



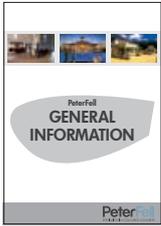
PeterFell

# TECHNICAL SPECIFICATIONS

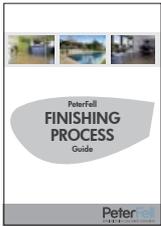
Guide

This Technical Specifications Guide details all specification requirements for the PeterFell System. It is designed for use by specifiers, architects, designers and project managers. This guide details all aspects of the PeterFell System, including practical and design considerations, to enable successful execution in any project.

For more information on the PeterFell System, including a system overview, product information and application instruction, please refer to the documents described below.



The PeterFell General Information Booklet provides an overview of the PeterFell System and is recommended to be read by anybody interested in using this system in their concrete project, and prior to using this booklet.



The PeterFell Finishing Process Guide contains full product information and application instruction for the PeterFell Finishing Process - the cleaning, grouting, preparation, and sealing of coloured concrete floors. This guide is essential for all contractors or home handy persons who are using the PeterFell System.

These documents, along with colour swatches, product information, and photo galleries, are available on our website:

[www.peterfell.co.nz](http://www.peterfell.co.nz)

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The following is a general job flow of the PeterFell System. The exact procedure will vary for each job depending on the specific project requirements. Contact Peter Fell Ltd to determine specific procedural requirements for each project.

## PeterFell System Job Flow Chart

### Choose the PeterFell System

Is concrete suitable? Is the PeterFell System suitable?

### Choose a concrete colour

Consult with PeterFell Ltd to choose a concrete colour.

### Coloured concrete is laid

The texture and finish of the concrete influences the colour, slip resistance, and gloss of the finished floor.

### Concrete is cured

Concrete curing should commence immediately following placement using water only.

### Concrete is cut

Construction (expansion) Cuts are employed to reduce concrete cracking. Later Decorative Cuts are used to generate a pattern on the concrete surface.

### Concrete is protected

The concrete is protected with polythene to prevent staining while it cures.

### Construction/landscaping is completed

All construction and landscaping is completed prior to beginning Finishing Process.

### Clean up

Protective covers are removed, concrete is dried, and any contaminants removed.

### Cuts are grouted

Decorative cuts are filled with PFL Non-Shrink Grout.

### Surface Preparation

Surface laitance (efflorescence) is removed with PFL Surface Preparation and PFL Neutralizer & Cleaner to prepare the concrete for sealing

### Concrete is sealed

Sealer is applied to enhance the colour and protect the concrete surface from staining.

PeterFell Finishing Process

The following are the technical specifications for the PeterFell System. This procedural specification is applicable for most projects, however additional processes may be required in specific cases. If further clarification or additional information is required, please contact Peter Fell Ltd.

An abbreviated specification of the PeterFell System (called 'PFL Quick Specs') is provided on the last pages of this document. This can be forwarded to contractors for use on site or as a quick reference.

## i Specify the PeterFell System

Determine the suitability of the PeterFell System for project. For an introduction to the PeterFell System refer to the 'PeterFell General Information' booklet, visit [www.peterfell.co.nz](http://www.peterfell.co.nz) or contact Peter Fell Ltd.

**Specification:** The PeterFell System. Consultation with Peter Fell Ltd.

**Timing:** At initiation/planning of project.

**Action:** Owner, architect/engineer, designer/landscaper in consultation with Peter Fell Ltd.

## ii Confirmation of Contractors

Confirm contractors for the project. Peter Fell Ltd provides NO contractors - refer to Appendix A for contractor and applicator information. Contact Peter Fell Ltd if further clarification on contractors is required.

**Specification:** Construction company/Builder/Project Manager:  
 Concrete Placer:  
 Concrete Cutter:  
 Concrete 'Finisher':  
 Other contractors:

**Timing:** Contractors must be confirmed prior to commencement of any work.

**Action:** Owner/project manager.

## iii Specify the Concrete Colour

Concrete colour should be selected in consultation with Peter Fell Ltd. Factors influencing colour selection are outlined in Appendix C (i), or contact Peter Fell Ltd for further information.

**Specification:** PFL Special Colour XXX

**Timing:** Colour must be ordered *at least* 5 days prior to the concrete pour date.

- Colour dosing can only be calculated once concrete specifications are finalised (refer to Appendix B (iii) for colour dosing information).

**Action:** Owner/Project Manager, designer/landscaper in consultation with Peter Fell Ltd to select a colour.

Owner/Project Manager/builder/concrete placer to order the colour.

## iv Specify the Concrete

Concrete is to be specified as per project specifications. Further details on concrete placement and finishing specification is provided in Appendix C.

### (a) Preparation:

All site preparation should be conducted in accordance with engineering specifications.

Ground Preparation: As per engineering specifications.

Moisture Barrier: As per building code requirements.

Note: It is recommended polythene is used as a moisture barrier under all concrete.

Insulation: As per project specifications.

Note: Standard use of expanded polystyrene (closed cell) is recommended.

Refer: Appendix F (iv) for details on under floor heating specifications.

Reinforcing: As per NZS 3109 and/or engineers specification

### (b) Concrete:

To be supplied by a graded concrete plant (NZRMCA).

Type: Standard or pumped concrete

Note: Changes in concrete type will impact on colour dosing.

Strength: As per engineering specifications

Note: It is recommended that 20 MPa is the minimum concrete strength used for all applications unless otherwise specified.

Admixtures: As per project requirements

Refer: Appendix C (i) for details on admixture specifications.

### (c) Colour Dosing:

Colour dosing calculated by Peter Fell Ltd.

Refer: Appendix B (iii) for details on colour dosing.

### (d) Placing and finishing:

Concrete is to be placed by an experienced concrete placer. The placing and finishing of the concrete determines the final texture and appearance of the finished floor. Details on concrete finishes are provided in Appendix C.

Placing: Concrete is to be placed as per NZS 3109

Finishing: Concrete should be finished as per NZS 3114, with additional detail of specific finish required.

Refer: Appendix C for specification details on concrete finishes.

### (e) Curing:

Concrete should be cured as per NZS 3109.

Note: No curing compounds are to be used on PeterFell floors.

Refer: Appendix C (iii) for specification details on concrete curing.

**Timing:** Concrete specifications are required to determine oxide dosing and impact of concrete finish on design elements in project i.e. concrete colour

**Action:** Owner/project manager/concrete placer.

PeterFell System Specifications continued over page...

## v Specify the Concrete Cutting

Construction Cuts should be executed according to engineer/project specification. Construction Cuts are augmented with Decorative Cuts to form the desired pattern. For information on concrete cutting in the PeterFell System refer to Appendix D.

**Specification:** Construction (expansion) Cuts as per engineer/project specification  
Decorative Cuts placed can be placed wherever desired

**Timing:** Construction Cuts must be executed with 24 hours of concrete placement.  
Decorative Cuts to be executed at least 5 days after concrete placement.

**Action:** Owner/Project Manager, designer/architect (Decorative Cuts) concrete cutter.

## vi Specify Concrete Protection

Concrete should be protected with polythene as soon as possible after finishing and initial cure. Polythene protects from marking and helps concrete curing. Refer to Appendix C (iv) for information on concrete protection.

**Specification:** Concrete to be protected with 250 micron polythene.

**Timing:** Concrete must be protected after initial curing.

**Action:** Owner/Project Manager, builders/landscapers.

### The following steps constitute the PeterFell Finishing Process

For full product information and application instruction refer to the PeterFell Finishing Process Guide

## vii Specify Clean Up

Once concrete is fully cured and construction/landscaping is completed, polythene should be removed and surface cleaned of contaminants. For full product information and application instruction refer to the 'PeterFell Finishing Process Guide'.

