

# Bexley TLC

Galliford Try

Structural Specification

Project No. X252015

Document No. BTLC-AKS-XX-XX-T-S-0001

Revision: P01

Status: S3

13-02-2026

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Revision	Description	By	Checked / Approved	Date
P01	Stage 3 Issue	RY	PM	13.02.26

**B50****General structural requirements****Tendering - Not Used****General****110 Eurocodes**

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1. National Annexes: Reference to a Eurocode, or to an execution or a material standard referenced therein, is deemed to include the appropriate United Kingdom National Annex, to the Eurocode or referenced standard. Nationally determined parameters shall apply. Non-contradictory complementary information: Applies when referenced in the National Annex.
2. Substitution of alternative design rules for Eurocode Application Rules: Not permitted

**120 Structural work**

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1. Designated codes of practice: To the Eurocodes appropriate to the nature of the structure
2. Design working life: 60 years
3. Completed structure generally: To comply with the requirements of the designated codes of practice and the standards referenced therein. Deflections and other structural movements at serviceability limit state to be compatible with requirements of the building fabric, movement joints and weathertightness.
4. Special requirements: None None

**130 Contractor's design**

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1. Engineer responsible for overall stability of structure: AKSWard Structural Engineers
2. Design supervision/ checking levels: Persons not involved in preparing the design Persons not involved in preparing the design
3. Design requirements: None additional None additional
4. Design quality control: To BS EN ISO 9001
5. Maintenance: Make provision for and submit details of requirements to ensure the safety and serviceability of the structure, including:
  - 5.1. Critical parts that should be regularly inspected, with recommendations for the frequency of inspection.
  - 5.2. Elements susceptible to corrosion, mechanical wear or fatigue that may need to be reconstructed or replaced during the design working life of the structure.
  - 5.3. Means of safe access for maintenance and repair.

**150 Ground investigation report**

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1. Requirement: Consider adequacy of data provided and submit proposals if additional investigation will be necessary to justify design
2. Datum for borehole logs: As noted within SI Report by Ridge
3. Obstructions and voids: Break out disused foundations to the extent shown on drawing shown on architectural demolition plans

**Performance****210 Consequence for localized failure from an unspecified cause**

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1. Standard: To Building Regulations (Eng): Approved Document A, Section 5
  - 1.1. Consequence class: 2a
  - 1.2. Building Class: 2a

2. Design requirements: For ties and for anchorage of precast elements - To PD 6687, clause 2.20 For ties and for anchorage of precast elements - To PD 6687, clause 2.20

### **250 Limits on movement generated by construction**

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1. Definition of critical values
  - 1.1. Threshold value: The value beyond which further movement will be of significant concern.
  - 1.2. Action value: The value at which execution must cease.
2. Precautions: Take as follows if movements reach critical values:
  - 2.1. Threshold: Review situation, assess possible causes and submit proposals to ensure that action values are not exceeded.
  - 2.2. Action: Stop work, report and revise working procedures to prevent further movements.

### **310 Damage to existing structures and services**

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1. Permissible damage criteria
  - 1.1. Structures: No damage permitted
  - 1.2. Services: No damage permitted

### **320 Loads/ actions**

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1. Generally: Specified loads/ actions are characteristic values unless otherwise described.

### **330 Design loads**

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1. Description: For piles
2. Source: As per structural drawings

### **331 Design Loads**

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1. Description: For connections in structural steelwork
2. Source: As per connection loads document

### **460 Wind loads/ actions**

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1. Description: Generally
2. Standard: To BS EN 1991-1-4.
3. Criteria: Peak velocity pressure
  - 3.1. Wind direction and value: As calculated to standard
4. External pressure coefficient: Appropriate to element under consideration.
5. Internal pressure coefficient
  - 5.1. Normal: The more critical of +0.2 and -0.3.
  - 5.2. Accidental: Not applicable
6. Features affecting loads: None other than those shown on drawings
7. Special requirements: None

### **520 Foundation loads**

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1. Description: ON PILES
2. Foundation layout: As drawing BTLC-AKS-ZZ-FN-D-S-2001
3. Vertical loads: As per drawing BTLC-AKS-ZZ-ZZ-D-S-2002
  - 3.1. Eccentricity of applied load: Loads are concentric on foundation
4. Horizontal loads: As schedule

**560 Diaphragm action**

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1. Description: TO SUPPORT LOADS FROM wind loading
2. Requirement: Floor/ roof is required to act as a diaphragm to transmit horizontal forces from the external walls to shear walls/ frames.
3. Horizontal force
  - 3.1. Wind load: As clause 460
  - 3.2. Other loads: None
4. Location of shear walls/ frames: As drawings

**Execution****700 Execution generally**

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1. Standard: Report conflict between specification and the designated codes of practice and the standards referenced therein before ordering affected materials or executing affected work.
2. Inspection levels: To BS EN 1990, Table B5, level IL2.
  - 2.1. Special requirements: None
3. Quality control: To BS EN ISO 9001
4. Tolerances: Notwithstanding tolerances specified elsewhere, do not exceed requirements for compliance with the designated code.

**705 Connections and anchorages**

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1. End and edge distances and spacing (minimum): Unless otherwise specified or detailed, as required by the designated code of practice for fixings/ anchorages carrying maximum load.
2. Report locations where
  - 2.1. Type and number of fixings cannot be accommodated.
  - 2.2. Size or position of members prevents correct positioning.

**710 Geotechnical work**

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1. Geotechnical design report: Keep a copy on site during the execution of the geotechnical work.
2. Requirements for testing and monitoring: As geotechnical design report
3. Assumed ground conditions: As geotechnical design report

**720 Stability during execution**

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1. Permanent bracing system: New School Building
  - 1.1. Vertical: Steel wall bracing as detailed
  - 1.2. Horizontal: Steel roof bracing as detailed/ Composite action floors
2. Temporary bracing/ restraints: Provide as necessary until permanent bracing system is complete and sufficiently mature to carry loads and all connections have been made to the permanent system.
  - 2.1. Special requirements: None
3. Design loads: Structure has been designed for the completed state.
  - 3.1. Magnitude: Request details as necessary
4. Before loading structure: Take into account:
  - 4.1. Reduction in strength due to immaturity of elements.
  - 4.2. Reduction in loadbearing capacity due to partial completion of continuous elements.

## Completion

### 900 Geotechnical records

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1. Submit
  - 1.1. Details and results of monitoring.
  - 1.2. Details and purpose of any changes to the geotechnical work.
2. Timing: Within 30 days of the completion of the foundations
3. Special requirements: None

Ω End of Section

D20

## Excavating and filling

### Generally/the site

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#### 110 Site investigation

1. Report: 5019466-RDG-XX-ST-DOC-C-00FGIR01 - ENHANCED SURVEY REPORT July 2023 by Ridge

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#### 145 Variations in ground water level

1. Give notice: If levels encountered are significantly different from levels in the site investigation report or previously measured.

### Clearance/excavating

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#### 170 Removing small trees, shrubs, hedges and roots

1. Identification: Clearly mark trees to be removed.
2. Small trees, shrubs and hedges: Cut down.
3. Roots: Grub up and dispose of without undue disturbance of soil and adjacent areas.
4. Safety: Comply with Forest Industry Safety Accord safety leaflets.

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#### 175 Felling large trees

1. Definition: Girth over 600 mm.
2. Identification: Clearly mark trees to be removed.
3. Safety: Comply with Forest Industry Safety Accord safety leaflets.
4. Felling: As close to the ground as possible.
5. Stumps: Remove mechanically to a minimum depth of 300 mm below ground level
6. Work near retained trees: Take down trees carefully in small sections to avoid damage to adjacent trees that are to be retained, where tree canopies overlap and in confined spaces generally.

