CONCRETE SPECIFICATION

Rev	Date	Originated By	Checked By	Comments
-	Oct 15			Tender

E05 IN SITU CONCRETE CONSTRUCTION GENERALLY

110 ARRANGEMENT OF INFORMATION: The different parts of insitu concrete construction are specified in separate sections as follows:

E10 In situ concrete mixes, casting and curing
E20 Formwork
E30 Reinforcement
E40 Designed joints
E41 Worked Finishes to Insitu Concrete

Clauses dealing with particular aspects of certain types of construction may thus be dispersed over several sections.

300A CONSTRUCTION ACCURACY: Unless stated otherwise in the following clauses permitted deviations and tolerances are to be in accordance with Section 7 of the NATIONAL STRUCTURAL CONCRETE SPECIFICATION FOR BUILDING CONSTRUCTION Third Edition.

310 SURFACE REGULARITY OF STRUCTURAL CONCRETE FLOORS: Sudden irregularities not permitted. When measured with slip gauges to BS 8204-1 or -2 (or equivalent) the variation in gap under a straightedge (with feet) placed anywhere on the surface to be not more than specified in the following clause(s).

312 SURFACE REGULARITY of floors which are to be a wearing surface, and floors to receive sheet or tile finishes directly bedded in adhesive.

5 mm under a 3 m straightedge
2 mm under a 1 m straightedge.

314 SURFACE REGULARITY of floors to receive screeds/ toppings/beds up to 50 mm thick:

10 mm under a 3 m straightedge.

E10 IN SITU CONCRETE MIXES, CASTING AND CURING

CONCRETE MIXES

130A NORMAL DESIGNED MIX FOR Substructure Works, Foundations & Internal Ground Slabs

- To the relevant clauses of BS 8500 (Parts 1 & 2)
- Strength Class C28/35
- Nominal maximum size of aggregate: 20 mm
- Aggregate(s):
  Coarse: To BS EN 12620
  Sand: To BS EN 12620
  Special requirements: N/A
- Cement:
  PC, PBFC, HSBC, PPFAC.
  Combinations to BS 8500 of PC with ggbs or pfa.
- Minimum cement content: 300 kg/cu m
- Maximum free-water/cement ratio: 0.6

- Maximum cement content: N/A kg/cu m
- Admixture(s): N/A
- Maximum total percentage of chloride ion by mass of cement: 0.4%
- Rate of sampling for compressive strength testing:

Type of Structure	Sample to represent a volume of cubic metres.
Critical Structures e.g. masts, cantilevers, columns, loadbearing walls.	10
Intermediate Structure e.g. beams, slabs, non loadbearing walls	20

- Information to be provided by the producer: - Refer NSCS

130B NORMAL DESIGNED MIX FOR Superstructure – Steel/Concrete Composite Slabs

- To the relevant clauses of BS 8500
- Strength Class C25/30
- Nominal maximum size of aggregate: 20 mm
- Aggregate(s):
  Coarse: To BS EN 12620
  Sand: To BS EN 12620
  Special requirements: N/A
- Cement:
  PC, PBFC, HSBC, PPFAC.
  Combinations to BS 8500 of PC with ggbs or pfa.
- Minimum cement content: 275 kg/cu m
- Maximum free-water/cement ratio: 0.65
- Maximum cement content: [N/A] kg/cu m
- Admixture(s): [N/A]
- Maximum total percentage of chloride ion by mass of cement: 0.4%
- Rate of sampling for compressive strength testing: one sample per 15 cu m.
- Information to be provided by the producer: - Refer NSCS

130C NORMAL DESIGNED MIX FOR: All External Slabs & Retaining Walls

- To the relevant clauses of BS 8500
- Strength Class C32/40
- Nominal maximum size of aggregate: 20 mm
- Aggregate(s):
  Coarse: To BS EN 12620
  Sand: To BS EN 12620
  Special requirements: Air entrained - 5.5% air content.
- Cement:
  PC, PBFC, HSBC, PPFAC.
  Combinations to BS 8500 of PC with ggbs or pfa.
- Minimum cement content: 325 kg/cu m

- Maximum free-water/cement ratio: 0.55
- Maximum cement content: [N/A] kg/cu m
- Admixture(s): [N/A]
- Maximum total percentage of chloride ion by mass of cement: 0.4%
- Rate of sampling for compressive strength testing: one sample per 15 cu m.
- Information to be provided by the producer: - Refer NSCS.

