
BELLE VUE COOP ACADEMY

Belle Vue Coop Academy STR SPECIFICATION

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Ss_20_05_15_70

Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits **UNCHANGED**

Systems

Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

1. Description: Pad foundations and strip footings to be 600mm deep RC, with mass fill below to adequate and virgin strata. Refer to GAs for levels.
2. System performance: [Ss_20_05_15/245 Drawings and reinforcement schedules for reinforced concrete construction](#); [Ss_20_05_15/250 Reinforcement detailing](#); [Ss_20_05_15/210 Loads applied to foundations](#); [Ss_20_05_15/235 Settlement criteria for buildings and structures](#); [Ss_20_05_15/230 Geotechnical design](#)
3. Blinding: [Pr_20_31_16_21 Designated concrete FND2Z](#)
4. Reinforcement
 - 4.1. Type of reinforcement: [Pr_20_96_71_12 Carbon steel fabric reinforcement](#); [Pr_20_96_71_14 Carbon steel ribbed bar reinforcement](#)
 - 4.2. Reinforcement accessories: [Pr_20_96_71_15 Carbon steel post-installed starter bars](#); [Pr_20_96_71_51 Mechanical reinforcement couplers](#)
5. Concrete: [Pr_20_31_16_21 Designated concrete RC32/40](#)
6. Heave Protection: Heave protection is to be provided to the foundations highlighted on the foundation GAs.
Refer to drawings for typical detail
7. Cast in accessories: [Pr_20_29_08_38 Holding down bolt assemblies](#)
8. Execution: [Ss_20_05_15/615 Accuracy of construction](#); [Ss_20_05_15/655 Adverse temperature conditions](#); [Ss_20_05_15/660 Casting concrete against faces of excavations](#); [Ss_20_05_15/665 Concrete supply on large pours](#); [Ss_20_05_15/610 Execution of concrete foundations](#); [Ss_20_05_15/668 Concrete Finishes Schedule for Specific Areas Trowelled Finish \(B\)](#); [Ss_20_05_15/672 Unformed finishes in concrete](#); [Ss_20_05_15/720 Forming construction and movement joints in concrete generally Type A](#); [Ss_20_05_15/730 Forming movement joints in concrete rafts and foundations](#); [Ss_20_05_15/625 Inspection of surfaces to receive concrete](#); [Ss_20_05_15/630 Installing substructure formwork](#); [Ss_20_05_15/620 Preparation of surfaces to receive concrete](#); [Ss_20_05_15/617 Formations to receive concrete](#); [Ss_20_05_15/735 Day joints](#)
9. System completion: [Ss_20_05_15/810 Post completion structural testing of concrete structures](#); [Ss_20_05_15/820 Surface cracking of concrete structures](#)

System performance

Ss_20_05_15/210 Loads applied to foundations

1. Design loads: Refer to BDP loading document and drawings

Ss_20_05_15/230 Geotechnical design

1. Standards: In accordance with [BS EN 1997-1](#), [BS EN 1997-2](#) and [BS 8004](#).
2. Design category:
3. Ground investigation report
 - 3.1. Review of ground investigation report:
 - 3.2. Datum for borehole logs:
4. Existing subsoil conditions
 - 4.1. Soil strength and density:

- 4.2. Ground water conditions:
- 4.3. Obstructions and voids:
- 5. Geotechnical design report
 - 5.1. Review of geotechnical design report:
 - 5.2. Monitoring of ground conditions:
 - 5.3. Availability of report: Keep a copy of the report on site during the execution of the geotechnical work.
- 6. Existing buildings and below ground services:

Ss_20_05_15/235 Settlement criteria for buildings and structures

- 1. Requirement: Design and/ or construct the building such that anticipated deflection or deformation of any part of the building, or ground movements due to its construction, will not impair its stability or that of any other building.
- 2. Permitted settlement at serviceability limit state: Submit proposals. To be verified and accepted by engineer

Ss_20_05_15/245 Drawings and reinforcement schedules for reinforced concrete construction

- 1. Building component designations: To [BS EN ISO 4157-1](#).
- 2. Reinforcement schedules: To [BS 8666](#).
- 3. Reinforcement drawings: To [BS EN ISO 3766](#).

Ss_20_05_15/250 Reinforcement detailing

- 1. Detailing rules for particular situations: To [PD 6687-1](#).
- 2. Order of priority when clashes occur: Continuity of column steel followed by primary beam steel, followed by secondary beam steel.
- 3. Reinforcement for crack control: Provide reinforcement and adjust spacing of reinforcement as required.

Products

Pr_20_29_08_08 Bolt boxes

- 1. Description:
- 2. Manufacturer: Contractors Choice
- 3. Material:
- 4. Shape:
- 5. Execution: [Pr_20_29_08/625 Fixing bolt boxes](#)

Pr_20_29_08_38 Holding down bolt assemblies

Shared by: [Ss_20_10_75_35 Heavy steel framing systems](#)

- 1. Description: Contractor to be responsible for completing the holding down bolt design in accordance with BS EN 1993. Refer to concrete specification for concrete grade.
- 2. General requirements: [Pr_20_29_08_08 Bolt boxes](#)
- 3. Manufacturer: Contractors choice
- 4. Bolts
 - 4.1. Standard: To [BS 7419](#).
 - 4.2. Head arrangement: Hexagon, with round neck.
 - 4.3. Size

- 4.3.1. Thread diameter: As drawings
- 4.3.2. Nominal length: As drawings
- 4.4. Property class: 8.8 to [BS EN ISO 898-1](#) and [BS EN 15048-1](#).
- 4.5. Finish: Galvanized to [BS EN ISO 10684](#).
Sherardized to [BS 7371-8](#).
Zinc plated to [BS EN ISO 4042](#).
- 5. Nuts
 - 5.1. Standard: To [BS EN ISO 4032](#).
To [BS EN ISO 4034](#).
 - 5.2. Property class: To match bolt strength.
 - 5.3. Finish: To match bolt
 - 5.4. Nuts used on connections subject to vibrations:: Secure to prevent loosening. Use self locking nuts, an approved chemical product or locknuts. Ensure joints are free to move where slotted holes are provided for movement connections
- 6. Washers
 - 6.1. Standard: Plain to [BS 4320](#), Form G.
Provide at least one washer under the element of the bolt to be tightened.
 - 6.2. Finish: To match bolt
- 7. Washer plates
 - 7.1. Format: As required
 - 7.2. Finish: Galvanized to [BS EN ISO 10684](#).
Sherardized to [BS 7371-8](#).
 - 7.3. Size: 150 x 150 x 10 mm.
- 8. Execution: [Pr_20_29_08/620 Fixing holding down bolts](#)

Pr_20_31_16_21 Designated concrete RC32/40

Shared by: [Ss_30_12_85_16 Composite steel and concrete floors](#) and [Ss_30_12_85_70 Reinforced Concrete Floor - Suspended Ground Floor Slab](#)

- 1. Description: ALL SUPER STRUCTURE CONCRETE, PAD FOUNDATIONS, STRIP FOOTINGS, LIFT PIT, GROUND FLOOR SLAB
- 2. Supplied by: Contractors choice
- 3. Ready mixed concrete producer
 - 3.1. Third party accreditation: Currently certified by a body accredited by UKAS to [BS EN ISO/IEC 17065](#) for product conformity certification of ready-mixed concrete.
 - 3.2. Source
 - 3.2.1. Name and address of depot: Submit before any concrete is delivered.
 - 3.2.2. Delivery notes: Retain for inspection.
 - 3.3. Information
 - 3.3.1. Product information to be provided to the producer: Provide concrete producer with information required by [BS 8500-1](#), clauses 4 and 5 and [BS EN 206](#).
 - 3.3.2. Product information to be provided by the producer: Certificate from a United Kingdom Accreditation Service (UKAS) approved independent laboratory that the concrete conforms to [BS 8500-1](#).
 - 3.3.3. Mix design robustness: Submit evidence to demonstrate robustness of mix design.
 - 3.4. Declarations of non-conformity from concrete producer: Notify immediately.
- 4. Standards: To [BS EN 206](#), [BS 8500-1](#), and [BS 8500-2](#).
- 5. Concrete designation: CB32/40.
- 6. Properties

- 6.1. Consistence class: Contractor proposals
- 6.2. Chloride class: normal
- 6.3. Cement and cement combination (maximum): 550 kg/m³.
7. Aggregates
 - 7.1. Nominal size (maximum): 20 mm.
 - 7.2. Additional requirements for aggregates: Freeze-thaw resisting.
 - 7.3. Recycled aggregates: Permitted.
 - 7.4. Source of recycled aggregates: Submit proposals
8. Fibres: Not required
9. Admixtures
 - 9.1. Standard: Not to be used without prior approval
 - 9.2. Type of admixture: N/A
 - 9.3. Colouring agent: N/A
10. Air content (minimum): Contractor proposal
11. Additional mix requirements: None
12. Execution: [Pr_20_31_16/610 Mixing in fibres](#); [Pr_20_31_16/630 Placing normal weight concrete generally](#); [Pr_20_31_16/695 Temperature of concrete](#); [Pr_20_31_16/712 Curing class](#); [Pr_20_31_16/714 Curing generally](#); [Pr_20_31_16/722 Early age thermal cracking](#); [Pr_20_31_16/726 Broken cubes or cylinders from failed strength tests](#); [Pr_20_31_16/728 Initial project testing of concrete](#); [Pr_20_31_16/730 Project testing of concrete generally](#); [Pr_20_31_16/732 Regular project testing of concrete](#); [Pr_20_31_16/734 Site adjustments to specification](#); [Pr_20_31_16/736 Testing laboratory](#); [Pr_20_31_16/738 Test records](#); [Pr_20_31_16/724 Plastic settlement](#)

Pr_20_31_16_21 Designated concrete FND2Z

1. Description: FOR BLINDING AND MASS CONCRETE FILL
2. Supplied by: Contractor Proposals
3. Ready mixed concrete producer
 - 3.1. Third party accreditation: Currently certified by a body accredited by UKAS to [BS EN ISO/IEC 17065](#) for product conformity certification of ready-mixed concrete.
 - 3.2. Source
 - 3.2.1. Name and address of depot: Submit before any concrete is delivered.
 - 3.2.2. Delivery notes: Retain for inspection.
 - 3.3. Information
 - 3.3.1. Product information to be provided to the producer: Provide concrete producer with information required by [BS 8500-1](#), clauses 4 and 5 and [BS EN 206](#).
 - 3.3.2. Product information to be provided by the producer: Type and strength class of cement. Type of aggregates. Type of admixtures. Type of additions. Certificate from a United Kingdom Accreditation Service (UKAS) approved independent laboratory that the concrete conforms to [BS 8500-1](#).
 - 3.3.3. Mix design robustness: Submit evidence to demonstrate robustness of mix design.
 - 3.4. Declarations of non-conformity from concrete producer: Notify immediately.
4. Standards: To [BS EN 206](#), [BS 8500-1](#), and [BS 8500-2](#).
5. Concrete designation: FND2Z.
6. Properties
 - 6.1. Consistence class: Contractors choice
 - 6.2. Chloride class: Normal
 - 6.3. Cement and cement combination (maximum): ACEC Class AC-2z to BRE special digest 1
7. Aggregates

- 7.1. Nominal size (maximum): 20 mm.
- 7.2. Additional requirements for aggregates: Freeze-thaw resisting.
- 7.3. Recycled aggregates: Permitted
- 7.4. Source of recycled aggregates: Submit proposals
8. Fibres: Not required
9. Admixtures
 - 9.1. Standard: Not to be used without prior approval
 - 9.2. Type of admixture: N/A
 - 9.3. Colouring agent: N/A
10. Air content (minimum): Contractor proposals
11. Additional mix requirements: N/A
12. Execution: [Pr_20_31_16/610 Mixing in fibres](#); [Pr_20_31_16/630 Placing normal weight concrete generally](#); [Pr_20_31_16/695 Temperature of concrete](#); [Pr_20_31_16/712 Curing class](#); [Pr_20_31_16/714 Curing generally](#); [Pr_20_31_16/722 Early age thermal cracking](#); [Pr_20_31_16/726 Broken cubes or cylinders from failed strength tests](#); [Pr_20_31_16/728 Initial project testing of concrete](#); [Pr_20_31_16/730 Project testing of concrete generally](#); [Pr_20_31_16/732 Regular project testing of concrete](#); [Pr_20_31_16/734 Site adjustments to specification](#); [Pr_20_31_16/736 Testing laboratory](#); [Pr_20_31_16/738 Test records](#); [Pr_20_31_16/724 Plastic settlement](#)

Pr_20_96_71_12 Carbon steel fabric reinforcement

Shared by: [Ss_30_12_85_16 Composite steel and concrete floors](#) and [Ss_30_12_85_70 Reinforced Concrete Floor - Suspended Ground Floor Slab](#)

1. Description:
2. Supplied by: A company holding valid certificates of approval for product conformity issued by the UK Certification Authority for Reinforcing Steels ([CARES](#)).
3. Manufacturer: Submit proposals
4. Standard: Reinforcement: To BS 4449, BS 4482, BS 4483 or BS 6744.
Cutting and bending: To BS 8666
Source of reinforcement: Companies holding valid certificates of approval for product conformity issued by the UK Certification Authority for Reinforcing Steels ([CARES](#)).
5. Designation: As drawings
6. Strength grade: To [BS 4449](#), grade B500B.
7. Test Certificates: General: Provide the manufacturer's test certificate in respect of each batch of reinforcement delivered to the site together with a delivery note stating the weight, number, length and diameter of bars comprising each consignment.
8. Corrosion protection
 - 8.1. Integral coatings: Hot dip galvanized to [BS EN ISO 1461](#).
 - 8.2. Coating thickness (minimum):
9. Protection: Dropping from height, mechanical damage and shock loading: Prevent

Cleanliness of reinforcement at time out pouring concrete: Free from corrosive pitting, loose millscale, loose rust and contaminants which may adversely affect the reinforcement, bond or between the two.

10. Execution: Reference to missing clause Installing fabric reinforcement

Pr_20_96_71_14 Carbon steel ribbed bar reinforcement

Shared by: [Ss_35_10_85_65 Precast concrete stair or ramp systems](#), [Ss_30_12_85_16 Composite steel and concrete floors](#) and [Ss_30_12_85_70 Reinforced Concrete Floor - Suspended Ground Floor Slab](#)

1. Supplied by: A company holding valid certificates of approval for product conformity issued by the UK Certification Authority for Reinforcing Steels ([CARES](#)).

2. **Standard:** Standards:
 - Reinforcement: To BS 4449, BS 4482, BS 4483 or BS 6744.
 - Cutting and bending: To BS 8666
3. **Strength grade:** Generally B500B, but B500C where detailed.
4. **Dimensions**
 - 4.1. **Diameter:** As schedule
 - 4.2. **Length:** As schedule
5. **Shape code:** As schedule
6. **Designation:** As schedule
7. **Corrosion protection**
 - 7.1. **Integral coatings:** Hot dip galvanized to [BS EN ISO 1461](#).
 - 7.2. **Coating thickness (minimum):**
 - 7.3. **Timing of application:** After cutting but before bending.
8. **Protection:** Dropping from height, mechanical damage and shock loading: Prevent

Cleanliness of reinforcement at time out pouring concrete: Free from corrosive pitting, loose millscale, loose rust and contaminants which may adversely affect the reinforcement, bond or between the two.
9. **Execution:** Reference to missing clause Installing bar reinforcement; Reference to missing clause Installing in situ continuity reinforcement

Pr_20_96_71_15 Carbon steel post-installed starter bars

Shared by: [Ss_30_12_85_70 Reinforced Concrete Floor - Suspended Ground Floor Slab](#)

1. **Description:**
2. **Supplied by:** A company holding valid certificates of approval for product conformity issued by the UK Certification Authority for Reinforcing Steels ([CARES](#)).
3. **Standard:** To [BS 4449](#).
4. **Strength grade:**
5. **Diameter:**
6. **Shape code:**
7. **Designation:** To [BS 4449](#), clause 5.
8. **Execution:** [Pr_20_96_71/660 Installing starter bars](#)

Pr_20_96_71_51 Mechanical reinforcement couplers

1. **Description:**
2. **Supplied by:**
3. **Manufacturer:**
4. **Coupler type:**
5. **Execution:** [Pr_20_96_71/645 Installing mechanical couplers](#)

Execution

Pr_20_29_08/605 Fixing with bolts generally

Shared by: [Pr_20_29_08_66 Preloaded bolt assemblies](#) , [Pr_20_29_08_84 Stainless steel hexagon headed nuts and bolts](#) , [Pr_20_29_08_11 Carbon steel hexagon headed nuts and bolts](#) and [Pr_20_29_08_07 Black hexagon nuts and bolts](#)

1. **Preparation:** Protect threaded length from damage, place washers, packings, ferrules as required.
2. **Initial fix:** Tighten sufficiently to hold unloaded components – check line and level of components before final tightening.

3. **Final fix:** Tighten nuts to hold components in final position when fully loaded.
4. **Finishing:** Apply locking nut. Fix plastic caps. Crop threaded end to specified height above nut. Fit split pins to secure castellated nut.

Pr_20_29_08/620 Fixing holding down bolts

1. General requirements: [Pr_20_29_08/605 Fixing with bolts generally](#)
2. Preparation: Set bolt assemblies into position and hold in template.
3. Bolt tightening: Allow concrete to reach the required strength before tightening nuts.
4. Grouting of bolt boxes: Fill void around bolts.

Pr_20_29_08/625 Fixing bolt boxes

1. Bolt boxes: Place into position over the holding down bolts.
2. Cover (minimum): As specified nominal cover to reinforcement

Pr_20_31_16/610 Mixing in fibres

Shared by: [Pr_20_31_16_21 Designated concrete](#)

1. Fibre addition
 - 1.1. Rate (minimum): 25 kg/m³.
 - 1.2. **Modifications to rate:** Modify addition rate if necessary to achieve required properties.
2. Dispersion of fibres: Uniform without balling.

Pr_20_31_16/630 Placing normal weight concrete generally

Shared by: [Pr_20_31_16_21 Designated concrete](#)

1. **Timing:** Place as soon as practicable after mixing and while sufficiently plastic for full compaction.
2. **Temperature**
 - 2.1. **Temperature Records:** Throughout the period of concrete construction record:
 - Daily: maximum and minimum atmospheric shade temperatures
 - Under adverse temperature conditions: temperature at commencement and end of placing
 - Location: shade, close to the structure.
 - 2.2. **Limitations:** Do not place concrete when air temperature is below 3°C on a falling thermometer. Do not resume placing of concrete until rising air temperature has reached 3°C. Do not place against frozen or frost covered surfaces.
 - 2.3. **Temperature (maximum):** 30°C.
 - 2.4. **Temperature (minimum):** 5°C.
3. **Continuity of pours:** Place in final position in one continuous operation up to construction or movement joints. Avoid formation of cold joints.
4. **Discharging concrete:** Prevent uneven dispersal, segregation or loss of ingredients or any adverse effect on the formwork or formed finishes.
5. **Thickness of layers:** To suit methods of compaction and achieve efficient amalgamation during compaction.
6. **Vibrators::** Maintain sufficient numbers and types of vibrator to suit pouring rate, consistency and location of concrete.

External vibrators: obtain approval before use.

- 6.1. **Poker Vibrators:** Do not use to make concrete flow horizontally into position, except where necessary to achieve full compaction under void formers and ast in accessories and at vertical joints

7. **Compaction:** Fully compact concrete to full depth to remove entrapped air. Continue until air bubbles cease to appear on top surface.
Areas for particular attention: around reinforcement, under void formers, cast in accessories, into corners of formwork and at joints.
8. **Consecutive batches of concrete:** Amalgamate without damaging adjacent partly hardened concrete.
9. **Methods of compaction:** To suit consistence class and use of concrete.
10. **Records:** Maintain for time, date and location of pours.
11. **Construction Joints:** If construction joints are not shown on the drawings, obtain approval for their positions before work starts.

Preparation of joint surfaces: Select from:

- Brushing and spraying; remove surface laitance and expose aggregate finish while concrete is still green
- other methods: submit proposals

Joint surfaces immediately before placing fresh concrete should be clean and damp

Position: position construction joints to avoid distress or damage to the works particularly from thermal movement or shrinking effects. The position and spacing of joints that will be acceptable will vary from place to place but the following table gives an indication of acceptable limit.

Construction	Max Area (m ²)	Max Dim (m)
RC foundation bases	100m ²	10m
Slabs with restraints both ends	100m ²	13m
Slabs with restraint one end	250m ²	20m
Slabs with little restraint	500m ²	30m
Walls	40m ²	6m

Proposals resulting in alteration to reinforcement: Take responsibility for providing full revised details for approval prior to work commencing on site.

Pr_20_31_16/695 Temperature of concrete

Shared by: [Pr_20_31_16_21 Designated concrete](#)

1. **Application:** Water-retaining concrete or Concrete sections thicker than 500 mm.
2. **High temperatures and steep temperature gradients:** Prevent build-up during first 24 hours after casting. Prevent coincidence of maximum heat gain from cement hydration with high air temperature and/ or solar gain.
3. **Rapid changes in concrete temperature:** Prevent during the first 7 days after casting.
4. **Preventative measures:** Submit proposals for protecting concrete when predicted ambient temperatures indicate risk of concrete freezing or overheating

Pr_20_31_16/712 Curing class

Shared by: [Pr_20_31_16_21 Designated concrete](#)

1. **Standard:** To [BS EN 13670](#).
2. **Curing class:**

Pr_20_31_16/714 Curing generally

Shared by: [Pr_20_31_16_21 Designated concrete](#)

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.
 - Surfaces covered by formwork: Retain formwork in position and, where necessary to satisfy curing period, cover surfaces immediately after striking.

