

FUNDAMENTAL PRINCIPLE

A composite floor is a cold-rolled steel sheet with regularly spaced embossing on its webs. The performances of the composite floor are indicated in the Technical Application Documents relating to each PCB (composite floor).

These performances indicate the behaviour of the steel sheet according to its use:

- > Shuttering on-site: the steel sheet must ensure the safety of the fitting staff
- > After concrete drying: the steel sheet acts as a concrete reinforcement

The floor is said to be composite as the embossments interlock the steel sheet to the concrete, which combines the properties of these two materials (this whole forms a composite slab).

As the steel sheet is on the underside of the concrete slab, the use of composite floors in crawl spaces is prohibited (humid and aggressive atmosphere on the underside).

Any type of coating can be placed on the upper concrete side.

Specific points:

Composite floor slabs intended for use outdoors (balconies, flat roofs, etc.) must be watertight.

For flat roofs, in addition to waterproofing the concrete slabs, it is strongly recommended to insulate the floor to prevent condensation.



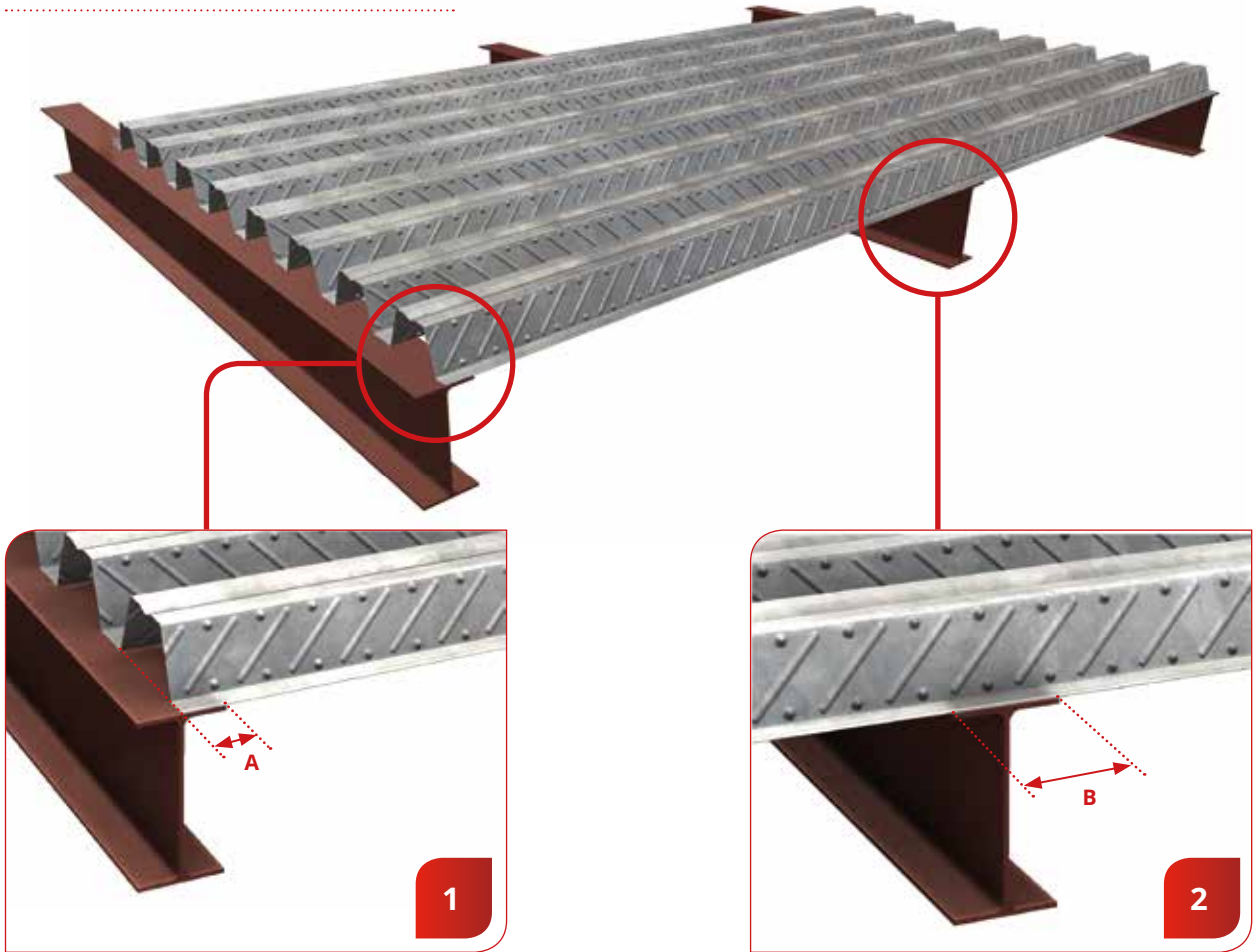
The composite floor can be delivered galvanised or pre-painted (depending on available stock)

Suspended ceilings can be installed under the composite floors. Fixing system using hangars across the steel sheet at the bottom of the trough is possible either before or after casting with the help of plugs with a maximum diameter of 8 mm.