130D NORMAL DESIGNED MIX FOR Mass Concrete Fill, Drainage Works and other Sundries

- To the relevant clauses of BS 8500
- Strength Class C16/20
- Nominal maximum size of aggregate: 20 mm
- Aggregate(s):
  Coarse: To BS EN 12620
  Sand: To BS EN 12620
  Special requirements: N/A
- Cement:
  PC, PBFC, HSBC, PPFAC.
  Combinations to BS 8500 of PC with ggbs or pfa.
- Minimum cement content: 175 kg/cu m
- Maximum free-water/cement ratio: N/A
- Maximum cement content: N/A kg/cu m
- Admixture(s): N/A
- Maximum total percentage of chloride ion by mass of cement: 0.4%
- Rate of sampling for compressive strength testing: one sample per 20 cu m.
- Information to be provided by the producer: - Refer NSCS.

130E NORMAL DESIGNED MIX FOR Blinding Concrete

- To the relevant clauses of BS 8500
- Strength Class C12/15
- Nominal maximum size of aggregate: 14 mm
- Aggregate(s):
  Coarse: To BS EN 12620
  Sand: To BS EN 12620
  Special requirements: N/A
- Cement:
  PC, PBFC, HSBC, PPFAC.
  Combinations to BS 8500 of PC with ggbs or pfa.
- Minimum cement content: 175 kg/cu m
- Maximum free-water/cement ratio: N/A
- Maximum cement content: N/A kg/cu m
- Admixture(s): N/A
- Maximum total percentage of chloride ion by mass of cement: 0.4%
- Rate of sampling for compressive strength testing: one sample per 20 cu m.
- Information to be provided by the producer – Refer NSCS.

MATERIALS, BATCHING AND MIXING

215 READY-MIXED CONCRETE must be used for E10/130A, E10/130B, E10/130C, E10/130D and E10/130E and must be obtained from a plant which holds current certification meeting the requirements of the NACCB, Category 2 for product conformity. Each mix must be obtained from only one source unless otherwise approved. Confirm name and address of depot(s) to CA before any concrete is delivered. Retain all delivery notes for inspection.

255 CEMENTS:

- The following abbreviations apply:
  PC42.5 Portland cement, Class 42.5 (in lieu of OPC)
  PC52.5 Portland cement, Class 52.5 (in lieu of RHPC)
  SRPC Sulphate resisting Portland cement
  PBFC Portland blastfurnace cement
  HSBC High slag blastfurnace cement (in lieu of LHPBC)
  PPFAC Portland pulverised-fuel ash cement
  ggbs Ground granulated blastfurnace slag
  pfa Pulverized fuel ash
- Cements, ggbs and pfa must comply with the relevant British Standards. Portland cements must have cement certification meeting the requirements of the NACCB, Category 2 for product conformity.

305A NATURAL AGGREGATES FOR DESIGNED/PRESCRIBED MIXES: To give a drying shrinkage of concrete not exceeding 0.055% for normal concrete and 0.045% for water retaining concrete, when tested to BS 812

325 EXPOSED CONCRETE: Obtain approval before altering constituent materials or proportions of concrete which will be exposed in the finished work.

355 RISK OF ALKALI SILICA REACTION IN DESIGNED/PRESCRIBED MIXES: Refer BS 8500 for guidance. Inform CA if this necessitates a change in specification. Submit evidence of compliance to CA before making concrete for use in the Works.