- Top surfaces: cover immediately after placing and compacting. If covering is removed for finishing operations, replace it immediately afterwards

2. **Surface Temperature:** Maintain above 5C throughout the specified curing period or four days, whichever is longer
3. **Method statement:** Submit.
4. **Records required:** 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.
5. **Covering:** Sheet coverings: suitable impervious material

Curing compounds: selection criteria:

- Curing efficiency: not less than 75% or for surfaces exposed to abrasion 90%
- coloring: fugitive dye
- Application to concrete exposed in the finished works: readily removable without disfiguring the surface
- Application to concrete to receive bonded construction/finish: no impediment to subsequent bonding

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.

6. **Curing Periods:** Submit proposals prior to casting

Pr_20_31_16/722 Early age thermal cracking

Shared by: [Pr_20_31_16_21 Designated concrete](#)

1. **Method statement:** Submit proposals for prevention of early age thermal cracking in deep lifts and large volume pours, taking account of:
 - Temperature differentials across sections
 - Coefficient of thermal expansion of concrete
 - Strain capacity of the concrete mix (aggregate dependent)
 - restraint

Pr_20_31_16/724 Plastic settlement

Shared by: [Pr_20_31_16_21 Designated concrete](#)

1. **Settlement cracking**
 - 1.1. **Inspection :** 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.
 - 1.2. **Timing:** During the first few hours after placing and whilst concrete is still capable of being fluidized by the vibrator.
2. **Re-compaction:** Where agreed with the CA, re-vibrate concrete.
3. **Removal of cracks::** Re-vibrate concrete

Pr_20_31_16/726 Broken cubes or cylinders from failed strength tests

Shared by: [Pr_20_31_16_21 Designated concrete](#)

1. **Retention:** Keep separately the pieces of each cube or cylinder that fails to meet the conformity requirements for individual results.
2. **Period of retention:** Obtain instructions

Pr_20_31_16/728 Initial project testing of concrete

Shared by: [Pr_20_31_16_21 Designated concrete](#)

1. Standard: To [BS EN 14889-1](#) and [BS EN 14889-2](#).
2. Tests: Compressive strength.
Consistence.
Early age compressive strength testing at 3 and 5 days.
Flexural strength.
3. Timing: Contractor to submit proposals
4. Sampling
 - 4.1. Sampling Point: At point of use.
 - 4.2. Sample size: minimum sample size required to confirm the effect of steel and polymer fibres on consistence and strength of concrete shall be as table 2 of BS EN 14889-1
 - 4.3. Number of batches: 3 batches
 - 4.4. Number of samples from each batch: 3 samples required from each batch
 - 4.5. Number of samples for concrete pavements: Refer to table 7 of BS EN 13877-2

Pr_20_31_16/730 Project testing of concrete generally

Shared by: [Pr_20_31_16_21 Designated concrete](#)

1. Standard: To [BS EN 206](#), Annex B.
2. Performance characteristics
 - 2.1. Compressive strength: To [BS EN 12390-3](#).
 - 2.2. Flexural strength: To [BS EN 12390-5](#).
 - 2.3. Consistence: To [BS EN 206](#).
3. Recording: Maintain complete correlated records including:
 - concrete designation
 - sampling, site tests, and identification numbers of specimens testing in laboratory
 - location of the parts of the structure represented by each sample
 - location in the structure of the batch from which each sample is taken
4. 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, and/or
 - Proposals for rectification.
 - Obtain approval for 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.
 - Whatever the specified sampling, testing and compliance procedures show that a concrete mix is not in accordance with the specification (even if the work is eventually accepted), and such measures are taken to help in establishing whether or not the work is acceptable, such measures:
 - will be at the expense of the Contractor, and
 - will not be considered as grounds for extension of time

Pr_20_31_16/732 Regular project testing of concrete

Shared by: [Pr_20_31_16_21 Designated concrete](#)

1. **Tests required:** Compressive strength.
Early age compressive strength testing at 3 and 5 days.
Tensile strength and modulus of elasticity.
2. **Identity testing**
 - 2.1. **Standard:** To [BS EN 206](#), Annex B.
 - 2.2. **Sampling**
 - 2.2.1. **Sampling points:** At point of discharge from delivery truck.
 - 2.2.2. **Rate:** Critical areas (locations to be agreed) - one sample per 12m³

Superstructure, generally- one sample per 18m³

Substructure, generally - one sample per 24m³

Mass concrete - one sample per 60m³
3. **Test standards**
 - 3.1. **Compressive strength:** To [BS EN 12390-3](#).
 - 3.2. **Flexural strength:** To [BS EN 12390-5](#).
 - 3.3. **Fibre content:** To [BS EN 14488-7](#).
 - 3.4. **Air content of air entrained concrete:** To [BS EN 12350-7](#).
 - 3.5. **Testing of consistence class of self-compacting concrete**
 - 3.5.1. **Slump flow test:** To [BS EN 12350-8](#).
 - 3.5.2. **Viscosity test t500:** To [BS EN 12350-8](#).
 - 3.5.3. **Viscosity class V-funnel test:** To [BS EN 12350-9](#).
 - 3.5.4. **Passing ability classes - L-box:** To [BS EN 12350-10](#).
 - 3.5.5. **Sieve segregation resistance classes:** To [BS EN 12350-11](#).
 - 3.5.6. **Passing ability classes – J-ring:** To [BS EN 12350-12](#)
4. **Consistence testing period:** Contractors choice. Between 1-4h
5. **Storage of cubes and cylinders :** Store cubes or cylinders for early age strength testing under the same conditions as concrete in members.

Pr_20_31_16/734 Site adjustments to specification

Shared by: [Pr_20_31_16_21 Designated concrete](#)

1. **Legitimate changes:** Determine adjustments with concrete producer. Maintain conformity to the specification.
2. **Changes to specification of fresh concrete (outside concrete producer's responsibility):** Submit proposals in advance for approval

Pr_20_31_16/736 Testing laboratory

Shared by: [Pr_20_31_16_21 Designated concrete](#)

1. **Testing laboratory**
 - 1.1. **Accreditation:** Accredited by [UKAS](#) or other national equivalent.
 - 1.2. **Information required:** Name and [UKAS](#) reference number or other national equivalent.
 - 1.3. **Timing:** Submit at least 3 weeks in advance of making trial mixes or concrete for use in the works.

Pr_20_31_16/738 Test records

Shared by: [Pr_20_31_16_21 Designated concrete](#)

1. **Requirement:** Maintain complete correlated records.

2. **Content of records:** Concrete designation.
Record of masses of constituents in batch or load (e.g. cement. content).
Water:cement ratio.
Chloride content.
Date and place of sampling.
Location in structure.
Consistence (method used and results).
Viscosity.
Segregation resistance.
Passing ability.
Density.
Fibre content.
Air content.
Volume of concrete batch or load tested.
Number and codes of specimens tested.
Numbers and dates of delivery tickets related to tests.
Delivery tickets.
3. **Number of copies:** 3.
4. **Format of records:** Electronic.
5. **Period for submission of records:** Submit within one day of completion of each test.
6. **Records on site:** Keep a complete set on site available for inspection.

Pr_20_96_71/645 Installing mechanical couplers

1. **Installation**
 - 1.1. **Location of mechanical couplers:**
 - 1.2. **Limitations :**

Pr_20_96_71/660 Installing starter bars

1. **Standard:** To [BS EN 1504-6](#).
2. **Personnel:** Use only appropriately trained personnel to install post-installed starter bars.
3. **Preparation:** Ensure hole free from dust and debris before installation. Where resin adhesives are used to bond starter bars, ensure that the hole is dry.

Ss_20_05_15/610 Execution of concrete foundations

1. **Formation to receive concrete**
 - 1.1. **Requirement:** Free from loose soil, topsoil, organic material, rubbish and standing water.
2. **Standard:** To [BS EN 13670](#).
3. **Execution class for concrete structures:**
4. **Trench fill foundations:** Place concrete immediately after inspection and no more than four hours after exposing the formation.
5. **Foundations for gravity retaining walls:**

Ss_20_05_15/615 Accuracy of construction

1. **Setting out:** To [BS 5964-1](#).
2. **Element shape and position:** To [BS 5606](#). To Section 10 of the [NSCS](#).
3. **Geometrical tolerances for concrete structures:** To [BS EN 13670](#), Tolerance class 1.

Ss_20_05_15/617 Formations to receive concrete

1. **Condition prior to filling:** Free from loose soil, topsoil, organic material, rubbish and standing water.
2. **Permissible deviations in levels**
 - 2.1. **Beneath mass concrete foundations:** ± 25 mm.

- 2.2. Beneath ground bearing slabs:
- 2.3. Beneath reinforced concrete foundations: ± 15 mm.
- 2.4. Embankments and cuttings: ± 50 mm.
- 2.5. Ground abutting external walls: ± 50 mm, with finished level at least 150 mm below dpc.
- 2.6. Beneath pile supported slabs:
- 3. Foundation next to retaining walls:

Ss_20_05_15/620 Preparation of surfaces to receive concrete

- 1. Preparation of surfaces to receive concrete generally
 - 1.1. Cleaning of formwork: Ensure that formwork or other surfaces are clean of debris, tying wire clippings, fastenings and free water.
 - 1.2. Timing of cleaning of formwork: Immediately before placing concrete.
- 2. Casting concrete against construction joints
 - 2.1. Preparation of hardened surface: Remove surface laitance and expose aggregate by lightly brushing and spraying. Curing compounds are not permitted on the faces of construction joints. Clean and dampen immediately before placing fresh concrete.
- 3. Casting on prepared substrate or steeply sloping surfaces: Prevent water loss
- 4. Casting concrete against steel
 - 4.1. Preparation of steel to receive concrete: Remove loose material, rust, scale and paint, debris, tying wire clippings, rebound from previously placed sprayed concrete and other matter that could adversely affect bond with the concrete.

Ss_20_05_15/625 Inspection of surfaces to receive concrete

- 1. Inspections
 - 1.1. Period of notice (minimum): 4 hours.
 - 1.2. Timing of inspections: First inspection when reinforcement fixing is close to completion, second inspection when reinforcement and formwork are ready for concreting.

Ss_20_05_15/630 Installing substructure formwork

Shared by: [Ss_30_12_85_70 Reinforced Concrete Floor - Suspended Ground Floor Slab](#)

- 1. Edges of substructure formwork: Cut around penetrations and downstands.
- 2. Laying substructure formwork: Butt edges tightly. Seal joints to prevent penetration of concrete.
- 3. Vertical Faces:: stiffen as necessary to act as shutter
- 4. Formwork/ insulation surfaces:: Protect from indentation by spaces and other items
- 5. Joints in formwork/insulation and with edge structure and penetrations:: seal to prevent penetration of concrete
- 6. Concrete placement: Restrain formwork/ insulation against movement

Ss_20_05_15/655 Adverse temperature conditions

- 1. Protection of concrete: Submit proposals
- 2. Period for assessment : 10 working days.

Ss_20_05_15/660 Casting concrete against faces of excavations

- 1. Required locations: When design relies on passive resistance of soil for the transfer of horizontal load into the ground such as Foundations supporting wind bracing. Portal frame foundations. Trench fill foundations. Engineer to advice.
- 2. Stability of faces of excavations: Prevent contamination of concrete by loose soil.

Ss_20_05_15/665 Concrete supply on large pours

1. **Large concrete pours:** Where elements are detailed to be cast in a single pour without joints, make prior arrangements for a back-up supply of concrete.

Ss_20_05_15/668 Concrete Finishes Schedule for Specific Areas Trowelled Finish (B)

1. **General Finishing:** Timing: carry out at optimum times in relation to setting and hardening of concrete.
Prohibited treatments to concrete surfaces:
 - Wetting to assist surface working
 - Sprinkling cement
2. **Ground Beams:** Reference to missing clause Finishes in concrete Wood Floated Finish
3. All floors to receive underfloor heating/ sprung floors/screed: [Ss_20_05_15/668 Finishes in concrete Trowelled Finish \(D\)](#)
4. All floors to receive painted finish: Reference to missing clause Finishes in concrete Power Ground Finish for Wearing Surface to top of slab
5. All slabs to receive membrane roof finish: Reference to missing clause Finishes in concrete Wood Floated Finish to top of slab
6. All other floor slabs: [Ss_20_05_15/668 Finishes in concrete Trowelled Finish \(D\)](#) to top of slab
7. All lift shaft internal walls: Reference to missing clause Concrete sealers
8. Plant areas: Reference to missing clause Surface hardeners

Ss_20_05_15/668 Finishes in concrete Trowelled Finish (D)

1. **Formed finish:** Smooth floated finish.
Surface on completion: Even with no ridges or steps

Ss_20_05_15/672 Unformed finishes in concrete

1. Unformed finish:

Ss_20_05_15/720 Forming construction and movement joints in concrete generally Type A

1. **Accuracy:** Position and form joints accurately, straight, well-aligned and truly vertical or horizontal or parallel with setting out lines of the building.
2. **Position**
 - 2.1. **Location:** Submit to CA for approval a layout of proposed location of construction joints and sequence of pours.
 - 2.2. **Modifications to joint design or location::** Submit proposals
3. **Placing concrete to form movement joints:** Prevent concrete entering joints or penetrating or impregnating compressible joint fillers. Do not place concrete simultaneously on both sides of movement joints.
4. **Preparation of construction joints:** Roughening of joint surfaces, select from:
 - Brushing or spraying: remove surface laitance and expose aggregate finishes while concrete is still green
 - Other methods: submit proposalsCondition of joint surfaces immediately before placing fresh concrete: clean and damp
5. **Reinforcement::** Allow for and ensure that the already detailed reinforcement drawings are adjusted for any additional reinforcement requirements to deal with the proposed construction joints to the approval of the CA
6. **Construction joints made at end of working day:** Not permitted in watertight concrete

7. **Forms and stop ends for projecting continuity reinforcement:** Accommodate reinforcement without temporary bending or displacement.

Ss_20_05_15/730 Forming movement joints in concrete rafts and foundations

1. **Depth:** Extend joint filler board from underside of sealing groove fillet to full depth of slab.
2. **Holes for dowel bars:** Accurately bore holes to form a sliding fit for dowel bars.
3. **Completion:** Round upper edges of slabs at joints to 5 mm radius. Do not overwork concrete.

Ss_20_05_15/735 Day joints

1. **Preparation for day joints:** Manage pour to have a full face, and have materials available to form an emergency/ day joint while concrete can still be worked.
2. **Location and details of day joints and proposals for joint preparation:** Submit proposals and receive agreement before pour is completed.
3. **Limitations on use of day joints:** Not permitted on concrete surfaces exposed in the finished works. Not permitted in concrete wearing surfaces. Not permitted in concrete exposed to view.

System completion

Ss_20_05_15/810 Post completion structural testing of concrete structures

1. Test required
 - 1.1. Load tests:
 - 1.2. Core tests
 - 1.2.1. Standard: To [BS EN 12504-1](#).
 - 1.3. Ultrasonic pulse velocity tests
 - 1.3.1. Standard: To [BS EN 12504-4](#).
 - 1.4. Gamma ray tests:
 - 1.5. Rebound hammer tests
 - 1.5.1. Standard: To [BS EN 12504-2](#).
 - 1.6. In situ early age strength test of concrete
 - 1.6.1. Standard: To [BS EN 12504-3](#).
2. Timing:
3. Content of report:
4. Submission:

Ss_20_05_15/820 Surface cracking of concrete structures

1. **Critical crack width (maximum):** 0.3 mm.
2. **Cracks wider than critical crack width:** Survey frequency and extent.
3. **Report:** Submit. Include findings and recommendations for rectification.

Ω End of System

Ss_20_10_75_35 Heavy steel framing systems **UNCHANGED**

Systems

Ss_20_10_75_35 Heavy steel framing systems

1. Description: All three superstructure blocks are of steel frame construction with composite metal deck slabs and metal deck roofs
2. System performance: [Ss_20_10_75/205 Design submittals](#); [Ss_20_10_75/210 Structural design supervision and checking](#); [Ss_20_10_75/230 Requirements of the National Structural Steelwork Specification \(NSSS\)](#); [Ss_20_10_75/225 Design of steel framing systems](#)
3. Framing members: [Pr_20_85_03_11 Carbon steel angle sections](#); [Pr_20_76_51_12 Carbon steel beams, columns, channels and tees](#); [Pr_20_76_52_16 Carbon steel hot-finished hollow sections](#); [Pr_20_76_51_15 Carbon steel curved sections](#); [Pr_20_76_51_11 Carbon steel bars](#)
4. Connections
 - 4.1. Connection fasteners: [Pr_20_29_08_66 Preloaded bolt assemblies](#); [Pr_20_29_08_11 Carbon steel hexagon headed nuts and bolts](#); [Ss_20_10_75/732 Welding](#) [Ss_20_10_75/730 Site welding generally](#); [Pr_20_29_08_84 Stainless steel hexagon headed nuts and bolts](#)
 - 4.2. Connection accessories: [Pr_20_29_60_96 Washers](#) [Self-locking nuts](#). [Nylon bushes](#).
5. Bracing systems: [Pr_20_85_84_88 Tension or compression bracing products](#); [Pr_20_76_51_11 Carbon steel bars](#); [Pr_20_76_52_16 Carbon steel hot-finished hollow sections](#)
6. Anchors to concrete and masonry
 - 6.1. Type of anchor: [Pr_20_29_08_38 Holding down bolt assemblies](#); [Pr_20_29_03_28 Expansion anchors](#); [Pr_20_29_03_84 Stainless steel chemical anchor sockets](#); [Pr_20_29_03_12 Carbon steel chemical anchor sockets](#)
 - 6.2. Fixings: [Pr_20_29_08_11 Carbon steel hexagon headed nuts and bolts](#); [Pr_20_29_08_84 Stainless steel hexagon headed nuts and bolts](#); [Pr_20_29_03_11 Carbon steel chemical anchor rods](#); [Pr_20_29_08_07 Black hexagon nuts and bolts](#)
7. Bedding material beneath baseplates: Fill completely with a 1:1.25:2 cement:sand:fine aggregate mix, tamped well against properly fixed supports as filling proceeds
Cement: [Pr_20_31_12_60 Portland cements](#) BS EN 197-1. CEM 1 42.5 or 52.5
Sand: to BS882, grading limit M or equivalent to BS EN 12620
Aggregate size: maximum 10mm
8. Filling to bolt pockets: Fill completely with neat cement slurry.
9. Composite floor construction
 - 9.1. Steel profiled sheet for composite floor slabs and beams: [Pr_25_71_51_89 Steel profiled sheet](#)
 - 9.2. End support fasteners: [Pr_20_29_56_78 Shot-fire nails](#); [Pr_35_90_15_37 Headed stud shear connectors](#)
 - 9.3. Side support fasteners: [Pr_20_29_76_76 Self-drilling screws](#); [Pr_20_29_56_78 Shot-fire nails](#)
 - 9.4. Seam stitching fasteners: [Pr_20_29_76_76 Self-drilling screws](#)
 - 9.5. Shear connectors: [Pr_35_90_15_37 Headed stud shear connectors](#)
10. Movement joint bearings: [Pr_20_85_85_80 Sliding surface bearings](#); [Pr_20_85_85_74 Rubber bearings](#); [Pr_20_29_60_77 Shims and folding wedges](#)
11. Custom made products: [Ss_30_10_30/760 Fabrication](#)
12. Execution: [Ss_20_10_75/612 Execution of steel and composite structures](#); [Ss_20_10_75/627 Installing bedding under column baseplates](#); [Ss_20_10_75/730 Site welding generally](#); [Ss_20_10_75/762 Modification of steel structures](#); [Ss_20_10_75/792 Site testing of shear stud welding](#); [Ss_20_10_75/784 Installation of prototypes or mock-ups](#); [Ss_20_10_75/790 Non-destructive testing \(NDT\) of welds](#); [Ss_20_10_75/740 Forming movement joints in steel framing systems](#); [Ss_20_10_75/732 Welding](#); [Ss_20_10_75/734 Temporary welds](#); [Ss_20_10_75/736 Welding of stainless steel](#); [Ss_20_10_75/738](#)

Special welding procedures; Ss_20_10_75/786 Inspection levels; Ss_20_10_75/628 Sealing hollow sections; Ss_20_10_75/624 Use of permanent support; Ss_20_10_75/626 Installing column bases; Ss_20_10_75/794 Site testing of anchors to concrete and masonry; Ss_30_10_30/760 Fabrication; Ss_20_10_75/616 Accuracy and Tolerances of construction

13. Erection :

13.1. **Generally:** Unless otherwise noted in this specification, the steelwork erection shall generally be in accordance with the national structural steelwork specification, NSSS.
Draw to the engineers attention any potential conflict between the two

13.2. **Outline Method of Erection:**

13.3. **Safe working conditions:** Plan and carry out erection of steelwork for the structural frame to ensure safe working conditions at all times

13.4. **Recommendations for detailing, fabrication and site erection procedure contained in all part of BS EN1993:** Deemed to form part of this specification. Be fully conversant with this and all other relevant Eurocodes

13.5. **Erection drawings:** Prepare showing clearly the position of each member in the structure. Provide the workmen on site with adequate copies
Do not use engineers drawings as erection drawings

13.6. **Method Statement:** Within two weeks of acceptance of the works, contract tender submit an erection method statement including details of (with drawings as appropriate):

- method and sequence of erection
- allocation of craneage time required
- calculation of erection stresses
- details for any temporary works including fixing details needed to maintain stability during erection and until permanent works stability is complete, including temporary guys and bracing proposed for use during erection

13.7. **Stud welding:** Produce a method statement where required by the works.

