KingFlor® KF40®

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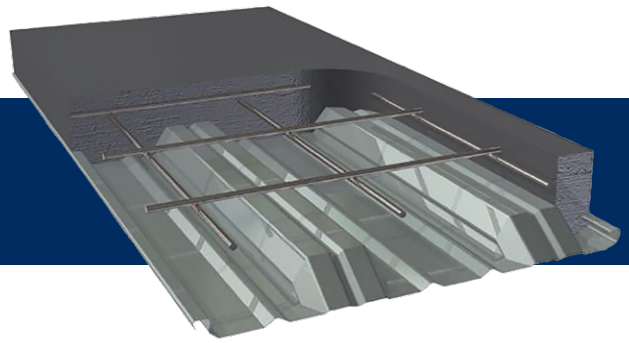
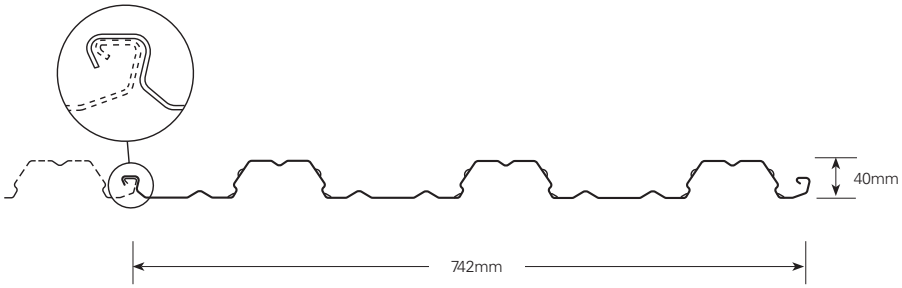


Fielders KingFlor® KF40® is a revolutionary steel formwork solution suitable for concrete slabs in all types of construction. KF40® combines the performance of a traditional flat pan profile with the unmatched economy and concrete saving of a trapezoidal deck.



Features and Benefits

Feature	Benefit
SquashCut™ ends	No end caps needed. Also provides rigid and secure platform during construction.
Unique off-set lap	Enables shear studs to be placed centrally in the pan in the optimal position.
Unique profile	Concrete savings up to 40kg/m^2 (16mm off slab depth).
Lower 40mm height	Suitable for post-tensioning ducts.
Wide 742mm cover	Economical deck.
Strong re-entrant features	KF40® has been specifically designed to provide a strong and reliable shear bond performance giving strong composite slabs.

Concrete Savings

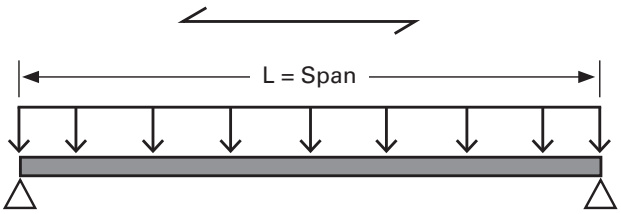
KF40® saves the equivalent of 16mm of concrete from the overall slab depth by concrete volume when compared to conventional concrete slabs. This represents a significant saving in concrete costs, supporting framework and foundation loads.

KF40® Material Specifications

KF40® is manufactured from G550 (550 MPa Yield Stress) steel in a 3-PAN profile with a Base Metal Thickness (BMT) of 0.75mm and 1.00mm. The galvanised coating thickness is a Z350 (350 g/m^2) in accordance with AS 1397:2001.

Material Properties	0.75 BMT	1.00 BMT
Mass Area – Average mass of 3-PAN deck per plan area (kg/m^2)	8.35	10.97
Mass Linear – Mass of individual 3-PAN length (kg/m)	6.19	8.14
Zinc Coating (g/m^2) (Z350)	350	350
Yield Strength (MPa)	550	550

KF40® 3-Pan Formwork/Slab Span Tables
Single Span



Single Slab Span (L) on Steel support

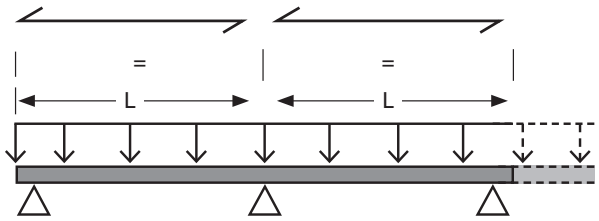
Formwork deflection limits L/130 and L/240