INSTALLATION INSTRUCTIONS

METAL/WOOD/CONCRETE STRUCTURE



	TYPE OF SUPPORT		
	Steel	Wood	Concrete
1 End support (A)	50mm	70mm	50mm
2 Intermediate support (B)	80mm	100mm	80mm

END LAP

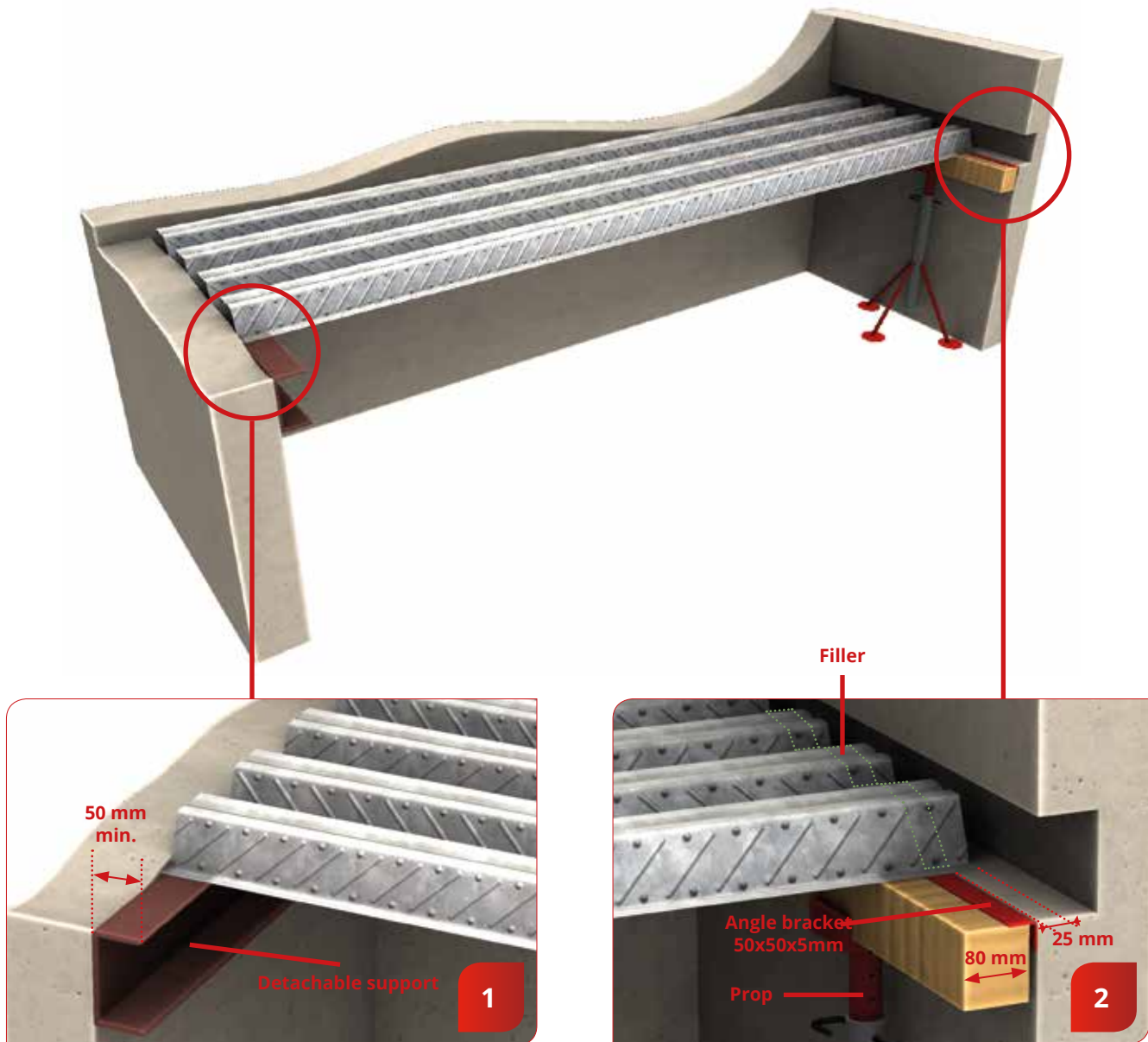


PROFILE	OVERLAP DIMENSION (C)	MAXIMUM OFFSET FROM THE END OF THE SHEET IN RELATION TO THE AXIS OF THE SUPPORT (D)
PCB 20	25 mm	25 mm
PCB 60 / PCB 80	40 mm	25 mm

INSTALLATION INSTRUCTIONS

RENOVATION

There are different ways of supporting the floor on a load-bearing wall under renovation.



1 – External support

A joist (metal or wood) is fixed onto the load-bearing wall to serve as a support for the composite floor. Fixing of the external support should be adjusted according to the type of support wall. The minimum width of the support is 50mm (see table on previous page).