13.8. **Pre Erection Checks:** Scope: at least 7 days before proposed erection start date, check the following:

- Foundations and other structures to which steelwork will be attached: accuracy of setting out
- Holding down bolts: position, protruding length, slackness and condition.
Report any inaccuracies or defects without delay.

Obtain permission to commence erection

As erection proceeds: install safety rails or wires. Advise type and fixing detail and at what stage installation will take place

13.9. **Marking for Erection:** Each structural element: Clearly mark to show its position and orientation in the structure upon reference to the erection drawings. Mark in contrasting coloured paint or similar weatherproof media

Steel with special surface finishes: mark so as not to damage or deface this finish

13.10. **Delivery, Storage and Handling:** Fabricated parts: Handle and stack in such a way that permanent damage is not caused to components. Minimise damage to the protective treatment of the steel.

Damage in transit: protect all work. Take particular care to stiffen free ends, prevent permanent distortion and adequately protect all machined surfaces. Pack suitably and identify all nuts, bolts, washers, screws, small plates and articles

Components: do not allow to swing freely. Use man made fibre ropes, webbing or chains with clean, undamaged heavy rubber sheathing to hold and guide the lift into place.

- 13.11. **Erection Equipment:** Adequate for the use for which it is put to on site and shall not cause damage or non permanent deformation to the structure.
Non compliant equipment: remove from site.

- 13.12. **Temporary Support:** Take responsibility for the stability, adequacy, accuracy and correct assembly of the structure during all stages of erection

Elements to be supported: structural steel frame generally

Bracing/Restraints: provide as necessary until permanent condition can be made to both the vertical and horizontal planes of the frame for the overall lateral stability. Give particular attention and allow adequate consideration for the temporary condition prior to completion of the installation of roof decking and composite floor decking which provide diaphragm action in the permanent condition.

Forces and moments in elements: Make an independent assessment until the connections are made.

14. Protective Coatings:

Follow the recommendations of BS EN ISO 12944 in the interpretation of this specification and the execution of the work

- 14.1. Systems: [Ss_40_90_35_35 Hot-dip galvanizing systems](#); [Ss_40_90_40_42 Intumescent coating systems](#)
[Pr_35_31_22_02 Painting of Steelwork](#)

- 14.2. Surfaces not to be coated:

- Any surface within 150mm of areas to be site welded
- The contact surfaces of High strength friction grip bolted connections
- Top flange surfaces of composite beams supporting a concrete flooring system
- Steel members which are to be encased in or in contact with concrete

- 14.3. **Coating Materials:** Manufacturing Batches: Use from one batch whenever possible. Where more than one batch is to be used, keep separate, allocate to distinct parts or areas of the work and give notice

Manufacturers recommendations: Check all coating materials are recommended by their manufacturers for the particular surface and exposure conditions and are compatible with each other

Storage: Store the coating materials in accordance with manufacturers instructions

- 14.4. **Health and Safety:** Adhere strictly to all Health and Safety data sheets, together with guidance notes, supplied by the manufacturer. Forward a copy of the relevant data sheets to the CA with written confirmation that they have been read, understood and will be adhered to.
- 14.5. **Maintenance Procedure:** Arrange for the protective coating manufacturer to confirm the maintenance procedure for the outer decorative paint finishes for the internal and external exposed areas, and to provide, on request, a written maintenance specification for adoption at the end of the anticipated life expectancy period
- 14.6. **Handling and Storing Coated Steelwork:** General: Use methods and equipment which will minimise chafing, chipping and other damage

Drying/Curing: Ensure an adequate period for each coat before handling

Handling: Use suitable packings, lashing, lifting harnesses, nylon slings, rubber protected chains and chocks, etc

Protection during transportation: Stack clear of all surfaces and separated by timber chocks. Protects from possible adverse effects of ponded water. Exercise extreme care and attention to ensure the finished surface remains undamaged where the finish coat is shop applied. Make allowance for bubble wrap protection or similar

Protection on site: stack for storage clear of the ground, separated by timber chocks so that ponding does not occur.

14.7. **Protection:** Freshly applied surface coatings: adequately protect from damage

Signs and barriers: exhibit "wet paint" signs and provide protective barriers where necessary

Adjacent surfaces to those being covered: protect

Surfaces to be painted: Ensure they are dry, clean and free from any dirt, oil, grease or other contamination

14.8. **Remedial Work:** Unsatisfactory tested material: re execute any work coated with that material

Unsatisfactory application or dry film thickness: re-execute. Inadequate dry film thickness or surface defects due to inclement weather may be remedied by rubbing down and applying further coats as instructed, depending on the type of surface coating.

Early degradation of coatings by blistering, peeling, flaking, cracking, lack of adhesion: make good by complete removal, preparation and reapplication of all coats as instructed

Mechanical damage to coatings: make good by local cutting back to bare bright steel, preparation and reapplication of all coats to leave a neat, continuous flat finish

Expose bare metal: clean thoroughly and prime within 2 hours

Extensively damaged work: return to the workshop, blast clean the affected area, and reapply protective coating

Ss_40_90_35_35 Hot-dip galvanizing systems

1. **Steelwork to be galvanised:**
2. **Standards:** Hot dip galvanise to BS EN ISO 1461. Include all screws, bolts, nuts, washers etc.
3. **Timing:** Subsequent to fabrication and welding unless approved by the Contractors representative. Where permission is granted for subsequent fabrication and welding, cold galvanise the affected area to approval
4. **Repairs:** Repair by cold galvanising all damaged elements to approval. Include the complete removal of all deleterious material including slag, scale, oil, paint etc. from the weld and/or area of breakdown of protection. Prepare the surface to ensure that the local protection is of a comparable standard to the general protection
5. **Structural Hollow Sections:** Provide adequate ventilation holes. After galvanising plug holes in an approved manner.
6. **Treatment of Site Welded Joints in Galvanised Steelwork:** Preparation: After welding, and without delay, remove scale and weld spatter from weld areas. Remove traces of dust. Wash with clean water and allow to dry

Coating: reinstate using one of the methods given in BS EN ISO 1461, clause 6.3
7. **Galvanised Fasteners:** Treatment: after steelwork erection and before applying site coatings, thoroughly degrease and clean. Etch prime.
8. **Site preparation of galvanised surfaces for painting:** Thoroughly degrease. Remove white corrosion products. Wash off and allow to dry before applying etching wash or primer
9. **Post Galvanising Inspection:**
 - 9.1. **Inspector:** Submit, on request, evidence of training and competence in visual inspection for liquid metal assisted cracking
 - 9.2. **Components for which visual inspection is not required, procedure PGI-0:** Not applicable
 - 9.3. **Components requiring additional inspection:** Procedure PGI-2A: None
Procedure PGI-2B: None
 - 9.4. **Timing:** Before erection of steelwork and application of other coatings

- 9.5. **Action in event of non compliance:** Submit: Full records of all post galvanising inspections, drawing attention to any erected components that are required to be quarantined

Procedure PGI 3: Carry out on all quarantined components, and submit report

Sites of suspected defects: Remove zinc coating by grinding back to bright metal for a distance of not less than 50mm around each defect and from a similar area on opposite face of member and inspect

Remedial actions: submit proposals for approval

10. Samples Required: [Ss_40_90_40/305 Control samples - Steel](#)
11. Execution: [Ss_40_90_40/625 Operatives](#)
[Ss_40_90_40/620 Working conditions](#); [Ss_40_90_40/610 Information to be provided prior to commencement of work](#); [Ss_40_90_40/670 Inspection of Coating Work](#)
12. System Completion: [Ss_40_90_40/800 Information to be provided on completion](#); [Ss_40_90_40/895 Verification of performance](#)

Ss_40_90_40_42 Intumescent coating systems

1. Description:
2. System performance: [Ss_40_90_40/205 Design submittals](#); [Ss_40_90_40/215 Durability](#); [Ss_40_90_40/210 Fire resistance](#); [Ss_40_90_40/290 Compliance with performance requirements](#)
3. System manufacturer:
4. Pre-treatment:
5. Primer: Compatible with intumescent coating under general and fire conditions.

Intumescent manufacturers recommendations and test evidence: Submit before priming. Include test data to BS 476-20 -21 or BS EN 1363-1 and BS EN 1365-2, -3 and -4 as appropriate

6. Intumescent coat: [Pr_35_31_68_43 Intumescent protective coatings](#)
7. Finish: [Pr_35_31_77_42 Intumescent coating sealers](#)
8. Bolt head and nut protection: [Pr_35_31_68_43 Intumescent protective coatings](#)
9. Samples required: [Ss_40_90_40/305 Control samples - Steel](#)
10. Execution: [Ss_40_90_40/610 Information to be provided prior to commencement of work](#); [Ss_40_90_40/620 Working conditions](#); [Ss_40_90_40/625 Operatives](#); [Ss_40_90_40/630 Off-site intumescent-coated steel](#); [Ss_40_90_40/635 Working procedures](#); [Ss_40_90_40/650 Preparatory blast cleaning of existing steel](#); [Ss_40_90_40/655 Preparatory manual cleaning of new steel](#); [Ss_40_90_40/660 Condition of new steelwork](#); [Ss_40_90_40/670 Inspection of Coating Work](#); [Ss_40_90_40/675 Sprayed coating application off site](#); [Ss_40_90_40/680 Sprayed coating application on site](#); [Ss_40_90_40/715 Applying top sealer coats](#); [Ss_40_90_40/720 Completion of coatings applied off site](#)
11. System completion: [Ss_40_90_40/800 Information to be provided on completion](#); [Ss_40_90_40/895 Verification of performance](#)

System performance

Ss_20_10_75/205 Design submittals

1. Detailed design
 - 1.1. Requirement: Complete the design of the system
 - 1.2. Purpose: To demonstrate compliance with performance requirements
 - 1.3. Design loads: As load schedule
 - 1.4. Submittals: Drawings, schedules, technical information, calculations and manufacturers' literature as appropriate.

- 1.5. **Timing:** Before commencing fabrication, to allow the engineer minimum 2 weeks for approval
- 1.6. **Format:** Drawings and specification in BIM compliant format

Ss_20_10_75/210 Structural design supervision and checking

1. Required level of design supervision: In accordance with [BS EN 1990](#), DSL 2.

Ss_20_10_75/225 Design of steel framing systems

1. Requirement: *Design:*
To [BS EN 1990](#), [BS EN 1991](#), [BS EN 1993-1-1](#), [NA+A1:2014 to BS EN 1993-1-1:2005+A1:2014](#), [BS EN 1993-1-2](#) and [BS EN 1993-1-8](#).

Submit:

- General arrangement drawings with individual steel members clearly identified
- Calculations for all connections (steel and concrete - see below)

On completion of general arrangement drawings and following review and comments, prepare detailed fabrication drawings showing complete details for the works. Take full responsibility of the correctness of all aspects of the drawings. Submit a PDF copy of each drawings.

Allow minimum 10 working days for comments on each issue of design/production information from receipt to dispatch

2. Design life:
3. Fire performance
 - 3.1. Fire resistance:
 - 3.2. Reaction to fire:
4. Design concept:
5. Design loading: As loading schedule.
6. Design/Detailing of connections by steelwork contractor:
 - 6.1. **Design responsibility:** Design and detail connections in accordance with the requirements of BS EN 1993-1-8

Other responsibilities:

- produce fabrication details for review.
 - Provide calculations for Building Control submission and review of the engineer
 - All connection designs to take into consideration the requirements of Robustness of Construction in accordance with BS EN 1991-1-7.
 - Where necessary, obtain interface loadings and details from other specialist contractors.
 - Connections to foundations and walls: design fixings to concrete and provide interface information as NSSS clause 3.3.
- 6.2. **Design requirements:** Bolted connections to BS EN1993-1-8 clause 3.4 and 2.6. Minimum 2 bolts per connection, M20. Choose bolt dimensions so that threads do not occur in shear plane of joint.

Punching of bolt holes not permitted.

Welded connections to BS EN1993-1-8 sections 4 and 7 and in accordance with Welding section of this specification. All welds to be minimum 6FW

Members forming bracing systems or space grid systems: unless detailed or instructed otherwise, position so that their lines of action intersect at a point

- 6.3. **Submission for approval::** Submit a PDF copy of all typical and special connections details together with supporting calculations for approval prior to the preparation of the shop drawings. Allowing at least 10 working days for their review. These details are to be A3 format maximum.

7. **Connections into Concrete by steelwork contractor:** Steelwork contractor to design connections to existing structures, foundations or walls. Design and detail fixings to concrete as ETAG 001 Annex C.

Submit a PDF copy of all typical and special connections details together with supporting calculations for approval prior to the preparation of the shop drawings. Allowing at least 10 working days for their review. These details are to be A3 format maximum.

8. **Design of steelwork to be galvanised:** Steel grades: do not use steel downgraded from a higher specification

Detail design: avoid details that will increase the risk of initiating liquid metal assisted cracking (LMAC)

9. **Design of movement joints**

9.1. **Type and location of movement joint:**

9.2. **Continuity at movement joints:** *Provide for movement in all components bridging a joint and continuity of joints through structure and finishes.*

Ss_20_10_75/230 Requirements of the National Structural Steelwork Specification (NSSS)

1. **Standard:** Comply with the latest edition of NSSS
2. **Requirements not covered by the NSSS :** N/A
3. **Conflicts between the NSSS and project specifications:** N/A
4. **Documents:** *Make available for the duration of the work, at the fabrication shop and on-site.*
5. **References to Engineer in NSSS**
 - 5.1. **Definition:** For the purpose of this contract, interpret such references as being to the person named in the project management sections as the consulting structural engineer.

Ss_40_90_40/205 Design submittals

1. **Detailed design:** Complete the design of the system. Determine the primer, intumescent and finish coat thicknesses for every steel member to comply with the specified periods of fire resistance. Comply with intumescent manufacturer's current technical recommendations.
2. **Submittals**
 - 2.1. **Schedules:** Content: steel member sizes, weights, loading conditions, etc. showing, for each variant, the exposed perimeter/ sectional area (Hp/A) ratio and required intumescent thickness.
 - 2.2. **Drawings:** Content: steelwork drawings marked in colour to show required intumescent thickness for each member.
 - 2.3. **Supporting information:** System certification, reports and calculations.
 - 2.4. **Timing:** At least two weeks before starting intumescent work.
 - 2.5. **Format:** BIM compliant

Ss_40_90_40/210 Fire resistance

1. **Standard:** To [BS EN 13501-2](#).
2. **Requirement:**

Ss_40_90_40/215 Durability

1. **Requirement:** Assess for durability in accordance with [BS EN 16623](#), clause 5.
2. **In service environment**

- 2.1. Standard: To [BS EN ISO 12944-2](#).
- 2.2. Category:
- 3. Life to first maintenance (minimum):

Ss_40_90_40/290 Compliance with performance requirements

- 1. Requirement: Project specific evaluation of intumescent materials.
- 2. Method
 - 2.1. Standard: In accordance with [BS EN 16623](#), clause 6 for coatings.
 - 2.2. Test results:

Products

Pr_20_29_03_11 Carbon steel chemical anchor rods

- 1. Description:
- 2. Manufacturer:
- 3. Certification: Where a European Assessment Document (EAD) or European Technical Assessment Guideline (ETAG) is available, provide a European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP). Otherwise provide third party certification by a [United Kingdom Accreditation Service](#) (UKAS)-approved independent laboratory.
- 4. Finish: Galvanized to [BS 7371-6](#).
- 5. Head arrangement: Nut and washer.
- 6. End arrangement: Chisel point.
- 7. Property class: 8.8, to [BS EN ISO 898-1](#).
- 8. Execution: [Pr_20_29_03/611 Fixing anchors using cartridge-applied adhesive](#); [Pr_20_29_03/620 Fixing anchors using chemical anchor capsules](#)

Pr_20_29_03_12 Carbon steel chemical anchor sockets

- 1. Description:
- 2. Manufacturer: Contractors Choice
- 3. Certification: Where a European Assessment Document (EAD) or European Technical Assessment Guideline (ETAG) is available, provide a European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP). Otherwise provide third party certification by a [United Kingdom Accreditation Service](#) (UKAS)-approved independent laboratory.
- 4. Finish: Galvanized to [BS 7371-6](#).
- 5. Property class: 8.8, to [BS EN ISO 898-1](#).
- 6. Safe working load (minimum):
- 7. Accessories: Threaded swivel lifting eye.
- 8. Execution: [Pr_20_29_03/611 Fixing anchors using cartridge-applied adhesive](#); [Pr_20_29_03/620 Fixing anchors using chemical anchor capsules](#)

Pr_20_29_03_28 Expansion anchors

- 1. Description:
- 2. Manufacturer: Contractors choice
- 3. Certification: Where a European Assessment Document (EAD) or European Technical Assessment Guideline (ETAG) is available, provide a European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP). Otherwise provide third party certification by a [United Kingdom Accreditation Service](#) (UKAS)-approved independent laboratory.
- 4. Format:
- 5. Material:

6. Finish:
7. Head arrangement:
8. Anchor length: As drawings
9. Accessories:
10. Thread diameter: As drawings
11. Execution: [Pr_20_29_03/610 Fixing with anchors Type A](#)

Pr_20_29_03_84 Stainless steel chemical anchor sockets

1. Description:
2. Manufacturer:
3. Certification: Where a European Assessment Document (EAD) or European Technical Assessment Guideline (ETAG) is available, provide a European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP). Otherwise provide third party certification by a [United Kingdom Accreditation Service](#) (UKAS)-approved independent laboratory.
4. Steel grade:
5. Size
 - 5.1. Thread diameter: As drawings
 - 5.2. Length: As drawings
6. Safe working load (minimum):
7. Accessories:
8. Execution: [Pr_20_29_03/611 Fixing anchors using cartridge-applied adhesive](#); [Pr_20_29_03/620 Fixing anchors using chemical anchor capsules](#)

Pr_20_29_08_07 Black hexagon nuts and bolts

1. Description:
2. Manufacturer: Contractors Choice
3. Bolts
 - 3.1. Standard: To [BS 4190](#).
 - 3.2. Property class:
 - 3.3. Bolt type:
 - 3.4. Finish: Galvanized to [BS EN ISO 10684](#).
4. Nuts
 - 4.1. Standard: To [BS 4190](#).
 - 4.2. Nut type:
 - 4.3. Finish:
 - 4.4. Strength grade designation: To suit grade of bolt, as NSSS, clause 2.3.2 and NSSS CE Marking version clause 2.4.3
5. Accessories: Locking nut.
Plastics cap to bolt head.
6. Execution: [Pr_20_29_08/605 Fixing with bolts generally](#)

See [Pr_20_29_08_08 Bolt boxes](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

Pr_20_29_08_11 Carbon steel hexagon headed nuts and bolts

1. Description:
2. Manufacturer: Contractors Choice
3. Bolts

- 3.1. Standard: To [BS EN ISO 4014](#).
- 3.2. Size
 - 3.2.1.Thread diameter: As drawings
 - 3.2.2.Length: As drawings
- 3.3. Property class: 8.8 to [BS EN ISO 898-1](#).
- 3.4. Finish: Zinc plated to [BS EN ISO 4042](#).
- 4. Nuts
 - 4.1. Standard: To [BS EN ISO 4032](#). To [BS EN ISO 4033](#). To [BS EN ISO 4034](#).
 - 4.2. Property class: To match bolt strength.
 - 4.3. Finish: Zinc plated to [BS EN ISO 4042](#).
- 5. Accessories: Locking nut. Plastics cap to bolt head.
- 6. Execution: [Pr_20_29_08/605 Fixing with bolts generally](#)

See [Pr_20_29_08_38 Holding down bolt assemblies](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

Pr_20_29_08_66 Preloaded bolt assemblies

- 1. Description:
- 2. Manufacturer: Contractors Choice
- 3. Standard: To [BS EN 14399-1](#).
- 4. Bolts
 - 4.1. Designation:
 - 4.2. Size
 - 4.2.1.Thread diameter: As drawings
 - 4.2.2.Length: As drawings
 - 4.3. Finish: Hot dip galvanized to [BS EN ISO 10684](#). Sherardized to [BS 7371-8](#).
- 5. Nuts
 - 5.1. Designation:
 - 5.2. Finish: As bolt.
- 6. Washers
 - 6.1. Standard:
 - 6.2. Finish: As bolt.
- 7. Execution: [Pr_20_29_08/605 Fixing with bolts generally](#)

Pr_20_29_08_84 Stainless steel hexagon headed nuts and bolts

- 1. Description:
- 2. Manufacturer: Contractors Choice
- 3. Bolts
 - 3.1. Standard: To [BS EN ISO 4014](#).
To [BS EN ISO 4016](#).
 - 3.2. Size
 - 3.2.1.Thread diameter: As drawings
 - 3.2.2.Length: As drawings
 - 3.3. Steel grade: A4 to [BS EN ISO 3506-1](#).
- 4. Nuts

- 4.1. Standard: To [BS EN ISO 4032](#).
To [BS EN ISO 4033](#).
To [BS EN ISO 4034](#).

- 4.2. Property class: To match bolt strength.

- 5. Accessories: Locking nut. Plastics cap to bolt head.
- 6. Execution: [Pr_20_29_08/605 Fixing with bolts generally](#)

Pr_20_29_56_78 Shot-fire nails

Shared by: [Ss_30_12_85_16 Composite steel and concrete floors](#)

- 1. Description:
- 2. Manufacturer: Contractors Choice
- 3. Material: As drawings
- 4. Factory finish: As drawings
- 5. Shank size
 - 5.1. Length: As drawings
 - 5.2. Diameter: As drawings

Pr_20_29_60_77 Shims and folding wedges

- 1. Description:
- 2. Manufacturer: Contractors Choice
- 3. Certification: . *Provide European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP).*
- 4. Material: To match baseplate
- 5. Dimensions: No larger than baseplate above
- 6. Execution: [Pr_20_29_60/620 Installing shims and folding wedges](#)

Pr_20_29_60_96 Washers

- 1. Description:
- 2. Manufacturer: Contractors Choice
- 3. Washers
 - 3.1. Type: To [BS 4320](#).
 - 3.2. Material:
 - 3.3. Finish:

Pr_20_29_76_76 Self-drilling screws

Shared by: [Ss_30_12_85_16 Composite steel and concrete floors](#)

- 1. Description:
- 2. Manufacturer: Contractors Choice
- 3. Standard: To [BS EN ISO 1479](#).
- 4. Material: As drawings
- 5. Finish: As drawings
- 6. Head type: As drawings
- 7. Size
 - 7.1. Diameter: As drawings
 - 7.2. Length: As drawings
- 8. Washers: Steel.

9. Execution: [Pr_20_29_76/620 Fixing with screws](#)

Pr_20_31_12_60 Portland cements

1. Description:
2. Manufacturer: Contractors Choice
3. Standard: To [BS EN 197-1](#).
4. Cement type: Portland cement, CEM I.
5. Strength class: 42.5N.

Pr_20_76_51_11 Carbon steel bars

1. Description:
2. Supplied by: Contractors choice.
Obtain steel from a source accredited to a national or internationally accepted quality standard
3. Standard
 - 3.1. General delivery conditions: To [BS EN 10025-1](#).
 - 3.2. Specific delivery conditions: To [BS EN 10025-2](#).
 - 3.3. Grades and qualities: S355JR
4. Grade options for steel to be galvanized: To [BS EN 10025-1](#), options 2 and 5.
5. Corrosion protection
 - 5.1. Galvanizing
 - 5.1.1. Standard: Hot-dip galvanized to [BS EN ISO 1461](#). Include all screws, bolts, nuts, washers.
 - 5.1.2. Coating thickness (minimum): 45 micrometre.
 - 5.2. Applied coatings:
6. Specific Requirements: Hard stamping not permitted except as indicated on drawings.
Provide product analysis for steel that is to be galvanized.
Steel to be galvanized to have a carbon equivalent value not exceeding 0.44.
Do not use steel showing signs of corrosion.
Ensure the quality of the manufactured steel meets the required aesthetic appearance of the structure
7. Dimensional tolerances: To [BS EN 10060](#).
8. Size: As drawings

Pr_20_76_51_12 Carbon steel beams, columns, channels and tees

Shared by: [Ss_30_12_85_16 Composite steel and concrete floors](#)

1. Description:
2. Supplied by: Contractors Choice
Obtain steel from a source accredited to a national or internationally accepted quality standard
3. Standard
 - 3.1. General delivery conditions: To [BS EN 10025-1](#).
 - 3.2. Specific delivery conditions: To [BS EN 10025-2](#).
 - 3.3. Grades and qualities: S355JR.
4. Grade options for steel to be galvanized: To [BS EN 10025-1](#), options 2 and 5.
5. Corrosion protection
 - 5.1. Galvanizing
 - 5.1.1. Standard: Hot-dip galvanized to [BS EN ISO 1461](#). Include all screws, bolts, nuts, washers.
 - 5.1.2. Coating thickness (minimum): 45 micrometre.
 - 5.2. Applied coatings:

6. **Specific Requirements:** Hard stamping not permitted except as indicated on drawings.
Provide product analysis for steel that is to be galvanized.
Steel to be galvanized to have a carbon equivalent value not exceeding 0.44.
Do not use steel showing signs of corrosion.
Ensure the quality of the manufactured steel meets the required aesthetic appearance of the structure
7. **Dimensions:** To [BS EN 10365](#).
8. **Dimensional tolerances:** To [BS EN 10034](#).
9. **Size:** Refer to structural engineer drawings

Pr_20_76_51_15 Carbon steel curved sections

1. **Description:**
2. **Supplied by:** Contractors Choice
Obtain steel from a source accredited to a national or internationally accepted quality standard
Do not use steel showing signs of corrosion.
Ensure the quality of the manufactured steel meets the required aesthetic appearance of the structure
3. **Standard:** To [BS EN 10025-2](#). To [BS EN 10025-5](#).
4. **Grade:** S355JR.
5. **Grade options for steel to be galvanized:** To [BS EN 10025-1](#), options 2 and 5.
6. **Corrosion protection**
 - 6.1. **Galvanizing**
 - 6.1.1. **Standard:** Hot-dip galvanized to [BS EN ISO 1461](#). Include all washers, nuts, bolts
 - 6.1.2. **Coating thickness (minimum):** 45 micrometre.
 - 6.2. **Applied coatings:**
7. **Radius:** As drawings

Pr_20_76_52_16 Carbon steel hot-finished hollow sections

Shared by: [Ss_30_12_85_16 Composite steel and concrete floors](#)

1. **Description:**
2. **Supplied by:** Contractors Choice.
Obtain steel from a source accredited to a national or internationally accepted quality standard
3. **Standard:** To [BS EN 10210-1](#).
To BS EN 10034, BS EN 10056
4. **Grade:** S355J0H.
5. **Grade options for steel to be galvanized:** To [BS EN 10210-1](#), options 1.1 and 1.4.
6. **Corrosion protection**
 - 6.1. **Galvanizing**
 - 6.1.1. **Standard:** Hot-dip galvanized to [BS EN ISO 1461](#). Include all nuts, bolts, washers
 - 6.1.2. **Coating thickness (minimum):** 45 micrometre.
 - 6.2. **Applied coatings:**
7. **Specific Requirements:** Hard stamping not permitted except as indicated on drawings.
Provide product analysis for steel that is to be galvanized. Steel to be galvanized to have a carbon equivalent value not exceeding 0.44.
Do not use steel showing signs of corrosion.
Ensure the quality of the manufactured steel meets the required aesthetic appearance of the structure
8. **Dimensions and dimensional tolerances:** To [BS EN 10210-2](#).
9. **Size:** As drawings

Pr_20_85_03_11 Carbon steel angle sections

Shared by: [Ss_30_12_85_16 Composite steel and concrete floors](#)

1. Description:
2. Supplied by: Contractors Choice
Obtain steel from a source accredited to a national or internationally accepted quality standard
3. Standard
 - 3.1. General delivery conditions: To [BS EN 10025-1](#).
 - 3.2. Specific delivery conditions: To [BS EN 10025-2](#).
 - 3.3. Grades and qualities: S355
4. Grade options for steel to be galvanized: To [BS EN 10025-1](#), options 2 and 5.
5. Corrosion protection
 - 5.1. Galvanizing
 - 5.1.1. Standard: Hot-dip galvanized to [BS EN ISO 1461](#).
 - 5.1.2. Coating thickness (minimum): 45 micrometre.
 - 5.2. Applied coatings:
6. Specific Requirements: Hard stamping not permitted except as indicated on drawings.
Provide product analysis for steel that is to be galvanized.
Steel to be galvanized to have a carbon equivalent value not exceeding 0.44.
Do not use steel showing signs of corrosion.
Ensure the quality of the manufactured steel meets the required aesthetic appearance of the structure
7. Dimensions and dimensional tolerances: To [BS EN 10056-1](#) and [BS EN 10056-2](#).
8. Size: Refer to structural engineer's drawings

Pr_20_85_84_88 Tension or compression bracing products

1. Description:
2. Manufacturer: Contractors Choice
3. Certification: Where a European Assessment Document (EAD) or European Technical Assessment Guideline (ETAG) is available, provide a European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP). Otherwise provide third party certification by a [United Kingdom Accreditation Service](#) (UKAS)-approved independent laboratory.
4. Material: Carbon steel.
5. Tensile capacity (minimum): Refer to drawings
6. Dimensions
 - 6.1. Cross section: Refer to drawings
 - 6.2. Diameter: Refer to drawings
7. Features:
8. Isolation system:
9. Finish
 - 9.1. Bar:
 - 9.2. Fork and nut:
 - 9.3. Coupler:
 - 9.4. Disc:
10. Finish designation:
11. Fixings:

Pr_20_85_85_74 Rubber bearings

1. Description:

2. Manufacturer: Contractors Choice
3. Standard: To [BS EN 1337-3](#).
4. Certification: . *Provide CE marking and a Declaration of Performance (DoP)*.
5. Material: Natural rubber.
6. Form: Solid.
7. Load capacity (maximum): Refer to drawings
8. Allowable movements of rubber bearings: Refer to drawings

Pr_20_85_85_80 Sliding surface bearings

1. Description:
2. Manufacturer: Contractors Choice
3. Standard: To [BS EN 1337-7](#).
4. Certification: Provide CE marking and a declaration of performance
5. Load capacity (maximum): Refer to drawings
6. Allowable movement of sliding bearings: Refer to drawings
7. Execution: [Pr_20_85_85/630 Installing sliding surface bearings](#)

Pr_25_71_51_89 Steel profiled sheet

Shared by: [Ss_30_12_85_16 Composite steel and concrete floors](#)

1. **Scope of contractor design:** Profile and thickness of metal decking, types, sizes, number and spacing of fixings, stiffening around openings.

Determine structural sizes required to support specified loads without damage or undue deflection.
Design standards: BS EN 1993 and BS EN 1994

2. Manufacturer: Similarly approved to manufacturer specified on drawings
3. Standards: In accordance with [BS EN 1993-1-3](#).
4. Material standard: To [BS EN 10346](#)
5. Designation: S350GD+Z275 N-A-C.
6. Thickness: As specified on drawings
7. Soffit: Finishes to architects requirements
8. Execution: [Pr_25_71_51/610 Installing profiled metal decking](#)
9. Design Criteria:
 - Metal decking to be designed together with designated concrete for the composite floor
 - Concrete tolerance and finish as concrete specification
 - Loads: as per BDP loading document
 - Construction Loads; 1.5kpa plus dead weight of concrete including allowance for ponding
 - Deflection (maximum during construction): span /180
 - Fire rating: 60 minutes
10. Supporting structure:: Steel beam top flange

Pr_35_31_22_02 Painting of Steelwork

1. Preparation for Painting:
 - 1.1. **General requirements:** The term 'clean' means to be free from any matter which would contaminate the subsequent paint film and thus affect the life and durability of the coating
 - 1.2. **Offsite Preparation and Paining:** Working area: covered and properly lit, heated and ventilated

Sequence of working: select from the following and submit proposals.

- fabricate, blast clean, prime
 - blast clean, fabricate, remove flash rust with a light overall sweep blast, prime
 - blast clean, apply weldable prefabrication primer, fabricate, prime
- Prefabrication primer (option 3): type recommended by manufacturer of post fabrication primer. Thickness of post fabrication primer coat may be reduced if not as recommended by manufacturer

Surfaces inaccessible after assembly: apply full treatment and coating system including, if necessary, local application of site coatings.

- 1.3. Blast cleaning for painting: [Ss_40_90_40/650 Preparatory blast cleaning of existing steel](#)
[Ss_40_90_40/655 Preparatory manual cleaning of new steel](#)
- 1.4. Preparation for site welding of shop painted steelwork: Method, select from the following:
- Mask weld areas immediately after blast cleaning and before coating steelwork. If paint system comprises more than one coat, step each coat 30mm back from edge of preceding coat and away from masked areas. remove masking immediately before welding
 - Prepare and paint steelwork including weld areas. Grind off to bare steel around each weld area immediately before welding.
- 1.5. [Treatment of site welded joints in painted steelwork](#): After welding, and without delay, remove scale and weld spatter from weld areas. Remove traces of rust. Wash with clean water allow to dry. Prime without delay.

Protective/Decorative coatings: apply to weld areas to match surrounding painted areas

- 1.6. [Treatment of site welded joints in galvanised steelwork](#): After welding, and without delay, remove scale and weld spatter from weld areas. Remove traces of rust. Wash with clean water and allow to dry

Coating: reinstate using one of the methods given in BS EN 1461, 6.3

- 1.7. [Bolted joints \(other than friction grip joints\)](#): Steelwork to be shop painted: apply full shop specification to joint faces

Steelwork to be erected with mill finish then site painted: before erection, prepare and prime joint faces and allow to dry

Bolted joints in externally exposed steelwork:

- immediately before assembling, apply a further coat of primer and bring surfaces together while still wet.
 - after assembling, and before applying site coatings, seal crevices to bolts and joint perimeters with a compatible sealant
- 1.8. [Faying surfaces of friction grip joints](#): Protection: immediately after blast cleaning and before coating surrounding areas, mask faying surfaces to protect from contamination and deterioration.

Paint systems comprising more than one coat: step each coat 30mm back from the edge of preceding coat and away from masked areas

Removal of protection: immediately before bolting, remove masking. Check faying surfaces are free from adhesive. Clean with solvent if necessary

- 1.9. [Friction grip joints in shop painted steelwork](#): post assembly treatment of bolts and surrounding areas: after final tightening of bolts and inspection of joints:
- thoroughly degrease and clean uncoted areas including bolts
 - prime without delay
 - apply full shop coating specification

Direct tension indicators: seal measuring gap to prevent ingress of moisture

- 1.10. [Fasteners](#) : Uncoated fasteners: after steelwork erection and before applying site coatings, thoroughly degrease and clean. Without delay, coat to match adjacent shop painted areas

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

- 1.11. **Site preparatio for shop painted steelwork:** 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
2. **Painting:** Surface preparation or previously applied coating: Determine acceptability prior to a[[lication of specified coatings.
 - 2.1. **Finishes generally:** Applied finish: Ensure that the finish does not in any way slump, flow, crack, flake, split, sag, pit, bubble, blister, float, effloresce, craze, shrink, break, wrinkle, crinkle, yellow, chalk, fade, discolour, powder, stain, bleed or lose its finish or gloss taking full account of the extremes of all atmospheric and environmental conditions specified for the service life.
 - Thinners: Do not add to paint to change its constitution or consistency in any way unless agreed by the protective coating manufacturer.
 - Finish required: Durable, resilient, of uniform texture, colour and appearance within the limits of the agreed samples and without irregularities or distortion. Ensure coatings match colour and gloss of agreed control samples.
 - Interval between successive coats: At least 24 hours or as recommended by protective coating manufacturer.Applied finish: Ensure that the finish does not in any way slump, flow, crack, flake, split, sag, pit, bubble, blister, float, effloresce, craze, shrink, break, wrinkle, crinkle, yellow, chalk, fade, discolour, powder, stain, bleed or lose its finish or gloss taking full account of the extremes of all atmospheric and environmental conditions specified for the service life.
 - Thinners: Do not add to paint to change its constitution or consistency in any way unless agreed by the protective coating manufacturer.
 - Finish required: Durable, resilient, of uniform texture, colour and appearance within the limits of the agreed samples and without irregularities or distortion. Ensure coatings match colour and gloss of agreed control samples.
 - Interval between successive coats: At least 24 hours or as recommended by protective coating manufacturer.Applied finish: Ensure that the finish does not in any way slump, flow, crack, flake, split, sag, pit, bubble, blister, float, effloresce, craze, shrink, break, wrinkle, crinkle, yellow, chalk, fade, discolour, powder, stain, bleed or lose its finish or gloss taking full account of the extremes of all atmospheric and environmental conditions specified for the service life.
 - Thinners: Do not add to paint to change its constitution or consistency in any way unless agreed by the protective coating manufacturer.
 - Finish required: Durable, resilient, of uniform texture, colour and appearance within the limits of the agreed samples and without irregularities or distortion. Ensure coatings match colour and gloss of agreed control samples.
 - Interval between successive coats: At least 24 hours or as recommended by protective coating manufacturer.
 - 2.2. **Environmental conditions:** [Ss_40_90_40/620 Working conditions](#)
 - 2.3. **Coatings:** Surfaces to be coated: Clean, dust free and suitably dry. Previous coats to be adequately cured.
 - Multiple coats of same material: Use different tints to assist checking of complete coverage.
 - Penultimate coat: Colour recommended by paint manufacturer to suit top coat colour.
 - Finish required: Smooth and even, of uniform thickness and colour, free from defects.
 - Dust and damage: Keep all surfaces free from dust during coating and drying. Adequately protect the completed work from damage.
 - Materials used in preparation: To be types recommended by their manufacturers and the coating manufacturer for the situation and the surfaces being prepared.
 - Manufacturing batches: Use from one batch wherever possible. Where more than one batch is to be used, keep separate, allocate to distinct parts or areas of the work and give notice.
 - Unsatisfactory work: Make good in accordance with previous clauses and to approval.

- 2.4. **Film thickness:** Wet film thickness: During application, check thickness of each coat with a wheel or comb gauge used in accordance with BS EN ISO 2808.
- Accumulated dry film thickness: After each coat has dried, check total accumulated film thickness.
 - Method: Magnetic or electromagnetic meter.
 - Number and position of measurements: As directed.
 - Validation: Measurements to be independently witnessed.
 - Meter calibration: Check against standard shims and recalibrate regularly against a smooth steel reference plate.
 - Average dry film thickness:
 - At least specified thickness over any square metre.
 - No reading to be less than 75% of specified thickness.
 - Accumulated dry film thickness deficiency: Apply additional coat(s) at your own expense if required.
 - Top coat dry film thickness: Sufficient to give an even, solid, opaque appearance
- 2.5. **Stripe Coat:** External angles, nuts, bolt heads, rough weld seams, and areas difficult to coat: apply an additional stripe coat of primer

Pr_35_31_68_43 Intumescent protective coatings

1. Description:
2. Manufacturer: Contractors Choice
3. Composition: Submit proposals
4. Colour: Refer to architects specification
5. Execution:

Pr_35_31_77_42 Intumescent coating sealers

1. Description:
2. Manufacturer: Contractors Choice
3. Composition: Submit proposals
4. Colour: Refer to architectural specification
5. Execution: Applying coating

Pr_35_90_15_37 Headed stud shear connectors

Shared by: [Ss_30_12_85_16 Composite steel and concrete floors](#)

1. Description:
2. Manufacturer: Contractors Choice
3. Standard: To [BS EN ISO 13918](#).
4. Certification: *Provide European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP).*
5. Designation: As drawings
6. Dimensions: As drawings
7. Execution: [Pr_35_90_15/610 Fixing headed stud shear connectors](#)

Ss_40_90_40/305 Control samples - Steel

1. Purpose: For use as a reference sample.
2. Labelling: Clearly label all submitted samples.
3. Timing: Before ordering for project

4. **Exposed steelwork requiring a decorative finish:** Arrange for a sample flat plate, approx 500mm square, or by agreement, a suitable piece of steel to be coated in accordance with the specification in advance of the main works
5. **Following approval:** Keep this sample at works and use as a reference to establish consistency of the finished work

Execution

Pr_20_29_03/610 Fixing with anchors Type A

1. **Preparation:** Protect threaded length from damage. Drill pilot hole, and prepare for insertion of anchor. Place washers, packings, ferrules as required.
2. **Initial fix:** Tighten sufficiently to hold unloaded components – check line and level of components before final tightening.
3. **Final fix:** Tighten nuts to hold components in final position when fully loaded.
4. **Torque:** submit proposals
5. **Finishing:** Apply locking nut. Fix plastic caps. Crop threaded end to specified height above nut. Fit split pins to secure castellated nut.
6. **Inspection:** Inspection of the installation of mechanical fixings by appropriately qualified personnel required and to be recorded in accordance with agreed protocol.

Pr_20_29_03/611 Fixing anchors using cartridge-applied adhesive

1. **Position:** Keep well away from edges in order to prevent the dislodging of masonry units or spalling of the face.
2. **Preparation of surface, hole into which chemical is applied:** Drill hole to correct diameter and depth. Clean drill hole and remove all dust, water and debris.
3. **Installation:** Dispense to waste until an even colour and then pump into hole. Insert stud or socket with a twisting action.
4. **Curing:** Allow to cure prior to attaching fixture.

Pr_20_29_03/620 Fixing anchors using chemical anchor capsules

1. **Position:** Keep well away from edges in order to prevent the dislodging of masonry units or spalling of the face.
2. **Preparation of surface, hole into which chemical is applied:** Drill hole to correct diameter and depth. Clean drill hole and remove all dust, water and debris.
3. **Installation:** Place capsule in drill hole. Drive stud through capsule until stud reaches the base of the hole or the depth marker on the stud is reached.
4. **Curing:** Allow to cure prior to attaching fixture.

