

# R beams

(28 day concrete strength)

## Section Properties

**ULTRAFloor**

August 2011

Non Composite Section Properties	Units	130 R	150 R	200 R
Mass of Section	kg/m	34	39	54
Gross Area	mm <sup>2</sup>	13078	15988	21943
EI	Nmm <sup>2</sup>	8.047 X 10 <sup>11</sup>	11.558 X 10 <sup>11</sup>	28.452 X 10 <sup>11</sup>
<b>Positive Moments</b>				
Ultimate Moment capacity ( $\phi\text{Mu}^{\text{pos}}$ )	kNm	6.95	8.83	19.38
Cracking Moment ( $\text{Mcr}^{\text{pos}}$ )	kNm	5.03	6.32	10.41
Reinforcement Shear component ( $\phi\text{Vuc.reo}^{\text{pos}}$ )	kN	8.88	9.41	11.67
Moment Shear component ( $\phi\text{Mo.max}^{\text{pos}}$ )	kNm	2.69	3.33	5.24
Web Shear capacity ( $\phi\text{Vuc.web}^{\text{pos}}$ )	kN	14.60	21.40	33.33
<b>Negative Moments</b>				
Ultimate Moment capacity ( $\phi\text{Mu}^{\text{neg}}$ )	kNm	4.18	9.27	12.73
Cracking Moment ( $\text{Mcr}^{\text{neg}}$ )	kNm	2.14	4.57	6.18
Reinforcement Shear component ( $\phi\text{Vuc.reo}^{\text{neg}}$ )	kN	7.05	7.67	9.42
Moment Shear component ( $\phi\text{Mo.max}^{\text{neg}}$ )	kNm	0.70	2.22	2.33
Web Shear capacity ( $\phi\text{Vuc.web}^{\text{neg}}$ )	kN	14.60	21.40	33.33
<b>Material Details</b>				
<p><b>CONCRETE:</b> 65MPa</p> <p><b>STEEL TENDONS:</b></p> <ul style="list-style-type: none"> <li>7-wire ordinary strand, 9.5mm low-relaxation</li> <li>Area = 54.7mm<sup>2</sup></li> <li>Min Breaking Load = 102kN</li> <li>Min Tensile Strength (<math>f_p</math>) = 1850 Mpa</li> <li>Yield Strength = 0.85 x <math>f_p</math> (stress relieved wire)</li> <li>Modulus of Elasticity = 195 x 10<sup>3</sup>MPa</li> </ul>				

### Shear Notes:

Shear capacity varies along the length of the beam, and is dependent on applied loads.  $\phi\text{Vuc}$  = Lesser of  $\phi\text{Vuc.flexure}$  &  $\phi\text{Vuc.web}$  /  $\phi\text{Vuc.flexure}$  =  $\phi\text{Vuc.reo}$  + ABS [ $\phi\text{Mo}(V^*/M^*)$ ] /

$\phi\text{Mo}$  Varies at the ends of the beams where the strand is developing and is a constant value  $\phi\text{Mo.max}$  outside of this zone.

From 0 to 56mm from the end of the beam :  $\phi\text{Mo}$  = Nil / From 56 to 558mm from the end of the beam :  $\phi\text{Mo}$  = varies from Nil to  $\phi\text{Mo.max}$  / Past 558mm from the end of the beam :  $\phi\text{Mo}$  =  $\phi\text{Mo.max}$

### Important Note:

Section properties in Western Australia may vary slightly, please contact Ultrafloor on 1800 858 723 for details.

# M beams

(28 day concrete strength)

## Section Properties

**ULTRAFloor®**

August 2011

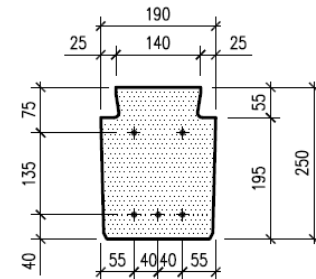
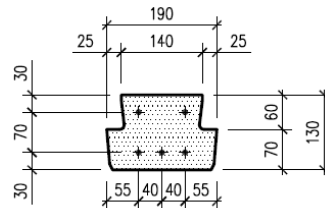
Non Composite Section Properties	Units	130 M	250 M
Mass of Section	kg/m	51	107
Gross Area	mm <sup>2</sup>	20878	43143
EI	Nmm <sup>2</sup>	12.465 X 10 <sup>11</sup>	91.782 X 10 <sup>11</sup>
<b>Positive Moments</b>			
Ultimate Moment capacity ( $\phi Mu^{pos}$ )	kNm	11.28	42.34
Cracking Moment ( $Mcr^{pos}$ )	kNm	8.62	26.68
Reinforcement Shear component ( $\phi Vuc.reo^{pos}$ )	kN	14.77	22.44
Moment Shear component ( $\phi Mo.max^{pos}$ )	kNm	4.93	14.00
Web Shear capacity ( $\phi Vuc.web^{pos}$ )	kN	27.13	67.10
<b>Negative Moments</b>			
Ultimate Moment capacity ( $\phi Mu^{neg}$ )	kNm	12.59	25.04
Cracking Moment ( $Mcr^{neg}$ )	kNm	6.58	12.17
Reinforcement Shear component ( $\phi Vuc.reo^{neg}$ )	kN	12.90	17.80
Moment Shear component ( $\phi Mo.max^{neg}$ )	kNm	3.54	2.98
Web Shear capacity ( $\phi Vuc.web^{neg}$ )	kN	27.13	67.10

