Concreting

A guide to managing a concrete pour

Allied Concrete

A Guide To Managing A Pour, And Getting The Best Results From Your Concrete

An awareness of the process and associated difficulties that are required to effectively manage a concrete pour. Often the project manager is ultimately responsible to ensure all variables are covered.

The Process

Setup And Ordering

- Ensure there is safe and clear access to the site for concrete trucks
- Check if reinforcing is required. Ask us about READY Floor as an option. www.alliedconcrete.co.nz/readyfloor-calculator
- Sub-grade preparation, level and flat. Check if a vapour barrier such as polythene is necessary
- Confirm the type of concrete, slump and volume that is required. Check the weather, accelerator or retarders may be required to cope with hot or cold conditions
- Work out the speed of supply. Taking into consideration travel time, how close together the concrete trucks are required?
- Have your account details or method of payment, contact phone number and site address available
- If concrete cutting is required ensure that it is done as soon as possible after placing

Placing

- Choose an experienced concrete placer, ask to view some of their recent work
- Monitor water added to concrete on site, (check with the batcher to ensure that the maximum water content is not exceeded). Adding extra water will reduce the concrete strength
- Vibrate or rod the concrete to ensure adequate compaction
- Screed the concrete to the correct level
- Float off to close the surface (smooth off). Take care not to overwork wet concrete (this will bring too much cement paste to the surface) and do not add water to the surface when troweling, either action will weaken the final surface

Finishing

- The finishing process can only begin when the concrete has stiffened sufficiently and the bleed water has evaporated from the surface. The timing of this will depend on both the weather and the concrete temperature

- Determine how dense and hard wearing you want the concrete surface to be. Depending on the requirements different finishing methods are available, these include:
    - Mechanical power floating: for a hard wearing smooth surface (standard internal finish)
    - Bull float: applicable for most external surfaces, can be broomed to add grip
    - Decorative finishes: exposed aggregates, ground or polished. These are specialised finishes that require training and expertise to achieve a high level of finish

Curing

- Concrete should be protected from early loss of moisture; this loss can cause shrinkage cracking, as little strength development has occurred to withstand the stresses resulting from the volume change (due to loss of water)
- A good curing environment should exist immediately after finishing, and for best results for seven days
- After finishing and before curing can take place without damaging the surface, an evaporation retardant might be required to slow moisture loss in hot weather

Curing Methods

- Ponding: build a sand bund around the perimeter and fill with water to cover slab
- Spraying: the use of sprinklers to keep slab continuously wet
- Covering: impermeable covering such as plastic sheet will trap moisture on concrete surface and minimise evaporation
- Curing compounds: apply after finishing when bleed water disappears (use with caution, these products may affect follow on trades like paint, tiles, vinyl, adhesives)

How To Minimise Cracking

Control Joints

A shrinkage control joint is defined in NZS3604 as “a line along which the horizontal strength of a slab is deliberately reduced so that any shrinkage in the slab will result in a crack forming along that line”.

- Concrete should be cut as soon as possible without saw-cuts chipping on edges (within 12 hours in Summer, 24 hours in Winter). Soft-cut saws can be 6 to 8 hours after placing
- Cuts should be 1/3 of the depth of the concrete, try and keep sections as square as possible to equalise shrinkage in each direction
- Control joints can be made at the time of placing with a specially shaped trowel or by adding plastic or steel inserts
- Cracks may occur where dimensions change in the slab or around obstructions and re-entrant corners i.e. columns, waste pits, drainage sumps etc. Use diagonal bars at the corners or put in joints to prevents cracking. Make sure that any saw cuts are not too far apart to relieve stress

Plastic Shrinkage Cracks

Plastic shrinkage cracks are formed in the surface of the concrete before it has set (or in a plastic state); often they may not become visible until some time later.

As a general rule, if it is good weather to hang out washing to dry it is ideal weather for plastic cracking to occur as well. Our web site www.alliedconcrete.co.nz has a graph to help you assess the risk of cracking on any given day.

