



CONSTRUCTION ISSUE

CONCRETE FINISHES**1 GENERAL****1.1 CROSS REFERENCES****Cross reference**

Conform to the *Preliminaries*.

Conform to the Environmental Management section of the invitation to tender document.

Related worksections

Conform to associated worksections as follows: Insitu Concrete, Concrete Formwork

2 QUALITY**2.1 SAMPLES****Sample panels**

Surface treatment: Do not proceed with the related work until, for surface treatments, the accepted range of treatments has been determined.

3 MATERIALS AND COMPONENTS**3.1 MATERIALS****Clear resin sealers**

Type: Transparent acrylic resin sealer, resistant to ultraviolet rays, suitable for exterior or interior applications, rendering the surface impervious to stains of oils, grease, water and acids, non-yellowing, non-discolouring to the base surfaces, cut with a combination of hydrocarbon solvents to give good penetration into the surface.

Total solids: At least 14%.

Surface hardeners

Suitable for cementitious toppings or as laid surfaces.

4 EXECUTION**4.1 TOLERANCES****Tolerance classes**

Determine tolerance classes using a straight edge placed anywhere on the surface in any direction.

Class 1: Planeness. When a straightedge 3 m long is placed on the surface at any position, no part of the surface shall be more than 3 mm below the straightedge.

Smoothness. When a straightedge 150 mm long is placed on the surface at any position, no part of the surface shall be more than 1 mm below the straightedge.

Class 2: When a straightedge 3 m long is placed on the surface at any position, no part of the surface shall be more than 6 mm below the straightedge.

Class 3: When a straightedge 1.2 m long is placed on the surface at any position, no part of the surface shall be more than 6 mm below the straightedge.

4.2 CAMBER

Where the soffit of the concrete element is either specified or noted on the Contract Drawings to be cambered, the unformed surface of the element shall be similarly cambered.

In the event that the floor doesn't take up a flat surface subsequent to stripping of forms the contractor shall allow for a subsequent additional concrete topping pour where the floor has pre-camber specified in conjunction with a level top surface.

4.3 SURFACE MODIFIERS**Seal stripper**

Thoroughly clean the surface before the application of finishes to masonry and cementitious floors. Remove wax (buffable, self-polishing and acrylic paste types), heavy duty polymer finishes, and clear resin sealer using a seal stripper.

Surface hardeners

Apply to clean surfaces. Do not apply to non-slip topping.

4.4 UNFORMED SURFACES**General**

Finish the unformed surface of the concrete in accordance with **Unformed Surfaces Schedule**.

Finish Types

Type A - Scratched Finish

After the concrete has been placed, struck off, consolidated and levelled to a Class 3 tolerance, the surface shall be roughened with stiff brushes or rakes before final set.

Type B - Floated Finish

After the concrete has been placed, struck off, consolidated and levelled, the concrete shall not be worked further until ready for floating. Begin floating when the water sheen has disappeared and/or when the mix has stiffened sufficiently to permit the proper operation of a power-driven float. The surface shall then be consolidated with power-driven floats. Hand floating with wood or corked-faced floats shall be used in locations inaccessible to the power-driven machine. Trueness of surface shall be re-checked at this stage with a 3 metre straight edge applied at not less than two different angles. All high spots shall be cut down and all low spots filled during this procedure to the required tolerance. The slab shall then be re-floated immediately to a uniform, smooth, granular texture.

Type C - Steel Trowelled Finish

Where a trowelled finish is specified, finish the surface first with power floats, as specified above, where applicable; then with power trowels and finally with hand trowels. The first trowelling after power floating shall be done by a power trowel and shall produce a smooth surface which is relatively free from defects, but which may still contain some trowel marks. Additional trowelling shall be done when a ringing sound is produced as the trowel is moved over the surface. The surface shall be thoroughly consolidated by the hand trowelling operations. The finished surface shall be free from any trowel marks, uniform in texture and appearance, and shall be placed to the required tolerance. Damage due to burnishing will not be accepted.

On surfaces intended to support floor coverings or membranes, any defects of sufficient magnitude to show through the floor coverings shall be removed by grinding.

Type D - Broomed Finish

Pavement slabs and slabs in locations so specified shall be given a coarse transverse scored texture by drawing a broom or hessian belt across the surface. This operation shall follow immediately after floating as outlined above.

