

2.2.2 WALLS

2.2.2.3 HOLLOWCORE WALL PANELS

GENERAL DESCRIPTION

Pretensioned hollowcore panels are used as walling for industrial and commercial buildings, either as cladding or in loadbearing applications. The panels have excellent structural strength and good fire resistance, acoustic and thermal properties making them ideal for this use. Typical applications require two- to four-hour fire resistance periods.

The effective thickness generally determines the minimum fire resistance period. It is defined as the net cross-sectional area divided by its width. Core shapes vary as illustrated in *Typical Sections*. The table, *Section Properties*, lists the FRL for some effective thicknesses and the typical hollowcore panel that would achieve it. These fire resistance values are in accordance with AS 3600. Generally, a fire test of a hollowcore panel will yield a better FRL and manufacturers should be consulted for particular applications.

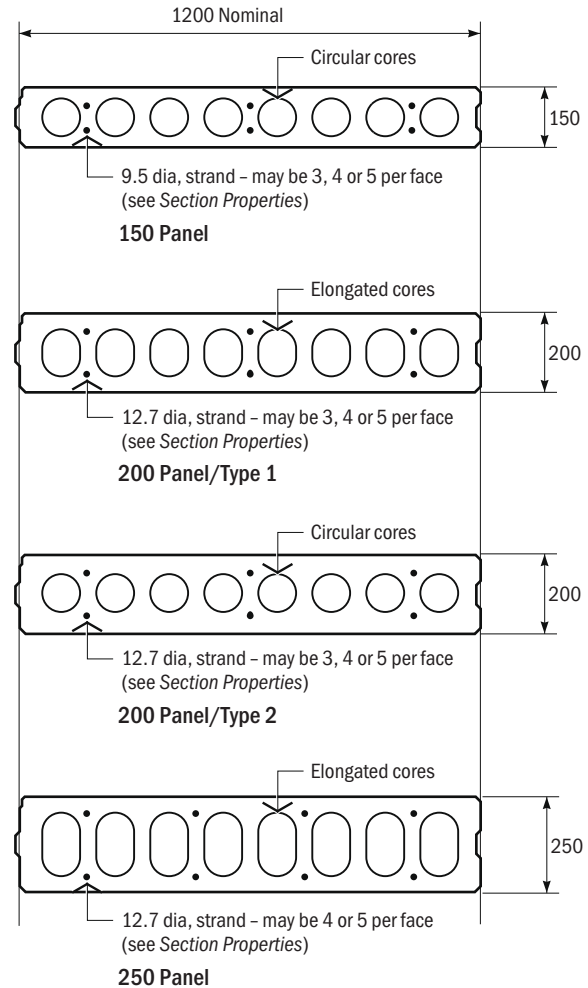
In a building, the panels stand vertically on a strip footing, a slab edge or a beam or they are stacked horizontally against the columns of the structure. Restraint fixing is by simple steel clips to the structure and by grouted dowels at the base of vertical panels.

Cladding panels are designed for wind actions and sometimes may retain earth fill against the building. Vertical panels may also carry structural loads from the roof or floors, resulting in both axial force and bending. If they are classified as slender columns, incidental load eccentricity due to initial and temperature bow must be taken into account in assessing capacity.

The panels are manufactured by specialised equipment that partly automates the production process. Two techniques are used: slip-forming or extrusion. The casting beds are typically 150 to 175 m long. The individual panels are cut to length the day following casting. Maximum length is about 12 m and is usually determined for the various thicknesses by handling stresses during transport and erection (see *Section Properties*). The panel width and core shapes are determined by the machine used. The most common panel width is 1200 mm. The standard thicknesses are 150, 200 and 250 mm.

The generic surface finishes are: machine trowel, exposed aggregate and profiled ribs. The actual finishes available will depend on the individual manufacturer and type of casting machine. The back surface is off-form and may exhibit colour variations at the core positions.

TYPICAL SECTIONS



Note: Distance from concrete surface to strand axis is 40 mm.

SECTION PROPERTIES*

Effective thickness (mm)	Panel type	FRL (min)	Handling orientation	Capacity, ϕM_U (kN-m)/Maximum length (m) for following strand layout		
				2 layers x 3 per face	2 layers x 4 per face	2 layers x 5 per face
100	150 panel	180/90/90	Vertical	25.1/7.50	32.7/8.00	40.0/8.50
			Horizontal	25.1/8.00	32.7/8.50	40.0/8.50
125	200 panel/ Type 1	180/120/120	Vertical	37.5/8.50	49.2/9.75	60.6/10.50
			Horizontal	37.5/9.50	49.2/10.50	60.6/11.50
150	200 panel/ Type 2	180/180/180	Vertical	37.5/8.50	49.2/9.75	60.6/10.50
			Horizontal	37.5/9.50	49.2/10.50	60.6/11.50
150	250 panel	180/180/180	Vertical	-	65.5/11.50	80.9/12.00
			Horizontal	-	65.5/12.00	80.9/14.00

* Based on concrete surface to strand axis of 40 mm for all panels