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#### 225 Handling topsoil

1. Standard: To BS 3882.
2. Aggressive weeds
  - 2.1. Species: Notify the presence of species included in the Weeds Act, section 2, or the appropriate Wildlife and Countryside Act for the relevant jurisdiction.
  - 2.2. Give notice: Obtain instructions before moving topsoil.
3. Contamination: Do not mix topsoil with:
  - 3.1. Subsoil, stone, hardcore, rubbish or material from demolition work.
  - 3.2. Other soil or material containing aggressive weeds, sharps, plastics and non soil forming materials and notifiable animal or plant diseases.
  - 3.3. Oil, fuel, cement or other substances harmful to plant growth.
  - 3.4. Other classifications of topsoil.
4. Multiple handling: Keep to a minimum. Use topsoil immediately after stripping.

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#### 240 Adjacent excavations

1. Requirement: Where an excavation encroaches below a line drawn at an angle from the nearest formation level of another higher excavation, the lower excavation, all work within it and backfilling thereto, must be completed before the higher excavation is made.
2. Angle of line below horizontal: 45°

D20

Excavating and filling

3. Backfill material: Compacted general filling as clause 617

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**250 Permissible deviations from formation levels**

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1. Beneath mass concrete foundations:  $\pm 25$  mm.
2. Beneath ground bearing slabs and r.c. foundations:  $\pm 15$  mm.
3. Embankments and cuttings:  $\pm 50$  mm.
4. Ground abutting external walls:  $\pm 50$  mm, but such as to ensure that finished level is not less than 150 mm below dpc.

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**267 Inspection of formations in shrinkable soils**

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1. Inspect formation: For signs of conducting and fine moisture absorbing roots.
2. Give notice: If significant quantities of roots are visible in the formation or in the bottom 75 mm of the walls of the excavation.

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**270 Foundations generally**

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1. Give notice if
  - 1.1. A natural bearing formation of undisturbed subsoil is not obtained at the depth shown on the drawings.
  - 1.2. The formation contains soft or hard spots or highly variable material.

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**283 Formations for pile supported structures**

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1. Excavate: To the design formation level.
2. Compact: As necessary to ensure formation will support weight of concrete without settlement.
3. Blinding to formation: Contractors choice

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**310 Unstable ground**

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1. Generally: Ensure that the excavation remains stable at all times.
2. Give notice: Without delay if any newly excavated faces are too unstable to allow earthwork support to be inserted.
3. Take action: If instability is likely to affect adjacent structures or roadways, take appropriate emergency action.

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**320 Recorded features**

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1. Recorded foundations, beds, drains, manholes, etc.: As drawing existing survey drawings
2. Contaminated earth: Remove and disinfect as required by Local Authority.

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**330 Unrecorded features**

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1. Give notice: If unrecorded foundations, beds, voids, basements, filling, tanks, pipes, cables, drains, manholes, watercourses, ditches, etc. not shown on the drawings are encountered.

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**335 New foundations crossing old foundations or walls**

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1. Break out: The old foundation/ wall where it crosses the new foundation/ wall:
  - 1.1. Length of breaking out: Width of the new foundation/ wall plus 500 mm on either side of new foundation.
  - 1.2. Depth of breaking out: Full depth of existing foundation/ wall
2. Disturbed/ softened soil: When the formation for the old foundation/ wall is deeper than the formation of the new foundation.

- 2.1. Excavate: Soil that has been disturbed and/ or softened on either side of the old wall/ foundation, and for 300 mm into undisturbed ground on either side.
3. Step up: The formation for the new foundation as necessary on either side of the old foundation/ wall until the formation is at its design level.
  - 3.1. Size of steps: Minimum distance between steps 1000mm and maximum height of step 500mm
4. Backfilling beneath design formation level: Compacted Type 1

### **360 Excess excavation**

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1. Excavation taken wider than required
  - 1.1. Backfill: With hardcore as clause 710
2. Excavation taken deeper than required
  - 2.1. Backfill: With well graded granular material or lean mix concrete

### **370 Underground structures in landscape areas**

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1. Generally: Remove walls, roads, foundations, disused services, drains, manholes and the like to minimum depth.
2. Minimum depth below finished levels
  - 2.1. Grass, ground cover and perennial planting: 500 mm
  - 2.2. Shrub planting: 750 mm.
  - 2.3. Within 2 m of tree planting: 1000 mm.
3. Walls and slabs remaining: In every 10 m<sup>2</sup> of wall or slab, make a drainage hole at least 600 mm diameter.

### **Disposal of materials**

#### **415 Excavated topsoil removal**

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1. General: Remove from site.

#### **450 Water**

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1. Generally: Keep all excavations free from water until:
  - 1.1. Formations are covered.
  - 1.2. Below ground constructions are completed.
  - 1.3. Basement structures and retaining walls are able to resist leakage, water pressure and flotation.
2. Drainage: Form surfaces of excavations and fill to provide adequate falls.
3. Removal of water: Provide temporary drains, sumps and pumping as necessary. Do not pollute watercourses with silt laden water.

#### **454 Ground water level, springs or running water**

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1. Give notice: If it is considered that the excavations are below the water table.
2. Springs/ Running water: Give notice immediately if encountered.

#### **457 Pumping**

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1. General: Do not disturb excavated faces or stability of adjacent ground or structures.
2. Pumped water: Discharge without flooding the site or adjoining property.
3. Sumps: Construct clear of excavations. Fill on completion.
  - 3.1. Locations: Contractor's choice

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**460 Permanent drainage system**

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1. Disposal of water from the excavations through system: Not permitted

**Filling**

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**500 Proposed fill materials**

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1. Details: Submit full details of proposed fill materials to demonstrate compliance with specification, including:
  - 1.1. Type and source of imported fill.
  - 1.2. Proposals for processing and reuse of material excavated on site.
  - 1.3. Test reports as required elsewhere.
2. Timing: At least 21 days before starting filling

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**510 Hazardous, aggressive or unstable materials**

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1. General: Do not use fill materials which would, either in themselves or in combination with other materials or ground water, give rise to a health hazard, damage to building structures or instability in the filling, including material that is:
  - 1.1. Frozen or containing ice.
  - 1.2. Organic.
  - 1.3. Contaminated or noxious.
  - 1.4. Susceptible to spontaneous combustion.
  - 1.5. Likely to erode or decay and cause voids.
  - 1.6. With excessive moisture content, slurry, mud or from marshes or bogs.
  - 1.7. Clay of liquid limit exceeding 80 and/or plasticity index exceeding 55.
  - 1.8. Unacceptable, class U2 as defined in the 'Specification for highway works', clause 601.

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**520 Frost susceptibility**

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1. General: Except as allowed below, fill must be non frost-susceptible as defined in the 'Specification for highway works', clause 801.8.
2. Test reports: If the following fill materials are proposed, submit a laboratory report confirming they are non frost- susceptible:
  - 2.1. Fine grained soil with a plasticity index less than 20%.
  - 2.2. Coarse grained soil or crushed granite with more than 10% retained on a 0.063 mm sieve.
  - 2.3. Crushed chalk.
  - 2.4. Crushed limestone fill with average saturation moisture content in excess of 3%.
  - 2.5. Burnt colliery shale.
3. Frost-susceptible fill: May only be used:
  - 3.1. At depths below the finished ground surface greater than: 350 mm
  - 3.2. Within the external walls of buildings below spaces that will be heated. Protect from frost during construction.
  - 3.3. Where frost heave will not affect structural elements.

