

13.5.2 Installation

- a) according to manufacturer's instructions
- b) use coverings from same production run to ensure uniform colour and texture in one area
- c) agree on direction of seams and pile; pile to lie down stairs; place longitudinal seams away from traffic areas; place cross seams in crotch of stairs
- d) start full widths on door side of room; finish carpets under doors within thickness of closed door
- e) cover exposed carpet edges with *suitable* metal edging strip
- f) to prevent bow-wave effects under wheels, for example in medical institutions, stick carpet to floor with suitable adhesive
- g) use protective stair nosing on carpet tiles and fibre-bonded coverings
- h) stair nosings to have minimum radius of 12,5 mm; if less, use protective nosing
- i) secure covering by carpet gripper lengths at each crotch riser and tread or by means of adhesive
- j) ensure continuity of level between covering and stair nosing; fix nosing to *suitable* spacers, e.g. hardboard or plywood strips with adhesive and screws
- k) nosings to be wide enough (60—100 mm) to prevent rocking.

13.6 Epoxy flooring

- a) type: seamless epoxy mortar floor
- a) epoxy mortar: epoxy resin mixed with *suitable* aggregate of specified colour and size

application

- b) according to manufacturer's instructions
- c) scabble or sandblast surface to provide necessary grip
- d) prime surface with low-viscosity epoxy
- e) apply final epoxy finish after 10 h by trowel or by self-levelling, to thickness and finish as specified
- f) prepare sample panel
- g) stop finish against metal strips on both sides of movement joints.

14 Painting, paperhanging

Invoked standard when required: SANS 10305 Painting of Buildings part 4, 5, 6

Invoked standard when required: SANS 12944 Paints and varnishes – corrosion protection of steel structures by protective paint systems

14.1 Materials

- a) *suitable* for intended purpose and for surface to which it is to be applied
- b) restrict all paint to one manufacturer where possible; complete paint systems – primer, undercoat and finishing coat – to be as recommended by the same manufacturer
- c) containers to reach site unopened, bearing SANS -mark and specification number when specified
- d) exterior quality for exterior work

primers

- e) alkali-resistant plaster primers: SANS 1416
- f) primers for interior and exterior wood: SANS 678.
- g) zinc phosphate primers for steel: SANS 1319.
- h) pretreatment, wash or etching primers (one or two-pack) for metals: of *suitable* quality
- i) primer-sealers, penetrating primers, masonry sealers, bonding liquid and universal primers for plaster, concrete, brick, block and stone: of *suitable* quality or the subject of an active Agrément Certificate

undercoats

- j) universal undercoats: SANS 681

finishing paints

- k) alkyd high gloss finishing paint: SANS 630
- l) decorative paint for interior use: SANS 515
- m) emulsion paint: SANS 1586
- n) textured emulsion wall coating: SANS 1227
- o) aluminium paint, general purpose: SANS 682
- p) micaceous iron oxide paint, masonry paint, cement paint and lime-wash: of *suitable* quality or the subject of an active Agrément Certificate

varnishes, varnish stains, stains, sealers

- q) varnish or varnish stains for interior use: SANS 887
- r) stains: water-borne or solvent-borne
- s) sealers: water-borne acrylic exterior quality, *suitable* for application on the material to be coated; sealers for wood to contain fungicides that inhibit the development of blue-stain fungi

bituminous and tar-based coatings

- t) bituminous aluminium paint: SANS 802
- u) other bitumen-based coatings: of *suitable* quality or the subject of an active Agrément Certificate

specialized coatings

- v) two-pack epoxy primers, two-pack coal-tar epoxy coatings, one and two-pack epoxy and polyurethane coatings, cellulose coatings, and vinyl primers, undercoats and finishes: of *suitable* quality or the subject of an active Agrément Certificate

knotting, stopping, fillers

- w) knotting for the treatment of knots in wood: quick-drying resin solution or an aluminium primer
- x) stopping and fillers: *suitable* to fill holes and imperfections in the material to be painted
- y) fillers: oil-based, emulsion-based or supplied in powdered form

stirring

- z) stir paint materials before use and at intervals during use unless the manufacturer's instructions state otherwise

thinning

- aa) thin paint only to improve penetration or facilitate application, for example on surfaces of high or variable porosity, or for spray application; thinner type and proportion: as recommended by the manufacturer

two-pack materials

- bb) observe manufacturer's instructions regarding mixing proportions, induction period (standing time), pot life and the possible extension of pot life.

14.2 Preparation of surfaces

- a) allow time for the drying of surface moisture
- b) ensure work by other tradesmen that might affect painting has been completed
- c) inspect factory-primed components to ensure that the primer is in satisfactory condition; if not, take remedial action
- d) remove excess pipe jointing material
- e) when specified, remove hardware, light fittings and other removable fittings that can be contaminated; mark, store and refix after completion
- f) mask fittings that cannot be removed
- g) seal cracks between frames, skirtings, cornices etc. and walls with paintable acrylic sealant
- h) protect surfaces not to be painted

cleaning

- i) clean all surfaces of dirt, grease, soot, mould and marks –spare no time or effort
- j) limit cleaning to dry abrading and dusting when possible
 - by means of stiff brush (not wire), abrasive paper, emery cloth, steel wire wool or nylon fibre pads as required
 - always sandpaper wood in direction of grain
 - remove pencil marks and other surface discolouration
 - in the case of window frames, take care not to scratch the glass, especially with abrasive paper
 - dusting: after dusting down, sweep or vacuum floors; do not sweep or dust whilst painting is in progress
- k) remove superficial dirt by washing only if required
 - with a solution of sugar soap, household detergent, cleaning powder or mild soap
 - use proprietary cleaning materials strictly in accordance with the manufacturer's instructions
 - rinse surfaces with clean water before the solution dries
 - allow to dry before coating
 - proprietary emulsion cleaners or degreasing solutions may be used for removing heavy deposits of oil or grease

existing coatings

- l) keep only when in a sound condition and compatible to the coating to be applied

- m) remove completely or partially any coating under condition of poor adhesion, flaking, peeling, blistering, cracking, crazing and severe chalking or powdering, and when adhesion is generally sound but with a rough surface
- n) remove completely if the coating to be applied is not compatible with the existing one; seek specialist information from the manufacturer in case of doubt
- o) remove by burning off or by the use of paint removers, washing, scraping, abrading, steam, abrasive blast cleaning or other *suitable* method

burning off

- p) burn off using blowtorch or hot-air gun
- q) take care not to burn or crack the background
- r) remove all flammable materials from the work area
- s) use other methods on wood that is to be refinished with a clear coating system, on carved or heavily moulded woodwork, or for removal of highly flammable coatings
- t) means of extinguishing fires shall be readily available when burning off

paint removers

- u) type: *suitable* for the removal of the coating at hand
- v) alkaline (or caustic) type paint removers: do not use on zinc or aluminium
- w) solvent type paint removers: use under conditions of proper ventilation and the removal of possible sources of ignition
- x) apply paint removers liberally and in sufficient applications to enable easy removal
- y) clean surface when removal is complete, in *according to manufacturer's instructions*

abrasive blast cleaning

- z) abrasive blast cleaning: SANS 10064
- aa) take care not to damage the background
- bb) mask surrounding surfaces

treatment of organic growth

- cc) remove mould (mildew) and algae (green and black stains) before painting by scraping or brushing, blast-cleaning or high-pressure water cleaning, followed by the application of a *suitable* fungicidal wash like a solution of 1 part bleach to 4 parts water or, in the case of proprietary materials, as directed
- dd) apply washes in dry weather
- ee) apply a further application of fungicidal wash after removal of the dead organisms to delay re-establishment of the growth.
- ff) allow to dry before overcoating.

14.3 Colours

- a) colours of undercoats to match finishing coat but with enough difference to be able to distinguish between coats
- b) prepare colour samples of finishing coats before any bulk paint is purchased
- c) identification colour marking (e.g. pipes transporting different fluids/gases): SANS 10140.

14.4 Preparation for painting

- a) select paint systems most suited to the environment, compatible with substrate and other components of the system
- b) follow manufacturer's instructions; observe manufacturer's recommendations in respect of temperature and its relation to curing time and pot life
- c) sandpaper all coats of paint and varnish and leave time to dry before next coat is applied

- d) do not paint when conditions are unsuitable, for example dust, insufficient light, direct sunlight or inclement weather; do not apply paint if the ambient temperature is <10>35 °C, or if the relative humidity is <10>85 %
- e) mask all surrounding surfaces when spray-painting; do not spray paint in windy weather.

14.5 Knotting, stopping, filling and priming

- a) knotting: to cover wood knots
- b) stopping: for stopping up holes, wide cracks, open joints and similar imperfections, including the repair or removal and replacement of defective glazing putties
- c) use cement plaster or a proprietary plaster repair product for stopping holes in plaster; spot prime all plaster repairs, fillers etc. on walls with a masonry primer once fully cured
- d) fillers: for filling and levelling, for example shallow depressions, open grain, surface roughnesses, nail and screw heads, fine cracks and restoration of the original film thickness where this was locally damaged
- e) apply stopping and fillers by flexible putty knife on broad surfaces, and by brush on mouldings; allow surfaces to dry; rub down to a smooth surface
- f) prime or seal woodwork to be built in before building in or fixing; this applies to structural timber, all frames, all six sides of a door, and to rebates and backs of beads in glazing apertures.

14.6 On-site pre-treatment and priming of non-ferrous metals and stainless steel

aluminium

- a) smooth aluminium surfaces (sheets, extrusions and aluminized steel): degrease, and lightly abrade or pretreat with a twin-pack vinyl wash primer, followed by one coat zinc phosphate primer
- b) rough aluminium surfaces (castings and sprayed metal coatings): lightly abrade, remove dust and dirt; sprayed metal coatings might require washing; pretreat sprayed metal coatings with a wash primer or etching primer immediately after application of the coating, followed by one coat zinc phosphate primer

zinc and zinc aluminium alloy, sprayed coatings

- c) zinc sheet, zinc-coated steel (hot dip galvanized, sherardized or electroplated), and zinc aluminium alloy coated steel (hot dip): degrease, and lightly abrade or pretreat with a wash or etching primer, followed by one coat zinc phosphate primer
- d) sprayed zinc and zinc aluminium alloy coatings: wash if required, and pretreat with a wash or etching primer, preferably immediately after application of the coating, followed by one coat zinc phosphate primer
- e) where hot dip galvanized steel was unavoidably welded on site, clean joint and repair coating using a zinc rich paint or epoxy

copper, brass and bronze

- f) copper, brass and bronze coatings: degrease, and lightly abrade or pretreat with a wash or etching primer

lead

- g) lead: wet abrade and pretreat with a wash or etching primer

cadmium coatings

- h) cadmium coatings: degrease, and lightly abrade or pretreat with a wash or etching primer

tin coatings

- i) tin coatings: degrease and lightly abrade

chromium and nickel coatings

- j) chromium and nickel coatings (if corroded): abrade and pretreat with a wash or etching primer

stainless steel

- k) stainless steel: degrease, and lightly abrade or pretreat with a wash or etching primer.

