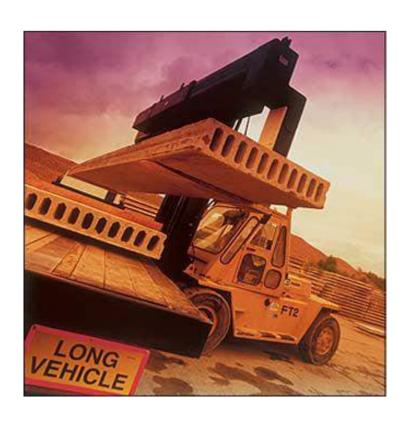
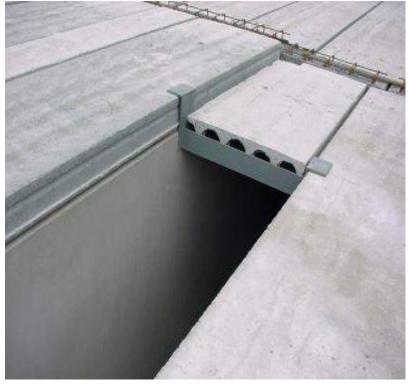
# **Precast Slabs**





### PRECAST FLOOR AND ROOF SYSTEMS

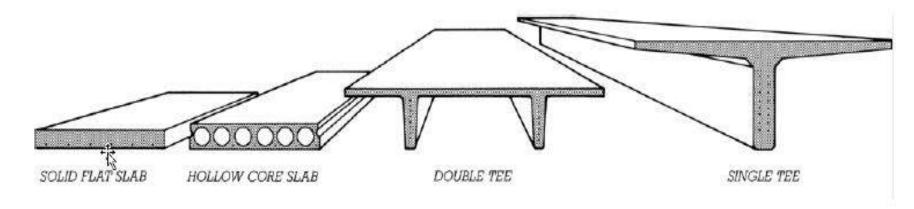
Types of precast units for floor and roof systems include:

solid or ribbed slabs, hollow-core slabs, single and double tees, rectangular beams, L-shaped beams, inverted-T-beams, and I-beams.

Hollow-core slabs are usually available in normal-weight or structural lightweight concrete. Units range from 0.4 to 1.2 m. in width, and from 10 to 30 cm. in depth.

Long-span, precast-concrete floor and roof units are usually prestressed. Short members, 9 more less, are often made with ordinary reinforcement.

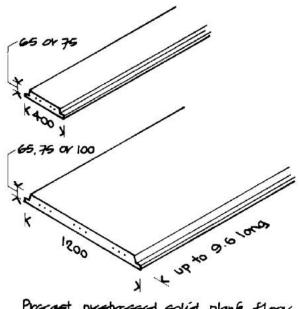
#### 1.1 Precast Slabs



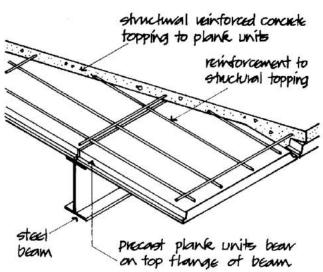


### Precast concrete plank floor units

These comparatively thin, prestressed solid plank, concrete floor units are designed as permanent shuttering and for composite action with structural reinforced concrete topping, as illustrated in Fig. 112. The units are 400 or 1200 wide, 65, 75 or 100 thick and up to  $9\frac{1}{2}$  metres long for floors and 10 metres for roofs. It may be necessary to provide some temporary propping to the underside of these planks until the concrete topping has gained sufficient strength.



Precast prestressed solid plank floor units

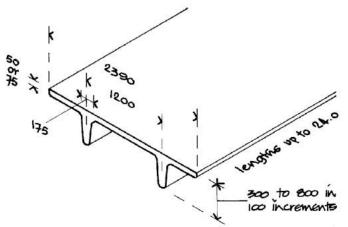


Precast plank floor units for composite construction floor

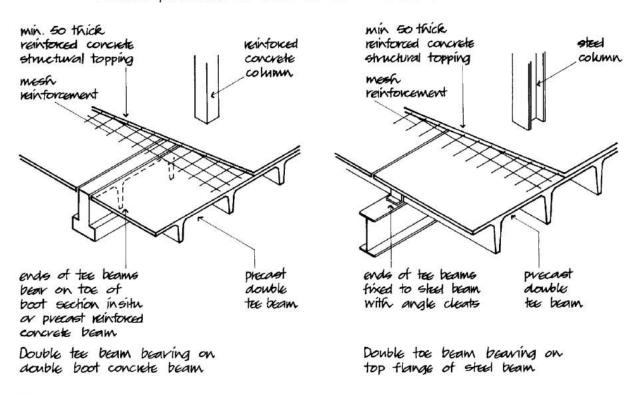
Fig. 112

#### Precast concrete tee beams

Precast prestressed concrete tee beam floors are mostly used for long span floors in such buildings as stores, supermarkets, swimming pools and multistorev car parks where there is a need for wide span floors and the depth of this type of floor is not a disadvantage. The floor units are cast in the form of a double tee, as illustrated in Fig. 113. The strength of these units is in the depth of the ribs which support and act with the comparatively thin top web. A structural reinforced concrete topping is cast on top of the floor units.



Precast prestressed reinforced concrete double tee beam



Precast prestressed concrete double tee beam

Fig. 113

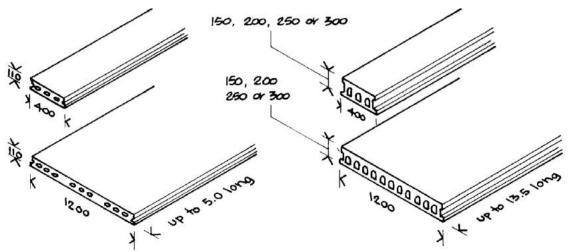


#### Precast hollow floor units

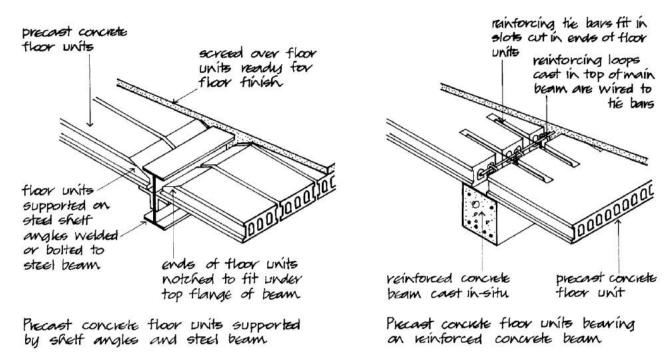
These large precast reinforced concrete, hollow floor units are usually 400 or 1200 wide, 110, 150, 200, 250 or 300 thick and up to ten metres long for floors and thirteen and a half metres long for roofs. The purpose of the voids or hollows in the floor units is to reduce dead weight without affecting strength. The reinforcement is cast into the webs between hollows.

The hollow floor units can be used by themselves as floor slab with a floor screed or they may be used with a structural reinforced concrete topping with tie bars over beams for composite action with the beams. End bearing of these units is a minimum of 75 on steel and concrete beams and 100 on masonry and brick walls. Figure 111 is an illustration of precast hollow floor units.

Hollow-core slabs manufacturers should be consulted for load and span data because camber and deflection often control the serviceability of such units, regardless of strength.