**Specification:** Concrete to be cleaned as specified in the 'PeterFell Finishing Process Guide'.

**Timing:** Protective polythene should be removed only when all construction/landscaping is complete.

Polythene must be removed at least one week prior to sealing (see Appendix E for details).

**Action:** Owner/Project Manager, 'Finishing' contractor.

## viii Specify Grouting

Decorative Cuts are filled with PFL Non-Shrink Grout which can be coloured with PFL oxides. Refer to PFL Finishing Process Guide for full product and application information.

**Specification:** Cuts to be grouted with PFL Non-Shrink Grout as described in the 'PeterFell Finishing Process Guide'.

Note: Specify appropriate PFL Special Oxide if grout is to be coloured.

**Timing:** Cuts can be grouted once concrete is cured.

**Action:** Owner/Project Manager, 'Finishing' contractor.

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## Specify Surface Preparation

Concrete should be treated with PFL Surface Preparation or PFL Eco Surface Preparation to remove surface laitance prior to sealing. Refer to the 'PeterFell Finishing Process Guide' for full product and application information.

**Specification:** Concrete is to be prepared for sealing with a mild, medium, or heavy treatment of PFL Surface Preparation or PFL Eco Surface Preparation and PFL Neutralizer & Cleaner as described in PeterFell Finishing Process Guide.

Refer: Appendix E (ii) for details on surface preparation specifications.

**Timing:** Surface laitance should be removed immediately prior to sealing.

**Action:** Owner/Project Manager, concrete cutter.

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## Specify the Sealer

It is imperative that the correct sealer is specified for floor use. PeterFell sealer specification details are provided in Appendix E (iii). For full product and application instructions refer to the 'PeterFell Finishing Process Guide'.

**Specification:** PFL Acrylic Sealer or PFL Glaze Sealer or Other  
PFL CoverSeal (for all internal residential floors)  
optional: PFL Anti-Slip, PFL Glaze Primer

**Timing:** Sealer can only be applied at least 28 days after concrete is poured.

**Action:** Owner/Project Manager, 'Finishing' contractor.

# Appendix A Contractor Information

The PeterFell System can be employed in any project involving concrete. While the PeterFell System requires no specialist applicators or training, it is recommended that all aspects of the System are carried out by appropriately skilled, competent trades people. Peter Fell Ltd provides all necessary products along with full application instructions, however

Peter Fell Ltd does not provide any labour or contractors.

A description of the contractors required to execute the PeterFell System is provided below. As with any project, the successful application is dependent on the competence and workmanship of the contractors employed. At all stages it is imperative that system specifications and application instructions are strictly adhered to. Similarly, as there is the potential for multiple trades people to be employed to work on the same project, it is essential that all parties are aware of the system requirements at all times.

Full consultation on the PeterFell System must be undertaken by all parties prior to the commencement of any work.

## i Architects/Designers

The PeterFell System can be specified for any project involving concrete. All components of the PeterFell System should be considered prior to specification, as some factors will have practical and aesthetic ramifications i.e. concrete finishing (specifically texture) and sealer type will influence concrete colour. All finishing products specified must be checked to be appropriate for the intended application. If clarification is required on any aspect of the specifications, product range or application, please contact Peter Fell Ltd.

## ii Concrete Contractors

It is recommended that all concrete is placed by an experienced concrete placer following proper concrete practices. There is little difference between the placing of standard grey concrete and PeterFell coloured concrete, so no specialised training is required. Peter Fell Ltd calculates the colour dosing and customises manufacture for each job. The key difference between a PeterFell coloured concrete floor and standard concrete is that the finishing of the concrete is critical as that is the final surface. Subsequently the required texture and finish must be clearly specified, and all relevant parties must be advised.

## iii Concrete Cutter

The Construction Cuts position and Decorative Cut pattern should be determined at the design stage.

It is recommended that all concrete is cut by a professional concrete cutter. Construction Cuts should be executed following standard cutting practices, in no case should be done with a hand-held blade.

The placement of Decorative Cuts is to be specified, both in placement and cut width, and they are to be executed using standard concrete cutting practices.

## iv Concrete 'Finishing' Contractor

The PeterFell Finishing Process can be completed by any competent handy person. Full product information and application instructions are provided in the 'PeterFell Finishing Process Guide'. For full application instructions or clarification on this process or any of our products please contact Peter Fell Ltd.

# Appendix B Colour Information

## i Concrete Colour Selection

The PeterFell System is an integral colour system, where a liquid colour (oxide) is mixed through the concrete. This results in the permanent colouring of the concrete which, unlike surface coatings, will not chip off or wear away. This colour method also means that

Each PeterFell floor is unique.  
PeterFell floors display natural variation in colour.

It is the natural variation in colour that typifies the PeterFell System. This variation is random, and is dependent on a number of factors including the colour, texture and finish of the floor. While the colour dosing is tightly controlled (detailed in Appendix B (iii)), the final colour is influenced by a number of elements, which are discussed in the table below:

### Concrete Colour Considerations

Concrete	While the composition of all concrete is very similar, the use of different cements, aggregates, or admixtures by different concrete suppliers will impact on the concrete colour. Also, site conditions, placing, and drying of the concrete will also influence the final concrete colour.
Texture	The concrete texture not only determines the surface finish, but will influence the concrete colour. Textured surfaces: The colour typically appears darker and more matt due to the textural refraction of light Smooth surfaces: The colour typically appears lighter, and the floor potentially glossier, due to reflection of light off the surface.
Sealers	ALL concrete floors should be sealed, irrespective of application or function. Sealing protects the concrete from staining and marking, but also enhances the concrete colour. As can be seen on our samples, sealers can change the final appearance of the colour, so it is important the effect of the sealer is taken into account when selecting a concrete colour.
Environment	The situation in which the concrete is being used, and it's surrounding environment will significantly influence the concrete colour - exactly the same as for paint. The amount and type of light reflected on the coloured concrete changes the appearance, as will surrounding decor and furnishings.
Colour Matching	Due to the integral colour method, every PeterFell floor is unique - this means that it is difficult to match existing concrete floors. While exactly the same colour may be used, the above factors mean that there is no guarantee that the two concrete areas will be the same colour. Colour matching is also complicated by the age and condition of the existing concrete.

Concrete Colour Considerations continued over page...

## Concrete Colour Considerations (continued):

Photography	It is almost impossible to ascertain the true colour of coloured concrete floors from photographs. Factors such as light, perspective, and image manipulation all alter the appearance of colour in photographs, and they should not be used to choose a concrete colour.
Exposed Aggregate or Ground Concrete	In any concrete where aggregate (stones) are visible, it is the aggregate which will be the predominant aesthetic component. PeterFell colours can be used in exactly the same way as for standard concrete, but the colour will be heavily influenced by the aggregate. Contact Peter Fell Ltd for further advice on colouring ground or exposed aggregate floors.

## ii Concrete Colour Dosing

All PFL Special Colours have a specific dose rate. This dose rate cannot be altered as this will affect the colour. This dose rate is calculated as a percentage of the cement content of the concrete i.e. most colours are dosed at 5% by weight of cement. As the cement content of concrete varies depending on type and strength of concrete, and will vary for the same concrete between suppliers (and even between plants from the same supplier), the amount of oxide required can only be calculated once the concrete details have been finalised. The key information required is the cement content of the concrete, as it is from this that all dosing is calculated. Peter Fell Ltd has cement content details of all major concrete companies and can easily calculate all dose rates and oxide requirements.

PFL Special Colours are manufactured specifically for each job. They are batched for specific load sizes to simplify dosing at the plant, reducing the chance of incorrect colour dosing. Peter Fell Ltd must be notified immediately if load sizes are changed as this will effect colour dosing and the colour will need to be re-batched. All buckets are clearly labelled with bucket weight, load number, number of buckets per load, and total oxide required per load. All oxides are weighed to an accuracy of 0.01 kg, and all mixes are swatch tested prior to dispatch to ensure absolute accuracy and quality.

