

REGIONAL EXAMPLE PANEL

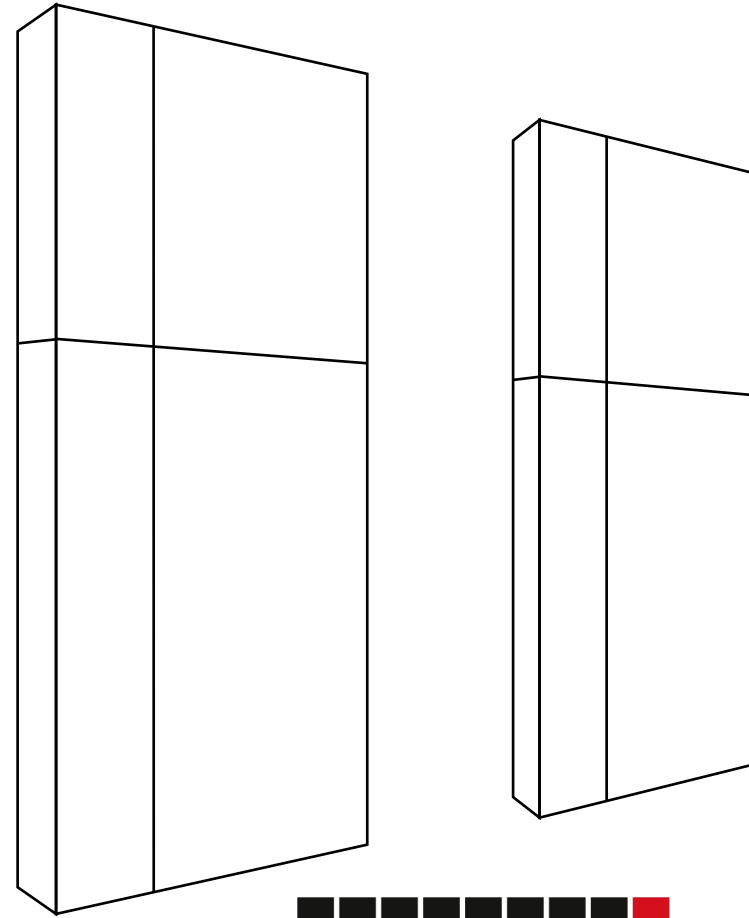
GUIDANCE NOTES



CONCRETE FINISHES

to

NSCS Edition 5



The site (Central England) has been generously provided by
PERI LTD

CONSTRUCT gratefully acknowledges their co-operation and support.

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CONCRETE FINISHES - EXAMPLE PANELS GUIDANCE NOTES FOR INTERPRETATION AND USE

Introduction – CONSTRUCT

CONSTRUCT Concrete Structures Group Limited is an association, membership of which is based on specialist concrete contractors and associated companies in the supply chain, notably those in the ready mixed concrete, formwork and reinforcement industries. Its objectives are to promote excellence in concrete structures and to introduce measures which will improve construction efficiency and productivity.

For further information on CONSTRUCT contact - The Executive Secretary Tel: 0844 249 1355 E-mail: enquiries@construct.org.uk

The members of CONSTRUCT identified the need for physical reference panels to demonstrate typical finishes. The DETR agreed and offered 50% funding for a project to produce and locate panels at strategic sites throughout the UK under a Partners in Technology contract. The reference panels were produced to represent concrete finishes described in BS 8110 Structural Concrete but are considered as representative of ordinary and plain finishes as described by the Fifth Edition of the National Structural Concrete Specification for Building and Construction aligned with BS EN 13670 Execution of Concrete Structures. The notes relating to the panels refer to the standards set for ordinary and plain finishes.

Introduction – Example Panels

These panels constitute a realistic, consistently achievable standard as a benchmark for the benefit of the construction industry. They represent interpretations of the most often used finishes in situ concrete, agreed by a committee of experienced, professional practitioners appointed by CONSTRUCT. They relate to finishes described in BS EN 13670: 2009 clause 8.8 as amplified by NSCS Specification clause 8.7.1.