Precast concrete floor units

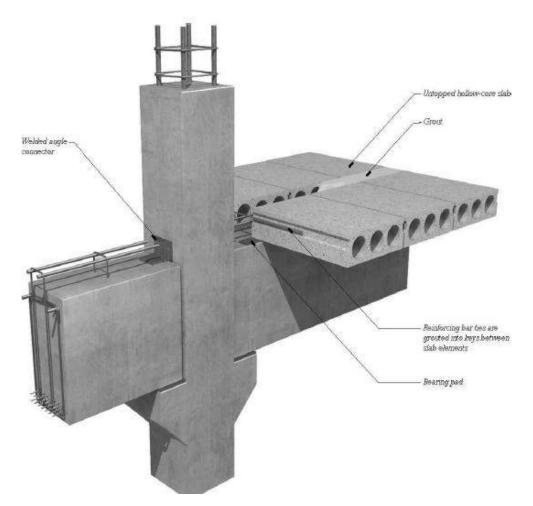


Hollow precast reinforced concrete floor units

Fig. 111

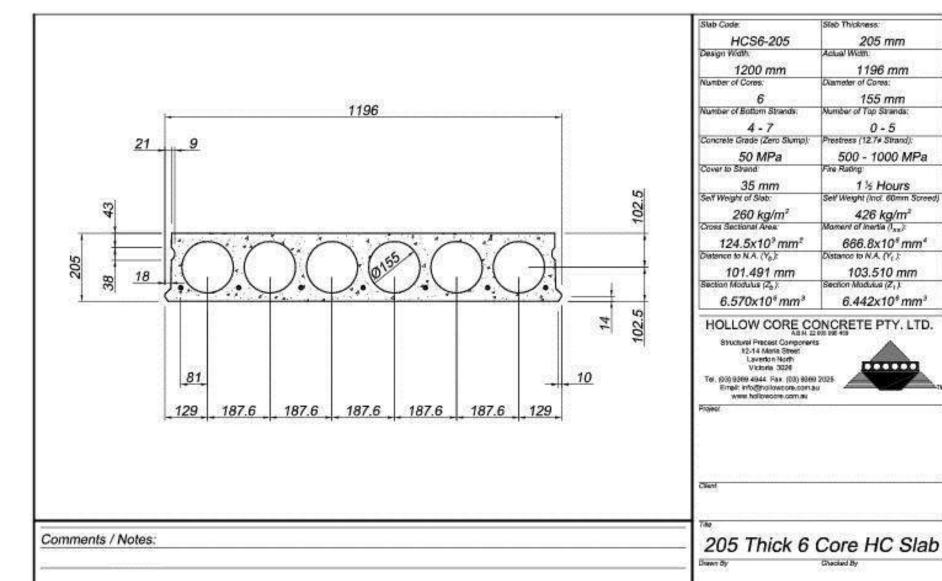
# Technical specification, sections and connections of

### Precast hollow-core slab units



# **Standards Sections**





Date

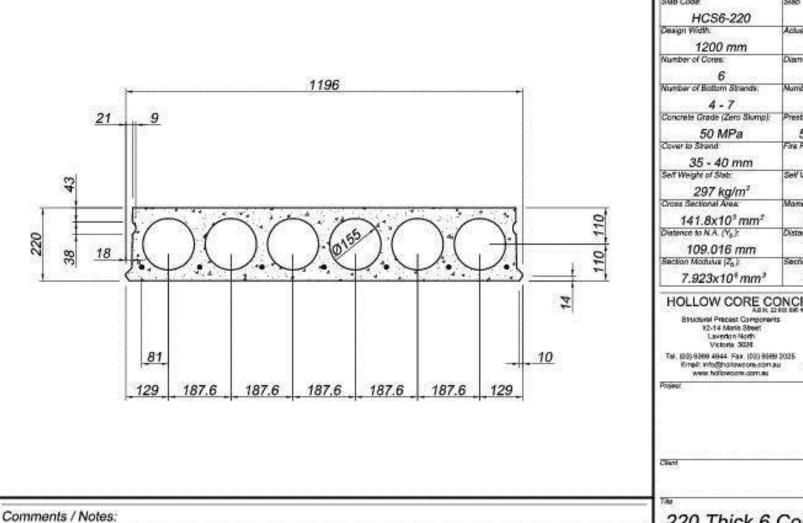
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Slab Code:	Steb Th/ckness:
HCS6-220	220 mm
Design Width:	Actual Width:
1200 mm	1196 mm
Number of Cores:	Diameter of Cores:
6	155 mm
Number of Bottom Strands:	Number of Top Strands:
4-7	0-5
Concrete Grade (Zero Slump):	Prestress (12.7# Strand):
50 MPa	500 - 1000 MPa
Cover to Strend	Fire Rating:
35 - 40 mm	1½ - 2 Hours
Self Weight of Slab:	Self Weight (Incl. 60mm Screed)
297 kg/m²	464 kg/m²
Cross Sectional Area:	Mament of Inertia (I <sub>XX</sub> ):
141.8x103 mm2	863.8x10° mm4
Distance to N.A. (Y <sub>0</sub> ):	Distance to N.A. (Y <sub>L</sub> ):
109.016 mm	110.985 mm
Section Modulus (Z <sub>0</sub> ):	Section Modulus (Z <sub>1</sub> ):
7.923x10 <sup>6</sup> mm <sup>3</sup>	7.783x10° mm³

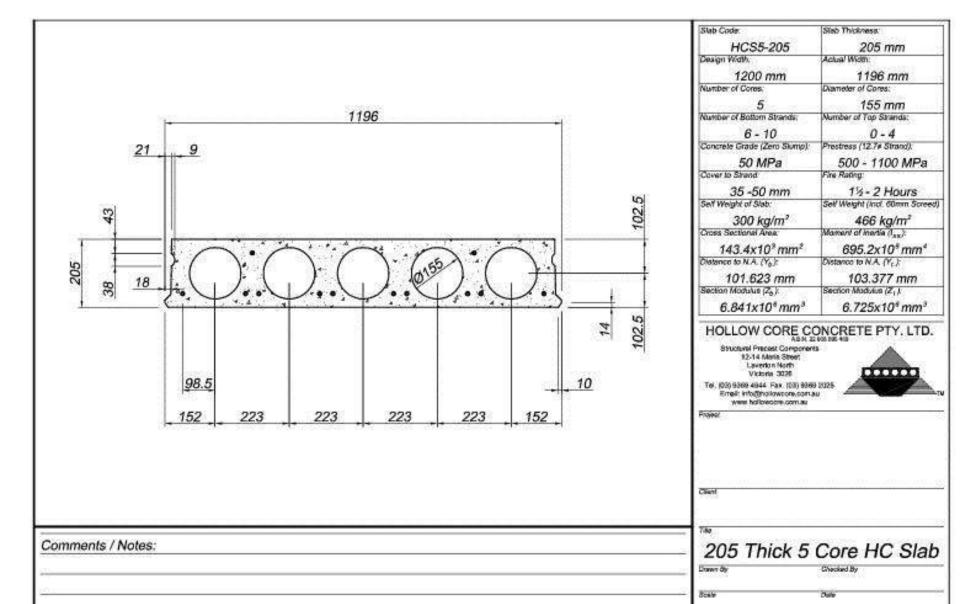
#### 220 Thick 6 Core HC Slab

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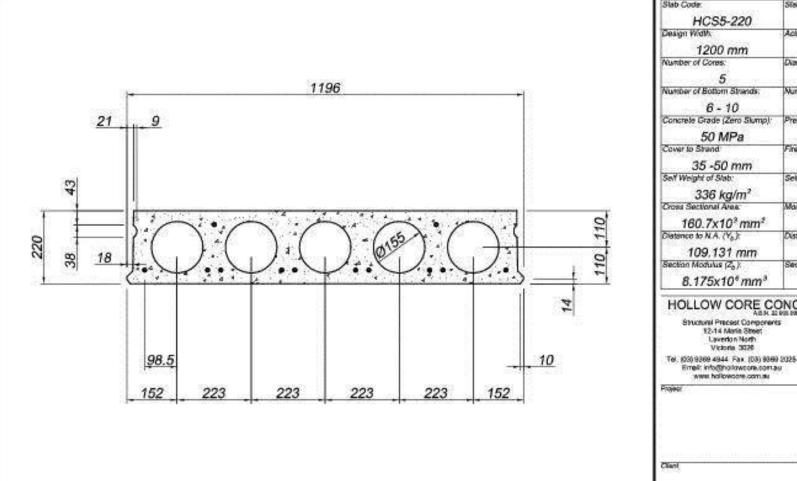


