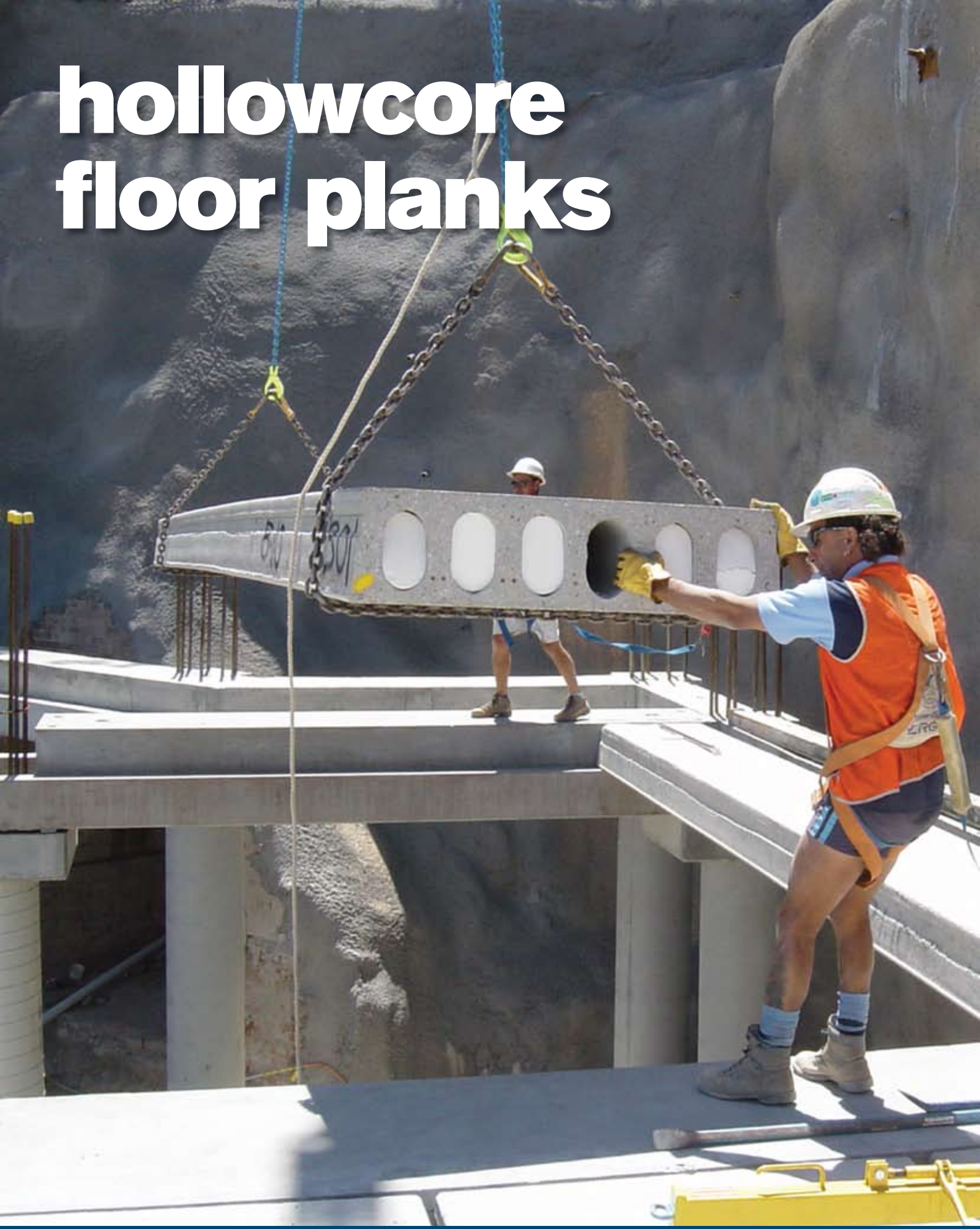
hollowcore floor planks



Hanson

hanson hollowcore floor

Contents

Hollowcore floor planks are widely used throughout the world and have been supplied to the Australian market for over 30 years. Hanson hollowcore floor planks are nominally 1200mm wide and available in thicknesses of 150mm, 200mm, 250mm and 300mm. They come in two forms; artificially roughened on the upper face to provide high interface shear capacity with an insitu concrete topping layer, or smoothed by application of a machine-trowelled mortar layer during manufacture.

