conditions – including two deflection limit options.

The values displayed have been produced through numerical calculations in accordance with BS EN 1993-1-3 and may be read in parallel with the design software where both have been completed with ratification and assessment by the Steel Construction Institute (SCI).

For designs that fall outside of the remit of these tables, and for more detailed design functionality, the software is freely available.

For further information on these tables and product range, please contact CMF Ltd.

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The logo for MetMezz, featuring the word 'Met' in red and 'Mezz' in white, with a registered trademark symbol (®) to the upper right of the 'z'.

**Construction
Metal Forming**

Specialists in steel construction products

Unit 3, Mamhilad Tech. Park,
Old Abergavenny Rd,
Mamhilad, Monmouthshire, NP4 0JJ

Customer services: 01495 761 080

Sales enquiries: 01495 788 936

Technical support: 01495 788 937

e: info@cmf.uk.com

www.cmf.uk.com

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