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Slab Code:	Steb Th/ckness:						
HCS5-220	220 mm						
Design Width:	Actual Width:						
1200 mm	1196 mm						
Number of Cores:	Diameter of Cores:						
5	155 mm						
Number of Bottom Strands:	Number of Top Strends:						
6 - 10	0-4						
Concrete Grade (Zero Slump):	Prestress (12.7# Strand):						
50 MPa	500 - 1200 MPa						
Cover to Strend	Fire Rating:						
35 -50 mm	1% - 3 Hours						
Self Weight of Slab:	Self Weight (Incl. 60mm Screed,						
336 kg/m²	503 kg/m²						
Cross Sectional Area:	Mameril of Inertia (I <sub>XX</sub> ):						
160.7x10 <sup>2</sup> mm <sup>2</sup>	892.1x10° mm4						
Distance to N.A. (Y <sub>b</sub> ):	Distance to N.A. (Y <sub>E</sub> ):						
109.131 mm	110.869 mm						
Section Modulus (Z <sub>b</sub> ):	Section Modulus (Z <sub>1</sub> ):						
8.175x10 <sup>6</sup> mm <sup>3</sup>	8.047x10 <sup>6</sup> mm <sup>3</sup>						

#### HOLLOW CORE CONCRETE PTY. LTD.

Structural Precest Components 12-14 Maria Street Laverton North Victoria 3026

Errell: info@hollowcore.com.au

#### 220 Thick 5 Core HC Slab

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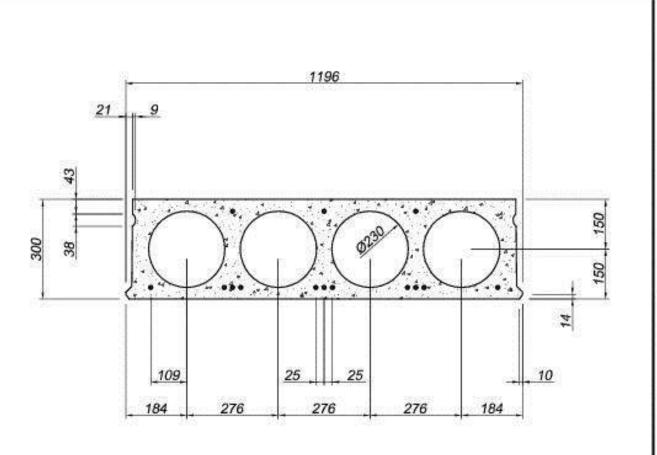
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Slab Code:	Steb Thickness:							
HCS4-300	300 mm							
Design Width:	Actual Width:							
1200 mm	1196 mm							
Number of Cores:	Diameter of Cores:							
4	230 mm							
Number of Bottom Strends:	Number of Top Strands:							
5-11	0-3							
Concrete Grade (Zero Slump):	Prestress (12.7# Strand):							
50 MPa	500 - 1200 MPa							
Cover to Strend	Fire Rating:							
35 -50 mm	1½ - 4 Hours							
Self Weight of Slab:	Self Weight (Incl. 60mm Screed)							
380 kg/m²	554 kg/m²							
Cross Sectional Area:	Mamerit of Inertia (I <sub>XX</sub> ):							
181.5x10° mm²	2067.2x10°mm4							
Distance to N.A. (Y <sub>b</sub> ):	Distance to N.A. (Y <sub>L</sub> ):							
148.809 mm	151.191 mm							
Section Modulus (Z <sub>6</sub> ):	Section Modulus (Z <sub>1</sub> ):							
13.891x10°mm°	13.673x10° mm³							

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#### 300 Thick 4 Core HC Slab

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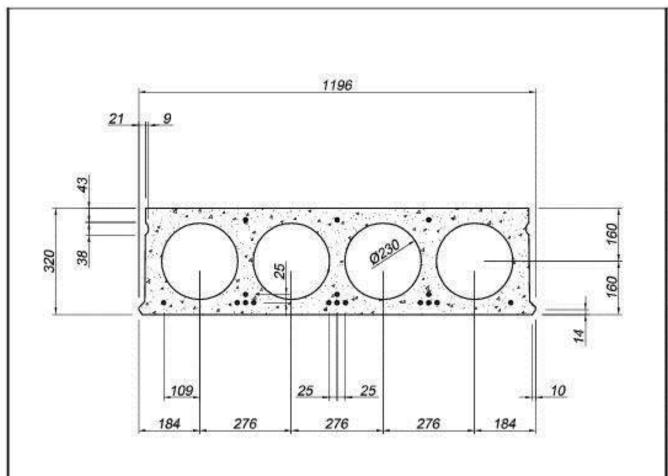
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Slab Code:	Stab Thickness:
HCS4-320	320 mm
Design Wath.	Actual Width:
1200 mm	1196 mm
Number of Cores:	Diameter of Cores:
4	230 mm
Number of Bottom Strands:	Number of Top Strands:
5 - 14	0-3
Concrete Grade (Zero Slump):	Prestress (12.7# Strand):
50 MPa	500 - 1200 MPa
Cover to Strend:	Fire Rating:
35 -50 mm	1% - 4 Hours
Self Weight of Slab:	Self Weight (Incl. 60mm Screed)
428 kg/m²	603 kg/m²
Cross Sectional Area:	Mament of Inertia (I <sub>Ax</sub> ):
204.6x10° mm²	2625.1x10 <sup>6</sup> mm <sup>4</sup>
Distance to N.A. (Y <sub>b</sub> ):	Distance to N.A. (Y <sub>E</sub> .):
158.843 mm	161.157 mm
Section Modulus (Z <sub>0</sub> ):	Section Modulus (Z <sub>1</sub> ).
16.526x10 <sup>6</sup> mm <sup>3</sup>	16.289x10° mm3

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#### 320 Thick 4 Core HC Slab

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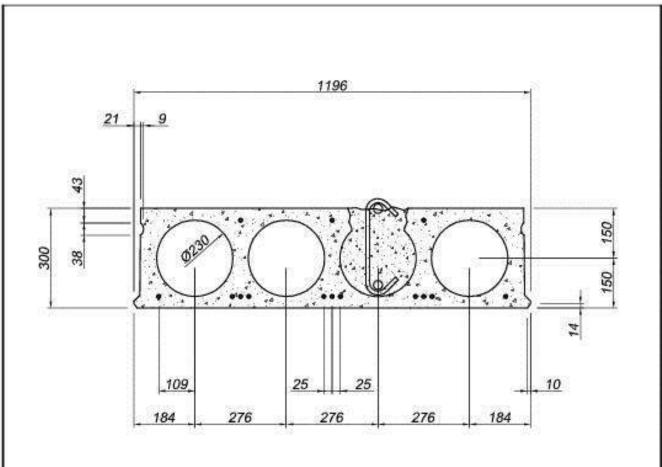
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Slab Code:	Steb Th/okness:						
HCS3-300	300 mm						
Design Width:	Actual Width:						
1200 mm	1196 mm						
Number of Cores:	Diameter of Cores:						
3	230 mm						
Number of Bottom Strands:	Number of Top Strands:						
5-11	0-3						
Concrete Grade (Zero Slump):	Prestress (12.7# Strand):						
50 MPa	500 - 1200 MPa						
Cover to Strand:	Fire Reting:						
35 -50 mm	1½ - 4 Hours						
Self Weight of Slab:	Self Weight (Incl. 60mm Screed)						
466 kg/m²	640 kg/m²						
Cross Sectional Area:	Moment of Inertia (I <sub>nx</sub> ):						
223.0x103 mm2	2204.6x10°mm4						
Diatence to N.A. (Y <sub>0</sub> ):	Distance to N.A. (Y <sub>L</sub> ):						
149.031 mm	150.969 mm						
Section Modulus (Z <sub>b</sub> ):	Section Modulus (Z <sub>1</sub> ):						
14.793x10 <sup>6</sup> mm <sup>3</sup>	14.603x10 <sup>8</sup> mm <sup>3</sup>						