### Colour Dosing Example

Require PFL Special Oxide 155 for 9 m<sup>3</sup> of standard 20 MPa concrete to be batched into 1 x 5 m<sup>3</sup> load and 1 x 4 m<sup>3</sup> load

- PFL 155 is dosed at standard 5% by weight of cement
- The cement content of the concrete is 240 kg per m<sup>3</sup>
  - The cement content can be obtained directly from the concrete supplier or from Peter Fell Ltd.

Therefore:

$$\begin{aligned} \text{Oxide Dose rate} &= 240 \text{ kg/m}^3 \times 5\% \\ &= 12 \text{ kg/m}^3 \end{aligned}$$

$$\begin{aligned} \text{Total oxide required} &= 12 \text{ kg/m}^3 \times 9 \text{ m}^3 \\ &= 108 \text{ kg} \end{aligned}$$

$$\begin{aligned} \text{Oxide per load} & \text{ For } 5 \text{ m}^3 \text{ load} &= 12 \text{ kg/m}^3 \times 5 \text{ m}^3 = 60 \text{ kg (typically supplied in 3 x 20 kg units)} \\ & \text{ For } 4 \text{ m}^3 \text{ load} &= 12 \text{ kg/m}^3 \times 4 \text{ m}^3 = 48 \text{ kg (typically supplied in 2 x 24 kg units)} \end{aligned}$$

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## Concrete Colour Samples

Peter Fell Ltd provides small concrete samples for colour selection (see below for sample details), available from the Auckland showroom. Peter Fell Ltd will send up to four colour samples on request to be used for colour matching. It is strongly recommended that prior to a request being made that the full colour range is viewed. Colour boards are available for viewing at most ready mix concrete plants nation wide - contact Peter Fell Ltd for location details. Swatches are available online, however it is recommended that concrete samples are referred to prior to final colour selection.

While samples are available it is strongly recommended that actual PeterFell concrete floors are viewed prior to making any colour choice. The Peter Fell Ltd showroom contains over 40 concrete floors on display, along with expert sales staff to help with colour selection. For further information on concrete samples or choosing a colour contact Peter Fell Ltd.

### PeterFell Colour Samples



sealed with  
PFL Acrylic Sealer

sealed with  
PFL Glaze Sealer

Colour samples give an indication of colour only.

- The final concrete colour will be influenced by the placing of the concrete, the environment, and the situation in which the concrete is applied.

Colour Samples do not show variation in colour.

- As samples are cast in moulds they do not display the natural variation in colour typical of the PeterFell System.

Colour samples do not represent the texture or 'finish' of actual concrete.

- As samples are cast in moulds they do not represent the texture and 'finish' of placed concrete, which influence the final concrete colour.

The samples are designed to provide a fair representation of PeterFell colours, however as Peter Fell Ltd has no control over the use of our colours we can offer no colour warranty or guarantee.

The ultimate responsibility for colour selection is that of the end user!

## i Concrete Admixture

Standard admixtures including air entrainer, set accelerators, set retarders, water reducing agents and superplasticisers will have minimal impact on the PeterFell System. However, calcium chloride based admixtures, or admixtures which alter the cementitious matrix, can affect the colour distribution i.e. increase the colour 'mottleness'. It is recommended that in hot weather water retarders are used to delay and control concrete set time. In cold weather, non-chlorine accelerators and/or superplasticisers should be used to improve handling and performance of the concrete

## ii Concrete Finishes

All concrete should be finished in accordance with New Zealand Standard 3114. In addition to these guidelines, further detail on the required finish must be specified. Refer to table on following page for outline of concrete finishes, their resulting texture, impact on concrete colour, and their typical application.

The concrete finish determines the surface texture and influences the concrete colour.

It is imperative that the correct finish is specified for the intended application. It is the concrete finish that determines the slip resistance of the concrete surface (see Appendix F (xvi) for further details). Finishing of the concrete will also influence the final concrete colour, and therefore the overall appearance of the finished floor. It is essential that the desired finish is clearly communicated to the concrete contractor to ensure there is no misunderstanding of the concrete finish required.

## iii Concrete Curing

Curing is the maintenance of satisfactory moisture content in concrete following placement to allow proper hydration of the cement. It is through this hydration that the concrete strength and durability is established.

Consequently as a first step in hot or exposed sites (i.e. prone to wind and extreme weather) it is recommended anti-evaporation compounds are used to stop rapid loss of moisture.

The curing period is dependent on the properties required of the concrete, but typically lasts for several days to weeks. However, it is the first 24 hours which are the most critical, during which time curing should be closely monitored. The curing process will be affected by site conditions, most notably temperature and humidity, which contribute to moisture loss from concrete.

No curing compounds are to be used in the PeterFell System

Curing compounds form a film on the concrete surfaces that reduces water loss to aid concrete curing. However, this film prevents the sealer applied later from penetrating and binding to the concrete surface, ultimately leading to delamination. Hence It is recommended that water is the only curing agent used on PeterFell coloured concrete floors. Water should be applied to the surface in a mist or fine spray. Care should be exercised when wetting the surface to ensure hoses or other devices do not mark the concrete. Materials that retain water (i.e. sand or hessian cloth) can be used to aid curing, however care must be exercised in timing and application as not to damage the concrete surface. Polythene sheets can also be used to stop water loss, and also aid in the protection of concrete during the curing process (see Appendix C (iv) for details on the protection of concrete). For more information on concrete curing refer to NZS 3109 Specification for Concrete Construction, Clause 7, or the Cement and Concrete Association of New Zealand website ([www.ccanz.co.nz](http://www.ccanz.co.nz)).

## Concrete Finishes

Type	Finish	Class	Technique	Notes	Coefficient of friction (wet)*
Smooth Finish	Trowled	U3	Steel trowelling (manual or mechanical) of floated finish when concrete is sufficiently hardened.	Standard internal finish, or where smooth finish is required. Smooth floors typically lighten the colour appearance, although if the surface is mechanically finished colour can be enhanced.	0.3 - 0.45
	Machined	U4	Vibrating or oscillating screed. May be supplemented with long handled float.	Used to increase durability of concrete. General commercial application for floors subject to heavy machinery or high use.	Test
Non-Slip Finish	Screeded	U1	Hand sawing motion with straight screed	First stage of concrete placement. Generates textured surface applicable for footpaths, patios and driveways. Texture tends to increase the depth of colour and minimise colour variation in concrete.	0.6 - 0.8
	Floated	U2	Wood or bull float	Higher standard of finish than U1, applicable for most external surfaces. Texture tends to increase the depth of colour and minimise colour variation in concrete.	0.65 - 0.85
	Broomed	U5/U6	Hard, soft or wire bristled broom or rubber tyning	Very textured finish for footpaths, yards, and driveways where extreme grip is required. Texture significantly increases depth of colour and minimise colour variation in concrete.	0.65 - 0.85
Ground or polished concrete	Ground	U11	Low speed coarse stone grinding of U2 finished surface.	Very smooth surface in which aggregate profile is visible. Colour will appear darker due to visual impact of aggregate.	est. 0.15 - 0.6
	Exposed aggregate	-	Aggregate exposed at time of placing	Texture generated from exposed aggregate. Applicable for external surfaces, most commonly used for driveways and paths. Concrete colour will be strongly influenced by aggregate.	0.4 - 0.9
Sandstone Finish	Sandstone	-	Treatment of concrete surface with concentrated solution of PFL Surface Preparation	Exposes sand and fine aggregate at concrete surface, generating sandy texture. Applicable for exterior surfaces	est. 0.55 - 0.90

\* = values taken from New Zealand Building Code, Clause D1 - Access Routes, Acceptable Solutions 1, Table 2: 'Acceptable Slip Resistance for Walking Surfaces'.

