



NEW CONCRETE DRIVEWAYS WHAT TO EXPECT

WHILE PROVIDING A RESIDENTIAL CONCRETE DRIVEWAY ON THE GROUND IS RELATIVELY STRAIGHTFORWARD, THERE ARE MANY ASPECTS OF DESIGN AND CONSTRUCTION THAT REQUIRE SKILL AND EXPERIENCE IN ORDER TO PRODUCE AN ACCEPTABLE FINISHED PRODUCT.

CONCRETE USES INGREDIENTS - SAND, AGGREGATE, WATER AND CEMENT, ALL OF WHICH ORIGINATE FROM NATURALLY OCCURRING MATERIALS. SO SOME VARIATION IN COLOUR AND TEXTURE OF A CONCRETE SURFACE IS TO BE EXPECTED.

BUT JUST WHAT IS "ACCEPTABLE" IN A NEW CONCRETE DRIVEWAY?

TO HELP ANSWER THIS QUESTION THIS SHORT LEAFLET OFFERS SIMPLE GUIDANCE ACROSS A RANGE OF AREAS THAT INFLUENCE THE OUTCOME WHEN CONSTRUCTING A RESIDENTIAL CONCRETE DRIVEWAY.



WHEN TO INSPECT?

A concrete pavement takes 3 - 6 months to harden and dry out, so judging it after a week or so after construction may ignore some of the longer term changes. In time the concrete will gain strength and lighten in colour, but it will continue to shrink for up to 6 months.



SURFACE FINISH

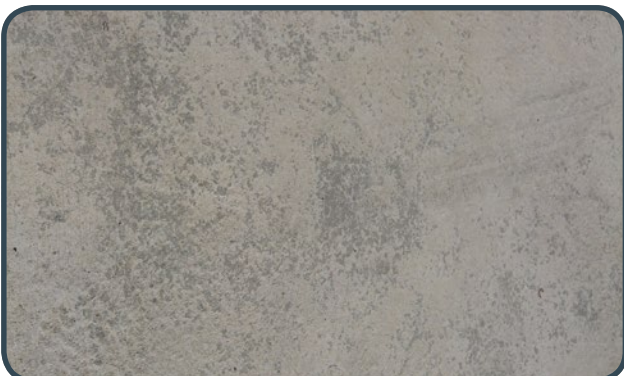
The surface finish on a concrete driveway needs to provide skid resistance. A smooth surface will be treacherous to walk on in wet or frosty weather, particularly if it is on a slope. A light broom finish is therefore commonly applied.



Sample panels can be used to agree on the surface appearance. The NZ Standard for concrete finishes requires sample panels to be viewed from a distance of 3 metres. View the driveway from this distance when assessing the driveway's surface finish.

COLOUR DIFFERENCES

Concrete generally lightens in colour as it gains strength and dries out. Contrasting dark and light areas of new concrete will become less visible as the concrete dries out.



PINTO

A particularly severe type of discolouration that may appear as the concrete dries out is 'pinto'. Pinto does not include stains caused by foreign materials that come into contact with the concrete surface after finishing.



There does not appear to be one common cause for pinto. While the material components of concrete can influence the overall colour of concrete they are not usually contributing factors to pinto.

Observations indicate that possible causes are related to environmental factors (e.g. ground conditions) or concrete construction practices. These could include:

- residual ground fertiliser
- moisture movement from ground
- movement and settling of bleed water
- rain water on slab
- adding water during finishing
- differential curing



Suggested steps to reduce the risk of pinto involve controlling environmental variables and close oversight of placing, finishing and curing. Where possible, it is advisable to:

- minimise water added to ready mixed concrete truck
- employ consistent placing and finishing techniques
- give the surface a light power float for consistent density
- use anti-vaps (to reduce the surface water evaporation rate)
- place polythene under the slab to prevent moisture movement
- keep the concrete surface wet to cure for a week
- uniformly prepare substrate



There are various courses of action to help lessen the appearance of pinto, including:

- pinto will fade with time
- application of an acid wash
- application of white vinegar
- grinding the surface
- application of a proprietary sealer

EXPOSED AGGREGATE

Constructing an exposed aggregate driveway requires a degree of expertise. A specialist concrete placer should be chosen on the basis of other driveways they have completed successfully.

Variation in the distribution and size of stone is to be expected, the surface should be viewed for uniformity from a distance of 3 metres. A surface sealer is usually applied to enhance the exposed aggregate by giving it a 'wet look'.

It must be remembered that removing the top layer of paste to expose the aggregate may also expose surface defects. These may include air voids, which can occur if the concrete is not vibrated.



STRENGTH

Concrete takes approximately one month to achieve maximum strength; it will take longer in cold weather. As such, the hardness or strength of the concrete driveway cannot be judged in the first few weeks after construction.

SURFACE CRACKS

While the visual acceptability of cracks is very subjective, a 0.3mm wide crack can be regarded as acceptable. Surface cracks up to 0.3mm wide can be expected in concrete for a variety of reasons and such small cracks do not compromise the strength of the concrete and cannot be seen unless viewed up close.



Cracks wider than 1mm should be assessed on an individual basis in terms of possible effects on durability and performance requirements and, depending on the surface texture and finish, also on aesthetic requirements.



Despite adopting good design, detailing and construction practices, such as control joints and reinforcing mesh, to minimise the risk of cracking, there will be situations where cracks may occur as a result of movements in concrete due to changes in its moisture content and temperature.

Driveways may also be subjected to excessive loads that may also result in cracking. It is important to keep vehicles off a new concrete driveway for around 2 to 3 weeks. If cracking does occur over time, it is important to identify the cause, and then assess whether the cracking is acceptable, or needs repair.



TOLERANCES

Like all building materials, some tolerances on dimensions and flatness should be allowed for in concrete driveways. For instance, a 100mm thick driveway can be between 95mm and 105mm thick.



DRIVEWAY CROSS-FALL

A 1 in 50 cross-fall should be built into a driveway to prevent rainfall puddling on the surface. However, some minor puddling up to 5mm deep is to be expected when allowing for tolerances.



COMMUNICATION IS KEY

As with all construction projects, communication from the very beginning is essential to ensure an outcome that meets the customer's expectations.

During the planning stage of a concrete driveway the concrete contractor is encouraged to discuss all possible outcomes with the customer.

CCANZ MATERIAL

This leaflet complements CCANZ's *Residential Concrete Driveways and Paths (IB 80)* information bulletin. IB 80 provides guidance on the planning, design, construction, maintenance and specification aspects that need to be considered to ensure a successful concrete paving project.

With concise information at hand, those involved in a new concrete driveway will more clearly understand the factors that combine to influence the finished product, and in turn be better placed to make an assessment.

This leaflet and IB 80 are free to download from the Publications section of the CCANZ website www.ccanz.org.nz



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