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MATERIALS

TS 3.10.02

GENERIC TECHNICAL SPECIFICATION
FOR CIVIL, STRUCTURAL AND BUILDING ENGINEERING

SECTION NO : 02

TITLE : MATERIALS

GENERIC TECHNICAL SPECIFICATION FOR CIVIL, STRUCTURAL AND BUILDING ENGINEERING

This document shall be read in conjunction with Generic Technical Specification Civil, Structural and Building Engineering – Introduction, ref: TS 3.10.00.

The clause numbering system relates to the numbering system in CESWI6 Specification.

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MATERIALS

2.1 Materials in Contact with Potable Water

- 2.1.2 The *Contractor* shall provide to the *Contract Administrator* certification to demonstrate compliance with Clause 2.1.1. This is a **Hold Point**.

2.3 Admixtures for Concrete or Grout

- 2.3.3 If the *Contractor* wishes to use admixtures, details of the admixtures shall be submitted to the *Contract Administrator* for approval to demonstrate that the admixture is compatible with all other constituents in the mix and other materials embedded in the concrete or grout as well as their effectiveness. The *Contract Administrator* may require verification of the suitability of admixtures by trial mixes. This is a **Hold Point**.
- 2.3.4 Admixtures for sprayed concrete shall be in accordance with BS EN 934: Part 5.

2.8 Bitumen Road Emulsions

- 2.8.1 Clause 2.8.1 is deleted in its entirety and replaced as follows:

Bitumen road emulsions shall comply with the relevant provisions of Series 900 of the Highways Agency's 'Specification for Highway Works'.

- 2.8.2 Clause 2.8.2 is deleted in its entirety.

2.11 Boards for Panelling

- 2.11.1 Clause 2.11.1 is deleted in its entirety and replaced as follows:

Boards for panelling shall comply with the relevant provisions of the appropriate Standard, as set out in the following table:

Board type	Standard
Cement-bonded particleboards	BS EN 634
Expanded polystyrene boards - expandable boards	BS EN 13163
Expanded polystyrene boards - extruded boards	BS EN 13164
Fibre board - hardboard	BS EN 622: Part 2
Fibre board - medium board	BS EN 622: Part 3
Fibre board - softboards	BS EN 622: Part 4
Fibre board - MDF	BS EN 622: Part 5
Gypsum plasterboard	BS EN 520, BS EN 13950, BS EN 14190, BS EN 13915
Rigid polyurethane foam	BS EN 13165
Laminated plastics sheet veneered boards	BS 4965
Oriented strand board	BS EN 300
Resin-bonded unfaced particleboards (chipboard)	BS EN 312
Particle boards	BS EN 634

- 2.11.2 Joint fillers, finishes, tapes and similar shall be as recommended by the manufacturers of the gypsum plasterboards.

2.13 Bricks and Blocks

- 2.13.1 Clause 2.13.1 is deleted in its entirety and replaced as follows:

Bricks and blocks shall be in accordance with the relevant provisions of the appropriate Standard, as set out below:

Type of brick or block	Standard
Aggregate concrete masonry units (Dense and lightweight)	BS EN 771: Part 3
Autoclaved aerated concrete units	BS EN 771: Part 4
Calcium silicate masonry units	BS EN 771: Part 2
Clay bricks	BS EN 771: Part 1
Clay flue blocks	BS EN 1806
Clay flue liners	BS EN 1457
Clay flue terminals	BS EN 13502
Concrete flue blocks	BS EN 1858
Manufactured stone units	BS EN 771: Part 5
Natural stone masonry units	BS EN 771: Part 6

2.13.2 Clause 2.13.2 is deleted in its entirety and replaced as follows:

Bricks to be used for manholes and chambers shall be Class B Engineering bricks defined as solid and having the following performance characteristics in accordance with BS EN 771: Part 1:

- (i) Compressive strength: 75N/mm²
- (ii) Water absorption (by mass): 7.0%
- (iii) Freeze/thaw resistance category: F2
- (iv) Active soluble salts content category: S2

2.13.7 Clay brick slips shall not be less than 25 mm thick cut from facing bricks.

2.13.8 Facing bricks shall be sound well burnt bricks of uniform shape and colour with no chipped exposed edges.

2.13.9 Concrete bricks used in conjunction with concrete blockwork for infilling round jambs, openings or heads of walls shall be of similar composition and appearance to the blocks and shall be of a size compatible with the selected block.