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#### 300 Thick 3 Core HC Slab

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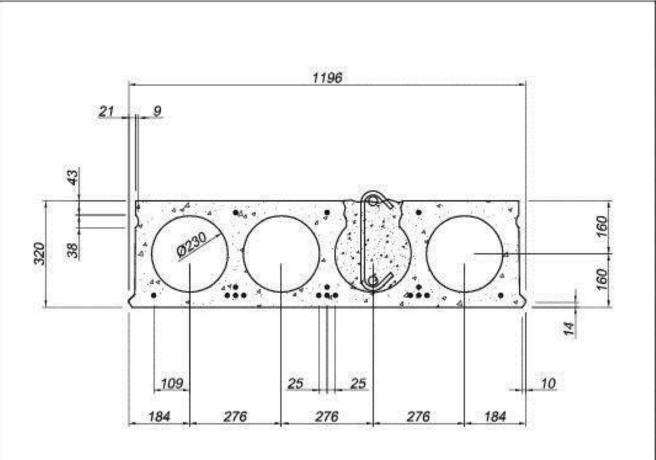
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Slab Code:	Slab Thickness:
HCS3-320	320 mm
Design Width:	Actual Width:
1200 mm	1196 mm
Number of Cores:	Diameter of Cores:
3	230 mm
Number of Bottom Strands:	Number of Top Strands:
5 - 14	0-3
Concrete Grade (Zero Slump):	Prestress (12.7¢ Strand):
50 MPa	500 - 1200 MPa
Cover to Strend:	Fire Rading:
35 -50 mm	1½ - 4 Hours
Self Weight of Slab:	Self Weight (Incl. 60mm Screed
515 kg/m <sup>2</sup>	690 kg/m²
Cross Sectional Area:	Mament of Inertia (I <sub>XX</sub> ):
246.2x10° mm²	2762.5x10 <sup>6</sup> mm <sup>4</sup>
Distance to N.A. (Y <sub>0</sub> ):	Distance to N.A. (Y <sub>L</sub> ):
159.038 mm	160.962 mm
Section Modulus (Z <sub>b</sub> ):	Section Modulus (Z <sub>1</sub> ):
17.370x10° mm³	17.162x10 <sup>6</sup> mm <sup>3</sup>

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#### 320 Thick 3 Core HC Slab

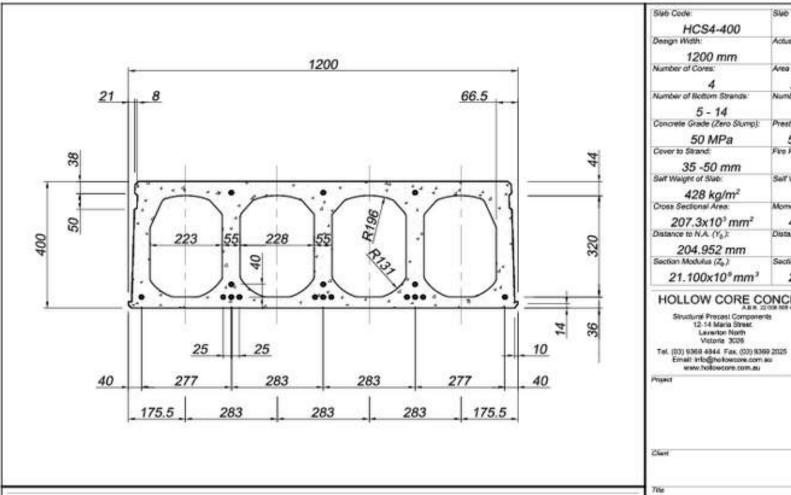
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Slati Code:	Slab Thickness						
HCS4-400	400 mm						
Design Width:	Actual Width:						
1200 mm	1196 mm						
Number of Cores:	Area of Cores:						
4	260.0x103 mm2						
Number of Bottom Strands:	Number of Top Strends:						
5 - 14	0-3						
Concrete Grade (Zero Slump):	Prestress (12.7s Strand):						
50 MPa	500 - 1200 MPa						
Cover to Strand:	Fire Rating:						
35 -50 mm	1½ - 4 Hours						
Self Weight of Slab:	Self Weight (Incl. 60mm Screed)						
428 kg/m <sup>2</sup>	608 kg/m <sup>2</sup>						
Cross Sectional Area:	Moment of Inertia (I <sub>xx</sub> ):						
207.3x103 mm2	4324.4x10"mm"						
Distance to N.A. (Y <sub>0</sub> ):	Distance to N.A. (Y <sub>1</sub> ):						
204.952 mm	195.048 mm						
Section Modulus (Z <sub>b</sub> .):	Section Modulus (Z <sub>1</sub> ):						
21.100x10° mm3	22.171x10 <sup>8</sup> mm <sup>3</sup>						

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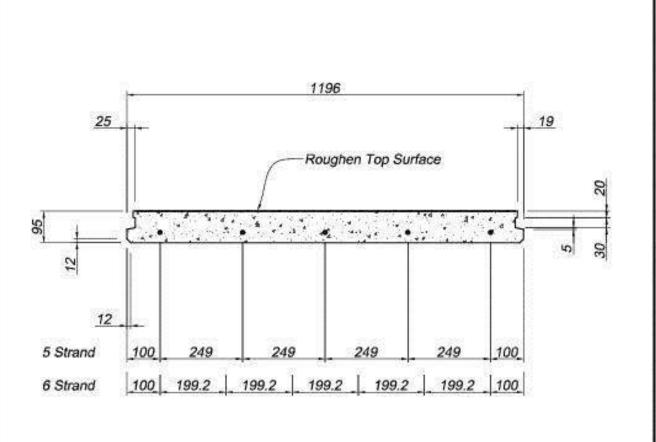


#### 400 Thick 4 Core HC Slab

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Slab Code:	Steb Thickness:						
MS-95	95 mm						
Design Width:	Actual Width:						
1200 mm	1196 mm						
Concrete Grade:	Strand Diameter:						
50 MPa	12.7ømm						
Number of Bottom Strands:	Prestress.						
4-7	500 - 1200 MPa						
Cover to Strand:	Fire Rating:						
25 - 35 mm	1 - 1½ Hours						
Self Weight of Slab:	Self Weight (Incl. 60mm Screed)						
232 kg/m²	375 kg/m²						
Cross Sectional Area:	Moment of Inertia (I <sub>NK</sub> ):						
111.1x103 mm2	83.71x10° mm4						
Distance to N.A. (Y <sub>b</sub> ):	Distance to N.A. (Y <sub>c</sub> ):						
47.134 mm	47.866 mm						
Section Modulus (Z <sub>b</sub> ):	Section Modulus (Z <sub>1</sub> ):						
1.776x10° mm3	1.749x10* mm3						

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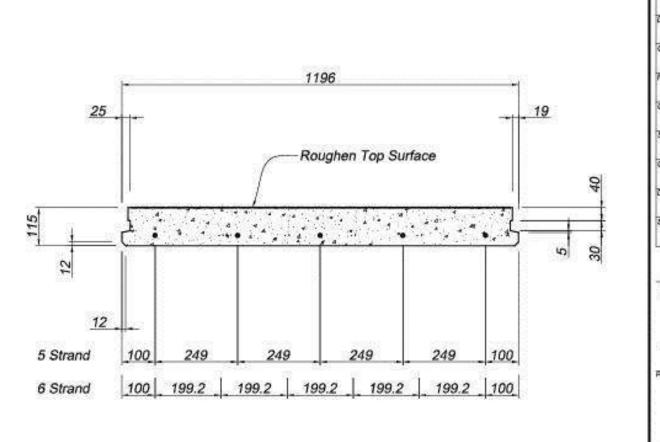
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#### 95 Thick Mini Slab

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Scale Date

Job No. Drawing No.

