SPECIFYING FIELDERS

Second Edition

FIELDERS

FINISH ON TOP WITH FIELDERS

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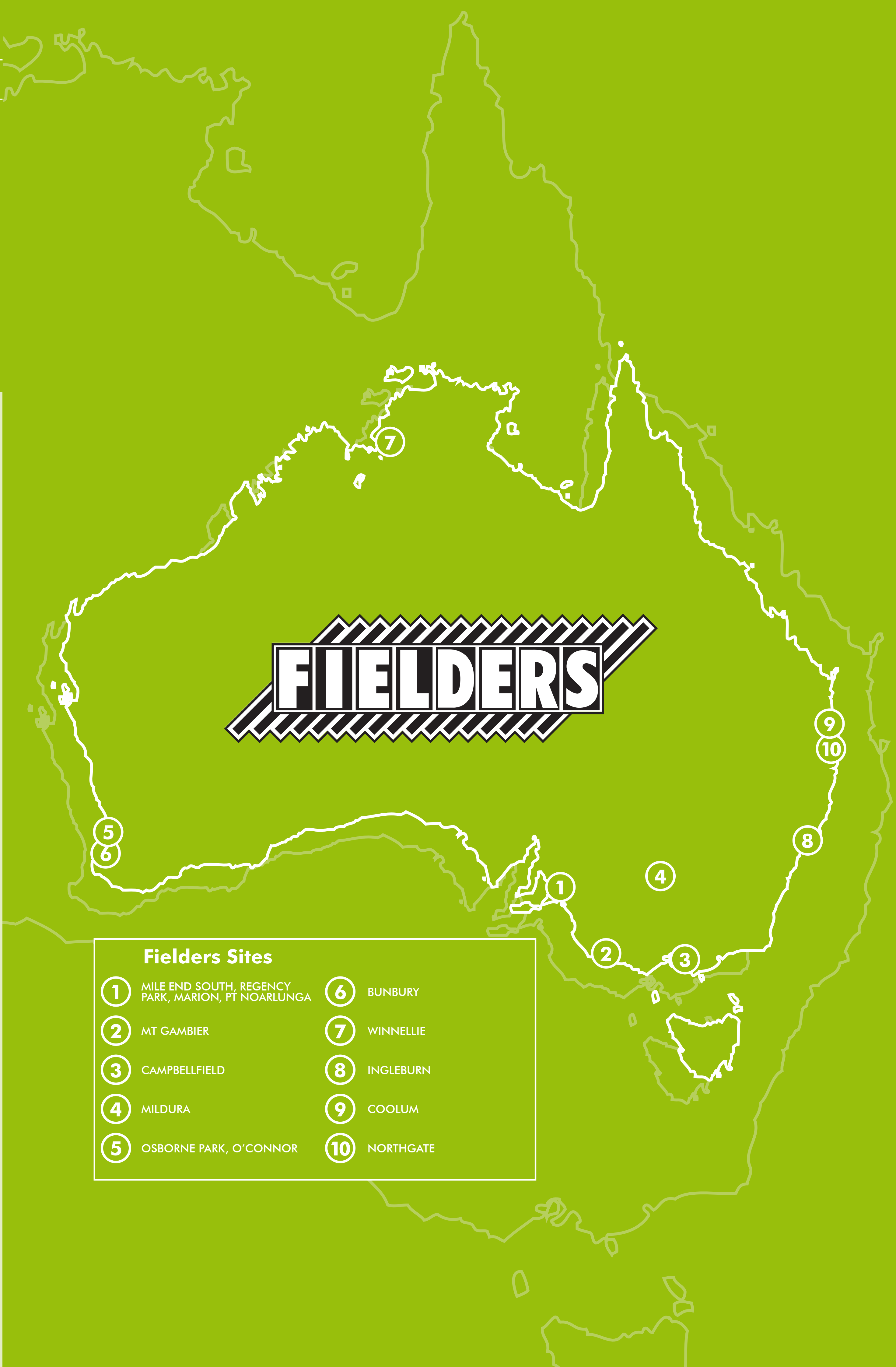
The information contained within this document is subject to change as Fielders is constantly improving its products. Contact Fielders to confirm this data is current.

Revision 2007.07.31



Fielders Sites

1	MILE END SOUTH, REGENCY PARK, MARION, PT NOARLUNGA	6	BUNBURY
2	MT GAMBIER	7	WINNELLIE
3	CAMPBELLFIELD	8	INGLEBURN
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SPECIFYING FIELDERS

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Adelaide ■ Melbourne ■ Sydney ■ Brisbane ■ Perth ■ Darwin

Freecall: 1800 182 255 ■ Fax: (08) 8292 3678 ■ Email: info@fielders.com.au ■ Web: www.fielders.com.au

1.0 Introduction

1.0 Introduction

1.1 Company Profile

Fielders have been synonymous with quality and strength for over 100 years in an industry where success is reliant on client satisfaction. Initially providing roofing materials, the company has now extended its product range and reach across Australia to include purlins, door frames, carports & verandahs, fencing and flooring. This ensures comprehensive product offerings and support for all aspects of building construction. Utilising our progressive culture, specialised resources and market leading position, Fielders is famous for our avant-garde approach to manufacturing and installation. We are the only company to have introduced eight Mobile Roofing Mills, three new concealed fix roofing profiles and five KingFlor formwork systems in the past ten years.

Being at the forefront of international roofing and flooring standards, we have attracted the loyalty of many architects, engineers, roofers, formworkers and builders who have experienced the benefits of the reduced logistical, labour and time expenditures Fielders products afford them. With these and many other new developments, Fielders will continuously strive for growth through superior products, convenience, quality and service. With Fielders, you will always "Finish On Top".

1.2 Scope of Manual

This "Specifying Fielders - KingFlor" manual is intended as a guide for the selection design and installation of the Fielders KingFlor range while also providing details for the selection of KingFlor accessories manufactured by Fielders and others. This manual serves as a reference to assist in the specification of Fielders products for all personnel involved with steel formwork, from engineers to formworkers and builders. By following the guidelines in this manual a cost effective and safe flooring design can be achieved.

The information in this document deals specifically with the broad range of products available from Fielders and is not intended for use with alternative products.

1.3 Guarantees & Warranties

BlueScope Steel offers a warranty of up to 15 years* from the date of installation against perforation by natural degradation, when used within the building envelope (not exposed to natural environment). It is applicable to building applications located greater than 1km from severe marine or industrial environments only, and applies to the following products when used in KingFlor applications:

- DECKFORM® Z350 steel - 10 years maximum
- DECKFORM® Z450 steel - 15 years maximum

In conjunction with the warranty provided by BlueScope Steel, Fielders provide a 10 year Structural Performance Guarantee. Refer to the KingFlor Structural Performance Guarantee application form for further details and conditions, available from Fielders or downloadable from www.fielders.com.au.

1.4 Disclaimer

Any person who uses the "Specifying Fielders- KingFlor" manual acknowledges that the use of this manual is only permitted by Fielders on the basis that the provisions of this disclaimer apply.

Care has been taken to ensure the information in the KingFlor Design Manual is accurate, however Fielders does not accept responsibility for its use, or for errors due to misinterpretation by the user. The manual, associated programs, data files and documentation are the property of Fielders. Reproduction of any kind, in whole or in part in any form, without prior written consent is strictly prohibited.

To the maximum extent permissible by law, all conditions, warranties, guarantees and representations on the part of Fielders are expressly excluded. Fielders liability for any claim arising out of the use of this manual is limited to the re-supply of material. Under no circumstances shall Fielders be liable for any consequential or indirect losses.

If the user is not a qualified expert, it is recommended that the user obtain qualified expert advice when seeking confirmation on product application. The KingFlor Design Manual has been produced for use by practising architects and engineers as a design aid. Responsibility for the interpretation and application of the data lies entirely with the architect, engineer, contractor or builder.

Data and information is only applicable to products manufactured or supplied by Fielders and are not applicable for other manufacturers' and suppliers' products which may differ in grade, size, gauge, chemical composition, tolerances, conformance to relevant standards and mechanical properties.

The product range manufactured and supplied by Fielders may change without notice.

Queries relating to the information contained in this manual should be directed to Fielders.

★ **Warranty requests are evaluated on a case-by-case basis. BlueScope Steel reserves the right to determine the warranty period given. All BlueScope Steel warranties are subject to terms and conditions, which are available from Fielders or from BlueScope Steel.**

1.5 Testing

To ensure outcomes predicted were achieved in practice, all profiles have undergone extensive testing at various universities in Australia and around the world, including the Universities of Adelaide and Western Sydney, Universities in the UK and New Zealand. This data has been used as the design basis for the tables in this manual and in the KingFlor Designer Suite software package.

1.6 Trademarks

BlueScope® and DECKFORM® are registered trademarks of BlueScope Steel Limited. Sigma EP Universal Primer® and Sigma Cover Miocoat® are registered trademarks of Wattyl. CP620™, CP680™ and CP680-N™ are trademarks of Hilti.

KingFlor®, KF70®, KF40®, KF57®, and RF55® are registered trademarks of Fielders Australia Pty Ltd. KingSlab™, KingFire™ and KingBeam™ are trademarks of Fielders Australia Pty Ltd.

All other trade marks are properties of their respective owners.

2.0 Design Data

2.0 Design Data

2.1 About KingFlor®

Fielders lead the industry with the largest range of composite steel formwork solutions in Australia. The KingFlor range of products suit both steel and concrete frame construction and provide the most economical design for your concrete slab.

KingFlor forms a composite slab, which consists of the profiled steel KingFlor decking and an in-situ reinforced concrete slab. KingFlor not only acts as permanent formwork for the concrete, but also provides sufficient shear bond with the concrete so that when the concrete has gained strength, the two materials act together compositely and reduce the requirement for additional bottom reinforcement.

Profile Types

The KingFlor range of profiles can be separated into two groups: re-entrant profiles (KF57 & RF55) and trapezoidal profiles (KF40 & KF70)

Re-entrant Profiles

- Easy to lay profile
- Closed, embedded rib contributes to Fire Emergency Reinforcing
- Flat soffit appearance
- Unpropped spans of up to 3m

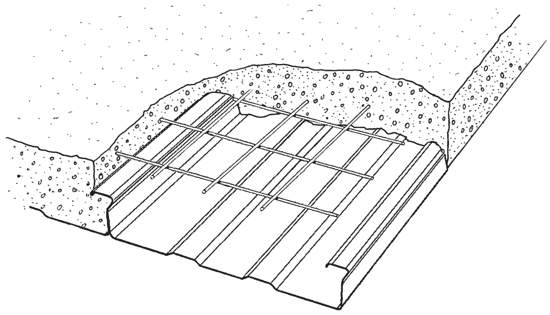


Figure 2.1.A KF57® Re-entrant profile

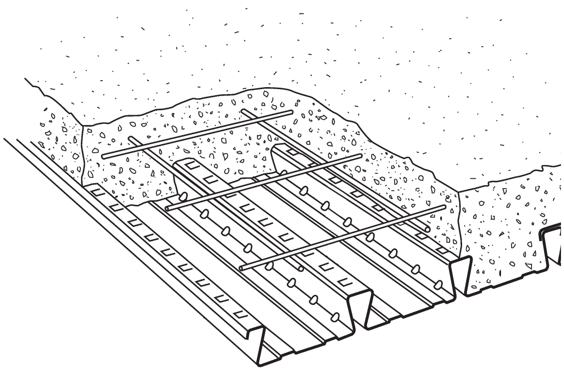


Figure 2.1.B RF55® Re-entrant profile

Trapezoidal Profiles

- Unpropped spans of up to 3.5m
- Open ribs with a more even distribution of steel provides a stiffer profile
- Provide concrete savings of up to 65kg/m² of floor
- SquashCut ends

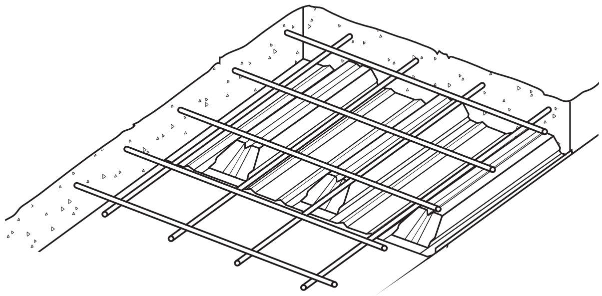


Figure 2.1.C KF40® Trapezoidal deck

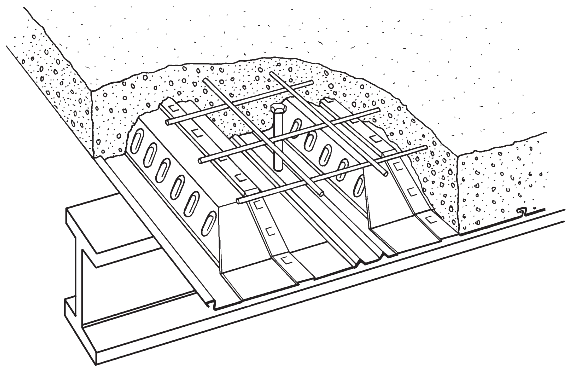


Figure 2.1.D KF70® Trapezoidal deck

Applications and Features of KingFlor®					
Features	**KF57®**	**RF55®**	**KF40®**	**KF70®**	
Utilisation in composite beam design	✓	✓	✓	✓	
Reduced floor to floor height	-	-	-	-	
Reduction in propping	✓	✓	✓	✓✓	
Use in domestic applications	✓✓	✓✓	✓✓	✓	
Use in commercial applications	✓	✓	✓✓	✓✓	
Fire rated slabs	✓✓	✓	✓	✓	
Use in concrete frame	✓	✓	✓✓	✓	
Acoustic performance	✓✓	✓✓	✓	✓	
Use in post-tensioned slabs	✓✓	✓	✓✓	✓	
Service hangers	-	✓	-	✓	
SquashCut ends	-	-	✓	✓	

Table 2.1.A Indicative Applications & Features of the KingFlor Range Features & Applications

Applications and Features of KingFlor®

Each KingFlor profile possesses its own unique features to suit various building requirements, such as flat soffits for ceiling aesthetics (KF57) or SquashCut ends for ease of construction (KF40 and KF70). Table 2.1.A provides a guidance on the main features of each KingFlor profile and is to assist designers to select the most appropriate profile. Your local Fielders representative is aware of the specific properties of each deck and will assist in the selection of the most appropriate KingFlor profile.

Dilemmas of Ply

- Labour intensive
- OH & S and Union issues - heavy use of on-site labour delays building programs and lifts on-site costs.

Advantages of KingFlor®

The traditional form of constructing concrete slabs involves ply formwork being used as a base for the slab. The reinforcement is laid over the ply prior to concrete being poured. Once the concrete has cured the ply is then removed. KingFlor is a permanent formwork solution that saves time and reduces steel reinforcing costs.

Using KingFlor has the following advantages over ply formwork:

- Cost savings in materials and labour
- Greater safety
- Speed of installation
- KingFlor removes the need for traditional bottom face reinforcement in many applications.

Cost Savings

The cost comparison figure 2.1.F shows that KF70 and KF57 provide superior savings compared to insitu methods due to reduced labour and material usage.

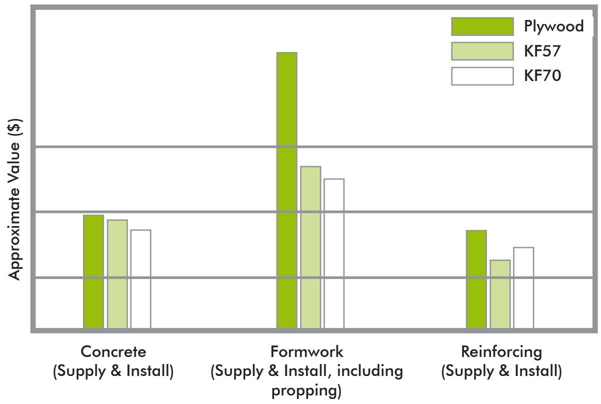


Figure 2.1.F Comparative Costs Note

Note: Graphics are based on actual figures of a typical 8.4m grid, concrete band beam and formed slab configuration.

Safety and Speed

Normally, safety rails or mesh must be installed around penetrations for services until these are fitted. This can be a time consuming and costly exercise. With KingFlor, this is not necessary. The decking is laid over the penetration and the concrete is simply blocked out, refer to figure 2.1.G. Depending on the penetration size, additional reinforcement or trimmer beams can be installed around the opening to satisfy the in-service loading condition.

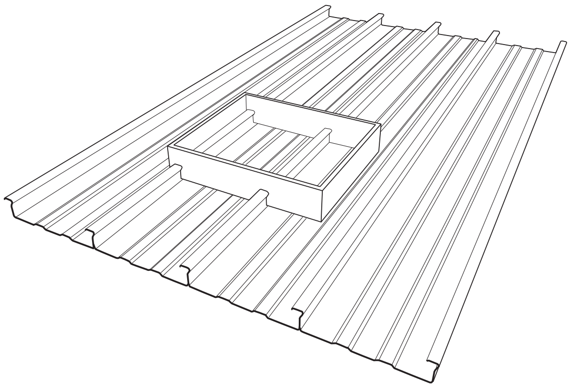


Figure 2.1.G Penetrations

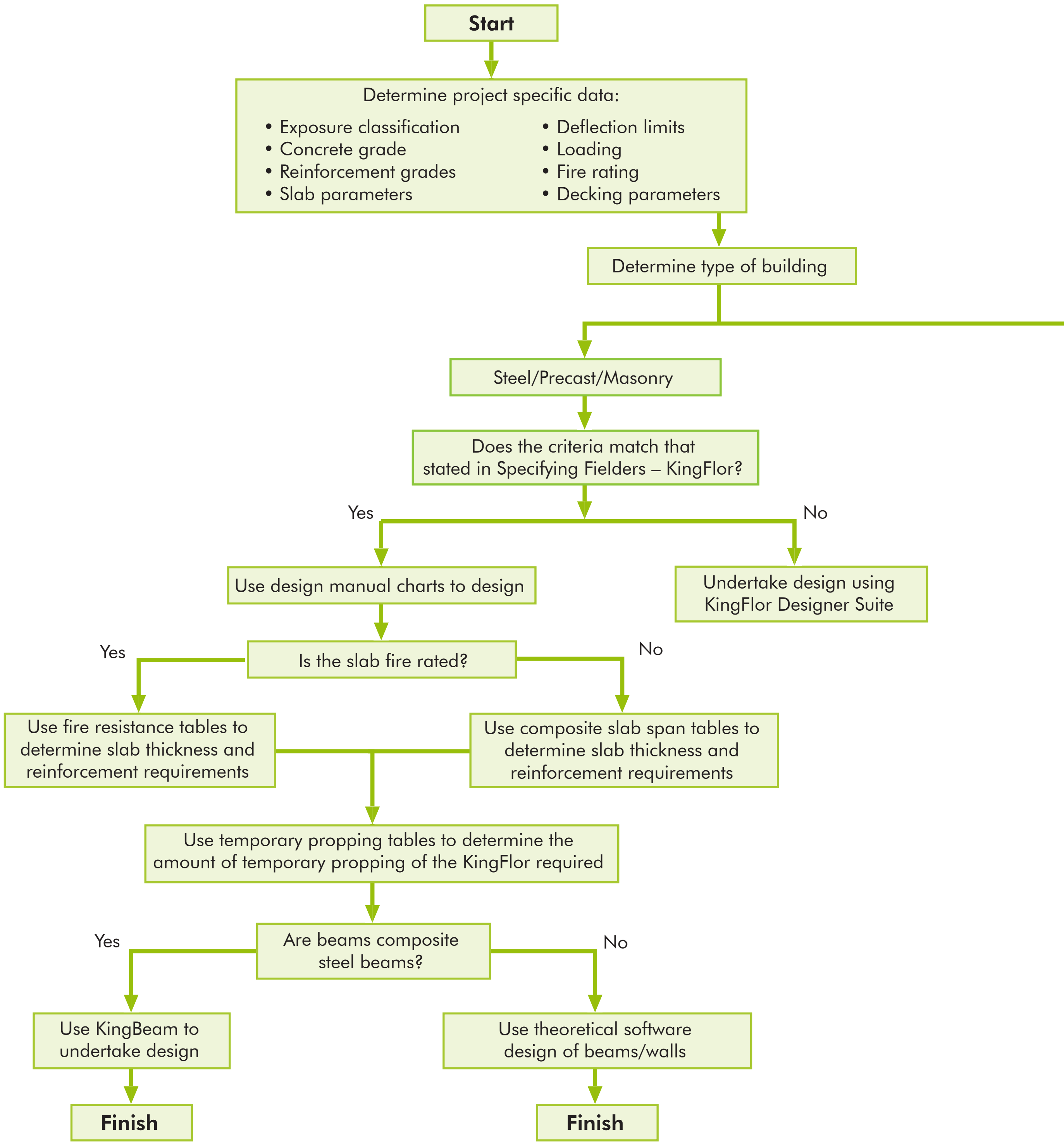
KingFlor composite steel frames allow for unpropped construction, which saves labour and hire costs. The absence of propping allows the builder to start fit-out of the floor immediately below the floor that has just been concreted, without having to wait up to 21 days for the back props to be removed.

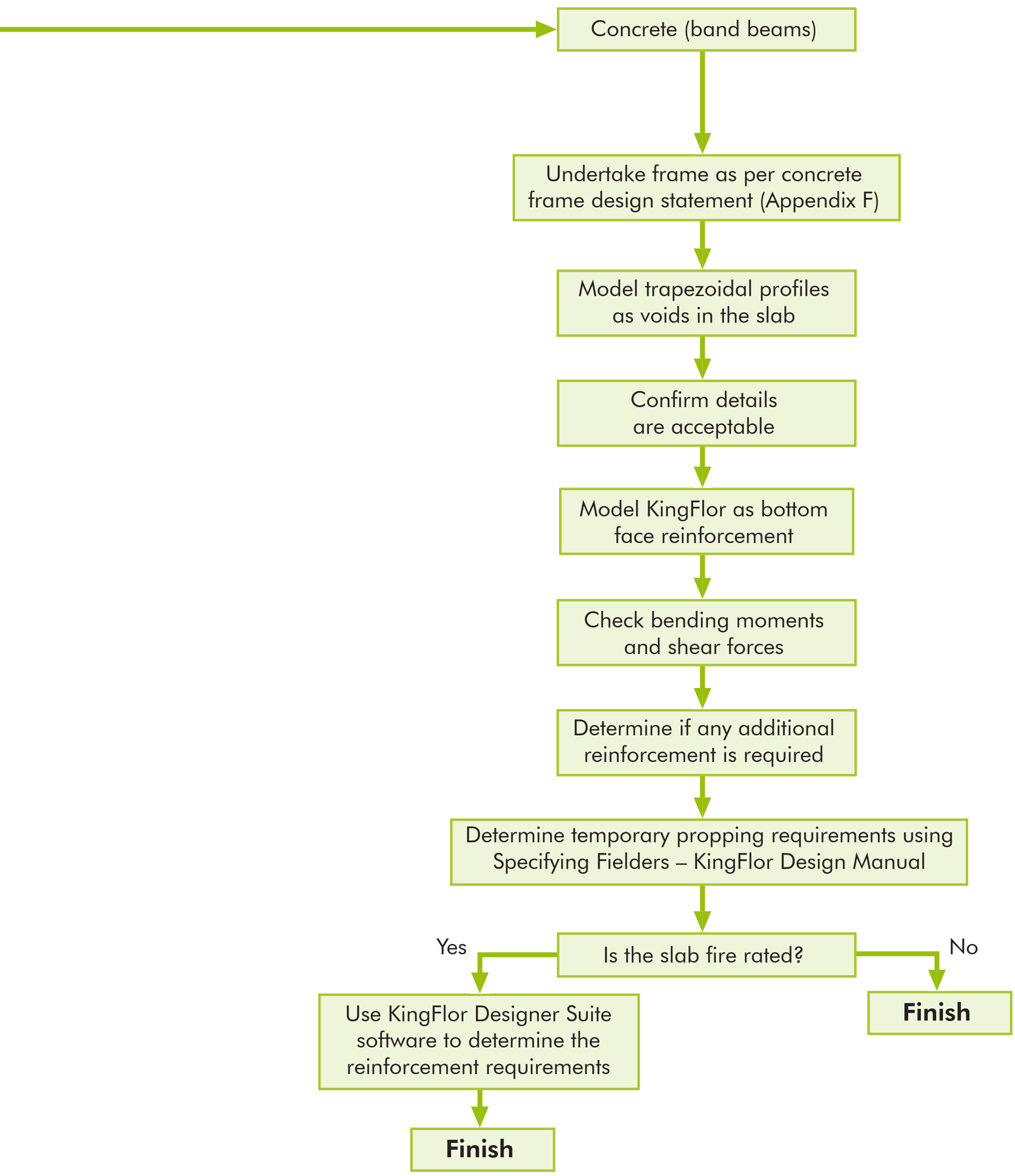
2.2 The Use of Australian Standards

There is currently no Australian Standard that covers the design of composite slabs and currently there is no work being undertaken to create such a code. AS 2327.1:2003 considers the geometry of the sheeting and the location of the shear studs for re-entrant profiles only. In the past AS 3600: 2001 – Section 8.5 Deflection of Beams has been used, however it was never the intent of the Standards Committee for AS 3600: 2001 to be used for composite slab design. AS 3600: 2001 considers symmetrically reinforced sections with uniform curing from both the top and the bottom of the slab. However, with composite slabs it is common for the slabs to be asymmetrically reinforced with the majority of the reinforcement in the bottom face, and the nature of the steel decking does not allow for uniform curing of the slab. As such Fielders has decided to use the deflection criteria as stated in AS 3600:1994 rather than the 2001 version as this more accurately models the actual deflection experienced in the field. Fielders are currently undertaking research to determine the most appropriate design procedure to be used for deflection calculation.

If you have any questions or require any further information on this topic please contact your local Fielders representative.

2.3 Design Flow Chart for KF57® RF55®, KF40®, and KF70®




Concrete (band beams)
Undertake frame as per concrete frame design statement (Appendix F)
Model trapezoidal profiles as voids in the slab
Confirm details are acceptable
Model KingFlor as bottom face reinforcement
Check bending moments and shear forces
Determine if any additional reinforcement is required
Determine temporary propping requirements using Specifying Fielders – KingFlor Design Manual
Is the slab fire rated?
Yes
Use KingFlor Designer Suite software to determine the reinforcement requirements
Finish
No
Finish

2.4 Good Practice Guide for KingFlor® Steel Decking

The specifications for KingFlor provided below are also available from the Fielders website: www.fielders.com.au.

KingFlor Specification

Fielders offer a KingFlor specification and KingFlor drawing notes that can be used in conjunction with the project specification and notes. Electronic copies are available for download at www.fielders.com.au.

a. Products

1.1 Material Specifications

See the relevant product sections for detailed material specifications.

b. Execution

b.1 Storage and Handling

Panels are to be delivered to the building site or specified storage area, in strapped bundles. If not required for immediate use, bundles should be neatly stacked clear of the ground with a fall for drainage and protected by waterproof covers. Do not allow rain or condensation to be trapped between panels.

To minimise damage to the sheets, break open bundles of KingFlor only when installation is due to commence. Check to ensure that any temporary supports required are in place prior to installing the decking.

When lifting, it is recommended that an appropriate beam with several lifting points and carefully located and packed slings, be used. Unprotected chain slings can damage the bundle during lifting. When synthetic slings are used there is a risk of severing them on the edges of the decking sheets.

If timber packers are used, they should be secured to the bundle before lifting so that when the slings are released they do not fall to the ground. Bundles must never be lifted using the metal banding.

b.2 Cutting

Panels are supplied at the required lengths to minimise on-site cutting. Where necessary, panels can be cut using a power saw with an abrasive disc or a metal cutting friction blade. When cutting, panels should be turned over with the ribs downwards. Where holes are to be cut for pipes etc, the use of a hole saw is recommended.

b.3 Propping

Provide temporary propping during concrete placing and curing in accordance with the engineers' drawings.

One at a time, all shores to complete floors should be first loosened and then tightened to ensure equal loads in all props before casting of the next floor over. Repeat this process for each floor to be cast.

Propping generally consists of substantial timber or steel bearers supported by a line of props, adjusted to prevent settlement of the working levels during the concrete placement and curing. Propping shall be designed to support the weight of wet concrete and construction loads.

Where the underside of the KingFlor is to remain exposed as a feature, a wide ply form strip attached to the bearers will minimise marking. Strips of 300mm wide are commonly used.

Propping shall not be removed until the concrete has reached sufficient strength to support superimposed loads.

b.4 Installation/Fixing

- Panels should be accurately aligned, side laps fully lapped and the gap between abutting ends kept to a minimum.
- Provision should be made so that all panels have full end and intermediate bearing support on the building framework of a minimum of 50mm unless otherwise stated on the structural drawings.
- The decking is continuous over all intermediate temporary supports without intermediate splicing or joining. Sheeting shall only terminate at ends into a permanent support (i.e. steel beam or concrete beam).
- The propping supports shall be effectively rigid such that their vertical deflection during the construction phase can be ignored.
- It is the contractors responsibility to ensure that the vertical props have sufficient strength to withstand the construction load, are braced and secured appropriately to withstand all incidental and construction loads.
- Panels fixed to structural steelwork should be fixed by decking nails or self-drilling/tapping fasteners.
- One fastener should be provided in each pan at every permanent support.
- Fixing panels to masonry supports may not be necessary if concrete is placed immediately after panels are laid. If fixing is required to prevent movement due to wind or for safety reasons during placement of concrete, the panels should be secured to the temporary timber bearers by nailing.
- When a KingFlor slab is to be poured in conjunction with a band beam, it is the contractor's responsibility to ensure that the temporary ply used to form the concrete beam is positioned, held and secured

sufficiently to form the beam to engineers details. The KingFlor must pass the ply form of the beam a minimum of 50mm. Care must be taken that the KingFlor decking does not penetrate into the band beam to such an extent that it fowls the internal reinforcing used in the band beam.

b.5 Shear Studs

Where composite construction is shown on the drawings, the requirements for the installation of the shear studs are to be in accordance with 'Specifying Fielders - KingFlor', AS 2327.1:2003 and AS 1554.2:2003, this specification and other codes referenced within these documents.

b.6 Concrete Placing

Concrete should be placed in a manner that minimises the permanent deflection of the decking. When concreting is poured in the same direction as the span of the decking it should be placed first over the supports where the decking is continuous, followed by the mid span region and finally the areas above the end supports. When concrete is being poured transversely to the decking ribs, it should be placed first at the edge where a decking sheet is supported by the under lap of an adjacent sheet. This will help to ensure that the longitudinal seams between sheets remain closed.

b.7 Penetrations

Penetrations should only be cut once the concrete is cured (i.e. the concrete has reached a minimum of 75% of its design strength). If penetrations are cut prior to the concrete having cured there may be the requirement of propping around the penetration. Seek professional engineering advice for penetrations larger that 150mm square. Keep penetrations within the ribs where possible. Do not cut ribs without prior permission of the design engineer.

b.8 Permanent Loading

Do not place permanent loads, including masonry walls, on the concrete structure until the concrete has cured and all props have been removed.

b.9 Construction Loading

Do not place construction loads, including plant and equipment, on the concrete structure, which exceeds the design capacity of the structure. Seek permission for such loads.

Concrete curing can take approximately 2 to 4 weeks, with a generally accepted benchmark of 21 days for the concrete to reach 75% strength. These times are dependent on the curing process and environmental conditions.

b.10 Deflection

Design the formwork to withstand the applied loads so that the sum of its deflection under load, steel formwork settlement, and its initial inaccuracy in position does not exceed the absolute or relative deviations from true position permitted in AS 3610:1995 or as per the engineers' details.

2.5 Drawing Notes for KingFlor®

The drawing notes for KingFlor provided below are also available from the Fielders website: www.fielders.com.au

The following KingFlor drawing notes are recommended to be included as part of the drawing note sheet.

1. For reinforcement size, spacing and dimensions, refer to plan.
2. All bottom bars to be placed in KingFlor trays before mesh is laid and securely tied to supporting reinforcement.
3. All top bars to be placed on top of, and tied to the mesh.
4. KingFlor panels to have the side laps fastened at 1800mm maximum centres. With No. 12 x 20 self drilling screws.*
5. Before placing concrete, ensure that KingFlor panels are free of debris and substances which could adversely affect the steel/concrete bond.
6. Concrete to conform to the specification, and shall be free of admixtures containing calcium chloride, salts or superplasticiers.
7. KingFlor panels to be securely fixed or held down to prevent displacement under construction loads or wind uplift prior to concreting all in accordance with 'Specifying Fielders - KingFlor'.
8. Minimum bearing width of panels on support walls and beams shall be 50mm (adjust to suit design).
9. Provide 'alcor' strip or similar approved bond breaker to all masonry walls under slab.
10. Use KingFlor panels in continuous lengths over a minimum of two spans internally unless noted or shown otherwise.
11. No masonry shall be laid on the slab whilst it is propped.

* **This is a good practice suggestion, not a mandatory requirement.**

2.6 KingFlor® Designer Suite

The KingFlor Designer Suite includes KingFlor Designer, KingBeam and KingSlab & KingFire software packages, and is available for downloading from www.fielders.com.au.

KingFlor® Designer

Fielders' KingFlor Designer software can be used to achieve the optimal slab design. KingFlor Designer is a state of the art design tool that allows for the optimum design to be reached quickly, easily and efficiently. The user simply inputs the project specific parameters then KingFlor Designer will generate a graphical display of the design results and print a full summary of calculations and results. KingFlor Designer allows the designer maximum flexibility in the selection of design parameters and easily allows the designer to compare KF57, RF55, KF40 and KF70 profiles.

Notes for Using KingFlor® Designer

Spans

The KingFlor deck must always span without interruption between 2 or more permanent supports to ensure composite behaviour. The slab is assumed to span via composite action one way parallel to the decking ribs (i.e. 2 way spanning is not supported).

Continuous slabs in excess of 4 spans are treated as 4 span/slabs.

Designs are assessed on the end span performance, as this span is critical for uniform loads and span lengths.

Temporary Propping

Temporary supports or props may be used to extend the formwork capabilities of KingFlor products.

Testing

Deck capacity in the construction stage is based upon test data for strength and stiffness and using the design rules in AS 4600:2005 for shear and buckling interaction with bending.

Capacity of composite and reinforced concrete slabs are based upon test data plus the design rules of AS 3600:1994.

KingBeam™

KingBeam is made for the quick and convenient design of composite beams in conjunction with Fielders KingFlor range. A summary user guide is provided in Appendix E. KingBeam is used for the analysis and design of simply supported beams in accordance with AS 2327.1:2003, Composite Structures Part 1: Simply Supported Beams. The software takes into account various factors such as beam span, size, propping, slab depth and estimated design loads for each construction stages. It then calculates the beams' forces, moment distribution and deflections.

KingSlab™ & KingFire™

KingSlab & KingFire has been produced to assist engineers in designing the reinforcing requirements at the junction of the band beam and the KingFlor slab, and the additional bottom face reinforcing required above the deck. KingSlab needs to be used in conjunction with a concrete finite element analysis software package such as Slabs or RAPT to determine top face reinforcing requirements as well as serviceability deflections.

For instructions and a design example on how to use KingSlab & KingFire refer to Appendix D.

2.7 Accessories

The following accessories are manufactured for the KingFlor range. For availability and pricing please refer to the Fielders Price Book.

Fielders are able to make flashings to suit a range of needs such as slab infills, pour breaks etc. For further information please contact your local Fielders representative.

Edge Form / Flashings

An easy and economical method of forming up the edges of concrete slabs is to order the edge form from Fielders. It is custom made from galvanised steel in lengths between one and six metres long.

The bottom edge of the form is slipped between the KingFlor profile, and the beam or wall below. The top edge is restrained from movement during concrete placement, by the installation of galvanised straps nominally 20-25mm wide every 600mm, usually fastened by hex head self drilling screws or pop-rivets.

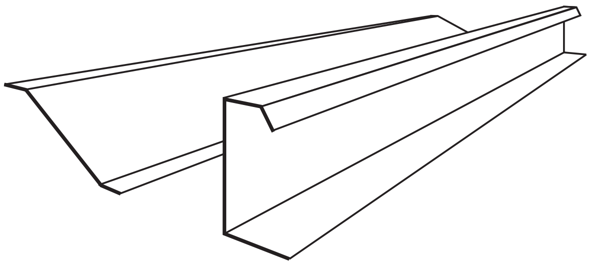


Figure 2.7.A Edge Form and Band Beam Flashings

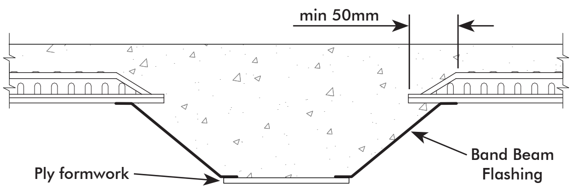


Figure 2.7.B Band Beam Flashing

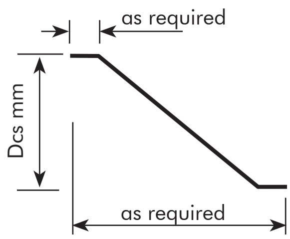


Figure 2.7.C Band Beam Flashing Dimensions

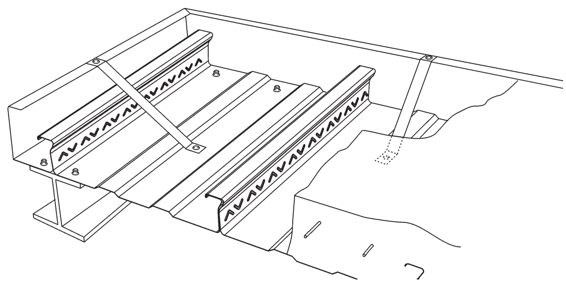


Figure 2.7.D Edge Form

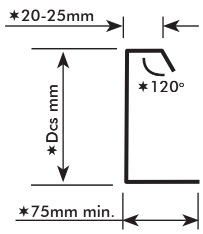


Figure 2.7.E Standard Edge Form Dimensions

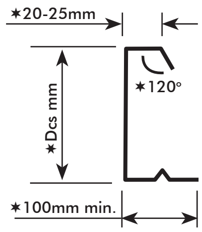


Figure 2.7.F Edge Form with Drip Grove Dimensions

* All dimensions can be altered to suit project

Edge Form Selector Maximum Cantilever (mm)				
Edge trim depth (mm)	Galv. Steel Edge Trim Thickness (mm)			
	1.0	1.2	1.6	2.0
130	100	125	160	195
150	0	115	150	185
200	N/R	100	130	160
250	N/R	0	100	135
300	N/R	N/R	0	100
350	N/R	N/R	N/R	0

Table 2.7.A Edge Form Selector

Note: N/R = not recommended

KF70® Service Hangers

The 15mm high raised dovetail stiffener allows for the quick and easy suspension of services once the slab has sufficiently hardened.

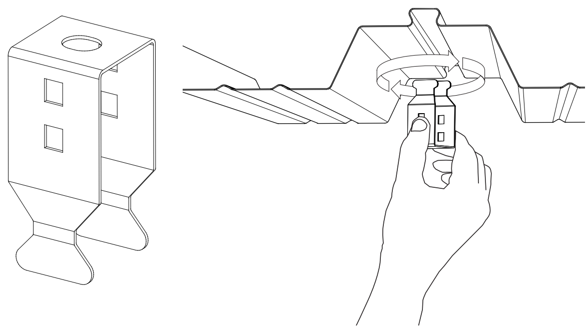


Figure 2.7.G KF70® Suspension Bracket

The KF70 Suspension Brackets are threaded to accommodate metric bolts and threaded rods. The KF70 Suspension Brackets are fixed by being inserted into the raised dovetail of the profile and rotated 90 degrees.

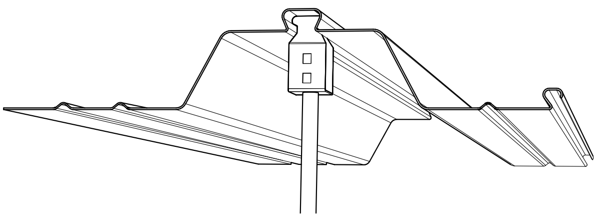


Figure 2.7.H KF70® Suspension Bracket Fixings 1

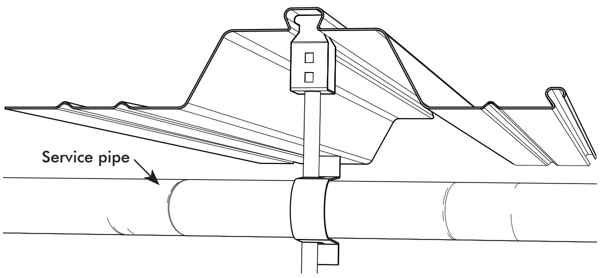


Figure 2.7.I KF70® Suspension Bracket Fixings 2

RF55® Service Hangers

Wedge nuts are used to fit in the RF55 dovetail and provide a hole to suit a 6mm threaded rod.

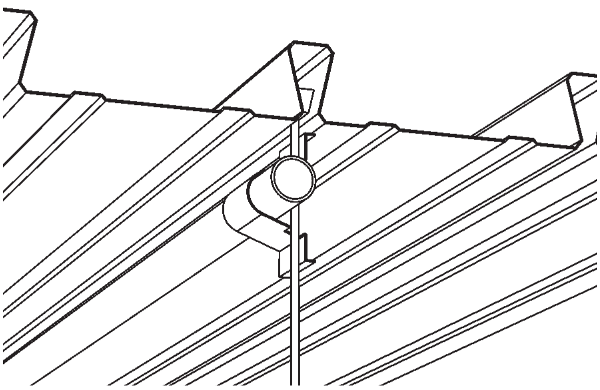


Figure 2.7.J RF55® Wedge Nut Threaded Service Hanger

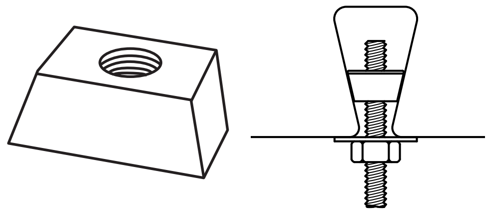


Figure 2.7.K RF55® Wedge Nut

KF70® End Infill

Where ever SquashCut is not used the ends of the KF70 profile can be sealed with either the KF70 metal end cap or the KF70 polystyrene infill piece, both shown below and available from Fielders.

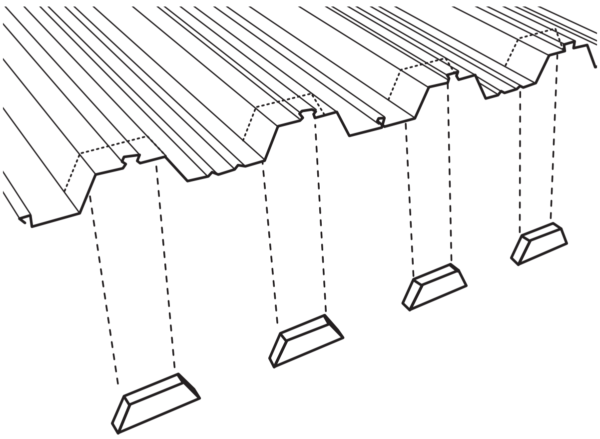


Figure 2.7.L KF70® Polystyrene Infill Piece

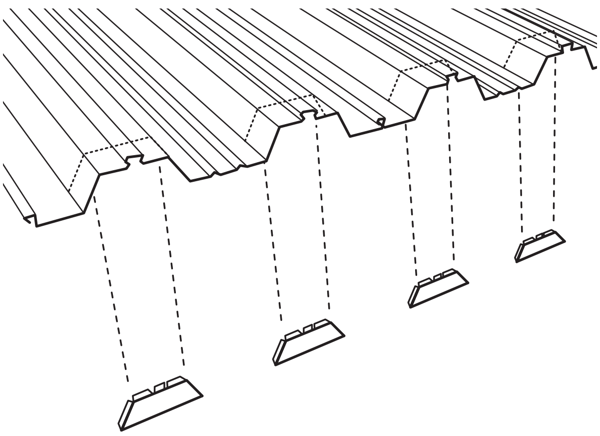


Figure 2.7.M KF70® Metal Infill Piece

RF55® End Infill

RF55 end infills are available to minimise concrete seepage. Care must be taken to ensure the end infills are installed correctly. RF55 end infills are mainly used in the joints of non-continuous sheets over beams.

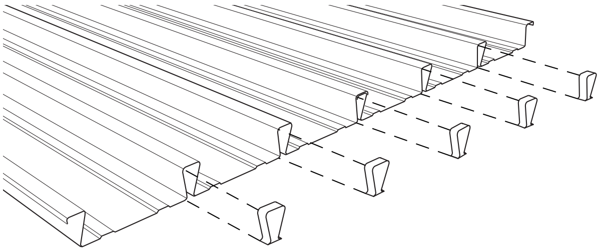


Figure 2.7.N RF55® Foam Infill Pieces

KF70® Concrete Pour Break

The concrete pour break is designed to shore off areas not intended to be concreted on KF70 decking.

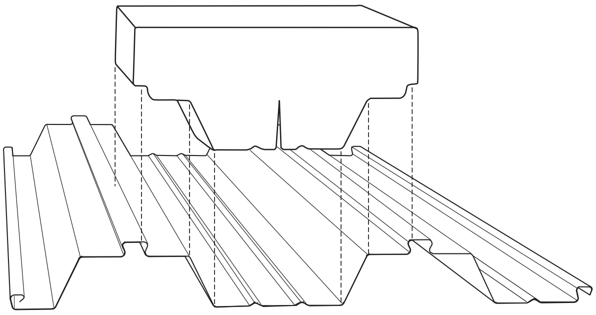


Figure 2.7.O KF70® Concrete Pour Break

Fire Accessories

Hilti offer a range of passive fire prevention products to suit all KingFlor profiles.

Hilti CP680-N Cast-In Firestop Collar

One step fire protection of pipes for up to 4 hours.

Key Customer Benefits

- Tested to latest standard AS 1530.4:2005
- One-step installation
- No additional caulking
- Ready to use out of the package
- Economical to use with short installation time
- Only three sizes to cover all pipe diameters from 32mm up to 115mm
- Easy to remove and replace pipe
- Allows for pipe adjustments during installation
- Up to 4 hour FRL

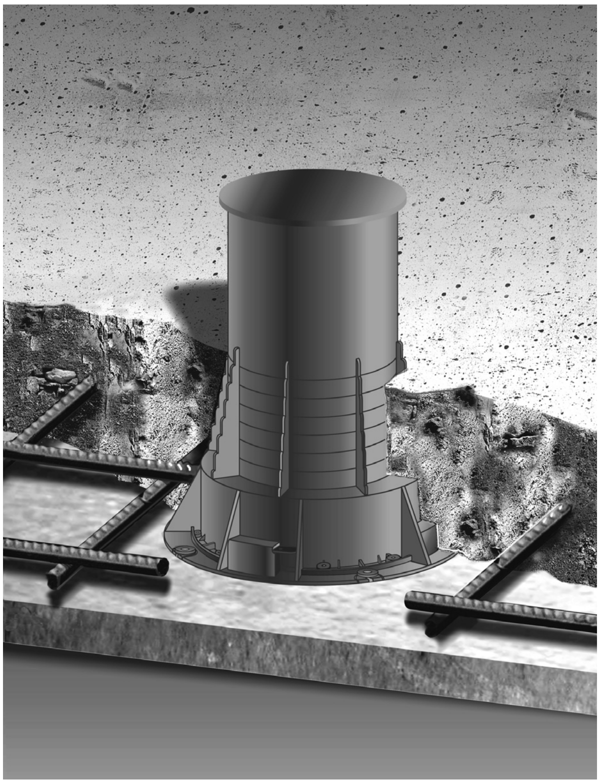


Figure 2.7.P CP680-N Cast-in Firestop Collar

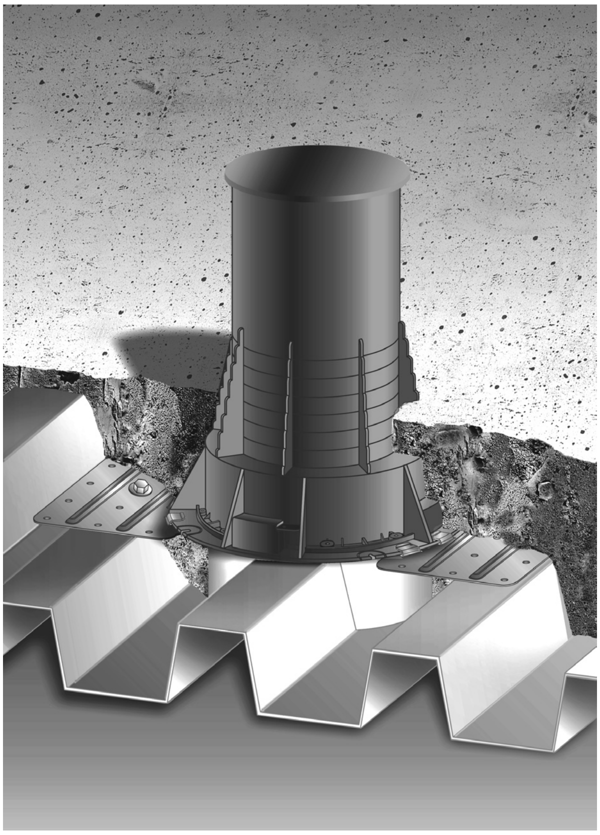


Figure 2.7.Q CP680 Metal Deck Adaptor

Hilti CP620 Expanding Fire Seal
Expanding two-component PU-based foam.

Key customer benefits

- One solution for various applications
- Easy handling for difficult to reach openings
- No additional coating required
- Paintable
- Impervious to smoke

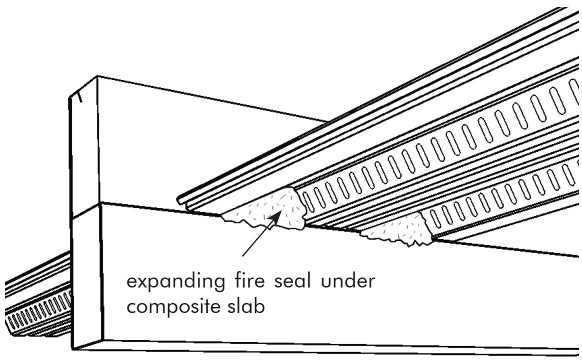


Figure 2.7.R KF70 and CP620 Expanding Fire Seal

For further information on Hilti products, contact you local Hilti office on: 131 292 or visit www.hilti.com.

2.8 Fire Design

Fire Resistance is assessed in accordance with Fielders test data and published methods based on Australian research into insulation and structural adequacy of composite reinforced concrete slabs incorporating steel deck formwork when subjected to prescribed fire exposure periods.

Fire Design

Additional design is required for cases where the floor is required to have a minimum fire rating level. Various fire ratings can be achieved by:

- The placing of additional supplementary bottom face fire reinforcement
- Applying a spray-on retardant
- Installing a fire rated ceiling
- Installing a sprinkler system

Refer to the Building Code of Australia or your regulatory authority for specific requirements for fire rating. To undertake a fire design of the slab using additional bottom face reinforcement refer to Fire Resistance tables in sections 3.10, 3.11 (for re-entrant profiles), 4.10, 4.11 (for trapezoidal profiles) and 5.7 (for deep deck profiles) or KingFlor Designer for an appropriate analysis.

2.9 Corrosion Protection

To ensure the longevity of KingFlor it should be installed with a minimum of 450mm cover off the ground with good cross ventilation and not in a corrosive environment.

To achieve additional corrosion protection to KingFlor sheeting in highly corrosive environments, additional paint treatment can be applied to the underside of the decking. A two-part paint system is recommended, consisting of a universal primer and a miocoat. Prior to any paint being applied the underside of the decking will need to be prepared by cleaning with a grease solvent and a light scourer. This can be followed with Wattyl Sigma EP Universal Primer and then a Wattyl Sigmacover Miocoat sprayed onto the deck.

For further information and specifications please refer to the Wattyl website www.wattyl.com.au or your local Wattyl representative on 1300 139 780.

2.10 Formwork Construction

In composite concrete floors, the quality of formwork is vital in ensuring a successful project. Besides the load of concrete slab, the formwork must also be designed to withstand additional temporary loads during the construction of the composite floor.

According to AS 2327.1-2003: Composite Structures, the construction stages involved (before any composite action occurs between the steel formwork and the concrete slab) are:

Stage 1 (Prior to concrete placement)

This includes:

- Handling and erection of any steelwork, formwork and falsework involved

Stage 2 (Prior to concrete placement)

This stage includes:

- Attachment of shear studs and placement of reinforcement

Stage 3 (During concrete placement)

This stage includes:

- Any additional loads associated with the pouring of concrete until its initial set

Stage 4 (After concrete placement)

This stage includes:

- The hardening of the concrete slab after its initial set until the compressive strength reaches 15 MPa. Composite action occurs after this stage

Stacked Materials

In general, formwork is designed to allow for additional loads from stacked materials. According to AS 2327.1: 2003, stacked materials refer to other construction materials such as formwork components, reinforcement, bricks or any other materials that temporarily subjects loading onto the formwork. The magnitude of additional loads from stacked materials is given below.

Uncontrolled Environment

Within an uncontrolled construction environment, such as small projects within isolated areas, the magnitude of additional loads from stacked materials that can be included in the formwork design is:

1. 4 kPa within construction stages 1, 2 and 4
2. Not applicable for construction stage 3, during the pouring of concrete

Controlled Environment

For controlled environments, where clear and concise advice for the construction is provided, loads less than the ones given above may be used. AS 2327.1: 2003 requires that these loads must be clearly shown in the project documentation.

Fielders provide KingFlor Designer software to assist in the design of composite slabs using KingFlor steel formwork profiles. The software states the capacity of the slab at construction stages 2 and 4, at the bottom of the "Spans and Materials" screen. KingFlor Designer considers construction stage 3 when undertaking construction stage design.

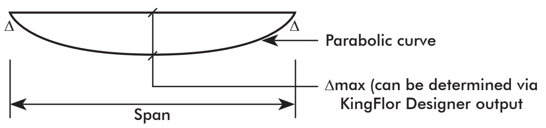
2.11 Construction Loads

The composite slab span tables and temporary propping tables assume a value of 1.0kPa for this construction live load due to the weight of workers and equipment.

The composite slab selection tables and temporary propping tables allow for the additional weight of concrete ponding due to decking deflection at Stage II of the construction cycle. KingFlor Designer makes this allowance also.

To approximate the amount of extra concrete required in a slab due to deflection in the decking the following equation can be used.

$$\text{Volume} = \frac{2}{3} \times \Delta\text{max} \times \text{span} \times \text{width}$$



Parabola equation can also be found at: www.csgnetwork.com/areaparabola.htm.

Should the designer require specific allowance for the additional stacking of materials at either Stage 1 or Stage 3 prior to the slab reaching full strength, then the designer should consult AS 3610:1995 Clause 4.4.2.4. This clause prescribes an additional allowance of up to 4.0kPa for stacking materials at both Stage I and Stage III of the construction cycle, depending on the programming of the works.

The composite slab span tables and temporary propping tables make no allowance for these additional loads due to the stacking of materials. The designer is encouraged to use KingFlor Designer or contact the local Fielders representative for specific advice, should the stacking of materials be required.

2.12 Deflection Limits

Deflection limits are important in assessing suitability to applications and visual and physical characteristics of composite slabs. Section 3 of AS 3610:1995 "Formwork for Concrete" details the five classes of surface finish, providing guidelines on the physical and visual characteristics of composite slabs and the applicability to different building requirements.

Fielders recommends a deflection limit of span/240 if the aesthetic appearance of the slab is considered important. This limit is equivalent to a Class 3 surface finish where good visual quality is required. If aesthetics are not considered to be important for the design, for example, in a situation with concealed soffits, a deflection limit of span/150 is recommended. This is equivalent to a Class 5 surface finish.

For higher visual quality where aesthetics are considered vital, a Class 1 or 2 surface is recommended. This may be achieved by increasing the width of the prop bearers to limit indentation.

Alternative deflection limits can be set when designing with the KingFlor Designer Suite.

In practice, there are numerous factors during construction that may vary the actual deflection of the steel decking under construction loads, such as the number, trueness and alignment of the temporary propping and the placement method of the concrete. The deflections in the KingFlor manual tables and software should only be regarded as guidance for design. The deflection values shown in Fielders literature relate to the vertical deflection of the decking rib in the direction of the deck span. Further consideration may need to be given for any deflection of the pan of the profile in the direction perpendicular to the deck span (i.e. "bellying" of the profiles pan) under concrete load.

If the slab soffit is assumed to have aesthetic significance in its final application then further consideration may need to be given to the following practices in order to best minimise deflection and local deformation of the decking during construction loading;

- The use of 1.00mm base metal thickness material will help minimise local deformation (creasing) of the steel pans where the header beams are located compared to thinner gauge profiles.
- Wide Ply strips may be positioned above the header bearers to assist in dispersing the load and minimise any local deformation of the decking due to the headers. Strips of 300mm wide are commonly used.
- Specific care must be taken for slabs depths over 180mm as these slabs tend to become more susceptible to deflection control and deformation issues in propped applications. This is most true for re-entrant profiles (KF57, RF55) compared to trapezoidal profiles (KF40, KF70).

2.13 Composite Steel Beam Design

Composite slabs and beams are most commonly used in commercial and industrial buildings due to the speed and economy of construction. Savings in beam weight can be achieved when the composite slab is effectively anchored to the steel beam. The slab will then act as a compression flange whilst the steel beam acts as a tension member

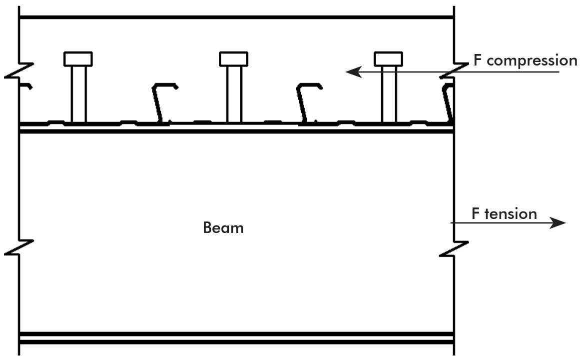


Figure 2.13.A Compression and Tension Forces

Composite beams are normally hot rolled or fabricated steel sections acting compositely with the concrete slab. Composite interaction is achieved by the attachment of shear connectors to the top of the beam. These connectors generally take the form of headed studs and can be welded in the workshop or on-site through the decking. Fielders recommend the shear studs to be welded on site, as this will allow for continuity of the KingFlor sheets and more economical designs. The shear connectors are required to provided sufficient longitudinal shear connection between the beam and the concrete so that they act together compositely.

Shear Stud Specification

Shear studs are manufactured from low carbon steel with a minimum yield point of 380 N/mm^2 and ultimate tensile strength of 450 N/mm^2. Studs should typically be specified with a shank diameter of 19mm and can vary in length from 75-200mm. The minimum concrete covering the top of the stud should be a minimum of 30mm.

Standard Stud Sizes

Stud Diameter (mm)	Stud Length (mm)
19	75
19	95
19	110
19	125
19	150
19	175
19	200

Table 2.13.A Standard Stud Sizes

Shear studs are generally fixed to the steel beam with a hand held arc stud welding gun. An arc is established between the stud and the work piece using a conventional welding power source. After a brief time, the stud is plunged onto the weld pool and the current shut off. For the full strength of the shear studs to be achieved, the base metal thickness of the top flange should be at least 1/3 of the base diameter of the shear stud. Studs should be installed to a location tolerance of ±1.2 mm with an angular tolerance of 3°. Stud welding to steel structure should be done in accordance with AS 1554.2:2003.

As the galvanized or paint coating thickness increases, then time, current, and plunge settings will normally be adjusted up through the range of stud welding settings.

A series of shear stud installation tests have been carried out on 1.0mm thick Z350 and Z450 zinc coated profiled steel to the top flanges of steel beams. The shear studs were welded to beams through metal decking with various galvanised coatings. Testing of the stud welding through the decking was carried out by placing a long pipe over the welded stud and manually bending the stud over to approximately 60°. If the weld did not fracture, then it was deemed to be satisfactory.

The results indicated that both Z350 and Z450 are weldable under appropriate conditions and precautions, including the removal of moisture and dirt from the decking, beam or stud. The Z450 does have a slightly increased spatter level but this should not be an issue as the surface is covered by concrete.

Composite Beam Design with KingFlor®

AS 2327.1:2003 currently considers narrow open re-entrant steel ribs (KF57 and RF55), however it fails to consider trapezoidal profiles in detail. AS 2327.1:2003 can be used in combination with the design rules contained within this document to design KF40 and KF70 composite beams.

KingBeam is a composite steel frame software package contained within the KingFlor Designer Suite. KingBeam determines the size of the steel beam required and the applied shear force that needs to be resisted by the shear studs for composite steel beams in conjunction with KingFlor steel decking profiles. For a guide of how to use KingBeam refer to Appendix E.

Design of Shear Studs

Some profiles on the market have a central location of the lapping rib which creates a 'preferred' and a 'non-preferred' side of the rib to place the shear stud to obtain optimum capacity of the shear stud. This creates unnecessary complexity for sub contractors on site to be able to distinguish the most beneficial placement of the stud. Fielders have introduced an 'off set' lap to both the KF40 and KF70 profiles to enable the shear studs to be placed centrally in the pan on all occasions to simplify design and installation.

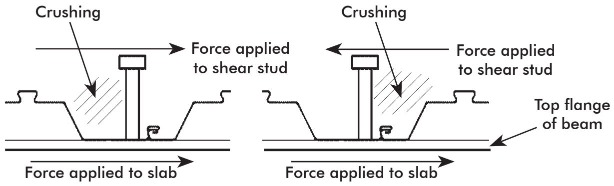


Figure 2.13.B KF70® with Offset Lap

The design of shear studs to be used in composite slabs should be in accordance with AS 2327.1:2003.

Clause 8.2.2.1 determines that shear studs in composite slabs should not extend less than 40mm above the top of the steel ribs of the profiled steel sheeting. Therefore, the minimum stud heights after welding (h_c) are determined by the overall rib height of the ribs of the profiles (h_r).

KingFlor® Rib Height	
Profile	**Rib Height h_r (mm)**
KF57	57
RF55	55
KF70	55
KF40	40

Table 2.13.B KingFlor® Rib Height

Note: KF70 uses shoulder height.

KingFlor® Minimum Stud Height (After Welding)	
Profile	**Stud Height h_c (mm)**
KF57	100
RF55	100
KF70	100
KF40	100

Table 2.13.C KingFlor® Minimum Stud Height

Also, in accordance with clause 9.7.1(c), the top face of the horizontal transverse reinforcement with a diameter of d_{bt}, used to strengthen Type 2 and Type 3 shear surfaces, shall be at least 30mm below the top of the shear connectors. For example, if 10mm bars are used with KF70 they will be required to be laid directly on the ribs.

Table 8.5 of AS 2327.1:2003 provides the minimum concrete cover (c_{min}) to the top of welded stud shear connectors, which depends on exposure classification. Therefore, the minimum overall depth of the composite slab shall be determined using the following equation:

$$Dcs_{min} = h_c + c_{min}$$

where

Dcs_{min} = minimum overall depth of the composite slab (mm)

h_c = minimum stud height (mm)

c_{min} = is the minimum concrete cover to the top of the welded studs (mm)

For exposure classifications A1 or A2, with standard concrete strength grades of 32MPa and above, the minimum concrete cover is 20mm. Using the values of $h_{c.min}$ leads to the absolute minimum overall depth of the composite slab $Dcs_{min.abs}$, shown in table 2.13.D.

KingFlor® Minimum Slab Thickness for Exposure Classification A1 and A2	
Profile	**$Dcs_{min.abs}$ (mm)**
KF57	120
RF55	120
KF70	120
KF40	120

Table 2.13.D KingFlor® Minimum Slab Thickness for Exposure Classification A1 and A2

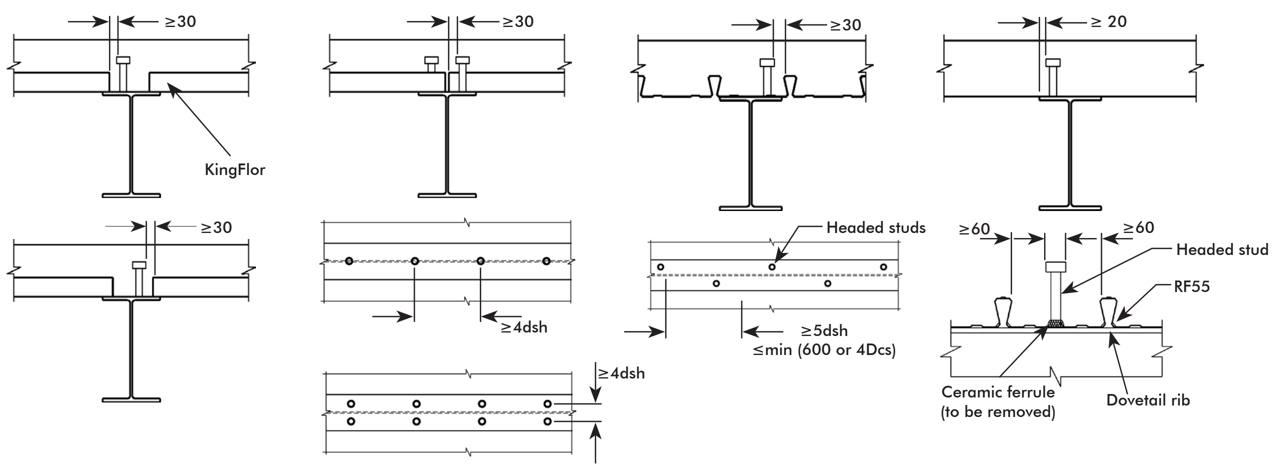


Figure 2.13.C Shear Stud Location Details

Minimum stud spacings are specified to ensure that compressive forces do not concentrate in the concrete local to the studs (which can result from overlapping force distribution cones) and that each stud is adequately embedded. Minimum longitudinal spacing is LL $\geq 4d_{sh}$ with minimum transverse spacing of LT $\geq d_{sh}$, where d_{sh} is the diameter of the shank of the shear stud. To prevent shear failure of the concrete component, it is recommended the shear studs be staggered rather than having a central line of studs. Maximum spacing is defined to prevent separation of the slab from the beams and to ensure a balanced transfer or shear force. Refer to figure 2.13.D for shear stud location details.

The number of welded studs per transverse cross-section nx shall not exceed 2 per pan.

Headed studs forming pairs in secondary beams shall be spaced transversely so that their centre-to-centre spacing, measured perpendicular to the longitudinal axis of the steel beam, is not less than 80mm. Stud pairs should be spaced closer at between 60mm and 80mm.

For the trapezoidal profiles (KF70/KF40), the nominal base metal thickness of the steel sheeting shall not be less than 0.75mm, except it shall be 1.0mm if the higher shear capacity for single studs is required (see table 2.13.E).