2.13.10 Concrete masonry units shall be suitable for fair faced work unless otherwise shown on the Drawings.

2.13.11 The *Contractor* shall provide samples of all bricks and blocks proposed to be incorporated in the works for approval by the *Contract Administrator*. This is a **Hold Point**.

2.14 Cast Stone

2.14.2 Clause 2.14.2 is deleted in its entirety and replaced as follows:

Manufactured stone units shall comply with the relevant provisions of BS EN 771: Part 5.

2.15 Cement

2.15.1 Clause 2.15.1 is deleted in its entirety and replaced as follows:

Cement shall:

- (a) be factory-produced by the cement manufacturer and comply with the relevant provisions of the appropriate Standard as set out below:

Cement Type	Standards
Portland (CEM I)	BS EN 197: Part 1
Portland-silica fume (CEM II/A-D)	BS EN 197: Part 1
Portland limestone (CEM II/A-L; CEM II/A-LL)	BS EN 197: Part 1
Portland-pozzolana (CEM II/A-Q; CEM II/A-Q)	BS EN 197: Part 1
Portland-slag (CEM II/A-S; CEM II/B-S)	BS EN 197: Part 1
Portland-fly ash (CEM II/A-V; CEM II/B-V)	BS EN 197: Part 1
Blastfurnace (CEM III/A; CEM III/B)	BS EN 197: Part 1
Pozzolanic (CEM (IV/B)	BS EN 197: Part 1
Sulphate-resisting Portland	BS 4027, see Note (1)
Blastfurnace slag	BS EN 197: Part 4
Pozzolanic pulverised-fuel ash	BS 6610
Masonry	BS EN 413: Part 1

- (1) Notwithstanding the requirement for the cement to comply with BS 4027, the cement shall be low alkali with an equivalent sodium oxide (Na_2O eq) content of less than 0.6% defined by weight as $\% \text{K}_2\text{O} \times 0.658 + \% \text{Na}_2\text{O}$ and determined by the method and procedure in BS EN 196: Part 2.

Or

- (b) Consist of a combination of Portland (CEM I) cement complying with the relevant provisions of BS EN 197: Part 1 and ground granulated blast furnace slag (ggbs) or pulverised-fuel ash (pfa) to be included as part of the concrete mix by simultaneously combining them with the other concrete materials at the concrete mixer in accordance with the following:

Cementitious Component	Standard to be complied with	Percentage of ggbs or pfa as Mass of Total Content
Other than Cement		
ggbs	BS EN 15167: Part 1	25 – 84
pfa	BS EN 450: Part 1	25 – 40

2.16 Cement Grouts

- 2.16.4 Unless otherwise agreed, grout packing under metal bases shall be a proprietary, pre-packed, non-shrink cementitious or epoxy based grout. Cementitious grouts shall be non-metallic, chloride free and contain non-reactive aggregates. The *Contractor* shall provide details of the grout including product conformity certificate to the *Contract Administrator* for approval. This is a **Hold Point**.

2.18 Coated Macadam

Clause 2.18 is deleted in its entirety and replaced by Clause 2.146.

2.19 Compressible Filler and Packing for Pipelines

- 2.19.1 Clause 2.19.1 is deleted in its entirety and replaced as follows:

Compressible board for interrupting concrete protection to pipelines shall be expanded polystyrene to BS 3837 or bitumen impregnated insulating board to BS EN 120 and BS EN 317. The minimum thickness of compressible filler shall be as follows:

Nominal Bore of Pipe (mm)	Thickness of Compressible Filler (mm)
Less than 450	18
450 - 1200	36
Exceeding 1200	54

2.20 Concrete - General

- 2.20.6 Clause 2.20.6 is deleted in its entirety and replaced as follows:

Where identity testing is specified as defined in BS 8500: Part 1, Clause 8.2.1 and Annexe B for strength, it shall be undertaken in accordance with BS EN 206: Part 1, Annexe B as follows:

Type of Structure	Sample to Represent a Volume of (m ³)
Cantilevers, columns	10
Beams, slabs and walls	20
Solid rafts	50

Testing for strength shall be undertaken as follows:

Number of Cubes from Each Sample	Days after Casting
1	7
2	28
1	In reserve for further testing, if required

- 2.20.7 Unless otherwise stated, concrete shall be in accordance with the guidance given in BS 8500: Part 1.
- 2.20.8 Where the reactive alkali content from sources other than cementitious material exceeds 0.2kg/m^3 they shall be taken into account so that the reactive alkali content of the mix does not exceed 3kg/m^3 of sodium oxide equivalent (Na_2O eq).
- 2.20.9 Sprayed concrete with preliminary testing shall be in accordance with BS EN 14487: Part 1.
- 2.20.10 All testing shall be undertaken by a laboratory accredited for the relevant tests by NAMAS.

2.21 Concrete Containing pfa or ggbs

- 2.21.2 The reactive alkali content of the concrete mix shall not exceed 3kg/m^3 of sodium oxide equivalent (Na_2O eq) as determined by the method and procedure in BS EN 196: Part 2.

2.26 Concrete Pipes and Fittings

- 2.26.4 Each concrete jacking pipe shall incorporate three injection holes, spaced equally around the circumference. In addition, each pipe may incorporate lifting holes and fixing holes for securing temporary apparatus. All such holes shall be threaded to enable plugs to be screwed into the sockets to withstand external water pressures. Collars for jacking pipes shall be of the fixed collar type, cast integrally with the pipes but shall not be attached to reinforcement and associated spacers required to provide structural strength for in-situ loading conditions. Collars shall be fabricated from:

- (i) Stainless steel plate to BS EN 10095, or
- (ii) Weldable structural mild steel plate

2.29 Copper Pipes and Fittings

- 2.29.3 Fittings for copper pipes shall have capillary soldered brazed or compression joints to BS EN 1254: Parts 1 and 2.

2.31 Damp-Proof Course

2.31.1 Clause 2.31.1 is deleted in its entirety and replaced as follows:

Damp-proof course materials shall accord with BS 743 and shall comply with the relevant provisions of the appropriate Standard, as set out below:

Material	Standard
Bituminous	BS 6398
Clay masonry units (HD Type)	BS EN 771: Part 1
Lead	BS EN 12588
Mastic asphalt (limestone aggregate)	BS 6925
Polyethylene	BS 6515
Slate	BS 743

2.31.2 The *Contractor* shall provide samples of all damp-proof courses proposed to be incorporated in the works for approval by the *Contract Administrator*. This is a **Hold Point**.

2.32 Doors, Frames and Linings

2.32.3 Doors, frames, linings and fittings shall comply with the relevant provisions of the appropriate Standard, as set out below:

Element	Standard
Doors - steel framed and glazed	BS 6510
Doorsets - PVC-U	BS 7412
Doors - PVC-U Class S	BS EN 12608
Doorsets - wooden	BS 4787: Part 1
Door leaves and frames - timber and wood based - external	BS EN 14220
Door leaves and frames - timber and wood based - internal	BS EN 14221
Frames - metal	BS 1245
Locks and latches	BS EN 12209 and LPS 1242
Closing devices	BS EN 1154
Emergency exit devices	BS EN 1125 and BS EN 179

2.32.4 Special furniture including escutcheons, card holders and name plates shall be finished to match the remainder of the furniture.

- 2.32.5 The *Contractor* shall obtain the approval of the *Contract Administrator* for the proposed manufacturer of doors, frames and linings. This is a **Hold Point**.
- 2.32.6 Sample sections shall be submitted to the *Contract Administrator* for approval to demonstrate the standard of fabrication and finish to be provided. This is a **Hold Point**.
- 2.32.7 Fixings shall comply with the provisions included in Clauses elsewhere in this Specification as well as the following requirements:

Element	
Decorative wood work for wood stopping	Lost headed nails
Hardwood, acidic wood or where clear surfaces are specified	Brass cup screws, or, Stainless steel screws with pressed socket pattern

- 2.32.8 The performance requirements shall comply with the provisions of the following Standards:

Performance	Standard
Windows and pedestrian doorsets without resistance to fire and/or smoke leakage	BS EN 14351: Part 1, and BS 6375: Parts 1, 2 and 3
Internal pedestrian doorsets without resistance to fire and/or smoke leakage	prEN 14351: Part 2 and BS 6375: Parts 1, 2 and 3
Windows and pedestrian doorsets with resistance to fire and/or smoke leakage	BS EN 14600 and BS 6375: Parts 1, 2 and 3
Windows and doors - burglar resistance	CEN ENV 1627
Windows and doors - air permeability	BS EN 12207
Windows and doors - watertightness	BS EN 12208
Windows and doors - resistance to wind load	BS EN 12210
Windows and doors - explosion resistance	BS EN 13123: Parts 1 and 2
Windows and pedestrian doors - mechanical durability	BS EN 12400
Doors - strength	BS EN 1192
Doors - operating forces	BS EN 12217
Doors - climatic influences	BS EN 12219
Windows - soft and heavy body impact	BS EN 13049
Windows - mechanical properties	BS EN 13115

- 2.32.9 Fire resistance shall comply with the relevant provisions of BS EN 13501: Parts 1 and 5 or BS 476: Parts 20, 22 and 23 as appropriate.

2.32.10 Weatherstrips shall be to BS EN 12365: Part 1.

2.32.11 Wood door sets shall be:

Location	Type
External	Hardwood
Internal	Softwood

2.32.12 Approved intumescent seals shall be provided around fire doors.

2.32.13 Veneered doors in pairs shall have matching veneers.

2.32.14 All flush timber doors shall be flat and smooth, with lippings, glue bonded.

2.32.15 Minimum requirements for hanging shall comply with the following requirements:

Door specification	Hanging specification
Internal non-fire doors up to 45 kg in weight or up to 2150mm x 850mm in size	Two unwashed steel hinges (bright zinc plated) 100mm x 75mm each fixed to the door and frame by 8 steel countersunk screws.
Internal fire doors up to 45 kg in weight or up to 2150mm x 850mm in size	Three unwashed steel hinges (bright zinc plated) 100mm x 75mm each fixed to the door and frame by 8 steel countersunk screws.
Internal fire and non-fire doors up to 60 kg in weight or up to 2500mm x 1000mm in size	Three (fire) and two (non-fire) washed steel hinges (bright zinc plated) 100mm x 75mm each fixed to the door and frame by 8 stainless steel countersunk screws.
External doors up to 45 kg in weight or up to 2150mm x 850mm in size	Three stainless steel hinges 100mm x 75mm each fixed to the door and frame by 8 stainless steel countersunk screws.
External doors up to 60 kg in weight or up to 2500mm x 1000mm in size	Three stainless steel hinges 100mm x 75mm each fixed to the door and frame by 8 steel countersunk screws.
Internal non-fire doors opening 1800mm up to 45 kg in weight or up to 2150mm x 850mm in size	Two unwashed steel projecting hinges (bright zinc plated) 100mm x 100mm each fixed to the door and frame by 8 steel countersunk screws.
Internal fire doors opening 1800mm up to 60 kg in weight or up to 2500mm x 1000 mm in size	Three unwashed steel projecting hinges (bright zinc plated) 100mm x 100mm each fixed to the door and frame by 8 steel countersunk screws.
Internal doors opening 1800mm up to 60 kg in weight or up to 2500mm x 1000mm in size	Three (fire) and two (non-fire) unwashed steel projecting hinges (bright zinc plated) 100mm x 100mm each fixed to the door and frame by 8 steel countersunk screws.
External doors opening 1800mm up to 45 kg in weight or up to 2150mm x 850mm in size	Three stainless steel hinges 100mm x 100mm each fixed to the door and frame by 8 stainless steel countersunk screws.
External doors opening 1800mm up to 60 kg in weight or up to 2500mm x 1000 mm in size	Three steel hinges 100mm x 100mm each fixed to the door and frame by 8 stainless steel countersunk screws.

