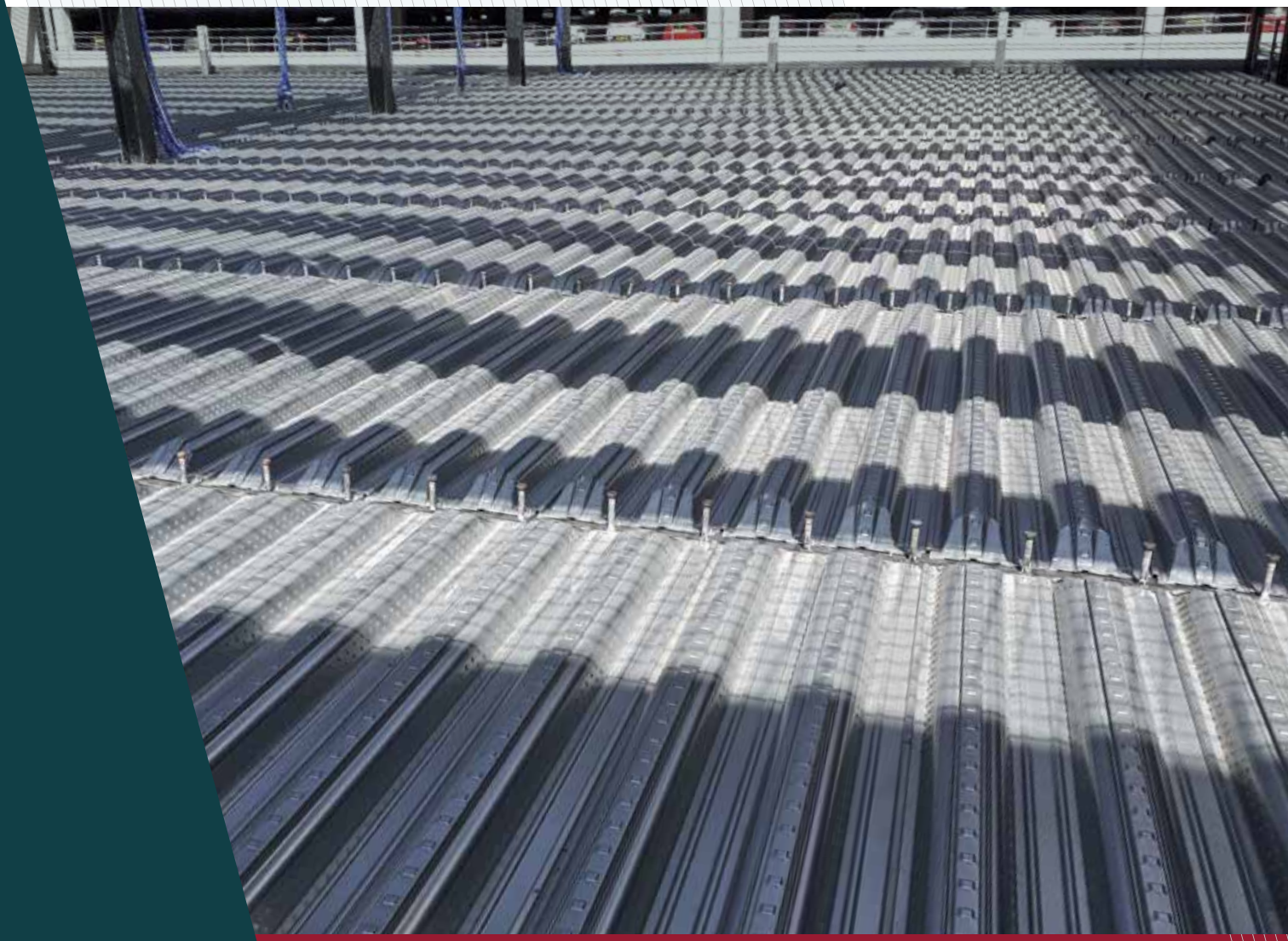
MetFloor®



COMPOSITE METAL DECKING

TECHNICAL MANUAL

CMF®
Construction Metal Forming

Version 1.7 | 02/22

Introduction

Construction Metal Forming Limited (CMF) formed in 2005, providing a state-of-the-art manufacturing facility in South Wales with excellent transport links to the whole of the UK.

The facility set-out to house three dedicated roll forming production lines, developed solely for the manufacture of **MetFloor** metal decking. Due to continued success and investment in 2015 **CMF** saw the procurement and installation of the UK's only Shear Stud manufacturing production line. The **Composite Shear Connector (CSC)** was born through natural progression following the successful implementation of the decking lines.

The next major milestone saw the procurement of a state-of-the-art fully CNC roll forming line with a capacity to roll sections up to 500mm deep and in gauges from 1.2 to 3.5mm thick. This gave **CMF** the opportunity to develop the **MetPurl** range, as well as the **MetMezz** Mezzanine floor system.

With this comprehensive product portfolio, **CMF** provide their clients with a one stop shop for cold-formed metal construction products.

CMF offer the complete, tried and tested, composite metal flooring solution.

Our MetFloor product range and associated design software have been fully tested and developed with assistance from The Steel Construction Institute (SCI) and Imperial College London (ICL), and our operations certified to ISO 9001.

Contents

MetFloor® MANUFACTURING CAPABILITY

CMF, in association with its national network of distributors and registered installers, offer the following services:

- Composite and Non-Composite Metal Floor Decking analysis and design using the SCI Assessed MetFloor design software to both British Standards & Eurocodes
- Project specific construction design and drawing using the latest BIM technology
- Manufacture of three high performance deck profiles and associated metal flashings
- Packaging and loading to meet project specific requirements
- Delivery throughout the UK, Europe and beyond, by curtain sided articulated vehicles
- Site installation including the erection of safety netting, laying and fixing of metal decking and flashings
- Supply and welding of CMF's proprietary CSC Shear Studs
- Supply and pouring of concrete to complete the floor slab using mesh, fibre and bar reinforcement

All the above services are provided in accordance with British Standards or Eurocodes, industry Codes of Practice and current Health and Safety Regulations.

Details of CMF distributors and registered installers can be found on our website (**www.cmf.uk.com**) or alternatively by contacting the CMF Sales Department on **01495 788 936**.

MANUFACTURING

CMF's production facility, established in 2005 and expanded in 2017/18, combines a manufacturing floor area of 3000m² with an 800m² office space.

The expansive coil stocking bay is serviced by four 10tonne capacity overhead cranes which provide all required lifting operations within the facility. Raw material and completed product can be stored in our external stock bays which extend to three sides of the building.

Decking products are manufactured on three independent profiling machines which allow maximum flexibility to produce up to 2,000m² per eight hour working shift for each machine, as well as a dedicated Bradbury line for various light gauge framing products and accessory lines to support the full product range. When operating a two shift system a total of 12,000m² of composite decking can be produced per day.

All machines are fitted with fully automated CNC systems to ensure accurate sheet length control and bundling. Two machines are also fitted with proprietary crushed-end tooling and additional auto stacking capabilities to maximise service efficiency.

Bundles are printed with the sheet description, CE performance data and pack weights for full product traceability and to avoid handling errors on site. Roll-forming and pack loading is completed by fully trained operatives carrying out manufacturing duties, quality checks and vehicle loading to CMF's high quality standards and providing complete flexibility to meet order demands.

MetFloor®

MetFloor® is the registered trade name for Construction Metal Forming's decking profile range, which has been created with over 50 years of experience in the metal flooring market.

All MetFloor profiles are manufactured from steel coil to BS EN 10143 and BS EN 10346, with guaranteed minimum yield strength of 350N/mm² and a total galvanized coating mass of 275g/m² as standard.

If required, profiles can be rolled using steel strip with a minimum yield strength of 450N/mm² – for more information on increased steel grades, please contact CMF. With a cover width at just 600mm, the lightweight, easy to handle MetFloor product ensures safe on-site working conditions and compliance with manual handling regulations.

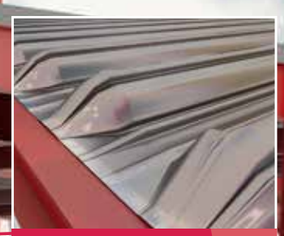
COMPONENT OVERVIEW

DECKING RANGE, DIMENSIONS & PROPERTIES 10

CLOSURE PLATES 18

EDGE TRIMS 18

END CAPS 18



CRUSHED ENDS 17

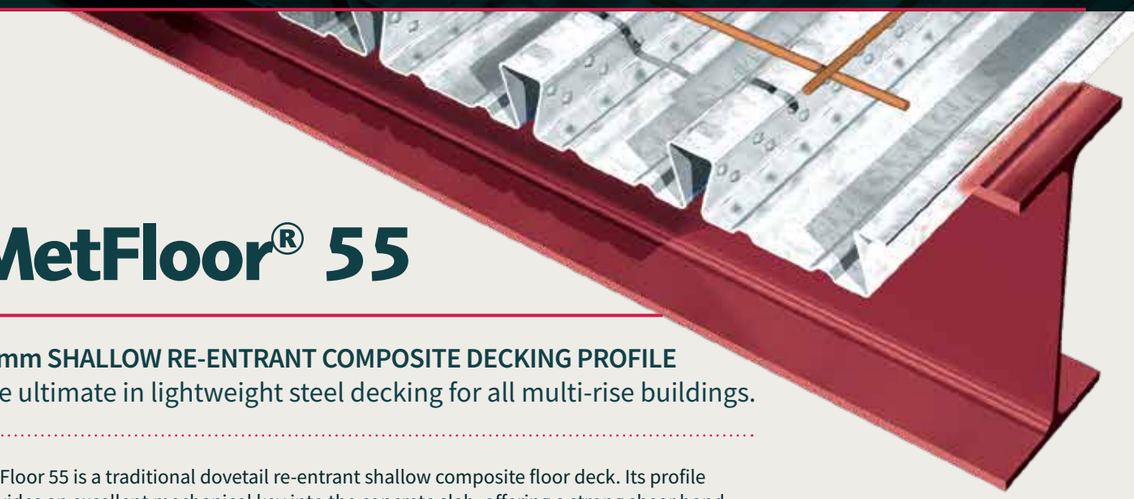
CSC SHEAR STUDS 29

FIBREDECK 20

SERVICE INTEGRATION (APERTURES & HANGERS) 31 & 47

COATING SOLUTIONS 42

COMPONENT DIMENSIONS & PROPERTIES

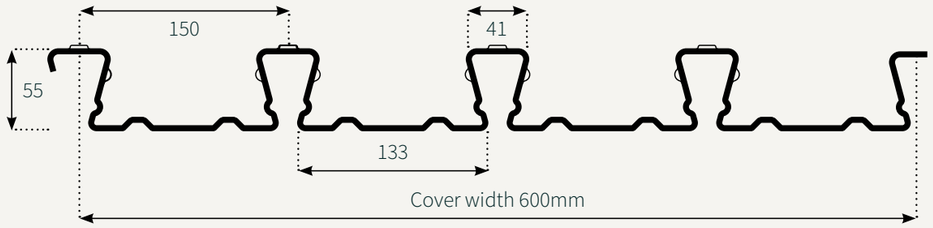


MetFloor® 55

55mm SHALLOW RE-ENTRANT COMPOSITE DECKING PROFILE

The ultimate in lightweight steel decking for all multi-rise buildings.

MetFloor 55 is a traditional dovetail re-entrant shallow composite floor deck. Its profile provides an excellent mechanical key into the concrete slab, offering a strong shear bond augmented by stiffeners located in the profile trough. MetFloor 55 presents a virtually flat soffit and only a relatively thin slab is required for fire design requirements.

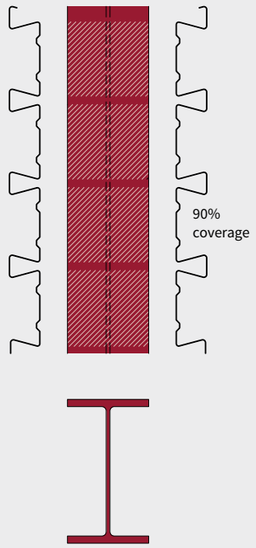


CE

SHEAR STUDS

MetFloor 55 has a wide trough which gives great flexibility and efficiency when placing shear studs.

For more information on shear studs see CMF's Composite Shear Connector (CSC) product range.



FIRE PERFORMANCE

Because the re-entrant dovetail profile has only a very small soffit opening, little heat is transferred through the slab when exposed to fire.

As such, the fire design can be achieved with a smaller slab depth. Fire performance of supporting composite beams is also enhanced with no additional fire protection required to the top flange of the steel beam when used with MetFloor 55 decking (MetFloor 55 can provide ≥85% beam coverage in line with SCI publication P375 guidance).

FIRE PERIOD (minutes)	MINIMUM SLAB DEPTHS FOR NORMAL WEIGHT CONCRETE (mm)	
	Fabric mesh reinforcement	FibreDeck
30	100	100
60	100	100
90	110	110
120	125	125

SUSPENDED CEILINGS & SERVICES

Services are easy to attach to MetFloor 55 with recessed ribs provided at 150mm centres.

This provides the perfect connection for service hangers via a wedge nut or similar device.

PRODUCT BENEFITS

- **Available in 0.9mm, 1.0mm and 1.2mm gauges**
- **Unpropped decking spans in excess of 3.5m can be achieved**
- **Thermally efficient profile, reduces heat transfer and eases attainment of required fire ratings**
- **Offers a greater concrete mass, providing superior acoustic potential**
- **Available with a variety of enhanced coating systems for increased corrosion resistance**

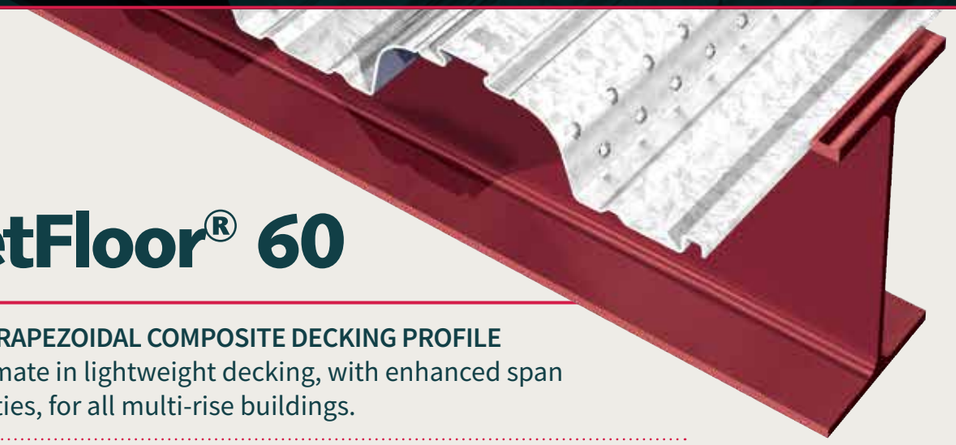
Nominal thickness (mm)	Steel Grades (N/mm²)	Profile depth (mm)	Height of neutral axis (mm)	Profile area (mm²)	Profile weight (kN/m²)
0.9	S350 / S450	55	18	1648	0.13
1.0	S350 / S450	55	18	1840	0.15
1.2	S350 / S450	55	18	2223	0.18

METFLOOR 55 COMPOSITE SLAB – CONCRETE VOLUMES & WEIGHTS			
Slab depth (mm)	Concrete volume (m³/m²)	Weight of concrete (kN/m²)	
		Wet	Dry
100	0.088	2.25	2.16
110	0.098	2.51	2.41
120	0.108	2.76	2.65
130	0.118	3.02	2.90
140	0.128	3.27	3.14
150	0.138	3.53	3.39
160	0.148	3.78	3.63
170	0.158	4.04	3.88
180	0.168	4.29	4.12
190	0.178	4.55	4.37
200	0.188	4.80	4.61
210	0.198	5.06	4.86
220	0.208	5.31	5.10
230	0.218	5.57	5.35
240	0.228	5.82	5.59
250	0.238	6.08	5.84

Volume & weight table notes

1. Weight of ponded concrete from beam and decking deflections are not included
2. Weight of decking profile and mesh is not included (see profile properties table for profile weight)
3. Concrete densities are based on normal weight concrete; wet = 2550kg/m³, dry = 2450kg/m³

COMPONENT DIMENSIONS & PROPERTIES



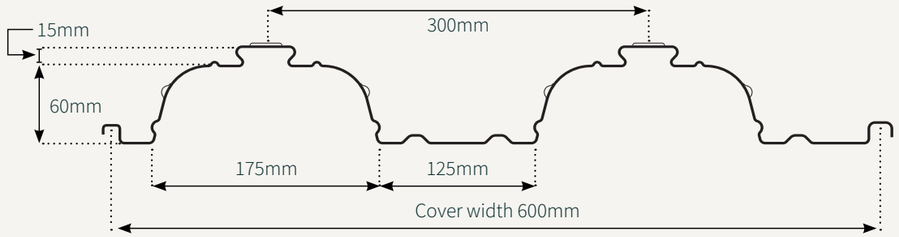
MetFloor® 60

60mm TRAPEZOIDAL COMPOSITE DECKING PROFILE

The ultimate in lightweight decking, with enhanced span capabilities, for all multi-rise buildings.

MetFloor 60 is a shallow trapezoidal composite floor deck with exceptional spanning capabilities and reduced concrete usage. The result is a highly cost effective, attractive and easy to install floor solution.

MetFloor 60 is engineered with optional closed ends, and provides excellent fire protection where designs may be completed without the need for filler blocks. The profile is designed with trough stiffeners and side laps positioned to guarantee optimum central placement of shear studs.



CE

SHEAR STUDS

Enhanced shear stud interactions are provided by means of the optimised profile geometry, guaranteeing central shear-stud positioning for enhanced composite action.

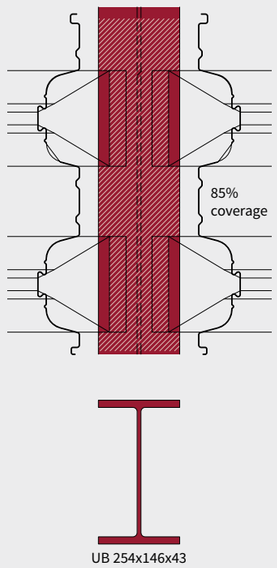
FIRE PERFORMANCE

With the availability of crushed ends, the MetFloor 60 profile provides exceptional fire protection and aids in building compartmentation.

The fire performance of supporting composite beams is also enhanced with the application of crushed ended decking, with the potential to negate additional fire protection to the top flange of the steel beam (MetFloor 60 with crushed ends may be arranged on supporting beams to provide ≥85% beam coverage in line with SCI publication P375 guidance).

FIRE PERIOD (minutes)	MINIMUM SLAB DEPTHS FOR NORMAL WEIGHT CONCRETE (mm)	
	Fabric mesh reinforcement	FibreDeck
30	120	120
60	120	120
90	130	130
120	140	140

FibreDeck slab depths are provided for Eurocode designs – British Standards may require increased depths.



PRODUCT BENEFITS

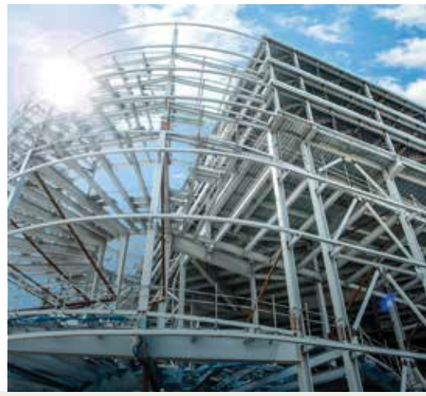
- Available in 0.9mm, 1.0mm and 1.2mm gauges
- Unpropped decking spans in excess of 4.5m can be achieved
- May be supplied with crushed ends for improved composite action and increased thermal and acoustic efficiencies
- Available coated with a variety of metallic or organic coatings for various applications
- Ideal for multi-rise construction and mezzanine floors due to speed of installation, the reduced transport costs and by providing working platforms during construction
- Suspended ceilings and services may be attached to the profile dovetail with the proprietary Lindapter Type MF decking fixing

Nominal thickness (mm)	Steel Grades (N/mm²)	Profile depth (mm)	Height of neutral axis (mm)	Profile area (mm²)	Profile weight (kN/m²)
0.9	S350 / S450	60	30	1269	0.103
1.0	S350 / S450	60	30	1416	0.114
1.2	S350 / S450	60	30	1711	0.137

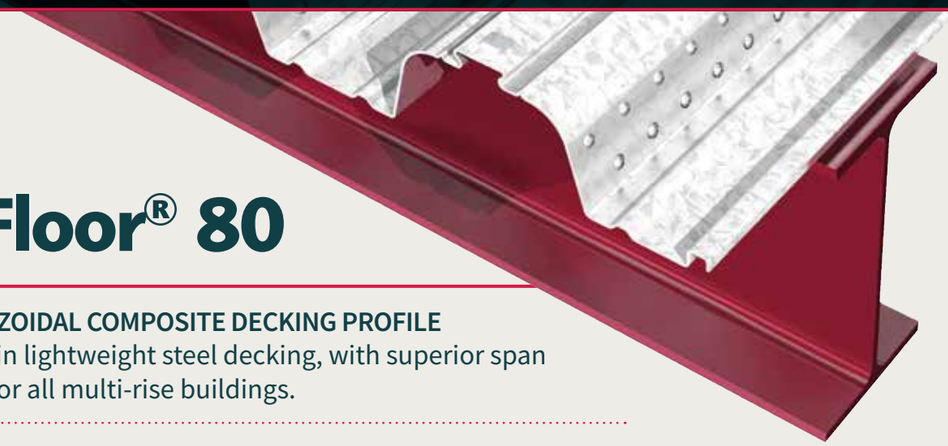
METFLOOR 60 COMPOSITE SLAB – CONCRETE VOLUMES & WEIGHTS			
Slab depth (mm)	Concrete volume (m³/m²)	Weight of concrete (kN/m²)	
		Wet	Dry
120	0.086	2.19	2.10
130	0.096	2.44	2.35
140	0.106	2.70	2.59
150	0.116	2.95	2.84
160	0.126	3.21	3.08
170	0.136	3.46	3.33
180	0.146	3.72	3.57
190	0.156	3.97	3.82
200	0.166	4.23	4.06
210	0.176	4.48	4.31
220	0.186	4.74	4.55
230	0.196	4.99	4.80
240	0.206	5.25	5.04
250	0.216	5.50	5.29

Volume & weight table notes

1. Weight of ponded concrete from beam and decking deflections are not included
2. Weight of decking profile and mesh is not included (see profile properties table for profile weight)
3. Concrete densities are based on normal weight concrete; wet = 2550kg/m³, dry = 2450kg/m³



COMPONENT DIMENSIONS & PROPERTIES



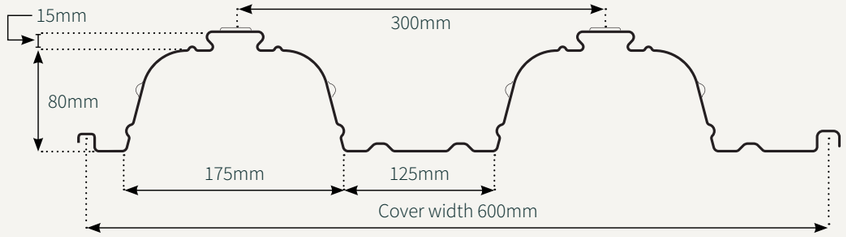
MetFloor® 80

80mm TRAPEZOIDAL COMPOSITE DECKING PROFILE

The ultimate in lightweight steel decking, with superior span capabilities, for all multi-rise buildings.

MetFloor 80 is a deeper trapezoidal composite floor deck with superior spanning capabilities, enabling a reduced concrete volume for equivalent slab depths. The result is a highly cost effective, attractive and easy to install floor solution.

MetFloor 80 also provides great acoustic performance, engineered with optional closed ends, and excellent fire protection where designs may be completed without the need for filler blocks. The profile is designed with trough stiffeners and side laps positioned to guarantee optimum central placement of shear studs.



CE

SHEAR STUDS

Enhanced shear stud interactions is provided by means of the optimised profile geometry, guaranteeing central shear-stud positioning for enhanced composite action.

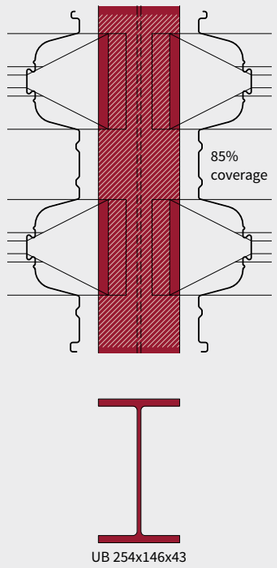
FIRE PERFORMANCE

With the availability of crushed ends, the MetFloor 80 profile provides exceptional fire protection and aids in building compartmentation.

The fire performance of supporting composite beams is also enhanced with the application of crushed ended decking, with the potential to negate additional fire protection to the top flange of the steel beam (MetFloor 80 with crushed ends may be arranged on supporting beams to provide ≥85% beam coverage in line with SCI publication P375 guidance).

FIRE PERIOD (minutes)	MINIMUM SLAB DEPTHS FOR NORMAL WEIGHT CONCRETE (mm)	
	Fabric mesh reinforcement	FibreDeck
30	140	140
60	140	140
90	150	150
120	160	160

FibreDeck slab depths are provided for Eurocode designs – British Standards may require increased depths.



PRODUCT BENEFITS

- Available in 0.9mm, 1.0mm and 1.2mm gauges
- Unpropped decking spans in excess of 5.0m can be achieved
- May be supplied with crushed ends for improved composite action and increased thermal and acoustic efficiencies
- Available coated with a variety of metallic or organic coatings for various applications
- Ideal for multi-rise construction and car park structures, maximising column spacing for increased capacity, combined with speed of installation
- Suspended ceilings and services may be attached to the profile dovetail with the proprietary Lindapter Type MF decking fixing

Nominal thickness (mm)	Steel Grades (N/mm²)	Profile depth (mm)	Height of neutral axis (mm)	Profile area (mm²)	Profile weight (kN/m²)
0.9	S350 / S450	80	46	1359	0.120
1.0	S350 / S450	80	46	1517	0.135
1.2	S350 / S450	80	46	1833	0.150

METFLOOR 80 COMPOSITE SLAB – CONCRETE VOLUMES & WEIGHTS			
Slab depth (mm)	Concrete volume (m³/m²)	Weight of concrete (kN/m²)	
		Wet	Dry
140	0.097	2.46	2.37
150	0.107	2.72	2.61
160	0.117	2.97	2.86
170	0.127	3.23	3.10
180	0.137	3.48	3.35
190	0.147	3.74	3.59
200	0.157	3.99	3.84
210	0.167	4.25	4.08
220	0.177	4.50	4.33
230	0.187	4.76	4.57
240	0.197	5.01	4.82
250	0.207	5.27	5.06

Volume & weight table notes

1. Weight of ponded concrete from beam and decking deflections are not included
2. Weight of decking profile and mesh is not included (see profile properties table for profile weight)
3. Concrete densities are based on normal weight concrete; wet = 2550kg/m³, dry = 2450kg/m³

SYSTEM ARRANGEMENTS

MetFloor Profiled Metal Decking

The MetFloor profiled decking range may be applied to several standard spanning arrangements.

These influence the design, logistics and erection and should be thoroughly considered during the development and design stages.

SINGLE SPAN DECKING

This arrangement consists of individual decking sheets between each primary support.

Often used where beams are pre-studded, this solution is ideal where frame durability is of specific importance (**Figure 2**). Single span decking is also the method required where decking sits below the top flange of supporting steelwork (**Figure 1**).

DOUBLE SPAN DECKING

A more efficient arrangement is to have the decking double spanning across two adjacent bays.

Continuity of the steel deck enables a more economical construction design, which typically limits, and provides efficiency in the erection. Where shear connectors are required, these are welded through-deck, and requires the top flange of supporting beams to be free from paint, metallic coatings and other potential weld contaminants. See **Figure 3**.

MULTI-SPAN DECKING

Where efficiencies in the build sequence can be achieved through its application, multi-spanning decking may be specified.

Here decking sheets span over more than two consecutive bays. See **Figure 4**.

Figure 1.
Single span decking inset within supporting beams, resulting in single span conrete

Figure 2.
Single span decking inset between pre-studded beams; concrete is continuous

Figure 3.
Double span decking with continuous concrete over

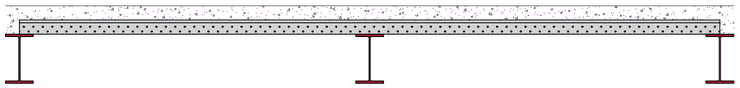
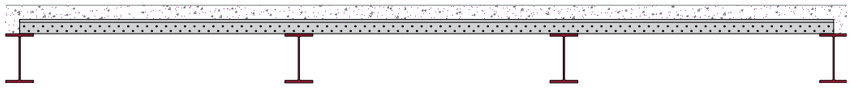


Figure 4.
Multi-span decking with continuous concrete over



Concrete & Reinforcement

Continuity should also be considered within the concrete element of a composite slab, which can be described as either single span or continuous.

SINGLE SPAN CONCRETE/ REINFORCEMENT

Single spanning concrete (and reinforcement) describes where the concrete is monolithic between two adjacent supports only – for example, where the slab depth sits below supporting beams **(see Figure 1, above)**.

In this type of concrete arrangement, additional bar reinforcement is required for the fire design, and further information on this is provided within the Design Information on page 26.

CONTINUOUS CONCRETE/ REINFORCEMENT

Where the concrete and reinforcement are continuous across more than one bay it may be described as continuous **(Figures 2, 3 & 4, above)**.

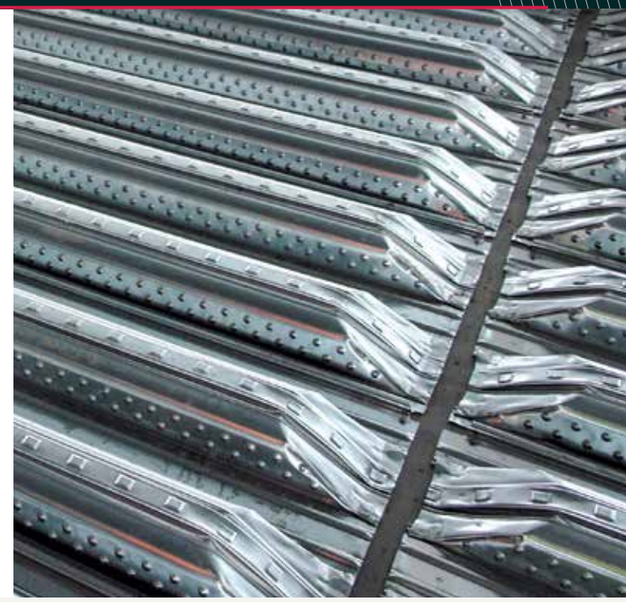
Within the CMF MetFloor software two continuous concrete conditions are available for design[1]. These are “End” for the final bay in an otherwise continuous multi-bay slab, or “Internal” for those bays inbound of the ends.

[1] End and Internal span options available for BS EN 1994-1-1 designs only

PLAIN ENDS & CRUSHED ENDS

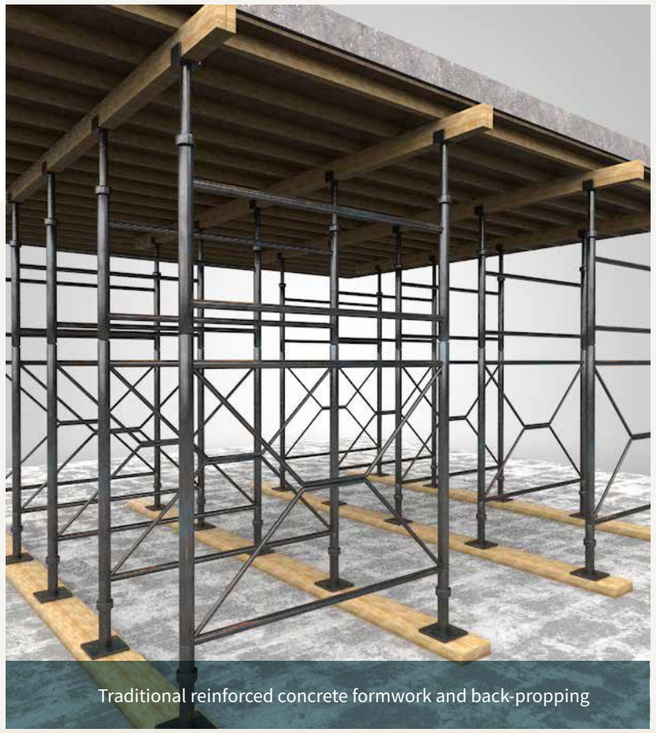
MetFloor 60 and MetFloor 80 decking profiles may be supplied with either plain ends or crushed ends. Plain ends are most common on double or multi-span decking, where junctions between decking sheets are achieved by abutting the profiles tightly. At the ends of continuous slabs, end caps are required to finish the decking run and limit grout loss through the otherwise open section.

Crushed ends are often utilised on pre-studded supporting steels, where the space between sheets produced by the prefabricated shear connectors would require end caps. The use of crushed ends also improves thermal and acoustic efficiencies and benefits the fire and composite design of supporting steelwork. Utilising crushed ends limits grout loss without the need for end caps to be installed. It should be noted that a crushed end does not provide an impermeable seal and, as for all concreting operations, some seepage and overspill should be expected.

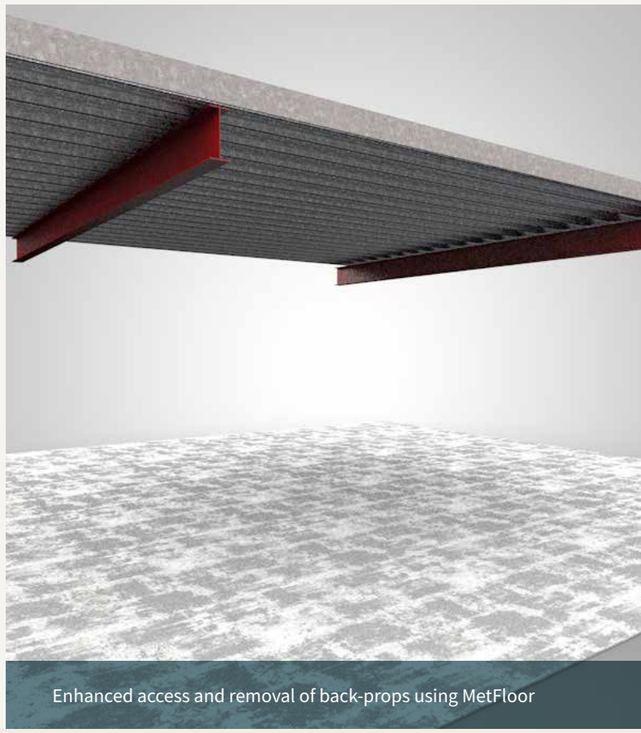


PERMANENT SHUTTERING

MetFloor decking may also be used as permanent shuttering for reinforced concrete designs, negating traditional formwork or back-propping, and allowing other trades to proceed with clear floor access.