## iv Concrete Protection

Concrete in its raw state is very porous, and prone to marking and staining. As the concrete is the final surface in the PeterFell System, extra care should be taken to protect the concrete while curing occurs. During construction or landscaping there are a multitude of potential contaminants present on site. It should be emphasised to all contractors that the concrete is to be the finished surface and that extra care should be taken.

The best way to protect the concrete is with polythene - black 250 micron sheets are recommended. To ensure even curing, wet the slab lightly prior to overlaying the polythene. Ensure polythene has no folds as this may lead to line mark staining. The use of polythene may be difficult in external situations due to environmental limitation i.e. wind. The polythene can be held in place by taping using strong adhesive building or agricultural rubber type tape. The concrete slab must be dry around the edges to ensure the tape can correctly adhere. The polythene should not be secured using weights or similar as they will potentially affect colour developments in the concrete. Avoid stacking of materials on top of the polythene as this creates microenvironments on the concrete surface. As an extra precaution during construction, old carpet can be placed over the polythene. Cardboard and other cover boards can also be used, however these can curl and create a work hazard. Do not lay any carpet or similar material directly on the concrete surface as material may leach out and stain and mark concrete, and these materials do not provide adequate protection against liquid contaminants. In these areas moisture is drawn to the surface creating a reflective mark of the load that is difficult to remove.

It is essential that all protective covers are removed in sufficient time to allow the concrete to dry completely prior to application of the sealer. Concrete dries slowly so the longer the polythene is off the slab the better, but this will depend on the progress of construction and how much potential there is for contamination - obviously for the painting stage the polythene should remain on!

Protective covers should be removed at least one week prior to sealing

Any concrete surface must be *completely* dry prior to the application of any sealer. Moisture trapped under the sealer can cause the sealer to whiten (termed 'blooming'), or in extreme cases result in sealer delamination. To facilitate the drying process, protective covers may be lifted from internal surfaces once curing is complete and the site is weather tight. Externally, once the slab is cured the polythene may be discarded or replaced with more protection that allows the concrete to dry more efficiently i.e. cardboard. However, once the polythene is removed, caution should be exercised to minimise the risk of staining and marking of the concrete surface.

# Appendix **D** Cutting Information

Concrete cutting is an essential component of the PeterFell System. There are two types of cuts employed:

Construction Cuts:	Essential to control the natural shrinkage and cracking of concrete. Cuts <u>must</u> be correctly positioned, cut to the correct depth, and be executed within 24 hours of the concrete being poured.
Decorative Cuts:	Used to generate a pattern on the surface of the concrete.

All cuts should be marked in crayon. Do not use string lines or coloured chalk as they are difficult to remove. Specification of details for both types of cuts are described below. For information or advice on the placement of all concrete cuts please contact Peter Fell Ltd.

## **i** Construction Cuts

The placement of Construction Cuts must be determined prior to commencement of any concrete work. As concrete hardens (cures), excess water evaporates causing the concrete to shrink and so crack. Construction Cuts should be executed shortly after the concrete is placed to control random shrinkage cracking. As the concrete hardens, cracking occurs beneath the sawn slot when shrinkage exceeds the tensile strength of the concrete. As shrinkage begins almost immediately following placement, it is imperative that the Construction Cuts are executed within 24 hours of placement. Cutting too early causes ravelin or aggregate dislodgement, causing joint spalls. Sawing too late may mean uncontrolled cracking. Liaison between concrete cutter and concrete placer is paramount to ensure cutting is executed at the correct time.

All Construction Cuts should be continuous, not staggered or offset. Cuts must incorporate any changes of angles in slab layout. When the Construction Cut cannot be carried to the edge of the slab, due to either physical or design limitations, a crack is likely to radiate from the end of the cut to the slab edge. Whilst the positioning of Construction Cuts is determined by the concrete design, consideration should be given to the placement of the Decorative Cuts i.e. if a decorative diamond pattern is desired, the Construction Cuts can be employed at a 45 degree angle, instead of 90 degree angle which would generate a square pattern.

Construction Cuts are typically 3 mm wide and cut to a depth of one third the depth of the concrete. Vertical loads are transmitted across the joint by aggregate interlock between the opposite faces of the crack, providing the crack is not wide. If the saw cut is too shallow then random cracking will occur. If the saw cut is too deep, aggregate interlock may be insufficient to transfer vertical loads.

Concrete slabs should be cut allowing a maximum area of 16 m<sup>2</sup> for an average slab (approximately 100 m<sup>2</sup>). Decorative Cuts (see following section) should be placed over the Construction Cuts to incorporate them into the cut pattern and enable the cut to be grouted.

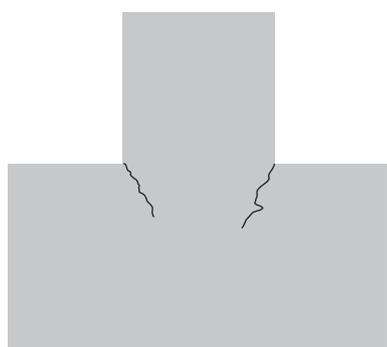
While cutting is the most common jointing process, other procedures can be employed. Consult with an engineer or concrete technician for other jointing options.

## ii Decorative Cuts

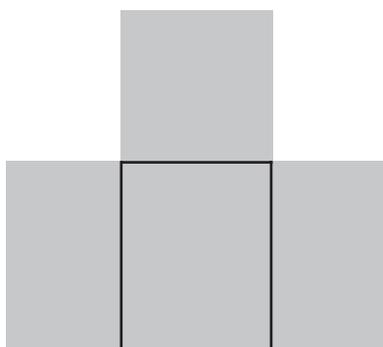
Unlike Construction Cuts, Decorative Cuts are employed simply for aesthetic effect. Subsequently, these cuts can be placed anywhere in the concrete and can be executed at any time, even months after the concrete is placed. However, it is recommended that Decorative Cuts are done 5 - 10 days after the concrete is placed, as at this stage the concrete will be of sufficient strength to enable a clean cut face, and still be soft enough to allow ease of cutting. If the concrete is too soft there is an increased chance that aggregate can be dislodged during cutting, resulting in jagged cut edges. If a continuous Decorative Cut pattern is required, ensure cutting is complete before any framing or other physical obstructions are placed on the concrete. If such limitations exist, cuts can be made parallel to the framing (or obstacle) to generate a border.

Decorative cuts are wider than Construction Cuts - typically done with a 10 mm saw blade (generating 9-13 mm cut), and only penetrate 10-15 mm into the slab. The only limitation on the width and depth of the Decorative Cut is that they need to be able to be grouted, which is difficult if they are too thin or deep. Decorative cuts are placed over Construction Cuts (see diagram below) to allow grouting, and to integrate the Construction Cuts into the decorative pattern. The placement of the Decorative Cuts is limited only by the Construction Cuts. For ideas and draft Decorative Cuts please contact Peter Fell Ltd.