Revision



Slab Code:	Steb Thickness:							
MS-115	115 mm							
Design Width:	Actual Width:							
1200 mm	1196 mm							
Concrete Grade:	Strand Diameter:							
50 MPa	12.7ømm							
Number of Bottom Strands.	Prestress.							
4-7	500 - 1200 MPa							
Cover to Strand:	Fire Rating:							
25 - 45 mm	1 - 2 Hours							
Self Weight of Slab:	Self Weight (Incl. 60mm Screed)							
281 kg/m <sup>2</sup>	425 kg/m²							
Cross Sectional Area:	Moment of Inertia (I <sub>KK</sub> ):							
134.2x103 mm2	148.7x10*mm*							
Distance to N.A. (Y <sub>b</sub> .):	Distance to N.A. (Y <sub>t</sub> ):							
57.117 mm	57.883 mm							
Section Modulus (Z <sub>b</sub> ):	Section Modulus (Z <sub>1</sub> ):							
2.603x10 <sup>4</sup> mm <sup>3</sup>	2.568x10* mm3							

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#### 115 Thick Mini Slab

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# **Units Span Specifications**



#### **LOAD SPAN TABLES**

#### **Coltman Hollow Core Slabs**

These tables are for guidance purposes only. Where deflections natural frequency etc require consideration please contact our Technical Department. (The design includes for self weight and an allowance of 1.75 Kn/m² for finishes, but does not include for any partition allowance or the effect of any service holes)

#### Maximum Permissible Spans In Metres

	Waxiiii	ann i on	IIIOOIDIO	Opulio	III IVIOG	-						
	Live Load	ing (Kn/m²	)									
Unit Cross Section Depth - Self Weight	0.75	1.50	2.00	2.50	3.00	3.50	4.00	5.00	7.50	10.00	12.50	15.00
(Solid slab)  100mm Deep - 2.36 Kn/m2	5.00	5.00	5.00	5.00	4.88	4.70	4.55	4.27	3.76	3.40	3.12	2.91
150mm Deep - 2.35 Kn/m2	7.50	7.50	7.50	7.50	7.26	7.00	6.77	6.36	5.60	5.06	4.65	4.32
(Sound slab - 300 kg/m2)  00000000000000001  150mm Deep - 2.94 Kn/m2	7.50	7.50	7.50	7.35	7.08	6.85	6.63	6.26	5.54	5.03	4.63	4.32
200mm Deep - 2.94 Kn/m2	10.00	10.00	9.86	9.48	9.14	8.84	8.56	8.07	7.15	6.49	5.98	5.57
250mm Deep - 3.66 Kn/m2	12.50	12.05	11.64	11.24	10.87	10.53	10.23	9.69	8.64	7.87	7.28	6.80

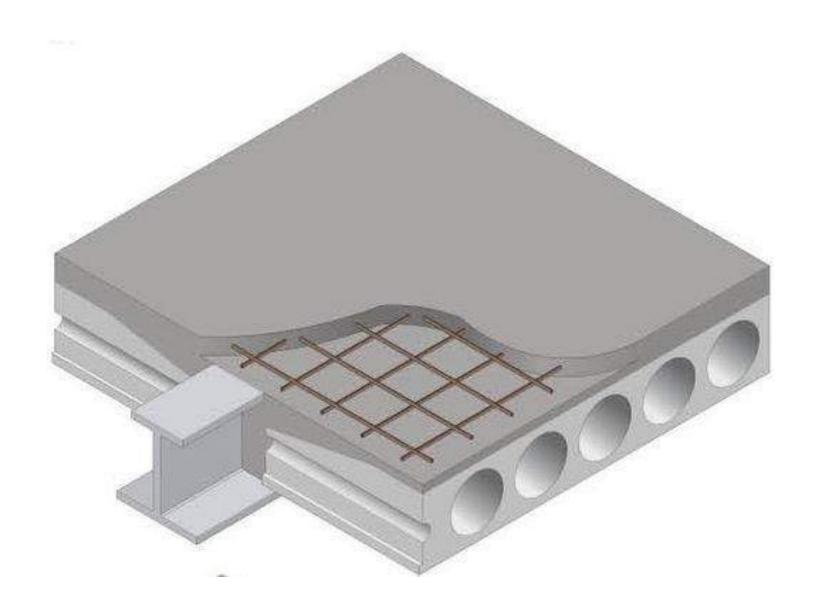
#### Maximum Permissible (Unpropped) Spans In Metres

Live Loading (Kn/m²)

Depth of P.C unit (mm)	Depth of topping (mm)	Total Struct depth (mm)	Total self weight (Kn/m²)	0.75	1.50	2.00	2.50	3.00	3.50	4.00	5.00	7.50	10.00	12.50	15.00
75	75	150	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.73	3.57	3.43
75	125	200	4.95	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.67	3.59
100	50	150	3.79	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.69	4.36	4.04	3.54
100	100	200	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.89	4.70	4.52	4.37
150	50	200	3.83	7.50	7.50	7.50	7.50	7.50	7.40	7.25	6.98	6.40	5.86	5.43	4.95
150	75	225	4.43	7.50	7.50	7.50	7.50	7.50	7.39	7.27	7.04	6.56	6.16	5.82	5.54
200	50	250	4.49	10.0	9.80	9.58	9.37	9.18	9.00	8.82	8.50	7.82	7.22	6.71	6.06
200	75	275	5.09	9.90	9.61	9.44	9.27	9.10	8.95	8.80	8.53	7.94	7.46	7.05	6.70
250	50	300	5.25	11.42	11.06	10.82	10.61	10.41	10.21	10.03	9.68	8.93	8.23	7.68	7.22
250	75	325	5.85	11.15	10.84	10.65	10.47	10.29	10.13	9.97	9.67	9.03	8.50	8.05	7.62

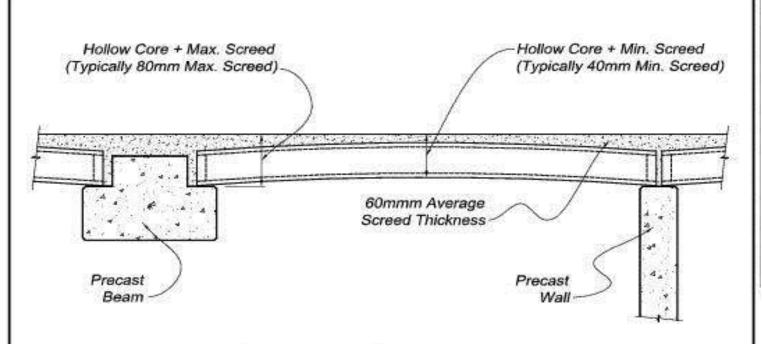
Partition loadings should be determined in accordance with clause 5.2.2.2 of BS 8110. Line loads should be converted to imposed blanket loads for preliminary design purposes. Minimum topping depths are taken at centre of span therefore due allowance should be made for camber when determining overall floor depth.

# **Screed construction**



## Screed

A non-structural sand and cement or grano screed is normally laid by the Principal Contractor over the floor (before plastering the soffit) to provide a level surface for finishes. A minimum screed thickness of 40mm is suggested, with due allowance being made for the camber of units. It is strongly recommended that a light two-way reinforcing fabric is incorporated in the screed. Anti-crack reinforcement in the screed should always be provided by the Principal Contractor over supporting beams and walls.



