

SCIB INDUSTRIALISED BUILDING SYSTEM SDN BHD

HOLLOWCORE SLAB



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Company No: 554894-A

(A Wholly Owned Subsidiary of Sarawak Consolidated Industries Berhad
- A member of Bursa Malaysia Securities Berhad)



MS ISO 9001 REG. NO AR 1476

Quality Systems • Model for Quality Assurance
In Production, Installation and Servicing

SCIB Industrialised Building System Sdn Bhd

HOLLOWCORE SLAB



A Hollowcore slab is a precast concrete element with continuous voids provided to reduce self-weight and to provide an efficient structural section, manufactured by slip-form or extrusion techniques.

THE BENEFITS OF HOLLOWCORE FLOORS

◆ Rapid Construction

Hollowcore slabs are cut to lengths to suit the building design before leaving the factory, resulting in safe and speedy construction, and reduced cost.

◆ Working Platform

Hollowcore slabs provide an immediate working platform for other trades once grouted.

◆ Long Span

Hollowcore slabs achieve long spans, resulting in flexible open space with fewer beams, walls and supporting columns.

◆ No Formwork or Propping

Expensive formwork and temporary props are eliminated.

◆ High Load Capacity

Hollowcore floors can support the heavy loads required in most factories, warehouses and storage buildings.

◆ Fire Resistance

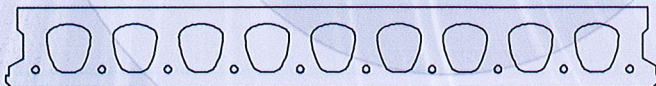
All slabs have a 1 hour fire resistance. This can however be enhanced up to 4 hours.

◆ Holes for Services

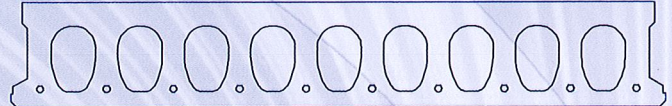
Holes can be preformed to accommodate services, dependent on size and location. Call us for further details.

Section profiles

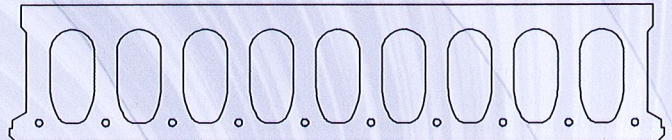
Section profiles may vary in detail depending on the machines. Our current available section profiles are shown as follows: -



150mm thick slip-formed hollow core slab



200mm thick slip-formed hollow core slab



250mm thick slip-formed hollow core slab

Slab Depths

Slab depths typically range from 150mm to 400mm.

Slab Widths

Slabs are cast in 1200mm wide but smaller widths are made by sawing the slab longitudinally.

Structural Performance

Span load capacity may vary slightly between type of machine/section but the table below will give general guidance on performance characteristics.

- Design of Hollowcore floor slabs in accordance with BS8110: (1997) The Structural Use of Concrete.

- Hollowcore slabs are designed to have effective shear key joints between adjacent slabs such that when grouted the individual slabs become a system that behaves similarly to a monolithic slab.

- Prestressed Hollowcore slabs will exhibit an upward camber, the degree of which will depend upon the span and the amount of prestressing force applied. Due allowance must be made for this in determining finishes and overall floor thicknesses. Further guidance should be obtained from our engineers where necessary.

- Diaphragm action is sometimes required from a floor slab in order to transmit horizontal force to the primary supporting structure. Hollowcore slabs may be used efficiently to produce a diaphragm either with or without a composite structural topping. Various connection details are available to provide the interaction between the floor and primary structure.

Working Loads	150mm Slipformed	200mm Slipformed	250mm Slipformed	320mm Extruded*	400mm Extruded*
1.5 kN/m ²	8.0	9.5	11.5	13.5	17.0
2.5 kN/m ²	7.0	8.0	10.5	12.5	16.0
4.0 kN/m ²	6.0	7.5	9.5	11.5	14.5
5.0 kN/m ²	5.5	7.0	9.0	11.0	14.0
7.5 kN/m ²	5.0	6.0	8.0	9.5	12.5

Note:

- * Available soon
- Capacity of slab can be enhanced by composite topping, and other ways. Contact our engineers for more details.

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Hollowcore slabs may be used in conjunction with a structural topping where enhanced performance is required e.g. heavy point loads, complex structural integration, heavy service penetration etc.

The soffit of a hollowcore slab is generally from a steel mould and is therefore suitable for an exposed finish in structures such as car parks and industrial buildings, and for a wide variety of applied finishes in other types of building. Top finish to the precast slab is designed to receive a levelling screed or an appropriate flooring system.