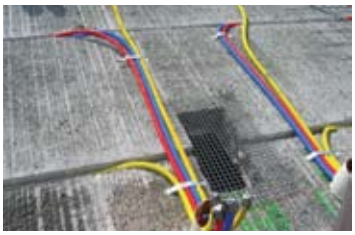
Dependant on load requirements, clear spans of up to 14 metres can be obtained at costs which are lower than most flooring systems.

features and advantages

- Hanson hollowcore planks are precast in our factory away from your building site.
- All floors for your building are stored ready to be delivered as quickly as needed for installation.
- Productivity on site is greatly improved
- Expensive formwork and propping is eliminated with access within the work site vastly improved.
- Once erected, Hanson hollowcore planks can be used as an instant work deck.
- Planks are cut to fit, complete with any penetrations, before leaving the factory, making on site construction simple, quick and effective.
- The hollow cores reduce the flooring dead load. The smaller crane size required ensures economical erection.
- The smooth plank soffit will readily accept a painted finish.
- Hanson floor planks are effective sound transmission barriers
- The longitudinal core holes in hollowcore planks can be used as service ducts for plumbing, electric and data cables, etc. Breakouts can be drilled as required.

Artificially roughened hollowcore floor planks

Smoothed surface hollowcore floor planks



Services easily accommodated

plank applications

The artificially roughened plank can be designed as a continuous flooring system by the use of additional reinforcement in the topping concrete over supports.

Smooth surface planks without insitu topping can be used in light load situations such as multi level carparks, office and apartment buildings. The planks are usually simply supported in these instances. After camber corrections the planks can be used as the finished running surface in the case of car parks or have a thin levelling screed applied to produce a surface on which carpet can be directly laid

design data

maximum span/ depth

application	ratio
floors	35–40
roofs	40–45

The availability of Hanson Design Software provides greater flexibility in the application of hollowcore flooring. The selection of software menu items Design or Analysis gives the designer the opportunity to quickly size a hollowcore floor plank for a particular load case.

The plank span length is the primary consideration. For a framed structure the most economical grid is to maximise the span of the hollowcore plank and minimise the span of the support beams with a minimum number of load paths.

Hollowcore floor planks are best suited as simply supported one way spanning slabs, where lateral restraint of the building is provided by shear walls.

Alternatively, connections between vertical elements and hollowcore flooring can be designed to resist moments. Also, multi-span hollowcore flooring structures can be designed to promote continuity.

manufacture

Hollowcore planks are cast by a self propelled machine on 170m long line steel form casting beds. Earth moist concrete is intensely compacted around core formers and prestress tendons. The tendons are anchored to bulkheads at each end of the form.

floor depth

The load span chart on page 6 can be used for a preliminary selection of a floor plank. A nominal concrete topping of 60mm has been used for all planks except for the 300 plank that has a 75mm topping.

plank width

It is preferable that the floor plan dimensions suit a 1200 mm module width. Non modular dimensions can be accommodated with longitudinally cut planks or wet-cast planks.

plank length

The planks are cut to the length required for their location in the floor plan. The ends can be cut to an angle to suit skewed layouts.

connections

The Hanson Detailing Manual covers typical connection details between hollowcore floor planks and supporting beams or walls. The connection details at a support must not only transfer load but also contribute to the monolithic behaviour of the entire structure.

camber and topping

Hollowcore floor planks are cambered because of the upward bending induced by the prestressing. This camber should be allowed for in detailing the planks. A site cast topping unifies the planks into a monolithic floor, takes out differential levels between planks and provides a uniform working surface.

fire resistance level

The FRL is normally varied by changing the cover to the strands and generally adding topping to the floor. This is effective up to a fire resistance period of 180 minutes. Flexural continuity at one end of a span for imposed loads substantially increases the fire resistance period for structural adequacy or enables a reduction in cover.

loads

The Loads Menu in the design software provides options for input of distributed and point permanent or imposed loads. Advice on point and line loads is also contained in the software and the Precast Handbook.

bearing support

Typical connection and support details are shown in the Hanson Detailing Manual. The design software default bearing length value of 75mm is nominal and 60mm is the recommended minimum. The designer must specify the required length, taking into account such factors as the loading, supporting materials, manufacturing tolerances, placement tolerances and any support rotation.

