# Specification Preambles

**17 January 2017**

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# C90 Alterations - spot items

## GENERAL

30 RECYCLED MATERIALS

- Materials arising from alterations: May be recycled or reused elsewhere in the project, subject to compliance with the appropriate specification.
- Evidence of compliance: Submit full details and supporting documentation.

## J31 Liquid applied waterproof roof coatings

15 ROOFING GENERALLY

- Substrates: Secure, clean, dry, smooth, free from frost, contaminants, voids and protrusions.
- Adverse weather: Do not apply coatings in wet or windy conditions or at temperatures below 5°C, unless otherwise permitted by coating manufacturer.
- Unfinished areas of roof: Keep dry.
- Completed coatings: Firmly adhered, fully sealed, smooth, weatherproof and free draining.

20A RENEWING EXISTING SUBSTRATES/ COVERINGS

- Timing: Only remove sufficient substrates/ coverings as will be renewed and made weathertight on same day.
- Defective areas: Clean and make good or replace in accordance with coating manufacturer's recommendations.
- Flashings: Raise to clean surfaces to receive coatings.

25 TIMBER TRIMS, ETC

- Quality: Planed, free from wane, pitch pockets, decay and insect attack (except ambrosia beetle damage).
- Moisture content at time of covering (maximum): 22%.
- Preservative treatment: As recommended for purpose by waterproof coating manufacturer.
- Fixing: Sherardized steel screws at minimum 600 mm centres.

30 LAYING VAPOUR CONTROL LAYER

- Sheets: Loose laid, flat and smooth.
- Laps: Sealed using materials and method recommended by sheet manufacturer.
- Upstands, kerbs and other penetrations: Enclose edges of insulation. Lap with roof coatings to form a complete seal.

35A LAYING WARM DECK ROOF INSULATION

- Setting out:
  - Long edges: Fully supported and run at right angles to structure.
    Joints: Butted together.
  - Ends: Adequately supported.
    Joints: Staggered.
- Mechanical fixing: Six screws and washers per board to agreed pattern.
- Completion: Boards in good condition, well-fitting and stable.

40 LAYING OVERLAY TO WARM DECK ROOF INSULATION

- Setting out:
  - Joints: Butt together.
  - End joints: Stagger to break joint with insulation.
- Bedding: Full bed of bonding compound.
- Mechanical fixing: Six screws and washers per board to agreed pattern.

50 APPLICATION OF ROOF COATINGS

- Primer/ Conditioner: Brush well in to ensure local or full area coverage according to type. Allow to dry before overcoating.
- Movement joints in substrate: Apply debonding tape and reinforcement strip bedded in a preliminary application or roof coating.
- Reinforcement strip: Apply to junctions at upstands, penetrations and outlets, also joints and fixings in discontinuous unit substrates. Bed in a preliminary application of coating.
- Roof coatings: Monitor thickness by taking wet/ dry film thickness readings. Maintain full thickness around angles, junctions and features.
- Rainwater outlets: Form with watertight joints.

55 SKIRTINGS AND UPSTANDS

- Top edges of coatings: Where not protected by flashings, apply into chases cut to a minimum depth of 10 mm.
- Completion of chases: When coatings are fully cured, prepare chase and apply sealant as section Z22.
  - Sealant: To BS EN ISO 11600.
  Colour: As coating.

65 INSPECTION

- Coating surfaces: Check when cured for discontinuities.
- Defective areas: Apply another coating.

## J41 Reinforced bitumen membrane roof coverings

15 ROOFING GENERALLY

- Substrates: Secure, clean, dry, smooth, and free from frost, contaminants, voids and protrusions.
- Adverse weather: Do not lay coverings in high winds, wet or damp conditions or in extremes of temperature unless effective temporary cover is provided over working area.
- Unfinished areas of roof: Keep dry. Protect edges of laid membrane from wind action.
- Completed coverings: Firmly attached, fully sealed, smooth, weatherproof and free draining.

20A RENEWING EXISTING COVERINGS

- Substrate: Do not damage.
- Timing: Only remove sufficient coverings as will be renewed and made waterproof on the same day.

25A MAKING GOOD EXISTING REINFORCED BITUMEN MEMBRANE ROOF COVERING

- Dust, dirt, debris, moss, plants and grease: Remove.
- Blisters: Star cut, dry out and re-bond.
- Defective areas of bitumen membrane: Cut back to substrate and dry out. Patch level with existing covering with layers of matching bitumen membrane lapped minimum 100 mm onto existing membrane.
- Cracked and split bitumen membrane: Cut back to substrate 150 mm wide at cracks and splits and dry out. Insert 150 mm wide strip of matching bitumen membrane, bonded to substrate at edges only. Fully bond a layer of bitumen membrane over strip, lapped minimum 100 mm onto existing bitumen membrane at edges.

30 TIMBER TRIMS, ETC

- Quality: Planed, free from wane, pitch pockets, decay and insect attack (except ambrosia beetle damage).
- Moisture content at time of covering (maximum): 22%.
- Preservative treatment: As recommended by bitumen membrane manufacturer.
- Fixing: Sherardized steel screws at maximum 600 mm centres.

35 JOINTS IN RIGID BOARD SUBSTRATES

- Cover strips: Bitumen membrane to BS 8747, class S2P3, 150 mm wide. Lay centrally over substrate joints and adhere with bonding compound along edges only.

40 LAYING VAPOUR CONTROL LAYER

- Attachment Securely bond or nail to substrate.
- Laps: 75 mm minimum, fully bitumen sealed.
- Penetrations: Fully seal using bonding or taping methods recommended by manufacturer.
- Exposed edges: Enclose with vapour control layer to provide an adequate seal when overlapped by roof covering. Form a complete envelope around insulation.

45 LAYING WARM DECK ROOF INSULATION

- Setting out:
  - Long edges: Fully support and run at right angles to structure.
  - End edges: Adequately support.
  - Joints: Butt together.
  - End joints: Stagger.
- Bedding: Full bed of bonding compound.
- Mechanical fixing: Six screws and washers per board to agreed pattern.
- Completion: Boards must be in good condition, well-fitting and stable.