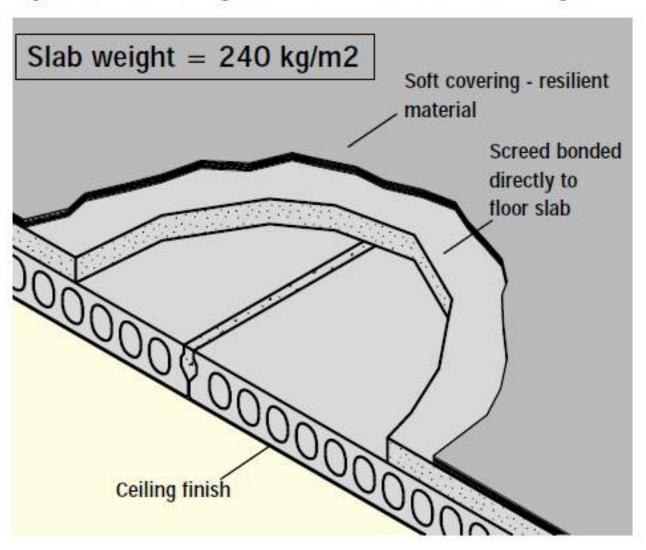
# Screed Geometrey (Not to Scale)

#### Note:

- 1. Screed Concrete to be low shrinkage mix and if necessary superplasticised to facilitate placing.
- 2. Provide construction joints or sawcut joints in screed at approximately 8000 maximum centers in each direction. Saw cuts to be performed within 18 hours of pouring.

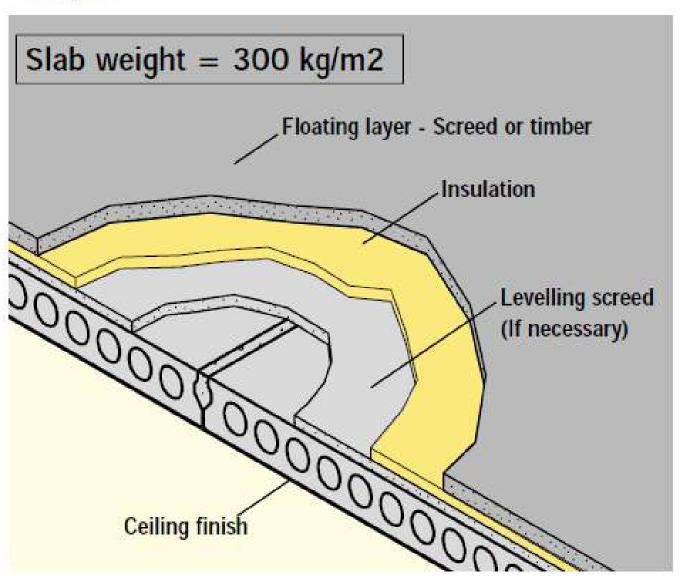
Floor Type1

Concrete base with soft covering. Mass of floor base including any screed and/or ceiling finish should not be less than 365 kg/m2

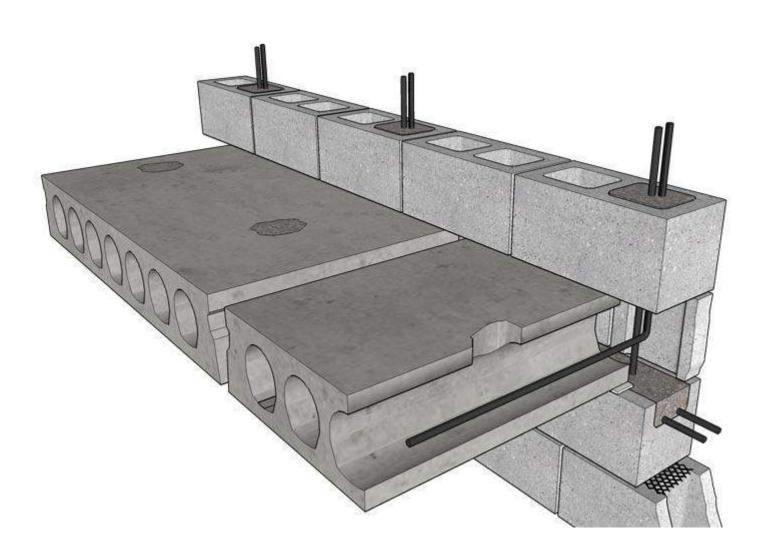


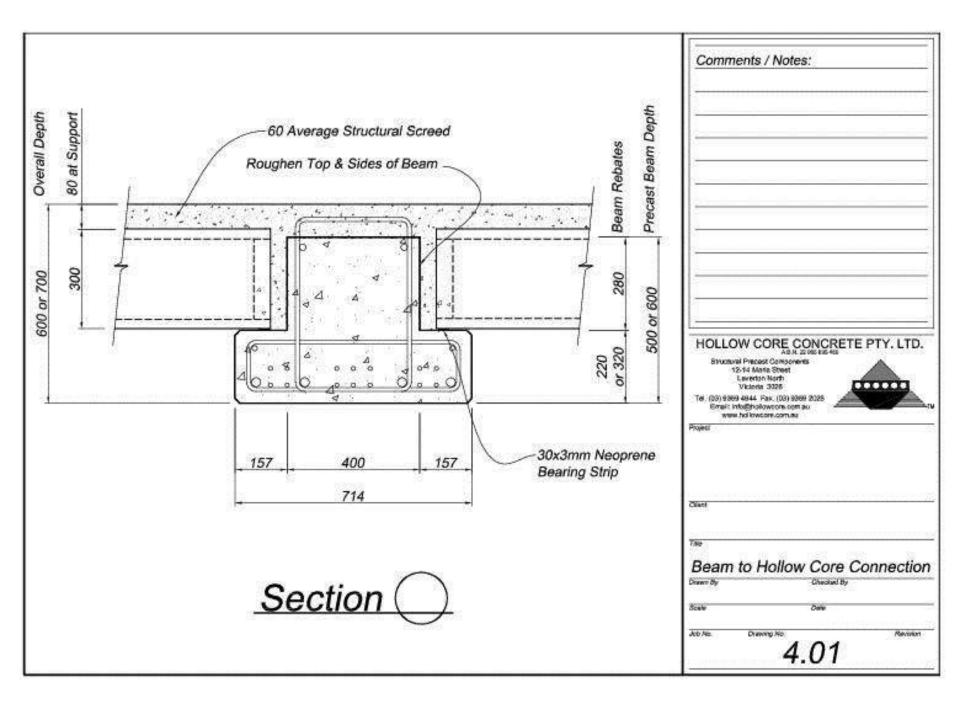
Floor Type2

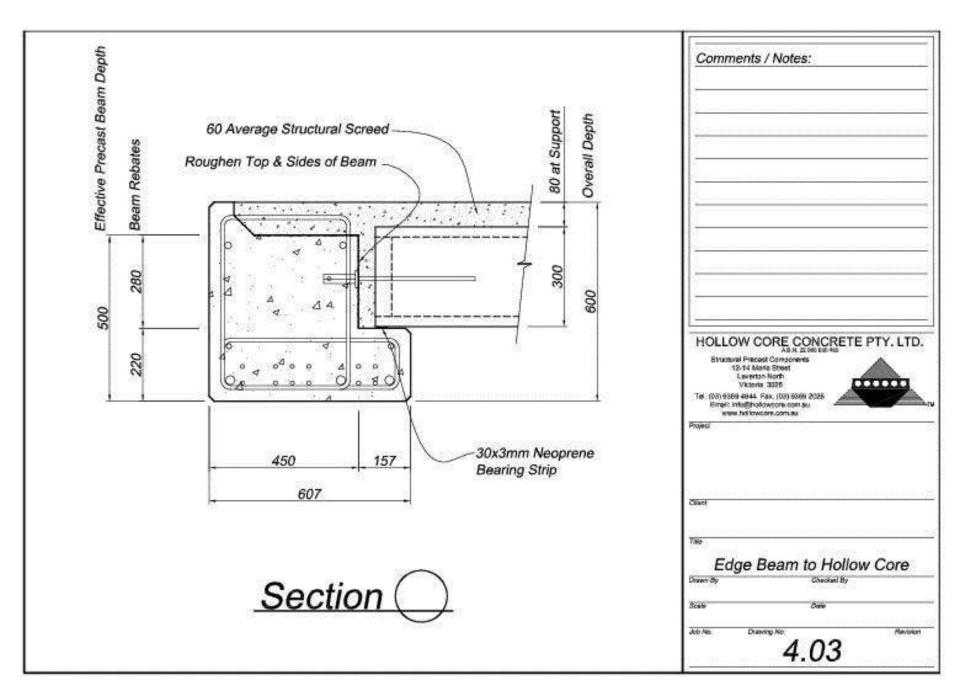
Concrete base with floating layer. Mass of floor base including any localised levelling screed and/or ceiling finish should not be less than 300 kg/m<sup>2</sup>