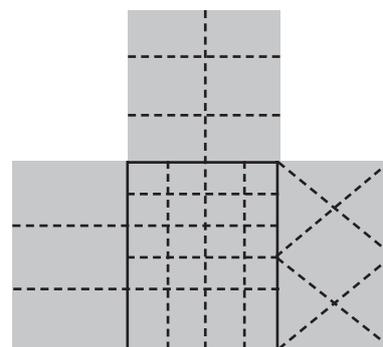
### Concrete Cuts



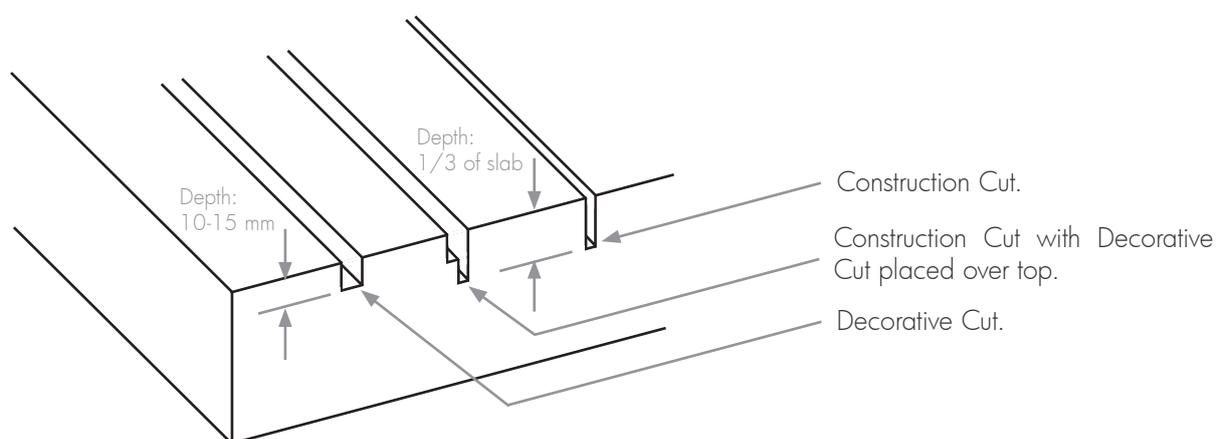
Shrinkage crack likely to originate from changes in angles in slab.



Construction Cuts placed to control cracking.



Decorative Cuts (dotted lines) can be placed around Construction Cuts to form a pattern.



Construction Cut.

Construction Cut with Decorative Cut placed over top.

Decorative Cut.

# Appendix E Finishing Process Information

A key aspect of the PeterFell System is the PeterFell Finishing Process. All concrete floors must be sealed to enhance the colour, and protect the surface from staining and marking. The PeterFell Finishing Process (outlined below) encompasses concrete cleaning, grouting of cuts, and the preparation and sealing of concrete floors. For full product information and application instruction refer to the 'PeterFell Finishing Process Guide' or contact Peter Fell Ltd.

## The PeterFell Finishing Process

### Clean up

Protective covers are removed and any stains or contaminants removed.

### Grouting

Decorative cuts are filled with PFL Non-Shrink Grout.

### Surface Preparation

Surface laitance (efflorescence) is removed with PFL Surface Preparation and PFL Neutralizer & Cleaner to prepare the concrete for sealing

### Sealing

Sealer is applied to enhance the colour and protect the concrete from staining and marking.

## i Clean up

It is essential that all construction debris, rubbish, marks and contaminants are removed from the concrete prior to sealing. Failure to properly clean the concrete surface can compromise sealer application and lead to sealer delamination. Sealing will also highlight any marks or stains on the surface, which once sealed, will be difficult to remove. Clean up should also occur prior to treatment with PFL Surface Preparation as the acidic surface preparation may react with contaminants to further damage or mark the concrete. For full information on the cleaning and preparation of concrete surfaces for sealing refer to the 'PeterFell Finishing Guide' or contact Peter Fell Ltd.

## ii Grouting

All Decorative Cuts should be filled with PFL Non-Shrink Grout. As Construction Cuts are only 3 mm wide, it is recommended that Decorative Cuts are placed over top, even if no other Decorative Cuts are being used, to allow cuts to be properly filled (see Appendix D for cutting specification details). PFL Non-Shrink Grout is a specially designed shrinkage-compensated grout with excellent substrate adhesion, is non-corrosive, non-toxic, and impact resistant. Grouting should not be conducted as for ceramic tiles as this will result in staining of the concrete. It is recommended that grouting is conducted using a PFL Grout Gun, although it can be applied by trowel providing cuts are lined with PFL Grout Tape to prevent contamination of the concrete surface surrounding the cut. For full application instruction refer to the PeterFell Finishing Process Guide.

## ii Grouting (continued)

PFL Non-Shrink Grout can be coloured using ANY colours in the PeterFell colour range. *Most commonly, the concrete colour is also used as the grout colour.* As PFL Non-Shrink Grout is a slightly darker base colour than concrete when colour is used in the grout it will also appear darker, offering a subtle contrast whilst retaining the same colour tone as the concrete. However a lighter or darker colour can be used for a contrast, or the grout can be left in its natural colour. As the colour is added to the grout on site, colour tone can be adjusted to suit individual requirements.

While PFL Non-Shrink Grout is engineered with a unique 2 - stage shrinkage compensation mechanism and displays excellent substrate adhesion, in cases of excessive slab movement, due to design or environment, any stresses or cracking will occur down Construction Cuts (what they are designed for). This movement can result in cracking (typically fine hairline cracks) or 'popping' of cementitious grout - even of PFL Non-shrink grout with impact resistant compounds. In these extreme cases a more flexible material should be used - contact Peter Fell Ltd for further information.

## iii Surface Preparation

It is critical that the floor is treated with either PFL Surface Preparation or PFL Eco Surface Preparation prior to application of any sealer. These solutions remove surface laitance (efflorescence) present on the surface of all new concrete, which no other method will do effectively. If this laitance is not correctly removed the sealer will not be able to adhere correctly to the concrete surface, resulting in the delamination of the sealer. The surface preparation solutions will not however remove all contaminants from the surface of the concrete. These should be removed prior to treatment with any surface preparation solution (refer to PeterFell Finishing Process Guide for details on cleaning of concrete).

As surface laitance forms on the surface of the concrete it masks the 'true' colour of the concrete, which is subsequently revealed following treatment with the surface preparation solution. This standard application (mild etch) is essential in the preparation of the floor for sealing, and will not alter the inherent floor characteristic. However, if it is desired, PFL Surface Preparation can be used to alter both the texture and finish of the floor by adjusting the solution strength and treatment time. It is essential that PFL Surface Preparation is correctly diluted and that a test area is completed to ensure dilution is appropriate for the intended application. The table below gives an indication of the effects of different dilution effects of PFL Surface Preparation or PFL Eco Surface Preparation.

### Use of different PFL Surface Preparation strengths

Mild etch	Recommended for preparation of internal floors, or areas with minimal surface laitance. Will not significantly alter the texture and colour of the floor.
Medium etch	Recommended for preparation of external surfaces, or areas with significant surface laitance. Prolonged treatment exposes sand (and eventually aggregate), increasing surface texture and change the concrete appearance.
Heavy etch	Recommended only when heavy exposure or Sandstone Finish (see Appendix C) of concrete surface is required. Will significantly alter the appearance and texture of the concrete - proceed with caution!

## iii

## Sealing

Sealing is the final step in the PeterFell System. Sealing enhances the concrete colour and protects the concrete from staining and marking. There are several key factors that should be considered when specifying sealers:

All concrete floors should be sealed.  
The concrete surface must be properly prepared prior to sealing.  
The sealer selected must be suitable for the intended application.

Peter Fell Ltd offers a range of sealing and finishing products (outlined below) designed specifically for use on concrete floors. It is imperative that the correct sealer is selected for the intended application - refer to the chart over the page for assistance in selecting the correct sealer. For full product information and application instructions refer to the 'PeterFell Finishing Process Guide', or contact Peter Fell Ltd.