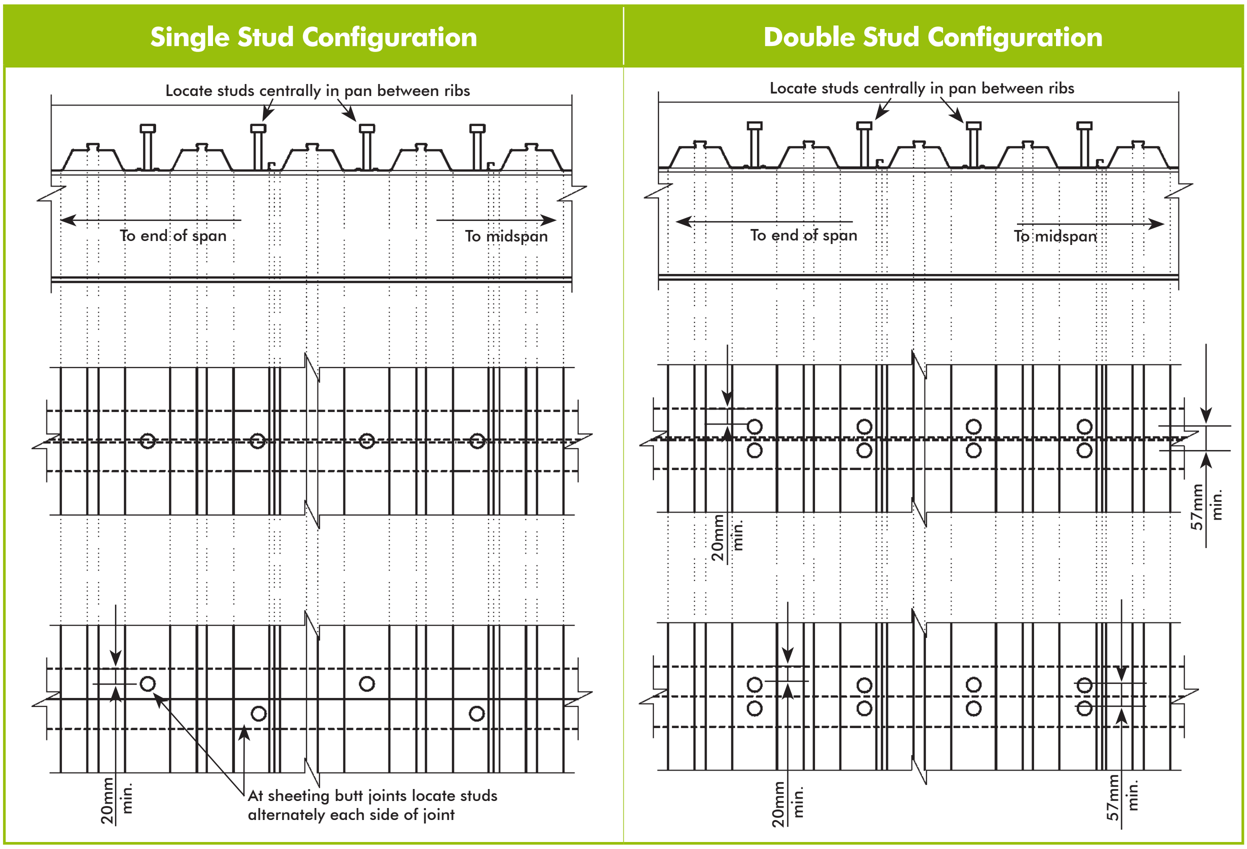


Figure 2.13.D Shear Stud Locations with Off-set Laps

Shear Stud Capacity

Profile	n_x	f_{cs} (MPa)	f_{vs} (kN)	
KF57/RF55	1	25	89	As per AS 2327.1-2003, table 8.1.
KF70/KF40	1	25	65	As determined by tests.
KF57/RF55	1	32	93	As per AS 2327.1-2003, table 8.1.
KF70/KF40	1	32	68	Refer to table 2.13.C for minimum stud heights. Minimum sheeting thickness to be 1.00mm for higher shear capacities.
KF70/KF40	2	25	65	Deckmesh for KF70 & KF40 must be used as "beam-zone' reinforcement in secondary internal beams (placed centrally over the steel beam)

Table 2.13.E Shear Stud Capacity

Notation:

n_x = the number of shear studs per pan of KingFlor profile
f_{cs} = concrete grade
f_{vs} = shear stud capacity

Concrete Grade
The minimum concrete grade shall be Grade 25MPa, and the concrete type shall be normal-weight in accordance with AS 3600:2001.

Transverse Reinforcement
Transverse reinforcement is added to ensure against longitudinal splitting of the concrete. Resistance to splitting is contributed to by the concrete and steel top mesh. Any shortfall in shear resistance by studs can be compensated by the addition of steel bar reinforcement.

Longitudinal shear reinforcement shall be designed in accordance with Section 9.3 and provided in accordance with Section 9.7 of AS 2327.1:2003.

For mesh area and reinforcing area summary data refer to Appendix I.

Steel Beam Selection
For preliminary steel beam size information refer to Appendix H.

2.14 Decking Layout

A decking layout drawing is recommended to be prepared by the formworker for clarity to determine the quantity, type and size of KingFlor required for the job. An example of this is figure 2.14.A. Alternatively the quantities may be determined from the engineers' floor plan. The drawing should clearly mark the type of KingFlor and its gauge, decking orientation, any temporary propping and the location of any shear studs prewelded to the beams.

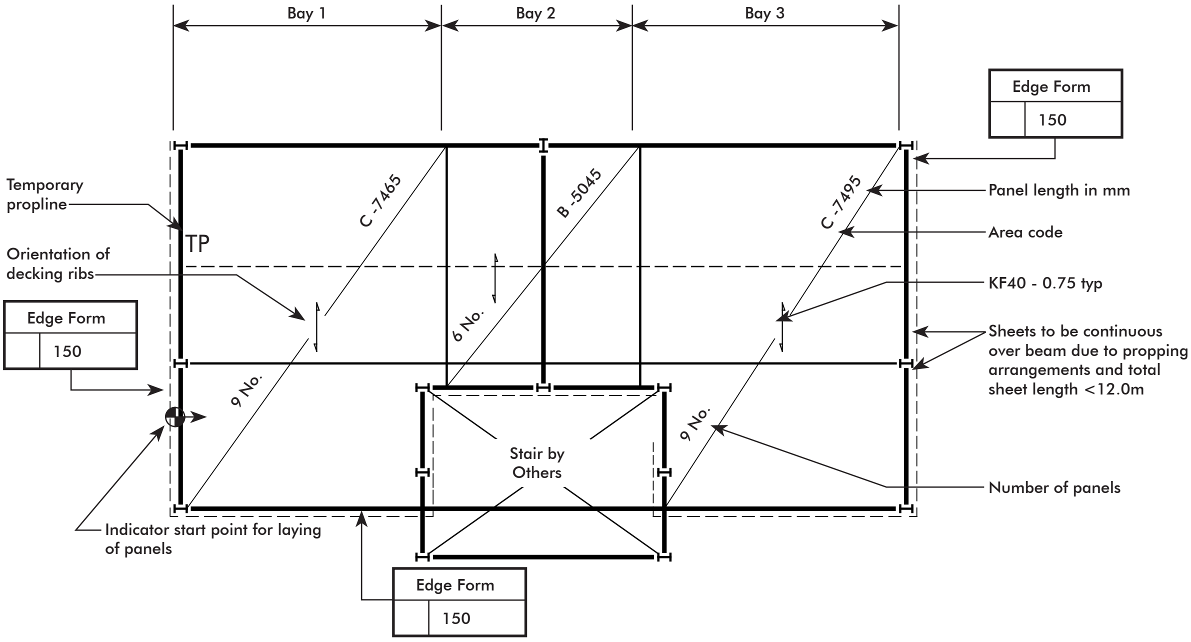


Figure 2.14.A Example Decking Layout Diagram

2.15 Acoustics

Understanding the Transfer of Noise

Acoustics and noise transfer in buildings are becoming important issues in the construction industry. There are several issues that must be understood to fully appreciate the transfer of noise. Noise is an airborne vibration, which has an effect on the eardrum. Noise has two characteristics: its level and its frequency.

There are two types of noise: airborne and impact sound. Airborne sounds are those that are transferred in the air. These noises include traffic, conversations, and music. Impact sounds are those that are propagated in the walls and floors of a building and include noise such as footsteps and drills. Most noises encountered in a building consist of both airborne and impact sounds.

The two major influences in the transfer of noise are absorption and reflection. There are three main areas in a room that influence the transfer of the noise, ceiling, walls and floor (for a suspended floor).

- The ceiling is the major sound surface in many rooms. As the room size increases so does the importance of the ceiling. Ceilings in a commercial application are often constructed from or covered by some form of sound absorbing mineral tile. However, ceiling tiles do not provide a uniform surface (e.g. joints between tiles, and also light fittings, either recessed or suspended). Flat lucite/perspex lenses over fluorescent tubes are the worst fittings for sound reflection. Parabolic, deep cell diffusers are the best for sound absorption.
- Walls – these are usually the next most influential surface. Their importance increases as room size decreases. Typically walls have very poor sound absorbing qualities and this is often made worse by putting sound reflectors against the walls e.g. filing cabinets.
- Floor – carpeting the floor will only slightly increase the NRC (noise reduction coefficient). Moving to thicker carpeting is often not a cost-effective solution because much of the floor area is covered with furniture with a worse NRC. Carpeting will however reduce impact noise.

It must be understood that the decibel rating is a logarithmic scale. The mass law equation predicts that each time the frequency of measurement or the mass per unit area of a single layer wall is doubled, the transmission loss increases by about 6dB.

Decibel Rating System

Sound Pressure Level (dB)	Description of Activity	Typical Subjective Description
0	Threshold of hearing	Absolute silence
20	Whispering at one metre	Very quiet
40	Quiet residential neighbourhood	Quiet
60	Conversation at one metre	Moderately noisy
80	Shouting	Noisy
100	Heavy industry	Very Noisy
120	Heavy gun-fire	Intolerable
140	Rocket launch at 100 metres away	Intolerable

Table 2.15.A Decibel Rating

Effects of Materials

The acoustic behaviour of materials is influenced by several parameters: its mass, reactivity, and vibration absorption. The increased weight per unit area of panel decreases sound transmission. The increased frequency of incident sound decreases sound transmission. Apart from the mass of the panel other factors that affect sound transmission are:

- Panel stiffness – at very low frequencies the stiffness (i.e. resistance to deformation) may have more effect than its weight. In this part of the frequency range insulation is termed stiffness controlled.
- Rigid panels – if a rigid panel is struck it will continue to vibrate at frequencies determined by its size, shape, and thickness – this is its "natural frequency" (natural mode of vibration).

A good rule of thumb is the stiffer the panel, the more sound it will transmit. A profiled steel sheet of a given thickness can produce the same structural strength as a flat panel of substantially greater weight and thickness. That is because a profiled panel will have a higher bending stiffness than a flat one.

Acoustical data is usually quoted in terms of either sound absorption or sound transmission. Sound transmission loss is the more relevant value and is expressed as a function of frequency. This is R_w (alternatively know as sound transmission coefficient) and it is given for a particular material. It is measured in decibels.

Concrete

A single layer of poured concrete 150mm thick gives an R_w of about 55.

Effects of Systems

If a higher R_w value is necessary, and it often is in high quality construction, it is not economical to continually double the wall or floor thickness to achieve it. Double layer assemblies are a more practical way of getting high R_w values without excessive weight.

A built-up steel cladding system comprises an external profiled sheet, a perforated or non-perforated internal liner sheet and an infill between the two sheets, such as mineral fibre. The transmission loss of such a system can be modified in a number of ways:

- The total mass can be increased by using a denser or thicker layer of infill.
- Better performance is possible through using dense, soft rolls of mineral fibre infills, rather than rigid ones.
- Transmission loss is also improved via an air-gap inside the outer face of the cladding as it minimises transmission of reverberations from the external sheets to the insulation.

If sound absorption in a room is important, then the internal sheet of the cladding system should be perforated to allow deadening by the insulation. However this can also have a reverse effect on the transmission loss characteristics of a structure.

The ideal double layer assembly has no rigid mechanical connection between its two surfaces. Rigid mechanical connections are the acoustical equivalent of an electrical short circuit or a thermal bridge in an insulated wall and should be avoided.

The mechanical connection between layers of wallboard can be reduced by the use of staggered wood studs, separate rows of wood studs, or a single row of wood studs with resilient metal furring channels to support the wallboard layers independently of each other. Non-load-bearing steel studs are usually resilient enough to provide adequate mechanical decoupling between the layers. Good results have also been obtained using 150mm load-bearing steel studs in conjunction with resilient channels.

Connection between a floor system and a ceiling should be via acoustic resilient mounts.

Small openings, such as fixing points and penetrations, allow airborne sound to pass through the element. Therefore to increase the insulation properties of the element it is important for that element to be airtight. To seal perimeters and penetrations for services and dense, flexible material such as a mastic should be used. For areas where large movement is expected, a polyurethane fire and acoustic rated sealant should be used.

The following websites are a good reference for further information:

www.insulation.com.au

www.csr.com.au

www.rondo.com.au

For specific information about the acoustic performance of particular KingFlor profiles, see the relevant profile sections in this manual.

For further information contact your local Fielders representative.

2.16 Environmental Sustainability

Environmental sustainability is becoming one of the most important issues in construction. This is reflected by the introduction of Greenstar ratings and the upgrade of the BCA to include more environmental requirements. The 2006 BCA is only the start of the environmental requirements with continued upgrades of the BCA expected to make requirements more stringent.

There are many issues to be considered when improving the sustainability of a building such as:

- Choice of construction material
- Minimisation of environmental impact in use, such as design for low-energy
- Flexibility of design to allow for future adaptation with minimal extra cost or disruption

When designing for environmental sustainability it is important to consider all aspects of the design and construction of a building not just the materials used. When comparing materials, the environmental performance of the material should be compared rather than the properties per weight. For example, when comparing the performance of KingFlor to plywood formwork, the reduction of steel reinforcement in the slab, as well as the overall reduction of materials required should be considered.

Fielders are continually looking at ways to reduce steel waste and to keep all steel scrap on the factory floor where it is directly transported to recycling rather than going to land fill. This is evident in Fielders products being rolled to measure, and new products like AngleCut for which S-Rib Corrugated sheets are pre-cut prior to delivery, reducing on site waste.

BCA

Changes to the BCA environmental requirements that came into effect in 2006 require that the following items be addressed:

- Thermal performance
- Building sealing
- Air-conditioning
- Artificial lighting
- Hot water supply
- Access for maintenance
- Material properties
- Ductwork insulation and sealing
- Lighting and power control devices

Life Span of the Building

The life span of the building is an important aspect to consider when determining the environmental impact of material selection. Steel products require minimal on-going maintenance when used and treated in an appropriate manner at the time of original installation. In most instances, KingFlor can easily exceed a life span of 50 years before first maintenance is required. When maintenance is required there are refurbishment solutions available which will extend the functional lifetime of the building.

VM Zinc is a unique material. Being 99% zinc, the life span of VM Zinc products exceeds 100 years before first maintenance is required, even in highly marine environments.

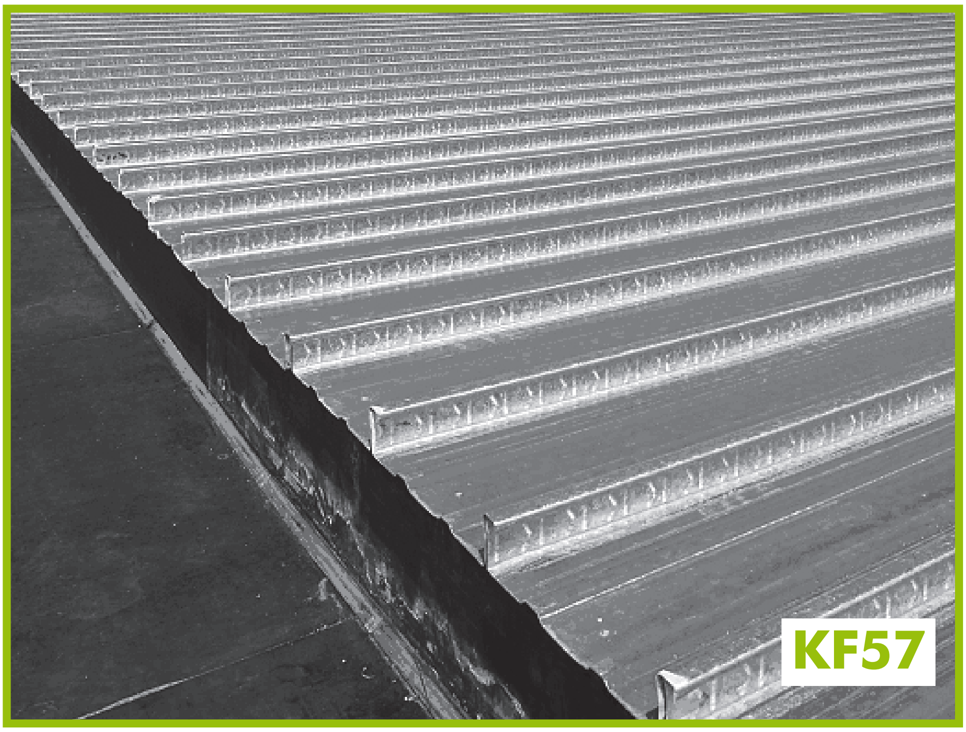
R-R-R (Refurbish Re-use Recycle)

Steel is a 100% recyclable material and therefore it is an ideal material for environmental sustainability. The inclusion of steel scrap does not compromise the quality of new steel and has become a normal part to the steel production process. Due to steel's magnetic properties it is the easiest material to recover for recycling, and requires 70% less energy than virgin steel to produce.

Globally, the demand for steel exceeds that which can be derived from scrap alone. This means that, for the time being, virgin steel production is essential for contributing to the developing global infrastructure.

Presently BlueScope roll formed steel contains a minimum of 15% recycled steel.

Re-entrant Profiles



Waterfront City Carpark, Docklands, VIC

Adelaide Airport, Adelaide, SA

3.0 Re-entrant Profiles

3.0 Re-entrant Profiles

3.1 KF57® Specification and Design

KF57 is manufactured from G550 (550 MPa Yield Stress) steel with a base metal thickness (BMT) of 0.75mm and 1.00mm. Base Metal Thickness of 0.60mm is also available on request. The galvanised coating thickness is Z350 (minimum 350g/m²) in accordance with AS 1397:2001.

Figure 3.1.A KF57® Profile

Note: All dimensions are nominal only.

Fielders KF57 is a steel formwork solution suitable for composite concrete slabs in concrete and steel framed construction. KF57 is a light and easy to use steel decking, offering an optimum formwork solution. KF57 is designed to combine with a concrete slab to produce a composite steel / concrete slab system. This is created by the chemical and mechanical bond that develops between the insitu concrete and the galvanised surface along the sheeting profile. KF57's ribs provide an effective mechanical interlock for the concrete.

KF57® Embossments

In some areas KF57 is made with a 'K' embossment on the web of the rib and an optional ReLok embossment at the base of the rib. The embossments increase the longitudinal shear strength of the KF57 profile, which may be necessary in applications that utilise post-tensioning. For further information contact your local Fielders representative.

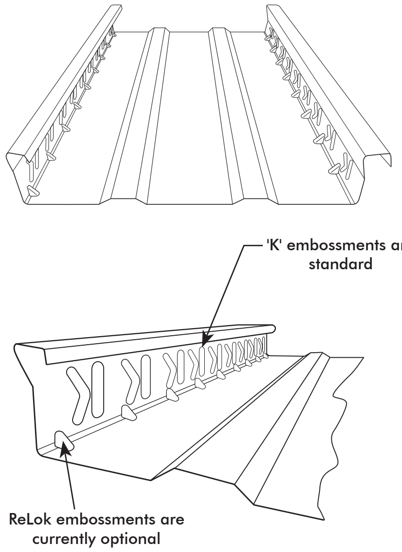


Figure 3.1.B KF57® Embossments

KF57® Material Specifications			
Material Properties	**0.60 BMT**	**0.75 BMT**	**1.00 BMT**
Mass Area – Average mass of fitted deck per plan area (kg/m²)	8.09	9.97	13.10
Mass Linear – Mass of individual length (kg/m)	2.43	2.99	3.93
Mass Area (m²/t)	124	100	76
Zinc Coating (g/m²) (Z350)	350	350	350
Yield Strength (MPa)	550	550	550
Friction Coefficient	0.50	0.50	0.50
Sheet Section Steel Area A_{sh} (mm²/m)	956	1195	1593
Centroid Height y_{sh} (mm)	14.10	14.10	14.10
Bare Sheet Resistance M_u^+ (kNm/m)	3.36	4.2	5.32
Bare Sheet Resistance M_u^- (kNm/m)	2.18	2.73	3.83
Vertical Shear Resistance (kN/m)	48.70	95.10	130.70
Web Crushing Resistance - End span (kN/m)	47.30	68.30	101.70
Web Crushing Resistance - Internal span (kN/m)	62.20	90.50	135.50
Capacity Reduction Factor – ϕ bare steel ultimate limit state analysis	0.90	0.90	0.90
Moment of Inertia Ix^+ (mm⁴/m)	402400	503000	670500
Moment of Inertia Ix^- (mm⁴/m)	295000	369000	502000

Table 3.1.A KF57® Material Specifications

3.2 RF55® Specification and Design

RF55 is manufactured from a G550 (550 MPa Yield Stress) steel with a base metal thickness (BMT) of 0.75mm, 0.90mm or 1.00mm.

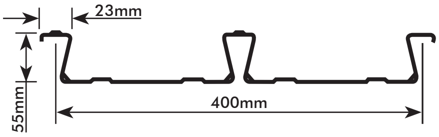


Figure 3.2.A RF55®-2P Profile

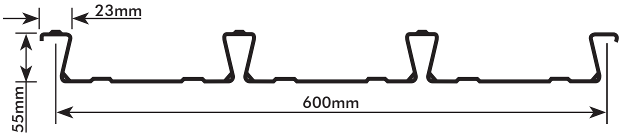


Figure 3.2.B RF55®-3P Profile

Note: All dimensions are nominal only.

Base metal thickness of 0.60mm is also available on request. The galvanised coating thickness is Z350 (minimum 350g/m²) in accordance with AS 1397:2001.

Fielders RF55 is a traditional re-entrant profile that provides excellent performance in suspended concrete slabs. RF55 is used in both concrete and steel frame construction and utilises patented technology to achieve superior spanning capabilities, less deflection and greater composite strength. RF55 comes with a range of accessories allowing for easy suspension of ceilings and services.

RF55 is available in two sheet widths. The traditional 600mm wide cover, 3 pan, and the easy to handle, 400mm wide cover, 2 pan. The RF55-2P is equivalent in all aspects technically to the RF55-3P. Similarly, the recommendations for RF55 in construction also apply to both RF55-3P and RF55-2P. Please check with your local branch as to which version applies in your state.

Both KF57 and RF55 can deliver cost savings when used in the following types of construction:

- Residential construction
- Multi-level carparks
- Multi-storey buildings
- Commercial buildings
- Shopping centres

RF55® Material Specifications

Material Properties		0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT
Mass Area –	Average mass of fitted 2-PAN deck per plan area (kg/m²)	8.57	10.56	12.55	13.87
	Average mass of fitted 3-PAN deck per plan area (kg/m²)	8.38	10.32	12.27	13.56
Mass Linear –	Mass of individual 2-PAN length (kg/m)	3.43	4.22	5.02	5.55
	Mass of individual 3-PAN length (kg/m)	5.03	6.19	7.36	8.14
Mass Area (m²/t)	2-PAN	117	95	80	72
	3-PAN	119	97	81	74
Zinc Coating (g/m²) (Z350)		350	350	350	350
Yield Strength (MPa)		550	550	550	550
Friction Coefficient		0.5	0.5	0.5	0.5
Sheet Section Steel Area A_{sh} (mm²/m)	2-PAN	1013	1266	1519	1688
	3-PAN	990	1238	1485	1650
Centroid Height y_{sh} (mm)		15.4	15.4	15.4	15.4
Bare Sheet Resistance M_u^+ (kNm/m)		4.0	5.6	7.5	8.3
Bare Sheet Resistance M_u^- (kNm/m)		2.2	3.1	4.2	5.0
Vertical Shear Resistance (kN/m)		16.4	24.8	34.8	42.6
Web Crushing Resistance - End span (kN/m)		16.4	24.8	34.8	42.6
Web Crushing Resistance - Int span (kN/m)		42.1	62.0	85.7	103.5
Capacity Reduction Factor – ϕ bare steel ultimate limit state analysis		0.9	0.9	0.9	0.9
Moment of Inertia I_x^+ (mm⁴/m)		I_x^+ is dependent on span, refer to Appendix J			
Moment of Inertia I_x^- (mm⁴/m)		I_x^- is dependent on span, refer to Appendix J			

Table 3.2.A RF55® Material Specifications

3.3 Acoustic Performance of KF57® and RF55® Slabs

KF57 and RF55 slabs have the same acoustic performance as a solid concrete slab of the same thickness.

3.4 Fire Design

The BCA requires that floors must achieve satisfactory levels in the criterion of structural adequacy, integrity and insulation. These three criterion are defined in greater detail in AS 1530.4:2005. The performance objective and requirements associated with the provision of a fire-resistance period. It is necessary that fire does not pass from one enclosure to the other, irrespective of whether this is due to collapse, formation of cracks and fissures, or excessive temperature rise.

Analysis of the fire performance of RF55 and KF57 has been undertaken to determine insulation and integrity in accordance with established fire engineering principles. It was found that ignition will not occur and the slab will achieve the necessary performance with respect to insulation (provided the maximum temperature of the unexposed face does not exceed 275°C). The standard fire tests concluded that the KF57 and RF55 profile would achieve the fire resistance period fo insulation an integrity for overall slab thickness as detailed in table 3.4.A.

Fire Resistance Minimum Slab Depth for Insulation and Integrity		
FRL (minutes)	RF55® Minimum Dcs (mm)	KF57® Minimum Dcs (mm)
60	90	90
90	100	100
120	120	120
180	140	140
240	170	160

Table 3.4.A RF55® & KF57® Fire Resistance - Minimum Slab Depth for Insulation and Integrity

Note: Table 3.4.A values are for Normal Density concrete. No contribution from ceiling or applied passive surface treatments have been allowed for in this table.

Contribution of KF57® Ribs

In testing KF57 slabs the temperatures recorded on the top portion of the ribs found that they could contribute significantly to the positive bending capacity of the slab in fire conditions, thus reducing the area of additional bottom face reinforcing mesh required. The resulting reductions in bottom face fire reinforcing mesh are given in table 3.4.B.

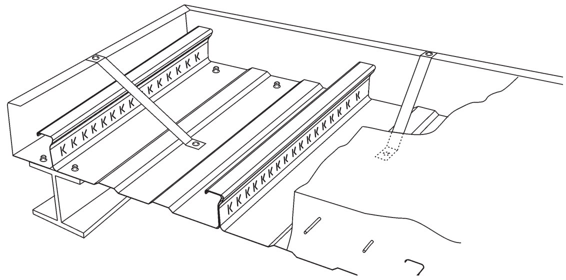


Figure 3.4.A KF57®

Note: The closed rib of KF57 contributes to the bottom face fire reinforcing in the slab as well as having the same insulation performance of a solid slab.

KF57® Reduction in Fire Reinforcement Mesh Area			
FRL (minutes)	Steel Mesh Area (mm²/m)		
	0.60 BMT	0.75 BMT	1.00 BMT
30	209	261	348
60	199	248	331
90	228	285	381
120	217	270	361
180	267	334	446
240	0	0	0

Table 3.4.B KF57® Reduction in Fire Reinforcement Mesh Area

Note: Reduction in fire reinforcement considers the reinforcement to be at the same height as the top of the KF57 rib, 57mm from the bottom of the pan.

Analysis of KF57

The following set of simplified equations have been formulated for the elevated temperature bending strength of both positive and negative moment regions of KF57 slabs. The method of analysis complies with the recommendations given in Clause 5.9 of AS 3600:2001.

Values of the strength reduction factor R_{st} for steel reinforcing positions y_c = 55mm (y_c shown in figure 3.4.C) have been derived from testing results and are given in table 3.4.C, as a function of fire resistance period and the allowable positions of reinforcement located within the shaded regions shown in figure 3.4.B.

KF57® Strength Reduction Factor R_{st} at Top of Ribs	
FRL (minutes)	Strength Reduction Factor (R_{st}) for y_c = 55mm
60	1.00
90	0.75
120	0.54
180	0.26
240	0.09

Table 3.4.C **KF57® Strength Reduction Factor R_{st} at Top of Ribs**

where

y_c = distance to the centroid of steel reinforcement measured from slab soffit (in mm)

The R_{st} values in table 3.4.C are for reinforcement located 55mm from the bottom of the pan (y_c = 55mm), for all other locations refer to table 3.4.D.

Positive Bending Capacity

The design strength in positive bending of a KingFlor composite slab cross-section, assuming the soffit of the slab to be exposed to fire, can be determined using the equation:

$$\phi M^{+}_{u} = \phi R_{st} A_{st}^{+} f_{sy} d^{+} \left[1 - \frac{0.6 R_{st} A_{st}^{+} f_{sy}}{b d^{+} f'_{c}} \right]$$

where

ϕ = strength reduction factor taken equal to 0.8

R_{st} = reduction factor due to the effect of temperature on the yield strength of the reinforcing steel give in tables 3.4.C and 3.4.D.

f_{sy} = yield strength of reinforcing steel mesh, taken as 500MPa

d^{+} = effective depth of section in positive bending (see figure 3.4.B)

b = width of composite slab

f'_c = characteristic compressive strength of concrete at 28 days which may be taken as equal to the specified strength grade

A_{st}^{+} = area of steel at a cross-section which acts in tension when the cross-section is subjected to positive bending, where the location of the steel can be anywhere within the shaded region shown in figure 3.4.B

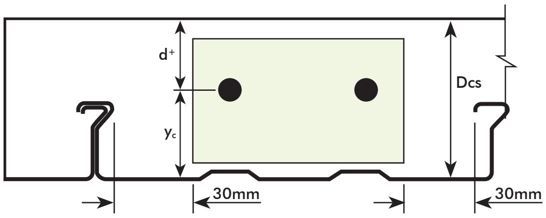


Figure 3.4.B **Allowable Positions of Steel Reinforcement in the Composite Slab With KF57®**

The expression of the positive bending equation above is the same as that used in the calculation of the design strength in positive bending of a singly-reinforced cross-section at room temperature conditions, but makes allowance for the influence of temperature on the strength of the reinforcing steel. Therefore, in using this equation, it is necessary to ensure that the slab cross-section is under-reinforced at the end of the fire period. Therefore, the limit of k_u^{+} (determined at the end of the fire period and ignoring the presence of any compressive reinforcement) has been chosen as:

$$k_u^{+} = \frac{R_{st} A_{st}^{+} f_{sy}}{0.85 \gamma b d^{+} f'_{c}} \leq 0.40$$

where

γ = 0.85 – 0.007(f'_c – 28) within the limits of 0.65 to 0.85

Reinforcement

Resistance to positive bending actions in the fire situation is provided by embedded reinforcement at various levels within the slab as follows:

Top Face Reinforcement

Usually mesh, this is generally located very close to the top surface, hence, the effective lever arm and the contribution in flexural resistance is correspondingly small. The temperature based strength reduction effects are accounted for by a factor (R_{st}) computed in relation to both the concrete cover of longitudinal wires from the underside and the fire exposure period.

If lower level fire reinforcement is provided, the "shrinkage" reinforcement is positioned away from the tensile zone and becomes ineffective in resisting positive bending actions.

Fire Mesh Reinforcement

Fire mesh reinforcement resting directly on the KF57/RF55 rib tops, with longitudinal wires positioned well clear of the rib. The temperature based strength reduction effects are accounted for by a factor (R_{st}) computed in relation to both the concrete cover of longitudinal wires from the exposed KF57/RF55 profile and the fire exposure period.

Fire Bar Reinforcement

Fire bar reinforcement either supported on conventional spacer devices or resting directly on the fire mesh (as above), with longitudinal bars positioned as far clear from the rib as feasible.

The temperature based strength reduction effects are accounted for by a factor (R_{st}) computed in relation to both the concrete cover from the exposed KF57/RF55 profile and the fire exposure period.

Concrete resistance as a compression element at top of slab is taken as fully contributing since temperature is less than 350°C.

KF57® Strength Reduction Factor (R_{st})

FRL (minutes)	y_c (mm)	R_{st}
60	≥ 55	1.00
	$30 \leq y_c < 55$	$0.0168y_c + 0.076$
	$10 < y_c < 30$	$0.029y_c - 0.29$
	≤ 10	0.00
90	≥ 80	1.00
	$40 \leq y_c < 80$	$0.01y_c - 0.2$
	$17 < y_c < 40$	$0.0261y_c - 0.4435$
	≤ 17	0.00
120	≥ 100	1.00
	$55 \leq y_c < 100$	$0.0102y_c - 0.0222$
	$25 < y_c < 55$	$0.018y_c - 0.45$
	≤ 25	0.00
180	≥ 120	1.00
	$75 \leq y_c < 120$	$0.0107y_c - 0.28$
	$35 < y_c < 75$	$0.013y_c - 0.455$
	≤ 35	0.00
240	≥ 145	1.00
	$95 \leq y_c < 145$	$0.0083y_c - 0.2040$
	$50 < y_c < 95$	$0.0121y_c - 0.5670$
	≤ 50	0.00

Table 3.4.D KF57® Strength Reduction Factor (R_{st})

Negative Bending Capacity

The design strength in negative bending of a KingFlor composite slab cross-section, assuming the soffit of the slab to be exposed to fire, can be determined using the equation:

$$\phi M^-_U = \phi R_{st} A_{st}^- f_{sy}(d^- - d_x)$$

where

ϕ = strength reduction factor taken equal to 0.8

R_{st} = reduction factor due to the effect of temperature on the yield strength of the reinforcing steel give in tables 3.4.C and 3.4.D

f_{sy} = yield strength of reinforcing steel mesh, taken as 500Mpa

d^- = effective depth of section in negative bending (see figure 3.4.C)

d_x = distance from slab soffit to resultant compressive force of section in negative bending (see figure 3.4.C)

A_{st}^- = area of steel at a cross-section which acts in tension when the cross-section is subjected to negative bending, where the location of the steel can be anywhere within the shaded region as shown in figure 3.4.B

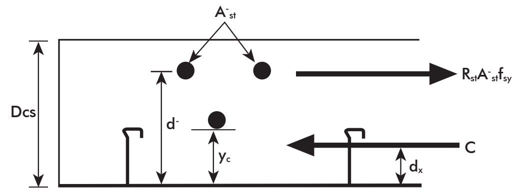


Figure 3.4.C Force Equilibrium in Negative Bending.

The values of d_x are given in table 3.4.E as a function of the depth of the neutral axis at ultimate load ($k_u^- d^-$) and the fire resistance period. The limit of k_u^- has been chosen as:

$$k_u^- = \frac{R_{st} A_{st}^- f_{sy}}{0.85\gamma\, b d^- f'_c} \leq 0.40$$

where

γ = $0.85 - 0.007(f'_c - 28)$ within the limits of 0.65 to 0.85

Values for d_x for Negative Bending for KF57®
$k_u^- d^- \leq 200$mm

FRL (minutes)	d_x (mm)
60	$0.65\, k_u^- d^- + 8.16$
90	$0.95\, k_u^- d^- + 11.41$
120	$0.89\, k_u^- d^- + 18.77$
180	$1.23\, k_u^- d^- + 24.15$
240	$1.31\, k_u^- d^- + 37$

Table 3.4.E Values for d_x for Negative Bending for KF57®

Reinforcement

Resistance to negative bending actions in the fire situation is provided by embedded negative flexural reinforcement at upper levels within the slab as follows:

Top Face Reinforcement

This is usually mesh which is generally located very close to the top surface for shrinkage control. The temperature based strength reduction effects are accounted for by a factor (R_{st}) computed in relation to both the concrete

cover of longitudinal wires from the exposed KF57/RF55 profile and the fire exposure period.

Supplementary Bar Reinforcement

Supplementary bar reinforcement is either supported on conventional spacer devices or resting directly on the top face mesh (as above), with longitudinal bars evenly spaced. The temperature based strength reduction effects are accounted for by a factor (R_{st}) computed in relation to both the concrete cover from the exposed KF57/RF55 profile and the fire exposure period.

Concrete resistance as a compression element at bottom of slab is reduced when temperature is greater than 350°C. The allowance made for loss of effective concrete strength is accounted for by the reduction of effective depth by an amount (d_x), which is computed in relation to the fire exposure period.

For more detailed fire analysis, please contact your local Fielders KingFlor representative.

Exposed Surface Area-To-Mass Ratio (ESA/M)

Where the Building Code of Australia allows for deemed-to-satisfy requirements to assess the fire capacity of the structural steel working using the ratio of area of steel on mass (ESA/M), the following assessment may be used.

KF57 and RF55 consider the supporting beams to have a 3-sided exposure, with the top flange essentially concealed with the deck and concrete slab. The limiting ESA/M value for 3-sided exposure is 30m²/ tonne for floor beams.

Re-entrant Profiles and Post-Tensioning

When post-tensioned slabs are designed in conjunction with steel decking it is important to consider the location of the conduits to that of the ribs. The location of the conduits is important for determining the heat transfer in the event of a fire from the rib to the tendons. Analytical results using the heat transfer program Tasef-2, developed by Lund Institute of Technology, Sweden and the results from relevant testing have been used to determine the adequacy of the placement of post-tensioning tendons with re-entrant profiles.

See appendix B for Fielders PT Plus Design Solutions

KF57®

The computer program Tasef-2, predicts that the temperatures at the top of the KF57 rib are 490°C and 450°C respectively after standard fire exposure of 120 minutes for Dcs 120mm and 140mm. Pre-stressing strands placed 12mm above the rib results in a temperature difference from that of the rib of 75°C. The strand temperatures are 415°C and 375°C respectively after 120 minutes of standard fire exposure for Dcs 120mm and 140mm. Published information stipulates a temperature of 635°C at 25mm from a concrete face. It follows that supporting the conduits directly on the ribs does not present a worse situation. Where pre-stressed slabs are continuous, the tendons must be further elevated above the ribs over the supports or additional reinforcement added to resist negative moments.

In AS 3600:2001, it is assumed that for continuous concrete elements the negative steel is unaffected by the fire if placed sufficiently far enough from the heated soffit. The bending strength equations in the previous pages for ϕM_u^+ and ϕM_u^- have been formulated for the elevated temperature bending strength of both positive and negative moment of KF57 slabs. The method of analysis for structural adequacy of the fire resistant KF57 composite slabs complies with clause 5.9 of AS 3600:2001.

RF55®

The location of the post tension conduit for RF55 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 current and future versions of AS 3600:2001. For the case of tendons having parallel orientation to the deck it is assumed that the conduit is located centrally between RF55 ribs. This gives a distance from the centreline of the rib to the edge of the conduit of 60mm, and to the centreline of the tendon closest to the edge of the conduit of 72mm. The required distances from the heated soffit to the bottom of the conduit have been determined using TASEF-2 analyses previously undertaken for RF55®. The limiting distances to the edge of the conduit to achieve the nominated FRL are summarised in Table 3.4.F and relate to the edge of the conduit being located a minimum distance between the exterior of the top of the rib and the edge of the conduit being greater than or equal to 30mm. The slab thickness has been assumed to be 140mm but the results can be considered to be applicable to the range of practical post-tensioned concrete slabs.

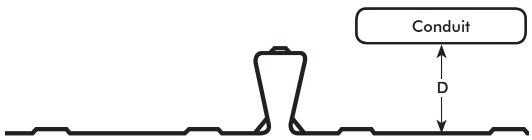


Figure 3.4.D Distance Between the Bottom of Pan and the Underside of the Pre-stressing Conduit

Minimum Distance (D) Between Bottom of the Pan and Underside of the Conduit - Tendons Parallel to Deck			
FRL (minutes)	Simply Supported (mm)	Continuous (mm)	Flat Slabs
120	45	25	35
180	70	45	60
240	85	55	80

Table 3.4.F **Minimum Distance Between Bottom of Pan and Underside of Conduit - Tendons Parallel to Deck**

For the case of tendons having perpendicular orientation to the deck the location of the conduit is required to be greater than that for the parallel orientation. Using the TASEF-2 analysis results for RF55, the minimum distances between the top of rib and the underside of a conduit to achieve a required FRL are given in table 3.4.G.

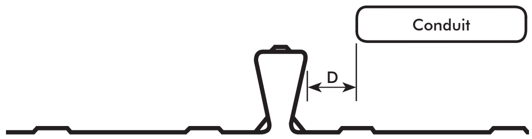


Figure 3.4.E **Distance Between the Between Top of Rib and Underside of the Pre-stressing Conduit**

Minimum Distance (D) Between Top of the Rib and Underside of the Conduit - Tendons Perpendicular to Deck			
FRL (minutes)	Simply Supported (mm)	Continuous (mm)	Flat Slabs
120	12	0	8
180	20	5	15
240	35	10	25

Table 3.4.G **Minimum Distance Between Top of Rib and Underside of Conduit - Tendons Perpendicular to Deck**

It is assumed that the pre-stressing tendons are encapsulated within a conduit that is subsequently grouted after tensioning. It is further assumed that the width of this conduit is 80mm and that no less than 6mm of grout exists between the inside surface and the outer surface of a pre-stressing tendon.

3.5 Crack Control for KF57® and RF55®

The tables in the following sections have been prepared considering moderate crack control. To increase or decrease the crack control requirement vary the mesh in accordance with table 3.5.A

The crack control reinforcement is for shrinkage and temperature only, not flexure.

The crack control tables exclude exposure classifications B1, B2 and C.

Crack Control						
Dcs (mm)	KF57® Reinforcement			RF55® Reinforcement		
	Minor	Moderate	Strong	Minor	Moderate	Strong
100	SL52	SL72	SL92	SL52	SL72	SL92
110	SL62	SL82	SL102	SL62	SL82	SL102
120	SL62	SL82	SL81	SL62	SL92	SL81
130	SL62	SL92	SL81	SL62	SL92	SL102
140	SL72	SL102	RL918	SL72	SL102	RL918
150	SL72	SL102	RL918	SL72	SL102	RL918
160	SL82	SL81	RL1018	SL82	SL81	RL1018
170	SL82	SL81	RL1018	SL82	SL81	RL1018
180	SL82	SL81	RL1118	SL82	SL81	RL1118
190	SL92	RL918	RL1118	SL92	RL918	RL1118
200	SL92	RL918	RL1118	SL92	RL918	RL1118
210	SL92	RL918	RL1218	SL92	RL918	RL1218
220	SL92	RL918	RL1218	SL92	RL918	RL1218
230	SL102	RL1018	RL1218	SL102	RL1018	RL1218
240	SL102	RL1018	RL1218	SL102	RL1018	RL1218
250	SL102	RL1018	-	SL102	RL1018	-

Table 3.5.A RF55® and KF57® Crack Control

Notes for table 3.5.A:

1. Table prepared in accordance with AS 3600:2001.
2. Rectangular mesh to be laid such that the largest bars must be oriented perpendicular to the decking span.
3. SL718 mesh can be replaced with SL102.
4. SL818 mesh can be replaced with SL81 as only transverse bars are effective.
5. Laps in mesh to occur midspan.
6. Mesh to be located on top of slab.

3.6 KF57® Composite Slab Properties Tables

KF57® Composite Slab Properties

KF57® **0.60**

Dcs (mm)	Slab Weight (kPa)	Equivalent Concrete Quantity (mm^3/mm^2)	Design Strength in Positive Bending $\phi M_{uo}+$ (kNm/m)	Gross Second Moment of Area - I ($x10^6$ mm^4/m)★	Cracked Section Second Moment of Area - I_{cr} ($x10^6$ mm^4/m)★
100	2.41	100	30.90	95.59	35.79
105	2.53	105	33.00	110.05	40.21
110	2.65	110	35.10	125.93	44.95
115	2.77	115	37.20	143.31	49.93
120	2.89	120	39.30	162.19	55.30
125	3.01	125	41.40	182.65	60.91
130	3.13	130	43.50	204.77	66.91
135	3.25	135	45.70	228.63	73.15
140	3.37	140	47.80	254.22	79.71
145	3.49	145	49.90	281.71	86.66
150	3.61	150	52.00	311.10	93.85
155	3.73	155	54.10	342.47	101.36
160	3.85	160	56.20	375.80	109.18
165	3.97	165	58.30	411.27	117.39
170	4.10	170	60.40	448.96	125.85
175	4.22	175	62.50	488.77	134.62
180	4.34	180	64.60	530.96	143.78
185	4.46	185	66.70	575.44	153.18
190	4.58	190	68.80	622.28	162.98
195	4.70	195	70.90	671.66	173.01
200	4.82	200	73.00	723.56	183.44
205	4.94	205	75.10	777.99	194.18
210	5.06	210	77.20	835.19	205.24
215	5.18	215	79.30	894.99	216.62
220	5.30	220	81.40	957.64	228.31
225	5.42	225	83.50	1023.13	240.32
230	5.54	230	85.60	1091.54	252.72
235	5.66	235	87.70	1162.88	265.36
240	5.78	240	89.80	1237.30	278.40
245	5.90	245	91.90	1314.80	291.75
250	6.02	250	94.00	1395.46	305.41

Table 3.6.A KF57® Composite Slab Properties - 0.60 BMT

Parameters

★ Values are given in transformed concrete sections, 25MPa.

Modular ratio 7.9.

KF57® Composite Slab Properties

KF57® **0.75**

Dcs (mm)	Slab Weight (kPa)	Equivalent Concrete Quantity (mm^3/mm^2)	Design Strength in Positive Bending $\phi M_{uo}+$ (kNm/m)	Gross Second Moment of Area - I ($x10^6$ mm^4/m)★	Cracked Section Second Moment of Area - I_{cr} ($x10^6$ mm^4/m)★
100	2.41	100	35.4	98.43	42.34
105	2.53	105	39.6	113.21	47.64
110	2.65	110	42.3	129.40	53.25
115	2.77	115	44.9	147.18	59.25
120	2.89	120	47.6	166.37	65.65
125	3.01	125	50.2	187.31	72.44
130	3.13	130	52.8	209.82	79.55
135	3.25	135	55.4	234.16	87.06
140	3.37	140	58.1	260.31	94.96
145	3.49	145	60.7	288.27	103.25
150	3.61	150	63.3	318.13	111.94
155	3.73	155	66.0	350.05	120.95
160	3.85	160	68.6	384.02	130.43
165	3.97	165	71.2	420.12	140.23
170	4.09	170	73.8	458.36	150.42
175	4.21	175	76.5	498.89	161.00
180	4.33	180	79.1	541.62	172.06
185	4.45	185	81.7	586.81	183.44
190	4.57	190	84.4	634.45	195.21
195	4.70	195	87.0	684.54	207.38
200	4.82	200	89.6	737.15	220.02
205	4.94	205	92.2	792.45	232.97
210	5.06	210	94.9	850.36	246.32
215	5.18	215	97.5	911.03	260.07
220	5.30	220	100.1	974.54	274.29
225	5.42	225	102.7	1040.90	288.82
230	5.54	230	105.4	1110.19	303.83
235	5.66	235	108.0	1182.47	319.24
240	5.78	240	110.6	1257.84	335.04
245	5.90	245	113.3	1336.29	351.16
250	6.02	250	115.9	1417.97	367.82

Table 3.6.B KF57® Composite Slab Properties - 0.75 BMT

Parameters

★ Values are given in transformed concrete sections, 25MPa.

Modular ratio 7.9.

KF57® Composite Slab Properties

KF57® **1.00**

Dcs (mm)	Slab Weight (kPa)	Equivalent Concrete Quantity (mm^3/mm^2)	Design Strength in Positive Bending $\phi M_{uo}+$ (kNm/m)	Gross Second Moment of Area - I ($x10^6$ mm^4/m)★	Cracked Section Second Moment of Area - I_{cr} ($x10^6$ mm^4/m)★
100	2.41	100	35.4	103.02	52.14
105	2.53	105	39.6	118.34	58.78
110	2.65	110	44.1	135.09	65.81
115	2.77	115	48.8	153.42	73.31
120	2.89	120	53.8	173.33	81.29
125	3.01	125	59	194.81	89.74
130	3.13	130	64.4	218.12	98.67
135	3.25	135	70.1	243.16	108.15
140	3.37	140	73.8	270.02	118.03
145	3.49	145	77.3	298.86	128.45
150	3.61	150	80.8	329.59	139.36
155	3.73	155	84.3	362.37	150.73
160	3.85	160	87.8	397.29	162.66
165	3.97	165	91.3	434.34	175.06
170	4.09	170	94.8	473.61	188.02
175	4.21	175	98.3	515.16	201.37
180	4.33	180	101.8	559.08	215.35
185	4.45	185	105.3	605.38	229.73
190	4.57	190	108.8	654.12	244.66
195	4.70	195	112.3	705.39	260.15
200	4.82	200	115.9	759.35	276.11
205	4.94	205	119.4	815.91	292.62
210	5.06	210	122.9	875.16	309.60
215	5.18	215	126.4	937.18	327.14
220	5.30	220	129.9	1002.12	345.15
225	5.42	225	133.4	1069.90	363.72
230	5.54	230	136.9	1140.68	382.83
235	5.66	235	140.4	1214.47	402.43
240	5.78	240	143.9	1291.41	422.57
245	5.90	245	147.4	1371.44	443.19
250	6.02	250	150.9	1454.71	464.36

Table 3.6.C KF57® Composite Slab Properties - 1.00 BMT

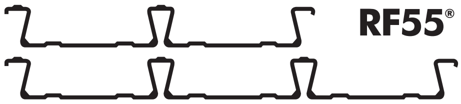
Parameters

★ Values are given in transformed concrete sections, 25MPa.

Modular ratio 7.9.

3.7 RF55® Composite Slab Properties Tables

RF55® Composite Slab Properties



RF55®

0.60

Dcs (mm)	Slab Weight (kPa)	Equivalent Concrete Quantity (mm^3/mm^2)	Design Strength in Positive Bending $\phi M_{uo}+$ (kNm/m)	Gross Second Moment of Area - I ($x10^6$ mm^4/m)★	Cracked Section Second Moment of Area - I_{cr} ($x10^6$ mm^4/m)★
100	2.26	94	31.5	92.27	34.05
105	2.38	99	33.7	106.57	38.55
110	2.50	104	35.9	122.29	43.37
115	2.62	109	38.1	139.44	48.51
120	2.74	114	40.3	158.16	53.96
125	2.86	119	42.5	178.46	59.72
130	2.98	124	44.7	200.42	65.81
135	3.10	129	46.8	224.04	72.21
140	3.22	134	49.0	249.48	78.92
145	3.34	139	51.2	276.82	86.03
150	3.46	144	53.4	305.97	93.38
155	3.58	149	55.6	337.09	101.12
160	3.70	154	57.8	370.27	109.18
165	3.82	159	60.0	405.59	117.55
170	3.94	164	62.2	443.03	126.24
175	4.06	169	64.4	482.61	135.25
180	4.18	174	66.6	524.56	144.65
185	4.30	179	68.8	568.80	154.37
190	4.42	184	71.0	615.49	164.40
195	4.54	189	73.2	664.63	174.75
200	4.66	194	75.4	716.29	185.41
205	4.78	199	77.6	770.57	196.47
210	4.90	204	79.8	827.45	207.85
215	5.02	209	82.0	887.09	219.62
220	5.14	214	84.2	949.50	231.63
225	5.26	219	86.4	1014.76	244.03
230	5.38	224	88.6	1082.93	256.83
235	5.50	229	90.8	1154.03	269.86
240	5.62	234	93.0	1228.13	283.29
245	5.74	239	95.2	1305.40	297.12
250	5.86	244	97.3	1385.82	311.18

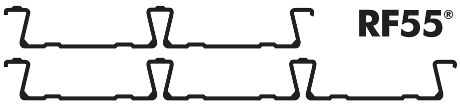
Table 3.7.A RF55® Composite Slab Properties - 0.60 BMT

Parameters

★ Values are given in transformed concrete sections, 25MPa.

Modular ratio 7.9.

RF55® Composite Slab Properties



RF55®

0.75

Dcs (mm)	Slab Weight (kPa)	Equivalent Concrete Quantity (mm^3/mm^2)	Design Strength in Positive Bending $\phi M_{uo}+$ (kNm/m)	Gross Second Moment of Area - I ($x10^6\ mm^4/m$)★	Cracked Section Second Moment of Area - I_{cr} ($x10^6\ mm^4/m$)★
100	2.26	94	34.3	94.72	40.13
105	2.38	99	38.5	109.34	45.47
110	2.50	104	42.9	125.37	52.06
115	2.62	109	45.8	142.91	57.35
120	2.74	114	48.6	162.03	63.91
125	2.86	119	51.3	182.73	70.78
130	2.98	124	54.1	205.08	78.05
135	3.10	129	56.8	229.26	85.79
140	3.22	134	59.6	255.17	93.85
145	3.34	139	62.3	282.98	102.31
150	3.46	144	65.0	312.68	111.15
155	3.58	149	67.8	344.36	120.48
160	3.70	154	70.5	378.17	130.11
165	3.82	159	73.3	414.04	140.23
170	3.94	164	76.0	452.12	150.65
175	4.06	169	78.8	492.41	161.56
180	4.18	174	81.5	535.07	172.85
185	4.30	179	84.3	580.02	184.54
190	4.42	184	87.0	627.42	196.71
195	4.54	189	89.8	677.27	209.19
200	4.66	194	92.5	729.72	222.15
205	4.78	199	95.2	784.79	235.50
210	4.90	204	98.0	842.54	249.25
215	5.02	209	100.7	903.05	263.47
220	5.14	214	103.5	966.33	278.08
225	5.26	219	106.2	1032.45	293.09
230	5.38	224	109.0	1101.58	308.50
235	5.50	229	111.7	1173.62	324.37
240	5.62	234	114.5	1248.75	340.65
245	5.74	239	117.2	1327.04	357.32
250	5.86	244	120.0	1408.41	374.46

Table 3.7.B RF55® Composite Slab Properties - 0.75 BMT

Parameters

★ Values are given in transformed concrete sections, 25MPa.

Modular ratio 7.9.

RF55® Composite Slab Properties

RF55® **0.90**

Dcs (mm)	Slab Weight (kPa)	Equivalent Concrete Quantity (mm^3/mm^2)	Design Strength in Positive Bending $\phi M_{uo}+$ (kNm/m)	Gross Second Moment of Area - I ($x10^6$ mm^4/m)★	Cracked Section Second Moment of Area - I_{cr} ($x10^6$ mm^4/m)★
100	2.26	94	34.3	97.01	45.58
105	2.38	99	38.4	111.94	51.75
110	2.50	104	42.8	128.30	58.30
115	2.62	109	47.5	146.15	65.41
120	2.74	114	52.4	165.66	72.84
125	2.86	119	57.5	186.76	80.82
130	2.98	124	62.7	209.59	89.19
135	3.10	129	66.0	234.16	98.04
140	3.22	134	69.2	260.54	107.36
145	3.34	139	72.5	288.82	117.16
150	3.46	144	75.8	319.08	127.43
155	3.58	149	79.1	351.31	138.17
160	3.70	154	82.4	385.68	149.31
165	3.82	159	85.7	422.18	161.00
170	3.94	164	89.0	460.89	173.17
175	4.06	169	92.3	501.81	185.81
180	4.18	174	95.6	545.10	198.92
185	4.30	179	98.9	590.76	212.51
190	4.42	184	102.2	638.87	226.57
195	4.54	189	105.5	689.51	241.11
200	4.66	194	108.8	742.68	256.12
205	4.78	199	112.1	798.53	271.68
210	4.90	204	115.4	857.15	287.64
215	5.02	209	118.6	918.45	304.15
220	5.14	214	121.9	982.60	321.14
225	5.26	219	125.2	1049.67	338.67
230	5.38	224	128.5	1119.67	356.61
235	5.50	229	131.8	1192.66	375.09
240	5.62	234	135.1	1268.74	394.05
245	5.74	239	138.4	1347.98	413.57
250	5.86	244	141.7	1430.37	433.55

Table 3.7.C RF55® Composite Slab Properties - 0.90 BMT

Parameters

★ Values are given in transformed concrete sections, 25MPa.

Modular ratio 7.9.

RF55® Composite Slab Properties

RF55®

1.00

Dcs (mm)	Slab Weight (kPa)	Equivalent Concrete Quantity (mm^3/mm^2)	Design Strength in Positive Bending $\phi M_{uo}+$ (kNm/m)	Gross Second Moment of Area - I ($x10^6$ mm^4/m)★	Cracked Section Second Moment of Area - I_{cr} ($x10^6$ mm^4/m)★
100	2.26	94	34.3	98.51	49.06
105	2.38	99	38.4	113.60	55.70
110	2.50	104	42.8	130.27	62.88
115	2.62	109	47.5	148.36	70.47
120	2.74	114	52.4	168.11	78.61
125	2.86	119	57.5	189.44	87.22
130	2.98	124	62.9	212.59	96.30
135	3.10	129	68.5	237.40	105.94
140	3.22	134	74.4	264.18	116.05
145	3.34	139	79.0	292.77	126.72
150	3.46	144	82.7	323.35	137.86
155	3.58	149	86.4	355.97	149.47
160	3.70	154	90.0	390.73	161.71
165	3.82	159	93.7	427.63	174.35
170	3.94	164	97.4	466.73	187.63
175	4.06	169	101.0	508.05	201.37
180	4.18	174	104.7	551.82	215.59
185	4.30	179	108.3	597.95	230.44
190	4.42	184	112.0	646.54	245.77
195	4.54	189	115.7	697.65	261.65
200	4.66	194	119.3	751.37	278.00
205	4.78	199	123.0	807.78	294.91
210	4.90	204	126.6	866.87	312.45
215	5.02	209	130.3	928.72	330.38
220	5.14	214	134.0	993.50	348.94
225	5.26	219	137.6	1061.13	368.06
230	5.38	224	141.3	1131.75	387.65
235	5.50	229	144.9	1205.38	407.88
240	5.62	234	148.6	1282.09	428.58
245	5.74	239	152.3	1361.96	449.83
250	5.86	244	155.9	1445.07	471.63

Table 3.7.D RF55® Composite Slab Properties - 1.00 BMT

Parameters

★ Values are given in transformed concrete sections, 25MPa.

Modular ratio 7.9.

3.8 KF57® Composite Slab Span Tables

Composite Slab Span Tables Notes

The composite slab span tables are to be used to design KingFlor composite slabs that do not have a fire requirement and meet the assumptions below. For a fire rated slab refer to the fire resistance tables. For designs outside the parameters below and specified on the tables refer to the KingFlor Designer Suite or your local Fielders representative. For propping requirements refer to the temporary propping tables.

Notation

Dcs = depth of composite slab.
L = Span between permanent supports.
Bars - N12@200 indicates N12 bars at 200mm centres.

Loads

Construction Live Load 1.0kPa
Ceiling & Services Load 0.35kPa
Partitions Load 0.5kPa

Short & Long-Term Factors

Short-term factor ψ = 0.7
Long-term factor ψ = 0.4
Combination-term factor ψ = 0.4

Concrete Properties

Normal wet density of concrete 2400kg/m^3
Normal dry density of concrete 2350 kg/m^3
Concrete strength f'c = 25MPa
Exposure Classification A1 with moderate crack control
Cover to top reinforcement is 30mm

Reinforcing

Steel Yield Strength f_{sy} = 500MPa

Mesh

Mesh is to be located in the top of the slab. Where the mesh code ends with a 'T' (eg. RL918T), the larger bars are to be located perpendicular to the decking ribs with the smaller perpendicular bars on top. Laps in mesh are to occur midspan.

Bars

Bars where required, are to be placed over internal permanent supports, on top of mesh. Length of bars are to be 0.6 x larger span + width of support. The bars are to be located 0.3 x span from edge of support for internal supports.

Spans

Spans L1, L2, L3 etc. cannot differ by more than 5% from both L1 and Ln.

Span is considered to be the larger of L1, L2...Ln.

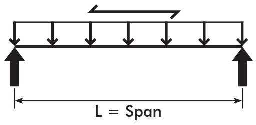
Support width 50mm

The composite slab tables have been prepared with the assumptions stated above. More refined designs can be obtained from Fielders or by using the KingFlor Designer Suite. Contact your local Fielders representative for design assistance.