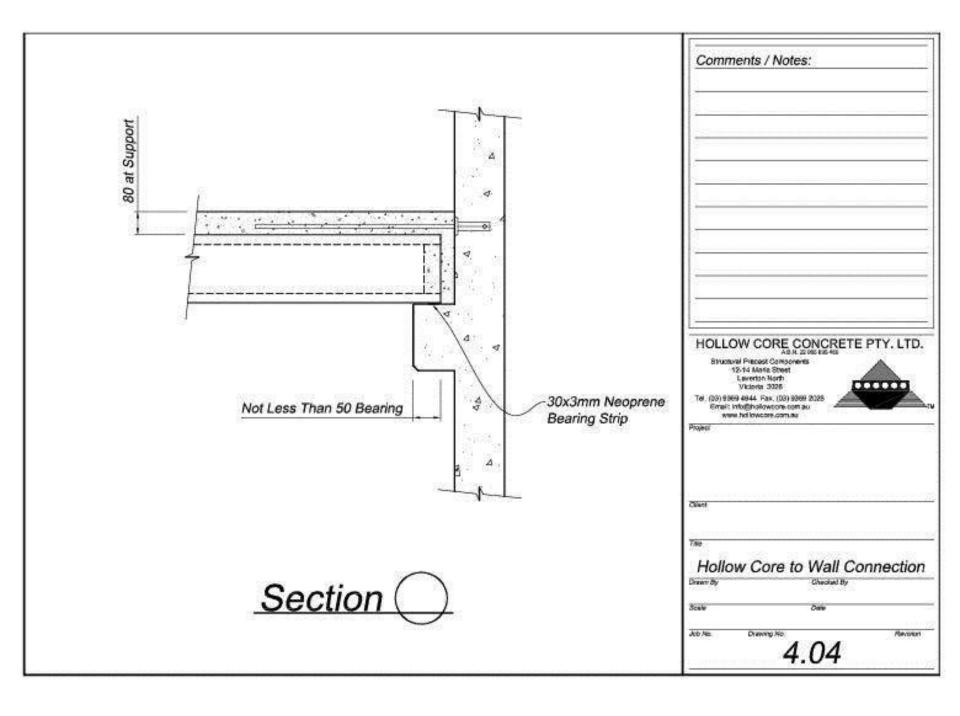


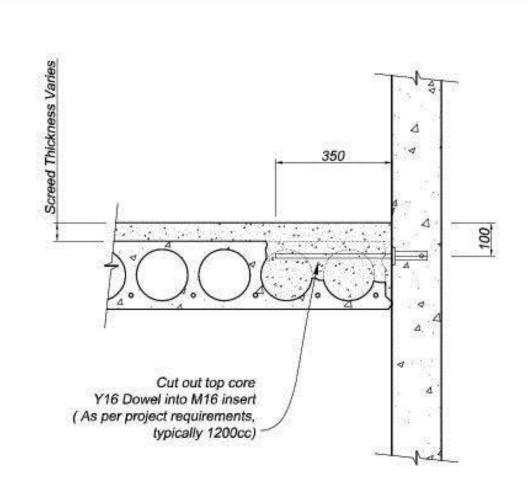
# **Connection Details**

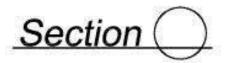




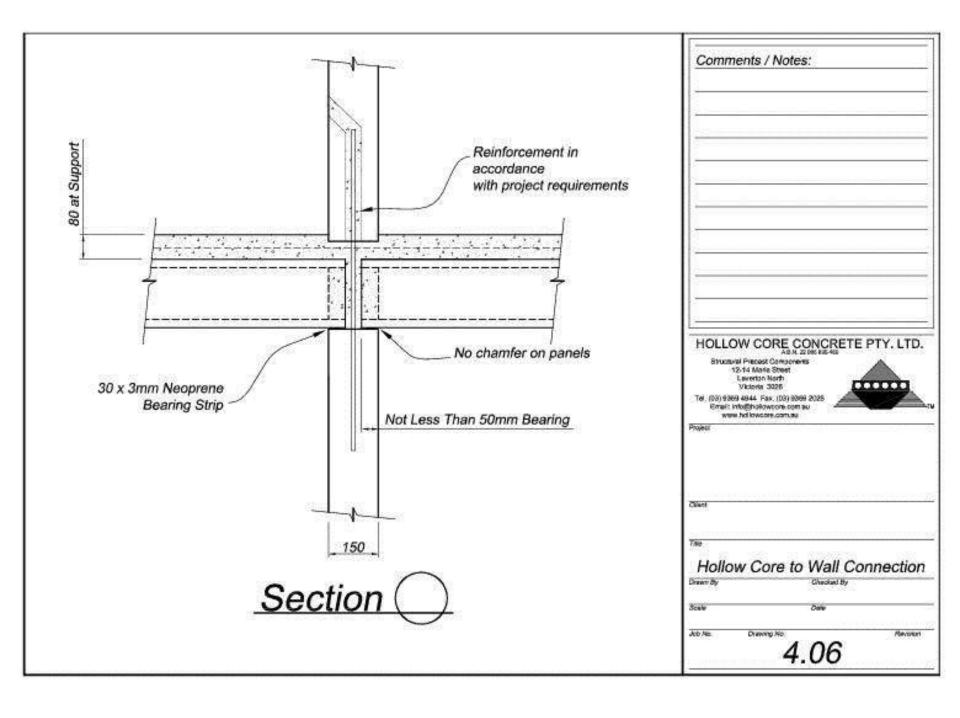


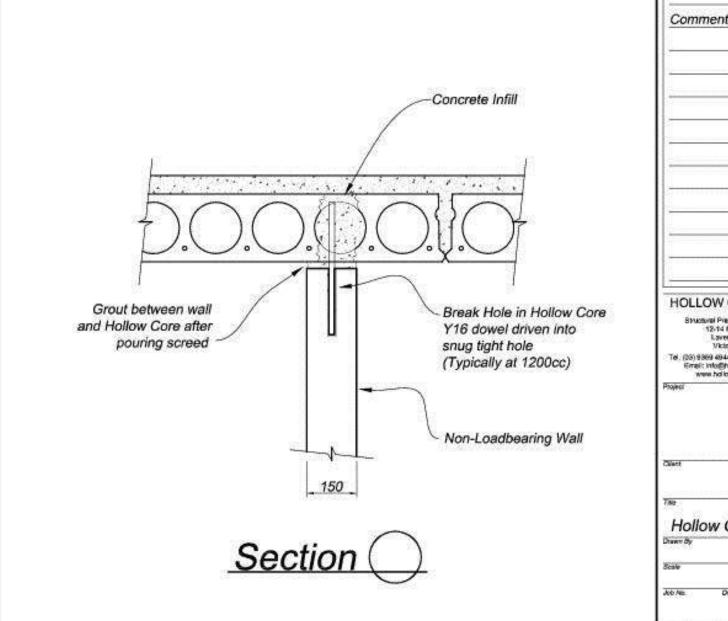




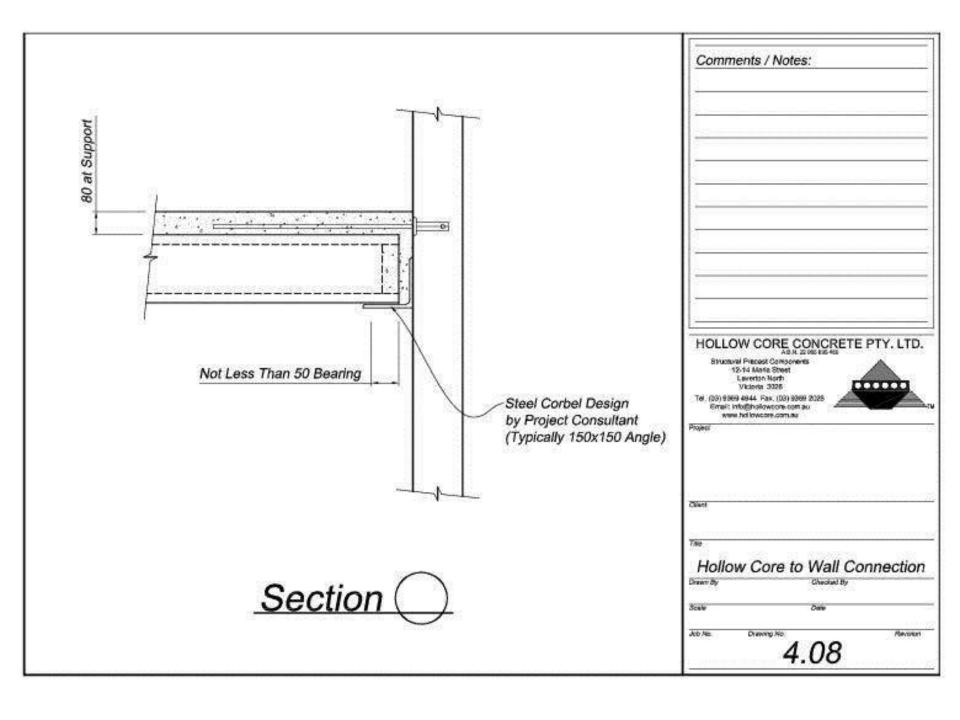