### PeterFell Sealer Range

PFL Acrylic Sealer	<p>PFL Acrylic Sealer is a durable sealer designed for application on internal and external concrete floors.</p> <ul style="list-style-type: none"> <li>- Retains natural colour and finish of coloured concrete.</li> <li>- Commonly used on internal floors with PFL CoverSeal.</li> <li>- Not for high use areas or those subject to vehicular traffic i.e. driveways.</li> </ul>
PFL Glaze Sealer	<p>PFL Glaze Sealer is a highly durable, multi-purpose sealer, ideal for driveways and high-use areas.</p> <ul style="list-style-type: none"> <li>- Accentuates the colour in concrete giving a 'wet look' finish</li> <li>- Can be used with PFL Anti-Slip to improve grip on smooth concrete surfaces.</li> <li>- Can be used with PFL Glaze Primer to achieve a natural finish, similar finish to that of PFL Acrylic Seal, with the advantage of PFL Anti-Slip.</li> </ul>

In addition to these two sealers, Peter Fell Ltd has the following sealer related products:

PFL Glaze Primer	<p>PFL Glaze Primer is used to prime concrete surfaces prior to application of PFL Glaze Sealer.</p> <ul style="list-style-type: none"> <li>- Enables natural colour finish with PFL Anti-Slip.</li> <li>- NOT for high use areas or those subject to vehicular traffic i.e. driveways.</li> </ul>
PFL CoverSeal	<p>PFL CoverSeal must be applied to all internal sealer floors. It is a water based, high gloss, anti-scuff, stain repellent floor polish for use on interior sealed PeterFell coloured concrete floors.</p> <ul style="list-style-type: none"> <li>- Can be applied over both PFL Acrylic and PFL Glaze sealers.</li> </ul>
PFL Anti-Slip	<p>PFL Anti-Slip can be added to PFL Glaze Sealer to provide improved texture and grip to smoothly finished concrete surfaces.</p>

# Which PeterFell Sealer do I use?



For assistance in selecting the appropriate sealer for the intended application please contact Peter Fell Ltd.

# Appendix **D** Miscellaneous Specifications

The following points cover miscellaneous specification of the PeterFell System. If further information is required on any of these matters please contact Peter Fell Ltd.

## **i** Colouring Only Part of a Concrete Floor

The PeterFell System does not have to be used exclusively in all concrete in a project. The PeterFell System can easily be used in projects where only a portion of the concrete is required to be coloured i.e. other areas covered with carpet, wood flooring etc. The coloured concrete should be placed first and taken to at least one metre past where other flooring is to be used. Care must be exercised in placing, especially in regard to cross contamination of grey concrete into the coloured area. Contractors must be vigilant when finishing to avoid contaminating the coloured concrete with plain concrete from work boots and equipment. All tools should be thoroughly cleaned when moving from plain to coloured concrete. Communication with contractors on these matters is essential to ensure successful execution of the PeterFell System.

## **ii** Exposed Aggregate Concrete

The PeterFell System can be integrated into projects using exposed aggregate concrete. This type of concrete uses different types of aggregates (stones) which are then exposed on the surface to give a unique stoney texture and appearance. This type of concrete is commonly used for exterior applications such as driveways and paths, or areas where the unique stoney texture is beneficial.

The primary aesthetic consideration when choosing exposed aggregate concrete is the aggregate itself. In New Zealand there are wide range of natural aggregates offered, encompassing a range of different sizes, colours, and combinations of stones. It is advisable to contact your local concrete supplier to determine the available aggregates in your area. The PeterFell System can be used to provide a complimentary (or contrasting) background colour to the aggregate selected. The PeterFell Finishing Process is also strongly recommended, even in situations where no colour is added to the concrete, as sealing exposed aggregate concrete will not only protect the surface from staining and marking, but also enhances the natural colour of the aggregate.

## **iii** Concrete Overlays

The PeterFell System can be used to colour concrete overlays exactly as for standard concrete flooring. All concrete overlays should be undertaken with due diligence to ensure optimal structural integrity. It is recommended that all overlays are bound to the existing substrate i.e. using an epoxy bonding agent. The overlay should be of an appropriate thickness, typically four times average aggregate size with a minimum depth of 50 mm. For any overlay under 80 mm, cuts in the existing slab should be transferred to the overlay, and all cracks should be 'bandaged'. Consultation with an engineer or concrete professional is strongly recommended for all overlay projects.

## **iv** Underfloor Heating

The PeterFell System can be used with all types of underfloor heating. The primary consideration when using any heating system is the placement of Construction (expansion) Cuts. These cuts are required in all concrete, coloured or plain, and should never be omitted. Care should be taken in the preparation and placement of piping, wiring, or heating coils. The placement of all sub-floor components should be clearly defined prior to the placing and cutting of the concrete to ensure successful integration of the heating system into the concrete floor. Typically, heating components are placed 500 mm from any Construction Cut. All components should be secured in place at regular intervals to prevent movement during concrete placement. Communication with all relevant contractors is essential to the successful integration of any under floor heating system in concrete.

## v Decorative Concrete Effects

The PeterFell System can be augmented with a variety of material to change the appearance of the finished surface. The table below lists some common methods for creating decorative features in concrete. The overall design, structural impact, and the effect on the concrete colour and finish, should all be taken into account when considering a decorative feature. It is also imperative that all contractors involved are experienced in the application of the decorative effect, and that appropriate preparations and correct application techniques are employed.

Grinding/ Polishing	This is the process where the surface of the concrete is mechanically removed exposing the aggregate and generating a very smooth surface. Refer to Appendix F (vi) for grinding and polishing specification details.
In lays	Virtually any material can be placed in the surface of the concrete for decorative effect. Refer to Appendix F (vii) for in lay specification details.
Murals/Painting	This decorative effect has been around for centuries, and encompasses a wide range of applications, from detailed murals to corporate logos. It is essential that the materials used to create the art work are compatible with concrete i.e. won't leech through the concrete. It is essential that a sealer is placed over the art (and the surrounding concrete) to protect from wear and damage.
Edging/Borders	A number of elements can be used to border concrete or as a mowing strip. These elements may add textural variation (i.e. concrete pavers) or simply change the appearance of the concrete (i.e. grinding a border pattern). Integration of these elements into the PeterFell System is dependent on the materials or processes involved. Consult with Peter Fell Ltd and/or contractors for application advice.
Channels	A common decorative tool is the use of channels in the concrete which are then filled i.e. with loose river pebbles or decorative grasses (e.g. mondo grass). Channels are also a convenient way to integrate drainage and irrigation into concrete design. Channels can be generated in a number of ways, most commonly by boxing out the channel and pouring separate slabs. Consideration should be given to the material used to fill the channels and their impact on the concrete.
Broadcast Aggregates (Seeding)	A range of materials can be integrated into the surface wet concrete for decorative effect e.g. shells and glass. The material must be compatible with concrete. Do not use sodium based glass products, as these will cause alkali aggregate reaction, damaging the concrete. Care should be taken to ensure material is correctly integrated into the surface, and will not be removed by subsequent treatments i.e. grinding. The material used should also be practical and not pose a health and safety risk i.e. no sharp edges.
Surface Effects	The placing and finishing of concrete determine the surface properties of the concrete. Manipulation of the surface can also be used for decorative effect. An example is the Sandstone finish achieved through the use of PFL Surface Preparation (see Appendix E (ii) for details). This process exposes sand and fine aggregates in the concrete which not only alter the texture of the concrete, but also the appearance.

## vi Grinding/Polishing

Grinding is the process where the surface of the concrete is mechanically removed, generating a very flat surface and revealing the aggregate profile. Grinding can be incorporated into the PeterFell System, offering an alternative to standard coloured concrete. Aesthetically, the key component of a ground floor is the concrete aggregate. In these floors, the PeterFell colours offer a complementary (or contrasting) background colour. The grinding of a standard concrete will expose the natural angular shape of the aggregate. The grinding of speciality aggregates, such as those used in exposed aggregate concrete, provides a greater diversity in cross section shape and colour in the finished floor. Consult with your local ready mix supplier or grinding contractor for available aggregates when considering grinding. Aggregates and other foreign matter (i.e. glass and shell) can also be seeded into the concrete surface for decorative effect. Care must be taken when seeding material into the concrete surface to ensure it is properly incorporated.