See [Pr_20_29_08/605 Fixing with bolts generally](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

See [Pr_20_29_08/620 Fixing holding down bolts](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

See [Pr_20_29_08/625 Fixing bolt boxes](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

Pr_20_29_60/620 Installing shims and folding wedges

1. **Position:** . *Shims or folding wedges to be tightly fixed between substrate and supported structure, and positioned to enable cover provided by mortar, grout or concrete to achieve required level of durability.*

Pr_20_29_76/620 Fixing with screws

1. **Clearance holes:** Required.

2. Fastener spacing: Contractor designed
3. Finished level of screw heads
 - 3.1. Exposed: Contractor designed
 - 3.2. Concealed (holes filled or stopped): Sink minimum 2 mm below surface.
4. Minimum sizing: Minimum diameter 20mm
Minimum 2 number per connection
Choose bolt/screw dimensions to ensure that threads do not occur in shear plane of joint

Pr_20_85_85/630 Installing sliding surface bearings

1. Lubrication: *.Apply silicone grease to sliding surfaces.*

Pr_25_71_51/610 Installing profiled metal decking

1. Bearing (minimum) : 50mm bearing on steel supports and 70mm for bearing on other materials
2. Workmanship::
 - 2.1. Installation:: Seams and ribs of deck must be parallel, with no damage to deck coating
 - 2.2. Cut sheets:: Clean edges with true lines and no burrs.
Treatment of edges: as recommended by decking manufacturer
 - 2.3. Penetrations:: Cut openings to the minimum size necessary. Reinforce edges with trimming plates
 - 2.4. Cleanliness:: Remove debris from within decking construction
 - 2.5. Plumbing of the structure:: Allow for cut holes and make good
 - 2.6. Cutting to deck: : Tape to prevent concrete seepage
 - 2.7. Fixings:: Drill all holes. Holes for main fixings to be 1.5mm larger than diameter of fastening when self drilling type with pilot point is used.
3. Attachment of decking and accesories::
 - 3.1. Scope of contractors design: Type, size and number
 - 3.2. Requirement:: To resist specified wind load
 - 3.3. Standard: In accordance with BS EN 1991, using appropriate location, exposure, height, building shape, size, and taking account for existing and known future adjacent and attached buildings.

Design method: contractors choice
 - 3.4. Topographic increment:: Before applying the same average topographic data in all directions, check whether actual topographic data gives a worse condition and use the higher value
 - 3.5. Shelter from upwind obstructions:: Provide justification for assumption
 - 3.6. Internal pressures, without dominant openings: Pressure coefficient (cpi): For each case considered, sue the most onerous value of +0.2 or -0.3

Size effect factors (Ca) use 1
4. Painting structure:: Before the decking is attached, paint surfaces of supporting structure that will be subsequently inaccessible.
5. Prevention of electrolytic action: Isolating tape: type recommended by decking manufacturer.
Location: to contact surfaces of supports and sheets of dissimilar metals
6. Fire resisting Profile Fillers: Supplier: Decking manufacturer
Type/Shape: To match decking profile void
Location: refer to architectural drawings for compartmentation lines
Fixing: Fit securely, as recommended by manufacturer, to form fire compartment

Pr_35_90_15/610 Fixing headed stud shear connectors

1. Welding method: Submit proposal.
Describe working method, site safety and means of access. Submit prior to commencing stud welding
2. Welders competence:: To be certified by equipment manufacturer or other recognised authority

3. **Trial Welding::** Before starting, demonstrate suitability of materials, equipment and welding system proposed for welding of studs.
Fix no less than ten studs for testing.
During the work, at the beginning of each shift, each welder is to fix not less than two studs for testing.

Testing trial welds: Visually inspect. Each trial weld is to exhibit full 360 degree 'flash'
Subject to each trial stud to a 30 degrees bend test; welds must show no sign of cracking.

4. **Production Welds:** To be visually free from cracks and lack of fusion and capable of developing at least the nominal ultimate strength of the studs
5. **Temperature:** Do not weld when ambient temperature is below 0 degrees celsius
6. **Decking::** To be free from water, grease and debris. To be in contact with steel beam flange for welding, removing indentations or profiles as necessary
7. **Top surface of beam flanges::** To be free from mill scale, rust, grease, oil, water, paint and other substances detrimental to welding. Ensure flanges are cleaned prior to laying decking
8. **Standard:** To [BS EN ISO 14555](#).
9. **Spacing:** Refer to drawings and typical details

Ss_20_10_75/612 Execution of steel and composite structures

1. **Standard:** To [BS EN 1090-2](#).
To the [NSSS](#), sections 4 to 9.
2. **Execution class for steel structures:**
3. **Visual requirements:**

Ss_20_10_75/616 Accuracy and Tolerances of construction

Shared by: [Ss_35_10_85_65 Precast concrete stair or ramp systems](#)

1. **Setting out:** To [BS 5964-1](#).
Contractor to take responsibility for coordinating tolerances in order to ensure that all elements of construction fit together and comply with the dimensional requirements shown on the drawings.
2. **Accuracy of instruments:** To [BS 5606, Annex A](#).
3. **Component shape and position:** To [BS 5606](#). To the [NSCS](#), section 10.
4. **Geometrical tolerances for concrete structures:** To [BS EN 13670](#), tolerance class 1.
- 4.1. **General requirement for formwork:** Accurately and robustly constructed to produce finished concrete in the required positions and to the required dimensions
- Formed surfaces: free from twist and bow, other than any required cambers
- Intersections, line and angles: square plumb and true
- 4.2. **Permissible deviations::** In addition to the requirements of BS 5606 and NSCS, no member shall deviate from its design position in accordance with the following limits:
- all setting out dimensions $\pm 6\text{mm}$
 - overall plan dimensions at ground level $\pm 25\text{mm}$
 - Dimensions between tops of floor slabs (storey heights) $\pm 20\text{mm}$
 - Dimension between top of ground slab and top or roof slab: $\pm 16\text{mm}$ up to 30m height with $\pm 8\text{mm}$ for each subsequent 30m
 - Deviation from vertical of columns and walls (storey height) $\pm 6\text{mm}$
 - Deviation from vertical of columns and walls from top of ground slab to top of roof slab $\pm 25\text{mm}$ up to 30m height with $\pm 6\text{mm}$ for each subsequent 12m of height, up to $\pm 65\text{mm}$
 - Slab edge position (+ve outwards): $+5\text{mm}$ and -10mm
 - Undersides of foundations, bases... $+5\text{mm}$ and -100mm
 - Top surfaces of foundations, bases... $+5\text{mm}$ and -20mm
- 4.3. **Levels of structural concrete floors:** Maximum tolerances for designed levels to be as follows:

- Floors which are self finished, and floors to receive sheet or tile finishes directly bedded in adhesive: $\pm 10\text{mm}$
- Floors to receive mastic asphalt flooring/underlays directly: $\pm 10\text{mm}$
- Floors to receive mastic asphalt flooring/underlays laid on mastic asphalt levelling coat: $\pm 15\text{mm}$
- Floors to receive fully bonded screeds/toppings/beds: $\pm 15\text{mm}$
- Floors to receive unbonded or floating screeds/beds: $\pm 20\text{mm}$

4.4. **Concrete Tolerances:** Tolerances for finished concrete to be:

- Deviation from Vertical or Specified Batter

RC column and walls supporting
superstructure $\pm 6\text{ mm}$

Mass concrete piers and walls $\pm 40\text{ mm}$ but
 $\pm 10\text{ mm}$ in any 3 m

- Deviation from Level or Specified Gradient

RC floor beams, floors, slabs, etc $\pm 10\text{ mm}$ from datum but
 $\pm 3\text{ mm}$ under a 3 m
straight edge

Exposed lintels, cills, conspicuous
lines, plinths or seatings $\pm 6\text{ mm}$

- Deviation from Specified Alignment

RC columns and beams $\pm 6\text{ mm}$

RC walls $\pm 12\text{ mm}$ but
 $\pm 6\text{ mm}$ in 3 m

- Variation in Cross-sectional Dimensions

RC columns $\pm 6\text{ mm}$

RC beams $\pm 3\text{ mm}$

RC slabs and walls up to 300 mm thick $\pm 5\text{ mm}$

RC slabs and walls over 300 mm thick $\pm 10\text{ mm}$

Mass concrete piers and walls $\pm 6\text{ mm}$

- Positional Tolerance

Position on plan of any point or face
in relation to the nearest building

grid line on the same level

Structural frame $\pm 10\text{ mm}$

Foundations $\pm 35\text{ mm}$

Deviation in size of openings $\pm 6\text{ mm}$

Deviation in position of embedded

fixtures (other than reinforcement

and HD fixings for Structural Steelwork) $\pm 6\text{ mm}$

- Space between Elements

Faces of adjacent columns and

faces of adjacent walls $\pm 10\text{ mm}$

- Stair Tolerances

In a flight total rise $\pm 12\text{ mm}$

total going $\pm 12\text{ mm}$

In consecutive steps rise $\pm 3\text{ mm}$

going $\pm 6\text{ mm}$

- Lift Shafts

Deviation of walls from vertical $\pm 20\text{ mm}$

Internal size at any place $\pm 30\text{ mm}$

- The stated tolerances are to be applied in isolation and are not to be combined. Note that the maximum permitted deviations will only be acceptable in isolated cases. Normally no more than 1 in 5 measurements would be expected to deviate by more than half the maximum permitted deviation. If a larger proportion of deviations is found to lie between 50% and 100% of the maximum permitted values, it will indicate that the work is below the specified standard and is not acceptable under the contract without remedy.

5. **Geometrical tolerances for steel structures:** To [BS EN 1090-2](#), Annex B, class 1.

5.1. **Positioning and levelling the steelwork::** Contractor to take responsibility

5.2. **Permissible deviations::** In addition to the requirements of BS EN 1993 and NSSS, comply with the following:

- the level of the underside of a column base plate is not to deviate from the specified level by more than 5mm
- the space beneath a base plate is not to be less than 10mm and not more than 40mm
- the deviation of a column at any level is not to exceed the greater of 5mm or 1/600 of the column height over the actual position of the column at ground floor level
- Members other than columns are not to deviate from the specified position on plan relative to the columns to which they are connected by more than 5mm
- The level of the top of the steelwork at any level is to be within 10mm of the specified level
- The difference in levels between two or more beams meeting at a columns is to be less than 5mm, unless noted otherwise on drawings
- gaps in joints that depend on contact bearing after alignment are not to exceed 1mm.
- The maximum permitted deviation from a square as measured from a point 50mm from any corner shall be ± 1.5 degrees.

6. **Geometrical tolerances for timber structures:** To BS 5606

Ss_20_10_75/624 Use of permanent support

1. **Permanent vertical support:** Steel columns - Refer to drawings.
2. **Permanent horizontal support:**
3. **Timing:** After concrete has achieved specified 28-day strength.

Ss_20_10_75/626 Installing column bases

1. **Final design and sizing::** Contractor to take responsibility for the final design and sizing of column base plates in accordance with BS EN 1993
2. **Levels:** Adjust with steel shims and/or folding wedges no larger than necessary.
3. **Locations of shims and wedges:** Position symmetrically around perimeter of base plate. Do not use a single central pack.
4. **Spaces beneath column bases :** Where outside specified limits, give notice immediately. Do not place filling and bedding. Submit method statement for corrective actions.
5. **Accuracy of erection:** Where holding down bolts are outside of geometrical tolerances, give notice immediately. Do not place filling and bedding, or alter baseplate and predrilled holes. Submit method statement for corrective actions.

Check, and correct errors before filling and bedding beneath bases and carrying out other adjacent works.

Ss_20_10_75/627 Installing bedding under column baseplates

1. **Preparation:** Scarify surfaces to provide a good mechanical key.
2. **Thickness range:** 25-40mm
3. **Bolt pockets:** Fill completely.
4. **Filling spaces beneath base plates:** Fill completely. Tamp well as filling proceeds, against properly fixed supports where required. Bedding material should be of a consistency that enables it to be placed easily.
5. **Base plates larger than 1m²::** Make 25mm diameter holes for pressure grouting, escape of entrapped air or direct compaction of filling/bedding material

Ss_20_10_75/628 Sealing hollow sections

1. **Vent and drainage holes**
 - 1.1. **Requirement:** Seal perforations to prevent moisture access. Debris and moisture removed before sealing ends and openings.

- 1.2. **Appearance of seal:** Flush with external face of hollow section.
- 1.3. **Material for seal:** Corrosion resistant, durable, and able to accept applied finishes.
- 1.4. **Method of sealing:** Submit to the engineer for approval

Ss_20_10_75/730 Site welding generally

1. **In situ welding:** Not acceptable.
Notwithstanding clause 8.7 of the National Structural Steelwork Specification, permitted only where approved. If approved submit certification of weld procedures and qualifications of welders to be used on site at least five working days prior to start of the works.
2. **Reinstatement of damaged surface treatments:** Submit proposals
3. **Working Conditions:** Suitable and safe. Do not weld when surfaces are wet or when ambient temperature is below 0°C.
4. **Testing:** Test 100% of site welds unless directed otherwise.

Ss_20_10_75/732 Welding

1. **Standards:** To [BS EN 1011-1](#) and [BS EN 1011-2](#).
2. **General::** *Written welding procedures in accordance with BS EN ISO 15609-1.*

Reduce distortion to a minimum and adopt pre setting if necessary. Take all precautions to avoid built in stresses

3. **Face preparation::** In accordance with BS EN 1011.
Fusion faces, angle of bevel, root radius, etc...
Prepare properly to give the approved weld forms.
4. **Assembly for welding::** Parts to be welded: assemble such that they are easily accessible and visible to the operator

Fusion faces: Carefully align and maintain correct gap and alignment during welding

Butt joints: Align root faces to within 2mm

Fillet welds: keep edges and surfaces to be joined in as close contact as possible. Gap not to exceed 2mm

5. **Workshops::** Carry out welding in workshops or under similar controlled conditions. Allow inspection of material and assemblies before commencement of welding
6. **Supervisor::** Carry out welding under the direction of an experienced and competent supervisor.
7. **Major welds::** Keep records of all major welds as required to ensure that all test results and welding operators responsible for the work can be identified. Hard stamping of finished work for this purpose is NOT permitted.
8. **Flame cutting type S355 materials::** Dressing of flame cut edges to be in accordance with NSSS, subject to demonstration of procedures to limit hardening effects to acceptable levels.
9. **Cold worked steel 20mm or more, thick welds in components which will be subject to tensile stresses and any other critical welds::** Stress relieve or demonstrate procedures to limit hardening effects to acceptable levels.
10. **Welding to dissimilar metals:** Not permitted if there is a risk of bimetallic corrosion
11. **Welding between different grades of steel::** Use electrode relating to the higher yield stress material. Store in bundles in dry conditions. Protect from adverse weather and damage.
12. **Quality management systems:** . To [BS EN ISO 3834-3](#).
13. **Certification of welders**
 - 13.1. **Certification:** To [BS EN ISO 9606-1](#).
To [BS EN ISO 14732](#).
 - 13.2. **Verification of welding procedures:** Submit.

13.3. **Welding procedure qualification records:** In accordance with BS EN ISO 15614-1

14. **Corrective action:** To Annex D of the [NSSS](#).

15. **Approval of welding procedure::** Prior to commencing fabrication, submit for approval certification of weld procedure qualifications of any welders to be used, together with details of welding methods and procedures to be used, and of testing procedures to be carried out.

Take responsibility for correct welding and for minimising distortion in the finished structure.

16. **Butt welding:** Full strength butt weld, FSBW, implies a full penetration, full strength weld; except on tubes, weld from both sides. Gouge out the back of the first run.

17. **Preheating:** Adhere to the recommendations of BS EN 1011. Do not weld mild steel when the ambient or plate temperature is 0C or below. Where the combined plate thickness is equal to 50mm or over, and the ambient or plate temperature is under 10C, only weld where approved, special precautions are taken to prevent too rapid a rate of cooling and heat loss.

Wet surfaces or where ambient temperature is 0C or less: heat sections to be welded until they are warm to the touch for a distance of not less than 75mm on either side of the joint.

18. **Welding of structural hollow sections:** Weld hollow members continuously and keep interior of members clean, dry and free from loose scale.

Provide vent holes where the structure, or part of the structure, is to be hot dip galvanised after fabrication.

Plug these holes after galvanising.

Close all openings, internally unpainted tubes or other elements with a suitable continuous welded cover plate or other approved means.

Structural hollow sections with a wall thickness of less than 4mm: provide special close tolerance fit-ups. Submit proposals prior to commencement of any works.

Welds at end plates and flush surfaces: grind flush.

Ss_20_10_75/734 Temporary welds

1. **Welds (including tack welds) not indicated on drawings:** Not permitted without approval, even for temporary attachment or repair of faulty plates.

Ss_20_10_75/736 Welding of stainless steel

1. **Standard:** To [BS EN 1011-1](#) and [BS EN 1011-3](#).

2. **Welding to dissimilar metals:** Not permitted if there is a risk of bimetallic corrosion

Ss_20_10_75/738 Special welding procedures

1. **Requirement:** Submit procedure for approval

2. **Position:** in accordance with BS EN101

Ss_20_10_75/740 Forming movement joints in steel framing systems

1. **Position:** Refer to drawings

2. **Bolts in slotted holes.:** Fit with washer, spring washer, nut and lock nut and shouldered bolt

3. **Appearance and fit.:** Bolts centred in slotted holes unless otherwise indicated. Joints free to move

Ss_20_10_75/762 Modification of steel structures

1. **Approvals:** Do not modify any element of the structure without approval.

2. **Period required for approvals:** Five working days.

3. **Temporary fabrication or erection attachments:** May remain when they do not interfere with subsequent works, and will be completely hidden by finishes. Otherwise, must be removed

Ss_20_10_75/784 Installation of prototypes or mock-ups

1. Required samples
 - 1.1. Locations:
 - 1.2. Timing: Construct during preliminary installation. Obtain approval of appearance before proceeding.

Ss_20_10_75/786 Inspection levels

1. Access:: Allow CA and/or an independent inspection authority access at any reasonable time to workshops, and those of any suppliers, to enable inspection of the work during fabrication. Provide all facilities, hand tools, lighting, etc.
2. Materials and fixings: Take responsibility for ensuring soundness and quality
3. Commencement of fabrication:: Give notice
4. Completion of fabrication:: Give 14 day notice to allow, if necessary, inspections or tests to be carried out prior to despatch of steelwork to site
5. Welds uneven in size or oversized:: Make good at your own expense
6. Inspection level: To [BS EN 1990](#), IL2.

Ss_20_10_75/790 Non-destructive testing (NDT) of welds

1. Testing: Required.
2. Certification of welders: *Submit evidence of certification.*
3. Preparation: *Prepare test pieces as necessary. All welds to be visually inspected prior to NDT.*
4. Radiographic testing:: Performed by an approved independent testing station on any site welds chosen by CA
5. Welds containing any form of crack, lack of penetration or lack of fusion:: Unacceptable
6. Defective areas of weld:: Cut out and reweld in an approved manner
7. Repaired welds: Reinspected using the same technique as previously adopted. No further repairs allowed to a rewelded area.
8. Testing authority:
9. Test and examination results
 - 9.1. Timing: *Submit test and examination results Immediately they are available.*
 - 9.2. Format: Electronic.
 - 9.3. Number of copies: One.
10. Acceptance criteria: Weld acceptance criteria to be adopted and the amount of non destructive weld testing required will be in accordance with the NSSS or BS EN ISO 5817
11. Exceptions to NSSS requirements
 - 11.1. Weld location:
 - 11.2. Weld type:

Ss_20_10_75/792 Site testing of shear stud welding

1. Standard: To [BS EN ISO 14555](#).
2. Acceptance requirements: before starting, demonstrate suitability of materials, equipment and welding system proposed for welding of studs.
Fix no less than 10 studs for testing.
During the work, at the beginning of each shift, each welder is to fix not less than 2 studs for testing
Visually inspect trial welds.
Each weld is to exhibit full 360 degree flash.
Welds to be visually free from cracks and lack of fusion and capable of developing at least the nominal ultimate strength of the studs.

Ss_20_10_75/794 Site testing of anchors to concrete and masonry

1. Standard: To [BS 5080-1](#). To [BS 5080-2](#).
2. Preliminary tests: . *Five tests for tensile loading to failure in locations that will be hidden in completed structure.*
3. Proof tests: . *Test 10% of working fixings to 1.5 times the working load.*
4. Test failures: Report immediately. Submit method statement for alternative method of fixing.

Ss_30_10_30/760 Fabrication

1. Notification of Commencement: Give notice before fabrication is due to start.
Period of minimum notice: 10 working days
2. Tolerances for Fabrication: Fabrication tolerances in accordance with BS EN 1090-2 except where stated below:
 - Length of member: shall not deviate from its specified length by more than +0mm and -3mm. Design joints so that permitted deviations in length do not accumulate
 - Holes for Black, Precision and High strength friction grip shop and site bolts: shall be 2mm larger in diameter than the size of bolt specified
 - Close tolerance holes for black and precision bolts: drill undersized holes in members and assembly ream to diameter not exceeding the bolt diameter plus 0.5mm. Only use close tolerance holes for shop assembled connections
 - Special tolerances: provide net or slotted holes
3. Thermal Cutting: All thermal cutting: subject to approval

Manual thermal cutting: Only permitted for specific approved applications

Manual thermal cutting of edges to be welded: not permitted

Edges of all plate cut by flame and subsequently welded: Dress prior to welding. Amount of metal removed: subject to approval

4. Workmanship: Sheared or cropped edges: Dress to a neat workmanlike finish and free from distortion where parts are to be in metal to metal contact

Defective work: at your own expense rectify for approval or replace

5. Marking: Identifying and recording materials and components: submit details of proposed methods

Location of marks: Generally, visible for checking after erection. Weathering steel: on surfaces not exposed to open view in the completed works

Steel to be blast cleaned, pickled, metal sprayed or galvanised: marked so that subsequent treatment cannot obliterate the marking

6. Hard stamping: Usage not permitted except if/as indicated on drawings
7. End connections: Angle cleats: Project 10mm beyond ends of simply supported members
8. Steelwork to be galvanised: Cutting, frilling, and shop welding: complete before galvanising

Vent and drain holes: provide as necessary. Submit proposals for locations. Sealing required to all external steelwork.

