The Grove, Hythe - Ext.Repairs&Decs - Reference Specification

26 Jun 2019

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A90 GENERAL TECHNICAL REQUIREMENTS

GENERAL

Precedence

General: Where, and to the extent that, documents conflict the following orders of precedence apply:

- Schedules of work override preliminaries, which override contract drawings, which override the Reference specification.
- Work sections of the Reference specification override A90.

Conflict in the documents: Give notice.

Definitions and interpretations - general

Employer's Representative: The person nominated in the Contract as Employer's Representative, Architect, Contract Administrator or Project Manager.
Reference specification: Not all clauses in the Reference specification apply to this project. If in doubt about the applicability of a clause, obtain instructions.
Communication: When required to communicate – including advise, inform, submit, give notice, instruct, agree, confirm, seek or obtain information, consent or instructions, or make arrangements – do so in writing to the Employer's Representative.
Responses from the Employer's Representative: Do not proceed until response has been received.

Definitions and interpretations – products and work

Remove:

- Disconnect, dismantle as necessary and take out the designated products or work and associated accessories, fastenings, supports, linings and bedding materials. Dispose of unwanted materials.
- Excludes taking out and disposing of associated pipework, wiring, ductwork or other services.

Keep for reuse:

- Do not damage designated products or work. Clean off bedding and jointing materials.

Make good:

- Execute local remedial work to designated work. Make secure, sound and neat.
- Excludes redecoration and/ or replacement.

Repair:

- Execute remedial work to designated products. Make secure, sound and neat.
- Excludes redecoration and/ or replacement.

Refix: Fix removed products.
Replace: Supply and fix new products matching those removed. Execute work to match original new state of that removed.
Ease: Adjust moving parts of designated products or work to achieve free movement and good fit in open and closed positions.
Match existing: Provide products and work of the same appearance and features as the original, excluding ageing and weathering. Make joints between existing and new work as inconspicuous as possible.

Documents

Currency: References to published documents are to the editions, including amendments, current on the date of the Invitation to tender.
Services drawings: Diagrammatic, except to the extent that figured dimensions are given or calculable.
Dimensions: Do not rely on scaled dimensions.

COMPLIANCE

Compliance generally

Submittals, samples, inspections and tests: Undertake to suit the Works programme. Do not conceal, or proceed with, affected work until compliance with requirements is confirmed.
Compliance with proprietary specifications: Retain on site evidence that the proprietary product specified has been supplied.
Compliance with performance specifications: Submit evidence of compliance, including test reports indicating properties tested, pass/ fail criteria, test methods and procedures, test results, identity of testing agency, test dates and times, identities of witnesses, and analysis of results.

Design and production documentation

Design compliance: Submit certification that design complies with documented requirements.
Documentation:

- Draft: Submit complete design and production documentation.
- Final: Submit sufficient copies for distribution to affected parties. Keep at least one copy on site.

Space requirements: Check space requirements of products or work indicated diagrammatically in the contract documents. Submit a report on consequent variations needed to the design.
Drawings: Include dimensions.

Authorities and statutory undertakers

Approvals: Submit evidence of approvals of relevant authorities and statutory undertakers.

Product samples

Complying samples: Retain in good, clean condition on site.

PRODUCTS AND EXECUTION

General quality

Products generally: New. Proposals for recycled products will be considered.

- Supply of each product: From the same source or manufacturer.
- Whole quantity of each product required to complete the Works: Consistent kind, size, quality and overall appearance.
- Product tolerances: Where critical, measure a sufficient quantity to determine compliance.

Execution generally: Fix, apply, install or lay products securely, accurately, plumb, neatly and in alignment

- Colour batching: Do not use different colour batches where they can be seen together.
- Dimensions: Check on-site dimensions.
- Finished work: Not defective, e.g. not damaged, disfigured, dirty, faulty, or out of tolerance

Sizes

General dimensions: Nominal.
Cross section dimensions of timber: Finished dimensions.

Substitution

Products: If an alternative product to that specified is proposed, obtain approval before ordering the product.
Work: If alternative work to that specified is proposed, obtain approval before execution.
Reasons: Submit reasons for the proposed substitution.
Documentation: Submit relevant information, including:

- manufacturer and product reference;
- cost;
- availability;
- relevant standards;
- performance;
- function;
- compatibility of accessories;
- proposed revisions to drawings and specification;
- compatibility with adjacent work;
- appearance; and
- copy of warranty/ guarantee.