KF57® Composite Slab Spans

Single Spans 0.60 BMT

KF57®



0.60

Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	105	SL72	-	105	SL72	-	105	SL72	-
1,250	105	SL72	-	105	SL72	-	105	SL72	-
1,500	105	SL72	-	105	SL72	-	105	SL72	-
1,750	105	SL72	-	105	SL72	-	105	SL72	-
2,000	105	SL72	-	105	SL72	-	105	SL72	-
2,250	105	SL72	-	105	SL72	-	105	SL72	-
2,500	105	SL72	-	105	SL72	-	105	SL72	-
2,750	105	SL72	-	105	SL72	-	105	SL72	-
3,000	105	SL72	-	105	SL72	-	110	SL82	-
3,250	105	SL72	-	105	SL72	-	120	SL82	-
3,500	105	SL72	-	115	SL82	-	130	SL92	-
3,750	115	SL82	-	125	SL92	-	140	SL92	-
4,000	120	SL92	-	140	SL92	-	155	SL102	-
4,250	135	SL92	-	150	SL102	-	165	SL81	-
4,500	145	SL102	-	160	SL81	-	175	SL81	-
4,750	155	SL102	-	170	SL81	-	195	RL918T	-
5,000	165	SL81	-	180	SL81	-	210	RL918T	-
5,250	175	SL81	-	200	RL918T	-	225	RL1018T	-
5,500	195	RL918T	-	215	RL918T	-	240	RL1018T	-
5,750	210	RL918T	-	230	RL1018T	-	250	RL1018T	-
6,000	225	RL1018T	-	245	RL1018T	-	270	RL1118T	-
6,250	240	RL1018T	-	260	RL1018T	-	285	RL1118T	-
6,500	255	RL1018T	-	275	RL1118T	-	300	RL1118T	-
6,750	270	RL1118T	-	290	RL1118T	-	320	RL1218T	-
7,000	285	RL1118T	-	310	RL1118T	-	335	RL1218T	-

Table 3.8.A KF57® Composite Slab Spans - Single Spans 0.60 BMT

Deflection Criteria

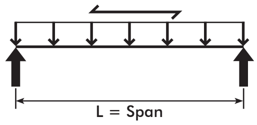
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

KF57® Composite Slab Spans

Single Spans 0.75 BMT

KF57®



0.75

Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	105	SL72	-	105	SL72	-	105	SL72	-
1,250	105	SL72	-	105	SL72	-	105	SL72	-
1,500	105	SL72	-	105	SL72	-	105	SL72	-
1,750	105	SL72	-	105	SL72	-	105	SL72	-
2,000	105	SL72	-	105	SL72	-	105	SL72	-
2,250	105	SL72	-	105	SL72	-	105	SL72	-
2,500	105	SL72	-	105	SL72	-	105	SL72	-
2,750	105	SL72	-	105	SL72	-	105	SL72	-
3,000	105	SL72	-	105	SL72	-	105	SL72	-
3,250	105	SL72	-	105	SL72	-	115	SL82	-
3,500	105	SL72	-	115	SL82	-	130	SL92	-
3,750	110	SL82	-	125	SL92	-	140	SL92	-
4,000	120	SL82	-	135	SL92	-	150	SL102	-
4,250	130	SL92	-	145	SL102	-	165	SL81	-
4,500	140	SL102	-	155	SL81	-	175	SL81	-
4,750	155	SL102	-	170	SL81	-	190	RL918T	-
5,000	160	SL81	-	180	SL81	-	205	RL918T	-
5,250	175	SL81	-	200	RL918T	-	220	RL918T	-
5,500	195	RL918T	-	215	RL918T	-	235	RL1018T	-
5,750	210	RL918T	-	230	RL1018T	-	250	RL1018T	-
6,000	225	RL1018T	-	240	RL1018T	-	265	RL1118T	-
6,250	235	RL1018T	-	255	RL1018T	-	280	RL1118T	-
6,500	250	RL1018T	-	270	RL1118T	-	295	RL1118T	-
6,750	265	RL1118T	-	290	RL1118T	-	315	RL1118T	-
7,000	280	RL1118T	-	305	RL1118T	-	330	RL1218T	-

Table 3.8.B KF57® Composite Slab Spans - Single Spans 0.75 BMT

Deflection Criteria

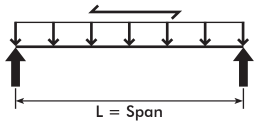
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

KF57® Composite Slab Spans

Single Spans 1.00 BMT

KF57®



1.00

Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	105	SL72	-	105	SL72	-	105	SL72	-
1,250	105	SL72	-	105	SL72	-	105	SL72	-
1,500	105	SL72	-	105	SL72	-	105	SL72	-
1,750	105	SL72	-	105	SL72	-	105	SL72	-
2,000	105	SL72	-	105	SL72	-	105	SL72	-
2,250	105	SL72	-	105	SL72	-	105	SL72	-
2,500	105	SL72	-	105	SL72	-	105	SL72	-
2,750	105	SL72	-	105	SL72	-	105	SL72	-
3,000	105	SL72	-	105	SL72	-	105	SL72	-
3,250	105	SL72	-	105	SL72	-	115	SL82	-
3,500	105	SL72	-	110	SL82	-	125	SL92	-
3,750	110	SL82	-	120	SL82	-	135	SL92	-
4,000	120	SL82	-	130	SL92	-	150	SL102	-
4,250	130	SL92	-	145	SL102	-	160	SL81	-
4,500	140	SL92	-	155	SL102	-	170	SL81	-
4,750	150	SL102	-	165	SL81	-	185	SL81	-
5,000	160	SL81	-	180	SL81	-	200	RL918T	-
5,250	175	SL81	-	195	RL918T	-	215	RL918T	-
5,500	185	SL81	-	210	RL918T	-	230	RL1018T	-
5,750	205	RL918T	-	225	RL1018T	-	245	RL1018T	-
6,000	215	RL918T	-	240	RL1018T	-	260	RL1018T	-
6,250	230	RL1018T	-	255	RL1018T	-	275	RL1118T	-
6,500	250	RL1018T	-	265	RL1118T	-	290	RL1118T	-
6,750	260	RL1018T	-	280	RL1118T	-	310	RL1118T	-
7,000	275	RL1118T	-	300	RL1118T	-	325	RL1218T	-

Table 3.8.C KF57® Composite Slab Spans - Single Spans 1.00 BMT

Deflection Criteria

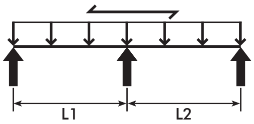
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

KF57® Composite Slab Spans

Double Span 0.60 BMT

KF57®



0.60

Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
1,250	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
1,500	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
1,750	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,000	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,250	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,500	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,750	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
3,000	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
3,250	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@300
3,500	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@250
3,750	110	SL82	N12@400	110	SL82	N12@300	110	SL82	N12@200
4,000	110	SL82	N12@400	110	SL82	N12@250	130	SL92	N12@250
4,250	110	SL82	N12@350	110	SL82	N12@200	140	SL92	N12@225
4,500	110	SL82	N12@275	115	SL92	N12@200	145	SL102	N12@225
4,750	110	SL82	N12@225	125	SL92	N12@200	145	SL102	N12@200
5,000	115	SL82	N12@225	135	SL92	N12@200	160	SL81	N12@250
5,250	125	SL92	N12@225	140	SL92	N12@175	160	SL81	N12@200
5,500	135	SL92	N12@225	150	SL102	N12@200	175	SL81	N12@200
5,750	140	SL92	N12@200	155	SL81	N12@200	190	RL918T	N12@250
6,000	150	SL102	N12@200	165	SL81	N12@175	205	RL918T	N12@250
6,250	155	SL81	N12@200	175	SL81	N16@300	205	RL918T	N12@225
6,500	165	SL81	N12@200	180	SL81	N16@300	205	RL918T	N16@200
6,750	175	SL81	N12@200	195	RL918T	N16@225	220	RL918T	N16@200
7,000	185	SL81	N12@200	205	RL918T	N16@200	225	RL1018T	N16@175

Table 3.8.D KF57® Composite Slab Spans - Double Span 0.60 BMT

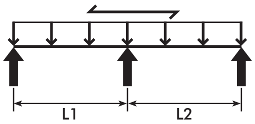
Deflection Criteria

Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

KF57® Composite Slab Spans
Double Span 0.75 BMT

KF57®



0.75

Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
1,250	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
1,500	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
1,750	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,000	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,250	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,500	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,750	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
3,000	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
3,250	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@325
3,500	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@250
3,750	110	SL82	N12@400	110	SL82	N12@325	115	SL82	N12@225
4,000	110	SL82	N12@400	110	SL82	N12@250	125	SL92	N12@225
4,250	110	SL82	N12@350	120	SL82	N12@250	135	SL92	N12@225
4,500	110	SL82	N12@275	130	SL92	N12@250	145	SL102	N12@225
4,750	110	SL82	N12@225	135	SL92	N12@225	150	SL102	N12@200
5,000	120	SL82	N12@200	135	SL92	N12@200	160	SL81	N12@225
5,250	125	SL92	N12@225	140	SL92	N12@175	170	SL81	N12@225
5,500	130	SL92	N12@200	145	SL102	N12@175	185	SL81	N12@225
5,750	140	SL92	N12@200	155	SL102	N12@175	195	RL918T	N16@250
6,000	150	SL102	N12@200	165	SL81	N12@175	195	RL918T	N16@225
6,250	155	SL102	N16@325	175	SL81	N16@300	195	RL918T	N16@200
6,500	165	SL81	N16@300	185	SL81	N16@300	205	RL918T	N16@200
6,750	170	SL81	N16@300	195	RL918T	N16@225	220	RL918T	N16@200
7,000	180	SL81	N16@300	205	RL918T	N16@200	225	RL1018T	N16@175

Table 3.8.E KF57® Composite Slab Spans - Double Span 0.75 BMT

Deflection Criteria

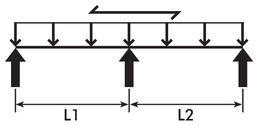
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

KF57® Composite Slab Spans

Double Span 1.00 BMT

KF57®



1.00

Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
1,250	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
1,500	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
1,750	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,000	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,250	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,500	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,750	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
3,000	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
3,250	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@325
3,500	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@250
3,750	110	SL82	N12@400	110	SL82	N12@325	115	SL82	N12@225
4,000	110	SL82	N12@400	110	SL82	N12@250	125	SL92	N12@225
4,250	110	SL82	N12@350	115	SL82	N12@200	135	SL92	N12@225
4,500	110	SL92	N12@325	120	SL82	N12@200	145	SL102	N12@225
4,750	110	SL92	N12@250	135	SL92	N12@225	150	SL102	N12@200
5,000	115	SL92	N12@225	135	SL92	N12@200	160	SL81	N12@200
5,250	125	SL92	N12@200	140	SL102	N12@200	160	SL81	N12@200
5,500	130	SL92	N12@200	150	SL102	N12@200	175	SL81	N12@200
5,750	135	SL92	N12@200	150	SL81	N12@200	190	RL918T	N16@250
6,000	145	SL102	N12@200	165	SL81	N12@200	205	RL918T	N16@250
6,250	155	SL102	N12@200	170	SL81	N16@300	205	RL918T	N16@225
6,500	160	SL81	N12@200	180	SL81	N16@300	205	RL918T	N16@200
6,750	170	SL81	N12@200	195	RL918T	N16@225	210	RL918T	N16@175
7,000	180	SL81	N12@200	200	RL918T	N16@200	220	RL918T	N16@175

Table 3.8.F KF57® Composite Slab Spans - Double Span 1.00 BMT

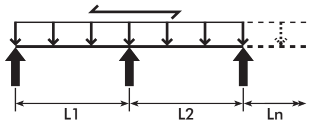
Deflection Criteria

Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

KF57® Composite Slab Spans
Continuous Span 0.60 BMT

KF57®



0.60

Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
1,250	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
1,500	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
1,750	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,000	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,250	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,500	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,750	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
3,000	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
3,250	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
3,500	110	SL82	N12@400	110	SL82	N12@400	120	SL82	N12@400
3,750	110	SL82	N12@400	110	SL82	N12@400	125	SL92	N12@400
4,000	110	SL82	N12@400	110	SL82	N12@350	130	SL92	N12@350
4,250	110	SL82	N12@400	120	SL82	N12@325	135	SL92	N12@300
4,500	110	SL82	N12@400	130	SL92	N12@375	145	SL102	N12@325
4,750	120	SL82	N12@400	135	SL92	N12@325	150	SL102	N12@275
5,000	130	SL92	N12@400	145	SL102	N12@375	160	SL81	N12@350
5,250	140	SL92	N12@400	155	SL102	N12@350	170	SL81	N12@325
5,500	145	SL102	N12@400	160	SL81	N12@400	180	SL81	N12@300
5,750	155	SL102	N12@400	175	SL81	N12@400	195	RL918T	N16@300
6,000	165	SL81	N12@400	185	SL81	N12@375	205	RL918T	N16@300
6,250	170	SL81	N12@400	195	RL918T	N12@200	215	RL918T	N16@300
6,500	180	SL81	N12@400	205	RL918T	N16@300	225	RL1018T	N16@275
6,750	195	RL918T	N12@225	215	RL918T	N16@300	245	RL1018T	N16@275
7,000	210	RL918T	N12@200	230	RL1018T	N16@275	250	RL1018T	N16@250

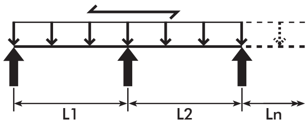
Table 3.8.G KF57® Composite Slab Spans - Continuous Span 0.60 BMT

Deflection Criteria
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

KF57® Composite Slab Spans
Continuous Span 0.75 BMT

KF57®



0.75

Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
1,250	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
1,500	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
1,750	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,000	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,250	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,500	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,750	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
3,000	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
3,250	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
3,500	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@325
3,750	110	SL82	N12@400	110	SL82	N12@400	115	SL82	N12@275
4,000	110	SL82	N12@400	110	SL82	N12@350	120	SL82	N12@250
4,250	110	SL82	N12@400	115	SL82	N12@300	130	SL92	N12@275
4,500	115	SL82	N12@400	125	SL92	N12@350	140	SL92	N12@250
4,750	120	SL82	N12@350	135	SL92	N12@325	150	SL102	N12@275
5,000	125	SL92	N12@400	145	SL102	N12@375	160	SL81	N12@350
5,250	140	SL92	N12@400	150	SL102	N12@325	175	SL81	N12@350
5,500	145	SL102	N12@400	160	SL81	N12@400	180	SL81	N12@300
5,750	155	SL102	N12@400	175	SL81	N12@400	190	RL918T	N16@300
6,000	165	SL81	N12@400	180	SL81	N12@350	205	RL918T	N16@300
6,250	175	SL81	N12@400	195	RL918T	N12@200	220	RL918T	N16@300
6,500	185	SL81	N12@400	205	RL918T	N16@300	225	RL1018T	N16@275
6,750	195	RL918T	N12@200	215	RL918T	N16@300	235	RL1018T	N16@250
7,000	205	RL918T	N12@200	225	RL1018T	N16@275	250	RL1018T	N16@250

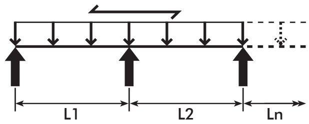
Table 3.8.H KF57® Composite Slab Spans - Continuous Span 0.75 BMT

Deflection Criteria
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

KF57® Composite Slab Spans
Continuous Span 1.00 BMT

KF57®



1.00

Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
1,250	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
1,500	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
1,750	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,000	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,250	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,500	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
2,750	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
3,000	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
3,250	110	SL82	N12@400	110	SL82	N12@400	110	SL82	N12@400
3,500	110	SL82	N12@400	110	SL82	N12@400	115	SL82	N12@375
3,750	110	SL82	N12@400	110	SL82	N12@400	120	SL82	N12@300
4,000	110	SL82	N12@400	110	SL82	N12@350	130	SL92	N12@350
4,250	110	SL82	N12@400	115	SL82	N12@300	130	SL92	N12@275
4,500	115	SL82	N12@400	125	SL92	N12@350	140	SL92	N12@250
4,750	120	SL82	N12@350	130	SL92	N12@300	150	SL102	N12@275
5,000	130	SL92	N12@400	140	SL92	N12@275	155	SL81	N12@325
5,250	140	SL92	N12@375	150	SL102	N12@325	165	SL81	N12@300
5,500	145	SL102	N12@400	160	SL81	N12@400	175	SL81	N12@275
5,750	155	SL102	N12@400	175	SL81	N12@400	185	SL81	N12@250
6,000	160	SL81	N12@400	185	SL81	N12@375	200	RL918T	N16@300
6,250	170	SL81	N12@400	195	RL918T	N12@200	220	RL918T	N16@300
6,500	180	SL81	N12@400	200	RL918T	N16@300	225	RL1018T	N16@275
6,750	195	RL918T	N12@200	215	RL918T	N16@300	235	RL1018T	N16@250
7,000	200	RL918T	N16@300	220	RL918T	N16@275	250	RL1018T	N16@250

Table 3.8.I KF57® Composite Slab Spans - Continuous Span 1.00 BMT

Deflection Criteria

Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

3.9 RF55® Composite Slab Span Tables

Composite Slab Span Tables Notes

The composite slab span tables are to be used to design KingFlor composite slabs that do not have a fire requirement and meet the assumptions below. For a fire rated slab refer to the fire resistance tables. For designs outside the parameters below and specified on the tables refer to the KingFlor Designer Suite or your local Fielders representative. For propping requirements refer to the temporary propping tables.

Notation

Dcs = depth of composite slab.
L = Span between permanent supports.
Bars - N12@200 indicates N12 bars at 200mm centres.

Loads

Construction Live Load 1.0kPa
Ceiling & Services Load 0.35kPa
Partitions Load 0.5kPa

Short & Long-Term Factors

Short-term factor ψ = 0.7
Long-term factor ψ = 0.4
Combination-term factor ψ = 0.4

Concrete Properties

Normal wet density of concrete 2400kg/m^3
Normal dry density of concrete 2350 kg/m^3
Concrete strength f'c = 25MPa
Exposure Classification A1 with moderate crack control
Cover to top reinforcement is 30mm

Reinforcing

Steel Yield Strength f_{sy} = 500MPa

Mesh

Mesh is to be located in the top of the slab. Where the mesh code ends with a 'T' (eg. RL918T), the larger bars are to be located perpendicular to the decking ribs with the smaller perpendicular bars on top. Laps in mesh are to occur midspan.

Bars

Bars where required, are to be placed over internal permanent supports, on top of mesh. Length of bars are to be 0.6 x larger span + width of support. The bars are to be located 0.3 x span from edge of support for internal supports.

Spans

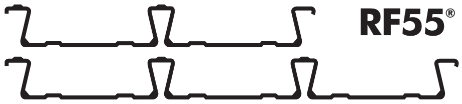
Spans L1, L2, L3 etc. cannot differ by more than 5% from both L1 and Ln.

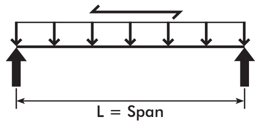
Span is considered to be the larger of L1, L2...Ln.

Support width 50mm

The composite slab tables have been prepared with the assumptions stated above. More refined designs can be obtained from Fielders or by using the KingFlor Designer Suite. Contact your local Fielders representative for design assistance.

RF55® Composite Slab Spans
Single Spans 0.60 BMT





0.60

Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	100	SL72	-	100	SL72	-	100	SL72	-
1,250	100	SL72	-	100	SL72	-	100	SL72	-
1,500	100	SL72	-	100	SL72	-	100	SL72	-
1,750	100	SL72	-	100	SL72	-	100	SL72	-
2,000	100	SL72	-	100	SL72	-	100	SL72	-
2,250	100	SL72	-	100	SL72	-	100	SL72	-
2,500	100	SL72	-	100	SL72	-	100	SL72	-
2,750	100	SL72	-	100	SL72	-	100	SL72	-
3,000	100	SL72	-	100	SL72	-	110	SL82	-
3,250	100	SL72	-	105	SL72	-	120	SL92	-
3,500	100	SL72	-	115	SL82	-	130	SL92	-
3,750	110	SL82	-	125	SL92	-	140	SL102	-
4,000	120	SL92	-	135	SL92	-	155	SL102	-
4,250	135	SL92	-	150	SL102	-	165	SL81	-
4,500	140	SL102	-	155	SL81	-	175	SL81	-
4,750	155	SL102	-	170	SL81	-	195	RL918T	-
5,000	165	SL81	-	180	SL81	-	210	RL918T	-
5,250	175	SL81	-	210	RL918T	-	220	RL918T	-
5,500	195	RL918T	-	215	RL918T	-	235	RL1018T	-
5,750	210	RL918T	-	230	RL1018T	-	250	RL1018T	-
6,000	220	RL918T	-	245	RL1018T	-	265	RL118T	-
6,250	235	RL1018T	-	260	RL118T	-	285	RL118T	-
6,500	250	RL1018T	-	275	RL118T	-	305	RL118T	-
6,750	265	RL118T	-	290	RL118T	-	330	RL1218T	-
7,000	285	RL118T	-	305	RL118T	-	360	RL1218T	-

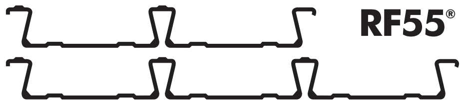
Table 3.9.A RF55® Composite Slab Spans - Single Spans 0.60 BMT

Deflection Criteria

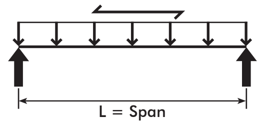
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

RF55® Composite Slab Spans
Single Span 0.75 BMT



RF55®



0.75

Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	100	SL72	-	100	SL72	-	100	SL72	-
1,250	100	SL72	-	100	SL72	-	100	SL72	-
1,500	100	SL72	-	100	SL72	-	100	SL72	-
1,750	100	SL72	-	100	SL72	-	100	SL72	-
2,000	100	SL72	-	100	SL72	-	100	SL72	-
2,250	100	SL72	-	100	SL72	-	100	SL72	-
2,500	100	SL72	-	100	SL72	-	100	SL72	-
2,750	100	SL72	-	100	SL72	-	100	SL72	-
3,000	100	SL72	-	100	SL72	-	105	SL72	-
3,250	100	SL72	-	105	SL72	-	115	SL92	-
3,500	100	SL72	-	115	SL82	-	130	SL92	-
3,750	110	SL82	-	125	SL92	-	140	SL102	-
4,000	120	SL92	-	135	SL92	-	150	SL102	-
4,250	130	SL102	-	145	SL102	-	160	SL81	-
4,500	140	SL102	-	155	SL81	-	175	SL81	-
4,750	155	SL102	-	170	SL81	-	190	RL918T	-
5,000	165	SL81	-	180	SL81	-	205	RL918T	-
5,250	175	SL81	-	200	RL918T	-	220	RL918T	-
5,500	195	RL918T	-	215	RL918T	-	235	RL1018T	-
5,750	205	RL918T	-	225	RL1018T	-	250	RL1018T	-
6,000	220	RL918T	-	240	RL1018T	-	265	RL118T	-
6,250	235	RL1018T	-	255	RL1018T	-	280	RL118T	-
6,500	250	RL1018T	-	270	RL118T	-	295	RL118T	-
6,750	265	RL118T	-	285	RL118T	-	315	RL1218T	-
7,000	280	RL118T	-	300	RL118T	-	330	RL1218T	-

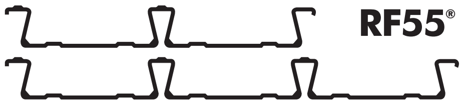
Table 3.9.B RF55® Composite Slab Spans - Single Span 0.75 BMT

Deflection Criteria
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

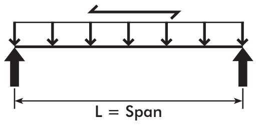
Refer to the start of this section for additional parameters used to calculate the above table.

RF55® Composite Slab Spans

Single Span 0.90 BMT



RF55®



0.90

Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	100	SL72	-	100	SL72	-	100	SL72	-
1,250	100	SL72	-	100	SL72	-	100	SL72	-
1,500	100	SL72	-	100	SL72	-	100	SL72	-
1,750	100	SL72	-	100	SL72	-	100	SL72	-
2,000	100	SL72	-	100	SL72	-	100	SL72	-
2,250	100	SL72	-	100	SL72	-	100	SL72	-
2,500	100	SL72	-	100	SL72	-	100	SL72	-
2,750	100	SL72	-	100	SL72	-	100	SL72	-
3,000	100	SL72	-	100	SL72	-	105	SL72	-
3,250	100	SL72	-	105	SL72	-	115	SL82	-
3,500	100	SL72	-	110	SL82	-	125	SL92	-
3,750	110	SL82	-	120	SL92	-	135	SL102	-
4,000	120	SL92	-	135	SL92	-	150	SL102	-
4,250	130	SL92	-	145	SL102	-	160	SL81	-
4,500	140	SL102	-	155	SL102	-	175	SL81	-
4,750	150	SL102	-	165	SL81	-	190	RL918T	-
5,000	160	SL81	-	180	SL81	-	205	RL918T	-
5,250	175	SL81	-	195	RL918T	-	215	RL918T	-
5,500	190	RL918T	-	210	RL918T	-	230	RL1018T	-
5,750	205	RL918T	-	225	RL1018T	-	245	RL1018T	-
6,000	220	RL918T	-	240	RL1018T	-	260	RL118T	-
6,250	235	RL1018T	-	250	RL1018T	-	275	RL118T	-
6,500	245	RL1018T	-	270	RL118T	-	295	RL118T	-
6,750	260	RL118T	-	285	RL118T	-	310	RL118T	-
7,000	275	RL118T	-	300	RL118T	-	325	RL1218T	-

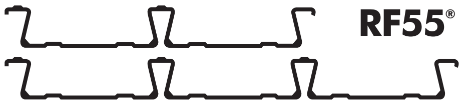
Table 3.9.C RF55® Composite Slab Spans - Single Span 0.90 BMT

Deflection Criteria

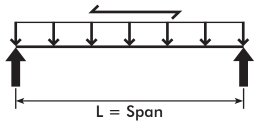
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

RF55® Composite Slab Spans
Single Span 1.00 BMT



RF55®



1.00

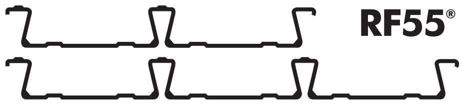
Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	100	SL72	-	100	SL72	-	100	SL72	-
1,250	100	SL72	-	100	SL72	-	100	SL72	-
1,500	100	SL72	-	100	SL72	-	100	SL72	-
1,750	100	SL72	-	100	SL72	-	100	SL72	-
2,000	100	SL72	-	100	SL72	-	100	SL72	-
2,250	100	SL72	-	100	SL72	-	100	SL72	-
2,500	100	SL72	-	100	SL72	-	100	SL72	-
2,750	100	SL72	-	100	SL72	-	100	SL72	-
3,000	100	SL72	-	100	SL72	-	105	SL72	-
3,250	100	SL72	-	100	SL72	-	115	SL82	-
3,500	100	SL72	-	110	SL82	-	125	SL92	-
3,750	110	SL82	-	120	SL92	-	135	SL92	-
4,000	115	SL92	-	135	SL92	-	150	SL102	-
4,250	130	SL92	-	145	SL102	-	160	SL81	-
4,500	140	SL102	-	155	SL102	-	170	SL81	-
4,750	150	SL102	-	165	SL81	-	190	RL918T	-
5,000	160	SL81	-	180	SL81	-	200	RL918T	-
5,250	175	SL81	-	195	RL918T	-	210	RL918T	-
5,500	190	RL918T	-	210	RL918T	-	230	RL1018T	-
5,750	200	RL918T	-	220	RL918T	-	245	RL1018T	-
6,000	215	RL918T	-	235	RL1018T	-	260	RL118T	-
6,250	230	RL1018T	-	250	RL1018T	-	275	RL118T	-
6,500	245	RL1018T	-	265	RL118T	-	290	RL118T	-
6,750	260	RL118T	-	280	RL118T	-	305	RL118T	-
7,000	275	RL118T	-	295	RL118T	-	325	RL1218T	-

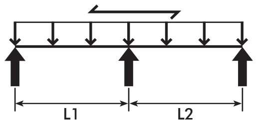
Table 3.9.D RF55® Composite Slab Spans - Single Span 1.00 BMT

Deflection Criteria
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

RF55® Composite Slab Spans
Double Span 0.60 BMT





0.60

Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,500	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,750	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,500	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,750	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
3,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@350
3,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@275
3,500	105	SL72	N12@400	105	SL72	N12@350	110	SL82	N12@250
3,750	105	SL72	N12@400	105	SL72	N12@275	120	SL92	N12@275
4,000	105	SL72	N12@350	105	SL72	N12@225	130	SL92	N12@250
4,250	105	SL72	N12@300	110	SL82	N12@200	140	SL102	N12@275
4,500	105	SL72	N12@225	120	SL92	N12@225	145	SL102	N12@225
4,750	110	SL82	N12@250	130	SL92	N12@225	145	SL102	N12@200
5,000	115	SL82	N12@225	135	SL92	N12@200	160	SL81	N12@250
5,250	125	SL92	N12@225	140	SL102	N12@200	170	SL81	N12@225
5,500	135	SL92	N12@225	150	SL102	N12@200	180	SL81	N12@200
5,750	140	SL102	N12@225	155	SL102	N12@175	200	RL918T	N12@150
6,000	150	SL102	N12@200	165	SL81	N12@200	210	RL918T	N12@250
6,250	155	SL81	N12@250	175	SL81	N12@200	210	RL918T	N12@225
6,500	165	SL81	N12@250	180	SL81	N16@300	215	RL918T	N12@200
6,750	175	SL81	N12@225	195	RL918T	N16@225	220	RL918T	N12@200
7,000	185	RL918T	N16@250	210	RL918T	N16@225	240	RL1018T	N12@200

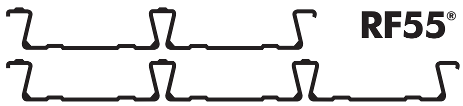
Table 3.9.E RF55® Composite Slab Spans - Double Span 0.60 BMT

Deflection Criteria

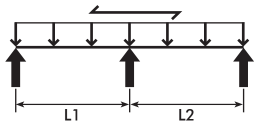
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

RF55® Composite Slab Spans
Double Span 0.75 BMT



RF55®



0.75

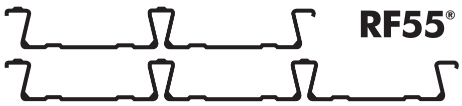
Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,500	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,750	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,500	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,750	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
3,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@350
3,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@275
3,500	105	SL72	N12@400	105	SL72	N12@350	110	SL82	N12@250
3,750	105	SL72	N12@400	105	SL72	N12@275	115	SL82	N12@225
4,000	105	SL72	N12@350	110	SL82	N12@250	125	SL92	N12@225
4,250	105	SL72	N12@300	120	SL92	N12@300	135	SL92	N12@225
4,500	105	SL72	N12@225	130	SL92	N12@275	145	SL102	N12@225
4,750	110	SL82	N12@225	135	SL92	N12@250	155	SL102	N12@225
5,000	115	SL82	N12@225	135	SL92	N12@200	165	SL81	N12@250
5,250	125	SL92	N12@225	140	SL102	N12@200	175	SL81	N12@250
5,500	130	SL92	N12@200	150	SL102	N12@200	185	RL918T	N16@275
5,750	140	SL102	N12@200	155	SL81	N12@225	195	RL918T	N16@250
6,000	150	SL102	N12@200	165	SL81	N12@200	205	RL918T	N16@250
6,250	155	SL102	N12@200	175	SL81	N12@200	205	RL918T	N16@225
6,500	165	SL81	N12@200	180	SL81	N16@300	205	RL918T	N16@200
6,750	175	SL81	N12@200	195	RL918T	N16@225	220	RL918T	N16@200
7,000	180	SL81	N12@200	210	RL918T	N16@200	225	RL1018T	N16@175

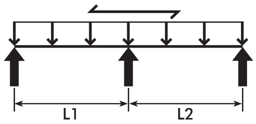
Table 3.9.F RF55® Composite Slab Spans - Double Span 0.75 BMT

Deflection Criteria
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

RF55® Composite Slab Spans
Double Span 0.90 BMT





0.90

Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,500	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,750	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,500	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,750	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
3,000	105	SL72	N12@400	105	SL72	N12@400	110	SL82	N12@400
3,250	105	SL72	N12@400	105	SL72	N12@400	110	SL82	N12@325
3,500	105	SL72	N12@400	110	SL82	N12@400	110	SL82	N12@250
3,750	105	SL72	N12@400	115	SL82	N12@375	115	SL82	N12@225
4,000	110	SL82	N12@400	120	SL92	N12@375	120	SL92	N12@200
4,250	115	SL82	N12@400	120	SL92	N12@300	130	SL92	N12@200
4,500	115	SL82	N12@325	120	SL92	N12@200	130	SL92	N16@325
4,750	120	SL92	N12@325	125	SL92	N12@200	135	SL92	N16@275
5,000	120	SL92	N12@250	135	SL92	N12@200	145	SL102	N16@250
5,250	130	SL92	N12@250	140	SL102	N12@200	150	SL102	N16@250
5,500	130	SL92	N12@200	150	SL102	N12@200	160	SL81	N16@300
5,750	135	SL102	N12@200	155	SL81	N12@200	170	SL81	N16@300
6,000	145	SL102	N12@200	160	SL81	N12@200	180	SL81	N16@250
6,250	155	SL102	N12@200	175	SL81	N12@200	190	RL918T	N16@200
6,500	160	SL81	N12@200	180	SL81	N16@300	205	RL918T	N16@200
6,750	170	SL81	N12@200	195	RL918T	N16@225	220	RL918T	N16@200
7,000	180	SL81	N12@200	205	RL918T	N16@200	230	RL1018T	N16@175

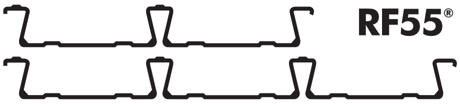
Table 3.9.G RF55® Composite Slab Spans - Double Span 0.90 BMT

Deflection Criteria
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

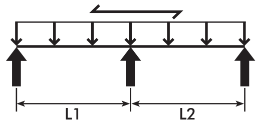
Refer to the start of this section for additional parameters used to calculate the above table.

RF55® Composite Slab Spans

Double Span 1.00 BMT



RF55®



1.00

Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,500	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,750	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,500	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,750	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
3,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@325
3,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@250
3,500	105	SL72	N12@400	105	SL72	N12@350	105	SL72	N12@200
3,750	105	SL72	N12@400	105	SL72	N12@275	110	SL82	N12@200
4,000	105	SL72	N12@350	110	SL82	N12@250	120	SL92	N12@200
4,250	105	SL72	N12@300	115	SL82	N12@225	130	SL92	N12@200
4,500	105	SL72	N12@225	125	SL92	N12@250	140	SL102	N12@225
4,750	110	SL82	N12@225	135	SL92	N12@250	150	SL102	N12@200
5,000	115	SL82	N12@200	135	SL92	N12@200	160	SL81	N12@225
5,250	120	SL92	N12@225	135	SL92	N12@150	170	SL81	N12@225
5,500	130	SL92	N12@200	145	SL102	N12@175	180	SL81	N12@200
5,750	135	SL92	N12@200	155	SL102	N12@175	190	RL918T	N16@250
6,000	145	SL102	N12@200	160	SL81	N12@200	195	RL918T	N16@225
6,250	155	SL102	N12@200	175	SL81	N12@200	195	RL918T	N16@200
6,500	160	SL81	N12@225	180	SL81	N16@300	205	RL918T	N16@200
6,750	170	SL81	N12@225	190	RL918T	N16@225	220	RL918T	N16@200
7,000	180	SL81	N12@200	200	RL918T	N16@200	225	RL1018T	N16@175

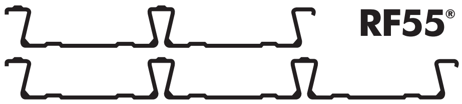
Table 3.9.H RF55® Composite Slab Spans - Double Span 1.00 BMT

Deflection Criteria

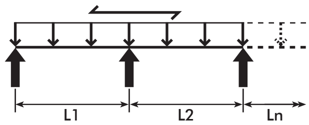
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

RF55® Composite Slab Spans
Continuous Span 0.60 BMT



RF55®



0.60

Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,500	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,750	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,500	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,750	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
3,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
3,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@350
3,500	105	SL72	N12@400	105	SL72	N12@400	110	SL82	N12@325
3,750	105	SL72	N12@400	110	SL82	N12@400	120	SL92	N12@375
4,000	105	SL72	N12@400	115	SL82	N12@400	130	SL92	N12@350
4,250	105	SL72	N12@375	120	SL92	N12@400	135	SL92	N12@300
4,500	115	SL82	N12@400	125	SL92	N12@350	140	SL102	N12@300
4,750	120	SL92	N12@400	135	SL92	N12@325	155	SL102	N12@300
5,000	130	SL92	N12@400	145	SL102	N12@375	160	SL81	N12@375
5,250	135	SL92	N12@400	155	SL102	N12@350	170	SL81	N12@325
5,500	145	SL102	N12@400	160	SL81	N12@400	180	SL81	N12@300
5,750	155	SL102	N12@400	170	SL81	N12@400	195	RL918T	N16@300
6,000	165	SL81	N12@400	180	SL81	N12@350	205	RL918T	N16@300
6,250	170	SL81	N12@400	195	RL918T	N12@200	215	RL918T	N16@300
6,500	180	SL81	N12@400	205	RL918T	N16@300	225	RL1018T	N16@275
6,750	195	RL918T	N12@225	215	RL918T	N16@300	240	RL1018T	N16@275
7,000	205	RL918T	N12@200	235	RL1018T	N16@300	250	RL1018T	N16@250

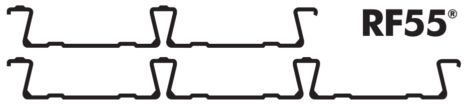
Table 3.9.I RF55® Composite Slab Spans - Continuous Span 0.60 BMT

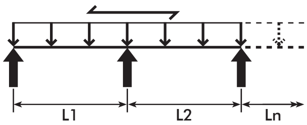
Deflection Criteria
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

RF55® Composite Slab Spans

Continuous Span 0.75 BMT





0.75

Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,500	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,750	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,500	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,750	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
3,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
3,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@350
3,500	105	SL72	N12@400	105	SL72	N12@400	110	SL82	N12@325
3,750	105	SL72	N12@400	105	SL72	N12@350	120	SL92	N12@375
4,000	105	SL72	N12@400	110	SL82	N12@350	125	SL92	N12@325
4,250	105	SL72	N12@375	115	SL82	N12@300	135	SL92	N12@300
4,500	110	SL82	N12@400	125	SL92	N12@350	140	SL102	N12@300
4,750	120	SL92	N12@400	135	SL92	N12@325	155	SL102	N12@300
5,000	125	SL92	N12@400	140	SL102	N12@350	160	SL81	N12@350
5,250	135	SL92	N12@400	155	SL102	N12@350	175	SL81	N12@350
5,500	145	SL102	N12@400	160	SL81	N12@400	180	SL81	N12@300
5,750	155	SL102	N12@400	170	SL81	N12@400	190	RL918T	N16@300
6,000	160	SL81	N12@400	180	SL81	N12@350	200	RL918T	N16@300
6,250	170	SL81	N12@400	195	RL918T	N12@200	215	RL918T	N16@300
6,500	180	SL81	N12@400	205	RL918T	N16@300	225	RL1018T	N16@275
6,750	195	RL918T	N12@225	215	RL918T	N16@300	240	RL1018T	N16@250
7,000	205	RL918T	N12@200	235	RL1018T	N16@300	250	RL1018T	N16@250

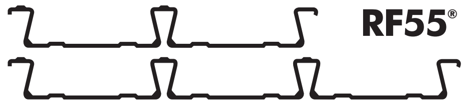
Table 3.9.J RF55® Composite Slab Spans - Continuous Span 0.75 BMT

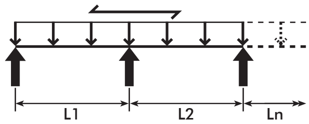
Deflection Criteria

Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

RF55® Composite Slab Spans
Continuous Span 0.90 BMT


RF55®



0.90

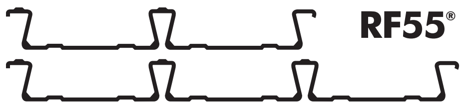
Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,500	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,750	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,500	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,750	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
3,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
3,250	105	SL72	N12@400	105	SL72	N12@400	110	SL82	N12@400
3,500	105	SL72	N12@400	105	SL72	N12@400	110	SL82	N12@325
3,750	105	SL72	N12@400	105	SL72	N12@350	115	SL82	N12@275
4,000	105	SL72	N12@400	110	SL82	N12@350	120	SL92	N12@275
4,250	105	SL72	N12@375	120	SL92	N12@400	130	SL92	N12@275
4,500	110	SL82	N12@400	125	SL92	N12@350	140	SL102	N12@300
4,750	120	SL92	N12@400	130	SL92	N12@300	155	SL102	N12@300
5,000	125	SL92	N12@400	140	SL102	N12@350	160	SL81	N12@350
5,250	135	SL92	N12@375	150	SL102	N12@325	165	SL81	N12@300
5,500	145	SL102	N12@400	160	SL81	N12@400	180	SL81	N12@300
5,750	155	SL102	N12@400	170	SL81	N12@400	190	RL918T	N16@300
6,000	160	SL81	N12@400	180	SL81	N12@350	200	RL918T	N16@300
6,250	170	SL81	N12@400	195	RL918T	N12@200	215	RL918T	N16@300
6,500	180	SL81	N12@400	200	RL918T	N16@300	220	RL918T	N16@275
6,750	195	RL918T	N12@200	210	RL918T	N16@300	245	RL1018T	N16@275
7,000	200	RL918T	N12@200	225	RL1018T	N16@275	245	RL1018T	N16@250

Table 3.9.K RF55® Composite Slab Spans - Continuous Span 0.90 BMT

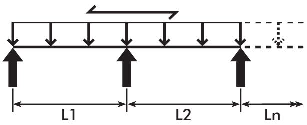
Deflection Criteria
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

RF55® Composite Slab Spans
Continuous Span 1.00 BMT



RF55®



1.00

Span (mm)	Load = 1.5kPa			Load = 3.0 kPa			Load = 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,500	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
1,750	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,500	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
2,750	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
3,000	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@400
3,250	105	SL72	N12@400	105	SL72	N12@400	105	SL72	N12@350
3,500	105	SL72	N12@400	105	SL72	N12@400	115	SL82	N12@375
3,750	105	SL72	N12@400	105	SL72	N12@350	125	SL92	N12@400
4,000	105	SL72	N12@400	110	SL82	N12@350	125	SL92	N12@325
4,250	105	SL72	N12@375	115	SL82	N12@300	135	SL92	N12@300
4,500	110	SL82	N12@400	125	SL92	N12@350	140	SL102	N12@300
4,750	115	SL82	N12@350	135	SL92	N12@325	145	SL102	N12@250
5,000	125	SL92	N12@400	140	SL102	N12@350	155	SL102	N12@250
5,250	135	SL92	N12@375	155	SL102	N12@350	165	SL81	N12@300
5,500	140	SL102	N12@400	160	SL81	N12@400	180	SL81	N12@325
5,750	155	SL102	N12@400	170	SL81	N12@400	190	RL918T	N16@300
6,000	160	SL81	N12@400	180	SL81	N12@350	200	RL918T	N16@300
6,250	165	SL81	N12@400	195	RL918T	N12@200	215	RL918T	N16@300
6,500	175	SL81	N12@400	200	RL918T	N16@300	220	RL918T	N16@275
6,750	190	RL918T	N12@200	210	RL918T	N16@300	235	RL1018T	N16@250
7,000	200	RL918T	N12@200	220	RL918T	N16@275	245	RL1018T	N16@250

Table 3.9.L RF55® Composite Slab Spans - Continuous Span 1.00 BMT

Deflection Criteria
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

3.10 KF57® Fire Resistance Tables

Table 3.10.A KF57 Fire Resistance - Floor Live Load 1.5kPa - Single Span
Table 3.10.B KF57 Fire Resistance - Floor Live Load 3.0kPa - Single Span
Table 3.10.C KF57 Fire Resistance - Floor Live Load 5.0kPa - Single Span
Table 3.10.D KF57 Fire Resistance - Floor Live Load 1.5kPa - Double Span
Table 3.10.E KF57 Fire Resistance - Floor Live Load 3.0kPa - Double Span
Table 3.10.F KF57 Fire Resistance - Floor Live Load 5.0kPa - Double Span
Table 3.10.G KF57 Fire Resistance - Floor Live Load 1.5kPa - Continuous Spans
Table 3.10.H KF57 Fire Resistance - Floor Live Load 3.0kPa - Continuous Spans
Table 3.10.I KF57 Fire Resistance - Floor Live Load 5.0kPa - Continuous Spans

Fire Resistance Tables Notes

The fire resistance tables are to be used to design fire rated KingFlor composite slabs that meet the assumptions below. For designs outside the parameters below and specified on the tables refer to the KingFlor Designer Suite or your local Fielders representative. For propping requirements refer to the temporary propping tables.

All fire resistance tables assume a BMT of 0.6mm. For design with other BMT's use KingFlor Designer Suite or contact your local Fielders representative.

Notation

Dcs = depth of composite slab.
L = Span between permanent supports.
Bars - N12@200 indicates N12 bars at 200mm centres.
Fire Reo - 1xN16/300 indicates 1 N16 bar at 300mm centres (in multiples of pan spacings)

Loads

Construction Live Load 1.0kPa
Ceiling & Services Load 0.35kPa
Partitions Load 0.5kPa

Short & Long-Term Factors

Short-term factor ψ = 0.7
Long-term factor ψ = 0.4
Combination-term factor ψ = 0.4

Concrete Properties

Normal wet density of concrete 2400kg/m^3
Normal dry density of concrete 2350 kg/m^3
Concrete strength f'c = 25MPa
Exposure Classification A1 with moderate crack control
Cover to top reinforcement is 30mm

Reinforcing

Steel Yield Strength f_{sy} = 500MPa

Mesh

Mesh is to be located in the top of the slab. Where the mesh code ends with a 'T' (eg. RL918T), the larger bars are to be located perpendicular to the decking ribs with the smaller perpendicular bars on top. Laps in mesh are to occur midspan.

Bars

Bars where required, are to be placed over internal permanent supports, on top of mesh. Length of bars are to be 0.6 x larger span + width of support. The bars are to be located 0.3 x span from edge of support for internal supports.

Fire reinforcement (Fire Reo) is to be located in the bottom of the slab in accordance with AS 3600:2001, Table 5.5.3 (A) "Fire Resistance Periods for Slabs". Bars are to be continuous & lapped at supports.

Figure 3.10.A Fire Reinforcement Detail

Spans

Spans L1, L2, L3 etc. cannot differ by more than 5% from both L1 and Ln.

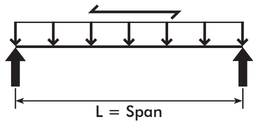
Span is considered to be the larger of L1, L2...Ln.

Support width 50mm

The fire resistance tables have been prepared with the assumptions stated above. More refined designs can be obtained from Fielders or by using the KingFlor Designer Suite. Contact your local Fielders representative for design assistance.

KF57® Fire Resistance
Single Span - Floor Live Load 1.5kPa


KF57®



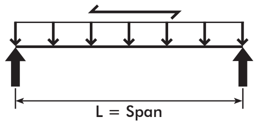
1.5kPa

Span (mm)	60 minutes Dcs	Mesh	Bars	Fire Reo	90 minutes Dcs	Mesh	Bars	Fire Reo	180 minutes Dcs	Mesh	Bars	Fire Reo
1,000	105	SL72	-	-	105	SL72	-	-	140	SL92	-	-
1,500	105	SL72	-	-	105	SL72	-	-	140	SL92	-	-
2,000	105	SL72	-	-	105	SL72	-	-	140	SL92	-	-
2,500	105	SL72	-	-	105	SL72	-	-	140	SL92	-	1xN10/300✦
3,000	105	SL72	-	1xN10/600✦	105	SL72	-	1xN10/600✦	140	SL92	-	1xN12/300✦
3,500	105	SL72	-	1xN10/300✦	105	SL72	-	1xN10/300✦	140	SL92	-	1xN16/300✦
4,000	120	SL82	-	1xN10/300✦	120	SL82	-	1xN12/300✦	140	SL92	-	1xN16/300✦
4,500	145	SL102	-	1xN10/300✦	145	SL102	-	1xN12/300✦	145	SL102	-	1xN20/300✦
5,000	160	SL81	-	1xN10/300✦	160	SL81	-	1xN12/300✦	165	SL81	-	1xN20/300✦
5,500	185	SL81	-	1xN12/300✦	185	SL81	-	1xN16/300✦	185	SL81	-	1xN20/300✦
6,000	220	RL918T	-	1xN12/300✦	220	RL918T	-	1xN16/300✦	220	RL918T	-	1xN20/300✦
6,500	250	RL1018T	-	1xN12/300✦	250	RL1018T	-	1xN16/300✦	250	RL1018T	-	1xN20/300✦
7,000	275	RL1118T	-	1xN16/300✦	275	RL1118T	-	1xN16/300✦	280	RL1118T	-	2xN20/300✦

Table 3.10.A KF57® Fire Resistance - Single Span - Floor Live Load 1.5kPa

KF57® Fire Resistance
Single Span - Floor Live Load 3.0kPa


KF57®



3.0kPa

Span (mm)	60 minutes Dcs	Mesh	Bars	Fire Reo	90 minutes Dcs	Mesh	Bars	Fire Reo	180 minutes Dcs	Mesh	Bars	Fire Reo
1,000	105	SL72	-	-	105	SL72	-	-	140	SL92	-	-
1,500	105	SL72	-	-	105	SL72	-	-	140	SL92	-	-
2,000	105	SL72	-	-	105	SL72	-	-	140	SL92	-	1xN10/600✦
2,500	105	SL72	-	-	105	SL72	-	1xN10/600✦	140	SL92	-	1xN10/300✦
3,000	105	SL72	-	1xN10/600✦	105	SL72	-	1xN10/300✦	140	SL92	-	1xN12/300✦
3,500	115	SL82	-	1xN10/300✦	115	SL82	-	1xN10/300✦	140	SL92	-	1xN16/300✦
4,000	135	SL92	-	1xN10/300✦	135	SL92	-	1xN10/300✦	140	SL92	-	1xN20/300✦
4,500	155	SL102	-	1xN10/300✦	155	SL102	-	1xN12/300✦	160	SL81	-	1xN20/300✦
5,000	180	SL81	-	1xN10/300✦	180	SL81	-	1xN12/300✦	180	SL81	-	1xN20/300✦
5,500	210	RL918T	-	1xN12/300✦	215	RL918T	-	1xN12/300✶	215	RL918T	-	1xN20/300✦
6,000	240	RL1018T	-	1xN12/300✦	240	RL1018T	-	1xN16/300✦	240	RL1018T	-	1xN20/300✦
6,500	270	RL1118T	-	1xN12/300✶	270	RL1118T	-	1xN16/300✦	270	RL1118T	-	2xN20/300✦
7,000	300	RL1118T	-	1xN16/300✦	300	RL1118T	-	1xN16/300✦	300	RL1118T	-	2xN20/300✦

Table 3.10.B KF57® Fire Resistance - Single Span - Floor Live Load 3.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

✦ 20mm

✶ 40mm

† 60mm

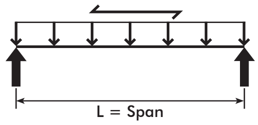
Shaded cells denote that internal span fire reinforcement is required.

These tables have been prepared considering KF57 0.6mm. For other gauges refer to KingFlor Designer.

Refer to the start of this section for additional parameters used to calculate the above table.

KF57® Fire Resistance
Single Span - Floor Live Load 5.0kPa

KF57®



5.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	105	SL72	-	-	105	SL72	-	-	140	SL92	-	-
1,500	105	SL72	-	-	105	SL72	-	-	140	SL92	-	-
2,000	105	SL72	-	-	105	SL72	-	-	140	SL92	-	1xN10/600✦
2,500	105	SL72	-	1xN10/600✦	105	SL72	-	1xN10/600✦	140	SL92	-	1xN12/300✦
3,000	105	SL72	-	1xN10/300✦	110	SL82	-	1xN10/300✦	140	SL92	-	1xN16/300✦
3,500	130	SL92	-	1xN10/300✦	130	SL92	-	1xN10/300✦	140	SL92	-	1xN16/300✦
4,000	150	SL102	-	1xN10/300✦	155	SL102	-	1xN10/300✦	155	SL102	-	1xN20/300✦
4,500	175	SL81	-	1xN10/300✦	175	SL81	-	1xN12/300✦	175	SL81	-	1xN20/300✦
5,000	205	RL918T	-	1xN10/300✦	205	RL918T	-	1xN12/300✦	205	RL918T	-	1xN20/300✦
5,500	235	RL1018T	-	1xN12/300✦	235	RL1018T	-	1xN12/300✶	235	RL1018T	-	1xN20/300✦
6,000	260	RL1018T	-	1xN16/300✦	260	RL1018T	-	1xN16/300✦	265	RL1118T	-	1xN20/300✦
6,500	295	RL1118T	-	1xN16/300✦	295	RL1118T	-	1xN16/300✦	295	RL1118T	-	2xN20/300✦
7,000	325	RL1218T	-	1xN16/300✦	325	RL1218T	-	1xN16/300✦	325	RL1218T	-	2xN20/300✦

Table 3.10.C KF57® Fire Resistance - Single Span - Floor Live Load 5.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

✦ 20mm
✶ 40mm
† 60mm

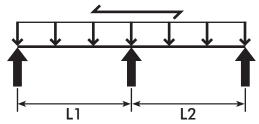
Shaded cells denote that internal span fire reinforcement is required.

These tables have been prepared considering KF57 0.6mm. For other gauges refer to KingFlor Designer.

Refer to the start of this section for additional parameters used to calculate the above table.

KF57® Fire Resistance
Double Span - Floor Live Load 1.5kPa

KF57®



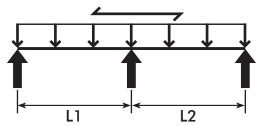
1.5kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
1,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
2,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
2,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
3,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
3,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	1xN10/300✦
4,000	105	SL82	N10@275	-	105	SL72	N10@250	1xN10/600✦	140	SL92	N10@400	1xN12/300✱
4,500	105	SL82	N12@250	1xN10/600✦	105	SL72	N12@225	1xN10/300✦	140	SL92	N10@300	1xN16/300✦
5,000	120	SL82	N12@200	1xN10/600✦	115	SL82	N12@225	1xN10/300✦	150	SL102	N10@300	1xN16/300✱
5,500	130	SL92	N12@200	1xN10/300✦	130	SL92	N12@200	1xN10/300✦	150	SL102	N12@300	1xN20/300✱
6,000	150	SL102	N12@200	1xN10/300✦	150	SL102	N12@200	1xN10/300✱	150	SL102	N16@300	1xN20/300✱
6,500	165	SL81	N12@200	1xN10/300✦	165	SL81	N12@200	1xN12/300✦	165	SL81	N16@300	1xN20/300✱
7,000	180	SL81	N12@200	1xN10/300✦	180	SL81	N12@200	1xN12/300✦	180	SL81	N16@300	2xN20/300✦

Table 3.10.D KF57® Fire Resistance - Double Span - Floor Live Load 1.5kPa

KF57® Fire Resistance
Double Span - Floor Live Load 3.0kPa

KF57®



3.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
1,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
2,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
2,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
3,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
3,500	105	SL72	N10@225	-	105	SL72	N10@225	-	140	SL92	N10@400	1xN12/300✦
4,000	115	SL82	N10@200	-	115	SL82	N10@200	1xN10/600✦	140	SL92	N10@400	1xN12/300✱
4,500	115	SL92	N12@200	-	120	SL92	N12@225	1xN10/300✦	145	SL102	N10@300	1xN16/300✦
5,000	130	SL102	N12@200	-	135	SL92	N12@200	1xN10/300✦	150	SL81	N10@275	1xN16/300✱
5,500	150	SL102	N12@200	1xN12/300✦	150	SL102	N12@200	1xN10/300✦	150	SL81	N12@250	1xN20/300✦
6,000	165	SL81	N12@200	1xN12/300✦	165	SL81	N12@200	1xN10/300✱	165	SL81	N12@200	1xN20/300✱
6,500	180	SL81	N16@300	1xN12/300✦	180	SL81	N16@300	1xN12/300✦	180	SL81	N16@300	1xN20/300✱
7,000	205	RL918T	N16@200	1xN12/300✦	205	RL918T	N16@200	1xN12/300✦	205	RL918T	N16@200	1xN20/300✱

Table 3.10.E KF57® Fire Resistance - Double Span - Floor Live Load 3.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

✦ 20mm
✱ 40mm
† 60mm

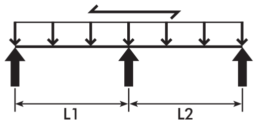
Shaded cells denote that internal span fire reinforcement is required.

These tables have been prepared considering KF57 0.6mm. For other gauges refer to KingFlor Designer.

Refer to the start of this section for additional parameters used to calculate the above table.

KF57® Fire Resistance
Double Span - Floor Live Load 5.0kPa

KF57®



5.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
1,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
2,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
2,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
3,000	105	SL72	N10@250	-	105	SL72	N10@200	-	140	SL92	N10@400	-
3,500	110	SL82	N12@250	-	110	SL82	N12@250	-	140	SL92	N10@400	1xN12/300✶
4,000	130	SL92	N12@250	-	130	SL92	N12@250	-	140	SL102	N10@200	1xN16/300✶
4,500	140	SL92	N12@200	-	140	SL92	N12@200	-	150	SL102	N12@250	1xN16/300✶
5,000	150	SL102	N16@325	-	150	SL102	N16@325	1xN10/300✦	150	SL102	N16@325	1xN16/300✶
5,500	165	SL81	N16@300	-	165	SL81	N16@300	1xN10/300✦	165	SL81	N16@300	1xN20/300✶
6,000	180	SL81	N16@200	-	180	SL81	N16@275	1xN12/300✦	185	SL81	N16@275	1xN20/300✶
6,500	210	RL918T	N16@200	-	210	RL918T	N16@200	1xN12/300✦	210	RL918T	N16@200	1xN20/300✶
7,000	240	RL1018T	N16@200	1xN10/300✦	240	RL1018T	N16@200	1xN12/300✦	240	RL1018T	N16@200	1xN20/300✶

Table 3.10.F KF57® Fire Resistance - Double Span - Floor Live Load 5.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

✦ 20mm
✶ 40mm
† 60mm

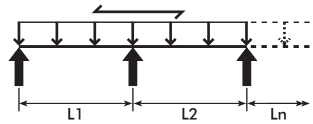
Shaded cells denote that internal span fire reinforcement is required.

These tables have been prepared considering KF57 0.6mm. For other gauges refer to KingFlor Designer.

Refer to the start of this section for additional parameters used to calculate the above table.

KF57® Fire Resistance
Continuous Span - Floor Live Load 1.5kPa

KF57®



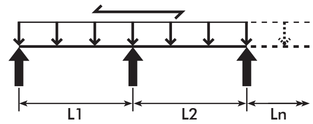
1.5kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
1,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
2,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
2,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
3,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
3,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	1xN12/300✦
4,000	110	SL82	N10@400	-	110	SL82	N10@400	1xN10/600✦	140	SL92	N10@400	1xN12/300✶
4,500	115	SL82	N10@300	1xN10/600✦	115	SL82	N10@300	1xN10/300✦	140	SL92	N12@400	1xN16/300✶
5,000	130	SL92	N10@300	1xN10/300✦	130	SL92	N10@300	1xN10/300✦	145	SL102	N12@400	1xN16/300✶
5,500	145	SL102	N10@300	1xN10/300✦	145	SL102	N10@300	1xN10/300✦	145	SL102	N12@400	1xN20/300✶
6,000	165	SL81	N10@300	1xN10/300✦	165	SL81	N10@300	1xN10/300✶	165	SL81	N12@400	1xN20/300✶
6,500	180	SL81	N10@300	1xN10/300✦	185	SL81	N10@300	1xN12/300✦	185	RL918T	N12@225	1xN20/300✶
7,000	205	RL918T	N12@200	1xN10/300✶	205	RL918T	N12@200	1xN12/300✶	205	RL918T	N12@200	1xN20/300✶

Table 3.10.G KF57® Fire Resistance - Continuous Span - Floor Live Load 1.5kPa

KF57® Fire Resistance
Continuous Span - Floor Live Load 3.0kPa

KF57®



3.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	
1,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	
2,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	
2,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	
3,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	
3,500	105	SL72	N10@325	-	105	SL72	N10@325	1xN10/600✦	140	SL92	N10@400	1xN12/300✶
4,000	110	SL82	N10@250	-	110	SL82	N10@250	1xN10/300✦	140	SL92	N10@400	1xN16/300✶
4,500	125	SL92	N10@250	1xN10/600✦	125	SL92	N10@250	1xN10/300✦	160	SL81	N10@400	1xN16/300✶
5,000	145	SL102	N10@275	1xN10/600✶	145	SL102	N10@275	1xN10/300✦	160	SL81	N10@400	1xN16/300✶
5,500	160	SL81	N10@275	1xN10/300✦	165	SL81	N10@275	1xN10/300✦	165	SL81	N10@325	1xN20/300✶
6,000	180	SL81	N10@250	1xN10/300✦	180	SL81	N10@250	1xN12/300✦	180	SL81	N10@250	1xN20/300✶
6,500	205	RL918T	N16@300	1xN10/300✦	205	RL918T	N16@300	1xN12/300✦	205	RL918T	N16@300	1xN20/300✶
7,000	225	RL1018T	N16@275	1xN10/300✶	225	RL1018T	N16@275	1xN12/300✶	225	RL1018T	N16@275	1xN20/300✶

Table 3.10.H KF57® Fire Resistance - Continuous Span - Floor Live Load 3.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

✦ 20mm
✶ 40mm
† 60mm

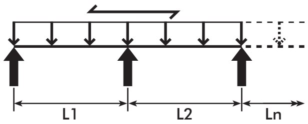
Shaded cells denote that internal span fire reinforcement is required.

These tables have been prepared considering KF57 0.6mm. For other gauges refer to KingFlor Designer.

Refer to the start of this section for additional parameters used to calculate the above table.

KF57® Fire Resistance
Continuous Span - Floor Live Load 5.0kPa

KF57®



5.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
1,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
2,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
2,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL92	N10@400	-
3,000	110	SL82	N10@400	-	110	SL82	N10@400	-	140	SL92	N10@400	-
3,500	110	SL82	N10@225	-	110	SL82	N10@225	1xN10/300✦	140	SL92	N10@400	1xN12/300✶
4,000	125	SL92	N10@225	-	125	SL92	N10@225	1xN10/300✦	145	SL102	N10@400	1xN16/300✶
4,500	140	SL102	N10@200	-	140	SL102	N10@200	1xN10/300✦	145	SL102	N10@225	1xN16/300✶
5,000	160	SL81	N10@200	-	160	SL81	N10@200	1xN10/300✦	160	SL81	N10@225	1xN20/300✦
5,500	180	SL81	N10@200	1xN10/300✦	180	SL81	N10@200	1xN12/300✦	180	SL81	N10@200	1xN20/300✶
6,000	200	RL918T	N16@300	1xN10/300✦	200	RL918T	N16@300	1xN12/300✦	200	RL918T	N16@300	1xN20/300✶
6,500	225	RL1018T	N16@275	1xN10/300✶	225	RL1018T	N16@275	1xN12/300✶	225	RL1018T	N16@275	1xN20/300✶
7,000	250	RL1018T	N16@250	1xN10/300✶	250	RL1018T	N16@250	1xN12/300✶	250	RL1018T	N16@250	1xN20/300✶

Table 3.10.I KF57® Fire Resistance - Continuous Span - Floor Live Load 5.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required.

These tables have been prepared considering KF57 0.6mm. For other gauges refer to KingFlor Designer.

Refer to the start of this section for additional parameters used to calculate the above table.

3.11 RF55® Fire Resistance Tables

Table 3.11.A RF55 Fire Resistance - Floor Live Load 1.5kPa - Single Span
Table 3.11.B RF55 Fire Resistance - Floor Live Load 3.0kPa - Single Span
Table 3.11.C RF55 Fire Resistance - Floor Live Load 5.0kPa - Single Span
Table 3.11.D RF55 Fire Resistance - Floor Live Load 1.5kPa - Double Span
Table 3.11.E RF55 Fire Resistance - Floor Live Load 3.0kPa - Double Span
Table 3.11.F RF55 Fire Resistance - Floor Live Load 5.0kPa - Double Span
Table 3.11.G RF55 Fire Resistance - Floor Live Load 1.5kPa - Continuous Spans
Table 3.11.H RF55 Fire Resistance - Floor Live Load 3.0kPa - Continuous Spans
Table 3.11.I RF55 Fire Resistance - Floor Live Load 5.0kPa - Continuous Spans

Fire Resistance Tables Notes

The fire resistance tables are to be used to design fire rated KingFlor composite slabs that meet the assumptions below. For designs outside the parameters below and specified on the tables refer to the KingFlor Designer Suite or your local Fielders representative. For propping requirements refer to the temporary propping tables.

All fire resistance tables assume a BMT of 0.6mm. For design with other BMT's use KingFlor Designer Suite or contact your local Fielders representative.

Notation

Dcs = depth of composite slab.
L = Span between permanent supports.
Bars - N12@200 indicates N12 bars at 200mm centres.
Fire Reo - 1xN16/300 indicates 1 N16 bar at 300mm centres (in multiples of pan spacings)

Loads

Construction Live Load 1.0kPa
Ceiling & Services Load 0.35kPa
Partitions Load 0.5kPa

Short & Long-Term Factors

Short-term factor ψ = 0.7
Long-term factor ψ = 0.4
Combination-term factor ψ = 0.4

Concrete Properties

Normal wet density of concrete 2400kg/m^3
Normal dry density of concrete 2350 kg/m^3
Concrete strength $f'c$ = 25MPa
Exposure Classification A1 with moderate crack control
Cover to top reinforcement is 30mm

Reinforcing

Steel Yield Strength f_{sy} = 500MPa

Mesh

Mesh is to be located in the top of the slab. Where the mesh code ends with a 'T' (eg. RL918T), the larger bars are to be located perpendicular to the decking ribs with the smaller perpendicular bars on top. Laps in mesh are to occur midspan.

Bars

Bars where required, are to be placed over internal permanent supports, on top of mesh. Length of bars are to be 0.6 x larger span + width of support. The bars are to be located 0.3 x span from edge of support for internal supports.

Fire reinforcement (Fire Reo) is to be located in the bottom of the slab in accordance with AS 3600:2001, Table 5.5.3 (A) "Fire Resistance Periods for Slabs". Bars are to be continuous & lapped at supports.

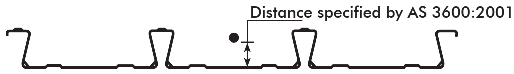


Figure 3.11.A Fire Reinforcement Detail

Spans

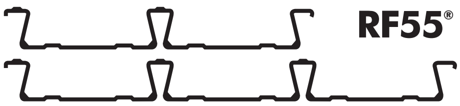
Spans L1, L2, L3 etc. cannot differ by more than 5% from both L1 and Ln.

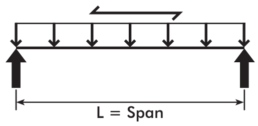
Span is considered to be the larger of L1, L2...Ln.

Support width 50mm

The fire resistance tables have been prepared with the assumptions stated above. More refined designs can be obtained from Fielders or by using the KingFlor Designer Suite. Contact your local Fielders representative for design assistance.

RF55® Fire Resistance
Single Span - Floor Live Load 1.5kPa



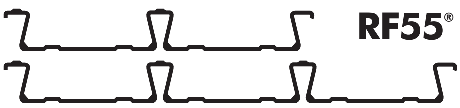


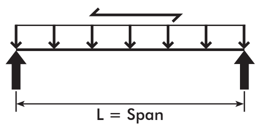
1.5kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	100	SL72	-	-	100	SL72	-	-	140	SL102	-	-
1,500	100	SL72	-	-	100	SL72	-	-	140	SL102	-	-
2,000	100	SL72	-	-	100	SL72	-	1xN10/400✦	140	SL102	-	-
2,500	100	SL72	-	1xN10/600✦	100	SL72	-	1xN10/200✦	140	SL102	-	1xN10/200✦
3,000	100	SL72	-	1xN10/400✦	100	SL72	-	1xN10/200✦	140	SL102	-	1xN12/200✦
3,500	100	SL72	-	1xN10/400✦	100	SL72	-	1xN12/200✦	140	SL102	-	1xN16/200✦
4,000	120	SL92	-	1xN10/200✦	120	SL92	-	1xN12/200✦	140	SL102	-	1xN16/200✦
4,500	140	SL102	-	1xN10/200✦	140	SL102	-	1xN12/200✦	150	SL102	-	1xN16/200✦
5,000	160	SL81	-	1xN10/200✦	160	SL81	-	1xN12/200✶	165	SL81	-	1xN16/200✦
5,500	190	RL918T	-	1xN10/200✦	195	RL918T	-	1xN12/200✶	195	RL918T	-	1xN16/200✦
6,000	215	RL918T	-	1xN10/200✦	215	RL918T	-	1xN16/200✦	215	RL918T	-	1xN16/200✦
6,500	250	RL1018T	-	1xN12/200✦	250	RL1018T	-	1xN16/200✦	250	RL1018T	-	1xN16/200✦
7,000	275	RL1118T	-	1xN12/200✦	275	RL1118T	-	1xN16/200✦	275	RL1118T	-	1xN16/200✦

Table 3.11.A RF55® Fire Resistance - Single Span - Floor Live Load 1.5kPa

RF55® Fire Resistance
Single Span - Floor Live Load 3.0kPa





3.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	100	SL72	-	-	100	SL72	-	-	140	SL102	-	-
1,500	100	SL72	-	-	100	SL72	-	-	140	SL102	-	-
2,000	100	SL72	-	-	100	SL72	-	1xN10/200✦	140	SL102	-	-
2,500	100	SL72	-	1xN10/600✦	100	SL72	-	1xN10/200✦	140	SL102	-	1xN12/200✦
3,000	100	SL72	-	1xN10/400✦	100	SL72	-	1xN10/200✦	140	SL102	-	1xN12/200✦
3,500	115	SL82	-	1xN10/200✦	115	SL82	-	1xN12/200✦	140	SL102	-	1xN16/200✦
4,000	135	SL92	-	1xN10/200✦	135	SL92	-	1xN12/200✦	140	SL102	-	1xN16/200✦
4,500	155	SL102	-	1xN10/200✦	155	SL102	-	1xN12/200✦	155	SL102	-	1xN16/200✦
5,000	175	SL81	-	1xN10/200✦	180	SL81	-	1xN12/200✶	180	SL81	-	1xN16/200✦
5,500	210	RL918T	-	1xN10/200✦	210	RL918T	-	1xN12/200✶	210	RL918T	-	1xN16/200✦
6,000	235	RL1018T	-	1xN12/200✦	240	RL1018T	-	1xN16/200✦	245	RL1018T	-	1xN16/200✦
6,500	265	RL1118T	-	1xN12/200✦	265	RL1118T	-	1xN16/200✦	265	RL1118T	-	1xN16/200✦
7,000	295	RL1118T	-	1xN12/200✦	295	RL1118T	-	1xN16/200✦	295	RL1118T	-	1xN20/200✦

Table 3.11.B RF55® Fire Resistance - Single Span - Floor Live Load 3.0kPa

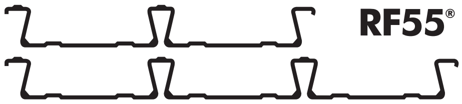
The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

✦ 20mm
✶ 40mm
† 60mm

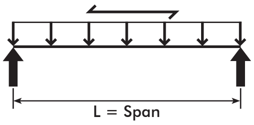
Shaded cells denote that internal span fire reinforcement is required.

Refer to the start of this section for additional parameters used to calculate the above table.

RF55® Fire Resistance
Single Span - Floor Live Load 5.0kPa



RF55®



5.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	100	SL72	-	-	100	SL72	-	-	140	SL102	-	-
1,500	100	SL72	-	-	100	SL72	-	-	140	SL102	-	-
2,000	100	SL72	-	1xN10/600✦	100	SL72	-	1xN10/200✦	140	SL102	-	1xN10/200✦
2,500	100	SL72	-	1xN10/400✦	100	SL72	-	1xN10/200✦	140	SL102	-	1xN10/200✦
3,000	105	SL82	-	1xN10/400✦	110	SL82	-	1xN10/200✦	140	SL102	-	1xN12/200✦
3,500	125	SL92	-	1xN10/200✦	130	SL92	-	1xN12/200✦	140	SL102	-	1xN16/200✦
4,000	150	SL102	-	1xN10/200✦	150	SL102	-	1xN12/200✦	150	SL102	-	1xN16/200✦
4,500	170	SL81	-	1xN10/200✦	175	SL81	-	1xN12/200✦	175	SL81	-	1xN16/200✦
5,000	205	RL918T	-	1xN10/200✦	205	RL918T	-	1xN12/200^	205	RL918T	-	1xN16/200✦
5,500	230	RL1018T	-	1xN10/200✦	230	RL1018T	-	1xN16/200✦	230	RL1018T	-	1xN16/200✦
6,000	260	RL1118T	-	1xN12/200✦	260	RL1118T	-	1xN16/200✦	260	RL1118T	-	1xN16/200✦
6,500	305	RL1118T	-	1xN12/200✦	305	RL1118T	-	1xN16/200✦	305	RL1218T	-	1xN20/200✦
7,000	360	RL1218T	-	1xN12/200✦	360	RL1218T	-	1xN16/200✦	360	RL1218T	-	1xN20/200✦

Table 3.11.C RF55® Fire Resistance - Single Span - Floor Live Load 5.0kPa

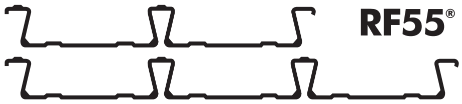
The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

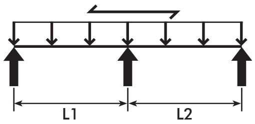
✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required.

Refer to the start of this section for additional parameters used to calculate the above table.