50 LAYING REINFORCED BITUMEN MEMBRANES GENERALLY

- Bonding: Continuous.
  - Pour and roll bonding: Use hot compound. Remove excess compound at laps of top layer/ cap-sheet.
  - Torch-on bonding: Leave a continuous bead of compound at laps of top layer/ cap-sheet.
- Laps:
  - Direction: Install membranes so that water drains over and not into laps.
  - Side and end laps: Minimum 75 mm and fully sealed.
  - Head and side laps: Offset.
- Successive layers: Apply without delay. Do not trap moisture.
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55 NAILING FIRST LAYER OF REINFORCED BITUMEN MEMBRANE

- Fix to timber substrates with galvanized extra-large head clout nails to BS 1202-1, 20 mm long.
- Fixing centres:
  - General area: Maximum 150 mm grid centres.
  - Perimeter of roof and all side and head laps: 50 mm.

70 SKIRTINGS AND UPSTANDS

- Angle fillets: 50 x 50 mm triangular section treated timber , nail fixed.
- Venting first layer of membrane: Stop at angle fillet. Fully bond in bitumen for 300 mm strip around perimeters. Overlap onto upstand with strips of BS 8747, class S1P1 reinforced bitumen membrane fully bonded with 75 mm lap onto first layer, except where subsequent two layers are of high performance polyester based membrane.
- Other layers of membrane: Carry in staggered formation up upstand, with each layer fully bonded. Where practicable carry cap sheet over top of upstand.
- Upstands:
  - At ends of rolls: Carry bitumen membrane up without using separate strip.
  - Elsewhere: Use matching strips of bitumen membrane, maintaining laps.

## K10 Gypsum board dry linings/ partitions/ ceilings

65 DRY LINING GENERALLY

- General: Use fixing, jointing, sealing and finishing materials, components and installation methods recommended by board manufacturer.
- Standard:
  - Gypsum plasterboard to BS EN 520.
  - Gypsum fibre board to BS EN 15283-2.
  - Evidence of compliance: All sheets to be CE marked. Submit Declaration of Performance (DoP).
- Cutting gypsum boards: Neatly and accurately without damaging core or tearing paper facing. Minimize cut edges.
- Two layer boarding: Stagger joints between layers.
- Finishing: Neatly to give flush, smooth, flat surfaces free from bowing and abrupt changes of level.

67 SKIM COAT PLASTER FINISH

- Plaster type: As recommended by board manufacturer.
  - Thickness: 2-3 mm.
- Joints: Fill and tape except where coincident with metal beads.
- Finish: Tight, matt, smooth surface with no hollows, abrupt changes of level or trowel marks.

69 INSTALLING BEADS/ STOPS

- Cutting: Neatly using mitres at return angles.
- Fixing: Securely using longest possible lengths, plumb, square and true to line and level, ensuring full contact of wings with substrate.
- Finishing: After joint compounds/ plasters have been applied, remove surplus material while still wet from surfaces of beads exposed to view.

70 ADDITIONAL SUPPORTS

- Framing: Accurately position and securely fix to give full support to:
  - Partition heads running parallel with, but offset from main structural supports.
  - Fixtures, fittings and services.
  - Board edges and lining perimeters.

85 MINERAL WOOL INSULATION

- Fitting insulation: Closely butted joints and no gaps. Prevent slumping.
- Electrical cables overlaid by insulation: Size accordingly.

87 SEALING GAPS AND AIR PATHS

- Sealing: Apply sealant to perimeter abutments and around openings as a continuous bead with no gaps.
  - Gaps between floor and underside of gypsum board: After sealing, fill with joint compound.

90 SEAMLESS JOINTING
- Filling and taping: Fill joints, gaps and internal angles with jointing compound and cover with continuous lengths of tape, fully bedded.
- Finishing: Feather out jointing compound to give a flush, smooth, seamless surface.
- Nail/ screw depressions and minor indents: Fill to give a flush surface.

115 METAL STUD PARTITION SYSTEM
- See Drawing

Structural performance:
- Strength grade to BS 5234-2.

**GENERAL/ PREPARATION**

325 PREPARATION OF MASONRY TO RECEIVE WALL LININGS
- General: Suitable to receive lining system. Redundant fixtures and services removed. Cutting, chasing and making good completed.
- Holes, gaps, service penetrations, perimeter junctions and around openings: Seal.
- Adhesive fixings: Prepare substrate to achieve effective bonding.
  - Contaminants: Remove loose material, dirt, grease, oil, paper, etc.
  - Absorption: Control by dampening, priming or applying bonding agents as necessary.

409 GYPSUM PLASTERBOARD (IMPROVED SOUND INSULATION)
- Type: 12.5mm Soundbloc.
- Core density (minimum): 820 kg/m³.

**INSTALLATION**

455 METAL FRAMING FOR PARTITIONS/ WALL LININGS
- Setting out: Accurately aligned and plumb.
  - Frame/ Stud positions: Equal centres to suit specified linings, maintaining sequence across openings.
  - Additional studs: To support vertical edges of boards.
- Fixing centres at perimeters (maximum): 600 mm.
- Openings: Form accurately.
  - Door sets: Use sleeved or boxed metal studs and/ or suitable timber framing to achieve strength grade requirements for framing assembly and adequately support weight of door.
  - Services penetrations: Allow for associated fire stopping.

465 STAGGERED STUD PARTITIONS
- Horizontal frame members (noggins, bearers, etc.) and boards: Fix between alternate studs and not touching adjacent offset studs.

475 METAL FURRINGS FOR WALL LININGS
- Setting out: Accurately aligned and plumb.
  - Vertical furring positions: Equal vertical centres to suit specified linings, maintaining sequence across openings. Position adjacent to angles and openings.
  - Additional vertical furrings: To support vertical edges of boards and at junctions with partitions.
  - Horizontal furring positions: To provide continuous support to edges of boards.
- Adhesive bedding to furrings:
  - Dabs: Length 200 mm (minimum). Located at ends of furrings and thereafter at 450 mm (maximum) centres.

  Junctions with partitions: Continuous bed with no gaps across cavity.

485 SUSPENDED CEILING GRIDS

- Setting out: Accurately aligned and level.
  - Grid members and hangers: Centres to suit specified linings and imposed loads.
  - Additional grid members: Provide bracing and stiffening at upstands, partition heads, access hatches, etc.
- Fixing: Securely at perimeters, grid joints, top and bottom hanger fixings.

530 CAVITY FIRE BARRIERS WITHIN PARTITIONS/ WALL LININGS

- Metal framed systems:
  - Installation: Form accurately and fix securely with no gaps to provide a complete barrier to smoke and flame.
- Adhesive fixed wall lining systems:
  - Material: Adhesive compound.
  - Installation: Form in a continuous line with no gaps to provide a complete barrier to smoke and flame.