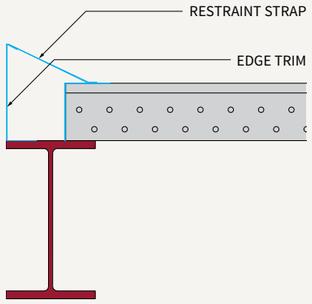


Traditional reinforced concrete formwork and back-propping



Enhanced access and removal of back-props using MetFloor

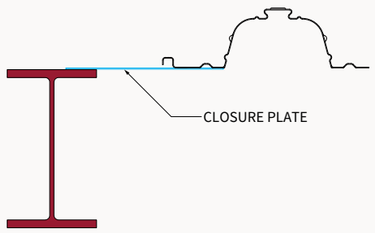
ACCESSORY COMPONENTS



EDGE TRIMS

Edge trims are formed from galvanized steel sheet and used to maintain the correct wet concrete level at decking perimeters. They should be fixed to the supporting structure in the same manner as the deck and anchored to the decking by use of restraint straps at 600mm centres. Restraint straps are fixed to the top of the deck profile with rivets or self-drilling screws.

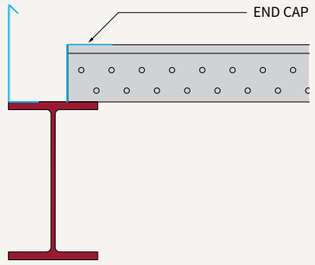
The standard edge trim geometry is shown below, with typical heights ranging between 100mm and 300mm to suit standard composite slab depths. Trims should bear onto supports by a minimum of 50mm. For information on maximum cantilevers of edge trim, see page 30.



CLOSURE PLATES

Closure plates are employed where an exact number of decking sheets cannot be fit within a structural bay and are used to close the remaining gap between the decking and edge beam.

They may also be used to assist in closing similar spaces which remain around junctions with structural elements such as columns. Closure plates should only be used on the non-loadbearing side of the decking sheet. Closure plates are typically supplied in steel gauges from 0.9mm to 2.0mm and to a maximum width of 250mm.



END CAPS

Where decking sheets do not abut, and where crushed ends are not specified, end caps are used to prevent excessive grout loss through the open profile.

Typically, individual ends caps are installed one per decking peak and are fixed to the crown of the deck with a self-drilling self-tapping screw.

FIBREDECK

Developed by CMF in conjunction with Fibermesh (A Sika Brand); **FibreDeck** is the smart alternative to mesh reinforcement in composite metal deck construction.

FibreDeck combines high performance Novocon FE1050 steel and polypropylene Fibermesh 150e3 microsynthetic fibres. These are combined to form the FibreDeck three-dimensional fibre reinforcement system.

FIBERMESH 150e3

Fibermesh's world leading brand of microsynthetic fibres is internationally proven to inhibit plastic shrinkage and settlement cracking.

Fibermesh reinforced concrete also benefits from increased impact and abrasion resistance and reduced permeability. In the event of fire, the microsynthetic fibres provide strong resistance against explosive spalling.

NOVOCON FE1050

Novocon high performance steel fibres are proven to provide a high level of ductility to the concrete and long-term crack control.

Load carrying capabilities are also improved with traditional reinforcement potentially negated through use of the FibreDeck system.

FibreDeck provides measurable performance benefits through the entire lifespan of the concrete; from simplifying placement, to minimising cracks in the plastic state and controlling cracks during hardening, with the result a concrete solution providing years of exceptional durability.

The **FibreDeck** system eliminates the costly and time-consuming process of mesh fabric reinforcement where contractors must deliver, fit and install the welded wire mesh prior to the concrete pour, with the mesh itself posing a potential obstruction to other site operations. Maintaining the correct mesh height, position, concrete cover and lapping can be difficult during mesh placement and concrete pouring.

FibreDeck reinforcement is added to the concrete mix and then delivered ready to pump onsite, enabling a reduction in installation times of around 20%.

FibreDeck is a certified floor deck system available for use with CMF MetFloor 55, 60 and 80 composite decking profiles.

INTERNATIONALLY & INDEPENDENTLY TESTED

FibreDeck reinforced composite metal deck systems have been extensively tested in accordance with BS EN 1365-2 at UKAS (previously NAMAS) accredited fire laboratories under the guidance of the SCI.

The results, analysed and approved by the SCI, show that FibreDeck reinforced composite metal deck systems provide equivalent, or even superior, performance to traditional wire mesh solutions, with fire ratings of up to two hours available.

FIBREDECK SAVES YOU MONEY

- Save labour costs
- Potential programme improvement
- Eliminate the need to buy, transport and store mesh
- Reduce crane hire costs
- Save on potential concrete volumes

FIBREDECK SIMPLIFIES INSTALLATION

- No hoisting, lifting or manual handling of mesh
- No steel fixing or tying requirements
- No spacer requirements
- Three dimensional reinforcement delivered ready to pump
- Easier concrete application with no trip hazards or snagging from mesh
- Fibre reinforcement is always in the correct position
- No scaffold staging required for loading out of mesh

FIBREDECK PROVIDES TECHNICAL IMPROVEMENTS

Independent tests show that FibreDeck:

- Provides the same or better performance as traditional welded wire mesh
- Reduces the risk of plastic shrinkage
- Mitigates the explosive spalling tendency of concrete within fire
- Provides strong loadbearing capabilities for greater toughness and long-term crack control
- Provides superior transverse reinforcement to composite beams compared to A393 mesh (SCI, 2006)

Fibre reinforcement amounts for standard FibreDeck dosages:

FibreDeck Dosage (kg/m^3)	Novocon FE1050 (kg/m^3)	Fibermesh 150e3 (kg/m^3)
25	25	0.9
30	30	0.9
35	35	0.9

TRANSVERSE REINFORCEMENT FOR COMPOSITE BEAMS

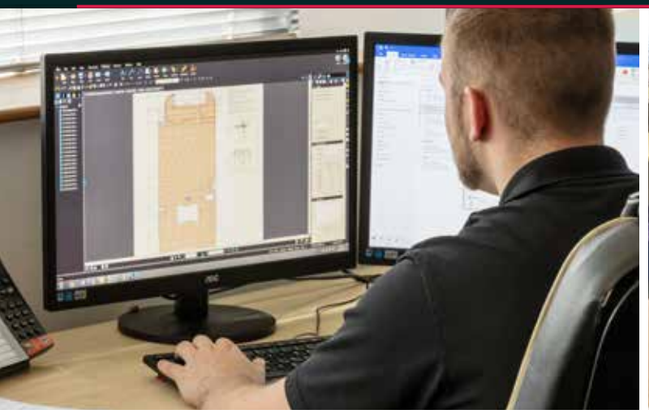
Testing of Novocon FE1050 and Fibermesh 150 has been completed by Fibermesh at the University of Bath; overseen by the SCI.

The results of this testing indicate that Fibermesh dosages of 25, 30 and $35kg/m^3$ may provide a sufficient longitudinal shear resistance in excess of that offered by an A393 square fabric mesh[2].

[2] Based on a solid 130mm normal weight C25/30 concrete slab (SCI, 2006)

DESIGN INFORMATION

PROCEDURES FOR THE DESIGN OF COMPOSITE SLABS



The design of profiled steel decking and composite slabs is covered by BS EN 1994 *Design of composite steel and concrete structures* or BS 5950-4 *Code of practice for design of composite slabs with profiled steel sheeting*.

Further design guidance and industry standards are also available from industry bodies such as the SCI, including publications P300 *Composite Slabs and Beams using Steel Decking* (SCI, 2009) and PN005 NCCI: *Fire resistance design of composite slabs* (SCI, 2012).

DESIGN PARAMETERS

The main parameters which determine the composite slab design are listed below:

- **Decking Span (unpropped)**
  – dictates the general beam spacing
- **Slab Span (propped deck)**
  – dictates the maximum beam spacing
- **Concrete Type**
  – influences minimum slab depth and unpropped decking span
- **Fire rating**
  – dictates the minimum slab depth and reinforcement requirements

The engineering design of the composite floor can then be subdivided into three main categories:

1. **Construction Stage**
2. **Composite Design (Normal Stage)**
3. **Fire Design (Fire Stage)**

Further checks are also required for serviceability (deflection and vibration).

TWO STAGE DESIGN

All composite floors are considered in two isolated stages:

1. **Wet concrete and construction loads**
   Carried by the deck alone during the construction stage
2. **Hardened concrete and gravity loads**
   Carried by the composite slab during the normal and fire design stages

In most cases the construction stage determines the deck specification, particularly when the deck is not temporarily propped. It is normally then the fire requirement which determines the slab depth, and in some instances any acoustic requirements (a higher acoustic performance requires a higher concrete mass).

LOADS AND LOAD ARRANGEMENTS

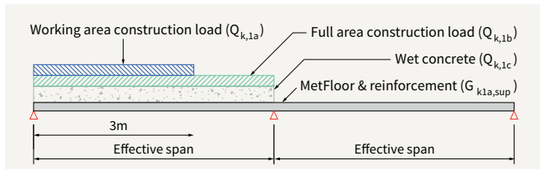
Loading is a function of the structures' operational use and includes the self-weight of the composite slab (decking, concrete and reinforcement), superimposed dead loads from finishes, ceilings and service runs, and the relevant imposed loads for the structural category.

These should be agreed with the client in the early stages of design. The various parts of BS 6399 and BS EN 1991 provide further details on calculating these actions and give guidance for the selection of imposed loads for various structural categories. For most applications the imposed load does not limit the design.

CONSTRUCTION CONDITION

In the construction stage the deck must support the wet weight of concrete and the construction imposed load – this should be no less than 1.5kN/m².

For Eurocode designs the construction load is split into a uniformly distributed area load and a localised patch load, applied as pattern loading subject to the chosen arrangement. For British Standard designs the construction load may be increased to 4.5/Lp (span of the decking) if this is greater than the basic 1.5kN/m².



GENERAL ARRANGEMENT

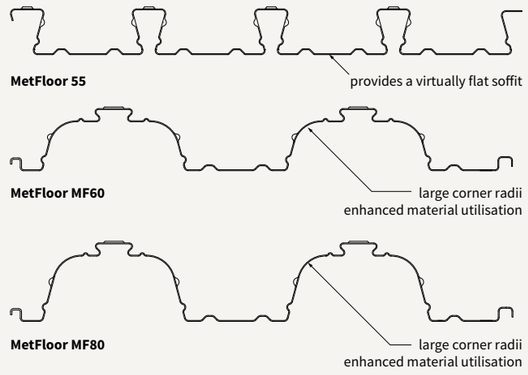
To achieve the most efficient decking arrangement, the deck should span continuously over two bays; and wherever possible an unpropped construction should always be the first choice. Further details on decking arrangements can be found on page 16.

MetFloor decking profiles may also be used as permanent formwork for Reinforced Concrete. This approach negates the composite stage of an otherwise composite slab design, with the decking used as construction stage shuttering only. This removes the need for temporary formwork and extensive back-propping, increasing accessible space for follow on trades and other operations.

PROFILE SELECTION

Profile selection usually depends on the deck's spanning capability, subject to the slab depth.

Typically spans of 4 to 5m can be achieved with the MetFloor 80 product and 3.5 to 4.5m for MetFloor 60. Where acoustic requirements govern, MetFloor 55 provides an ideal solution but is also employed where a virtually flat soffit is required or where of benefit to suspended services. Both the MetFloor 60 and MetFloor 80 are trapezoidal profiles which have noticeable large corner radii – utilising these large corner radii ensures the profile is fully efficient and working to its maximum potential, leading to longer spanning floor slab solutions.



CONCRETE SELECTION

Concrete specifications for composite slabs are typically for normal weight concrete (NWC), but light weight concrete (LWC) may also be specified.

NWC uses natural aggregates which are widely accessible. LWC uses artificial aggregates such as expanded pulverized fuel ash pellets. This gives LWC considerable advantages in fire performance, reduced slab depths and longer unpropped spans where the concrete self-weight is reduced but is not readily available to all parts of the UK.

Typical design strengths are 30 – 35N/mm² for both NWC and LWC where design strengths are in accordance with BS EN 1992 or BS 8110. The following table provides information on concrete density and modular ratios which are typical for BS EN 1992 based designs.

Concrete Density and Modular Ratio

Concrete Type	Wet (kg/m³)	Dry (kg/m³)	Modular Ratio
NWC	2550	2450	10
LWC	2050	1950	15

The ratio of the elastic modulus of steel and concrete depends on the type of concrete, the duration of load and the relative humidity of the environment. This is due to the effects of creep in concrete.

In the above table, the modular ratios are average values determined from short-term and long term requirements. Storage and other largely permanent loads should be considered as long term.

For further information see BS EN 1994-1-1 § 9.8.2 (5) or BS 5950-3.1.

DESIGN CHECKS

CONSTRUCTION STAGE CHECKS

Loads considered at the construction stage consist of the slab self-weight and the basic construction load, which is limited to a minimum of 1.5kN/m² and treated as an imposed load.

Where heavy construction plant is used on the hardened composite slab reference should be made to the rules for forklift trucks given below.

NORMAL STAGE CHECKS – COMPOSITE CONDITION

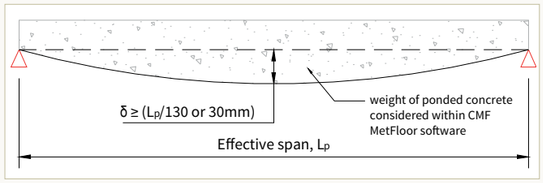
During the Normal, composite stage, slabs are designed assuming they are simply supported between supporting beams.

No account is taken of the continuity provided by the decking profile or slab reinforcement for the ultimate limit state design and this is reflected within the CMF MetFloor software.

SERVICEABILITY CHECKS

Serviceability refers to the functionality of the designed structure and the conditions by which it can be considered useful.

This includes limiting deflections to avoid damage to finishes, and vibrations for user comfort.



DEFLECTION

Deflection checks are completed to provide limits on the decking deflection during construction (including allowance for concrete ponding on longer spans) and for the overall deflection of the composite slab in the operational stage.

This can be considered through both span/deflection ratios and span-to-depth ratios. Deflection limits should be agreed with the client, but in the absence of precise information the following limits may be adopted.

The construction stage deflection limits should not normally exceed the following:

Lp/180 or 20mm *(whichever is the lesser)*
When the effects of ponding are not taken into account

Lp/130 or 30mm *(whichever is the lesser)*
When the effects of ponding are taken into account i.e. the additional weight of concrete due to the deck deflection is included in the design of the deck profile

Where Lp is the effective span of the deck.

The deflection of the normal stage composite slab should not normally exceed the following:

Ls/350 or 20mm *(whichever is the lesser)*
For deflection due to imposed load

Ls/250
For deflection due to the total load

According to BS 5950-4 and BS EN 1994-1-1, ponding resulting from the deflection of the decking shall be considered if the construction stage deflection exceeds 10% of the overall slab depth. CMF's software and load span tables take ponding into account in line with these recommendations.

SPAN-TO-DEPTH RATIO

As a general guide, span to depth ratios based on the overall slab depth should be in accordance with the following table.

Data is taken from SCI P300 with reference to BS EN 1992-1-1 for lightly stressed concrete, with additional BS 5950-4 values provided in brackets.

	Span to Depth Ratios (span/depth)		
	Single Spans	**End Spans**	**Internal Spans**
NWC	20 (30)	26 (35)	30 (38)
LWC	18.8 (25)	24.5 (30)	28.3 (33)

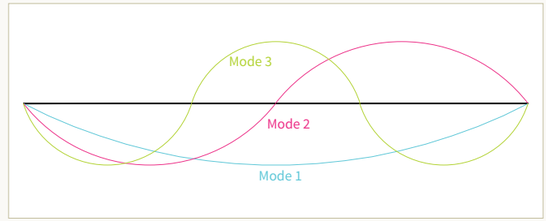
DESIGN INFORMATION
DESIGN CHECKS

VIBRATION

Vibration checks are used to provide occupant comfort and is related to the operational use of the composite floor.

Where there is no specific information, the natural frequency of the composite slab should not be greater than 5Hz for normal office, industrial or domestic usage. For applications such as dance floors or those which support sensitive machinery, limits may need to be set higher. For this type of activity, we would recommend that the slab should be checked in accordance with the SCI publication P076: Design guide on the vibration of floors or the calculation methods outlined in the SCI publication P354: Design of floors for vibration: A new approach.

Within the MetFloor design software package, a calculation is carried-out for the natural frequency of the floor slab. The natural frequency is calculated using the self-weight of the slab, ceiling and services, screed (if applicable) and 10% of the imposed load. For Eurocode designs, the imposed loads considered for the vibration check are altered using the psi-factor. The natural frequency limit can be reduced to 4Hz because of the altered load used in the calculation. To determine the vibration response of sensitive floors with greater accuracy refer to the calculation methods in SCI publication P354 "Design of Floors for Vibration: A New Approach". This enables designers to compare the response with the acceptance levels found within BS 6472 and ISO 10137 for building designs, and in the Department of Health performance standard for hospitals, HTM 08-01 Acoustics.



FIRE ENGINEERING

Within the design of CMF's composite metal decking there are two key design requirements:

- Bending resistance in the fire condition (fire moment design effect)
- Minimum slab depth to provide adequate insulation

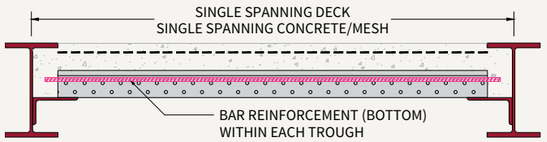
For the fire design of composite slabs, reference is made to NCCI standard PN005. This Non-Contradictory Complementary Information is produced by the SCI where the UK National Annex to BS EN 1994-1-2 states that the design rules within BS EN 1994-1-2 shall not be used. Loadbearing floor fire tests completed by CMF, and in conjunction with the SCI, helped lead to this standard's publication and implementation within the UK.

Based on this NCCI standard, the design procedure for a composite slab in the fire condition can be calculated using either the simple or fire engineering method.

SIMPLE METHOD

The simple method is based on the use of fabric mesh only (no reinforcement bar) and the required insulation depth for the given fire rating.

This method of fire analysis will always be the most economic and can be used on simply supported decks or for continuous decking designs where the mesh and concrete is able to be continued to an adjacent floor bay. Where single spanning slabs are isolated such that the mesh and concrete cannot be continued outside of the designed bay, bar reinforcement must be specified. In this condition the fire engineering method shall be employed.



FIRE ENGINEERING METHOD

The fire engineering method considers the insulation depth, specified fabric mesh and the bar reinforcement within each decking trough.

The fire insulation depth (depth of concrete above the deck profile) must meet the requirements of BS 5950-8 / PN005 or floor fire tests which have demonstrated that a reduced insulation depth can be used.

The CMF MetFloor software carries out the analysis for the two methods described above, utilising a fire engineering system produced by the SCI and based on the NCCI document PN005 which is used to calculate the design requirements. This enables specifications to be completed by design, without the need for additional specific fire tests.

Within the load-span data provided within this document the simple method for fire design is primarily used. Where the design requires, an increased load span capability under fire can be achieved by including bar reinforcement and using the fire engineering method described above.

FIRE INSULATION

Minimum slab depths are provided within the decking profile product pages of this manual with limits suitable for BS 5950-8 and NCCI PN005 designs.

SHEAR CONNECTORS IN FIRE SITUATION

For the fire design case, composite beams should be adequately tied into the composite slab.

This may be achieved by providing U-bars and shear connectors, with shear connectors typically provided at maximum 300mm centres. Where this is completed it may be possible to negate catenary actions from the composite slab to the supporting beams. See SCI publications P288 and P390 for further information. Composite structural designs shall be completed in line with relevant national design standards.

REINFORCEMENT
& NON-STRUCTURAL CRACKS

BAR REINFORCEMENT

The most efficient composite slab designs do not typically require bar reinforcement, utilising mesh reinforcement alone which is continued into adjacent floor bays as described for the fire design.

Where bar reinforcement is required, the axis distance of bar is defined as the distance from the bottom of the ribs to the centre of the bar. This has a minimum value of 25mm, and a maximum value of the profile height (e.g. 80mm for the MetFloor 80 profile). Where required, bar reinforcement is placed with one bar per profile trough.

ANTI-CRACK MESH REINFORCEMENT

Anti-crack, or fabric, mesh reinforcement is the most typical reinforcement solution for composite slabs and provides both resistance in fire and an anti-cracking solution.

Where mesh is used BS 5950-4 recommends that 0.1% of the gross cross-sectional area of the slab is used in determining the mesh requirements. For propped construction consideration should be given to increasing the area of steel reinforcement over supports.

For Eurocode designs BS EN 1994-1-1 makes the following recommendations:

0.2% of the slab area for unpropped construction, and 0.4% of the slab area for propped construction.

In slabs subject to line loads, the mesh should comprise 0.4% of the cross-sectional area of the concrete topping, propped and unpropped. These limits ensure adequate crack control in visually exposed applications (0.5 mm maximum crack width). The mesh reinforcement should be positioned at a maximum of 30 mm from the top surface. Elsewhere, 0.1% reinforcement may be used to distribute local loads on the slab (or 0.2% to BS EN 1994).

MESH REINFORCEMENT LAPS

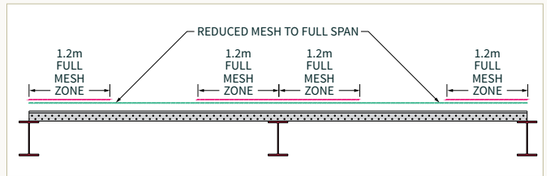
Mesh laps should be detailed in accordance with the requirements of BS EN 1992-1-1 and the following values are recommended:

- 300mm for A142 mesh
- 400mm for A193, A252 & A393 mesh

REDUCED MESH

Where EN 1994-1-1 mesh rules are utilised, as recommended by CMF and the SCI, the full stipulated mesh density applies to the slab 1.2m either side of every support.

Elsewhere, towards the midspan of the slab, mesh areas may be halved (to 0.2% for propped and 0.1% for unpropped constructions), providing there are no concentrated loads, openings or similar details to be considered.



IMPORTANT: Any reduction in mesh specification to the midspan of the slab must be checked for adequacy under fire.

TRANSVERSE REINFORCEMENT FOR CONCENTRATED LOADS

Where concentrated loads are to be supported by the composite slab these can be applied as one of three types:

1. Point Load
2. Line Load – perpendicular to the span
3. Line Load – parallel to the span

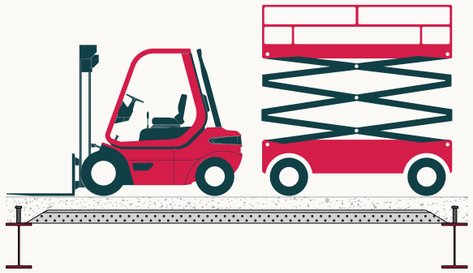
Parallel line loads and points loads spaced perpendicular to the span, and more than 500mm apart, should be considered separately within the CMF MetFloor software. For those closer than 500mm, the loads may be combined to produce a single concentrated load. Where line and point loads fall along the same line parallel to the span, multiple concentrated loads may be applied, spaced as required.

Where concentrated loads are applied, BS EN 1994-1-1 § 9.4.3 is referenced, and for loads not exceeding 7.5kN (point) or 5.0kN/m (line) transverse reinforcement is calculated as 0.2% of the structural concrete cross section above the ribs. Where these loads are exceeded, increased transverse reinforcement based on BS EN 1992-1-1 § 9.3.1.1 is recommended, with a minimum area of 20% of the principal reinforcement (the effective section of the decking profile).

USING FORKLIFT TRUCKS

If forklift trucks or similar concentrated loading from heavy plant is expected, then a minimum 0.5% reinforcement should be provided over the supports and 0.2% elsewhere to control cracking. See SCI AD150 for further information.

These rules may also be considered where other construction plant is used on the hardened composite slab. Additional mesh for transverse reinforcement may be required where construction plant applies high concentrated loads to the composite slab – these requirements are highlighted on the report output from the CMF MetFloor software. Outrigger pads may also be employed to assist in load spreading and can be considered within the design as part of the finishes thickness.



FIBREDECK

FibreDeck may also be used to replace anti-crack mesh.

See FibreDeck pages for further information on CMF's proprietary fibre reinforcement system.

EXPOSED FLOORS

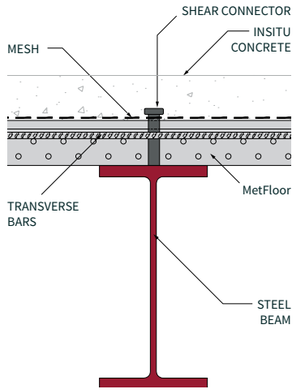
Composite floors are usually covered by finishes, floorings or raised service floors, where because cracking is not visible, light top reinforcement is adequate – typically 0.1% of the gross cross sectional area.

However, where the composite slab is left uncovered – such as for power-trowelled floor finishes – cracking, particularly over beams, may not be adequately controlled by the light mesh provided. Although this cracking does not have any structural significance, its appearance and the possibility of the crack edge wearing under traffic may be problematic. Methods of addressing this, can be found in the Concrete Society publications Concrete Advice No. 13 (Cracking in Composite Concrete/Corrugated Metal Decking Floors Slabs) and Technical Report TR75 (Composite Concrete Slabs Using Steel Decking) which provide mesh sizing and detailing for specific crack width control.

SUPPORTING BEAMS

There are several considerations for supporting [composite] beams which should be made when designing composite floor slabs including transverse reinforcement, shear connectors and lateral restraint from decking.

TRANSVERSE REINFORCEMENT



MetFloor composite floor decks contribute to the transverse reinforcement of composite beams; provided that the decking is either continuous across the top flange of the steel beam or alternatively that it is welded to the steel beam by shear stud connectors.

For further information refer to BS EN 1994-1-1 § 6.6.6.4 or BS 5950-3.1 § 5.6.4.

DECK PROVIDING LATERAL RESTRAINT AND DIAPHRAGM ACTION

Upon installation with suitable fastening, the MetFloor decking may be utilised for lateral restraint and to provide a diaphragm to the support structure.

Further information can be obtained regarding decking being used to provide lateral restraint to the support structure from the British Standards and/or Eurocodes, as well as SCI publication P360 and advisory desk note AD 175.

Note: Beams designed with the deck providing lateral restraint are inevitably smaller than beams designed unrestrained. As such these beams will have a greater deflection when compared to unrestrained beams. This greater construction stage beam deflection has a direct relationship to the slab depth i.e. the beam deflection will have an influence on the slab depth and should be considered within the design. However, where industry guidelines advise composite slabs to be poured to a thickness as opposed to a level, the finished level may be affected and not the slab depth.

BS EN 1090-4 advises that it is necessary to mark diaphragm areas of structural class I in the envelope as "diaphragm" on layout drawings, highlighted within the O&M manual and with a clear and permanent warning sign on the finished construction. Consideration should also be given for where openings are cut into the composite slab.

SHEAR CONNECTORS

Through the application of composite shear connectors, savings of up to 50% can be made in beam weight with the effectively anchored composite slab acting as a compression flange to the beam.

The slab and beam are generally connected by through-deck welding 19mm diameter shear connectors of varying heights which are fixed to the beam after the decking has been laid. Typical specifications are as follows for through-deck welded studs:

- 19mm x 95mm LAW used with MetFloor 55 and MetFloor 60
- 19mm x 120mm LAW used with MetFloor 80

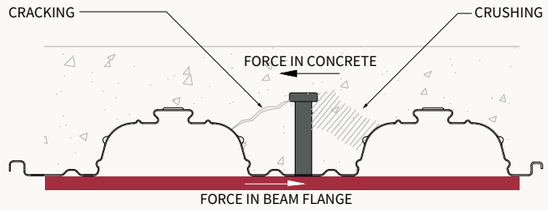
When decking is laid perpendicular to the steel beam, and the beam designed to act compositely with the slab, the capacity of headed studs should be taken as the capacity of a solid slab multiplied by the reduction factor k. The method for calculating the k factors differs between BS 5950-3.1 and BS EN 1994-1-1, with further information available from the SCI published NCCI PN001.

It is vital that site conditions are suitable for stud welding and that bend tests are completed following the welding procedure.

PLACEMENT AND DECK SUITABILITY

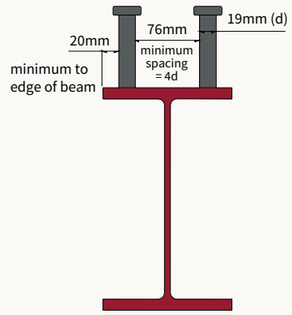
The spacing and position of shear connectors is important and shall be defined by the structural design engineer and identified on the decking layout drawings.

Shear connectors cannot be placed on profile stiffeners. However, for each of the MetFloor profiles, the position of the stiffeners and side lap allows for studs to be placed centrally. This optimised position ensures suitable cover to all sides and produces a favourable and efficient shear connection for maximum stud capacities.



Where more than one shear connector is required per trough, it is recommended to limit stud quantities to a maximum of two. The addition of further shear connectors is not considered to provide any practical additional restraint and is not explicitly covered by BS EN 1994-1-1.

The minimum centre-to-centre spacing of shear connectors is 5d along the beam and 4d between adjacent shear connectors, where d is the nominal shank diameter. Where rows of shear connectors are staggered the minimum transverse spacing of longitudinal lines of shear connectors should be 3d. The shear connector should not be closer than 20mm to the edge of the beam (shank of shear connector to toe of beam).



For further information on the use of shear connectors see SCI/MCRMA publication P300 ***Composite Slabs and Beams using Steel Decking: Best Practice for Design and Construction*** and CMF's Composite Shear Connector (CSC) product data sheet, available online.

NON-WELDED SHEAR CONNECTORS

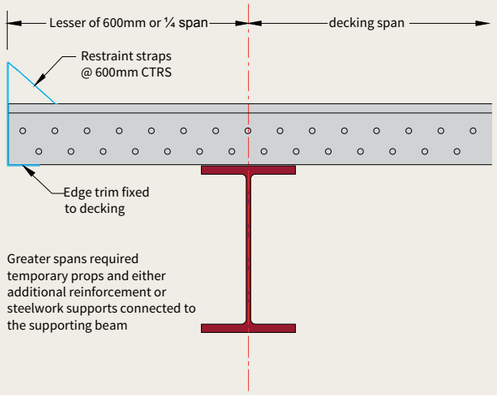
As an alternative to welded shear studs Hilti Shear connectors may be utilised with further information available at www.hilti.com. These are typically used on smaller projects where beams are fully painted or galvanized prior to studwelding operations.

CANTILEVERS

The projected cantilever of decking in the span direction should be no more than 600mm or ¼ of the span (whichever is the least), depending on the slab depth and the selected deck type.

Cantilevers greater than this will require temporary props and additional reinforcement based on a reinforced concrete design, or cantilevered steel members connected to the primary edge beam.

Where the deck is parallel to the edge beam, no cantilever can be achieved by the decking alone and additional support is required. For these cantilevers perpendicular to the decking span and projecting up to 200mm from the toe of the beam, an edge trim may be utilised to achieve the projection – see the below table for edge trim cantilevers. For cantilevers greater than 200mm (depending on specific details), the edge trim/deck should span between stub beams which are connected to the edge beam. If stub beams have not been allowed for, then the edge construction may have to be propped from the floor below with an appropriate reinforcement design for the final unpropped projection.



CANTILEVERED EDGE TRIM

Edge trim is used to maintain the correct concrete level at perimeters and should be fixed to the supports in the same manner as the deck and restrained by use of straps.

Where cantilevers are to be achieved by the edge trim component the following table provides maximum cantilevers for typical standard slab depths.

MAXIMUM CANTILEVERS FOR STANDARD EDGE TRIMS

Trim/Slab depth (mm)	Edge trim thickness (mm)			
	0.9	1.2	1.5	2.0
130	100	125	155	195
150	50	115	145	185
200	n/a	100	125	160
250	n/a	50	100	135
300	n/a	n/a	50	100
350	n/a	n/a	n/a	50

Table notes

(n/a = trim gauge not recommended) Values are for guidance only.

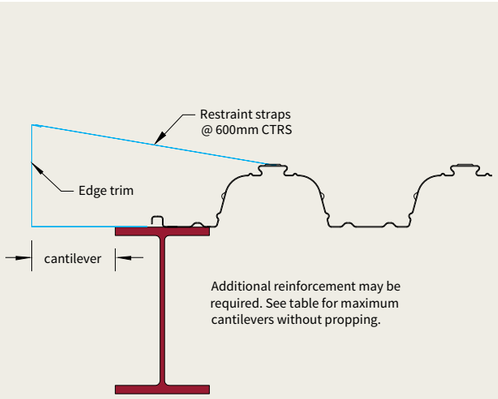
Serviceability is based on an approximate 3mm deflection and wet concrete weight only.

Edge trims are designed assuming restraint straps are installed at maximum 600mm centres.

Cantilevers are provided for edge trim acting as formwork only – the final cantilevered slab shall be designed to BS 8110 or BS EN 1992.

For other slab depths use the cantilever rules for the next tabulated slab depth (e.g. for a 190mm slab depth, use rules for 200mm).

For non-standard arrangements a temporary works design may be required.



SLAB OPENINGS

Openings and apertures can be readily accommodated within a composite slab, either by boxing out before the concrete is poured and cutting out the deck after the concrete has hardened, or after the concrete is hardened by core drilling. Decking should not be cut until the concrete has gained 75% of its strength.

Slab openings can be grouped into three size categories with distinct rules for their formation:

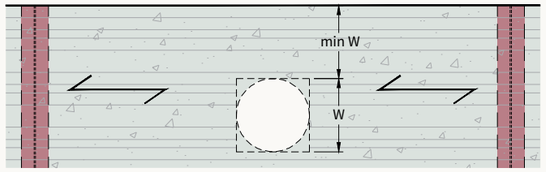
- **Small Openings** – up to 300mm square/ diameter
  Normally no need for any additional reinforcement
- **Medium Openings** – 300mm to 700mm
  Normally requires additional reinforcement in each orthogonal direction
- **Large Openings** – greater than 700mm
  Shall be trimmed with additional permanent steelwork connected back to primary supports

Openings over 700mm must have their required additional trimming steels installed prior to the decking. The decking can then be cut away from the opening zone immediately and an edge trim installed as for standard perimeter edge conditions. For all other opening sizes (small or medium), decking must not be cut prior to the concrete being poured or hardening.

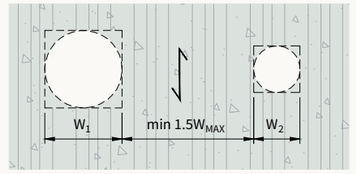
OPENING RULES

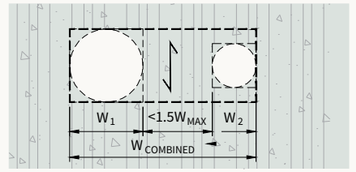
Where W is the width of the opening across the span of the decking, the following rules shall be followed. Where these rules cannot be met, the opening must be trimmed with additional steelwork:

1. The distance between an opening and an unsupported edge must be a minimum of the opening width, W



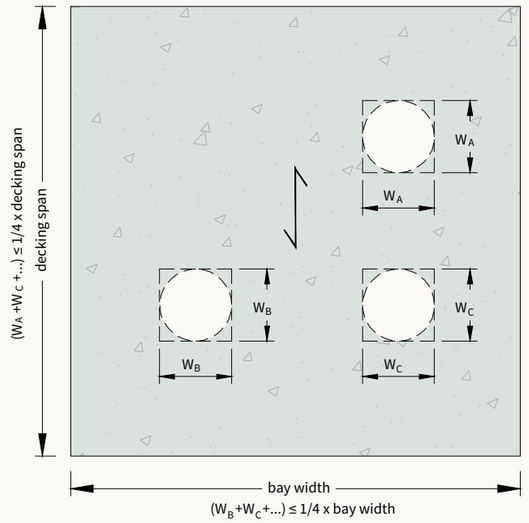
2. Openings must not be spaced closer than 1.5W of the larger opening – where closer the holes shall be considered as a single larger opening





3. No more than ¼ of the width of any bay shall be removed by openings

4. No more than ¼ of the width of the deck span shall be removed by openings



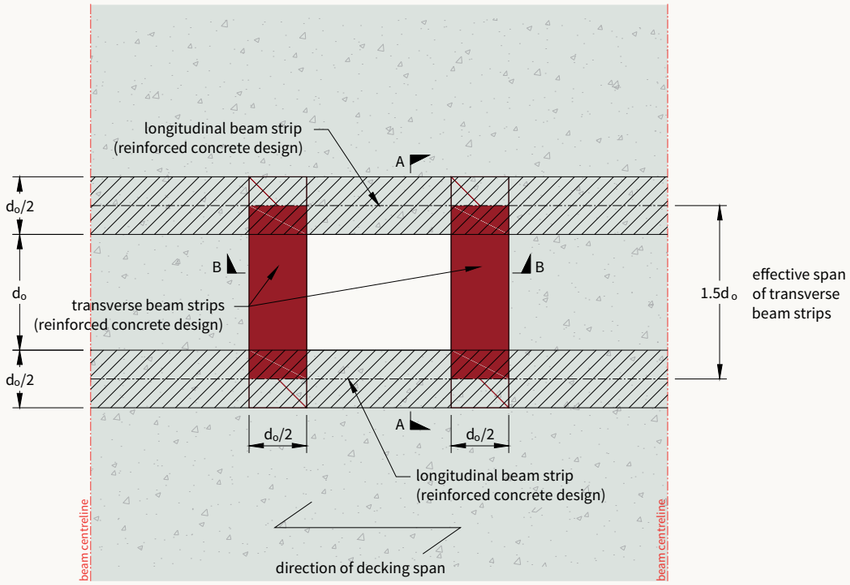
SLAB DESIGN AROUND OPENINGS

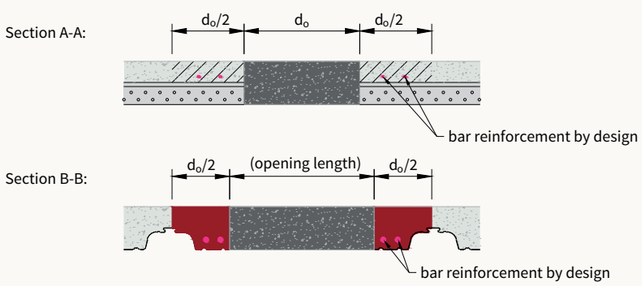
Where small openings (up to 300mm) are specified, there is typically no need for additional reinforcement.

For medium openings (300mm to 700mm) the slab around the opening should be designed based on the use of beam strips around its perimeter. The effective breadth of these beam strips should be taken as do/2, where do is the width of the opening in the direction transverse to the decking span.

For the design of the beam strips transverse to the decking span, only the concrete above the decking ribs shall be considered. These beam strips are assumed to be simply supported and to span 1.5do. The longitudinal beam strips are then designed to resist the load from the transverse beam strips combined with their own self-weight and respective proportion of the floor loading. Designs for the effective beam strips should be in accordance with BS EN 1992-1-1 or BS 8110-1.

Large openings require additional steelwork to support the perimeter, connected back to the primary supports.





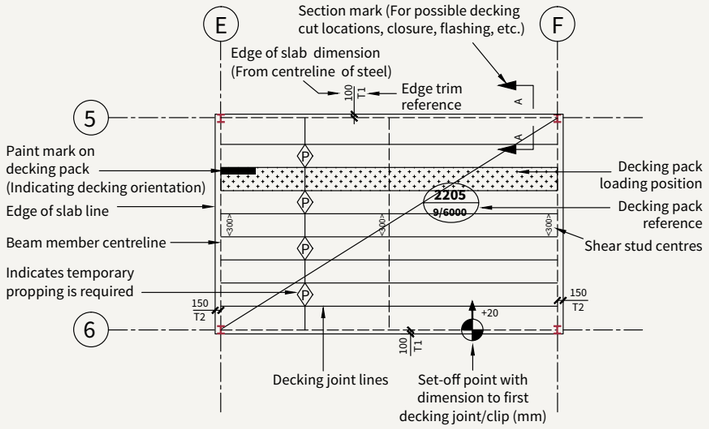
EFFECT OF OPENINGS ON COMPOSITE BEAMS

Where openings fall within the usual effective breadth of the concrete flange of any composite beams (typically span/8 each side of the beam centre line), the beam resistance should be checked for the reduced effective slab.

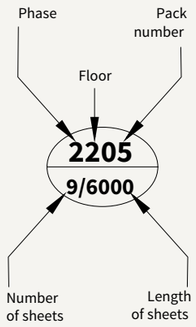
STANDARD DETAILS

The following standard details apply to the full MetFloor range and provide information on general arrangement and layouts

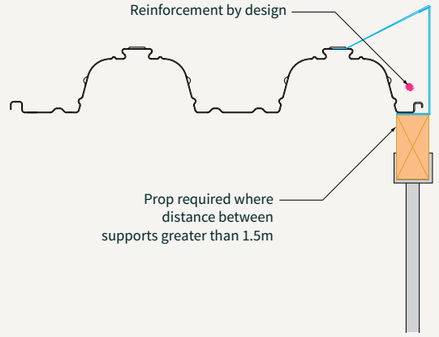
PLAN VIEW OF TYPICAL FLOOR LAYOUT



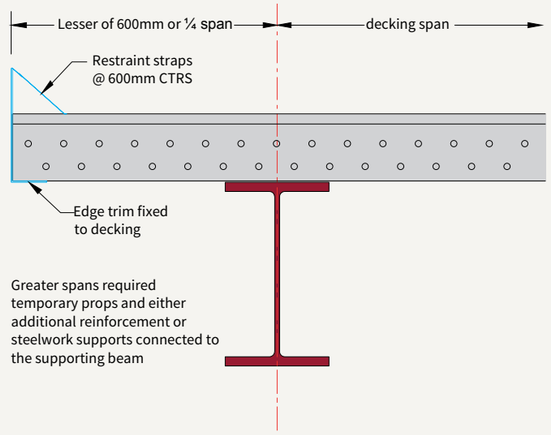
DECK NOTATION



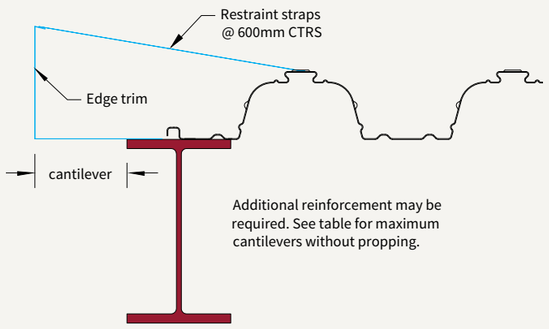
UNSUPPORTED EDGE DETAIL



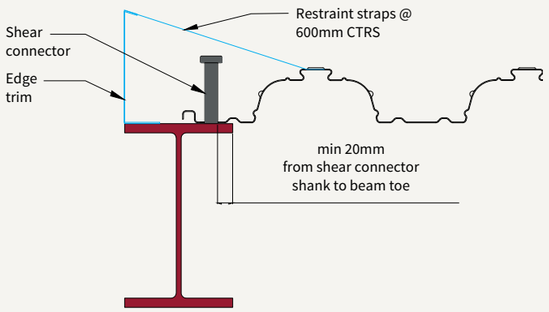
TYPICAL END CANTILEVER



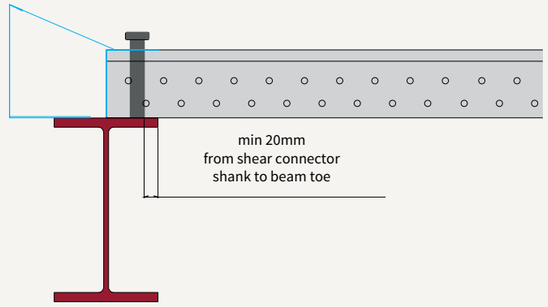
TYPICAL SIDE DETAIL



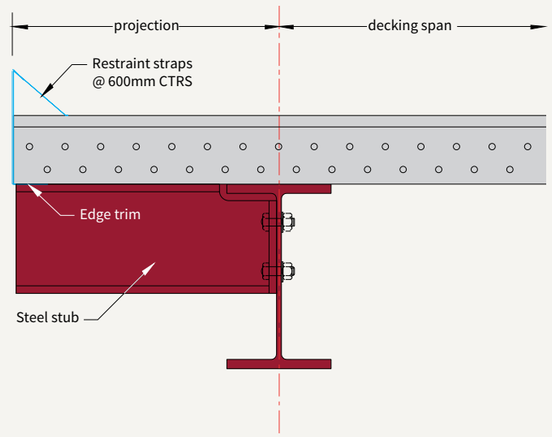
TYPICAL SIDE DETAIL WITH SHEAR CONNECTOR



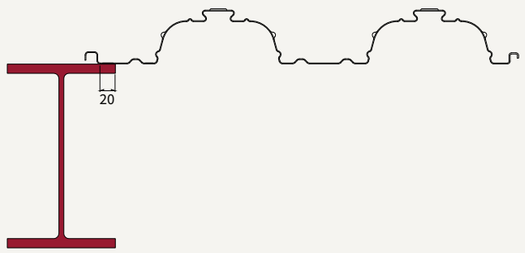
END DETAIL



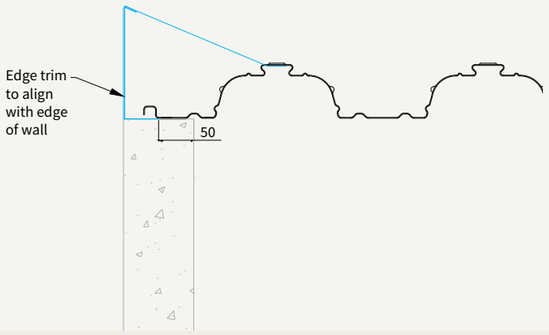
SIDE CANTILEVER WITH STUB BRACKET



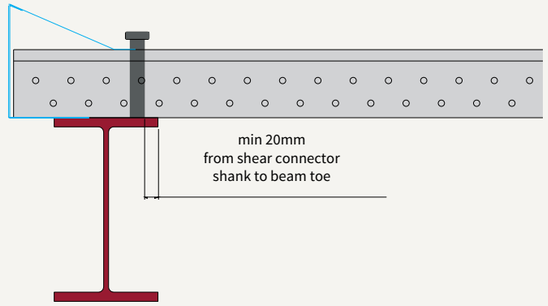
RECOMMENDED SIDE BEARING ONTO STEEL



RECOMMENDED SIDE BEARING ONTO OTHER MATERIALS



END DETAIL ALTERNATIVE 1

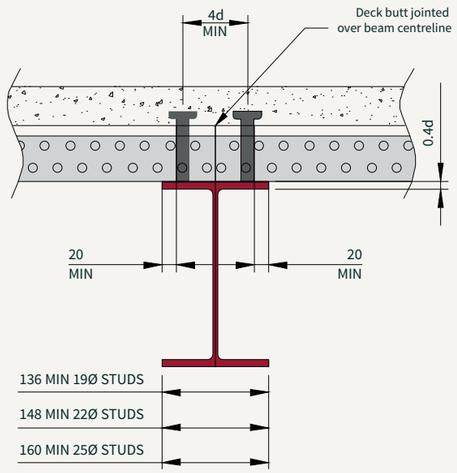


STANDARD DETAILS

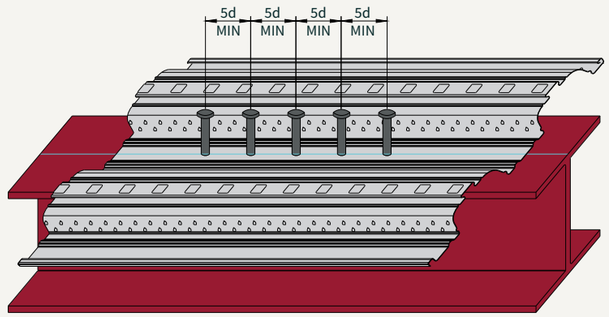
TYPICAL DETAILS SHOWING STUD OFFSET REQUIREMENTS

Note:
Dimension 'd' is the diameter of the shear stud.
Only 19mmØ shear studs can be directly through-deck welded. 22Ø & 25Ø shear studs either have to have holes pre-cut in decking, or welded directly to steel.

Typical detail showing **2 studs** per trough

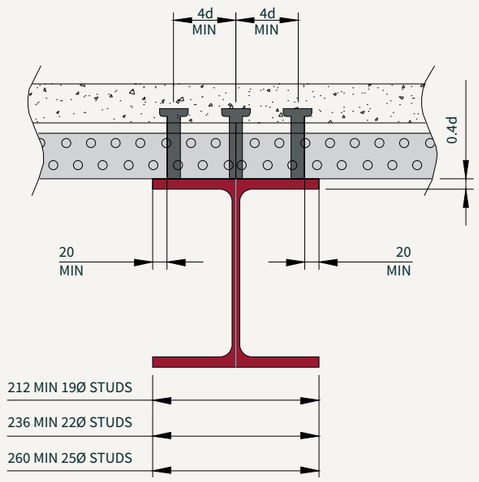


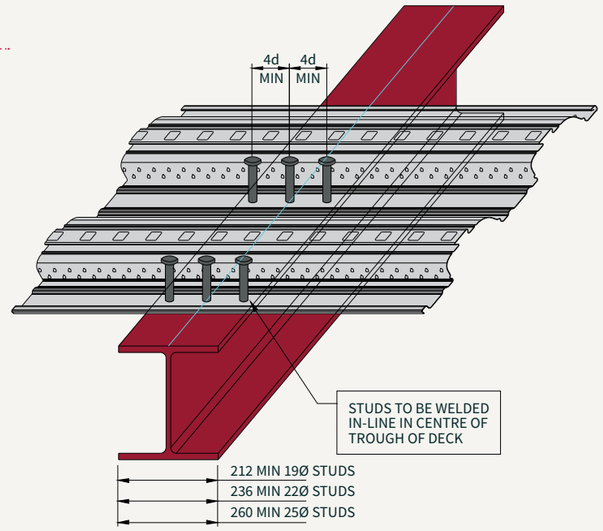
3-dimensional details showing stud in-line along beam length



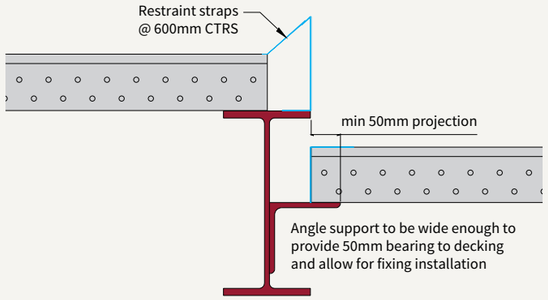
3-DIMENSIONAL DETAIL
SHOWING STUDS IN-LINE ALONG
BEAM LENGTH

Typical detail showing **3 studs** per trough

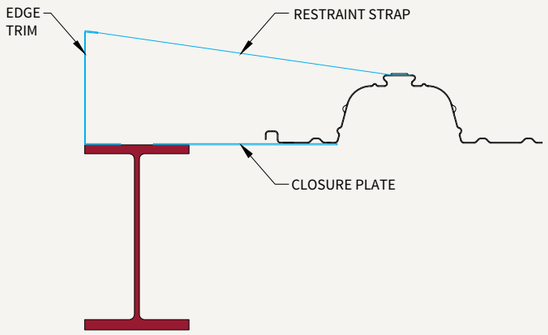




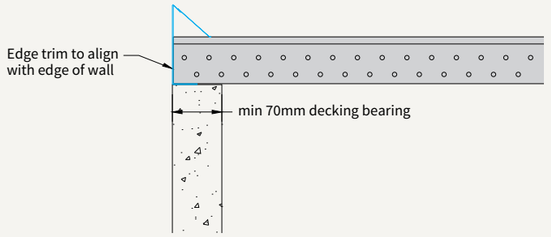
STEP IN FLOOR



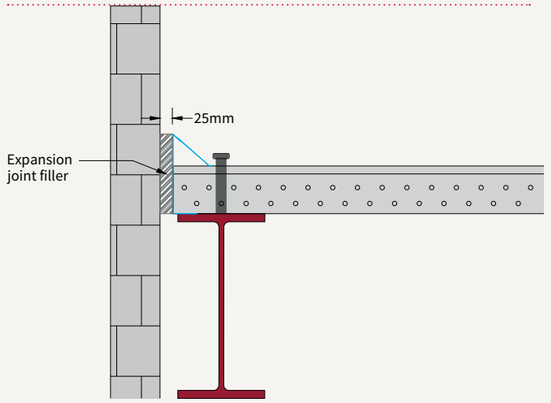
TYPICAL EDGE WITH PLATE



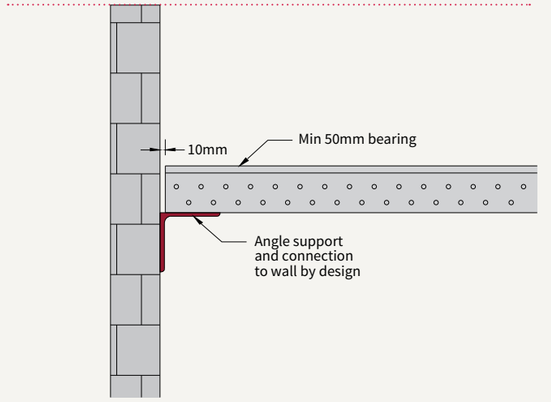
BEAM AT PERIMETER WALL



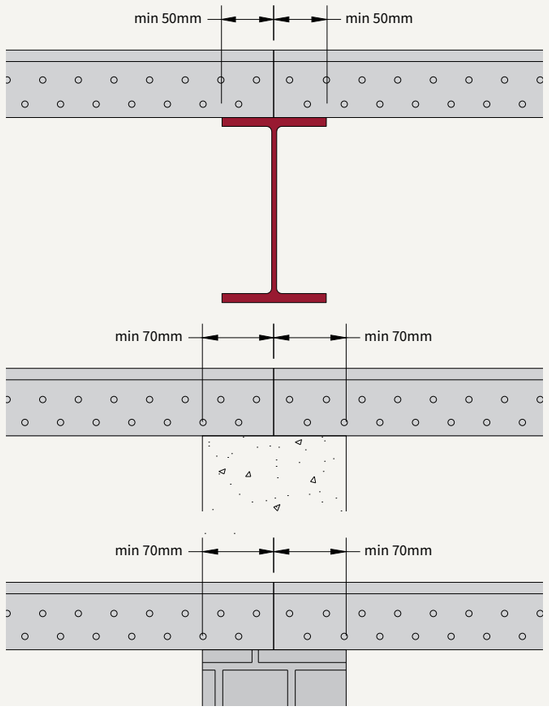
TYPICAL WALL END DETAIL



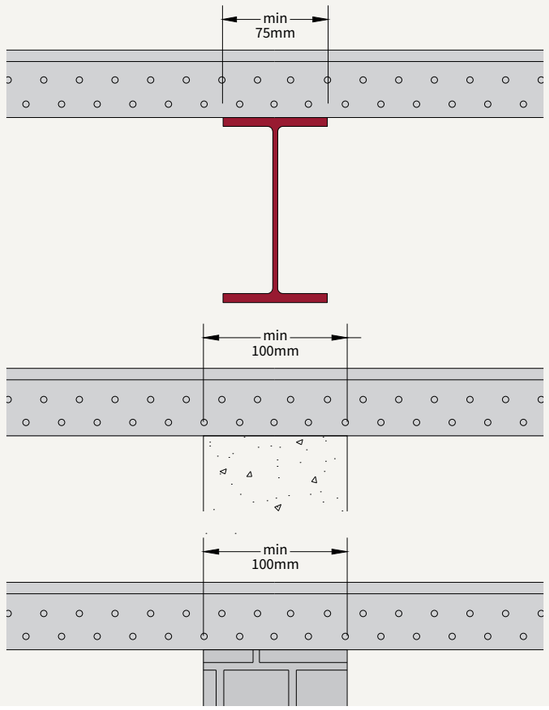
TYPICAL SIDE DETAIL



END BEARING AND SHARED BEARING (MINIMUM)



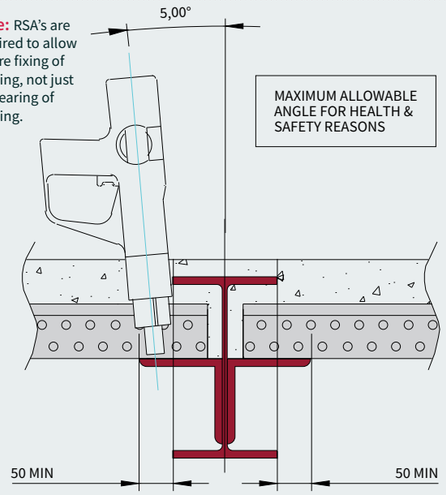
CONTINUOUS BEARING (MINIMUM)



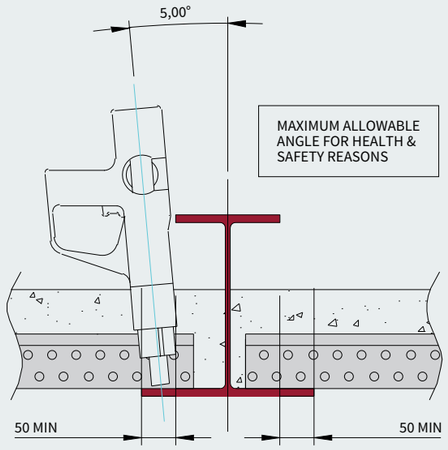
DETAILS FOR INSTALL AND FIXING ACCESS:

Supporting with RSA's

Note: RSA's are required to allow secure fixing of decking, not just for bearing of decking.



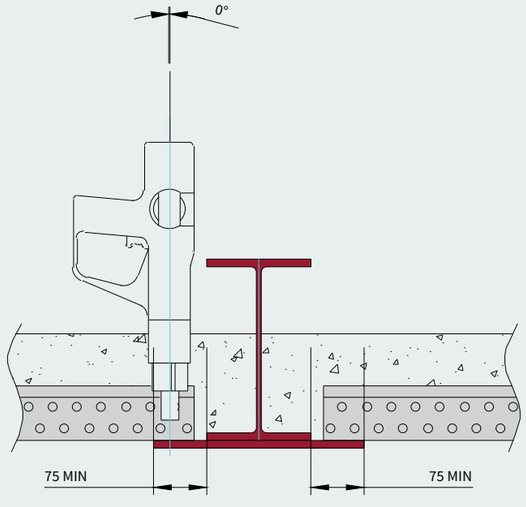
Supporting with Plates (Butt-Welded Plates)



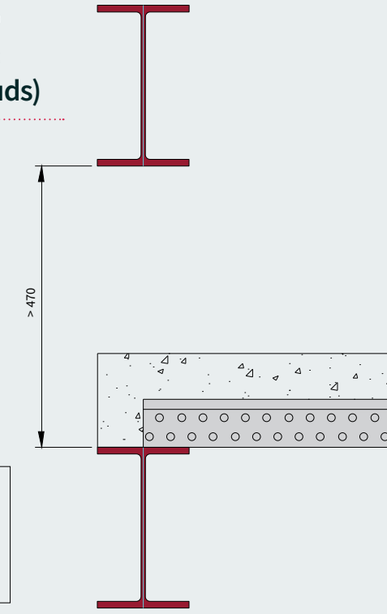
DETAILS FOR INSTALL AND FIXING ACCESS (CONTINUED):

Note: RSA's are required to allow secure fixing of decking, not just for bearing of decking.

Supporting with Plates (Plate Welded to Bottom Flange)

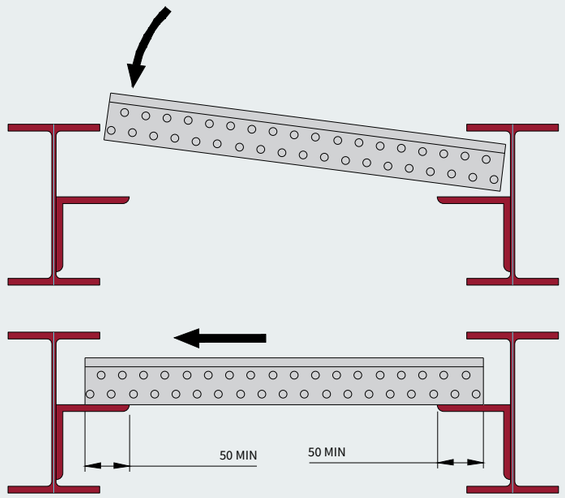


Fixing with Steel Above (Applies to Shot-Fired Pins & Welded Shear Studs)



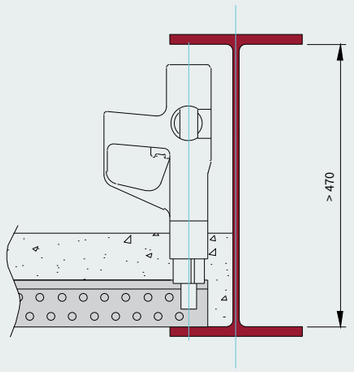
IF SHOT FIRED PINS OR WELDED SHEAR STUDS CANNOT BE PROVIDED DUE TO LACK OF CLEARANCE, ENGINEER TO PROPOSE A SUITABLE SOLUTION

Decking Supports to be Designed to Allow Correct Placement & Bearing of Decking

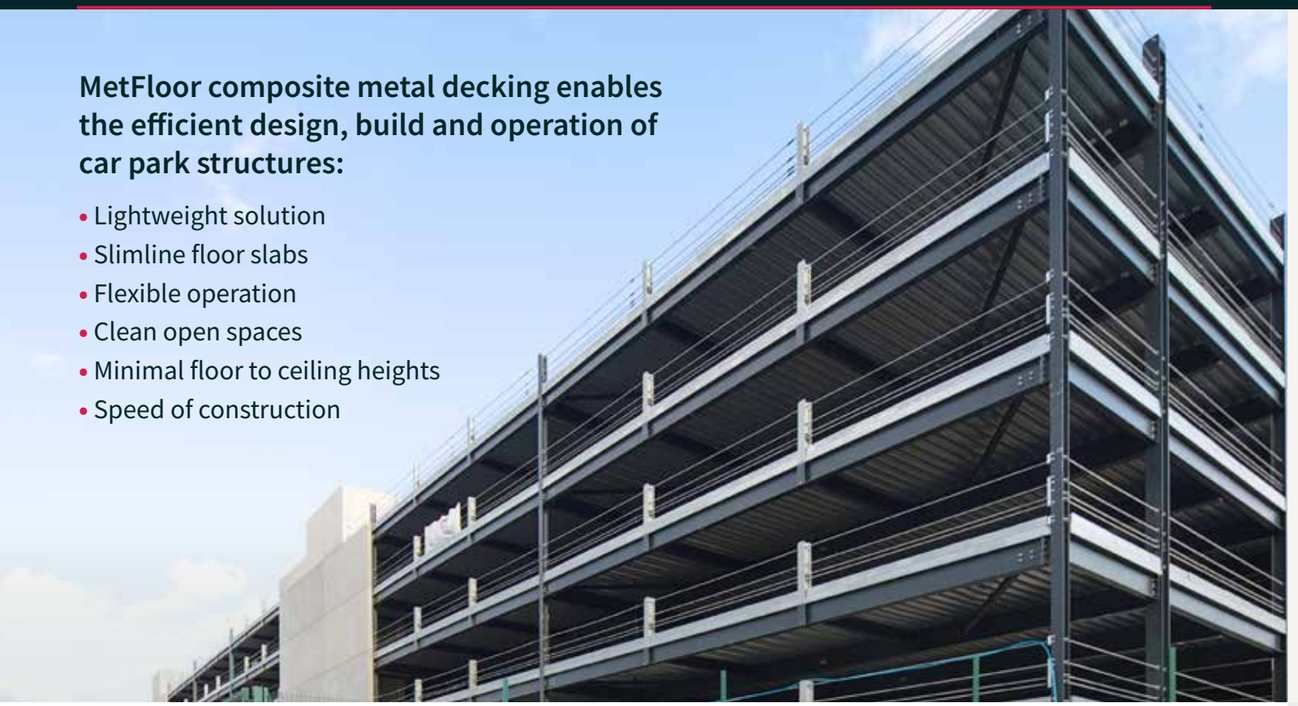


Fixing to Bottom Flange of Steel

FIXING TO BOTTOM FLANGE ONLY PERMISSABLE WHERE CLEARANCE OF 470mm OR MORE IS ACHIEVED



CAR PARK STRUCTURES



MetFloor composite metal decking enables the efficient design, build and operation of car park structures:

- Lightweight solution
- Slimline floor slabs
- Flexible operation
- Clean open spaces
- Minimal floor to ceiling heights
- Speed of construction

METFLOOR 60 & METFLOOR 80 TRAPEZOIDAL DECKING PROFILES

MetFloor composite floor decking provides the same impressive benefits to car parks as to other steel-framed buildings. Efficiencies are gained through speed of erection, reduced carriage requirements, and the provision of a working platform during construction without the necessity of extensive formwork and back-propping.

The MetFloor composite decking range also provides structural efficiencies through reduced structure, overall floor weight and depth.

RAMPS

The CMF MetFloor range can be installed to form sloped floor slabs such as car park ramps.

Installed on rotated or cranked supporting beams, or from fabricated secondary supports, MetFloor may be used to form ramps within car parking structures.

For ramp applications MetFloor decking is typically installed perpendicular to the slope. This enables the profile ribs to provide resistance to the wet concrete flow. The concrete mix must also be appropriate to form the required slope.

Accessory components such as edge trim is typically provided at standard 90° angles, but where the design calls for flush or vertical edges, non-standard trim angles may be produced to order.

CAR PARK ROOFING

With a lightweight composite roof over the top parking deck, additional protection is provided to the top floor, allowing users to park safely in all weathers.

Car park operators and users will benefit from the protection that MetFloor gives against the external environment.

The aesthetics of car parking structures is also enhanced with the application of MetFloor decking, blending into the urban environment.

END CRUSH FACILITY

In both the MetFloor 60 and 80 composite floor profiles, each of CMF's dedicated lines can form a manufactured closed end, which limits grout loss and eliminates the need for the installation of end caps.

This enables both a quicker installation time and a more aesthetically pleasing finish. Crushed ended MetFloor decking is the ideal solution for multiple single span decking projects such as car parking structures.

COATINGS

Where car parks are constructed and operated within a semi-external environment, alternative coatings may be specified to enhance the decking durability.

The MetFloor product is typically manufactured with a Z275 galvanized zinc coating. Subject to the environmental corrosion category, this standard coating may not be sufficient for car park structures. As such, CMF offer a range of high durability coatings for improved corrosion resistance and which are commonly specified for car parking schemes. These include enhanced metallic coatings and organic coloured coatings.

The most commonly specified solutions for car parking structures are CMF's enhanced metallic coating options. Specifications include ZM310 and ZM430 zinc-magnesium coatings which provide longer expected lifespans and are suitable for more corrosive environments.

The predicted lifespan of a composite slab soffit in a semi-external environment will vary by location and local conditions. In order to achieve the designed lifespan, a robust inspection and maintenance regime shall be employed, with the maintenance of coatings completed in line with manufacturers' recommendations.

For further guidance please contact CMF's Technical Department and see page number 42 for further information on durability.

Design Recommendations

Car park structures often require additional design considerations compared to typical building structures.

Attention should be made to waterproofing measures and details provided to avoid the ponding of water and to enable effective drainage. Inspection and maintenance shall also be completed in line with the owner or operator's life-care plan.

For further information regarding car park design see IStructE Design recommendations for multi-storey and underground car parks (Fourth edition).

DURABILITY

COATING SOLUTIONS

All CMF's MetFloor profiles are manufactured from galvanized steel strip to BS EN 10346 with a Z275 (275 g/m2) coating as standard – total coating thickness of 0.04mm.

For most typical applications a design life to first maintenance up to, or exceeding, 50 years can be expected when used in an internal, dry and unpolluted environment e.g. offices, hospitals and warehouses. Where the environment is more corrosive CMF can offer alternative coating solutions and provide advice on additional site applied protection.

STANDARD GALVANIZED COATING

MetFloor's standard Z275 zinc coating is suitable for most internal decking applications and can also be post-painted on site for enhanced durability or to create an aesthetic colour finish.

Application / Corrosion Category		Indicative Lifespan*
Internal	C1	> 60 years
External	C3	Up to 28 years

ENHANCED METALLIC COATINGS

MetFloor is available with enhanced metallic coatings consisting of zinc-aluminium-magnesium alloys.

Typical coatings include ZM310 and ZM430.

These enhanced coatings are optimised for long-term corrosion resistance. The performance advantage of these enhanced alloys vs. standard zinc increases as the exposed environment becomes harsher. The enhanced metallic coatings also have superior self-healing properties at sheared edges or punched hole locations.

Application / Corrosion Category		Indicative Lifespan*	
		ZM310	ZM430
Internal	C2	> 70 years	> 100 years
Internal	C3	> 45 years	> 65 years
Internal	C4	> 30 years	> 40 years
External	C3	> 60 years	> 80 years
External	C4	> 40 years	> 55 years
External	C5	> 35 years	> 50 years

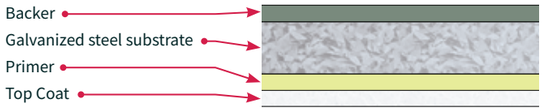
ORGANIC COLOURED COATINGS

Coloured coatings solutions may be applied to the MetFloor product as an additional layer over the standard galvanized coil.

These are applied to the steel coil prior to roll-forming, removing the need for onsite painting."

Providing both an aesthetic finish and enhanced durability, the lifespan of the steel deck may be improved when combined with appropriate inspection and maintenance.

Application / Corrosion Category		Indicative lifespan to first maintenance*
Internal	C1	(Aesthetic maintenance only)
External	C3	> 25 years



For more information on coating solutions see CMF's data sheets available at **www.cmf.uk.com** or speak to CMF's Technical Team.

EXPOSED SLABS

Where composite slabs are used in external environments, particularly where exposed from above, the robust design and detailing of the structure and profiled decking is critical since the ingress of any water or other contaminants will be difficult to detect and may cause hidden corrosion.

External applications must provide effective drainage measures, with water directed into appropriately designed and maintained drainage systems and include measures to stop water penetration.

*The lifespans stated do not constitute a guarantee as lifespans vary with location and usage and can only be confirmed on a project by project basis.

CONSTRUCTION & SITEWORK

The following guidance is produced to assist in the execution and installation of MetFloor composite slabs.

For further information on the execution and installation of composite slabs see the BCSA Code of Practice for Metal Decking and Studwelding (2014) and the UKMDA Approved Code of Practice for the Installation of Metal Decking and Thru Deck Stud Welding (2018).

OFFLOADING

Floor decking is packed into bundles of up to 24 sheets and secured with metal strapping.

Single bundles may be up to 650mm wide (or the width of a single sheet), 750mm high and can weigh up to 2.5 tonnes subject to the decking length. Bundles typically weight about 1.5 tonne. Loads are normally delivered by articulated lorry, and the main contractor should ensure suitable access and appropriate standing for delivery, offloading and storage.

Each decking pack is provided with a delivery label, identifying the product, contract information and contents, including a declaration of performance and CE marking information. Contractors receiving the decking should check this information as soon as the delivery is made with attention given to the product specification to ensure it is in line with installation drawings.

Upon receipt of the CMF products, the decking contractor should complete a visual inspection to ensure there is no damage prior to further handling or installation.

Decking packs shall be off-loaded by use of crane, tele-handler, rough terrain forklift or other suitable, mechanical means, and unloaded to a predetermined safe storage area. Where possible, decking packs shall be unloaded to the immediate vicinity of the installation area in order to prevent multi-handling. Positions for offloading may be indicated by the subcontractor on the decking drawings produced or within their installation method statement. In order to avoid damage to the decking bundle CMF recommend the use of protected chain slings – other lifting methods may damage the deck or be cut by the thin gauge steel sheeting. Bundles must never be lifted from the metal strapping. Where timber packs are used between decking sheets or bundles, these must be secured prior to lifting.

STORAGE

MetFloor decking shall be stored in a safe manner and on suitable ground.

Bundles shall be stored to avoid overturning or spillage and to limit any residual risk to installers and others in the area. The products and their storage area shall be arranged to ensure that water and corrosive chemicals (including de-icing salts) cannot collect, where their presence may affect the decking and its coating(s) and as such reduce the estimated design life.

DECKING INSTALLATION

Installation shall be completed by CMF distributors and/or installers who are suitably registered or qualified under recognised qualification schemes.

Detailed construction drawings shall be produced to enable correct loading-out, installation and sequence and the installation completed in line with best practice. Care must be taken to ensure the MetFloor decking product remains undamaged and free from defect, where any defects proven to be as a result of poor workmanship will invalidate any warranty provided.

Details of CMF distributors and registered installers can be found on our website or alternatively by contacting the CMF Sales Department.

PLACING DECKING

When preparing for decking placement the supporting steelwork shall be made safe for lifting decking packs into place and clear of dirt or debris – beam flanges may also need to be free of paint or galvanized zinc to provide a suitable surface for studwelding where specified.

Individual sheets shall be placed and oriented in line with contractor's drawings and arranged so that the side laps are oriented the same way to achieve the required connection between adjacent sheets. This ensures no further turning of sheets is required manually. Refer to contractor's section drawings to ensure decking packs are lifted the correct way up – for MetFloor 60 and MetFloor 80 the dovetail detail should be at the top, for MetFloor 55 the embossments should project upwards. If in doubt, ask. Drawings should also be referred to for any temporary support or propping requirements.

Both adequate time and good weather are needed to achieve an efficient installation. Decking should be installed from the position indicated on contractor's drawings; typically, at building corners to reduce the number of unprotected edges.

Decking sheets are slid into position and, if possible, fixed into place before the next sheet is installed. This helps maintain the installed decking position and provides a robust working platform minimising the risk of accident and injury.

Bearing requirements outlined in this document shall be adhered to (50mm minimum on steel), and joints in decking should never be made at temporary support points (decking should be continuous unless at an end). It is recommended not to fasten decking to temporary supports to assist removing the temporary supports once the concrete has hardened.

Where sheets are butted together, or where they interface with other elements, foaming or taping may be required. 5mm gaps are generally acceptable, being too small to allow aggregate through (BCSA, 2014). If decking sheets need to be cut (e.g. around columns or similar obstructions) this can be completed using a grinder or nibbler – any remaining gaps should be filled.

Unwanted parts or off cuts should be placed in a skip for recycling in line with the site waste management plan. To avoid multi-handling, skips should be positioned in the vicinity of the working area and placed over beams to avoid damage to the decking. Where bundles are only partially installed these must be suitably anchored to avoid being displaced by strong winds.

TEMPORARY PROPPING

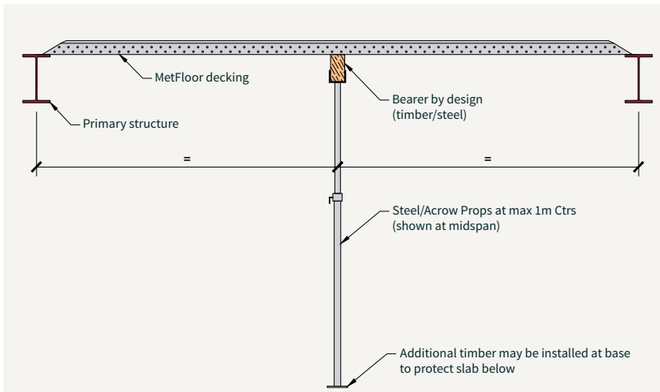
The first choice for any decking scheme should be for the deck to be unpropped. However, where propping is required by design, the main contractor or designated temporary works co-ordinator is responsible for ensuring the safe design and installation of temporary props.

Subject to the design, props are typically placed at either mid-span (1no line of props) or third points (2no lines of props) and installed with equal spacing between lines of propping and primary supports. Propping shall be provided by means of a continuous timber or steel bearer, supported by adjustable steel tube props (or Acrow props). Bearers should be supported by props at no greater than 1m centres and suitably braced to avoid being displaced during construction. Props shall not be placed more than 300mm away from the ends of bearers and not more than 500mm from the decking side support. The props should be stable without relying on friction with the deck for lateral stability. It is recommended that bearing widths be no less than 100mm to avoid marking the slab soffit. Props must be level and not over-tightened, with the decking above kept in a level position – a maximum upward camber between permanent supports of Ls/350 may be acceptable, where Ls is the effective span between permanent supports (e.g. 3m span; 3000/350 = 8.6mm).

Props should not be removed until the floor slab has reached 75% of its characteristic strength based on sample cube or cylinder tests. Upon removal, the slab should be allowed to develop its full design strength before any heavy traffic is applied. This is crucial as without fully hardening the slab may become subject to cracking. Similarly, propping may not be placed on top of another slab until it has been laid for a minimum of 7 days or reached 75% of its characteristic strength.

For the design of bearers, reference should be made to BS EN 1995-1-1 (or BS 5268-2) or BS EN 1993-1-1 (or BS 5950-1), with bearers designs as simple or continuous beams. For the prop specification, designers should refer to BS 4074/BS EN 1065 or proprietary load tables. Bearers must be designed to limit deflections to a maximum 10mm. See also BRE report BR 394 for further information on the design of backpropping.

Temporary propping shall be designed, installed, inspected and removed by a suitably qualified or experienced competent person.



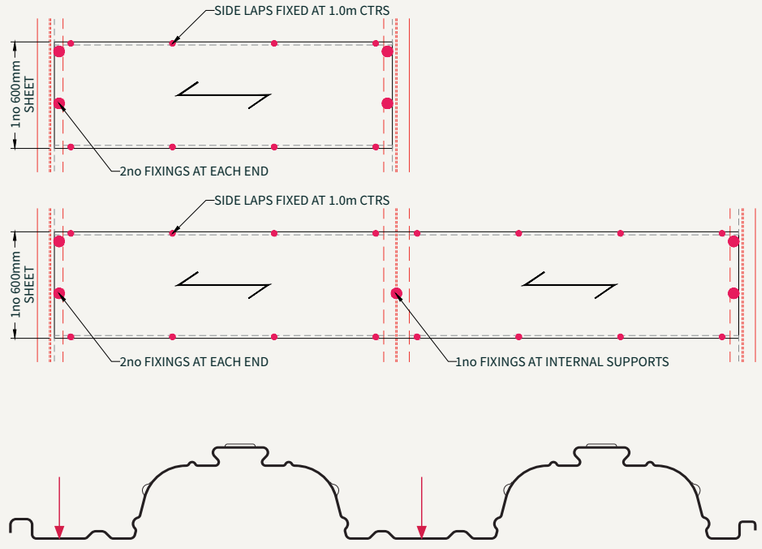
FIXING DECKING

As soon as the decking is laid fixings shall be applied through each trough to the supporting structure.

Where the supporting structure is a hot-rolled steel frame decking is typically fastened using powder-actuated/gas-fired nails or self-drilling screws. Each decking sheet shall be lapped to each adjacent sheet using the proprietary lapping detail and fixed at 1.0m centres. Where shear studs are used and the decking multi-spanning, two fixings shall be installed per sheet at end supports and one fixing per sheet at intermediate supports. Fixings for side bearings should be provided at 600mm centres.

Typical fixing arrangements are shown below. Where decking is to be fixed to materials other than hot-rolled steel, the structural designer shall be consulting for suitable quantities and specification. Fixing spacing and edge distances from the fixing manufacture shall be adhered to.

The following table provides further information on standard fixings.



It is recommended that fixings be placed within the central flat portion of the decking trough. This is done to ensure the deck is firmly pinned to further inhibit grout loss. Fixing locations should be placed with consideration for the positioning of shear connectors.

Fixing Guidance				
To Steel	Temporary Fix	Hilti X-U 15 P8 TH Hilti X-P 14	Shot-fired Gas-fired	Or equivalent for temporary fastenings prior to through-deck studwelding (studs at min 300mm centres)
	Heavy Duty	Hilti X-ENP-19 / ITW Spit SBR14	Powder-actuated	Subject to design actions for wind and lateral restraint
		Hilti S-MD / Evolusion TSHW	Self-drilling screws	Or equivalent suitable for base steel thickness
To Concrete		Hilti HUS range / SFS intec TB-T / EJOT 4H 32	Mechanical anchors	Or equivalent; fixed into pre-drilled hole
To Blockwork		Rawlplug FX-N-L	Hammer-in	Or equivalent suitable for base constituents
To Timber, Glulam or CLT		Hilti S-MP 53 Z / EJOT JA3	Self-drilling screws	Or equivalent; in line with manufacturers recommendation
To side laps, end closures etc.		Hilti S-MD 01 Z / other 5.5 x 25mm / other 4.8 x 19mm	Self-drilling screws	Or equivalent suitable for the installed decking or part gauge

See fixing manufacturers' literature for further information and guidance on installation

***Suitability of blockwork fixings and capacities are subject to block type, strength and arrangement – on site testing is recommended.**

Additional fixings may be required where the decking is designed to provide a diaphragm for the stability of the primary structure and where wind speeds dictate in the temporary condition.

STUDWELDING

Further to the Design Information provided in this document, composite shear connectors manufactured in accordance with BS EN ISO 13918 should be installed by CMF distributors and/or registered installers or other suitably qualified specialist studwelding organisations.

Details of CMF distributors and registered installers can be found on our website or alternatively by contactingthe CMF Sales Department.

PLACING REINFORCEMENT

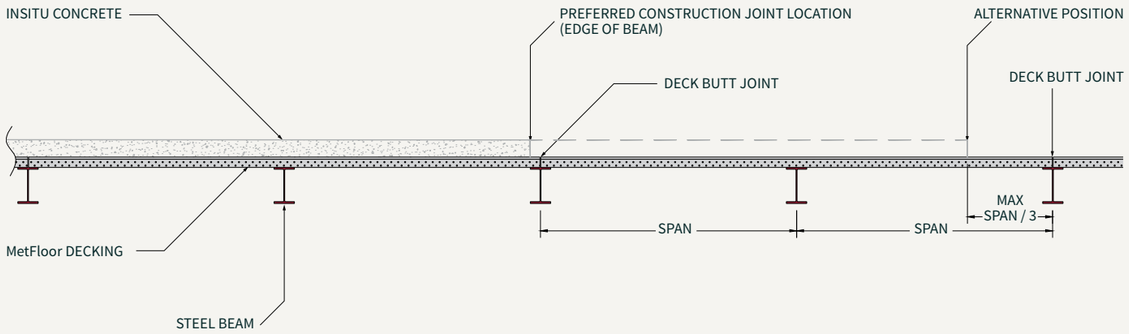
Where mesh reinforcement is used, it should be positioned towards to the top of the composite slab.

Top cover to the reinforcement mesh is typically 25mm. Greater cover may be necessary for heavier mesh specifications and for designs requiring improved load distribution for concentrated loads - where mesh has a large cover dimension consideration should be given for slab durability and non-structural cracking. For bar reinforcement, similar rules apply from the base of the composite slab, with minimum offsets for the axis dimension of the bar determined by design for the specified fire resistance period. Reinforcement spacers and chairs may be required to maintain correct mesh and bar heights – see BS 7973-2 for more information.

CONSTRUCTION JOINTS

When construction or day joints are required, these should be formed as close as possible to an adjacent butt joint.

Where this isn't possible then the distance of a construction joint to the end of the current decking sheet shall not exceed one third of the span. For further information on construction joints guidance is available from the BCSA, Concrete Society and SCI.



PLACING CONCRETE

Dirt and grease can adversely affect the performance of the hardened slab and as such should be cleared from the decking prior to the concrete pour.

Oil may be present on the decking product from the manufacturing process which may be left in place. Concrete shall be poured evenly, working in the direction of span. Care shall be taken to avoid heaping of concrete. Construction and day joints should occur over support beams and preferably at a decking joint. For more information on safe pouring of concrete see BCSA document Code of Practice for Metal Decking and Stud Welding (BCSA, 2014).

DRILLING

Whether core drilling or drilling for other secondary purposes, the use of percussive drilling devices must be avoided as this can negatively impact the bond between the metal deck and concrete.

For the anchors or similar items, the use of small-scale rotary hammer drills is considered acceptable.

SERVICES INTEGRATION

The re-entrant profile of the MetFloor 55 range and the raised dovetail above the shoulders of the MetFloor 60 and MetFloor 80 profiles allows for easy installation of suspended ceilings and services.

For the MetFloor 55 profile, a threaded V-Nut may be used. These are available from Lindapter (Type VN V-Nut) and is simply offered up into the re-entrant profile and turned to be wedged into place.

For MetFloor 60 and MetFloor 80 Lindapter's Type MF connector should be employed. This uses a profiled bracket and threaded wedge, where the bracket is pushed into the decking's dovetail and the wedge rotated to secure the connector into place.

lindapter

TYPE MF DECKING FIXINGS

Type MF is a high quality, cost-effective connection for securing building services and is specifically designed for MetFloor 60 and MetFloor 80 profiles.

The MF fits inside the dovetail shaped re-entrant channel for its designated profile.

Decking Profile Pattern

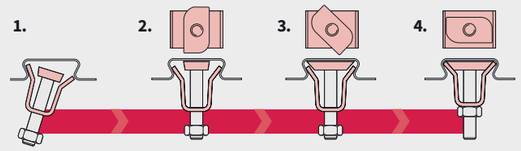
KEY BENEFITS & TECHNICAL DATA

- Fast, cost effective installation
- No special tools required
- No weakening of decking profiles
- No damage to the decking surface
- No possibility of delamination
- Adjustable and easy to remove

Safe Working Load (3:1 Factor of Safety)			
Product Code	**Rod min 4.6**	**Tensile / 1 Rod (kN)**	**Tightening Torque (Nm)**
MF06	M6	1.47	10
MF08	M8	1.47	10
MF10	M10	1.47	10

Bracket: Steel strip, zinc plated + JS500 | **Wedge:** Malleable iron, zinc plated.

Note: It is the responsibility of the M&E contractor/designer to ensure that the Type MF fixings are sufficient to carry the required services load.



1. Pre-assemble the bracket and wedge (flat surface facing up) onto the threaded rod and insert one side of the bracket into the re-entrant channel of decking.
2. Insert the other side of the bracket into position inside the decking.
3. Turn the wedge clockwise until the position in Fig. 4 has been achieved.
4. Tighten the nut on the rod to a torque of 10Nm (prevent rod from rotating).

- Install the decking fixings after the concrete has been poured and has reached full strength.
- If the decking profile is deformed or distorted, do not install the fixing. If in doubt, contact the Technical Support team for advice.

Health & Safety

Handling

Galvanized steel decking shall be handled with care.

Adequate training shall be completed, and protective gloves and clothing must be worn when handling steel decking to avoid contamination from protective oil coverings and to avoid cuts from sharp edges and corners.

Eye hazards

Adequate eye protection conforming to BS 2092/BS EN 166 must be worn when cutting strapping and steel decking to avoid serious eye injury.

Eye protection shall also be worn during fastening operations.

Noise hazards

Adequate hearing protection, such as ear defenders, must be worn when handling or cutting decking and shot firing to avoid the risk of permanent hearing damage.

Noise levels may be high, particularly when using powder or gas actuated nail guns.

Respiratory Hazards

When welding or flame cutting galvanized steel decking, fumes containing oxides of iron and zinc are produced – if inhaled these can cause metal fume fever.

This is a short lasting condition with flu-like symptoms. Adequate Respiratory Protective Equipment must be worn to prevent the risk of Occupational Respiratory Diseases. The following provides workplace exposure limits as published by the HSE.

Substance	Workplace exposure limit		Notes
	8 hour TWA	15 minute STEL	
Iron oxide fume	5mg/m³	10 mg/m³	UK WEL
Zinc oxide fume	5mg/m³	–	(Previous UK WEL)

Fumes may also be produced by powder-actuated nail guns – refer to manufacturer information.

Health & Safety, continued

Explosives & Ballistics

Powder-actuated or gas-fire nail guns pose a major hazard when used by inexperienced operatives.

Nail guns shall only be used by trained operatives and in line with manufacturer's instructions.

Working at Height

For the installation of profiled sheet decking and associated elements, always employ site safety measures such as safety netting, edge protection systems and suitably protected means of access.

These shall be completed in line with the site rules and standards, and following the risk assessments and method statements (RAMS) completed for the works.

OPERATION & MAINTENANCE

Subject to the environmental corrosion category and site exposure, the MetFloor system may achieve a design life in excess of sixty years.

In order to achieve this the installation shall be completed in line with best practices. Steps shall be taken to ensure that the product is free from damage and that any measures applied which protect it from corrosion and degradation are maintained throughout its working life. It shall be noted that the design life does not constitute a warranty.

Regular inspection must be completed at intervals, and in a manner, which is suitable for the requirements of the structural type and in line with the required maintenance regime for the application. Consideration must be made for both the steel deck and concrete infill as both elements are crucial to the composite action of the slab and as such the longevity of the structure.

DECOMMISSIONING

The MetFloor product may be dismantled as part of the composite slab unit.

Suspended fixtures and finishes shall be removed from the decking soffit and finishes to the top of concrete removed and disposed of in line with individual product O&Ms. Lifting points shall be fitted to the composite slab and the slab cut into manageable sections. The cut sections shall be held by crane whilst their connections at end and mid supports are broken by suitable means; subject to the connections used and site conditions. Once disconnected the cut slab sections may be lifted away to a safe working area. Specialists in decommissioning and demolition shall be consulted.

RECYCLING

Upon specialist separation of the constituent materials, steel may be recycled in its entirety to produce new structural steel components.

Steel scraps and off cuts should also be recycled. Concrete may be recycled or reused to produce aggregates for new concrete installations or as base courses for a variety of infrastructure applications.

METFLOOR DESIGN SOFTWARE

The CMF MetFloor design software is a state-of-the-art application for the design and specification of CMF's market leading composite metal decking.

The software incorporates the construction stage, operational ultimate and serviceability checks and composite slab fire designs. The MetFloor software has been developed following the completion of composite slab tests carried out at Imperial College London, together with fire tests carried out at Paus (Czech Republic), both managed and their results implemented by the SCI.

The MetFloor software enables the designer to carry out a composite decking and slab design for all loading arrangements, including concentrated line and points loads and associated punching shear checks.

With a simple and precise setup and user interface, CMF's MetFloor software offers the user an easy to use design tool with detailed and precise outputs.

Designs are completed to BS 5950-4 or BS EN 1994-1-1 with fire designs completed in line with British Standards and the UK National Annex to BS EN 1994-1-2 & NCCI PN005c respectively. Once the design has been finalised, a comprehensive calculation report can be published, complete with the SCI "ASSESSED" logo – CMF is the first decking manufacturer to have carried out this SCI Assessed procedure for all its profiles.

To download the CMF MetFloor design software, go to www.cmf.uk.com/software.php

Other software available from CMF includes the MetPurl suite which provides a design method for the MetPurl purlins and side-rail range and for the MetMezz mezzanine system for industrial floors and storage, handling and distribution facilities.

The MetFloor product range can be found within the following leading structural analysis and design software, ready for application into user's structural models.

Tekla Structural Designer

SCIA ENGINEER

masterSERIES

Bentley Advancing Infrastructure

LOAD SPAN DATA

Summary

The following pages offer a suite of load span data provided in formats to suit designers and estimators working to both Eurocode and British Standards.

This data is provided as an initial reference to obtain a MetFloor decking span for the given conditions and arrangements. The load span data covers a wide range of possible designs but is not exhaustive. The CMF MetFloor software should be used for full composite slab specification and for construction stage designs.

Data Sets

The following load span data is split into three sections:

1. **Load Span Tables to BS EN 1994**
2. **Load Span Tables to BS 5950**
3. **Depth/Span Charts to BS EN 1994**

Load span tables are limited to slab depths up to 200mm. This does not represent an upper limit. For designs using larger slab depths the CMF MetFloor software should be utilised.

NOTES

The following load span data is based upon the following design criteria:

- Minimum construction load applied in accordance with BS 5950 or BS EN 1994 respectively
- Stated loading refers to characteristic variable loads
- Loads used (and Eurocode Categories) applied are as follows:
- 2.5kN/m² (Cat B) + 1.0kN/m² (partitions) = 3.5kN/m²
- 4.0kN/m² (Cat C) + 1.0kN/m² (partitions) = 5.0kN/m²
- 7.5kN/m² (Cat E)
- 10.0kN/m² (Cat E)
- Dead loads applied include for the self-weight of decking, concrete and reinforcement
- No specific allowance is made for superimposed dead loads
- 350N/mm² decking yield strength
- Normal Weight C30/37 (Eurocode designation) or "C30" (British Standard cube strength)
- Modular Ratio = 10
- Wet Density = 2550kg/m³ (Eurocode Standard) and 2400kg/m³ (British Standard)
- Dry Density = 2450kg/m³ (Eurocode Standard) and 2350kg/m³ (British Standard)
- Minimum mesh used unless noted by an asterisk (*)
- Reinforcement yield strength = 500N/mm² (Eurocode Standard) and 460N/mm² (British Standard)
- Allowance taken for 19mm Shear Connector
- Natural frequency limit set to 5Hz
- Partial Interaction used for the Longitudinal Shear Method (Eurocode)
- 152mm support width (spans may be altered by the support width difference for alternative conditions)
- All double spans are assumed equal spanning
- All single spans are assumed to have discontinuity of concrete and mesh
- Prop widths are taken as 100mm where applicable
- All propped designs are based on a single row of props at the mid-span position

LOAD SPAN TABLES TO BS EN 1994 (EUROCODES)

MetFloor® 55

Single span decking / single span concrete (Fire Engineering Method)

Props	Fire Period	Slab Depth (mm	Mesh 0.2% min. req'd	Total Applied Load (kN/m²)											
				0.9mm				1.0mm				1.2mm			
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
None	60 minutes	100	A142	2.91*	2.91*	2.91*	2.91*	3.15*	3.15*	3.15*	3.15*	3.37*	3.37*	3.37*	3.37*
		110	A142	2.84*	2.84*	2.84*	2.84*	3.07*	3.07*	3.07*	3.07*	3.29*	3.29*	3.29*	3.29*
		120	A142	2.76*	2.76*	2.76*	2.76*	2.99*	2.99*	2.99*	2.99*	3.21*	3.21*	3.21*	3.21*
		130	A193	2.70*	2.70*	2.70*	2.70*	2.92*	2.92*	2.92*	2.92*	3.14*	3.14*	3.14*	3.14*
		140	A193	2.63*	2.63*	2.63*	2.63*	2.86*	2.86*	2.86*	2.86*	3.07*	3.07*	3.07*	3.07*
		150	A193	2.58*	2.58*	2.58*	2.58*	2.80*	2.80*	2.80*	2.80*	3.01*	3.01*	3.01*	3.01*
		160	A252	2.53*	2.53*	2.53*	2.53*	2.74*	2.74*	2.74*	2.74*	2.96*	2.96*	2.96*	2.96*
		170	A252	2.48*	2.48*	2.48*	2.48*	2.68*	2.68*	2.68*	2.68*	2.91*	2.91*	2.91*	2.91*
		180	A252	2.43*	2.43*	2.43*	2.43*	2.63*	2.63*	2.63*	2.63*	2.86*	2.86*	2.86*	2.86*
		190	A393	2.39*	2.39*	2.39*	2.39*	2.58*	2.58*	2.58*	2.58*	2.81*	2.81*	2.81*	2.81*
		200	A393	2.35*	2.35*	2.35*	2.35*	2.54*	2.54*	2.54*	2.54*	2.77*	2.77*	2.77*	2.77*
None	90 minutes	110	A142	2.84*	2.84*	2.84*	2.84*	3.07*	3.07*	3.07*	3.07*	3.29*	3.29*	3.29*	3.29*
		120	A142	2.76*	2.76*	2.76*	2.76*	2.99*	2.99*	2.99*	2.99*	3.21*	3.21*	3.21*	3.21*
		130	A193	2.70*	2.70*	2.70*	2.70*	2.92*	2.92*	2.92*	2.92*	3.14*	3.14*	3.14*	3.14*
		140	A193	2.63*	2.63*	2.63*	2.63*	2.86*	2.86*	2.86*	2.86*	3.07*	3.07*	3.07*	3.07*
		150	A193	2.58*	2.58*	2.58*	2.58*	2.80*	2.80*	2.80*	2.80*	3.01*	3.01*	3.01*	3.01*
		160	A252	2.53*	2.53*	2.53*	2.53*	2.74*	2.74*	2.74*	2.74*	2.96*	2.96*	2.96*	2.96*
		170	A252	2.48*	2.48*	2.48*	2.48*	2.68*	2.68*	2.68*	2.68*	2.91*	2.91*	2.91*	2.91*
		180	A252	2.43*	2.43*	2.43*	2.43*	2.63*	2.63*	2.63*	2.63*	2.86*	2.86*	2.86*	2.86*
		190	A393	2.39*	2.39*	2.39*	2.39*	2.58*	2.58*	2.58*	2.58*	2.81*	2.81*	2.81*	2.81*
		200	A393	2.35*	2.35*	2.35*	2.35*	2.54*	2.54*	2.54*	2.54*	2.77*	2.77*	2.77*	2.77*
None	120 minutes	125	A142	2.73*	2.73*	2.73*	2.73*	2.96*	2.96*	2.96*	2.96*	3.17*	3.17*	3.17*	3.17*
		130	A193	2.70*	2.70*	2.70*	2.70*	2.92*	2.92*	2.92*	2.92*	3.14*	3.14*	3.14*	3.14*
		140	A193	2.63*	2.63*	2.63*	2.63*	2.86*	2.86*	2.86*	2.86*	3.07*	3.07*	3.07*	3.07*
		150	A193	2.58*	2.58*	2.58*	2.58*	2.80*	2.80*	2.80*	2.80*	3.01*	3.01*	3.01*	3.01*
		160	A252	2.53*	2.53*	2.53*	2.53*	2.74*	2.74*	2.74*	2.74*	2.96*	2.96*	2.96*	2.96*
		170	A252	2.48*	2.48*	2.48*	2.48*	2.68*	2.68*	2.68*	2.68*	2.91*	2.91*	2.91*	2.91*
		180	A252	2.43*	2.43*	2.43*	2.43*	2.63*	2.63*	2.63*	2.63*	2.86*	2.86*	2.86*	2.86*
		190	A393	2.39*	2.39*	2.39*	2.39*	2.58*	2.58*	2.58*	2.58*	2.81*	2.81*	2.81*	2.81*
		200	A393	2.35*	2.35*	2.35*	2.35*	2.54*	2.54*	2.54*	2.54*	2.77*	2.77*	2.77*	2.77*

Double span decking / continuous concrete

Props	Fire Period	Slab Depth (mm	Mesh 0.2% min. req'd	Total Applied Load (kN/m²)											
				0.9mm				1.0mm				1.2mm			
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
None	60 minutes	100	A142	3.34	3.34	3.34*	3.33*	3.63	3.63	3.61*	3.48*	4.09	4.09	3.90*	3.56*
		110	A142	3.25	3.25	3.25*	3.24*	3.53	3.53	3.52*	3.51*	3.98	3.98	3.97*	3.86*
		120	A142	3.24	3.24	3.24	3.23*	3.43	3.43	3.43*	3.42*	3.88	3.88	3.87*	3.86*
		130	A193	3.15	3.15	3.15	3.15	3.35	3.35	3.35	3.35	3.78	3.78	3.78	3.78*
		140	A193	3.07	3.07	3.07	3.07	3.30	3.30	3.30	3.30	3.69	3.69	3.69	3.69
		150	A193	3.00	3.00	3.00	3.00	3.28	3.28	3.28	3.28	3.61	3.61	3.61	3.61
		160	A252	2.93	2.93	2.93	2.93	3.20	3.20	3.20	3.20	3.53	3.53	3.53	3.53
		170	A252	2.87	2.87	2.87	2.87	3.13	3.13	3.13	3.13	3.46	3.46	3.46	3.46
		180	A252	2.81	2.81	2.81	2.81	3.07	3.07	3.07	3.07	3.42	3.42	3.42	3.42
		190	A393	2.75	2.75	2.75	2.75	3.00	3.00	3.00	3.00	3.39	3.39	3.39	3.39
		200	A393	2.70	2.70	2.70	2.70	2.94	2.94	2.94	2.94	3.33	3.33	3.33	3.33
None	90 minutes	110	A142	3.25	3.25*	3.24*	3.24*	3.53	3.52*	3.51*	3.51*	3.98	3.97*	3.96*	3.86*
		120	A142	3.24	3.24	3.22*	3.22*	3.43	3.43*	3.42*	3.42*	3.88	3.87*	3.86*	3.86*
		130	A193	3.15	3.15	3.15*	3.14*	3.35	3.35	3.34*	3.34*	3.78	3.78	3.77*	3.77*
		140	A193	3.07	3.07	3.07*	3.07*	3.30	3.30	3.29*	3.29*	3.69	3.69	3.68*	3.68*
		150	A193	3.00	3.00	3.00	3.00*	3.28	3.28	3.28*	3.27*	3.61	3.61	3.60*	3.60*
		160	A252	2.93	2.93	2.93	2.93	3.20	3.20	3.20	3.20	3.53	3.53	3.53	3.53*
		170	A252	2.87	2.87	2.87	2.87	3.13	3.13	3.13	3.13	3.46	3.46	3.46	3.46
		180	A252	2.81	2.81	2.81	2.81	3.07	3.07	3.07	3.07	3.42	3.42	3.42	3.42
		190	A393	2.75	2.75	2.75	2.75	3.00	3.00	3.00	3.00	3.39	3.39	3.39	3.39
		200	A393	2.70	2.70	2.70	2.70	2.94	2.94	2.94	2.94	3.33	3.33	3.33	3.33
None	120 minutes	125	A142	3.20	3.20*	3.19*	3.19*	3.39	3.39*	3.38*	3.38*	3.83	3.82*	3.82*	3.81*
		130	A193	3.15	3.15	3.15*	3.14*	3.35	3.35	3.34*	3.34*	3.78	3.78*	3.77*	3.76*
		140	A193	3.07	3.07	3.07*	3.07*	3.30	3.30	3.29*	3.29*	3.69	3.69	3.68*	3.68*
		150	A193	3.00	3.00	3.00	2.99*	3.28	3.28	3.27*	3.27*	3.61	3.61	3.60*	3.60*
		160	A252	2.93	2.93	2.93	2.93	3.20	3.20	3.20	3.20*	3.53	3.53	3.53*	3.53*
		170	A252	2.87	2.87	2.87	2.87	3.13	3.13	3.13	3.13	3.46	3.46	3.46	3.46*
		180	A252	2.81	2.81	2.81	2.81	3.07	3.07	3.07	3.07	3.42	3.42	3.42	3.42
		190	A393	2.75	2.75	2.75	2.75	3.00	3.00	3.00	3.00	3.39	3.39	3.39	3.39
		200	A363	2.70	2.70	2.70	2.70	2.94	2.94	2.94	2.94	3.33	3.33	3.33	3.33

MetFloor® 55 – Propped

Single span decking / single span concrete (Fire Engineering Method)