14.7 Application of paint

- a) apply paint by brush, roller or spray-gun as required

brush or roller

- b) prime wood surfaces by brush only, well worked in
- c) clean brushes and rollers after use and hang to dry

spray gun

- d) spray painting is allowed only where this is the accepted method of application
- e) spray paint by air spray, airless spray or electrostatic spray of appropriate type, *suitable* to the material and type of work
- f) mask or otherwise protect adjacent surfaces not to be sprayed
- g) do not spray-apply conventional primers
- h) clean spraying equipment every time after use, or when changing the paint colour, by spraying copious amounts of thinner or solvent through the spray gun

general

- i) apply paint coats according to manufacturer's instructions
- j) allow paint coats to dry before applying subsequent coats
- k) colours: to sample
- l) tints of undercoats: distinguishable from succeeding coats.
- m) minimise waste from paint and associated materials: buy only enough paint for the job; store with lid tightly closed; minimise brush or roller cleaning by wrapping in plastic between coats; brush or roll the applicator onto newspaper before cleaning; do not pour cleaning liquids straight down the drain – allow solids to settle before doing so; dispose solids as garbage.

14.8 Paint systems for on-site application

Paint system and colour: as specified.

14.8.1 Cement-based surfaces, brick and stone

(cement plaster, concrete, brick, block and stone; fibre-cement goods; cement-based boards, tiles and panels; glass-fibre reinforced cement (GRC) cladding)

alkyd paint

- a) one coat alkali-resistant primer; or, for plaster only,
- b) a water-thinned primer, followed by, for interior work only,
- c) one universal undercoat and one coat alkyd gloss finish; or
- d) two coats alkyd semi-gloss or matt finish; or, for exterior work,
- e) one universal undercoat and one or two coats alkyd gloss finish

emulsion paint

- f) a water-thinned first coat of emulsion paint on surfaces of high or variable porosity; and, for interior work only,

- g) two coats matt, high-opacity finish "contract" emulsion paint SANS 1586 grade 4; or
- h) one coat ditto, spray applied; or, for exterior work,
- i) two or three coats matt or semi-gloss finish general purpose emulsion paint, or
- j) for fibre-cement roofs in *coastal areas*, an anti-fungicidal paint

textured emulsion paint

- k) *suitable* primer; and, for interior work only,
- l) one coat sand-textured paint, over-painted if required

masonry paint

- m) *suitable* primer; and
- n) mineral type masonry paint for interior or exterior work; or, for exterior work only,
- o) two coats smooth or fine-textured solvent-borne or emulsion-based masonry paint; or
- p) one or two coats heavy-textured solvent-borne masonry paint; or
- q) one coat heavy-textured emulsion-based masonry paint.

cement paint

- r) two coats cement paint for interior or exterior work
- s) not on gypsum plaster

masonry sealers

- t) one or two coats according to manufacturer's instructions

lime wash

- u) two coats lime wash, applied with a 200 mm block brush.

14.8.2 Ferrous metals

- a) (clean iron and steel; total film thickness should be 115 to 145 μm)

alkyd paint on blast-cleaned surfaces

- b) two coats solvent-borne primer; and
- c) one coat solvent-borne undercoat; and
- d) two coats alkyd gloss finish

alkyd paint on manually cleaned surfaces

- e) two coats etching primer (one-pack or two-pack) or zinc phosphate primer; and
- f) one coat solvent-borne undercoat; and
- g) two coats alkyd gloss finish

alkyd paint on factory primed surfaces

- h) inspect primer for soundness and touch up where required, and
- i) one coat solvent-borne undercoat; and
- j) two coats alkyd gloss finish

alkyd paint on cast iron

- k) remove bitumen until clean, sound substrate is achieved
- l) paint one coat metal primer, and one coat high gloss alkyd paint, or
- m) two coats general purpose semi-gloss emulsion paint

micaceous iron oxide paint on blast-cleaned or manually cleaned surfaces

- n) two coats micaceous iron oxide paint, high-build type

aluminium paint on blast-cleaned or manually cleaned surfaces

(fencing material)

- o) two coats aluminium paint

heat-resistant paint

- p) heat-resistant paint system on steel: of *suitable* type, applied according to manufacturer's instructions.

14.8.3 Wood**alkyd paint on interior wood**

(window joinery, skirtings, doors and frames)

- a) wood primer; and
- b) one coat universal undercoat and one coat alkyd gloss finish; or
- c) two coats alkyd gloss finish

alkyd paint on interior plywood doors

- d) water-borne primer, but check compatibility with water-repellant organic solvent preservatives; and
- e) one coat universal undercoat and one coat alkyd gloss finish; or
- f) two coats alkyd gloss finish

alkyd paint on exterior softwood and plywood

(window joinery, solid doors and frames, cladding, bargeboards, fascias and soffits)

- g) one coat solvent or water-borne semi-transparent primer (base coat); followed by
- h) one or two coats universal undercoat; and
- i) one or two coats alkyd gloss finish

textured coatings on exterior softwood and plywood

(window joinery, solid doors and frames, cladding, bargeboards, fascias and soffits)

- j) one coat solvent-borne or aluminium textured primer; and
- k) one or two coats emulsion or solvent-borne textured coating

alkyd paint on exterior hardwood

- l) one coat aluminium primer; and
- m) one or two coats universal undercoat; and
- n) one or two coats alkyd gloss finish (two coats externally)

paint on exterior plywood doors

- o) transparent preservative primer/base coat; and
- p) multi-coat paints formulated for improved performance according to manufacturer's recommendations, gloss finish

alkyd paint on wood fibre and particle board

(hardboard, mediumboard, medium density fibreboard (MDF) and softboard not factory-primed or sealed)

- q) one coat primer-sealer or water-thinned primer or aluminium primer; or
- r) one coat alkali-resistant primer for flame-retardent treated board; or
- s) one coat aluminium wood primer for bitumen-impregnated softboard; or
- t) one coat resin-based wood primer or primer-sealer or water-thinned primer or aluminium primer for particle board; and
- u) one coat universal undercoat and one coat alkyd gloss finish; or

- v) two coats alkyd semi-gloss finish

emulsion paint on wood fibre and particle board

(hardboard, mediumboard, medium density fibreboard (MDF) and softboard not factory-primed or sealed)

- w) no primer, except for absorbent board in which case first coats shall be thinned; or
- x) one coat alkali-resistant primer for flame-retardent treated board; or
- y) no primer for bitumen-impregnated softboard; or
- z) no primer for particle board, except for single layer board in which case a resin-based primer shall be applied; and
- aa) two or three coats semi-gloss finish general purpose emulsion paint

alkyd paint on softwood or hardwood gates and fences

- bb) one coat solvent-borne or aluminium primer; and
- cc) one or two coats universal undercoat; and
- dd) two coats alkyd gloss finish

transparent finish systems for wood (interior)

(interior general joinery, surfaces, linings and fittings)

- ee) decorative wood stain, as required; and
- ff) one or two coats interior alkyd, urethane or urethane/alkyd resin varnish, on worktops, or
- gg) one or two coats urethane varnish, two-pack or moisture-curing, for surfaces requiring exceptional abrasion resistance, or
- hh) one or two coats wood sealer *suitable* for interior use

transparent finish systems for wood (exterior)

(exterior window joinery, solid doors and frames, cladding, bargeboards, fascias and soffits)

- ii) two or three coats exterior wood sealer.

14.8.4 Plasterboard

(ceilings, bulkheads, partitions)

alkyd paint

- a) a primer–sealer or water-thinned primer; and
- b) one coat universal undercoat; and
- c) one coat alkyd semi-gloss finish; or
- d) two coats alkyd semi-gloss finish

emulsion paint

- e) two coats matt, high hiding, scrub resistant emulsion paint on walls
- f) two coats matt utility grade emulsion paint on ceilings and bulkheads.

14.8.5 Plastics

paint on unplasticized polyvinyl chloride (PVC-U)

(PVC-U cladding, window and door frames, gutters, down-pipes, waste and vent pipes and window frames)

- a) two-pack wash primer followed by conventional alkyd gloss or emulsion paint finish system; or
- b) a long-life coating of a specialized type, such as two-pack polyurethane or epoxy

paint on glass-reinforced polyester (GRP)

- c) remove wax coating; and

- d) one coat two-pack epoxy primer; and
- e) one coat two-pack polyurethane

paint on plastic coatings on metals

- f) paint systems on plastics coatings on metals shall be of a *suitable* type

paint on polystyrene

(ceiling tile or sheet)

- g) two coats matt utility grade emulsion paint

paint on glass

(glass, glazed brick, terracotta, faience, ceramic tiles and vitreous enamel)

- h) a conventional alkyd gloss or emulsion paint finish system; or
- i) a long-life coating of a specialized type, such as two-pack polyurethane or epoxy.

14.8.6 Intumescent paint

Apply *suitable* intumescent paint on structural steelwork, electrical cables, PVC pipes, wood and thatch by brush, roller or spray where specified, to achieve the required fire resistance.

14.9 Paperhanging

wallpaper

- a) type, pattern, colour: as specified

preparation

- b) ensure plaster surfaces are mature and dry
- c) apply a primer coat on very porous plaster only
- d) remove loose or blistering paint on previously painted surfaces
- e) clean down, fill with *suitable* filler to a smooth surface
- f) knot, prime, stop and sand down wood surfaces

hanging

- g) hang wallpaper vertically with close-fitted and plumb vertical joints; no horizontal joints are allowed; ensure adjacent sheets match in pattern
- h) tightly fit wallpaper against skirtings, ceilings, door frames and windows
- i) apply patent wallpaper adhesive to the back of the wallpaper using a brush
- j) hang wallpaper while adhesive is still wet, position immediately
- k) roll lightly to remove air bubbles
- l) wipe spills with damp cloth.

15 Furniture, equipment, stairs, architectural metalwork

15.1 Joinery

15.1.1 Solid wood

hardwood

- a) hardwood: *SANS 1099*
- b) grade: clear and free of sapwood for visible faces; semi-clear for faces that will not be visible.
- c) required marking: trade name, grade (clear grade—red, semi-clear grade—blue) on one piece in each bundle

softwood

- d) softwood: *SANS 1783-3*
- e) grade: clear and free of sapwood for visible faces; semi-clear for faces that will not be visible.
- f) preservative treatment: required for exterior work
- g) required marking: trade name on one end, grade on other end (clear grade – black; semi-clear – red) on each piece

laminated timber

- h) laminated timber: *SANS 1460*
- i) type: furniture (F)
- j) appearance and finish: sanded and smoothed (G)
- k) preservative treatment: required for softwood exterior work
- l) required marking: application, exposure class, type, appearance and finish on each board

15.1.2 Wood board

plywood and composite board

- a) plywood and composite board: *SANS 929*
- b) required marking: trade name, exposure class, thickness, grade, preservative treatment on each board

decorative melamine-faced boards (MFB)

- c) decorative melamine-faced boards (MFB): *SANS 1763*
- d) required marking: *SANS 1763* + 'MFB' + thickness + abrasion and lamina thickness + Z

fibreboard

- e) fibreboard: *SANS 540*
- f) required marking: type on each board.

particle board

- g) particle board: *SANS 50312*
- h) required marking: *SANS 50312 / EN 312*

oriented strand board (OSB)

- i) oriented strand board (OSB): *SANS 472*

15.1.3 Polymer laminate and solid surfaces

high pressure decorative laminates (HPL)

- a) high pressure decorative laminates (HPL): *SANS 4586*
- b) required marking: *SANS 4586 + type + resistance*, e.g. HPDL—*SANS ISO 4586—P333*

continuous pressed laminates (CPL)

- c) continuous pressed laminates (CPL): *SANS 1762/4586*

polymer solid surfacing material

- d) synthetic work surfaces: consisting of acrylic and/or polyester resin and mineral fillers
- e) joints: seamless.