Hollow sections: insides of sections: debris and moisture removed before sealing ends and openings

9. Shop Inspection: Give notice before fabricating steelwork generally
Minimum 5 working days.
Fabricator to provide the Engineer the fabrication programme in advance.

Ss_40_90_40/610 Information to be provided prior to commencement of work

1. **Items:** Health and Safety Policy.
Statement of compatibility of materials.
Application method statement.
Remedial works method statement.

Ss_40_90_40/620 Working conditions

1. **Environmental conditions**
 - 1.1. **Ambient temperature (minimum):** 5°C.
 - 1.2. **Steelwork temperature (minimum):** 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 (maximum):** below 85%.
2. **Recommended environmental conditions:** Maintain during application and drying.
3. **Surface condition:** Clean and dry at time of application. Unaffected by moisture or frost
4. **Application of coatings:** taken as acceptance of the suitability and conditions within any given area
5. **Precautions:** take all necessary precautions including restrictions on working hours, providing temporary protection, and allowing extra drying time to ensure that coatings are not adversely affected by climatic conditions before, during and after application.

Ss_40_90_40/625 Operatives

1. **Operatives:** UKAS accredited 'Competent Person' to [BS EN ISO/IEC 17024](#) Personnel Certification.
2. **Evidence of training and experience:** Verification of the skills and training and management.

Ss_40_90_40/630 Off-site intumescent-coated steel

1. **Handling and erection:** Use methods and devices designed to minimize damage to intumescent coatings.
2. **Damaged areas of coating:** Reinstate in accordance with intumescent coating manufacturer's recommendations.

Ss_40_90_40/635 Working procedures

1. **Standard:** In accordance with [BS EN 16623](#).
2. **Give notice :** Before commencing surface preparation and coating application.
3. **Quality control:** Record project-specific procedures for surface preparation and coating application.

Ss_40_90_40/650 Preparatory blast cleaning of existing steel

1. **Preparation:** Remove oil, grease and contaminants. Remove millscale by chipping, grinding and/or heat treatment
2. **Rust grades::** Ensure that steel complies with BS 7079: PART 1 at time of blasting as follows:
 - dry blasting: Initial rust grade A or B
 - Wet blasting: initial rust grade A, B or C
3. **Blast cleaning**
 - 3.1. **Standard:** To the specified BS 7079: Part A1 preparation grades. Control quality of preparation in accordance with BS EN ISO 12944.
 - 3.2. **Purpose:** To remove existing coatings and rust.
 - 3.3. **Atmospheric condition:** Dry.
 - 3.4. **Abrasive:** Suitable type and size, free from fines, moisture and oil.
 - 3.5. **Finish:** To [BS EN ISO 8501-1](#) preparation grade SA2½, with an average profile of approximately 75 micrometres.
 - 3.6. **Abrasive residues and moisture:** Remove.

4. **Surface Defects:** Remove all defects likely to be detrimental to the protective painting system including:
 - defects in the steel, including cracks, surface laminations, shelling and deep pitting as required by BS EN 10025
 - Defects resulting from fabrication, including fins at cuts, burrs, sharp edges and weld spatter
5. **Primer:** Apply one coat to bare steel areas as soon as possible after cleaning and before gingering or blackening appears. Remove coating edges that lift as a result of priming, and reprime.

Ss_40_90_40/655 Preparatory manual cleaning of new steel

1. **Preparation:** Remove oil, grease and contaminants.
2. **Loose or unsound coatings:** Remove to a firm edge. Abrade to give a good key. Leave a clean, dry surface.
3. **Exposed steel finish:** To [BS EN ISO 8501-1](#) preparation grade St2, clean but unpolished.
4. **Primer:** Apply one coat to bare steel areas as soon as possible after cleaning and before gingering or blackening appears. Remove coating edges that lift as a result of priming, and reprime.

Ss_40_90_40/660 Condition of new steelwork

1. **Requirement:** Free from rust, millscale, grease and contaminants.
2. **Manual cleaning of new steelwork:** Remove fins, burrs, sharp edges, weld spatter, loose rust, and loose scale

Surface finish: clean but unpolished to BS EN ISO 8501-1 grade ST 2

Finishing: thoroughly degrease and clean down. Remove any consequent rusting back to grade st 2.
Prime without delay

Ss_40_90_40/670 Inspection of Coating Work

1. **Requirement:** Permit coating manufacturer or independent party to:
 - Inspect quality control records.
 - Take dry film thickness and other measurements.
 - Take samples of products.

Do not comply with any directions or requests from the coating manufacturers representative until confirmed by the CA
2. **Submit:** Coating manufacturer's inspection reports without delay.
3. **Notice:** Give notice dates for:
 - start of surface preparation and coating
 - coated members or components leaving the works
 - period of notice: minimum 7 working days
4. **Samples for testing::** Allow the CA to take samples from sealed containers, spray gun containers or workman's kettles. Unopened sealed containers may be required to be set aside for subsequent tests.

Ss_40_90_40/675 Sprayed coating application off site

1. **Standard:** In accordance with [BS EN 16623](#).
2. **Uncoated areas of steel:**

Ss_40_90_40/680 Sprayed coating application on site

1. **Standard:** In accordance with [BS EN 16623](#).
2. **Uncoated areas of steel:**
3. **Spraydrift:** Minimize.
4. **Masking**
 - 4.1. **Requirement:** Protect designated adjacent surfaces.

4.2. Designated surfaces:

Ss_40_90_40/715 Applying top sealer coats

1. **Appearance:** Provide an even, solid, opaque appearance, free from runs, sags and other visual defects.

Ss_40_90_40/720 Completion of coatings applied off site

1. **Uncoated areas of steel:** Following erection of steelwork, apply intumescent coating locally.
2. **Unscheduled additional connections to erected steelwork:** Remove and reinstate intumescent coating locally.

System completion

Ss_40_90_40/800 Information to be provided on completion

1. **Submittals:** Operation and maintenance information.
Product certification.
Application documentation.
Thickness control results.
Certificate of Conformity.

Ss_40_90_40/895 Verification of performance

1. **Requirement:** Check completed system and provide assurance of compliance with specified performance.
2. **Submittals**
 - 2.1. **Content:** Description of inspections, remedial works carried out and certification of compliance.
 - 2.2. **Format:** Electronic submission
 - 2.3. **Timing:** At completion of coating work.

Ω End of System

Ss_30_12_85_16 Composite steel and concrete floors **UNCHANGED**

Systems

Ss_30_12_85_16 Composite steel and concrete floors

1. Description: All upper floors to Sports Block, Drama Block and Teaching Block, excluding roofs.
2. System performance: [Ss_30_12_85/205 Design submittals](#); [Ss_30_12_85/236 Design of permanent formwork systems](#)
3. Framing members: [Pr_20_76_51_12 Carbon steel beams, columns, channels and tees](#); [Pr_20_85_03_11 Carbon steel angle sections](#); [Pr_20_76_52_16 Carbon steel hot-finished hollow sections](#)
4. Permanent formwork
 - 4.1. Steel profiled sheet for composite floor slabs and beams: [Pr_25_71_51_89 Steel profiled sheet Comflor 60, 1.2mm gauge generally, or equally approved](#)
 - 4.2. Fixings for permanent formwork
 - 4.2.1. End support fixings: [Pr_20_29_76_76 Self-drilling screws](#); [Pr_20_29_56_78 Shot-fire nails](#)
 - 4.2.2. Side support fixings: [Pr_20_29_76_76 Self-drilling screws](#); [Pr_20_29_56_78 Shot-fire nails](#)
 - 4.2.3. Seam stitching fasteners: [Pr_20_29_76_76 Self-drilling screws](#)
5. Shear connectors: [Pr_35_90_15_37 Headed stud shear connectors](#)
6. Ancillary accessories to permanent formwork: [Pr_20_76_51_21 Cold-formed galvanized steel sections](#)
7. In situ Concrete: [Pr_20_31_16_21 Designated concrete RC32/40 140mm thick](#)
8. Reinforcement
 - 8.1. Type of reinforcement: [Pr_20_96_71_12 Carbon steel fabric reinforcement](#); [Pr_20_96_71_14 Carbon steel ribbed bar reinforcement](#)
 - 8.2. Reinforcement accessories: [Pr_20_96_71_66 Prefabricated continuity reinforcement strips](#)
9. Execution: [Ss_30_12_85/612 Execution of steel and composite structures](#); [Ss_30_12_85/640 Concrete supply on large pours](#); [Ss_30_12_85/744 Inspection levels](#); [Ss_30_12_85/752 Site testing of shear stud welding](#)
10. System completion: [Ss_30_12_85/830 Surface cracking of concrete](#); [Ss_30_12_85/845 Verification of performance](#)

System performance

Ss_30_12_85/205 Design submittals

1. Detailed design
 - 1.1. Requirement: The contractor or specialist steelwork fabricator is to fully design and detail the decking.

Provide calculations and drawings as required

Profile and thickness of metal decking, types, sizes, number and spacing of fixings, stiffening around openings.
 - 1.2. Design loads: Refer to BDP loading document
 - 1.3. Submittals: Drawings, schedules, technical information, calculations and manufacturers' literature as appropriate.
 - 1.4. Timing: Submit before preparing fabrication drawings.
 - 1.5. Format: Drawings and specification in BIM compliant format

Ss_30_12_85/236 Design of permanent formwork systems

1. Standard: To [BS 5975](#), [BS EN 12812](#) and [BS EN 13670](#).
2. Design class:

Products

See [Pr_20_29_56_78](#) Shot-fire nails in [Ss_20_10_75_35](#) Heavy steel framing systems

See [Pr_20_29_76_76](#) Self-drilling screws in [Ss_20_10_75_35](#) Heavy steel framing systems

See [Pr_20_31_16_21](#) Designated concrete RC32/40 in [Ss_20_05_15_70](#) Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See [Pr_20_76_51_12](#) Carbon steel beams, columns, channels and tees in [Ss_20_10_75_35](#) Heavy steel framing systems

Pr_20_76_51_21 Cold-formed galvanized steel sections

1. Description:
2. Manufacturer: Contractors choice
3. Primary components:
4. Ancillary components:
5. Material
 - 5.1. Standard: To [BS EN 10346](#).
 - 5.2. Designation:
 - 5.3. Thickness:
 - 5.4. Coating finish:
6. Surface quality:
7. Surface treatment:

See [Pr_20_76_52_16](#) Carbon steel hot-finished hollow sections in [Ss_20_10_75_35](#) Heavy steel framing systems

See [Pr_20_85_03_11](#) Carbon steel angle sections in [Ss_20_10_75_35](#) Heavy steel framing systems

See [Pr_20_96_71_12](#) Carbon steel fabric reinforcement in [Ss_20_05_15_70](#) Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See [Pr_20_96_71_14](#) Carbon steel ribbed bar reinforcement in [Ss_20_05_15_70](#) Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

Pr_20_96_71_66 Prefabricated continuity reinforcement strips

Shared by: [Ss_30_12_85_70](#) Reinforced Concrete Floor - Suspended Ground Floor Slab

1. Description: Kwikastrip OEA
2. Manufacturer: Contractors Choice
3. Requirement: A company holding a valid Technical Product Approval certificate issued by the UK Certification Authority for Reinforcing Steels ([CARES](#)) or equivalent.

See [Pr_25_71_51_89](#) Steel profiled sheet in [Ss_20_10_75_35](#) Heavy steel framing systems

See [Pr_35_90_15_37](#) Headed stud shear connectors in [Ss_20_10_75_35](#) Heavy steel framing systems

Execution

See [Pr_20_29_76/620](#) Fixing with screws in [Ss_20_10_75_35](#) Heavy steel framing systems

See [Pr_20_31_16/610 Mixing in fibres](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

See [Pr_20_31_16/630 Placing normal weight concrete generally](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

See [Pr_20_31_16/695 Temperature of concrete](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

See [Pr_20_31_16/712 Curing class](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

See [Pr_20_31_16/714 Curing generally](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

See [Pr_20_31_16/722 Early age thermal cracking](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

See [Pr_20_31_16/724 Plastic settlement](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

See [Pr_20_31_16/726 Broken cubes or cylinders from failed strength tests](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

See [Pr_20_31_16/728 Initial project testing of concrete](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

See [Pr_20_31_16/730 Project testing of concrete generally](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

See [Pr_20_31_16/732 Regular project testing of concrete](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

See [Pr_20_31_16/734 Site adjustments to specification](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

See [Pr_20_31_16/736 Testing laboratory](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

See [Pr_20_31_16/738 Test records](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

See [Pr_25_71_51/610 Installing profiled metal decking](#) in [Ss_20_10_75_35 Heavy steel framing systems](#)

See [Pr_35_90_15/610 Fixing headed stud shear connectors](#) in [Ss_20_10_75_35 Heavy steel framing systems](#)

Ss_30_12_85/612 Execution of steel and composite structures

1. Standard: To [BS EN 1090-2](#).
2. Execution class for steel structures:
3. Visual requirements:

Ss_30_12_85/640 Concrete supply on large pours

Shared by: [Ss_30_12_85_70 Reinforced Concrete Floor - Suspended Ground Floor Slab](#)

1. Large concrete pours: Submit to CA for approval a layout showing the position of proposed construction joints, if any; the sequence of construction; and a method statement on the arrangements to supply, handle and finish the intended area of pour.

Where elements are detailed to be cast in a single pour without joints, make prior arrangements for a back up supply of concrete.

2. **Number of joints:** Keep to the minimum necessary for the execution and progress of the work
3. **Forming joints:** Accurately to detail and in locations shown on the drawings. If not shown on drawings, submit proposal in advance of concreting, for approval by structural engineer
4. **Modifications:** If necessary, agree revisions to joint design or location with CA before proceeding
5. **Gaps or voids in formwork:** Do not allow concrete to enter or render movement joints ineffective
6. **Compressible joint filler materials:** Do not allow concrete to impregnate or penetrate

Ss_30_12_85/744 Inspection levels

Shared by: [Ss_30_12_85_70 Reinforced Concrete Floor - Suspended Ground Floor Slab](#)

1. Inspection level: To [BS EN 1990](#), IL2.

Ss_30_12_85/752 Site testing of shear stud welding

1. Standard: To [BS EN ISO 14555](#).
2. Acceptance requirements: *Final acceptance of welds in accordance with [BS EN 1090-2](#), section 12 and Annex A.*

System completion

Ss_30_12_85/830 Surface cracking of concrete

Shared by: [Ss_30_12_85_70 Reinforced Concrete Floor - Suspended Ground Floor Slab](#)

1. Method of measurement: Submit proposals
2. Crack width (maximum): Maximum crack width varies with use of concrete. Refer to BS EN 1992-1-1 table 7.1N for recommended limiting values. [NA to BS EN 1992-1-1:2004](#), Table NA.4 confirms values acceptable in the UK.
Absolute maximum 0.3mm
3. Cracks wider than maximum permissible crack width: *Survey frequency, location, width and extent of cracks. Submitted report to include findings and recommendations for rectification.*

Ss_30_12_85/845 Verification of performance

1. Requirement: *Check completed system and provide assurance of compliance with specified performance.*
2. Submittals
 - 2.1. Format: certificate of compliance
 - 2.2. Timing: at completion of installation

Ω End of System

Ss_30_12_85_70

Reinforced Concrete Floor - Suspended Ground Floor Slab

UNCHANGED

Systems

Ss_30_12_85_70 Reinforced Concrete Floor - Suspended Ground Floor Slab

1. Description:
2. System performance: [Ss_30_12_85/240 Drawings and reinforcement schedules for reinforced concrete construction](#); [Ss_30_12_85/250 Reinforcement detailing](#); [Ss_30_12_85/260 Abrasion resistance of concrete wearing surfaces](#); [Ss_30_12_85/265 Slip resistance of wearing surfaces](#); [Ss_30_12_85/294 Surface regularity of concrete floors](#); Surface regularity of vehicular concrete floors; Design of concrete decking systems; [Ss_30_12_85/215 Structural design supervision and checking](#); [Ss_30_12_85/236 Design of permanent formwork systems Type A](#); [Ss_20_10_75/616 Accuracy and Tolerances of construction Type A](#); [Ss_30_12_85/296 Surface regularity of vehicular concrete floors](#)
3. Blinding: [Pr_15_31_26_36 Hardcore](#)
4. Underlay
 - 4.1. Type of underlay:
 - 4.2. Underlay accessories:
5. Sub-floor insulation:
 - 5.1. Proprietary Underslab Insulation: Refer to manufacturer information, reference and locations to architects specification
 - 5.2. Underslab Polythene damp proof membrane: Manufacturer and reference: to be agreed
Thickness: minimum 2000g
Sheets; lay on blinding before placing structural concrete
Joints: Seal all joints with tape recommended by manufacturer
Protection: adequately protect membrane from puncturing or damage. Ensure membrane is protected by minimum 6mm Servipak board or similar approved before fixing slab reinforcement
6. Permanent formwork
 - 6.1. Type of permanent formwork: [Pr_25_71_29_16 Compressible board substructure formwork](#)
 - 6.2. Execution: [Pr_25_71_29/605 Installing permanent formwork](#); [Ss_20_05_15/630 Installing substructure formwork](#)
 - 6.3. Sustainability of timber, including formwork: [Ac_05_50_91/340 Timber sourcing](#)
 - 6.4. Inserts Holes and Chases: Positions and details:
 - Dimensioned on drawings provided on behalf of the Employer: Do not change without consent.
 - Undimensioned or from other sources: Submit proposals.
 - Positioning relative to reinforcement: Give notice of any conflicts well in advance of placing concrete.
 - Method of forming: Fix inserts or box out as required. Do not cut hardened concrete without approval.
 - 6.5. Form Ties: Metal associated with form ties/ devices: Prohibited within cover to reinforcement. Compatible with reinforcement metal.
 - 6.6. Surface Retarders: • Use: Obtain approval.
 - Reinforcement: Prevent contact with retarder.
 - 6.7. Striking: Timing: Prevent any disturbance, damage or overloading of the permanent structure.

General: 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:

For an Average mean of daily minimum and maximum air temperatures during the period: 3°C

Vertical formwork to:
columns, walls and beams 1 day
Soffit forms to slabs 8 days
Props to slabs and soffit forms to beams 20 days
Props to beams 28 days

For an Average mean of daily minimum and maximum air temperatures during the period: 7°C

Vertical formwork to:
columns, walls and beams 3/4 day
Soffit forms to slabs 6 days
Props to slabs and soffit forms to beams 15 days
Props to beams 21 days

For an Average mean of daily minimum and maximum air temperatures during the period: 16°C

Vertical formwork to:
columns, walls and beams ½ day
Soffit forms to slabs 4 days
Props to slabs and soffit forms to beams 10 days
Props to beams 14 days

• Other mixes: Submit details of proposed periods for mixes using admixtures or other types of cement.

7. Concrete: [Pr_20_31_16_21 Designated concrete RC32/40](#)

8. Reinforcement

8.1. Type of reinforcement:

[Pr_20_96_71_14 Carbon steel ribbed bar reinforcement](#)

8.2. Reinforcement accessories: [Pr_20_96_71_15 Carbon steel post-installed starter bars](#);
[Pr_20_96_71_66 Prefabricated continuity reinforcement strips](#)

9. Designed joints

9.1. Joints in Forms: Requirements including joints in form linings and between forms and completed work:

- Prevent loss of grout, using seals where necessary.
- Prevent formation of steps. Secure formwork tight against adjacent concrete.