RF55® Fire Resistance
Double Span - Floor Live Load 1.5kPa



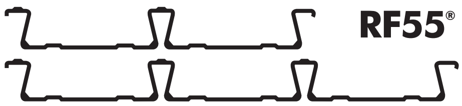


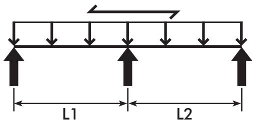
1.5kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
1,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
2,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
2,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
3,000	105	SL72	N10@400	1xN10/600✦	105	SL72	N10@400	1xN10/400✦	140	SL102	N10@400	-
3,500	105	SL72	N10@400	1xN10/600✦	105	SL72	N10@400	1xN10/200✦	140	SL102	N10@400	1xN10/200✦
4,000	105	SL72	N10@250	1xN10/600✦	105	SL82	N10@300	1xN10/200✦	140	SL102	N10@400	1xN10/200✶
4,500	110	SL82	N10@200	1xN10/600✦	110	SL82	N10@200	1xN10/200✶	140	SL102	N12@300	1xN12/200✶
5,000	115	SL92	N12@250	1xN10/600✦	115	SL92	N12@250	1xN10/200✶	140	SL102	N12@200	1xN16/200✦
5,500	130	SL92	N12@225	1xN10/600✦	130	SL92	N12@200	1xN10/200✶	140	SL102	N12@200	1xN16/200✶
6,000	145	SL102	N12@200	1xN10/600✦	150	SL102	N12@200	1xN10/200✦	150	SL102	N12@200	1xN16/200✶
6,500	165	SL81	N12@200	1xN10/600✦	165	SL81	N12@200	1xN10/200✦	165	SL81	N12@200	1xN16/200✶
7,000	180	SL81	N12@200	1xN10/400✦	180	SL81	N12@200	1xN10/200✶	180	SL81	N12@200	1xN16/200✶

Table 3.11.D RF55® Fire Resistance - Double Span - Floor Live Load 1.5kPa

RF55® Fire Resistance
Double Span - Floor Live Load 3.0kPa





3.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
1,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
2,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
2,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
3,000	105	SL72	N10@400	1xN10/600✦	105	SL72	N10@400	1xN10/200✦	140	SL102	N10@400	1xN10/200✦
3,500	105	SL72	N10@200	1xN10/600✦	105	SL72	N10@200	1xN10/200✦	140	SL102	N10@400	1xN10/200✦
4,000	105	SL72	N12@200	1xN10/600✦	105	SL72	N12@200	1xN10/200✦	140	SL102	N10@400	1xN16/200✦
4,500	115	SL82	N12@200	1xN10/600✦	115	SL82	N12@200	1xN10/200✦	140	SL102	N12@200	1xN16/200✦
5,000	135	SL92	N12@200	1xN10/600✦	135	SL92	N12@200	1xN10/200✦	140	SL81	N12@200	1xN16/200✶
5,500	150	SL102	N12@200	1xN10/600✦	150	SL102	N12@200	1xN10/200✦	150	SL81	N12@200	1xN16/200✶
6,000	160	SL81	N12@200	1xN10/600✦	165	SL81	N12@200	1xN10/200✦	165	SL81	N12@200	1xN16/200✦
6,500	180	SL81	N16@300	1xN10/600✦	180	SL81	N16@300	1xN10/200✦	185	RL918T	N16@200	1xN16/200✦
7,000	200	RL918T	N16@200	1xN10/600✦	205	RL918T	N16@200	1xN10/200✦	205	RL918T	N16@200	1xN16/200✦

Table 3.11.E RF55® Fire Resistance - Double Span - Floor Live Load 3.0kPa

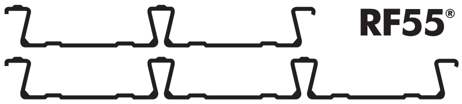
The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

✦ 20mm
✶ 40mm
† 60mm

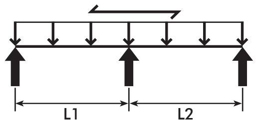
Shaded cells denote that internal span fire reinforcement is required.

Refer to the start of this section for additional parameters used to calculate the above table.

RF55® Fire Resistance
Double Span - Floor Live Load 5.0kPa



RF55®



5.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
1,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
2,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
2,500	105	SL72	N10@400	-	105	SL72	N10@400	1xN10/400✦	140	SL102	N10@400	-
3,000	105	SL72	N10@250	1xN10/600✦	105	SL72	N10@250	1xN10/200✦	140	SL102	N10@400	1xN10/200✦
3,500	110	SL82	N12@250	1xN10/600✦	105	SL72	N12@200	1xN10/200✦	140	SL102	N10@400	1xN12/200✦
4,000	115	SL92	N12@200	1xN10/600✦	115	SL82	N12@175	1xN10/200✦	140	SL102	N10@200	1xN12/200✶
4,500	130	SL92	N16@300	1xN10/600✦	130	SL92	N16@300	1xN10/200✦	140	SL81	N12@275	1xN16/200✶
5,000	145	SL102	N16@300	1xN10/600✦	145	SL102	N16@300	1xN10/200✦	150	SL81	N12@200	1xN16/200
5,500	160	SL81	N16@300	1xN10/600✦	160	SL81	N16@300	1xN10/200✦	165	SL81	N16@300	1xN16/200✦
6,000	180	SL81	N16@275	1xN10/600✦	180	SL81	N16@275	1xN10/200✦	180	SL81	N16@275	1xN16/200✦
6,500	205	RL918T	N16@200	1xN10/600✦	205	RL918T	N16@200	1xN10/200✦	205	RL918T	N16@200	1xN16/200✦
7,000	225	RL1018T	N16@175	1xN10/600✦	225	RL1018T	N16@175	1xN10/200✦	225	RL1018T	N16@175	1xN16/200✦

Table 3.11.F RF55® Fire Resistance - Double Span - Floor Live Load 5.0kPa

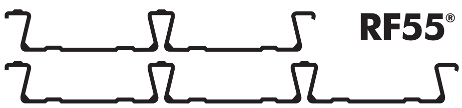
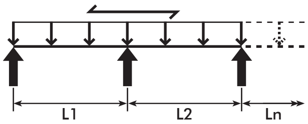
The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required.

Refer to the start of this section for additional parameters used to calculate the above table.

RF55® Fire Resistance
Continuous Span - Floor Live Load 1.5kPa

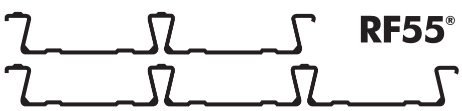
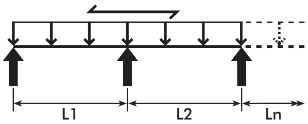
RF55®



1.5kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
1,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
2,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
2,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
3,000	105	SL72	N10@400	1xN10/600✦	105	SL72	N10@400	1xN10/600✦	140	SL102	N10@400	1xN10/400✦
3,500	105	SL72	N10@400	1xN10/600✦	105	SL72	N10@400	1xN10/200✦	140	SL102	N10@400	1xN10/400✶
4,000	105	SL82	N10@400	1xN10/600✦	105	SL82	N10@400	1xN10/200✦	140	SL102	N10@400	1xN10/200✶
4,500	115	SL92	N10@400	1xN10/600✦	115	SL92	N10@400	1xN12/200✦	140	SL102	N10@250	1xN12/200✶
5,000	130	SL102	N10@400	1xN10/400✦	130	SL102	N10@400	1xN12/200✦	150	SL102	N10@350	1xN16/200✦
5,500	145	SL102	N10@325	1xN10/400✦	145	SL102	N10@325	1xN12/200✦	150	SL102	N10@350	1xN16/200✶
6,000	160	SL81	N10@400	1xN10/400✦	160	SL81	N10@400	1xN12/200✦	165	SL81	N12@400	1xN16/200✶
6,500	180	SL81	N10@325	1xN10/200✦	180	SL81	N10@325	1xN12/200✦	180	SL81	N12@300	1xN16/200✦
7,000	205	RL918T	N12@200	1xN10/200✦	205	RL918T	N12@200	1xN12/200✦	205	RL918T	N16@300	1xN16/200✦

Table 3.11.G RF55® Fire Resistance - Continuous Span - Floor Live Load 1.5kPa

RF55® Fire Resistance
Continuous Span - Floor Live Load 3.0kPa

RF55®



3.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
1,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
2,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
2,500	105	SL72	N10@400	-	105	SL72	N10@400	1xN10/600✦	140	SL102	N10@400	-
3,000	105	SL72	N10@400	1xN10/600✦	105	SL72	N10@400	1xN10/400✦	140	SL102	N10@400	1xN10/400✶
3,500	105	SL72	N10@325	1xN10/600✦	105	SL72	N10@325	1xN10/200✦	140	SL102	N10@400	1xN10/200✶
4,000	110	SL82	N10@250	1xN10/600✦	110	SL82	N10@250	1xN10/200✦	140	SL102	N10@400	1xN12/200✶
4,500	125	SL92	N10@250	1xN10/600✦	125	SL92	N10@250	1xN10/200✦	145	SL102	N10@400	1xN16/200✶
5,000	140	SL102	N10@250	1xN10/600✦	140	SL102	N10@250	1xN10/200✦	150	SL102	N10@300	1xN16/200✶
5,500	160	SL81	N10@250	1xN10/600✦	160	SL81	N10@300	1xN10/200✦	160	SL81	N10@300	1xN16/200✶
6,000	180	SL81	N10@250	1xN10/400✦	180	SL81	N10@250	1xN10/200✦	180	SL81	N10@250	1xN16/200✶
6,500	215	RL918T	N12@200	1xN10/400✦	215	RL918T	N12@200	1xN10/200✶	215	RL918T	N12@200	1xN16/200✶
7,000	235	RL1018T	N16@300	1xN10/400✦	235	RL1018T	N16@300	1xN10/200✶	235	RL1018T	N16@300	1xN16/200✶

Table 3.11.H RF55® Fire Resistance - Continuous Span - Floor Live Load 3.0kPa

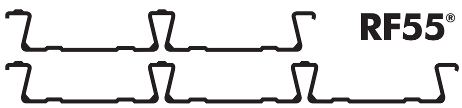
The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

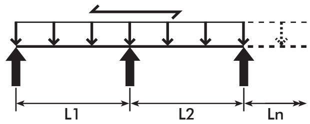
✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required.

Refer to the start of this section for additional parameters used to calculate the above table.

RF55® Fire Resistance
Continuous Span - Floor Live Load 5.0kPa





5.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
1,500	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
2,000	105	SL72	N10@400	-	105	SL72	N10@400	-	140	SL102	N10@400	-
2,500	105	SL72	N10@400	-	105	SL72	N10@400	1xN10/600✦	140	SL102	N10@400	1xN10/400✦
3,000	105	SL72	N10@300	1xN10/600✦	105	SL72	N10@300	1xN10/400✦	140	SL102	N10@400	1xN10/200✦
3,500	110	SL82	N10@200	1xN10/600✦	110	SL82	N10@200	1xN10/200✦	140	SL102	N10@400	1xN10/200✶
4,000	120	SL92	N10@200	1xN10/600✦	125	SL92	N10@200	1xN10/200✦	145	SL102	N10@400	1xN12/200✶
4,500	140	SL102	N10@200	1xN10/600✦	140	SL102	N10@200	1xN10/200✦	150	SL102	N10@200	1xN12/200✶
5,000	155	SL81	N10@200	1xN10/600✦	160	SL81	N10@200	1xN10/200✦	160	SL81	N10@200	1xN16/200✦
5,500	175	SL81	N10@200	1xN10/600✦	180	SL81	N10@200	1xN10/200✦	180	SL81	N10@200	1xN16/200✦
6,000	200	RL918T	N16@300	1xN10/600✦	200	RL918T	N16@300	1xN10/200✦	200	RL918T	N16@300	1xN16/200✦
6,500	235	RL1018T	N16@300	1xN10/400✦	235	RL1018T	N16@300	1xN10/200✦	225	RL1018T	N16@300	1xN16/200✦
7,000	245	RL1018T	N16@250	1xN10/400✦	245	RL1018T	N16@250	1xN10/200✶	245	RL1018T	N16@250	1xN16/200✦

Table 3.11.I RF55® Fire Resistance - Continuous Span - Floor Live Load 5.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required.

Refer to the start of this section for additional parameters used to calculate the above table.

3.12 KF57® Temporary Propping Tables

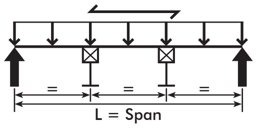
Index of KF57® Temporary Propping Tables

Temporary Propping Tables Notes

1. The tables on the following pages denote maximum allowable centreline to centreline span in millimetres between permanent supports after temporary propping is removed.
2. The practical limit for span to slab depth ratio is considered to be 35 for single span slabs, or 40 for continuous slabs. Values above these limits have been listed in brackets "[ ]". The use of the results in brackets must be confirmed with the structural engineer or a Fielders representative as the long term serviceability and composite performance of the resulting concrete slab may not be suitable for the project application.
3. Allowance has been made for ponding of wet concrete due to decking deflection, density 2400kg/m^3.
4. Loading is considered in accordance with AS 1170.0:2002, AS 2327.1:2003, AS 3610:1995 with a Stage III construction live load allowance of 1.0kPa in accordance with AS 2327.1:2003 Appendix F.
5. The requirements for Stages II & IV material stacking loads, in accordance with Appendix F of AS2327.1: 2003, are assumed to be zero.
6. It is recommended that an experienced structural engineer design the composite slab to ensure sufficient capacity to meet strength and long term deflection requirements.
7. The temporary propping tables have been prepared for a span/150 & span/240 deflection criteria. A span/240 deflection is generally considered aesthetically satisfactory for exposed soffits.
8. These tables are based upon effective section properties of the sheeting calculated in accordance to AS 4600:2005.
9. Care must be exercised when placing concrete to avoid mounding.
10. Wide ply strips, of 300 mm wide, shall be provided to prevent any concentrated loads being applied to the sheeting, particularly for exposed soffits, to avoid direct point loading of the sheet overlap ribs and unsupported edges of the sheeting.
11. When using the table for two or more spans the adjacent spans should not differ in length by more than 5%.
12. A maximum sheet length of 12m has been considered.
13. A minimum bearing width of the permanent support has been considered to be 50mm.
14. Fielders recommend a gauge of 1.00 mm BMT for exposed soffits in propped applications to avoid creasing of steel decking. Please contact your local KingFlor representative for further information.

KF57® Equally Spaced Props - Single Spans
Maximum Spans (mm) for Deflection L/150

KF57®



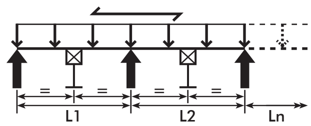
L/150

Dcs (mm)	Unpropped			1 Row of Props			2 Rows of Props		
	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT
100	2,050	2,300	2,600	[5,300]	[5,900]	[6,650]	[7,950]	[8,800]	[9,800]
110	2,000	2,250	2,500	[5,150]	[5,700]	[6,450]	[7,700]	[8,500]	[9,500]
120	1,950	2,150	2,450	[5,000]	[5,550]	[6,300]	[7,500]	[8,300]	[9,250]
130	1,900	2,150	2,400	[4,900]	[5,400]	[6,150]	[7,300]	[8,100]	[9,050]
140	1,850	2,100	2,350	4,750	[5,300]	[6,000]	[7,150]	[7,900]	[8,900]
150	1,800	2,050	2,300	4,650	5,150	[5,850]	[6,950]	[7,750]	[8,700]
160	1,800	2,000	2,250	4,550	5,050	[5,750]	[6,800]	[7,550]	[8,550]
170	1,750	1,950	2,200	4,450	4,950	5,600	[6,650]	[7,400]	[8,400]
180	1,700	1,950	2,150	4,350	4,850	5,500	[6,550]	[7,250]	[8,200]
190	1,700	1,900	2,150	4,300	4,750	5,400	6,400	[7,150]	[8,050]
200	1,650	1,850	2,100	4,200	4,650	5,300	6,300	7,000	[7,900]
210	1,650	1,850	2,050	4,100	4,600	5,200	6,200	6,850	[7,800]
220	1,600	1,800	2,050	4,050	4,500	5,100	6,100	6,750	7,650
230	1,600	1,800	2,000	4,000	4,450	5,050	6,000	6,650	7,550
240	1,550	1,750	1,950	3,900	4,350	4,950	5,900	6,550	7,400
250	1,550	1,750	1,950	3,850	4,300	4,850	5,800	6,450	7,300

Table 3.12.A KF57® Equally Spaced Props - Single Spans - Maximum Spans (mm) for Deflection L/150

KF57® Equally Spaced Props - Two or More Spans
Maximum Spans (mm) for Deflection L/150

KF57®



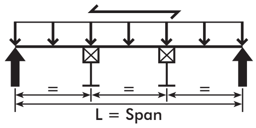
L/150

Dcs (mm)	Unpropped			1 Row of Props			2 Rows of Props		
	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT
100	2,650	2,950	3,300	[5,300]	[5,900]	[6,650]	[7,950]	[8,800]	[9,800]
110	2,550	2,800	3,150	[5,150]	[5,700]	[6,400]	[7,700]	[8,500]	[9,500]
120	2,500	2,750	3,050	[5,000]	[5,550]	[6,250]	[7,500]	[8,300]	[9,250]
130	2,400	2,700	3,000	4,850	[5,400]	[6,100]	[7,300]	[8,100]	[9,050]
140	2,350	2,600	2,950	4,750	5,250	[5,950]	[7,150]	[7,900]	[8,900]
150	2,300	2,550	2,900	4,650	5,150	5,850	[7,000]	[7,750]	[8,700]
160	2,250	2,500	2,850	4,550	5,050	5,700	[6,800]	[7,550]	[8,550]
170	2,200	2,450	2,800	4,450	4,950	5,600	6,700	[7,400]	[8,400]
180	2,150	2,400	2,700	4,350	4,850	5,500	6,550	[7,250]	[8,200]
190	2,100	2,350	2,650	4,250	4,750	5,400	6,400	[7,150]	[8,050]
200	2,100	2,300	2,600	4,200	4,650	5,300	6,300	7,000	7,900
210	2,050	2,250	2,600	4,100	4,600	5,200	6,200	6,850	7,800
220	2,000	2,250	2,550	4,050	4,500	5,100	6,100	6,750	7,650
230	2,000	2,200	2,500	4,000	4,450	5,000	6,000	6,650	7,550
240	1,950	2,150	2,450	3,900	4,350	4,950	5,900	6,550	7,400
250	1,900	2,150	2,400	3,850	4,300	4,850	5,800	6,450	7,300

Table 3.12.B KF57® Equally Spaced Props - Two or More Spans - Maximum Spans (mm) for Deflection L/150

KF57® Equally Spaced Props - Single Spans
Maximum Spans (mm) for Deflection L/240

KF57®



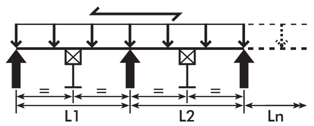
L/240

Dcs (mm)	Unpropped			1 Row of Props			2 Rows of Props		
	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT
100	2,050	2,300	2,550	[5,200]	[5,600]	[6,150]	[7,250]	[7,750]	[8,550]
110	2,000	2,250	2,500	[5,000]	[5,400]	[5,950]	[7,000]	[7,500]	[8,250]
120	1,950	2,150	2,400	[4,850]	[5,250]	[5,800]	[6,850]	[7,350]	[8,050]
130	1,900	2,150	2,350	[4,750]	[5,150]	[5,700]	[6,650]	[7,150]	[7,900]
140	1,850	2,100	2,300	4,600	[5,000]	[5,550]	[6,500]	[7,000]	[7,700]
150	1,800	2,050	2,250	4,500	4,900	[5,450]	[6,400]	[6,850]	[7,550]
160	1,800	2,000	2,200	4,400	4,750	5,350	[6,250]	[6,700]	[7,400]
170	1,750	1,950	2,200	4,300	4,650	5,250	[6,150]	[6,600]	[7,250]
180	1,700	1,950	2,150	4,200	4,600	5,150	6,050	[6,500]	[7,150]
190	1,700	1,900	2,100	4,150	4,500	5,050	5,950	6,400	[7,050]
200	1,650	1,850	2,100	4,050	4,400	4,950	5,850	6,300	6,900
210	1,650	1,850	2,050	4,000	4,350	4,900	5,750	6,200	6,800
220	1,600	1,800	2,000	3,950	4,250	4,800	5,650	6,100	6,700
230	1,600	1,800	2,000	3,850	4,200	4,700	5,600	6,000	6,650
240	1,550	1,750	1,950	3,800	4,150	4,650	5,500	5,950	6,550
250	1,550	1,750	1,950	3,750	4,050	4,600	5,450	5,850	6,450

Table 3.12.C KF57® Equally Spaced Props - Single Spans - Maximum Spans (mm) for Deflection L/240

KF57® Equally Spaced Props - Two or More Spans
Maximum Spans (mm) for Deflection L/240

KF57®



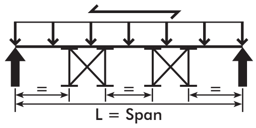
L/240

Dcs (mm)	Unpropped			1 Row of Props			2 Rows of Props		
	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT
100	2,600	2,800	3,050	[4,900]	[5,250]	[5,800]	[7,400]	[7,900]	[8,550]
110	2,300	2,500	2,750	[4,750]	[5,100]	[5,650]	[7,150]	[7,700]	[8,250]
120	2,250	2,450	2,650	4,650	[5,000]	[5,500]	[6,950]	[7,500]	[8,050]
130	2,200	2,350	2,600	4,550	4,850	[5,350]	[6,800]	[7,300]	[7,900]
140	2,150	2,300	2,550	4,450	4,750	5,250	[6,650]	[7,150]	[7,700]
150	2,100	2,250	2500	4,350	4,650	5,150	[6,500]	[7,000]	[7,550]
160	2,050	2,200	2,450	4,250	4,550	5,050	6,400	[6,850]	[7,400]
170	2,050	2,200	2,400	4,200	4,500	4,950	6,300	6,750	[7,250]
180	2,000	2,150	2,350	4,100	4,400	4,850	6,150	6,650	7,150
190	1,950	2,100	2,350	4,050	4,350	4,800	6,050	6,500	7,050
200	1,950	2,100	2,300	3,950	4,250	4,700	5,950	6,400	6,900
210	1,900	2050	2,250	3,900	4,200	4,650	5,900	6,300	6,800
220	1,850	2,000	2,200	3,850	4,150	4,550	5,800	6,250	6,700
230	1,850	2,000	2,200	3,800	4,100	4,500	5,700	6,150	6,650
240	1,800	1,950	2,150	3,750	4,050	4,450	5,600	6,050	6,550
250	1,800	1,950	2,150	3,700	4,000	4400	5,550	6,000	6,450

Table 3.12.D KF57® Equally Spaced Props - Two or More Spans - Maximum Spans (mm) for Deflection L/240

KF57® Frame Propping - 1200mm Frame Size
Maximum Spans (mm) for Deflection L/150

KF57®



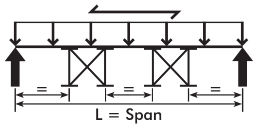
L/150

Dcs (mm)	1 Frame			2 Frame		
	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT
100	[5,300]	[5,800]	[6,400]	[8,550]	[9,300]	[10,200]
110	[5,200]	[5,700]	[6,300]	[8,400]	[9,150]	[10,050]
120	[5,200]	[5,600]	[6,100]	[8,400]	[9,000]	[9,750]
130	[5,100]	[5,600]	[6,000]	[8,250]	[9,000]	[9,600]
140	[5,000]	[5,500]	[5,900]	[8,100]	[8,850]	[9,450]
150	4,900	[5,400]	[5,800]	[7,950]	[8,700]	[9,300]
160	4,900	5,300	[5,700]	[7,950]	[8,550]	[9,150]
170	4,800	5,200	5,600	[7,800]	[8,400]	[9,000]
180	4,800	5,200	5,600	[7,800]	[8,400]	[9,000]
190	4,700	5,100	5,500	[7,650]	[8,250]	[8,850]
200	4,700	5,000	5,400	[7,650]	[8,100]	[8,700]
210	4,600	5,000	5,400	[7,500]	[8,100]	[8,700]
220	4,600	4,900	5,300	7,500	[7,950]	[8,550]
230	4,500	4,900	5,300	7,350	7,950	[8,550]
240	4,500	4,800	5,200	7,350	7,800	8,400
250	4,400	4,800	5,100	7,200	7,800	8,250

Table 3.12.E KF57® Frame Propping - 1200mm Frame Size - Maximum Spans (mm) for Deflection L/150

KF57® Frame Propping - 1500mm Frame Size
Maximum Spans (mm) for Deflection L/150

KF57®



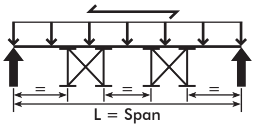
L/150

Dcs (mm)	1 Frame			2 Frame		
	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT
100	[5,600]	[6,100]	[6,700]	[9,150]	[9,900]	[10,800]
110	[5,500]	[6,000]	[6,600]	[9,000]	[9,750]	[10,650]
120	[5,500]	[5,900]	[6,400]	[9,000]	[9,600]	[10,350]
130	[5,400]	[5,900]	[6,300]	[8,850]	[9,600]	[10,200]
140	[5,300]	[5,800]	[6,200]	[8,700]	[9,450]	[10,050]
150	5,200	[5,700]	[6,100]	[8,550]	[9,300]	[9,900]
160	5,200	5,600	[6,000]	[8,550]	[9,150]	[9,750]
170	5,100	5,500	5,900	[8,400]	[9,000]	[9,600]
180	5,100	5,500	5,900	[8,400]	[9,000]	[9,600]
190	5,000	5,400	5,800	[8,250]	[8,850]	[9,450]
200	5,000	5,300	5,700	[8,250]	[8,700]	[9,300]
210	4,900	5,300	5,700	[8,100]	[8,700]	[9,300]
220	4,900	5,200	5,600	[8,100]	[8,550]	[9,150]
230	4,800	5,200	5,600	7,950	[8,550]	[9,150]
240	4,800	5,100	5,500	7,950	8,400	[9,000]
250	4,700	5,100	5,400	7,800	8,400	[8,850]

Table 3.12.F KF57® Frame Propping - 1500mm Frame Size - Maximum Spans (mm) for Deflection L/150

KF57® Frame Propping - 1200mm Frame Size
Maximum Spans (mm) for Deflection L/240


KF57®



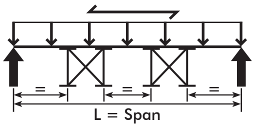
L/240

Dcs (mm)	1 Frame			2 Frame		
	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT
100	[5,000]	[5,300]	[5,700]	[8,100]	[8,550]	[9,150]
110	[4,900]	[5,200]	[5,600]	[7,950]	[8,400]	[9,000]
120	[4,800]	[5,100]	[5,500]	[7,800]	[8,250]	[8,850]
130	[4,700]	[5,000]	[5,400]	[7,650]	[8,100]	[8,700]
140	4,600	4,900	[5,300]	[7,500]	[7,950]	[8,550]
150	4,500	4,800	5,200	[7,350]	[7,800]	[8,400]
160	4,500	4,700	5,100	[7,350]	[7,650]	[8,250]
170	4,400	4,700	5,000	[7,200]	[7,650]	[8,100]
180	4,400	4,600	5,000	[7,200]	[7,500]	[8,100]
190	4,300	4,500	4,900	[7,050]	[7,350]	[7,950]
200	4,300	4,500	4,800	[7,050]	[7,350]	[7,800]
210	4,200	4,400	4,800	6,900	7,200	[7,800]
220	4,200	4,400	4,700	6,900	7,200	7,650
230	4,100	4,300	4,700	6,750	7,050	7,650
240	4,100	4,300	4,600	6,750	7,050	7,500
250	4,000	4,300	4,600	6,600	7,050	7,500

Table 3.12.G KF57® Frame Propping - 1200mm Frame Size - Maximum Spans (mm) for Deflection L/240

KF57® Frame Propping - 1500mm Frame Size
Maximum Spans (mm) for Deflection L/240


KF57®



L/240

Dcs (mm)	1 Frame			2 Frame		
	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT
100	[5,300]	[5,600]	[6,000]	[8,700]	[9,150]	[9,750]
110	[5,200]	[5,500]	[5,900]	[8,550]	[9,000]	[9,600]
120	[5,100]	[5,400]	[5,800]	[8,400]	[8,850]	[9,450]
130	[5,000]	[5,300]	[5,700]	[8,250]	[8,700]	[9,300]
140	4,900	[5,200]	[5,600]	[8,100]	[8,550]	[9,150]
150	4,800	5,100	[5,500]	[7,950]	[8,400]	[9,000]
160	4,800	5,000	5,400	[7,950]	[8,250]	[8,850]
170	4,700	5,000	5,300	[7,800]	[8,250]	[8,700]
180	4,700	4,900	5,300	[7,800]	[8,100]	[8,700]
190	4,600	4,800	5,200	[7,650]	[7,950]	[8,550]
200	4,600	4,800	5,100	[7,650]	[7,950]	[8,400]
210	4,500	4,700	5,100	[7,500]	[7,800]	[8,400]
220	4,500	4,700	5,000	7,500	[7,800]	[8,250]
230	-	4,600	5,000	-	7,650	[8,250]
240	-	4,600	4,900	-	7,650	8,100
250	-	4,600	4,900	-	7,650	8,100

Table 3.12.H KF57® Frame Propping - 1500mm Frame Size - Maximum Spans (mm) for Deflection L/240

3.13 RF55® Temporary Propping Tables

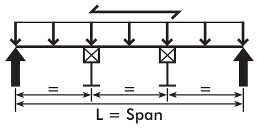
Index of RF55® Temporary Propping Tables

Temporary Propping Tables Notes

1. The tables on the following pages denote maximum allowable centreline to centreline span in millimetres between permanent supports after temporary propping is removed.
2. The practical limit for span to slab depth ratio is considered to be 35 for single span slabs, or 40 for continuous slabs. Values above these limits have been listed in brackets "[ ]". The use of the results in brackets must be confirmed with the structural engineer or a Fielders representative as the long term serviceability and composite performance of the resulting concrete slab may not be suitable for the project application.
3. Allowance has been made for ponding of wet concrete due to decking deflection, density 2400kg/m^3.
4. Loading is considered in accordance with AS 1170.0:2002, AS 2327.1:2003, AS 3610:1995 with a Stage III construction live load allowance of 1.0kPa in accordance with AS 2327.1:2003 Appendix F.
5. The requirements for Stages II & IV material stacking loads, in accordance with Appendix F of AS2327.1: 2003, are assumed to be zero.
6. It is recommended that an experienced structural engineer design the composite slab to ensure sufficient capacity to meet strength and long term deflection requirements.
7. The temporary propping tables have been prepared for a span/150 & span/240 deflection criteria. A span/240 deflection is generally considered aesthetically satisfactory for exposed soffits.
8. These tables are based upon effective section properties of the sheeting calculated in accordance to AS 4600:2005.
9. Care must be exercised when placing concrete to avoid mounding.
10. Wide ply strips, of 300 mm wide, shall be provided to prevent any concentrated loads being applied to the sheeting, particularly for exposed soffits, to avoid direct point loading of the sheet overlap ribs and unsupported edges of the sheeting.
11. When using the table for two or more spans the adjacent spans should not differ in length by more than 5%.
12. A maximum sheet length of 12m has been considered.
13. A minimum bearing width of the permanent support has been considered to be 50mm.
14. Fielders recommend a gauge of 1.00 mm BMT for exposed soffits in propped applications to avoid creasing of steel decking. Please contact your local KingFlor representative for further information.

RF55® Equally Spaced Props - Single Spans
Maximum Spans (mm) for Deflection L/150

RF55®

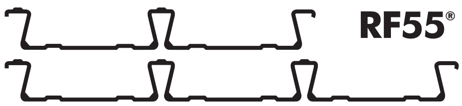


L/150

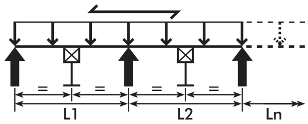
Dcs (mm)	Unpropped				1 Row of Props				2 Rows of Props			
	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT
100	2,000	2,600	2,700	2,800	[4,750]	[6,200]	[7,050]	[7,400]	[7,000]	[9,250]	[9,900]	[10,300]
110	2,000	2,500	2,650	2,700	[4,750]	[6,200]	[6,850]	[7,200]	[7,000]	[9,200]	[9,650]	[10,050]
120	2,000	2,450	2,600	2,700	[4,750]	[6,100]	[6,650]	[7,050]	[7,000]	[8,950]	[9,400]	[9,800]
130	2,000	2,400	2,500	2,600	[4,750]	[5,950]	[6,450]	[6,850]	[7,000]	[8,750]	[9,200]	[9,550]
140	2,000	2,350	2,450	2,550	4,550	[5,800]	[6,300]	[6,700]	[7,000]	[8,550]	[9,000]	[9,350]
150	2,000	2,300	2,400	2,500	4,300	[5,650]	[6,150]	[6,500]	[6,700]	[8,400]	[8,800]	[9,200]
160	2,000	2,250	2,350	2,450	4,100	5,500	[6,000]	[6,350]	[6,400]	[8,250]	[8,650]	[9,000]
170	2,000	2,200	2,300	2,400	3,900	5,400	5,850	[6,250]	[6,100]	[8,100]	[8,500]	[8,850]
180	2,000	2,150	2,300	2,400	3,700	5,300	5,750	6,100	5,850	[7,950]	[8,350]	[8,700]
190	1,950	2,150	2,250	2,350	3,550	5,200	5,600	6,000	5,600	[7,800]	[8,200]	[8,550]
200	1,950	2,100	2,200	2,300	3,400	5,100	5,500	5,850	5,350	[7,650]	[8,100]	[8,400]
210	1,900	2,050	2,200	2,250	3,300	4,950	5,400	5,750	5,150	[7,500]	[7,950]	[8,300]
220	1,850	2,050	2,150	2,250	2,900	4,750	5,350	5,650	4,950	7,350	[7,850]	[8,200]
230	1,800	2,000	2,100	2,200	2,850	4,600	5,250	5,500	4,450	7,200	7,750	[8,050]
240	1,800	1,950	2,100	2,200	2,750	4,450	5,150	5,500	4,300	6,950	7,650	7,950
250	1,750	1,950	2,050	2,150	2,700	4,300	5,100	5,400	4,200	6,750	7,550	7,850

Table 3.13.A RF55® Equally Spaced Props - Single Spans - Maximum Spans (mm) for Deflection L/150

RF55® Equally Spaced Props - Two or More Spans
Maximum Spans (mm) for Deflection L/150



RF55®

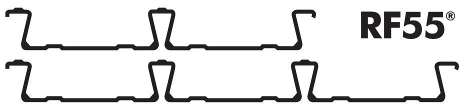


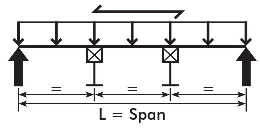
L/150

Dcs (mm)	Unpropped				1 Row of Props				2 Rows of Props			
	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT
100	2,350	3,100	3,300	3,350	[4,850]	[6,250]	[7,050]	[7,350]	[7,000]	[9,300]	[9,900]	[10,200]
110	2,350	3,050	3,200	3,300	[4,800]	[6,250]	[6,850]	[7,200]	[7,000]	[9,150]	[9,650]	[9,950]
120	2,350	2,950	3,100	3,250	[4,800]	[6,050]	[6,650]	[7,000]	[7,000]	[8,900]	[9,400]	[9,750]
130	2,350	2,900	3,050	3,150	4,700	[5,900]	[6,450]	[6,800]	[7,000]	[8,700]	[9,200]	[9,500]
140	2,350	2,800	3,000	3,100	4,650	[5,750]	[6,300]	[6,650]	[6,950]	[8,500]	[9,000]	[9,300]
150	2,200	2,750	2,900	3,000	4,400	5,600	[6,150]	[6,450]	[6,600]	[8,350]	[8,800]	[9,100]
160	2,100	2,700	2,850	2,950	4,200	5,500	5,900	6,300	6,300	[8,150]	[8,650]	[8,950]
170	2,000	2,650	2,800	2,900	4,000	5,350	5,800	6,200	6,000	[8,000]	[8,500]	[8,800]
180	1,900	2,600	2,750	2,850	3,850	5,250	5,700	6,050	5,750	[7,850]	[8,350]	[8,650]
190	1,800	2,550	2,700	2,800	3,650	5,150	5,600	5,800	5,500	[7,700]	[8,200]	[8,500]
200	1,750	2,500	2,700	2,750	3,500	5,050	5,500	5,700	5,300	7,600	[8,100]	[8,350]
210	1,650	2,450	2,650	2,750	3,400	4,950	5,400	5,600	5,100	7,450	7,950	[8,250]
220	1,500	2,400	2,600	2,700	3,250	4,850	5,350	5,500	4,900	7,300	7,850	[8,150]
230	1,450	2,350	2,550	2,650	2,900	4,750	5,250	5,450	4,400	7,100	7,750	8,000
240	1,400	2,250	2,550	2,600	2,850	4,600	5,150	5,400	4,250	6,850	7,650	7,900
250	1,350	2,200	2,500	2,600	2,750	4,450	5,100	5,300	4,150	6,650	7,550	7,800

Table 3.13.B RF55® Equally Spaced Props - Two or More Spans - Maximum Spans (mm) for Deflection L/150

RF55® Equally Spaced Props - Single Spans
Maximum Spans (mm) for Deflection L/240



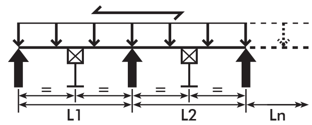


L/240

Dcs (mm)	Unpropped				1 Row of Props				2 Rows of Props			
	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT
100	2,000	2,250	2,350	2,450	[4,800]	[5,950]	[6,250]	[6,500]	[7,000]	[8,250]	[8,650]	[9,000]
110	2,000	2,200	2,300	2,400	[4,800]	[5,750]	[6,050]	[6,300]	[7,000]	[8,000]	[8,400]	[8,750]
120	1,950	2,150	2,250	2,350	[4,800]	[5,600]	[5,900]	[6,150]	[7,000]	[7,800]	[8,200]	[8,550]
130	1,900	2,100	2,200	2,250	[4,800]	[5,500]	[5,750]	[6,000]	[6,900]	[7,600]	[8,000]	[8,300]
140	1,850	2,050	2,150	2,200	4,550	[5,350]	[5,650]	[5,850]	[6,650]	[7,400]	[7,800]	[8,150]
150	1,800	1,950	2,100	2,200	4,300	[5,250]	[5,500]	[5,750]	[6,400]	[7,200]	[7,650]	[7,950]
160	1,750	1,900	2,050	2,150	4,100	5,100	5,400	[5,650]	[6,200]	[6,950]	[7,500]	[7,800]
170	1,700	1,850	2,000	2,100	3,900	5,000	5,300	5,500	[6,000]	[6,750]	[7,300]	[7,650]
180	1,650	1,850	1,950	2,050	3,700	4,850	5,200	5,400	5,800	[6,550]	[7,100]	[7,550]
190	1,600	1,800	1,900	2,000	3,550	4,750	5,100	5,350	5,600	6,350	[6,900]	[7,400]
200	1,600	1,750	1,850	2,000	3,400	4,600	5,050	5,250	5,300	6,200	6,750	[7,200]
210	1,550	1,700	1,850	1,950	3,300	4,500	4,950	5,150	5,150	6,050	6,550	7,000
220	1,550	1,700	1,800	1,900	2,900	4,400	4,850	5,100	4,950	5,900	6,400	6,850
230	1,500	1,650	1,750	1,850	2,850	4,300	4,750	5,000	4,450	5,750	6,250	6,700
240	1,450	1,600	1,750	1,850	2,750	4,200	4,650	4,950	4,300	5,600	6,150	6,550
250	1,450	1,600	1,700	1,800	2,700	4,150	4,550	4,850	4,200	5,500	6,000	6,400

Table 3.13.C RF55® Equally Spaced Props - Single Spans - Maximum Spans (mm) for Deflection L/240

RF55® Equally Spaced Props - Two or More Spans
Maximum Spans (mm) for Deflection L/240

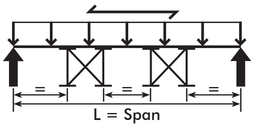


L/240

Dcs (mm)	Unpropped				1 Row of Props				2 Rows of Props			
	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT
100	2,350	2,700	2,850	2,950	[4,650]	[5,550]	[5,900]	[6,050]	[7,000]	[8,150]	[8,650]	[8,900]
110	2,350	2,650	2,800	2,900	[4,650]	[5,400]	[5,750]	[5,900]	[7,000]	[7,950]	[8,400]	[8,700]
120	2,350	2,550	2,700	2,800	4,650	[5,250]	[5,600]	[5,750]	[7,000]	[7,750]	[8,200]	[8,450]
130	2,250	2,500	2,650	2,750	4,650	5,150	[5,450]	[5,600]	[6,800]	[7,550]	[8,000]	[8,250]
140	2,200	2,450	2,600	2,700	4,500	5,000	5,300	5,500	[6,550]	[7,350]	[7,800]	[8,100]
150	2,100	2,350	2,550	2,600	4,350	4,900	5,200	5,400	[6,350]	[7,100]	[7,650]	[7,900]
160	2,050	2,300	2,500	2,550	4,200	4,750	5,100	5,300	6,100	[6,900]	[7,500]	[7,750]
170	2,000	2,200	2,450	2,500	4,000	4,600	5,000	5,200	6,050	6,650	[7,300]	[7,600]
180	1,900	2,150	2,350	2,500	3,850	4,450	4,900	5,100	5,750	6,450	7,100	[7,500]
190	1,800	2,100	2,300	2,450	3,650	4,350	4,750	5,000	5,500	6,300	6,900	7,300
200	1,750	2,050	2,250	2,350	3,500	4,200	4,650	4,900	5,300	6,150	6,750	7,100
210	1,650	2,000	2,200	2,300	3,400	4,100	4,550	4,800	5,100	5,950	6,550	6,950
220	1,500	1,950	2,150	2,250	3,250	4,000	4,400	4,650	4,900	5,950	6,400	6,800
230	1,450	1,900	2,100	2,200	2,900	3,900	4,300	4,550	4,400	5,900	6,250	6,600
240	1,400	1,850	2,050	2,150	2,850	3,850	4,250	4,450	4,250	5,750	6,150	6,500
250	1,350	1,800	2,000	2,100	2,750	3,750	4,150	4,350	4,150	5,650	6,000	6,350

Table 3.13.D RF55® Equally Spaced Props - Two or More Spans - Maximum Spans (mm) for Deflection L/240

RF55® Frame Propping - 1200mm Frame Size
Maximum Spans (mm) for Deflection L/150

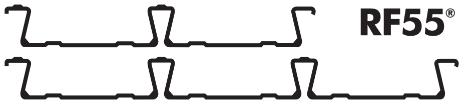


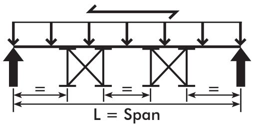
L/150

Dcs (mm)	1 Frame				2 Frames			
	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT
100	[5,200]	[6,600]	[7,200]	[7,200]	[8,400]	[10,350]	[11,400]	[11,400]
110	[5,100]	[6,500]	[7,000]	[7,000]	[8,250]	[10,050]	[11,100]	[11,100]
120	[5,000]	[6,300]	[6,900]	[6,900]	[8,100]	[9,900]	[10,950]	[10,950]
130	5,000	[6,200]	[6,700]	[6,800]	[7,950]	[9,750]	[10,800]	[10,800]
140	4,900	[6,100]	[6,600]	[6,600]	[7,800]	[9,600]	[10,650]	[10,650]
150	4,800	[6,000]	[6,500]	[6,500]	[7,650]	[9,300]	[10,350]	[10,350]
160	4,700	[5,900]	[6,400]	[6,400]	[7,500]	[9,150]	[10,200]	[10,200]
170	4,600	5,800	[6,300]	[6,300]	[7,350]	[9,000]	[10,050]	[10,050]
180	4,600	5,700	6,100	6,200	[7,350]	[9,000]	[9,900]	[10,050]
190	4,500	5,600	6,000	6,200	[7,200]	[8,850]	[9,750]	[9,900]
200	4,400	5,500	5,900	6,100	[7,050]	[8,700]	[9,600]	[9,750]
210	4,400	5,400	5,800	6,000	7,050	[8,550]	[9,450]	[9,600]
220	4,300	5,300	5,700	5,900	6,900	[8,400]	[9,300]	[9,600]
230	4,200	5,200	5,600	5,800	6,900	[8,250]	[9,150]	[9,450]
240	4,200	5,200	5,500	5,800	6,750	8,250	[9,000]	[9,300]
250	4,100	5,100	5,500	5,700	6,600	8,100	[8,850]	[9,150]

Table 3.13.E RF55® Frame Propping - 1200mm Frame Size - Maximum Spans (mm) for Deflection L/150

RF55® Frame Propping - 1500mm Frame Size
Maximum Spans (mm) for Deflection L/150





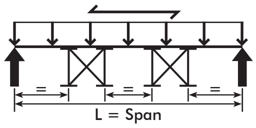
L/150

Dcs (mm)	1 Frame				2 Frames			
	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT
100	[5,500]	6,600]	[7,500	[7,600]	[8,850]	[10,500]	[11,850]	[12,150]
110	[5,400]	[6,500]	[7,400]	[7,400]	[8,700]	[10,350]	[11,700]	[12,000]
120	[5,300]	[6,300]	[7,200]	[7,300]	[8,550]	[10,050]	[11,400]	[11,700]
130	[5,200]	[6,200]	[7,100]	[7,100]	[8,250]	[9,900]	[11,250]	[11,550]
140	[5,100]	[6,100]	[7,000]	[7,000]	[8,100]	[9,750]	[11,100]	[11,400]
150	4,900	[6,000]	[6,900]	[6,900]	[7,950]	[9,450]	[10,950]	[11,250]
160	4,900	[5,900]	[6,800]	[6,800]	[7,800]	[9,300]	[10,800]	[11,100]
170	4,800	5,800	[6,700]	[6,700]	[7,800]	[9,150]	[10,650]	[10,950]
180	4,700	5,700	[6,600]	[6,600]	[7,650]	[9,000]	[10,500]	[10,800]
190	4,600	5,600	6,400	6,600	[7,350]	[8,850]	[10,350]	[10,650]
200	4,500	5,500	6,300	6,500	[7,200]	[8,700]	[10,200]	[10,500]
210	4,300	5,400	6,200	6,400	7,050	[8,700]	[10,050]	[10,350]
220	4,200	5,300	6,100	6,300	6,900	[8,550]	[9,900]	[10,350]
230	4,100	5,200	6,100	6,300	6,750	[8,400]	[9,750]	[10,200]
240	4,000	5,100	6,000	6,200	6,600	8,250	[9,600]	[10,050]
250	3,900	5,100	5,900	6,100	6,450	8,100	[9,450]	[9,900]

Table 3.13.F RF55® Frame Propping - 1500mm Frame Size - Maximum Spans (mm) for Deflection L/150

RF55® Frame Propping - 1200mm Frame Size
Maximum Spans (mm) for Deflection L/240

RF55®

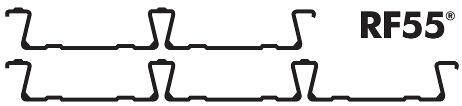


L/240

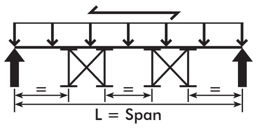
Dcs (mm)	1 Frame				2 Frames			
	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT
100	[5,300]	[6,000]	[6,300]	[6,400]	[8,400]	[9,600]	[10,200]	[10,200]
110	[5,100]	[5,800]	[6,100]	[6,300]	[8,250]	[9,300]	[9,900]	[10,050]
120	[5,000]	[5,600]	[6,000]	[6,100]	[8,100]	[9,000]	[9,600]	[9,900]
130	[4,900]	[5,400]	[5,800]	[6,000]	[7,950]	[8,850]	[9,300]	[9,600]
140	4,800	[5,300]	[5,600]	[5,900]	[7,800]	[8,550]	[9,150]	[9,450]
150	4,800	5,200	[5,500]	[5,700]	[7,650]	[8,400]	[9,000]	[9,300]
160	4,700	5,100	5,400	5,600	[7,500]	[8,250]	[8,700]	[9,000]
170	4,600	5,000	5,300	5,500	[7,350]	[8,100]	[8,550]	[8,850]
180	4,500	4,900	5,200	5,400	[7,350]	[7,950]	[8,400]	[8,700]
190	4,500	4,800	5,100	5,300	[7,200]	[7,800]	[8,250]	[8,550]
200	4,400	4,700	5,000	5,200	[7,050]	[7,650]	[8,100]	[8,400]
210	4,300	4,600	4,900	5,100	7,050	[7,650]	[7,950]	[8,250]
220	4,300	4,600	4,800	5,000	6,900	7,500	[7,800]	[8,100]
230	4,200	4,500	4,800	4,900	6,750	7,350	7,800	[8,100]
240	4,200	4,400	4,700	4,900	6,750	7,350	7,650	7,950
250	4,100	4,400	4,600	4,800	6,600	7,200	7,650	7,800

Table 3.13.G RF55® Frame Propping - 1200mm Frame Size - Maximum Spans (mm) for Deflection L/240

RF55® Frame Propping - 1500mm Frame Size
Maximum Spans (mm) for Deflection L/240



RF55®



L/240

Dcs (mm)	1 Frame				2 Frames			
	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT	0.60 BMT	0.75 BMT	0.90 BMT	1.00 BMT
100	[5,500]	[6,400]	[6,800]	[6,800]	[8,850]	[10,350]	[10,950]	[10,950]
110	[5,400]	[6,200]	[6,600]	[6,600]	[8,700]	[10,050]	[10,650]	[10,800]
120	[5,300]	[6,000]	[6,400]	[6,500]	[8,550]	[9,900]	[10,350]	[10,650]
130	[5,200]	[5,900]	[6,200]	[6,400]	[8,250]	[9,600]	[10,200]	[10,350]
140	[5,100]	[5,700]	[6,100]	[6,300]	[8,100]	[9,450]	[9,900]	[10,200]
150	4,900	[5,600]	[5,900]	[6,200]	[7,950]	[9,300]	[9,750]	[10,050]
160	4,900	5,500	[5,800]	[6,000]	[7,950]	[9,150]	[9,600]	[9,900]
170	4,800	5,400	5,700	5,900	[7,800]	[9,000]	[9,450]	[9,750]
180	4,700	5,300	5,600	5,800	[7,650]	[8,850]	[9,300]	[9,600]
190	4,600	5,200	5,500	5,700	[7,350]	[8,700]	[9,150]	[9,450]
200	4,500	5,100	5,400	5,600	[7,200]	[8,550]	[9,000]	[9,300]
210	4,300	5,100	5,400	5,500	7,050	[8,400]	[8,850]	[9,150]
220	4,200	5,000	5,300	5,500	6,900	[8,400]	[8,700]	[9,000]
230	4,100	4,900	5,200	5,400	6,750	[8,250]	[8,700]	[8,850]
240	4,000	4,900	5,100	5,300	6,600	8,100	[8,550]	[8,850]
250	3,900	4,800	5,100	5,300	6,450	8,100	8,400	[8,700]

Table 3.13.H RF55® Frame Propping - 1500mm Frame Size - Maximum Spans (mm) for Deflection L/240

3.14 Installation Guidelines for KF57® and RF55®

Temporary Propping for KF57® and RF55®

If temporary propping is required (refer to the appropriate Temporary Propping Tables or KingFlor Designer), it should be placed at the correct centres prior to laying the KF57/RF55 sheets. Generally timber or steel bearers with a minimum dimension of 75mm x 75mm are used on vertical props. The use of wider bearers can be considered to reduce visible marks in the KF57/RF55 after the concrete has hardened and the props are removed. The props should be installed so as to prevent settlement during loading by the wet concrete and other construction loads.

Note: Wide ply strips, of 300 mm wide, may 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 its 28 day strength.

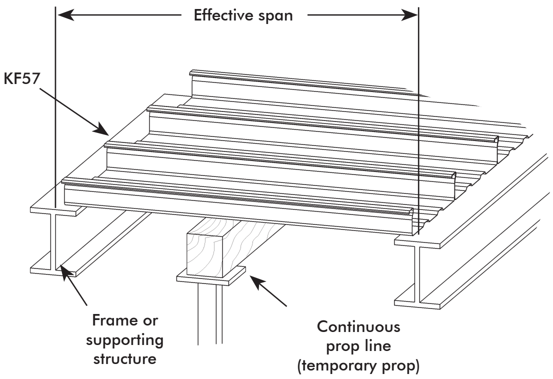


Figure 3.14.A Temporary Propping

Laying RF55®

1. Place the RF55 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.

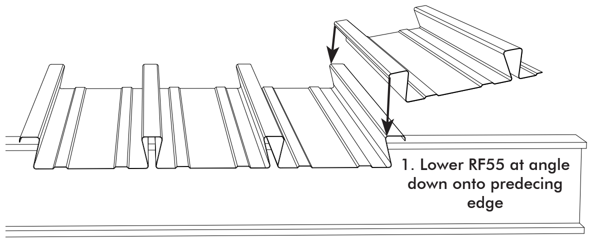


Figure 3.14.B Laying RF55® Step 1

2. Tap the female rib with a hammer at a 45° angle to lock it into place.

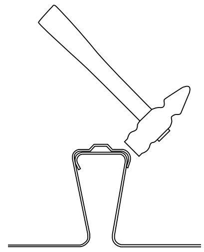


Figure 3.14.C Laying RF55® Step 2

Laying KF57®

1. Place the KF57 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 by locking the larger female rib over the male rib as shown in the following diagram.

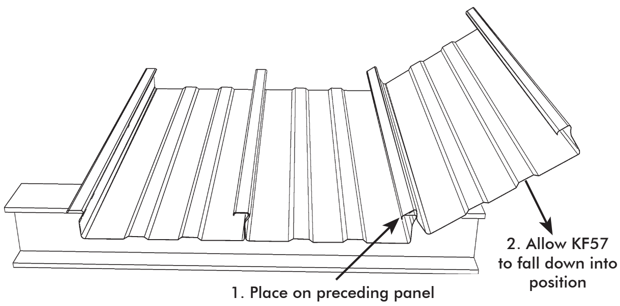


Figure 3.14.D Laying KF57® Step 2

Fasteners and Locations for KF57® and RF55®

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 steelwork 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, blockwork and concrete, the KF57/RF55 must be temporarily held in place against wind and other effects until the concrete is poured.

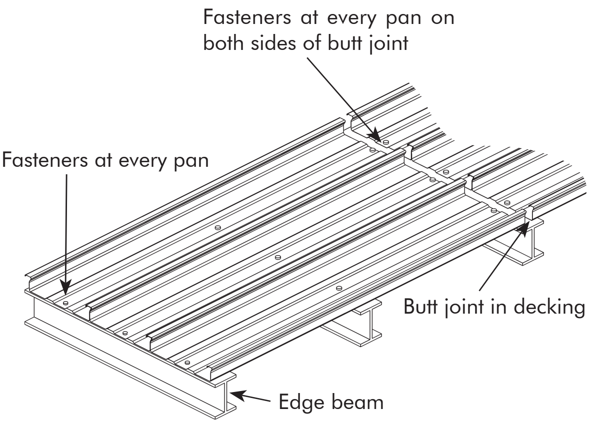


Figure 3.14.E Fasteners and Locations

Reinforcement

Place all reinforcement in strict accordance with the structural engineers drawings and specification.

Concrete Placement

The specified grade of concrete and any chemical admixtures must be in accordance with AS 3600:2001 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 reducing the floor slab capacity.

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

Concrete Additives

Concrete additives which aid the flow or workability of the concrete may affect the composite bond between the KF57/RF55 and the concrete. Before using any additives, consult your structural engineer or consult a Fielders representative.

Penetrations

Should it be necessary to provide a hole through the floor decking, the sheeting should only be cut after curing of the concrete. Before the actual concrete pour, any openings should be boxed out with timber shuttering or dense polystyrene blocks.

For isolated openings at right angles to the deck span, Fielders offer the following guidelines which must always be checked and approved by the structural engineer:

- Penetrations up to 200mm square may be acceptable without additional reinforcement
- Penetrations between 200mm and 500mm square may require additional reinforcement to trim the opening, designed in accordance with AS 3600:2001
- Penetrations greater than 500mm square typically require trimming steelwork support to be supplied by the fabricator
- A close group of penetrations transverse to the profile direction should be considered as a single large penetration

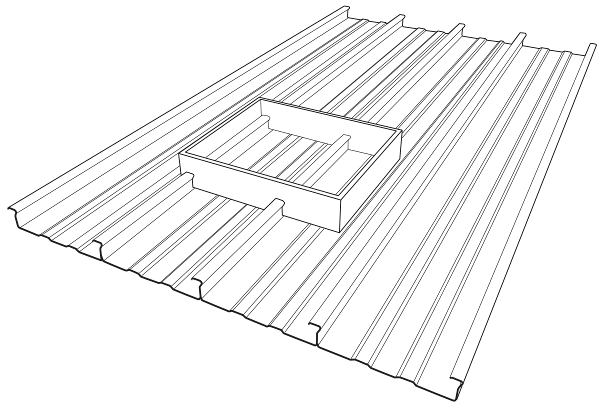


Figure 3.14.F Penetrations

3.15 Accessories for KF57® and RF55®

The following accessories are manufactured for the KingFlor range. For availability and pricing please refer to the Fielders Price Book.

Fielders are able to make flashings to suit a range of needs such as slab infills, pour breaks etc. For further information please contact your local Fielders representative.

Edge Form / Flashings

An easy and economical method of forming up the edges of concrete slabs is to order the KF57/RF55 Edge Form from Fielders. It is custom made from galvanised steel in lengths between one and six metres long.

The bottom edge of the Form is slipped between the KF57/RF55, and the beam or wall below. The top edge is restrained from movement during concrete placement, by the installation of galvanised straps nominally 20-25mm wide every 600mm, usually fastened by hex head self drilling screws or pop-rivets.

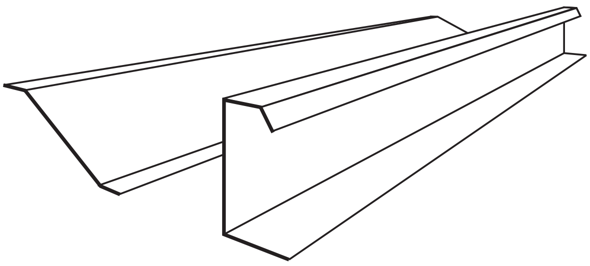


Figure 3.15.A Edge Form and Band Beam Flashings

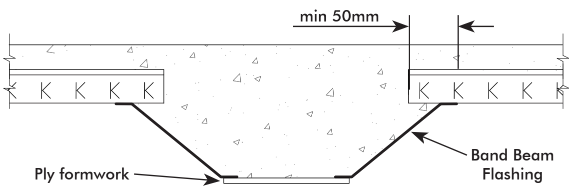


Figure 3.15.B Band Beam Flashing

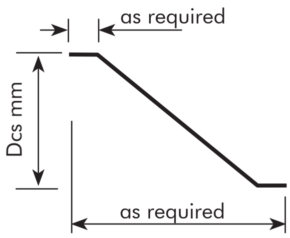


Figure 3.15.C Band Beam Flashing Dimensions

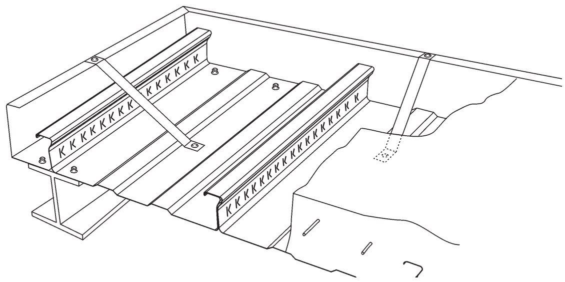


Figure 3.15.D Edge Form

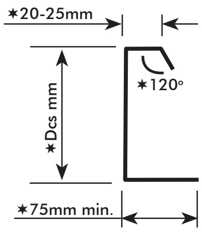


Figure 3.15.E Standard Edge Form Dimensions

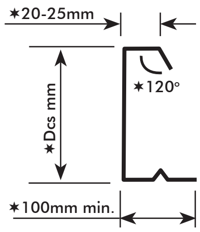


Figure 3.15.F Edge Form with Drip Grove Dimensions

* All dimensions can be altered to suit project

Edge Form Selector Maximum Cantilever (mm)				
Edge trim depth (mm)	Galv. Steel Edge Trim Thickness (mm)			
	1.0	1.2	1.6	2.0
130	100	125	160	195
150	0	115	150	185
200	N/R	100	130	160
250	N/R	0	100	135
300	N/R	N/R	0	100
350	N/R	N/R	N/R	0

Table 3.15.A Edge Form Selector

Note: N/R = not recommended

Service Hangers

Wedge nuts are used to fit in the RF55 dovetail and provide a hole to suit a 6mm threaded rod.

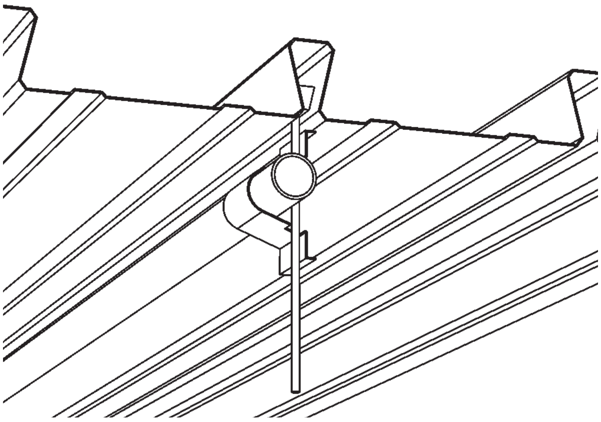


Figure 3.15.G RF55® Wedge Nut Threaded Service Hanger

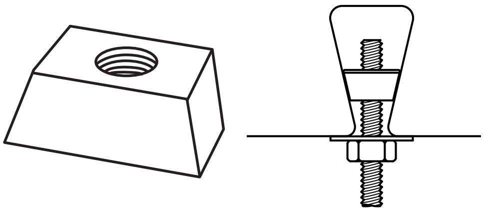


Figure 3.15.H RF55® Wedge Nut

RF55® End Infill

RF55 end infills are available to prevent concrete seepage. RF55 end infills are mainly used in the joints of non-continuous sheets over beams.

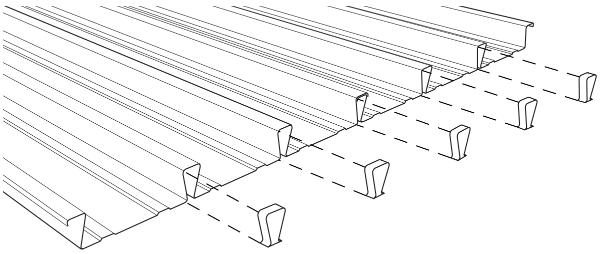


Figure 3.15.I RF55® Foam Infill Pieces

3.16 KF57® and RF55® Construction Details

Below are some typical construction details for the use of KF57/RF55 These are also available electronically from Fielders for use where appropriate. To download these CAD details visit : www.fielders.com.au

Note: All reinforcement as per engineer's details.

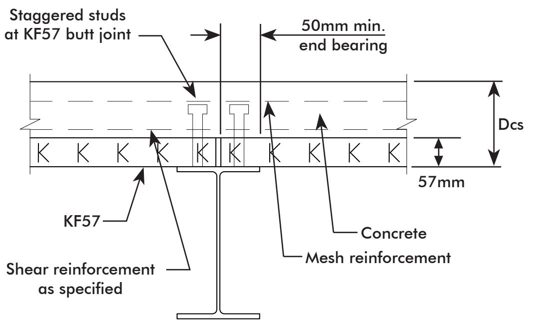


Figure 3.16.A KF57® Butt-Joint Detail

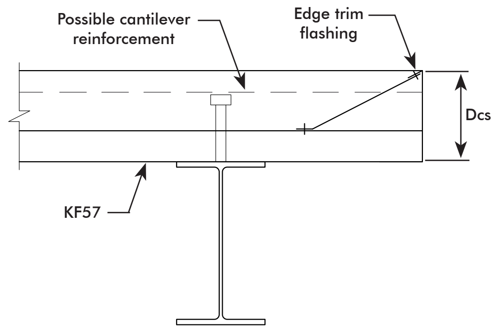


Figure 3.16.D KF57® End Cantilever Detail

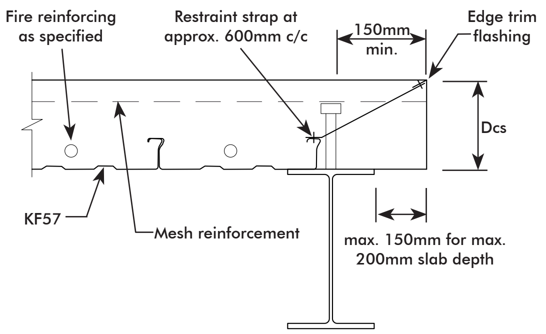


Figure 3.16.B KF57® Perimeter Detail

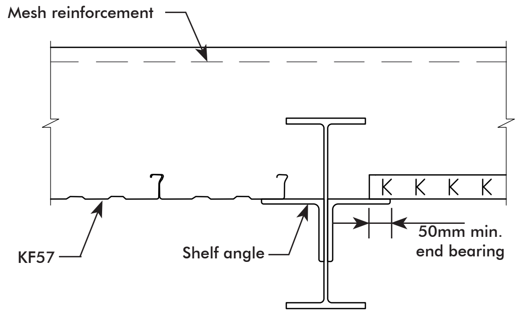


Figure 3.16.E KF57® Shelf Angle Detail

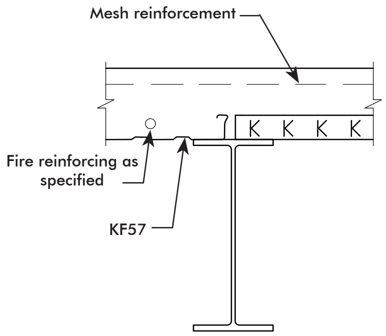


Figure 3.16.C KF57® Direction Change Detail

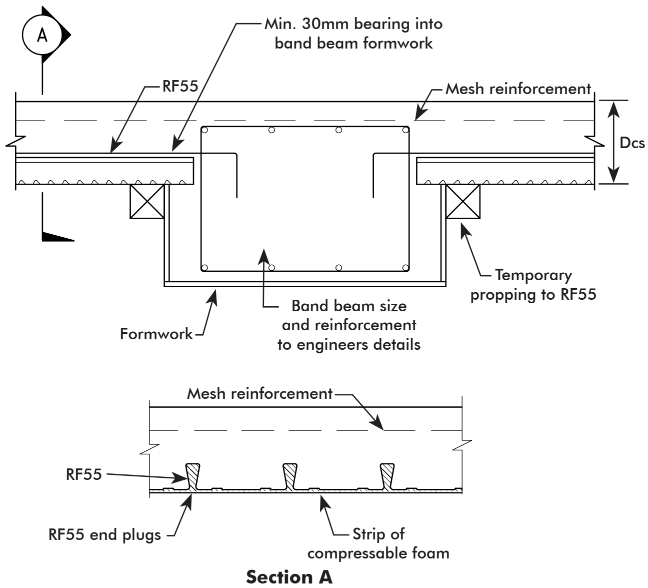


Figure 3.16.F RF55® Band Beam Details

Cantilevers Notes:

1. Construction stage deck cantilevers shall be limited to the lesser of (a) 1/4 x adjacent span, or (b) 600mm.
2. Decking acts as a permanent formwork only for cantilever. Reinforcement for the cantilever should be designed by Engineer.