15.1.4 Stone surfaces

stone surfacing material

- a) stone type, thickness etc. as specified.

15.1.5 Miscellaneous

hardware, fasteners

- a) see section 16

adhesives

- b) terminology and classification: *SANS 10183 part 1*
- c) requirements for structural applications: *SANS 10183 part 2*
- d) requirements for non-structural applications: *SANS 10183 part 3*
- e) phenolic and aminoplastic resin *SANS 1349*.

steel tubes for furniture

- f) steel tubes for furniture *SANS 657 part 4*, and mark-bearing.

15.1.6 Joinery

general

- a) joinery: manufactured in climate zone where joinery is to be installed
- b) joinery workshop: equipped with modern machinery manned by skilled personnel
- c) wood sizes as specified are exact finished sizes
- d) overall sizes: check on site before starting any joinery
- e) store materials in a safe and dry place
- f) apply proprietary materials according to manufacturer's instructions
- g) provide materials in single lengths whenever possible; place unavoidable joints over supports
- h) joints: mechanical (grooved, doweled, feathered, screwed, proprietary plates) plus adhesive; angle joints: to conceal end grain of natural wood or the edge of laminated or particle board
- i) arrises in solid wood: round slightly; vulnerable or exposed arrises: pencil round (3 mm radius)
- j) fixings: not visible except inside cupboards or drawers; in open units, or where unavoidable, use screws with matching caps; in natural solid wood surfaces with clear finishes, countersink to 6 mm below surface and glue in matching dowels
- k) exposed panel pin heads: punch and fill with stopping; stopping to match wood in case of clear finishes
- l) exposed edges of decorative laminate board: post formed
- m) use moisture resistant or exterior grade board in wet parts of joinery (e.g. sinks, wash basins) and all plinths

- n) edges of raw board cutouts: seal to prevent moisture ingress

grain, pattern

- o) grain or pattern: grain of all fitted visible clear-finished timber, or pattern of laminates when relevant, to run vertically on vertical surfaces and parallel to walls on horizontal surfaces, wherever practicable
- p) veneer on any one fitting to match in grain and colour; veneer on pairs of doors to match

plinths

- q) form plinths with front and back members and full height cross members at <900 mm centres
- r) scribe plinths to floor and secure to wall to provide a level platform for carcasses

tops

- s) solid hardwood tops: boards in single lengths or, if not possible, with staggered end joints, jointed with grooved, cross-tongued and glued joints or with grooved rebated and glued joints stopped 25 mm back from visible ends
- t) moisture resistant particle board tops: faced with high pressure decorative laminates with postformed exposed edges
- u) screw tops to framework to allow for movement: with rebated hardwood clamps or metal cleats at 300 mm centres, screwed from underneath

backs

- v) backs to fittings: hardboard or as specified
- w) bevel all exposed edges

drawers

- x) drawers: 12 mm softwood front, sides and back, grooved for 6 mm tempered hardboard bottom, screwed to 16 mm drawer face, or as specified

shop painting

- y) deliver joinery on site fully painted, or as specified.

15.1.7 Fixing

- a) fix only after space is fully enclosed and secure, all wet work is complete and dry, and airconditioning, lighting, site and stormwater works are complete
- b) fix joinery to masonry or concrete walls with *suitable* frame fixing anchors; provide necessary blocking pieces and subframes to take up inaccuracies of wall and floor faces; where exposed hardwood is to be anchor fixed: sink and pellet screw heads
- c) in all food handling areas: seal all carcass joints with walls and floors, and cable entries, with silicone beads for vermin proofing

wood cornices, skirtings, quarter rounds, rails

- d) skirtings of 68 mm and higher: hollow-rounded at the back
- e) fix members to walls with concealed fixings at centres not exceeding 600 mm
- f) fix members in long lengths with splayed heading joints and mitred corner joints
- g) fix skirtings to walls, not to floor boards; nail quarter rounds to skirtings with panel pins

shelf bands

- h) fix metal shelf bands to walls in a manner that will safely carry a working load of not less than 10,0 kN with a safety factor of 3
- i) use stainless steel anchors in areas within 1 km of the coastline
- j) start first band 100 mm away from corners of rooms or from other shelves which are at right angles.

15.2 Commercial kitchen cupboards

- a) commercial kitchen cupboards: *SANS 1385*
- b) required marking on casing of every unit: trade name, production lot
- c) sizes: supplier/manufacturer is responsible for checking sizes on site and for providing detail layout *drawings* before any work is started
- d) fix cupboards according to manufacturer's instructions
- e) seal all joints between work tops and walls
- f) inspect all cupboard components after fixing and leave in perfect working order
- g) protect cupboards from damage.

15.3 Commercial steel furniture

- a) commercial steel furniture: *SANS 757*
- b) powder coated finishes: *SANS 1274*.

15.4 Metal counters, balustrades, cladding, signs, street furniture

stainless steel

- a) austenitic stainless steel, grade as specified

aluminium

- b) anodising: *SANS 999*
- c) powder coating for interior use: *SANS 1274/1578*
- d) powder coating on external architectural aluminium: *SANS 1796*
- e) surface finishing: *SANS 10322*

prefinished sheet metal products

- f) prefinished sheet metal products: *SANS 1845*

protection

- g) remove protective covering only once all other contractors are off site.

15.5 Stairs

Type, structure, treads, balustrades: as specified.

16 Hardware

16.1 General

- a) sherardizing on ferrous products: SANS 53811
- b) electroplating: SANS 135/136/2081/2082
- c) powder coating: SANS 1274 type 6.

16.2 Fasteners

- a) fasteners: SANS 1700
- b) metal screws for wood: SANS 1171
- c) masonry anchors: proprietary expansion or chemical type
- d) plugs: proprietary plastic
- e) mild steel nails SANS 820
- f) required marking: protective coating on container.

16.3 Locks, latches, catches, bolts

- a) locks, latches (domestic type): SANS 4

padlocks

- b) padlocks: SANS 1533

keys

- c) supply two keys to every lock; no key must pass more than one lock unless master keyed
- d) master and grand master keys: as specified
- e) proprietary key control security systems: submit details.

16.4 Hinges

hinges for medium to heavy doors

- a) type: butt hinges for doors opening 90°; projecting hinges for doors opening 180° when frames are set back from wall faces.
- b) aluminium hinges: high tensile aluminium with fixed stainless steel pins in nylon bushes, and with nylon washers to each knuckle joint
- c) doors fitted with closers: provide low-friction bearing hinges
- d) size for steel, stainless steel, brass or bronze butt hinges for wood doors in wood frames:

Nominal hinge size L x w x t (mm)	Door leaves not exceeding any of the following		
	Mass (kg)	Width (mm)	Thickness (mm)
70 x 50 x 1,6	16	620	30
85 x 60 x 1,6	20	820	35
100 x 75 x 1,6	30	920	40
100 x 75 2,5	50	920	50
100 x 75 x 3,2	70	1020	50
125 x 100 x 3,2	80	1220	50

- e) size for aluminium hinges for aluminium doors, or for doors of other materials in aluminium frames, or to AAAMSA standards:

Nominal hinge size l x w x t (mm)	Door leaves not exceeding mass (kg)	Minimum construction	
		Knuckles	Screws/hinge leaf
100 x 70 x 3	30	3	3
100 x 80 x 3,5	50	5	4
130 x 50 x 3,4	75	Surface mount	3

- f) provide fixed pin or security hinges to exterior or security doors opening out
- g) number of hinges to
- doors not exceeding 2 040 mm high or 820 mm wide or 30 kg mass: 2
 - other doors: 3 for leaves between 2 040 and 2 340 mm high; 4 for leaves between 2 340 and 3 050 mm high
 - doors controlled by door closers: 3
 - fire doors: ...

16.5 Door closers

- a) single action overhead door closers *SANS* 1510
- b) manual action: with adjustable closing and latching speed
- c) floor springs, consisting of a floor spring unit set into the floor, bottom and top door strap of size and finish as specified.

16.6 Pelnets, curtain rails, rods, blinds

- a) indoor venetian blinds: *SANS* 947
- cross-straps: flutter-proof
 - screws: cadmium-plated.

16.7 Edge, feature, dividing strips

- a) edge strips: 3 x 40 mm
- b) dividing/feature strips: 3 x 25 mm.

16.8 Sunken door matting

- a) place level with floor finish in a sunken panel edged with metal edge strip as specified.

16.9 Number/name plates

symbolic safety signs

- a) symbolic safety signs *SANS* 1186

signwriting

- b) hand-painted lettering and graphics by tradesman with recognised qualifications and demonstrated experience

installation

- c) install signage level and plumb, securely mounted with concealed theft-resistant fixings
- d) fix self-adhesive signs free of bubbles and creases.

16.10 Drawer runners, slides

- a) type, load capacity, extension: as specified.

16.11 Fixing

- a) deliver door hardware items, ready for installation, in individual complete sets for each door, as follows:
 - clearly labelled to show its intended location
 - in a separate dust and moisture proof package
 - including the necessary templates, fixings and fixing instructions
- b) verify correct handing on site before supplying
- c) fix hardware with matching screws
- d) fix locks, handles, latches etc. at 1 000 mm from finished floor level to centre line of hardware
- e) ease and adjust locks on completion; adjust closers to suit
- f) hand over keys at completion; replace cylinders to which contractor had key access during construction with new cylinders with other keys
- g) label all keys with coloured plastic tags
- h) plug and screw curtain rail/rod brackets and tie-backs to wall
- i) project rails/rods 300 mm past reveals wherever possible, or continuous over windows occurring in series.
- j) fix safety signs according to SANS 1186 in positions as shown in *drawings*
- k) protect hardware during construction.

17 Glazing

17.1 Materials

glass

- a) basic soda lime silicate glass (float glass): SANS 50572
- b) safety and security glass: SANS 1263, symbol 1 (impact), 2 (burglar/vandal) or 3 (bullet) engraved permanently and visible after glazing on each sheet
- c) pattern glass: when relevant, discuss direction of pattern before cutting
- d) low-emissivity glass (low-e): spectrally selective coated glass BS EN 1096
- e) glass louvres: 6,5 mm NS safety glass, regardless of length or width, with polished edges
- f) frameless doors: 10 mm thick safety glass for internal use; 12 mm thick safety glass for external use
- g) insulated glass (double glazing): factory-prepared sealed insulated glazing units (SIGU), consisting of two panes of clear float glass separated by a sealed spacer to entrap a dehydrated air gap, indelibly mark-bearing with the trade name of the assembler/manufacturer, visible after installation
- h) work on glass: SANS 1817

polymer glazing

- i) polymer glazing: as specified

sealants

- j) sealants: see Section 6.