The amount of bearing required for a precast floor element is relative to a number of considerations including span, loading and type of support. Within the conventional range of designs the following general guidance is appropriate:

- 100mm bearing on masonry supports
- 75mm bearing on steel supports
- 75mm bearing on in-situ or precast concrete with minimum grade of C30

More detailed requirements of bearings for hollowcore slabs are contained in Clause 5.2.3 of BS8110 and take account of bearing stresses, possible spalling of support and of the supported member, and construction inaccuracies. For example, for a hollowcore slab spanning 6 metres and supported on a masonry wall the nominal design bearing would be:

Min Bearing related to Bearing stress (Clause 5.2.3.2)	40
Spalling of Masonry support (Clause 5.2.3.7.2)	25
Spalling of end of Hollowcore Slab (Clause 5.2.3.7.3)	Nil
Allowance for construction inaccuracies (Clause 5.2.4(b))	24
	89mm

It should be noted that the dimension produced by this calculation is the nominal design bearing which should be specified in order to achieve an acceptable minimum in practice.

Safety

Safety during erection is of paramount importance. Precast Slabs are heavy. Bearings must be sufficiently robust to withstand normal slab fixing methods during installation.

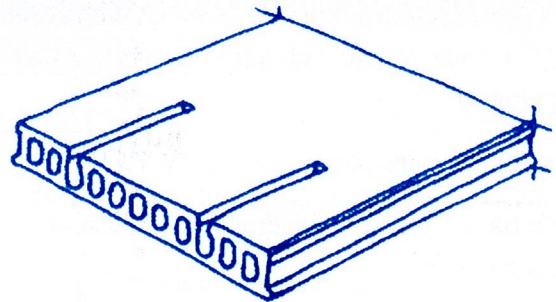
Masonry mortar must be allowed to achieve adequate maturity before slab erection commences.

Wider beams should be provided where support layouts necessitate irregular shaped slabs, e.g. splayed ends.

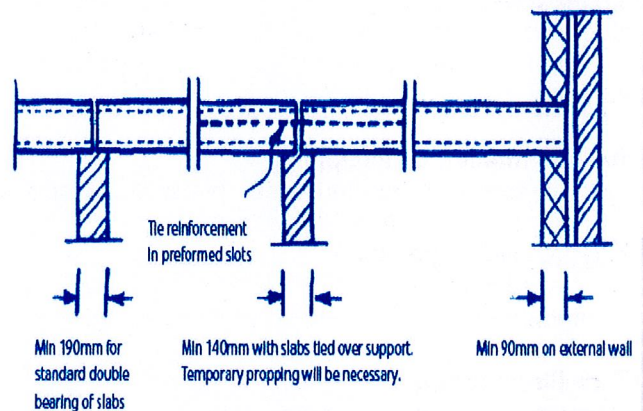
Particular consideration may be required where eccentric loading, large panels of unrestrained masonry or large penetrations are involved. Generally, precast concrete floor slabs are laid on to dry bearings in masonry buildings of up to 4 storeys and where bearing stresses are low. (BS8110 clause 5.2.5)

The building designer should consider the provision of flexible padding in a bearing if significant rotation is anticipated at the end of the floor unit.

Typical detail where a tie is required between slabs



Typical details and bearing requirements Masonry Construction



Where slabs span on to a wall from both sides a minimum wall thickness of 190mm is recommended.

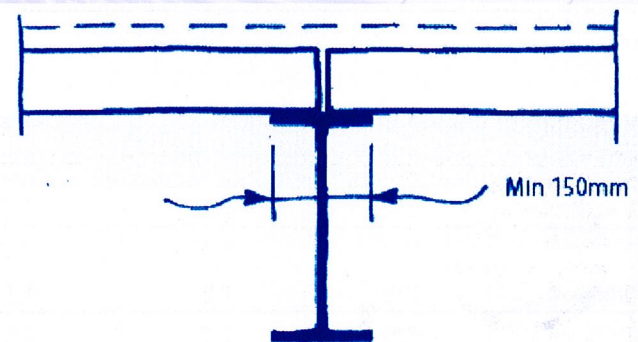
Where a wall thickness of 190mm cannot be achieved a tie should be provided at the support.

(N.B. the wall thickness should never be less than 140mm in this situation). In order to satisfy the tolerance for this situation a narrow support should only be used at one end of the slab.

Note: A shared bearing can be achieved by the use of a metal 'butt plate' as well as the tie detail shown.