Type E - Non Slip Finish

Where a non-slip finish is required, the surface shall be given a "dry shake" application of a ceramically bonded crushed aluminium oxide, or other approved abrasive particles. The rate of application of such material shall be not less than 1 kg/square metre

Unformed Surfaces Schedule

Element	Finish Tolerance	
	Type	Class
Floor slabs to receive vinyl sheet or paint finish	Type C	T Class 1
Stair treads	Type B	T Class 2
Floor slabs to receive topping slab, mortar bed or the like	Type A	T Class 3
Floor slabs to receive carpet finish	Type B	T Class 2
Slabs to receive membrane or the like	Type B	T Class 2
Pavement slabs and ramps unless otherwise noted	Type D	T Class 2

4.5 FORMED SURFACES

Evaluation of formed surfaces

If evaluation of formed surface tolerance or colour is required, complete the evaluation before surface treatment.

Smooth rubbed finish

Remove the forms while the concrete is green, patch immediately, and complete the rubbing not later than the following day. Wet the surface and rub using a carborundum or similar abrasive brick until a uniform colour and texture are produced. Do not provide cement grout other than the paste drawn from the green concrete by the rubbing process.

Exposed aggregate finish

Remove the forms while the concrete is green. Wet the surface and scrub using stiff fibre or wire brushes, using water freely, until the surface film of mortar is mechanically removed without the use of acid etching, and the aggregate uniformly exposed. Rinse the surface with clean water.

Bush hammered finish

Remove the minimum matrix using bush hammering to expose the coarse aggregate without recessing the matrix deeper than the aggregate, to give a uniform texture with insignificant random tool marks.

Floated finishes

Sand floated finish: Remove the forms while the concrete is green. Wet the surface and rub using a wood float. Rub fine sand into the surface until a uniform colour and texture are produced.

Grout floated finish: Remove the forms while the concrete is green. Dampen the surface and spread, using hessian pads or sponge rubber floats, a slurry consisting of one part cement (including an appropriate percentage of white cement) and one and a half parts sand passing a 1 mm sieve. Remove surplus until a uniform colour and texture are produced. Cure.

Blasted finishes

Abrasive: Blast the cured surface using hard, sharp graded abrasive fine aggregate particles until the coarse aggregate is in uniform relief.

Light abrasive: Blast the cured surface using hard, sharp graded abrasive fine aggregate particles to provide a uniform matt finish without exposing the coarse aggregate.

Classification of Form Finishes

Provide formed surface finishes in accordance with the **Formed Finishes Schedule**. The criteria to be used to determine acceptance are listed below. The classifications are generally in accordance with the categories of Surface Finish and Colour Uniformity listed in Section 3 of AS 3610, but where they are modified this specification shall prevail.

Formed Finishes Schedule

Location	Class of Surface Finish	Type of Colour Control
All exposed concrete	Class 2A	Controlled board marks and bolt holes

Note: No concrete is to have paint finish. All concrete noted to have an applied finish to have clear sealer only.

Critical Face of Elements

- Basement lift core external faces
- All exposed concrete slab soffits
- All exposed columns
- All pigmented elements, which shall be "charcoal".

Rebate Profile

- Width on face 5mm, depth 15mm
- Dummy joints to have same profile width gap width to match that proposed between separate panels.
- Sealant at joints to be recessed to rear of precast rebate. Colour to be agreed and match panel colour.
- Edge profiles and waterproofing details/rebates etc to be detailed by subcontractor to suit building type and exposure. Provide details prior to installation.

Test Panels

In accordance with AS 3610 – clause 3.6. Requirements as clause 3.6.2 (b). For each quality of concrete class provide minimum size 1200 x 1200mm. Panels to show perimeter joints, dummy joints and waterproof jointing profiles. In situ Test Panels may be constructed in locations approved by the Principal. If approved by the Principal, the sample panel shall form part of the completed contract works and serve as a future reference for balance of works throughout the construction stage.

Colour Control

In accordance with AS 3610 tonal range to be at the lightest grey end of scale possible with the concrete mix currently in use.

Surface Pattern Details

- Where board mark and bolt hole locations are critical refer to drawings for set out.
- Board set out based on maximising use of 2400 x 1200 timber forms.
- Tie Bolts set out based on either 250 or 300mm offset from board edge, horizontally 900mm maximum spacings, vertically 750mm maximum spacings.
- Form dummy holes and joints as appropriate to achieve pattern.
- Consistency between floors columns and exposed beams of board mark set out is critical.

Bolt hole filing

- Grout fill to form recess 6mm deep generally to all exposed class 2 / 2C / 2CX areas.

Construction / Expansion joints

- Subcontractor to confirm setout proposals and provide section details for comment prior to installation.
- Confirm any differences where joints are located in trafficable and non-trafficable areas.

Protection to Critical Faces

- Adequate to prevent surface damage and repair.

Making Good for Applied Finishes

Surfaces to receive applied render, paint etc., shall have arrises at formwork joints ground down to a flat surface. Blowholes etc., in surfaces to be painted shall be filled before painting.

No patching, filling or making good shall be permitted prior to inspection and written approval from the Superintendent.

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