17.2 Glazing

Invoked standard when specified: SANS 10137 The installation of glazing materials in buildings.

17.2.1 Glazing in frames

Applicable standard: SANS 2001-Construction Works Part CG1: Installation of Glazing.

Specification data:

- a) glass type, size, thickness: see 17.1
- b) frames for glazing: see Section 10.

17.2.2 Structural glazing

gaskets and sealants

- a) elastomeric structural glazing and panel gaskets: SANS 635
- b) structural sealants to be compatible with extrusion surface, glazing tape and glass, backed by regular test reports regarding adhesion of sealant to aluminium frame in accordance with ASTM/C 794-80 (standard test for adhesion-peel of elastomeric joint sealants)
- c) adhesion of sealant to aluminium, whether anodised or organic coated:
 - capable of maintaining an ultimate adhesive bond strength between aluminium and sealant of 0,828 MPa
 - design stress not to exceed 0,138 MPa
 - structural sealant glazing contractor to check adhesion of cured sealant on representative test joints on site before proceeding with installation
 - checks to be carried out periodically throughout installation period.
- d) use only freshly manufactured sealant; use only compatible accessory materials as recommended by sealant manufacturer, for example degreasing solvents, primers, back-up material with integral bond breaker, spacer and setting blocks

- e) fill sealant cavities completely

quality assurance

- f) ensure disciplined quality assurance during all stages of fabrication and installation
- g) factory glazing is preferred over site glazing.

17.2.3 Protection and cleaning

- a) protect glass against harmful splashes and weld splatter
- b) clean glass as soon as practicable after installation with mild soap and water
- c) ensure cleaning materials are not harmful to plastic glazing materials and glazing compounds.

17.3 Mirrors

- a) silvered float glass mirrors: SANS 1236, class A with chamfered and/or polished edges
- b) privacy mirrors: clear glass with mirrored venetian strips for visual privacy and/or security
- c) stainless steel mirrors: 0,9 mm thick bright annealed mirrored stainless steel
- d) fasten glass mirrors with chromium plated mirror screws to wall and allow 3 mm air space at back for ventilation, or fix mirrors with vertical strips of double sided tape to allow for ventilation; support mirrors larger than 1 m² with additional clips, anchors or beads
- e) fasten stainless steel mirrors with screws and/or glue in acceptable manner.

18 Drainage, sewerage, water and gas supply, fire equipment, sanitary plumbing

18.1 Roof eaves drainage

18.1.1 Materials

galvanized steel

- a) hot dip zinc-coated steel sheet: *SANS 3575/4998 Z275* or *AZ150* for inland regions, *Z600* or *AZ200* for coastal regions:
- 0,5 mm for domestic gutters up to 15 000 mm² (cross-sectional area) and domestic downpipes
 - 0,8 mm for gutters up to 30 000 mm²
 - 1,0 mm for gutters up to 50 000 mm²
 - 1,2 mm for box gutters with a maximum girth of 1225 mm
- b) nails, bolts and screws: zinc-plated or sherardized steel
- c) brackets: mild steel strip hot dip galvanized *SANS 121* after manufacture:
- 32 x 3,5 mm for gutters up to 15 000 mm²
 - 40 x 5,0 mm for gutters up to 30 000 mm²
 - 40 x 6,0 mm for gutters up to 50 000 mm²

copper

- d) copper sheet:
- 0,6 mm for gutters up to 15 000 mm²
 - 0,8 mm for gutters up to 30 000 mm²
 - 1,0 mm for gutters up to 50 000 mm²
 - 1,2 mm for box gutters with a maximum girth of 1225 mm
- e) brackets, nails, bolts and screws: copper or stainless steel

aluminium

- f) aluminium sheet:
- 0,7 mm for gutters up to 15 000 mm²
 - 0,8 mm for gutters up to 30 000 mm²
 - 0,9 mm for gutters up to 50 000 mm²
 - 1,0 / 1,2 mm for box gutters with a maximum girth of 1 225 mm
- g) brackets, nails, bolts and screws: aluminium alloy or stainless steel

PVC

- h) PVC-U gutters and downpipes: *SANS 11*
- brackets: aluminium alloy.

18.1.2 Gutters and downpipes

Gutters

- a) complete with angles, beads, stop ends and outlet nozzles where required

downpipes

- b) with the necessary offsets and shoes where required; minimum slope of 'horizontal' offsets: 5°

accessories

- c) outlet drop boxes: funnel shaped
- d) overflow weirs, hail guards, launders: as specified

gutter brackets

- e) material and finish: similar to gutter or compatible with, and with equal or better corrosion resistance

18.1.3 Installation

- a) according to manufacturer's instructions where relevant
- b) lap sheet metal gutter lengths >20 mm; seal with *suitable* sealant over full lap before riveting
- c) lay gutters in brackets to slight fall to outlets, nailed/screwed to roof timber at 2 m maximum centres in the case of sheet metal gutters, at 1 m in the case of U-PVC gutters, and at angles and outlets
- d) bolt sheet metal gutters to brackets close to underside of gutter bead with 6 mm diameter gutter bolts
- e) form on-site in one stop-end in every sheet metal gutter run a 20 mm lipped weir overflow over full gutter width
- f) ensure gutters fall to outlets – no ponding is allowed
- g) fix downpipes to walls, 25 mm clear of finished wall face, seam towards wall when relevant, with 25 x 1,6 mm hot dip galvanized mild steel holderbats, bolted around pipe in two halves, and with 6 mm diameter hot dip galvanized steel spiral nail driven into wall, at least twice per downpipe length and at 2 m maximum centres
- h) where required, fit rainwater pipes to stormwater drains with sheet metal flange to fit into socket of drain pipe, riveted and soldered to pipe; join pipes to drains with cement mortar.

18.2 Flat concrete roof, balcony and floor drainage

18.2.1 Rainwater outlets

- a) type: patent outlet with grating, or pipe without grating as specified
- b) patent outlet type:
 - ductile iron consisting of flanged funnel-shaped head with outlet threaded to take standard mild steel hot dip galvanized pipes, and with removable domical gratings for roofs or flat gratings for car parks, secured by centre hook bolt
 - cast outlet heads with necessary pipework into concrete, at such a level that ponding does not occur after waterproofing

18.2.2 Floor outlets

- a) grating: removable and capable of taking heavy vehicle loading
- b) grease and solids trap: easy-clean
- c) with tapered bottom for installation on 100 mm diameter pipe or clamp coupling
- d) set at such a level that ponding does not occur after flooring is installed.

18.2.3 Outlet downpipes

- a) PVC-U pipes: SANS 967
- b) hot dip galvanized steel pipes with screwed ends: SANS 62
- c) hot dip galvanized malleable cast iron fittings: SANS 14.

18.3 Stormwater drainage

18.3.1 Earthworks

Applicable standard: SANS 2001-Construction Works Part DP1: Earthworks for buried pipelines

and prefabricated culverts.

18.3.2 Stormwater drainage

Applicable standard: SANS 2001 Construction Works Part DP5: Stormwater drainage

pipes

- a) concrete pipes and associated fittings: *SANS 677*
- b) fibre cement pipes and associated fittings: *SANS 819*
- c) PVC-U pipes and associated fittings: *SANS 791/1601*
- d) GRP pipes and associated fittings: *SANS 1748-1*
- e) PP pipes and associated fittings: *SANS 8773*
- f) PE pipes and associated fittings: *SANS 4427*
- g) diameters: as specified

culverts

- h) precast concrete culverts *SANS 986* type portal.

18.3.3 In situ concrete stormwater channels

- a) concrete: grade 30
- b) cast rainwater channels and spill basins on well rammed earth filling
- c) lay channel floors to even fall of 1:250 minimum and as specified
- d) neatly form angles and sweeps around gulleys without changing channel profile
- e) form stop-ends at tops of gradients
- f) finish channels on exposed surfaces with 2:1 sand:cement plaster, trowelled smooth with rounded salient angles
- g) cast rainwater channels with isolation joints against walls and with keyed or doweled construction joints at 1,8 m maximum centres along its length
- h) cast concrete spill basins: to shape, size and finish as specified.

18.3.4 Agricultural drains

- a) pipes: 100 mm diameter agricultural drain pipes
- b) pattern: main drain with branch spreader drains to pattern and lengths as shown in drawings
- c) trenches: 600 mm wide x >700 mm deep at >2 m apart
- d) laying:
 - on 150 mm thick beds of clean, hard, durable stone graded from 35—75 mm, and covered after laying with same to 280 mm above tops of pipes
 - lay pipes with open joints
 - cover each joint with a flat stone to prevent infiltration of soil
 - plug lower end of main drain with 2:1 cement mortar
- e) filling: cover stone filling in trenches with *suitable* plastic sheeting and fill trenches with earth filling, lightly rammed.

18.4 Sewerage

18.4.1 Earthworks

Applicable standard: SANS 2001-Construction Works Part DP1: Earthworks for buried pipelines and prefabricated culverts.

18.4.2 Sewers (>160 mm)

Applicable standard: SANS 2001- Construction Works Part DP4: Sewers

Specification data:

- a) types of pipe, diameter, gradient etc.: as specified.

18.4.3 Sewers for buildings

Applicable standard: SANS 2001-Construction Works Part DP7: Sewers for Buildings

Specification data:

- a) type of pipe, diameter, gradient etc.: as specified.

18.4.4 Surface boxes, manhole covers, gully gratings, frames

- a) polymer concrete surface boxes, manhole and inspection covers, gully gratings and frames: SANS 1882, mark-bearing
- b) cast iron, cast steel, rolled steel combined with concrete gully tops and manhole tops for vehicular and pedestrian areas: SANS 50124 / EN 124, mark-bearing
- c) installation: top of dished gullies >150 mm above finished ground level or 50 mm above permanent paving.

18.4.5 Grease interceptors

- a) material, type, capacity and size: to approval of the local authority or as specified.

18.4.6 Pit latrines

- a) construction: masonry, patent precast concrete, patent polymer
- b) waterless ventilated improved pit (VIP) latrine: consisting of a structurally lined and ventilated underground pit, floor slab, ventilated wall enclosure with roof and door, toilet pedestal, toilet seat and lid
- c) masonry type: as described in NHBRC Home Building Manual Part 11 and relevant details, internal size of pit 750 x 1 500 x 2 000 mm minimum deep; exposed end of floor slab covered with precast concrete panels
- d) patent type: installed to manufacturer's instructions or to the requirements of an active Agrément certificate
- e) to the approval of the local authority.

18.4.7 Conservancy tanks, septic tanks and french drains

- a) conservancy tanks, septic tanks and french drains: SANS 10400-P, of type, construction, capacity as specified.
- b) patent type installed to manufacturer's instructions or to the requirements of an active Agrément certificate.

18.5 Water supply

18.5.1 Earthworks

Applicable standard: SANS 2001-Construction Works Part DP1: Earthworks for buried pipelines and prefabricated culverts.

18.5.2 Below ground medium pressure pipelines

Applicable standard: SANS 2001-Construction Works Part DP2: Medium pressure pipelines

Specification data:

- a) type of pipe, size etc.: as specified.