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**530 Placing fill**

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1. Surfaces of excavations and areas to be filled: Free from loose soil, topsoil, organic material, rubbish and standing water.
2. Freezing conditions: Do not place fill on frozen surfaces. Remove material affected by frost. Replace and recompact if not damaged after thawing.

3. Adjacent structures, membranes and buried services
  - 3.1. Do not overload, destabilise or damage.
  - 3.2. Submit proposals for temporary support necessary to ensure stability during filling.
  - 3.3. Allow 14 days (minimum) before backfilling against in situ concrete structures.
4. Layers: Place so that only one type of material occurs in each layer.
5. Earthmoving equipment: Vary route to avoid rutting.

### **535      Compaction generally**

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1. General: Compact fill not specified to be left loose as soon as possible after placing.
2. After compaction: Surface of each layer must be well closed, showing no movement under compaction plant, and without cracks, holes, ridges, loose material and the like.
3. Defective areas: Remove and recompact to full thickness of layer using new material.

### **540      Benching in fill**

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1. Adjacent areas: If, during filling the difference in level between adjacent areas of filling exceeds 600 mm, cut into edge of higher filling to form benches 600 mm minimum width and height equivalent to depth of a layer of compacted filling.
2. New filling: Spread and compact to ensure maximum continuity with previous filling.

### **617      Type 1 unbound mixture**

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1. Fill: To 'Specification for highway works', clauses 801 and 803:
  - 1.1. Crushed rock (other than argillaceous rock).
  - 1.2. Coarse crushed concrete aggregate.
  - 1.3. Recycled aggregates.
  - 1.4. Crushed non-expansive slag to clause 801.2.
  - 1.5. Well-burned non-plastic colliery shale.
2. Amendments to requirements in the 'Specification for highway works': None
3. Filling: To 'Specification for highway works', clause 802.

### **650      Protection of compacted filling**

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1. Temporary protective filling: Before allowing construction traffic, raise level of compacted cohesive soil filling at least 150 mm above formation level using properly compacted temporary filling.
2. Removal: Remove temporary protective filling from site before permanent construction.

### **710      Hardcore filling**

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1. Fill: Granular material, free from excessive dust, well graded, all pieces less than 75 mm in any direction:
  - 1.1. Test requirements
    - 1.1.1. Minimum 10% fines value tested in a soaked condition to BS 812-111 Not required.
    - 1.1.2. Impact value SZ tested to BS EN 1097-2 Not required.
2. Material
  - 2.1. Permitted materials in any one layer
    - 2.1.1. Crushed rock (other than argillaceous rock) or quarry waste with not more binding material than is required to help hold the stone together.
    - 2.1.2. Crushed concrete, crushed brick or tile, free from plaster, timber and metal.
    - 2.1.3. Crushed non-expansive slag.

- 2.1.4. Gravel or hoggin with not more clay content than is required to bind the material together, and with no large lumps of clay.
  - 2.1.5. Well-burned non-plastic colliery shale.
  - 2.1.6. Natural gravel.
  - 2.1.7. Natural sand.
3. Filling: Spread and level in 150 mm maximum layers. Thoroughly compact each layer.

### **730 Blinding**

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- 1. Surfaces to receive sheet overlays or concrete:
- 2. Blind with
  - 2.1. Concrete where shown on drawings; or
- 3. Sand, fine gravel, or other approved fine material applied to fill interstices. Moisten as necessary before final rolling to provide a flat, closed, smooth surface.
- 4. Sand for blinding: To BS EN 12620, grade 0/4 or 0/2 (MP).
- 5. Permissible deviations on surface level: +0/-25mm

### **Bioremediation - Not Used**

'specification for highway works: earthworks specification' appendices - Not Used

Ω End of Section

## D30 Piling

### General

#### 110 Piling specification

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1. Standard: Comply with the current edition of 'Specification for piling and embedded retaining walls' (SPERW).
2. Recognized British Standard for SPERW requirements: None
3. References to Engineer in SPERW: For the purpose of this contract, interpret such references as being to the person named in section A10 as administering the Contract on behalf of the Employer.

#### 130 Piles

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1. Standard: To SPERW, sections B2-B9, as appropriate to the pile type.
2. Permitted types: Any type of bored pile
3. Project specification: Submit proposals to cover the SPERW requirements in clause B1.2 and listed under this heading for the chosen pile type.
4. Other requirements: None

#### 180 Augured cast-in-place piles

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1. Standard: To SPERW, section B4.
2. Method of construction: Continuous flight auger
  - 2.1. Splitting of auger: Not permitted
3. Filling
  - 3.1. Material: Contractor's choice
  - 3.2. Placing: Inject through hollow stem of auger.
  - 3.3. Control of concreting/ grouting: Contractor's choice
4. Pile group designation: All
  - 4.1. Diameter: As schedule BTLC-AKS-XX-ZZ-DR-S-2002
  - 4.2. Length: Submit proposals
5. Reinforcement
  - 5.1. Quantity: Submit proposals
  - 5.2. Extent: Submit proposals
6. Sonic logging ducts: -
7. Other requirements: None

### System performance

#### 210 Contractor design

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1. Structural requirements
  - 1.1. Generally: As section B50.
  - 1.2. Modifications: None
2. Design responsibility
  - 2.1. Piles: Complete design of piles in accordance with SPERW, clause B1.4, option 2
  - 2.2. Other: None
3. Pile layout: As drawing BTLC-AKS-XX-ZZ-DR-S-2001
4. Pile design criteria: As clause 130 and schedule BTLC-AKS-XX-ZZ-DR-S-2002

5. Other requirements: None
6. Submission of information: As required by SPERW, table B1.1 and elsewhere, as appropriate for the pile type, materials and tests specified.
  - 6.1. Amendments to requirements specified in SPERW for information required
    - 6.1.1. Prior to commencing design: None
    - 6.1.2. Prior to commencing the works: Confirmation that installation of piles will not damage adjacent structures/ services and Confirmation that proposed rig/ auger configuration is not susceptible to flighting for pile diameters and soil conditions under consideration

## 280 Performance specification criteria for piles

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1. Pile group designation: All Piles
2. References for piles to be load tested
  - 2.1. Preliminary test: To be agreed
  - 2.2. Proof test: To be agreed
3. Requirements for test piles: Contractor's choice
4. Criteria
  - 4.1. Specified working load
    - 4.1.1. Axial (SWL): As per drawing BTLC-AKS-XX-ZZ-DR-S-2002
    - 4.1.2. Other: None
  - 4.2. Design verification load (DVL): Submit proposals
  - 4.3. Required factor of safety (minimum):
    - 3.0 with no load testing requirement.
    - 2.5 based on working pile tests to 1.5SWL carried out on at least 1% (minimum 5No.) piles (subject to approval from Building Control).
    - 2.0 based on load test of expendable piles to 2.5 SWL
  - 4.4. Permitted settlement at DVL: As per SPERW guidance
  - 4.5. Permitted settlement at DVL + ½ FreqSWL: As per SPERW guidance

## 290 Basis for setting out

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1. Site datum: Ordnance (Newlyn) datum
2. Site grid: As drawing BTLC-AKS-XX-ZZ-DR-S-2002

## 300 Commencing surface

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1. Level: To be determined by Contractor

## 310 Pile length – penetration

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1. Pile group designation: All Piles
2. Pile cut-off level: 75 mm above underside of pile cap
  - 2.1. Stratum: As drawing site investigation
  - 2.2. Penetration of pile into stratum (minimum): As per Contractor's design
  - 2.3. Other requirements: None

## Products

### 440 Permanent casing

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1. Reasons for use:

1. Requirements to be reviewed by the Contractor and proposals submitted with the final design (as required).

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**445 Sleeves**

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1. Description:
  1. Requirements as per Contractor's design.