Slab Depth (mm)	L/130 0.75 BMT Number of props per span				L/130 1.0 BMT Number of props per span				L/240 0.75 BMT Number of props per span				L/240 1.0 BMT Number of props per span			
	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
90	2250	[5900]	[8250]	[11250]	2450	[6450]	[9000]	[12300]	1850	[5000]	[6900]	[9450]	2050	[5450]	[7600]	[10300]
100	2150	[5700]	[8000]	[10900]	2350	[6250]	[8700]	[11900]	1750	[4800]	[6700]	[9100]	1950	[5250]	[7300]	[9950]
110	2100	[5550]	[7750]	[10550]	2300	[6100]	[8500]	[11550]	1700	[4650]	[6450]	[8800]	1900	[5100]	[7100]	[9650]
120	2050	[5400]	[7550]	[10250]	2250	[5950]	[8250]	[11250]	1650	[4550]	[6300]	[8550]	1800	[4950]	[6900]	[9400]
130	2000	[5300]	[7350]	[10000]	2150	[5800]	[8050]	[11000]	1600	4400	[6100]	[8300]	1750	[4850]	[6700]	[9100]
140	1950	[5150]	[7200]	[9750]	2100	[5650]	[7850]	[10700]	1550	4300	[5950]	[8100]	1700	4700	[6550]	[8900]
150	1900	5000	[7000]	[9550]	2050	[5550]	[7700]	[10500]	1500	4200	[5800]	[7900]	1650	4600	[6400]	[8700]
160	1850	4900	[6850]	[9350]	2050	5450	[7550]	[10250]	1450	4100	[5700]	[7750]	1650	4500	[6250]	[8500]
170	1800	4800	[6750]	[9200]	2000	5300	[7400]	[10050]	1400	4000	5550	[7600]	1600	4400	[6100]	[8350]
180	1750	4700	[6600]	[9000]	1950	5200	[7250]	[9900]	1400	3950	5500	[7450]	1550	4300	6000	[8150]
190	1700	4650	6500	[8850]	1900	5150	[7150]	[9700]	1350	3850	5400	[7300]	1500	4250	5900	[8000]
200	1650	4550	6400	[8700]	1900	5050	[7000]	[9550]	1300	3800	5300	[7200]	1500	4150	5800	[7900]
210	1650	4450	6300	[8550]	1850	4950	6900	[9400]	1300	3750	5200	7100	1450	4100	5700	[7750]
220	1600	4400	6200	[8450]	1800	4900	6800	[9250]	1250	3700	5100	6950	1400	4050	5600	7600
230	1600	4300	6100	[8300]	1750	4850	6700	[9150]	1250	3600	5050	6850	1400	4000	5500	7500
240	1550	4250	6000	8200	1750	4800	6600	[9000]	1250	3550	4950	6750	1350	3900	5450	7400
250	1550	4200	5950	8100	1700	4700	6550	[8900]	1200	3500	4850	6650	1350	3850	5400	7350
260	1500	4150	5850	8000	1700	4650	6450	8800	1200	3450	4800	6600	1350	3800	5300	7250
280	1450	4000	5700	7800	1650	4550	6300	8550	1150	3400	4700	6400	1300	3700	5200	7050
300	1400	3900	5600	7600	1600	4400	6150	8350	1150	3300	4600	6250	1250	3650	5050	6900
320	1400	3800	5500	7450	1550	4350	6000	8200	1100	3250	4500	6100	1250	3550	4950	6750
340	1350	3700	5400	7350	1550	4250	5900	8050	1050	3150	4400	6000	1200	3500	4800	6600

Notes:

1. Concrete density: 24kN/m³.
2. KF40® strength and serviceability capacities are based on full scale test results.
3. An additional concrete weight due to ponding of (0.7x deflection limit) 24.0kN/m³ has been considered for Strength and serviceability limit states.
4. The spans in the above table include a minimum bearing width of 50mm on each end support.
5. Supports shall be effectively rigid and strong to support construction loads.
6. The information contained in this publication is intended for guidance only. This information should only be use by a qualified structural engineer.
7. The practical limit for span to slab depth ratio is considered to be 35 for single spans, 40 for continuous spans. Values above these limits are listed in [ ] brackets.
8. The spans in the tables are based on the condition that KF40® sheets are fully restrained in the direction perpendicular to the sheet span.
9. Tables are based on the following maximum construction loads:
   - Workmen and equipment: 1kN/m²
   - Mounting of concrete: 2kN/m² over an area of 1.6m x 1.6m and zero on the rest of the area
   - Stacking of material on KF40® before placement of concrete: 1kN/m²
   - The table does not consider axial loads on the product
   - Allowance for weight of reinforcement as well as the effect of ponding is included

KF40® 3-Pan Formwork/Slab Span Tables
Continuous Span



Continuous: 3 spans (L) on steel support

Formwork deflection limits L/130 and L/240

Slab Depth (mm)	L/130 0.75 BMT Number of props per span				L/130 1.0 BMT Number of props per span				L/240 0.75 BMT Number of props per span				L/240 1.0 BMT Number of props per span			
	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
90	2750	[5600]	[8400]	[11200]	3000	[6100]	[9150]	[12250]	2300	[4700]	[7050]	[9400]	2500	[5150]	[7700]	[10300]
100	2650	[5400]	[8100]	[10850]	2900	[5900]	[8850]	[11800]	2200	[4500]	[6800]	[9050]	2400	[4950]	[7450]	[9900]
110	2550	[5250]	[7850]	[10500]	2800	[5750]	[8600]	[11500]	2150	4350	[6550]	[8750]	2350	[4800]	[7200]	[9600]
120	2500	[5100]	[7650]	[10200]	2750	[5600]	[8400]	[11200]	2100	4250	[6400]	[8500]	2250	4650	[7000]	[9350]
130	2450	4950	[7450]	[9950]	2650	[5450]	[8200]	[10900]	2000	4150	[6200]	[8300]	2200	4550	[6800]	[9100]
140	2350	4850	[7300]	[9750]	2600	5350	[8000]	[10650]	1950	4000	[6050]	[8050]	2150	4400	[6650]	[8850]
150	2300	4750	[7150]	[9500]	2550	5200	[7800]	[10450]	1900	3950	5900	[7900]	2100	4300	[6500]	[8650]
160	2250	4650	[7000]	[9300]	2500	5100	[7650]	[10200]	1850	3850	5750	[7700]	2050	4200	6350	[8450]
170	2250	4550	[6850]	[9150]	2450	5000	[7500]	[10000]	1850	3750	5650	[7550]	2000	4150	6200	[8300]
180	2200	4500	6750	[9000]	2400	4900	[7350]	[9850]	1800	3700	5550	[7400]	2000	4050	6100	[8150]
190	2150	4400	6600	[8800]	2350	4850	7250	[9700]	1800	3650	5450	7300	1950	4000	6000	[8000]
200	2100	4350	6500	[8650]	2300	4750	7150	[9500]	1750	3550	5350	7150	1900	3900	5900	7850
210	2100	4250	6400	[8550]	2300	4650	7000	[9350]	1700	3500	5300	7050	1900	3850	5800	7700
220	2050	4200	6300	8400	2250	4600	6900	[9250]	1700	3450	5200	6950	1850	3800	5700	7600
230	2000	4150	6200	8300	2200	4550	6800	9100	1650	3400	5100	6850	1850	3750	5600	7500
240	2000	4050	6100	8150	2200	4450	6700	8950	1650	3350	5050	6750	1800	3700	5500	7350
250	1950	4000	6050	8050	2150	4400	6650	8850	1600	3300	4950	6650	1800	3650	5450	7300
260	1950	3950	5950	7950	2150	4350	6550	8750	1600	3250	4900	6500	1750	3600	5400	7200
280	1900	3850	5800	7750	2100	4250	6400	8550	1550	3150	4750	6350	1700	3500	5250	7000
300	1850	3800	5700	7600	2050	4150	6250	8350	1500	3100	4650	6200	1650	3400	5150	6850
320	1800	3700	5550	7400	2000	4050	6100	8150	1500	3050	4550	6100	1600	3350	5050	6700
340	1800	3650	5450	7300	1950	4000	6000	8000	1450	2950	4450	5950	1600	3250	4900	6550
360	1750	3550	5350	7150	1900	3900	5900	7850	1450	2900	4350	5850	1550	3200	4800	6400
380	1700	3500	5250	7050	1850	3850	5750	7700	1400	2850	4300	5750	1550	3150	4700	6300
400	1700	3400	5100	6800	1850	3800	5650	7600	1350	2850	4250	5700	1500	3100	4650	6200

Notes:

1. Concrete density: 24kN/m³.
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8. The spans in the tables are based on the condition that KF40® sheets are fully restrained in the direction perpendicular to the sheet span.
9. Tables are based on the following maximum construction loads:
   - Workmen and equipment: 1kN/m²
   - Mounting of concrete: 2kN/m² over an area of 1.6m x 1.6m and zero on the rest of the area
   - Stacking of material on KF40® before placement of concrete: 1kN/m²
   - The table does not consider axial loads on the product
   - Allowance for weight of reinforcement as well as the effect of ponding is included

KF40® Pre-stressed / Post-tensioned Slabs

KF40® can be adopted as permanent formwork and composite reinforcement in the design and construction of post-tensioned composite slabs.