Grinding is usually a two phase process. The 'First Grind' removes most of the required surface layer, while the 'Second Grind' refines the surface to create the finished floor. The 'Second Grind' may encompass several passes over the floor to achieve the desired surface. Grinding can be conducted as a 'dry' or 'wet' process. Wet grinding is the recommended method as it is the most efficient, although this generates significant mess which needs to be considered from a site management perspective. It is recommended that the 'First Grind' is done 10 - 20 days after the concrete is poured, as the concrete has not gained full strength and framing or other obstacles may not yet be erected. The 'Second Grind' should be done before the lining goes on the framing, although may vary depending on other project requirements. The floor should then be protected for the duration of construction.

A number of ground finishes are available. There are no industry standards that define these finishes, however listed below are the terms used at Peter Fell Ltd when describing and specifying different ground finishes. These finishes will impact on the appearance of the concrete colour. The more of the aggregate exposed, the darker the colour will appear. In all applications, the desired finish should be clearly communicated to the grinder to ensure the desired final surface is achieved.

Grinding Depth	Finish
1 - 2 mm	'Salt and Pepper' grind
2 - 3 mm	Light grind
3 - 4 mm	Medium grind
5 + mm	Heavy grind

**Polishing** is simply a higher quality grind involving multiple (up to 12) passes over a floor using successively finer grades of grind (analogous to 'grit' of sandpaper). Polished floors are also treated with densifying agents to increase surface smoothness and increase surface light reflection.

All ground floors should be sealed. It is important to realise that grinding exposes air voids and may make pits in the concrete surface. The voids must be filled prior to sealing - sealers do not act as fillers. This is typically achieved by applying a light skim coat over the surface and re-grinding. The choice of sealer is important as it must form an even coating on the ground surface. As most sealers will not soak into the aggregate, but will penetrate into the surrounding cement matrix, following the application of several coats an uneven 'dimple' effect can result. For this reason epoxy type sealers are recommended as they provide an even coating. To improve the slip-resistance of the ground floor (which are very smooth and subsequently can be slippery) non-slip additives or an even graded sand should be incorporated into the sealer.

## vii In-Lays

A wide variety of material can be placed into concrete for decorative effect. Commonly used inlays include wood, tiles or ceramics, steel, and brass. Initial consideration should be given to the practicality of the proposed in-lay with respect to durability and safety i.e. sharp or brittle materials should be avoided. It is imperative that any in-lay is properly planned and care is taken in the execution.

Positioning of the in-lay should also be considered, ensuring the in-lay does not compromise the structural integrity of the concrete i.e. increase the probability of concrete cracking. In-lays can be fixed in a number of ways, and the method of application dependent on the materials being used. There are two general techniques, the direct method in which the in-lay is fixed first and the concrete poured around it, or indirectly, where an area is boxed off when the concrete is poured and the in-lay inserted later. Care should also be taken that the in-lay will not have a detrimental effect on the concrete i.e. does not leech chemicals or colours into the concrete such as tanned or stained wood. The in-lay must remain stable as movement may cause the material to be dislodged (i.e. warping wood) or compromise the integrity of the concrete. All in-lays should be carried out by an experienced trades person familiar with both the in-lay medium and the placing of concrete.

## viii Tilt Slab Colouring

The PeterFell System can be used to colour tilt slabs and other vertical concrete panels. The oxides are dosed exactly as for standard concrete, and should be specified as such. The same colour considerations should be taken into account when choosing colours for the slabs. It is also beneficial if slabs are cast at the same time by the same manufacturer to minimise colour variation due to environmental factors i.e. temperature, humidity etc. As with standard concrete, the effect of surface treatments i.e. sealers or waterproofing agents, and their effect on the colour should be taken into account.

## ix Pod System Flooring

The PeterFell System can be incorporated into projects using pod systems flooring i.e. Firth Rib-Raft, Allied Concrete Super Slab, Atlas Concrete Raft Flooring etc. In these situations standard concrete should be used to secure the pods, stopping at least 100 mm from the surface. A layer of coloured concrete (at least 100 mm thick) should then be placed immediately over top. The bottom layer of concrete must not be allowed to harden prior to application of the coloured top layer of concrete. Similarly, extreme care should be taken to avoid contaminating the top layer of coloured concrete with the underlying standard grey concrete. Contractors should ensure all equipment (including work boots) are cleaned between placing of standard concrete and the final coloured layer. If a shallow pod system is employed it may be more practical (and economical) to colour all the concrete.

## x Swimming Pool Surrounds

A common application of the PeterFell System is for swimming pool surrounds as the colour in the concrete is not directly affected by chlorine or salt water. Similarly, all the PeterFell sealers are suited for use around pools. When specifying the PeterFell System for pool surrounds ensure particular attention is paid to texture and finish of the concrete as this will determine slip resistance critical in this environment. PeterFell colours can also be used in the pool edging (refer to Appendix E (xiii) for specification details on concrete pavers) to complement (or contrast) the concrete colour. It is recommended that the pavers are laid first and the concrete finished up to the pavers or coping. Consult with Peter Fell Ltd for further information on the use of the PeterFell System for pool surrounds.

## xi Concrete Stairs

The PeterFell System can be used to colour concrete stairs. Stairs can be generated *in situ*, or precast off site and installed later. Either way PeterFell oxides can be used to integrally colour the stairs. All *in situ* poured stairs should be placed by an experienced trades person. The boxing should be constructed so it can be easily dismantled and the face of the rise trowelled. Alternatively, the rise can be plaster rendered following placement and curing of the concrete. PeterFell oxides can be used in the plaster (refer to Appendix E (xiv) for details on colouring plaster) to approximate the concrete colour.

## xii Concrete Bench tops

The PeterFell System can be used to colour concrete benchtops. The colour is added directly to the concrete exactly as for standard flooring. If the benchtop is to be ground, consideration should be given to the impact of aggregates and type of grinding used on the final appearance of the colour. Similarly, use of aggregates and sands may vary colour from that observed in standard concrete i.e. colour samples. It is not recommended that PeterFell sealers are used on benchtops. PeterFell sealers have been designed for use on floors only, they are not designed to protect the concrete from scratching and markings from knives and utensils, or to withstand direct heat i.e. hot pots. It is recommended that a specialist benchtop sealer is used which has been designed with this use in mind. For more information on concrete benchtops visit the Cement and Concrete Association of New Zealand website ([www.ccanz.co.nz](http://www.ccanz.co.nz)).

## xiii Paving Slabs

While the PeterFell System utilizes concrete as the primary medium, PeterFell colour can also be used in other cement based products like paving slabs and concrete tiles. However, while exactly the same colour may be used in both concrete and in pavers, the final colour may be different due to the different material components i.e. aggregates, sands, etc. Also, pavers are cast in moulds (individual units) and therefore will exhibit less colour variation than in concrete. It is recommended that the colour is seen in paver form, or test samples are completed to ensure colour is appropriate. Consideration should also be given to any sealing or finishing compound to be applied to the paver.

It is recommended that specialist concrete paver sealers are used, not PeterFell sealers. The PeterFell sealers are designed specifically for application on placed concrete floors, and not for the sealing of the more porous concrete pavers or tiles. The most common application for paving slabs or concrete coping in the PeterFell System is for edging around swimming pools, garden edging, or as mowing strip for driveways and paths. This is advantageous in reducing the number of design elements required, with the same colour able to be used in both the paving and concrete.

## xiv Plaster Colouring

PeterFell colour can be used in plaster and other similar cementitious mediums, and are simply added to the mix. If it is desired that the plaster colour matches the concrete, the dose of the colour in the plaster can simply be manipulated until the desired colour is achieved. While this is a simple process, it may require several test mixes to achieve the desired colour. It is essential that when manipulating the colour dose in plaster that the colour is assessed only when the plaster is completely dry as the colour will change as the plaster cures. Peter Fell Ltd has recommended dosing information for use of colour in plaster, including weight-to-liquid conversion for ease of application. When ordering colour for plaster is it essential that the total cement for the job is known, as this will determine the amount of oxide required. Please contact Peter Fell Ltd for further information.