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**470 Concrete generally**

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1. Standards: To BS 8500-2 and SPERW, section B21.
2. Project compressive strength testing of concrete: Required as SPERW, clause B21.8
3. Exchange of information: Provide concrete producer with information required by BS 8500-1, clauses 4 and 5.

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**530 Reinforcement generally**

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1. Steel reinforcement: To BS 4449.
  - 1.1. Type/ Strength grade: As per Contractor design
2. Cutting and bending: To BS 8666.
3. Supplier: Firm holding a valid certificate of approval issued under a product certification scheme operated by a third-party certification body with appropriate Category 2 accreditation from the United Kingdom Accreditation Service (UKAS).

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**540 Cover to reinforcement**

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1. Cover (nominal): Submit proposals
2. Method of ensuring correct cover: Submit details.

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**550 Laps in reinforcement**

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1. Length (minimum): As per Contractor's design

**Execution**

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**610 Method statement**

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1. Requirement: Submit proposed method of installation to achieve the design parameters, including:
  - 1.1. Details of equipment.
  - 1.2. Programme showing sequence and resources.
  - 1.3. Confirmation that performance requirements for load and settlement will be achieved.

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**615 Records and submission of information during the works**

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1. Generally: As required in SPERW, tables B1.1, B1.6 and elsewhere, as appropriate for the pile types, materials and tests specified.
2. Amendments to requirements: None

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**650 Performance of working piles**

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1. Substandard performance: Give notice if the performance of any pile is likely to be less than that of a similar pile when its test behaviour has been accepted

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**655 Testing excavated material**

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1. Contamination tests: Undertake at following rates:
  - 1.1. Made up ground: Contractor's choice
  - 1.2. Other soil types: Contractor's choice

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**680 Prohibition of support fluid**

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1. Usage: Not permitted.

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**685 Excavated material**

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1. Disposal: Contractor's responsibility

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**690 Disposal of pile heads**

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1. Cutting down and disposal: Contractor's responsibility.

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**710 Instrument failure when auguring piles**

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1. Manual monitoring: Use a stop watch.

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**755 Preparation of pile heads for integrity testing**

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1. Preparation: To suit test method.
2. Inconsistencies: Submit report on inconsistencies which could inhibit execution or interpretation of test.

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**760 Pile integrity testing – general**

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1. Method: Submit proposals
  - 1.1. Satisfactory evidence in support of proposals: Submit.
2. Period between casting and testing (minimum): Seven days
3. Piles to be tested
  - 3.1. Pile group designation: All
  - 3.2. Number of piles to be tested: All
  - 3.3. Locations: As drawing BTLC-AKSXX1-ZZ-DR-S-2001
4. Programme: To be determined by Main Contractor
5. Other requirements: None

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**780 Axial maintained load testing of preliminary piles**

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1. Standard: To SPERW, section B17.
2. Type of test: To be confirmed by Contractor as required for chosen factor of safety
  - 2.1. Initial proof load test: TBC by Contractor
  - 2.2. Completion of test: To maximum test load or failure to stabilize as SPERW, clause B17.13.
3. Special requirements: None

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**785 Axial maintained load proof testing of working piles**

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1. Type of test: TBC by Contractor as required for chosen factor of safety
2. Special requirements: None

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**810 Timing of pile load testing**

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1. Period between installation and load testing (minimum): Seven days

**825 Work to pile heads after testing**

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1. Preliminary/ anchor piles: Cut down to 150 mm below blinding layer to ground slab and backfill hole with granular material
2. Working piles: Cut back concrete to expose reinforcement to provide full lap between pile reinforcement and pile cap starter bars

**Completion****910 Health and safety file**

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1. Piling completion report: Collate and submit a full set of pile records for inclusion in the health and safety file.
2. Content and date for submission: As SPERW, clause B1.12.2.
  - 2.1. Record plan: Give the number of each pile and its final location relative to nearest grid line.
  - 2.2. Additional requirements: None

**920 Piling guarantee**

---

1. Type: Insurance backed. Administered by an independent insurance protection company.
  - 1.1. Guarantee period (minimum): 60 years from completion
  - 1.2. Documentation: Provide certificates/ guarantees at completion of piling works.

Ω End of Section

E05

**In situ concrete construction generally**

To be read with preliminaries/ general conditions.

**220 Structural design provided**

---

1. Description: All in situ RC concrete elements with the exception of piles
2. Requirements
  - 2.1. Generally: As section B50.
  - 2.2. Additional requirements: None
3. Production/ execution records: In accordance with the designated code of practice

**225 Temperature records**

---

1. Requirement: Throughout period of concrete construction record:
  - 1.1. Daily: Maximum and minimum atmospheric shade temperatures
  - 1.2. Under adverse temperature conditions: Temperature at commencement and end of placing.
2. Equipment: Contractor's choice
  - 2.1. Location: In the shade, close to the structure.

**235 Openings, inserts and fixings**

---

1. Requirement: Collate all information.
2. Submit: Details where openings, inserts and fixings can only be accommodated by adjustments to reinforcement.
3. Locate reinforcement: To ensure specified minimum cover at openings and inserts and to be clear of fixing positions.

**290 Accuracy of construction**

---

1. Setting out: To BS 5964-1.
2. Geometrical tolerances: To BS EN 13670, Tolerance Class 1
  - 2.1. Conflicts: Notwithstanding tolerances specified elsewhere, do not exceed requirements for compliance with the designated code of practice.
  - 2.2. Substitution of alternative requirements: None

**300 Levels of structural concrete floors**

---

1. Tolerances (maximum)
  - 1.1. Level of floor:  $\pm 10$ mm as measured from nearest temporary benchmark
  - 1.2. Steps in floor level:  $\pm 5$ mm

**310 Surface regularity of concrete floors to BS 8204 - general**

---

1. Standard: To BS 8204-1 or -2.
2. Measurement: From underside of a 2 m straightedge (between points of contact) placed anywhere on surface and using a slip gauge.

**315 Surface regularity of concrete floors to BS 8204 - tolerance class**

---

1. Description: SR2
2. Location: Upper surface of ground floor slabs
3. Abrupt changes: 2 mm maximum

E05

**In situ concrete construction generally**

410 In situ concrete construction - supervision/ checking

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1. Standard: To BS EN 13670, Execution Class 2

Ω End of Section

**E10****Mixing/casting/curing in situ concrete****Concrete****101 Specification**

---

1. Concrete generally: To BS 8500-2.
2. Exchange of information: Provide concrete producer with information required by BS 8500-1, clauses 4 and 5.

**105 Designated concrete**

---

1. Description: Concrete Blinding
2. Designation: GEN1
3. Fibres: Not required
4. Aggregates
  - 4.1. Size (maximum): 20 mm
  - 4.2. Coarse recycled aggregates: No special requirements
  - 4.3. Additional aggregate requirements: None
5. Special requirements for cement/ combinations: None
6. Consistence class: Contractor's choice
7. Chloride class: Normal Cl 1.0
8. Admixtures: Concrete producer's choice
9. Additional mix requirements: None

**106 Designated concrete**

---

1. Description: Mass concrete foundations generally
2. Designation: FND2
3. Fibres: Not required
4. Aggregates
  - 4.1. Size (maximum): 20 mm
  - 4.2. Coarse recycled aggregates: No special requirements
  - 4.3. Additional aggregate requirements: None
5. Special requirements for cement/ combinations: None
6. Consistence class: Contractor's choice
7. Chloride class: Normal
8. Admixtures: Concrete producer's choice
9. Additional mix requirements: None