415 ADMIXTURES FOR DESIGNED/PRESCRIBED MIXES:

- To BS EN 480
- Use only if specified or approved, and then in accordance with their manufacturer's recommendations.
- Do not use admixtures containing calcium chloride.
- Ensure that admixtures are compatible with all other materials, including other admixtures.

490 PROPERTIES OF FRESH CONCRETE to be determined by the Contractor in consultation with the concrete supplier to suit the one site circumstances and methods, but in all respects maintaining compliance with this Specification.

TESTING/CERTIFICATION

510 COMPLETE CORRELATED RECORDS must be maintained for each Designed and Prescribed mix including:

- Information in accordance with BS 8500
- All sampling, site tests and identification numbers of all specimens tested in the laboratory.
- The location of the part(s) of the structure represented by each sample.
- The location in the structure of the batch from which each sample is taken.

520 TEST LABORATORY: All specified testing of concrete cubes to be carried out by one NAMAS Accredited laboratory. Submit the name of the selected laboratory to CA as soon as possible and in any case before making trial mixes or concrete for use in the works.

530 TEST REPORTS: 1 copy of reports to be despatched to CA within one day of completion of each test.
Keep a complete set of reports on site.

571 EARLY AGE STRENGTH TESTING: Submit for approval a regime of accelerated or normal curing and early testing which is capable of predicting the 28 day strength of Designed mixes and which will be used for determining compliance. Make two additional cubes from each sample and cure normally so that, in the event of non-compliance, they can be tested at 28 days to provide information which will help in deciding the action to be taken.

580 FAILURES:

- If a concrete sample fails to achieve specified criteria or to pass specified tests, inform the CA without delay and submit:
  - Confirmation of the validity of the test results, and/or
  - Proposals for further tests to assess the strength of the concrete in the structure, as set out in BS EN 13791
  - Proposals for rectification.
- Obtain approval of all such evidence and proposals before proceeding. The CA may issue instructions for the work to be stopped or delayed until reasons for the failure have been established, possible consequences assessed, and appropriate preventative and remedial measures taken.

PLACING AND COMPACTING

640 CONSTRUCTION JOINTS:
- Submit details of proposed locations and obtain approval before proceeding.
- Carefully brush and spray surface while concrete is still green to remove surface laitance and expose aggregate finish. Obtain approval for any alternative method.
- Surface to be clean and damp when fresh concrete is placed against it.

650 CLEANING: At time of placing ensure that all surfaces on which concrete is to be placed are clean, with no debris, tying wire clippings, fastenings or free water.

660 INSPECTION: Inform CA before each pour of concrete to allow inspection of reinforcement and surfaces against which concrete is to be placed. Agree with CA the period of notice to be given.

670 TRANSPORTING:

- Avoid contamination, segregation, loss of ingredients, excessive evaporation and loss of workability. Cover concrete during heavy rain.
- Clean equipment immediately after use and whenever cement or aggregate is changed.
- Use suitable walkways and barrow runs for traffic over reinforcement and freshly placed concrete.

680 PLACING:

- Record time, date and location of all pours.
- Place as soon as practicable after mixing and while sufficiently plastic for full compaction. After discharge from the mixer do not add water or retemper mixes.
- Ensure that temperature of concrete is not more than 30 deg C in hot weather and not less than 5 deg C in cold weather. Do not place against frozen or frost covered surfaces.
- Place in final position in one continuous operation up to construction joints. Avoid formation of cold joints.
- Do not discharge from an excessive height or through reinforcement or other obstructions in a way which may cause uneven dispersal, segregation or loss of ingredients or adversely affect the formwork or formed finishes. Use suitable chutes or trunking where necessary.
- Place in layers no thicker than can be effectively compacted with the equipment being used, without delay between layers. Merge together by compaction.
- Do not use vibrators to make concrete flow horizontally into position, except where necessary to achieve full compaction under void formers and cast in accessories and at vertical joints.