Props	Fire Period	Slab Depth (mm	Mesh 0.2% min. req'd	Total Applied Load (kN/m²)											
				0.9mm				1.0mm				1.2mm			
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
One	60 minutes	100	A142	4.14*	3.91*	3.62*	3.40*	4.19*	3.96*	3.67*	3.45*	4.28*	4.04*	3.75*	3.52*
		110	A142	4.41*	4.18*	3.88*	3.66*	4.46*	4.23*	3.93*	3.70*	4.56*	4.32*	4.01*	3.78*
		120	A142	4.68*	4.44*	4.14*	3.91*	4.73*	4.50*	4.19*	3.95*	4.83*	4.59*	4.28*	4.04*
		130	A193	4.94*	4.70*	4.40*	4.17*	4.99*	4.76*	4.45*	4.21*	5.07*	4.85*	4.53*	4.29*
		140	A193	5.15*	4.97*	4.68*	4.45*	5.19*	5.01*	4.72*	4.48*	5.27*	5.09*	4.80*	4.55*
		150	A193	5.35*	5.19*	4.96*	4.72*	5.39*	5.22*	5.00	4.76*	5.46*	5.28*	5.05*	4.82*
		160	A252	5.55*	5.40*	5.18*	5.00*	5.59*	5.43*	5.20*	5.02*	5.65*	5.48*	5.25*	5.07*
		170	A252	5.57*	5.53*	5.36*	5.20*	5.79*	5.63*	5.41*	5.22*	5.84*	5.68*	5.46*	5.27*
		180	A252	5.41*	5.41*	5.40*	5.32*	5.88*	5.79*	5.62*	5.43*	6.05*	5.89*	5.67*	5.48*
		190	A393	5.26*	5.26*	5.25*	5.25*	5.71*	5.71*	5.68*	5.58*	6.25*	6.09*	5.86*	5.67*
		200	A393	5.13*	5.13*	5.13*	5.12*	5.57*	5.57*	5.56*	5.56*	6.39*	6.29*	6.06*	5.87*
One	90 minutes	110	A142	4.41*	4.18*	3.88*	3.66*	4.46*	4.23*	3.93*	3.70*	4.56*	4.32*	4.01*	3.78*
		120	A142	4.68*	4.44*	4.14*	3.91*	4.73*	4.50*	4.19*	3.95*	4.83*	4.59*	4.28*	4.04*
		130	A193	4.94*	4.70*	4.40*	4.16*	4.99*	4.76*	4.45*	4.21*	5.07*	4.85*	4.54*	4.29*
		140	A193	5.15*	4.97*	4.68*	4.45*	5.19*	5.01*	4.72*	4.48*	5.27*	5.09*	4.80*	4.55*
		150	A193	5.35*	5.19*	4.96*	4.72*	5.39*	5.22*	5.00*	4.76*	5.46*	5.28*	5.05*	4.82*
		160	A252	5.55*	5.40*	5.18*	5.00*	5.59*	5.43*	5.20*	5.02*	5.65*	5.48*	5.25*	5.07*
		170	A252	5.57*	5.53*	5.36*	5.20*	5.79*	5.63*	5.41*	5.22*	5.84*	5.68*	5.46*	5.27*
		180	A252	5.41*	5.41*	5.40*	5.32*	5.88*	5.79*	5.62*	5.43*	6.05*	5.89*	5.67*	5.48*
		190	A393	5.26*	5.26*	5.25*	5.25*	5.71*	5.71*	5.68*	5.58*	6.25*	6.09*	5.86*	5.67*
		200	A393	5.13*	5.13*	5.13*	5.12*	5.57*	5.57*	5.56*	5.56*	6.39*	6.29*	6.06*	5.87*
One	120 minutes	125	A142	4.81*	4.57*	4.27*	4.04*	4.86*	4.63*	4.32*	4.08*	4.96*	4.72*	4.40*	4.16*
		130	A193	4.94*	4.70*	4.40*	4.17*	4.99*	4.76*	4.45*	4.21*	5.07*	4.85*	4.53*	4.29*
		140	A193	5.15*	4.97*	4.68*	4.45*	5.19*	5.01*	4.71*	4.48*	5.27*	5.09*	4.80*	4.55*
		150	A193	5.35*	5.19*	4.96*	4.72*	5.38*	5.22*	5.00*	4.76*	5.46*	5.28*	5.05*	4.82*
		160	A252	5.55*	5.40*	5.18*	5.00*	5.59*	5.43*	5.20*	5.02*	5.65*	5.48*	5.25*	5.07*
		170	A252	5.56*	5.53*	5.36*	5.20*	5.79*	5.63*	5.41*	5.22*	5.84*	5.68*	5.46*	5.27*
		180	A252	5.41*	5.40*	5.34*	5.32*	5.87*	5.79*	5.62*	5.43*	6.05*	5.89*	5.67*	5.48*
		190	A393	5.26*	5.25*	5.23*	5.23*	5.70*	5.70*	5.68*	5.58*	6.25*	6.09*	5.86*	5.67*
		200	A393	5.13*	5.13*	5.12*	5.10*	5.57*	5.56*	5.54*	5.54*	6.39*	6.29*	6.06*	5.87*

Double span decking / continuous concrete

Props	Fire Period	Slab Depth (mm	Mesh 0.4% min. req'd	Total Applied Load (kN/m²)											
				0.9mm				1.0mm				1.2mm			
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
One	60 minutes	100	A193	4.67*	4.31*	3.78*	3.46*	4.73*	4.37*	3.83*	3.50*	4.84*	4.46*	3.92*	3.57*
		110	A252	5.01*	4.65*	4.16*	3.78*	5.06*	4.70*	4.20*	3.82*	5.14*	4.80*	4.28*	3.89*
		120	A393	5.26*	4.98*	4.53*	4.12*	5.31*	5.02*	4.57*	4.16*	5.39*	5.10*	4.64*	4.23*
		130	A393	5.52*	5.24*	4.88*	4.46*	5.56*	5.28*	4.92*	4.50*	5.64*	5.35*	5.00*	4.57*
		140	A393	5.78*	5.51*	5.16*	4.81*	5.82*	5.54*	5.19*	4.85*	5.89*	5.60*	5.25*	4.92*
		150	A393	5.91*	5.77*	5.42*	5.15*	6.07*	5.80*	5.45*	5.18*	6.15*	5.86*	5.50*	5.23*
		160	2x A252	5.82*	5.81*	5.66*	5.39*	6.13*	6.03*	5.69*	5.42*	6.33*	6.11*	5.74*	5.47*
		170	2x A252	5.71	5.70*	5.69*	5.57*	6.12*	6.12*	5.93*	5.65*	6.56*	6.33*	5.98*	5.70*
		180	2x A252	5.60	5.60	5.58*	5.57*	6.06	6.04*	6.01*	5.86*	6.62*	6.54*	6.19*	5.94*
		190	2x A393	5.44	5.44	5.44*	5.42*	5.91	5.91	5.89*	5.88*	6.55*	6.53*	6.41*	6.13*
		200	2x A393	5.31	5.31	5.31*	5.29*	5.77	5.77	5.75*	5.75*	6.46*	6.46*	6.44*	6.28*
One	90 minutes	110	A252	5.01*	4.65*	4.16*	3.78*	5.06*	4.70*	4.20*	3.82*	5.14*	4.80*	4.28*	3.89*
		120	A393	5.25*	4.98*	4.53*	4.12*	5.31*	5.02*	4.57*	4.16*	5.39*	5.10*	4.64*	4.23*
		130	A393	5.52*	5.24*	4.88*	4.46*	5.56*	5.28*	4.92*	4.50*	5.64*	5.35*	5.00*	4.57*
		140	A393	5.78*	5.51*	5.16*	4.81*	5.82*	5.54*	5.19*	4.85*	5.89*	5.60*	5.25*	4.92*
		150	A393	5.91*	5.77*	5.42*	5.15*	6.03*	5.80*	5.45*	5.18*	6.15*	5.86*	5.50*	5.23*
		160	2x A252	5.82*	5.81*	5.66*	5.39*	6.13*	6.03*	5.69*	5.42*	6.33*	6.11*	5.74*	5.47*
		170	2x A252	5.70*	5.70*	5.69*	5.57*	6.12*	6.12*	5.93*	5.65*	6.56*	6.33*	5.98*	5.70*
		180	2x A252	5.60	5.58*	5.57*	5.57*	6.04*	6.04*	6.01*	5.86*	6.62*	6.54*	6.19*	5.94*
		190	2x A393	5.44	5.44	5.42*	5.42*	5.91	5.89*	5.88*	5.86*	6.55*	6.53*	6.41*	6.13*
		200	2x A393	5.31	5.31	5.29*	5.28*	5.77	5.77	5.74*	5.74*	6.46*	6.45*	6.44*	6.28*
One	120 minutes	125	A393	5.39*	5.11*	4.71*	4.29*	5.43*	5.15*	4.75*	4.33*	5.52*	5.22*	4.83*	4.40*
		130	A393	5.52*	5.24*	4.88*	4.46*	5.56*	5.28*	4.92*	4.50*	5.64*	5.35*	5.00*	4.57*
		140	A393	5.78*	5.51*	5.16*	4.81*	5.82*	5.54*	5.19*	4.85*	5.89*	5.60*	5.25*	4.92*
		150	A393	5.91*	5.77*	5.42*	5.15*	6.07*	5.80*	5.45*	5.18*	6.15*	5.86*	5.50*	5.23*
		160	2x A252	5.81*	5.81*	5.66*	5.39*	6.13*	6.03*	5.69*	5.42*	6.33*	6.11*	5.74*	5.47*
		170	2x A252	5.70*	5.69*	5.67*	5.57*	6.12*	6.12*	5.93*	5.65*	6.56*	6.33*	5.98*	5.70*
		180	2x A252	5.58*	5.57*	5.55*	5.55*	6.03*	6.03*	5.98*	5.86*	6.62*	6.54*	6.19*	5.94*
		190	2x A393	5.44	5.42*	5.41*	5.39*	5.89*	5.88*	5.86*	5.86*	6.55*	6.53*	6.41*	6.13*
		200	2x A393	5.31	5.30	5.28*	5.26*	5.77	5.74*	5.71*	5.71*	6.45*	6.44*	6.40*	6.28*

LOAD SPAN TABLES TO BS EN 1994 (EUROCODES)

MetFloor® 60

Single span decking / single span concrete (Fire Engineering Method)

Props	Fire Period	Slab Depth (mm	Mesh 0.2% min. req'd	Total Applied Load (kN/m²)											
				0.9mm				1.0mm				1.2mm			
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
None	60 minutes	120	A142	3.53*	3.53*	3.52*	3.52*	3.65*	3.65*	3.65*	3.64*	3.87*	3.87*	3.87*	3.75*
		130	A142	3.43*	3.43*	3.43*	3.43*	3.55*	3.55*	3.55*	3.55*	3.77*	3.77*	3.76*	3.76*
		140	A193	3.34*	3.34*	3.34*	3.34*	3.46*	3.46*	3.46*	3.46*	3.67*	3.67*	3.67*	3.67*
		150	A193	3.26*	3.26*	3.26*	3.26*	3.38*	3.38*	3.38*	3.38*	3.59*	3.59*	3.59*	3.59*
		160	A252	3.19*	3.19*	3.19*	3.19*	3.31*	3.31*	3.31*	3.31*	3.51*	3.51*	3.51*	3.51*
		170	A252	3.12*	3.12*	3.12*	3.12*	3.24*	3.24*	3.24*	3.24*	3.44*	3.44*	3.44*	3.44*
		180	A252	3.06*	3.06*	3.06*	3.06*	3.18*	3.18*	3.18*	3.18*	3.38*	3.38*	3.38*	3.38*
		190	A393	2.99*	2.99*	2.99*	2.99*	3.12*	3.12*	3.12*	3.12*	3.31*	3.31*	3.31*	3.31*
		200	A393	2.93*	2.93*	2.93*	2.93*	3.06*	3.06*	3.06*	3.06*	3.25*	3.25*	3.25*	3.25*
None	90 minutes	130	A142	3.43*	3.43*	3.43*	3.42*	3.55*	3.55*	3.55*	3.54*	3.77*	3.77*	3.76*	3.75*
		140	A193	3.34*	3.34*	3.34*	3.34*	3.46*	3.46*	3.46*	3.46*	3.67*	3.67*	3.67*	3.66*
		150	A193	3.26*	3.26*	3.26*	3.26*	3.38*	3.38*	3.38*	3.38*	3.59*	3.59*	3.59*	3.59*
		160	A252	3.19*	3.19*	3.19*	3.19*	3.31*	3.31*	3.31*	3.30*	3.51*	3.51*	3.51*	3.51*
		170	A252	3.12*	3.12*	3.12*	3.12*	3.24*	3.24*	3.24*	3.24*	3.44*	3.44*	3.44*	3.44*
		180	A252	3.06*	3.06*	3.06*	3.06*	3.18*	3.18*	3.18*	3.18*	3.38*	3.38*	3.38*	3.37*
		190	A393	2.99*	2.99*	2.99*	2.99*	3.12*	3.12*	3.12*	3.12*	3.31*	3.31*	3.31*	3.31*
		200	A393	2.93*	2.93*	2.93*	2.93*	3.06*	3.06*	3.06*	3.06*	3.25*	3.25*	3.25*	3.25*
None	120 minutes	140	A193	3.34*	3.34*	3.33*	3.33*	3.46*	3.46*	3.45*	3.45*	3.67*	3.67*	3.66*	3.66*
		150	A193	3.26*	3.26*	3.25*	3.25*	3.38*	3.38*	3.37*	3.37*	3.59*	3.59*	3.58*	3.58*
		160	A252	3.19*	3.19*	3.19*	3.18*	3.31*	3.30*	3.30*	3.30*	3.51*	3.51*	3.50*	3.50*
		170	A252	3.12*	3.12*	3.12*	3.11*	3.24*	3.24*	3.24*	3.23*	3.44*	3.44*	3.43*	3.43*
		180	A252	3.06*	3.06*	3.06*	3.06*	3.18*	3.18*	3.18*	3.17*	3.38*	3.38*	3.37*	3.37*
		190	A393	2.99*	2.99*	2.99*	2.99*	3.12*	3.12*	3.11*	3.11*	3.31*	3.31*	3.31*	3.30*
		200	A393	2.93*	2.93*	2.93*	2.93*	3.06*	3.06*	3.06*	3.06*	3.25*	3.25*	3.25*	3.25*

Double span decking / continuous concrete

Props	Fire Period	Slab Depth (mm	Mesh 0.2% min. req'd	Total Applied Load (kN/m²)											
				0.9mm				1.0mm				1.2mm			
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
None	60 minutes	120	A142	3.90	3.89*	3.89*	3.60*	4.21	4.19*	4.00*	3.67*	4.58*	4.57*	4.10*	3.75*
		130	A142	3.79	3.78*	3.77*	3.77*	4.08	4.08*	4.07*	3.92*	4.49	4.47*	4.41*	4.03*
		140	A193	3.68	3.68	3.67*	3.67*	3.97	3.97	3.96*	3.96*	4.39	4.39*	4.38*	4.32*
		150	A193	3.58	3.58	3.58*	3.57*	3.87	3.87	3.86*	3.86*	4.31	4.31	4.30*	4.30*
		160	A252	3.49	3.49	3.49	3.49*	3.77	3.77	3.77	3.77*	4.22	4.22	4.21*	4.21*
		170	A252	3.44	3.44	3.44	3.43*	3.69	3.69	3.69	3.68*	4.13	4.13	4.12*	4.12*
		180	A252	3.42	3.42	3.42	3.42	3.61	3.61	3.61	3.60*	4.04	4.04	4.04	4.03*
		190	A393	3.36	3.36	3.36	3.36	3.55	3.55	3.55	3.55	3.95	3.95	3.95	3.95
		200	A393	3.28	3.28	3.28	3.28	3.49	3.49	3.49	3.49	3.87	3.87	3.87	3.87
None	90 minutes	130	A142	3.78*	3.77*	3.77*	3.77*	4.08*	4.07*	4.06*	3.94*	4.48*	4.47*	4.43*	4.03*
		140	A193	3.68	3.68*	3.67*	3.66*	3.97	3.96*	3.96*	3.95*	4.39*	4.38*	4.37*	4.32*
		150	A193	3.58	3.58	3.57*	3.57*	3.87	3.87*	3.86*	3.85*	4.31	4.30*	4.29*	4.29*
		160	A252	3.49	3.49	3.49*	3.49*	3.77	3.77	3.77*	3.76*	4.22	4.21*	4.21*	4.20*
		170	A252	3.44	3.44	3.44	3.43*	3.69	3.69	3.68*	3.68*	4.13	4.13	4.12*	4.12*
		180	A252	3.42	3.42	3.42	3.42*	3.61	3.61	3.61	3.60*	4.04	4.04	4.03*	4.03*
		190	A393	3.36	3.36	3.36	3.36	3.55	3.55	3.55	3.55	3.95	3.95	3.95	3.95
		200	A393	3.28	3.28	3.28	3.28	3.49	3.49	3.49	3.49	3.87	3.87	3.87	3.87
None	120 minutes	140	A193	3.68	3.67*	3.66*	3.66*	3.97*	3.96*	3.95*	3.94*	4.38*	4.37*	4.36*	4.35*
		150	A193	3.58	3.58	3.57*	3.57*	3.87	3.86*	3.85*	3.85*	4.31*	4.30*	4.29*	4.28*
		160	A252	3.49	3.49	3.49*	3.48*	3.77	3.77	3.76*	3.76*	4.22	4.21*	4.20*	4.20*
		170	A252	3.44	3.44	3.43*	3.43*	3.69	3.69	3.68*	3.67*	4.13	4.13	4.11*	4.11*
		180	A252	3.42	3.42	3.42*	3.42*	3.61	3.61	3.60*	3.60*	4.04	4.04	4.03*	4.02*
		190	A393	3.36	3.36	3.36	3.36	3.55	3.55	3.55	3.55	3.95	3.95	3.95	3.94*
		200	A393	3.28	3.28	3.28	3.28	3.49	3.49	3.49	3.49	3.87	3.87	3.87	3.87

MetFloor® 60 – Propped

Single span decking / single span concrete (Fire Engineering Method)

Props	Fire Period	Slab Depth (mm	Mesh 0.2% min. req'd	Total Applied Load (kN/m²)											
				0.9mm				1.0mm				1.2mm			
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
One	60 minutes	120	A142	4.44*	4.20*	3.90*	3.67*	4.49*	4.25*	3.94*	3.71*	4.59*	4.33*	4.02*	3.78*
		130	A142	4.73*	4.49*	4.17*	3.93*	4.78*	4.53*	4.21*	3.97*	4.86*	4.61*	4.29*	4.04*
		140	A193	5.01*	4.76*	4.44*	4.20*	5.04*	4.81*	4.48*	4.23*	5.10*	4.89*	4.56*	4.30*
		150	A193	5.21*	5.03*	4.71*	4.46*	5.25*	5.06*	4.75*	4.49*	5.31*	5.12*	4.83*	4.56*
		160	A252	5.41*	5.23*	4.98*	4.71*	5.45*	5.26*	5.01*	4.75*	5.51*	5.32*	5.06*	4.82*
		170	A252	5.61*	5.42*	5.17*	4.96*	5.64*	5.46*	5.20*	5.00*	5.70*	5.51*	5.26*	5.05*
		180	A252	5.62*	5.54*	5.36*	5.16*	5.83*	5.64*	5.39*	5.19*	5.89*	5.70*	5.45*	5.24*
		190	A393	5.46*	5.45*	5.40*	5.34*	5.78*	5.71*	5.58*	5.37*	6.07*	5.88*	5.63*	5.42*
		200	A393	5.30*	5.30*	5.29*	5.29*	5.60*	5.59*	5.57*	5.48*	6.25*	6.07*	5.82*	5.61*
One	90 minutes	130	A142	4.73*	4.49*	4.17*	3.93*	4.78*	4.53*	4.21*	3.97*	4.86*	4.61*	4.29*	4.04*
		140	A193	5.01*	4.76*	4.44*	4.20*	5.04*	4.81*	4.48*	4.23*	5.10*	4.89*	4.56*	4.30*
		150	A193	5.21*	5.03*	4.71*	4.46*	5.25*	5.06*	4.75*	4.49*	5.31*	5.12*	4.83*	4.56*
		160	A252	5.41*	5.23*	4.98*	4.71*	5.45*	5.26*	5.01*	4.75*	5.51*	5.32*	5.06*	4.82*
		170	A252	5.61*	5.42*	5.17*	4.96*	5.64*	5.46*	5.20*	5.00*	5.7*	5.51*	5.26*	5.05*
		180	A252	5.62*	5.54*	5.36*	5.16*	5.83*	5.64*	5.39*	5.19*	5.89*	5.70*	5.45*	5.24*
		190	A393	5.46*	5.45*	5.40*	5.34*	5.76*	5.71*	5.58*	5.37*	6.07*	5.88*	5.63*	5.42*
		200	A393	5.30*	5.29*	5.29*	5.27*	5.59*	5.59*	5.57*	5.48*	6.25*	6.07*	5.82*	5.61*
One	120 minutes	140	A193	5.01*	4.76*	4.44*	4.20*	5.04*	4.81*	4.48*	4.23*	5.10*	4.89*	4.56*	4.30*
		150	A193	5.21*	5.03*	4.71*	4.46*	5.25*	5.06*	4.75*	4.49*	5.31*	5.12*	4.83*	4.56*
		160	A252	5.41*	5.23*	4.98*	4.71*	5.45*	5.26*	5.01*	4.75*	5.51*	5.32*	5.06*	4.82*
		170	A252	5.61*	5.42*	5.17*	4.96*	5.64*	5.46*	5.20*	5.00*	5.70*	5.51*	5.26*	5.05*
		180	A252	5.62*	5.54*	5.36*	5.16*	5.83*	5.64*	5.39*	5.19*	5.89*	5.70*	5.45*	5.24*
		190	A393	5.45*	5.43*	5.40*	5.34*	5.76*	5.71*	5.58*	5.37*	6.07*	5.88*	5.63*	5.42*
		200	A393	5.29*	5.29*	5.27*	5.24*	5.59*	5.57*	5.56*	5.48*	6.25*	6.07*	5.82*	5.61*

Double span decking / continuous concrete

Props	Fire Period	Slab Depth (mm	Mesh 0.4% min. req'd	Total Applied Load (kN/m²)											
				0.9mm				1.0mm				1.2mm			
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
One	60 minutes	120	A252	5.02*	4.66*	4.09*	3.72*	5.07*	4.70*	4.13*	3.76*	5.14*	4.80*	4.21*	3.83*
		130	A393	5.29*	5.00*	4.44*	4.04*	5.33*	5.03*	4.48*	4.07*	5.40*	5.10*	4.55*	4.14*
		140	A393	5.55*	5.25*	4.78*	4.35*	5.59*	5.29*	4.82*	4.39*	5.66*	5.36*	4.90*	4.46*
		150	A393	5.81*	5.51*	5.13*	4.67*	5.85*	5.54*	5.17*	4.70*	5.91*	5.60*	5.23*	4.78*
		160	2x A252	6.05*	5.75*	5.37*	4.98*	6.09*	5.78*	5.40*	5.02*	6.16*	5.84*	5.46*	5.09*
		170	2x A252	5.95*	5.89*	5.59*	5.29*	6.22*	6.01*	5.62*	5.33*	6.40*	6.08*	5.68*	5.39*
		180	2x A252	5.80*	5.79*	5.72*	5.52*	6.11*	6.08*	5.84*	5.55*	6.63*	6.31*	5.90*	5.60*
		190	2x A393	5.61	5.61	5.59*	5.55*	5.93*	5.93*	5.88*	5.76*	6.78*	6.53*	6.12*	5.81*
		200	2x A393	5.44	5.44	5.42*	5.42*	5.76	5.76	5.74*	5.72*	6.74*	6.71*	6.34*	6.03*
One	90 minutes	130	A393	5.29*	5.00*	4.44*	4.04*	5.33*	5.03*	4.48*	4.07*	5.40*	5.10*	4.55*	4.14*
		140	A393	5.55*	5.25*	4.78*	4.35*	5.59*	5.29*	4.82*	4.39*	5.66*	5.36*	4.90*	4.46*
		150	A393	5.81*	5.51*	5.13*	4.67*	5.85*	5.54*	5.17*	4.70*	5.91*	5.60*	5.23*	4.78*
		160	2x A252	6.05*	5.75*	5.37*	4.98*	6.09*	5.78*	5.40*	5.02*	6.16*	5.84*	5.46*	5.09*
		170	2x A252	5.95*	5.89*	5.59*	5.29*	6.22*	6.01*	5.62*	5.33*	6.40*	6.08*	5.68*	5.39*
		180	2x A252	5.80*	5.78*	5.72*	5.52*	6.11*	6.08*	5.84*	5.55*	6.63*	6.31*	5.90*	5.60*
		190	2x A393	5.61	5.57*	5.58*	5.55*	5.93*	5.90*	5.88*	5.76*	6.78*	6.53*	6.12*	5.81*
		200	2x A393	5.44	5.44	5.41*	5.39*	5.76	5.74*	5.72*	5.70*	6.74*	6.71*	6.34*	6.03*
One	120 minutes	140	A393	5.55*	5.25*	4.78*	4.35*	5.59*	5.29*	4.82*	4.39*	5.66*	5.36*	4.90*	4.46*
		150	A393	5.81*	5.51*	5.13*	4.67*	5.85*	5.54*	5.17*	4.70*	5.91*	5.60*	5.23*	4.78*
		160	2x A252	6.05*	5.75*	5.37*	4.98*	6.09*	5.78*	5.40*	5.02*	6.16*	5.84*	5.46*	5.09*
		170	2x A252	5.95*	5.89*	5.59*	5.29*	6.22*	6.01*	5.62*	5.33*	6.40*	6.08*	5.68*	5.39*
		180	2x A252	5.78*	5.76*	5.72*	5.52*	6.11*	6.08*	5.84*	5.55*	6.63*	6.31*	5.90*	5.60*
		190	2x A393	5.58	5.56*	5.56*	5.53*	5.90*	5.88*	5.85*	5.76*	6.78*	6.53*	6.12*	5.81*
		200	2x A393	5.44	5.41*	5.39*	5.37*	5.76	5.70*	5.70*	5.68*	6.74*	6.71*	6.34*	6.03*

MetFloor® 80

Single span decking / single span concrete (Fire Engineering Method)

Props	Fire Period	Slab Depth (mm	Mesh 0.2% min. req'd	Total Applied Load (kN/m²)											
				0.9mm				1.0mm				1.2mm			
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
None	60 minutes	140	A142	3.96*	3.96*	3.96*	3.95*	4.14*	4.14*	4.13*	3.95*	4.29*	4.29*	4.29*	3.96*
		150	A142	3.86*	3.86*	3.86*	3.86*	4.06*	4.06*	4.06*	4.06*	4.21*	4.21*	4.21*	4.20*
		160	A193	3.76*	3.76*	3.76*	3.76*	3.98*	3.98*	3.98*	3.98*	4.13*	4.13*	4.13*	4.13*
		170	A193	3.67*	3.67*	3.67*	3.67*	3.91*	3.91*	3.91*	3.90*	4.06*	4.06*	4.06*	4.06*
		180	A252	3.59*	3.59*	3.59*	3.59*	3.83*	3.83*	3.83*	3.82*	4.00*	4.00*	4.00*	4.00*
		190	A252	3.51*	3.51*	3.51*	3.51*	3.75*	3.75*	3.75*	3.75*	3.93*	3.93*	3.93*	3.93*
		200	A252	3.44*	3.44*	3.44*	3.44*	3.69*	3.69*	3.69*	3.69*	3.87*	3.87*	3.87*	3.86*
None	90 minutes	150	A142	3.86*	3.86*	3.86*	3.85*	4.06*	4.06*	4.06*	4.05*	4.21*	4.21*	4.20*	4.20*
		160	A193	3.76*	3.76*	3.76*	3.75*	3.98*	3.98*	3.98*	3.97*	4.13*	4.13*	4.13*	4.12*
		170	A193	3.67*	3.67*	3.67*	3.67*	3.91*	3.91*	3.90*	3.89*	4.06*	4.06*	4.06*	4.05*
		180	A252	3.59*	3.59*	3.59*	3.59*	3.83*	3.83*	3.82*	3.82*	4.00*	4.00*	4.00*	3.99*
		190	A252	3.51*	3.51*	3.51*	3.51*	3.75*	3.75*	3.75*	3.75*	3.93*	3.93*	3.93*	3.93*
		200	A252	3.44*	3.44*	3.44*	3.44*	3.69*	3.69*	3.69*	3.68*	3.87*	3.87*	3.86*	3.86*
None	120 minutes	160	A193	3.76*	3.76*	3.75*	3.75*	3.98*	3.98*	3.97*	3.97*	4.13*	4.12*	4.12*	4.11*
		170	A193	3.67*	3.67*	3.66*	3.66*	3.91*	3.90*	3.89*	3.89*	4.06*	4.06*	4.05*	4.05*
		180	A252	3.59*	3.59*	3.58*	3.58*	3.83*	3.82*	3.81*	3.81*	4.00*	4.00*	3.99*	3.99*
		190	A252	3.51*	3.51*	3.51*	3.51*	3.75*	3.75*	3.74*	3.74*	3.93*	3.93*	3.92*	3.92*
		200	A252	3.44*	3.44*	3.44*	3.44*	3.69*	3.68*	3.68*	3.68*	3.87*	3.86*	3.86*	3.86*

Double span decking / continuous concrete

Props	Fire Period	Slab Depth (mm	Mesh 0.2% min. req'd	Total Applied Load (kN/m²)											
				0.9mm				1.0mm				1.2mm			
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
None	60 minutes	140	A142	4.44*	4.43*	4.43*	4.08*	4.74*	4.72*	4.50*	4.07*	5.15*	5.16*	4.63*	4.07*
		150	A142	4.32	4.32*	4.31*	4.30*	4.58*	4.56*	4.57*	4.31*	5.07*	5.05*	4.93*	4.41*
		160	A193	4.19	4.19	4.17*	4.17*	4.44	4.43*	4.42*	4.42*	4.97	4.96*	4.96*	4.61*
		170	A193	4.11	4.11	4.09*	4.09*	4.30	4.30	4.28*	4.28*	4.89	4.88*	4.88*	4.87*
		180	A252	4.08	4.08	4.08*	4.08*	4.22	4.22	4.21*	4.21*	4.81	4.81	4.79*	4.79*
		190	A252	3.96	3.96	3.95*	3.95*	4.20	4.20	4.20*	4.20*	4.68	4.68	4.67*	4.67*
		200	A252	3.84	3.84	3.84	3.83*	4.09	4.09	4.08*	4.08*	4.57	4.57	4.55*	4.55*
None	90 minutes	150	A142	4.32*	4.31*	4.30*	4.30*	4.56*	4.57*	4.55*	4.31*	5.05*	5.06*	4.93*	4.41*
		160	A193	4.19	4.17*	4.17*	4.15*	4.43*	4.42*	4.40*	4.40*	4.96*	4.96*	4.95*	4.61*
		170	A193	4.11	4.10*	4.09*	4.09*	4.30	4.28*	4.28*	4.27*	4.88*	4.88*	4.87*	4.87*
		180	A252	4.08	4.08	4.08*	4.07*	4.22	4.22	4.21*	4.20*	4.81	4.79*	4.78*	4.78*
		190	A252	3.96	3.96	3.95*	3.95*	4.20	4.20	4.20*	4.19*	4.68	4.67*	4.67*	4.65*
		200	A252	3.84	3.84	3.93*	3.93*	4.09	4.09	4.08*	4.08*	4.57	4.57	4.55*	4.54*
None	120 minutes	160	A193	4.18*	4.17*	4.15*	4.14*	4.42*	4.40*	4.40*	4.38*	4.95*	4.95*	4.94*	4.60*
		170	A193	4.11	4.09*	4.09*	4.09*	4.29*	4.28*	4.27*	4.25*	4.88*	4.87*	4.86*	4.86*
		180	A252	4.08	4.08*	4.06*	4.06*	4.22	4.21*	4.20*	4.20*	4.80	4.78*	4.78*	4.76*
		190	A252	3.96	3.96	3.95*	3.93*	4.20	4.20*	4.19*	4.19*	4.68	4.67*	4.65*	4.64*
		200	A252	3.84	3.84	3.83*	3.81*	4.09	4.09	4.08*	4.06*	4.57	4.55*	4.54*	4.54*

MetFloor® 80 – Propped

Single span decking / single span concrete (Fire Engineering Method)

Props	Fire Period	Slab Depth (mm	Mesh 0.2% min. req'd	Total Applied Load (kN/m²)											
				0.9mm				1.0mm				1.2mm			
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
One	60 minutes	140	A142	5.02*	4.77*	4.44*	4.07*	5.04*	4.80*	4.47*	4.07*	5.10*	4.87*	4.53*	4.07*
		150	A142	5.22*	5.03*	4.70*	4.36*	5.25*	5.05*	4.73*	4.38*	5.30*	5.10*	4.79*	4.40*
		160	A193	5.42*	5.23*	4.96*	4.68*	5.44*	5.25*	4.99*	4.68*	5.49*	5.30*	5.04*	4.70*
		170	A193	5.61*	5.42*	5.16*	4.95*	5.63*	5.44*	5.19*	4.97*	5.68*	5.49*	5.23*	4.99*
		180	A252	5.79*	5.61*	5.35*	5.14*	5.82*	5.63*	5.37*	5.16*	5.87*	5.67*	5.41*	5.20*
		190	A252	5.95*	5.79*	5.53*	5.32*	6.00*	5.81*	5.55*	5.34*	6.05*	5.86*	5.59*	5.38*
		200	A252	5.88*	5.82*	5.70*	5.49*	6.17*	5.99*	5.73*	5.52*	6.22*	6.03*	5.77*	5.56*
One	90 minutes	150	A142	5.22*	5.03*	4.70*	4.36*	5.25*	5.05*	4.73*	4.38*	5.30*	5.10*	4.79*	4.40*
		160	A193	5.42*	5.23*	4.96*	4.68*	5.44*	5.25*	4.99*	4.68*	5.49*	5.30*	5.04*	4.70*
		170	A193	5.61*	5.42*	5.16*	4.95*	5.63*	5.44*	5.19*	4.97*	5.68*	5.49*	5.23*	4.99*
		180	A252	5.79*	5.61*	5.35*	5.14*	5.82*	5.63*	5.37*	5.16*	5.87*	5.67*	5.41*	5.20*
		190	A252	5.95*	5.79*	5.53*	5.32*	6.00*	5.81*	5.55*	5.34*	6.05*	5.86*	5.59*	5.38*
		200	A252	5.88*	5.82*	5.70*	5.49*	6.17*	5.99*	5.73*	5.52*	6.22*	6.03*	5.77*	5.56*
One	120 minutes	160	A193	5.42*	5.23*	4.96*	4.68*	5.44*	5.25*	4.99*	4.68*	5.49*	5.30*	5.04*	4.70*
		170	A193	5.61*	5.42*	5.16*	4.95*	5.63*	5.44*	5.19*	4.97*	5.68*	5.49*	5.23*	4.99*
		180	A252	5.79*	5.61*	5.35*	5.14*	5.82*	5.63*	5.37*	5.16*	5.87*	5.67*	5.41*	5.20*
		190	A252	5.95*	5.79*	5.53*	5.32*	6.00*	5.81*	5.55*	5.34*	6.05*	5.86*	5.59*	5.38*
		200	A252	5.88*	5.82*	5.70*	5.49*	6.17*	5.99*	5.73*	5.52*	6.22*	6.03*	5.77*	5.56*