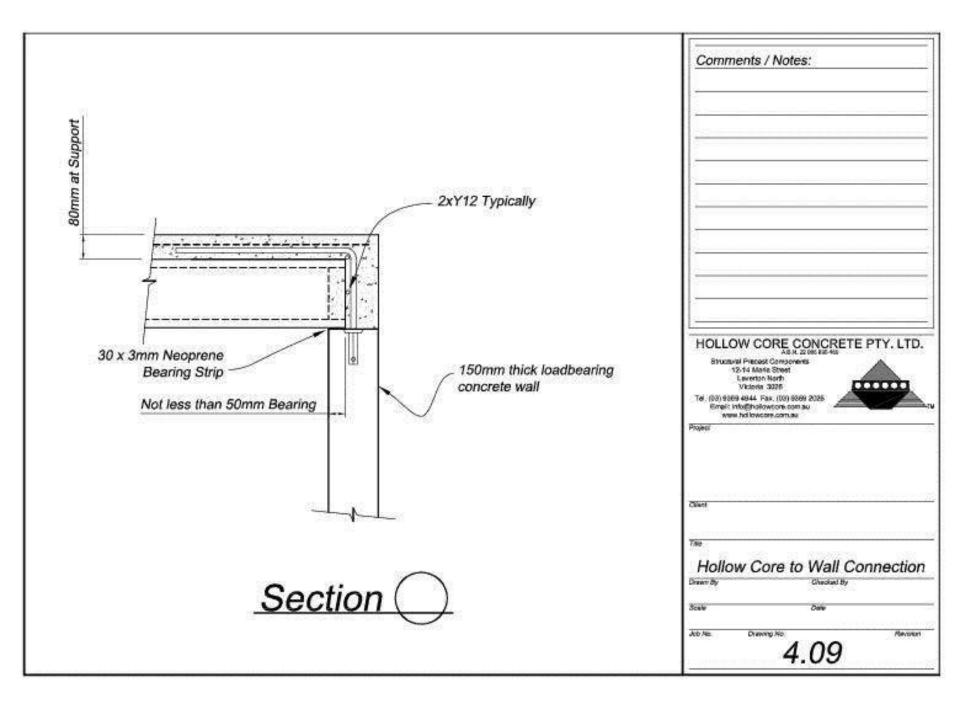
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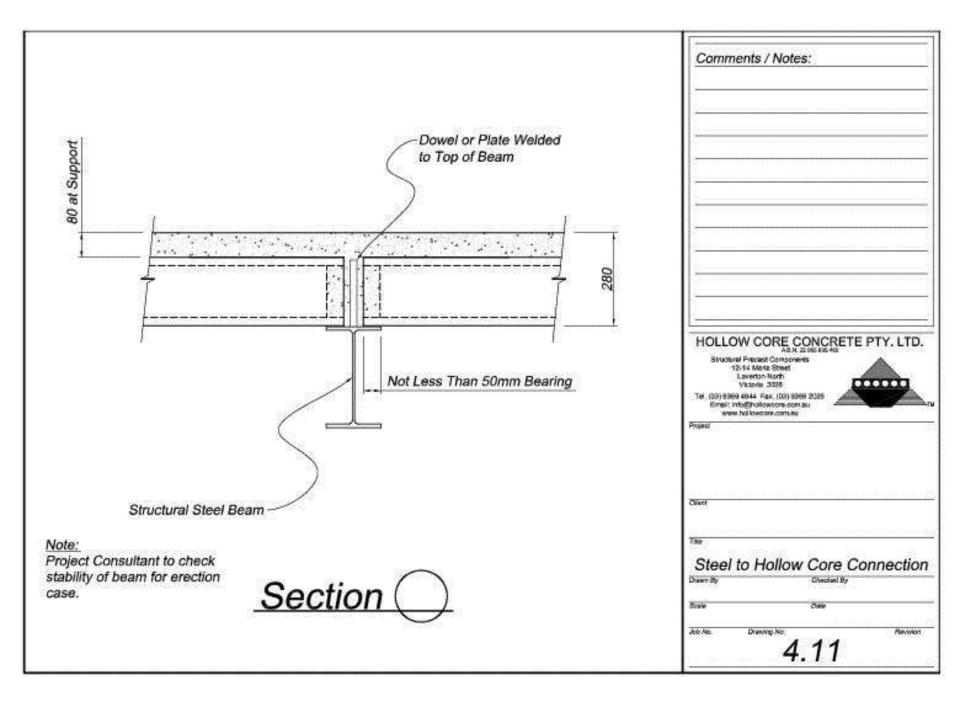


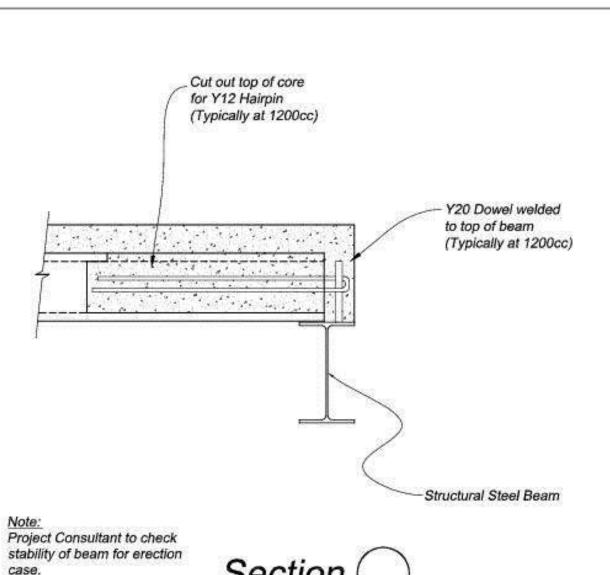


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Comments / Notes:

