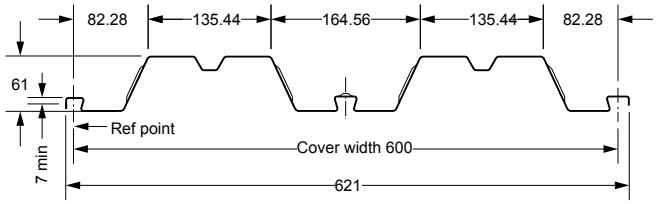
# Concrete Saver-60 0.75 t Composite Slab Design Information

(Uses 4% less concrete than regular profiles)

## Volume & Weight of Concrete (kN/m²) Table 9

| Slab Depth | Concrete Volume | Normal Weight Concrete | |
|---|---|---|---|
| (mm) | (m³/m²) | Wet | Dry |
| 110 | 0.078 | 1.87 | 1.83 |
| 120 | 0.088 | 2.11 | 2.07 |
| 130 | 0.098 | 2.35 | 2.30 |
| 140 | 0.108 | 2.59 | 2.54 |
| 150 | 0.118 | 2.83 | 2.77 |
| 160 | 0.128 | 3.07 | 3.01 |
| 180 | 0.148 | 3.55 | 3.48 |
| 200 | 0.168 | 4.03 | 3.95 |




Volume & Weight Table

1. The weight of concrete is: 2400 kg/m$^3$ (Wet)
   2350 kg/m$^3$ (Dry)
2. Deck, mesh weight and reinforcing are not included.
3. Ponding is not allowed for in this table

Note :- The height of the neutral axis is taken from the underside of the steel deck

## Concrete Saver-60 Section Properties (per metre width) Table 10

| Section Thickness (mm) | Design Mass (kg/m²) | Profile Weight (kN/m²) | Cross Sect Area (mm²/m) | Height to Neutral Axis (mm) | Moment of Inertia (cm⁴/m) | Ultimate Moment Capacity (kNm/m) |
|---|---|---|---|---|---|---|
| 0.75 | 8.59 | 0.084 | 1104.48 | 30.14 | 63.176 | 11.258 |
| 0.95 | 10.88 | 0.107 | 1399.51 | 30.35 | 80.023 | 13.482 |

## Concrete Saver-60 *Composite Properties per metre width of slab* t = 0.75 mm Table 11

| Modular Ratio | Slab Depth | Composite Slab Weight | Moment Capacity | Effective Depth | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | D | q2 | Mcs | ds | jd | a | Ic | Iuc | Ic + Iuc/2 Ina |
| n | mm | kPa | kNm | mm | mm | mm | 10⁶ x mm⁴ | 10⁶ x mm⁴ | 10⁶ x mm⁴ |
| 10 | 110 | 1.93 | 37.50 | 79.65 | 61.73 | 35.84 | 4.38 | 9.25 | 6.82 |
| | 120 | 2.16 | 42.21 | 89.65 | 69.48 | 40.34 | 5.57 | 11.93 | 8.75 |
| | 130 | 2.50 | 46.91 | 99.65 | 77.23 | 44.84 | 6.94 | 15.12 | 11.03 |
| | 140 | 2.73 | 52.94 | 109.65 | 87.15 | 45.00 | 8.50 | 18.85 | 13.67 |
| | 150 | 2.96 | 59.02 | 119.65 | 97.15 | 45.00 | 10.26 | 23.18 | 16.72 |
| | 160 | 3.42 | 65.09 | 129.65 | 107.15 | 45.00 | 12.23 | 28.17 | 20.20 |
| | 180 | 3.88 | 77.24 | 149.65 | 127.15 | 45.00 | 16.81 | 40.29 | 28.55 |
| | 200 | 4.34 | 89.39 | 169.65 | 147.15 | 45.00 | 22.29 | 55.61 | 38.95 |
| 18 | 110 | 1.93 | 37.50 | 79.65 | 61.73 | 35.84 | 3.60 | 5.84 | 4.72 |
| | 120 | 2.16 | 42.21 | 89.65 | 69.48 | 40.34 | 4.57 | 7.50 | 6.04 |
| | 130 | 2.50 | 46.91 | 99.65 | 77.23 | 44.84 | 5.70 | 9.46 | 7.58 |
| | 140 | 2.73 | 52.94 | 109.65 | 87.15 | 45.00 | 6.99 | 11.75 | 9.37 |
| | 150 | 2.96 | 59.02 | 119.65 | 97.15 | 45.00 | 8.44 | 14.41 | 11.42 |
| | 160 | 3.42 | 65.09 | 129.65 | 107.15 | 45.00 | 10.06 | 17.45 | 13.75 |
| | 180 | 3.88 | 77.24 | 149.65 | 127.15 | 45.00 | 13.83 | 24.80 | 19.32 |
| | 200 | 4.34 | 89.39 | 169.65 | 147.15 | 45.00 | 18.32 | 34.07 | 26.20 |

## SPREADER BEAMS & PROPS

Where temporary props are required to either, increase the limited span or to reduce the deflection due to the construction phase the following points should be noted.

a) The spreader beams or timbers should provide a minimum width of 100 mm. The spreader beams or timbers must be of sufficient depth and strength and requires specific design.

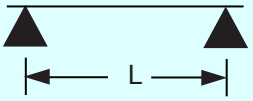
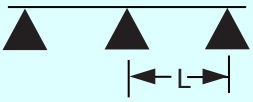
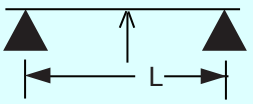
b) The spreader beams and props would normally be placed at the centre of the span and the temporary props evenly spaced to minimise any deflections. Final prop sizes and spacing should be approved by the consulting engineer.

c) The spreader beams and props should not be removed until the concrete has reached at least 70% of the design strength. (Approx 28 days)

d) If temporary props are used and are supported by a lower floor, consideration must be given to the strength and deflection imposed on the floor and structure below.

e) As a guide timber bearers need to be 100 mm wide by 200 mm deep for slab depths up to 160 mm deep and at least 250 : 300 mm deep for slab depths of 220 mm deep.
Timber bearers need to be free of imperfections in grain structure and knots.

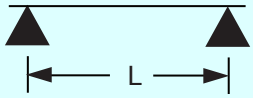
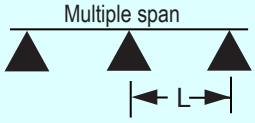
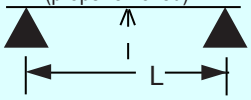
**Concrete Saver-60** Construction tables — **t = 0.75** — Table 12