### Material Details

**CONCRETE:** 65MPa

#### STEEL TENDONS:

- 7-wire ordinary strand, 9.5mm low-relaxation
- Area = 54.7mm<sup>2</sup>
- Min Breaking Load = 102kN
- Min Tensile Strength ( $f_p$ ) = 1850 Mpa
- Yield Strength = 0.85 x  $f_p$  (stress relieved wire)
- Modulus of Elasticity = 195 x 10<sup>3</sup>MPa



#### Shear Notes:

Shear capacity varies along the length of the beam, and is dependent on applied loads.  $\phi Vuc = \text{Lesser of } \phi Vuc.flexure \text{ \& } \phi Vuc.web / \phi Vuc.flexure = \phi Vuc.reo + ABS [\phi Mo(V*/M*)] / \phi Mo$  Varies at the ends of the beams where the strand is developing and is a constant value  $\phi Mo.max$  outside of this zone.

From 0 to 56mm from the end of the beam :  $\phi Mo = Nil /$  From 56 to 558mm from the end of the beam :  $\phi Mo = \text{varies from Nil to } \phi Mo.max /$  Past 558mm from the end of the beam :  $\phi Mo = \phi Mo.max$

#### Important Note:

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# C beams

(28 day concrete strength)

## Section Properties

**ULTRAFloor**

August 2011

Non Composite Section Properties	Units	150 C	200 C	250 C
Mass of Section	kg/m	84	114	145
Gross Area	mm <sup>2</sup>	33988	45943	57958
EI	Nmm <sup>2</sup>	26.651 X 10 <sup>11</sup>	64.309 X 10 <sup>11</sup>	126.904 X 10 <sup>11</sup>
<b>Positive Moments</b>				
Ultimate Moment capacity ( $\phi Mu^{pos}$ )	kNm	22.22	39.94	68.91
Cracking Moment ( $M_{cr}^{pos}$ )	kNm	14.13	22.83	43.88
Reinforcement Shear component ( $\phi V_{uc.reo}^{pos}$ )	kN	21.83	27.08	34.97
Moment Shear component ( $\phi Mo.max^{pos}$ )	kNm	7.81	12.01	24.93
Web Shear capacity ( $\phi V_{uc.web}^{pos}$ )	kN	50.11	70.99	91.11
<b>Negative Moments</b>				
Ultimate Moment capacity ( $\phi Mu^{neg}$ )	kNm	18.37	25.31	32.07
Cracking Moment ( $M_{cr}^{neg}$ )	kNm	9.39	12.96	15.40
Reinforcement Shear component ( $\phi V_{uc.reo}^{neg}$ )	kN	17.79	21.86	28.45
Moment Shear component ( $\phi Mo.max^{neg}$ )	kNm	4.26	4.51	3.12
Web Shear capacity ( $\phi V_{uc.web}^{neg}$ )	kN	50.11	70.99	91.11
<b>Material Details</b>				
<p><b>CONCRETE:</b> 65MPa</p> <p><b>STEEL TENDONS:</b></p> <ul style="list-style-type: none"> <li>7-wire ordinary strand, 9.5mm low-relaxation</li> <li>Area = 54.7mm<sup>2</sup></li> <li>Min Breaking Load = 102kN</li> <li>Min Tensile Strength (<math>f_p</math>) = 1850 Mpa</li> <li>Yield Strength = 0.85 x <math>f_p</math> (stress relieved wire)</li> <li>Modulus of Elasticity = 195 x 10<sup>3</sup>MPa</li> </ul>				

### Shear Notes:

Shear capacity varies along the length of the beam, and is dependent on applied loads.  $\phi V_{uc}$  = Lesser of  $\phi V_{uc.flexure}$  &  $\phi V_{uc.web}$  /  $\phi V_{uc.flexure}$  =  $\phi V_{uc.reo}$  + ABS [ $\phi Mo(V^*/M^*)$ ] /  $\phi Mo$  Varies at the ends of the beams where the strand is developing and is a constant value  $\phi Mo.max$  outside of this zone.

From 0 to 56mm from the end of the beam :  $\phi Mo$  = Nil / From 56 to 558mm from the end of the beam :  $\phi Mo$  = varies from Nil to  $\phi Mo.max$  / Past 558mm from the end of the beam :  $\phi Mo$  =  $\phi Mo.max$

### Important Note:

Section properties in Western Australia may vary slightly, please contact Ultrafloor on 1800 858 723 for details.