9.2. Joint type: Movement joint.

9.3. Joint fillers:

9.4. Joint sealant:

9.5. Joint accessories:

[Pr_20_29_23_11 Carbon steel dowel bars](#); [Pr_30_31_76_16 Construction joint sealants](#);
[Pr_35_90_15_86 Synthetic elastomer hydrophilic waterstops](#); [Pr_35_90_15_85 Surface-mounted polyvinyl chloride \(PVC\) flexible waterstops](#); [Pr_35_90_15_74 Rubber hydrophilic waterstops](#);
[Pr_35_31_66_21 Debonding compounds](#); [Pr_20_96_71_14 Carbon steel ribbed bar reinforcement](#);
[Pr_20_96_71_12 Carbon steel fabric reinforcement](#)

9.6. Execution:

[Ss_20_05_15/740 Preparation of construction joints](#)
[Ss_30_12_85/676 Formed joints in concrete wearing surfaces](#)
[Ss_20_05_15/720 Forming construction and movement joints in concrete generally](#)
[Ss_30_12_85/666 Forming expansion joints in concrete slabs](#)
[Ss_30_12_85/670 Forming tied longitudinal construction joints](#)

[Ss_30_12_85/672 Forming sawn grooves](#)

[Ss_30_12_85/674 Forming contraction joints with wet-formed groove; Ss_30_12_85/840](#)

[Inspection of tied and partially tied joints; Ss_30_12_85/640 Concrete supply on large pours](#)

10. Accessories cast into concrete

10.1. Structural accessories cast into concrete:

[Pr_20_85_84_11 Carbon steel cast-in channels](#)

10.2. Non-structural accessories cast into concrete:

11. System accessories: [Pr_35_31_77_15 Concrete surface sealers](#)

12. Samples required: [Ss_30_12_85/305 Control samples - Concrete Finishes](#)

13. Execution:

[Ss_30_12_85/640 Concrete supply on large pours; Ss_30_12_85/610 Execution of concrete structures; Ss_30_12_85/670 Forming tied longitudinal construction joints; Ss_30_12_85/672 Forming sawn grooves; Ss_30_12_85/622 Inspection of surfaces to receive concrete; Ss_30_12_85/744 Inspection levels; Ss_30_12_85/620 Preparation of surfaces to receive concrete; Ss_30_12_85/711 Formed finishes in concrete FINE SMOOTH FINISH](#)

14. System completion: [Ss_30_12_85/820 Post-completion structural testing of concrete structures; Ss_30_12_85/850 Testing of slip resistance; Ss_30_12_85/830 Surface cracking of concrete; Ss_30_12_85/840 Inspection of tied and partially tied joints](#)

System performance

Ss_30_12_85/215 Structural design supervision and checking

1. Required level of design supervision: In accordance with [BS EN 1990](#), DSL 2.

Ss_30_12_85/236 Design of permanent formwork systems Type A

1. Standard: To [BS 5975](#), [BS EN 12812](#) and [BS EN 13670](#).
2. Design class:

Ss_30_12_85/240 Drawings and reinforcement schedules for reinforced concrete construction

1. Building component designations:
2. Reinforcement schedules:
3. Reinforcement drawings:

Ss_30_12_85/250 Reinforcement detailing

1. Detailing information
 - 1.1. Reinforcement for crack control:
 - 1.2. Order of priority when clashes occur:

Ss_30_12_85/260 Abrasion resistance of concrete wearing surfaces

1. Abrasion resistance class:

Ss_30_12_85/265 Slip resistance of wearing surfaces

1. Standard:
2. Pendulum test value (minimum):

Ss_30_12_85/294 Surface regularity of concrete floors

1. Standard:

2. Measurement of surface regularity of floors:
3. Tolerances in surface regularity of floors
 - 3.1. Surface regularity class:
 - 3.2. Location of surface regularity class:
4. Abrupt changes (maximum):

Ss_30_12_85/296 Surface regularity of vehicular concrete floors

1. Measurement of surface regularity of floors:
2. Tolerances in surface regularity of floors
 - 2.1. Surface regularity class:
 - 2.2. Location of surface regularity class:

Products

Ac_05_50_91/340 Timber sourcing

1. **Description:** All timber and wood products used in structural and non structural elements will be from sustainable sources and will be legally sourced
2. **Timber source**
 - 2.1. **General requirements:** Obtain from well managed forests and/ or plantations.
 - 2.2. **Suppliers Statement:** all suppliers must provide and sign the following statement:
 - I confirm that none of the timber species used within this development are identified on the CITES list, appendices I, II, III
OR
 - I confirm that none of the timber species used within this development are identified on the CITES list, appendices I, II, and where a timber species used in the development is listed in appendix III of the CITES list, i confirm that it has not been or will not be sourced from the country seeking to protect this species as listed in appendix III
 - 2.3. **Documentation to be submitted:** Collect all chain of custody documentation from suppliers. The documentation must demonstrate independent certification of responsible forest management in accordance with the principles and criteria of the certification schemes. There must be a clear certificate number that refers to the chain of custody. This documentation must be handed over to the developer or their representative prior to commencement of construction.
3. **Certification scheme:** All suppliers must provide timber with at least one of the following certifications:
 - Canadian Standards Association CSA
 - Grown in Britain GiB
 - Forest Stewardship Council Certification Scheme FSC
 - Malaysian Timber Certification Council MTCC
 - Programme for the endorsement of forestry certification PEFC
 - Sustainable Forestry Initiative SFI
 - In accordance with the UK government timber procurement policyNo other certification schemes are acceptable.
All suppliers must provide letters of intent conforming that full chain of custody requirements can be met for all elements they are supplying
4. **Other evidence:**
5. **Timing of submissions:**

Pr_15_31_26/310 Fill materials generally

1. **Supplied by:** Contractors choice
2. **Proposed fill materials**

- 2.1. **Documentation:** Type and source of imported fill. Proposals for processing and reuse of material excavated on site. Test reports to demonstrate acceptability of fill materials.
- 2.2. **Submission of test reports:**
3. **Prohibited materials**
 - 3.1. **Prohibited materials generally:** Do not use 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.
 - 3.2. **Specific prohibited materials:** Materials which are frozen or containing ice. Contaminated or noxious materials. Materials susceptible to spontaneous combustion. Materials which are likely to erode or cause voids. Materials with excessive moisture content, slurry, mud or from marshes or bogs. Materials with a clay of liquid limit exceeding 80 and/ or plasticity index exceeding 55. Incompletely burnt colliery shale.
4. **Permitted sulfate content**
 - 4.1. **Water soluble sulfate (maximum):** 1500 mg/L in 2:1 water/ soil extract.
 - 4.2. **Total potential sulfate (maximum):** 0.6%.
 - 4.3. **Oxidizable sulfides (maximum):** 0.3% of total potential sulfate.
5. **Frost susceptible materials**
 - 5.1. **Requirement:** Fill materials shall be non frost-susceptible as defined in [MCHW Volume 1: Specification for highway works \(SHW\)](#), clause 801.8.
 - 5.2. **Designated materials:** Fine grained soil with a plasticity index of less than 20%.
 - 5.3. **Test reports confirming designated materials are non frost-susceptible:** Submit.
 - 5.4. **Permitted location of frost-susceptible fill materials:** 450 mm minimum below finished ground surface.

Pr_15_31_26_36 Hardcore

1. **Description:**
2. **General requirements:** [Pr_15_31_26/310 Fill materials generally](#)
3. **Supplied by:**
4. **Fill:** Granular material, free from excessive dust, well graded, all pieces less than 75 mm in any direction, minimum 10% fines value of 50 kN when tested in a soaked condition to [BS 812-111](#).
5. **Permitted materials in any one layer:** Crushed rock (other than argillaceous rock) or quarry waste with not more binding material than is required to help hold the stone together. Crushed concrete, crushed brick or tile, free from plaster, timber and metal. Crushed non-expansive slag.
6. **Execution:** Testing of suitability of fill materials

Pr_20_29_23_11 Carbon steel dowel bars

1. **Description:** to BS EN 10025-2
2. **Supplied by:** Submit proposals
3. **Product form:** Submit proposals
4. **Strength grade:** To [BS 4482](#), Grade 500.
5. **Debonding:** achieve effective debonding of each bar.
material: submit proposals
extent: submit proposals
6. **Certification:** Provide European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP).
7. **Condition:** Free from corrosive pitting, loose millscale, loose rust and contaminants which may adversely affect the bond to concrete or debonding material. Perfectly straight, with sawn (not sheared) ends. Placed at right angles to and centred on joint
8. **Finish:** Hot dip galvanized to [BS EN ISO 1461](#).

See [Pr_20_31_16_21](#) Designated concrete RC32/40 in [Ss_20_05_15_70](#) Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

Pr_20_85_84_11 Carbon steel cast-in channels

1. Description:
2. Manufacturer:
3. Material
 - 3.1. Standard: To [BS EN 10025-2](#).
 - 3.2. Designation:
 - 3.3. Finish:
4. Anchors:
5. Bolts
 - 5.1. Format: T-head.
 - 5.2. Steel grade:
 - 5.3. Thread diameter:
6. Masonry ties: Required.

See [Pr_20_96_71_12](#) Carbon steel fabric reinforcement in [Ss_20_05_15_70](#) Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See [Pr_20_96_71_14](#) Carbon steel ribbed bar reinforcement in [Ss_20_05_15_70](#) Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See [Pr_20_96_71_15](#) Carbon steel post-installed starter bars in [Ss_20_05_15_70](#) Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See [Pr_20_96_71_66](#) Prefabricated continuity reinforcement strips in [Ss_30_12_85_16](#) Composite steel and concrete floors

Pr_25_71_29_16 Compressible board substructure formwork

1. Description: HEAVE PROTECTION MEASURES TO UNDERSIDE OF SLAB, AS SHOWN ON GAS
2. Manufacturer: Cordek Ltd
3. Product Reference: Cellcore HX S
4. Third-party certification: BBA Agreement Certificate: 11/4862
5. Thickness: 160 mm
6. Grade: 09/13
7. Standards: NHBC Technical Standards
8. Recycled content (minimum): 25% to [BS EN ISO 14021](#).
9. Execution: [Pr_25_71_29/625](#) Installing substructure formwork

Pr_30_31_76_16 Construction joint sealants

1. Description:
2. Manufacturer: Submit proposals
3. Standard: To [BS EN ISO 11600](#).
4. Third party certification: Third party accredited by UKAS
5. Material: Submit proposals
6. Execution: [Pr_30_31_76/630](#) Applying joint sealants; [Pr_30_31_76/620](#) Joint preparation for sealant application; [Pr_30_31_76/610](#) Suitability of joints for sealant application

Pr_35_31_66_21 Debonding compounds

1. Description:
2. Manufacturer: Submit Proposals
3. Material: Submit Proposals
4. Execution: [Pr_35_31_66/610 Applying debonding compound to dowel bars](#)

Pr_35_31_77_15 Concrete surface sealers

1. Manufacturer: Contractors choice
2. Substrate: Moisture content: as recommended by sealer manufacturer. Test relative humidity to BS 8203, Annex A where required to verify suitability

Condition prior to application: cured, clean and free from contaminants

3. Primer: Refer to manufacturers recommendations
4. Application: Evenly to dry surfaces to form an effective seal but without a glossy finish
5. Colour: Clear.

Pr_35_90_15_74 Rubber hydrophilic waterstops

1. Description:
2. Manufacturer: Submit Proposals
3. Certification: Provide European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP).
4. Cross section: Submit product proposals
5. Execution: [Pr_35_90_15/620 Installing hydrophilic waterstops](#)

Pr_35_90_15_85 Surface-mounted polyvinyl chloride (PVC) flexible waterstops

1. Description:
2. Manufacturer: Submit proposals
3. Certification: *Provide European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP).*
4. Junctions and angles: Factory formed junction pieces
5. Width: Submit product proposals
6. Execution: [Pr_35_90_15/630 Installing surface mounted waterstops](#)

Pr_35_90_15_86 Synthetic elastomer hydrophilic waterstops

1. Description:
2. Manufacturer: Submit proposals
3. Certification: *Provide European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP).*
4. Dimensions: Submit product proposals
5. Execution: [Pr_35_90_15/620 Installing hydrophilic waterstops](#)

Ss_30_12_85/305 Control samples - Concrete Finishes

1. Samples: Sample areas that are part of finished work: size 8m².
Location: to be agreed
Approval of appearance: Obtain before proceeding with remainder of the work

Execution

See Pr_20_31_16/610 Mixing in fibres in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/630 Placing normal weight concrete generally in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/695 Temperature of concrete in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/712 Curing class in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/714 Curing generally in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/722 Early age thermal cracking in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/724 Plastic settlement in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/726 Broken cubes or cylinders from failed strength tests in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/728 Initial project testing of concrete in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/730 Project testing of concrete generally in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/732 Regular project testing of concrete in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/734 Site adjustments to specification in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/736 Testing laboratory in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/738 Test records in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_96_71/660 Installing starter bars in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

Pr_25_71_29/605 Installing permanent formwork

1. Installing formwork: Fix accurately and robustly to produce finished profile in the required positions.

Pr_25_71_29/625 Installing substructure formwork

1. General requirements:
2. Edges of substructure formwork: Cut edges neatly and accurately around penetrations and downstands.
3. Laying substructure formwork
 - 3.1. Vertical faces: Stiffen as necessary to act as shutter.
 - 3.2. Protection : Prevent indentation by spacers and other items.
 - 3.3. Joints: Butt edges tightly. Seal joints to prevent penetration of concrete.
 - 3.4. Support: Fully support on firm even substrate. Restrain against movement.

Pr_30_31_76/610 Suitability of joints for sealant application

1. Joint dimensions: Within limits specified for the sealant.
2. Substrate quality: Surfaces regular, undamaged and stable.
3. Joints not fit to receive sealant: Submit proposals for rectification.

Pr_30_31_76/620 Joint preparation for sealant application

1. Surfaces to which sealant must adhere: Remove temporary coatings, tapes, loosely adhering material, dust, oil, grease, surface water and contaminants that may affect bond.
2. Cleaning: Use materials and methods recommended by sealant manufacturer.
3. Vulnerable surfaces adjacent to joints:

Pr_30_31_76/630 Applying joint sealants

1. Substrate:
2. Environmental conditions: Do not dry or raise temperature of joints by heating.
3. Sealant application: Completely and neatly fill joints. Provide firm adhesion to substrates.
4. Sealant profiles
 - 4.1. Butt and lap joints: Slightly concave.
 - 4.2. Fillet joints:
5. Protection: Do not contaminate or damage finished joints.

Pr_35_31_66/610 Applying debonding compound to dowel bars

1. Preparation: Ensure that surfaces of concrete to which debonding compound is to be applied are clean, dry and free from dust or other matter.
2. Extent of debonding compound:

Pr_35_90_15/620 Installing hydrophilic waterstops

1. Condition of concrete surface at time of fixing: Clean and free from ponded or running water.
2. Position: As detailed
3. Method of fixing: Bonded using an adhesive approved by waterstop manufacturer

prevent wetting of exposed sections of waterstop

Pr_35_90_15/630 Installing surface mounted waterstops

1. Condition of concrete surface at time of fixing: Clean and free from ponded or running water, oil, grease and other chemical agents. The surface should be even and free from projections or indentations.

See [Ss_20_05_15/630 Installing substructure formwork](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

Ss_20_05_15/720 Forming construction and movement joints in concrete generally

1. Accuracy: Position and form joints accurately, straight, well-aligned and truly vertical or horizontal or parallel with setting out lines of the building.
2. Position
 - 2.1. Location: Submit to CA for approval a layout of proposed location of construction joints and sequence of pours.
 - 2.2. Modifications to joint design or location:: Submit proposals
3. Placing concrete to form movement joints: Prevent concrete entering joints or penetrating or impregnating compressible joint fillers. Do not place concrete simultaneously on both sides of movement joints.

4. **Preparation of construction joints:** Roughening of joint surfaces, select from:
 - Brushing or spraying: remove surface laitance and expose aggregate finishes while concrete is still green
 - Other methods: submit proposalsCondition of joint surfaces immediately before placing fresh concrete: clean and damp
5. **Reinforcement::** Allow for and ensure that the already detailed reinforcement drawings are adjusted for any additional reinforcement requirements to deal with the proposed construction joints to the approval of the CA
6. **Construction joints made at end of working day:** Not permitted in watertight concrete
7. **Forms and stop ends for projecting continuity reinforcement:** Accommodate reinforcement without temporary bending or displacement.

Ss_20_05_15/740 Preparation of construction joints

1. **Joint surfaces:** Brushing and spraying: Remove surface laitance and expose aggregate finish while concrete is still green.

Other methods: submit proposals

2. **Condition of joint surfaces immediately before placing fresh concrete:** Clean and damp.

Ss_20_10_75/616 Accuracy and Tolerances of construction Type A

1. **Setting out:** To BS 5964-1.
Contractor to take responsibility for coordinating tolerances in order to ensure that all elements of construction fit together and comply with the dimensional requirements shown on the drawings.
2. **Accuracy of instruments:** To BS 5606, Annex A.
3. **Component shape and position:** To BS 5606. To the NSCS, section 10.
4. **Geometrical tolerances for concrete structures:** To BS EN 13670, tolerance class 1.
 - 4.1. **General requirement for formwork:** Accurately and robustly constructed to produce finished concrete in the required positions and to the required dimensions

Formed surfaces: free from twist and bow, other than any required cambers

Intersections, line and angles: square plumb and true
 - 4.2. **Permissible deviations::** In addition to the requirements of BS 5606 and NSCS, no member shall deviate from its design position in accordance with the following limits:
 - all setting out dimensions $\pm 6\text{mm}$
 - overall plan dimensions at ground level $\pm 25\text{mm}$
 - Dimensions between tops of floor slabs (storey heights) $\pm 20\text{mm}$
 - Dimension between top of ground slab and top of roof slab: $\pm 16\text{mm}$ up to 30m height with $\pm 8\text{mm}$ for each subsequent 30m
 - Deviation from vertical of columns and walls (storey height) $\pm 6\text{mm}$
 - Deviation from vertical of columns and walls from top of ground slab to top of roof slab $\pm 25\text{mm}$ up to 30m height with $\pm 6\text{mm}$ for each subsequent 12m of height, up to $\pm 65\text{mm}$
 - Slab edge position (+ve outwards): +5mm and -10mm
 - Undersides of foundations, bases... +5mm and -100mm
 - Top surfaces of foundations, bases... +5mm and -20mm
 - 4.3. **Levels of structural concrete floors:** Maximum tolerances for designed levels to be as follows:
 - Floors which are self finished, and floors to receive sheet or tile finishes directly bedded in adhesive: $\pm 10\text{mm}$
 - Floors to receive mastic asphalt flooring/underlays directly: $\pm 10\text{mm}$
 - Floors to receive mastic asphalt flooring/underlays laid on mastic asphalt levelling coat: $\pm 15\text{mm}$

- Floors to receive fully bonded screeds/toppings/beds: $\pm 15\text{mm}$
- Floors to receive unbonded or floating screeds/beds: $\pm 20\text{mm}$

4.4. **Concrete Tolerances:** Tolerances for finished concrete to be:

- Deviation from Vertical or Specified Batter

RC column and walls supporting
superstructure $\pm 6\text{ mm}$

Mass concrete piers and walls $\pm 40\text{ mm}$ but
 $\pm 10\text{ mm}$ in any 3 m

- Deviation from Level or Specified Gradient

RC floor beams, floors, slabs, etc $\pm 10\text{ mm}$ from datum but
 $\pm 3\text{ mm}$ under a 3 m

straight edge

Exposed lintels, cills, conspicuous
lines, plinths or seatings $\pm 6\text{ mm}$

- Deviation from Specified Alignment

RC columns and beams $\pm 6\text{ mm}$

RC walls $\pm 12\text{ mm}$ but

$\pm 6\text{ mm}$ in 3 m

- Variation in Cross-sectional Dimensions

RC columns $\pm 6\text{ mm}$

RC beams $\pm 3\text{ mm}$

RC slabs and walls up to 300 mm thick $\pm 5\text{ mm}$

RC slabs and walls over 300 mm thick $\pm 10\text{ mm}$

Mass concrete piers and walls $\pm 6\text{ mm}$

- Positional Tolerance

Position on plan of any point or face

in relation to the nearest building

grid line on the same level

Structural frame $\pm 10\text{ mm}$

Foundations $\pm 35\text{ mm}$

Deviation in size of openings $\pm 6\text{ mm}$

Deviation in position of embedded

fixtures (other than reinforcement

and HD fixings for Structural Steelwork) $\pm 6\text{ mm}$

- Space between Elements

Faces of adjacent columns and

faces of adjacent walls $\pm 10\text{ mm}$

- Stair Tolerances

In a flight total rise $\pm 12\text{ mm}$

total going $\pm 12\text{ mm}$

In consecutive steps rise $\pm 3\text{ mm}$

going $\pm 6\text{ mm}$

- Lift Shafts

Deviation of walls from vertical $\pm 20\text{ mm}$

Internal size at any place $\pm 30\text{ mm}$

• The stated tolerances are to be applied in isolation and are not to be combined. Note that the maximum permitted deviations will only be acceptable in isolated cases. Normally no more than 1 in 5 measurements would be expected to deviate by more than half the maximum permitted deviation. If a larger proportion of deviations is found to lie between 50% and 100% of the maximum permitted values, it will indicate that the work is below the specified standard and is not acceptable under the contract without remedy.

5. **Geometrical tolerances for steel structures:** To [BS EN 1090-2](#), Annex B, class 1.

5.1. **Positioning and levelling the steelwork::** Contractor to take responsibility

5.2. **Permissible deviations::** In addition to the requirements of BS EN 1993 and NSSF, comply with the following:

- the level of the underside of a column base plate is not to deviate from the specified level by more than 5mm
- the space beneath a base plate is not to be less than 10mm and not more than 40mm
- the deviation of a column at any level is not to exceed the greater of 5mm or 1/600 of the column height over the actual position of the column at ground floor level
- Members other than columns are not to deviate from the specified position on plan relative to the columns to which they are connected by more than 5mm
- The level of the top of the steelwork at any level is to be within 10mm of the specified level
- The difference in levels between two or more beams meeting at a columns is to be less than 5mm, unless noted otherwise on drawings
- gaps in joints that depend on contact bearing after alignment are not to exceed 1mm.
- The maximum permitted deviation from a square as measured from a point 50mm from any corner shall be ± 1.5 degrees.