**107 Designated concrete**

---

1. Description: Structural topping for composite slabs
2. Designation: RC30/37
3. Fibres: Not required
4. Aggregates
  - 4.1. Size (maximum): 10 mm
  - 4.2. Coarse recycled aggregates: No special requirements
  - 4.3. Additional aggregate requirements: None

5. Special requirements for cement/ combinations: None
6. Consistence class: Contractor's choice
7. Chloride class: Normal
8. Admixtures: Concrete producer's choice
9. Additional mix requirements: None

#### **108 Designated concrete**

---

1. Description: External hard standings for plant and bin stores
2. Designation: PAV2
3. Fibres: Not required
4. Aggregates
  - 4.1. Size (maximum): 20 mm
  - 4.2. Coarse recycled aggregates: No special requirements
  - 4.3. Additional aggregate requirements: None
5. Special requirements for cement/ combinations: None
6. Consistence class: Contractor's choice
7. Chloride class: Normal
8. Admixtures: Concrete producer's choice
9. Additional mix requirements: None

#### **132 Designed concrete**

---

1. Description: RC slabs, ground beams and pile caps
2. Embedded metal: Carbon steel reinforcement
3. Compressive strength class (cylinder/ cube minimum): C32/40
4. Target density (oven-dry): Normal
5. Fibres: Not required
6. Aggregates
  - 6.1. Size (maximum): 20 mm
  - 6.2. Type/ Density: Normal weight
  - 6.3. Coarse recycled aggregates: Not permitted
  - 6.4. Additional aggregate requirements: None
7. Design chemical class: DC-1
8. Limiting values for composition
  - 8.1. Water:cement ratio (maximum): As DC-class
  - 8.2. Cement/ combination content (minimum): As DC-class
  - 8.3. Cement/ combination content (maximum): Not applicable
  - 8.4. Air content in situ (minimum): No requirement
9. Consistence class: Contractor's choice
10. Permitted cement/ combinations: As permitted for DC-class
11. Chloride class: Cl 0.30
12. Admixtures: Concrete producer's choice
13. Colour: Not applicable
14. Additional mix requirements: None

**Materials, batching and mixing****215 Ready-mixed concrete**

---

1. Production plant: Currently certified by a body accredited by UKAS to BS EN ISO/IEC 17065 for product conformity certification of ready-mixed concrete.
2. Source of ready-mixed concrete: Obtain from one source if possible . Otherwise, submit proposals.
  - 2.1. Name and address of depot: Submit before any concrete is delivered.
  - 2.2. Delivery notes: Retain for inspection.
3. Declarations of nonconformity from concrete producer: Notify immediately.

**221 Information about proposed concretes**

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1. Submit when requested
  - 1.1. Details listed in BS 8500-1, clause 5.2.
  - 1.2. Additional information: Data concerning the anticipated rate of strength gain

**225 Changes to specification**

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1. Changes to specification of fresh concrete (outside concrete producer's responsibility): Prohibited

**230 Interruption of supply during concreting**

---

1. Elements without joints: Where elements are detailed to be cast in a single pour without joints, make prior arrangements for a back-up supply of concrete.
2. Elsewhere
  - 2.1. Preparation: Manage pour to have a full face, and have materials available to form an emergency construction joint while concrete can still be worked.
  - 2.2. Before pour is completed: Submit location and details of joint, make proposals for joint preparation.

**415 Admixtures**

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1. Calcium chloride and admixtures containing calcium chloride: Do not use.

**Project testing/ certification - Not Used****Placing/ compacting/ curing and protecting****630 Premature water loss**

---

1. Requirement: Prevent water loss from concrete laid on absorbent substrates.
  - 1.1. Underlay: Select from:
    - 1.1.1. Polyethylene sheet: 250 micrometres thick.
    - 1.1.2. Building paper: To BS 1521, grade B1F.
  - 1.2. Installation: Lap edges 150 mm.

**640 Construction joints**

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1. Location of joints: Submit proposals when not shown on drawings
2. Preparation of joint surfaces: Remove surface laitance and expose aggregate by lightly brushing and spraying. Joint surface to be clean and damp immediately before placing fresh concrete

**648 Adverse temperature conditions**

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1. Requirement: Submit proposals for protecting concrete when predicted ambient temperatures indicate risk of concrete freezing or overheating.

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**650 Surfaces to receive concrete**

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1. Cleanliness of surfaces immediately before placing concrete: Clean with no debris, tying wire clippings, fastenings or free water.

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**660 Inspection of surfaces**

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1. Notice: Give notice to allow inspections of reinforcement and surfaces before each pour of concrete.
  - 1.1. Period of notice: Obtain instructions.
2. Timing of inspections: When reinforcement and formwork are ready for concreting

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**670 Transporting**

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1. General: Avoid contamination, segregation, loss of ingredients, excessive evaporation and loss of workability . Protect from heavy rain.
2. Entrained air: Anticipate effects of transport and placing methods in order to achieve specified air content.

---

**680 Placing**

---

1. Records: Maintain for time, date and location of all pours.
2. Timing: Place as soon as practicable after mixing and while sufficiently plastic for full compaction.
3. Temperature limitations for concrete: 30°C (maximum) and 5°C (minimum), unless otherwise specified. Do not place against frozen or frost covered surfaces.
4. Continuity of pours: Place in final position in one continuous operation up to construction joints. Avoid formation of cold joints.
5. Discharging concrete: Prevent uneven dispersal, segregation or loss of ingredients or any adverse effect on the formwork or formed finishes.
6. Thickness of layers: To suit methods of compaction and achieve efficient amalgamation during compaction.
7. Poker vibrators: Do not use 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.

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**690 Compacting**

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1. General: Fully compact concrete to full depth to remove entrapped air. Continue until air bubbles cease to appear on the top surface.
  - 1.1. Areas for particular attention: Around reinforcement, under void formers, cast-in accessories, into corners of formwork and at joints.
2. Consecutive batches of concrete: Amalgamate without damaging adjacent partly hardened concrete.
3. Methods of compaction: To suit consistence class and use of concrete.

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**720 Vibrators**

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1. General: Maintain sufficient numbers and types of vibrator to suit pouring rate, consistency and location of concrete.
2. External vibrators: Obtain approval for use .

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**730 Plastic settlement**

---

1. Settlement cracking: Inspect fresh concrete closely and continuously wherever cracking is likely to occur, including the top of deep sections and at significant changes in the depth of concrete sections.
  - 1.1. Timing: During the first few hours after placing and whilst concrete is still capable of being fluidized by the vibrator.
2. Removal of cracks: Revibrate concrete.

### 810 Curing generally

---

1. Requirement: Keep surface layers of concrete moist throughout curing period, including perimeters and abutments, by either restricting evaporation or continuously wetting surfaces of concrete.
  - 1.1. Surfaces covered by formwork: Retain formwork in position and, where necessary to satisfy curing period, cover surfaces immediately after striking.
  - 1.2. Top surfaces: Cover immediately after placing and compacting. If covering is removed for finishing operations, replace it immediately afterwards.
2. Surface temperature: Maintain above 5°C throughout the specified curing period or four days, whichever is longer.
3. Records: Maintain details of location and timing of casting of individual batches, removal of formwork and removal of coverings. Keep records on site, available for inspection.

### 811 Coverings for curing

---

1. Sheet coverings: Suitable impervious material.
2. Curing compounds: Selection criteria:
  - 2.1. Curing efficiency: Not less than 75% or for surfaces exposed to abrasion 90%.
  - 2.2. Colouring: Fugitive dye.
  - 2.3. Application to concrete exposed in the finished work: Readily removable without disfiguring the surface.
  - 2.4. Application to concrete to receive bonded construction/ finish: No impediment to subsequent bonding.
3. Interim covering to top surfaces of concrete: Until surfaces are in a suitable state to receive coverings in direct contact, cover with impervious sheeting held clear of the surface and sealed against draughts at perimeters and junctions.