| Span (n10) Clear span + 100 mm | Props | Slab Depth (mm) | Max Span (m) | Max Defl (mm) | Span (m) | Defl (mm) | Span (m) | Defl (mm) | Span (m) | Defl (mm) | Limit B&C 1.5 | Span Ratio | L/130 (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single span  | | 110 | 3.30 | 26 | 2.90 | 15 | 2.60 | 10 | 2.26 | 5 | | 30.0 | 25 |
| | | 120 | 3.30 | 29 | 2.81 | 15 | 2.55 | 10 | 2.20 | 5 | | 27.5 | 25 |
| | | 130 | 3.20 | 28 | 2.74 | 15 | 2.50 | 10 | 2.15 | 5 | | 24.6 | 25 |
| | | 140 | 3.10 | 26 | 2.70 | 15 | 2.45 | 10 | 2.11 | 5 | | 22.1 | 24 |
| | | 150 | 3.10 | 29 | 2.63 | 15 | 2.40 | 10 | 2.06 | 5 | | 20.7 | 24 |
| | | 160 | 3.00 | 27 | 2.58 | 15 | 2.35 | 10 | 2.03 | 5 | | 18.8 | 23 |
| | | 180 | 2.90 | 27 | 2.50 | 15 | 2.30 | 10 | 1.96 | 5 | | 16.1 | 22 |
| | | 200 | 2.80 | 26 | 2.43 | 15 | 2.22 | 10 | 1.90 | 5 | | 14.0 | 22 |
| Multiple span  | | 110 | 3.50 | 14 | 2.80 | 5 | 2.60 | 4 | 2.40 | 3 | 1.49 | 31.8 | 27 |
| | | 120 | 3.40 | 13 | 2.70 | 5 | 2.50 | 4 | 2.40 | 3 | 1.51 | 28.3 | 26 |
| | | 130 | 3.20 | 11 | 2.60 | 5 | 2.40 | 4 | 2.30 | 3 | 1.45 | 24.6 | 25 |
| | | 140 | 3.10 | 11 | 2.60 | 5 | 2.40 | 4 | 2.20 | 3 | 1.46 | 22.1 | 24 |
| | | 150 | 3.00 | 10 | 2.50 | 5 | 2.40 | 4 | 2.20 | 3 | 1.47 | 20.0 | 23 |
| | | 160 | 2.90 | 10 | 2.40 | 4 | 2.40 | 4 | 2.20 | 3 | 1.46 | 18.1 | 22 |
| | | 180 | 2.70 | 8 | 2.30 | 4 | 2.30 | 4 | 2.10 | 3 | 1.44 | 15.0 | 21 |
| | | 200 | 2.60 | 8 | 2.20 | 4 | 2.20 | 4 | 2.00 | 3 | 1.48 | 13.0 | 20 |
| Single span (propped)  | 1 | 110 | 3.90 | 1.3 | | | | | | | 0.76 | 35.5 | 30 |
| | 1 | 120 | 4.20 | 2.0 | | | | | | | 0.90 | 35.0 | 16 |
| | 1 | 130 | 4.60 | 3.2 | | | | | | | 1.09 | 35.4 | 18 |
| | 1 | 140 | 4.90 | 4.5 | | | | | | | 1.26 | 35.0 | 19 |
| | 1 | 150 | 5.20 | 6.2 | | | | | | | 1.17 | 34.7 | 20 |
| | 1 | 160 | 5.60 | 9.1 | | | | | | | 1.71 | 35.0 | 22 |
| | 1 | 180 | 6.00 | 13.6 | | | | | | | 2.08 | 33.3 | 23 |
| | 2 | 200 | 6.50 | 4.2 | | | | | | | 1.44 | 32.5 | 25 |

** Clear Span + 100mm*

Construction Tables have maximum spans shown in the composite tables when n = 10.

For slabs when n = 18 the deflection of the composite slab limits possible spans to less than those given in the construction table