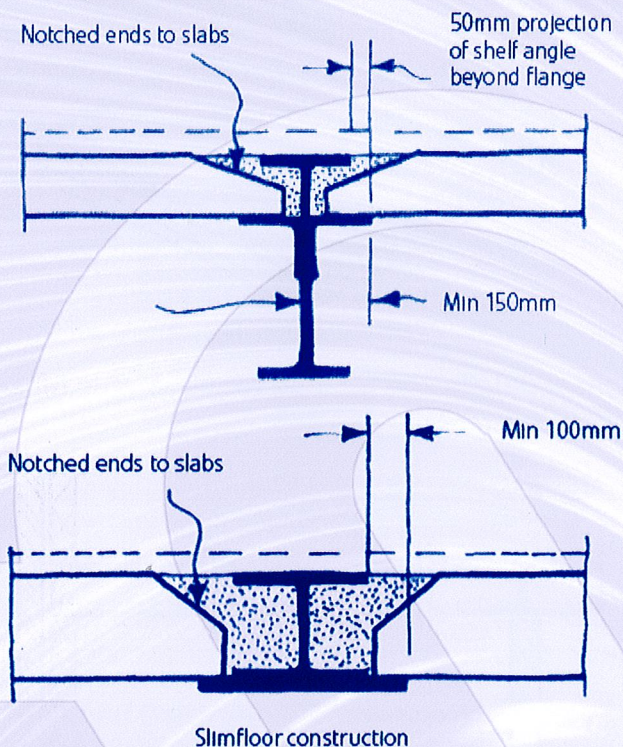
Precast Floors in Steel Frame Construction

Slab on top of steelwork



HOLLOWCORE SLAB

Shelf angle bearings



Simple Support

Slabs are designed simply supported and independent of the steel beams.

Advantage: Ease of manufacture and construction.

Shelf angle Support

Steel beam is not considered to be composite with slab.

Advantages: Reduction in overall construction depth.

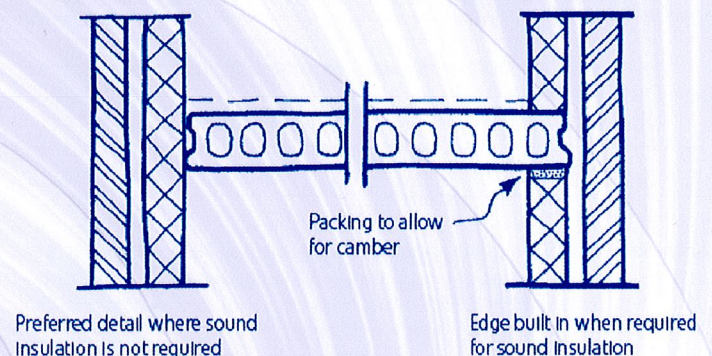
Increased fire resistance to beam by virtue of containment of top flange and vertical leg of shelf angle.

Slim-floor Construction

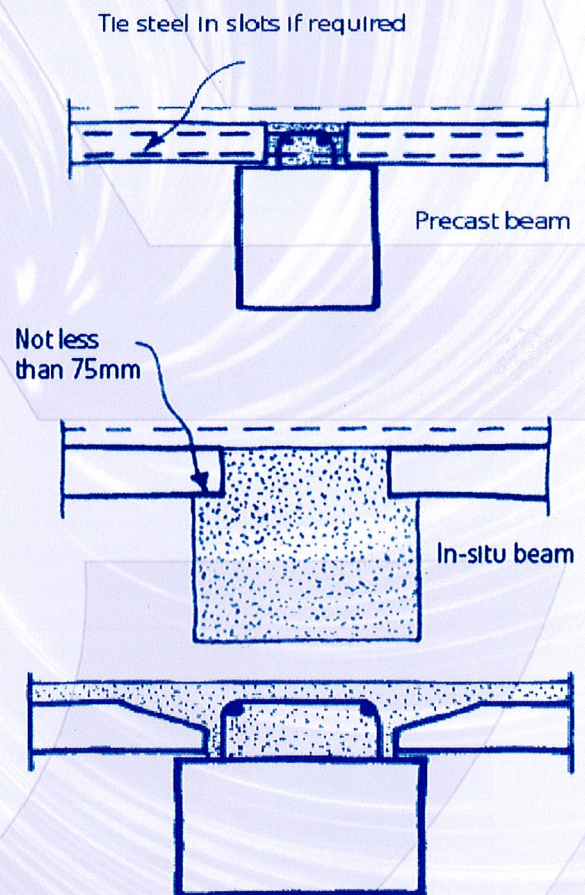
A steel beam is provided of a configuration which allows the precast floor slab to take a bearing on the bottom flange of the beam.

Advantages: Minimum overall structural depth achieving a virtually flush soffit line, providing an unobstructed route for services and a minimum floor to floor height. Additional reinforcement may be required, depending on design conditions.

Typical flank wall detail



Precast Floors in Precast or In-situ Construction



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