### 812 Preventing early age thermal cracking

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1. Deep lifts or large volume pours: Submit proposals for curing to prevent early age thermal cracking, taking account of:
  - 1.1. Temperature differentials across sections.
  - 1.2. Coefficient of thermal expansion of the concrete.
  - 1.3. Strain capacity of the concrete mix (aggregate dependent).
  - 1.4. Restraint.

### 818 Curing periods generally

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1. Minimum periods: When not otherwise indicated, to BS EN 13670, Annex F.8.5.

### 840 Protection

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1. Prevent damage to concrete, including
  - 1.1. Surfaces generally: From rain, indentation and other physical damage.
  - 1.2. Surfaces to exposed visual concrete: From dirt, staining, rust marks and other disfiguration.
  - 1.3. Immature concrete: From thermal shock, physical shock, overloading, movement and vibration.
  - 1.4. In cold weather: From entrapment and freezing expansion of water in pockets, etc.

Ω End of Section

E20

**Formwork for in situ concrete****Generally/ preparation****110 Loadings**

---

1. Requirement: Design and construct formwork to withstand the worst combination of the following:
  - 1.1. Total weight of formwork, reinforcement and concrete.
  - 1.2. Construction loads including dynamic effects of placing, compacting and construction traffic.
  - 1.3. Wind and snow loads.

**132 Propping**

---

1. General: Prevent deflection and damage to the structure. Carry down props to bearings strong enough to provide adequate support throughout concreting operations.

**170 Work below ground**

---

1. Description: Building C Mass Concrete Pad foundations
2. Casting vertical faces against faces of excavation: Permitted provided face of excavation is stable
  - 2.1. Requirements: Prevent contamination of concrete by loose soil

**182 Compressible board substructure formwork**

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1. Manufacturer: [Cordek Ltd](#)
  - 1.1. Contact details
    - 1.1.1. Address: Spring Copse Business Park  
Slinfold  
West Sussex  
RH13 0SZ
    - 1.1.2. Telephone: [+44 \(0\)1403 799600](tel:+44(0)1403799600)
    - 1.1.3. Web: <https://www.cordek.com>
    - 1.1.4. Email: [sales@cordek.com](mailto:sales@cordek.com)
  - 1.2. Product reference: [Cellcore HX S](#)
2. Third party certification: BBA Agreement certificate.
3. Material: Expanded polystyrene (EPS) and polypropylene.
4. Thickness: 225 mm.
5. Execution: Installing substructure formwork.
6. Grade: 13 / 18.
7. Standards: NHBC Technical Standards.
8. Colour: White.
9. Dimensions: 2400 x 1200 mm.

**Construction****310 Accuracy**

---

1. General requirement for formwork: Accurately and robustly constructed to produce finished concrete in the required positions and to the required dimensions.
2. Formed surfaces: Free from twist and bow (other than any required cambers).
3. Intersections, lines and angles: Square, plumb and true.

E20

Formwork for in situ concrete

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**320 Joints in forms**

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1. Requirements including joints in form linings and between forms and completed work
  - 1.1. Prevent loss of grout, using seals where necessary.
  - 1.2. Prevent formation of steps. Secure formwork tight against adjacent concrete.

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**330 Inserts, holes and chases**

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1. Positions and details
  - 1.1. Dimensioned on drawings provided on behalf of the Employer: Do not change without consent.
  - 1.2. Undimensioned or from other sources: Submit proposals.
2. Positioning relative to reinforcement: Give notice of any conflicts well in advance of placing concrete.
3. Method of forming: Fix inserts or box out as required. Do not cut hardened concrete without approval.

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**340 Kickers**

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1. Method statement: Submit proposals including means of achieving quality of concrete consistent with that specified for the column or wall.
  - 1.1. Kicker height: 100 mm

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**480 Surface retarders**

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1. Use: Obtain approval.
2. Reinforcement: Prevent contact with retarder.

**Striking**

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**510 Striking formwork**

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1. Timing: Prevent any disturbance, damage or overloading of the permanent structure.

**Formed finishes**

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**610 Basic finish**

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1. Location: Faces below ground level
2. Finish: Faces fully compacted and cover to reinforcement provided.

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**620 Plain finish**

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1. Location: Surfaces to be direct painted
2. Finish: Even and dense. Arrange formwork panels in a regular pattern as a feature of the surface.
3. Permissible deviation of surfaces
  - 3.1. Sudden irregularities (maximum): 3 mm.
  - 3.2. Gradual irregularities (maximum): 3 mm, when measured from the underside of a 1 m straightedge, placed anywhere on surface.
4. Variations in colour
  - 4.1. Permitted: Those caused by impermeable formwork linings.
  - 4.2. Not permitted: Those caused by contamination or grout leakage.
5. Surface blemishes
  - 5.1. Permitted: Blowholes less than 10 mm in diameter and at an agreed frequency.
  - 5.2. Not permitted: Voids, honeycombing, segregation and other large defects.
6. Formwork tie holes: In a regular pattern and filled with matching mortar.

Ω End of Section



**E30****Reinforcement for in situ concrete****Reinforcement****110 Quality assurance of reinforcement**

---

1. Standards
  - 1.1. Reinforcement: To BS 4449, BS 4482, BS 4483 or BS 6744.
  - 1.2. Cutting and bending: To BS 8666.
2. Source of reinforcement: Companies holding valid certificates of approval for product conformity issued by the UK Certification Authority for Reinforcing Steels (CARES).

**150 Ribbed bar reinforcement**

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1. Standard: To BS 4449.
  - 1.1. Strength grade: B500B

**210 Standard fabric reinforcement**

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1. Standard: To BS 4483.
2. Strength grade: B500B

**Workmanship****310 Cutting and bending reinforcement**

---

1. General: To schedules and to BS 8666.
2. Bending on site, including minor adjustments: Obtain instructions

**320 Protection of reinforcement**

---

1. Dropping from height, mechanical damage and shock loading: Prevent.
2. Cleanliness of reinforcement at time of pouring concrete: Free from corrosive pitting, loose mill scale, loose rust and contaminants which may adversely affect the reinforcement, concrete, or bond between the two.

**410 Laps or splices**

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1. Details not shown on drawings: Obtain instructions.

**425 Laps not detailed on drawings**

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1. Laps in bar reinforcement (minimum): 40 x bar diameter
2. Laps in fabric reinforcement (minimum): 40 x bar diameter
  - 2.1. Laps at corners: Avoid four layer build-up.

**427 Laps in fabric reinforcement**

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1. Terms: As defined in BCA publication 97.321.
2. Lap type
  - 2.1. Long edge of fabric: Nested in plane lap with bars in centre layer bundled and bars in outer layers spaced apart to ensure full encapsulation in concrete
  - 2.2. Short edge of fabric: Butt end bars in adjacent fabric sheets and provide loose bars of the same diameter and type as the fabric bars, tied to and with a full lap with the bars in each sheet
3. Other requirements: None

**451 Fixing reinforcement**

---

1. Standard: To BS 7973-1 and -2.
2. Installation: In addition to any spacers and chairs shown on drawings or schedules, provide adequate support, tie securely and maintain the specified cover.
3. Tying
  - 3.1. Wire type: 16 gauge black annealed. Use stainless steel wire for stainless steel reinforcement.
4. Ends of tying wire: Prevent intrusion into the concrete cover. Remove loose ends.
5. Compatibility of metals: Prevent contact between ordinary carbon steel and stainless or galvanized reinforcement.