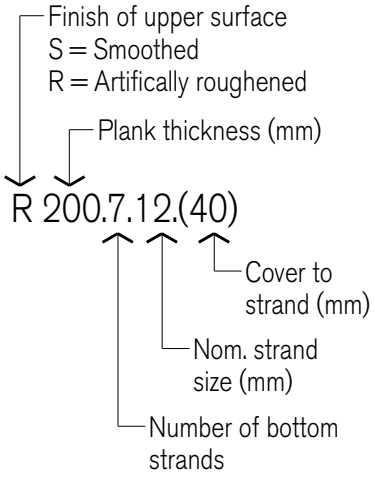
vibration

AS3600 does not prescribe any design criteria for the control of vibration. The Precast Handbook provides further reading on this topic. Hanson's Design Software calculates the fundamental frequency of the plank. A reported value below 3 cycles per second should be investigated further since this is the resonance band for normal foot traffic.

detailed design

Detailed design for any floor plank situation should be prepared by the Structural Engineer responsible for the structure as a whole. Hanson disclaims all liability for loss or damage where product information contained in this brochure is used without obtaining qualified expert advice on the suitability for use in your specific application. For the range of Hanson services, including design, costing, detailing, manufacture and erection, contact Hanson.

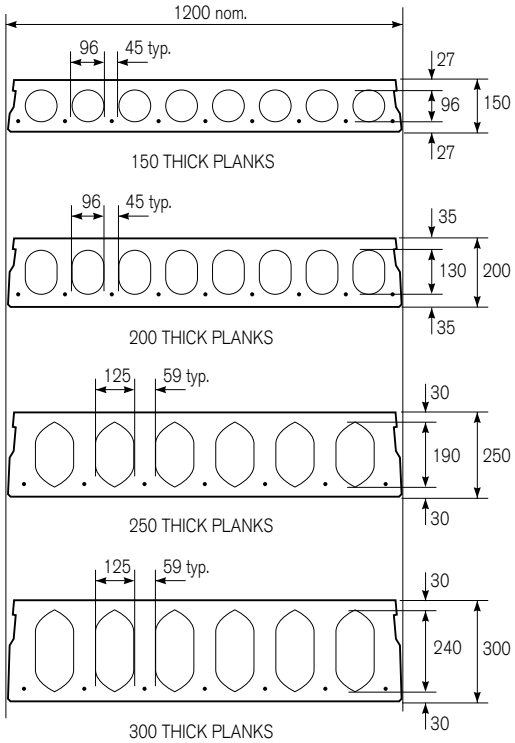
plank identification



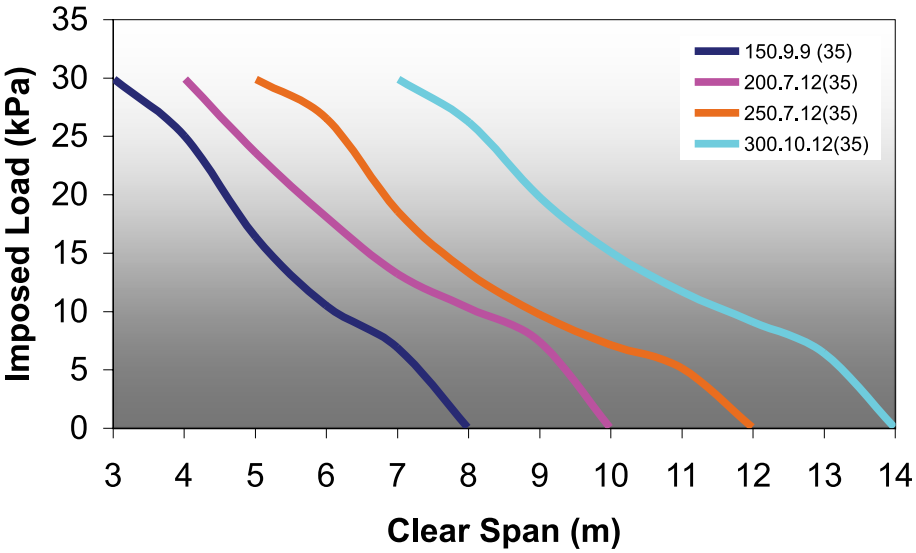
precast handbook (Z48)

The National Precast publication is available from Standards Australia and provides further reading on the design and use of hollowcore flooring.

