

Specification of Surface Finishes under AS 3610



High-rise office building clad with high-quality polished facade panels providing Class 2 finish – the best the precast industry can produce

1 Introduction

Precast concrete offers designers opportunities to achieve a high standard of surface finish. It however encompasses a wide range of products – from below ground pits to polished reconstructed granite facades. This data sheet deals with those precast concrete components which are exposed to view and which are required to have a finish meeting certain architectural criteria and which are not adequately dealt with by AS 3610. This will include facade units other than those with an applied finish, some structural components such as bridge units, building columns and beams and street furniture.

There are two broad categories of architectural precast concrete – *off form* and *exposed aggregate* finishes. The latter category includes sandblasted, polished,

honed, water washed, acid etched and like finishes where the off form surface layer of fines is removed.

The Australian standard which covers surface finish is AS 3610—1995, *Formwork for Concrete*, and its Supplement 1—1990. These documents cover only off form surfaces and do not apply to unformed or subsequently treated surfaces.

2 Difficulties with AS 3610—1995

Specifiers often call for inappropriate classes of finish based on AS 3610. The most common of these are calling for a class of finish concerned with off form concrete when exposed aggregate is specified, calling for a class of finish where the surface in question is unformed, and calling for a Class 1 finish which is impossible to achieve in all but a minority of cases.

A further difficulty is the administration of the AS 3610 specification for colour control. The colours in the code are grey and difficult to translate to typical precast concrete colours and therefore especially difficult to use for the evaluation of individual precast units.

This data sheet seeks to provide a basis for rational specification of surface finishes.

3 Applicability of Surface Classes

Class 1

Class 1 should not be specified except as allowed by AS 3610. The restrictions covered by the code include:

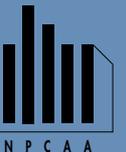
- Class 1 is the highest standard with the most rigorous specification and is only recommended for use in very special features of buildings of a monumental nature.
- Selected small elements
- Areas of special importance in limited quantities
- Elements contained in a single pour.

This of course implies that finishes from different pours will differ from one another.

It is clear therefore that, as much as all concerned would have a preference for specifying what seems to be the best, Class 1 must never be specified for areas such as a facade, for structural units in a project or for other instances which fall outside of the restrictions quoted above.

Class 2

Class 2 is that which will be specified for most good quality architectural precast concrete.



N P C C A A



All precast concrete facades can be painted as these hollowcore wall panels have been

Class 3

Class 3 has application for buildings and structures where visual quality is important but which is of less importance architecturally. It provides a perfectly acceptable standard for many industrial and civil structures and will result in cost savings for the owner.

Classes 4 and 5

These classes are for situations where the visual quality is not important and apply to surfaces which are concealed from general view or are never seen. They are outside the scope of this data sheet.

4 Controlling Surface Finishes in Practice

The specification of Class 1 finish can only be for a very important element in a very important structure. It will rarely occur. It is essential that the specifier be completely confident of what can be achieved or that trials are carried out before an order is let.

The overwhelming majority of finishes will be Class 2 and 3. These are simple to specify and achieve for flat or uncomplicated precast units but far more difficult for complex units. AS 3610 is very difficult to apply to off form finishes for blowhole and colour control. It will often lead to a greater range of colour variation or blowhole size and number than is desirable. By far the best result in these areas comes from the provision of samples from the manufacturer and by reference to existing buildings with similar characteristics.

Sophisticated polished, sandblasted and other such architectural finishes must be controlled by samples and by reference to good practice as found on existing buildings. Samples made from moulds incorporating any complex shapes or other details may be required if the outcome cannot be confidently predicted. The designer must then inspect the first panels from the production moulds to ensure that variables such as the depth of sandblast are satisfactory.

Above all it must be remembered that perfect colour, segregation and blowhole control cannot be achieved. Precast concrete is made from natural materials and subject to variation for a host of reasons. For absolute uniformity in these areas precast units should be painted.

5 Hollowcore

Prestressed hollowcore wall and floor units are widely used in Australia with over 500 000 square metres being produced per annum. They are an exceptionally efficient product which use a minimum of steel and concrete.

Hollowcore units are manufactured with slipform or screw feed technology with a standard of finish determined by the characteristics of the machine. Hollowcore units will generally be in the range of Classes 2 and 3 but each manufacturing method will give different results and it is therefore imperative that specifications which are available from the manufacturers be used instead of specifications for conventional concrete.



Top quality Class 2 off-form finish in industrial building representative of best industry practice

6 Paint Finishes

Precast concrete which complies with good practice and AS 3610 may nevertheless require further treatment of airholes or other minor but normal imperfections prior to application of some paint finishes. This work, unless otherwise agreed, is normally the responsibility of the customer.

7 Summary

Precast concrete can deliver exceptional architectural results but in order to achieve that designers and specifiers must understand the product rather than relying solely on prescriptive specifications.

AS 3610—1995 is a useful document but is not suitable for specifying classes of surface finish for most architectural precast concrete and does not deal at all with the specific characteristics of hollowcore. In particular the term 'Class 1' implies that other classes are inferior to it. This is not the case.

The *Precast Handbook* currently being produced by the CIA and NPCAA will deal with the subject of this data sheet in more detail.