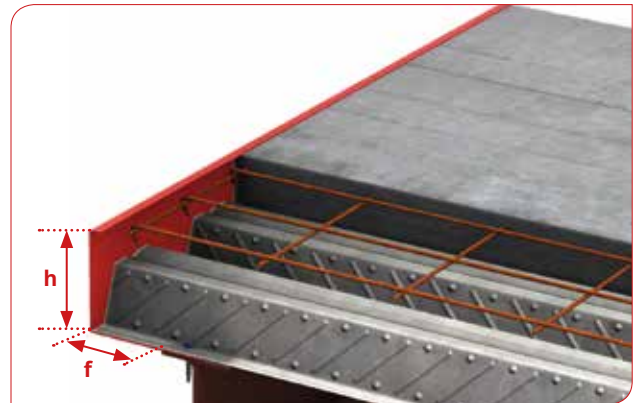
2 – Beam slot

A free slot can be made in the wall. At the beam slot, when the concrete is being poured, a prop line and a 50x50x5mm angle bracket must be fixed to the wall. The rim of the composite floor beyond the edge of the wall is at least 25 mm. A foam filler is used to seal the edge (on the underside) set back from the edge of the floor. Rods (rebar) should be provided to take the strain at the edge of the floor.

ROOF EDGE SHUTTERING

The curb ensures sealing during casting as well as the slab stopend. The curb is installed on the joist at the same time as the floor.

The minimum thickness of the curb depends on the overhang (f) (max. 200mm unpropped) of the floor and the thickness of the concrete slab h (see table below)



Curb with turnback (12mm min.)

0.88	1	1.2	1.5
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Curb without turnback

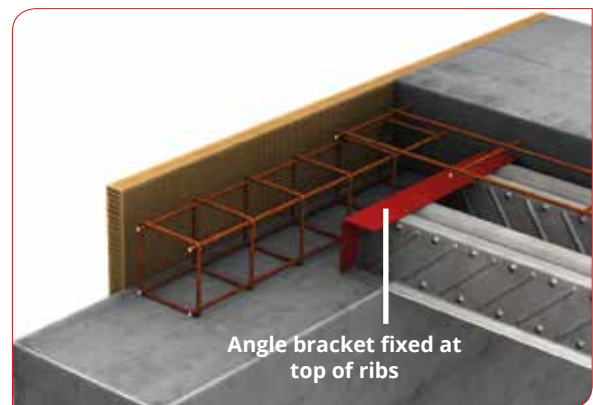
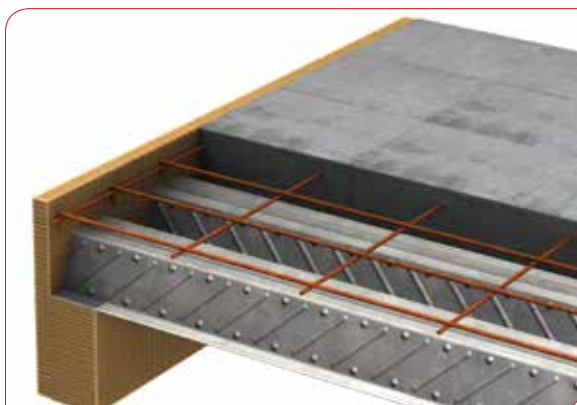
2	2.5	3
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Minimum thickness of galvanised metal for the curbs (mm)													
Thickness h (mm)	Cantilever overhang: f (mm)												
	0	25	50	75	100	125	150	175	200	225	250	275	300
60 to 100	0.88	0.88	1	1	1.2	1.2	1.5	2	2.5	2.5	3	3	3
110	0.88	0.88	1	1.2	1.2	1.5	1.5	2	2.5	2.5	3	3	3
120	0.88	0.88	1	1.2	1.5	1.5	2	2	2.5	2.5	3	3	3
130	0.88	1	1.2	1.5	1.5	2	2	2.5	2.5	2.5	3	3	
140	1	1.2	1.2	1.5	1.5	2	2	2.5	2.5	2.5	3	3	
150	1.2	1.2	1.5	1.5	2	2	2.5	2.5	2.5	3	3	3	
160	1.2	1.5	1.5	2	2	2.5	2.5	2.5	2.5	3	3		
180	1.5	1.5	2	2	2.5	2.5	2.5	2.5	3	3	3		
200	2	2	2.5	2.5	2.5	3	3	3	3				
220	2	2.5	2.5	2.5	3	3							
250	2.5	2.5	3	3									
280	2.5	3	3										

Provide a prop row greater than 200 mm at overhang

Traditional wooden shuttering can also be used.