The shallow overall depth of the KF40® profile allows post-tensioning tendons to be draped in the spanning and transverse directions of the slab without clashes.

The primary post-tensioning tendons draped parallel to the spanning direction of the KF40® slab are located centrally between ribs at the cover specified in Tables 2A, 2B and 2C to achieve the required FRL.

The minimum recommended post-tensioned slab thickness is 160mm to allow tendons to be draped and pre-stressing anchorages to fit within the slab depth without causing horizontal splitting.

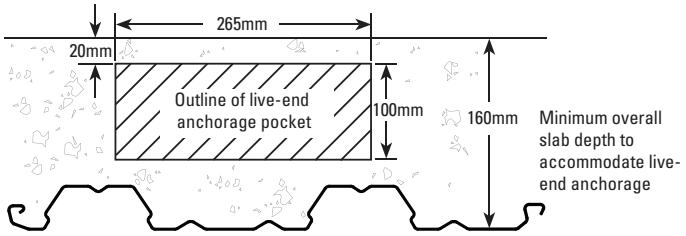


FIGURE 1: Fitting a Typical Live-End Anchorage in a Composite Slab Incorporating KF40®
Note: Anti-bursting reinforcement can be supported off lap ribs, which ideally are only 20mm high and allow concrete aggregate to pass around the reinforcing bars as necessary.

Locating Longitudinal Tendons

The location of the post-tension tendon for KF40® slabs are determined in order to not exceed the limiting steel temperatures of 450°C (simply supported), 520°C (flat slab) and 650°C (continuous) to ensure consistency with the current version of AS 3600:2018.

For the case of tendons having parallel orientation to the deck it is assumed that the tendon is located centrally between two KF40® ribs. This gives a distance from the centreline of the rib to the edge of the tendon of 85mm. The required distances from the heated soffit to the bottom of the tendon have been determined using TASEF-2 analyses previously undertaken for KF40®.

The slab thickness has been assumed to be 160mm but the results can be considered to be applicable to the range of practical post-tensioned concrete slabs.

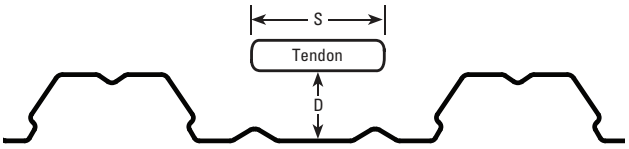


FIGURE 2: Distances to the Prestressing Tendon.

Table 2A: Minimum Distance (D) to Underside of Tendon from Soffit (S = 45mm)

FRL	Simply Supported (mm)	Continuous (mm)	Flat Slabs (mm)
120	47	25	36
180	67	35	55
240	83	47	70

Table 2B: Minimum Distance (D) to Underside of Tendon from Soffit (S = 70mm)

FRL	Simply Supported (mm)	Continuous (mm)	Flat Slabs (mm)
120	49	25	38
180	69	37	58
240	84	49	73

Table 2C: Minimum Distance (D) to Underside of Tendon from Soffit (S = 90mm)

FRL	Simply Supported (mm)	Continuous (mm)	Flat Slabs (mm)
120	53	25	42
180	71	38	60
240	85	50	75

Locating Transverse Tendons

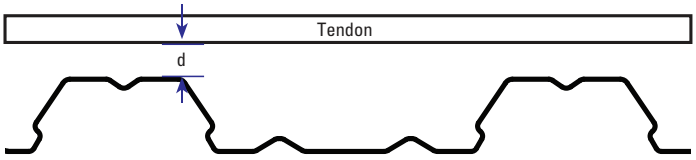


FIGURE 3: Distance between Top of Rib and underside of Tendon

Table 3: Minimum Distance between Top of Rib and underside of Tendon

FRL	Simply Supported (mm)	Continuous (mm)	Flat Slabs (mm)
120	40	22	33
180	53	31	44
240	65	38	56

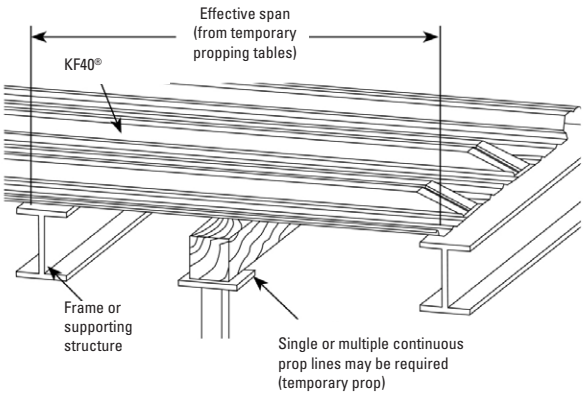
Installing KingFlor® KF40®

Temporary Propping

If temporary propping is required (refer to the temporary propping tables), props should be placed at the correct centres prior to laying the KF40® sheets. Generally, timber or steel bearers with a minimum dimension of 75mm x 75mm are used on vertical props. The props should be installed so as to prevent settlement during loading by wet concrete and other construction loads.