Alterations to adjacent work: If needed, advise scope, nature and cost.
Manufacturers' guarantees: If substitution is accepted, submit.

Incomplete documentation

General: Where and to the extent that products or work are not fully documented, they are to be:

- Of a kind and standard appropriate to the nature and character of that part of the Works where they will be used.
- Suitable for the purposes stated or reasonably to be inferred.

Manufacturers' recommendations

General: Comply with manufacturer's current printed recommendations and instructions.
Changes to recommendations or instructions since close of tender: Submit details.
Manufacturers' current recommendations and instructions: Keep copies on site.
Ancillary products and accessories: Use those supplied or recommended by main product manufacturer.
Agrément certified products: Comply with limitations, recommendations and requirements of relevant valid certificates.

Defects in existing work

Reporting undocumented defects: When discovered, immediately give notice. Do not proceed with affected related work until response has been received.
Documented remedial work: Do not execute work which may:

- hinder access to defective products or work; or
- be rendered abortive by remedial work.

Accuracy, appearance and fit

Tolerances and dimensions: If likely to be critical to execution or difficult to achieve, as early as possible either:

- submit proposals; or
- arrange for inspection of appearance of relevant aspects of partially finished work.

General tolerances (maximum): To BS 5606, tables 1 and 2.
Structural floor design level tolerances (maximum):

- Floors which are to be self-finished, and floors to receive sheet or tile finishes directly bedded in adhesive: ±10 mm.
- Floors to receive dry board/ panel work with little or no tolerance on thickness: ±10 mm.
- Floors to receive fully bonded screeds/ toppings/ beds: ±15 mm.
- Floors to receive unbonded or floating screeds/ beds: ±20 mm.

Services runs
General: Provide adequate space and support for services, including unobstructed routes and fixings.
Services inaccessible after installation: Submit proposals for future location and identification of runs and fittings.
Fixing of services: Submit typical details of locations, types and methods of fixing of services to fabric.

Spares
General: Supply designated spares in their original packaging.

C40 CLEANING MASONRY AND CONCRETE

GENERAL

Cross-reference

General: Read with A90 General technical requirements.

PRODUCTS

Plain poultices

Softening agent: Deionized water.

Surface biocides

Types: Registered by the Health and Safety Executive (HSE) and listed on the HSE website under non-agricultural pesticides.
Compatibility with surface: Free from staining or other harmful effects.

Water spray

Nozzles: Position and direction adjustable, relative to surfaces and profiles.

EXECUTION

General

Standard: In accordance with BS 8221-1.

Removal of fittings

Timing: Before commencement of cleaning work.
Disturbance to surfaces: Minimize.

Protection

Surfaces not designated for cleaning: Prevent damage, including marking and staining.
Openings: Prevent ingress of water, cleaning agents and detritus.

- Vents and grilles: Seek instructions before sealing.

Temporary mechanical fastenings:

- In masonry: Locate in joints.
- In other surfaces: Seek instructions.

Control and disposal of wash water and detritus

Disposal: Safely. Obtain approvals from relevant Authority
Control of wash water: Collect and divert to prevent ingress and damage to building fabric and adjacent areas.
Above and below ground drainage systems: Keep free from detritus and maintain normal operation.

Cold weather

Cleaning procedures using water: Do not use when air temperature is at or below 5°C.

- Damp surfaces: Protect from frost.

Chemical cleaning agents: Do not use when surface temperatures are below those recommended by manufacturer.

Cleaning generally

Operatives: Appropriately trained and experienced for each type of cleaning work.

- Evidence of training: Submit on request.

Control of cleaning: Confine cleaning processes and materials to designated areas. Prevent wind drift.
Detritus: Remove regularly. Dispose of safely
Monitoring: Frequently check results of cleaning compared to approved trial samples. If results established by trials are not achieved, seek instructions.
Modifications to cleaning methods and materials: Seek instructions.

Record of cleaning works

Written report: Record cleaning methods and procedures used for each type of surface and deposit.
Content: Relevant attributes of cleaning methods used including:

- Equipment and settings.
- Dwell times.
- Number of applications.
- Ambient temperatures.

Submission: At completion of cleaning works.

Trial samples

Records: Maintain written records for each trial area, including cleaning methods and conditions, to enable replication of results elsewhere.

Removal of loosely adhered deposits

Timing: Before commencement of other cleaning methods.
Surfaces: Prevent damage, including abrasion.

Biocide application
Preparation: Dampen dry growths and remove loose growths.
Surfaces: Prevent damage, including abrasion.
Biocide treatment: Appropriate solutions to kill growths and inhibit further growths.

- Dead growths: Remove.

Abrasive blocks
Types: Suitable grades of carborundum or gritstone.
Application: Lubricate with water. Remove detritus.
Abrasive power tools: Prohibited.

Abrasives cleaning
Surfaces: Minimize abrasion.

- Ingrained deposits: Seek instructions.

Equipment settings (including nozzle type and distance from surface): Adjust regularly to achieve optimum cleaning performance for each surface.
Detritus: Remove with clean water.

Water spray cleaning (mounted nozzles)
Surfaces: Minimize water run-off. Prevent damage.
Adjustment of washing cycle and nozzle positions: Regularly to achieve optimum cleaning performance.

Pressurized water cleaning
Surfaces: Prevent damage.
Equipment settings (including nozzle type and distance from surface): Adjust regularly to achieve optimum cleaning performance for each surface.

Steam cleaning
Surfaces: Prevent damage.
Equipment settings (including nozzle type and distance from surface): Adjust regularly to achieve optimum cleaning performance for each surface.

Testing pH values for chemical cleaning
pH indicator: To distinguish pH values between 1–14.
Testing before cleaning:

- Clean rinsing water, wetted surfaces and joints: Test for pH. Record as 'control' values

Testing after water rinsing and neutralization:

- Wetted surfaces and joints: Record pH values.
- Acceptance criteria: Seek instructions.

Chemical cleaning
Surfaces: Prevent damage, including discolouration, bleaching and efflorescence.
Product variables (including concentrations, dwell times and number of applications): Adjust for each surface to achieve optimum cleaning performance.
Application: To wetted surfaces.

- Drying out: Prevent unless recommended otherwise by cleaning product manufacturer.

Removal of chemicals and neutralization: As recommended by product manufacturer, including rinsing with clean water.

- Additional treatment: Where water rinsing is insufficient to neutralize surface, apply compatible neutralizing agent.
- Surfaces and joints: Minimize absorption of chemicals. Prevent damage, including abrasion.

Plain poulticing
Surfaces: Prevent damage.
Application: To wetted surfaces. Maintain contact with surfaces as poultice dries out. Reinforce poultice as necessary.

- Drying: Prevent excessively rapid or localized drying out.

Spent poultice material: Do not reuse.

Bird preventive devices
Generally: Achieve an effective deterrent to roosting birds.
Fasteners and adhesives: Compatible with building components and substrate.
Timing: Coordinate with other related trades.
Thermal and building movement: Allow for, where appropriate.

- Movement joints: Do not bridge.

Roost inhibitors, nets and mesh screens: Correctly fitted and tensioned.

F10 BRICK AND BLOCK WALLING

GENERAL

Cross-reference

General: Read with A90 General technical requirements.
Mortars: Read with Z21.

PRODUCTS

New masonry units

Aggregate concrete bricks and blocks: To BS EN 771-3.
Autoclaved aerated concrete (AAC) blocks: To BS EN 771-4.
Calcium silicate bricks: To BS EN 771-2.
Clay blocks: To BS EN 771-1.

- Type: LD.

Clay bricks: To BS EN 771-1.
Gypsum blocks: To BS EN 12859.
Manufactured stone blocks: To BS EN 771-5.
Standard special shape bricks: To BS 4729.

Second hand masonry units

Reclaimed facing bricks: Sound, free from mortar and deleterious matter.

EXECUTION

Workmanship generally

Standard: To BS 5628-3 (withdrawn but citied in Building Regulations)

Conditioning clay and calcium silicate bricks

Bricks delivered warm from manufacturing process: Do not use until cold.
Absorbent bricks in warm weather: Wet to reduce suction. Do not soak.

Conditioning concrete bricks/ blocks

Autoclaved concrete bricks/ blocks delivered warm from manufacturing process: Do not use.
Age of nonautoclaved concrete bricks/ blocks: Do not use until at least four weeks old.
Avoidance of suction in concrete bricks/ blocks: Do not wet.

- Use of water retaining mortar admixture: Submit details.

Laying generally

Mortar joints generally: Fill vertical joints. Lay bricks, solid and cellular blocks on a full bed.
Autoclaved aerated concrete (AAC) blocks laid with thin mortar adhesive joints: Fill vertical joints. Lay blocks on a full bed.
Clay blocks with interlocking vertical joints: Dry vertical joints. Lay blocks on a full bed of thin layer mortar.
Bond where not specified: Half lap stretcher.
Vertical joints in facework: Even widths. Plumb at every fifth cross joint along course.

Height of lifts

General: Rack back when raising quoins and other advance work.
Walling using cement gauged or hydraulic lime mortar:

- Lift height: 1.2 m (maximum) above any other part of work at any time.
- Daily lift height: 1.5 m (maximum) for any one leaf.

Walling using thin joint mortar glue:

- Lift height: 1.3 m (maximum) above any other part of work at any time.

Levelling of separate leaves using cement gauged or hydraulic lime mortar

Locations for equal levelling of cavity wall leaves: As follows:

- Every course containing vertical twist type ties or other rigid ties.
- Every third tie course for double triangle/ butterfly ties.
- Courses in which lintels are to be bedded.

Coursing brickwork

Gauge for new work with bricks of 65 mm work height: Four brick courses including bed joints to 300 mm.
Tying in to existing brickwork: Line up with existing brick courses.

Laying frogged bricks

Single frogged bricks: Frog uppermost.
Double frogged bricks: Larger frog uppermost.
Frog cavity: Fill with mortar.

Laying gypsum blocks with tongues and grooves

Orientation: Tongued length uppermost

Support of existing work

Joint above inserted lintel or masonry: Fully consolidated with semidry mortar to support existing structure.

Block bonding new walls to existing
Pocket requirements: Formed as follows:
- Width: Full thickness of new wall.
- Depth: 100 mm (minimum).

Vertical spacing of pockets:
- Brick to brick: 4 courses high at 8 course centres.
- Block to block: Every other course.

Pocket joints: Fully filled with mortar.

Jointing
Profile: Consistent in appearance.
Accessible joints not exposed to view: Struck flush as work proceeds.

Pointing
Joint preparation: Remove debris. Dampen surface.

Fire stopping
Avoidance of fire and smoke penetration: Tight fit between cavity barriers and masonry. Leave no gaps.

Adverse weather
General: Do not use frozen materials or lay on frozen surfaces.
Air temperature requirements: Do not lay bricks/ blocks:
- In cement gauged mortars when at or below 3°C and falling or unless it is at least 1°C and rising.
- In hydraulic lime:sand mortars when at or below 5°C and falling or below 3°C and rising.
- In thin joint/ layer mortar glue when outside the limits set by the mortar manufacturer.

Temperature of walling during curing: Above freezing until hardened.
Newly erected walling: Protect at all times from:
- Rain and snow.
- Drying out too rapidly in hot conditions and in drying winds.

Facework
Colour consistency of masonry units:
- Methods to ensure that delivered units are consistent and of an even colour range within deliveries: Submit proposals.
- Conformity: Check each delivery for consistency of appearance with previous deliveries and with approved reference panels; do not use if variation is excessive.
- Finished work: Free from patches, horizontal stripes and racking back marks.

Appearance:
- Brick/ block selection: Do not use units with damaged faces or arrises.
- Cut masonry units: Where cut faces or edges are exposed cut with table masonry saw.
- Quality control: Lay masonry units to match relevant reference panels.
- Setting out: To produce satisfactory junctions and joints with built-in elements and components.
- Coursing: Evenly spaced using gauge rods.
- Lifts: Complete in one operation.
- Methods of protecting facework: Submit proposals.

Ground level: Commencement of facework: Not less than 150 mm below finished level of adjoining ground or external works level.
Putlog scaffolding: Not permitted in facework.
Toothed bond: New and existing facework in the same plane: Bond together at every course to achieve continuity of bond and coursing.
Cleanliness:
- Facework: Keep clean.
- Mortar on facework: Allow to dry before removing.
- Removal of marks and stains: Rubbing not permitted.

F22 CAST STONE ASHLAR WALLING AND DRESSINGS

GENERAL

Cross-reference

General: Read with A90 General technical requirements.
Mortar: Read with Z21 Mortars.

PRODUCTS

Cast stone

Standard: To BS 1217 and the United Kingdom Cast Stone Association (UKCSA) 'Technical manual for cast stone'

Reinforcement

Standards:

- Steel reinforcing bars: To BS 4449.
- Steel fabric reinforcement: To BS 4483.
- Galvanized reinforcement: Galvanized to BS EN ISO 1461 after cutting.
- Stainless steel reinforcement: To BS 6744, designation 1.4301.

EXECUTION

Mixes generally

Constituent materials and mix design: Achieve constant colour and texture for each finish type.
Aggregates for facing mixes: Free from particles which may cause 'popouts', or unsightly marking or staining.
Total chloride ion content: Cl 0.40 (maximum).
Admixtures containing calcium chloride: Do not use.

Control samples

Production programme of purpose made units: Prepare samples after finalization of details and submit before proceeding with manufacture of remaining quantity.
Delivery programme of proprietary units: Submit control sample before proceeding with ordering of remaining quantity.
Quantity: One of each specified unit.
Retention: Keep on site for comparison purposes.

Compressive strength testing

Cube strength: Sampling to BS 1217. Testing to BS EN 12390-1, 2 and 3 as appropriate, with compaction and curing representative of the methods used in production of the cast stone components.

Working and placing reinforcement

General: To BS EN 1996-1-1.
Cutting and bending: To BS 8666
Condition at time of placement: Clean, free of corrosive pitting, loose materials and substances which adversely affect the reinforcement, mix, or bond between the two.
Fixing: Accurate and secure. Prevent intrusion of wire or clips into the cover.

Cover to reinforcement for cast stone

Definition: Minimum cover to reinforcement.
Steel reinforcement:

- External faces (exposed to weather): 40 mm.
- Internal faces (protected from weather): 30 mm.

Galvanized steel reinforcement:

- External faces (exposed to weather): 30 mm.
- Internal faces (protected from weather): 20 mm.

Stainless steel reinforcement:

- All faces: The greater of 10 mm or twice the bar diameter.

Other materials/ coatings: Submit proposals including minimum cover.

Separate facing and backing mixes

Thickness of facing mix at any point (minimum): 20 mm.
Distance of reinforcement from the junction of the two mixes (minimum): 10 mm.
Joining facing and backing mixes: Bond so that they are effectively monolithic.

Casting and curing

Compaction: Thorough.
Protection: Prevent premature drying out during curing period.
Immature components: Prevent distortion from movement, vibration, overloading, physical shock, rapid cooling and thermal shock.
Delivery to site: Not until at least 14 days after casting.

Quality of finishes

Appearance standard: As established by samples.

Adverse weather
General: Do not use frozen materials or lay on frozen surfaces.
Air temperature: Do not lay blocks/ dressings:

- In cement gauged mortars: At or below 3°C and falling or below 1°C and rising.
- In hydraulic lime:sand mortars: At or below 5°C and falling or below 3°C and rising.

Temperature of walling during curing: Above freezing until mortar hardened
Newly erected walling: Protect at all times from:

- Rain and snow.
- Drying out too rapidly in hot conditions and in drying winds.

Laying
Accuracy:

- Selection: Do not use units with damaged faces or arrises.
- Courses: Level and true to line.
- Faces, angles and features: Plumb.
- Setting out: Achieve satisfactory junctions and joints with adjoining or built-in elements and components.

Controlling suction: Dampen cast stones as necessary in warm weather.
Mortar joints:

- Laying: Full bed of mortar with all joints and voids filled.
- Temporary distance pieces: Lead or stainless steel. Remove when mortar is sufficiently strong.
- Appearance: Neat and consistent.

Cleanliness: Keep facework clean. Rubbing and other abrasive or chemical cleaning methods to remove marks and stains, not permitted.
Cutting of reinforced units: Not permitted.

Ground level
Extent of facework below finished level of adjoining ground or external works (minimum): 150 mm.

Putlog scaffolding
Use: Not permitted.

One piece sills/ thresholds
Bed joints: Leave open except under:

- End bearings.
- Masonry mullions.

Pointing on completion: Mortar to match adjacent work.

Openings
Method of forming: Rigid templates, accurately fabricated to the required size.

Pointing joints
Joint preparation: Rake out to depth of 7–10 mm as work proceeds.
Pointing: Dust, dampen and neatly point in a continuous operation working from the top of the wall downwards.

F30 ACCESSORIES AND SUNDRY ITEMS FOR BRICK BLOCK AND STONE WALLING

GENERAL

Cross-reference
General: Read with A90 General technical requirements.

PRODUCTS

Air bricks in external walling
Standard: To BS 493, Class 1.

Cavity insulation
Glass or rock wool batts: To BS EN 13162 or Agrément certified
Expanded polystyrene (EPS) boards: To BS EN 13163 or Agrément certified
Extruded polystyrene (XPS) boards: To BS EN 13164 or Agrément certified
Polyisocyanurate (PIR) foam boards: To BS EN 13165 or Agrément certified
Polyurethane (PUR) foam boards: To BS EN 13165 or Agrément certified.
Phenolic foam boards: To BS EN 13166 or Agrément certified

Concrete fill to base of cavity wall
Standard: To BS EN 206 and BS 8500-2.

Coping units
Precast concrete, clayware, slate and natural stone: To BS 5642-2.

Fireplace components
Standard: To BS 1251.

Flexible damp proof courses and cavity trays
Bitumen based: To BS 6398.
Polyethylene: To BS 6515.
Pitch polymer, bitumen polymer, polypropylene, and ethylene polypropylene based: Agrément certified

Flue blocks
Clay/ Ceramic: To BS EN 1806.

Flue linings
Clay/ Ceramic: To BS EN 1457-1 and -2.
Concrete: To BS EN 1857.

Gratings/ Ventilators in internal walling
Standard: To BS 493, Class 2.

Lintels
Precast concrete, precast clay block and prefabricated steel: To BS EN 845-2.

Meshwork joint reinforcement
Standard: To BS EN 845-3.

Plain clay tiles
Standard: To BS EN 1304.

Sills
Precast concrete, clayware, slate and natural stone: To BS 5642-1.

Wall ties
Cavity ties: To BS 1243, DD 140-2 or BS EN 845-1.
Slip ties and slot ties: To BS EN 845-1.

EXECUTION

Air bricks in external walling and gratings/ ventilators in internal walling
Placement: Built in with no gaps at joints.

Cavities in masonry walling
Concrete fill to base of cavity wall:

- Extent: Maintain 75 mm between top of fill and external ground level and 225 mm (minimum) between top of fill and ground level dpc.
- Placement: Compact to eliminate voids.

Cleanliness: Cavity base and faces, ties, insulation and exposed dpcs free from mortar and debris.

Cavity trays
Formed in-situ:
- Joint treatment: Use unjointed wherever possible, otherwise lap 100 mm (minimum) and seal to produce a free draining and watertight installation.
- Horizontal cavity trays: Support using cavity closer.
- Sloping cavity trays: Prevent sagging.
- Cleanliness: Free from debris and mortar droppings.

Preformed:
- Placement: To provide a free draining and watertight installation.
- Joint treatment: As manufacturer's recommendations.

Over openings and other cavity bridgings:
- Length: To extend 150 mm (minimum) beyond ends of lintels/ bridgings.

Cavity trays – gas resistant
Formed in-situ:
- Joint treatment: Use unjointed wherever possible, otherwise lap 150 mm (minimum) and seal to form a gas and watertight installation.
- Joint with damp proof membrane: Overlap dpc/ cavity tray 150 mm (minimum).

Cavity wall insulation
Full fill type:
- Placement: Continuous and free of mortar and debris.

Partial fill type:
- Placement: Secure against face of inner leaf.
- Residual cavity: Clear and unobstructed.
- Joints between boards, at closures and penetrations: No gaps and free from mortar and debris.

Dpcs – horizontal
Placement: In continuous lengths on full even bed of fresh mortar, with 100 mm laps at joints and full laps at angles.
Width: At least full width of leaf unless otherwise specified. Edges of dpc not covered with mortar or projecting into cavity
Overlying construction: Immediately cover with full even bed of mortar to receive next masonry course.
Overall finished joint thickness: As close to normal as practicable.
Ground level dpcs:
- Joint with damp proof membrane: Continuous and effectively sealed.

Stepped dpcs in external walls:
- External walls on sloping ground: Install dpcs 150 mm (minimum) above adjoining finished ground level.

Sill dpcs: In one piece and turned up at back when sill is in contact with inner leaf.
Coping/ Capping dpcs:
- Bed in one operation to ensure maximum bond between masonry units, mortar and dpc.
- Dpcs crossing cavity: Provide rigid support to prevent sagging.

Dpcs – vertical
Form: In one piece wherever possible.
Joints: Upper part overlapping lower 100 mm (minimum).
Jamb dpcs at openings:
- Joint with cavity tray/ lintel at head: Full underlap.
- Joint with sill/ horizontal dpc at base: Full overlap.
- Projection into cavity: 25 mm (minimum).
- Relationship with frame: In full contact.

Jamb dpcs to built in timber frames:
- Fixing: Securely fastened to back of frame.
- Fasteners: Galvanized clout nails or staples.

Flues – block system
Block placement: Finish joints flush to ensure a smooth, unrestricted flueway.
- Starter, offset and transfer blocks: Use.
- Coursing: As adjacent masonry.
- Non-bonded blocks: Support.
- Joints between blocks: Seal.

Testing flue system:
- Core ball test and smoke test to BS EN 15287-1: On completion, carry out each test. If obstructions or leaks are revealed, submit proposals for making good.

Flues – clay/ ceramic lining system
Linings placement: Fully bed with socket or rebate uppermost using correct starters, adaptors, bends etc.

- Joints: Flush to provide an unrestricted flueway with smooth interior surfaces.

Testing flue system:

- Core ball test and smoke test to BS EN 15287-1, NA 8: On completion, carry out each test. If obstructions or leaks are revealed, submit proposals for making good.

Frames
Built in frames: Remove horns and provide support.

- Fixing cramps: Fully bed in mortar.

Frames in prepared openings:

- Formation of opening: Use accurate, rigid templates to required size.

Lintels
Placement: Bed on mortar used for adjacent work.

- Bearing: 100 mm (minimum).

Precast concrete and precast clay block lintels: Use slate packing pieces.

Meshwork joint reinforcement
Placement: Lay on an even bed of mortar in a continuous strip.
Laps:

- Joints: 225 mm (minimum).
- Angles: Full.

Keep edges back from face of work:

- External: 20 mm.
- Internal: 12 mm.

Joint finish: Normal thickness.

Movement joints with sealant
Joint preparation and sealant application: As section Z22.
Filler:

- Thickness: To match design width of joint.
- Placement: Build in as work proceeds with no projections into cavities and to correct depth to receive sealant system.

Movement joints without sealant
Filler to standard joints:

- Thickness: To match design width of joint.
- Placement: Build in as work proceeds filling the joint but without projecting into cavities.

Filler to fire resistant joints:

- Placement: Compress and insert into place in open joint.
- Adhesives and accessories: Types recommended by filler manufacturer.

Pinning up to soffits
Top joint of loadbearing walls: Fill and consolidate with mortar

Pointing in flashings
Joint preparation: Free of debris and lightly wetted.
Pointing mortar: As for adjacent walling.
Placement: Fill joint and finish flush.

Precast concrete, clayware, slate and natural stone coping units
Joints: Full and finished flush.
Placement: Lay on a full bed of mortar to line and level.

Precast concrete, clayware, slate and natural stone sills
Joints: Flush.
Bedding one piece sills: Leave bed joints open except under end bearings and masonry mullions.
Pointing on completion: To match adjacent work.

Preformed dpc/ cavity tray junction cloaks/ stop ends
Placement: To provide a free draining and watertight installation.