18.5.3 Below ground water installation for buildings

Applicable standard: SANS 2001-Construction Works Part DP6: Below ground Water installations for Buildings.

Specification data:

- a) type of pipe, size etc.: as specified.

18.5.4 Above ground water installation

Invoked standard when required: SANS 10252 Water supply and drainage for buildings.

materials

- a) pipes, and associated fittings recommended by pipe manufacturer: material as specified, supplied from one source
- b) water supply and distribution system components: SANS 1808
- c) float valves SANS 752

installation

- d) pipes: according to manufacturer's instructions
- e) discuss measures to avoid unsightly pipework before any chasing or cutting for pipework is started
- f) fixing of pipes <20 mm: chased or surface fixed as specified
- g) fixing of pipes >20 mm: surface fixed or run in ducts
- h) surface fixing on internal walls: in neat straight horizontal and vertical runs to internal walls only, after plastering, with hot dip galvanized cast iron holderbats SANS 1209, or plastic holderbats for copper or polypropylene pipes, at centres *according to manufacturer's instructions*; leave clear space of 15 mm between pipe and finished wall
- i) surface fixing on external walls: prohibited except for a short distance of vertical rising main from ground level to floor level
- j) chasing:
 - not in wall faces that are to receive roof flashing
 - in solid masonry only, not deeper than one third of wall thickness vertically and not more than one sixth of wall thickness horizontally; avoid horizontal chasing where possible
 - in walls constructed of structural masonry and hollow blocks: only with permission, or locate pipes in cavities during construction
 - ensure chases, holes and recesses are made so as not to impair strength or stability of walls, or reduce fire resistant properties of wall
 - fill chases in masonry walls with class I or II mortar once pipes are in position
- k) fasten pipes firmly to roof timber
 - with hot dip galvanized mild steel or copper pipe clips screwed on
 - polypropylene hot water pipes: support continuously
 - polypropylene pipes: not closer than one metre from hot water geysers
- l) use bends in preference to elbows if practicable; if a reduction in size of pipe takes place at an angle, the bend or elbow must be the size of the larger pipe
- m) no air may lodge in pipes; maintain a proper fall
- n) provide for expansion in long lengths of pipes
- o) insert long- screws or suitable couplings at convenient points to provide for alterations and repairs
- p) provide unions at in- and outlets to geysers

testing

- q) fill entire water reticulation system with water
- r) ensure air is evacuated
- s) pressurise water in system to one-and-a-half times the expected design working pressure by means of a pump and maintain pressure for four hours
- t) inspect system for leakages and repair
- u) inspect again after connecting to mains.

18.5.5 Water storage tanks

- v) accessories: inlet, outlet, overflow pipe connections, float valve of same bore as supply pipe
- w) drip tray in roof space: SANS 1848.

18.6 Electric geysers and solar water heaters

18.6.1 Electric geysers

- a) geysers: SANS 151
- b) required marking: capacity, working pressure, mounting position, design, standing loss per 24h in kWh, moisture resistance class, colour coding (yellow—50 kPa, blue—100 kPa, black—200 kPa, brown—300 kPa, red—400 kPa, green—600 kPa)
- c) install: to SANS 10254 and according to manufacturer's instructions, including drip trays
- d) position geysers in roof spaces on firm timber bearers near ceiling hatch so that electric element can be reached through the hatch from a step ladder, whenever possible
- e) preset geyser thermostat to 50° C.

18.6.2 Solar water heaters

- a) domestic solar water heaters: SANS 1307, mark-bearing.

18.7 Gas supply

Gas installation: SANS 10087.

18.8 Fire equipment

- a) all fire equipment to approval of local authority

fire hydrants

- b) fire hydrants: SANS 1128 part 1

fire hose reels

- c) fire hose reels: 30 m long x 20 mm diameter light duty rubber fire hose, fixed base, couplings, connections, branch pipes and nozzles: SANS 543 and SANS 1128 part 2
- d) fix reels against walls with *suitable* frame anchors or expansion bolts at a height of 2 100 mm from floor to spindle, or to height as specified
- e) enclose reel in security cupboard with clear acrylic cover and *suitable* closer when specified

portable fire extinguishers

- f) general purpose, non-refillable fire extinguishers: SANS 1322 and mark-bearing
- g) water, foam or dry powder rechargeable extinguishers: SANS 1910
- h) CO₂ type extinguishers: portable rechargeable carbon dioxide extinguishers: SANS 1567 and mark-bearing
- i) BCF type extinguishers: halogenated hydrocarbon fire extinguishers: SANS 1151 and mark-bearing
- j) hang extinguishers on wall hooks screwed and plugged to wall
- k) enclose in security cupboard with clear acrylic cover and *suitable* closer when specified.

18.9 Sanitary plumbing

18.9.1 Sanitary appliances

- a) fitted with waste, plug and chain as required

baths

- b) acrylic baths: SANS 1402 / 50198

- c) handles: when specified

basins

- d) glazed ceramic wash-hand basins: *SANS 497*
 e) stainless steel wash-hand basins: *SANS 906*

wash troughs

- f) stainless steel wash troughs: *SANS 906*
 g) concrete wash troughs
 - reinforced concrete, with reeded front
 - drainers to be of reinforced concrete with lip to fit over side of trough and fixed to trough with copper dowels and to wall with bracket supplied
 - pedestals to be of reinforced concrete
 - bed pedestals on floor, and trough on pedestals, with 1:2 cement-sand mortar

water closets

- h) glazed ceramic water closets: *SANS 497*

flushing cisterns

- i) glazed ceramic flushing cisterns: *SANS 497*
 j) plastic flushing cisterns: *SANS 821*
 k) cistern flush valves: *SANS 1509*

urinals

- l) glazed ceramic urinals: *SANS 497*
 m) stainless steel urinals: *SANS 924*

sinks

- n) glazed ceramic sinks: *SANS 497*
 o) stainless steel sinks with draining boards for domestic use: *SANS 242*
 p) stainless steel sinks for institutions: *SANS 907*

shower enclosures

- q) shower enclosures
 - shower enclosures for domestic purposes: *SANS 549*
 - glass: *SANS 1263*
 - anodizing: *SANS 999*
 - powder coating: *SANS 1274/1578/1796*

bains marie

- r) bains marie and hot cupboards: *SANS 1174*.

18.9.2 Taps, valves, showerheads

- a) water taps (metallic): *SANS 226*, class as suitable to dynamic supply pressure
 b) water taps (plastic bodies): *SANS 1021*, class as suitable to dynamic supply pressure
 c) taps for cold and hot water: mark-bearing blue and red respectively
 d) aerators: required
 e) wall type taps: with sliding flange
 f) single control mixer taps: *SANS 1480*
 g) flush valves: *SANS 1240*, type as specified.
 a) showerhead: type as specified.

18.9.3 Traps

- a) plastic waste traps: SANS 1321, part 1
- b) rubber waste traps: SANS 1321 part 2.

18.9.4 Miscellaneous

- a) holders, shelves, cabinets: as specified

18.9.5 Fixing of sanitary fittings generally

- a) leave protective wrappings in position for as long as possible
- b) fix in a manner that will facilitate future removal
- c) install fittings to manufacturer's instructions
- d) fix appliances securely; use manufacturer's brackets and fixing methods wherever possible; use frame anchors for fixing brackets – do not screw and plug
- e) bed water closet pans in 1:3 cement-sand mortar; bed squatter pans in grade 10 concrete
- f) brick up open sides of build-in type baths
- g) bed acrylic baths in 1:5 cement:sand mortar on three rows of bricks, or bed solidly on dry river sand or concrete
- h) fix shower heads at 2 100 mm above shower floor level
- i) fix urinals at 610mm from floor to front lip of urinal bowl
- j) seal joints.

19 Electrical works

Invoked standard when required: SANS 10142–The wiring of premises.

19.1 Earthworks

Applicable standard: SANS 2001-Construction Works Part DP1: Earthworks for buried pipelines and prefabricated culverts.

19.2 Cable ducts (underground)

Applicable standard: SANS 2001-Construction Works Part DP3: Cable ducts.

19.3 Materials and installation

19.3.1 Wiring

conduits

- a) conduits: SANS 950/61386
- b) embed in wall chases with cement mortar and clamps
- c) do not chase in wall faces that are to receive roof flashing (see Section 7)
- d) fix on wall surfaces and in roof spaces with clamps
- e) embed in concrete surface beds
- f) do surface fixing level, plumb, neatly and in straight lines

conductors

- g) PVC isolated copper conductors: SANS 150

electric cables

- h) PVC armoured copper cable: SANS 1574/1411

distribution board and meter cabinets

- i) prepainted pressed steel with door and latch: SANS 1973, with isolator, earth leakage protection unit: SANS 767, and circuit breakers as required
- j) build in cabinets in walls, or surface mount, as specified
- k) label all functions in distribution board and provide legend card

switches and sockets

- l) switches: SANS 60669, including dimmer, remote-control, isolating and time-delay switches

plug and socket systems

- m) 3 pin 16 Amp wall switch sockets: SANS 164
- n) boxes and enclosures with covers: SANS 1085/60670
- o) build in boxes for switches at 1 500 mm above floor level or as specified
- p) build in boxes for sockets at 300 mm above floor level except above work tops where these must be 1 200 mm above floor level or as specified
- q) telephone or television points: build in boxes at 300 mm above floor level or as specified; connect with conduit to roof space and through to roof overhang nearest telephone connection or television antenna; provide conduit with draw wire.

19.3.2 Fittings

luminaires

- a) type: as specified

- b) luminaires: *SANS* 60598, complete with lamps, ballasts, control gear and earth terminals; control gear within luminaires to be mark-bearing
- c) fix luminaires at as late a stage as possible, and protect from damage
- d) earth all luminaires

stove, hob, oven, cooker hood

- e) stoves: *SANS* 153
- f) commercial kitchen extraction systems: *SANS* 1850.

19.4 Testing

- a) inform local authority at completion of electrical installation for inspection
- b) provide a copy of the electrical test certificate before handing over.

19.5 Lightning protection

To *SANS* 10313/*SANS* 61024.

20 Mechanical works

20.1 Installation

- a) install equipment and services level and plumb; fix securely; organise reticulated services neatly
- b) fix directly to structure where possible, independantly of suspended ceilings; trim around holes or penetrations through non-structural elements
- c) maintain fire and acoustic rating integrity of false ceilings etc.
- d) allow for movement in both structure and services
- e) conceal cables, ducts, trays, pipes etc. unless installed in plant spaces, ceilings, riser cupboards, etc. or as specified
- f) provide heavy items of equipment with permanent fixtures for lifting as recommended by the manufacturer.

20.2 Building penetrations

- a) do not embed pipes that operate under pressure in concrete or surfacing material
- b) seal penetrations through fire rated elements according to fire regulations
- c) seal penetrations through non-fire rated elements around conduits and sleeves, and around cables within sleeves; if the building element is acoustically rated, maintain the rating
- d) seal roof penetrations with metal upstand flashings and counter flashings – do not use fabric reinforced paint or bitumen
- e) provide primed metal or PVC sleeves with diameter sufficient to allow 12 mm space around interior pipe (or pipe insulation) or cable.

20.3 Location and access

Locate and arrange all services and equipment so that:

- a) tray and overflow pipe are provided to each tank, hot water heater and storage vessel
- b) fan coil units, valves or other potential leak sources are not located over rooms containing water sensitive equipment or finishes
- c) inspection and maintenance operations can be carried out with minimum inconvenience and disruption to building occupants or damage to the building structure or finishes
- d) services and equipment are readily accessible for inspection and maintenance and arranged so that inspection and maintenance can be carried out in a safe and efficient manner
- e) access is provided by catladders and catwalks from floor level to plant (including high level tanks) requiring regular inspection and maintenance, and/or where height of ceiling prohibits access from standing ladders
- f) equipment that requires inspection and maintenance in false ceilings with removable tiles is accessible, and, where this is not the case, by means of access panels
- g) the number of access panels is kept to a minimum – coordinate with other trades to use common access panels where feasible

20.4 Vibration suppression

Minimise transmission of vibration from rotating equipment to building elements by means of flexible connections, inertia bases, restriction of maximum rotation speed to 1500 r/min, isolation mountings or spring mountings.

21 External works

21.1 Paving

Invoked standards when specified:

Precast concrete paving blocks—laying manual. The Concrete Masonry Association

Technical guide: Clay Pavers & Paving—selection and construction guidelines. Corobrik

Applicable standard: SANS 1200 MJ Standardized specification for civil engineering construction: Segmented paving.

21.1.1 Materials

units

- a) precast concrete segmental paving blocks: *SANS 1058*
- b) burnt clay paving units: *SANS 1575*
- c) precast concrete paving slabs: *SANS 541*.

in situ concrete

- d) in-situ concrete: see Section 2

sand for bedding and jointing of flexible paving

- e) free of soluble salts or contaminants likely to cause efflorescence or staining
- f) moisture content: 5 – 8 %
- g) grading limits:

Sieve size (mm)	% passing
9,25	100
4,75	95 – 100
2,36	80 – 100
1,18	50 – 85
0,60	25 – 60
0,30	10 – 30
0,15	5 – 15
0,075	0 – 10

- h) jointing sand: to pass a 1,18 mm sieve, containing 10 – 50 % material passing a 0,075 mm sieve

mortar for rigid paving

- i) sand with fineness modulus in the region of 2,2 – 4,0 to minimize permeability
- j) mortar: *SANS 2001-Construction Works Part CM1*, class I external, class II internal
- k) use minimum water

infill concrete

- l) infill concrete: grade 25/10 .

21.1.2 Preparation

subgrade

- a) excavate to achieve finished levels and falls as specified
- b) remove soft spots and biodegradable material and replace with suitable filling material
- c) complete installation of all sub-soil drainage pipes

- d) compact to 90% *MOD AASHTO*; take special care to compact trenches and around manholes – stabilise with 5% cement prior to compaction if necessary

sub-base for flexible paving

- e) sub-base material and construction: as specified by a *competent person*
- f) form paving surface profile on finished surface of sub-base – do not make up irregularities in surface with bedding sand

concrete sub-base for rigid paving

- g) sub-base concrete: grade 10 as described under Section 2, to thickness and with reinforcement as specified

weed killer

- h) treat area to be paved with *suitable* weed killer when specified
- i) take care that trees or shrubs that have to be retained are not affected

levels, falls, pattern

- j) ensure kerbs and edge restraints are complete and levels and falls are correct
- k) agree on pattern, edges, cutting of units etc. before laying.

21.1.3 Laying

flexible block/brick paving

- a) keep long axis square to line of traffic flow
- b) lay pavers true to line and level on loose and evenly spread sand bedding of compacted thickness 25 ± 10 mm
- c) lay full units first
- d) joints: 2 – 6 mm wide
- e) fill areas in which a full unit will not fit with clean-cut units or, if less than 25 % of a full unit, with concrete left for 24 h before compacting
- f) compact surface as soon as practicable, not closer than 1 m from free edges or working faces, with high frequency, low amplitude mechanical flat plate vibrator capable of producing a centrifugal force of 7 – 16 kN at a frequency of approximately 75 – 100 Hz on a plate size of 0,35 – 0,5 m²; make sufficient passes to compact sand bedding to 15 – 35 mm thickness; make at least two passes
- g) brush joint filling sand into joints after first pass; remove excess sand on completion
- h) on grades exceeding 8%, cast concrete anchor beams across road as specified

flexible slabs

- i) lay slabs on 50 mm clean river sand
- j) joints: fill with class I cement mortar and strike off with jointer, or leave open when specified

rigid block/brick paving

- k) clean base concrete
- l) set out pavers with string, templates or gauge rods, or dry lay entire area
- m) brush 1:1 cement:fine sand slurry over surface
- n) dip clay pavers with high absorption rate in water before laying; otherwise do not wet pavers
- o) butter each paver, bed solid in mortar, and fill joint in one operation
- p) tool joints flush or bucket handle
- q) form 10 mm movement joints at 4,5 m intervals at right angles in two directions, and against or edge restraints like buildings, manholes and columns
- r) fill movement joints with *suitable* sealant – see Section 6

in situ concrete paving

- s) see section 2

cutting

- t) cut pavers with a masonry disc cutter

accuracy

- u) gradual allowed deviation under 3 m straight edge: 10 mm maximum
- v) allowed difference in level between adjacent units: 3 mm maximum
- w) allowed deviation of line of pattern: 15 mm in 3 m maximum.

cleaning

- x) leave paving clean and free from stains.

21.2 Concrete culverts, kerbs, channels**21.2.1 Materials**

- a) precast concrete culverts: *SANS 986*, type portal
- b) kerbs, edgings and channels: *SANS 927*
- c) mortar: *SANS 2001-Construction Works Part CM1*, class I
- d) bedding material: crushed stone, sinter, slag, sand or *suitable* porous material with a particle size of 13 mm maximum
- e) backing concrete: grade 15
- f) sealant: see Section 6.

21.2.2 Laying

- a) excavate trenches for kerbs and channels to below required level and refill with >70 mm of bedding material
- b) compact to required level and slope to density of >90 % *MOD AASHTO*
- c) bed kerbs and channels on 50 mm bedding material with 10 mm joints filled with mortar; wet joints well before jointing
- d) lay kerbs and channels in 1 000 mm maximum lengths for straight or curved kerbs with a radius of >20 m
- e) lay in 500 mm maximum lengths for curved kerbs with a radius between 4 and 20 m, or 300 mm maximum for radii up to 4 m
- f) provide 12 mm wide movement joints in channels at intervals not exceeding 20 m and leave open or fill with polysulphide when dry as specified
- g) support backs of kerbs with well-compacted backing concrete
- h) fill behind kerbs with suitable material in layers not exceeding 150 mm, wet and compact to 90 % *MOD AASHTO* density
- i) protect concrete units against damage and discolouration.

accuracy

- j) maximum deviation of any edge, centre line or vertical surface from specified position: 25 mm
- k) maximum allowed deviation of any invert level: 10 mm.

21.3 Concrete retaining blocks

Invoked standard when required: *SANS 207* Design and construction of reinforced soils and fills soil reinforcement

Invoked standard when required: *SANS 10409* Design, selection and installation of geomembranes

Invoked standard when required: Concrete Retaining Block Walls—Installation Manual, published by the Concrete Manufacturer's Association

blocks

- a) concrete retaining blocks: *SANS 508*

geomembranes

- b) thermoplastic geomembranes: *SANS 1526*

preparation

- c) ascertain position and depth of existing buried services before excavating; avoid damage
d) prepare level and compacted earth foundation trench of depth as specified
e) in case of walls not higher than 1,2 m, lay 300 x 75 mm deep layer of compacted granular base material like crushed rock or gravel
f) in case of walls higher than 1,2 m, lay concrete strip foundation of 150 mm thick and of width as specified
g) install behind wall when specified:
- perforated drain pipe with positive gravity flow to outlets
 - aggregate blanket drain
 - geofabric covering

placing

- h) stack units by hand, without mortar, true to line, level and in pattern as specified
i) place suitable granular backfill and compact
j) lay geofabric reinforcement when specified
k) clean wall, clear debris and pockets, ready to accept planting.

21.4 Gabions

Applicable standard: SANS 1200 Standardized specification for civil engineering construction Section DK: Gabions and pitching

materials

- a) hexagonal woven steel wire mesh gabions and revet mattresses: *SANS 1580*

laying

- a) prepare bases
b) assemble cages on site and fill with clean, hard, unweathered boulders or rock fragments with minimum size two-thirds of basket thickness or 300 mm, whichever is smallest.

21.5 Fencing

21.5.1 Line wire and chain-link mesh fencing

- a) zinc-coated fencing line wire (plain and barbed): *SANS 675*, of zinc coating class light for inland areas, heavy for coastal or corrosive regions
b) chain-link (diamond) mesh fencing and wire accessories: *SANS 1373 / 675 / 10244*

straining eye bolts

- c) straining eye bolts: 10 mm diameter x 300 mm threaded mild steel bolt with eye, washer and nut, hot dip galvanized to *SANS 121 / SANS 14713*
d) permanent wire pullers: prohibited

posts, stays, standards, droppers

- e) precast concrete posts: prestressed alkali aggregate reactive concrete

- f) wood posts, stays and droppers, preservative treated to SANS 1288 hazard class H4: hardwood SANS 457-3, 145—174 mm diameter posts and stays, 32—50 mm droppers
- g) posts provided with necessary holes for hinges, straining bolts, binding wire etc.

erection

- h) clear fence route; roughly level to obtain uniform gradient
- i) excavate holes 400 x 400 x 800 mm deep for posts and 300 x 300 x 600 mm deep for stays
- j) plant posts and stays in grade 15 concrete to 50 mm above ground level with chamfered top surface: at gates, ends, corners, intersections and at intermediate distances not exceeding 90 m, or at acute changes in level
- k) provide stays to all straining posts in direction of line of fence
- l) drive standards 450 mm deep into ground at 3 m centres
- m) thread straining wire through holes in standards at bottom, top and intermediate centres not exceeding 300 mm for wire fencing, or at intermediate centres not exceeding 600 mm for wire mesh fencing; bind around posts or straining eye bolts, and strain
- n) bind droppers to straining wire with binding wire
- o) cover with wire mesh when relevant, tension and bind securely to straining wire at every third mesh; join roll ends with a spiral to form a continuous fence; tie or clip welded mesh to straining wire at 300 mm centres; trim roll ends by overlapping 100 mm
- p) in the case of PVC-coated wire, take care not to crack or puncture the coating
- q) if ground is soft or post or stay cannot be securely fixed: improvise
- r) make good any damaged protective coatings
- s) do not cut preservative treated timber where it will be in the ground
- t) check fence on completion; grease hinges; cut off projecting bolt threads; burr over bolt ends to prevent nut removal, and coat with bitumen paint.

fencing gates

- u) steel gates with tubular frames and wire or mesh filling (for farm and domestic use)
- v) hang gates on adjustable hinges
- w) provide gates with steel spring or U catches, drop bolts and locking devices
- x) drop bolts to drop in *suitable* length of pipe set in concrete to 30 mm above ground level

finish

- y) finish to gates and accessories: two coats bituminous aluminium paint SANS 682 grade 1 inland; hot dip galvanized SANS 121/14713 in *the coastal region* or corrosive atmospheres.