## xv Commercial and Industrial Coatings

While the PeterFell System can be used to permanently colour all forms of concrete, the finishing products applied must be suited to the specific application (refer to Appendix E (iii) for sealer information). For industrial or high use areas, additional compounds or finishes may be required to protect the concrete. These materials will impact on the colour and finish of the floor. Consult with Peter Fell Ltd for further information regarding the use of other surfacing agents.

## xvi Slip Resistance

The PeterFell System encompasses a diverse range of concrete surface finishes, from smooth ground floors to textured exterior surfaces.

The slip resistance of any PeterFell floor is determined by the texture of the concrete surface

New Zealand Building Code (NZBC) stipulates that access routes, defined as walking surfaces such as decks, patios and steps on the approach to the main entrance to housing and common areas of communal residential and multi-unit dwelling accommodation, have a coefficient of friction ( $\mu$ ) of 0.4 for flat surfaces. This slip resistance requirement is designed to safeguard the movement of people into and out of buildings. For details on slip resistant requirements refer to NZBC Clause D1 - Access Routes.

In the PeterFell System, the coefficient of friction is determined by the concrete surface. The coefficient of friction for various concrete finishes is presented in Appendix C (ii). For a complete list of slip resistant surface rating refer to NZBC Clause D1 - Access Routes, Acceptable Solutions 1, Table 2: 'Acceptable Slip Resistance for Walking Surfaces'. The correct application of PeterFell sealers will not significantly reduce the slip resistance of the concrete surface. However, if the sealer is applied incorrectly, there is the possibility that the sealer will reduce the coefficient of friction.

PeterFell offers an anti-slip compound (PFL Anti-Slip) which can be impregnated in PFL Glaze sealer. Use of PFL Glaze Sealer with PFL Anti-Slip has an estimated  $\mu$  of 0.55-0.90\*. PFL CoverSeal, which is applied over PFL sealers on internal floors, has a coefficient of friction of >0.5#. While these products have sufficient slip resistance, the concrete surface is still the key determinant of slip resistance in the PeterFell System.

\* = NZBC D1/AS1 Table 2, Portland cement concrete surface (finished in compliance with NZS 3114), coated and grit impregnated.

# = American Society for Testing and Materials (ASTM) Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine. see [www.astm.org/Standards/D2047.htm](http://www.astm.org/Standards/D2047.htm) for more information.

The PeterFell product range is listed below. For full product information, application instruction, and price please contact Peter Fell Ltd

## Colour

PFL Special Oxides	PFL Special Oxides are liquid oxide colours for the integral colouring of concrete in the PeterFell System.
PFL Powder Oxides	Peter Fell Ltd has a range of powder oxides for bulk distribution.
PFL Truck Packs	Powder oxides packed in soluble bags that can be added directly to concrete. Simplifies handling of powder oxides.

## Grouting Products

PFL Non-Shrink Grout	PFL Non-Shrink Grout is a shrinkage compensated cementitious grout designed for decorative grouting in the PeterFell System.
PFL Grout Gun	PFL Grout Gun is designed for delivery of PFL Non-Shrink Grout in to decorative cuts in the PeterFell System.
PFL Grout Tape	PFL Grout Tape is used when grouting decorative cuts in the PeterFell System.

## Surface Preparation Products

PFL Surface Preparation	PFL Surface Preparation is a traditional etching solution used to prepare concrete surfaces for sealing.
PFL Eco Surface Preparation	PFL Eco Surface Preparation is an environmentally friendly, less corrosive alternative to traditional etching products used to prepare concrete surfaces for sealing.

## Sealers

PFL Acrylic Sealer	PFL Acrylic Sealer is a durable sealer designed for application on internal and external concrete floors.
PFL Glaze Sealer	PFL Glaze Sealer is a highly durable, multi-purpose sealer, ideal for driveways and high-use areas.

## Sealer Related Products

PFL Glaze Primer	PFL Glaze Primer is used to prime concrete surfaces prior to application of PFL Glaze Sealer if a more natural colour is desired.
PFL CoverSeal	PFL CoverSeal is a water based, high gloss, anti-suff, stain repellent floor treatment for use on interior sealed PeterFell coloured concrete floors.
PFL Anti-Slip	PFL Anti-Slip can be added to PFL Glaze Sealer to provide improved texture and grip to smoothly finished concrete surfaces.
PFL Broom	PFL Brooms are perfect for application of PFL Sealers on exterior surfaces.

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## Sealer Related Products (continued)

PFL CoverSeal Stripper	PFL CoverSeal Stripper removes PFL CoverSeal from internal floors.
PFL Sealer Stripper	PFL Sealer Stripper can be used to remove all PFL sealers from concrete surfaces.

## Cleaning and Maintenance Products

PFL Neutralizer & Cleaner	PFL Neutralizer & Cleaner is a biodegradable cleaner designed to neutralize PFL Surface Preparation and for the general cleaning of concrete surfaces.
PFL Algaecide	PFL Algaecide is used to remove algae, moss, and lichen from concrete surfaces without the need for water blasting.

## Cement Paint

Snowcem	PFL Supercem is a traditional lime wash product for application on plaster or block walls.
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For full product information, application instruction, and pricing please contact Peter Fell Ltd.

# Peter Fell Ltd

81-83 Patiki Road, Avondale, Auckland, New Zealand

P.O. Box 90608, Victoria Street West, Auckland 1142, NZ

ph: 0800 422 6568 or (09) 828 6460 fax: (09) 820 0722

e-mail: [info@peterfell.co.nz](mailto:info@peterfell.co.nz)

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The following are abbreviated specifications for the PeterFell System. For full specifications refer to the 'PeterFell Technical Specifications Guide' or contact Peter Fell Ltd.

### i Specified concrete colouring method:

Specification:

### ii Specified Contractors

Refer to 'PeterFell Technical Specifications Guide' Appendix A for contractor specification details.

Project Manager:

Concrete Placer:

Concrete Cutter:

Concrete 'Finisher':

Other contractors:

### iii Specified Concrete Colour:

Refer to 'PeterFell Technical Specifications Guide' Appendix B for concrete colour specification details.

Specification:

### iv Concrete Specifications

Refer to 'PeterFell Technical Specifications Guide' Appendix C for concrete specification details.

#### (a) Preparation

Ground Preparation:

Moisture Barrier:

Insulation:

Reinforcing:

#### (b) Concrete

Type:  Strength:

Admixtures:

(c) Colour Dose:

#### (d) Placing and finishing

Placing:

Finishing:

Finish Specified

(e) Curing:

## v Concrete Cutting Specifications

Refer to 'PeterFell Technical Specifications Guide' Appendix D for concrete cutting specification details.

Construction (expansion) cuts:

Decorative cuts:

## vi Concrete Protection Specifications

Refer to 'PeterFell Technical Specifications Guide' Appendix C (iv) for concrete protection specification details.

Specification:

## vii Concrete Clean Up Specifications

Refer to 'PeterFell Technical Specifications Guide' Appendix E for concrete clean up specification details.

Refer to 'PeterFell Finishing Process Guide' for product information and application instructions.

Specification:

## viii Grouting Specifications

Refer to 'PeterFell Technical Specifications Guide' Appendix E for grouting specification details.

Refer to 'PeterFell Finishing Process Guide' for product information and application instructions.

Specification:

## ix Surface Preparation Specifications

Refer to 'PeterFell Technical Specifications Guide' Appendix E for surface preparation specification details.

Refer to 'PeterFell Finishing Process Guide' for product information and application instructions.

Specification:  or

Preparation Strength:  or  or

## x Sealing Specifications

Refer to 'PeterFell Technical Specifications Guide' Appendix E for concrete clean up specification details.

Refer to 'PeterFell Finishing Process Guide' for product information and application instructions.

Specification:  or  or

optional:

For full specifications and product information contact:

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