Double span decking / continuous concrete

Props	Fire Period	Slab Depth (mm	Mesh 0.4% min. req'd	Total Applied Load (kN/m²)											
				0.9mm				1.0mm				1.2mm			
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
One	60 minutes	140	A252	5.55*	5.24*	4.73*	4.07*	5.58*	5.27*	4.76*	4.07*	5.63*	5.32*	4.82*	4.06*
		150	A393	5.81*	5.48*	5.07*	4.39*	5.82*	5.51*	5.10*	4.40*	5.88*	5.56*	5.16*	4.39*
		160	A393	6.04*	5.72*	5.34*	4.71*	6.07*	5.75*	5.36*	4.71*	6.12*	5.80*	5.41*	4.72*
		170	A393	6.28*	5.96*	5.57*	5.02*	6.30*	5.98*	5.59*	5.03*	6.36*	6.03*	5.64*	5.03*
		180	2x A252	6.35*	6.18*	5.78*	5.31*	6.52*	6.21*	5.81*	5.31*	6.58*	6.26*	5.85*	5.33*
		190	2x A252	6.20*	6.20*	5.99*	5.57*	6.62*	6.43*	6.02*	5.60*	6.77*	6.48*	6.07*	5.59*
		200	2x A252	6.05*	6.05*	6.00*	5.79*	6.47*	6.47*	6.23*	5.85*	6.93*	6.70*	6.28*	5.86*
One	90 minutes	150	A393	5.80*	5.48*	5.07*	4.39*	5.82*	5.51*	5.10*	4.40*	5.88*	5.56*	5.16*	4.39*
		160	A393	6.04*	5.72*	5.34*	4.71*	6.07*	5.75*	5.36*	4.71*	6.12*	5.80*	5.41*	4.71*
		170	A393	6.28*	5.96*	5.57*	5.02*	6.30*	5.98*	5.59*	5.03*	6.36*	6.03*	5.64*	5.02*
		180	2x A252	6.35*	6.18*	5.78*	5.31*	6.52*	6.21*	5.81*	5.31*	6.58*	6.26*	5.85*	5.32*
		190	2x A252	6.20*	6.20*	5.99*	5.57*	6.62*	6.43*	6.02*	5.60*	6.77*	6.48*	6.07*	5.59*
		200	2x A252	6.05*	6.05*	6.00*	5.79*	6.47*	6.47*	6.23*	5.85*	6.93*	6.70*	6.28*	5.86*
One	120 minutes	160	A393	6.04*	5.72*	5.34*	4.70*	6.07*	5.75*	5.36*	4.70*	6.12*	5.80*	5.41*	4.69*
		170	A393	6.28*	5.96*	5.57*	5.02*	6.30*	5.98*	5.59*	5.01*	6.36*	6.03*	5.64*	5.01*
		180	2x A252	6.35*	6.18*	5.78*	5.31*	6.52*	6.21*	5.81*	5.31*	6.58*	6.26*	5.85*	5.30*
		190	2x A252	6.20*	6.20*	5.99*	5.57*	6.62*	6.43*	6.02*	5.60*	6.77*	6.48*	6.07*	5.59*
		200	2x A252	6.05*	6.03*	6.00*	5.79*	6.47*	6.47*	6.23*	5.85*	6.93*	6.70*	6.28*	5.86*

LOAD SPAN TABLES TO BS 5950 (BRITISH STANDARDS)

MetFloor® 55

Single span decking / single span concrete (Fire Engineering Method)

Props	Fire Period	Slab Depth (mm	Mesh 0.1% min. req'd	Total Applied Load (kN/m²)											
				0.9mm				1.0mm				1.2mm			
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
None	60 minutes	100	A142	2.97*	2.97*	2.97*	2.97*	3.22*	3.22*	3.22*	3.22*	3.40*	3.40*	3.40*	3.40*
		110	A142	2.89*	2.89*	2.89*	2.89*	3.14*	3.14*	3.14*	3.14*	3.31*	3.31*	3.31*	3.31*
		120	A142	2.80*	2.80*	2.80*	2.80*	3.07*	3.07*	3.07*	3.07*	3.23*	3.23*	3.23*	3.23*
		130	A142	2.73*	2.73*	2.73*	2.73*	3.01*	3.01*	3.01*	3.01*	3.17*	3.17*	3.17*	3.17*
		140	A142	2.67*	2.67*	2.67*	2.67*	2.93*	2.93*	2.93*	2.93*	3.10*	3.10*	3.10*	3.10*
		150	A142	2.61*	2.61*	2.61*	2.61*	2.87*	2.87*	2.87*	2.87*	3.04*	3.04*	3.04*	3.04*
		160	A193	2.56*	2.56*	2.56*	2.56*	2.80*	2.80*	2.80*	2.80*	2.98*	2.98*	2.98*	2.98*
		170	A193	2.51*	2.51*	2.51*	2.51*	2.74*	2.74*	2.74*	2.74*	2.93*	2.93*	2.93*	2.93*
		180	A193	2.46*	2.46*	2.46*	2.46*	2.69*	2.69*	2.69*	2.69*	2.88*	2.88*	2.88*	2.88*
		190	A193	2.42*	2.42*	2.42*	2.42*	2.63*	2.63*	2.63*	2.63*	2.84*	2.84*	2.84*	2.84*
		200	A193	2.38*	2.38*	2.38*	2.38*	2.59*	2.59*	2.59*	2.59*	2.80*	2.80*	2.80*	2.80*
None	90 minutes	110	A142	2.89*	2.89*	2.89*	2.89*	3.14*	3.14*	3.14*	3.14*	3.31*	3.31*	3.31*	3.31*
		120	A142	2.80*	2.80*	2.80*	2.80*	3.07*	3.07*	3.07*	3.07*	3.23*	3.23*	3.23*	3.23*
		130	A142	2.73*	2.73*	2.73*	2.73*	3.01*	3.01*	3.01*	3.01*	3.17*	3.17*	3.17*	3.17*
		140	A142	2.67*	2.67*	2.67*	2.67*	2.93*	2.93*	2.93*	2.93*	3.10*	3.10*	3.10*	3.10*
		150	A142	2.61*	2.61*	2.61*	2.61*	2.87*	2.87*	2.87*	2.87*	3.04*	3.04*	3.04*	3.04*
		160	A193	2.56*	2.56*	2.56*	2.56*	2.80*	2.80*	2.80*	2.80*	2.98*	2.98*	2.98*	2.98*
		170	A193	2.51*	2.51*	2.51*	2.51*	2.74*	2.74*	2.74*	2.74*	2.93*	2.93*	2.93*	2.93*
		180	A193	2.46*	2.46*	2.46*	2.46*	2.69*	2.69*	2.69*	2.69*	2.88*	2.88*	2.88*	2.88*
		190	A193	2.42*	2.42*	2.42*	2.42*	2.63*	2.63*	2.63*	2.63*	2.84*	2.84*	2.84*	2.84*
		200	A193	2.38*	2.38*	2.38*	2.38*	2.59*	2.59*	2.59*	2.59*	2.80*	2.80*	2.80*	2.80*
None	120 minutes	125	A142	2.77*	2.77*	2.77*	2.77*	3.04*	3.04*	3.04	3.04*	3.20*	3.20*	3.20*	3.20*
		130	A142	2.73*	2.73*	2.73*	2.73*	3.01*	3.01*	3.01*	3.01*	3.17*	3.17*	3.17*	3.17*
		140	A142	2.67*	2.67*	2.67*	2.67*	2.93*	2.93*	2.93*	2.93*	3.10*	3.10*	3.10*	3.10*
		150	A142	2.61*	2.61*	2.61*	2.61*	2.87*	2.87*	2.87*	2.87*	3.04*	3.04*	3.04*	3.04*
		160	A193	2.56*	2.56*	2.56*	2.56*	2.80*	2.80*	2.80*	2.80*	2.98*	2.98*	2.98*	2.98*
		170	A193	2.51*	2.51*	2.51*	2.51*	2.74*	2.74*	2.74*	2.74*	2.93*	2.93*	2.93*	2.93*
		180	A193	2.46*	2.46*	2.46*	2.46*	2.69*	2.69*	2.69*	2.69*	2.88*	2.88*	2.88*	2.88*
		190	A193	2.42*	2.42*	2.42*	2.42*	2.63*	2.63*	2.63*	2.63*	2.84*	2.84*	2.84*	2.84*
		200	A193	2.38*	2.38*	2.38*	2.38*	2.59*	2.59*	2.59*	2.59*	2.80*	2.80*	2.80*	2.80*

Double span decking / continuous concrete

Props	Fire Period	Slab Depth (mm	Mesh 0.1% min. req'd	Total Applied Load (kN/m²)											
				0.9mm				1.0mm				1.2mm			
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
None	60 minutes	100	A142	3.44	3.44	3.44*	3.40*	3.74	3.74	3.72*	3.45*	4.21	4.21*	3.88*	3.54*
		110	A142	3.35	3.35	3.35*	3.34*	3.65	3.65	3.63*	3.60*	4.11	4.11	4.10*	3.85*
		120	A142	3.30	3.30	3.30	3.30*	3.56	3.56	3.56*	3.54*	4.01	4.01	4.01*	4.00*
		130	A142	3.27	3.27	3.27	3.27*	3.47	3.47	3.47	3.47*	3.92	3.92	3.92	3.91*
		140	A142	3.20	3.20	3.20	3.20	3.40	3.40	3.40	3.40*	3.84	3.84	3.84	3.84*
		150	A142	3.12	3.12	3.12	3.12	3.37	3.37	3.37	3.37	3.76	3.76	3.76	3.76*
		160	A193	3.05	3.05	3.05	3.05	3.33	3.33	3.33	3.33	3.68	3.68	3.68	3.68
		170	A193	2.99	2.99	2.99	2.99	3.27	3.27	3.27	3.27	3.61	3.61	3.61	3.61
		180	A193	2.92	2.92	2.92	2.92	3.21	3.21	3.21	3.21	3.54	3.54	3.54	3.54
		190	A193	2.85	2.85	2.85	2.85	3.15	3.15	3.15	3.15	3.50	3.50	3.50	3.50
		200	A193	2.80	2.80	2.80	2.80	3.09	3.09	3.09	3.09	3.44	3.44	3.44	3.44
None	90 minutes	110	A142	3.35	3.35*	3.34*	3.33*	3.65	3.63*	3.63*	3.60*	4.11*	4.09*	4.08*	3.85*
		120	A142	3.30	3.30	3.30*	3.29*	3.56	3.56*	3.54*	3.54*	4.01	4.00*	4.00*	3.99*
		130	A142	3.27	3.27	3.27*	3.26*	3.47	3.47	3.47*	3.46*	3.92	3.91*	3.91*	3.91*
		140	A142	3.20	3.20	3.19*	3.18*	3.40	3.40	3.40*	3.39*	3.84	3.84	3.83*	3.83*
		150	A142	3.12	3.12	3.12	3.12*	3.37	3.37	3.37*	3.36*	3.76	3.76	3.75*	3.75*
		160	A193	3.05	3.05	3.05	3.05	3.33	3.33	3.33	3.33*	3.68	3.68	3.68	3.68
		170	A193	2.99	2.99	2.99	2.99	3.27	3.27	3.27	3.26*	3.61	3.61	3.61	3.61
		180	A193	2.92	2.92	2.92	2.92	3.21	3.21	3.21	3.21	3.54	3.54	3.54	3.54
		190	A193	2.85	2.85	2.85	2.85	3.15	3.15	3.15	3.15	3.50	3.50	3.50	3.50
		200	A193	2.80	2.80	2.80	2.80	3.09	3.09	3.09	3.09	3.44	3.44	3.44	3.44
None	120 minutes	125	A142	3.30*	3.29*	3.29*	3.29*	3.51*	3.50*	3.50*	3.50*	3.95*	3.95*	3.95*	3.95*
		130	A142	3.27*	3.27*	3.26*	3.26*	3.47*	3.47*	3.46*	3.46*	3.92*	3.91*	3.91*	3.90*
		140	A142	3.19*	3.19*	3.18*	3.18*	3.40*	3.40*	3.39*	3.39*	3.84*	3.83*	3.83*	3.83*
		150	A142	3.12	3.12*	3.11*	3.11*	3.37*	3.37*	3.36*	3.36*	3.76*	3.75*	3.75*	3.75*
		160	A193	3.05	3.05	3.05*	3.05*	3.33	3.33*	3.33*	3.33*	3.68	3.68*	3.68*	3.68*
		170	A193	2.99	2.99	2.99*	2.98*	3.27	3.27	3.26*	3.26*	3.61	3.61*	3.61*	3.61*
		180	A193	2.92	2.92	2.92	2.92*	3.21	3.21	3.21*	3.20*	3.54	3.54	3.54*	3.54*
		190	A193	2.85	2.85	2.85	2.85*	3.15	3.15	3.14*	3.14*	3.50	3.50	3.49*	3.49*
		200	A193	2.80	2.80	2.80	2.80*	3.09	3.09	3.09	3.04*	3.44	3.44	3.44*	3.44*

MetFloor® 55 – Propped

Single span decking / single span concrete (Fire Engineering Method)

Props	Fire Period	Slab Depth (mm	Mesh 0.1% min. req'd	Total Applied Load (kN/m²)											
				0.9mm				1.0mm				1.2mm			
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
One	60 minutes	100	A142	4.32*	4.03*	3.71*	3.40*	4.37*	4.09*	3.75*	3.43*	4.45*	4.17*	3.82*	3.51*
		110	A142	4.63*	4.35*	4.00*	3.70*	4.69*	4.40*	4.04*	3.73*	4.77*	4.48*	4.12*	3.82*
		120	A142	4.95*	4.67*	4.30*	4.03*	5.01*	4.71*	4.34*	4.05*	5.07*	4.79*	4.42*	4.13*
		130	A142	5.21*	4.98*	4.60*	4.33*	5.24*	5.02*	4.64*	4.35*	5.31*	5.08*	4.72*	4.43*
		140	A142	5.44*	5.21*	4.93*	4.64*	5.47*	5.24*	4.93*	4.67*	5.54*	5.31*	5.01*	4.73*
		150	A142	5.70*	5.47*	5.18*	4.94*	5.73*	5.50*	5.21*	4.97*	5.78*	5.55*	5.26*	5.03*
		160	A193	5.83*	5.68*	5.41*	5.18*	5.87*	5.73*	5.44*	5.21*	6.01*	5.78*	5.49*	5.25*
		170	A193	5.73*	5.74*	5.58*	5.40*	6.09*	5.92*	5.61*	5.42*	6.25*	6.02*	5.67*	5.00*
		180	A193	5.62*	5.60*	5.58*	5.51*	5.99*	5.99*	5.83*	5.64*	6.47*	6.25*	5.89*	5.47*
		190	A193	5.49*	5.47*	5.47*	5.45*	5.89*	5.89*	5.81*	5.76*	6.60*	6.45*	6.16*	5.90*
		200	A193	5.36*	5.36*	5.35*	5.35*	5.76*	5.74*	5.74*	5.72*	6.61*	6.53*	6.35*	6.12*
One	90 minutes	110	A142	4.63*	4.35*	4.00*	3.70*	4.69*	4.40*	4.04*	3.73*	4.77*	4.48*	4.12*	3.82*
		120	A142	4.95*	4.67*	4.30*	4.03*	5.01*	4.71*	4.34*	4.05*	5.07*	4.79*	4.42*	4.13*
		130	A142	5.21*	4.98*	4.60*	4.33*	5.24*	5.02*	4.64*	4.35*	5.31*	5.08*	4.72*	4.43*
		140	A142	5.44*	5.21*	4.93*	4.64*	5.47*	5.24*	4.93*	4.67*	5.54*	5.31*	5.01*	4.73*
		150	A142	5.70*	5.47*	5.18*	4.94*	5.73*	5.50*	5.21*	4.97*	5.78*	5.55*	5.26*	5.03*
		160	A193	5.83*	5.68*	5.41*	5.18*	5.87*	5.73*	5.44*	5.21*	6.01*	5.78*	5.49*	5.25*
		170	A193	5.73*	5.74*	5.58*	5.40*	6.09*	5.92*	5.61*	5.42*	6.25*	6.02*	5.67*	5.00*
		180	A193	5.62*	5.60*	5.58*	5.51*	5.99*	5.99*	5.83*	5.64*	6.47*	6.25*	5.89*	5.47*
		190	A193	5.49*	5.47*	5.47*	5.45*	5.89*	5.89*	5.81*	5.76*	6.60*	6.45*	6.16*	5.90*
		200	A193	5.36*	5.36*	5.35*	5.35*	5.76*	5.74*	5.74*	5.72*	6.61*	6.53*	6.35*	6.12*
One	120 minutes	125	A142	5.09*	4.82*	4.45*	4.18*	5.12*	4.87*	4.48*	4.20*	5.19*	4.95*	4.57*	4.28*
		130	A142	5.21*	4.98*	4.60*	4.33*	5.24*	5.02*	4.64*	4.35*	5.31*	5.08*	4.72*	4.43*
		140	A142	5.44*	5.21*	4.93*	4.64*	5.47*	5.24*	4.93*	4.67*	5.54*	5.31*	5.01*	4.73*
		150	A142	5.70*	5.47*	5.18*	4.94*	5.73*	5.50*	5.21*	4.97*	5.78*	5.55*	5.26*	5.03*
		160	A193	5.83*	5.68*	5.41*	5.18*	5.87*	5.73*	5.44*	5.21*	6.01*	5.78*	5.49*	5.25*
		170	A193	5.73*	5.74*	5.58*	5.40*	6.09*	5.92*	5.61*	5.42*	6.25*	6.02*	5.67*	5.00*
		180	A193	5.62*	5.60*	5.58*	5.51*	5.99*	5.99*	5.83*	5.64*	6.47*	6.25*	5.89*	5.47*
		190	A193	5.49*	5.47*	5.47*	5.45*	5.89*	5.89*	5.81*	5.76*	6.60*	6.45*	6.16*	5.90*
		200	A193	5.36*	5.36*	5.35*	5.32*	5.76*	5.74*	5.74*	5.72*	6.61*	6.53*	6.35*	6.12*

Double span decking / continuous concrete

Props	Fire Period	Slab Depth (mm	Mesh 0.1% min. req'd	Total Applied Load (kN/m²)											
				0.9mm				1.0mm				1.2mm			
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
One	60 minutes	100	A142	4.42*	4.10*	3.72*	3.40*	4.45*	4.15*	3.77*	3.44*	4.54*	4.24*	3.85*	3.51*
		110	A142	4.73*	4.42*	4.04*	3.70*	4.78*	4.47*	4.09*	3.75*	4.87*	4.56*	4.17*	3.82*
		120	A142	5.05*	4.74*	4.36*	4.05*	5.08*	4.79*	4.40*	4.08*	5.16*	4.88*	4.48*	4.13*
		130	A142	5.30*	5.05*	4.68*	4.38*	5.33*	5.08*	4.72*	4.42*	5.40*	5.15*	4.78*	4.49*
		140	A142	5.54*	5.28*	5.00*	4.70*	5.57*	5.32*	5.03*	4.74*	5.64*	5.39*	5.07*	4.80*
		150	A142	5.80*	5.56*	5.25*	5.01*	5.83*	5.59*	5.28*	5.03*	5.88*	5.64*	5.33*	5.08*
		160	A193	5.98*	5.79*	5.48*	5.24*	6.07*	5.83*	5.51*	5.26*	6.13*	5.88*	5.56*	5.31*
		170	A193	5.90*	5.88*	5.66*	5.46*	6.20*	6.02*	5.74*	5.48*	6.36*	6.11*	5.79*	5.53*
		180	A193	5.77*	5.77*	5.74*	5.56*	6.13*	6.13*	5.94*	5.71*	6.53*	6.30*	6.02*	5.75*
		190	A193	5.63*	5.63*	5.61*	5.60*	6.03*	5.96*	5.96*	5.86*	6.60*	6.46*	6.18*	5.97*
		200	A193	5.47*	5.45*	5.45*	5.45*	5.92*	5.92*	5.89*	5.89*	6.56*	6.54*	6.35*	6.09*
One	90 minutes	110	A142	4.73*	4.42*	4.04*	3.70*	4.78*	4.47*	4.09*	3.75*	4.87*	4.56*	4.17*	3.82*
		120	A142	5.05*	4.74*	4.36*	4.05*	5.08*	4.79*	4.40*	4.08*	5.16*	4.88*	4.48*	4.13*
		130	A142	5.30*	5.05*	4.68*	4.38*	5.33*	5.08*	4.72*	4.42*	5.40*	5.15*	4.78*	4.49*
		140	A142	5.54*	5.28*	5.00*	4.70*	5.57*	5.32*	5.03*	4.74*	5.64*	5.39*	5.07*	4.80*
		150	A142	5.80*	5.56*	5.25*	5.01*	5.83*	5.59*	5.28*	5.03*	5.88*	5.64*	5.33*	5.08*
		160	A193	5.98*	5.79*	5.48*	5.24*	6.07*	5.83*	5.51*	5.26*	6.13*	5.88*	5.56*	5.31*
		170	A193	5.90*	5.88*	5.66*	5.46*	6.20*	6.02*	5.74*	5.48*	6.36*	6.11*	5.79*	5.53*
		180	A193	5.77*	5.77*	5.74*	5.56*	6.13*	6.13*	5.94*	5.71*	6.53*	6.30*	6.02*	5.75*
		190	A193	5.63*	5.63*	5.61*	5.60*	6.03*	5.96*	5.96*	5.86*	6.60*	6.46*	6.18*	5.97*
		200	A193	5.47*	5.45*	5.45*	5.45*	5.92*	5.92*	5.89*	5.89*	6.56*	6.54*	6.35*	6.09*
One	120 minutes	125	A142	5.05*	4.74*	4.36*	4.05*	5.08*	4.79*	4.40*	4.08*	5.16*	4.88*	4.48*	4.13*
		130	A142	5.30*	5.05*	4.68*	4.38*	5.33*	5.08*	4.72*	4.42*	5.40*	5.15*	4.78*	4.49*
		140	A142	5.54*	5.28*	5.00*	4.70*	5.57*	5.32*	5.03*	4.74*	5.64*	5.39*	5.07*	4.80*
		150	A142	5.80*	5.56*	5.25*	5.01*	5.83*	5.59*	5.28*	5.03*	5.88*	5.64*	5.33*	5.08*
		160	A193	5.98*	5.79*	5.48*	5.24*	6.07*	5.83*	5.51*	5.26*	6.13*	5.88*	5.56*	5.31*
		170	A193	5.90*	5.88*	5.66*	5.46*	6.20*	6.02*	5.74*	5.48*	6.36*	6.11*	5.79*	5.53*
		180	A193	5.77*	5.77*	5.74*	5.56*	6.13*	6.13*	5.94*	5.71*	6.53*	6.30*	6.02*	5.75*
		190	A193	5.63*	5.63*	5.61*	5.60*	6.03*	5.96*	5.96*	5.86*	6.60*	6.46*	6.18*	5.97*
		200	A193	5.49*	5.45*	5.45*	5.45*	5.92*	5.92*	5.89*	5.89*	6.56*	6.54*	6.35*	6.09*

MetFloor® 60

Single span decking / single span concrete (Fire Engineering Method)

Props	Fire Period	Slab Depth (mm	Mesh 0.1% min. req'd	Total Applied Load (kN/m²)											
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
				0.9mm				1.0mm				1.2mm			
None	60 minutes	120	A142	3.56*	3.56*	3.56*	3.55*	3.69*	3.68*	3.68*	3.65*	3.91*	3.91*	3.89*	3.78*
		130	A142	3.47*	3.47*	3.46*	3.46*	3.59*	3.59*	3.59*	3.58*	3.81*	3.80*	3.80*	3.79*
		140	A142	3.38*	3.38*	3.38*	3.38*	3.50*	3.50*	3.50*	3.50*	3.71*	3.71*	3.71*	3.70*
		150	A142	3.30*	3.30*	3.30*	3.30*	3.42*	3.42*	3.42*	3.42*	3.63*	3.63*	3.63*	3.63*
		160	A142	3.23*	3.23*	3.23*	3.23*	3.35*	3.35*	3.35*	3.34*	3.55*	3.55*	3.55*	3.55*
		170	A142	3.16*	3.16*	3.16*	3.16*	3.28*	3.28*	3.28*	3.28*	3.48*	3.48*	3.48*	3.48*
		180	A193	3.10*	3.10*	3.10*	3.10*	3.22*	3.22*	3.22*	3.22*	3.41*	3.41*	3.41*	3.41*
		190	A193	3.05*	3.05*	3.05*	3.05*	3.16*	3.16*	3.16*	3.16*	3.35*	3.35*	3.35*	3.35*
		200	A193	2.99*	2.99*	2.99*	2.99*	3.10*	3.10*	3.10*	3.10*	3.30*	3.30*	3.30*	3.30*
None	90 minutes	130	A142	3.47*	3.47*	3.46*	3.46*	3.59*	3.59*	3.59*	3.58*	3.81*	3.80*	3.80*	3.79*
		140	A142	3.38*	3.38*	3.38*	3.38*	3.50*	3.50*	3.50*	3.50*	3.71*	3.71*	3.71*	3.70*
		150	A142	3.30*	3.30*	3.30*	3.30*	3.42*	3.42*	3.42*	3.42*	3.63*	3.63*	3.63*	3.63*
		160	A142	3.23*	3.23*	3.23*	3.23*	3.35*	3.35*	3.35*	3.34*	3.55*	3.55*	3.55*	3.55*
		170	A142	3.16*	3.16*	3.16*	3.16*	3.28*	3.28*	3.28*	3.28*	3.48*	3.48*	3.48*	3.48*
		180	A193	3.10*	3.10*	3.10*	3.10*	3.22*	3.22*	3.22*	3.22*	3.41*	3.41*	3.41*	3.41*
		190	A193	3.05*	3.05*	3.05*	3.05*	3.16*	3.16*	3.16*	3.16*	3.35*	3.35*	3.35*	3.35*
		200	A193	2.99*	2.99*	2.99*	2.99*	3.10*	3.10*	3.10*	3.10*	3.30*	3.30*	3.30*	3.30*
None	120 minutes	140	A142	3.38*	3.38*	3.38*	3.38*	3.50*	3.50*	3.50*	3.49*	3.71*	3.71*	3.71*	3.70*
		150	A142	3.30*	3.30*	3.30*	3.30*	3.42*	3.42*	3.42*	3.42*	3.63*	3.63*	3.63*	3.62*
		160	A142	3.23*	3.23*	3.23*	3.23*	3.35*	3.35*	3.35*	3.34*	3.55*	3.55*	3.55*	3.55*
		170	A142	3.16*	3.16*	3.16*	3.16*	3.28*	3.28*	3.28*	3.28*	3.48*	3.48*	3.48*	3.48*
		180	A193	3.10*	3.10*	3.10*	3.10*	3.22*	3.22*	3.22*	3.22*	3.41*	3.41*	3.41*	3.41*
		190	A193	3.05*	3.05*	3.05*	3.05*	3.16*	3.16*	3.16*	3.16*	3.35*	3.35*	3.35*	3.35*
		200	A193	2.99*	2.99*	2.99*	2.99*	3.10*	3.10*	3.10*	3.10*	3.30*	3.30*	3.30*	3.30*

Double span decking / continuous concrete

Props	Fire Period	Slab Depth (mm	Mesh 0.1% min. req'd	Total Applied Load (kN/m²)											
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
				0.9mm				1.0mm				1.2mm			
None	60 minutes	120	A142	4.03	4.02*	3.96*	3.68*	4.35*	4.35*	4.08*	3.72*	4.88*	4.75*	4.16*	3.79*
		130	A142	3.91	3.91*	3.89*	3.87*	4.23	4.22*	4.21*	4.03*	4.75*	4.74*	4.51*	4.10*
		140	A142	3.80	3.80	3.78*	3.78*	4.12	4.12*	4.10*	4.10*	4.63	4.62*	4.61*	4.41*
		150	A142	3.75	3.75	3.74*	3.74*	4.02	4.01*	4.01*	4.00*	4.52	4.51*	4.50*	4.49*
		160	A142	3.72	3.72	3.72*	3.70*	3.92	3.92	3.90*	3.90*	4.41	4.41*	4.39*	4.39*
		170	A142	3.63	3.63	3.62*	3.62*	3.83	3.83	3.83	3.82*	4.31	4.31	4.31*	4.30*
		180	A193	3.53	3.53	3.53	3.53	3.82	3.82	3.82	3.81*	4.22	4.22	4.22*	4.21*
		190	A193	3.45	3.45	3.45	3.45	3.77	3.77	3.77	3.77*	4.13	4.13	4.13	4.12*
		200	A193	3.37	3.37	3.37	3.37	3.69	3.69	3.69	3.68*	4.05	4.05	4.05	4.05*
None	90 minutes	130	A142	3.91*	3.90*	3.88*	3.68*	4.22*	4.21*	4.20*	3.72*	4.73*	4.72*	4.16*	3.79*
		140	A142	3.80*	3.79*	3.78*	3.78*	4.12*	4.11*	4.10*	4.09*	4.62*	4.61*	4.60*	4.10*
		150	A142	3.75	3.75*	3.73*	3.74*	4.01*	4.01*	4.00*	3.99*	4.51*	4.50*	4.50*	4.41*
		160	A142	3.72	3.72*	3.70*	3.70*	3.92	3.91*	3.90*	3.90*	4.41*	4.40*	4.39*	4.39*
		170	A142	3.63	3.62*	3.62*	3.61*	3.83	3.83*	3.82*	3.82*	4.31*	4.31*	4.30*	4.29*
		180	A193	3.53	3.53	3.53*	3.52*	3.82	3.82	3.81*	3.81*	4.22	4.22*	4.21*	4.21*
		190	A193	3.45	3.45	3.45	3.45*	3.77	3.77	3.77*	3.76*	4.13	4.13	4.12*	4.12*
		200	A193	3.37	3.37	3.37	3.37*	3.69	3.69	3.68*	3.67*	4.05	4.05	4.05*	4.04*
None	120 minutes	140	A142	3.79*	3.78*	3.78*	3.78*	4.11*	4.10*	4.09*	3.72*	4.61*	4.60*	4.60*	4.10*
		150	A142	3.75*	3.74*	3.73*	3.73*	4.01*	4.00*	4.00*	4.09*	4.50*	4.50*	4.49*	4.41*
		160	A142	3.72*	3.71*	3.70*	3.70*	3.91*	3.91*	3.90*	3.89*	4.40*	4.39*	4.39*	4.39*
		170	A142	3.62*	3.62*	3.61*	3.61*	3.83*	3.82*	3.82*	3.81*	4.31*	4.30*	4.30*	4.29*
		180	A193	3.53	3.53	3.52*	3.52*	3.82	3.81*	3.81*	3.80*	4.22*	4.21*	4.21*	4.20*
		190	A193	3.45	3.45	3.45*	3.44*	3.77	3.77*	3.76*	3.76*	4.13	4.13*	4.12*	4.11*
		200	A193	3.37	3.37	3.37*	3.36*	3.69	3.69	3.67*	3.67*	4.05	4.05*	4.04*	4.04*

MetFloor® 60 – Propped

Single span decking / single span concrete (Fire Engineering Method)

Props	Fire Period	Slab Depth (mm	Mesh 0.1% min. req'd	Total Applied Load (kN/m²)											
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
				0.9mm				1.0mm				1.2mm			
One	60 minutes	120	A142	4.69*	4.38*	4.01*	3.66*	4.73*	4.42*	4.05*	3.69*	4.81*	4.50*	4.13*	3.76*
		130	A142	5.01*	4.70*	4.31*	3.96*	5.04*	4.74*	4.35*	4.00*	5.11*	4.82*	4.42*	4.07*
		140	A142	5.25*	5.00*	4.60*	4.27*	5.28*	5.04*	4.65*	4.31*	5.34*	5.10*	4.72*	4.38*
		150	A142	5.47*	5.24*	4.90*	4.58*	5.51*	5.27*	4.94*	4.62*	5.57*	5.33*	5.01*	4.69*
		160	A142	5.40*	5.38*	5.14*	4.87*	5.73*	5.48*	5.17*	4.91*	5.79*	5.54*	5.23*	4.98*
		170	A142	5.27*	5.27*	5.20*	5.10*	5.85*	5.70*	5.38*	5.13*	6.00*	5.76*	5.43*	5.19*
		180	A193	5.10*	5.10*	5.10*	5.06*	5.78*	5.74*	5.58*	5.33*	6.21*	5.96*	5.63*	5.38*
		190	A193	4.94*	4.94*	4.94*	4.94*	5.61*	5.61*	5.57*	5.46*	6.40*	6.17*	5.83*	5.58*
		200	A193	4.78*	4.78*	4.78*	4.78*	5.45*	5.45*	5.45*	5.43*	6.35*	6.27*	6.03*	5.78*
One	90 minutes	130	A142	5.01*	4.70*	4.31*	3.96*	5.04*	4.74*	4.35*	4.00*	5.11*	4.82*	4.42*	4.07*
		140	A142	5.25*	5.00*	4.60*	4.27*	5.28*	5.04*	4.65*	4.31*	5.34*	5.10*	4.72*	4.38*
		150	A142	5.47*	5.24*	4.90*	4.58*	5.51*	5.27*	4.94*	4.62*	5.57*	5.33*	5.01*	4.69*
		160	A142	5.40*	5.38*	5.14*	4.87*	5.73*	5.48*	5.17*	4.91*	5.79*	5.54*	5.23*	4.98*
		170	A142	5.27*	5.27*	5.20*	5.10*	5.85*	5.70*	5.38*	5.13*	6.00*	5.76*	5.43*	5.19*
		180	A193	5.10*	5.10*	5.10*	5.06*	5.78*	5.74*	5.58*	5.33*	6.21*	5.96*	5.63*	5.38*
		190	A193	4.94*	4.94*	4.94*	4.94*	5.61*	5.61*	5.57*	5.46*	6.40*	6.17*	5.83*	5.58*
		200	A193	4.78*	4.78*	4.78*	4.78*	5.45*	5.45*	5.45*	5.43*	6.35*	6.27*	6.03*	5.78*
One	120 minutes	140	A142	5.25*	5.00*	4.60*	4.27*	5.28*	5.04*	4.65*	4.31*	5.34*	5.10*	4.72*	4.38*
		150	A142	5.47*	5.24*	4.90*	4.58*	5.51*	5.27*	4.94*	4.62*	5.57*	5.33*	5.01*	4.69*
		160	A142	5.40*	5.38*	5.14*	4.87*	5.73*	5.48*	5.17*	4.91*	5.79*	5.54*	5.23*	4.98*
		170	A142	5.27*	5.27*	5.20*	5.10*	5.85*	5.70*	5.38*	5.13*	6.00*	5.76*	5.43*	5.19*
		180	A193	5.10*	5.10*	5.10*	5.06*	5.78*	5.74*	5.58*	5.33*	6.21*	5.96*	5.63*	5.38*
		190	A193	4.94*	4.94*	4.94*	4.92*	5.61*	5.61*	5.57*	5.46*	6.40*	6.17*	5.83*	5.58*
		200	A193	4.78*	4.78*	4.78*	4.78*	5.45*	5.45*	5.45*	5.43*	6.35*	6.27*	6.03*	5.78*