Factors Which Lead To Plastic Cracking

- Sunny and or windy days (high evaporation rate)
- Low humidity (higher evaporation rate)
- Exposed sites (higher evaporation rate)
- Broom finishes (increase surface area and evaporation rate)

How To Minimise The Risk Of Plastic Shrinkage Cracking

- Do not place concrete when the weather conditions are too severe for you to control the evaporation rates of water from your concrete
- Moisten the sub-grade and forms prior to starting the pour

- Use polypropylene fibres in your mix – Allied Concrete stock a wide range of poly fibre options
- Use an anti-evaporative spray to prevent excessive water loss from slab. We supply and recommend SIKA-film (use in accordance with manufacturers instructions)
- Cover the concrete with polythene or membrane cure immediately after finishing

Hot Weather Concreting

- Check weather conditions and assess the risk of plastic cracking
- Organise workers and trucks so you avoid/ minimise delays
- Use Antivap spray and cure the concrete
- Consider early morning or evening placement
- Retarder may be necessary to slow the setting time or to allow for travel

Cold Weather

- Low temperatures drastically slow the setting process (less than 5 degrees is considered unfavorable)
- Do not place onto frozen ground or if snow is forecast. In extremely cold conditions consider READY Now
- Order concrete with accelerator in it
- Consider using a higher grade of concrete and a lower slump (lower water content)
- Do not attempt to finish concrete until all bleed water has evaporated, this will take longer on cold days
- If a frost is expected cover the slab

Frost damage

Decorative Concrete

Recommended minimum strength for decorative concrete is 20MPa.

READY Colour

READY Colour is a premium range of colours that will not leach out of the concrete however there will always be natural variation in colour, texture and appearance due to concrete being a natural material.

When using READY Colour you need to be aware of the following:

- Areas in shade, the time of day, and concrete poured in stages on different days can have an affect on the final colour
- Accelerators can cause the concrete to produce a variable colour
- READY Colour often requires an acid wash to remove efflorescence (white minerals) from the surface. This is a specialised operation and requires experience

READY Exposed

- Exposed or polished concrete will show any foot prints or marks that have been filled in by screeding slurry across them. To prevent this fill with a shovel of mixed concrete

READY Products

For a superior finish we recommend using READY Sealer for decorative concrete. When sealing concrete you need to be aware of the following:

- Ensure that you not seal when the concrete temperature is below 12 degrees or when it is damp (moisture will make the sealer go ‘milky’)
- There is a minimum of 28 days from placing until concrete can be sealed

Ask About Our READY Solutions

READY Floor

- Steel fibre reinforced concrete is an economic alternative to traditional crack control mesh reinforcement and can be used for any lightly loaded concrete ground floor

READY Colour

- For internal floors, driveways, patios, paths and pool surrounds think coloured concrete

READY Exposed

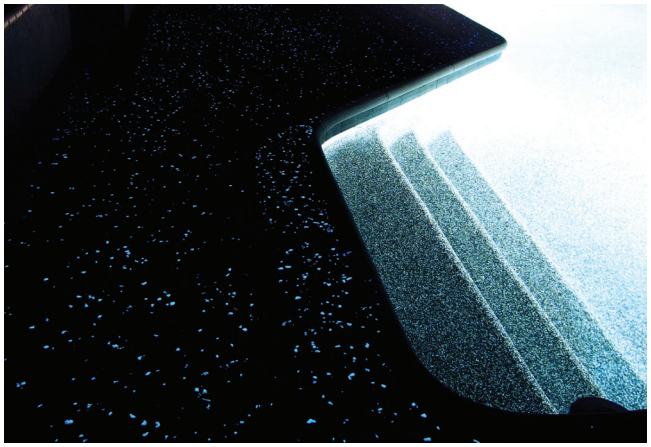
- Combine the strength, durability and affordability of concrete with the natural beauty of New Zealand's spectacular riverbeds

READY Products

- READY Sealer, READY Acid and READY Thinner

READY Now

- A specific mix designed for cold weather*



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Consult your Allied Concrete representative for specialised information.

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