- 2.32.16 Hinges shall be located 125mm from the top edge and 250mm from the bottom edge. Other hinges, when specified, shall be equally spaced between the top and bottom hinges.
- 2.32.17 Unless otherwise stated, locks for doors shall be able to be operated using the substation key suite. Three keys shall be provided for each lock where non-substation key suite locks are applicable. Each key shall be attached to a Traffolyte label with black lettering on a white background in Arial font, 4mm high indicating the room/item name as provided by the *Contract Administrator*.

2.34 Draw Cord

- 2.34.1 Clause 2.34.1 is deleted in its entirety and replaced as follows:

Draw cords for pulling of cables through ducts shall be rot and vermin proof with a minimum breaking load of 5kN and be in accordance with BS EN ISO 9554 and BS EN ISO 1346.

2.36 Ductile Iron, Cast Iron and Steel Pipes, Flanges and Fittings

- 2.36.3 Clause 2.36.3 is deleted in its entirety and replaced as follows:

Steel pipes, fittings and joints shall comply with the relevant provisions of BS EN 10224, BS EN 10216: Part 1 or BS EN 10217: Part 1 SAW Grade 430.

- 2.36.7 Clause 2.36.7 is deleted in its entirety and replaced as follows:

Cement mortar linings for potable water pipelines shall comply with the requirements of BS EN 545. Where a seal coat is required, it shall comply with the requirements of BS ISO 16132 and the complete system shall be approved under the Water Supply (Water Quality) Regulations 2000. In addition, the Instructions for Use issued by the Drinking Water Inspectorate as part of the approval shall be followed.

- 2.36.10 All exposed ferrous metal including pipes, valves and brackets shall be externally protected in accordance with the requirements of the *Contract Administrator*.

2.37 Electrodes, Filler Rods and Wires for Welding

- 2.37.2 Clause 2.37.2 is deleted in its entirety and replaced as follows:

Electrodes for the manual metal-arc welding of carbon and carbon manganese steel and stainless steel shall comply with the relevant provisions of BS EN ISO 2560 and BS EN 1600 respectively.

- 2.37.4 Clause 2.37.4 is deleted in its entirety and replaced as follows:

Filler rods and wires for gas-shielded arc welding of ferritic steel, austenitic stainless steel and aluminium and aluminium alloy shall comply with the relevant provisions of BS EN ISO 14341 and BS EN ISO 636 respectively.

2.38 Expanded Metal Angle Beads

2.38.1 Clause 2.38.1 is deleted in its entirety and replaced as follows:

Expanded metal angle beads shall comply with the relevant provisions of BS EN 13658: Parts 1 and 2.

2.38.2 Fixings shall comply with the provisions of BS 8481.

2.42 Fixings for Metalwork

2.42.1 Clause 2.42.1 is deleted in its entirety and replaced as follows:

Mild steel bolts and nuts shall be hot dipped galvanised in accordance with BS EN ISO 1460 and stainless steel bolts and nuts shall be manufactured from Grade 316S31 steel complying with BS EN 10083: Part 1, BS EN 10084, BS EN 10085, BS EN 10087, BS EN 10095, BS EN 10250: Part 4 and BS EN ISO 9445.

2.42.2 Clause 2.42.2 is deleted in its entirety and replaced as follows:

Stainless steel proprietary fixings, bolts and nuts shall be manufactured from Grade 316S31 steel complying with BS EN 10083: Part 1, BS EN 10084, BS EN 10085, BS EN 10087, BS EN 10095, BS EN 10250: Part 4, BS EN ISO 3506 and BS EN ISO 9445. Mild and high yield steel proprietary fixings shall be protected in accordance with the relevant provisions of the appropriate Standard as set out below:

Type of Protection	Type of Fitting		
	Cast-in, Having No Machined Thread	Cast-in/expanding, Basic Major Diameter of Machined Thread	
		Not exceeding 19mm	Exceeding 19mm
Hot dipped galvanised	BS EN ISO 1460	-	-
Electroplated zinc	BS EN ISO 2081 and BS EN ISO 2082	BS 7371: Part 12	BS EN ISO 2081 and BS EN ISO 2082

2.43 Flashings

2.43.1 Clause 2.43.1 is deleted in its entirety and replaced as follows:

Flashings shall comprise one of the following materials in accordance with the relevant provisions of the appropriate Standard, as set out below:

Type	Standard
Sheet or strip aluminium	BS EN 485: Parts 1 to 3
Bituminous felt flashings	BS EN 13707
Sheet or strip copper	BS EN 1172
Milled lead strip	BS EN 12588
Sheet or strip zinc alloy	BS EN 988

2.43.2 The *Contractor* shall submit samples of the proposed flashings to be used for approval by the *Contract Administrator*. This is a **Hold Point**.

2.43.3 Thicknesses of lead flashings shall accord with the following table:

Location	Thickness Code to BS 6915 (Thickness, mm) Colour Code
Gutter linings	6 (2.65) Black
Skirts	4 (1.80) Blue
Wall coverings	5 (2.24) Red
Ridges and hip coverings	5 (2.24) Red
Valley	5 (2.24) Red
Cornice coverings	5 (2.24) Red
Flashings, collars, aprons and soakers	4 (1.80) Blue
Other weatherings	4 (1.80) Blue

2.43.4 Clips, fasteners, solder and other fixing accessories for lead flashings shall comply with the provisions of the specifications stated in BS 6915.

2.44 Floor Tiles

2.44.1 Clause 2.44.1 is deleted in its entirety and replaced as follows:

Floor tiles shall comply with the relevant provisions of the appropriate Standard, as set out in the following table:

Type	Standard
Ceramic	BS EN 14411
Thermoplastic	BS EN 649
Semi-flexible PVC	BS EN 654
Unbacked flexible PVC	BS EN 649
PVC with jute, polyester felt or polyester felt with PVC backing	BS EN 650
Terrazzo	BS EN 13748: Parts 1 and 2
Cast stone	BS 1217

- 2.44.2 All sheeting shall be capable of being welded to provide a watertight membrane, and where it abuts PVC flexible skirting. The skirting shall also be capable of being welded at junctions along their length, at corners and to the sheet flooring.
- 2.44.3 All fittings and special tiles including inter alia coves, skirtings, cappings, channels and stop treads shall be obtained from the same manufacturer as the floor tiles and of the same material and Standard, where included, as the floor.

2.48 Gaskets for Flanged Joints

- 2.48.1 Clause 2.48.1 is deleted in its entirety and replaced as follows:

Gaskets for flanged pipe joints shall be of the inside-bolt-circle type for pipes of bore less than 300mm and full face type for bores equal to or greater than 300mm.

2.49 General Filling Materials

- 2.49.1 Clause 2.49.1 is deleted in its entirety and replaced as follows:

The following imported fill material shall accord with the requirements described below:

Class	Types of materials	Sieve size, mm	Percentage by mass passing
I	Crushed rock, clay-bound gravel, well burnt colliery, shale, sand and gravel	75	100
		63	85-90
		37.5	50 – 70
		20	20 - 40
		10	0 -15
II	Hardcore – shall consist of any combination of broken or crushed concrete, clean hard brick, coarse gravel or hard stone. It shall be free from dust, rubbish and any other deleterious matter.	125	100
		75	70 – 90
		37.5	30 – 50
		20	10 – 25
		10	0 - 10
III	Quarry stone, concrete or stone rubble	375	100
		150	Not exceeding 50
		75	Not exceeding 15
IV	Well graded crushed rock, crushed slag, crushed concrete or well burnt non-plastic shale.	75	100
		37.5	85 – 100
		10	40 -70
		5	25 – 45
		600 micron	8 – 22
		75 micron	0 -10

2.49.3 Notwithstanding the requirements in Clause 2.49.2, acceptable and unacceptable materials for capping layer, general fill including structures and foundations, gabion fill and geotextiles shall comply with the requirements of Series 600: Earthworks in the Highways Agency's 'Specification for Highway Works'.