6. Geometrical tolerances for timber structures: To BS 5606

Ss_30_12_85/610 Execution of concrete structures

1. Standard: To [BS EN 13670](#). To the [NSCS](#), section 4.
2. Execution class for concrete structures:

Ss_30_12_85/620 Preparation of surfaces to receive concrete

1. Preparation of services to receive concrete generally
 - 1.1. [Cleaning of formwork](#): Ensure that formwork or other surfaces are clean of debris, tying wire clippings, fastenings and free water.
 - 1.2. [Timing of cleaning of formwork](#): Immediately before placing concrete.
2. [Casting concrete against construction joints](#): To prepare hardened surface, remove surface laitance and expose aggregate by lightly brushing and spraying. Curing compounds are not permitted on the faces of construction joints. Clean and dampen immediately before placing fresh concrete.
3. [Placing in situ concrete toppings on precast concrete](#)
 - 3.1. [Preparation](#): To prepare precast surface, thoroughly clean and wet surfaces of the precast concrete floor units with which concrete topping will come into contact.
 - 3.2. [Thickness of in situ concrete topping \(minimum\)](#): As specified on drawings
4. [Casting on prepared substrate or steeply sloping surfaces](#): Prevent water loss.
5. [Casting concrete against steel](#): To prepare steel to receive concrete, remove loose material, rust, scale and paint, debris, tying wire clippings, rebound from previously placed sprayed concrete and other matter that could adversely affect bond with the concrete.
6. [Casting against existing construction](#): Isolate new construction from existing. Submit method proposals for approval if not shown on drawings

Ss_30_12_85/622 Inspection of surfaces to receive concrete

1. Inspections
 - 1.1. [Period of notice \(minimum\)](#): Give notice to allow inspections of reinforcement and surfaces before each pour of concrete:
Period of notice: Obtain instructions
 - 1.2. [Timing of inspections](#): To be agreed

See [Ss_30_12_85/640 Concrete supply on large pours](#) in [Ss_30_12_85_16 Composite steel and concrete floors](#)

Ss_30_12_85/666 Forming expansion joints in concrete slabs

1. Depth:
2. Holes for dowel bars:

3. Completion:

Ss_30_12_85/670 Forming tied longitudinal construction joints

1. Standard: To [Concrete Society Technical Report 28](#).
2. Formed groove
 - 2.1. Dimensions (minimum width x depth):
 - 2.2. Preparation:
 - 2.3. Method:
3. Completion:

Ss_30_12_85/672 Forming sawn grooves

1. **Sawing:** Sufficiently early to prevent random cracking (within 24 hours or casting slab) and to produce strong, well defined arises
2. **Groove filling:** Sheet joint filler and sealant
Manufacturer: contractors choice

Joints finished with sealant: leave sufficient space for sealant by using temporary formers

3. Groove dimensions
 - 3.1. Sawn groove
 - 3.1.1. Depth: Not less than one quarter of the depth of slab
 - 3.1.2. Width (minimum): as narrow as practicable. Refer to drawings

Ss_30_12_85/674 Forming contraction joints with wet-formed groove

1. Standard: To [Concrete Society Technical Report 28](#).
2. Wet formed groove
 - 2.1. Timing:
 - 2.2. Groove depth:
3. Joint spacing:
4. Completion:

Ss_30_12_85/676 Formed joints in concrete wearing surfaces

1. Temporary forms: Square edged with a steel top surface.
2. Placing concrete: Thoroughly compact at edges to give level, closely abutted joints with no lipping.
3. Forms/ stop ends generally: Rigid and grout tight
4. Forms/ stop ends for projecting continuity reinforcement: To accomodate bars or fabric without temporary bending or displacement

Ss_30_12_85/711 Formed finishes in concrete FINE SMOOTH FINISH

Shared by: [Pr_25_30_90_15 Concrete stair flight and landing units](#)

1. **Formed finish:** For areas of concrete exposed and aesthetically important: Provide a surface quality and type in accordance with Class 1, Type B of BS 8110-1 clauses 6.2.7.2 and 6.2.7.3 respectively. Reference should also be made to National Structural Concrete Specification section 4.6 and to National Reference Panels.
 - Finish: Smooth and even. Panels to be as large as is practicable and arranged in a regular pattern as a feature of the surface, using an impervious sheet material (eg resin faced plywood or steel) unless where specified in clause E20/120 above. Boards to be new on first use and re-used in line with manufacturer's recommendations.
 - Soffit formwork layout to Architect's requirements, without change in panel orientation throughout the building.

- All nails are to be uniformly arranged and equally spaced.
- Columns: In addition to that below, columns are to be totally free of any visible shutter marks, other abrupt irregularities or colour variations.
- Permissible deviation of surfaces:
 - Sudden irregularities (maximum): 3 mm.
 - Gradual irregularities when measured from the underside of a 1 m straightedge, placed anywhere on surface (maximum): 3 mm.
- Variations in colour:
 - Permitted: Those caused by impermeable form linings.
 - Not permitted: Discoloration caused by:
 - Contamination or grout leakage.
 - Replacement of formwork panels.
- Cover spacers: Submit proposals appropriate to visually exposed finish.
- Surface blemishes:
 - Permitted: Blowholes less than 2 mm in diameter and at a frequency limited to a maximum of 20 no. blowholes of 1 mm or less and 2 no. blowholes of 1 mm to 2 mm in any 300 mm x 300 mm area. It is anticipated that this level of finish may be achieved using a correctly proportioned in conjunction with suitable formwork.
 - Not permitted: Voids, honeycombing, segregation and other defects.
- Making good:
 - Remove projecting fins and rub down with a carborundum stone, but otherwise finish to be left as struck.
 - Making good will not normally be permitted.
- Formwork tie holes: In a regular and approved pattern and filled with matching mortar

See [Ss_30_12_85/744 Inspection levels](#) in [Ss_30_12_85_16 Composite steel and concrete floors](#)

System completion

Ss_30_12_85/820 Post-completion structural testing of concrete structures

1. Test required
 - 1.1. Load tests:
 - 1.2. Core tests:
 - 1.3. Ultrasonic pulse velocity tests:
 - 1.4. Gamma ray tests:
 - 1.5. Rebound hammer tests:
 - 1.6. In situ early age strength test of concrete:
2. Timing:
3. Test report
 - 3.1. Content of report:
 - 3.2. Submission:

See [Ss_30_12_85/830 Surface cracking of concrete](#) in [Ss_30_12_85_16 Composite steel and concrete floors](#)

Ss_30_12_85/840 Inspection of tied and partially tied joints

1. Purpose: To determine whether shrinkage is concentrated at occasional joints
joints that have opened significantly more than the average: submit proposals for grouting
2. Timing: at intervals from one month after casting of slab for duration of works

Ss_30_12_85/850 Testing of slip resistance

1. Standard:
2. Method:

3. Test results:
4. Timing:

Ω End of System

Ss_35_10_85_65

Precast concrete stair or ramp systems **UNCHANGED**

Systems

Ss_35_10_85_65 Precast concrete stair or ramp systems

1. Description: All stair and steps are to be precast concrete
2. System performance: [Ss_35_10_85/205 Design submittals](#); [Ss_35_10_85/220 Design of stair and ramp systems generally](#)
3. System manufacturer: Contractors Choice
4. Precast concrete unit: [Pr_25_30_90_15 Concrete stair flight and landing units](#); [Pr_25_30_90_18 Concrete step units](#)
5. Continuity reinforcement: [Pr_20_96_71_14 Carbon steel ribbed bar reinforcement](#)
6. System accessories: [Pr_20_85_84_13 Carbon steel lateral restraint straps](#); [Pr_20_29_03_77 Socket anchors](#)
7. Grouting: Mix 1:6 cement:sharp sand (1:4 if soft sand or in wet weather)
Preparation: thoroughly clean and wet surfaces
Fill all joints and surface irregularities
8. Execution: [Ss_35_10_85/612 Execution of steel and composite stair or ramp systems](#); [Ss_35_10_85/796 Site testing of anchors to concrete and masonry](#); [Ss_20_10_75/616 Accuracy and Tolerances of construction](#)

System performance

Ss_35_10_85/205 Design submittals

1. Detailed design
 - 1.1. Requirement: Carry out precast stair and landing design. The stairs are proposed to be precast concrete elements acceptable to the architect. Allow for bearing and tie details to be aesthetically acceptable to the Architect.
 - 1.2. Purpose: To demonstrate compliance with performance requirements
 - 1.3. Design loads: Refer to BDP loading document. Generally allow for an imposed load of 4kN/m2 plus dead weight of architectural finishes.
 - 1.4. Submittals: Drawings, schedules, technical information, calculations and manufacturers' literature as appropriate.

Submit method statement and risk assessment for installation

Submit programme in advance of construction
 - 1.5. Timing: 2 weeks before commencing fabrication for approval
 - 1.6. Format: Drawings, calculations and specifications in BIM compliant format

Ss_35_10_85/220 Design of stair and ramp systems generally

1. Design for accidental loading: To [BS EN 1991-1-7](#), Table A.1, consequence class 2a.

Products

Pr_20_29_03_77 Socket anchors

1. Manufacturer: Contractors choice
2. Certification: Where a European Assessment Document (EAD) or European Technical Assessment Guideline (ETAG) is available, provide a European Technical Assessment (ETA) with CE marking and a

Declaration of Performance (DoP). Otherwise provide third party certification by a [United Kingdom Accreditation Service](#) (UKAS)-approved independent laboratory.

3. Material: Carbon steel property class 8.8 to [BS EN ISO 898-1](#).
4. Finish: submit proposals
5. Safe working load (minimum): submit proposals
6. Anchor length: submit proposals
7. Thread diameter: submit proposals
8. End type: submit proposals
9. Threaded inserts: submit proposals
10. Execution: [Pr_20_29_03/610 Fixing with anchors](#)

Pr_20_85_84_13 Carbon steel lateral restraint straps

1. Description:
2. Manufacturer: Contractors Choice
3. Standard: To [BS EN 845-1](#).
4. Certification: Where a European Assessment Document (EAD) or European Technical Assessment Guideline (ETAG) is available, provide a European Technical Assessment (ETA) with CE marking and a Declaration of Performance (DoP). Otherwise provide third party certification by a [United Kingdom Accreditation Service](#) (UKAS)-approved independent laboratory.
5. Form of lateral restraint strap:
6. Corrosion protection: Hot dip galvanized to [BS EN ISO 1461](#).
7. Dimensions
 - 7.1. Length: submit proposals
 - 7.2. Cross section: 30 x 5 mm.
8. Execution: [Pr_20_85_84/720 Installing lateral restraint straps](#)

See [Pr_20_96_71_14 Carbon steel ribbed bar reinforcement](#) in [Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits](#)

Pr_25_30_90_15 Concrete stair flight and landing units

1. Manufacturer: Contractors choice
2. Standard: To [BS EN 14843](#).
3. Stair and landing unit configuration: Refer to architectural drawings
4. Stair and landing unit finishes:: Refer to architectural drawings.
To top :
[Ss_20_05_15/668 Finishes in concrete Trowelled Finish](#)
To soffit and sides:
[Ss_30_12_85/711 Formed finishes in concrete FINE SMOOTH FINISH](#)
5. Storage: clear of ground on level bearers correctly positioned
6. Lifting: at designed lifting points, using special lifting devices and cradles as necessary
7. Bearings: Set on level bearings ensuring not less than the minimum seating recommended by manufacturers
8. Openings, sinkings and junctions with walls: form in accordance with precast units manufacturers recommendations
9. Cutting/Drilling: Do not cut or drill units except as recommended and agreed by manufacturer and engineer
10. Cast-in accessories
 - 10.1. Type:
 - 10.2. Position:

Pr_25_30_90_18 Concrete step units

1. Manufacturer: Contractors Choice
2. Standards: To [BS EN 14843](#).
3. Step unit configuration: Refer to architectural information

Execution

Pr_20_29_03/610 Fixing with anchors

1. Preparation: Protect threaded length from damage. Drill pilot hole, and prepare for insertion of anchor. Place washers, packings, ferrules as required.
2. Initial fix: Tighten sufficiently to hold unloaded components – check line and level of components before final tightening.
3. Final fix: Tighten nuts to hold components in final position when fully loaded.
4. Torque: submit proposals
5. Finishing: Apply locking nut. Fix plastic caps. Crop threaded end to specified height above nut. Fit split pins to secure castellated nut.
6. Inspection: Inspection of the installation of mechanical fixings by appropriately qualified personnel required and to be recorded in accordance with agreed protocol.

Pr_20_85_84/720 Installing lateral restraint straps

1. Centres (maximum): 1250 mm centres to abutting external cavity walls.
2. Fixing lateral restraint straps to masonry.: Ensure that cranked end is in tight contact with cavity face of wall inner leaf and pointing downwards.
3. Fixing lateral restraint straps to timber members.: Fix noggings and packs tightly beneath straps. Fix straps to at least three joists.
4. Fixing lateral restraint straps to precast concrete floor or roof decks: Grout cranked end into floor or roof deck joint. Screw strap to precast concrete flooring.
5. Interruption of lateral support: Submit proposals and method statement
6. Size of noggings and packs: Not less than three quarters of joist/ rafter/ tie depth and not less than 38 mm thick.
7. Notching of joists: Notch joists so that straps fit flush with surface. Do not notch rafters or ties.
8. Fixings for lateral restraint straps (minimum): 4 no. wood screws per strap evenly spread.

Ss_20_05_15/668 Finishes in concrete Trowelled Finish

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

Protection: protect surface from construction traffic until flooring material is laid

Unsuitable concrete surface: make good with smoothing compound and bear all costs

See [Ss_20_10_75/616 Accuracy and Tolerances of construction](#) in [Ss_20_10_75_35 Heavy steel framing systems](#)

See [Ss_30_12_85/711 Formed finishes in concrete FINE SMOOTH FINISH](#) in [Ss_30_12_85_70 Reinforced Concrete Floor - Suspended Ground Floor Slab](#)

Ss_35_10_85/612 Execution of steel and composite stair or ramp systems

1. Standard: To [BS EN 1090-2](#).
2. Execution class for steel structures: To [BS EN 1090-2](#), EXC 2.

3. Visual requirements: TBC

Ss_35_10_85/796 Site testing of anchors to concrete and masonry

1. Standard: To [BS 5080-1](#) and [BS 5080-2](#).
2. Preliminary tests: *Five tests for tensile loading to failure in locations that will be hidden in completed structure.*
3. Proof tests: *Test 10% of working fixings to 1.5 times the working load.*
4. Test failures: Report immediately. Submit method statement for alternative method of fixing.

Ω End of System

Pr_20_31_16_21 Designated concrete **ADDED**

Products

Pr_20_31_01_11 Carbon steel fibres **ADDED**

1. Description:
2. Manufacturer: Contractors choice
3. Standard: To [BS EN 14889-1](#).
4. Material group:
5. Fibre properties
 - 5.1. Tensile strength (Rm): 510 N/mm².
 - 5.2. Ductility (minimum): The ductility is declared to the average number of bends in accordance with [BS EN 10218-1](#). See [BS EN 14889-1](#), clause 5.5.
 - 5.3. Modulus of elasticity: 210 N/mm².
6. Coating
 - 6.1. Coating material: Zinc.
 - 6.2. Coating weight: Submit proposals for approval

Pr_20_31_01_85 Stainless steel fibres **ADDED**

1. Description:
2. Manufacturer: Contractors Choice
3. Standard: To [BS EN 14889-1](#).
4. Material group:
5. Fibre properties (minimum)
 - 5.1. Tensile strength (Rm): 510 N/mm².
 - 5.2. Ductility (minimum): Submit proposals for approval
 - 5.3. Modulus of elasticity: Submit proposals for approval
6. Recycled content: Submit proposals for approval

Pr_20_31_01_86 Synthetic fibres **ADDED**

1. Description:
2. Manufacturer: Contractors Choice
3. Standard: To [BS EN 14889-2](#).
4. Dimensions
 - 4.1. Length: Submit proposals for approval
 - 4.2. Diameter: Submit proposals for approval
 - 4.3. Aspect ratio: Submit proposals for approval
 - 4.4. Shape: Submit proposals for approval
 - 4.5. Linear density: Submit proposals for approval
 - 4.6. Surface treatment or coating: Spin finish.
 - 4.7. Material: Submit proposals for approval
 - 4.8. Fibre classification: Submit proposals for approval

Pr_20_31_16_21 Designated concrete **ADDED**

1. Description:
2. Supplied by: Contractors Choice
3. Ready mixed concrete producer
 - 3.1. Third party accreditation: Currently certified by a body accredited by UKAS to [BS EN ISO/IEC 17065](#) for product conformity certification of ready-mixed concrete.
 - 3.2. Source
 - 3.2.1. Name and address of depot: Submit before any concrete is delivered.
 - 3.2.2. Delivery notes: Retain for inspection.
 - 3.3. Information
 - 3.3.1. Product information to be provided to the producer: Provide concrete producer with information required by [BS 8500-1](#), clauses 4 and 5 and [BS EN 206](#). - Delivery date and time.
Rate of supply.
Intended method of placing the concrete.
Special transport on site.
Special methods of placing.
Limitations of delivery vehicle.
Intended method of finishing the concrete.
Laboratory to be used for identity testing not accredited.
 - 3.3.2. Product information to be provided by the producer: Type and strength class of cement.
Type of aggregates.
Type of admixtures. Type of additions. Description of the fibres according to [BS EN 14889-1](#) or [BS EN 14889-2](#).
Target water: cement ratio.
Results of relevant previous tests for the concrete, e.g. from production or conformity control or from initial tests.
Strength development.
Sources of the constituents.
 - 3.3.3. Mix design robustness: Submit evidence to demonstrate robustness of mix design.
 - 3.4. Declarations of non-conformity from concrete producer: Notify immediately.
4. Standards: To [BS EN 206](#), [BS 8500-1](#), and [BS 8500-2](#).
5. Concrete designation:
6. Properties
 - 6.1. Consistence class:
 - 6.2. Chloride class:
 - 6.3. Cement and cement combination (maximum): 550 kg/m³.
7. Aggregates
 - 7.1. Nominal size (maximum): 25 mm.
 - 7.2. Additional requirements for aggregates: Freeze-thaw resisting.
 - 7.3. Recycled aggregates: Permitted.
 - 7.4. Source of recycled aggregates: Submit proposals
8. Fibres: [Pr_20_31_01_11 Carbon steel fibres](#); [Pr_20_31_01_86 Synthetic fibres](#); [Pr_20_31_01_85 Stainless steel fibres](#)
9. Admixtures
 - 9.1. Standard: To [BS EN 934-2](#).
 - 9.2. Type of admixture:
 - 9.3. Colouring agent:
10. Air content (minimum):
11. Additional mix requirements:

12. Execution: Pr_20_31_16/610 Mixing in fibres; Pr_20_31_16/630 Placing normal weight concrete generally; Pr_20_31_16/695 Temperature of concrete; Pr_20_31_16/712 Curing class; Pr_20_31_16/714 Curing generally; Pr_20_31_16/722 Early age thermal cracking; Pr_20_31_16/726 Broken cubes or cylinders from failed strength tests; Pr_20_31_16/728 Initial project testing of concrete; Pr_20_31_16/734 Site adjustments to specification; Pr_20_31_16/738 Test records; Pr_20_31_16/724 Plastic settlement; Pr_20_31_16/730 Project testing of concrete generally; Pr_20_31_16/732 Regular project testing of concrete; Pr_20_31_16/736 Testing laboratory; Ss_30_10_50/635 Preparation of surfaces to receive concrete; Ss_25_11_16/642 Inspection of surfaces to receive concrete

Execution

See Pr_20_31_16/610 Mixing in fibres in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/630 Placing normal weight concrete generally in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/695 Temperature of concrete in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/712 Curing class in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/714 Curing generally in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/722 Early age thermal cracking in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/724 Plastic settlement in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/726 Broken cubes or cylinders from failed strength tests in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/728 Initial project testing of concrete in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/730 Project testing of concrete generally in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/732 Regular project testing of concrete in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/734 Site adjustments to specification in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/736 Testing laboratory in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

See Pr_20_31_16/738 Test records in Ss_20_05_15_70 Reinforced Concrete - Pad Foundations, Strip Footings and Lift Pits

Ss_25_11_16/642 Inspection of surfaces to receive concrete **ADDED**

1. Inspections
 - 1.1. Period of notice (minimum): Give notice to allow inspection of reinforcement and surfaced before each pour of concrete.
 - 1.2. Timing of inspections: To be agreed

Ss_30_10_50/635 Preparation of surfaces to receive concrete ADDED

1. Preparation of surfaces to receive concrete generally
 - 1.1. **Cleaning of formwork:** Ensure that formwork or other surfaces are clean of debris, tying wire clippings, fastenings and free water.
 - 1.2. **Timing of cleaning of formwork:** Immediately before placing concrete.
2. **Casting concrete against existing construction:** Isolate new construction from existing. Submit proposals for approval, where not shown on drawings
3. **Casting concrete against construction joints:** Remove surface laitance and expose aggregate by lightly brushing and spraying. Curing compounds are not permitted on the faces of construction joints. Clean and dampen immediately before placing fresh concrete.
4. **Casting concrete against steel:** Prepare steel to receive concrete by removing loose material, rust, scale and paint, debris, tying wire clippings, rebound from previously placed sprayed concrete and other matter that could adversely affect bond with the concrete.

Ω End of Product

BDP.