Specifying visual concrete

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The Concrete Centre: Taking concrete forward

- Free resource for specifiers
- Concrete Quarterly
- Publications: general and technical
- Practice workshops
- Seminars and conferences
- Training courses

www.concretecentre.com     www.sustainableconcrete.org.uk
Visual concrete requires greater care in specification and execution than most concrete.

East Ham Customer Service Centre
Rick Mather Architects/Engineers HRW

Do some research/get advice pre-tender
Precast or cast in situ

Establish the available options to suit desired finish and form

Large range of finishes, colour and textures available with architectural precast concrete
As struck, structural precast

Hill Top House
Adrian James Architects

John Henry Brookes Building, Oxford Design Engine

As struck, cast in situ concrete

Depends on the facing of the form work or form lining

Evelyn Grace Academy
Zaha Hadid

Ply formwork face

Timber form liner

Lincoln Museum
Panter Hudspith
Consider texture & colour for cast in situ concrete

Shot blast cast in situ
One Poultry

Pigmented cast in situ
Submariner’s House, London
Jonathan Tuckey Design
Photo credit: Dirk Lindner

Understand the making processes

- Precast in factory conditions or cast in situ
- Range of products/supply/process of manufacture/delivery & construction
Understand the process of making

Concrete designed and delivered by local supplier using materials, to suit your stated performance requirements

Bespoke formwork and facing material

Visit examples & benchmark

Pudding Mill Lane
Pumping Station
John Lyall Architects

Aquatics Centre, Zaha Hadid Architects/ARUP
Manage expectations

3m viewing distance

Westminster Underground station
Hopkins Architects

Angel Building, London
AHMM / AKT

Understand form face qualities

- Range of repeated use
- Cost
- Quality
- Finish produced
- Potential shapes
- Relationship with release agent
Impact of different ply facing

- Medium density overlay (MDO) / Paper Faced Panels = Matt non-shiny surface finish to the concrete
- High Density Overlay (HDO) = shinier surface

Define concrete mix requirements for cast in situ concrete

Good visual concrete requires a slightly different ‘recipe’
Recognised ‘Designed’ mix proportions

Recognised effective ‘recipe’:
- Cementitious binder (cement) - minimum 350Kg/m³
- Sand content - not more than twice the cement content
- Total aggregate - not more than six times the cement content
- Coarse Aggregate - For 20mm max. size not more than 20% to pass a 10mm sieve
- Consistence - 125 to 150 slump S3
- Water/Cement ratio - 0.5 or less

Or consider self-compacting concrete designed for visual concrete

Select preferred cement type

Cement is main source of colour of concrete

Cement with 50% GGBS (Ground Granulated Blast Furnace Slag)

Cement with 30% FA (Fly Ash)
Get samples/ build mock ups

• To test mix/formwork/release agent/curing time/workmanship combination
• To agree final finish & making good

Get samples/ build mock ups

Precast suppliers offer a large selection
• BS 8110: Finish A, B & C with finish classes 1, 2 & special
• Replaced by: BS EN 13670: basic, ordinary, plain and special

BS EN 13670

Table F.4 — Types of surface finish

<table>
<thead>
<tr>
<th>Type</th>
<th>Normal application</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formed surfaces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic Finish:</td>
<td>Where no particular requirement is needed.</td>
<td>Foundations</td>
</tr>
<tr>
<td>Ordinary Finish:</td>
<td>Where not of visual importance or to receive applied finishes.</td>
<td>Areas with applied render finish or uneven surfaces such as inside ducts or lift shafts.</td>
</tr>
<tr>
<td>Plain Finish:</td>
<td>Where visual effect is of some importance.</td>
<td>Areas seen occasionally and areas which are prepared, direct painted areas where there are some particular requirements.</td>
</tr>
<tr>
<td>Special Finish:</td>
<td>Where special requirements have to be given.</td>
<td>Areas where surface regularity and/or colour are important.</td>
</tr>
<tr>
<td>Unformed surfaces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic Finish:</td>
<td>A closed uniform surface produced by levelling. No further work is required.</td>
<td>Area to receive a screeded finish or other applied finishes.</td>
</tr>
<tr>
<td>Ordinary Finish:</td>
<td>A level uniform surface produced by floating or similar process.</td>
<td>Area for false floor and other applied floorings.</td>
</tr>
<tr>
<td>Plain Finish:</td>
<td>A dense smooth surface produced by travelling or similar</td>
<td>Normal warehouses and factories, areas of plant rooms and work areas without other finish than paint.</td>
</tr>
<tr>
<td>Special Finish:</td>
<td>A surface where special requirements have to be given for further working of another finish.</td>
<td>Areas of warehouse floors for special trafficking.</td>
</tr>
</tbody>
</table>
The National Structural Concrete Specification for Building Construction - NSCS v 4

- Prepared by the industry - clients, designers, contractors and specialists
- Aims to benefit all, with information collected together in one place
- Download free PDF:
  www.construct.org.uk/index.php/useful-stuff/publications

Simplify tender information
- Clear indication of extent and design intent
- Set out formwork/ precast joints

Dwg by Burwell Deakins Architects
Design and describe elements in 3D
Understand and describe the forms to improve buildability and optimise formwork

Good workmanship
- Suitable facing, formwork & accessories, well constructed
- Appropriate release agent, applied correctly
- Cleanliness and communication on site
- Correct and consistent mix and materials
- Appropriate placement and compaction
- Adequate protection
Coordinated remediation

- Some likely to be required for cast in situ
- If in doubt if needed - don’t!
- Specification to state that method is to be agreed before carried out

It is a team effort

- Client understanding/expectation of finish
- Architects description of aesthetic requirements
- Structural engineers specification
- Concrete contractor/ supplier input for project specifics
Concrete wall cast into folded rubber, Redruth, Cornwall, by Walter Jacks Studio

THANK YOU
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