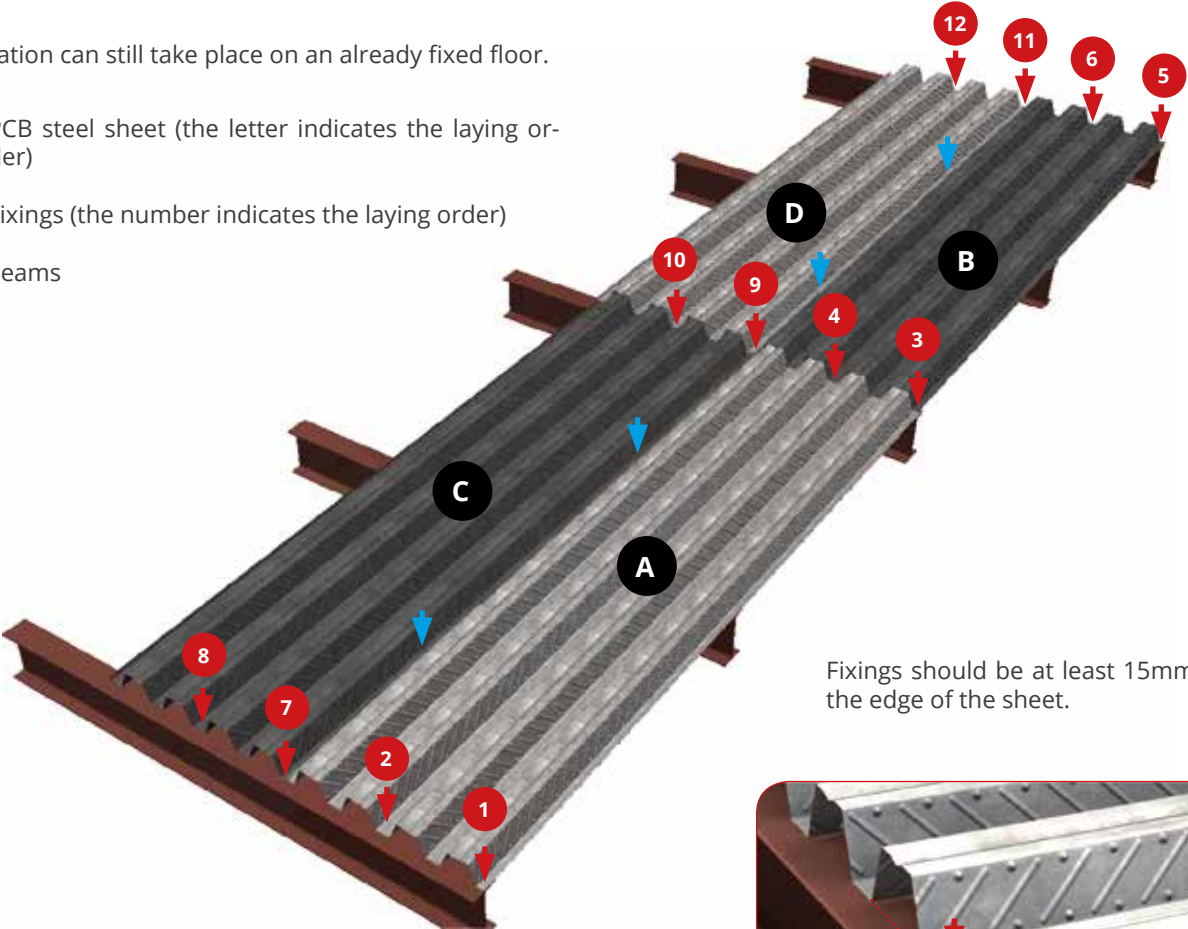
In the case of a concrete support, ring beams are required (edge leakage stop) and sealing during pouring can be ensured by using a foam filler or an angle bracket fixed to the top of the rib of the composite floor.



FLOOR FITTING PLAN

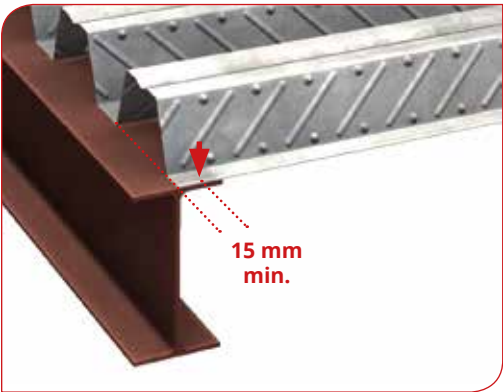
Circulation can still take place on an already fixed floor.





- PCB steel sheet (the letter indicates the laying order)
- ↓ Fixings (the number indicates the laying order)
- ↗ Seams



Fixings should be at least 15mm from the edge of the sheet.

- Stage 1:** Install floor A and secure it with fixtures 1 and 2
- Stage 2:** Install floor B and secure it with fixtures 3 to 6 (fixings common to floor A and B)
- Stage 3:** Install floor C and secure it with fixtures 7 and 8 (fixings common to floor A and C)
- Stage 4:** Install floor D and secure it with fixtures 9 to 12 (fixings common to all 4 floors)




Fixing on metal support		Concrete support fixing	Timber support fixing
 Nail Ø 4.5 x 21 mm	 Self-drilling screw Ø 6.3 x 22 mm	 threaded anchor Ø4.5 x 21 mm	 Sleep screw Ø 8 x 60 mm

Once in position and secured, the sheets can be joined at the seams. This ensures the strength of the floors and sealing during concrete pouring.