Double span decking / continuous concrete

Props	Fire Period	Slab Depth (mm	Mesh 0.1% min. req'd	Total Applied Load (kN/m²)											
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
				0.9mm				1.0mm				1.2mm			
One	60 minutes	120	A142	4.77*	4.45*	4.02*	3.66*	4.82*	4.49*	4.06*	3.69*	4.90*	4.57*	4.13*	3.76*
		130	A142	5.08*	4.77*	4.36*	3.96*	5.12*	4.81*	4.40*	4.00*	5.18*	4.88*	4.47*	4.07*
		140	A142	5.33*	5.07*	4.67*	4.28*	5.36*	5.10*	4.70*	4.31*	5.42*	5.16*	4.78*	4.38*
		150	A142	5.59*	5.31*	4.97*	4.59*	5.60*	5.34*	5.00*	4.62*	5.66*	5.39*	5.06*	4.69*
		160	A142	5.57*	5.45*	5.20*	4.89*	5.83*	5.56*	5.23*	4.93*	5.89*	5.61*	5.28*	5.00*
		170	A142	5.39*	5.40*	5.26*	5.15*	5.97*	5.79*	5.44*	5.18*	6.12*	5.84*	5.49*	5.23*
		180	A193	5.22*	5.22*	5.22*	5.22*	5.91*	5.86*	5.64*	5.38*	6.32*	6.05*	5.70*	5.43*
		190	A193	5.06*	5.06*	5.06*	5.06*	5.74*	5.74*	5.71*	5.58*	6.53*	6.26*	5.91*	5.64*
		200	A193	4.92*	4.92*	4.92*	4.92*	5.60*	5.60*	5.60*	5.58*	6.52*	6.43*	6.12*	5.84*
One	90 minutes	130	A142	5.08*	4.77*	4.36*	3.96*	5.12*	4.81*	4.40*	4.00*	5.18*	4.88*	4.47*	4.07*
		140	A142	5.33*	5.07*	4.67*	4.28*	5.36*	5.10*	4.70*	4.31*	5.42*	5.16*	4.78*	4.38*
		150	A142	5.59*	5.31*	4.97*	4.59*	5.60*	5.34*	5.00*	4.62*	5.66*	5.39*	5.06*	4.69*
		160	A142	5.57*	5.45*	5.20*	4.89*	5.83*	5.56*	5.23*	4.93*	5.89*	5.61*	5.28*	5.00*
		170	A142	5.39*	5.40*	5.26*	5.15*	5.97*	5.79*	5.44*	5.18*	6.12*	5.84*	5.49*	5.23*
		180	A193	5.22*	5.22*	5.22*	5.22*	5.91*	5.86*	5.64*	5.38*	6.32*	6.05*	5.70*	5.43*
		190	A193	5.06*	5.06*	5.06*	5.06*	5.74*	5.74*	5.71*	5.58*	6.53*	6.26*	5.91*	5.64*
		200	A193	4.92*	4.92*	4.92*	4.92*	5.60*	5.60*	5.60*	5.58*	6.52*	6.43*	6.12*	5.84*
One	120 minutes	140	A142	5.33*	5.07*	4.67*	4.28*	5.36*	5.10*	4.70*	4.31*	5.42*	5.16*	4.78*	4.38*
		150	A142	5.59*	5.31*	4.97*	4.59*	5.60*	5.34*	5.00*	4.62*	5.66*	5.39*	5.06*	4.69*
		160	A142	5.57*	5.45*	5.20*	4.89*	5.83*	5.56*	5.23*	4.93*	5.89*	5.61*	5.28*	5.00*
		170	A142	5.39*	5.40*	5.26*	5.15*	5.97*	5.79*	5.44*	5.18*	6.12*	5.84*	5.49*	5.23*
		180	A193	5.22*	5.22*	5.22*	5.22*	5.91*	5.86*	5.64*	5.38*	6.32*	6.05*	5.70*	5.43*
		190	A193	5.06*	5.06*	5.06*	5.06*	5.74*	5.74*	5.71*	5.58*	6.53*	6.26*	5.91*	5.64*
		200	A193	4.92*	4.92*	4.92*	4.92*	5.60*	5.60*	5.58*	5.58*	6.52*	6.43*	6.12*	5.84*

MetFloor® 80

Single span decking / single span concrete (Fire Engineering Method)

Props	Fire Period	Slab Depth (mm	Mesh 0.1% min. req'd	Total Applied Load (kN/m²)											
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
				0.9mm				1.0mm				1.2mm			
None	60 minutes	140	A142	4.06*	4.06*	4.06*	4.04*	4.16*	4.16*	4.15*	4.08*	4.32*	4.31*	4.30*	4.11*
		150	A142	3.97*	3.97*	3.96*	3.95*	4.08*	4.08*	4.08*	4.07*	4.23*	4.23*	4.23*	4.22*
		160	A142	3.87*	3.87*	3.87*	3.87*	4.01*	4.01*	4.01*	4.00*	4.16*	4.16*	4.16*	4.15*
		170	A142	3.78*	3.78*	3.78*	3.78*	3.94*	3.94*	3.94*	3.94*	4.09*	4.09*	4.09*	4.08*
		180	A142	3.70*	3.70*	3.70*	3.70*	3.86*	3.86*	3.86*	3.86*	4.03*	4.03*	4.03*	4.03*
		190	A193	3.63*	3.63*	3.63*	3.63*	3.79*	3.79*	3.79*	3.78*	3.97*	3.97*	3.97*	3.97*
		200	A193	3.56*	3.56*	3.56*	3.56*	3.72*	3.72*	3.72*	3.72*	3.90*	3.90*	3.90*	3.90*
None	90 minutes	150	A142	3.97*	3.97*	3.96*	3.95*	4.08*	4.08*	4.08*	4.07*	4.23*	4.23*	4.22*	4.22*
		160	A142	3.87*	3.87*	3.87*	3.87*	4.01*	4.01*	4.01*	4.00*	4.16*	4.16*	4.16*	4.15*
		170	A142	3.78*	3.78*	3.78*	3.78*	3.94*	3.94*	3.94*	3.94*	4.09*	4.09*	4.09*	4.08*
		180	A142	3.70*	3.70*	3.70*	3.70*	3.86*	3.86*	3.86*	3.86*	4.03*	4.03*	4.03*	4.03*
		190	A193	3.63*	3.63*	3.63*	3.63*	3.79*	3.79*	3.79*	3.78*	3.97*	3.97*	3.97*	3.97*
		200	A193	3.56*	3.56*	3.56*	3.56*	3.72*	3.72*	3.72*	3.72*	3.90*	3.90*	3.90*	3.90*
None	120 minutes	160	A142	3.87*	3.87*	3.87*	3.86*	4.01*	4.01*	4.01*	4.00*	4.16*	4.16*	4.16*	4.15*
		170	A142	3.78*	3.78*	3.78*	3.78*	3.94*	3.94*	3.94*	3.93*	4.09*	4.09*	4.09*	4.08*
		180	A142	3.70*	3.70*	3.69*	3.70*	3.86*	3.86*	3.86*	3.86*	4.03*	4.03*	4.03*	4.02*
		190	A193	3.63*	3.63*	3.63*	3.63*	3.79*	3.79*	3.78*	3.78*	3.97*	3.97*	3.97*	3.97*
		200	A193	3.56*	3.56*	3.56*	3.56*	3.72*	3.72*	3.72*	3.72*	3.90*	3.90*	3.90*	3.90*

Double span decking / continuous concrete

Props	Fire Period	Slab Depth (mm	Mesh 0.1% min. req'd	Total Applied Load (kN/m²)											
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
				0.9mm				1.0mm				1.2mm			
None	60 minutes	140	A142	4.43*	4.42*	4.40*	4.12*	4.77*	4.76*	4.55*	4.12*	5.33*	5.25*	4.60*	4.18*
		150	A142	4.38*	4.37*	4.36*	4.35*	4.65*	4.64*	4.62*	4.46*	5.24*	5.22*	4.93*	4.52*
		160	A142	4.32	4.32*	4.31*	4.30*	4.54	4.52*	4.51*	4.51*	5.12*	5.10*	5.10*	4.83*
		170	A142	4.21	4.21*	4.19*	4.19*	4.43	4.43*	4.42*	4.41*	5.01*	5.00*	4.99*	4.98*
		180	A142	4.10	4.10	4.09*	4.08*	4.41	4.41*	4.40*	4.40*	4.90	4.89*	4.88*	4.87*
		190	A193	3.99	3.99	3.99*	3.98*	4.35	4.35	4.35*	4.34*	4.79	4.79	4.77*	4.77*
		200	A193	3.90	3.90	3.90	3.90*	4.25	4.25	4.25*	4.24*	4.69	4.69	4.68*	4.68*
None	90 minutes	150	A142	4.37*	4.36*	4.36*	4.35*	4.64*	4.63*	4.62*	4.46*	5.23*	5.22*	4.93*	4.52*
		160	A142	4.32*	4.31*	4.30*	4.30*	4.52*	4.51*	4.51*	4.51*	5.10*	5.10*	5.10*	4.83*
		170	A142	4.21*	4.20*	4.19*	4.18*	4.42*	4.42*	4.42*	4.41*	5.00*	4.99*	4.98*	4.98*
		180	A142	4.10	4.09*	4.08*	4.07*	4.41*	4.41*	4.40*	4.40*	4.89*	4.88*	4.87*	4.87*
		190	A193	3.99	3.99	3.98*	3.98*	4.35	4.35*	4.34*	4.33*	4.79*	4.78*	4.77*	4.77*
		200	A193	3.90	3.90	3.90*	3.88*	4.25	4.25*	4.24*	4.23*	4.69	4.69*	4.68*	4.67*
None	120 minutes	160	A142	4.31*	4.31*	4.30*	4.30*	4.51*	4.51*	4.51*	4.51*	5.10*	5.10*	5.10*	4.83*
		170	A142	4.20*	4.19*	4.18*	4.18*	4.42*	4.42*	4.41*	4.41*	4.99*	4.98*	4.98*	4.98*
		180	A142	4.09*	4.08*	4.08*	4.07*	4.41*	4.40*	4.40*	4.40*	4.88*	4.88*	4.87*	4.87*
		190	A193	3.99	3.99*	3.98*	3.97*	4.35*	4.34*	4.33*	4.33*	4.78*	4.78*	4.77*	4.77*
		200	A193	3.90	3.90*	3.89*	3.88*	4.25*	4.24*	4.24*	4.23*	4.69*	4.68*	4.67*	4.67*

MetFloor® 80 – Propped

Single span decking / single span concrete (Fire Engineering Method)

Props	Fire Period	Slab Depth (mm	Mesh 0.1% min. req'd	Total Applied Load (kN/m²)											
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
				0.9mm				1.0mm				1.2mm			
One	60 minutes	140	A142	5.24*	4.98*	4.58*	4.13*	5.26*	5.02*	4.61*	4.13*	5.31*	5.06*	4.65*	4.16*
		150	A142	5.47*	5.22*	4.87*	4.50*	5.49*	5.24*	4.90*	4.51*	5.54*	5.28*	4.95*	4.54*
		160	A142	5.68*	5.44*	5.12*	4.83*	5.71*	5.46*	5.14*	4.86*	5.76*	5.50*	5.18*	4.90*
		170	A142	5.81*	5.65*	5.32*	5.07*	5.92*	5.67*	5.35*	5.10*	5.97*	5.71*	5.39*	5.14*
		180	A142	5.71*	5.68*	5.52*	5.27*	6.13*	5.87*	5.55*	5.30*	6.18*	5.92*	5.59*	5.34*
		190	A193	5.51*	5.51*	5.50*	5.39*	6.13*	6.02*	5.74*	5.49*	6.38*	6.12*	5.79*	5.53*
		200	A193	5.35*	5.35*	5.35*	5.33*	6.00*	5.99*	5.87*	5.67*	6.57*	6.32*	5.98*	5.72*
One	90 minutes	150	A142	5.47*	5.22*	4.87*	4.50*	5.49*	5.24*	4.90*	4.51*	5.54*	5.28*	4.95*	4.54*
		160	A142	5.68*	5.44*	5.12*	4.83*	5.71*	5.46*	5.14*	4.86*	5.76*	5.50*	5.18*	4.90*
		170	A142	5.81*	5.65*	5.32*	5.07*	5.92*	5.67*	5.35*	5.10*	5.97*	5.71*	5.39*	5.14*
		180	A142	5.71*	5.68*	5.52*	5.27*	6.13*	5.87*	5.55*	5.30*	6.18*	5.92*	5.59*	5.34*
		190	A193	5.51*	5.51*	5.50*	5.39*	6.13*	6.02*	5.74*	5.49*	6.38*	6.12*	5.79*	5.53*
		200	A193	5.35*	5.35*	5.35*	5.33*	6.00*	5.99*	5.87*	5.67*	6.57*	6.32*	5.98*	5.72*
One	120 minutes	160	A142	5.68*	5.44*	5.12*	4.83*	5.71*	5.46*	5.14*	4.86*	5.76*	5.50*	5.18*	4.90*
		170	A142	5.81*	5.65*	5.32*	5.07*	5.92*	5.67*	5.35*	5.10*	5.97*	5.71*	5.39*	5.14*
		180	A142	5.71*	5.68*	5.52*	5.27*	6.13*	5.87*	5.55*	5.30*	6.18*	5.92*	5.59*	5.34*
		190	A193	5.51*	5.51*	5.50*	5.39*	6.13*	6.02*	5.74*	5.49*	6.38*	6.12*	5.79*	5.53*
		200	A193	5.35*	5.35*	5.35*	5.33*	6.00*	5.99*	5.87*	5.67*	6.57*	6.32*	5.98*	5.72*

Double span decking / continuous concrete

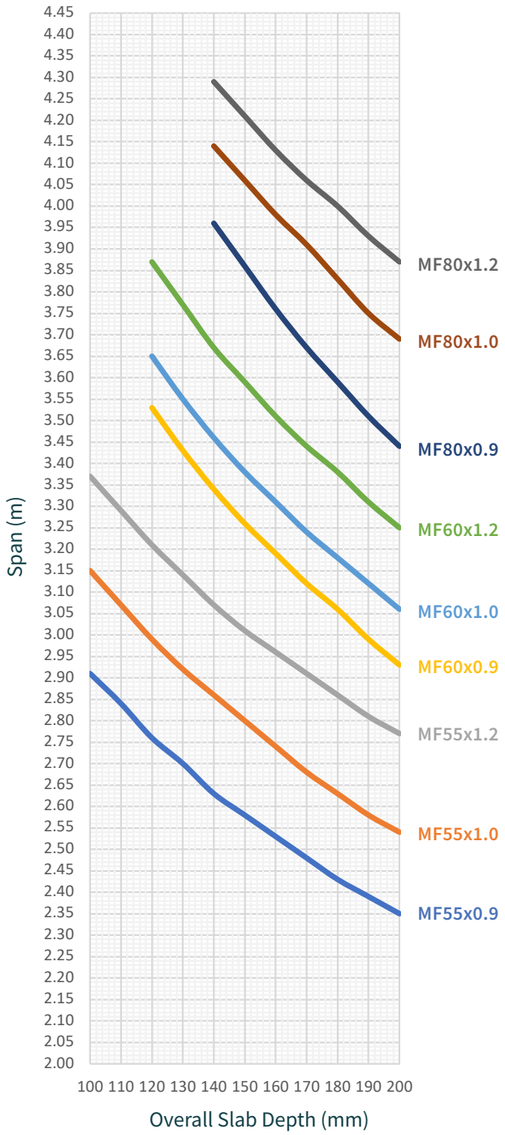
Props	Fire Period	Slab Depth (mm	Mesh 0.1% min. req'd	Total Applied Load (kN/m²)											
				3.5	5	7.5	10	3.5	5	7.5	10	3.5	5	7.5	10
				0.9mm				1.0mm				1.2mm			
One	60 minutes	140	A142	5.32*	5.05*	4.62*	4.13*	5.34*	5.08*	4.63*	4.13*	5.39*	5.12*	4.65*	4.16*
		150	A142	5.55*	5.29*	4.93*	4.52*	5.57*	5.31*	4.97*	4.52*	5.62*	5.36*	5.01*	4.54*
		160	A142	5.78*	5.51*	5.17*	4.84*	5.80*	5.54*	5.19*	4.87*	5.85*	5.58*	5.24*	4.90*
		170	A142	5.90*	5.73*	5.38*	5.12*	6.02*	5.75*	5.41*	5.14*	6.07*	5.80*	5.45*	5.19*
		180	A142	5.86*	5.81*	5.59*	5.32*	6.23*	5.96*	5.61*	5.35*	6.28*	6.01*	5.66*	5.39*
		190	A193	5.68*	5.68*	5.60*	5.52*	6.23*	6.12*	5.81*	5.54*	6.49*	6.21*	5.86*	5.59*
		200	A193	5.50*	5.50*	5.50*	5.48*	6.15*	6.07*	6.01*	5.73*	6.69*	6.41*	6.06*	5.78*
One	90 minutes	150	A142	5.55*	5.29*	4.93*	4.52*	5.57*	5.31*	4.97*	4.52*	5.62*	5.36*	5.01*	4.54*
		160	A142	5.78*	5.51*	5.17*	4.84*	5.80*	5.54*	5.19*	4.87*	5.85*	5.58*	5.24*	4.90*
		170	A142	5.90*	5.73*	5.38*	5.12*	6.02*	5.75*	5.41*	5.14*	6.07*	5.80*	5.45*	5.19*
		180	A142	5.86*	5.81*	5.59*	5.32*	6.23*	5.96*	5.61*	5.35*	6.28*	6.01*	5.66*	5.39*
		190	A193	5.68*	5.68*	5.60*	5.52*	6.23*	6.12*	5.81*	5.54*	6.49*	6.21*	5.86*	5.59*
		200	A193	5.50*	5.50*	5.50*	5.48*	6.15*	6.07*	6.01*	5.73*	6.69*	6.41*	6.06*	5.78*
One	120 minutes	160	A142	5.78*	5.51*	5.17*	4.84*	5.80*	5.54*	5.19*	4.87*	5.85*	5.58*	5.24*	4.90*
		170	A142	5.90*	5.73*	5.38*	5.12*	6.02*	5.75*	5.41*	5.14*	6.07*	5.80*	5.45*	5.19*
		180	A142	5.86*	5.81*	5.59*	5.32*	6.23*	5.96*	5.61*	5.35*	6.28*	6.01*	5.66*	5.39*
		190	A193	5.68*	5.68*	5.60*	5.52*	6.23*	6.12*	5.81*	5.54*	6.49*	6.21*	5.86*	5.59*
		200	A193	5.50*	5.50*	5.50*	5.48*	6.15*	6.07*	6.01*	5.73*	6.69*	6.41*	6.06*	5.78*

DEPTH-SPAN CHARTS TO BS EN 1994 (EUROCODES)

Single span decking / single span concrete – no propping

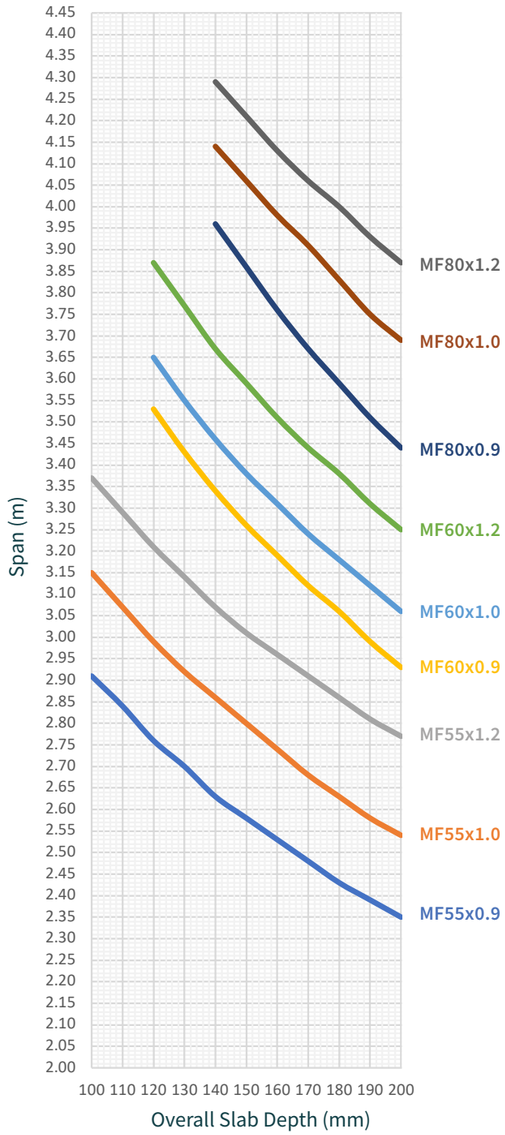
2.5kN/m² (Category B) + 1.0kN/m² partitions

60 minute fire rating



4.0kN/m² (Category C) + 1.0kN/m² partitions

60 minute fire rating

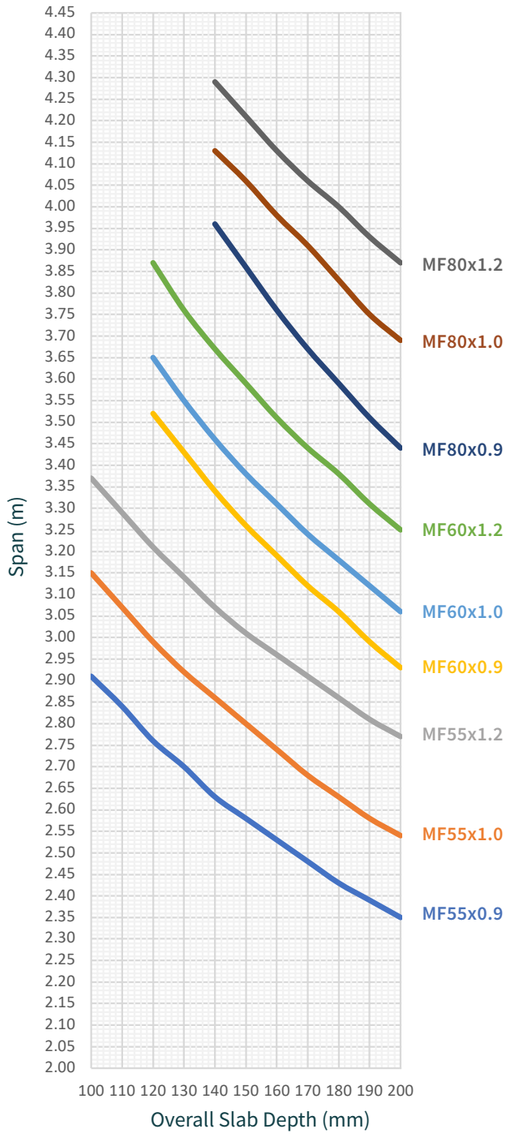


Notes: For estimating purposes only. Data is not exhaustive and shown as a smooth curve between data points. For full detailed designs use CMF MetFloor software. For slab depths greater than 200mm the CMF MetFloor software shall be used

Single span decking / single span concrete – no propping

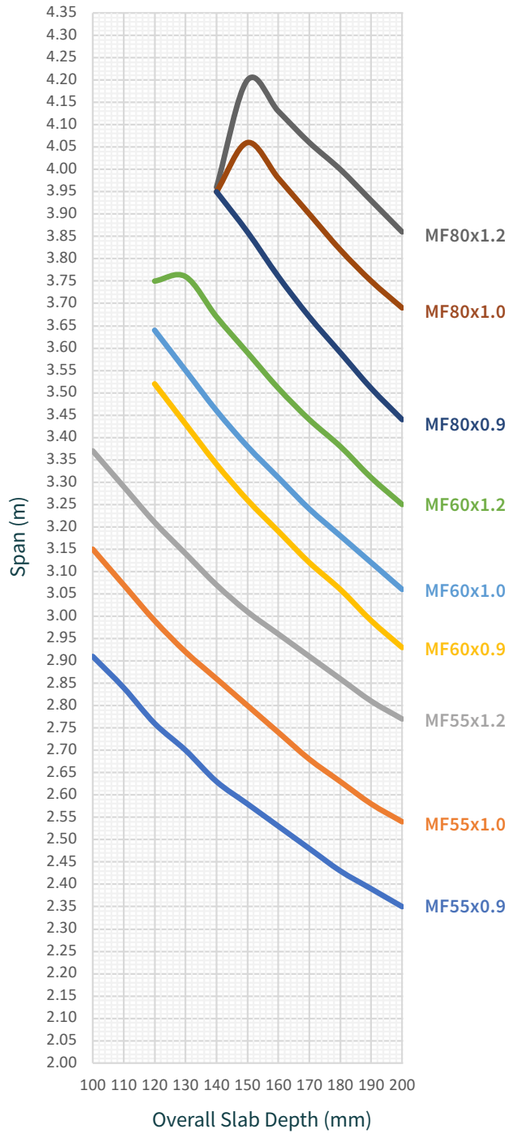
7.5kN/m² (Category E)

60 minute fire rating



10.0kN/m² (Category E)

60 minute fire rating



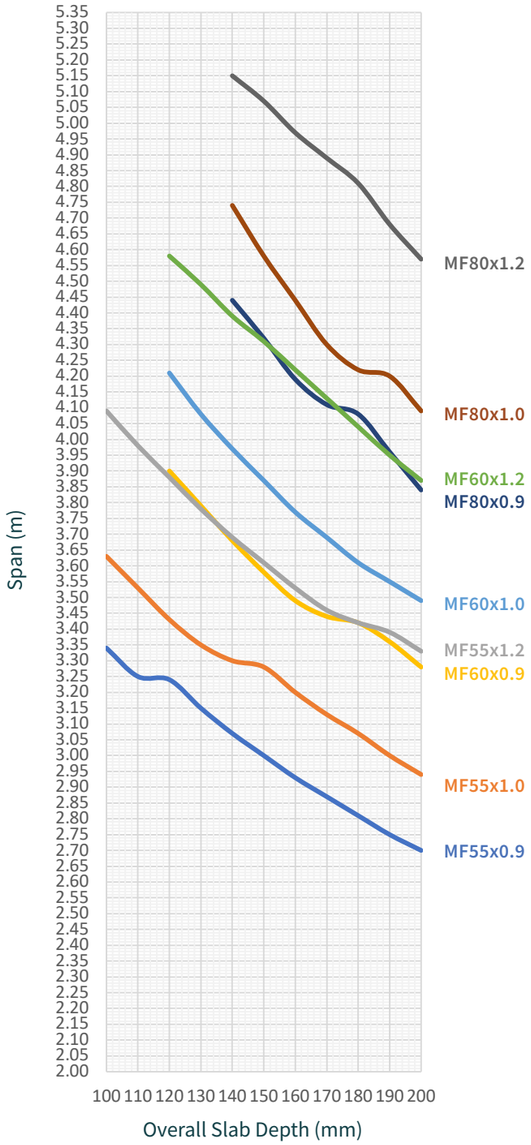
Notes: For estimating purposes only. Data is not exhaustive and shown as a smooth curve between data points. For full detailed designs use CMF MetFloor software. For slab depths greater than 200mm the CMF MetFloor software shall be used

DEPTH-SPAN CHARTS TO BS EN 1994 (EUROCODES)

Double span decking / continuous concrete – no propping

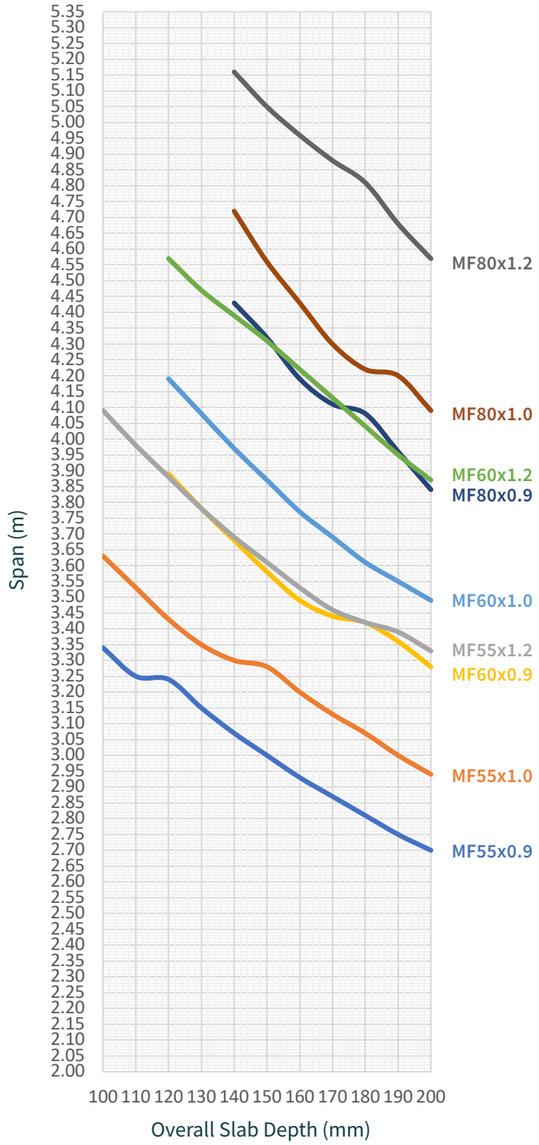
2.5kN/m² (Category B) + 1.0kN/m² partitions

60 minute fire rating



4.0kN/m² (Category C) + 1.0kN/m² partitions

60 minute fire rating

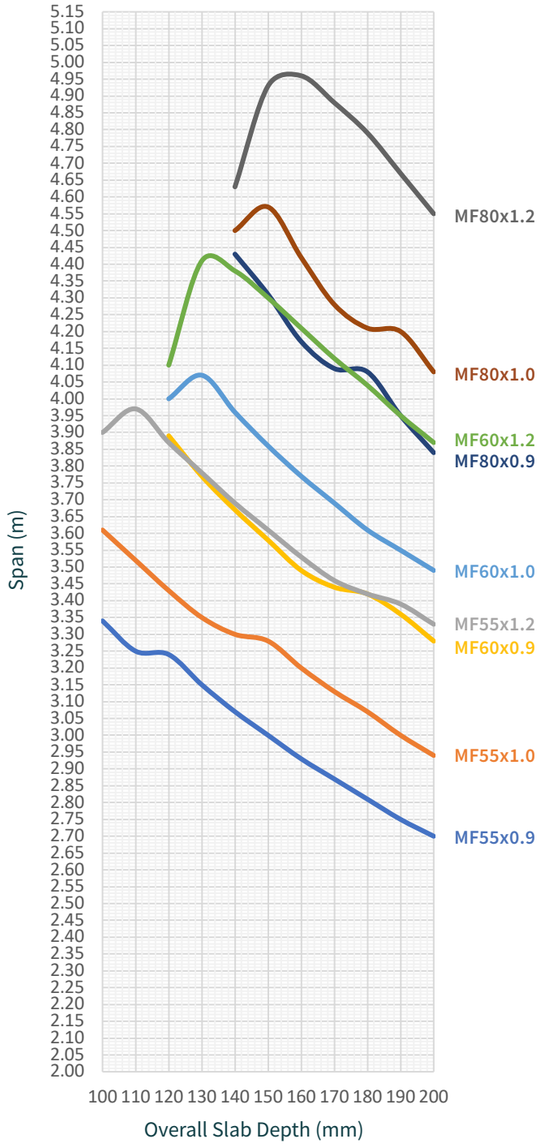


Notes: For estimating purposes only. Data is not exhaustive and shown as a smooth curve between data points. For full detailed designs use CMF MetFloor software. For slab depths greater than 200mm the CMF MetFloor software shall be used

Double span decking / continuous concrete – no propping

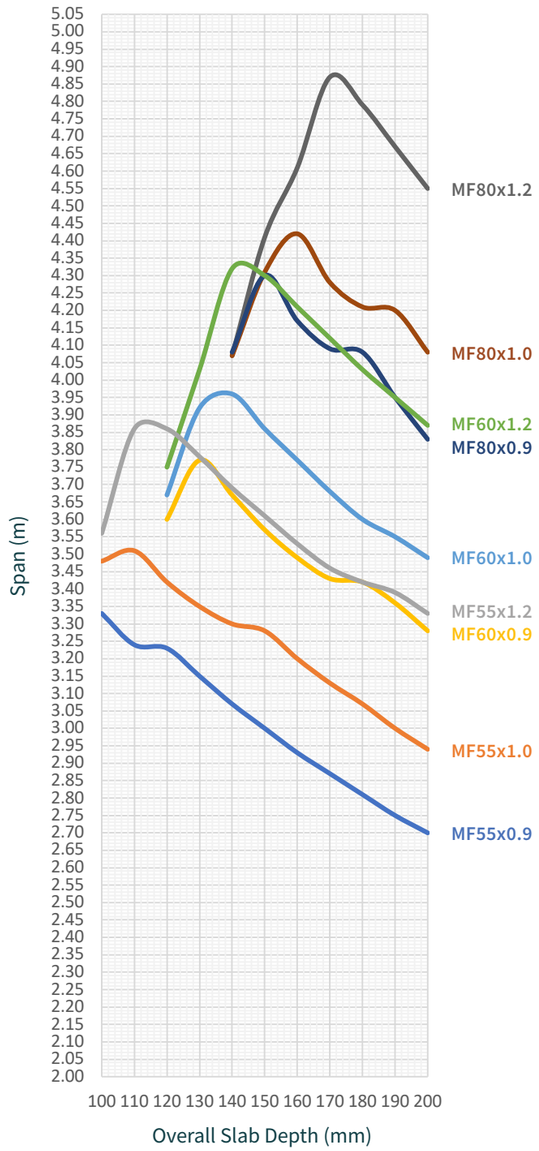
7.5kN/m² (Category E)

60 minute fire rating



10.0kN/m² (Category E)

60 minute fire rating

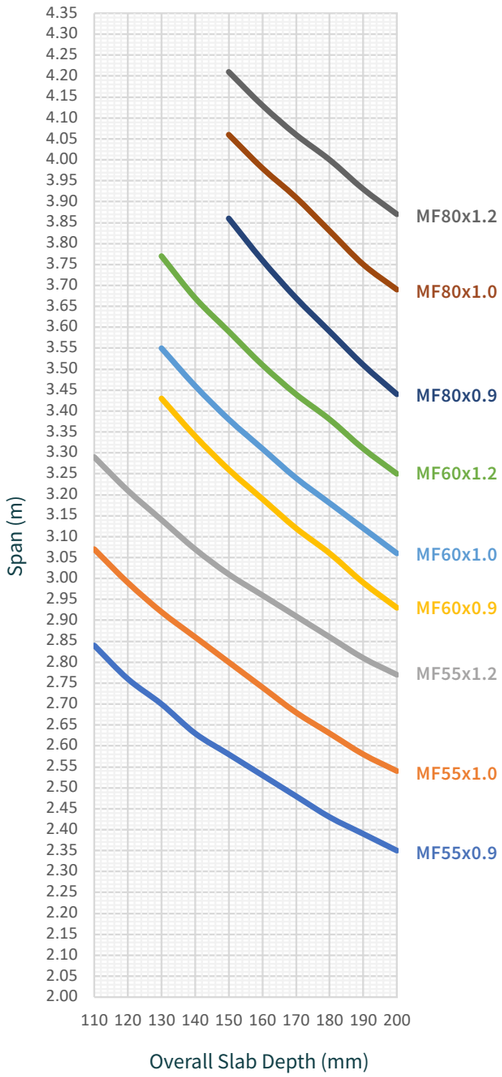


Notes: For estimating purposes only. Data is not exhaustive and shown as a smooth curve between data points. For full detailed designs use CMF MetFloor software. For slab depths greater than 200mm the CMF MetFloor software shall be used