690 COMPACTING: Fully compact concrete to full depth (until air bubbles cease to appear on the top surface), especially around reinforcement, cast-in accessories, into corners of formwork and at joints. Ensure amalgamation with previous batches, but do not damage adjacent partly hardened concrete. Use appropriate type(s) of mechanical vibration for all concrete except where otherwise noted.

720 VIBRATORS: Provide standby vibrators. Do not use external vibrators without approval.

CURING AND PROTECTION

810 CURING:

- Prevent surface evaporation from concrete throughout the period(s) specified below by:
  - Retaining formwork in position and, if necessary, covering surfaces immediately after striking, and
  - Covering top surfaces immediately after placing and compacting each bay, removing covering only to permit any finishing operations and replacing immediately thereafter.
- Maintain surface temperature above 5 degC throughout the periods specified below or four days, whichever is the longer
- Maintain detailed records of location and timing of casting of individual batches, removal of formwork and removal of coverings. Keep on site, available for inspection.

820 CURING PERIODS, in days (t = the average number of degrees centigrade air temperature during the curing period):

- Concrete surfaces which in the finished building will be exposed to the elements; concrete wearing surface floors and pavements; watertight concrete:

	Concrete made using PC42.5, PC 52.5 SRPC	Concrete made using PPFAC, PBFC, HSBC, pfa, ggbs
Drying winds or dry, sunny weather	140 t+10	180 t+10
Intermediate conditions	100 t+10	140 t+10
Damp weather, protected from sun and wind	100 t+10	100 t+10

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- Other structural concrete surfaces (cements as above):

Drying winds or dry, sunny weather	80 t+10	140 t+10
Intermediate conditions	60 t+10	80 t+10
Damp weather, protected from sun and wind	No special requirements	No special requirements

- Obtain prior approval for curing periods for mixes using admixtures or other types of cement.

840 PROTECTION: Prevent damage to concrete, including:

- Surfaces generally: From rain, indentation and other physical damage.
- Surfaces to be exposed in the finished work: From dirt, staining, rust marks and other disfiguration.
- Immature concrete: From thermal shock, physical shock, overloading, movement and vibration.
- In cold weather: From entrapment of water in pockets, etc. and freezing expansion thereof.

E20 FORMWORK FOR IN SITU CONCRETE

GENERALLY/PREPARATION

110 LOADINGS: Design and construct formwork to withstand the worst combination of:

- Total weight of formwork, reinforcement and concrete.
- Construction loads including dynamic effects of placing, compacting and construction traffic.
- Wind and snow loads.

120A DETAILS: Provide joint layouts and joint details.

130 PROPPING: Provide adequate propping to prevent deflection and damage to the structure. Carry down such props to bearings strong enough to provide adequate support.

150 BEARINGS:

- Prop through other decks if construction load on a particular deck exceeds the design loading and concrete has not achieved the 28 day strength.
- Submit details of proposed prop bearings and through propping to CA. The contractor is responsible for the design of all temporary propping ensuring that no element of the permanent works is overstressed.

160 CAMBERS:

- Specified cambers relate to the concrete immediately before formwork is struck. Make adequate allowance for deflection of formwork under weight of fresh concrete. Top surfaces of concrete must also be cambered to maintain the required structural depths and profiles.
- After striking of formwork and removal of props check levels to determine extent of any residual camber and inform CA.

161 CAMBERS: Unless otherwise shown on drawings construct forms to achieve the following upward cambers:

- Slabs: 0.2 % of span measured at centre:
- Beams: 0.2% of span measured at centre:
- Cantilever beams: 0.5% of cantilever measured at free end:
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170 WORK BELOW GROUND:

- Vertical faces of strip footings, bases and slabs may be cast against faces of excavation, provided:
  - Prior approval is obtained.
  - The faces are sufficiently accurate and stable.
  - Supports to faces are withdrawn progressively as concrete is placed.
  - Adequate measures are taken to prevent contamination of concrete.
- Faces of walls must be cast against formwork.