545 CAVITY FIRE BARRIERS WITHIN SUSPENDED CEILINGS

- Fixing at perimeters and joints: Secure, stable and continuous with no gaps, to provide a complete barrier to smoke and flame.
- Service penetrations: Cut and pack to maintain barrier integrity. Sleeve flexible materials. Adequately support services passing through barrier.
- Ceiling systems for fire protection: Do not impair fire resisting performance of ceiling system.

555 FIRE STOPPING AT PERIMETERS OF DRY LINING SYSTEMS

- Material: Tightly packed mineral wool or intumescent mastic/ sealant.
- Application: To perimeter abutments to provide a complete barrier to smoke and flame.

560 JOINTS BETWEEN BOARDS

- Tapered edged plasterboards:
  - Bound edges: Lightly butted.
  - Cut/ unbound edges: 3 mm gap.
- Square edged plasterboards: 3 mm gap.
- Square edged fibre reinforced gypsum boards: 5 mm gap.

565 VERTICAL JOINTS

- Joints: Centre on studs.
  - Partitions: Stagger joints on opposite sides of studs.
    Two layer boarding: Stagger joints between layers.

570 HORIZONTAL JOINTS

- Surfaces exposed to view: Horizontal joints not permitted. Seek instructions where height of partition/ lining exceeds maximum available length of board.
- Two layer boarding: Stagger joints between layers by at least 600 mm.
- Edges of boards: Support using additional framing.
  - Two layer boarding: Support edges of outer layer.

575 PLANK PLASTERBOARD

- First layer in two layer boarding: Square edged with long edges at right angles to studs.

580 INSULATION BACKED PLASTERBOARD

- General: Do not damage or cut away insulation to accommodate services.
- Installation at corners: Carefully cut back insulation or plasterboard as appropriate along edges of boards to give a continuous plasterboard face, with no gaps in insulation.

590 FIXING PLASTERBOARD TO METAL FRAMING/ FURRINGS

- Partitions/ Wall linings: Fix securely and firmly at the following centres (maximum):
  - Single layer boarding: To all framing at 300 mm centres. Reduce to 200 mm centres at external angles.
  - Multi-layer boarding: Face layer at 300 mm centres, and previous layers around perimeters at 300 mm centres.
- Ceilings: 230 mm. Reduce to 150 mm at board ends and at lining perimeters.
- Position of screws from edges of boards (minimum): 10 mm.
  - Screw heads: Set in a depression. Do not break paper or gypsum core.

592 FIXING INSULATION BACKED PLASTERBOARD TO METAL FURRINGS

- Fixing to furrings: In addition to screw fixings apply continuous beads of adhesive sealant to furrings.

595 DEFLECTION HEADS

- Fixing boards: Do not fix to head channels.

610 FIXING PLASTERBOARD TO TIMBER

- Fixing to timber: Securely at the following centres (maximum):
  - Nails: 150 mm.
  - Screws to partitions/ wall linings: 300 mm. Reduce to 200 mm at external angles.
  - Screws to ceilings: 230 mm.
- Position of nails/ screws from edges of boards (minimum):
  - Bound edges: 10 mm.
  - Cut/ unbound edges: 13 mm.
- Position of nails/ screws from edges of timber supports (minimum): 6 mm.

620 FIXING PLASTERBOARD WITH ADHESIVE DABS

- Setting out boards: Accurately aligned and plumb.
- Fixing to substrates: Securely using adhesive dabs.
- Adhesive dab spacings for each board:
  - Horizontally: One row along top edge and one continuous dab along bottom edge.
  - Vertically: One row along each edge and thereafter at intermediate spacings to suit size of board:

| Thickness (mm) | Width (mm) | Dab centres (mm) |
|---|---|---|
| 9.5 | 1200 | 400 |
| 9.5/12.5 | 900 | 450 |
| 12.5 | 1200 | 600 |

- Adhesive dab dimensions (width x length): At least 50-75 mm x 250 mm.
  Position of dabs from edges/ ends of boards (minimum): 25 mm.

625 FIXING INSULATION BACKED PLASTERBOARD WITH ADHESIVE DABS

- Fixing to substrates: In addition to adhesive dab fixings, secure boards with nailable plugs in locations recommended by board manufacturer.

630 FIXING INSULATION BACKED PLASTERBOARD WITH ADHESIVE SPOTS

- Setting out boards: Accurately aligned and plumb.
- Fixing to substrates: Securely using adhesive spots and mechanical fastenings.
- Adhesive spot spacings to each board: Four vertical rows, at 400 mm centres in each row.
- Adhesive spot diameters (minimum): 25 mm.
- Mechanical fasteners: Nailable plugs in locations recommended by board manufacturer.

**FINISHING**

650 LEVEL OF DRY LINING ACROSS JOINTS

- Sudden irregularities: Not permitted.
- Joint deviations: Measure from faces of adjacent boards using methods and straightedges (450 mm long with feet/ pads) to BS 8212, clause 3.3.5.
  - Tapered edge joints:
    Permissible deviation (maximum) across joints when measured with feet resting on boards: 3 mm.
  - External angles:
    Permissible deviation (maximum) for both faces: 4 mm.
  - Internal angles:
    Permissible deviation (maximum) for both faces: 5 mm.

692 RIGID BEADS/STOPS

- Internal: To BS EN 13658-1.
- External: To BS EN 13658-2.

## K30 Panel partitions

50 WORKMANSHIP GENERALLY

- Setting out: Plumb, true to line and level and free from bowing, undulations and other planar distortions.
- Stability: Fix securely, with additional supports where necessary at perimeters.

70 PERIMETER SEALS

- Sealant material: A type recommended by the partition/ panel manufacturer.
- Application: Continuously to clean, dry, dust free surfaces, leaving no gaps. In accordance with the sealant manufacturer's instructions.

80 FINISHING

- Filling and taping: Fill joints, gaps and internal angles with jointing compound and cover with continuous lengths of tape. Apply more jointing compound and feather out to give a flush, seamless surface.
- Minor imperfections: Remove by lightly sanding.
- Primer/ Sealer: As recommended by the plasterboard manufacturer.

## K32 Panel / duct and wall linings / screens

20 INSTALLATION

- Accuracy: Set out to ensure frames and/ or panels and doors are plumb, level and accurately aligned.
- Modifications: Do not cut, plane or sand prefinished components except where shown on drawings.
- Fixing: Secure components using methods and fasteners recommended by the cubicle manufacturer.

## K40 Demountable suspended ceilings

10A SUSPENDED CEILINGS: THE WORKS

- Standard: To BS EN 13964.
- Evidence of compliance: All ceilings kits to be CE marked. Submit Declaration of Performance (DoP).
- Suspension system: Install all hangers, fixings, primary supports, main runners, cross members, perimeter trims, splines, noggings, clips bracing, bridging etc. necessary to complete the installation.

40 WORKMANSHIP GENERALLY

- Fixing: Secure. In accordance with manufacturers' recommendations and BS 8290-3. Provide additional bracing and stiffening to give a stable ceiling system.
- Setting out: Accurate. Provide level soffits free from undulations and lipping.
- Lines and joints: Straight and parallel to walls, unless specified otherwise.
- Edge infill units size (minimum): Half standard width or length.
- Corner infill units size (minimum): Half standard width and length.
- Grid: Position to suit infill unit sizes. Allow for permitted deviations from nominal sizes of infill units.

50 WIRE HANGERS

- General: Straighten before use.
- Installation: Install vertical without bends or kinks. Do not allow hangers to press against fittings.
- Fixing: Tie securely at top and bottom with tight bends to loops to prevent vertical movement.

60 CAVITY FIRE BARRIERS

- Material Wire reinforced mineral wool .
  - Thickness: To give same resistance as ceiling.
- Fixing: Accurate. Secure with no gaps. Provide a complete barrier to smoke and flame.
- Do not impair fire resisting performance of ceiling system.

## L20 Doors/ shutters/ hatches

10 TIMBER PROCUREMENT

- Timber (including timber for wood-based products): Obtained from well-managed forests and/ or plantations in accordance with:
  - The laws governing forest management in the producer country or countries.
  - International agreements such as the Convention on International Trade in Endangered Species of wild fauna and flora (CITES).
- Documentation: Provide either:
  - Documentary evidence (which has been or can be independently verified) regarding the provenance of all timber supplied.
  - Evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood-based products.
- Certification scheme: Contractor's choice, submit proposals.
- Other evidence: None.

30A WOOD DOORS

Materials: Generally to BS EN 942.

- - Joinery workmanship: As section Z10.
- Accuracy: To BS 4787-1.

52A WOOD DOOR FRAMES

- Materials: Generally to BS EN 942.
  - Joinery workmanship: As section Z12.
- Fixing: Spacing of fixings (frames not predrilled): Maximum 150 mm from ends of each jamb, adjacent to each hanging point and at 600 mm maximum centres.

70 FIRE AND SMOKE RESISTANCE

- Requirement: Specified performance to be the minimum period attained when tested for integrity in accordance with BS 476-22, BS EN 1634-1 or BS EN 1634-3.
- Components and assemblies will be marked to the relevant product standard and/ or third party certification rating.

75 FIRE RESISTING/ SMOKE CONTROL DOORS/ DOORSETS

- Gaps between frames and supporting construction: Filled as necessary in accordance with door/ door set manufacturer's instructions.

85 FIXING IRONMONGERY GENERALLY

- Fasteners: Supplied by ironmongery manufacturer.
  - Finish/ Corrosion resistance: To match ironmongery.
- Holes for components: No larger than required for satisfactory fit/ operation.
- Adjacent surfaces: Undamaged.
- Moving parts: Adjusted, lubricated and functioning correctly at completion.

# L40 General glazing

10 WORKMANSHIP AND POSITIONING GENERALLY

- Glazing:
  - Generally: In accordance with BS 6262 series.
  - Integrity: Wind and watertight under all conditions. Make full allowance for deflections and other movements.
- Glass:
  - Standards: Generally to BS 952 and to the relevant parts of:
    BS EN 572 for basic soda lime silicate glass.
    BS EN 1096 for coated glass.
    BS EN 12150 for thermally toughened soda lime silicate glass.
    BS EN ISO 12543 for laminated glass.
  - Quality: Free from scratches, bubbles and other defects.
  - Dimensional tolerances: Panes/ sheets to be accurately sized.
- Material compatibility: Glass/ plastics, surround materials, sealers primers and paints/ clear finishes to be compatible. Comply with glazing/ sealant manufacturers' recommendations.

30 PREPARATION

- Surrounds, rebates, grooves and beads: Clean and prepare before installing glazing; ensure compliance with any certified installation requirements.

57A BEAD FIXED INSULATING GLASS UNITS

- IGU: As clause 60A.
  Glazing installation:
  - Insulating unit: Located centrally in surround using setting and location blocks and distance pieces.
  - Inner sealant: Applied to full height of rebate.
  - Outer sealant: Applied to fill edge clearance void and space between unit and beads up to sight line.
  - Finished thickness of back and front bedding after inserting glazing (minimum): 3 mm.
  - Beads: Bedded on outer sealant and fixed securely.
  - Excess sealant: Trimmed to a smooth chamfer.

60A INSULATED GLASS UNITS: VISION PANELS

- Manufacturer: Contractor's choice.
  - Product reference: Contractor's choice.
- Standard: BS EN 1279.

65A FIRE RESISTANT TAPE/ STRIP GLAZING

- Installation: By a firm currently registered under a UKAS certified accreditation scheme for the installation of fire resistant glazing, in accordance with glazing manufacturer's recommendations.
- Certification: Submit fire test certification for system, including any framing, installation and maintenance requirements or restrictions.

## M20 Plastered/ Roughcast coatings

65 MIXING

- Render mortars (site-made):
  - Batching: By volume using gauge boxes or buckets.
  - Mix proportions: Based on damp sand. Adjust for dry sand.
- Mixes: Of uniform consistence and free from lumps.

67 COLD WEATHER

- Internal work: Take precautions to prevent damage to internal coatings when air temperature is below 3°C..

71 SUITABILITY OF SUBSTRATES

- General: Suitable to receive coatings. Sound, free from contamination and loose areas.

80 PLASTERBOARD BACKINGS

- Additional framing supports:
  - Fixtures, fittings and service outlets: Accurately position to suit fasteners.
  - Board edges and perimeters: To suit type and performance of board.
- Joints:
  - Joint widths (maximum): 3 mm.
  - End joints: Stagger between rows.
  - Two layer boarding: Stagger joints between layers.
- Joint reinforcement tape: Apply to joints and angles except where coincident with metal beads.

82 BEADS/ STOPS

- Location: External angles and stop ends.
- Materials:
  - External render: Stainless steel.
  - Internal plaster/ render: Galvanized steel.
- Fixing: Secure and true to line and level.
  - Beads/ stops to external render: Fix mechanically.

87 APPLICATION OF COATINGS

- General: Apply coatings firmly and achieve good adhesion.
- Appearance of finished surfaces: Even and consistent. Free from rippling, hollows, ridges, cracks and crazing.
  - Accuracy: Finish to a true plane with walls and reveals plumb and square.
- Drying out: Prevent excessively rapid or localized drying out.
- Keying undercoats: Cross scratch (plaster coatings) and comb (render coatings). Do not penetrate undercoat.

## M40 Ceramic Tiling

15 NEW BACKGROUNDS/BASES

- Background drying times (minimum):
  - Brick/block walls: 6 weeks.
  - Rendering: 2 weeks.
  - Gypsum plaster: 4 weeks.
- Base drying times (minimum):
  - Concrete slabs: 6 weeks.

  Cement : sand screeds: 3 weeks.

20 EXISTING BACKGROUNDS/BASES GENERALLY

- Efflorescence, laitance, dirt, loose and defective material: Remove and make good defective areas with materials compatible with background/base and bedding.
- Deposits of oil, grease and other materials incompatible with the bedding: Remove.
- Tile, paint and other nonporous surfaces: Clean.
- Wet backgrounds: Dry before tiling.
- Paint with unsatisfactory adhesion: Remove so as not to impair bedding adhesion.

25 NEW PLASTER

- Plaster primer: Apply if recommended by adhesive manufacturer.

30 FIXING GENERALLY

- Colour/ shade: Avoid unintended variations within tiles for use in each area/ room.
  - Variegated tiles: Mix thoroughly.
- Adhesive: Compatible with background/ base.
- Cut tiles: Neat and accurate.
- Fixing: Provide adhesion over entire background/ base and tile backs.
- Final appearance: Before bedding material sets, make adjustments necessary to give true, regular appearance to tiles and joints.
- Deviation of surface: Measure from underside of a 2 m straightedge with 3 mm thick feet placed anywhere on surface. The straightedge should not be obstructed by the tiles/ mosaics and no gap should be greater than 6 mm, i.e. a tolerance of $\pm$ 3 mm.
- Surplus bedding material: Clean from joints and face of tiles/ mosaics.

32 MORTAR BEDDING

- Bedding mix:
  - Cement: Portland to BS EN 197-1, type CEM I/42.5.
  - Sand for walls: Fine aggregate to BS EN 13139.

    Grading designation: 0/2 (CP or MP) category 2 fines.
  - Sand for floors: Fine aggregate to BS EN 13139.
- Grading designation: 0/4 (MP) category 1 fines and between 20-66% passing a 0.5 sieve.
- Batching: Select from:
  - Batch by weight.
  - Batch by volume: Permitted on the basis of previously established weight : volume relationships of the particular materials. Use accurate gauge boxes. Allow for bulking of damp sand.
- Mixing: Mix materials thoroughly to uniform consistence. Use a suitable forced action mechanical mixer. Do not use a free fall type mixer.
- Application: At normal temperatures use within two hours. Do not use after initial set. Do not retemper.

35 SETTING OUT

- Joints: True to line, continuous and without steps.
  - Joints on walls: Horizontal, vertical and aligned round corners.
  - Joints in floors: Parallel to main axis of space or specified features.
- Cut tiles: Minimise number, maximise size and locate unobtrusively.
- Joints in adjoining floors and walls: Align.
- Joints in adjoining floors and skirtings: Align.

55 ADHESIVE BED - NOTCHED TROWEL AND BUTTERING METHOD TO WALLS

- Application: By floated coat of adhesive to dry background. Comb surface.
- Tiling: Apply thin even coat of adhesive to backs of dry tiles. Fill any profiles. Press tiles firmly onto float coat.
- Finished adhesive thickness: 3 mm or within the range allowed by the adhesive manufacturer.

70 GROUTING

- Sequence: Grout when bed/adhesive has set sufficient to prevent disturbance of tiles.
- Joints: 6 mm deep (or depth of tile if less). Free from dust and debris.
- Grouting: Fill joints completely, tool to profile, clean off surface. Leave free from blemishes.
- Polishing: When grout is hard, polish tiling with dry cloth.

## M50 Rubber/ plastics/ cork/ lino/ carpet tiling/ sheeting

15A CARPET TILING
- Carpet tiles to BS EN 1307:

60 SETTING OUT TILES
- Method: Set out from centre of area/ room so that wherever possible:
  - Tiles along opposite edges are of equal size.
    Edge tiles are more than 50% of full tile width.

65 LAYING COVERINGS
- Base/ substrate condition: Rigid, dry, smooth, free from grease, dirt and other contaminants.
- Use a primer where recommended by adhesive manufacturer. Allow to dry thoroughly.
- Adhesive: As specified, as recommended by covering manufacturer or, as approved.
- Conditioning of materials prior to laying: As recommended by manufacturer.
- Environment: Before, during and after laying, provide adequate ventilation and maintain temperature and humidity approximately at levels which will prevail after building is occupied.
- Finished coverings: Accurately fitted, tightly jointed, securely bonded, smooth and free from air bubbles, rippling, adhesive marks, stains, trowel ridges and high spots.

70A EDGINGS AND COVER STRIPS
- Manufacturer: Contractor's choice .
  - Product reference: Contractor's choice .
- Fixing: Secure (using matching fasteners where exposed to view) with edge of covering gripped.

85 WASTE
- Spare covering material: Retain suitable material for patching. On completion submit pieces for selection. Hand over selected pieces to Employer.

## M60 Painting/ clear finishing

30 PREPARATION GENERALLY

- Standard: In accordance with BS 6150.
- Refer to any pre-existing CDM Health and Safety File and CDM Construction Phase Plan where applicable.
- Risk assessment and method statement for hazardous materials: Prepare for operations, disposal of waste, containment and reoccupation, and obtain approval before commencing work.
- Preparation materials: Types recommended by their manufacturers and the coating manufacturer for the situation and surfaces being prepared.
- Substrates: Sufficiently dry in depth to suit coating.
- Efflorescence salts, dirt, grease and oil: Remove.
- Surface irregularities: Provide smooth finish.
- Organic growths and infected coatings:
  - Remove with assistance of biocidal solution.
  - Apply residual effect biocidal solution to inhibit regrowth.
- Joints, cracks, holes and other depressions: Fill with stoppers/ fillers. Provide smooth finish.
- Dust, particles and residues from preparation: Remove and dispose of safely.
- Doors, opening windows and other moving parts:
  - Ease, if necessary, before coating.
  - Prime resulting bare areas.

32 PREVIOUSLY COATED SURFACES GENERALLY

- Preparation: In accordance with BS 6150, clause 11.5.
- Contaminated or hazardous surfaces: Give notice of:
  - Coatings suspected of containing lead.
  - Substrates suspected of containing asbestos or other hazardous materials.
  - Significant rot, corrosion or other degradation of substrates.
- Risk assessment and method statement for hazardous materials: Prepare for operations, disposal of waste, containment and reoccupation, and obtain approval before commencing work.
- Removing coatings: Do not damage substrate and adjacent surfaces or adversely affect subsequent coatings.
- Loose, flaking or otherwise defective areas: Carefully remove to a firm edge.
- Alkali affected coatings: Completely remove.
- Retained coatings:
  - Thoroughly clean.
  - Gloss coated surfaces: Provide key.
- Partly removed coatings: Apply additional preparatory coats.
- Completely stripped surfaces: Prepare as for uncoated surfaces.

35 FIXTURES AND FITTINGS

- Risk assessment and method statement for hazardous materials: Prepare for operations, disposal of waste, containment and reoccupation, and obtain approval before commencing work.
- Removal: Before commencing work: Ironmongery, cover plates, grilles, wall clocks, and other surface mounted fixtures.
- Replacement: Refurbish as necessary, refit when coating is dry.

37 WOOD PREPARATION

- General: Provide smooth, even finish with lightly rounded arrises.
- Degraded or weathered surface wood: Take back surface to provide suitable substrate.
- Degraded substrate wood: Repair with sound material of same species.
- Heads of fasteners: Countersink sufficient to hold stoppers/ fillers.
- Resinous areas and knots: Apply two coats of knotting.
- Defective primer: Take back to bare wood and re-prime.

39 STEEL PREPARATION

- Corrosion and loose scale: Take back to bare metal.
- Residual rust: Treat with a proprietary removal solution.
- Bare metal: Apply primer as soon as possible.

41 MASONRY AND RENDERING PREPARATION

- Loose and flaking material: Remove.

43 PLASTER PREPARATION

- Nibs, trowel marks and plaster splashes: Scrape off.
- Over-trowelled 'polished' areas: Provide suitable key.

52 SEALING OF INTERNAL MOVEMENT JOINTS

- General: To junctions of walls and ceilings with architraves, skirtings and other trims.
- Sealant: Water-borne acrylic.
  - Manufacturer: Contractor's choice.
    Product reference: Contractor's choice.
  - Preparation and application: As section Z22.

61 COATING GENERALLY

- Application standard: In accordance with BS 6150, clause 9.
- Conditions: Maintain suitable temperature, humidity and air quality.
- Surfaces: Clean and dry at time of application.
- Thinning and intermixing: Not permitted unless recommended by manufacturer.
- Priming coats: Apply as soon as possible on same day as preparation is completed.
- Finish:
  - Even, smooth and of uniform colour.
  - Free from brush marks, sags, runs and other defects.
  - Cut in neatly.
- Doors, opening windows and other moving parts: Ease before coating and between coats.

75 BEAD GLAZING TO COATED WOOD

- Before glazing: Apply first two coats to rebates and beads.

## N11 Domestic kitchen fittings, furnishings and equipment

10A FITTED BASE UNITS AND WALL UNITS

- Dimensions: To BS EN 1116.
- Surface finishes: To BS 6222-3.

## N13 Sanitary appliances and fittings

70 INSTALLATION GENERALLY

- Assembly and fixing: Fix appliances securely to structure, without taking support from pipelines, level and plumb and so that surfaces designed to fall drain as intended.
- Jointing and bedding compounds: Recommended by manufacturers of appliances, accessories and pipes, to form watertight joints between appliances and backgrounds (except cisterns) and between appliances and discharge pipes.

# N25 Permanent access and safety equipment

## GENERAL REQUIREMENTS

50 SAFETY

- General: The equipment as installed must have no irregularities/ projections capable of inflicting personal injury.

## P12 Fire stopping systems

**EXECUTION**

62 EXECUTION GENERALLY
- Gaps: Seal gaps between building elements and services, to provide fire resistance and resist the passage of smoke.
- Adjacent surfaces: Prevent overrun of sealant or mortar on to finished surfaces.

63 INSTALLING FIRE STOP LAMINATES
- Fitting of strips: Compress strips and fit into gap, so that, as they decompress the strips wedge themselves in the void.
- Shrink wrapping: Do not remove.
- Joints:
  - Ends of strips: Fit intumescent 'end piece' at both ends of run of stop laminate.
  Joints between strips: Fit two intumescent 'end pieces' at each butt joint.

64 APPLYING INTUMESCENT FOAM
- New joints: Remove builder's debris, mortar droppings, grease, and other contaminants.
- Old joints: Clean and remove existing sealant from each joint.
- Priming: Lightly moisten substrate with water.
- Application: Fill joint to approximately half its depth, and allow foam to expand to face of joint.
- Trimming: Trim excess foam to give a neat, flush appearance.

65A APPLYING INTUMESCENT MORTAR
- Sequence: Install mortar after services are permanently installed.
- Loose dust and combustible materials: Remove from the opening.
- Shuttering: Install suitable shuttering panels to the faces of the opening.
- Temperature: Do not apply mortar when it could be damaged by frost.
- Mortar cure: Do not disturb mortar before final set has taken place.
- Shuttering: Remove after mortar has cured.

66A INSTALLING MINERAL WOOL BATTS
- Installing batts: Fit tight into void between the penetrating services and the surrounding construction to form a solid barrier.
  Face of batts: Flush with the surface of wall, floor or soffit.
- Joints between batts: Closed butt joints; seal with acoustic intumescent sealant.
- Gaps between services and barrier: Seal with fire resisting sealant.

68 FIXING PIPE COLLARS
- Collar fixing: Contractor's choice .
- Gap around collar: Contractor's choice .
- Length of wraps: Project 50 mm from each side of the element.

71 INSERTING SEALANT BACKING MATERIAL
- Preparation: Removed debris from service penetration.
- Installation: Insert joint filler to full depth of joint leaving sufficient depth to apply sealant.

73 APPLYING SEALANTS GENERALLY
- Application: As section Z22.

74A APPLYING CAPPING SEALANT

- Preparation: De-grease using cleaner recommended by sealant manufacturer.
- Priming: Contractor's choice .
- Temperature: Do not apply water based sealants when they could be damaged by frost.

**COMPLETION**

91 CLEANING

- Masking tapes: Remove.
- Cleaning: Clean off splashes and droppings. Wipe down finishes.

92 INSPECTION

- Notice for inspection (minimum): 3 working days.

## P20 Unframed isolated trims/ skirtings/ sundry items

10A SOFTWOOD
- Quality of wood and fixing: To BS 1186-3.

20A HARDWOOD
Quality of wood and fixing: To BS 1186-3.

35A MEDIUM DENSITY FIBREBOARD
Manufacturer: Contractor's choice.
- Product reference: Contractor's choice.
- Standard: To BS EN 622-5.
  - Formaldehyde class: To BS EN 622-1, Class E1.

40A PLYWOOD
Appearance class to BS EN 635:
Bond quality to BS EN 314-2:

45A PARTICLEBOARD
Standard: To BS EN 312.

80 INSTALLATION GENERALLY
- Joinery workmanship: As section Z10.
- Metal workmanship: As section Z11.
- Methods of fixing and fasteners: As section Z20.
- Straight runs: To be in one piece, or in long lengths with as few joints as possible.
- Running joints: Location and method of forming to be agreed where not detailed.
- Joints at angles: Mitre, unless shown otherwise.
- Position and level: To be agreed where not detailed.

## P21 Door/ window ironmongery

6A SINGLE AXIS DOOR HINGES
Standard: To BS EN 1935.
Hinges to doors on escape routes and fire/ smoke control doors: CE marked.

12A OVERHEAD DOOR CLOSERS
Standard: To BS EN 1154.
- Devices to fire/ smoke control doors: CE marked.

• Operational adjustment:
- Variable power: Matched to size, weight and location of doors. Fully closing latched doors and holding unlatched doors closed.
Closing against smoke seals of fire doors: Positive. No gaps.

24A DOOR LOCKS
Standard: To BS EN 12209.

28A DOOR LATCHES
• Standard: To BS EN 12209.
• Latch spring strength: Select to prevent un-sprung lever handles drooping.

30A EMERGENCY EXIT DEVICES
• Standard: To BS EN 179.
- Devices for locked doors on escape routes: CE marked.

38A LEVER HANDLES
• Standard: To BS EN 1906.

# P31 Holes, chases, covers and supports for services

10 HOLES, RECESSES AND CHASES IN MASONRY

- Locations: To maintain integrity of strength, stability and sound resistance of construction.
- Sizes: Minimum needed to accommodate services.
  - Holes (maximum): 300 mm².
- Walls of hollow or cellular blocks: Do not chase.
- Walls of other materials:
  - Vertical chases: No deeper than one third of single leaf thickness, excluding finishes.
  - Horizontal or raking chases: No longer than 1 m. No deeper than one sixth of the single leaf thickness, excluding finishes.
- Chases and recesses: Do not set back to back. Offset by a clear distance at least equal to the wall thickness.
- Cutting: Do not cut until mortar is fully set. Cut carefully and neatly. Avoid spalling, cracking and other damage to surrounding structure.

20 NOTCHES AND HOLES IN STRUCTURAL TIMBER

- General: Avoid if possible.
- Sizes: Minimum needed to accommodate services.
- Position: Do not locate near knots or other defects.
- Notches and holes in same joist: Minimum 100 mm apart horizontally.
- Notches in joists:
  - Position: Locate at top. Form by sawing down to a drilled hole.
  - Depth (maximum): 0.15 x joist depth.
  - Distance from supports: Between 0.1 and 0.2 x span.
- Holes in joists:
  - Position: Locate on neutral axis.
  - Diameter (maximum): 0.25 x joist depth.
  - Centres (minimum): 3 x diameter of largest hole.
  - Distance from supports: Between 0.25 and 0.4 of span.
- Notches in roof rafters, struts and truss members: Not permitted.
- Holes in struts and columns: Locate on neutral axis.
  - Diameter (maximum): 0.25 x minimum width of member.
  - Centres (minimum): 3 x diameter of largest hole.
  - Distance from ends: Between 0.25 and 0.4 of span.

30 PIPE SLEEVES

- Material: Match pipeline.
- Sleeves: Extend through full thickness of wall or floor. Position accurately.
  - Clearance around service (maximum): 20 mm or diameter of service, whichever is the lesser.
  - Installation: Bed solid.

40A SEALING AROUND SERVICES

- Service: As drawings.
- Location: Pipe sleeves through walls and floors.
- Sealing material: Intumescent sealant.
- Method: Completely fill gaps with sealant and finish neatly

## Z10 Purpose made joinery

10 FABRICATION

- Standard: To BS 1186-2.
- Sections: Accurate in profile and length, and free from twist and bowing. Formed out of solid unless shown otherwise.
  - Machined surfaces: Smooth and free from tearing, wooliness, chip bruising and other machining defects.
- Joints: Tight and close fitting.
- Assembled components: Rigid. Free from distortion.
- Screws: Provide pilot holes. Heads of countersunk screws sunk at least 2 mm below surfaces visible in completed work.
- Adhesives: Compatible with wood preservatives applied and end uses of timber.

20 CROSS SECTION DIMENSIONS OF TIMBER

- General: Dimensions on drawings are finished sizes.
- Maximum permitted deviations from finished sizes:
  - Softwood sections: To BS EN 1313-1.
  - Hardwood sections: To BS EN 1313-2.

30 PRESERVATIVE TREATED WOOD

- Cutting and machining: Completed as far as possible before treatment.
- Extensively processed timber: Retreat timber sawn lengthways, thicknessed, planed, ploughed, etc.
- Surfaces exposed by minor cutting and/ or drilling: Treat as recommended by main treatment solution manufacturer.

40 MOISTURE CONTENT

- Wood and wood based products: Maintained within range specified for the component during manufacture and storage.

50 FINISHING

- Surfaces: Smooth, even and suitable to receive finishes.
  - Arrises: Eased unless shown otherwise on drawings.
- End grain in external components: Sealed with primer or sealer as section M60 and allowed to dry before assembly.