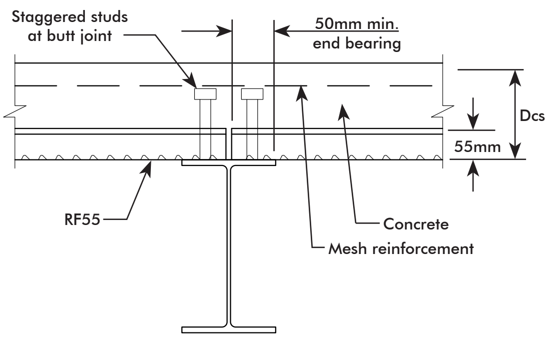


Figure 3.16.G RF55® Butt-Joint Details

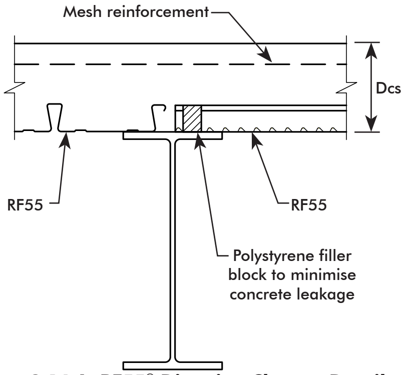


Figure 3.16.J RF55® Direction Change Detail

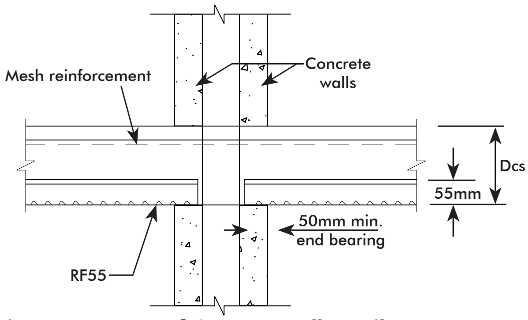


Figure 3.16.H RF55® Concrete Wall Detail

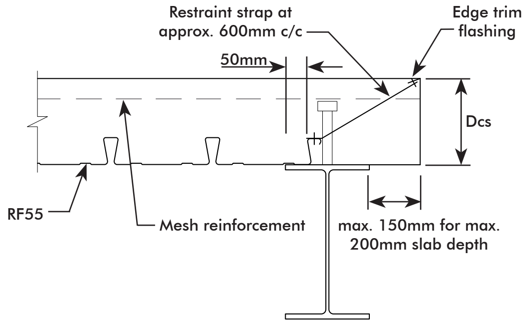


Figure 3.16.K RF55® End Cantilever Detail

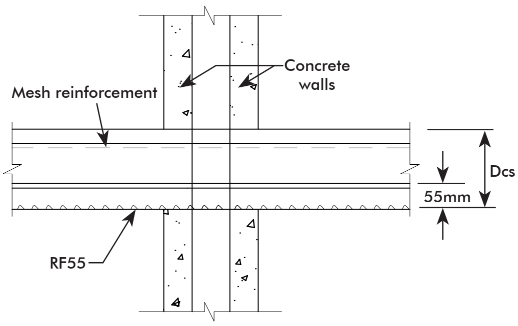


Figure 3.16.I RF55® Concrete Wall Detail - Continuous Sheeting

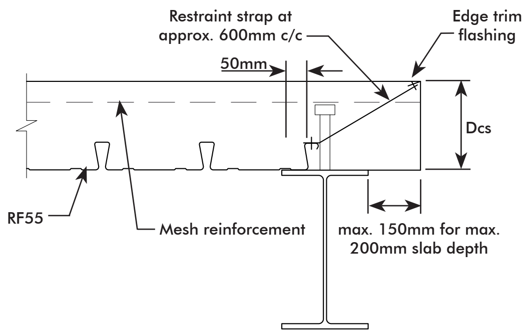


Figure 3.16.L RF55® Perimeter Detail

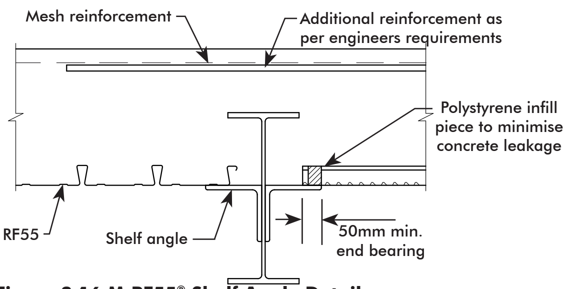


Figure 3.16.M RF55® Shelf Angle Detail

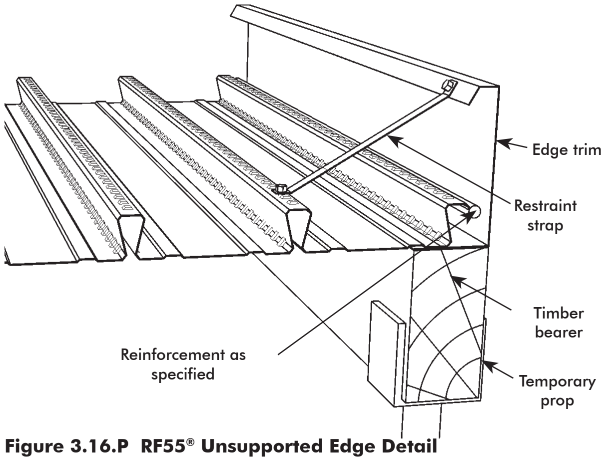


Figure 3.16.P RF55® Unsupported Edge Detail

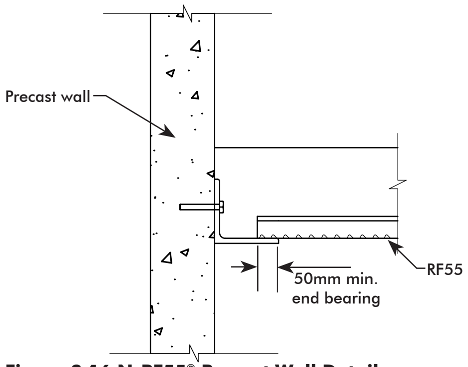


Figure 3.16.N RF55® Precast Wall Detail

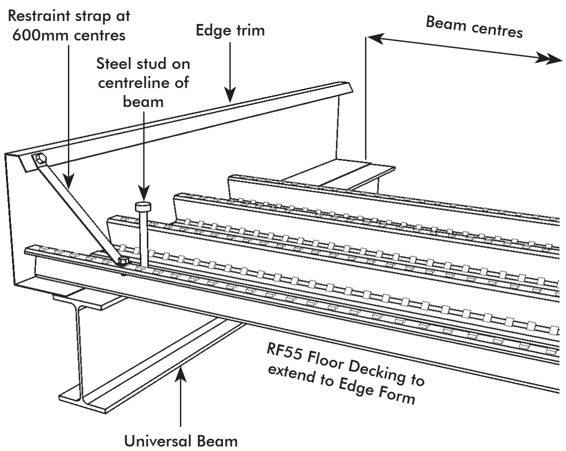


Figure 3.16.Q RF55® End Detail Alternative One

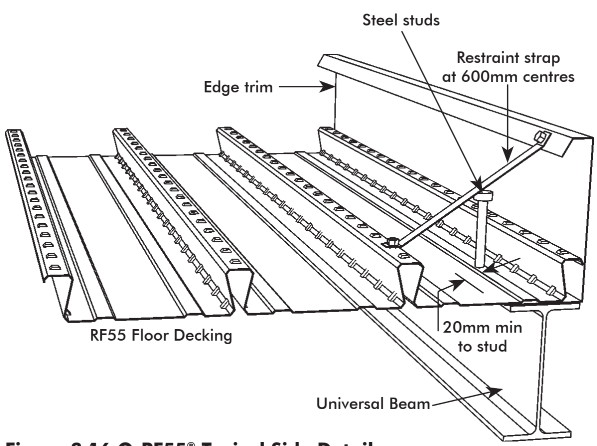


Figure 3.16.O RF55® Typical Side Detail

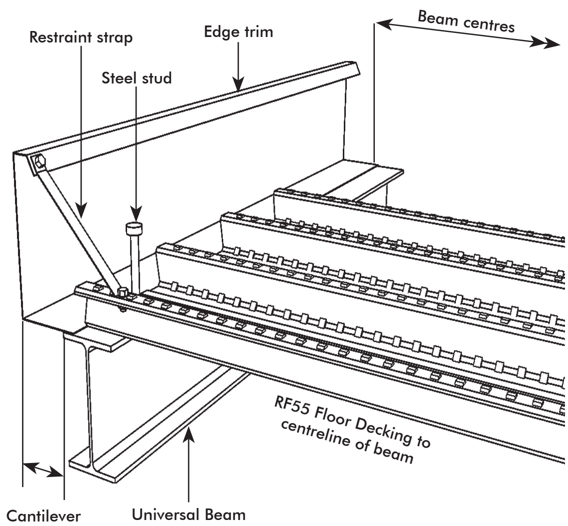
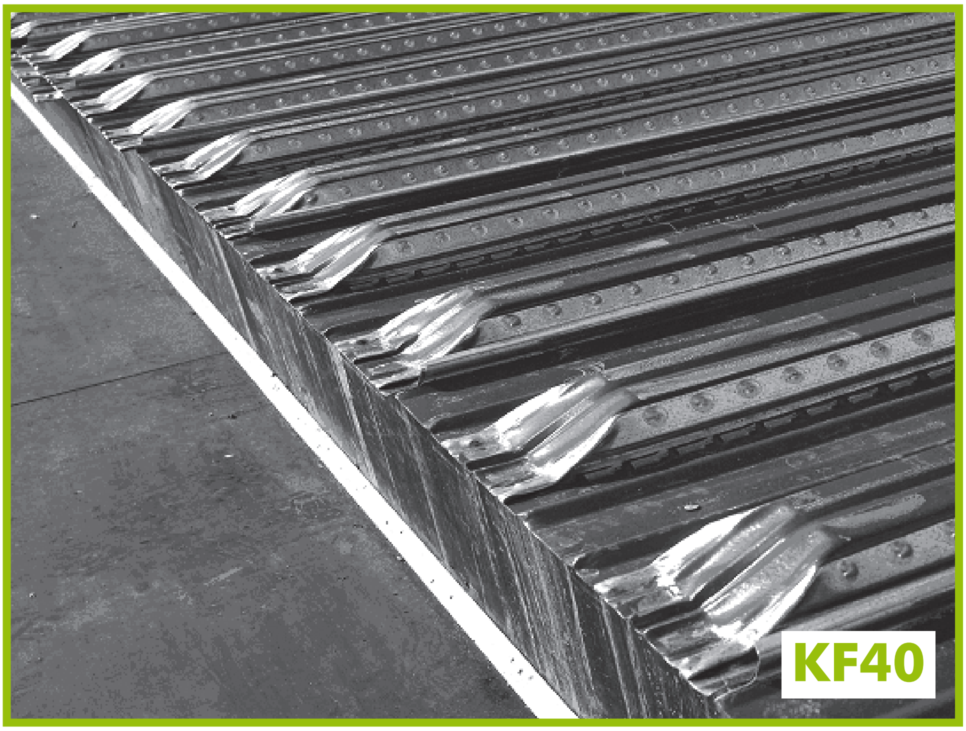


Figure 3.16.R RF55® End Detail Alternative Two

Trapezoidal Profiles



Brunswick Apartments, Melbourne, VIC

Place on Brougham Apartments, Adelaide, SA

4.0 Trapezoidal Profiles

4.0 Trapezoidal Profiles

4.1 KF70® Specification and Design

KF70 is manufactured from G550 (550MPa Yield Stress) steel with a base metal thickness (BMT) of 0.75mm or 1.00mm. Base Metal Thickness of 0.60mm is also available on request. The galvanised coating thickness is Z350 (minimum 350g/m^2) in accordance with AS 1397:2001.

Fielders KF70 is a revolutionary steel formwork solution suitable for composite concrete slabs in concrete and steel-framed construction. KF70 is the answer to increased market demand for a lightweight profile capable of large spans. The KF70 profile displaces 26mm of concrete from the total slab depth to achieve a lightweight slab.

KF70 has delivered cost savings when used in the following types of construction:

- Multi-level carparks
- Multi-storey buildings
- Commercial buildings

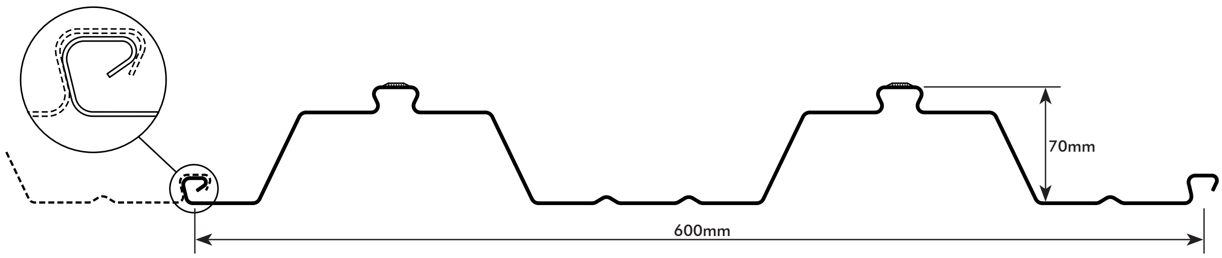


Figure 4.0.A KF70® Profile

Note: All dimensions are nominal only.

KF70® Material Specifications

Material Properties	0.75 BMT	1.00 BMT
Mass Area – Average mass of fitted deck per plan area (kg/m^2)	9.17	12.23
Mass Linear – Mass of individual length (kg/m)	5.50	7.34
Mass Area (m^2/t)	109	81
Zinc Coating (g/m^2) (Z350)	350	350
Yield Strength (MPa)	550	550
Friction Coefficient	0.5	0.5
Sheet Section Steel Area A_{sh} (mm^2/m)	1100	1467
Centroid Height y_{sh} (mm)	27.7	27.7
Bare Sheet Resistance M_u^+ (kNm/m)	7.83	11.75
Bare Sheet Resistance M_u^- (kNm/m)	9.33	11.67
Vertical Shear Resistance (kN/m)	44.5	84.0
Web Crushing Resistance - End span (kN/m)	34.5	51.2
Web Crushing Resistance - Internal span (kN/m)	45.3	67.7
Capacity Reduction Factor – ϕ bare steel ultimate limit state analysis	0.9	0.9
Moment of Inertia Ix+ (mm^4/m)	584000	745000
Moment of Inertia Ix - (mm^4/m)	584000	745000

Table 4.0.A KF70® Material Specifications

4.2 KF40® Specification and Design

KF40 is manufactured from G550 (550MPa Yield Stress) steel with a base metal thickness (BMT) of 0.60mm, 0.75mm or 1.00mm. The galvanised coating thickness is Z350 (350g/m²) in accordance with AS 1397: 2001.

Fielders KF40 is a revolutionary steel formwork solution suitable for composite concrete slabs in concrete and steel framed construction. An optimum strength-to-weight profile, KF40 is the answer to increased market demand for a lightweight profile. The KF40 profile displaces 16mm of concrete from the total slab depth to achieve a lightweight slab.

KF40 has delivered cost savings when used in the following types of construction:

- Concrete framed construction
- Residential construction
- Commercial buildings

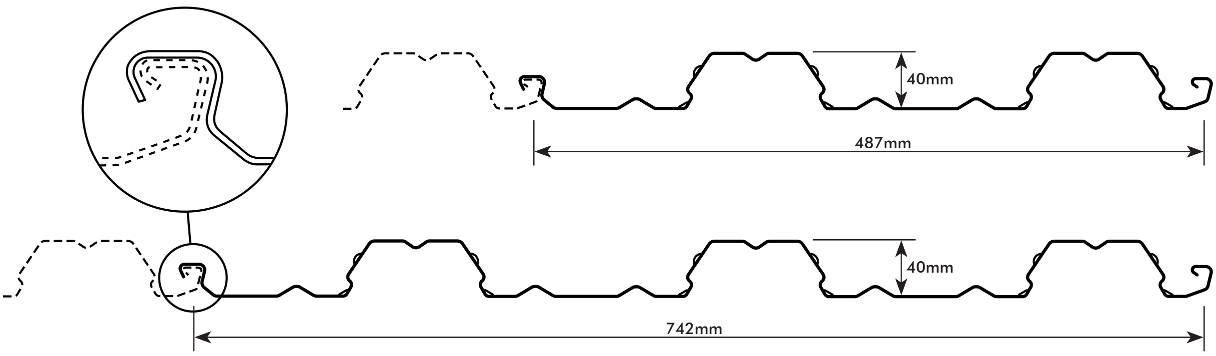


Figure 4.2.A KF40® Profile Details

Note: All dimensions are nominal only.

KF40® Material Specifications			
Material Properties	**0.60 BMT**	**0.75 BMT**	**1.00 BMT**
Mass Area – Average mass of fitted 2-PAN deck per plan area (kg/m²)	7.04	8.67	11.39
Average mass of fitted 3-PAN deck per plan area (kg/m²)	6.78	8.35	10.97
Mass Linear – Mass of individual 2-PAN length (kg/m)	3.43	4.22	5.55
Mass of individual 3-PAN length (kg/m)	5.03	6.19	8.14
Mass Area (m²/t) 2-PAN	142	115	88
3-PAN	147	120	91
Zinc Coating (g/m²) (Z350)	350	350	350
Yield Strength (MPa)	550	550	550
Friction Coefficient	0.5	0.5	0.5
Sheet Section Steel Area A_{sh} (mm²/m) 2-PAN	832	1040	1386
3-PAN	800	1000	1334
Centroid Height y_{sh} (mm)	14	14	14
Bare Sheet Resistance M_u^+ (kNm/m) – single span sheets	2.48	3.91	5.75
– multi-span sheets	2.98	4.69	6.90
Bare Sheet Resistance M_u^- (kNm/m)	0	0	0
Vertical Shear Resistance (kN/m)	7.78	10.63	16.20
Web Crushing Resistance - End span (kN/m)	7.78	10.63	16.20
Web Crushing Resistance - Int span (kN/m)	9.81	15.35	22.50
Capacity Reduction Factor – ϕ bare steel ultimate limit state analysis	0.90	0.90	0.90
Moment of Inertia Ix+ (mm⁴/m)	Ix + is dependent on span, refer to Appendix K		
Moment of Inertia Ix - (mm⁴/m)	Ix - is dependent on span, refer to Appendix K		

Table 4.2.A KF40® Material Specifications

4.3 Acoustic Performance of KF70® and KF40® Slabs

A crucial issue when designing adjoined residential or aged care premises is the transmission of noise through floor systems. In isolation, profiled steel formwork slabs do not offer the same level of sound insulation as of form slabs. However, shallow floors generally exceed the current requirements of the 2006 BCA when installed with a ceiling and insulation (refer to figure 4.3.A for typical configuration).

The R_w value is a laboratory based test result, and is similar to the STC that has been in use for a number of years. The R_w+C_{tr} value is the R_w plus a correction for noise containing greater proportions of lower frequency. The R_w value is usually applied for Class 9c buildings and R_w+C_{tr} is applied for apartment buildings as in the following tables.

Class 9c Buildings (Aged Care Facilities)

The 2006 BCA requires that floor/ceiling systems for Class 9c buildings include an R_w rating not less than 45 and no specified impact noise numerical requirement.

Deemed-to-satisfy constructions include:

- Pre-cast 100mm thick concrete slab
- 100mm thick in-situ concrete slab with density not less than 2500kg/m³

Apartment Buildings (Sole Occupancy Units)

Currently the 2006 BCA requires that floor/ceiling systems for sole occupancy units include an R_w+C_{tr} rating not less than 50 with an impact noise control $L_{n,w}+C_I$ not greater than 62.

Refer to Table 4.3.A and Table 4.3.B for the proposed acceptable R_w and R_w+C_{tr} ratings for ceiling provision combinations.

Where there is no ceiling provision, the BCA requires that the floor surface finish is carpet on underlay.

We expect that the $L_{n,w}+C_I$ impact noise criterion of not exceeding 62 will be met for all configurations that meet the airborne noise requirement.

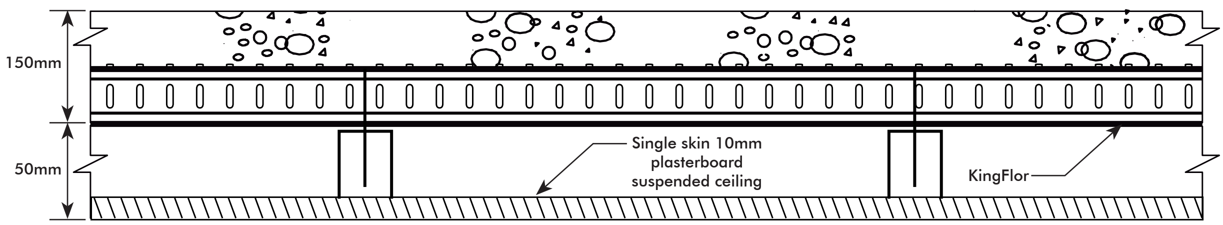


Figure 4.3.A Shallow Composite Floor - Bare Concrete Slab with Plasterboard Ceiling

KF70® Acoustic Performance

Dcs (mm)	Ceiling Provision: None	Plasterboard: 10mm Plasterboard	Cavity: 15mm Cavity	Cavity: 50mm Cavity with Resilient Mounts	Cavity: 100mm Cavity with Resilient Mounts	Insulation: No Insulation	Insulation: Polyester Insulation	R_w	$R_w + C_{tr}$
100 In-situ Slab	●							48-49	46
200 In-situ Slab	●							59	53
130	●							45-46	44
		●	●			●		46	43
		●		●		●		50	45
		●		●			●	60	51
		●			●	●		54	49
		●			●		●	65	57
150	●							48-49	46
		●	●					48	44
		●		●		●		52	47
		●		●			●	61	52
		●			●	●		55	50
		●			●		●	>65	58
170	●							51	47
		●	●					50	45
		●		●		●		53	47
		●		●			●	58	51
		●			●	●		56	50
		●			●		●	>65	59
200	●							54	50
		●	●					52	46
		●		●		●		55	49
		●		●			●	63	54
		●			●	●		58	52
		●			●		●	>65	60
220	●							56	51
		●	●					54	48
		●		●		●		57	50
		●		●			●	64	53
		●			●	●		60	53
		●			●		●	>65	60
230	●							57	52
		●	●					55	49
		●		●		●		58	51
		●		●			●	65	54
		●			●	●		60	53
		●			●		●	>65	61

Table 4.3.A KF70® Acoustic Performance

KF40® Acoustic Performance

Dcs (mm)	Ceiling Provision								
	None	Plasterboard	Cavity			Insulation		R_w	R_w+C_{tr}
		10mm Plasterboard	15mm Cavity	50mm Cavity with Resilient Mounts	100mm Cavity with Resilient Mounts	No Insulation	Polyester Insulation		
100 In-situ Slab	●							48-49	46
200 In-situ Slab	●							59	53
130	●							48	45
		●	●			●		47	44
		●		●		●		51	46
		●		●			●	61	52
		●			●	●		54	49
		●			●		●	>65	58
150	●							50	47
		●	●					49	46
		●		●		●		53	47
		●		●			●	62	53
		●			●	●		56	50
		●			●		●	>65	59
170	●							53	48
		●	●					51	45
		●		●		●		54	48
		●		●			●	63	53
		●			●	●		57	50
		●			●		●	>65	60
200	●							55	51
		●	●					53	47
		●		●		●		56	50
		●		●			●	64	53
		●			●	●		59	52
		●			●		●	>65	60
220	●							57	52
		●	●					55	49
		●		●		●		58	51
		●		●			●	65	54
		●			●	●		61	54
		●			●		●	>65	61
230	●							58	53
		●	●					56	50
		●		●		●		59	51
		●		●			●	>65	54
		●			●	●		62	54
		●			●		●	>65	61

Table 4.3.B KF40® Acoustic Performance

4.4 Fire Design

The BCA requires that floors must achieve satisfactory levels in the criterion of structural adequacy, integrity and insulation. These three criterion are defined in greater detail in AS 1530.4:2005. The performance objective and requirements associated with the provision of a fire-resistance period. It is necessary that fire does not pass from one enclosure to the other, irrespective of whether this is due to collapse, formation of cracks and fissures, or excessive temperature rise.

Analysis of the fire performance of KF70 and KF40 has been undertaken to determine insulation and integrity in accordance with established fire engineering principles. It was found that ignition will not occur and the slab will achieve the necessary performance with respect to insulation (provided the maximum temperature of the unexposed face does not exceed 275°C). The standard fire tests concluded that the KF70 and KF40 profile would achieve the fire resistance period for insulation and integrity for overall slab thicknesses as detailed in table 4.4.A.

Fire Resistance
Minimum Slab Depth for Insulation and Integrity

FRL (minutes)	KF70® and KF40® Minimum Dcs (mm)
60	120
90	120
120	125
180	150
240	170

Table 4.4.A KF70® and KF40® Fire Resistance - Minimum Slab Depth for Insulation and Integrity.

Note: Table 4.4.A values are for Normal Density Concrete.

No contribution from ceiling or applied passive surface treatments has been allowed for in table 4.4.A.

Analysis of KF70® and KF40®

The following set of simplified equations have been formulated for the elevated temperature bending strength of both positive and negative moment regions of KF70/KF40 slabs. The method of analysis complies with the recommendations given in Clause 5.9 of AS 3600:2001.

For more details on analysis methods, refer to appendix G.

Values of the strength reduction factor R_{st} for steel reinforcing positions y_c = 75mm (for KF70) and y_c = 60mm (for KF40) (y_c shown in figure 4.4.A and 4.4.B) have been derived from the results of extensive analysis of KF40/KF70 slab cross-sections, and are given in table 4.4.B, as a function of fire resistance period and the allowable positions of reinforcement located within the shaded regions shown in figures 4.4.A and 4.4.B.

Strength Reduction Factor
R_{st} at Top of Ribs

FRL (minutes)	Strength Reduction Factor (R_{st})	
	KF70 y_c = 75mm	KF40 y_c = 60mm
60	1.00	0.90
90	0.77	0.65
120	0.58	0.48
180	0.33	0.24
240	0.15	0.07

Table 4.4.B Strength Reduction Factor R_{st} at Top of Ribs

where

y_c = distance to the centroid of steel reinforcement measured from slab soffit (in mm)

The R_{st} values in table 4.4.B are for reinforcement located 75mm from the bottom of the pan (y_c = 75mm for KF70 and y_c = 60mm for KF40), for all other locations refer to tables 4.4.C.

Positive Bending Capacity

The design strength in positive bending of a KingFlor composite slab cross-section, assuming the soffit of the slab to be exposed to fire, can be determined using the equation:

$$\phi M^{+}_{u} = \phi R_{st} A_{st}^{+} f_{sy} d^{+} \left[1 - \frac{0.6 R_{st} A_{st}^{+} f_{sy}}{b d^{+} f'_{c}} \right]$$

where

ϕ = strength reduction factor taken equal to 0.8

R_{st} = reduction factor due to the effect of temperature on the yield strength of the reinforcing steel give in tables 4.4.C

f_{sy} = yield strength of reinforcing steel mesh, taken as 500MPa

d^{+} = effective depth of section in positive bending (see figure 4.4.A and 4.4.B)

b = width of composite slab

f'_{c} = characteristic compressive strength of concrete at 28 days which may be taken as equal to the specified strength grade

A_{st}^{+} = area of steel at a cross-section which acts in tension when the cross-section is subjected to positive bending, where the location of the steel can be anywhere within the shaded region shown in figure 4.4.A and 4.4.B

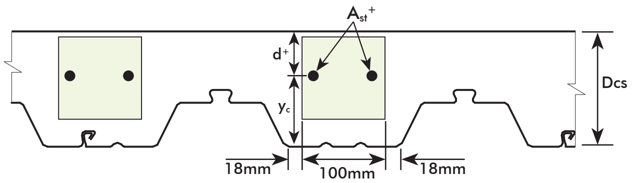


Figure 4.4.A Allowable Positions of Steel Reinforcement in the Composite Slab With KF70®

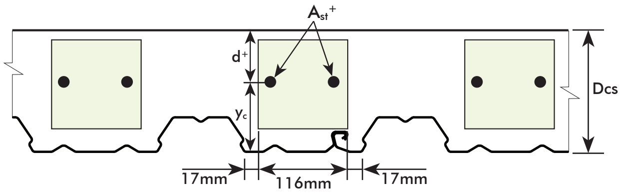


Figure 4.4.B Allowable Positions of Steel Reinforcement in the Composite Slab With KF40®

The expression of the positive bending equation above is the same as that used in the calculation of the design strength in positive bending of a singly-reinforced cross-section at room temperature conditions, but makes allowance for the influence of temperature on the strength of the reinforcing steel. Therefore, in using this equation, it is necessary to ensure that the slab cross-section is under-reinforced at the end of the fire period. Therefore, the limit of k_u^+ (determined at the end of the fire period and ignoring the presence of any compressive reinforcement) has been chosen as:

$$k_u^+ = \frac{R_{st} A_{st}^+ f_{sy}}{0.85 \gamma \, b d^+ f'_c} \leq 0.40$$

where

γ = 0.85 – 0.007(f'_c – 28) within the limits of 0.65 to 0.85

Reinforcement

Resistance to positive bending actions in the fire situation is provided by embedded reinforcement at various levels within the slab as follows:

Top Face Reinforcement

Usually mesh, this is generally located very close to the top surface, hence, the effective lever arm and the contribution in flexural resistance is correspondingly small. The temperature based strength reduction effects are accounted for by a factor (R_{st}) computed in relation to both the concrete cover of longitudinal wires from the underside and the fire exposure period.

If lower level fire reinforcement is provided, the "shrinkage" reinforcement is positioned away from the tensile zone and becomes ineffective in resisting positive bending actions.

Fire Mesh Reinforcement

Fire mesh reinforcement resting directly on the KF70/KF40 rib tops, with longitudinal wires positioned well clear of the rib. The temperature based strength reduction effects are accounted for by a factor (R_{st}) computed in relation to both the concrete cover of longitudinal wires from the exposed KF70/KF40 profile and the fire exposure period.

Fire Bar Reinforcement

Fire bar reinforcement either supported on conventional spacer devices or resting directly on the fire mesh (as above), with longitudinal bars positioned as far clear from the rib as feasible.

Strength Reduction Factor (R_{st})

FRL (minutes)	KF70®		KF40®	
	y_c (mm)	R_{st}	y_c (mm)	R_{st}
60	≥ 75	1.00	≥ 70	1.00
	55 ≤ y_c < 75	0.0120y_c + 0.1000	45 ≤ y_c < 70	0.0134y_c + 0.0620
	15 < y_c < 55	0.0190y_c – 0.2850	15 < y_c < 45	0.0222y_c – 0.3325
	≤ 15	0.00	≤ 15	0.00
90	≥ 95	1.00	≥ 90	1.00
	60 ≤ y_c < 95	0.0114y_c – 0.0840	55 ≤ y_c < 90	0.0124y_c – 0.1134
	25 < y_c < 60	0.0171y_c – 0.4270	25 < y_c < 55	0.0189y_c – 0.4725
	≤ 25	0.00	≤ 25	0.00
120	≥ 115	1.00	≥ 105	1.00
	80 ≤ y_c < 115	0.0100y_c – 0.1500	70 ≤ y_c < 105	0.0108y_c – 0.1310
	35 < y_c < 80	0.0144y_c – 0.5030	35 < y_c < 70	0.0178y_c – 0.6230
	≤ 35	0.00	≤ 35	0.00
180	≥ 135	1.00	≥ 130	1.00
	100 ≤ y_c < 135	0.0100y_c – 0.3500	90 ≤ y_c < 130	0.0088y_c – 0.1375
	50 < y_c < 100	0.0130y_c – 0.6500	45 < y_c < 90	0.0144y_c – 0.6500
	≤ 50	0.00	≤ 45	0.00
240	≥ 115	1.00	≥ 145	1.00
	110 ≤ y_c < 115	0.0092y_c – 0.4294	100 ≤ y_c < 145	0.0088y_c – 0.2824
	65 < y_c < 110	0.0122y_c – 0.7601	55 < y_c < 100	0.0134y_c – 0.7358
	≤ 65	0.00	≤ 55	0.00

Table 4.4.C Strength Reduction Factor (R_{st}) for KF70® and KF40®

The temperature based strength reduction effects are accounted for by a factor (R_{st}) computed in relation to both the concrete cover from the exposed KF70/KF40 profile and the fire exposure period.

Concrete resistance as a compression element at top of slab is taken as fully contributing since temperature is less than 350°C.

Negative Bending Capacity

The design strength in negative bending of a KingFlor composite slab cross-section, assuming the soffit of the slab to be exposed to fire, can be determined using the equation:

$$\phi M^-_U = \phi R_{st} A_{st}^- f_{sy}(d^- - d_x)$$

where

- ϕ = strength reduction factor taken equal to 0.8
- R_{st} = reduction factor due to the effect of temperature on the yield strength of the reinforcing steel give in tables 4.4.C
- f_{sy} = yield strength of reinforcing steel mesh, taken as 500Mpa
- d^- = effective depth of section in negative bending (see figure 4.4.C)
- d_x = distance from slab soffit to resultant compressive force of section in negative bending (see figure 4.4.C)
- A_{st}^- = area of steel at a cross-section which acts in tension when the cross-section is subjected to negative bending, where the location of the steel can be anywhere within the shaded region as shown in figure 4.4.A and 4.4.B

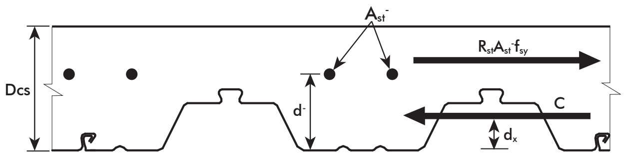


Figure 4.4.C Force Equilibrium in Negative Bending.

The values of d_x are given in table 4.4.D as a function of the depth of the neutral axis at ultimate load ($k_u^- d^-$) and the fire resistance period. The limit of k_u^- has been chosen as:

$$k_u^- = \frac{R_{st} A_{st}^- f_{sy}}{0.85\gamma\, b d^- f'_c} \leq 0.40$$

where

γ = 0.85 – 0.007(f'$_c$ – 28) within the limits of 0.65 to 0.85

Values for d_x for Negative Bending for KF40®

FRL (minutes)	d_x (mm)
60	$0.81k_u^- d^- + 13$
90	$0.96k_u^- d^- + 20$
120	$0.85k_u^- d^- + 27$
180	$0.92k_u^- d^- + 37$
240	$0.78k_u^- d^- + 49$

Table 4.4.D Values for d_x for Negative Bending for KF40®

Reinforcement

Resistance to negative bending actions in the fire situation is provided by embedded negative flexural reinforcement at upper levels within the slab as follows:

Top Face Reinforcement

This is usually mesh which is generally located very close to the top surface for shrinkage control. The temperature based strength reduction effects are accounted for by a factor (R_{st}) computed in relation to both the concrete cover of longitudinal wires from the exposed KF70/KF40 profile and the fire exposure period.

Supplementary Bar Reinforcement

Supplementary bar reinforcement is either supported on conventional spacer devices or resting directly on the top face mesh (as above), with longitudinal bars evenly spaced. The temperature based strength reduction effects are accounted for by a factor (R_{st}) computed in relation to both the concrete cover from the exposed KF70/KF40 profile and the fire exposure period.

Concrete resistance as a compression element at bottom of slab is reduced when temperature is greater than 350°C. The allowance made for loss of effective concrete strength is accounted for by the reduction of effective depth by an amount (d_x), which is computed in relation to the fire exposure period.

For more detailed fire analysis, please contact your local Fielders KingFlor representative.

Exposed Surface Area-To-Mass Ratio (ESA/M)

To assess the fire capacity of the structural steel work using the ratio of area of steel on mass (ESA/M), see appendix G.

KF40® Prestressed / Post-tensioned Slabs

KF40 can be used in conjunction with prestressed/ post-tensioned slabs to act as an economical form of permanent formwork, reducing propping and labour requirements.

Concrete slabs may be prestressed parallel or perpendicular to that of the KF40 ribs. It is common for the slab to act primarily in the spanning direction of the steel decking, making it a one-way slab. In this case the main prestressing is aligned in this direction, and accordingly the cables must be draped to act effectively. At the edges of the slabs the cables are normally centralised in the depth of the slab. In the mid-span regions they are placed as low as possible in the slab with about 20mm bottom cover to the prestress ducts (noting that design for fire resistance may require a greater cover). Over internal supports the top cover is minimised. The cable profiles take up a parabolic shape in between these points.

The cables must be anchored at their dead and live ends. After the stressing operation the ducts are normally grouted. To avoid bursting the ducts during the high pressure grouting operation, adequate concrete cover (normally at least 20mm) must be provided to the ducts. The prestressing cables are typically spaced transversely at between 1000mm and 3000mm centres depending on the thickness of the slab and the intensity of prestress required.

Post-tensioned concrete slabs are normally at least 150mm deep in order to fit the prestressing anchorages into the slab without causing horizontal splitting, and also accommodate some drape of the cables. Slabs up to 200mm thick are very common in building floors.

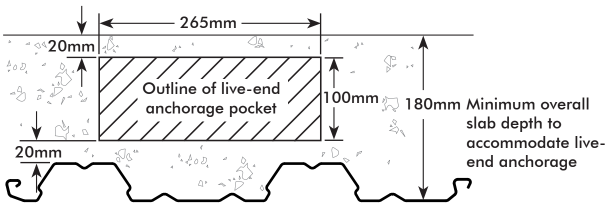


Figure 4.4.D Fitting a Typical Live-End Anchorage in a Composite Slab Incorporating KF40®

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 Conduits

The location of the post-tension conduit 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 current and future versions of AS 3600:2001.

For the case of tendons having parallel orientation to the deck it is assumed that the conduit is located centrally between two KF40 ribs. This gives a distance from the centreline of the rib to the edge of the conduit of 85mm. The required distances from the heated soffit to the bottom of the conduit have been determined using TASEF-2 analyses previously undertaken for KF40. The limiting distances to the edge of the conduit to achieve the nominated FRL are summarised in table 4.4.E and table 4.4.F and relate to the edge of the conduit being located either 60mm or 75mm from the centreline of the rib as shown in figure 4.4.E.

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.

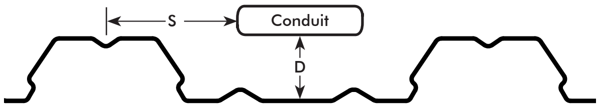


Figure 4.4.E Distances to the Prestressing Conduit

Minimum Distance to Underside of Conduit from Soffit (S = 60mm)

FRL (minutes)	Simply Supported (mm)	Continuous (mm)	Flat Slabs (mm)
120	82	55	72
180	97	84	93
240	109	83	100

Table 4.4.E Minimum Distance (D) to Underside of Conduit from Soffit (S=60)

Minimum Distance to Underside of Conduit from Soffit (S = 75mm)

FRL (minutes)	Simply Supported (mm)	Continuous (mm)	Flat Slabs (mm)
120	77	50	67
180	94	67	83
240	109	78	97

Table 4.4.F Minimum Distance (D) to Underside of Conduit from Soffit (S=75)

For the case of tendons having perpendicular orientation to the deck the location of the conduit is required to be greater than that for the parallel orientation. Using the TASEF-2 analysis results for KF40, the minimum distances between the bottom of the pan and the underside of a conduit to achieve a required FRL are given in table 4.4.G.

Minimum Distance to Underside of Conduit			
FRL (minutes)	Simply Supported (mm)	Continuous (mm)	Flat Slabs (mm)
120	92	75	84
180	100	79	97
240	112	85	106

Table 4.4.G Minimum Distance (D) to Underside of Conduit

It is assumed that the prestressing tendons are encapsulated within a conduit that is subsequently grouted after tensioning. It is further assumed that the width of this conduit is 80mm and that no less than 6mm of grout exists between the inside surface and the outer surface of a prestressing tendon.

Infill Panels

To extend the flat pan width to locate post-tensioning cables, infill panels are available.

Nominal flat pan width is between 250 and 400mm measured between nearest laps of adjacent decking ribs. Infill panels have a rib height of 20mm and are available in base metal thicknesses from 0.55 to 1.6mm (dependant on the width and depth of the slab).

The panel outstand limits the tendency for the span of the decking sheet on the extended side to deflect downwards under the weight of concrete supported by the infill panel.

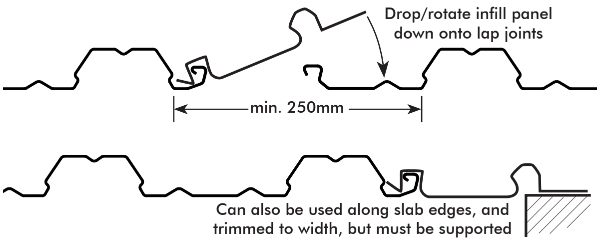


Figure 4.4.F Infill Panel Installation

See appendix B for Fielders PT Plus Design Solutions

4.5 Crack Control for KF70® and KF40®

The tables that follow have been prepared considering moderate crack control. To increase or decrease the crack control requirement vary the mesh in accordance with table 4.5.A

The crack control reinforcement is for shrinkage and temperature only, not flexure.

The crack control tables exclude exposure classifications B1, B2 and C.

Crack Control						
Dcs (mm)	KF70® Reinforcement			KF40® Reinforcement		
	Minor	Moderate	Strong	Minor	Moderate	Strong
100	N/A	N/A	N/A	SL62	SL82	SL81
110	N/A	N/A	N/A	SL62	SL92	SL81
120	SL62	SL92	SL81	SL62	SL92	RL918
130	SL62	SL92	SL81	SL72	SL102	RL918
140	SL72	SL102	RL918	SL72	SL102	RL1018
150	SL72	SL102	RL918	SL82	SL81	RL1018
160	SL82	SL81	RL1018	SL82	SL81	RL1118
170	SL82	SL81	RL1018	SL92	RL918	RL1118
180	SL82	SL81	RL1118	SL92	RL918	RL1118
190	SL92	RL918	RL1118	SL92	RL918	RL1218
200	SL92	RL918	RL1118	SL92	RL918	RL1218
210	SL92	RL918	RL1218	SL102	RL1018	RL1218
220	SL92	RL918	RL1218	SL102	RL1018	RL1218
230	SL102	RL1018	RL1218	SL102	RL1018	-
240	SL102	RL1018	RL1218	SL102	RL1018	-
250	SL102	RL1018	-	SL81	RL1118	-

Table 4.5.A KF70® and KF40® Crack Control

Notes for Table 4.5.A

1. N/A - Not Applicable
2. Table prepared in accordance with AS 3600:2001.
3. KF70 slabs less than 130mm are not recommended due to cover requirements to reinforcing as per AS 3600:2001.
4. Rectangular mesh to be laid such that the largest bars are oriented perpendicular to the decking span.
5. SL718 mesh can be replaced with SL102.
6. SL818 mesh can be replaced with SL81 as only transverse bars are effective.
7. Laps in mesh to occur mid span.
8. Mesh to be located on top of slab.

4.6 KF70® Composite Slab Properties Tables

Index of KF70® Composite Slab Properties Tables

KF70® Composite Slab Properties

0.75

Dcs (mm)	Slab Weight (kPa)	Equivalent Concrete Quantity (mm^3/mm^2)	Design Strength in Positive Bending $\phi M_{uo}+$ (kNm/m)	Gross Second Moment of Area - I ($\times 10^6$ mm^4/m)★	Cracked Section Second Moment of Area - I_{cr} ($\times 10^6$ mm^4/m)★
120	2.27	94	37.8	118.18	47.16
125	2.39	99	40.2	133.51	52.54
130	2.51	104	42.6	150.26	58.22
135	2.63	109	45.0	168.35	64.31
140	2.75	114	47.5	188.02	70.78
145	2.87	119	49.9	209.11	77.50
150	3.00	124	52.3	231.87	84.69
155	3.12	129	54.7	256.28	92.11
160	3.24	134	57.1	282.43	100.01
165	3.36	139	59.6	310.31	108.15
170	3.48	144	62.0	340.10	116.76
175	3.60	149	64.4	371.77	125.61
180	3.72	154	66.8	405.43	134.93
185	3.84	159	69.2	441.14	144.57
190	3.96	164	71.7	478.98	154.52
195	4.08	169	74.1	518.87	164.95
200	4.20	174	76.5	561.06	175.62
205	4.32	179	78.9	605.54	186.76
210	4.44	184	81.3	652.38	198.21
215	4.56	189	83.8	701.60	210.06
220	4.68	194	86.2	753.34	222.23
225	4.80	199	88.6	807.62	234.79
230	4.92	204	91.0	864.42	247.74
235	5.04	209	93.4	923.98	261.10
240	5.16	214	95.9	986.24	274.76
245	5.28	219	98.3	1051.25	288.82
250	5.40	224	100.7	1119.11	303.28

Table 4.6.A KF70® Composite Slab Properties - 0.75 BMT

Parameters

★ Values are given in transformed concrete sections, 25MPa.

Modular ratio 7.9.

KF70® Composite Slab Properties

KF70®

1.00

Dcs (mm)	Slab Weight (kPa)	Equivalent Concrete Quantity (mm^3/mm^2)	Design Strength in Positive Bending $\phi M_{uo}+$ (kNm/m)	Gross Second Moment of Area - I ($x10^6$ mm^4/m)★	Cracked Section Second Moment of Area - I_{cr} ($x10^6$ mm^4/m)★
120	2.27	94	40.9	123.48	58.14
125	2.39	99	45.4	139.44	64.94
130	2.51	104	50.2	156.82	72.05
135	2.63	109	55.2	175.62	79.71
140	2.75	114	60.2	195.92	87.77
145	2.87	119	63.5	217.80	96.30
150	2.99	124	66.7	241.35	105.23
155	3.11	129	69.9	266.55	114.71
160	3.23	134	73.1	293.49	124.58
165	3.36	139	76.4	322.32	134.93
170	3.48	144	79.6	352.97	145.76
175	3.60	149	82.8	385.68	157.05
180	3.72	154	86.1	420.28	168.74
185	3.84	159	89.3	457.02	180.99
190	3.96	164	92.5	495.88	193.63
195	4.08	169	95.7	536.96	206.82
200	4.20	174	99.0	580.26	220.41
205	4.32	179	102.2	625.92	234.55
210	4.44	184	105.4	673.95	249.17
215	4.56	189	108.6	724.43	264.18
220	4.68	194	111.8	777.44	279.74
225	4.80	199	115.1	833.06	295.78
230	4.92	204	118.3	891.20	312.21
235	5.04	209	121.3	852.11	329.19
240	5.16	214	124.8	1015.78	346.65
245	5.28	219	128.0	1082.30	364.66
250	5.40	224	131.2	1151.66	385.44

Table 4.6.B KF70® Composite Slab Properties - 1.00 BMT

Parameters

★ Values are given in transformed concrete sections, 25MPa.

Modular ratio 7.9.

4.7 KF40® Composite Slab Properties Tables

Index of KF40® Composite Slab Properties Tables

KF40® Composite Slab Properties

KF40® **0.60**

Dcs (mm)	Slab Weight (kPa)	Equivalent Concrete Quantity (mm^3/mm^2)	Design Strength in Positive Bending $\phi M_{uo}+$ (kNm/m)	Gross Second Moment of Area - I ($x10^6$ mm^4/m)★	Cracked Section Second Moment of Area - I_{cr} ($x10^6$ mm^4/m)★
90	1.79	74	22.4	53.48	21.25
95	1.91	79	24.2	62.88	24.49
100	2.04	84	25.9	73.47	27.97
105	2.16	89	27.7	85.08	31.76
110	2.28	94	29.4	97.96	35.71
115	2.40	99	31.2	112.18	39.97
120	2.52	104	33.0	127.59	44.48
125	2.64	109	34.7	144.49	49.30
130	2.76	114	36.5	162.82	54.35
135	2.88	119	38.3	182.65	59.65
140	3.00	124	40.1	204.06	65.18
145	3.13	129	41.8	227.13	71.02
150	3.25	134	43.5	251.93	77.10
155	3.37	139	45.3	278.48	83.50
160	3.49	144	47.0	306.84	90.14
165	3.61	149	48.8	337.09	97.09
170	3.73	154	50.6	369.33	104.20
175	3.85	159	52.3	403.53	111.71
180	3.97	164	54.1	439.87	119.45
185	4.09	169	55.8	478.27	127.43
190	4.22	174	57.6	518.95	135.64
195	4.34	179	59.4	651.85	144.25
200	4.46	184	61.1	607.12	153.02
205	4.58	189	62.9	654.75	162.11
210	4.70	194	64.6	704.92	171.51
215	4.82	199	66.4	757.53	181.15
220	4.94	204	68.2	812.75	191.02
225	5.06	209	69.9	870.58	201.21
230	5.18	214	71.7	931.09	211.72
235	5.31	219	73.4	994.45	222.46
240	5.43	224	75.2	1060.58	233.82
245	5.55	229	77.0	1129.62	244.82
250	5.67	234	78.7	1201.59	256.43

Table 4.7.A KF40® Composite Slab Properties - 0.60 BMT

Parameters

★ Values are given in transformed concrete sections, 25MPa.

Modular ratio 7.9.

KF40® Composite Slab Properties

KF40® **0.75**

Dcs (mm)	Slab Weight (kPa)	Equivalent Concrete Quantity (mm^3/mm^2)	Design Strength in Positive Bending $\phi M_{uo}+$ (kNm/m)	Gross Second Moment of Area - I ($x10^6$ mm^4/m)★	Cracked Section Second Moment of Area - I_{cr} ($x10^6$ mm^4/m)★
90	1.79	74	26.3	55.22	25.12
95	1.91	79	29.1	64.94	28.99
100	2.03	84	31.3	75.76	33.18
105	2.15	89	33.5	87.77	37.60
110	2.27	94	35.7	100.96	42.42
115	2.39	99	37.9	115.50	47.48
120	2.52	104	40.1	131.30	52.93
125	2.64	109	42.3	148.60	58.70
130	2.76	114	44.5	167.32	64.70
135	2.88	119	46.7	187.55	71.10
140	3.00	124	48.9	209.43	77.82
145	3.12	129	51.1	232.97	84.85
150	3.24	134	53.3	258.25	92.19
155	3.36	139	55.5	285.27	99.86
160	3.48	144	57.7	314.18	107.91
165	3.60	149	59.9	344.99	116.21
170	3.72	154	62.1	377.78	124.90
175	3.85	159	64.3	412.54	133.91
180	3.97	164	66.5	449.51	143.31
185	4.09	169	68.7	488.54	152.94
190	4.21	174	70.9	529.85	162.98
195	4.33	179	73.1	573.46	173.33
200	4.45	184	75.3	619.36	183.99
205	4.57	189	77.5	667.71	195.05
210	4.69	194	79.7	718.58	206.43
215	4.81	199	81.9	771.91	218.12
220	4.93	204	84.1	827.92	230.13
225	5.06	209	86.3	886.54	242.53
230	5.18	214	88.5	947.92	255.25
235	5.30	219	90.7	1011.99	268.28
240	5.42	224	92.9	1078.98	281.71
245	5.54	229	95.1	1148.90	295.46
250	5.66	234	97.3	1221.81	309.52

Table 4.7.B KF40® Composite Slab Properties - 0.75 BMT

Parameters

★ Values are given in transformed concrete sections, 25MPa.

Modular ratio 7.9.

KF40® Composite Slab Properties

KF40® **1.00**

Dcs (mm)	Slab Weight (kPa)	Equivalent Concrete Quantity (mm^3/mm^2)	Design Strength in Positive Bending $\phi M_{uo}+$ (kNm/m)	Gross Second Moment of Area - I ($x10^6$ mm^4/m)★	Cracked Section Second Moment of Area - I_{cr} ($x10^6$ mm^4/m)★
90	1.79	74	26.3	58.07	30.89
95	1.91	79	29.9	68.26	35.71
100	2.03	84	33.9	79.55	40.92
105	2.15	89	38.0	92.04	46.45
110	2.27	94	42.4	105.78	52.46
115	2.39	99	47.0	120.79	58.86
120	2.51	104	50.9	137.22	65.73
125	2.63	109	53.8	155.16	72.92
130	2.75	114	56.8	174.51	80.58
135	2.87	119	59.7	195.53	88.56
140	2.99	124	62.7	218.12	97.09
145	3.12	129	65.6	242.37	105.94
150	3.24	134	68.5	268.44	115.26
155	3.36	139	71.5	296.33	124.98
160	3.48	144	74.4	326.11	135.17
165	3.60	149	77.3	357.79	145.76
170	3.72	154	80.3	391.52	156.74
175	3.84	159	83.2	427.31	168.19
180	3.96	164	86.1	465.23	180.12
185	4.08	169	89.1	505.28	192.44
190	4.20	174	92.0	547.71	205.16
195	4.32	179	94.9	592.34	218.36
200	4.44	184	97.9	639.43	231.94
205	4.56	189	100.8	688.96	246.01
210	4.68	194	103.7	740.94	260.54
215	4.81	199	106.7	795.53	275.47
220	4.93	204	109.6	852.81	290.88
225	5.05	209	112.5	912.69	306.68
230	5.17	214	115.5	975.41	323.03
235	5.29	219	118.4	1040.90	339.70
240	5.41	224	121.3	1109.24	356.84
245	5.53	229	124.3	1180.58	374.46
250	5.65	234	127.2	1254.92	392.55

Table 4.7.C KF40® Composite Slab Properties - 1.00 BMT

Parameters

★ Values are given in transformed concrete sections, 25MPa.

Modular ratio 7.9.

4.8 KF70® Composite Slab Span Tables

Index of KF70® Composite Slab Tables

Composite Slab Span Tables Notes

The composite slab span tables are to be used to design KingFlor composite slabs that do not have a fire requirement and meet the assumptions below. For a fire rated slab refer to the fire resistance tables. For designs outside the parameters below and specified on the tables refer to the KingFlor Designer Suite or your local Fielders representative. For propping requirements refer to the temporary propping tables.

Notation

Dcs = depth of composite slab.
L = Span between permanent supports.
Bars - N12@200 indicates N12 bars at 200mm centers.

Loads

Construction Live Load 1.0kPa
Ceiling & Services Load 0.35kPa
Partitions Load 0.5kPa

Short & Long-Term Factors

Short-term factor ψ = 0.7
Long-term factor ψ = 0.4
Combination-term factor ψ = 0.4

Concrete Properties

Normal wet density of concrete 2400kg/m^3
Normal dry density of concrete 2350 kg/m^3
Concrete strength f'c = 25MPa
Exposure Classification A1 with moderate crack control
Cover to top reinforcement is 30mm

Reinforcing

Steel Yield Strength f_{sy} = 500MPa

Mesh

Mesh is to be located in the top of the slab. Where the mesh code ends with a 'T' (eg. RL918T), the larger bars are to be located perpendicular to the decking ribs with the smaller perpendicular bars on top. Laps in mesh are to occur midspan.

Bars

Bars where required, are to be placed over internal permanent supports, on top of mesh. Length of bars are to be 0.6 x larger span + width of support. The bars are to be located 0.3 x span from edge of support for internal supports.

Spans

Spans L1, L2, L3 etc. cannot differ by more than 5% from both L1 and Ln.

Span is considered to be the larger of L1, L2...Ln.

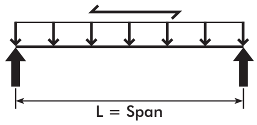
Support width 50mm

The composite slab tables have been prepared with the assumptions stated above. More refined designs can be obtained from Fielders or by using the KingFlor Designer Suite. Contact your local Fielders representative for design assistance.

KF70® Composite Slab Spans

Single Spans 0.75 BMT

KF70®



0.75

Span (mm)	Live Load 1.5kPa			Live Load 3.0 kPa			Live Load 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	130	SL82	-	130	SL82	-	130	SL82	-
1,250	130	SL82	-	130	SL82	-	130	SL82	-
1,500	130	SL82	-	130	SL82	-	130	SL82	-
1,750	130	SL82	-	130	SL82	-	130	SL82	-
2,000	130	SL82	-	130	SL82	-	130	SL82	-
2,250	130	SL82	-	130	SL82	-	130	SL82	-
2,500	130	SL82	-	130	SL82	-	130	SL82	-
2,750	130	SL82	-	130	SL82	-	130	SL82	-
3,000	130	SL82	-	130	SL82	-	130	SL82	-
3,250	130	SL82	-	130	SL82	-	135	SL92	-
3,500	130	SL82	-	135	SL82	-	150	SL92	-
3,750	130	SL82	-	145	SL92	-	160	SL102	-
4,000	140	SL92	-	155	SL102	-	175	SL81	-
4,250	150	SL102	-	170	SL102	-	190	SL81	-
4,500	165	SL102	-	180	SL81	-	200	SL81	-
4,750	175	SL81	-	195	SL81	-	220	RL918T	-
5,000	190	SL81	-	215	RL918T	-	240	RL1018T	-
5,250	210	RL918T	-	230	RL918T	-	250	RL1018T	-
5,500	225	RL918T	-	245	RL1018T	-	265	RL1018T	-
5,750	240	RL1018T	-	260	RL1018T	-	285	RL1118T	-
6,000	255	RL1018T	-	275	RL1118T	-	300	RL1118T	-
6,250	270	RL1018T	-	290	RL1118T	-	315	RL1118T	-
6,500	285	RL1118T	-	310	RL1118T	-	330	RL1218T	-
6,750	305	RL1118T	-	325	RL1118T	-	350	RL1218T	-
7,000	315	RL1118T	-	340	RL1218T	-	365	RL1218T	-

Table 4.8.A KF70® Composite Slab Spans - Single Spans 0.75 BMT

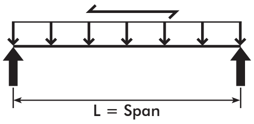
Deflection Criteria

Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

KF70® Composite Slab Spans
Single Spans 1.00 BMT

KF70®



1.00

Span (mm)	Live Load 1.5kPa			Live Load 3.0 kPa			Live Load 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	130	SL82	-	130	SL82	-	130	SL82	-
1,250	130	SL82	-	130	SL82	-	130	SL82	-
1,500	130	SL82	-	130	SL82	-	130	SL82	-
1,750	130	SL82	-	130	SL82	-	130	SL82	-
2,000	130	SL82	-	130	SL82	-	130	SL82	-
2,250	130	SL82	-	130	SL82	-	130	SL82	-
2,500	130	SL82	-	130	SL82	-	130	SL82	-
2,750	130	SL82	-	130	SL82	-	130	SL82	-
3,000	130	SL82	-	130	SL82	-	130	SL82	-
3,250	130	SL82	-	130	SL82	-	135	SL82	-
3,500	130	SL82	-	130	SL82	-	145	SL92	-
3,750	130	SL82	-	140	SL92	-	160	SL102	-
4,000	135	SL92	-	155	SL102	-	170	SL102	-
4,250	150	SL92	-	165	SL102	-	185	SL81	-
4,500	160	SL102	-	180	SL81	-	200	SL81	-
4,750	175	SL81	-	190	SL81	-	215	RL918T	-
5,000	185	SL81	-	210	RL918T	-	230	RL918T	-
5,250	200	SL81	-	225	RL918T	-	245	RL1018T	-
5,500	220	RL918T	-	240	RL1018T	-	260	RL1018T	-
5,750	230	RL918T	-	255	RL1018T	-	275	RL1118T	-
6,000	245	RL1018T	-	270	RL1018T	-	295	RL1118T	-
6,250	265	RL1018T	-	285	RL1118T	-	310	RL1118T	-
6,500	280	RL1118T	-	300	RL1118T	-	325	RL1118T	-
6,750	295	RL1118T	-	320	RL1118T	-	345	RL1218T	-
7,000	315	RL1118T	-	335	RL1218T	-	360	RL1218T	-

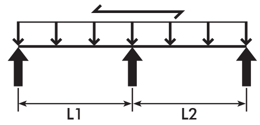
Table 4.8.B KF70® Composite Slab Spans - Single Spans 1.00 BMT

Deflection Criteria
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

KF70® Composite Slab Spans
Double Spans 0.75 BMT

KF70®



0.75

Span (mm)	Live Load 1.5kPa			Live Load 3.0 kPa			Live Load 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
1,250	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
1,500	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
1,750	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
2,000	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
2,250	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
2,500	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
2,750	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
3,000	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
3,250	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
3,500	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@350
3,750	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@275
4,000	130	SL82	N12@400	130	SL82	N12@375	145	SL92	N12@300
4,250	130	SL82	N12@400	135	SL82	N12@300	150	SL92	N12@250
4,500	130	SL82	N12@400	135	SL82	N12@250	160	SL102	N12@275
4,750	130	SL82	N12@325	145	SL92	N12@250	175	SL81	N12@375
5,000	135	SL82	N12@275	150	SL92	N12@225	185	SL81	N12@325
5,250	145	SL92	N12@300	160	SL102	N12@250	195	SL81	N12@300
5,500	155	SL102	N12@350	170	SL102	N12@225	200	SL81	N12@250
5,750	165	SL102	N12@300	175	SL81	N12@275	220	RL918T	N12@150
6,000	170	SL102	N12@275	185	SL81	N12@250	225	RL918T	N12@150
6,250	180	SL81	N12@350	200	SL81	N12@225	225	RL918T	N16@225
6,500	190	SL81	N12@325	210	RL918T	N16@275	230	RL918T	N16@225
6,750	200	SL81	N12@275	225	RL918T	N16@275	245	RL1018T	N16@200
7,000	215	RL918T	N16@300	235	RL918T	N16@250	255	RL1018T	N16@200

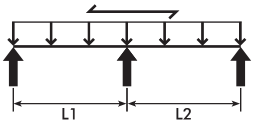
Table 4.8.C KF70® Composite Slab Spans - Double Spans 0.75 BMT

Deflection Criteria
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

KF70® Composite Slab Spans
Double Spans 1.00 BMT

KF70®



1.00

Span (mm)	Live Load 1.5kPa			Live Load 3.0 kPa			Live Load 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
1,250	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
1,500	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
1,750	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
2,000	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
2,250	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
2,500	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
2,750	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
3,000	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
3,250	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
3,500	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@350
3,750	130	SL82	N12@400	130	SL82	N12@400	135	SL82	N12@300
4,000	130	SL82	N12@400	130	SL82	N12@275	140	SL92	N12@275
4,250	130	SL82	N12@400	140	SL92	N12@400	150	SL92	N12@250
4,500	130	SL82	N12@400	150	SL92	N12@275	160	SL102	N12@275
4,750	130	SL82	N12@325	150	SL92	N12@275	170	SL81	N12@250
5,000	135	SL82	N12@275	160	SL102	N12@300	180	SL81	N12@300
5,250	140	SL92	N12@275	170	SL102	N12@275	190	SL81	N12@250
5,500	150	SL92	N12@275	175	SL81	N12@300	200	SL81	N12@225
5,750	160	SL102	N12@300	180	SL81	N12@275	200	RL918T	N12@200
6,000	170	SL102	N12@275	185	SL81	N12@225	210	RL918T	N16@250
6,250	190	SL81	N12@400	195	SL81	N12@225	215	RL918T	N16@225
6,500	190	SL81	N12@325	205	RL918T	N16@275	225	RL918T	N16@200
6,750	195	SL81	N12@275	220	RL918T	N16@250	240	RL1018T	N16@200
7,000	215	RL918T	N16@300	230	RL918T	N16@250	250	RL1018T	N16@200

Table 4.8.D KF70® Composite Slab Spans - Double Spans 1.00 BMT

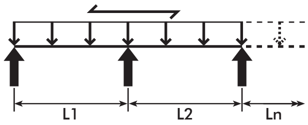
Deflection Criteria
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

KF70® Composite Slab Spans

Continuous Spans 0.75 BMT

KF70®



0.75

Span (mm)	Live Load 1.5kPa			Live Load 3.0 kPa			Live Load 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
1,250	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
1,500	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
1,750	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
2,000	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
2,250	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
2,500	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
2,750	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
3,000	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
3,250	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
3,500	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
3,750	130	SL82	N12@400	130	SL82	N12@400	135	SL82	N12@400
4,000	130	SL82	N12@400	130	SL82	N12@400	140	SL92	N12@400
4,250	130	SL82	N12@400	135	SL82	N12@400	150	SL92	N12@350
4,500	130	SL82	N12@400	145	SL92	N12@400	160	SL102	N12@400
4,750	135	SL82	N12@400	155	SL102	N12@400	170	SL102	N12@350
5,000	145	SL92	N12@400	165	SL102	N12@400	180	SL81	N12@400
5,250	155	SL102	N12@400	175	SL81	N12@350	195	SL81	N12@400
5,500	165	SL102	N12@400	185	SL81	N12@400	200	SL81	N12@375
5,750	175	SL81	N12@400	190	SL81	N12@400	215	RL918T	N12@200
6,000	185	SL81	N12@400	205	RL918T	N12@275	235	RL918T	N16@300
6,250	195	SL81	N12@400	220	RL918T	N12@225	240	RL1018T	N16@300
6,500	210	RL918T	N12@275	230	RL918T	N12@200	250	RL1018T	N16@300
6,750	220	RL918T	N12@250	240	RL1018T	N12@200	270	RL1018T	N16@300
7,000	235	RL918T	N12@225	250	RL1018T	N12@175	275	RL1118T	N16@275

Table 4.8.E KF70® Composite Slab Spans - Continuous Spans 0.75 BMT

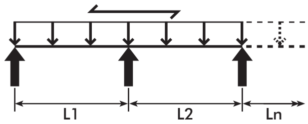
Deflection Criteria

Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

KF70® Composite Slab Spans
Continuous Spans 1.00 BMT

KF70®



1.00

Span (mm)	Live Load 1.5kPa			Live Load 3.0 kPa			Live Load 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
1,250	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
1,500	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
1,750	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
2,000	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
2,250	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
2,500	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
2,750	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
3,000	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
3,250	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
3,500	130	SL82	N12@400	130	SL82	N12@400	130	SL82	N12@400
3,750	130	SL82	N12@400	130	SL82	N12@400	135	SL82	N12@400
4,000	130	SL82	N12@400	130	SL82	N12@400	135	SL92	N12@375
4,250	130	SL82	N12@400	130	SL82	N12@400	145	SL92	N12@325
4,500	130	SL82	N12@400	140	SL92	N12@400	155	SL102	N12@375
4,750	135	SL82	N12@400	150	SL92	N12@400	170	SL102	N12@350
5,000	145	SL92	N12@400	160	SL102	N12@400	180	SL81	N12@400
5,250	155	SL102	N12@400	170	SL102	N12@400	190	SL81	N12@400
5,500	165	SL102	N12@400	180	SL81	N12@400	200	SL81	N12@350
5,750	170	SL81	N12@400	190	SL81	N12@400	210	RL918T	N16@300
6,000	185	SL81	N12@400	200	SL81	N12@400	225	RL918T	N16@300
6,250	190	SL81	N12@400	215	RL918T	N12@225	235	RL918T	N16@300
6,500	200	SL81	N12@400	225	RL918T	N12@200	245	RL1018T	N16@300
6,750	215	RL918T	N12@250	235	RL918T	N16@300	260	RL1018T	N16@275
7,000	230	RL918T	N12@225	250	RL1018T	N16@300	275	RL1118T	N16@275

Table 4.8.F KF70® Composite Slab Spans - Continuous Spans 1.00 BMT

Deflection Criteria
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

4.9 KF40® Composite Slab Span Tables

Index of KF40® Composite Slab Span Tables

Composite Slab Span Tables Notes

The composite slab span tables are to be used to design KingFlor composite slabs that do not have a fire requirement and meet the assumptions below. For a fire rated slab refer to the fire resistance tables. For designs outside the parameters below and specified on the tables refer to the KingFlor Designer Suite or your local Fielders representative. For propping requirements refer to the temporary propping tables.

Notation

Dcs = depth of composite slab.
L = Span between permanent supports.

Loads

Construction Live Load 1.0kPa
Ceiling & Services Load 0.35kPa
Partitions Load 0.5kPa

Short & Long-Term Factors

Short-term factor ψ = 0.7
Long-term factor ψ = 0.4
Combination-term factor ψ = 0.4

Concrete Properties

Normal wet density of concrete 2400kg/m³
Normal dry density of concrete 2350 kg/m³
Concrete strength f'c = 25MPa
Exposure Classification A1 with moderate crack control
Cover to top reinforcement is 30mm

Reinforcing

Steel Yield Strength f_{sy} = 500MPa

Mesh

Mesh is to be located in the top of the slab. Where the mesh code ends with a 'T' (eg. RL918T), the larger bars are to be located perpendicular to the decking ribs with the smaller perpendicular bars on top. Laps in mesh are to occur midspan.

Bars

Bars where required, are to be placed over internal permanent supports, on top of mesh. Length of bars are to be 0.6 x larger span + width of support. The bars are to be located 0.3 x span from edge of support for internal supports.

Spans

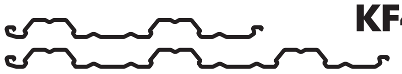
Spans L1, L2, L3 etc. cannot differ by more than 5% from both L1 and Ln.

Span is considered to be the larger of L1, L2...Ln.

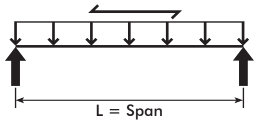
Support width 50mm

The composite slab tables have been prepared with the assumptions stated above. More refined designs can be obtained from Fielders or by using the KingFlor Designer Suite. Contact your local Fielders representative for design assistance.

KF40® Composite Slab Spans
Single Spans 0.60 BMT



KF40®



0.60

Span (mm)	Live Load 1.5kPa			Live Load 3.0 kPa			Live Load 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	90	SL72	-	90	SL72	-	90	SL72	-
1,250	90	SL72	-	90	SL72	-	90	SL72	-
1,500	90	SL72	-	90	SL72	-	90	SL72	-
1,750	90	SL72	-	90	SL72	-	90	SL72	-
2,000	90	SL72	-	90	SL72	-	90	SL72	-
2,250	90	SL72	-	90	SL72	-	90	SL72	-
2,500	90	SL72	-	90	SL72	-	100	SL82	-
2,750	90	SL72	-	95	SL82	-	110	SL92	-
3,000	95	SL82	-	105	SL82	-	120	SL92	-
3,250	105	SL82	-	120	SL92	-	130	SL102	-
3,500	115	SL92	-	130	SL102	-	140	SL81	-
3,750	125	SL102	-	140	SL102	-	155	SL81	-
4,000	135	SL102	-	150	SL81	-	165	SL81	-
4,250	145	SL81	-	160	SL81	-	185	RL918T	-
4,500	155	SL81	-	180	RL918T	-	200	RL918T	-
4,750	165	SL81	-	195	RL918T	-	215	RL1018T	-
5,000	185	RL918T	-	205	RL918T	-	230	RL1018T	-
5,250	200	RL918T	-	220	RL1018T	-	245	RL1118T	-
5,500	215	RL1018T	-	235	RL1018T	-	260	RL1118T	-
5,750	230	RL1018T	-	250	RL1118T	-	275	RL1118T	-
6,000	245	RL1118T	-	265	RL1118T	-	290	RL1118T	-
6,250	260	RL1118T	-	280	RL1118T	-	305	RL1218T	-
6,500	275	RL1118T	-	295	RL1118T	-	320	RL1218T	-
6,750	290	RL1118T	-	315	RL1218T	-	340	RL1218T	-
7,000	305	RL1218T	-	330	RL1218T	-		-	

Table 4.9.A KF40® Composite Slab Spans - Single Spans 0.60 BMT

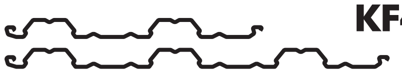
Deflection Criteria

Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

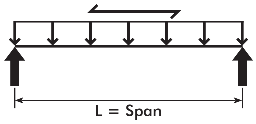
Refer to the start of this section for additional parameters used to calculate the above table.

KF40® Composite Slab Spans

Single Spans 0.75 BMT



KF40®



0.75

Span (mm)	Live Load 1.5kPa			Live Load 3.0 kPa			Live Load 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	90	SL72	-	90	SL72	-	90	SL72	-
1,250	90	SL72	-	90	SL72	-	90	SL72	-
1,500	90	SL72	-	90	SL72	-	90	SL72	-
1,750	90	SL72	-	90	SL72	-	90	SL72	-
2,000	90	SL72	-	90	SL72	-	90	SL72	-
2,250	90	SL72	-	90	SL72	-	90	SL72	-
2,500	90	SL72	-	90	SL72	-	95	SL82	-
2,750	90	SL72	-	95	SL82	-	105	SL92	-
3,000	95	SL82	-	105	SL82	-	120	SL92	-
3,250	100	SL82	-	115	SL92	-	130	SL102	-
3,500	110	SL92	-	125	SL102	-	140	SL102	-
3,750	120	SL102	-	140	SL102	-	155	SL81	-
4,000	135	SL102	-	145	SL81	-	165	SL81	-
4,250	140	SL81	-	160	SL81	-	185	RL918T	-
4,500	155	SL81	-	165	SL81	-	195	RL918T	-
4,750	165	SL81	-	190	RL918T	-	210	RL1018T	-
5,000	185	RL918T	-	205	RL918T	-	225	RL1018T	-
5,250	200	RL918T	-	220	RL1018T	-	240	RL1018T	-
5,500	210	RL1018T	-	230	RL1018T	-	255	RL1118T	-
5,750	225	RL1018T	-	245	RL1118T	-	270	RL1118T	-
6,000	240	RL1018T	-	265	RL1118T	-	285	RL1118T	-
6,250	255	RL1118T	-	275	RL1118T	-	300	RL1218T	-
6,500	270	RL1118T	-	295	RL1118T	-	320	RL1218T	-
6,750	285	RL1118T	-	310	RL1218T	-	335	RL1218T	-
7,000	305	RL1218T	-	325	RL1218T	-	355	RL1218T	-

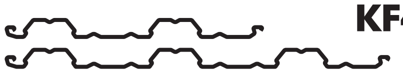
Table 4.9.B KF40® Composite Slab Spans - Single Spans 0.75 BMT

Deflection Criteria

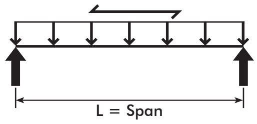
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

KF40® Composite Slab Spans
Single Spans 1.00 BMT



KF40®



1.00

Span (mm)	Live Load 1.5kPa			Live Load 3.0 kPa			Live Load 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	90	SL72	-	90	SL72	-	90	SL72	-
1,250	90	SL72	-	90	SL72	-	90	SL72	-
1,500	90	SL72	-	90	SL72	-	90	SL72	-
1,750	90	SL72	-	90	SL72	-	90	SL72	-
2,000	90	SL72	-	90	SL72	-	90	SL72	-
2,250	90	SL72	-	90	SL72	-	90	SL72	-
2,500	90	SL72	-	90	SL72	-	95	SL82	-
2,750	90	SL72	-	90	SL72	-	105	SL82	-
3,000	90	SL72	-	100	SL82	-	115	SL92	-
3,250	100	SL82	-	110	SL92	-	125	SL102	-
3,500	110	SL92	-	125	SL102	-	140	SL102	-
3,750	120	SL92	-	135	SL102	-	150	SL81	-
4,000	130	SL102	-	145	SL81	-	160	SL81	-
4,250	140	SL81	-	160	SL81	-	180	RL918T	-
4,500	150	SL81	-	170	SL81	-	190	RL918T	-
4,750	165	SL81	-	185	RL918T	-	205	RL918T	-
5,000	180	RL918T	-	200	RL918T	-	220	RL1018T	-
5,250	195	RL918T	-	215	RL1018T	-	235	RL1018T	-
5,500	210	RL1018T	-	230	RL1018T	-	250	RL1118T	-
5,750	220	RL1018T	-	240	RL1018T	-	265	RL1118T	-
6,000	235	RL1018T	-	255	RL1118T	-	280	RL1118T	-
6,250	250	RL1118T	-	275	RL1118T	-	300	RL1218T	-
6,500	265	RL1118T	-	290	RL1118T	-	315	RL1218T	-
6,750	285	RL1118T	-	305	RL1218T	-	330	RL1218T	-
7,000	300	RL1218T	-	320	RL1218T	-	350	RL1218T	-

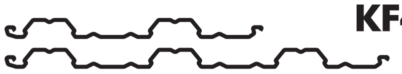
Table 4.9.C KF40® Composite Slab Spans - Single Spans 1.00 BMT

Deflection Criteria

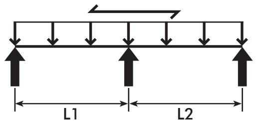
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

KF40® Composite Slab Spans
Double Spans 0.60 BMT



KF40®



0.60

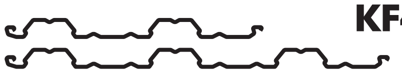
Span (mm)	Live Load 1.5kPa			Live Load 3.0 kPa			Live Load 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
1,250	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
1,500	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
1,750	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,000	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,250	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,500	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,750	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
3,000	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@300
3,250	100	SL82	N12@400	100	SL82	N12@400	105	SL92	N16@400
3,500	100	SL82	N12@400	100	SL82	N12@300	115	SL92	N16@400
3,750	100	SL82	N12@400	105	SL82	N12@275	120	SL92	N16@400
4,000	100	SL82	N12@350	110	SL92	N16@400	125	SL102	N16@400
4,250	105	SL82	N12@325	120	SL92	N16@400	135	SL102	N16@400
4,500	115	SL92	N12@375	125	SL102	N16@400	145	SL81	N16@275
4,750	120	SL92	N12@325	135	SL102	N16@400	150	SL81	N16@300
5,000	130	SL102	N12@375	145	SL81	N16@275	160	SL81	N16@300
5,250	140	SL102	N12@350	150	SL81	N16@275	170	SL81	N16@300
5,500	145	SL81	N12@400	160	SL81	N16@275	185	RL918T	N16@275
5,750	155	SL81	N12@400	170	SL81	N16@300	195	RL918T	N16@250
6,000	160	SL81	N12@325	185	RL918T	N16@300	205	RL918T	N16@225
6,250	170	SL81	N12@300	195	RL918T	N16@275	215	RL1018T	N16@225
6,500	185	RL918T	N16@300	205	RL918T	N16@275	225	RL1018T	N16@200
6,750	195	RL918T	N16@300	215	RL1018T	N16@250	235	RL1018T	N16@200
7,000	205	RL918T	N16@275	225	RL1018T	N16@225	245	RL1118T	N16@200

Table 4.9.D KF40® Composite Slab Spans - Double Spans 0.60 BMT

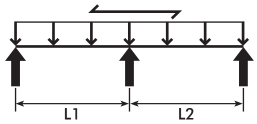
Deflection Criteria
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

KF40® Composite Slab Spans
Double Spans 0.75 BMT



KF40®



0.75

Span (mm)	Live Load 1.5kPa			Live Load 3.0 kPa			Live Load 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
1,250	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
1,500	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
1,750	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,000	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,250	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,500	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,750	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
3,000	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@275
3,250	100	SL82	N12@400	100	SL82	N12@400	110	SL92	N12@350
3,500	100	SL82	N12@400	105	SL82	N12@375	115	SL92	N12@300
3,750	100	SL82	N12@400	110	SL92	N12@375	120	SL92	N12@250
4,000	100	SL82	N12@350	115	SL92	N12@300	125	SL102	N16@400
4,250	105	SL82	N12@300	125	SL102	N12@375	130	SL102	N16@325
4,500	110	SL92	N12@325	135	SL102	N12@350	140	SL102	N16@325
4,750	120	SL92	N12@325	140	SL102	N12@300	150	SL81	N16@300
5,000	130	SL102	N12@375	145	SL81	N12@350	155	SL81	N16@300
5,250	135	SL102	N12@325	150	SL81	N12@275	165	SL81	N16@300
5,500	145	SL81	N12@400	160	SL81	N12@250	180	RL918T	N16@250
5,750	155	SL81	N12@375	170	SL81	N12@250	190	RL918T	N16@250
6,000	160	SL81	N12@325	180	RL918T	N16@275	200	RL918T	N16@225
6,250	170	SL81	N12@300	190	RL918T	N16@275	210	RL1018T	N16@225
6,500	185	RL918T	N16@300	200	RL918T	N16@250	220	RL1018T	N16@200
6,750	195	RL918T	N16@300	210	RL1018T	N16@250	230	RL1018T	N16@200
7,000	205	RL918T	N16@275	220	RL1018T	N16@225	245	RL1118T	N16@200

Table 4.9.E KF40® Composite Slab Spans - Double Spans 0.75 BMT

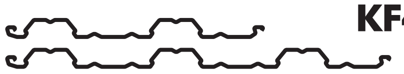
Deflection Criteria

Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

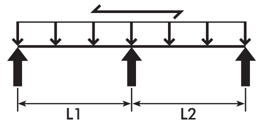
Refer to the start of this section for additional parameters used to calculate the above table.

KF40® Composite Slab Spans

Double Spans 1.00 BMT



KF40®



1.00

Span (mm)	Live Load 1.5kPa			Live Load 3.0 kPa			Live Load 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
1,250	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
1,500	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
1,750	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,000	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,250	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,500	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,750	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
3,000	100	SL82	N12@400	100	SL82	N12@400	110	SL92	N12@400
3,250	100	SL82	N12@400	100	SL82	N12@400	110	SL92	N12@350
3,500	100	SL82	N12@400	105	SL82	N12@375	120	SL92	N12@325
3,750	100	SL82	N12@400	110	SL92	N12@375	125	SL102	N12@325
4,000	100	SL82	N12@350	120	SL92	N12@350	135	SL102	N12@300
4,250	110	SL92	N12@400	125	SL102	N12@350	140	SL102	N12@250
4,500	110	SL92	N12@300	130	SL102	N12@300	145	SL81	N12@275
4,750	120	SL92	N12@325	130	SL102	N12@225	145	SL81	N12@225
5,000	125	SL102	N12@325	140	SL102	N12@225	155	SL81	N12@200
5,250	135	SL102	N12@325	150	SL81	N12@275	165	SL81	N12@200
5,500	145	SL81	N12@400	155	SL81	N12@250	180	RL918T	N16@250
5,750	150	SL81	N12@350	165	SL81	N12@225	190	RL918T	N16@250
6,000	160	SL81	N12@325	180	RL918T	N16@275	200	RL918T	N16@225
6,250	170	SL81	N12@300	185	RL918T	N16@250	205	RL918T	N16@200
6,500	180	RL918T	N16@300	195	RL918T	N16@250	215	RL1018T	N16@200
6,750	195	RL918T	N16@300	210	RL1018T	N16@250	230	RL1018T	N16@200
7,000	200	RL918T	N16@275	220	RL1018T	N16@225	240	RL1018T	N16@175

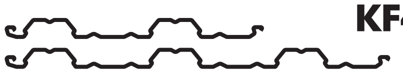
Table 4.9.F KF40® Composite Slab Spans - Double Spans 1.00 BMT

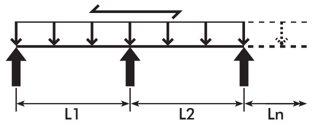
Deflection Criteria

Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

KF40® Composite Slab Spans
Continuous Spans 0.60 BMT


KF40®



0.60

Span (mm)	Live Load 1.5kPa			Live Load 3.0 kPa			Live Load 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
1,250	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
1,500	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
1,750	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,000	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,250	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,500	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,750	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
3,000	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
3,250	100	SL82	N12@400	100	SL82	N12@400	110	SL92	N12@400
3,500	100	SL82	N12@400	105	SL82	N12@400	115	SL92	N12@400
3,750	100	SL82	N12@400	110	SL92	N12@400	125	SL102	N12@400
4,000	105	SL82	N12@400	120	SL92	N12@400	135	SL102	N12@400
4,250	115	SL92	N12@400	130	SL102	N12@400	145	SL81	N12@400
4,500	120	SL102	N12@400	140	SL102	N12@400	155	SL81	N12@400
4,750	130	SL102	N12@400	145	SL81	N12@400	165	SL81	N12@400
5,000	140	SL102	N12@400	155	SL81	N12@400	180	RL918T	N12@225
5,250	150	SL81	N12@400	165	SL81	N12@400	190	RL918T	N12@225
5,500	155	SL81	N12@400	180	RL918T	N12@275	200	RL918T	N12@200
5,750	165	SL81	N12@400	190	RL918T	N12@250	215	RL1018T	N12@200
6,000	180	RL918T	N12@325	200	RL918T	N12@225	220	RL1018T	N16@300
6,250	190	RL918T	N12@300	215	RL1018T	N12@225	230	RL1018T	N16@300
6,500	200	RL918T	N12@300	220	RL1018T	N12@200	245	RL1118T	N16@300
6,750	215	RL1018T	N12@275	240	RL1018T	N12@200	255	RL1118T	N16@275
7,000	225	RL1018T	N12@250	245	RL1118T	N16@300	270	RL1118T	N16@275

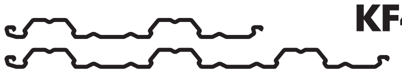
Table 4.9.G KF40® Composite Slab Spans - Continuous Spans 0.60 BMT

Deflection Criteria
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

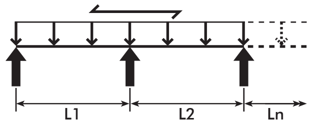
Refer to the start of this section for additional parameters used to calculate the above table.

KF40® Composite Slab Spans

Continuous Spans 0.75 BMT



KF40®



0.75

Span (mm)	Live Load 1.5kPa			Live Load 3.0 kPa			Live Load 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
1,250	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
1,500	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
1,750	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,000	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,250	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,500	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,750	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
3,000	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
3,250	100	SL82	N12@400	100	SL82	N12@400	105	SL92	N12@400
3,500	100	SL82	N12@400	100	SL82	N12@400	115	SL92	N12@400
3,750	100	SL82	N12@400	110	SL92	N12@400	125	SL102	N12@400
4,000	105	SL82	N12@400	120	SL92	N12@400	135	SL102	N12@400
4,250	115	SL92	N12@400	125	SL102	N12@400	145	SL81	N12@400
4,500	120	SL92	N12@400	135	SL102	N12@400	150	SL81	N12@400
4,750	130	SL102	N12@400	145	SL81	N12@400	160	SL81	N12@400
5,000	140	SL102	N12@400	155	SL81	N12@400	170	SL81	N12@400
5,250	145	SL81	N12@400	165	SL81	N12@400	185	RL918T	N12@200
5,500	155	SL81	N12@400	180	RL918T	N12@250	195	RL918T	N12@200
5,750	165	SL81	N12@400	190	RL918T	N12@250	205	RL918T	N16@300
6,000	180	RL918T	N12@300	200	RL918T	N12@225	220	RL1018T	N16@300
6,250	190	RL918T	N12@275	215	RL1018T	N12@225	230	RL1018T	N16@300
6,500	200	RL918T	N12@250	220	RL1018T	N12@200	245	RL1118T	N16@300
6,750	210	RL1018T	N12@225	230	RL1018T	N16@300	255	RL1118T	N16@275
7,000	220	RL1018T	N12@225	240	RL1018T	N16@300	270	RL1118T	N16@275

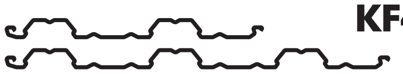
Table 4.9.H KF40® Composite Slab Spans - Continuous Spans 0.75 BMT

Deflection Criteria

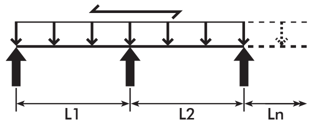
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

KF40® Composite Slab Spans
Continuous Spans 1.00 BMT



KF40®



1.00

Span (mm)	Live Load 1.5kPa			Live Load 3.0 kPa			Live Load 5.0kPa		
	Dcs	Mesh	Bars	Dcs	Mesh	Bars	Dcs	Mesh	Bars
1,000	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
1,250	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
1,500	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
1,750	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,000	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,250	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,500	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
2,750	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
3,000	100	SL82	N12@400	100	SL82	N12@400	100	SL82	N12@400
3,250	100	SL82	N12@400	100	SL82	N12@400	105	SL92	N12@400
3,500	100	SL82	N12@400	100	SL82	N12@400	115	SL92	N12@400
3,750	100	SL82	N12@400	110	SL92	N12@400	120	SL102	N12@400
4,000	105	SL82	N12@400	115	SL92	N12@400	130	SL102	N12@400
4,250	110	SL92	N12@400	125	SL102	N12@400	140	SL81	N12@400
4,500	120	SL92	N12@400	135	SL102	N12@400	150	SL81	N12@400
4,750	125	SL102	N12@400	140	SL81	N12@400	160	SL81	N12@400
5,000	135	SL102	N12@400	150	SL81	N12@400	170	SL81	N12@400
5,250	145	SL81	N12@400	160	SL81	N12@400	180	RL918T	N12@200
5,500	155	SL81	N12@400	170	SL81	N12@400	195	RL918T	N12@200
5,750	165	SL81	N12@400	185	RL918T	N12@225	205	RL918T	N12@175
6,000	180	RL918T	N12@300	195	RL918T	N12@225	215	RL1018T	N16@300
6,250	185	RL918T	N12@275	205	RL918T	N12@200	225	RL1018T	N16@300
6,500	195	RL918T	N12@250	215	RL1018T	N12@200	240	RL1018T	N16@275
6,750	210	RL1018T	N12@225	230	RL1018T	N12@175	250	RL1118T	N16@275
7,000	220	RL1018T	N12@225	240	RL1018T	N12@175	265	RL1118T	N16@250

Table 4.9.I KF40® Composite Slab Spans - Continuous Spans 1.00 BMT

Deflection Criteria
Construction Deflection = L/240
Incremental Deflection = L/500
Total Deflection = L/250

Refer to the start of this section for additional parameters used to calculate the above table.

4.10 KF70® Fire Resistance Tables

Index of KF70® Fire Resistance Tables

Fire Resistance Tables Notes

The fire resistance tables are to be used to design fire rated KingFlor composite slabs that meet the assumptions below. For designs outside the parameters below and specified on the tables refer to the KingFlor Designer Suite or your local Fielders representative. For propping requirements refer to the temporary propping tables.

Notation

Dcs = depth of composite slab.
L = Span between permanent supports.

Loads

Construction Live Load 1.0kPa
Ceiling & Services Load 0.35kPa
Partitions Load 0.5kPa

Short & Long-Term Factors

Short-term factor ψ = 0.7
Long-term factor ψ = 0.4
Combination-term factor ψ = 0.4

Concrete Properties

Normal wet density of concrete 2400kg/m^3
Normal dry density of concrete 2350 kg/m^3
Concrete strength f'c = 25MPa
Exposure Classification A1 with moderate crack control
Cover to top reinforcement is 30mm

Reinforcing

Steel Yield Strength f_{sy} = 500MPa
Bars - N12@200 indicates N12 bars at 200mm centers.

Mesh

Mesh is to be located in the top of the slab. Where the mesh code ends with a 'T' (eg. RL918T), the larger bars are to be located perpendicular to the decking ribs with the smaller perpendicular bars on top. Laps in mesh are to occur midspan.

Bars

Bars where required, are to be placed over internal permanent supports, on top of mesh. Length of bars are to be 0.6 x larger span + width of support. The bars are to be located 0.3 x span from edge of support for internal supports.

Fire reinforcement (Fire Reo) is to be located in the bottom of the slab in accordance with AS 3600:2001, Table 5.5.3 (A) "Fire Resistance Periods for Slabs". Bars are to be continuous & lapped at supports.

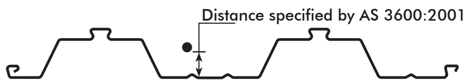


Figure 4.10.A Fire Reinforcement Detail

Spans

Spans L1, L2, L3 etc. cannot differ by more than 5% from both L1 and Ln.

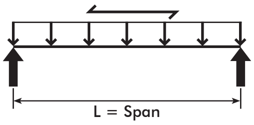
Span is considered to be the larger of L1, L2...Ln.

Support width 50mm

The fire resistance tables have been prepared with the assumptions stated above. More refined designs can be obtained from Fielders or by using the KingFlor Designer Suite. Contact your local Fielders representative for design assistance.

KF70® Fire Resistance
Single Spans - Floor Live Load 1.5kPa

KF70®



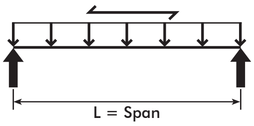
1.5kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	130	SL82	-	-	130	SL82	-	-	150	SL92	-	-
1,500	130	SL82	-	-	130	SL82	-	-	150	SL92	-	-
2,000	130	SL82	-	-	130	SL82	-	-	150	SL92	-	-
2,500	130	SL82	-	1xN10/300✦	130	SL82	-	1xN10/300✦	150	SL92	-	1xN16/300✦
3,000	130	SL82	-	1xN10/300✦	130	SL82	-	1xN12/300✦	150	SL92	-	1xN16/300✦
3,500	130	SL82	-	1xN12/300✦	130	SL82	-	1xN16/300✦	150	SL92	-	1xN20/300✦
4,000	140	SL92	-	1xN12/300✶	140	SL92	-	1xN16/300✦	150	SL92	-	1xN20/300✦
4,500	160	SL102	-	1xN16/300✦	160	SL102	-	1xN16/300✦	165	SL102	-	2xN20/300✦
5,000	180	SL81	-	1xN16/300✦	185	SL81	-	1xN16/300✶	190	SL81	-	2xN20/300✦
5,500	215	RL918T	-	1xN16/300✦	220	RL918T	-	1xN16/300✶	220	RL918T	-	2xN20/300✦
6,000	245	RL1018T	-	1xN16/300✦	245	RL1018T	-	1xN16/300✶	245	RL1018T	-	2xN20/300✦
6,500	280	RL1118T	-	1xN16/300✶	270	RL1118T	-	1xN20/300✦	275	RL1118T	-	2xN20/300✦
7,000	305	RL1118T	-	1xN16/300✶	300	RL1118T	-	1xN20/300✦	305	RL1118T	-	2xN20/300✦

Table 4.10.A KF70® Fire Resistance - Single Spans - Floor Live Load 1.5kPa

KF70® Fire Resistance
Single Spans - Floor Live Load 3.0kPa

KF70®



3.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	130	SL82	-	-	130	SL82	-	-	150	SL92	-	-
1,500	130	SL82	-	-	130	SL82	-	-	150	SL92	-	-
2,000	130	SL82	-	-	130	SL82	-	-	150	SL92	-	-
2,500	130	SL82	-	1xN10/300✦	130	SL82	-	1xN10/300✦	150	SL92	-	1xN16/300✦
3,000	130	SL82	-	1xN10/300✶	130	SL82	-	1xN12/300✶	150	SL92	-	1xN16/300✦
3,500	130	SL92	-	1xN12/300✦	130	SL82	-	1xN16/300✦	150	SL92	-	2xN16/300✦
4,000	155	SL102	-	1xN12/300✶	155	SL102	-	1xN16/300✦	160	SL102	-	2xN16/300✦
4,500	180	SL81	-	1xN16/300✦	180	SL81	-	1xN16/300✦	180	SL81	-	2xN16/300✦
5,000	200	SL81	-	1xN16/300✦	210	RL918T	-	1xN16/300✶	215	RL918T	-	2xN16/300✦
5,500	235	RL918T	-	1xN16/300✦	240	RL1018T	-	1xN16/300✶	240	RL1018T	-	2xN20/300✦
6,000	265	RL1018T	-	1xN16/300✦	270	RL1018T	-	1xN16/300✶	270	RL1018T	-	2xN20/300✦
6,500	300	RL1118T	-	1xN16/300✶	300	RL1118T	-	1xN20/300✦	295	RL1118T	-	2xN20/300✦
7,000	330	RL1218T	-	1xN16/300✶	325	RL1118T	-	1xN20/300✶	325	RL1118T	-	2xN20/300✦

Table 4.10.B KF70® Fire Resistance - Single Spans - Floor Live Load 3.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

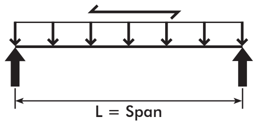
✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required. (No end spans)

Refer to the start of this section for additional parameters used to calculate the above table.

KF70® Fire Resistance
Single Spans - Floor Live Load 5.0kPa

KF70®



5.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	130	SL82	-	-	130	SL82	-	-	150	SL92	-	-
1,500	130	SL82	-	-	130	SL82	-	-	150	SL92	-	-
2,000	130	SL82	-	-	130	SL82	-	-	150	SL92	-	1xN12/300✦
2,500	130	SL82	-	1xN10/300✦	130	SL82	-	1xN12/300✦	150	SL92	-	1xN16/300✦
3,000	130	SL82	-	1xN12/300✦	135	SL82	-	1xN12/300✶	150	SL92	-	1xN20/300✦
3,500	150	SL92	-	1xN12/300✶	145	SL92	-	1xN16/300✦	170	SL102	-	1xN20/300✦
4,000	170	SL102	-	1xN16/300✦	170	SL102	-	1xN16/300✦	180	SL81	-	1xN20/300✦
4,500	195	SL81	-	1xN16/300✦	195	SL81	-	1xN16/300✦	200	SL81	-	1xN20/300✶
5,000	230	RL918T	-	1xN16/300✦	230	RL918T	-	1xN16/300✶	235	RL918T	-	2xN20/300✦
5,500	255	RL1018T	-	1xN16/300✦	260	RL1018T	-	1xN16/300✶	260	RL1018T	-	2xN20/300✦
6,000	290	RL1118T	-	1xN16/300✶	290	RL1118T	-	1xN16/300✶	290	RL1118T	-	2xN20/300✦
6,500	320	RL1118T	-	1xN16/300✶	315	RL1118T	-	1xN20/300✦	320	RL1118T	-	2xN20/300✦
7,000	355	RL1218T	-	1xN16/300✶	350	RL1218T	-	1xN20/300✶	350	RL1218T	-	2xN20/300✦

Table 4.10.C KF70® Fire Resistance - Single Spans - Floor Live Load 5.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

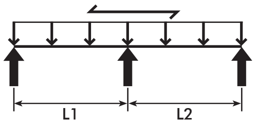
✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required. (No end spans)

Refer to the start of this section for additional parameters used to calculate the above table.

KF70® Fire Resistance
Double Spans - Floor Live Load 1.5kPa

KF70®



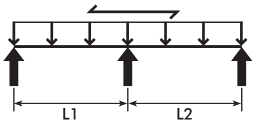
1.5kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
1,500	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
2,000	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
2,500	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
3,000	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
3,500	130	SL82	N10@400	1xN10/600✦	130	SL82	N10@400	1xN10/300✶	150	SL92	N10@400	1xN16/300✶
4,000	130	SL82	N10@400	1xN10/300✦	130	SL82	N10@400	1xN10/300†	150	SL92	N10@400	2xN16/300✶
4,500	130	SL82	N10@300	1xN10/300✶	130	SL82	N10@300	1xN16/300✶	150	SL92	N10@400	2xN16/300✶
5,000	135	SL92	N10@250	1xN12/300✶	135	SL92	N12@350	1xN16/300✶	160	SL102	N10@300	2xN16/300✶
5,500	155	SL102	N12@300	1xN12/300✶	160	SL102	N12@350	1xN16/300✶	160	SL102	N10@250	2xN20/300✶
6,000	165	SL81	N12@300	1xN12/300✶	170	SL102	N12@275	1xN16/300†	170	SL102	N12@275	2xN20/300✶
6,500	185	SL81	N12@300	1xN12/300†	185	SL81	N12@300	1xN16/300✶	185	SL81	N12@275	2xN20/300✶
7,000	200	SL81	N16@300	1xN16/300✦	200	SL81	N12@250	1xN16/300✶	200	SL81	N16@275	2xN20/300✶

Table 4.10.D KF70® Fire Resistance - Double Spans - Floor Live Load 1.5kPa

KF70® Fire Resistance
Double Spans - Floor Live Load 3.0kPa

KF70®



3.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
1,500	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
2,000	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
2,500	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
3,000	130	SL82	N10@400	1xN10/300✦	130	SL82	N10@400	1xN10/300*	150	SL92	N10@400	1xN12/300✶
3,500	130	SL82	N10@400	1xN10/300✦	130	SL82	N10@400	1xN10/300✶	150	SL92	N12@400	1xN16/300✶
4,000	130	SL82	N10@250	1xN10/300✦	130	SL82	N10@250	1xN12/300✶	150	SL92	N12@400	2xN16/300✶
4,500	135	SL92	N10@200	1xN10/300✶	140	SL92	N10@225	1xN12/300†	150	SL92	N12@375	2xN16/300✶
5,000	150	SL92	N12@225	1xN12/300✶	150	SL92	N12@225	1xN16/300✶	150	SL102	N12@275	2xN20/300✶
5,500	170	SL102	N12@225	1xN12/300✶	170	SL102	N12@225	1xN16/300✶	170	SL102	N12@225	2xN20/300✶
6,000	185	SL81	N12@225	1xN12/300✶	185	SL81	N12@250	1xN16/300✶	190	SL81	N12@250	2xN20/300✶
6,500	200	SL81	N16@250	1xN12/300✶	200	SL81	N12@200	1xN16/300✶	205	RL918T	N16@275	2xN20/300✶
7,000	230	RL918T	N16@250	1xN12/300†	230	RL918T	N16@250	1xN16/300✶	225	RL1018T	N16@225	2xN20/300✶

Table 4.10.E KF70® Fire Resistance - Double Spans - Floor Live Load 3.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

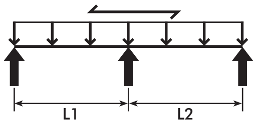
✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required. (No end spans)

Refer to the start of this section for additional parameters used to calculate the above table.

KF70® Fire Resistance
Double Spans - Floor Live Load 5.0kPa

KF70®



5.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
1,500	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
2,000	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
2,500	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
3,000	130	SL82	N10@400	1xN10/300✦	130	SL82	N10@400	1xN10/300✶	150	SL92	N10@400	1xN16/300✶
3,500	130	SL82	N10@250	1xN10/300✦	130	SL82	N10@250	1xN10/300†	150	SL92	N12@250	1xN16/300✶
4,000	140	SL92	N10@200	1xN10/300✶	140	SL92	N10@200	1xN12/300✶	150	SL92	N12@325	1xN20/300✶
4,500	150	SL92	N12@200	1xN10/300✶	150	SL92	N12@200	1xN12/300†	160	SL102	N16@200	1xN20/300✶
5,000	170	SL102	N12@200	1xN10/300✶	170	SL102	N12@200	1xN12/300†	170	SL81	N16@200	1xN20/300✶
5,500	185	SL81	N12@200	1xN10/300†	185	SL81	N12@200	1xN16/300✶	185	SL81	N16@200	1xN24/300✶
6,000	200	SL81	N16@225	1xN12/300✶	200	SL81	N16@300	1xN16/300✶	205	RL918T	N16@200	1xN24/300✶
6,500	230	RL918T	N16@200	1xN12/300✶	225	RL918T	N16@200	1xN16/300✶	225	RL918T	N16@200	1xN24/300✶
7,000	250	RL1018T	N16@200	1xN12/300✶	250	RL1018T	N16@200	1xN16/300✶	250	RL1018T	N16@200	1xN24/300✶

Table 4.10.F KF70® Fire Resistance - Double Spans - Floor Live Load 5.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

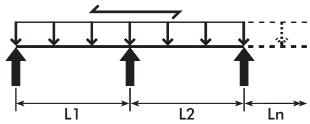
✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required. (No end spans)

Refer to the start of this section for additional parameters used to calculate the above table.

KF70® Fire Resistance
Continuous Spans - Floor Live Load 1.5kPa

KF70®



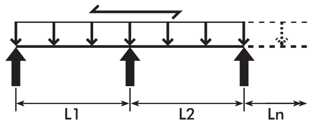
1.5kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
1,500	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
2,000	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
2,500	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
3,000	130	SL82	N10@400	1xN10/600✦	130	SL82	N10@400	1xN10/600✦	150	SL92	N10@400	1xN12/300✶
3,500	130	SL82	N10@400	1xN10/600✦	130	SL82	N10@400	1xN10/300✶	150	SL92	N10@400	1xN16/300✶
4,000	130	SL82	N10@400	1xN10/300✦	130	SL82	N10@400	1xN10/300†	150	SL92	N12@400	1xN16/300✶
4,500	130	SL82	N10@400	1xN10/300✶	135	SL92	N10@400	1xN12/300†	160	SL102	N12@400	1xN20/300✶
5,000	145	SL92	N10@400	1xN12/300✶	145	SL102	N10@400	1xN16/300✶	170	SL102	N12@400	1xN20/300✶
5,500	165	SL102	N10@400	1xN12/300✶	165	SL102	N10@400	1xN16/300✶	180	SL81	N12@400	1xN20/300✶
6,000	180	SL81	N10@400	1xN12/300✶	180	SL81	N10@400	1xN16/300✶	200	SL81	N12@400	1xN20/300✶
6,500	200	SL81	N12@250	1xN12/300✶	200	SL81	N12@300	1xN16/300✶	205	RL918T	N12@275	2xN20/300✶
7,000	230	RL918T	N12@200	1xN12/300†	230	RL918T	N12@200	1xN16/300✶	230	RL918T	N12@225	2xN20/300✶

Table 4.10.G KF70® Fire Resistance - Continuous Spans - Floor Live Load 1.5kPa

KF70® Fire Resistance
Continuous Spans - Floor Live Load 3.0kPa

KF70®



3.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
1,500	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
2,000	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
2,500	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
3,000	130	SL82	N10@400	1xN10/600✦	130	SL82	N10@400	1xN10/300✦	150	SL92	N10@400	1xN12/300✶
3,500	130	SL82	N10@400	1xN10/600✶	130	SL82	N10@400	1xN10/300✶	150	SL92	N10@400	1xN16/300✶
4,000	135	SL82	N10@400	1xN10/300✶	130	SL82	N10@375	1xN12/300✶	160	SL102	N12@400	1xN16/300✶
4,500	145	SL92	N10@350	1xN12/300✦	145	SL92	N10@350	1xN12/300†	170	SL81	N12@300	1xN16/300✶
5,000	160	SL102	N10@400	1xN12/300✶	160	SL102	N10@350	1xN16/300✶	185	RL918T	N16@300	1xN20/300✶
5,500	180	SL81	N10@400	1xN12/300✶	180	SL81	N10@400	1xN16/300✶	190	RL918T	N16@300	1xN20/300✶
6,000	200	SL81	N10@325	1xN12/300✶	200	SL81	N10@300	1xN16/300✶	200	RL918T	N16@300	2xN20/300✶
6,500	235	RL918T	N12@200	1xN12/300✶	225	RL918T	N12@200	1xN16/300✶	225	RL918T	N16@300	2xN20/300✶
7,000	250	RL1018T	N16@300	1xN12/300†	250	RL1018T	N16@300	1xN16/300✶	250	RL1018T	N16@300	2xN20/300✶

Table 4.10.H KF70® Fire Resistance - Continuous Spans - Floor Live Load 3.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

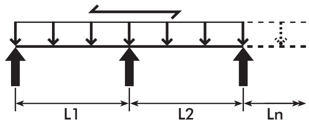
✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required. (No end spans)

Refer to the start of this section for additional parameters used to calculate the above table.

KF70® Fire Resistance
Continuous Spans - Floor Live Load 5.0kPa

KF70®



5.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
1,500	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
2,000	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	-
2,500	130	SL82	N10@400	-	130	SL82	N10@400	-	150	SL92	N10@400	1xN10/300✶
3,000	130	SL82	N10@400	1xN10/600✶	130	SL82	N10@400	1xN10/300✶	160	SL102	N10@400	1xN12/300✶
3,500	130	SL82	N10@350	1xN10/300✶	130	SL82	N10@375	1xN12/300✶	160	SL102	N12@300	1xN16/300✶
4,000	140	SL92	N10@300	1xN10/300✶	140	SL92	N10@300	1xN12/300✶	170	SL102	N12@300	1xN16/300✶
4,500	160	SL102	N10@300	1xN10/300✶	160	SL102	N10@300	1xN12/300†	170	SL81	N12@300	1xN20/300✶
5,000	180	SL81	N10@300	1xN10/300✶	180	SL81	N10@300	1xN12/300†	180	SL81	N12@300	1xN20/300✶
5,500	200	SL81	N10@250	1xN12/300✶	210	RL918T	N12@225	1xN12/300†	205	RL918T	N12@200	1xN20/300✶
6,000	235	RL918T	N12@200	1xN12/300✶	235	RL918T	N16@300	1xN12/300†	225	RL918T	N16@300	1xN20/300✶
6,500	250	RL1018T	N16@300	1xN12/300✶	250	RL1018T	N16@300	1xN16/300✶	245	RL1018T	N16@300	2xN20/300✶
7,000	270	RL1018T	N16@275	1xN12/300†	270	RL1018T	N16@250	1xN16/300✶	270	RL1018T	N16@300	2xN20/300✶

Table 4.10.I KF70® Fire Resistance - Continuous Spans - Floor Live Load 5.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required. (No end spans)

Refer to the start of this section for additional parameters used to calculate the above table.

4.11 KF40® Fire Resistance Tables

Index of KF40® Fire Resistance Tables

Fire Resistance Tables Notes

The fire resistance tables are to be used to design fire rated KingFlor composite slabs that meet the assumptions below. For designs outside the parameters below and specified on the tables refer to the KingFlor Designer Suite or your local Fielders representative. For propping requirements refer to the temporary propping tables.

Notation

Dcs = depth of composite slab.
L = Span between permanent supports.

Loads

Construction Live Load 1.0kPa
Ceiling & Services Load 0.35kPa
Partitions Load 0.5kPa

Short & Long-Term Factors

Short-term factor ψ = 0.7
Long-term factor ψ = 0.4
Combination-term factor ψ = 0.4

Concrete Properties

Normal wet density of concrete 2400kg/m^3
Normal dry density of concrete 2350 kg/m^3
Concrete strength f'c = 25MPa
Exposure Classification A1 with moderate crack control
Cover to top reinforcement is 30mm

Reinforcing

Steel Yield Strength f_{sy} = 500MPa
Bars - N12@200 indicates N12 bars at 200mm centers.

Mesh

Mesh is to be located in the top of the slab. Where the mesh code ends with a 'T' (eg. RL918T), the larger bars are to be located perpendicular to the decking ribs with the smaller perpendicular bars on top. Laps in mesh are to occur midspan.

Bars

Bars where required, are to be placed over internal permanent supports, on top of mesh. Length of bars are to be 0.6 x larger span + width of support. The bars are to be located 0.3 x span from edge of support for internal supports.

Fire reinforcement (Fire Reo) is to be located in the bottom of the slab in accordance with AS 3600:2001, Table 5.5.3 (A) "Fire Resistance Periods for Slabs". Bars are to be continuous & lapped at supports.

Figure 4.11.A Fire Reinforcement Detail

Spans

Spans L1, L2, L3 etc. cannot differ by more than 5% from both L1 and Ln.

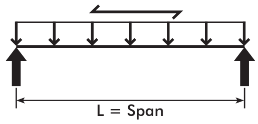
Span is considered to be the larger of L1, L2...Ln.

Support width 50mm

The fire resistance tables have been prepared with the assumptions stated above. More refined designs can be obtained from Fielders or by using the KingFlor Designer Suite. Contact your local Fielders representative for design assistance.

KF40® Fire Resistance
Single Spans - Floor Live Load 1.5kPa

KF40®



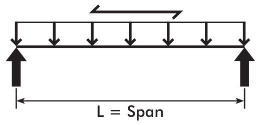
1.5kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
1,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,500	115	SL92	-	-	120	SL102	-	-	150	SL81	-	-
3,000	120	SL92	-	1xN10/247✦	120	SL102	-	1xN10/247✦	160	SL81	-	1XN12/247✦
3,500	120	SL92	-	1XN12/247✦	130	SL102	-	1XN12/247✦	170	SL81	-	1xN16/247✦
4,000	140	SL102	-	1XN12/247✦	145	SL81	-	1XN12/247✦	170	SL81	-	1xN16/247✦
4,500	160	SL81	-	1XN12/247✦	155	SL81	-	1XN12/247✦	180	RL918T	-	2xN16/247✦
5,000	185	RL918T	-	1xN16/247✶	185	RL918T	-	1xN16/247✦	185	RL918T	-	2xN16/247✦
5,500	210	RL1018T	-	1xN16/247✦	210	RL1018T	-	1xN16/247✦	210	RL1018T	-	2xN16/247✦
6,000	235	RL1018T	-	1xN16/247✦	235	RL1018T	-	1xN16/247✶	240	RL1018T	-	2xN16/247✦
6,500	260	RL1118T	-	1xN16/247✦	265	RL1118T	-	1xN16/247✶	265	RL1118T	-	2xN16/247✦
7,000	295	RL1118T	-	2xN16/247✦	295	RL1118T	-	2xN16/247✦	295	RL1118T	-	2xN16/247✦

Table 4.11.A KF40® Fire Resistance - Single Spans - Floor Live Load 1.5kPa

KF40® Fire Resistance
Single Spans - Floor Live Load 3.0kPa

KF40®



3.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
1,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,500	110	SL102	-	-	120	SL92	-	1xN10/247✦	160	SL81	-	-
3,000	120	SL102	-	1xN10/247✦	140	SL102	-	1xN10/247✶	175	RL918T	-	1xN16/247✦
3,500	125	SL102	-	1xN12/247✦	150	SL81	-	1XN12/247✦	185	RL918T	-	1xN16/247✦
4,000	145	SL81	-	1xN12/247✦	165	SL81	-	1XN12/247✶	195	RL918T	-	1xN16/247✦
4,500	170	SL81	-	1xN12/247✶	185	RL918T	-	1xN16/247✦	205	RL918T	-	2XN16/247✦
5,000	205	RL918T	-	1xN12/247✶	205	RL918T	-	1xN16/247✦	210	RL1018T	-	2XN16/247✦
5,500	230	RL1018T	-	1xN16/247✦	230	RL1018T	-	1xN16/247✦	230	RL1018T	-	2XN16/247✦
6,000	255	RL1118T	-	1xN16/247✦	255	RL1118T	-	1xN16/247✶	255	RL1118T	-	2XN16/247✦
6,500	285	RL1118T	-	1xN16/247✦	285	RL1118T	-	1xN16/247✶	285	RL1118T	-	2XN16/247✦
7,000	320	RL1218T	-	1xN16/247✦	320	RL1218T	-	1xN16/247✶	320	RL1218T	-	2XN16/247✦

Table 4.11.B KF40® Fire Resistance - Single Spans - Floor Live Load 3.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

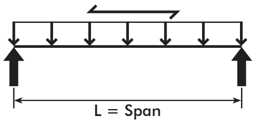
✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required. (No end spans)

Refer to the start of this section for additional parameters used to calculate the above table.

KF40® Fire Resistance
Single Spans - Floor Live Load 5.0kPa

KF40®



5.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
1,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,500	110	SL92	-	1xN10/247✦	130	SL102	-	1xN12/247✦	160	SL81	-	1xN12/247✦
3,000	120	SL102	-	1xN10/247✦	140	SL81	-	1xN12/247✦	165	SL81	-	1xN16/247✦
3,500	140	SL102	-	1xN12/247✦	155	SL81	-	1xN12/247✶	165	SL81	-	1xN16/247✦
4,000	165	SL81	-	1xN12/247✦	170	SL81	-	1xN16/247✦	185	RL918T	-	1xN16/247✦
4,500	195	RL918T	-	1xN12/247✶	195	RL918T	-	1xN16/247✦	195	RL918T	-	2xN16/247✦
5,000	225	RL1018T	-	1xN12/247✶	225	RL1018T	-	1xN16/247✦	220	RL1018T	-	2xN16/247✦
5,500	255	RL1118T	-	1xN16/247✦	255	RL1118T	-	1xN16/247✦	255	RL1118T	-	2xN16/247✦
6,000	280	RL1118T	-	1xN16/247✦	280	RL1118T	-	1xN16/247✶	280	RL1118T	-	2xN16/247✦
6,500	315	RL1218T	-	1xN16/247✦	315	RL1218T	-	1xN16/247✶	315	RL1218T	-	2xN16/247✦
7,000	345	RL1218T	-	1xN16/247✦	345	RL1218T	-	1xN16/247✶	345	RL1218T	-	2xN16/247✦

Table 4.11.C KF40® Fire Resistance - Single Spans - Floor Live Load 5.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

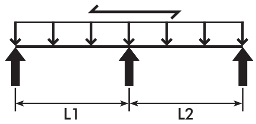
✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required. (No end spans)

Refer to the start of this section for additional parameters used to calculate the above table.

KF40® Fire Resistance
Double Spans - Floor Live Load 1.5kPa

KF40®



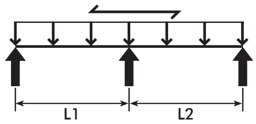
1.5kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
1,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
3,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
3,500	115	SL102	-	-	130	SL102	-	1xN10/247✶	150	SL81	-	1xN12/247✶
4,000	120	SL81	-	-	140	SL81	-	1xN10/247✶	165	SL81	-	1xN12/247✶
4,500	120	SL81	N10@400	1xN10/247✦	145	SL81	-	1xN10/247✶	170	RL918T	N10@300	1xN16/247✶
5,000	130	SL81	N10@400	1xN10/247✶	145	SL81	N10@400	1xN12/247✶	185	RL918T	N10@300	1xN16/247✶
5,500	155	SL81	N10@400	1xN10/247✶	160	SL81	N10@400	1xN12/247✶	200	RL1018T	N10@250	1xN16/247✶
6,000	170	SL81	N10@275	1xN10/247✶	170	SL81	N10@275	1xN12/247✶	210	RL1018T	N12@250	1xN16/247✶
6,500	210	RL1018T	N12@200	1xN10/247✶	210	RL1018T	N12@200	1xN12/247✶	240	RL1118T	N12@200	1xN16/247✶
7,000	250	RL1118T	N12@200	1xN10/247✶	250	RL1118T	N12@200	1xN12/247✶	250	RL1118T	N12@200	2xN16/247✶

Table 4.11.D KF40® Fire Resistance - Double Spans - Floor Live Load 1.5kPa

KF40® Fire Resistance
Double Spans - Floor Live Load 3.0kPa

KF40®



3.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
1,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
3,000	110	SL102	-	-	120	SL102	-	-	150	SL81	-	-
3,500	120	SL81	-	-	125	SL81	-	-	150	SL81	-	1xN12/247✶
4,000	150	SL81	-	1xN10/247✦	150	SL81	-	1xN10/247✶	160	SL81	-	1xN16/247✶
4,500	150	SL81	N10@400	1xN10/247✦	150	SL81	N10@400	1xN10/247✶	170	SL81	N10@400	1xN16/247✶
5,000	155	SL81	N10@300	1xN10/247✦	170	SL81	N10@400	1xN10/247✶	170	SL81	N10@400	2xN16/247✶
5,500	170	SL81	N10@200	1xN10/247✦	170	SL81	N10@225	1xN12/247✶	170	SL81	N10@200	2xN16/247✶
6,000	200	RL918T	N16@300	1xN10/247✦	200	RL918T	N16@300	1xN12/247✶	200	RL918T	N16@300	2xN16/247✶
6,500	200	RL918T	N16@250	1xN10/247✶	210	RL1018T	N16@275	1xN12/247✶	210	RL1018T	N16@275	2xN16/247✶
7,000	220	RL1018T	N16@225	1xN12/247✶	220	RL1018T	N16@225	1xN12/247✶	230	RL1118T	N16@250	2xN16/247✶

Table 4.11.E KF40® Fire Resistance - Double Spans - Floor Live Load 3.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

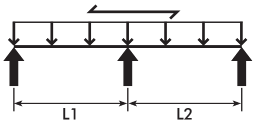
✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required. (No end spans)

Refer to the start of this section for additional parameters used to calculate the above table.

KF40® Fire Resistance
Double Spans - Floor Live Load 5.0kPa

KF40®



5.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
1,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,500	120	SL92	-	-	120	SL92	-	-	150	SL81	-	-
3,000	140	SL102	-	-	140	SL102	-	-	155	SL81	-	-
3,500	140	SL102	N10@400	1xN10/247✦	140	SL102	N10@400	1xN10/247✶	160	SL81	N10@400	1xN12/247✶
4,000	140	SL102	N10@250	1xN10/247✦	140	SL102	N10@250	1xN10/247✶	170	SL81	N10@375	1xN12/247✶
4,500	155	SL81	N10@250	1xN10/247✦	155	SL81	N10@250	1xN10/247✶	170	SL81	N10@350	1xN16/247✶
5,000	170	SL81	N12@250	1xN10/247✦	170	SL81	N12@250	1xN12/247✶	170	SL81	N12@200	1xN16/247✶
5,500	205	RL918T	N16@300	1xN10/247✦	205	RL918T	N16@300	1xN12/247✶	205	RL918T	N16@300	1xN16/247✶
6,000	240	RL1018T	N16@300	1xN10/247✦	240	RL1018T	N16@300	1xN12/247✶	240	RL1018T	N16@300	1xN16/247✶
6,500	250	RL1118T	N16@250	1xN10/247✶	250	RL1118T	N16@250	1xN12/247✶	250	RL1118T	N16@250	1xN16/247✶
7,000	290	RL1118T	N16@225	1xN10/247✶	290	RL1118T	N16@225	1xN12/247✶	290	RL1118T	N16@225	1xN16/247✶

Table 4.11.F KF40® Fire Resistance - Double Spans - Floor Live Load 5.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

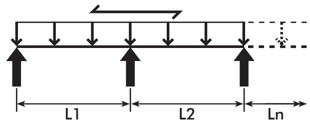
✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required. (No end spans)

Refer to the start of this section for additional parameters used to calculate the above table.

KF40® Fire Resistance
Continuous Spans - Floor Live Load 1.5kPa

KF40®



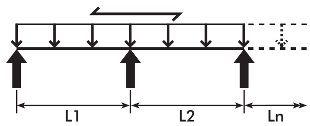
1.5kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
1,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
3,000	110	SL92	-	-	120	SL102	-	-	150	SL81	-	-
3,500	115	SL92	-	1xN10/247✦	120	SL102	-	1xN10/247✶	150	SL81	-	1xN12/247✶
4,000	125	SL102	-	1xN10/247✦	130	SL102	-	1xN10/247✶	150	SL81	-	1xN16/247✶
4,500	130	SL81	-	1xN10/247✦	130	SL102	N10@400	1xN12/247✶	160	SL81	-	1xN16/247✶
5,000	140	SL81	N10@400	1xN10/247✦	140	SL81	N10@400	1xN12/247✶	160	SL81	N10@400	1xN16/247✶
5,500	155	SL81	N10@400	1xN10/247✶	155	SL81	N10@400	1xN12/247✶	170	SL81	N10@400	1xN16/247✶
6,000	180	RL918T	N10@200	1xN12/247✦	180	RL918T	N10@200	1xN16/247✶	180	RL918T	N10@200	2xN16/247✶
6,500	200	RL918T	N12@250	1xN12/247✶	200	RL918T	N12@250	1xN16/247✶	200	RL918T	N12@250	2xN16/247✶
7,000	220	RL1018T	N12@225	1xN12/247✶	220	RL1018T	N12@225	1xN16/247✶	220	RL1018T	N12@225	2xN16/247✶

Table 4.11.G KF40® Fire Resistance - Continuous Spans - Floor Live Load 1.5kPa

KF40® Fire Resistance
Continuous Spans - Floor Live Load 3.0kPa

KF40®



3.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
1,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
3,000	110	SL102	-	-	125	SL102	-	-	150	SL81	-	-
3,500	125	SL102	-	1xN10/247✦	125	SL102	-	1xN10/247✶	150	SL81	-	1xN12/247✶
4,000	130	SL81	-	1xN10/247✦	135	SL81	-	1xN10/247✶	155	SL81	-	1xN16/247✶
4,500	165	SL81	-	1xN10/247✦	165	SL81	-	1xN10/247✶	165	SL81	-	1xN16/247✶
5,000	170	SL81	N10@400	1xN10/247✦	170	SL81	N10@400	1xN10/247✶	170	SL81	N10@400	1xN16/247✶
5,500	180	RL918T	N12@275	1xN10/247✶	180	RL918T	N12@275	1xN12/247✶	180	RL918T	N12@275	2xN16/247✶
6,000	200	RL918T	N12@225	1xN10/247✶	200	RL918T	N12@225	1xN12/247✶	200	RL918T	N12@225	2xN16/247✶
6,500	220	RL1018T	N12@200	1xN10/247✶	220	RL1018T	N12@200	1xN12/247✶	220	RL1018T	N12@200	2xN16/247✶
7,000	240	RL1118T	N12@175	1xN12/247✶	240	RL1118T	N12@175	1xN16/247✶	240	RL1118T	N12@175	2xN16/247✶

Table 4.11.H KF40® Fire Resistance - Continuous Spans - Floor Live Load 3.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

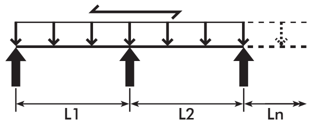
✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required. (No end spans)

Refer to the start of this section for additional parameters used to calculate the above table.

KF40® Fire Resistance
Continuous Spans - Floor Live Load 5.0kPa

KF40®



5.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
1,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,500	110	SL92	-	-	120	SL102	-	-	150	SL81	-	-
3,000	125	SL102	-	1xN10/247✦	125	SL102	-	1xN10/247✶	150	SL81	-	1xN12/247✶
3,500	135	SL81	-	1xN10/247✦	135	SL81	-	1xN10/247✶	150	SL81	-	1xN16/247✶
4,000	135	SL81	N10@400	1xN10/247✦	135	SL81	N10@400	1xN12/247✶	150	SL81	N10@400	1xN16/247✶
4,500	155	SL81	N10@400	1xN10/247✦	155	SL81	N10@400	1xN12/247✶	155	SL81	N10@350	1xN16/247✶
5,000	170	SL81	N10@275	1xN10/247✦	170	SL81	N10@275	1xN12/247✶	170	SL81	N10@200	1xN16/247✶
5,500	205	RL918T	N12@200	1xN10/247✦	205	RL918T	N12@200	1xN12/247✶	205	RL918T	N12@200	1xN16/247✶
6,000	220	RL1018T	N16@300	1xN10/247✶	220	RL1018T	N16@300	1xN12/247✶	220	RL1018T	N16@300	1xN16/247✶
6,500	265	RL1118T	N16@300	1xN10/247✶	265	RL1118T	N16@300	1xN12/247✶	265	RL1118T	N16@300	1xN16/247✶
7,000	270	RL1118T	N16@275	1xN10/247✶	270	RL1118T	N16@275	1xN16/247✶	270	RL1118T	N16@275	2xN16/247✶

Table 4.11.I KF40® Fire Resistance - Continuous Spans - Floor Live Load 5.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required. (No end spans)

Refer to the start of this section for additional parameters used to calculate the above table.

4.12 KF70® Temporary Propping Tables

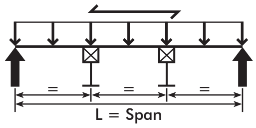
Index of KF70® Temporary Propping Tables

Temporary Propping Tables Notes

1. The tables on the following pages denote maximum allowable centreline to centreline span in millimetres between permanent supports after temporary propping is removed.
2. The practical limit for span to slab depth ratio is considered to be 35 for single span slabs, or 40 for continuous slabs. Values above these limits have been listed in brackets "[ ]". The use of the results in brackets must be confirmed with the structural engineer or a Fielders representative as the long term serviceability and composite performance of the resulting concrete slab may not be suitable for the project application.
3. Allowance has been made for ponding of wet concrete due to decking deflection, density 2400kg/m^3.
4. Loading is considered in accordance with AS 1170.0:2002, AS 2327.1:2003, AS 3610:1995 with a Stage III construction live load allowance of 1.0kPa in accordance with AS 2327.1:2003 Appendix F.
5. The requirements for Stages II & IV material stacking loads, in accordance with Appendix F of AS2327.1: 2003, are assumed to be zero.
6. It is recommended that an experienced structural engineer design the composite slab to ensure sufficient capacity to meet strength and long term deflection requirements.
7. The temporary propping tables have been prepared for a span/150 & span/240 deflection criteria. A span/240 deflection is generally considered aesthetically satisfactory for exposed soffits.
8. These tables are based upon effective section properties of the sheeting calculated in accordance to AS 4600:2005.
9. Care must be exercised when placing concrete to avoid mounding.
10. Wide ply strips, of 300 mm wide, shall be provided to prevent any concentrated loads being applied to the sheeting, particularly for exposed soffits, to avoid direct point loading of the sheet overlap ribs and unsupported edges of the sheeting.
11. When using the table for two or more spans the adjacent spans should not differ in length by more than 5%.
12. A maximum sheet length of 12m has been considered.
13. A minimum bearing width of the permanent support has been considered to be 50mm.
14. Fielders recommend a gauge of 1.00 mm BMT for exposed soffits in propped applications to avoid creasing of steel decking. Please contact your local KingFlor representative for further information.

KF70® Equally Spaced Props - Single Spans
Maximum Spans (mm) for Deflection L/150

KF70®



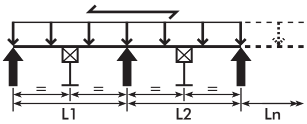
L/150

Dcs (mm)	Unpropped		1 Row of Props		2 Rows of Props	
	0.75 BMT	1.00 BMT	0.75 BMT	1.00 BMT	0.75 BMT	1.00 BMT
120	2,850	3,100	[7,450]	[8,100]	[10,450]	[11,250]
130	2,800	3,000	[7,200]	[7,850]	[10,150]	[10,950]
140	2,700	2,900	[6,950]	[7,700]	[9,900]	[10,650]
150	2,650	2,850	[6,750]	[7,500]	[9,650]	[10,450]
160	2,600	2,800	[6,550]	[7,350]	[9,450]	[10,200]
170	2,550	2,750	[6,400]	[7,200]	[9,250]	[10,000]
180	2,500	2,700	[6,200]	[7,050]	[9,100]	[9,800]
190	2,450	2,650	[6,050]	[6,950]	[8,950]	[9,650]
200	2,400	2,600	5,900	[6,850]	[8,800]	[9,500]
210	2,350	2,550	5,750	[6,700]	[8,650]	[9,350]
220	2,300	2,500	5,650	[6,600]	[8,500]	[9,200]
230	2,300	2,450	5,500	6,500	[8,400]	[9,050]
240	2,250	2,450	5,400	6,350	[8,250]	[8,900]
250	2,250	2,400	5,300	6,250	[8,150]	[8,800]

Table 4.12.A KF70® Equally Spaced Props - Single Spans - L/150

KF70® Equally Spaced Props - Two or More Spans
Maximum Spans (mm) for Deflection L/150

KF70®



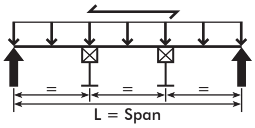
L/150

Dcs (mm)	Unpropped		1 Row of Props		2 Rows of Props	
	0.75 BMT	1.00 BMT	0.75 BMT	1.00 BMT	0.75 BMT	1.00 BMT
120	3,450	3,750	[7,100]	[7,650]	[10,450]	[11,250]
130	3,350	3,650	[6,900]	[7,450]	[10,150]	[10,950]
140	3,300	3,550	[6,750]	[7,250]	[9,900]	[10,650]
150	3,200	3,450	[6,600]	[7,100]	[9,650]	[10,450]
160	3,150	3,400	[6,450]	[6,950]	[9,450]	[10,200]
170	3,050	3,300	6,300	[6,800]	[9,250]	[10,000]
180	3,000	3,250	6,200	6,700	[9,100]	[9,800]
190	2,950	3,200	6,100	6,550	[8,950]	[9,650]
200	2,900	3,150	5,950	6,450	[8,800]	[9,500]
210	2,850	3,100	5,900	6,350	[8,650]	[9,350]
220	2,800	3,050	5,800	6,250	8,500	[9,200]
230	2,800	3,000	5,650	6,150	8,400	9,050
240	2,750	3,950	5,550	6,050	8,250	8,900
250	2,700	2,900	5,450	6,000	8,150	8,800

Table 4.12.B KF70® Equally Spaced Props - Two or More Spans - L/150

KF70® Equally Spaced Props - Single Spans
Maximum Spans (mm) for Deflection L/240

KF70®



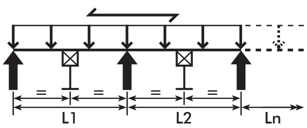
L/240

Dcs (mm)	Unpropped		1 Row of Props		2 Rows of Props	
	0.75 BMT	1.00 BMT	0.75 BMT	1.00 BMT	0.75 BMT	1.00 BMT
120	2,500	2,700	[6,550]	[7,100]	[9,100]	[9,850]
130	2,400	2,600	[6,400]	[6,900]	[8,850]	[9,550]
140	2,350	2,550	[6,200]	[6,700]	[8,650]	[9,300]
150	2,300	2,500	[6,050]	[6,550]	[8,400]	[9,100]
160	2,250	2,400	[5,950]	[6,400]	[8,250]	[8,900]
170	2,200	2,350	5,800	[6,250]	[8,050]	[8,700]
180	2,150	2,350	5,700	6,150	[7,900]	[8,500]
190	2,100	2,300	5,600	6,050	[7,750]	[8,350]
200	2,100	2,250	5,500	5,900	[7,600]	[8,200]
210	2,050	2,200	5,400	5,800	[7,500]	[8,100]
220	2,000	2,150	5,300	5,750	7,350	[7,950]
230	2,000	2,150	5,200	5,650	7,250	7,850
240	1,950	2,100	5,150	5,550	7,150	7,700
250	1,900	2,100	5,050	5,500	7,050	7,600

Table 4.12.C KF70® Equally Spaced Props - Single Spans - L/240

KF70® Equally Spaced Props - Two or More Spans
Maximum Spans (mm) for Deflection L/240

KF70®



L/240

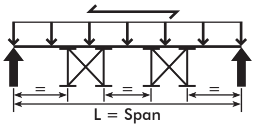
Dcs (mm)	Unpropped		1 Row of Props		2 Rows of Props	
	0.75 BMT	1.00 BMT	0.75 BMT	1.00 BMT	0.75 BMT	1.00 BMT
120	3,000	3,250	[6,200]	[6,700]	[9,100]	[9,850]
130	2,950	3,150	[6,050]	[6,500]	[8,850]	[9,550]
140	2,850	3,100	[5,850]	[6,350]	[8,650]	[9,300]
150	2,800	3,000	5,750	[6,200]	[8,400]	[9,100]
160	2,750	2,950	5,600	6,050	[8,250]	[8,900]
170	2,650	2,900	5,500	5,900	[8,050]	[8,700]
180	2,600	2,800	5,350	5,800	[8,000]	[8,500]
190	2,550	2,750	5,250	5,700	[7,900]	[8,350]
200	2,500	2,700	5,150	5,600	7,750	[8,200]
210	2,500	2,650	5,100	5,500	7,650	[8,100]
220	2,450	2,650	5,000	5,400	7,500	[8,000]
230	2,400	2,600	4,950	5,350	7,400	8,000
240	2,350	2,550	4,850	5,250	7,300	7,900
250	2,350	2,500	4,800	5,200	7,200	7,800

Table 4.12.D KF70® Equally Spaced Props - Two or More Spans - L/240

KF70® Frame Propping - 1200mm Frame Size

Maximum Spans (mm) for Deflection L/150

KF70®



L/150

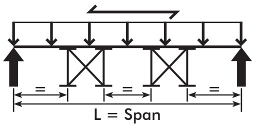
Dcs (mm)	1 Frame		2 Frame	
	0.75 BMT	1.00 BMT	0.75 BMT	1.00 BMT
120	[7,300]	[7,800]	[11,700]	[12,450]
130	[7,200]	[7,700]	[11,400]	[12,150]
140	[7,100]	[7,500]	[11,250]	[12,000]
150	[6,900]	[7,400]	[11,100]	[11,850]
160	[6,800]	[7,300]	[10,950]	[11,550]
170	[6,700]	[7,200]	[10,800]	[11,400]
180	[6,600]	[7,100]	[10,650]	[11,250]
190	6,500	[7,000]	[10,500]	[11,100]
200	6,400	6,900	[10,350]	[10,950]
210	6,400	6,800	[10,200]	[10,800]
220	6,300	6,700	[10,050]	[10,800]
230	6,200	6,600	[10,050]	[10,650]
240	6,100	6,600	[9,900]	[10,500]
250	6,100	6,500	[9,750]	[10,350]

Table 4.12.E KF70® Frame Propping - 1200mm Frame Size - Maximum Spans (mm) for Deflection L/150

KF70® Frame Propping - 1500mm Frame Size

Maximum Spans (mm) for Deflection L/150

KF70®



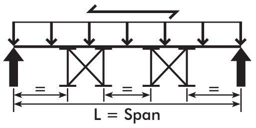
L/150

Dcs (mm)	1 Frame		2 Frame	
	0.75 BMT	1.00 BMT	0.75 BMT	1.00 BMT
120	[7,600]	[8,100]	[12,150]	[12,900]
130	[7,400]	[7,900]	[12,000]	[12,750]
140	[7,300]	[7,800]	[11,850]	[12,450]
150	[7,200]	[7,700]	[11,550]	[12,300]
160	[7,100]	[7,600]	[11,400]	[12,150]
170	[7,000]	[7,400]	[11,250]	[12,000]
180	[6,900]	[7,300]	[11,100]	[11,850]
190	[6,800]	[7,200]	[11,100]	[11,700]
200	6,700	[7,200]	[10,950]	[11,550]
210	6,600	7,100	[10,800]	[11,400]
220	6,600	7,000	[10,650]	[11,250]
230	6,500	6,900	[10,500]	[11,250]
240	6,400	6,800	[10,500]	[11,100]
250	6,400	6,800	[10,350]	[10,950]

Table 4.12.F KF70® Frame Propping - 1500mm Frame Size - Maximum Spans (mm) for Deflection L/150

KF70® Frame Propping - 1200mm Frame Size
Maximum Spans (mm) for Deflection L/240

KF70®



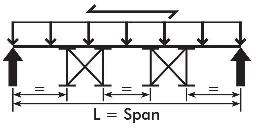
L/240

Dcs (mm)	1 Frame		2 Frame	
	0.75 BMT	1.00 BMT	0.75 BMT	1.00 BMT
120	[6,500]	[6,900]	[10,350]	[11,100]
130	[6,400]	[6,800]	[10,200]	[10,800]
140	[6,200]	[6,700]	[10,050]	[10,650]
150	[6,100]	[6,500]	[9,900]	[10,500]
160	[6,000]	[6,400]	[9,750]	[10,350]
170	5,900	[6,300]	[9,600]	[10,200]
180	5,900	6,200	[9,450]	[10,050]
190	5,800	6,200	[9,300]	[9,900]
200	5,700	6,100	[9,150]	[9,750]
210	5,600	6,000	[9,150]	[9,600]
220	5,600	5,900	[9,000]	[9,600]
230	5,500	5,900	[8,850]	[9,450]
240	5,400	5,800	[8,850]	[9,300]
250	5,400	5,700	8,700	[9,300]

Table 4.12.G KF70® Frame Propping - 1200mm Frame Size - Maximum Spans (mm) for Deflection L/240

KF70® Frame Propping - 1500mm Frame Size
Maximum Spans (mm) for Deflection L/240

KF70®



L/240

Dcs (mm)	1 Frame		2 Frame	
	0.75 BMT	1.00 BMT	0.75 BMT	1.00 BMT
120	[6,800]	[7,200]	[10,950]	[11,550]
130	[6,600]	[7,100]	[10,800]	[11,400]
140	[6,500]	[6,900]	[10,650]	[11,250]
150	[6,400]	[6,800]	[10,500]	[11,100]
160	[6,300]	[6,700]	[10,350]	[10,950]
170	[6,200]	[6,600]	[10,200]	[10,800]
180	6,200	[6,500]	[10,050]	[10,650]
190	6,100	6,400	[9,900]	[10,500]
200	6,000	6,400	[9,750]	[10,350]
210	5,900	6,300	[9,750]	[10,200]
220	5,900	6,200	[9,600]	[10,200]
230	5,800	6,200	[9,600]	[10,050]
240	5,800	6,100	[9,450]	[9,900]
250	5,700	6,000	[9,300]	[9,900]

Table 4.12.H KF70® Frame Propping - 1500mm Frame Size - Maximum Spans (mm) for Deflection L/240

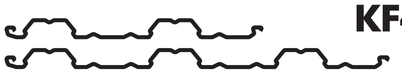
4.13 KF40® Temporary Propping Tables

Index of KF40® Temporary Propping Tables

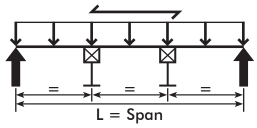
Temporary Propping Tables Notes

1. The tables on the following pages denote maximum allowable centreline to centreline span in millimetres between permanent supports after temporary propping is removed.
2. The practical limit for span to slab depth ratio is considered to be 35 for single span slabs, or 40 for continuous slabs. Values above these limits have been listed in brackets "[ ]". The use of the results in brackets must be confirmed with the structural engineer or a Fielders representative as the long term serviceability and composite performance of the resulting concrete slab may not be suitable for the project application.
3. Allowance has been made for ponding of wet concrete due to decking deflection, density 2400kg/m^3.
4. Loading is considered in accordance with AS 1170.0:2002, AS 2327.1:2003, AS 3610:1995 with a Stage III construction live load allowance of 1.0kPa in accordance with AS 2327.1:2003 Appendix F.
5. The requirements for Stages II & IV material stacking loads, in accordance with Appendix F of AS2327.1: 2003, are assumed to be zero.
6. It is recommended that an experienced structural engineer design the composite slab to ensure sufficient capacity to meet strength and long term deflection requirements.
7. The temporary propping tables have been prepared for a span/150 & span/240 deflection criteria. A span/240 deflection is generally considered aesthetically satisfactory for exposed soffits.
8. These tables are based upon effective section properties of the sheeting calculated in accordance to AS 4600:2005.
9. Care must be exercised when placing concrete to avoid mounding.
10. Wide ply strips, of 300 mm wide, shall be provided to prevent any concentrated loads being applied to the sheeting, particularly for exposed soffits, to avoid direct point loading of the sheet overlap ribs and unsupported edges of the sheeting.
11. When using the table for two or more spans the adjacent spans should not differ in length by more than 5%.
12. A maximum sheet length of 12m has been considered.
13. A minimum bearing width of the permanent support has been considered to be 50mm.
14. Fielders recommend a gauge of 1.00 mm BMT for exposed soffits in propped applications to avoid creasing of steel decking. Please contact your local KingFlor representative for further information.

KF40® Equally Spaced Props - Single Spans
Maximum Spans (mm) for Deflection L/150



KF40®



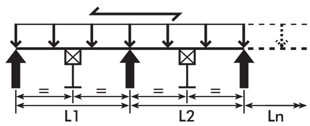
L/150

Dcs (mm)	Unpropped			1 Row of Props			2 Rows of Props		
	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT
90	1,550	2,300	2,500	[3,600]	[5,150]	[5,950]	[5,400]	[7,750]	[8,950]
100	1,550	2,200	2,400	[3,600]	[5,000]	[5,750]	[5,400]	[7,500]	[8,650]
110	1,550	2,150	2,350	3,600	[4,850]	[5,600]	[5,400]	[7,300]	[8,400]
120	1,550	2,100	2,250	3,600	[4,750]	[5,450]	[5,400]	[7,150]	[8,200]
130	1,550	2,000	2,200	3,600	[4,650]	[5,300]	[5,400]	[7,000]	[7,950]
140	1,550	1,950	2,150	3,600	4,550	[5,200]	[5,400]	[6,850]	[7,800]
150	1,550	1,900	2,100	3,550	4,450	5,050	[5,350]	[6,700]	[7,600]
160	1,550	1,850	2,050	3,500	4,350	4,950	5,350	[6,550]	[7,450]
170	1,550	1,850	2,050	3,450	4,300	4,850	5,150	[6,450]	[7,300]
180	1,550	1,800	2,000	3,350	4,200	4,800	5,050	6,300	[7,200]
190	1,550	1,750	1,950	3,300	4,100	4,700	5,000	6,200	[7,050]
200	1,550	1,700	1,900	3,250	4,050	4,600	4,900	6,100	6,950
210	1,500	1,700	1,900	3,200	4,000	4,550	4,800	6,000	6,850
220	1,500	1,650	1,850	3,150	3,900	4,500	4,750	5,900	6,750
230	1,450	1,650	1,800	3,100	3,850	4,400	4,650	5,800	6,650
240	1,450	1,600	1,800	3,050	3,800	4,350	4,600	5,700	6,550
250	1,400	1,600	1,750	3,000	3,750	4,300	4,550	5,650	6,450

Table 4.13.A KF40® Equally Spaced Props - Single Spans - Maximum Spans (mm) for Deflection L/150

KF40® Equally Spaced Props - Two or More Spans
Maximum Spans (mm) for Deflection L/150

KF40®

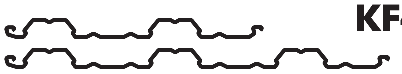


L/150

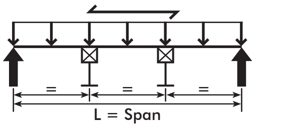
Dcs (mm)	Unpropped			1 Row of Props			2 Rows of Props		
	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT
90	1,850	2,600	3,050	3,600	[5,150]	[5,950]	[5,400]	[7,750]	[8,950]
100	1,850	2,550	2,950	3,600	[5,000]	[5,750]	[5,400]	[7,500]	[8,650]
110	1,850	2,450	2,850	3,600	[4,850]	[5,600]	[5,400]	[7,300]	[8,400]
120	1,850	2,400	2,750	3,600	4,750	[5,450]	[5,400]	[7,150]	[8,200]
130	1,850	2,350	2,700	3,600	4,650	[5,300]	[5,400]	[7,000]	[7,950]
140	1,850	2,300	2,650	3,600	4,550	5,200	5,400	[6,850]	[7,800]
150	1,800	2,250	2,600	3,550	4,450	5,050	5,350	[6,700]	[7,600]
160	1,800	2,200	2,550	3,500	4,350	4,950	5,250	[6,550]	[7,450]
170	1,750	2,200	2,500	3,450	4,300	4,850	5,150	6,450	[7,300]
180	1,700	2,150	2,450	3,350	4,200	4,800	5,050	6,300	7,200
190	1,700	2,100	2,400	3,300	4,100	4,700	5,000	6,200	7,050
200	1,650	2,050	2,350	3,250	4,050	4,600	4,900	6,100	6,950
210	1,650	2,050	2,300	3,200	4,000	4,550	4,800	6,000	6,850
220	1,600	2,000	2,300	3,150	3,900	4,500	4,750	5,900	6,750
230	1,600	1,950	2,250	3,100	3,850	4,400	4,650	5,800	6,650
240	1,550	1,950	2,250	3,050	3,800	4,350	4,600	5,700	6,550
250	1,550	1,900	2,200	3,000	3,750	4,300	4,550	5,650	6,450

Table 4.13.B KF40® Equally Spaced Props - Two or More Spans - Maximum Spans (mm) for Deflection L/150

KF40® Equally Spaced Props - Single Spans
Maximum Spans (mm) for Deflection L/240



KF40®

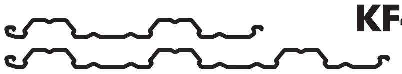


L/240

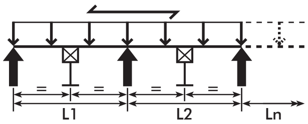
Dcs (mm)	Unpropped			1 Row of Props			2 Rows of Props		
	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT
90	1,550	2,000	2,200	[3,600]	[4,800]	[5,200]	[5,400]	[7,200]	[7,850]
100	1,550	1,900	2,100	[3,600]	[4,600]	[5,050]	[5,400]	[6,900]	[7,550]
110	1,550	1,850	2,050	3,600	[4,450]	[4,850]	[5,400]	[6,700]	[7,300]
120	1,550	1,800	1,950	3,600	[4,350]	[4,650]	[5,400]	[6,500]	[7,100]
130	1,550	1,700	1,900	3,600	4,200	[4,600]	[5,400]	[6,350]	[6,950]
140	1,550	1,650	1,850	3,600	4,100	4,500	[5,400]	[6,200]	[6,750]
150	1,500	1,650	1,800	3,550	4,000	4,400	[5,350]	[6,000]	[6,600]
160	1,450	1,600	1,750	3,500	3,900	4,300	5,250	[5,850]	[6,450]
170	1,450	1,550	1,700	3,450	3,800	4,200	5,150	5,750	[6,350]
180	1,400	1,500	1,700	3,350	3,750	4,150	5,050	5,600	6,200
190	1,350	1,500	1,650	3,300	3,650	4,050	5,000	5,500	6,100
200	1,350	1,450	1,600	3,250	3,600	4,000	4,900	5,400	6,000
210	1,300	1,450	1,600	3,200	3,500	3,900	4,800	5,300	5,850
220	1,300	1,400	1,550	3,150	3,450	3,850	4,750	5,200	5,750
230	1,250	1,400	1,550	3,100	3,400	3,750	4,650	5,100	5,650
240	1,250	1,350	1,500	3,050	3,350	3,700	4,600	5,000	5,600
250	1,250	1,350	1,500	3,000	3,300	3,650	4,550	4,950	5,500

Table 4.13.C KF40® Equally Spaced Props - Single Spans - Maximum Spans (mm) for Deflection L/240

KF40® Equally Spaced Props - Two or More Spans
Maximum Spans (mm) for Deflection L/240



KF40®

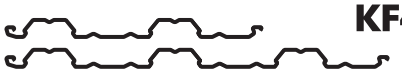


L/240

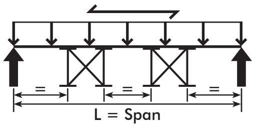
Dcs (mm)	Unpropped			1 Row of Props			2 Rows of Props		
	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT
90	1,850	2,450	2,650	3,600	[4,800]	[5,200]	[5,400]	[7,200]	[7,850]
100	1,850	2,350	2,550	3,600	[4,600]	[5,050]	[5,400]	[6,900]	[7,550]
110	1,850	2,300	2,500	3,600	[4,450]	[4,850]	[5,400]	[6,700]	[7,300]
120	1,850	2,200	2,400	3,600	4,350	4,750	[5,400]	[6,500]	[7,100]
130	1,850	2,150	2,350	3,600	4,200	4,600	[5,400]	[6,350]	[6,950]
140	1,850	2,100	2,300	3,600	4,100	4,500	5,400	[6,200]	[6,750]
150	1,800	2,050	2,250	3,550	4,000	4,400	5,350	6,000	[6,600]
160	1,800	2,000	2,200	3,500	3,900	4,300	5,250	5,850	[6,450]
170	1,750	1,950	2,150	3,450	3,800	4,200	5,150	5,750	6,350
180	1,700	1,900	2,100	3,350	3,750	4,150	5,050	5,600	6,200
190	1,700	1,900	2,000	3,300	3,650	4,050	5,000	5,500	6,100
200	1,650	1,850	2,050	3,250	3,600	4,000	4,900	5,400	6,000
210	1,650	1,800	2,000	3,200	3,500	3,900	4,800	5,300	5,850
220	1,600	1,800	1,950	3,150	3,450	3,850	4,750	5,200	5,750
230	1,600	1,750	1,950	3,100	3,400	3,750	4,650	5,100	5,650
240	1,550	1,700	1,900	3,050	3,350	3,700	4,600	5,000	5,600
250	1,550	1,700	1,900	3,000	3,300	3,650	4,550	4,950	5,500

Table 4.13.D KF40® Equally Spaced Props - Two or More Spans - Maximum Spans (mm) for Deflection L/240

KF40® Frame Propping - 1200mm Frame Size
Maximum Spans (mm) for Deflection L/150



KF40®



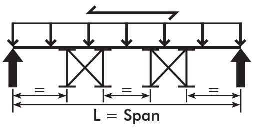
L/150

Dcs (mm)	1 Frame			2 Frame		
	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT
100	[4,300]	[5,300]	[5,700]	[7,050]	[8,700]	[9,150]
110	[4,100]	[5,200]	[5,600]	[6,750]	[8,400]	[9,000]
120	3,800	[5,100]	[5,500]	[6,300]	[8,250]	[8,850]
130	3,600	[5,000]	[5,400]	[6,000]	[8,100]	[8,700]
140	3,400	4,900	[5,300]	[5,700]	[7,950]	[8,550]
150	3,200	4,800	5,200	[5,400]	[7,950]	[8,400]
160	3,000	4,700	5,100	5,100	[7,800]	[8,400]
170	2,900	4,700	5,000	4,950	[7,650]	[8,250]
180	2,800	4,600	5,000	4,800	[7,500]	[8,100]
190	2,700	4,500	4,900	4,650	[7,500]	[7,950]
200	2,500	4,500	4,800	4,350	[7,350]	[7,950]
210	2,400	4,400	4,800	4,200	7,350	[7,800]
220	2,300	4,400	4,700	4,050	7,200	7,650
230	2,200	4,300	4,700	3,900	7,200	7,650
240	2,100	4,200	4,600	-	6,900	7,650
250	-	4,100	4,600	-	6,750	7,500

Table 4.13.G KF40® Frame Propping - 1200mm Frame Size - Maximum Spans (mm) for Deflection L/150

KF40® Frame Propping - 1500mm Frame Size
Maximum Spans (mm) for Deflection L/150

KF40®

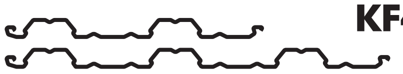


L/150

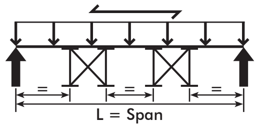
Dcs (mm)	1 Frame			2 Frame		
	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT
100	[4,100]	[5,600]	[6,100]	[6,900]	[9,300]	[9,900]
110	3,800	[5,500]	[5,900]	[6,450]	[9,150]	[9,750]
120	3,600	[5,500]	[5,800]	[6,000]	[9,000]	[9,600]
130	3,400	[5,400]	[5,700]	[5,700]	[8,850]	[9,450]
140	3,200	[5,300]	[5,600]	[5,400]	[8,700]	[9,300]
150	3,000	5,200	[5,600]	5,250	[8,550]	[9,150]
160	-	5,100	5,500	-	[8,550]	[9,000]
170	-	5,100	5,400	-	[8,400]	[9,000]
180	-	5,000	5,300	-	[8,250]	[8,850]
190	-	4,900	5,300	-	[8,100]	[8,700]
200	-	4,700	5,200	-	[7,800]	[8,700]
210	-	4,500	5,100	-	[7,500]	[8,550]
220	-	4,300	5,100	-	7,200	[8,400]
230	-	4,100	5,100	-	6,900	[8,400]
240	-	3,900	5,000	-	6,600	8,400
250	-	3,700	5,000	-	6,300	8,250

Table 4.13.G KF40® Frame Propping - 1500mm Frame Size - Maximum Spans (mm) for Deflection L/150

KF40® Frame Propping - 1200mm Frame Size
Maximum Spans (mm) for Deflection L/240



KF40®



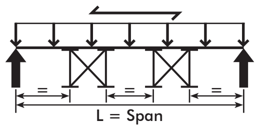
L/240

Dcs (mm)	1 Frame			2 Frame		
	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT
100	[4,300]	[4,700]	[5,100]	[7,050]	[7,650]	[8,250]
110	[4,100]	[4,600]	[5,000]	[6,750]	[7,500]	[8,100]
120	3,800	[4,500]	[4,900]	[6,300]	[7,500]	[7,950]
130	3,600	4,400	[4,800]	[6,000]	[7,350]	[7,800]
140	3,400	4,400	4,700	[5,700]	[7,200]	[7,650]
150	3,200	4,300	4,600	[5,400]	[7,050]	[7,500]
160	3,100	4,200	4,500	5,250	[6,900]	[7,500]
170	2,900	4,200	4,500	4,950	[6,900]	[7,350]
180	2,800	4,100	4,400	4,800	[6,750]	[7,200]
190	2,700	4,000	4,300	4,650	[6,750]	[7,200]
200	2,500	4,000	4,300	4,350	6,600	[7,050]
210	2,400	4,000	4,200	-	6,600	7,050
220	-	3,900	4,200	-	6,450	6,900
230	-	3,900	4,100	-	6,450	6,900
240	-	3,700	4,100	-	6,450	6,750
250	-	3,700	4,100	-	6,300	6,750

Table 4.13.G KF40® Frame Propping - 1200mm Frame Size - Maximum Spans (mm) for Deflection L/240

KF40® Frame Propping - 1500mm Frame Size
Maximum Spans (mm) for Deflection L/240

KF40®



L/240

Dcs (mm)	1 Frame			2 Frame		
	0.60 BMT	0.75 BMT	1.00 BMT	0.60 BMT	0.75 BMT	1.00 BMT
100	[4,100]	[5,100]	[5,500]	[6,900]	[8,550]	[9,000]
110	3,800	[5,000]	[5,400]	[6,450]	[8,400]	[8,850]
120	3,600	[4,900]	[5,300]	[6,150]	[8,250]	[8,700]
130	3,400	[4,800]	[5,200]	[5,700]	[8,100]	[8,550]
140	-	4,800	[5,100]	-	[7,950]	[8,400]
150	-	4,700	5,000	-	[7,800]	[8,250]
160	-	4,600	4,900	-	[7,800]	[8,250]
170	-	4,600	4,900	-	[7,650]	[8,100]
180	-	4,500	4,800	-	[7,650]	[7,950]
190	-	4,500	4,700	-	[7,500]	[7,950]
200	-	4,400	4,700	-	[7,500]	[7,800]
210	-	4,400	4,700	-	7,350	[7,800]
220	-	4,300	4,600	-	7,200	7,650
230	-	4,100	4,600	-	6,900	7,650
240	-	3,900	4,500	-	6,750	7,650
250	-	3,700	4,500	-	6,450	7,500

Table 4.13.G KF40® Frame Propping - 1500mm Frame Size - Maximum Spans (mm) for Deflection L/240

4.14 Installation Guidelines for KF70® and KF40®

Temporary Propping for KF40® and KF70®

If temporary propping is required, props should be placed at the correct centres prior to laying the KF40 or KF70 sheets. Generally timber or steel bearers with a minimum dimension of 75mm x 75mm are used for vertical props. The props should be installed so as to prevent settlement during loading by wet concrete and other construction loads.

Note: Wide ply strips, of 300 mm wide, may 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 its full 28 day strength.

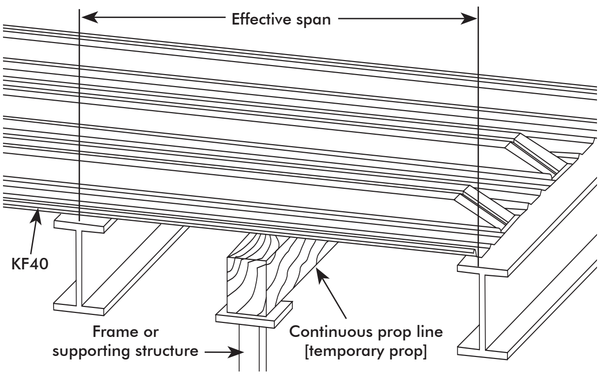


Figure 4.14.A KF40® Temporary Propping (KF70® similar)

Laying KF70® or KF40®

1. Place the KF40/KF70 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/KF70 by locking the larger female rib over the male rib as shown in figure 4.14.B.

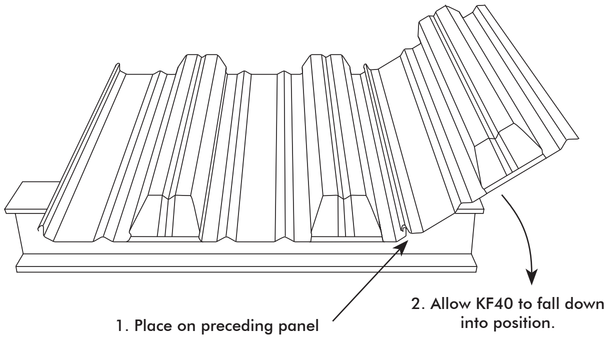


Figure 4.14.B Laying KF40® (KF70® Similar).

3. In situations where tilting of the sheet is not possible, Fielders are able to produce the KF70 or KF40 with an 'open lap' on request. This enables the sheets to be lapped and engaged by simply placing one lap on the other and applying pressure. In this instance, the lap must be crimped together as shown in figure 4.14.C. Sheets need to be crimped at 450mm centres.

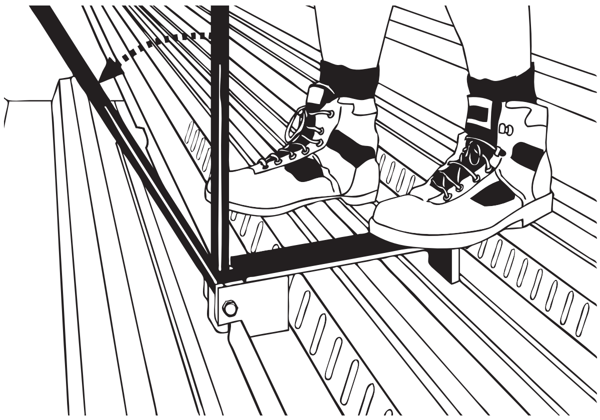


Figure 4.14.C KF70® Crimping Tool

Fasteners and Locations for KF70® and KF40®

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/KF70 must be temporarily held in place against wind and other effects until the concrete is poured.

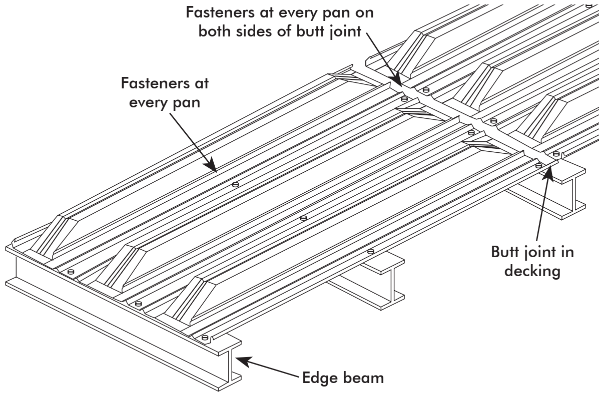


Figure 4.14.D KF40® Fasteners and Locations (KF70® Similar)

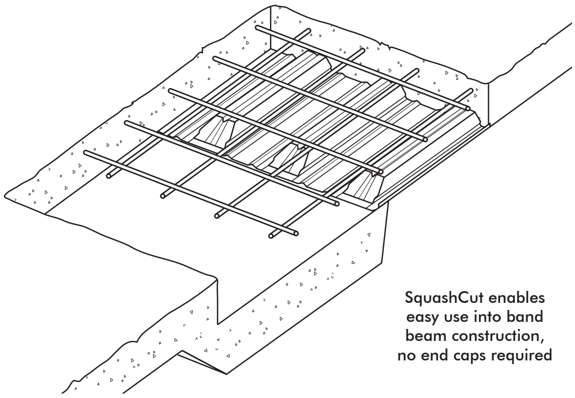


Figure 4.14.E SquashCut/Band Beam Detail

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 3600:2001 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.

Concrete Additives

Concrete additives which aid the flow or workability of the concrete may affect the composite bond between the KF70 and the concrete. Before using any additives, consult your structural engineer or Fielders representative for advice.

SquashCut™ KF70® and KF40®

KF40 and KF70 are available with a standard SquashCut end. This removes the need for end infills and other systems to stop the concrete pouring out of the trapezoidal void.

Penetrations

Should it be necessary to provide a hole through the floor decking, the sheeting should only be cut after curing of the concrete. Before the actual concrete pour, any openings should be boxed out with timber shuttering or dense polystyrene blocks.

For isolated openings at right angles to the deck span, Fielders offer the following guidelines which must always be checked and approved by the structural engineer:

- penetrations up to 200mm square may be acceptable without additional reinforcement.
- penetrations between 200mm and 500mm square may require additional reinforcement to trim the opening, designed in accordance with AS 3600:2001.
- penetrations greater than 500mm square typically require trimming steelwork support to be supplied by the fabricator.
- A close group of penetrations transverse to the profile direction should be considered as a single large penetration.

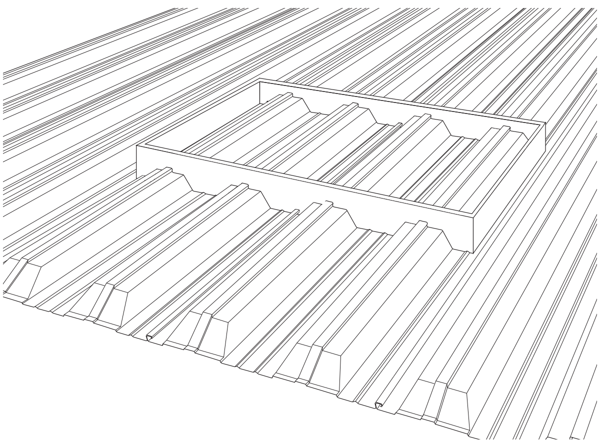


Figure 4.14.F KF70® Penetrations

4.15 Accessories for KF70® and KF40®

The following accessories are manufactured for the KingFlor range. For availability and pricing please refer to the Fielders Price Book.

Fielders are able to make flashings to suit a range of needs such as slab infills, pour breaks etc. For further information please contact your local Fielders representative.

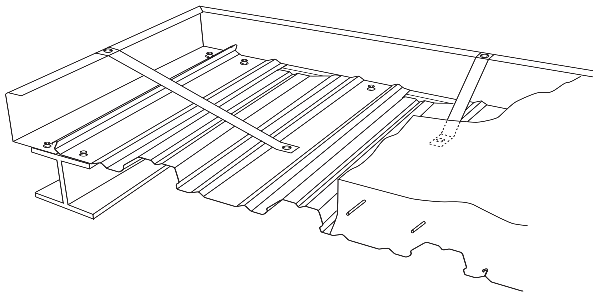


Figure 4.15.D KF40® Edge Form (KF70® similar)

Edge Form / Flashings

Galvanised steel edge forms can be used for the retention of wet concrete to the correct level at the decked floor perimeters. Easy and economical, it is custom made from galvanised steel in lengths between 1 and 6 metres long.

The bottom edge of the KF40/KF70 edge form is slipped between the KF40/KF70 sheet and the beam or wall below. Then it is usually shot-fired to the steel support structure or to the KF40/KF70 deck and the top of the trim is connected back to the decking with restraint straps at approximately 600mm centres using either pop-rivets or self-drilling screws.

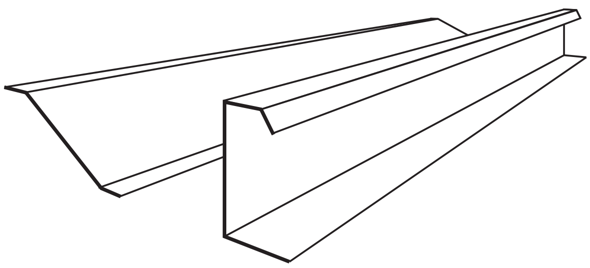


Figure 4.15.A Edge Form and Band Beam Flashings

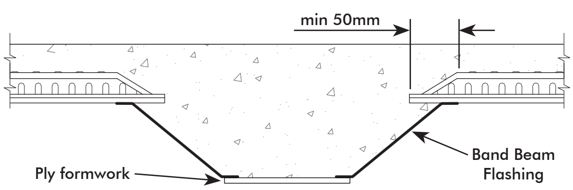


Figure 4.15.B Band Beam Flashing

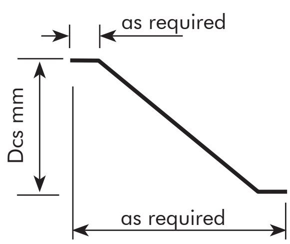


Figure 4.15.C Band Beam Flashing Dimensions

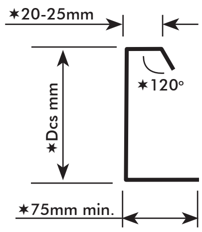


Figure 4.15.E Standard Edge Form Dimensions

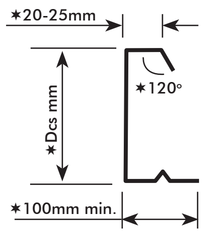


Figure 4.15.F Edge Form with Drip Grove Dimensions

* All dimensions can be altered to suit your project.

Edge Form Selector
Maximum Cantilever (mm)

Edge Trim Depth (mm)	Galv. Steel Edge Trim Thickness (mm)			
	1.0	1.2	1.6	2.0
130	100	125	160	195
150	0	115	150	185
200	N/R	100	130	160
250	N/R	0	100	135
300	N/R	N/R	0	100
350	N/R	N/R	N/R	0

Table 4.15.A Edge Form Selector

Note: N/R = not recommended

KF70® End Infill

Where ever SquashCut is not used the ends of the KF70 profile can be sealed with either the KF70 metal end cap or the KF70 polystyrene infill piece, both shown below and available from Fielders.

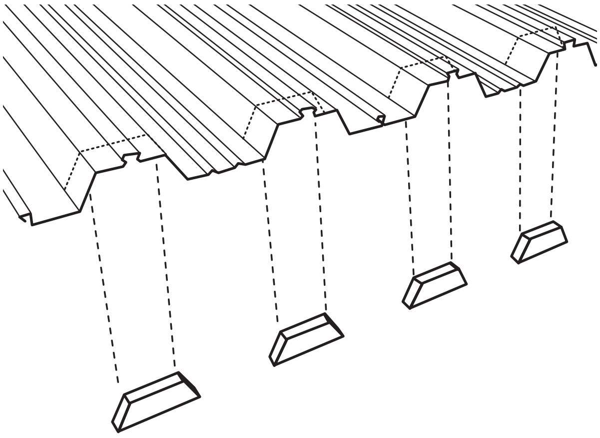


Figure 4.15.G KF70® Polystyrene Infill Piece

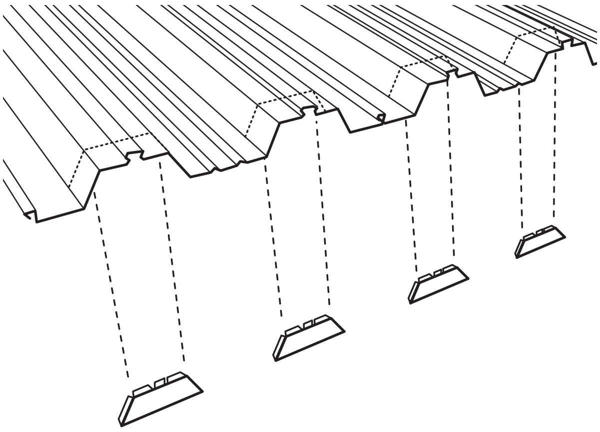


Figure 4.15.H KF70® Metal Infill Piece

KF70® Concrete Pour Break

The concrete pour break is designed to shore off areas not intended to be concreted on KF70 decking.

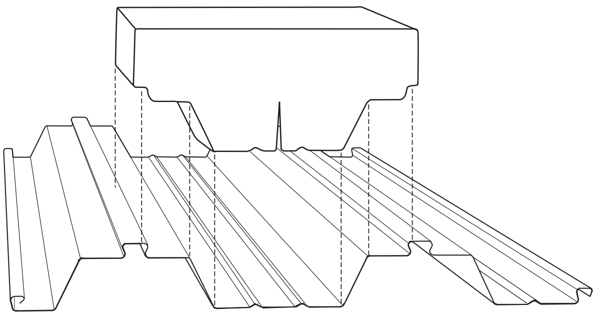


Figure 4.15.I KF70® Concrete Pour Break

KF70® Service Hangers

The 15mm high raised dovetail stiffener allows for the quick and easy suspension of services once the slab has sufficiently hardened.

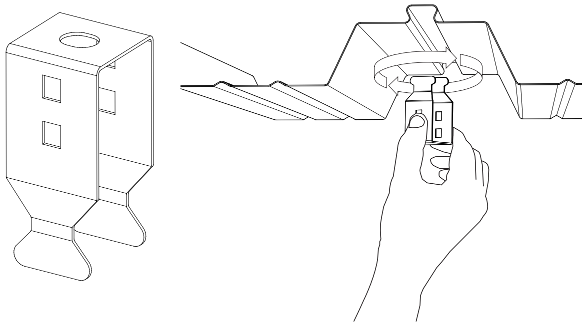


Figure 4.15.J KF70® Suspension Bracket

The KF70 Suspension Brackets are threaded to accommodate metric bolts and threaded rods. The KF70 Suspension Brackets are fixed by being inserted into the raised dovetail of the profile and rotated 90 degrees.

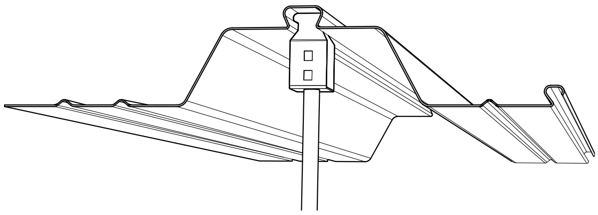


Figure 4.15.K KF70® Suspension Bracket Fixings 1

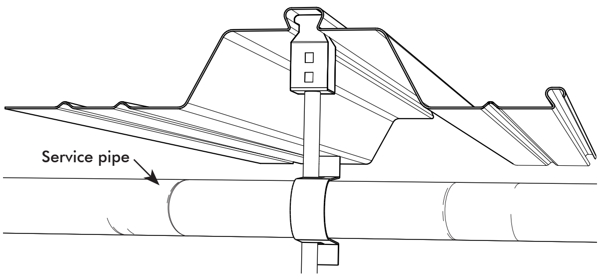


Figure 4.15.L KF70® Suspension Bracket Fixings 2

4.16 KF70® and KF40® Construction Details

Below are some typical construction details for the use of KF70 and KF40. These are also available electronically from Fielders for use where appropriate.

You can download these details in CAD format from: www.fielders.com.au

Note: All reinforcement as per engineer's details.

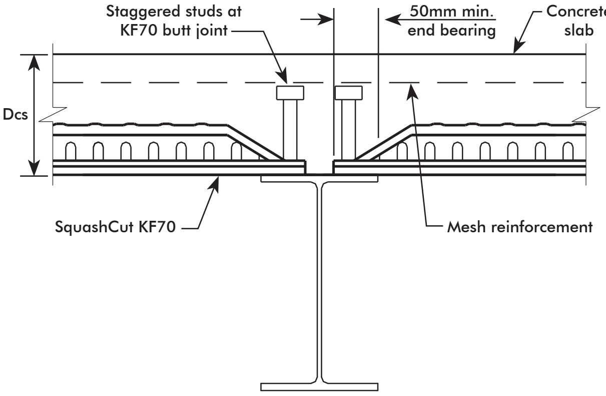


Figure 4.16.A KF70® Butt Joint Detail

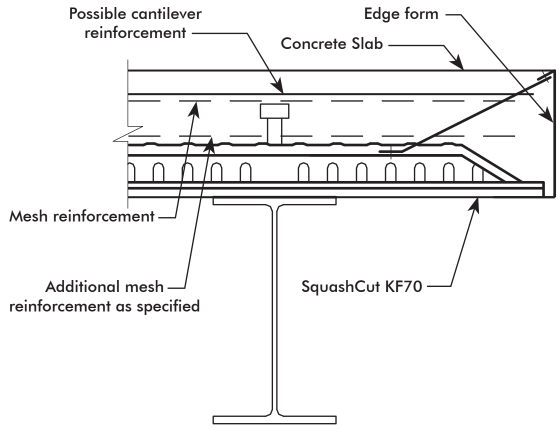


Figure 4.16.D KF70® End Cantilever Detail

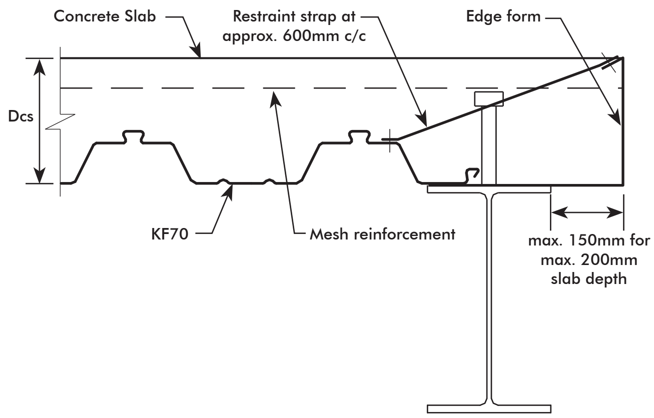


Figure 4.16.B KF70® Perimeter Detail

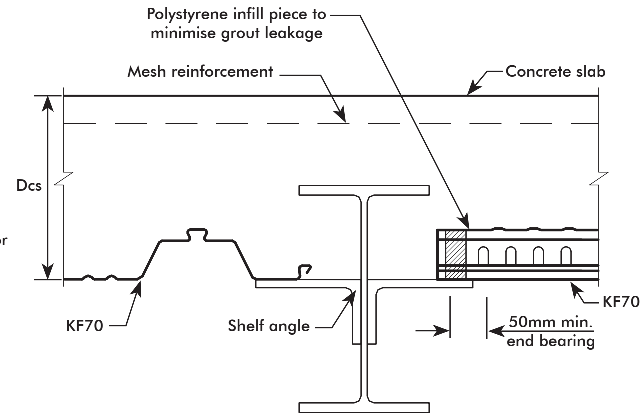


Figure 4.16.E KF70® Shelf Angle Detail

Note: SquashCut not shown.

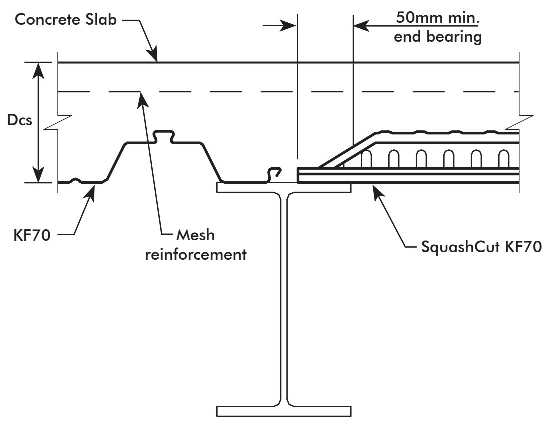


Figure 4.16.C KF70® Direction Change Detail

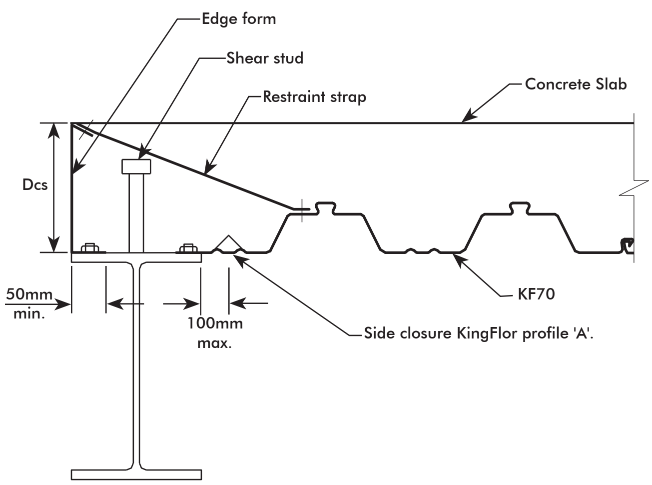


Figure 4.16.F Composite Beam Design Min. Edge Distance 6d to ℄ Stud from Edge of Slab

Cantilevers Notes:

1. Construction stage deck cantilevers shall be limited to the lesser of (a) 1/4 x adjacent span, or (b) 600mm.
2. Decking acts as a permanent formwork only for cantilever. Reinforcement for the cantilever should be designed by Engineer.

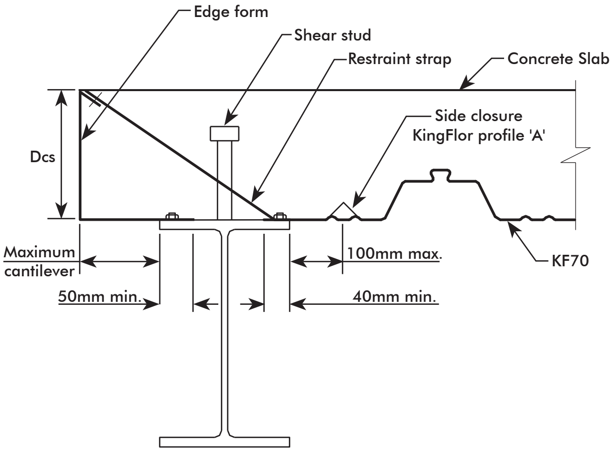


Figure 4.16.G Side Detail - KingFlor Cut to Width

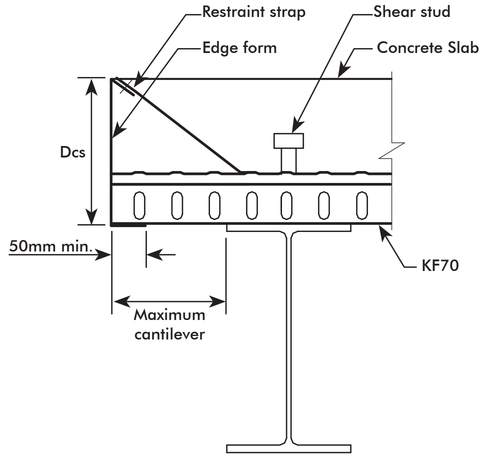


Figure 4.16.J End Detail KingFlor Cantilever

Note: SquashCut not shown.

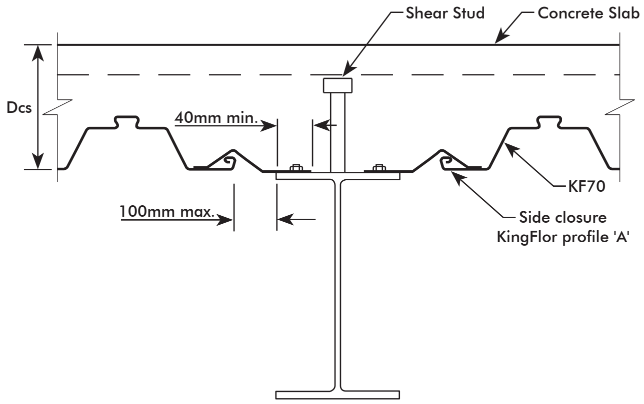


Figure 4.16.H KF70® Intermediate Beam Details

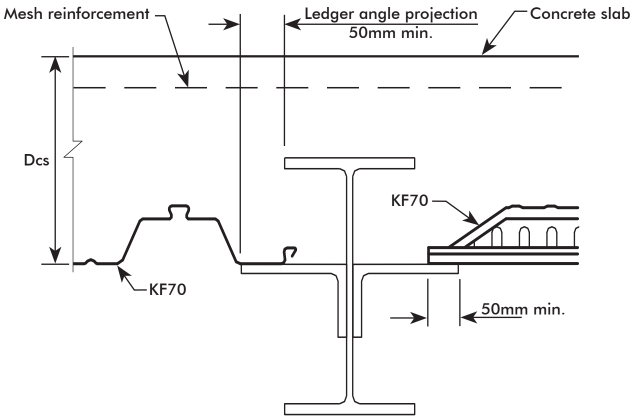


Figure 4.16.K Intermediate Beam KF70® Change of Direction with Ledger Angle

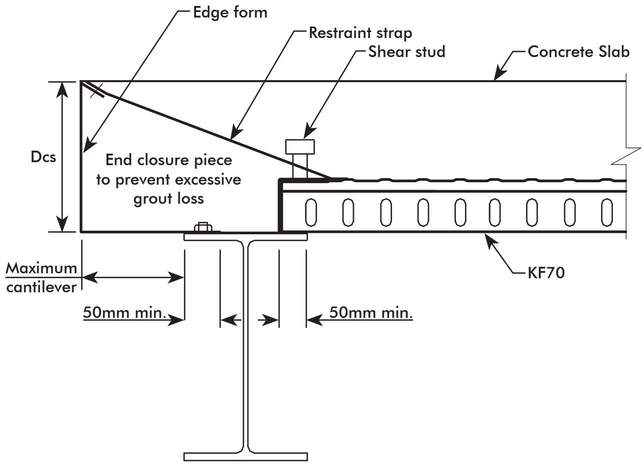


Figure 4.16.I KF70® End Detail using Closure Angle

Note: SquashCut not shown.

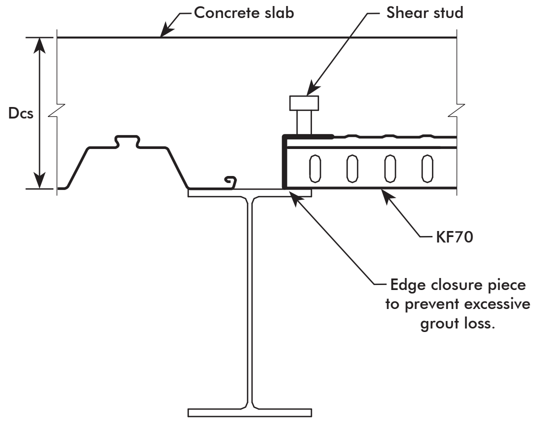


Figure 4.16.L Intermediate Beam KF70® Change of Direction

Note: SquashCut not shown.

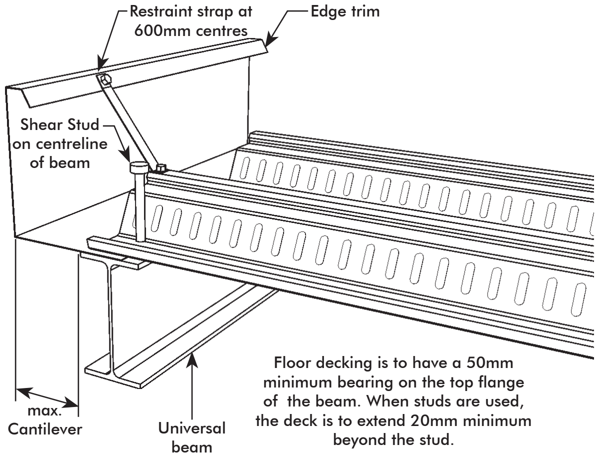


Figure 4.16.M KF70® Typical End Detail

Note: SquashCut not shown.

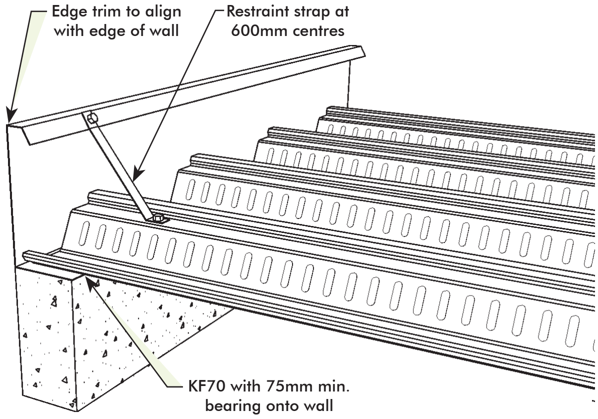


Figure 4.16.P Typical Wall End Detail for KF70®

Note: SquashCut not shown.

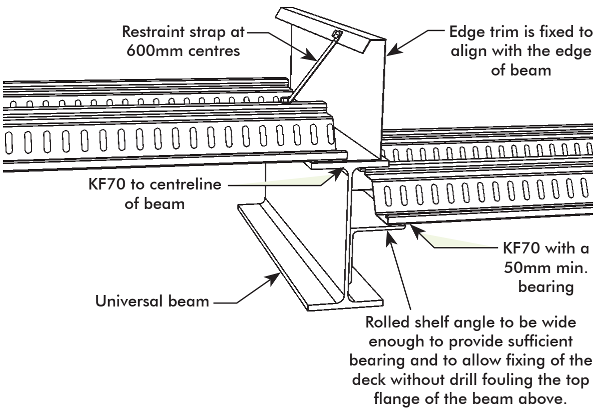


Figure 4.16.N KF70® Step in Floor Detail

Note: SquashCut not shown.

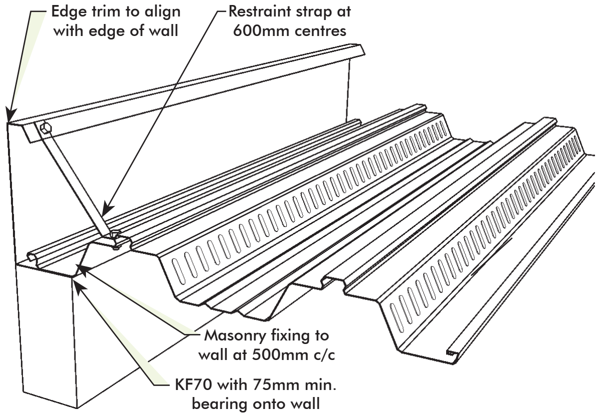


Figure 4.16.Q Typical Wall Side Detail for KF70®

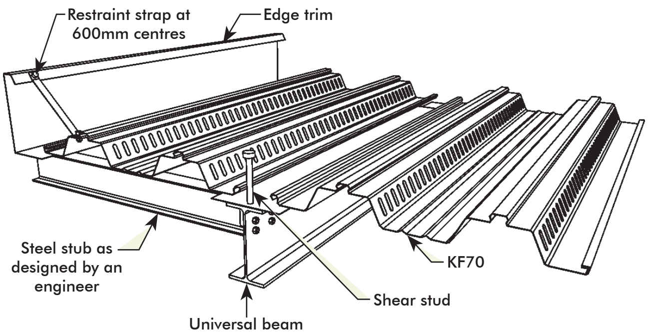


Figure 4.16.O KF70® Side Cantilever with Stub Bracket

Note: SquashCut not shown.

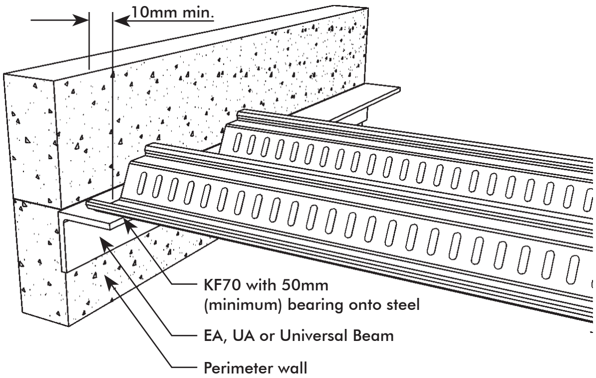


Figure 4.16.R KF70® Deck Inside of Wall Detail

Note: SquashCut not shown.

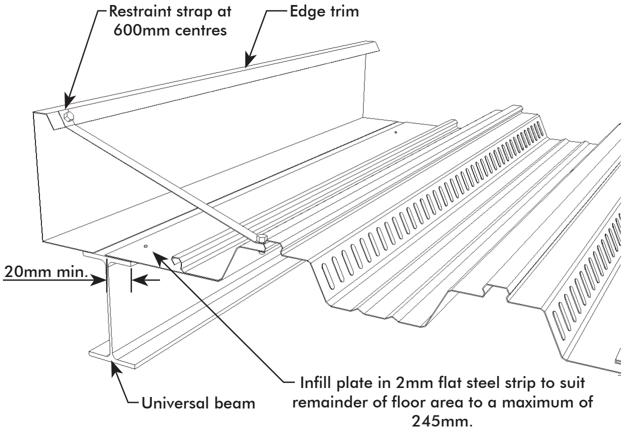


Figure 4.16.S KF70® Typical Edge with Infill Plate

Appendices

Appendix A FibreFlor™

As a form of secondary reinforcement to control cracks in concrete due to shrinkage and temperature, reinforcing steel mesh is increasingly found to be impractical and inefficient. It is subjected to time consuming and labour-intensive issues found in delivery, lifting and placement of the mesh and also any health and safety concerns. With the increasing demands of faster construction and savings in costs, builders and engineers alike seeking for better alternatives to steel mesh.

An innovative option to traditional steel wire mesh reinforcement is the newly developed FibreFlor™ system. The system incorporates KingFlor decking profiles with a combination of steel and synthetic fibres.

FibreFlor is a union of Fielders' KingFlor steel decking and Novomesh™ fibres. It aims to replace the need for steel mesh usage in construction, thus eliminating any issues that may exist with the traditional reinforcing option.

FibreFlor™ delivers significant benefits in terms of overall construction cost and time. The Novomesh™ fibres is mixed with the wet concrete and poured directly onto the steel decking. Cost savings is delivered by the reduction of labour and time taken, compared to steel mesh reinforcement.

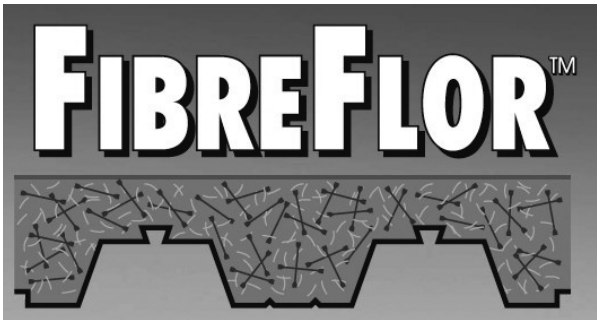
Figure A.A **Concrete Mixed with Fibres Poured Directly onto Steel Decking**

Figure A.B **FibreFlor™ Concrete Mix**

The Novomesh™ fibre system is a combination of steel and synthetic polypropylene fibres.

The blending of both types of fibres presents an effective method of crack control. The fibres work by holding together the cracks in the concrete slab. The steel fibres provide high levels of ductility to the concrete slab, also serving as long term crack control. The benefits of the synthetic fibres are in short term crack control, reducing cracking from plastic shrinkage and settlement. The effectiveness of the Novomesh fibre system is equivalent to that of reinforcing mesh, if not more superior.

FibreFlor™ decking systems meets a fire rating of up to 120 minutes, having been extensively tested in NAMAS certified fire testing facilities.



The presence of fibres also reduces, and may eliminate, the amount of conventional transverse reinforcement needed to control longitudinal splitting in composite beam applications with welded shear studs.

Benefits of FibreFlor:

- Up to 20% on site programme savings.
- No lifting and handling issues for the installation of mesh reinforcement.
- Easier concrete placement – no trip hazard from mesh.
- No on-site storage requirements
- No lapping or spacer products required

Appendix B PT Plus Design Solutions

Limited research has previously been conducted in the world, into the behaviour of prestressed composite floors incorporating steel decking, and yet in recent times it has become a popular form of construction in Australia due to the economic advantages of using steel decking as a substitute for conventional formwork systems in post-tensioned, concrete-frame buildings.

Structural design engineers normally completely ignore the presence of the steel decking, foregoing some of its benefits and ignoring potential problems, although sometimes they are making arbitrary decisions about the extent to which the steel decking might act as main tensile reinforcement in the direction of the sheeting ribs, in order to justify their designs.

With the development and general acceptance of reliable and efficient partial shear connection strength theory for composite slabs incorporating steel decks that develop strong mechanical resistance, it has been possible to develop a sound method for strength design of post-tensioned composite slabs, with Fielders' KingFlor profiles leading to more efficient economical slab designs.

PT Plus – Moment Capacity Tables for the Economical Design of Post-Tensioned Composite Slabs Incorporating Fielders KingFlor

Fielders' world first research has lead to the development of "PT Plus", a completely new set of design positive moment capacity tables to assist with the design of one-way, post-tensioned composite slabs incorporating Fielders' KingFlor composite steel formwork profiles and bonded prestressing strands as tensile reinforcement in the slab bottom face.

Fielders are able to assist structural design engineers in incorporating a PT Plus solution to their project, thereby accessing potential savings by utilising the KingFlor's contribution to the slab as main reinforcement.

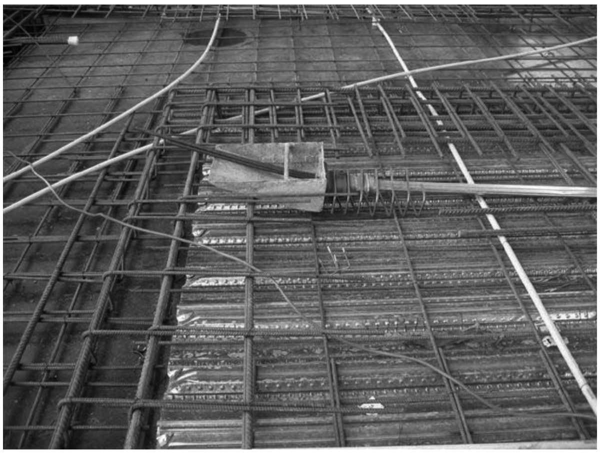


Figure B.A **Post tensioning cable on KingFlor**

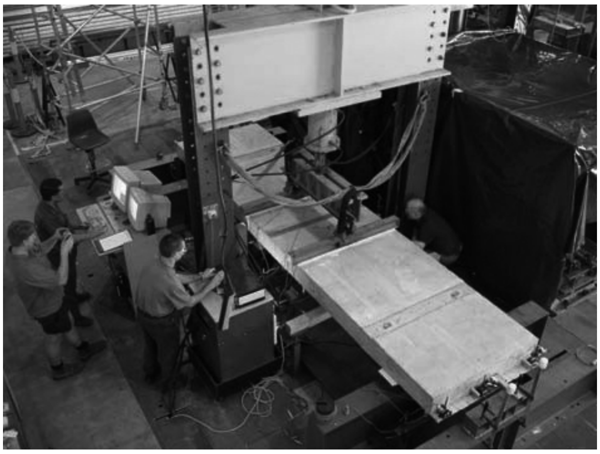


Figure B.B **Testing of pre-stressed composite slab incorporating the KingFlor profile**

Appendix C KingFlor® Design Examples

The following examples aim to help interpret KingFlor design aids. It is recommended that the KingFlor Designer software be used as it is accompanied by Help Files. This approach allows for greater design optimisation as the software offers an increased range of options. Alternatively, designers can use this manual.

The following typical examples will be investigated through both design methods:

- Example A - Simply Supported Span Design KF57
- Example B - Double Span Design RF55

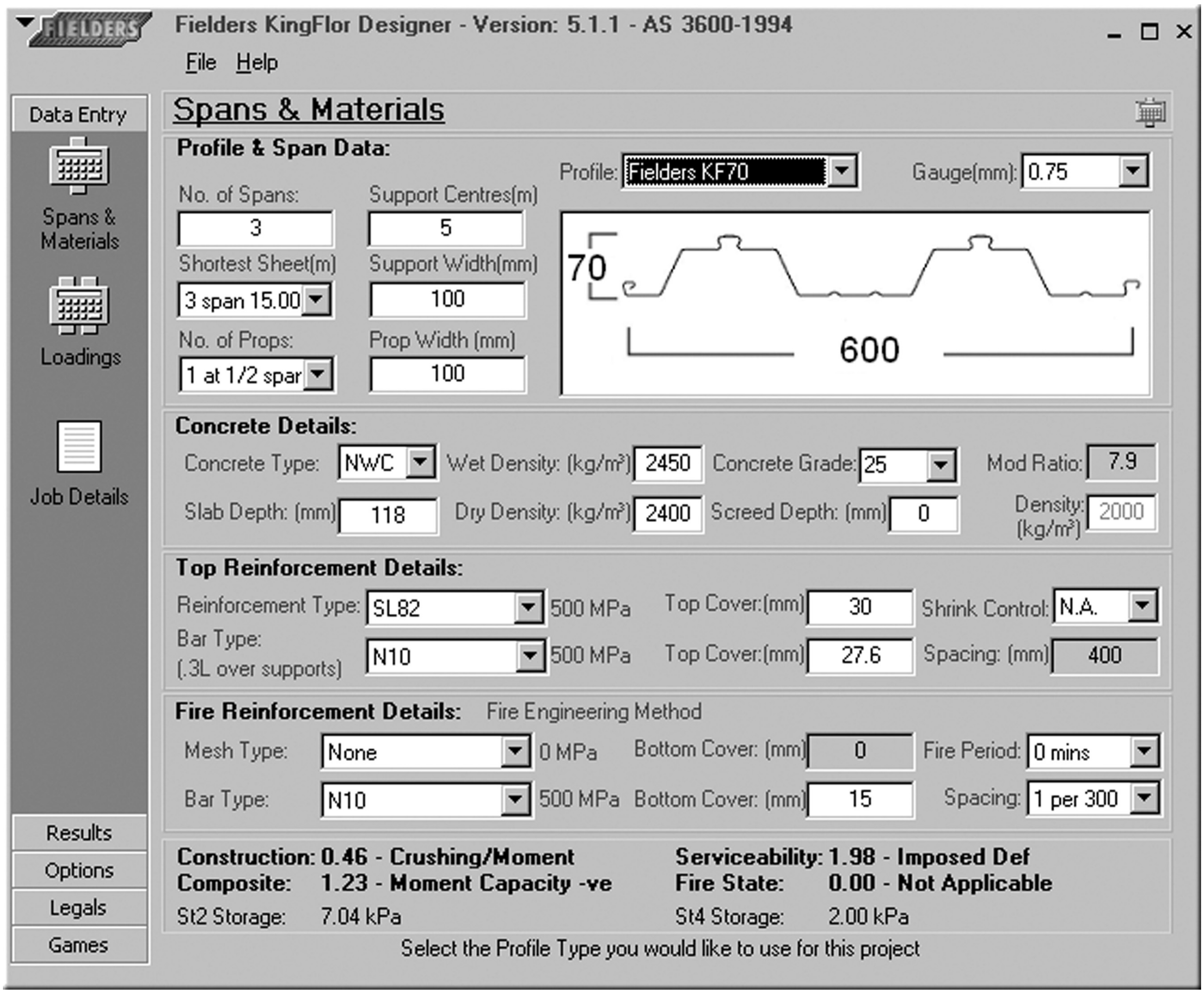


Figure C.A **KingFlor Designer**

Example A: Simply Supported Span Design

Design parameters:

- Case – Office Building
- KF57 profile in 0.75 mm base metal thickness
- 2.5 m simply supported single span
- Unpropped spans
- 90 minutes FRL with no fire reinforcement.
- Normal concrete with 32 MPa concrete grade
- Slab thickness of 105 mm
- Support width is 50 mm
- Moderate crack control with SL62 mesh
- 3 kPa live load, 1 kPa construction load, 0.5 kPa partitions, 0.35 kPa ceiling and services allowances
- Span/240 for construction stage, span/500 for incremental loads and span/250 for total loads deflection limits

Using KingFlor® Designer Suite:

KingFlor - Slab Design

1. Select KingFlor – Slab Design from the KingFlor Designer Suite package.
2. Select Spans & Materials from the Data Entry menu.
3. Input the parameters in Profile & Span Data and Concrete Details.
4. Select KF57 from the dropdown menu for Profiles located at the top RHS of the screen. Select 0.75 from the Gauge dropdown menu located next to Profiles.
5. Input 1 for single span in No. of Spans and 2.5 in Support Centres.
6. Input 50 mm for the Support Width and select No Props from the No. of props dropdown menu.
7. Under Concrete Details, Concrete Type should be NWC and select 32 from the Concrete Grade dropdown menu.
8. Under Top Reinforcement Details, select Moderate from the Shrink Control dropdown menu and SL62 mesh from the Reinforcement Type dropdown menu. No Bar reinforcement is required.
9. Under Fire Reinforcement Details, select 90 mins from the FRL Period dropdown menu. No fire reinforcement is required; hence select none in Mesh Type and Bar Type.
10. Select Loadings from the Data Entry menu.
11. Input all the loading conditions under Loadings. Pattern live load should be off.
12. Input all the load factors and the live load combination factors under Load Factors. The live load combination factors can be determined from AS 1170.0 "
13. Input all the deflection limits parameters as given above under Deflection Limits.
14. The Vibration Limit default value is set to 7 Hz. Return to Spans & Materials.
15. The bottom of the screen will show the design criteria unity factors. If the ratios are above unity (1), they will be shown in red, indicating an unsatisfactory design. For this example both Construction and Serviceability are above unity, hence re-design needs to occur.
16. The Construction design criterion indicates that the steel sheeting is unsatisfactory for the design. This can be rectified by adding temporary propping or by increasing the gauge (thickness) of the steel sheeting. Since it is an unpropped construction, change the sheeting gauge to 1.00 mm.
17. The Serviceability design criterion indicates that crack control reinforcement needs to be increased. Select SL72 from the Reinforcement Type dropdown menu.
18. The Fire State design criterion remains under unity without any fire reinforcement as the KF57 rib provides sufficient contribution to strength under fire conditions.
19. Design is now complete as the unity factors are all less than 1 and therefore satisfactory.
20. Select Results > Reports > Full Report to review the results of the analysis. To print report, select Print from the File menu. Designers should ensure the entry parameters are correct for each particular design solution.
21. Design solution – 105 mm thick slab on 1.00 mm KF57, SL72 top mesh reinforcement, and 32 MPa concrete grade with no propping required.