200A UNDERSLAB SHEET SLIP MEMBRANE:

- Manufacturer and reference: As specified on the contract drawings.
- Thickness: As specified on the contract drawings.
- Lay sheets on type '1' subbase blinded with fines.
- Seal all joints with tape and or laps as recommended by manufacturer.
- Ensure that insulation is covered with concrete blinding (see section E10) before fixing slab reinforcement.

210 STEELWORK: Remove all loose millscale and loose rust before encasing in concrete.

CONSTRUCTION

310 ACCURACY: Construct formwork accurately and robustly with adequate supports to produce finished concrete to the required dimensions. Formed surfaces must be free from twist and bow (other than any required cambers), all intersections, lines and angles being square, plumb and true.

320 JOINTS IN FORMS: Construct formwork, including joints in form linings and between forms and completed work, to prevent loss of grout, using seals when necessary. Secure formwork tight against adjacent concrete to prevent formation of steps.

330 INSERTS, HOLES AND CHASES:

- Confirm positions and details to ensure that alterations to and decisions about their size and location are not made without the knowledge and approval of the CA.
- Fix inserts or box out as required in correct positions before placing concrete. Form all holes and chases; do not cut hardened concrete without approval.

340 KICKERLESS CONSTRUCTION: Unless shown otherwise form horizontal construction joints at base of walls and columns without kickers, using one of the methods described in BCA Publication 47.023 'Kickerless construction'. The Contractor must satisfy himself as to the suitability of the chosen method.

350A FORM TIES: No metal part of any device for securing forms is to remain within the specified concrete cover.

- In the underground retaining walls methods of fixing formwork which result in holes through the concrete section when the formwork is removed are not permitted.
- Ties used in forming underground retaining walls shall be of a type to maintain water resistance of the construction.

470 RELEASE AGENTS: Type(s) which are suitable for use with the type(s) of formwork, formed finishes and specified applied finishes. Use the same type and make throughout the entire area of any one finish. Apply evenly to form faces, from top downwards, and to horizontal surfaces last. Use the minimum amount necessary to obtain a clean release and prevent excessive local collection. Prevent release agent touching the reinforcement, hardened concrete, other materials not part of the form face, and permanent forms.

480 SURFACE RETARDERS: Do not use without approval. Prevent retarder from touching the reinforcement.

STRIKING

510 RESPONSIBILITY: Strike formwork without disturbing, damaging or overloading structure, and without disturbing props. Notwithstanding other clauses in this specification and any checking or approvals by the CA, the responsibility for safe removal of any part of the formwork and any supports without damaging the structure rests with the Contractor.

520 MINIMUM PERIODS:

- The following periods (in days) for retaining formwork in position before striking apply to class 42.5 or sulphate-resisting Portland cement concrete with no cement replacement materials or admixtures:

Type of formwork	Average mean of daily minimum and maximum air temperatures during the period		
	16 degC	7 degC	3 degC
Vertical formwork to columns, walls and beams	0.5	0.75	1
Soffit forms to slabs	4	6	8
Props to slabs and soffit forms to beams	10	15	20
Props to beams	14	21	28

- Submit details of proposed periods for mixes using admixtures or other types of cement.

FORMED FINISHES

610A BASIC FINISH: no particular requirements, except those for tolerances and full compaction. As per Basic Finish reference BS 8110. To be adopted on elements that will not be exposed – substructure elements.