21.5.2 Weld mesh fencing

- a) material, mesh size, finish: as specified
- b) erection: according to manufacturer's instructions.

21.5.3 Barbed tape fencing

- a) barbed tape security barriers: SANS 1620, of material, form as specified
- b) erection: according to manufacturer's instructions.

21.5.4 Palisade fencing

steel

- a) steel palisade fences and gates: SANS 301-12
- b) pale points: forked or spiked
- c) panels: 3 m length, safety bolted to steel posts
- d) pales for heights up to 2,4 m for general purposes: corrugated and angle
- e) pales for heights of 3,0 m and 3,6 m for security purposes: corrugated

- f) plant posts in grade 15 concrete footings at 3 m centers or according to manufacturer
concrete
- g) posts, rails and pales: steel reinforced precast concrete grade 30
- h) bolts: galvanized carriage bolts
- i) plant posts in 600 x 600 x 600 mm concrete base at approximately 2 m centres
- j) bolt rails to posts, two per bay
- k) bolt pales to rails, nine per bay
- l) countersink bolts on both sides and grout holes solid
- m) erection: according to manufacturer's instructions.

21.5.5 Electric fencing

- a) electric fencing system: stranded wire on plastic or porcelain isolators on brackets, complete with energizer, batteries etc. as required
- b) wire: galvanized A grade high-tensile steel inland, or stainless steel for *coastal areas* or corrosive atmospheres
- c) electric fencing safety: SANS 10222-3 / 60335-2.

21.5.6 Gate automation

- a) electric gate motor with battery backup, crush protection, fine position control, remote control
- b) theft-resistant cages with padlock are required when specified.

21.5.7 Private swimming pool fencing

- a) private swimming pool fencing: SANS 1390, of height and protective coating as specified.

21.6 Precast concrete panel walling

- a) precast concrete posts and panels: SANS 1372
- b) plant posts 500 mm deep in grade 15 concrete at approximately 1,6 m centres
- c) slip in panels between posts, and level.

21.7 Swimming pools

- Invoked standard* when required: SANS 10209 The design and construction of swimming pools
- a) swimming pool: size, shape and finish as specified.

21.8 Timber decking

21.8.1 Materials

poles

- a) softwood: SANS 457-2
- b) hardwood: SANS 457-3
- c) preservative treated to SANS 1288 hazard class H3 when above ground, class H4 when in ground contact
- d) top diameter: colour marked
- e) required marking: metal tag with hazard class on each pole or bundle

sawn structural softwood

- f) sawn softwood SANS 1783-2 grade 5

sawn structural hardwood

- g) sawn hardwood (Eucalyptus) SANS 1707-1 grade 5

structural laminated timber

- h) structural laminated timber: SANS 1460
- i) exposure class: 1 (exterior)
- j) type: G (stocklam)
- k) stress grade: 5
- l) preservative treatment of softwood: SANS 1288 hazard class H3
- m) fire retardent treatment: when specified
- n) required marking: on each piece a combination of code letters: application, exposure class, type, appearance and finish, stress grade, e.g. S2GP5.

deck boarding

- o) softwood: industrial planed wood: SANS 1783-3
- p) hardwood: planed strip flooring: SANS 281
- q) shape: rectangular (not tongue-and groove) with arrised edges
- r) in long lengths
- s) preservative treatment: SANS 1288 hazard class H3

fixings

- t) brackets, shoes, threaded rod etc: mild steel, hot dip galvanized to SANS 121/SANS 14713
- u) nails, bolts, nuts, washers: SANS 1700, hot dip galvanized to SANS 121/SANS 14713
- v) screws: countersunk head to SANS 1171, of material as specified..

balustrades

- w) material, construction as specified.

21.8.2 Installation

- a) poles: plant in ground, or fix on brackets cast into concrete footings as specified
- b) plant poles in 300 mm diameter holes in ground on a bed of gravel or concrete; fill holes with gravel, tamp and top up with a collar of 200 mm concrete, shaped sloping away from pole
- c) bolt the structure of poles, beams, joists, cross bracing and strutting to comply with SANS 10082; recess bolt heads, washers and nuts
- d) space joists at centres less than 20x deck plank thickness
- e) fix decking boards at right angles to joists with a space of 7 mm between boards
- f) fix boards with screws with countersunk heads; plug with matching wood when specified
- g) pre-drill holes if wood tends to split
- h) support board header joints on double joists; leave space for ventilation between board heads
- i) protect end grain with metal caps when specified
- j) chamfer or round top surfaces of rails to assist the shedding of rainwater; round all sharp edges.

21.8.3 Wood finish

- a) seal wood with one coat of *suitable* sealant or oil before installation
- b) seal all end-grain as work proceeds after sawing to length
- c) finish with three coats sealant or oil after installation.

21.9 Landscaping**21.9.1 Definition of terms**

- a) *topsoil*: soil composed of 15—25 % clay, 10 % silt and 65—75 % sand with a minimum of 2% organic material, or red soil mixed with kraal manure in the ratio of 1 m³ kraal manure to 6 m³ red soil; topsoil to be free from omitrious matter and weed seeds

- b) *compost*: properly decomposed organic material, free from omitrious salts, waste products and impurities and with a pH-value between 4 and 7
- c) *fertilizer*: mixture of material complying with the specification under Law 36 of 1947; order and store in plastic bags.

21.9.2 Cleaning of site

- a) clean site for planting by removing existing grasses, weeds, foreign material and stone larger than 50 mm diameter before commencement of soil preparation
- b) clean site for hydroseeding by clearing out existing natural grasses without damage to the latter; remove loose foreign material from bare patches.

21.9.3 Preparation

soil for grass sods

- a) loosen existing topsoil throughout to a depth of 100 mm and mix thoroughly with 2:3:2 fertiliser in the ratio of 20 kg fertiliser to 150 m² of topsoil
- b) wet, level off and compact slightly on flat surfaces and mildly on inclined surfaces

soil for ground cover and shrub beds

- c) loosen existing topsoil throughout to a depth of 200 mm and mix thoroughly with 2:3:2 fertiliser in the ratio of 30 kg fertiliser to 150 m² of topsoil and with compost in the ratio of 6 m³ compost to 100 m² of topsoil
- d) wet, level off and compact slightly on flat surfaces and mildly on inclined surfaces

soil for shrubs

- e) dig 450 x 450 x 450 mm deep holes in soil for shrubs in bags 10 kg or larger and place excavated material aside
- f) fill holes with a mix of two parts excavated soil and one part compost
- g) add and mix throughout 500 g 2:3:2 fertiliser and 200 g bone phosphate per shrub hole
- h) compact slightly and allow for decrease in volume

soil for trees

- i) dig 900 x 900 x 900 mm deep holes in soil for trees and place excavated material aside
- j) finish base of hole with fall in general direction of slope of site
- k) fill holes with a mix of two parts excavated soil and one part compost
- l) add and mix throughout one kg 2:3:2 fertiliser and 300 g of bone phosphate
- m) compact slightly and allow for decrease in volume

soil for hydroseeding

- n) scarify all visible bare patches of existing soil 100 mm deep in both directions at 500 mm centres
- o) break up clods larger than 50 mm diameter, rake and level off.

21.9.4 Plant quality

- a) acquire all plant material from a registered nursery
- b) plants to be typical of their species or variety with normal densely developed branches and vigorous and healthy root system
- c) plants to be free from damaged parts, parasites, fungus, disfiguring knots, insects, pests and infestation
- d) grass sods to be approximately 1000 mm long and 500 mm wide and of uniform thickness; sods to be clipped short and soil base to be free from stones and clods
- e) ground covers to be well bushed with high leaf density and height of 300 mm above ground level, delivered ex nursery in minimum 4 kg bag containers

- f) shrubs to be multi-stemmed with generous side branches and well bushed to ground; shrubs to be >500 mm high as measured from crown of roots to outer leaf circumference, delivered ex nursery in minimum 4 kg bag containers except where specifically described otherwise in the bills of quantities
- g) trees to be >1,5 metre in height as measured from crown of roots to average top of tree (not to highest branch) and stem diameter >25 mm at ground level except where specified otherwise
- h) pruning wounds to be limited to 25 mm in size, showing vigorous bark growth all round
- i) replace all dead plants free of charge
- j) store plants under nursery conditions.

21.9.5 Planting

grass sods

- a) lay grass sods on wet prepared topsoil close together and fill joints and hollows with topsoil
- b) allow for area reduction
- c) roll surface to keep surface tolerance to a minimum and to allow a gradual change in slope at berms and embankments
- d) irrigate thoroughly after laying and rolling

ground covers

- e) plant ground covers in prepared topsoil and in holes somewhat larger than the plant bulb and at least 200 mm deep so that top of bulb coincides with finished level
- f) work edges of ground cover beds upwards to a height of 100 mm and compact
- g) irrigate thoroughly after planting

shrubs

- h) remove shrubs from containers and plant in backfilled holes so that top of soil originally in the containers is level with the finished ground level
- i) compact around shrubs and form 500 mm diameter x 150 mm deep soil dams around each shrub
- j) wet thoroughly after planting with 25 L of water per shrub

trees

- k) at distances from buildings, drains and freestanding walls that take into account the type of soil, especially expansive soils, and species and mature height of tree (see tree distance guidelines in SANS 10400-H Annex E)
- l) remove trees from containers and plant in backfilled holes so that top of soil originally in containers is level with finished ground level
- m) compact around trees and form 1000 mm diameter x 150 mm deep soil dams around each tree
- n) wet thoroughly after planting with 40 L of water per tree.

21.9.6 Hydroseeding

- a) on prepared soil
- b) water: 10 000 L per hectare
- c) fertiliser: lime at 4 t per hectare worked into the soil
- d) superphosphate: 0,3 t per hectare worked into the soil
- e) 2:3:2 at 0,5 t per hectare with seed mix
- f) LAN: 0,5 t per hectare worked into soil after 6 and 12 weeks
- g) anti-erosion compound: 200 kg per hectare with seed mix
- h) mulch: 400 kg per hectare with seed mix
- i) germinating agent: as per specialist's instruction
- j) seed mix: as specified.

21.9.7 Tree supports

- a) support every tree with 2,5 m long x 50 mm diameter treated eucalyptus stake driven 500 mm into soil
- b) tie each tree to stake with two steel wires sleeved in 300 mm long plastic hose-pipe section.

21.9.8 Precast concrete tree rings

- a) in two halves, size as specified
- b) place halves firmly and horizontally in soil dams around trees
- c) trim grass sods around tree rings where applicable.

21.9.9 Maintenance

- a) maintain plant material for the specified period including at least three months of the growing season namely September to March period:
- b) keep all planted areas free from weeds and loosen soil around ground covers, shrubs and trees once every two weeks
- c) prune shrubs and trees regularly according to accepted horticultural practice.
- d) replace sick or dead plants immediately
- e) mow grass sod areas weekly and remove cut grass
- f) mow all hydroseeded veld grass areas once every 3 months and remove cut grass
- g) apply 2:3:2 fertiliser at a rate of 5 kg per 100 m² of grass sod area once monthly
- h) water planted areas once per week during September to March and once every fortnight during April to August as follows: shrubs 25 L at a time; trees 40 L at a time.