| Concrete Saver-60 | Composite Span tables | | | | | | | | | t = 0.75 | | Table 13 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Support Condition | | 30 Mpa concrete n=10 | | | | 30 Mpa concrete n=18 | | | | | | | |
| | Slab | Imposed Load (kPa) | | | | Imposed Load (kPa) | | | | | | n=10 | n=18 |
| | Depth | 0 | 3.5 | 5 | 10 | 0 | 3.5 | 5 | 10 | BM | L/300 | Span | Span |
| | (mm) | m | m | m | m | m | m | m | m | kNm | | Ratio | Ratio |
| Single span  | 110 | 3.30 | 3.30 | 3.30 | 2.80 | 3.30 | 3.30 | 3.30 | 2.80 | 17.3 | 11.0 | 30.0 | 30.0 |
| | 120 | 3.30 | 3.30 | 3.30 | 3.10 | 3.30 | 3.30 | 3.30 | 3.10 | 21.5 | 11.0 | 27.5 | 27.5 |
| | 130 | 3.20 | 3.20 | 3.20 | 3.20 | 3.20 | 3.20 | 3.20 | 3.20 | 23.3 | 10.7 | 24.6 | 24.6 |
| | 140 | 3.10 | 3.10 | 3.10 | 3.10 | 3.10 | 3.10 | 3.10 | 3.10 | 22.1 | 10.3 | 22.1 | 22.1 |
| | 150 | 3.10 | 3.10 | 3.10 | 3.10 | 3.10 | 3.10 | 3.10 | 3.10 | 22.5 | 10.3 | 20.7 | 20.7 |
| | 160 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 21.3 | 10.0 | 18.8 | 18.8 |
| | 180 | 2.90 | 2.90 | 2.90 | 2.90 | 2.90 | 2.90 | 2.90 | 2.90 | 20.5 | 9.7 | 16.1 | 16.1 |
| | 200 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 19.7 | 9.3 | 14.0 | 14.0 |
| Multiple span  | 110 | 3.50 | 3.50 | 3.50 | 2.80 | 3.50 | 3.50 | 3.50 | 2.80 | 17.3 | 11.7 | 31.8 | 31.8 |
| | 120 | 3.40 | 3.40 | 3.40 | 3.10 | 3.40 | 3.40 | 3.40 | 3.10 | 21.5 | 11.3 | 28.3 | 28.3 |
| | 130 | 3.20 | 3.20 | 3.20 | 3.20 | 3.20 | 3.20 | 3.20 | 3.20 | 23.3 | 10.7 | 24.6 | 24.6 |
| | 140 | 3.10 | 3.10 | 3.10 | 3.10 | 3.10 | 3.10 | 3.10 | 3.10 | 22.1 | 10.3 | 22.1 | 22.1 |
| | 150 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 21.0 | 10.0 | 20.0 | 20.0 |
| | 160 | 2.90 | 2.90 | 2.90 | 2.90 | 2.90 | 2.90 | 2.90 | 2.90 | 19.9 | 9.7 | 18.1 | 18.1 |
| | 180 | 2.70 | 2.70 | 2.70 | 2.70 | 2.70 | 2.70 | 2.70 | 2.70 | 17.8 | 9.0 | 15.0 | 15.0 |
| | 200 | 2.60 | 2.60 | 2.60 | 2.60 | 2.60 | 2.60 | 2.60 | 2.60 | 16.9 | 8.7 | 13.0 | 13.0 |
| Single span (props removed)  | 110 | 3.90 | 3.50 | 3.30 | 2.80 | 3.80 | 3.70 | 3.60 | 2.80 | 17.3 | 13.0 | 35.5 | 34.5 |
| | 120 | 4.20 | 4.20 | 4.20 | 3.10 | 4.30 | 3.90 | 3.80 | 3.10 | 21.6 | 14.0 | 35.0 | 35.8 |
| | 130 | 4.60 | 4.60 | 4.40 | 3.50 | 4.50 | 4.10 | 4.00 | 3.50 | 28.1 | 15.3 | 35.4 | 34.6 |
| | 140 | 4.90 | 4.90 | 4.70 | 3.70 | 4.70 | 4.30 | 4.20 | 3.70 | 31.9 | 16.3 | 35.0 | 33.6 |
| | 150 | 5.20 | 5.10 | 5.00 | 3.90 | 4.80 | 4.50 | 4.40 | 3.90 | 36.0 | 17.3 | 34.7 | 32.0 |
| | 160 | 5.70 | 5.30 | 5.20 | 4.00 | 5.00 | 4.70 | 4.60 | 4.00 | 38.5 | 19.0 | 35.6 | 31.3 |
| | 180 | 6.00 | 5.80 | 5.70 | 4.40 | 5.30 | 5.10 | 5.00 | 4.40 | 48.1 | 20.0 | 33.3 | 29.4 |
| | 200 | 6.50 | 6.20 | 6.10 | 4.70 | 5.70 | 5.50 | 5.30 | 4.70 | 56.5 | 21.7 | 32.5 | 28.5 |

* clear span + 100 mm

## USING THE CONSTRUCTION & COMPOSITE SPAN TABLES

Both the single span and the multiple span sections of this table are controlled by the span to depth ratio, the span/130 ratio and the calculated deflections.
The multiple span and single span propped section is further controlled by a bending and crushing limit of 1.5.

The single span and multiple span sections provide both a value for the maximum possible span as well as spans of lower deflections.

The single span propped section is controlled by all of the above as well as inputs from the composite span tables. The live loads as indicated in red at the base of this table only apply to the single span propped section. Were the imposed load is 0 the result represents the dead load of the composite slab.

All strength calculations in the Composite Span tables are based on 30 MPa concrete.

The values of Span in this section are further influenced by the deflections imposed by the weight of live load plus dead load. The allowable deflection is a function of Span/300.

A further restraint is the bending moment.
The calculated bending moment must not exceed Moment Capacity, the values of which are shown in the appropriate 'Composite Properties Tables'

To assist a designer in calculations of deflection due to long term loading, properties of the composite slab using a modular ratio of 18 are shown along side the modular ratio of 10.

Deflection calculations in the composite tables are based on a modular ratio of 10.

The composite span tables do not allow for permanent loads like services, ceilings, finishes and partitions.