620A PLAIN SMOOTH FINISH:

- Produce an even finish with a sheet material with panels arranged in a regular pattern as a feature of the surface.
- Abrupt irregularities to be not greater than 3 mm. Gradual irregularities, expressed as maximum permissible deviation from a 1 m straight edge, to be not greater than 5 mm.
- Variation in colour resulting from the use of an impermeable form lining will be permitted but the surface to be free from discolouration due to contamination or grout leakage.
- Blowholes less than 10 mm in diameter will be permitted but otherwise surface to be free from voids, honeycombing, segregation and other large defects.
- Making good: Projecting fins are to be removed and rubbed down with a carborundum stone but otherwise the finish is to be left as struck. Making good of small defects will normally be permitted after inspection by CA.
- Arrises to be chamfered with a 25mm wide corner face.
- Formwork tie holes to be in an approved regular pattern, filled with matching mortar to an approved sample.
- As per Type A Finish reference BS 8110.

630A FINE SMOOTH FINISH: to be adopted on all exposed concrete faces or where painting is the final finish.

- Produce a smooth even finish with an impervious sheet material, with panels as large as is practicable and arranged in an approved regular pattern as a feature of the surface. Do not replace parts of formwork panels where this may cause a change of colour in the concrete.
- Abrupt irregularities will not be permitted. Gradual irregularities, expressed as maximum permissible deviation from a 1 m straight edge, to be not greater than 3 mm.
- Variation in colour resulting from the use of an impermeable form lining will be permitted but the surface is to be free from discolouration due to contamination or grout leakage.
- Cover spacers: Do not use without approval.
- Blowholes will not be permitted and surface to be free from voids, honeycombing, segregation and other defects.
- Making good: Projecting fins are to be removed and rubbed down with a carborundum stone but otherwise the finish is to be left as struck. Making good will not normally be permitted.
- Arrises to be chamfered with a 25mm wide corner face.
- Formwork tie holes to be in an approved regular pattern, filled with matching mortar to an approved sample.

E30 REINFORCEMENT FOR IN SITU CONCRETE

REINFORCEMENT

110 QUALITY ASSURANCE: All steel reinforcement specified to comply with BS EN 4449 or BS 4483 and cut and bent to BS 8666 is to be obtained from firm(s) holding a valid certificate of approval issued under a product certificate scheme operated by a third party certification body with appropriate Category 2 accreditation from the United Kingdom Accreditation Service (UKAS).

140 PLAIN BAR REINFORCEMENT: To BS EN 4449, Grade 250.

150 DEFORMED BAR REINFORCEMENT: To BS EN 4449, Grade 460.

165 GALVANIZED REINFORCEMENT: Type(s) as specified, galvanized to BS EN ISO 1461 after cutting but before bending

210 FABRIC REINFORCEMENT: To BS 4483.

WORKMANSHIP

310 CUT AND BEND reinforcement to schedules and to BS 8666. Do not bend when below 5 degrees without approval. Steel may be warmed to not more than 100 degrees. Do not rebend bars without approval. Tag bundles of reinforcement with labels to BS 8666

317 MECHANICAL DAMAGE: Reinforcement must not be roughly handled, dropped from a height, or subjected to shock loading or mechanical damage.

325 CLEANLINESS: At time of placing concrete, reinforcement to be clean and free of corrosive pitting, loose millscale, loose rust, ice, oil and other substances which may adversely affect the reinforcement, concrete, or bond between the two.

330 ADJUSTMENTS: Provide on site facilities for hand bending to deal with approved minor adjustments.

360 PROJECTING REINFORCEMENT: Grade 250 bars may be bent to radii not less than BS 8666. Grade 460 bars must not be bent or straightened without approval

410 LAPS OR SPLICES: Obtain instructions if details are not shown on drawings.

421 LAPS in fabric reinforcement, where not detailed, to be not less than 250 mm. Where necessary seek instructions to avoid a four layer build-up at corners.

434 STRUCTURAL WELDED JOINTS will not be permitted.

446A MECHANICAL JOINTS are to be used only in positions shown on the drawings, unless otherwise approved.