standard section details



load span chart



Hollowcore Flooring
load span chart 1.1.6
composite structural topping

fire resistance levels and required cover

	minimum additional topping thickness (mm) to achieve following FRL (minutes)			
plank thickness (mm)	60	120	180	240
150	nil	30	60	80
200	nil	nil	30	50
250	nil	nil	nil	26
300	nil	nil	nil	nil

	required cover (mm) for following FRL (minutes)			
span type	60	120	180	240
simply-supported	25	40	55	65
continuous	20	25	35	45

tolerances

length	± 10mm
width (1200mm)	+ 3mm - 6mm
cut width	± 10mm
thickness (average)	± 3mm
squareness of end	± 6mm
strand location	± 3mm
openings	- location + 20mm - dimension +20mm - squareness +20mm
wind	10mm per 3000mm
differential camber between adjacent planks of the same length	max 15mm

hollowcore flooring specification

This specification is intended to be used as a guide to preparing the general project specification or as a stand alone specification.

design and shop drawings

The Engineer is responsible for the design of the structure and for either the design of the planks or, where the plank design is carried out by others, the checking of the design. planks shall be designed in accordance with AS3600 for loadings supplied by the Engineer.

Shop drawings shall be prepared by Hanson from information supplied by the purchaser and shall be submitted prior to manufacture for approval by the purchaser for layout, adequacy and dimensions and by the engineer for the design. All dead, live and other loads shall be shown. The drawings shall show the locations of all planks and detail all openings as well as fire resistance levels and exposure classifications. Sections and details shall show the connections, edge conditions and end support details.

materials

Cement shall comply with AS-3972 and supplementary cementitious materials with AS-3582 parts 1 and 2. Aggregates shall comply with AS-2758.1 Chemical admixtures shall comply with AS-1478.1. Prestressing strand shall be stress-relieved low relaxation strand complying with AS-1311. Strand shall be clean at the time of concreting. Concrete shall have a characteristic strength (F'c) of 50 MPa and comply with AS-3600. Concrete strength at release shall be a minimum of 20 MPa. Topping concrete shall have a characteristic 28 day strength of 32 MPa or as shown on the shop drawings. If topping concrete is used to grout the keyways the maximum aggregate size shall be 10mm.

manufacture

Planks shall be machine cast on a long line bed and mechanically compacted. The external face shall be finished to an agreed standard, either to take a topping or otherwise. The underside face shall be off form with surface voids and colour variations limited to an agreed standard.

delivery and handling

Planks shall be lifted and supported during manufacture, storage, transport and erection only at the locations shown on the shop drawings. planks shall be stored off the ground supported by full width battens directly above each other or otherwise as directed by Hanson. planks shall be lifted only by methods approved by the relevant authorities.

erection

Planks shall be installed by an experienced erection contractor. The purchaser shall provide suitable site access to enable fully loaded semi-trailers, cranes and other equipment to operate unimpeded. The purchaser shall provide true and level bearing surfaces on all walls and beams supporting the planks. Bearing strips are to be set where required. Keyways are to be aligned and grouted with a 3:1 sand-cement grout or a topping concrete. Provide dams in the voids at the plank ends as required.

attachments and penetrations

Attachments to the planks, penetrations and chases within them shall be carried out only with the approval of the engineer and Hanson.

in situ topping

Where an insitu topping is shown on the shop drawings it shall be provided by the purchaser. The planks shall be thoroughly cleaned down and pre-wet so that the surface is moist, but not overly wet, prior to placing the topping. Reinforcing shall be placed and the topping finished and cured so that the plastic and shrinkage cracks are controlled to acceptable widths. Construction joints shall be provided as shown on the Engineer's drawings.

inspection and acceptance

Finished planks may be inspected within Hanson's factory by the Purchaser or its representatives. In the event of any serious damage or other problems with the planks then rectification shall be carried out by the responsible party as permitted by Hanson and the Engineer.

Hanson PLC is one of the world's leading heavy building materials companies. We are the world's largest producer of aggregates - crushed rock, sand and gravel - and one of the largest producers of concrete products, clay bricks and ready-mixed concrete. Our other principal products include asphalt and concrete roof tiles and our operations are in North America, the UK, Australia, Asia Pacific and Continental Europe. Hanson employs approximately 27,400 people in 14 countries.

Just as housing styles vary from state to state and area to area, the aggregates used in the production of Hanson products are subject to regional variations. Therefore the colours represented in this brochure are indicative only. We suggest sighting products first hand before ordering.

For more information call Hanson Precast:
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