**480 Nominal cover to reinforcement**

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1. Nominal cover: As drawings

**510 Rust staining**

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1. Staining of surfaces of concrete which will be exposed to view in the finished work: Prevent.

Ω End of Section

E41

Worked finishes to in situ concrete

To be read with preliminaries/ general conditions.

**150 Finishing**

---

1. Timing: Carry out at optimum times in relation to setting and hardening of concrete.
2. Prohibited treatments to concrete surfaces
  - 2.1. Wetting to assist surface working.
  - 2.2. Sprinkling cement.

**320 Trowelled finish**

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1. Surface on completion: Uniform, smooth but not polished, free from trowel marks and blemishes, and suitable to receive specified flooring material.

Ω End of Section

**G10****Structural steel framing****General requirements/ information****110 Contractor's design of joints**

---

1. Description: Steel frames
2. Design concept: Beams generally designed as simply supported under dead and imposed loads. Stability is provided by cross bracing. Moment connections are noted on the drawings.
3. Design responsibility: Design connections and detail steelwork and connections.
  - 3.1. Other responsibilities: None
4. Structural requirements
  - 4.1. Generally: As section B50.
    - 4.1.1. Modifications: None
  - 4.2. Design: Complete in accordance with the designated code of practice to satisfy specified performance criteria.
  - 4.3. Connections: Design and detail joints to designated code of practice
  - 4.4. Fixings to foundations and walls: No special requirements
  - 4.5. Additional requirements: None
5. Design and production information: As Preliminaries section A31 and clause 120

**115 Design constraints – general**

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1. Members forming bracing systems or girders of lattice construction: Unless detailed or instructed otherwise, position so that their lines of action intersect at a point.
2. Bolts
  - 2.1. Diameter (minimum): 16 mm
  - 2.2. Number per connection (minimum): Two, unless otherwise indicated.
  - 2.3. Other requirements: None
3. Punching of bolt holes: Not permitted
4. Welds: At least 6 mm fillet
5. Other constraints: None

**116 Design constraints – steelwork to be galvanized**

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1. Steel grades: Do not use steel downgraded from a higher specification.
2. Detail design: Avoid details that will increase the risk of initiating liquid metal assisted cracking (LMAC).
  - 2.1. Particular restrictions: None
3. Other requirements: None

**120 Drawings and calculations**

---

1. Information required: Connection drawings and calculations
2. Requirement: Before preparing detailed fabrication drawings, submit:
  - 2.1. General arrangement drawings with individual steel members clearly identified.
  - 2.2. Calculations for major connections.

**125 Specification standard**

---

1. Standard: Comply with latest edition of National Structural Steelwork Specification (NSSS).

- 1.1. Additional requirements: None
- 1.2. Document availability: For the duration of the work, at fabrication shop and on site.
2. References to Engineer in NSSS: For the purpose of this contract, interpret such references as being to a suitably experienced and chartered structural/ civil engineer appointed to fulfil this function by the Contractor and to report approvals/ agreements directly to the person named in section A10 as administering the Contract on behalf of the Employer.
  - 2.1. Exceptions: None

### **130 General steel sections and plates**

---

1. Description: All steelwork except hollow sections and plates
2. Standard: To BS EN 10025-2
3. Grade: S355JR
  - 3.1. Options: None
4. Source: Obtain steel from a source accredited to a national or internationally accepted quality standard.
5. Other requirements: None

### **135 Hollow steel sections**

---

1. Description: As noted on drawings
2. Standard: To BS EN 10210-1
3. Grade: S355J0H
  - 3.1. Options: None
4. Source: Obtain steel from a source accredited to a national or internationally accepted quality standard.
5. Other requirements: None

### **Frame systems - Not Used**

### **Cold-formed materials - Not Used**

### **Fabrication**

#### **190 Marking**

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1. Identifying and recording materials and components: Submit details of proposed methods.
2. Location of marks
  - 2.1. Generally: Visible for checking after erection.
  - 2.2. Weathering steel: On surfaces not exposed to open view in the completed work.
3. Steel to be blast cleaned, pickled, metal sprayed or galvanized: Marked so that subsequent treatment cannot obliterate the marking.

#### **195 Hard stamping**

---

1. Usage: Not permitted except as indicated on drawings.

#### **210 End connections**

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1. Angle web cleats: Project 10 mm beyond ends of simply supported members.

#### **215 Hollow sections**

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1. Insides of sections: Debris and moisture removed before sealing ends and openings.

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**220 Access/ Ventilation holes in base plates**

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1. Base plates larger than 1 m<sup>2</sup>: Make 25 mm diameter holes as necessary for pressure grouting, escape of entrapped air or direct compaction of filling/ bedding material.

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**225 Steelwork to be galvanized**

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1. Cutting, drilling and shop welding: Complete before galvanizing.
2. Vent and drain holes: Provide as necessary.
  - 2.1. Locations: Submit proposals.
  - 2.2. Sealing: Not required

**Welding**

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**255 Site welding**

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1. Usage: Permitted only where indicated on drawings.
2. Working conditions: Suitable and safe. Do not weld when surfaces are wet or when ambient temperature is below 0°C.

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**270 Additional welds**

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1. Welds (including tack welds) not indicated on drawings: Not permitted without approval.

**Bolt assemblies**

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**302 Non-preloaded bolt assemblies**

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1. Designation: Hexagon head bolts to BS EN ISO 4014, grade B
  - 1.1. Threading: Full length
2. Nuts and washers: To suit property class of bolt, as NSSS, clause 2.4.4.
3. Coating applied by manufacturer: Contractor's choice
4. Other requirements: None

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**390 Sealed hollow sections**

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1. Holes: Sealed to prevent access of moisture.
  - 1.1. Method of sealing: Submit proposals

**Erection**

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**405 Outline method of erection**

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1. Standard method will apply with no unusual considerations

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**410 Pre-erection checks**

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1. Scope: At least 7 days before proposed erection start date, check the following:
  - 1.1. Foundations and other structures to which steelwork will be attached: Accuracy of setting out.
  - 1.2. Holding down bolts: Position, protruding length, slackness and condition.
2. Inaccuracies and defects: Report without delay.
3. Permission to commence erection: Obtain.

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**420 Setting out**

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1. Permissible deviations: In addition to the requirements of the NSSS, add permissible deviations for different types of dimension and locations, as necessary.

**425 Modifications**

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1. Steelwork: Do not modify without approval.
2. Temporary fabrication/ erection attachments: May remain when they will not interfere with subsequent work, and will be completely hidden by finishes; otherwise, remove

**432 Temporary support**

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1. Permanent bracing system
  - 1.1. Vertical: Steel wall bracing and moment frames as shown on drawings
  - 1.2. Horizontal: Composite action floors/ Steel roof bracing as detailed
2. Temporary bracing/ restraints: Provide as necessary until permanent bracing system is complete and sufficiently mature to carry loads and all connections have been made to the permanent system.
3. Elements to be supported: To be determined by Contractor's temporary works engineer
4. Bracing/ Restraints: Provide as necessary until permanent connection can be made to floor and roof as deemed necessary by Temporary Works Engineer.
5. Forces and moments in temporary supports: Make an independent assessment

**440 Column bases**

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1. Levels: Adjust using steel shims or folding wedges no larger than necessary.
2. Location of shims/ wedges: Position symmetrically around perimeter of base plate. Do not use a single central pack.
3. Give notice: If space beneath any column base is outside specified limits for bedding thickness.
4. Accuracy of erection: Check, and correct errors before filling and bedding beneath bases and carrying out other adjacent work.

**443 Proprietary filling/ bedding of column bases**

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1. Bedding thickness range: As drawings
2. Preparation: Concrete surfaces scarified to provide a good mechanical key.
3. Bolt pockets and spaces beneath base plates: Completely filled with Non-shrink grout.