451 FIXING GENERALLY:

- Unless otherwise permitted fix reinforcement in position before placing concrete. In addition to any spacers and chairs shown on drawings or schedules, provide adequate support, tie securely and maintain the specified cover. Comply generally with Concrete Society Report CS 101 'Spacers for reinforced concrete' 1989.
- Unless otherwise specified tie using 16 swg annealed tying wire. Ensure that tying wire does not intrude into the concrete cover. Do not tack weld unless authorised by the CA and recommended by the reinforcement manufacturer.
- Do not fix or place reinforcement in contact with nonferrous metals.

470 COVER:

- Not less than the nominal cover minus 5 mm.
- Where reinforcement is located in a particular direction in relation to only one face of a member, not more than the nominal cover plus:
  5 mm on bars up to and including 12 mm size.
  10 mm on bars over 12 mm up to and including 25 mm size.
  15 mm on bars over 25 mm size.
- Before concreting check thoroughly that the specified cover dimensions have been obtained.

491 SPACERS to formed concrete finishes, if permitted (see section E20) to be approved type(s).

500 DAMAGE: Prevent damage to and disfigurement of forms, form linings and adjacent work.

510 RUST STAINING: Prevent rust staining of surfaces of concrete which will be exposed to view in the finished work, caused by, e.g. rust stained formwork or unprotected projecting reinforcement.

E40 DESIGNED JOINTS FOR IN SITU CONCRETE

120 CONSTRUCTION JOINTS GENERALLY

- Accuracy: Position and form joints accurately, straight, well-aligned and truly vertical or horizontal or parallel with setting out lines of the building.
- Modifications: If necessary to any joint design or location, agree before proceeding.
- Placing concrete:
  - Prevent concrete entering joints or penetrating compressible joint fillers and making movement joints ineffective.
  - Do not place concrete simultaneously on both sides of movement joints.

230 CONSTRUCTION JOINT FACES

- Roughening: While concrete is still green, remove laitance without loosening the aggregate to leave a thoroughly roughened, exposed aggregate finish.

310 FLEXIBLE WATERSTOPS

- Manufacturer: Fosroc or approved equal
  - Product reference: Supercast PVC or approved equal
  - Product reference: Supercast SW or approved equal
- Junctions and angles: Form with junction pieces recommended by manufacturer.
- Placing concrete: Fully compact concrete around waterstops to ensure that no voids or porous areas remain.

E41 WORKED FINISHES TO IN SITU CONCRETE

150 FINISHING GENERALLY

- Timing: Carry out finishing operations at optimum times in relation to the setting and hardening of the concrete.
- Prohibited treatments to concrete surfaces: Wetting to assist working and sprinkling cement.

230 BRUSHED FINISH – to be adopted for trafficked areas.

- Finish: Lightly textured surface produced while concrete is still green.
- Brush surface with a stiff broom or wire brush while still green. To produce a slightly textured surface.
- Hand or power trowel margins around the edges adjacent to walls, applying sufficient pressure to close the surface, to give a uniform smooth finish free from trowel marks and other blemishes.

310 SMOOTH FLOATED FINISH – to be adopted for exposed slab surfaces and suspended composite floor slabs that will be covered with a raised floor system.

- Finish: Even surface with no ridges or steps.

550 POWER TROWEL FINISH: - to be adopted for suspended composite floor slabs that will receive direct finishes.

- Float concrete to an even surface with no ridges or steps, then immediately commence curing.
- Successively power trowel at intervals, applying sufficient pressure to close the surface, to give a uniform smooth finish free from trowel marks and other blemishes.
  Resume specified curing without delay.

520 SURFACE SEALER

- Preparation: Clean cured concrete to remove dirt, grease, oil and other surface contaminants.
- Moisture content of slab: As recommended by sealer manufacturer. Test relative humidity to BS 8203, Annex A if required to verify suitability to receive sealer.
- Application: Evenly to dry surfaces using sufficient coats to form an effective seal but without a glossy finish.