Example B: Continuous Double Span Design

Design parameters:

- Case – Car park
- RF55 profile in 0.75 mm base metal thickness
- 5.5 m double span
- 1 row of props at mid-way at each spans
- 90 minutes FRL with no fire reinforcement
- Normal concrete with 32 MPa concrete grade
- Slab thickness of 140 mm
- Support width is 50 mm and propping width is 100 mm
- Moderate crack control with SL82 mesh
- 2.5 kPa live load, 1 kPa construction load, 0.5 kPa partitions, 0.35 kPa ceiling and services allowances
- Span/150 for construction stage, span/500 for incremental loads and span/250 for total loads deflection limits

Using KingFlor Designer Suite: KingFlor – Slab Design

1. Select KingFlor – Slab Design from the KingFlor Designer Suite package.
2. Select Spans & Materials from the Data Entry menu.
3. Input the parameters in Profile & Span Data and Concrete Details.
4. Select RF55 from the dropdown menu for Profiles located at the top RHS of the screen. Select 0.75 from the Gauge dropdown menu located next to Profiles.
5. Input 2 for double spans in No. of Spans and 5.5 in Support Centres.
6. Sheeting is to be run continuous; hence select 2 span 11.00 m in the Shortest Sheet dropdown menu.
7. Input 50 mm for the Support Width, 100 mm for the Prop Width and select 1 at ½ span from the No. of props dropdown menu.
8. Under Concrete Details, Concrete Type should be NWC and select 32 from the Concrete Grade dropdown menu.
9. Input 140 mm in Slab Depth.
10. 10. Under Top Reinforcement Details, select Moderate from the Shrink Control dropdown menu and SL82 mesh from the Reinforcement Type dropdown menu.
11. Under Fire Reinforcement Details, select 90 mins from the FRL Period dropdown menu.
12. Select Loadings from the Data Entry menu.
13. Input all the loading conditions under Loadings. Pattern live load should be off.
14. Input all the load factors and the live load combination factors under Load Factors. The live load combination factors can be determined from AS 1170.0 "
15. Input all the deflection limits parameters as given above under Deflection Limits.
16. The Vibration Limit default value is set to 7 Hz. Return to Spans & Materials.
17. The bottom of the screen will show the design criteria unity factors. If the ratios are above unity (1), they will be shown in red, indicating an unsatisfactory design. For this example the Composite, Serviceability and Fire State criteria are above unity, hence re-design needs to occur.
18. The Composite and Serviceability criteria can be improved by increasing the top reinforcements. Under Top Reinforcement Details, select N12 bars from the dropdown menu in Bar Type and change the Spacing to 150 mm. The Serviceability criterion is still unsatisfactory, which indicates more reinforcing for crack control. Select SL102 from the dropdown menu in Reinforcement Type.
19. The Fire State design criterion remains unsatisfactory. Under Fire Reinforcement Details, select N10 in Bar Type and 1 per 400 for Spacing. The value for Bottom Cover will need to be increased to 40 mm.
20. Design is now complete as the unity factors are all satisfactory.
21. Select Results > Reports > Full Report to review the results of the analysis. To print report, select Print from the File menu. Designers should ensure the entry parameters are correct for each particular design solution.
22. Design solution – 140 mm thick slab on 0.75 mm RF55, SL102 top mesh reinforcement and N12@150 top bar reinforcement, N10 bars per 400 mm for bottom reinforcement with 40 mm bottom cover and 32 MPa concrete grade with 1 rows of props at half span required.

Appendix D KingSlab™ & KingFire™ Instructions

KingSlab has been produced to assist engineers in designing the reinforcing requirements at the junction of the band beam and KingFlor slab, as well as an additional bottom face reinforcing required above that of the deck. KingSlab needs to be used in conjunction with a concrete finite element analysis software package such as Slabs or RAPT to determine top face reinforcing requirements as well as serviceability deflections.

KingSlab™

KingFlor slabs are generally designed as one-way slabs. The ribs in the decking act as a bottom face reinforcement and provide additional strength and stiffness to the slab.

For the design of RF55 and KF57 slabs can be modelled as solid, however the design for KF70 and KF40 slabs is a little more complicated as the model needs to consider the shape of the decking profile.

To undertake a design of KingFlor into band beams undertake the following steps.

1. Determine the layout of the concrete-frame building, design loads, floor deflection criteria and fire resistance level if applicable.
2. Choose the preferred KingFlor steel deck depending on a variety of factors, e.g. minimum depth of slab, FRL, aesthetics, etc., including availability and economics.
3. Undertake the concrete floor design using a conventional reinforced-concrete design package, e.g. SLABS. If the deck includes KF70, then the effect of this will need to be taken into account in the deflection and ultimate strength design.
4. Run KingSlab to determine if any additional conventional longitudinal reinforcement is required in the bottom-face of the composite slab under room-temperature conditions, knowing the type of steel decking chosen.

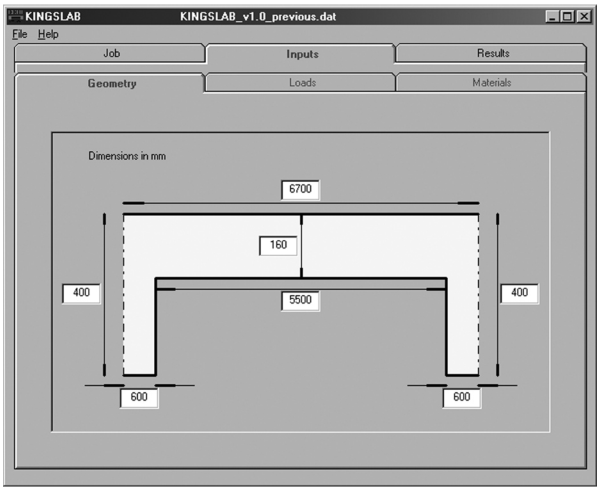


Figure D.B **Enter The Geometry Of The Slab And Band Beam**

Note: Width of band beam entered is half that of the total ban beam width.

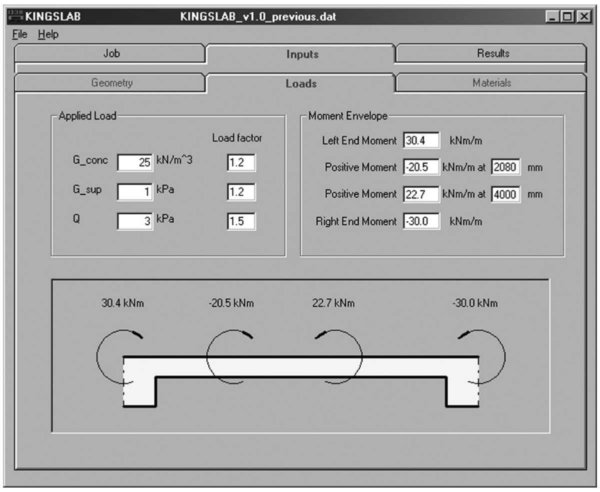


Figure D.C **Entering of Moments**

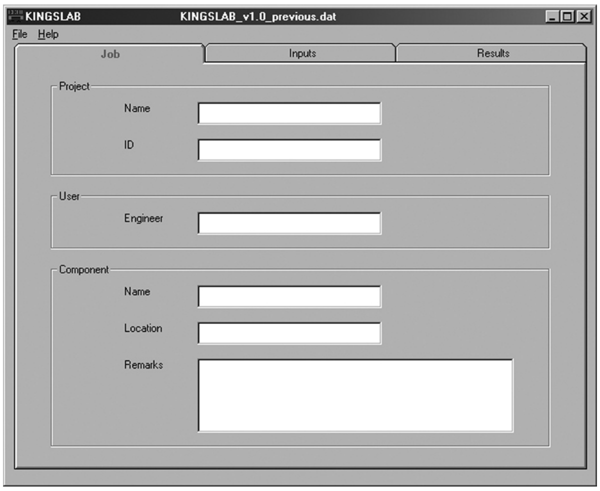


Figure D.A **Input Job Details For Reference**

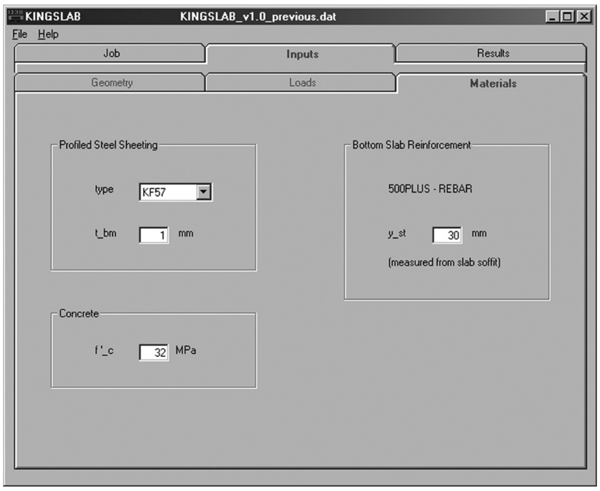


Figure D.D **Entering KingFlor® Profile Information**

Results

The top graph in figure D.E shows the bending moment envelope determined from SLABS. Intermediate values have been determined by the software using the factored dead and live loads. Where the bending moment diagram touches the design positive moment capacity curve (bottom brown line), additional longitudinal steel is required to match the design bending moment. Therefore, bending strength is satisfied at every location along the span.

The bottom graph in figure D.E shows that no additional bottom reinforcement is required. Moreover, it is apparent that 0.75 mm thick KF57 will be ample longitudinal reinforcement for the room-temperature conditions. It should be noted, as will be the case throughout this report, that it has been conservatively assumed that the sheeting is not continuous over internal supports, whereby it does not obtain additional anchorage into the adjoining span.

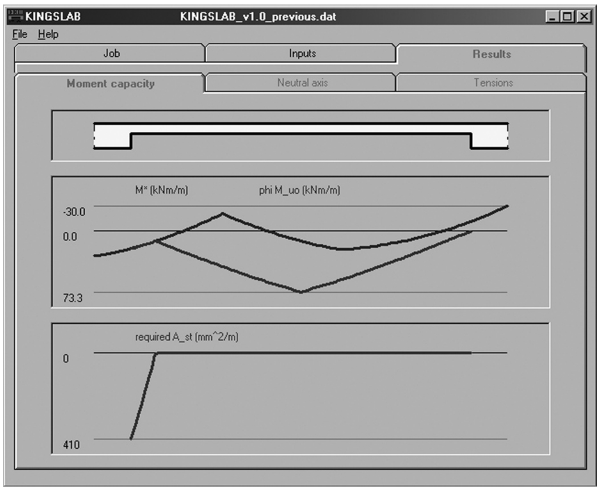


Figure D.E **Results - Moment Capacity**

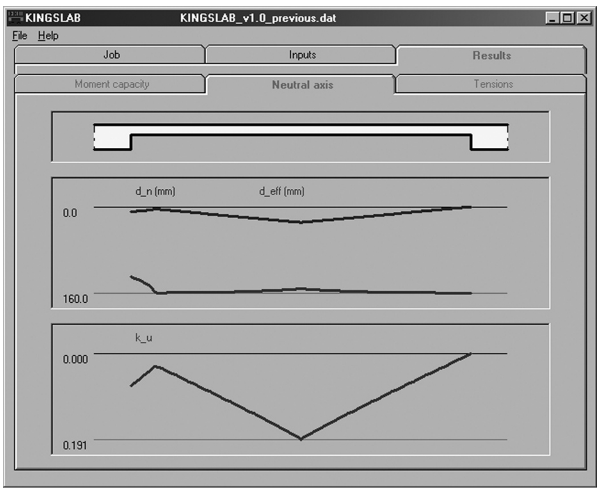


Figure D.F **Results - Neutral Axis**

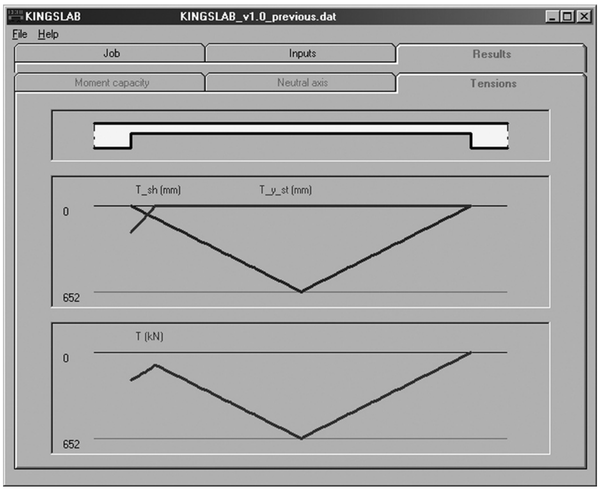


Figure D.G **Results - Tensions**

KingFire™

If the slab is to be fire rated, run KingFire knowing all conventional longitudinal reinforcement in the slab and the type of steel decking, and the fire resistance level.

At elevated temperatures under fire conditions, the presence of the steel decking should always be taken into account in design. While it may no longer make a contribution to the positive moment capacity of the slab, the steel ribs of the decking affect the transfer of heat through the concrete in the slab, which in turn may reduce the yield strength of the main conventional reinforcement during the fire design period depending on the proximity of the bars or mesh wires to the sheeting ribs. As such the positioning of the reinforcement and cover to the ribs must be detailed.

KingFire will allow the input of up to five layers of negative reinforcement and one layer of positive reinforcement. The reinforcing layers can extend at various positions along the slab.

Normally the approach taken is to specify all known negative reinforcement, and to then run KingFire to determine whether positive reinforcing is required. In the case of a typical internal span with some continuous main steel, it is often not necessary to provide additional reinforcement in the soffit of the slab for fire. However, this is unlikely to be the case for end spans.

The program generally only allows reinforcement to be put in at rib centres, which, however, is not necessary for KF57. It is important to enter the base metal thickness of the sheeting because the KF57 ribs can contribute as main reinforcement under fire conditions.

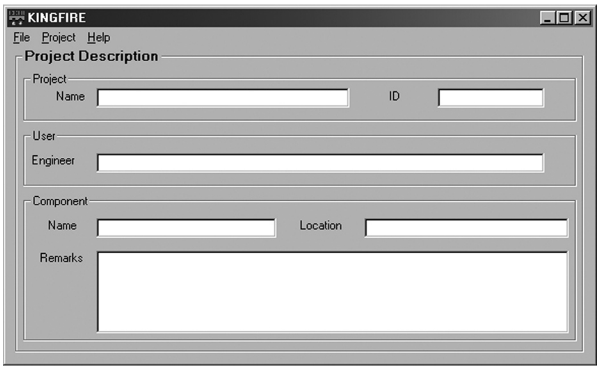


Figure D.H **Input Job Details For Reference**

End conditions allow for differentiation of internal and external spans

Select reinforcement layer

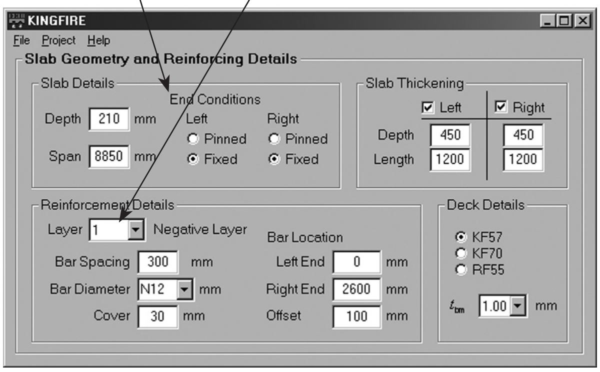


Figure D.I **Enter the Geometry and reinforcing Details**

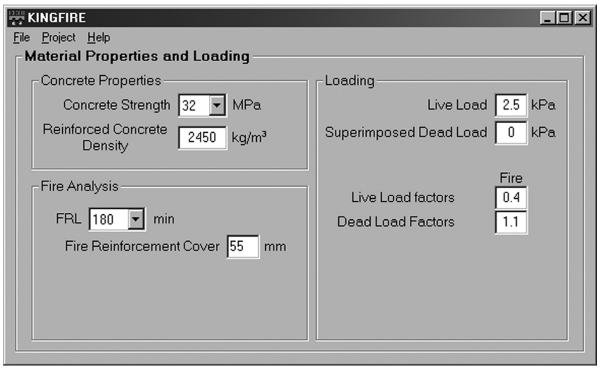


Figure D.J **Enter the Loads**

Click to show individual reinforcing layers

Clicking on this line will shift section line for diagram above

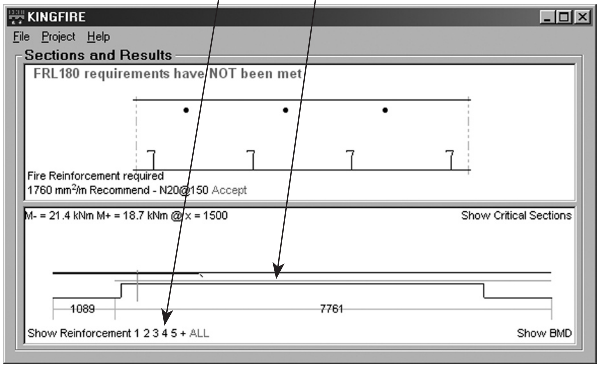


Figure D.K **Results**

Click to show or hide bending moment diagram

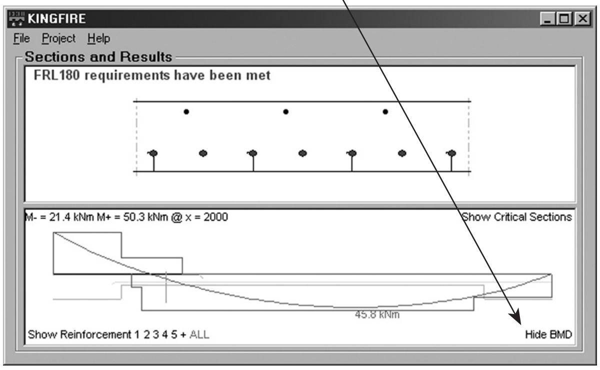


Figure D.L **Bending Moment Diagram**

After you have the results from KingFire, your design should be completed by doing the following:

1. Check top face main reinforcement over permanent support. This should be determined from the concrete analysis such as RAPT or Slabs.
2. Determining the propping requirements for KingFlor deck from the Specifying Fielders - KingFlor or KingFlor Designer.

For further reference, please refer to the KingSlab/KingFire Worked Example

Appendix E KingBeam™ Instructions

KingBeam has been developed to assist engineers with the design of simply supported composite beams incorporating Fielders KingFlor® profiles (KF70, KF40, KF57 and RF55), in accordance with AS 2327.1:2003 "Composite Structure Part 1: Simply supported beams".

KingBeam analyses both secondary and primary beams. Generally secondary beams are designed first as the end shear forces are required to be inputted for the design of the primary beams.

The current version of KingBeam computes the distribution of the minimum required compressive force in the concrete slab. The shear connection must then be designed manually using AS2327.1, and the testing results of the nominal shear capacities of KF70 and KF40 when these profiles are used.

Installing KingBeam™

KingBeam is located in the KingFlor Designer Suite. To install KingBeam, download the KingFlor Designer Suite software from www.fielders.com.au under Design Tools or alternatively use the CD supplied by your local Fielders representative.

Design with KingBeam™

To design with a new beam, select New Beam from the File menu. To edit an existing file, select Steel Section from the Data Input menu. Otherwise, select

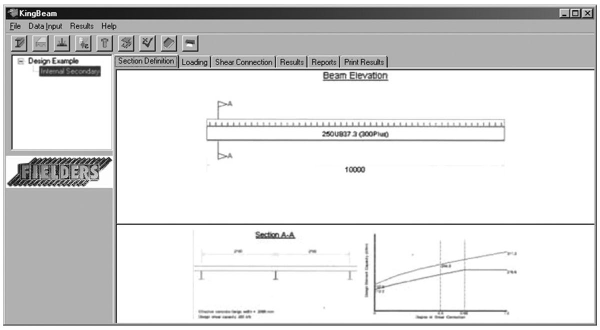


Figure E.A KingBeam™ Main Screen

Beam Details

The design starts by specifying the steel beam properties. Enter beam span, type and size in the Beam Details section.

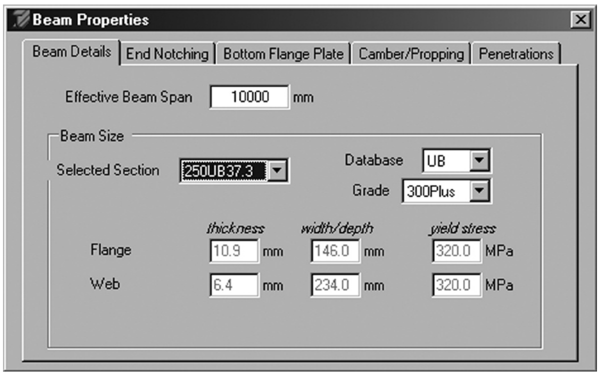


Figure E.B Beam Properties - Beam Details Screen

End Notching

In the End Notching page, enter any notching details to the steel beam. Users can select whether notching is at left or right end by ticking the appropriate boxes.

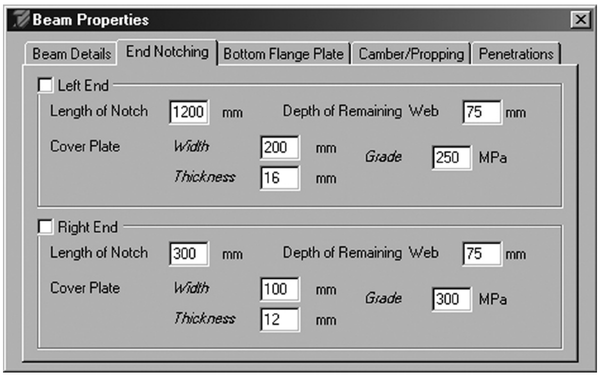


Figure E.C Beam Properties - End Notching

Bottom Flange Plate

In this section, users can select and enter details of any stiffening to the bottom flange of the beam.

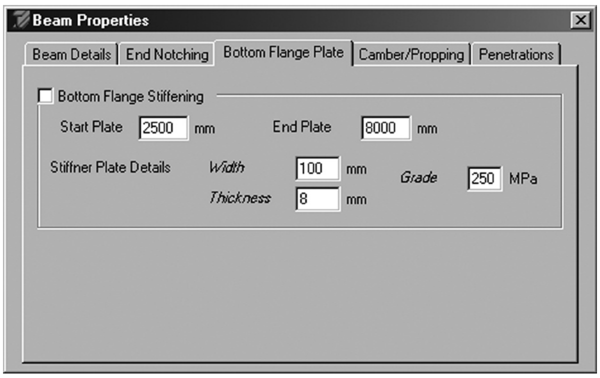


Figure E.D Beam Properties - Bottom Flange Plate

Camber/Propping

This section enables users to select any pre-cambering and propping of beam.

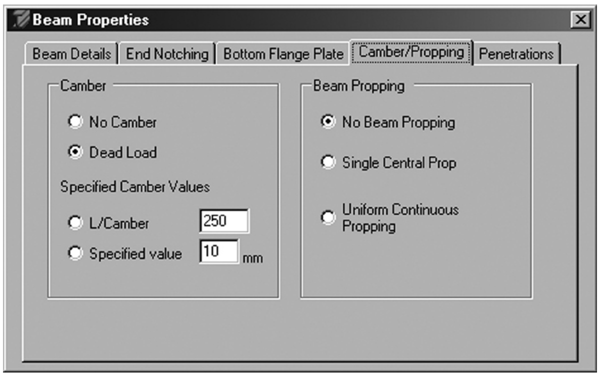


Figure E.E Beam Properties - Camber/Propping

This version of KingBeam is unable to analyse penetrations in the steel beam. Penetrations analysis will be included in future upgrades of the software.

Slab Properties

The "Slab Properties" page will automatically open after closing the Beam Properties page.

To change the values of the slab properties in an existing file, select Concrete Section from the Data Input menu. Otherwise, select .

Deck

Insert deck and slab details. Under Orientation, Input 90 for both Left and Right orientation for secondary beams and 0 for primary beams.

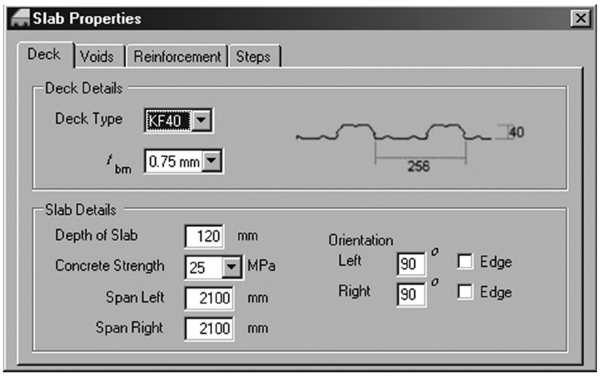


Figure E.F Slab Properties - Deck

For edge beams, tick the "Edge" box beside the orientation boxes. KingBeam requires at least 150mm from edge of slab to nearest shear connector.

Voids

Any voids located in slab and steel decking can be added into the design. A grey outline of the rectangular void indicates no voids exist in the slab. To add a void into the slab, click the "Add" button and fill in the required parameters. A pink outline of the rectangular void indicates a void is added into the slab.

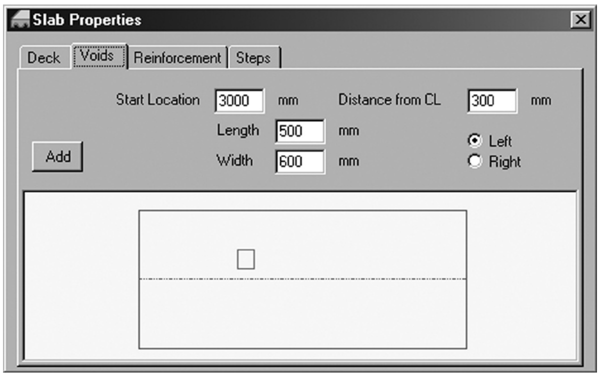


Figure E.G Slab Properties - Voids

Note: CL = centre line (the dashed line)

This version of KingBeam does not include Reinforcement or Steps in slab. Analysis of reinforcement and steps in composite beams will be included in future upgrades of the software.

Design Coefficients and Factors

After closing the Slab Properties page, the Design Coefficients and Factors page will automatically appear.

To edit the coefficients and factors in an existing file, select Design Coefficients and Factors from the Data Input menu. Otherwise, select .

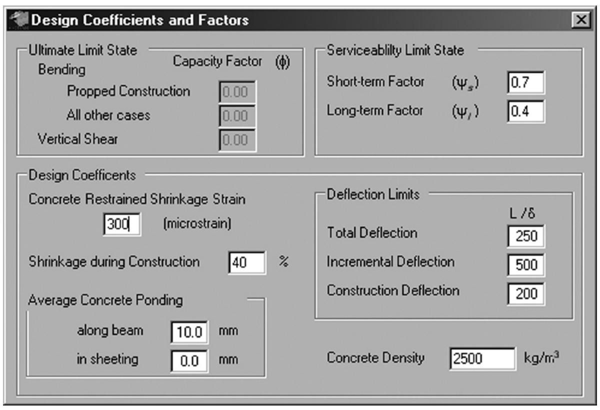


Figure E.H Design Coefficients and Factors

Users can input a concrete ponding value to be included in the analysis. Ponding of concrete is typically 70% the maximum deflection of the sheeting.

Loading

After inputting all the necessary requirements, go to the KingBeam main page and select the Loading tab. Otherwise, select .

Loads are divided into 6 components, to simulate the 6 construction stages as defined by Appendix F of AS2327.1 – 2003. All of the dead loads in KingBeam are accumulated through Stages 2 to 6; i.e. the dead loads from previous stages are included in the subsequent stages.

Stage 1

Period of placement of steelwork, including formwork.

Construction stage 1 is not analysed in KingBeam.

Stage 2

Period between the end of construction stage 1 and immediately prior to pouring of concrete.

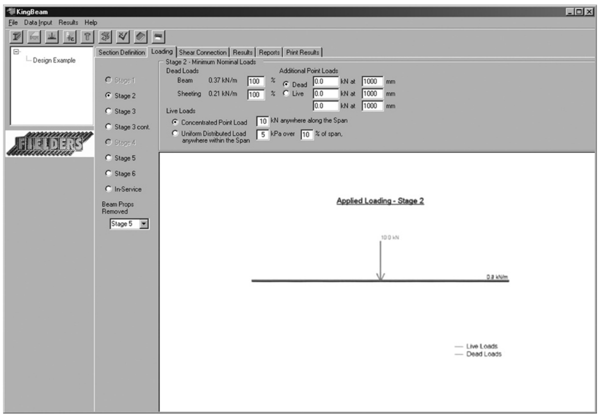


Figure E.1 Loading - Stage 2

Loads to be considered in construction stage 2 (as defined by AS2327.1):

Dead Load

KingBeam automatically calculate and include the self-weights of the steel beam and sheeting

Live Load

KingBeam will always include a 10 kN point load for anywhere along the span.

KingBeam also gives users the flexibility in choosing the UDL requirements of stage 2, in accordance to AS2327.1

For primary beam design, input the end shear reactions of the secondary beam in the "Additional Point Loads" section (as shown in worked example).

Stage 3

Period between the pouring of concrete and the initial set of the slab

Loads to be considered in construction stage 3:

Dead Load

KingBeam automatically includes the dead load of the beam and sheeting from stage 2.

AS 2327.1: 2003 specifies that designers must also include the weight of concrete on the tributary area. The tributary area depends on the propping of the sheeting.

For example, sheeting is propped with 2 props at 1/3 span. Therefore, users must reduce the percentage of the load exerted on the beam by the concrete by 33% (= 100% / 3). The worked example following this user guide further illustrates this example.

Live Load

Live loads for the steel beam in construction stage 3 is detailed in AS2327.1.

KingBeam allows users to add additional loads in this stage by selecting "Stage 3 cont." Click on the "Add" button to insert additional loads.

Stage 4

Period between the end of Stage 3 until the concrete reaches a compressive strength of 15 MPa.

KingBeam does not perform analysis for Construction Stage 4 because concrete is in the process of hardening until it reaches 15 MPa.

Stage 5 & 6

Period after end of Stage 4 until the end of construction.

Formwork should be removed during these construction stages. In the "Loading" page, the user can choose when temporary propping are removed.

Loads to be considered in construction Stage 5:

Live loads resulting from stacked materials are normally present in stage 5. Refer to AS 2327.1: 2003.

Loads to be considered in construction Stage 6:

Dead Load

Any superimposed dead loads can be added in stage 6

Live Load

Live loads resulting from stacked materials.

Refer to AS 2327.1: 2003 for further detail.

In-service - Completion of Construction

Loads that may occur in the in-service stage are usually live loads that the structure is required to carry in its lifetime. AS 1170.1-2002 "Structural Design Actions: Permanent, imposed and other actions" provides guidelines to the loading requirements of structures.

Shear Connection

After working through the construction stages, select the "Shear Connection" tab to view the minimum required degree of shear connection, design bending moment and maximum moment capacity diagrams. Otherwise, select

To view the degree of shear connection as a percentage, tick the "Show degree of shear connection" box. This will provide the user with the percentage of the required force developed in the concrete slab.

To view the required compressive force to be developed in concrete, tick the "Show minimum shear transfer" box. This will provide the total force (F_{cp}) that is required from the shear studs in the concrete slab.

Users can view the shear capacities in stages 5 to in-service by selecting the desired stage in the drop down menu below the graph.

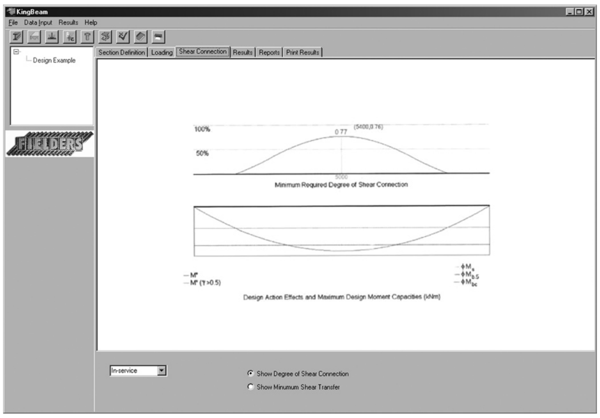


Figure E.J Shear Connection Screen

The F_{cp} value is used to obtain the number of shear studs required on the steel beam by dividing it with the design shear capacity of the shear studs (f_{ds}). The design shear capacity is a function of n (the number of shear studs), hence an iterative process is will be required, as explained below.

From AS 2327.1: 2003:

$$n_i = \frac{F_{cp}}{f_{ds}}$$

hence:

$$n_i \cdot f_{ds} \geq F_{cp}$$

The design shear capacity f_{ds} is defined as:

$$f_{ds} = øk_n f_{vs}$$

The load-sharing factor k_n is defined as:

$$k_n = 1.18 - \left[\frac{0.18}{\sqrt{n}} \right]$$

The value of ø is 0.85 and f_{vs} is the nominal shear capacity of a shear stud, as defined in Table 8.1 in AS 2327.1: 2003.

Results

In the "Results" section, users can view all of the results from the analysis such as deflection, bending and shear.

In-service Design Ratios

The In-service Design Ratios summarises the results of the design. The red line signifies unity, meaning the actual values resulted from the design is under the design limits.

If any of the columns goes exceeds the red line, re-design of the composite beam is required, usually by using a larger size steel beam.

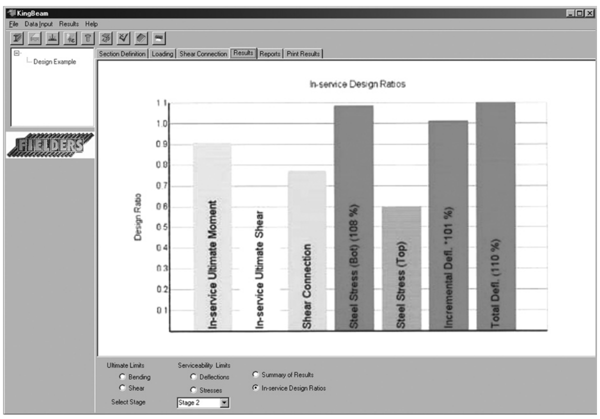


Figure E.K In-service Design Ratios

Ultimate Limits – Shear

Users can view the resultant end shear forces of the steel beam for the different construction stages.

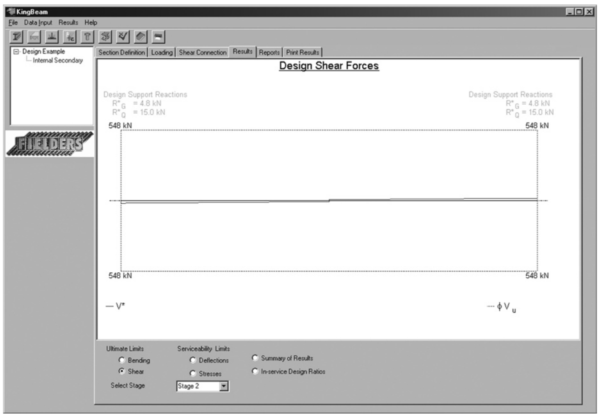


Figure E.L Beam Shear Screen Showing End Shear Reactions

End shear reactions of a secondary beam are required to be included into a primary beam design if the secondary beam is supported by the primary beam. The worked example following this user guide will detail the primary beam design further.

Note: The design support reactions shown here are factored loads. The reactions that are inputted into primary beam design must be unfactored (divide by 1.25 for dead load reactions R^*_G and 1.5 for live load reactions R^*_Q).

For further information, please refer to the KingBeam User Guide and Worked Example booklet.

Appendix F KingFlor® Design into Band Beams

When it comes to designing KingFlor to be used in conjunction with band beams there are several ways to undertake the design. One is to use KingSlab (see appendix D) and the other is to use RAPT. The following design guide can be used to model KingFlor slabs in RAPT provided the following conditions are met:

- The slab is a one-way slab and not a deeper beams.
- Loading of the slabs are uniform.

Step 1
Determine the layout of the concrete-frame building, design loads, floor deflection criteria and fire resistance level (FRL) if applicable.

Step 2
Choose the preferred KingFlor steel deck depending on a variety of factors, e.g. minimum depth of slab, FRL, aesthetics, etc., including availability and economics.

Step 3
Design the concrete floor slab in accordance with the following guidelines within RAPT design software package.

Step 4
If the slab is to be fire rated, run KingFire (see appendix D) knowing all conventional longitudinal reinforcement in the slab and the type of steel decking, and the fire resistance level.

Step 5
Complete the design by determining the propping requirements of the KingFlor deck from Fielders KingFlor Design Manual or Fielders KingFlor Design Software.

Emulating Composite Decks in RAPT

Step 1
Create a new design frame as a "One Way Slab and Beams".

For RF55 and KF57 profiles:

- Set up the model as per a conventional design.

For KF40 and KF70 profiles:

- Set the initial slab depths as per the following table:

Profile	Slab Depth (mm)
KF70	Dcs - 55
KF40	Dcs - 40

Table F.C

Where Dcs = overall depth of slab

Under the "Elements" menu of the design, add the following elements between each support to emulate the voided decking section:

Profile	Bar Type	Yield Stress (MPa)	Elastic Modulus (MPa)	Ductility	Peak Strain	Peak Stress (MPa)
KF57	Round	550	2.0E+05	Normal	0.05	600
RF55	Round	550	2.0E+05	Normal	0.05	600
KF70	Round	550	2.0E+05	Normal	0.05	600
KF40	Round	550	2.0E+05	Normal	0.05	600

Table F.A

Profile	BMT (mm)	Bar Diameter d_b (mm)	Bar Area (mm²)	Bar Inertia (mm⁴)	Bar Weight (kg/m)	Stock Length (mm)
KF57	1.00	93	1593	6.70E+05	13.25	12000
	0.75	70	1195	5.03E+05	10.19	12000
	0.60	56	956	4.02E+05	8.15	12000
RF55	1.00	431/f'c(1/2)	1664	Refer Appendix J	13.25	12000
	0.75	385/f'c(1/2)	1284	Refer Appendix J	10.19	12000
	0.60	335/f'c(1/2)	998	Refer Appendix J	8.15	12000
KF70	1.00	69.1	1467	7.45E+05	12.23	12000
	0.75	73.4	1100	5.84E+05	9.17	12000
KF40	1.00	19057/Hr*	1386	Refer Appendix K	11.39	12000
	0.75	19057/Hr*	1040	Refer Appendix K	8.67	12000
	0.60	19057/Hr*	832	Refer Appendix K	7.04	12000

Table F.B

* - Refer Appendix K.

Profile	Depth to Top of Slab (mm)	Element Depth (mm)	Width (mm)	Number
KF70	Dcs – 55	55	563*	1
KF40	Dcs – 40	40	563*	1

Table F.D

Where Dcs = overall depth of slab

* 563 is the overall width. Set 281.5mm each side of the centre line.

Step 2

Create a new user defined Reinforcement Bar group under the Materials section with the relevant properties provided in the table F.A.

And create the relevant "bars" within this group using the table F.B.

Step 3

Add user defined reinforcement zones at the bottom face of the slabs in accordance with the relevant properties provided in the table below. Terminate each reinforcement zone at the face of each beam (refer to figure F.E). Note that for detailing purposes, the decking must extend 25mm min into the concrete beam.

Step 4

The position and allowable spacing of the bottom reinforcement may be dictated by the profile adopted. The designer must set the Reinforcement Design Zones accordingly.

Step 5

Complete the model as per a conventional design. It should be noted that some warning messages may occur due to the low cover of the large bars modeled, however inspection of the results should show that the contribution of the deck is still included.

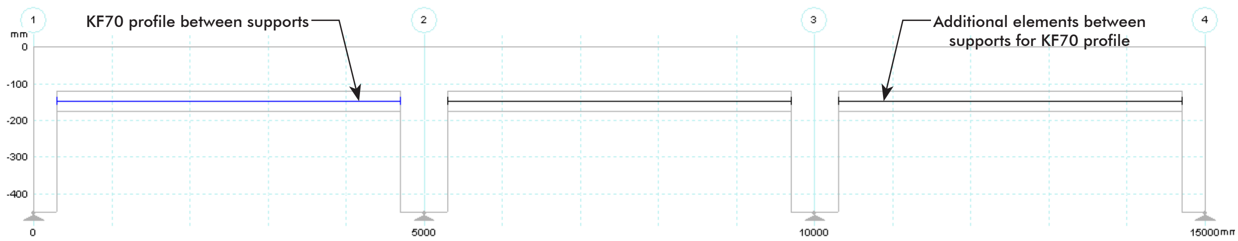


Figure F.A **An example of a RAPT model for KF70 profile. Note the position of the reinforcement within the additional "elements" between each support. (Reinforcement design zones not shown.)**

Profile	BMT (mm)	Bar Depth (mm)	Stagger of Bars (mm)	Development Each End (%)	Bar Size*	Number of Bars	Spacingof Bars
KF57	1.00	Dcs - 14.1	0	0	1.00KF57	1	0
	0.75	Dcs - 14.1	0	0	0.75KF57	1	0
	0.60	Dcs - 14.1	0	0	0.60KF57	1	0
RF55	1.00	Dcs - 15.4	0	0	1.00RF55	1	0
	0.75	Dcs - 15.4	0	0	0.75RF55	1	0
	0.60	Dcs - 15.4	0	0	0.60RF55	1	0
KF70	1.00	Dcs - 27.7	0	0	1.00KF70	1	0
	0.75	Dcs - 27.7	0	0	0.75KF70	1	0
KF40	1.00	Dcs - 14.0	0	0	1.00KF40	1	0
	0.75	Dcs - 14.0	0	0	0.75KF40	1	0
	0.60	Dcs - 14.0	0	0	0.60KF40	1	0

Table F.E

* Set bar size to user defined profile from Step 2.

Appendix G Additional Fire Design Data

Tasef-2

The heat transfer analysis through the KingFlor composite slabs cross-sections have been performed using the two-dimensional heat transfer program Tasef-2, developed by Lund Institute of Technology, Sweden. This program has previously been extensively verified by comparison between calculated and measured temperatures obtained from fire tests of composite slabs incorporating other steel sheeting profiles and more specifically, for Fielders' proprietary products KF57, KF70, and KF40.

Analysis

The structural adequacy of the fire-resistant KingFlor composite slabs has been assessed using elevated temperature structural analysis. This method complies with Clause 5.9 of AS 3600:2001. The calculation method is based on dividing the cross-section into a large number of small elements both horizontally and vertically. The discretised elements are the same as those used in the heat transfer analysis.

The fire resistance level of the slab has been assessed using the temperature profiles from the heat transfer analysis. The determination of the positive and negative moment capacities depends on the elevated temperature strengths of concrete and reinforcement through the cross-section, which in turn, depends on the temperature profile through the cross section.

Briefly, the calculation procedures based on the discretised elements for both positive (sagging) and negative (hogging) moment capacities can be summarised as follows:

Positive Moment Capacity

- Calculate temperature of reinforcement location (using Tasef-2).
- Calculate effect of temperature on reinforcement strength.
- Calculate moment capacity based on rectangular stress block theory as defined in AS 3600:2001.

Negative Moment Capacity

For each discretised concrete element:

- Calculate the centroid of the element.
- Calculate the temperature at the centroid of the element (by interpolation within Tasef-2 results).
- Calculate the force in the concrete element (using the height and width of the element).
- For the tensile reinforcement:
- Calculate temperature at top reinforcement location (using Tasef-2).
- Calculate effect of temperature on reinforcement strength.
- Calculate the force in the reinforcement.
- For the cross-section concerned:
- Determine the neutral axis location by summation of the tensile and compressive forces.
- Calculate the negative bending moment capacity by summation of moments about the neutral axis.

These procedures are carried out in an Excel spreadsheet to determine the positive and negative moment capacities at various fire resistance levels. However, this method is not recommended for design purposes and a set of simplified equations are derived for the design cross-section bending strength for both positive and negative moment regions. These are given in the following sections.

Exposed Surface Area-To-Mass Ratio

Where the Building Code of Australia allows for deemed-to-satisfy requirements to assess the fire capacity of the structural steel work using the ratio of area of steel on mass (ESA/M of Steel Sections in m^2/tonne), the following assessment for Fielders KingFlor range may be used.

KF57 and RF55 consider the supporting beams to have a 3-sided exposure, with the top flange essentially concealed with the deck and concrete slab. The limiting ESA/M value for 3-sided exposure is 30m^2/tonne for floor beams.

KF70 and KF40 alternates between covering and not covering the top flange of the beam. It can be assumed that the performance in fire is midway between 4-sided and 3-sided exposure.

In situations where bare steel construction is permitted by the BCA for carpark situations, the limiting ESA/M of 30m^2/tonne for floor beams (3-sided fire exposure) should be reduced to 25m^2/tonne when considering using KF70 or KF40 as the floor system.

Table G.A lists all OneSteel welded plate and hot rolled sections that have a ESA/M less than or equal to 25m^2/tonne for 3-sided exposure and therefore, can be used to support KF70 or KF40 floor slabs when a 30m^2/tonne requirement is specified by the BCA.

Moment Re-distribution

It is permissible to consider re-distribution of fire limit state bending moments according to the rules set out in AS 3600:2001 clause 7.6.8. There are limits placed upon both the reinforcement steel ductility (class L or N) and of k_u (neutral axis parameter/ductility factor).

For further information on fire design for structural steel members contact OneSteel market Mills on:

Tel: 1 800 178 335

Fax: 1 800 101 141

Email: OneSteelDirect@onesteel.com

ESA/M of Steel Sections

Welded Plate Sections		Hot Rolled Sections	
Section	ESA/M	Section	ESA/M
1200WB455	8.51	610UB125	14.90
1200WB423	9.10	610UB113	16.30
1200WB392	9.79	610UB101	18.10
1200WB342	10.4	530UB92.4	17.80
1200WB317	11.10	530UB82.0	19.90
1200WB278	12.10	460UB82.1	17.70
1200WB249	12.60	460UB74.6	19.40
1000WB322	10.00	460UB67.1	21.40
1000WB296	10.80	410UB59.7	21.90
1000WB258	11.80	410UB53.7	24.10
1000WB215	13.40	360UB56.7	21.10
900WB282	10.70	360UB50.7	23.40
900WB257	10.70	360UB44.7	26.30
900WB218	13.00	310UB46.2	23.20
900WB175	15.30	310UB40.4	26.20
800WB192	13.10	250UB37.3	24.70
800WB168	14.50	250UB31.4	29.00
800WB146	16.50	200UB29.8	26.30
800WB122	18.90	180UB22.2	27.10
700WB173	13.00	150UB18.0	28.30
700WB150	14.30	310UC158	9.66
700WB130	16.30	310UC137	11.00
700WB115	18.40	310UC118	12.70
500WC440	5.41	310UC97	15.30
500WC414	5.78	250UC89.5	13.90
500WC383	6.21	250UC72.9	16.80
500WC340	7.30	200UC59.5	16.80
500WC290	8.51	200UC52.2	18.90
500WC267	9.22	200UC46.2	21.20
500WC228	10.70	150UC37.2	20.30
400WC361	5.48	150UC30.0	24.60
400WC328	6.11		
400WC303	6.56		
400WC270	7.34		
400WC212	9.25		
400WC181	10.70		
400WC144	13.40		
350WC280	6.08		
350WC258	6.54		
350WC230	7.30		
350WC197	8.49		

Table G.A ESA/M of Steel Section

Appendix H Steel Beam Selection

Indicative Composite Steel Beam Selection
Primary Beam

Span (mm)	Spacing (mm)	Carparks			Office Buildings			Retail Centres		
		Beam, Grade 300	Camber (mm)	No. of Studs/Beam	Beam, Grade 300	Camber (mm)	No. of Studs/Beam	Beam, Grade 300	Camber (mm)	No. of Studs/Beam
6000	8000	360UB44.7	15	22	360UB44.7	15	22	410UB53.7	0	26
	9000	360UB44.7	20	22	360UB44.7	20	22	410UB59.7	0	28
	10000	360UB50.7	15	22	360UB50.7	20	24	460UB67.1	0	30
	11000	410UB53.7	15	26	410UB53.7	15	26	460UB74.6	0	34
	12000	410UB53.7	15	26	410UB53.7	15	26	460UB82.1	0	38
	13000	410UB59.7	15	26	410UB59.7	15	28	530UB82.0	0	38
	14000	460UB67.1	0	30	460UB67.1	0	30	530UB82.0	0	36
	15000	460UB67.1	15	30	460UB67.1	0	30	530UB92.4	0	42
	16000	460UB74.6	0	32	460UB67.1	15	30	610UB101	0	42
7000	8000	410UB53.7	20	26	410UB53.7	20	26	460UB67.1	15	30
	9000	410UB53.7	25	26	410UB53.7	25	26	460UB74.6	15	34
	10000	460UB67.1	15	30	460UB67.1	15	30	530UB82.0	0	36
	11000	460UB67.1	15	30	460UB67.1	20	30	530UB92.4	0	42
	12000	460UB74.6	15	32	460UB67.1	20	30	610UB101	0	46
	13000	460UB74.6	20	32	460UB74.6	20	34	610UB101	0	46
	14000	460UB82.1	20	36	460UB82.1	20	36	610UB101	0	46
	15000	530UB82.0	15	36	530UB82.0	15	36	610UB125	0	48
	16000	530UB92.4	15	40	530UB82.0	15	36	610UB125	0	48
8000	8000	460UB67.1	20	30	460UB67.1	20	30	530UB82.0	15	36
	9000	460UB67.1	25	30	460UB67.1	25	30	530UB92.4	15	42
	10000	460UB74.6	25	32	460UB74.6	25	34	610UB101	0	46
	11000	530UB82.0	20	36	530UB82.0	20	36	610UB101	0	46
	12000	530UB82.0	20	36	530UB82.0	20	36	610UB125	0	52
	13000	530UB92.4	20	40	530UB92.4	20	42	700WB115	0	52
	14000	530UB92.4	20	40	530UB92.4	20	42	700WB115	0	52
	15000	610UB101	15	44	610UB101	15	46	800WB122	0	54
	16000	60UB101	15	44	610UB101	20	46	800WB122	0	54
9000	8000	460UB74.6	30	32	460UB74.6	35	34	610UB101	15	46
	9000	530UB82.0	25	36	460UB82.1	35	36	610UB101	20	46
	10000	530UB92.4	25	40	530UB82.0	30	36	700WB115	0	52
	11000	530UB92.4	25	40	530UB92.4	25	42	700WB115	0	52
	12000	610UB101	20	44	610UB101	20	46	800WB122	0	56
	13000	610UB101	25	44	610UB101	25	46	800WB122	0	56
	14000	610UB113	20	46	610UB101	25	46	800WB146	0	60
	15000	610UB125	20	50	610UB125	20	52	800WB146	0	60
	16000	700WB115	20	50	610UB125	25	52	800WB168	0	60
10000	8000	530UB82.0	35	36	530UB82.0	35	36	700WB115	0	52
	9000	530UB92.4	35	40	530UB92.4	35	42	700WB115	20	52
	10000	610UB101	25	44	610UB101	30	46	800WB122	0	56
	11000	610UB101	30	44	610UB101	30	46	800WB146	0	60
	12000	610UB125	25	50	610UB113	30	46	800WB146	0	60
	13000	700WB115	25	50	610UB125	30	52	800WB168	0	60
	14000	700WB115	25	50	700WB115	25	52	900WB175	0	60
	15000	800WB122	20	52	800WB122	20	54	900WB175	0	60
	16000	800WB122	20	52	800WB122	20	54	900WB175	0	60
11000	8000	610UB101	30	44	610UB101	30	46	800WB122	0	52
	9000	610UB101	35	44	610UB101	35	46	800WB122	20	52
	10000	610UB125	30	50	610UB113	35	46	800WB146	0	56
	11000	700WB115	30	50	610UB125	35	52	800WB168	0	60
	12000	800WB122	25	52	700WB115	35	52	900WB175	0	60
	13000	800WB122	25	52	800WB122	25	54	900WB175	0	60
	14000	800WB146	20	62	800WB122	30	54	900WB218	0	60
	15000	800WB146	25	62	800WB146	25	64	900WB218	0	60
	16000	800WB146	25	62	800WB146	25	64	1000WB215	0	60
12000	8000	610UB113	40	46	610UB113	40	46	800WB146	0	60
	9000	610UB125	40	50	610UB125	40	52	800WB168	0	60
	10000	700WB115	40	50	700WB115	40	52	900WB175	0	60
	11000	800WB122	30	52	800WB122	30	54	900WB175	0	60
	12000	800WB146	25	52	800WB122	35	54	900WB218	0	62
	13000	800WB146	30	62	800WB146	30	64	900WB218	0	62
	14000	800WB146	30	62	800WB146	30	64	900WB257	0	64
	15000	900WB175	20	74	800WB146	35	64	900WB257	0	64
	16000	900WB175	25	74	800WB168	30	64	1200WB249	0	60

Table H.A Indicative Composite Steel Beam Selection - Primary Beam

Indicative Composite Steel Beam Selection
Secondary Beam

Span (mm)	Spacing (mm)	Carparks			Office Buildings			Retail Centres		
		Beam, Grade 300	Camber (mm)	No. of Studs/Beam	Beam, Grade 300	Camber (mm)	No. of Studs/Beam	Beam, Grade 300	Camber (mm)	No. of Studs/Beam
8000	2800	310UB40.4	25	20	310UB40.4	25	20	310UB40.4	30	38
9000	2800	310UB40.4	40	22	310UB40.4	45	22	360UB44.7	35	42
10000	2800	360UB44.7	45	25	360UB44.7	50	25	410UB53.7	35	52
11000	2800	410UB53.7	45	27	410UB53.7	45	27	410UB59.7	45	54
12000	2800	410UB59.7	55	30	410UB59.7	55	30	460UB67.1	50	60
13000	2800	460UB67.1	55	32	460UB67.1	60	32	530UB82.0	40	36
14000	2800	530UB67.1	50	36	530UB82.0	50	36	530UB92.4	50	36
15000	2800	530UB92.4	55	40	530UB92.4	55	37	610UB101	50	37
16000	2800	610UB101	50	44	610UB101	55	40	610UB125	50	40

Table H.B Indicative Composite Steel Beam Selection - Secondary Beam

Note: Table H.A and H.B represent examples of beam design specifications in typical applications. (Watson et al, 1996)

Appendix I Summary Tables

Mesh Area Summary						
Mesh	Longitudinal Wires		Cross Wires		Longitudinal Wires (mm²/m)	Cross Wires (mm²/m)
	Bar Diameter (mm)	Spacing (mm)	Bar Diameter (mm)	Spacing (mm)		
SL52	4.77	200	4.77	200	89	89
SL62	6.00	200	6.00	200	141	141
SL72	6.75	200	6.75	200	179	179
SL82	7.60	200	7.60	200	227	227
SL92	8.60	200	8.60	200	290	290
SL102	9.50	200	9.50	200	354	354
SL81	7.60	100	7.60	100	454	454
RL718	6.75	100	7.60	200	358	227
RL818	7.60	100	7.60	200	454	227
RL918	8.60	100	7.60	200	581	227
RL1018	9.50	100	7.60	200	709	227
RL1118	10.70	100	7.60	200	899	227
RL1218	11.90	100	7.60	200	1112	227

Table I.A **Mesh Area Summary Table**

Reinforcing Area Summary									
Dcs (mm)	Bar Area (mm²)								
	78.5	113	201	314	452	616	804	1020	1260
	Bar Diameter (mm)								
	10	12	16	20	24	28	32	36	40
	Bar Spacing (mm)								
50	1570	2260	4020	6280	-	-	-	-	-
75	1047	1506	2680	4186	6026	8213	10720	13600	16800
100	785	1130	2010	3140	4520	6160	8040	10200	12600
125	628	904	1608	2512	3616	4928	6432	8160	10080
150	523	753	1340	2093	3013	4107	5360	6800	8400
175	448	645	1148	1794	2582	3520	4594	5828	7200
200	393	565	1005	1570	2260	3080	4020	5100	6300
225	348	502	893	1395	2008	2737	3573	4533	5600
250	314	452	804	1256	1808	2464	3216	4080	5040
275	285	410	730	1141	1643	2240	2923	3709	4581
300	262	377	670	1047	1507	2053	2680	3400	4200

Table I.B **Reinforcing Area Summary Table**

Appendix J RF55® Additional Parameters

The following information can be used to design KingFlor RF55 for the formwork stages:

Formwork Stage

Flexural Stiffness - Single Spans

I_{ef} - The effective second moment of inertia of the steel decking in single span configuration shall be calculated using the following formula:

$$I_{ef}/t_{bm} = 226L + 105630$$

where

I_{ef} = effective second moment of inertia of the decking

L = effective span in mm - and not less than 1000mm

t_{bm} = nominal base metal thickness in mm

such that

$$331130 <= I_{ef}/t_{bm} <= 558800$$

It is assumed that the loading be essentially uniformly distributed, e.g. wet concrete loading and the modulus of elasticity of the steel sheeting E = 200,000MPa.

Flexural Stiffness - Multiple Spans

I_{ef} in multiple spans shall be calculated using the following formula:

$$I_{ef}/t_{bm} = 264L - 77275$$

where

I_{ef} = effective second moment of inertia of the decking

L = effective span in mm - and not less than 1000mm

t_{bm} = nominal base metal thickness in mm

such that

$$186725 <= I_{ef}/t_{bm} <= 558800$$

It is assumed that the loading be essentially uniformly distributed, e.g. wet concrete loading and the modulus of elasticity of the steel sheeting E = 200,000MPa

Appendix K KF40® Additional Parameters

The following are applicable for either simply-supported single spans or continuous multiple spans of KF40 SquashCut steel decking.

Effective Second Moment of Area in Positive Bending (I_{ef}^{+})

The effective second moment of area of the steel decking in positive bending in single-span or multi-span sheets (I_{ef}^{+}) shall be calculated using the following formulae:

$$I_{ef}^{+} / t_{bm} = 119{,}410 \ln (L+) - 627{,}840$$

such that:

$$184{,}500 \leq I_{ef}^{+} / t_{bm} \leq 279{,}800$$

where:

I_{ef}^{+}/ t_{bm} = mm^4/m/mm

t_{bm} = nominal base metal thickness of KF40 (in mm)

L^{+} = length of positive moment region (in mm)

The loading shall be essentially uniformly distributed within each span, as normally occurs under the weight of wet concrete at the completion of the pour.

Effective Second Moment of Area in Negative Bending, (I_{ef}^{-})

The effective second moment of area of the steel decking in positive bending in single-span or multi-span sheets (I_{ef}^{-}) shall be calculated using the following formulae:

$$I_{ef}^{-} = 134 (M_{p0}^{-} L^{-})^{0.83}$$

such that:

$$L^{-} \leq 1500 \text{ mm}$$

where:

I_{ef}^{-} = mm^4/m

L^{-} = length of negative moment region (in mm)

M_{p0}^{-} = length of negative moment region in millimetres, as defined in Fig. 1.

M_{p0}^{-} = 5.52 ln (t_{bm}) + 5.00

t_{bm} is the nominal base metal thickness for KF40 (in mm)

The loading shall be essentially uniformly distributed within each span, as normally occurs under the weight of wet concrete at the completion of the pour.

Mechanical Resistance of Sheeting (H_r) Value

The mechanical resistance of sheeting per unit width and length of slab (H_r) for KF40 shall be calculated based on the following formula:

$$H_r = \phi(1.2 - 0.1n_p)\, \phi\alpha t_{bm}^{\beta}$$

where:

ϕ = 0.85

n_p = number of pans per sheeting panel

α = 345 + 3.8·f'c

t_{bm} = base metal thickness of sheeting (mm)

β = 0.35 + 0.015·f'c

f'c = concrete grade (MPa)

Appendix L References

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AS/NZS 1554.2: 2003 – Structural steel welding: Stud welding (steel studs to steel).

AS 2327.1: 2003 – Composite structures: Simply supported beams

AS 3600: 2001 – Concrete structures

AS/NZS 4600: 1996 – Cold-formed steel structures.

BS 5950.1: 2000 – Structural use of steel work in buildings. Code of practice for design. Rolled and welded sections.

BS 5950.3: 1990 – Structural use of steel work in buildings. Design in composite construction. Code of practice for design of simple and continuous composite beams.

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Glossary

Acoustics
The transfer of noise in a building space.

Area of Steel
The total cross sectional area of steel.

Base Metal Thickness (BMT)
The thickness of the steel material excluding coating measured in millimetres.

Bearers
Generally the timber support that sits at the top of the propping frame and supports the KingFlor.

Bottom Face Reinforcement
Steel reinforcing bar or mesh located in the bottom half of the concrete slab.

Capacity Reduction Factor
A factor used to multiply the nominal capacity to obtain the design capacity (from Standards).

Cement
Portland or blended cement, or a mixture of the two complying with AS 3972.

Centroid
The centre of mass of an object.

Characteristic Strength
The value of strength of the material as determined by testing.

Composite Beam
Steel beam connected to the slab by shear connectors, normally shear studs.

Composite Concrete Member
A member consisting of both concrete and steel components which is connected in a manner such that the two components act as a singular member.

Composite Slab
The combination of a concrete slab with KingFlor steel decking.

Concrete
A mixture of cement, aggregate and water.

Construction Joint
A joint that is located in the slab for ease of construction. The joint does no impair the serviceability or strength of the slab.

Construction Loads
Loading subjected to the concrete slab during the construction period.

Cover
The distance from the outside of the reinforcing member to the nearest exterior of the member.

Crack Control
Top face reinforcement requirements to minimise cracking in a slab, in accordance with AS 3600:2001.

Curing
The processes of allowing wet concrete to achieve its maximum compressive stress. Usually over a period of 28 days.

Decibel
A measure of sound.

Deep Deck
A large open formed steel decking.

Edge Form
A folded steel edge made to the depth of the concrete slab fixed to the KingFlor.

Effective Depth
The distance from the compressive fibre of the concrete to the resultant tensile force.

Fire Exposure Condition
The exposure of the supporting steel beam. 4 sided when there is no slab and 3 sided with a slab resting on the entire length of the flange.

Flat Soffit
Flat soffit refers to no visible voids on the underside of the decking (I.e. KF57). The deflection of the decking is dependent on the design of the slab and the installation of temporary propping.

Formwork
The base of a concrete member. May be either permanent (KingFlor) or removable (ply form).

Fire Resistance Level (FRL)
The period, in minutes, of resistance to fire of a concrete member before it fails. As stated in AS 3600:2001.

Lightweight Concrete
Concrete made with lightweight coarse and normal weight fine aggregates having a dry density weight between 1800kg/m3 to 2100kg/m^3.

Mass Area
The weight of the unit per square metre.

Mass Linear
The weight of the unit per lineal metre.

Moment of Inertia
A property of a two dimensional cross section shape with respect to an axis, usually an axis through the centroid of the shape.

Mounding
The increased slab thickness due to the initial pouring prior to screeding of the slab.

Movement Joint
A joint made in the slab to allow movement between the two panels.

Normal Weight Concrete
Concrete which complies with AS 1379:2001 and normally has a dry density of 2400kg/m^3.

One-way Slab
A slab characterized by flexural action mainly in one direction.

Partial Shear Connection
The condition for which moment capacity of the composite beam is governed by the strength of the shear connection.

Penetrations
Projections through the concrete slab or steel decking.

Ponding
Increase in slab thickness due to the deflection of the KingFlor.

Post Tensioned Slabs
A one-way or two way slab with tendons which are post-tensioned after the concrete is cured.

Prop
A temporary support under the KingFlor slab which is normally removed when the concrete reaches 75% of its design strength.

Re-entrant Profile
An open ribbed profile where the base of the rib is narrower than the top.

Reinforcement
Steel bars or mesh.

Shear connector
A mechanical connector (normally a shear stud) welded to the top of the steel beam which enables the slab and beam to act as a composite member.

Simply Supported
A single span sheet pinned at ends.

Soffit
Underside of a slab.

Span-to-slab Depth Ratio
The effective span of the slab on the slab depth as per the requirements of AS 3600:2001.

Superimposed Dead Loads
Dead loads applied in addition to that of the self weight of the structure.

Tendon
A wire or strand which is intended to be pre-tensioned or post-tensioned.

Tensile Strength
The minimum ultimate strength of tension for the specified for the grade of steel.

Transverse Reinforcement
Reinforcement layed at right angles to that of the ribs of the KingFlor profile.

Trapezoidal Deck
An open ribbed profile where the base of the rib is wider than the top.

Yield Stress
The minimum yield stress in tension of the specified grade of steel.

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Fielders Ref# [ ] **(office use only)**

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Order Date ______________________

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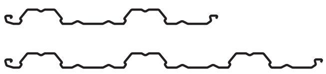
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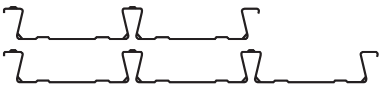
KF40®–3P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Deck Profile	BMT (mm)	Open/Closed Lap	Pack Reference	Quantity	Length (mm)

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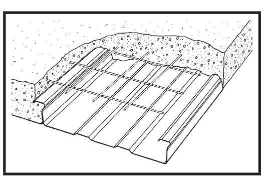
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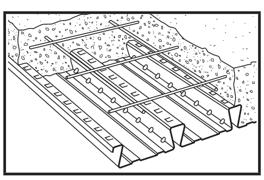
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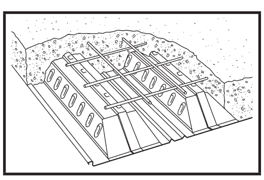
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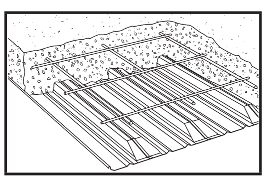
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BUILDING ADDRESS: ______________

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BUILDING SIZE: (FLOOR AREA IN M^2): ______________ INTENDED BUILDING USE: (i.e. CARPARK). ______________

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☐ TL-5/M/Clad ☐ Other______________ Maximum sheet length (m): ______________

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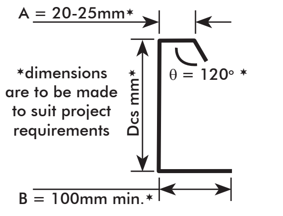
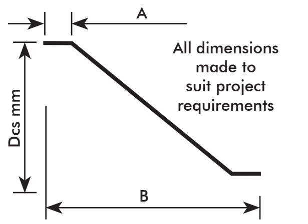
KingFlor® Edge Trim



Mark	Dcs (mm)	BMT (mm)	A (mm)	B (mm)	Length	Quantity

Band Beam Flashing



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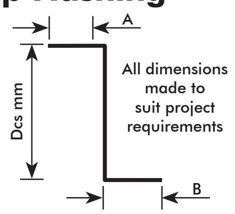
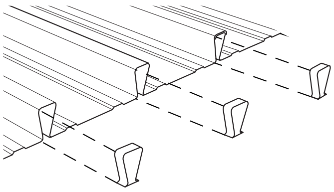
Step Flashing



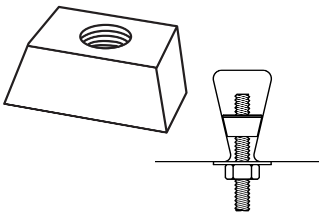
Mark	Dcs (mm)	BMT (mm)	A (mm)	B (mm)	Length	Quantity

RF55® Foam Infills



Mark	Quantity

RF55® Wedge Nut



Mark	Quantity

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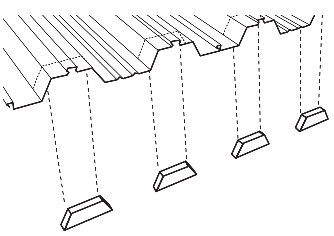

Mark	Foam/Metal	Quantity

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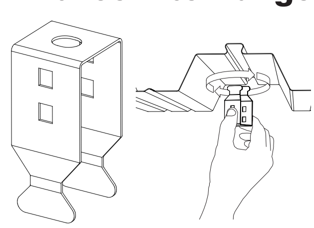

Mark	Quantity

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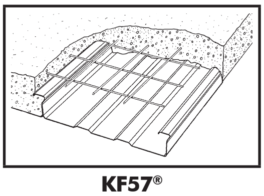

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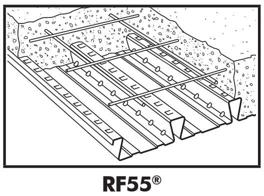

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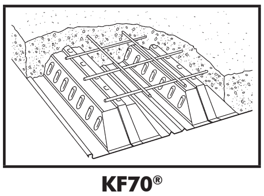

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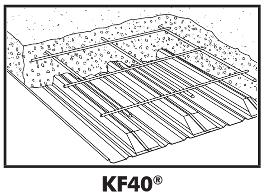

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