## Z11 Purpose made metalwork

31 METAL PRODUCTS
- Grades of metals, section dimensions and properties: To the appropriate British Standards and suitable for the purpose.
- Fasteners: Generally, same metal as component, with matching coating and finish.

50 PREPARATION FOR APPLICATION OF COATINGS
- General: Fabrication complete, and fixing holes drilled before applying coatings.
- Paint, grease, flux, rust, burrs and sharp arrises: Removed.

51 FABRICATION GENERALLY
- Contact between dissimilar metals in components: Avoid.
- Finished components: Rigid and free from distortion, cracks, burrs and sharp arrises.
  - Moving parts: Free moving without binding.
- Corner junctions of identical sections: Mitre.
- Prefinished metals: Do not damage or alter appearance of finish.

52 COLD FORMED WORK
- Profiles: Accurate, with straight arrises.

53 WELDING AND BRAZING GENERALLY
- Surfaces to be joined: Clean thoroughly.
- Tack welds: Use only for temporary attachment.
- Joints: Fully bond parent and filler metal throughout with no inclusions, holes, porosity or cracks.
- Surfaces of materials that will be self-finished and visible in completed work: Protect from weld spatter.
- Flux residue, slag and weld spatter: Remove.

54 WELDING OF STEEL
- Method: Metal arc welding to BS EN 1011-1 and -2.

56 FINISHING WELDED AND BRAZED JOINTS VISIBLE IN COMPLETE WORK
- Butt joints: Smooth, and flush with adjacent surfaces.
- Fillet joints: Neat.
- Grinding: Grind smooth where indicated on drawings.

58A GALVANIZING
- Standard: To BS EN ISO 1461.
- Vent and drain holes:

## Z12 Preservative/ fire retardant treatment

10 TREATMENT APPLICATION

- Timing: After cutting and machining timber, and before assembling components.
- Processor: Licensed by manufacturer of specified treatment solution.
- Certification: For each batch of timber provide a certificate of assurance that treatment has been carried out as specified.

20 COMMODITY SPECIFICATIONS

- Standard: Current edition of the Wood Protection Association (WPA) publication 'Industrial wood preservation specification and practice'.

25 PRESERVATIVE TREATMENT SOLUTION STRENGTHS/ TREATMENT CYCLES

- General: Select to achieve specified service life and to suit treatability of specified wood species.

50A FIRE RETARDANT TREATMENT

- Solution type: Humidity resistant.
  - Manufacturer: Contractor's choice.
    Product reference: Contractor's choice.
  - Application: Vacuum + pressure impregnation.
- Moisture content of wood:
  - At time of treatment: As specified for the timber/ component at time of fixing.
  - After treatment: Timber to be re-dried slowly at temperatures not exceeding 65°C to minimize distortion and degradation.

70 MAKING GOOD TO PROTECTION TREATMENT ON-SITE

- Fire retardant/ preservative solution: Compatible with off-site treatment.
- Application: In accordance with preservative manufacturer's recommendations.

## Z20 Fixings and adhesives

10 FIXINGS AND FASTENERS GENERALLY

- Integrity of supported components: Select types, sizes, quantities and spacings of fixings, fasteners and packings to retain supported components without distortion or loss of support.
- Components, substrates, fixings and fasteners of dissimilar metals: Isolate with washers or sleeves to avoid bimetallic corrosion.
- General usage: To recommendations of fastener manufacturers and/ or manufacturers of components, products or materials fixed and fixed to.
- Fixings: To be in straight lines, at regular centres.

25 FASTENER DURABILITY

- Materials: To have:
  - Bimetallic corrosion resistance appropriate to items being fixed.
  - Atmospheric corrosion resistance appropriate to fixing location.
- Appearance: Submit samples on request.

30 FIXINGS THROUGH FINISHES

- Penetration of fasteners and plugs into substrate: To achieve a secure fixing.

35 PACKINGS

- Materials: Non-compressible, corrosion proof.
- Area of packings: Sufficient to transfer loads.

40 CRAMP FIXINGS

- Fasteners: Fix cramps to frames with screws of same material as cramps.
- Fixings in masonry work: Fully bed in mortar.

50 PELLETED COUNTERSUNK SCREW FIXINGS

- Finished level of countersunk screw heads: Minimum 6 mm below timber surface.
- Pellets: Cut from matching timber, grain matched, glued in to full depth of hole.
- Finished level of pellets: Flush with surface.

55 PLUGGED COUNTERSUNK SCREW FIXING

- Finished level of countersunk screw heads: Minimum 6 mm below timber surface.
- Plugs: Glue in to full depth of hole.
- Finished level of plugs: Projecting above surface.

60 APPLYING ADHESIVES

- Surfaces: Clean. Regularity and texture to suit bonding and gap filling characteristics of adhesive.
- Support and clamping during setting: Provide as necessary. Do not mark surfaces of or distort components being fixed.
- Finished adhesive joints: Fully bonded. Free of surplus adhesive.

## Z22 Sealants

31A JOINTS

- Primer, backing strip, bond breaker: Types recommended by sealant manufacturer.

**EXECUTION**

61 SUITABILITY OF JOINTS

- Pre-sealing checks:
  - Joint dimensions: Within limits specified for the sealant.
  - Substrate quality: Surfaces regular, undamaged and stable.
- Joints not fit to receive sealant: Submit proposals for rectification.

62 PREPARING JOINTS

- Surfaces to which sealant must adhere:
  - Remove temporary coatings, tapes, loosely adhering material, dust, oil, grease, surface water and contaminants that may affect bond.
  - Clean using materials and methods recommended by sealant manufacturer.
- Vulnerable surfaces adjacent to joints: Mask to prevent staining or smearing with primer or sealant.
- Backing strip and/ or bond breaker installation: Insert into joint to correct depth, without stretching or twisting, leaving no gaps.
- Protection: Keep joints clean and protect from damage until sealant is applied.

63 APPLYING SEALANTS

- Substrate: Dry (unless recommended otherwise) and unaffected by frost, ice or snow.
- Environmental conditions: Do not dry or raise temperature of joints by heating.
- Sealant application: Fill joints completely and neatly, ensuring firm adhesion to substrates.
- Sealant profiles:
  - Butt and lap joints: Slightly concave.
  - Fillet joints: Flat or slightly convex.
- Protection: Protect finished joints from contamination or damage until sealant has cured.