300mm wide ply strips to be positioned above the header bearers to assist in dispersing the load and minimise any local deformation of the decking due to the headers.

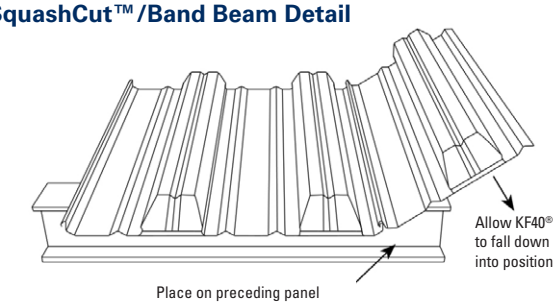
Temporary props should only be removed after the slab has reached sufficient strength (at least 75% of the specified 28 day strength). The full design load may only be applied once the slab has achieved 28-day strength.

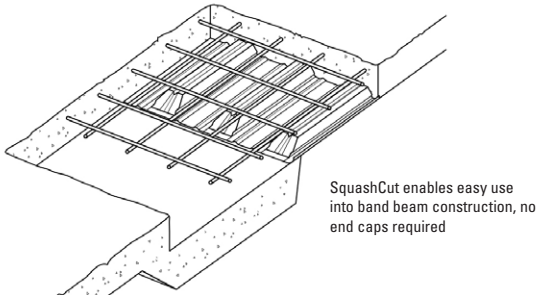


Laying KF40®

1. Place the KF40® sheet over the supports ensuring a minimum end bearing of 50mm. If supporting on a brick or masonry wall, provide a separating strip such as malthoid.
2. Engage subsequent sheets of KF40® by locking the larger female rib over the male rib as shown in the diagram below. No crimping is required in this situation.

SquashCut™ /Band Beam Detail



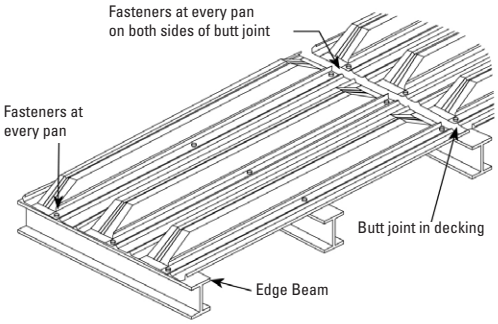


Fastener Locations

The decking must be positively fixed to the supporting structure in order to avoid movement and excessive deflection during the pouring of concrete.

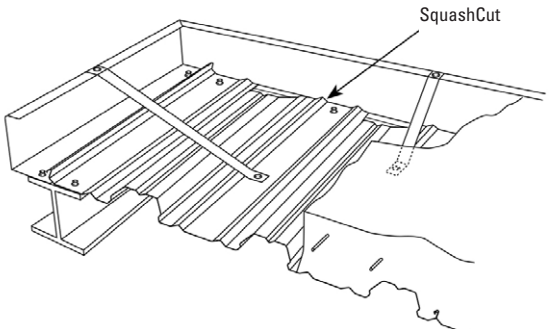
When fixing to a steel support structure, shot fired pins or self-drilling/tapping fasteners should be used. Provide one fastener in each pan at every support.

In the case of other support systems, such as brickwork, block work and concrete, the KF40® sheets must be temporarily held in place against wind and other effects until the concrete is poured.



Edge-form

Galvanised steel edge-forms can be used for the retention of wet concrete to the correct level at the decked floor perimeters. KF40® edge-form is usually shot-fired to the steel support structure or to the KF40® deck and the top of the edge-form is connected back to the decking with restraint straps at approximately 600mm centres using either pop-rivets or self-drilling screws.



Reinforcement

Place all reinforcement in strict accordance with the structural engineer's drawings and specification.

Concrete Placement

The specified grade of concrete and any chemical admixtures must be in strict accordance with AS 3600:2018 and the structural engineer's drawings and specification. The deck must be clear of any excess dirt, grease or debris as this inhibits bonding between the deck and concrete.

Ensure that concrete is applied evenly over the decking surface, as mounding of the wet concrete will cause excessive local loading.

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