SUNDUMBILI MAGISTRATE OFFICE: ADDITIONAL ACCOMMODATION

**BUILDING WORKS SPECIFICATION: SUPPLEMENTARY
PREAMBLES**

SUPPLEMENTARY PREAMBLES

The following Supplementary Preambles are to be read in conjunction with the "Standard Preambles to all Trades WB20 – 1986" included here before and are to apply to this Contract. Where these "Supplementary Preambles" are at variance with the "Standard Preambles to all Trades" referred to above, such variances are to take precedence and are to apply to this Contract.

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ALTERATIONS

All Notes, Preambles, etc. applicable for the various trades in the Bills of Quantities, will apply equally to the trades in this Bill.

Tenderers are advised to visit the site and satisfy themselves as to the nature and extent of the work to be done, and also to examine the condition of the existing buildings.

Tenderers are advised that all materials from pulling down (except where described to be re-used or handed over to the Director) will become the property of the Contractor, and all these materials, together with all rubbish and debris, must be immediately carted away, and the site left clean and unencumbered. Materials, etc. which are described to be handed over to Employer are to be carefully dismantled where necessary, and neatly stacked where directed on site. Items described as "removed" shall be removed from site.

Credit for the value of the materials from the pulling down may be allowed for on the final Summary page.

Prior to the removal of any timbers from the site, they are to be inspected by the government Entomologist as laid down in Section 32 of the Government Forest and Veld Conservation Act of 1941 (Act 13 of 1941) as amended. If any of the timbers are infested with wood destroying agencies, they are to be disposed of in the manner prescribed by the Government Entomologist.

The Contractor is to give ample notice to the Employer and Local Authorities regarding any disconnections necessary prior to the removal or interruption of electric light or telephone cables, water and sanitary services, etc.

Tenderers are advised that when sections of the buildings are to be occupied during the building operations, and the Contractor is required to carry out the work with as little noise, dust and disturbance as possible. Undisturbed access is to be given to patients, staff and visitors.

The Contractor is advised to check all dimensions affecting the existing building, as he will be held solely responsible for all new work being of the correct size. All sizes stated are approximate and under no circumstances will claims be entertained should actual sizes of existing items on site vary marginally from the sizes stated in this document.

The Contractor will be held solely responsible for any damage to persons, property, and equipment and for the safety of the structure throughout the whole of the Contract, and must make good at his own expense any damage that may occur.

The Contractor must obey the instructions of the Employer in carrying out any portion of the work which in his opinion requires expediting, and the Contractor shall give priority to such work as and when directed.

In taking down and removing existing work, the utmost care is to be observed to avoid any structural or other damage to the remaining portions of the building. The Contractor must also protect all work not removed, such as walls, floors, doors, windows or joinery, loose and fixed fittings and electrical equipment, appliances, etc. from damage during the progress on the works and provide all necessary materials in so doing.

Special care is to be taken not to interfere with any electric light, bell, power or telephone wires and fittings that may be encountered on site. New work to the existing electrical, air-conditioning, gas and telephone installations, etc. is included elsewhere in this document.

The Contractor must take the exigencies of the User/Client Service into consideration. Liaison is to be carried out through the offices of the Head: Works, with referrals to the Regional Director for a final decision.

No instructions may be received by the Contractor from the User/Client Authorities and all instructions are to be given by the Head: Works or his Representative in writing before they are put in hand.

CONCRETE, FORMWORK AND REINFORCEMENT

Cement is to comply with:

SABS ENV 197 (1 to 2)
SABS ENV 413 (1 to 2)
SABS ENV 196 (1 to 7)
SABS ENV 196 (21)

As applicable, and replaces the following SABS Specifications in the Standard Preambles:

SABS 471 Portland Cement (ordinary, rapid hardening and sulphate resisting)
SABS 626 Portland Blast Furnace Cement
SABS 831 Portland Cement 15 (ordinary and rapid hardening)

MASONRY

Masonry is to comply with **SABS Code of Practice 0249** and **0164** as applicable.

ROOF COVERINGS, ETC.

The installation of roof coverings and side cladding is to comply with **SABS Code of Practice 0237** as applicable.

CARPENTRY AND JOINERY

Note:

All timber must be treated in terms of **SABS Code of Practice 05** for GYMNOSPERMAE including all SA Pine species and ANGIOSPERMAE including all Eucalyptus species but excluding laminated timber. It is now a compulsory requirement to use only treated timber in buildings. The treatment shall comply with **SABS 457, 753, 754** or **1288**.

Reference must also be made to the appropriate Standard Preambles and SABS requirements for items not covered by these joinery preambles, etc. i.e. ironmongery, aluminium, glazing, paintwork, etc.

Where items are described as "plugged and screwed", they are to include for plugging and screwing to new or existing brickwork or concrete, with heads of screws sunk and pelleted.

Sawn softwood timber: General, Stress Graded, Industrial, Brandering and Battens is to comply with **SABS 1783 Parts 1 to 4** as applicable.

All hardwood is to be dark red meranti, even in grain and colour, selected for "Standard and Better" quality, from Malaysia, with a minimum density of 550 kg per cubic metre at a moisture content of 12%, and is to comply with **SABS 1099** as applicable.

Hardwood is, unless otherwise described, to be 3 mm untempered hardboard for floor units and 6 mm tempered hardboard for wall units.

Chipboard is, unless otherwise described, to be 16 mm thick.

Melamine faced chipboard is to be 16 mm thick with a white melamine impregnated finish on both sides.

Melamine faced chipboard in adjustable shelving is to be of the width as described with white plastic pre-glued edge strips or fixed with contact adhesive, or similar, to both edges and ends of the shelves. The number of shelves is stated in descriptions.

Materials generally are to comply with the following specifications and requirements as applicable:

Material	SABS Specification	Grade or Class
Softwood structural timber	1783)	
Softwood engineering timber	1783)	
Softwood studs for timber frames in building	1783)	Parts 1, 2, 3, 4
Softwood brander and battens	1783)	
Softwood joinery timber	1783)	
Softwood flooring boards	629	Flooring grade Heavy flooring board
Hardwood joinery timber	1099	Knotty grade
Hardwood strip flooring	281	As specified
Wooden ceiling and paneling boards	1039	As specified
Laminated timber (glulam)	1460	As specified
Gypsum, plasterboard	266	-
Wood fibreboard	540	As specified
Wood wood panels (cement bonded)	637	-
Fibre cement sheets: profiled and flat	685	As specified
Fibre cement boards	803	As specified
Plywood and composite board	929	As specified
Particle board: highly moisture resistant Exterior and flooring type	EN 312)	Parts 1 to 7
Particle board: interior type	EN 312)	
Decorative laminates	SABS ISO) 4586 and) SABS 1405)	High pressure
Decorative Melamine Faced Boards	1763	
Wooden doors (flush)	545	-
Materials for thermal insulation of buildings	1381	As applicable
Mild steel nails	820	-
Metal screws for wood	1171	-
Creosote	538	As specified
Timber roof trusses	0243	SABS Code of Practice

CEILINGS AND PARTITIONS

Refer to Joinery Fittings regarding specifications and requirements of materials.

IRONMONGERY

Materials

- i) Locks are to comply with **SABS 4** as applicable.
- ii) Door closers are to comply with **SABS 1510** as applicable.
- iii) Symbolic safety signs are to comply with **SABS 1186** as applicable.

All ironmongery, unless other wise described, is fixed to timber.
Sheet steel furniture to comply with **SABS 757** as applicable.

METAL WORK

Rates are to include for cutting to lengths, splay cut ends, shaping, holing, tapping, threading, forging, turning, fitting, assembling, welding, filing smooth, preparation, priming coats, hoisting, temporary bracing and fixing in position.

Electro-plating is to comply with **SABS ISO 1456** as applicable.

Aluminium Windows and Doors

NOTE:

Glazed aluminium alloy windows and sliding doors for external use are to comply with **SABS 1651** as applicable.

All items must conform to and carry the Certification Seal of AAAMSA and no items which are not so certified will be accepted on site.

The work is to be cleated and framed.

All visible surfaces are to have a 25 micron anodized finish as specified.

Anodised coatings on aluminium are to comply with **SABS 999** as applicable.

Rates are to include for setting up and building in as well as for isolation material between the aluminium surfaces and adjacent surfaces of a differing material.

All visible surfaces are to be covered with a temporary protective tape, later to be removed.

Float glass for glazing is to comply with **SABS EN 572 Part 2** as applicable.

Safety and security glazing materials for buildings is to comply with **SABS 1263 (1)** unless otherwise described. All panes are to be marked so as to be visible. Laminated safety glass is to carry a written five-year guarantee.

Windows and doors are to be watertight.

Silicon pointing to windows and doors is elsewhere.

PLASTERING

Rates for new plaster, screeds, etc. to existing surfaces are to include for all preparatory work and forming a key.

Removal of paint and/or varnish as well as the roughening of the existing face brick surfaces both externally and internally to receive new plaster has been measured separately.

Plaster and screeds, etc. in patches is generally of an isolated nature and to existing surfaces. Portion of the work may be in narrow widths.

Where alterations are to be done to the existing structure, the new plaster, etc. has been measured to a point 300 mm beyond the line of the alteration on the existing structure.

TILING

Ceramic Wall and Floor Tiles are to comply with **SABS 1449** as applicable.

PLUMBING AND DRAINAGE

Water Supply and Drainage for Buildings is to comply with **SABS Code of Practice 0252** as applicable.

Water Supply and Distribution System Components is to comply with **SABS 1808** as applicable.

Electrical Water Heater - Storage Heaters to comply with **SABS 151**.

Instantaneous Heaters to comply with **SABS 1356 and IEC 60335 (2-25)**

GLAZING

Glass (Basic soda lime silicate glass products) is to comply with:

SABS EN 572 Part 1	-	Definitions and General Physical and Mechanical Properties
SABS EN 572 Part 2	-	Float Glass
SABS EN 572 Part 3	-	Polished Wire Glass
SABS EN 572 Part 4	-	Drawn Sheet Glass
SABS EN 572 Part 5	-	Patterned Glass

Safety and security materials are to comply with **SABS 1263** as specified.

Laminated safety glass is to carry a written five-year guarantee.

HOT DIP GALVANISING: ALL HOT DIP GALVANISING ARTICLES

SHALL COMPLY WITH THE FOLLOWING STANDARDS:-

General:	Hot Dip Galvanising to SABS ISO 1461
Tubing:	Hot Dip Galvanizing to SABS EN 10240
Sheeting:	Hot Dip Galvanizing to SABS ISO 4998
Sheeting:	Structural Galvanizing to SABS ISO 3575
Fasteners:	Hot Dip Galvanizing to not exceeding 90 ym
	Code of Practice of Hot Dip Galvanizing to SABS ISO 14713

GENERAL NOTE:

All **SABS** Standards referred to herein shall be deemed to be omitted and replaced by the redesignated and renumbered "**SANS**" Reference (i.e. South African National Standards) as applicable.