

# ULTRAshells

(28 day concrete strength)

## Section Properties

**ULTRAFloor**<sup>®</sup>

August 2011

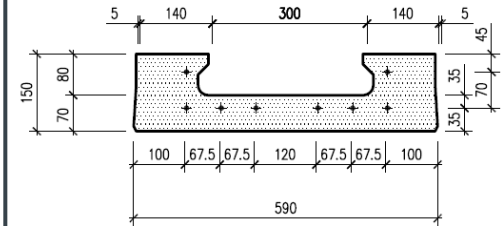
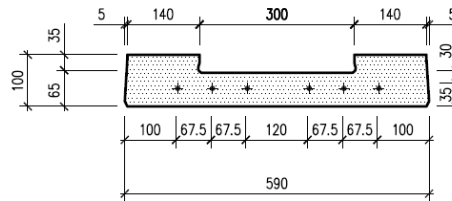
Non Composite Section Properties	Units	100 US	150 US
Mass of Section	kg/m	120	150
Gross Area	mm <sup>2</sup>	47995	61622
EI	Nmm <sup>2</sup>	14.773 X 10 <sup>11</sup>	45.423 X 10 <sup>11</sup>
<b>Positive Moments</b>			
Ultimate Moment capacity ( $\phi Mu^{pos}$ )	kNm	11.83	37.02
Cracking Moment ( $M_{cr}^{pos}$ )	kNm	11.41	24.55
Reinforcement Shear component ( $\phi V_{uc.reo}^{pos}$ )	kN	22.69	32.10
Moment Shear component ( $\phi Mo.max^{pos}$ )	kNm	5.94	12.45
Web Shear capacity ( $\phi V_{uc.web}^{pos}$ )	kN	47.89	57.68
<b>Negative Moments</b>			
Ultimate Moment capacity ( $\phi Mu^{neg}$ )	kNm	7.23	20.64
Cracking Moment ( $M_{cr}^{neg}$ )	kNm	4.30	10.99
Reinforcement Shear component ( $\phi V_{uc.reo}^{neg}$ )	kN	29.54	33.47
Moment Shear component ( $\phi Mo.max^{neg}$ )	kNm	1.13	3.78
Web Shear capacity ( $\phi V_{uc.web}^{neg}$ )	kN	47.89	57.68

### 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.  $\phi V_{uc}$  = 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.

# ULTRAshells

(28 day concrete strength)

## Section Properties

**ULTRAFloor**<sup>®</sup>

August 2011

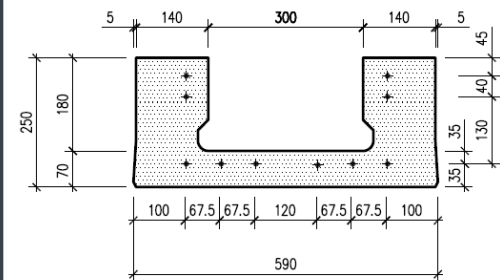
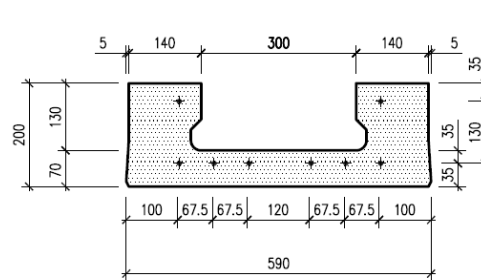
Non Composite Section Properties	Units	200 US	250 US
Mass of Section	kg/m	185	220
Gross Area	mm <sup>2</sup>	75622	89622
EI	Nmm <sup>2</sup>	111.425 X 10 <sup>11</sup>	218.075 X 10 <sup>11</sup>
<b>Positive Moments</b>			
Ultimate Moment capacity ( $\phi Mu^{pos}$ )	kNm	61.44	87.13
Cracking Moment ( $M_{cr}^{pos}$ )	kNm	39.72	58.01
Reinforcement Shear component ( $\phi V_{uc.reo}^{pos}$ )	kN	39.46	50.01
Moment Shear component ( $\phi Mo.max^{pos}$ )	kNm	18.96	26.81
Web Shear capacity ( $\phi V_{uc.web}^{pos}$ )	kN	77.70	105.81
<b>Negative Moments</b>			
Ultimate Moment capacity ( $\phi Mu^{neg}$ )	kNm	29.90	55.03
Cracking Moment ( $M_{cr}^{neg}$ )	kNm	17.54	34.48
Reinforcement Shear component ( $\phi V_{uc.reo}^{neg}$ )	kN	43.44	52.56
Moment Shear component ( $\phi Mo.max^{neg}$ )	kNm	5.14	13.32
Web Shear capacity ( $\phi V_{uc.web}^{neg}$ )	kN	77.70	105.81

### 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.  $\phi V_{uc}$  = 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.