PROFILE	STICH SPACING
PCB 20	600 mm
PCB 60 / PCB 80	1000 mm

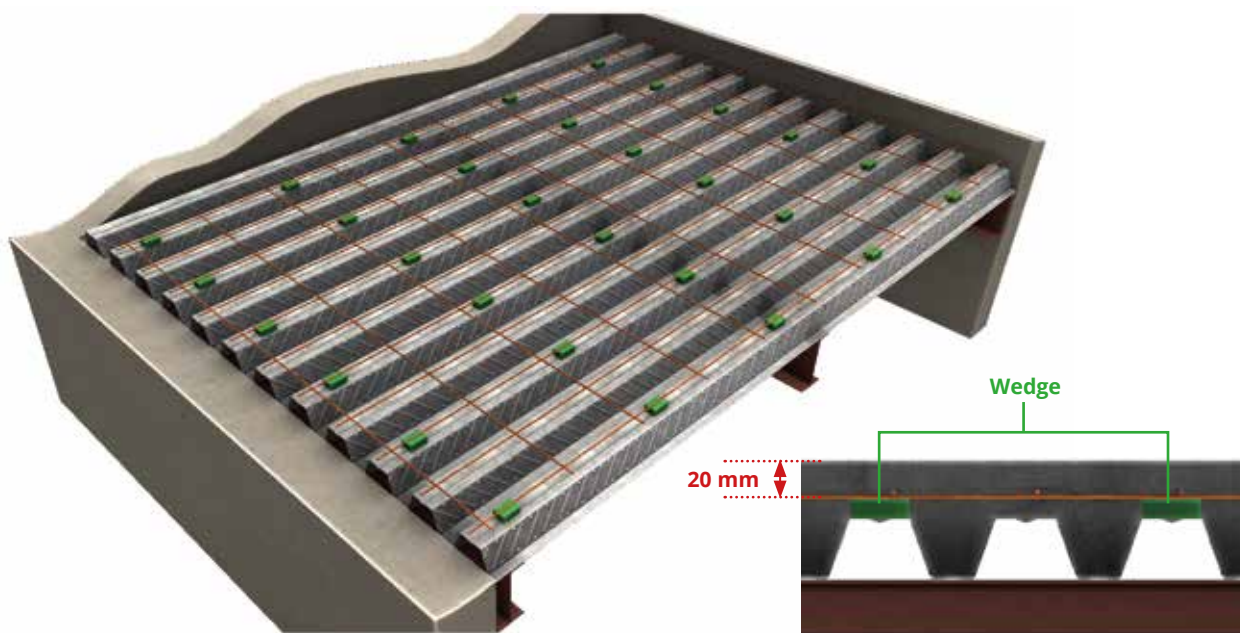
Seam stitching



Stitching screw
Ø 6.3 x 22 mm

WELDED WIRE MESH WEDGING

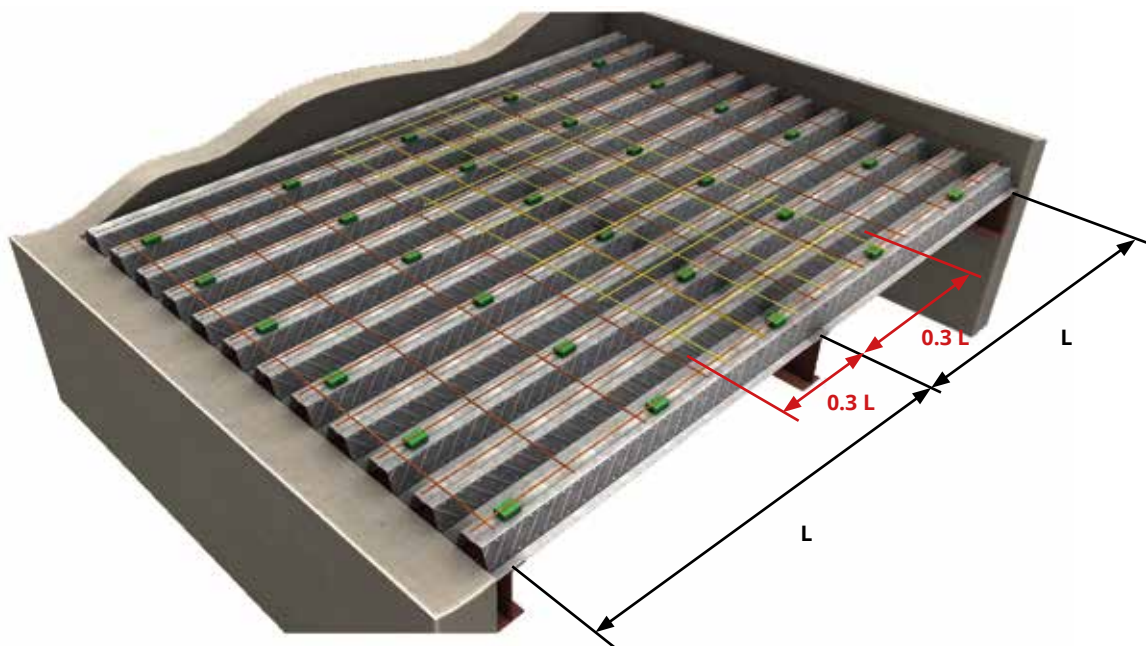
Welded wire mesh is used as reinforcement when the concrete is drying and to support the slab. Inadequate welded wire mesh wedging will cause cracks at the intermediate supports. The welded wire mesh generally covers the entire surface of the concrete slab. In order to comply with the prescribed wire mesh coating (20mm on upper face of the concrete slab), wedges should be used at the top of the ribs of the PCB floor.



Fitting steel bars (if required)

On the intermediate supports and if general welded wire mesh is not sufficient (determined by calculation), steel bar welded wire mesh is used at each support over a width that is at least 30% of the span of each side of the support.

For thin slabs (concrete thickness above the profile between 50 and 70mm) it is preferable to use general welded wire mesh (section determined by calculation).



ADETS WELDED MESH

Surface welded mesh (NF A35-024)

	Section	S _s cm ² /m	S _e mm	D _s mm	Ends AV AR ad ag mm / mm	Number of wire rods N _n	Length Width L l m	Nominal mass kg/m ²	Surface 1 roll or 1 panel m ²	Masses 1 roll or 1 panel kg	Packing	Masses 1 packet kg
PAF C®	0.80	0.80 0.80	200 200	4.5 4.5	100/100 100/100	12 18	3.60 2.40	1.250	8.64	10.80	100	1080
PAF 10®	1.19	1.19 1.19	200 200	5.5 5.5	100/100 100/100	12 21	4.20 2.40	1.870	10.08	18.85	70	1319

Structural welded mesh (NF A35-016-2 or NF A 35-019-2)

	Section	S _s cm ² /m	S _e mm	D _s mm	Ends AV AR ad ag mm / mm	Number of wire rods N _n	Length Width L l m	Nominal mass kg/m ²	Surface 1 roll or 1 panel m ²	Masses 1 roll or 1 panel kg	Packing	Masses 1 packet kg
ST 15®	1.42	1.42 1.42	200 200	6 6	100/100 100/100	12 20	4 2.40	2.220	9.60	21.31	70	1492
ST 20®	1.89	1.89 1.28	150 300	6 7	150/150 75/75	16 20	6 2.40	2.487	14.40	35.81	40	1432
ST 25®	2.57	2.57 1.28	150 300	7 7	150/150 75/75	16 20	6 2.40	3.020	14.40	43.49	40	1740
ST 25 C®	2.57	2.57 2.57	150 150	7 7	75/75 75/75	16 40	6 2.40	4.026	14.40	57.98	30	1739
ST 25 CS®	2.57	2.57 2.57	150 150	7 7	75/75 75/75	16 20	3 2.40	4.026	7.20	28.99	40	1160
ST 35®	3.85	3.85 1.28	100 300	7 7	150/150 50/50	24 20	6 2.40	4.26	14.40	57.98	30	1739
ST 40 C®	3.85	3.85 3.85	100 100	7 7	50/50 50/50	24 60	6 2.40	6.040	14.40	86.98	20	1740
ST 50®	5.3	5.03 1.68	100 300	8 8	150/150 50/50	24 20	6 2.40	5.267	14.40	75.84	20	1517
ST 50 C®	5.03	5.03 5.03	100 100	8 8	50/50 50/50	24 60	6 2.40	7.900	14.40	113.76	15	1706
ST 65 C®	6.36	6.36 6.36	100 100	9 9	50/50 50/50	24 60	6 2.40	9.980	14.40	143.71	10	1437

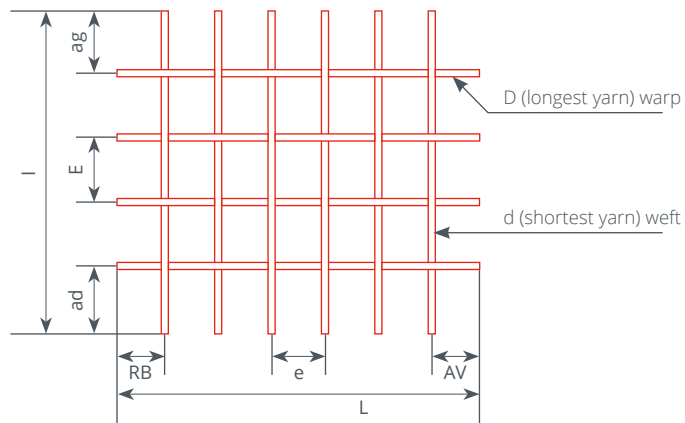
L: panel length
l: panel width

D: diameter of warp yarn
d : diameter of weft yarn

RB: rear end
FB: front end

ad = ag: end of edge

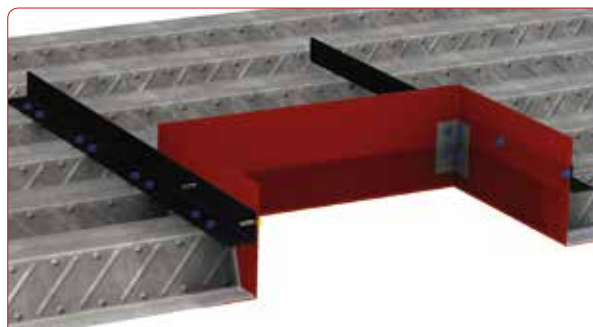
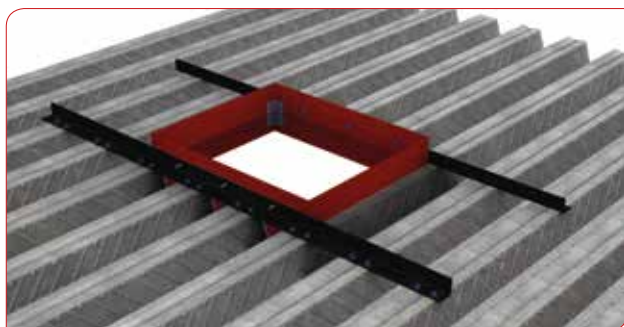
E: warp yarn spacing
e: weft yarn spacing



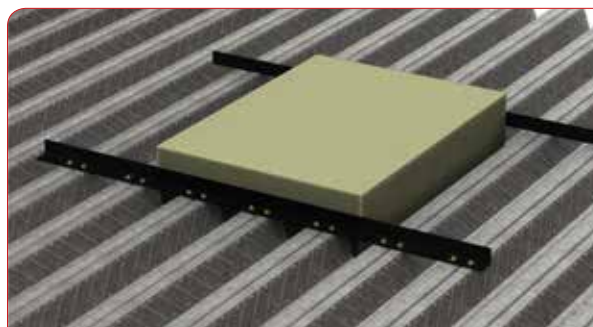
LIGHT WELL

SMALL LIGHT WELL (50X50CM)

Without trimmer: For small light wells (50x50 cm max.), floor reinforcement is done by fixing angle irons (50x50x5mm) onto the ribs (using self-tapping screws - 6.3x22mm) perpendicular to their direction on both sides of the opening.



The diagrams above show an example with angle irons. The curb (in red) can be replaced with a foam block or any other suitable system. The floor can be cut after the concrete has set if reinforcements were provided before pouring.

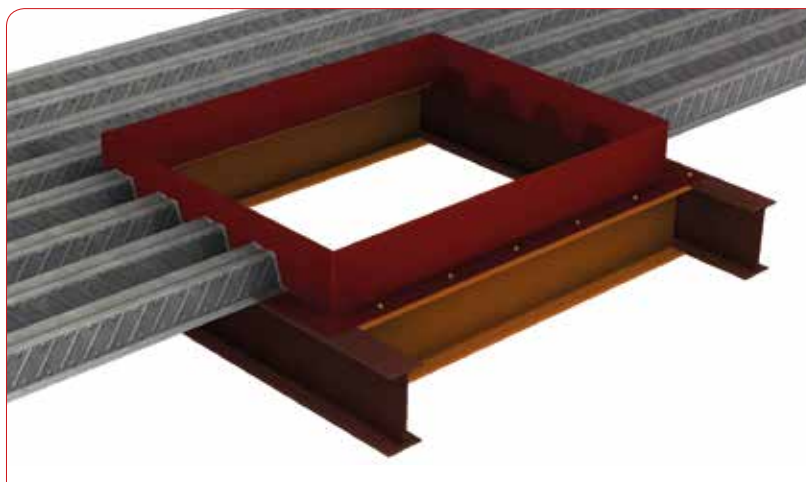


BIG LIGHT WELL

For bigger light wells, it is appropriate to use a trimmer which is an independent structural floor element that spans the floor joists.

If the floor needs to be cut after the concrete has dried and if supports were not put in place before pouring, please contact the technical department.
BACACIER:

sidep@bacacier.com



FIRE RESISTANCE RATING AND REINFORCEMENT

The fire resistance rating of floors is defined according to the following criteria:

R: Mechanical resistance (fire stability)

E: Protection against flames

I: Thermal insulation

The period specified by the fire resistance rating is the standardised time of fire exposure during which these criteria must be verified.

> E: Protection against flames

The protection against flames and hot or flammable gases criterion is ensured by the PCB composite floor if the installation conditions in this guide are followed.

> I: Thermal insulation

To ensure this thermal insulation criterion, the thickness of the BACACIER composite floor must comply with the values given in the table below:

Minimum slab thickness (mm) to meet for fire resistance rating per profile

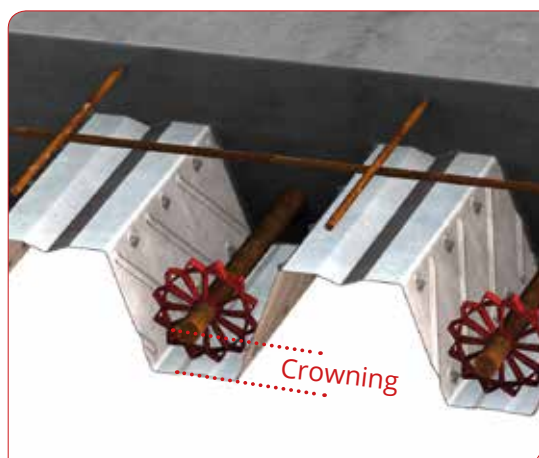
Profile	Fire resistance rating			
	30	60	90	120
PCB 20	70	90	110	130
PCB 60	110	120	140	160
PCB 80	130	130	150	170

> R: Mechanical strength (fire rating)

BACACIER PCB floors have a fire resistance of 30 minutes without additional reinforcement.

Above that period, steel rods need to be fitted into the ribs to ensure the mechanical strength.

Comply with the rebar crownings provided in the calculation note.



Recommended rebar coating to be respected for each profile

Profile	Fire rating		
	60	90	120
PCB 20	30 mm	35 mm	35 mm
PCB 60	25 mm	55 mm	65 mm
PCB 80	30 mm	55 mm	65 mm

PROPPING AND CONCRETE POURING

PROPPING CONDITION

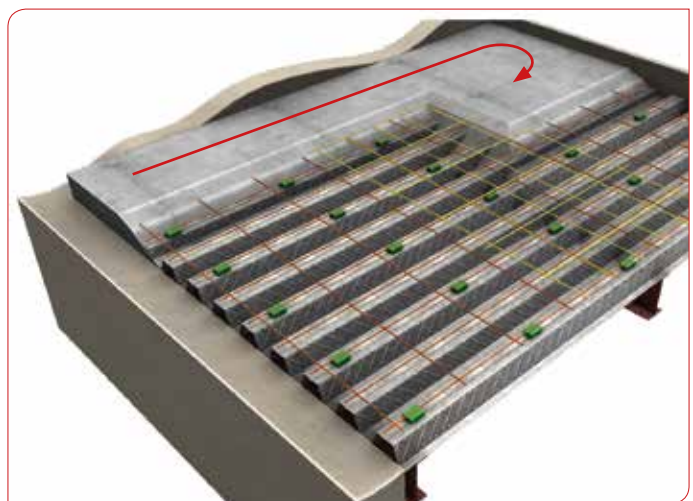
If required, propping must be carried out according to the following rules:

- the width of the prop rows must be at least 80 mm
- the prop rows must remain in place for at least 8 days after casting



CONCRETE POURING

The concrete must be uniformly spread so as to cover the steel sheet strips one after the other. Avoid local accumulation of concrete.



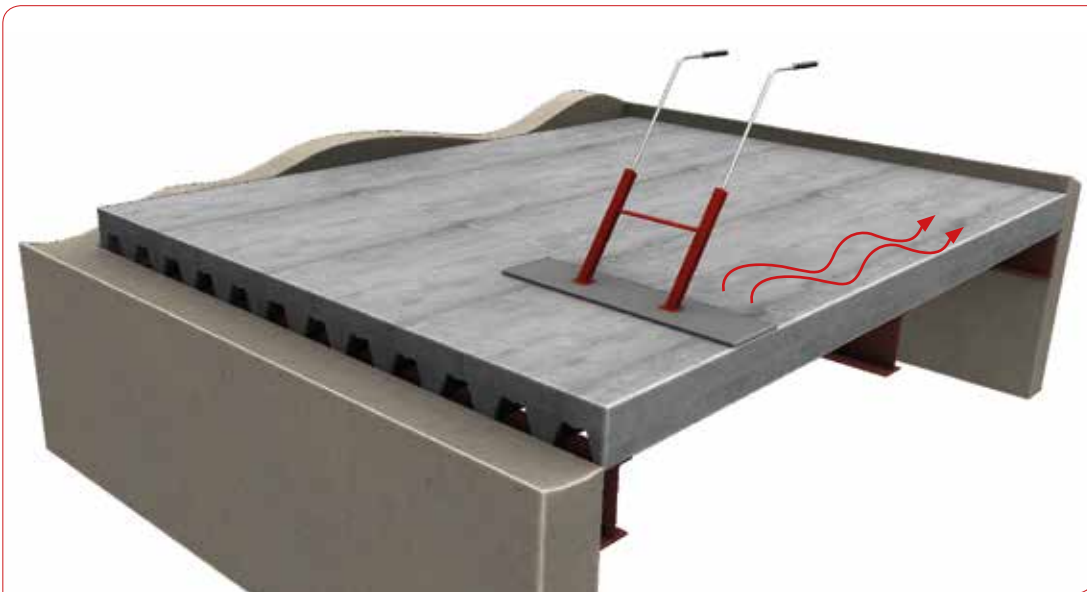
PROPPING AND CONCRETE POURING

The unloading of concrete by skip is to be carried out onto the load-bearing elements in order to prevent a temporary overload.

It is recommended to use a concrete pump.

For other methods of concreting, a stable traffic area should be provided (floor board placed on metal sheets).

Once the concrete has been poured, the surface is smoothed using a trowel or smoother.



The sizing of composite floors is done based on a concrete that has reached its minimum characteristics at 28 days. If the floor is subject to loads before the concrete has set, cracks are likely to form.



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