2.50 Glass for Glazing

- 2.50.2 Notwithstanding the requirements of Clause 2.50.1, glass shall also comply with the relevant provisions of the appropriate Standard, as set out below:

Glass Type	Standard
Soda lime silicate glass	BS EN 572: Parts 2 to 7 & 9
Fire resistant glazed elements	BS EN 357
Impact requirements	BS 6206

2.51 Glass Reinforced Plastics (GRP) Pipes and Fittings

- 2.51.1 Clause 2.51.1 is deleted in its entirety and replaced as follows:

Glass reinforced plastics (GRP) pipes and fittings shall comply with the relevant requirements of BS EN 1796 for water supply and BS EN 14364 for drainage and sewerage.

- 2.51.3 Pipes shall have flexible joints unless otherwise stated.

2.52 Glass Reinforced Plastic Products

- 2.52.2 Clause 2.52.2 is deleted in its entirety and replaced as follows:

Glass reinforcement shall be water resistant “E” type woven glass fibre to BS EN 14118: Parts 1 to 3 and BS 3749 with a minimal reinforcement content of 25-30%.

- 2.52.4 Cesspools shall be designed to BS 6297 and supplied by an approved manufacturer with accreditation to BS EN ISO 9001, and covered by a British Board of Agreement Certificate.

2.53 Glazing Materials

- 2.53.3 Glazing accessories, beads, tape, setting blocks, channels, gaskets and spacers shall be as recommended by the glazing manufacturers.

- 2.53.4 Setting blocks, distance pieces and location blocks in plasticised PVC shall be to BS 2571.

2.55 Grass Seed

- 2.55.2 Grass seed shall be certified and comply with the provisions of BS 4428 and the following:

- (i) Freshness: Produced for the current growing season
- (ii) Certification: Blue label certified varieties
- (iii) Standard: EC purity and germination regulations

- 2.55.3 The *Contractor* shall submit samples of mixtures as well as the official seed testing station certificate of germination to the *Contract Administrator* for approval. This is a **Hold Point**.

2.57 Gullies and Gully Cover Slabs

- 2.57.1 Clause 2.57.1 is deleted in its entirety and replaced as follows:

Precast concrete gullies and gully cover slabs shall comply with the relevant provisions of BS 5911: Part 6.

- 2.57.3 Clause 2.57.3 is deleted in its entirety and replaced as follows:

PVC-U gullies shall comply with BS EN 13598: Part 1.

- 2.57.4 All gullies shall have water sealed traps.

- 2.57.5 Linear drainage channels and gratings shall be in accordance with BS EN 1433.

2.58 Gully Covers, Gratings and Frames

- 2.58.2 Slots in gratings shall be selected such that they shall not be parallel to the flow of traffic.

2.59 Handrails and Balusters

- 2.59.1 Clause 2.59.1 is deleted in its entirety and replaced as follows:

Handrails and balusters shall be manufactured from material complying with the relevant provisions of the appropriate Standard, as set out in the following table. Protective barriers shall comply with the provisions of BS 6180 for Building-use Category 6.

Material	Handrails	
	Standard	
	Solid	Tubular
Mild steel	BS EN 10025	BS EN 10025 or BS EN 10296: Part 1 and BS EN 10297: Part 1
Stainless steel	BS EN 10083: Part 1 BS EN 10084 BS EN 10085 BS EN 10087 BS EN 10088: Parts 1 and 3 BS EN 10095 BS EN 10250: Part 4	BS EN 10296: Part 2
Aluminium	BS EN 1559: Parts 1 and 4	BS EN 1559: Parts 1 and 4 BS EN 515 and BS EN 573: Part 3
	Balusters	
Mild steel	BS EN 10025	BS EN 10025 or BS EN 10296: Part 1 and BS EN 10297
Stainless steel	BS EN 10083: Part 1 BS EN 10084 BS EN 10085 BS EN 10087 BS EN 10088: Parts 1 and 3 BS EN 10095	BS EN 10296: Part 2
Aluminium	BS EN 1676 and BS EN 1706	BS EN 1559: Parts 1 and 4 BS EN 515 and BS EN 573: Part: 3

2.59.3 Clause 2.59.3 is deleted in its entirety and replaced as follows:

After manufacture, aluminium handrails and balusters shall be anodised in accordance with BS EN 12373, Class 25.