It is impossible to produce panels with a perfect finish straight from the formwork. Neither is it practical to produce panels with a ‘just acceptable’ range of blemishes such as blowholes, surface irregularities, colour variation and arris lines. The panels produced have therefore been assessed in conjunction with these guidance notes. They should be reviewed from a standard distance of 3 metres and the prevailing light and ambient conditions should be taken into consideration. Information on the materials and methods used are only for background information. The panels are considered to be representative, irrespective of the type of material, methods and reuses of formwork used.

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Regional Example Panel – GA

WALL ELEVATION

FORMWORK ELEVATION

SECTION 1 - 1

SECTION 2 - 2

DIMS. TO B.S.4466

MARK	TYPE & SIZE	TOTAL No.	LENGTH	SHAPE CODE	A	B
01	T12	10	2900	20	STRAIGHT	
02	T12	22	900	20	STRAIGHT	
03	T10	5	900	38	400	160

T - TYPE 2 DEFORMED BARS, GRADE 460 COMPLYING WITH BS 4449.

NOTES

1. CONCRETE TO BE GRADE C 35 TO BS5328.
2. REINFORCEMENT TO BE HIGH YIELD.
3. COVER TO ALL BARS TO BE 40mm.
4. MANUFACTURER TO PROVIDE SPACERS BETWEEN REINFORCEMENT MATS AS REQD. AND MAY TAKE THE FORM OF REINFORCEMENT U BARS. ALL TIE WIRE ENDS MUST BE TURNED IN, AWAY FROM THE PANEL FORMWORK SURFACE.
5. BOLT HOLES FOR FORMWORK TO BE PLASTIC WITH CONES.
6. ONE BOLT HOLE TO BE FILLED FLUSH (ON BOTH SIDES), AND ONE BOLT HOLE TO BE FILLED AND NEATLY RECESSED TO WITHIN 10mm BELOW SURFACE (ON BOTH SIDES).
7. LIFTING SOCKETS TO BE C.C.L.M20 SOCKETS COMPLETE WITH 400mm LONG HAIRPIN T12 DIA. BARS ALL IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS OR SIMILAR AGREED.
8. TOTAL PANEL WEIGHT APPROX. 1.80 TONNES.
9. TWO PANELS TO BE CONSTRUCTED AS FOLLOWS :

PANEL FINISH	EACH SIDE	FORMWORK
ORDINARY	NEW	DOUGLAS FIR G1S (GOOD ONE SIDE) WITH MOULD RELEASE AGENT.
	USED	
PLAIN	NEW	PAPER FACED PLY (EVANS POURFORM) WITH MOULD RELEASE AGENT.
	USED	
10. PANELS MUST BE CONSTRUCTED IN THE VERTICAL POSITION AS WALL PANELS WITH TOP & BTM. POSITIONS AS MARKED.
11. FORMWORK TO BE OF THE SAME CONSTRUCTION TO ALL PANELS.

E	NOTES 1, 2, & 6 AMENDED	V.R.D.	06/2/98	A.W.
Mark	Revision	Chgd	Date	Drn

PETER BRETT ASSOCIATES
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Scale	1:25	Code Ref	C:\ALW\TYP_WALL
Date	SEPT 95	Drawn	A.W.
Checked	VRD	Passed	VRD

OPR/100

DETAILS OF PANELS - CONSTRUCTION DETAILS (Central)