Single span decking / single span concrete – no propping

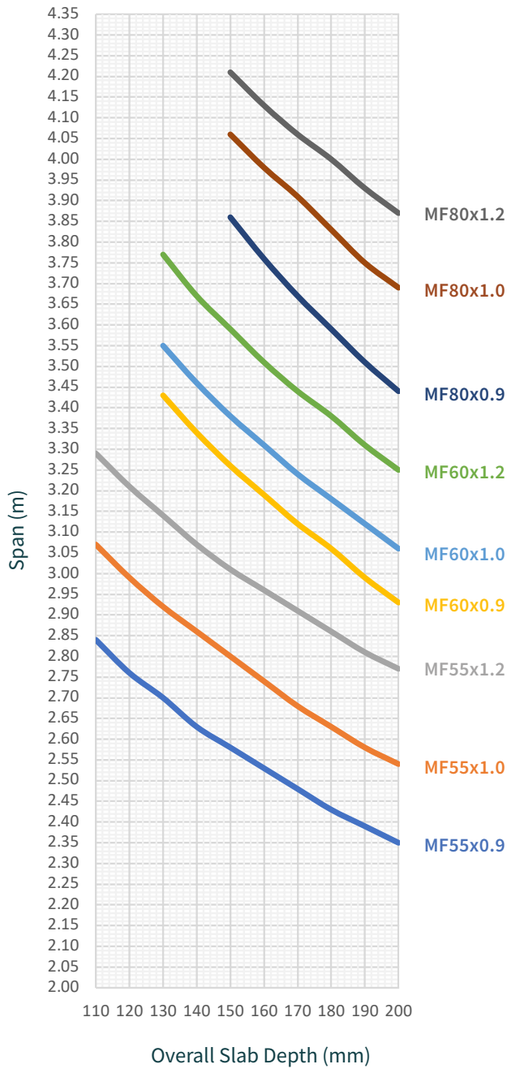
2.5kN/m² (Category B) + 1.0kN/m² partitions

90 minute fire rating



4.0kN/m² (Category C) + 1.0kN/m² partitions

90 minute fire rating



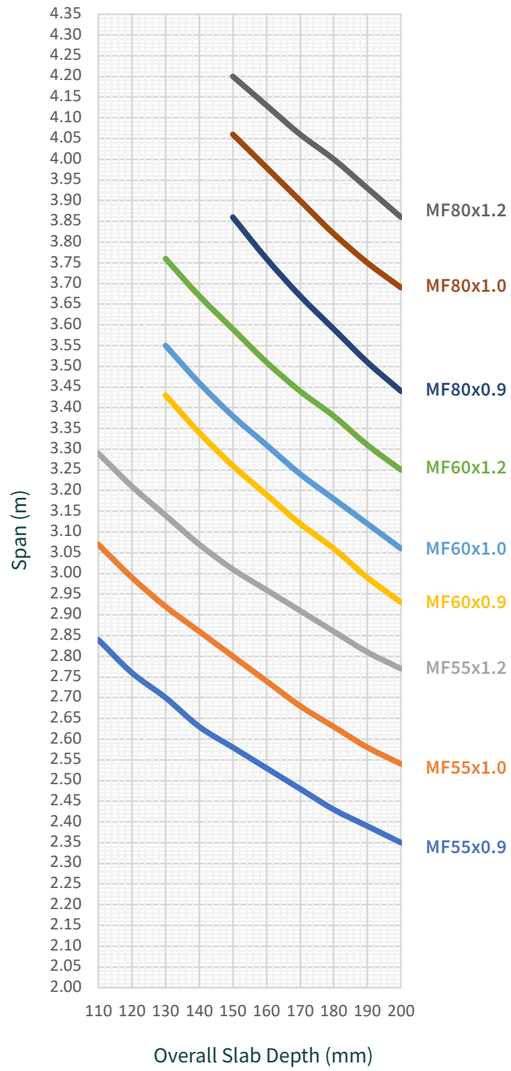
Notes: For estimating purposes only. Data is not exhaustive and shown as a smooth curve between data points. For full detailed designs use CMF MetFloor software. For slab depths greater than 200mm the CMF MetFloor software shall be used

DEPTH-SPAN CHARTS TO BS EN 1994 (EUROCODES)
90 MINUTE FIRE RATING

Single span decking / single span concrete – no propping

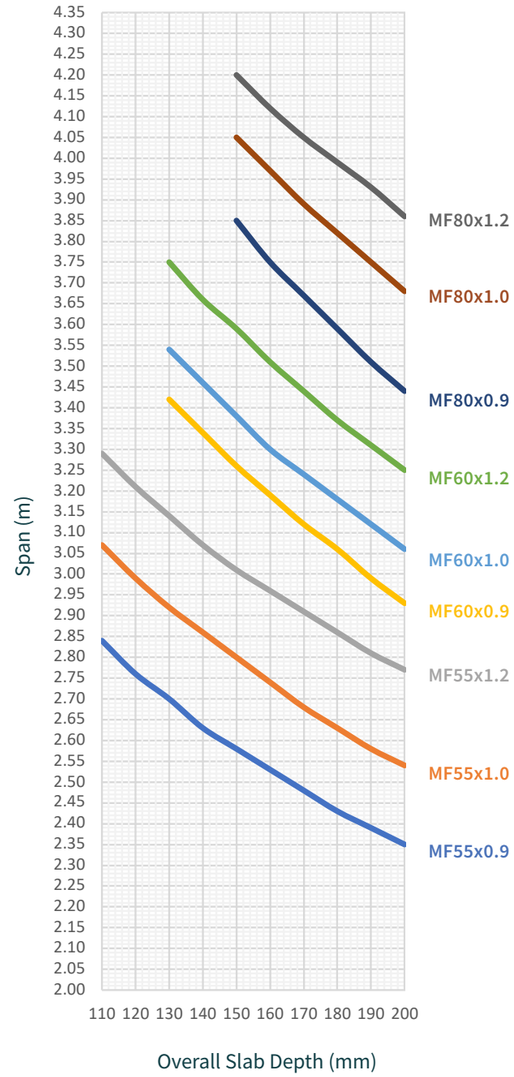
7.5kN/m² (Category E)

90 minute fire rating



10.0kN/m² (Category E)

90 minute fire rating

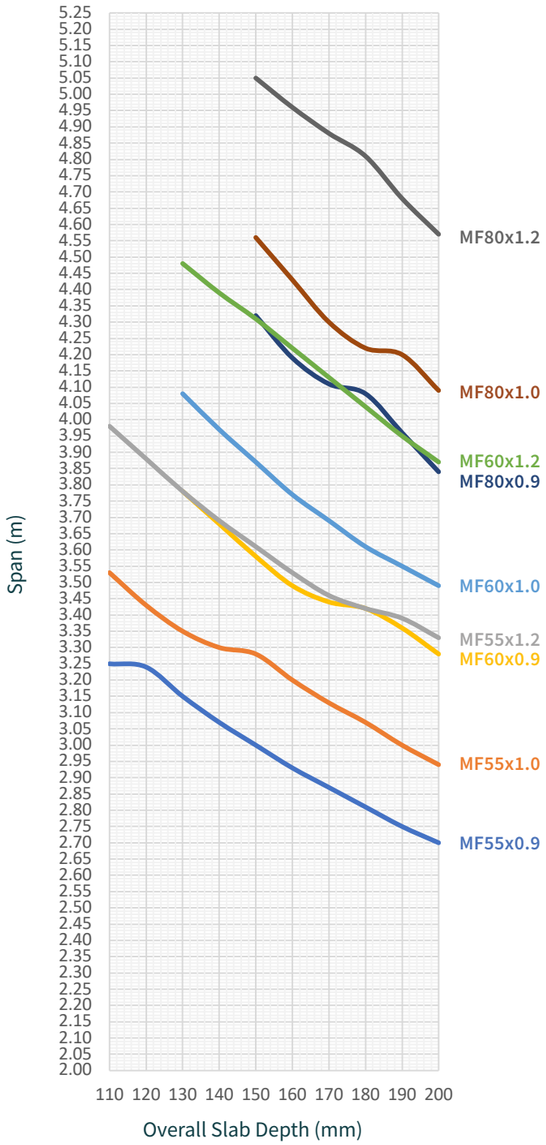


Notes: For estimating purposes only. Data is not exhaustive and shown as a smooth curve between data points. For full detailed designs use CMF MetFloor software. For slab depths greater than 200mm the CMF MetFloor software shall be used

Double span decking / continuous concrete – no propping

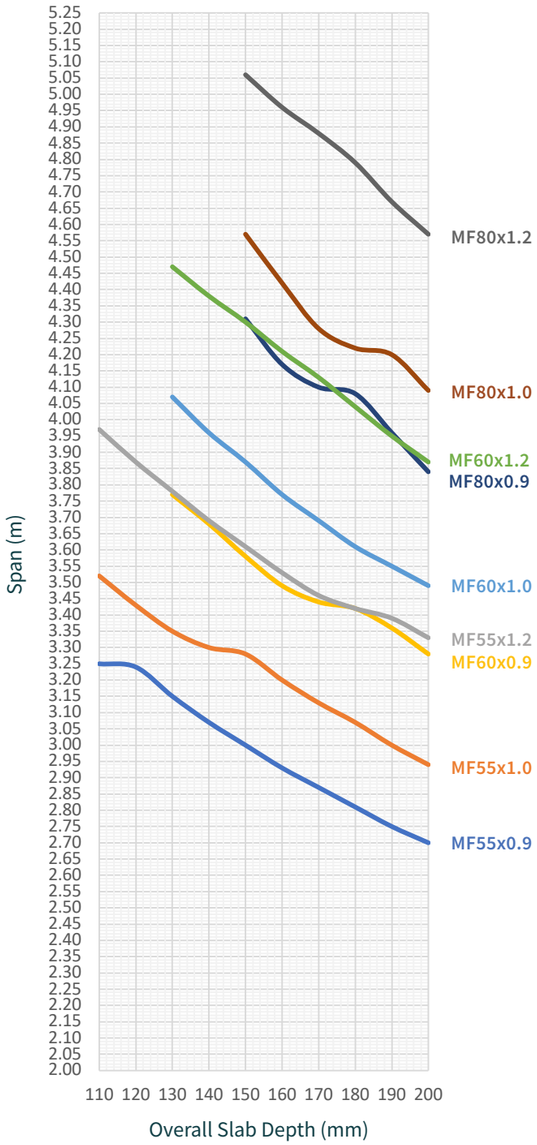
2.5kN/m² (Category B) + 1.0kN/m² partitions

90 minute fire rating



4.0kN/m² (Category C) + 1.0kN/m² partitions

90 minute fire rating



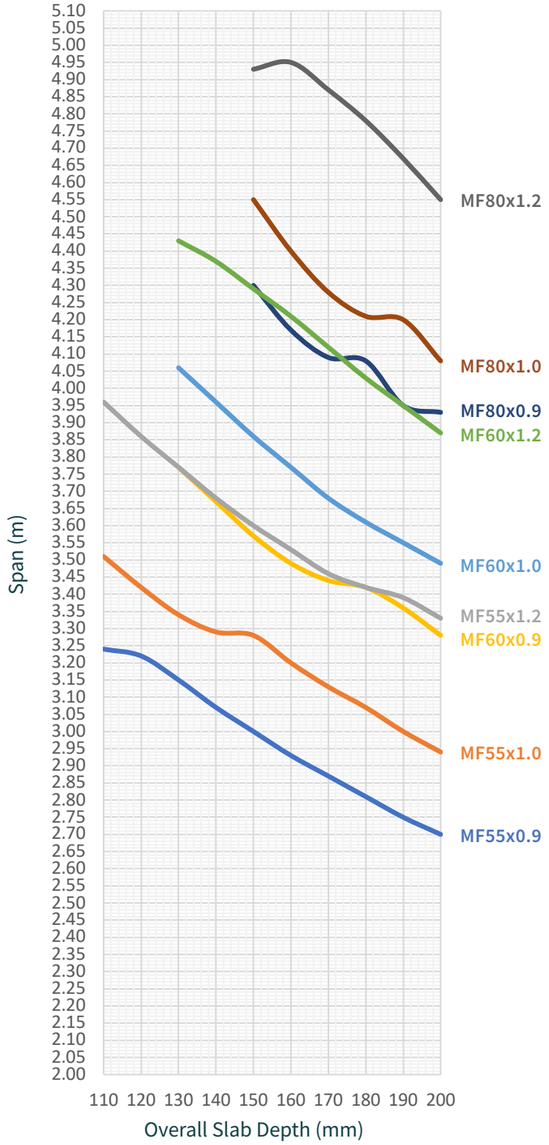
Notes: For estimating purposes only. Data is not exhaustive and shown as a smooth curve between data points. For full detailed designs use CMF MetFloor software. For slab depths greater than 200mm the CMF MetFloor software shall be used

DEPTH-SPAN CHARTS TO BS EN 1994 (EUROCODES)
90 MINUTE FIRE RATING

Double span decking / continuous concrete – no propping

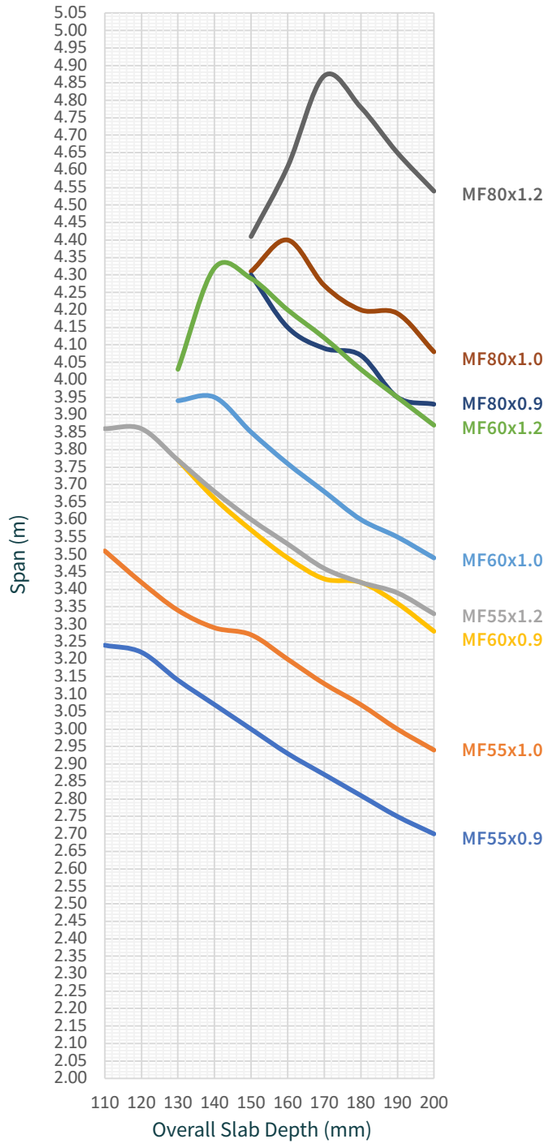
7.5kN/m² (Category E)

90 minute fire rating



10.0kN/m² (Category E)

90 minute fire rating

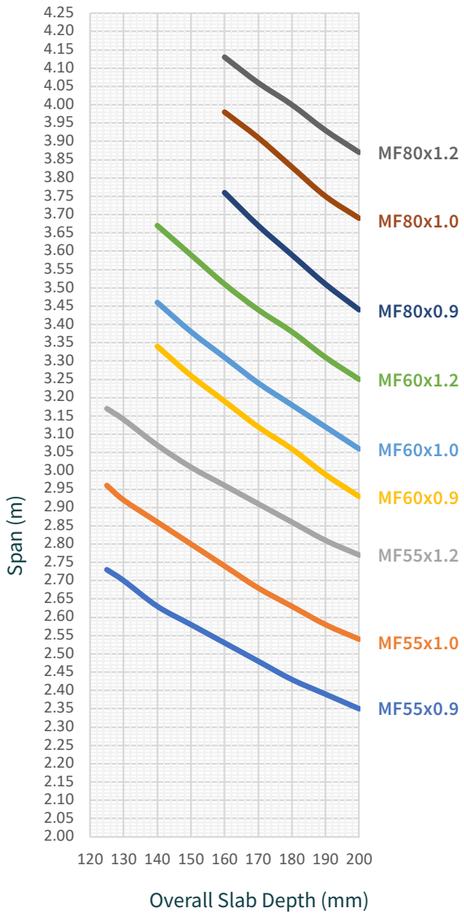


Notes: For estimating purposes only. Data is not exhaustive and shown as a smooth curve between data points. For full detailed designs use CMF MetFloor software. For slab depths greater than 200mm the CMF MetFloor software shall be used

Single span decking / single span concrete – no propping

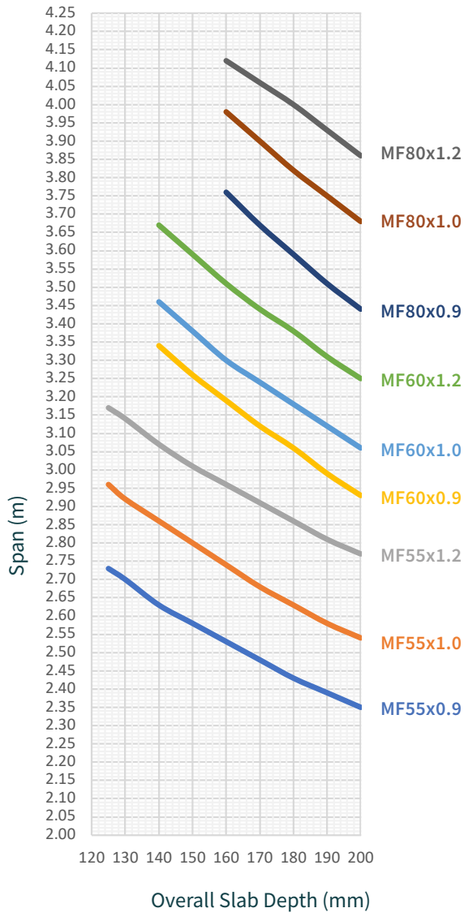
2.5kN/m² (Category B) + 1.0kN/m² partitions

120 minute fire rating



4.0kN/m² (Category C) + 1.0kN/m² partitions

120 minute fire rating



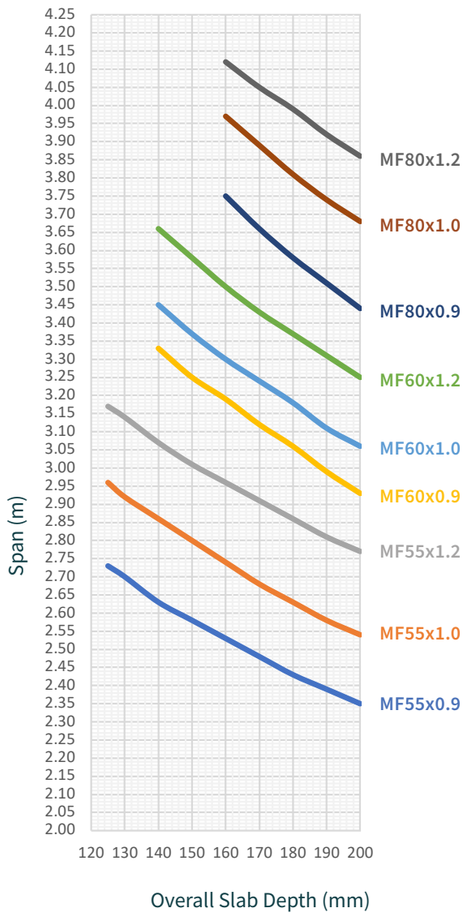
Notes: For estimating purposes only. Data is not exhaustive and shown as a smooth curve between data points. For full detailed designs use CMF MetFloor software. For slab depths greater than 200mm the CMF MetFloor software shall be used

DEPTH-SPAN CHARTS TO BS EN 1994 (EUROCODES)
120 MINUTE FIRE RATING

Single span decking / single span concrete – no propping

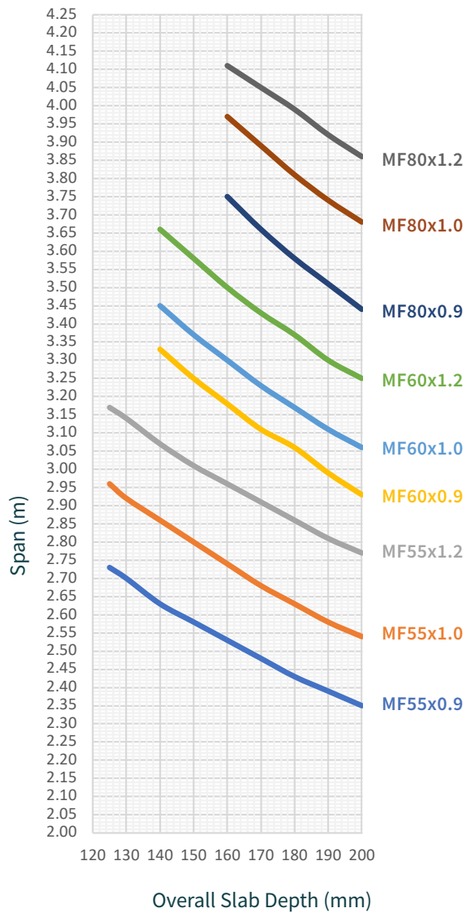
7.5kN/m² (Category E)

120 minute fire rating



10.0kN/m² (Category E)

120 minute fire rating



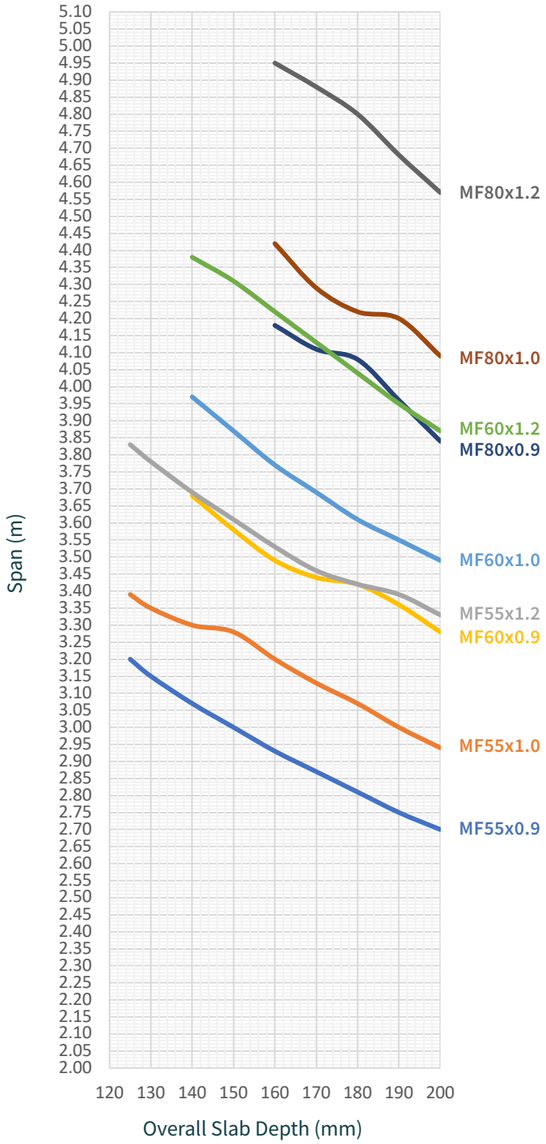
Notes: For estimating purposes only. Data is not exhaustive and shown as a smooth curve between data points. For full detailed designs use CMF MetFloor software. For slab depths greater than 200mm the CMF MetFloor software shall be used

DEPTH-SPAN CHARTS TO BS EN 1994 (EUROCODES)
120 MINUTE FIRE RATING

Double span decking / continuous concrete – no propping

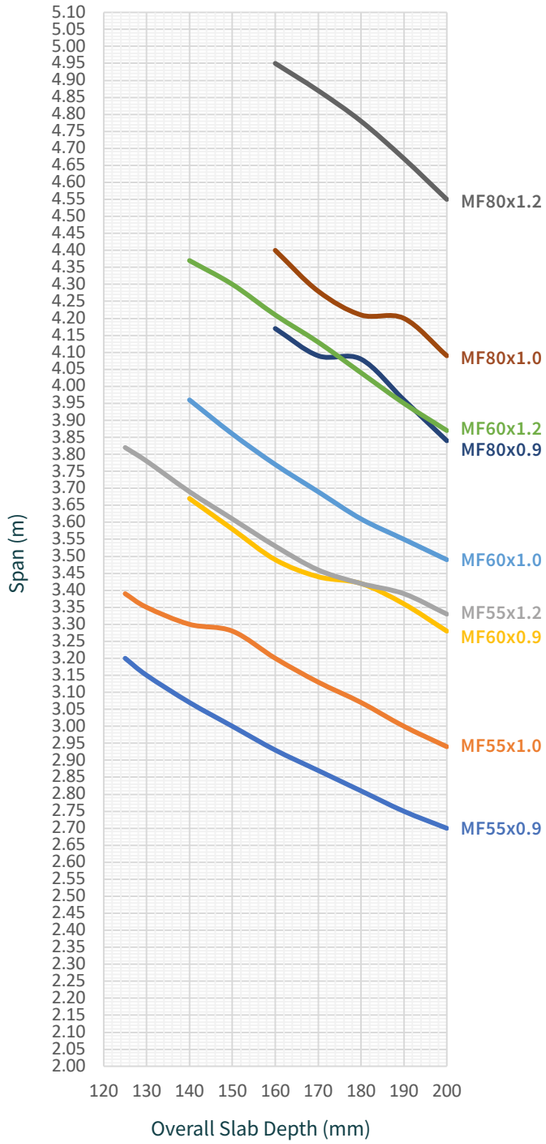
2.5kN/m² (Category B) + 1.0kN/m² partitions

120 minute fire rating



4.0kN/m² (Category C) + 1.0kN/m² partitions

120 minute fire rating

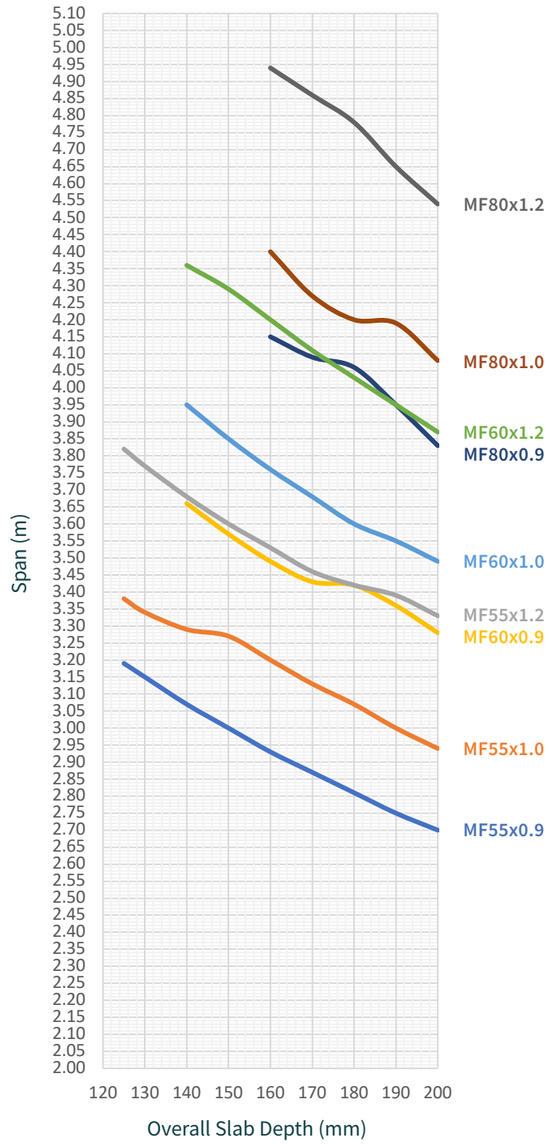


Notes: For estimating purposes only. Data is not exhaustive and shown as a smooth curve between data points. For full detailed designs use CMF MetFloor software. For slab depths greater than 200mm the CMF MetFloor software shall be used

Double span decking / continuous concrete – no propping

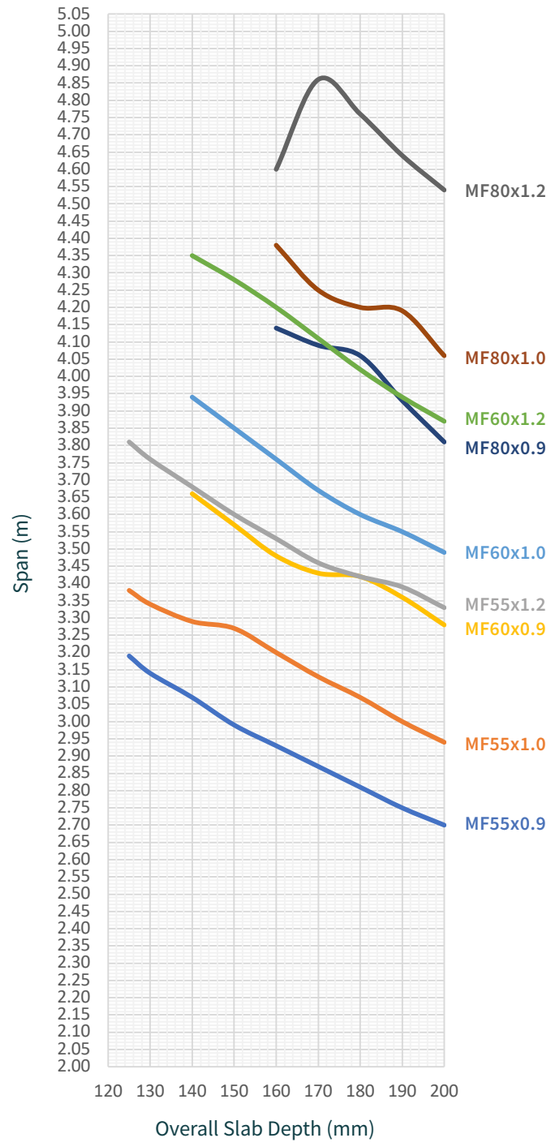
7.5kN/m² (Category E)

120 minute fire rating



10.0kN/m² (Category E)

120 minute fire rating



Notes: For estimating purposes only. Data is not exhaustive and shown as a smooth curve between data points. For full detailed designs use CMF MetFloor software. For slab depths greater than 200mm the CMF MetFloor software shall be used

REFERENCES

BCSA

National Structural Steelwork Specification for Building Construction (NSSS) (6th Edition, 2017)

Publication 37/04 – Code of Practice for metal decking and stud welding (2004)

BRE

BR 394 – Early striking of formwork and forces in backprops (2000)

British Standards Institute

British Standards (BS)

BS 2092:1987 – Specification for eye-protectors for industrial and non-industrial uses

BS 4074:1982 – Specification for metal props and struts

BS 5268-2:2002 – Structural use of timber. Code of practice for permissible stress design, materials and workmanship

BS 5950-1:2000 – Structural use of steelwork in building. Code of practice for design. Rolled and welded sections

BS 5950-3.1:1990+A1:2010 – Structural use of steelwork in building. Design in composite construction. Code of practice for design of simple and continuous composite beams

BS 5950-4:1994 – Structural use of steelwork in building. Code of practice for design of composite slabs with profiled steel sheeting

BS 5950-6:1995 – Structural use of steelwork in building. Code of practice for design of light gauge profiled steel sheeting

BS 5950-8:2003 – Structural use of steelwork in building. Code of practice for fire resistant design

BS 6472-1:2008 – Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting

BS 7973-2:2001 – Spacers and chairs for steel reinforcement and their specification. Fixing and application of spacers and chairs and tying of reinforcement

BS 8110-1:1997 – Structural use of concrete. Code of practice for design and construction

BS 8500-1:2015+A2:2019 – Concrete. Complementary British Standard to BS EN 206. Method of specifying and guidance for the specifier

BS 8500-2:2015+A2:2019 – Concrete. Complementary British Standard to BS EN 206. Specification for constituent materials and concrete

European Standards (BS EN)

BS EN 166:2002 – Personal eye protection. Specifications

BS EN 206:2013+A1:2016 – Concrete. Specification, performance, production and conformity

BS EN 197-1:2000 – Cement. Composition, specifications and conformity criteria for common cements

BS EN 1065:1999 – Adjustable telescopic steel props. Product specifications, design and assessment by calculation and tests

BS EN 1090-4:2018 – Execution of steel structures and aluminium structures. Technical requirements for cold-formed structural steel elements and cold-formed structures for roof, ceiling, floor and wall applications

BS EN 1365-2:2014 – Fire resistance tests for loadbearing elements. Floors and roofs

BS EN 1992-1-1:2004+A1:2014 – Eurocode 2: Design of concrete structures. General rules and rules for buildings

BS EN 1993-1-1:2005+A1:2014 – Eurocode 3. Design of steel structures. General rules and rules for buildings

BS EN 1993-1-3:2006 – Eurocode 3. Design of steel structures. General rules

BS EN 1994-1-1:2004 – Eurocode 4. Design of composite steel and concrete structures. General rules and rules for buildings

BS EN 1994-1-2:2005+A1:2014 – Eurocode 4. Design of composite steel and concrete structures. General rules. Structural fire design

BS EN 1995-1-1:2004+A2:2014 – Eurocode 5: Design of timber structures. General. Common rules and rules for buildings

BS EN 10143:2006 – Continuously hot-dip coated steel sheet and strip. Tolerances on dimensions and shape.

BS EN 10346:2015 – Continuously hot-dip coated steel flat products for cold forming. Technical delivery conditions.

BS EN 12350-(various parts):2019 – Testing fresh concrete

BS EN 12390-(various parts):2019 – Testing hardened concrete

BS EN 12620:2002+A1:2008 – Aggregates for concrete

BS EN 13670:2009 – Execution of concrete structures

International Standards (BS EN ISO / ISO)

BS EN ISO 9001:2015 – Quality management systems. Requirements

BS EN ISO 13918:2018 – Welding. Studs and ceramic ferrules for arc stud welding.

ISO 10137:2007 – Bases for design of structures. Serviceability of buildings and walkways against vibrations

Concrete Society

CA 13 – Cracking in Composite Concrete/ Corrugated Metal Decking Floors Slabs (2006)

TR75 – Composite concrete slabs using steel decking: guidance on construction and associated design considerations (2016)

Construct (Concrete Structures Group)

National Structural Concrete Specification (NSCS) (Fourth Edition, 2010)

Department of Health

Health Technical Memorandum (HTM) 08-01: Acoustics (2013)

Health & Safety Executive

HSE EH40/2005 Workplace exposure limits (2020)

Steel Construction Institute (SCI)

AD 150: Composite Floors – Wheel loads from Forklift Trucks (1993)

AD 175: Diaphragm action of steel decking during construction (2011)

P076 – Design Guide on the Vibration of Floors (1989)

P288 – Fire Safe Design: A New Approach to Multi-Storey Steel-Framed Buildings (Second Edition) (2006)

P300 – Composite Slabs and Beams using Steel Decking: Best Practice for Design and Construction (Revised Editions) (2009) / MCRMA Technical Paper No. 13

P354 – Design of Floors for Vibration: A New Approach (Revised Edition) (2009)

P360 – Stability of Steel Beams and Columns (2011)

P375 – Fire Resistance Design of Steel Framed Buildings (2012)

PN005c – NCCI: Fire resistance design of composite slabs (2012)

UKMDA

The UKMDA Approved Code of Practice for the Installation of Metal Decking and Thru Deck Stud Welding (2018)

Notes

Notes

MetFloor®

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