2.61 Imported Topsoil

- 2.61.3 Samples of the proposed topsoil shall be submitted to the *Contract Administrator* for approval. This is a **Hold Point**.

2.62 Imported Turf

- 2.62.2 Samples of the imported turves shall be submitted to the *Contract Administrator* for approval. This is a **Hold Point**.
- 2.62.3 Unless otherwise specified, turves shall be 'General Purpose Utility Turf with Rye Grass' with root mass 25 to 37mm thick. Broken turves shall not be used.

2.63 Industrial Flooring, Walkways and Stair Treads

- 2.63.2 Clause 2.63.2 is deleted in its entirety and replaced as follows:

Finishes specified by the *Contract Administrator* to steel flooring, walkways and stair treads shall comply with the relevant provisions as set out below:

Finish	Standard
Dipped in black bitumen	Type 1 of BS 3416
Hot dipped galvanised in single operation	BS EN ISO 1461
Sheradize	Class 1 of BS 4921

- 2.63.8 Assemblies shall be held in the galvanising bath until the temperature of the assembly is equal to the temperature of the bath. Galvanising procedures shall avoid distortion of the assemblies. Where distortion does occur, assemblies shall be straightened and a cold galvanising compound applied to the areas where galvanising has been damaged.
- 2.63.9 The *Contractor* shall submit fabrication details to the *Contract Administrator* for approval. This is a **Hold Point**.
- 2.63.10 The *Contractor* shall submit manufacturer's test and material certificates for each secondary steelwork assembly as appropriate. This is a **Hold Point**.

2.64 Joinery Timber

- 2.64.3 Notwithstanding the requirements of Sub-Clauses 2.64.1 and 2.64.2, timber shall also comply with the provisions of BS 1186: Part 3.
- 2.64.4 The *Contractor* shall provide documentation to the *Contract Administrator* to demonstrate that timber for the works is being sourced from supplies complying with the requirements of the Forest Stewardship Council (FSC). This is a **Hold Point**.

2.65 Joint Filler Board

2.65.6 Joint filler boards shall comply with the following types:

Ref	Description
F1	Compressible non-extruding bitumen impregnated fibreboard expansion joint filler
F2	Non absorbent closed cell, cross linked, semi-rigid polyethylene joint filler
F3	Non absorbent closed cell readily compressible polyethylene joint filler and back up strip
F4	Bonded granular cork expansion joint filler
F5	Expanding polyurethane foam gap filler
F6	Filling for caulking movement joints in fire barrier walls or slabs shall be with an approved proprietary fire blanket. It shall be non-alkaline, shall be chemically stable and contain no corrosion promoting agents.

2.66 Joint Sealing Compounds and Sealants

2.66.2 Clause 2.66.2 is deleted in its entirety and replaced as follows:

Hot poured joint sealants shall comply with BS EN 14188: Part 1.

2.66.3 Clause 2.66.3 is deleted in its entirety and replaced as follows:

Cold poured polymer-based joint sealants shall comply with BS EN 14188: Part 2 or BS 5212: Part 2.

2.66.6 Polysulphide sealants shall comply with BS EN ISO 11600.

2.66.7 Preformed joint seals shall comply with BS EN 14188: Part 3.

2.66.8 The *Contractor* shall submit to the *Contract Administrator* for approval, all manufacturers' technical literature, including directions for use, storage (including shelf life) and disposal, current test results to demonstrate compliance with the relevant standard above and health and safety information. This is a **Hold Point**.

2.68 Joist Hangers

2.68.1 Clause 2.68.1 is deleted in its entirety and replaced as follows:

Joist hangers shall comply with the provisions of BS EN 845: Part 1.