CONCRETE C28/35	Materials:	Cement	<i>CEM I</i>	- Rugby, Southam	
		Aggregate	<i>20-5mm granite</i>	- TQ Products, Cliff Hill	
		Sand	<i>Concrete sand</i>	- Ideal Aggs., Lingham	
		Admixture		- Grace Construction Products WRDA 90	
	Mix details:			- 300kg/m ³ cement; w/c 0.59; agg/cem 6.41; 45.3% sand	
FORMWORK	Design:	Pour rate	<i>Both finishes</i>	6 m/h	
		Consistence	<i>Both finishes</i>	S2 - 75 mm specified	
		Temperature	<i>Both finishes</i>	Concrete +10 °C: Air 15-25 °C	
	Materials:	Face sheeting	<i>Ordinary finish Plain finish</i>	Douglas fir G1S plywood; Plastic splay arris former Resin impregnated paper faced plywood (Pourform)	
		Secondary support	<i>Both finishes</i>	Timber 100mm x 75mm nominal PAR; ply joints backed	
		Primary support	<i>Both finishes</i>	PERI GT24300 lattice girders as soldiers	
		Release agent	<i>Both finishes</i>	Chemical - Admast Adolease	
	REINFORCEMENT		See Page 3	<i>Both panels</i>	
	CONSTRUCTION	Delivery:	Concrete	<i>Both finishes</i>	Ready-mixed (approx. 35 min. travel)
		Consistence:	Concrete	<i>Both finishes</i>	S2 - 90 mm specified
Placing:		Concrete	<i>Both finishes</i>	Crane and skip	
Pour rate:		Concrete	<i>Both finishes</i>	6 m/hr	
Compaction:		Concrete	<i>Both finishes</i>	Internal vibrator - 65mm petrol driven	
Temperature:			<i>Both finishes</i>	Concrete (unknown); Air 16 °C	
Striking:		Formwork	<i>Both finishes</i>	Approx. 80 hours	
Curing:		Concrete	<i>Both finishes</i>	Exposed to the weather	

ORDINARY FINISH - GUIDANCE

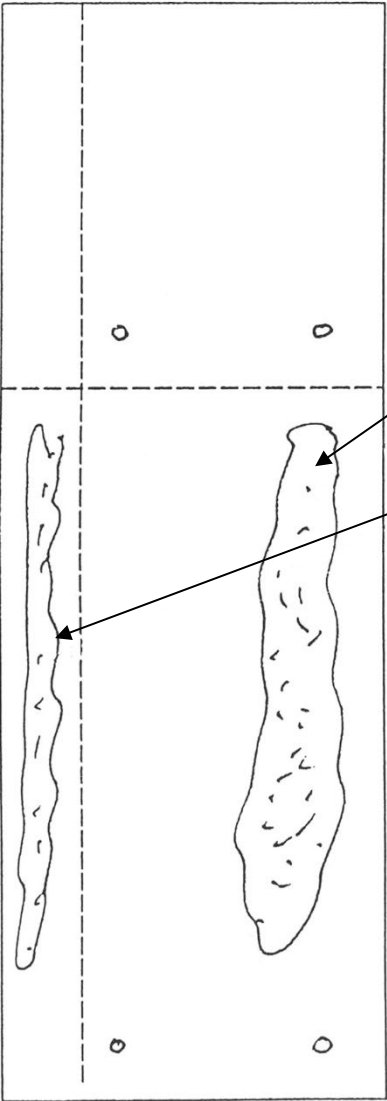
There are no special formwork requirements for this finish. Concrete should be thoroughly compacted and the formed surface should be free from major inherent blemishes and honeycombing. There is no requirement for consistency of colour for the struck surface. Surface defects may be made good subject to agreeing a method with the CA. Steps at joints between forms or at joints between precast elements to be a maximum of 5mm.

This is for use where visual quality is not important or it is to receive applied finishes. It is recommended that this finish is not used where surfaces are only to be painted. The use of small panel forming systems is considered suitable for producing this finish. Grain marks are generally due to slight absorbance variations causing local colour variation, but the surface is generally smooth. Panels and bolt holes do not need to be in a regular pattern. Colour of the finish will vary with the concrete delivered, the release agent used and reuse of the forming material. Project physical benchmarks must not be specified for this finish. As the concrete finish is not important visually, post-finishing to reduce as struck blemishes is acceptable; thus these can either be dealt with or accepted untreated by agreement between the CA and Constructor based on achieving an overall standard similar to the examples. If a system formwork is to be used, the finish off the form-face will generally be acceptable and the CA is expected to be aware of its quality.