**Testing - Not Used****Protective coatings****523 Compatibility of shop primer with site applied intumescent coating**

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1. Intumescent coating: M61/ 110.
2. Primer: Compatible with coating under general and fire conditions.
3. Manufacturer's recommendations and test evidence: Submit before priming. Include fire test data to BS 476-20 and -21, or BS EN 1363-1 and BS EN 1365-2, -3, and/or -4 as appropriate.

**550 Post-galvanizing inspection**

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1. Inspector: Submit, on request, evidence of training and competence in visual inspection for liquid metal assisted cracking.
2. Components for which visual inspection is not required (procedure PGI-0): Not applicable
3. Components requiring additional inspection
  - 3.1. Procedure PGI-2A: None
  - 3.2. Procedure PGI-2B: None
4. Timing: Before erection of steelwork or application of other coatings.
5. Action in event of non-compliance

- 5.1. Submit: Full records of all post-galvanizing inspections, drawing attention to any erected components that are required to be quarantined.
- 5.2. Procedure PGI-3: Carry out on all quarantined components, and submit report.
- 5.3. Sites of suspected defects: Remove zinc coating by grinding back to bright metal for a distance of not less than 50 mm around each defect and from a similar area on opposite face of member and inspect.
- 5.4. Remedial actions: Submit proposals.

### Protective coating systems

#### 610 Galvanizing to chemically cleaned steel

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1. Use/ location: All external steelwork
2. Preparation: Chemical cleaning.
3. Galvanizing: To BS EN ISO 1461.
  - 3.1. Minimum mean coating thickness: 85 micrometres.

#### 638 Shop priming

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1. Description: FOR INTUMESCENT COATING SYSTEM M61/110
2. Use/ location: As per fire strategy drawings
3. Shop preparation
  - 3.1. Generally: Blast cleaning to BS EN ISO 8501-1, preparation grade Sa 2½.
  - 3.2. Welds/ edges/ areas with surface imperfections: To BS EN ISO 8501-3, preparation grade P2.
4. Primer: Two pack epoxy
  - 4.1. Manufacturer: Contractor's choice
    - 4.1.1. Product reference: Contractor's choice
  - 4.2. Dry film thickness: To suit fire requirements
5. Special requirements: Stripe intermediate coat to external angles

### Preparation for painting

#### 710 Offsite preparation and painting

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1. Working area: Covered and properly lit, heated and ventilated.
2. Sequence of working: Select from the following and submit proposals:
  - 2.1. Fabricate, blast clean, prime.
  - 2.2. Blast clean, fabricate, remove flash rust with a light overall sweep blast, prime.
  - 2.3. Blast clean, apply weldable prefabrication primer, fabricate, prime.
3. Prefabrication primer (option 3): Type recommended by manufacturer of post fabrication primer.
  - 3.1. Thickness of post fabrication primer coat: May be reduced if and as recommended by manufacturer.
4. Surfaces inaccessible after assembly: Apply full treatment and coating system including, if necessary, local application of site coatings.

#### 725 Manual cleaning of new steelwork

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1. Preparation: Remove fins, burrs, sharp edges, weld spatter, loose rust and loose scale.
2. Surface finish: Clean but unpolished to BS EN ISO 8501-1, grade St 2.
3. Finishing: Thoroughly degrease and clean down. Remove any consequent rusting back to grade St 2. Prime without delay.

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**740 Bolted joints (other than preloaded joints)**

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1. Steelwork to be shop painted: Apply full shop specification to joint faces.
2. Steelwork to be erected with mill finish then site painted: Before erection, prepare and prime joint faces and allow to dry.
3. Bolted joints in externally exposed steelwork
  - 3.1. Immediately before assembling, apply a further coat of primer and bring surfaces together while still wet.
  - 3.2. After assembling and before applying site coatings, seal crevices to bolts and joint perimeters with a compatible sealant.

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**755 Uncoated fasteners**

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1. Treatment: After steelwork erection and before applying site coatings, thoroughly degrease and clean. Without delay, coat to match adjacent shop painted areas.

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**760 Galvanized fasteners**

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1. Treatment: After steelwork erection and before applying site coatings, thoroughly degrease and clean. Etch prime.

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**765 Site preparation of shop painted steelwork**

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1. Preparation: Touch in shop coats, as necessary, and allow to dry. Before applying site coats (when specified), abrade surfaces or wash down or both, as recommended by paint manufacturer.

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**770 Site preparation of galvanized surfaces for painting**

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1. Preparation: Thoroughly degrease. Remove white corrosion products. Wash off and allow to dry before applying etching wash or primer.

**Painting**

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**810 Environmental conditions**

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1. General requirements prior to starting coating work
  - 1.1. Surfaces: Unaffected by moisture or frost.
  - 1.2. Steel temperature: At least 3°C above dew point, with conditions stable or improving, and not high enough to cause blistering or wrinkling of the coating.
  - 1.3. Relative humidity: Below 85%.

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**815 Coatings**

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1. Surfaces to be coated: Clean, dust free and suitably dry. Previous coats to be adequately cured.
2. Multiple coats of same material: Use different tints to assist checking of complete coverage.
3. Penultimate coat: Colour recommended by paint manufacturer to suit top coat colour.
4. Finish required: Smooth and even, of uniform thickness and colour, free from defects.

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**820 Film thickness**

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1. Wet film thickness: During application, check thickness of each coat with a wheel or comb gauge used in accordance with BS EN ISO 2808.
2. Accumulated dry film thickness: After each coat has dried, check total accumulated film thickness.
  - 2.1. Method: Magnetic or electromagnetic meter.
  - 2.2. Number and position of measurements: As directed.
  - 2.3. Validation: Measurements to be independently witnessed.

- 2.4. Meter calibration: Check against standard shims and recalibrate regularly against a smooth steel reference plate.
3. Average dry film thickness
  - 3.1. At least specified thickness over any square metre.
  - 3.2. No reading to be less than 75% of specified thickness.
4. Top coat dry film thickness: Sufficient to give an even, solid, opaque appearance.

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**825 Stripe coat**

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1. External angles, nuts, bolt heads, rough weld seams, and areas difficult to coat: Apply an additional stripe coat of undercoat and finishing coat .

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**850 Junctions with concrete**

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1. Exposed steelwork partially embedded or encased in concrete: Apply two coats of bituminous coating locally to the steel/concrete junction.
2. Bituminous coating: To BS 6949, type 1, class A

Ω End of Section

**G30****Metal profiled sheet decking****Proprietary specified roof/ floor decking****110 Metal profiled sheet decking**

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1. Manufacturer: Tata Steel
  - 1.1. Product reference: Comflor 51+
2. Material: Steel, Grade S350 GD + Z275 to BS EN 10346
3. Thickness (nominal): 1.2 mm
4. Soffit finish: None
5. End laps (minimum): 150 mm
  - 5.1. Configuration: Supported
6. Supporting structure: Steel Frame
7. Accessories: Colorcoat required where used externally

**Performance specified roof/ floor decking - Not Used****Fixing decking****220 Painting structure**

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1. Sequence: Before the decking is attached paint surfaces of supporting structure that will be subsequently inaccessible.

**260 Fixing decking generally**

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1. Cut sheets: Clean edges with true lines and no burrs.
  - 1.1. Treatment of edges: As recommended by manufacturer
2. Penetrations: Cut openings to the minimum size necessary.
  - 2.1. Edge reinforcement: Submit proposals
3. Fixings: Drill all holes.
4. Cleanliness: Remove debris from within decking construction.
5. Installation: Seams and ribs of deck must be parallel, with no damage to deck coating.

Ω End of Section