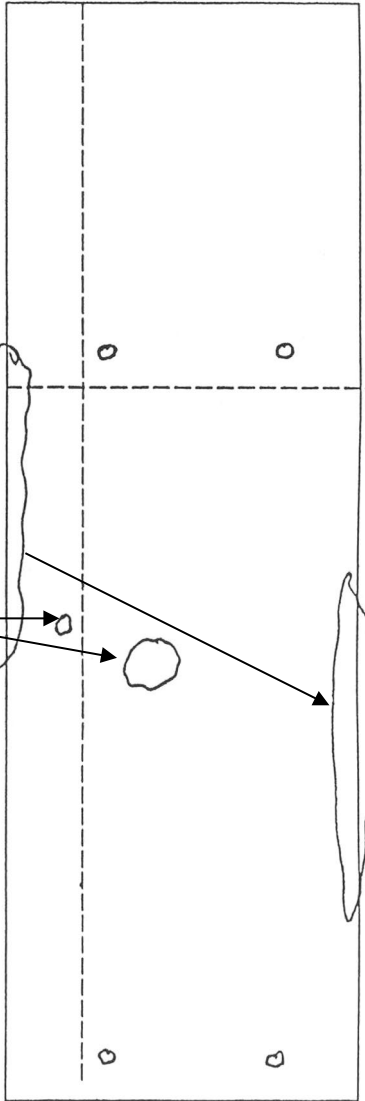
For precast systems, the finish of joints between elements, where required for structural performance, shall be agreed between the supplier and the CA. Joint preparation and layout shall be economical in nature, with the quality of finish aligned with the specified finish of the precast elements. Any requirements to enhance joint finish or layout that requires further time or cost necessitate specification of a special finish for the precast system.

ORDINARY FINISH - INTERPRETATION (Central)

SIDE 1 first use



SIDE 2 reused



These panels are typical of what should be expected of an Ordinary finish, subject to the comments below

Surface Blemishes

Note: Sealing of joints in formwork would reduce grout loss at edges

Outside Specification should be made good for exposed finish

Within Specification

Abrupt Irregularities

All ply joints within Specification

Mechanical damage may be removed if required

Making Good

Typical bolt hole making good shown - recessed and flush

General

Very low number of blow holes at top of pour/panel

PLAIN FINISH – GUIDANCE

A Plain finish is for use where visual quality is of some importance such as areas occasionally seen or to be directly painted. The use of sheet material to limit jointing in forming material is considered suitable for producing this finish. Joints between formwork panels will show and the step may be up to 3mm. Tie-bolt holes should ideally be recessed, or alternatively filled flush, although the latter may not be so aesthetically pleasing. Panels and bolt holes should be in a regular pattern determined by the Constructor, generally set by the formwork system used. If there are specific requirements for the size and spacing this is a special finish. Where good quality slab soffits are required with no specific requirements for panel joints, the Constructor can use their preferred formwork system with no specified panel size required.

A Plain concrete finish requires the careful selection of the concrete, release agent, and the use of good quality formwork. The concrete must be thoroughly compacted and all surfaces should be true with clean, sharp arrises. Only very minor inherent surface blemishes should occur, with no discolouration from the release agent or grout runs from adjacent pours. The struck surface should be of a consistent appearance from the materials used. The arrangement of formwork panels and tie-bolt holes will be in a regular pattern, set by the Constructor.

A plain finish cannot have specific colour requirements outside general colour consistency. Colour of the finish will change with concrete delivered and reuse of the forming material; the required consistent appearance requires the same form face material throughout. The Constructor selects the formwork to be used for a plain finish and the one choice open to the designer is for a matt or sheen finish. This should only require, at most, a modest adjustment to the form face and so has little impact on cost. A porous form face generally produces a matt finish and a non-porous form face a sheen appearance and an increase in small blowholes. Where no requirement is specified the general default will be a matt finish to soffits but could be a mix for walls and columns depending on the formwork selected. A different reflectance can be noted for different elements.

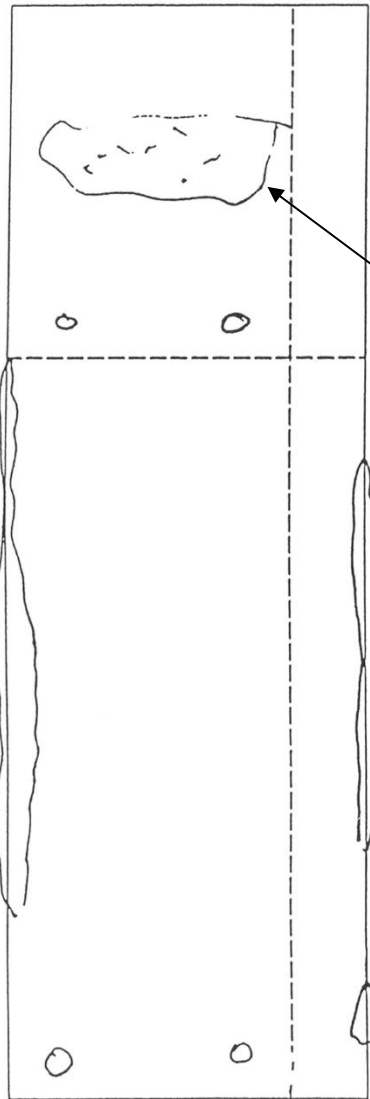
Reference to previous projects is important in defining colour; a sample is of little use as the long term colour can take 1 to 2 years to appear. The quality of overall appearance should be assessed at an appropriate working distance, see the Concrete Society and CONSTRUCT publication Plain formed concrete finishes Technical Report 52 for further guidance.

Post-finishing to reduce the as-struck surface defects is acceptable subject to agreeing a method with the CA. A Mock Up should not be specified for this finish, but a Project Physical Benchmark can be produced as one of the first areas of concrete poured on the project and used to set the project standard for the rest of the concrete.

PLAIN FINISH - INTERPRETATION (Central)

SIDE 1 first use

SIDE 2 reused



These panels are typical of what should be expected of a Plain finish, subject to the comments below

Surface Blemishes

Note: Sealing of joints in formwork would reduce grout loss at edges

Within specification

Abrupt Irregularities

Mechanical damage may be removed if required

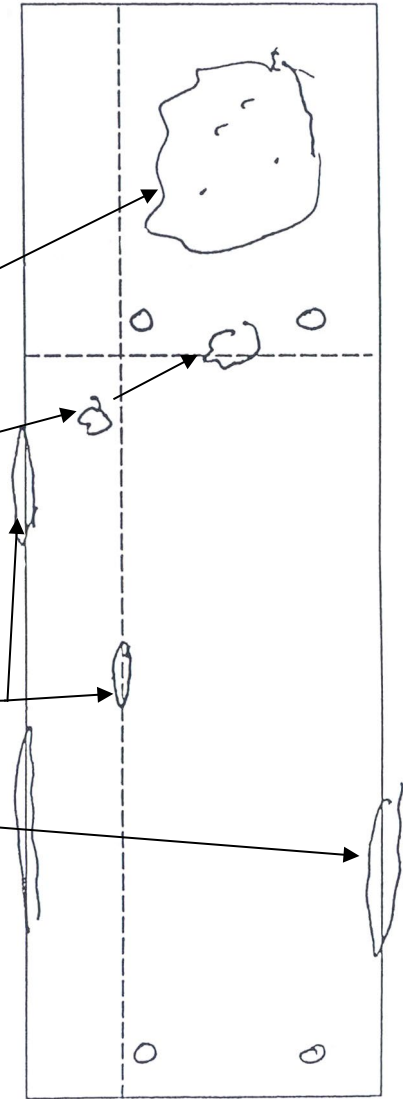
Colour

Note: Mastic sealing of joints in formwork would reduce edge and joint discolouration

Darkening at arrises, bolt holes and ply joint might need making good for exposed finish

General

Occasional large blowhole can be made good if required



LOCATION OF ALL SITES IN UK DISPLAYING PANELS



Scotland

North East England

Central England

London South

Scotland (Indoor Site)

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