Site formed dpc/ cavity tray junctions/ stop ends

- Three dimensional changes in shape: Form to provide a free draining and watertight installation. Seal laps.
- Alternative use of preformed junction cloaks/ stop ends: Submit proposals.

Ties in masonry cavity walls
Embedment in mortar beds: 50 mm (minimum).
Placement: Sloping slightly downwards towards outer leaf, without bending.

- Drip: Centred in the cavity and pointing downwards.

Provision of additional ties in cavity walls with full fill cavity insulation: One row to support lowest row of insulation batts.
Additional ties at openings and movement joints: 300 mm (maximum) centres vertically within 225 mm of vertical movement joints and reveals of unbonded openings.

Ties in masonry cladding to timber frames
Embedment in mortar beds: 50 mm (minimum).
Placement: Slope downwards away from timber frame, without bending.
Additional ties at openings and movement joints: 300 mm (maximum) centres vertically within 225 mm of vertical movement joints and reveals of unbonded openings.

Tile creasing
Placement: Two courses, broken jointed.

- Mortar: As adjacent work, full bed.

Joints: Full and finished flush.

Tile sills
Placement: Two courses, broken jointed, true to line and level on full bed of mortar
Joints: Full and finished flush.

Tops of restrained nonloadbearing walls
Restraints: Secure to soffit.
Filler placement: Full, no gaps.

Ventilation ducts in external walling
Placement: Across cavity, sloping away from inner leaf.

- Cavity seal: Full mortar joints.

Protection from water penetration to inner leaf: Where barrier is not integral to duct, form stepped dpc cavity tray with stop ends above duct, extending 150 mm on each side.

Wall plates
Placement: On full bed of mortar to correct horizontal level.

Weep holes
Locations: Through outer leaf immediately above base of cavity, at cavity trays, stepped dpcs and external openings.

- Position: 75 mm above top of cavity fill at base of cavity.

Provision: 1000 mm (maximum) centres and not less than two over each opening.

G20 CARPENTRY AND TIMBER FRAMING

GENERAL

Cross-reference

General: Read with A90 General technical requirements.

PRODUCTS

Timber procurement

Timber (including timber for wood based products): Obtained from well managed forests/ 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, or
- Evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood based products.

Strength grading

Grader: A company currently registered under a third party quality assurance scheme operated by a certification body approved by the UK Timber Grading Committee.

Grading and marking of softwood

- Timber of target/ finished thickness less than 100 mm and not specified for wet exposure: Graded at an average moisture content not exceeding 20% and no reading greater than 24% and clearly marked as 'DRY' or 'KD' (kiln dried).
- Timber graded undried (green) and specified for installation at higher moisture contents: Clearly marked as 'WET' or 'GRN'.
- Structural timber members cut from large graded sections: Regraded to approval and marked accordingly.

Timber products

Structural softwood (graded direct to strength class):

- Grading standard: To BS 4978, BS EN 14081-1, or other national equivalent and so marked.
- Strength class: To BS EN 338.

Structural softwood (strength class not specified):

- Grading standard: To the appropriate standard or rules for the specified grade and so marked.

Structural hardwood (strength class not specified):

- Grading standard: To BS 5756, BS EN 16737 and so marked.

Ungraded softwood:

- Quality of timber: Free from decay, insect attack (except pinhole borers) and with no knots wider than half the width of the section.

Wood trim for fascias, bargeboards and the like:

- Standard: To BS 1186-3

Non-structural plywood:

- Standard: To an approved national standard.
- Surface appearance: To BS EN 635-1, -2, -3 and -5.
- Bonding quality: To BS EN 314-2.

Trussed rafters:

- Design and fabrication: To BS EN 14250
- Manufacturer: A firm currently registered under a third party quality assurance scheme.

Structural softwood and hardwood cross section dimensions

Target sizes: To BS EN 336

Maximum permitted deviations from target sizes: Tolerances to BS EN 336, clause 4.3

- Sawn surfaces: Tolerance class 1 (T1).
- Further processed surfaces: Tolerance class 2 (T2)

Non-structural softwood cross section dimensions

Cross section dimensions specified are finished sizes.

Maximum permitted deviations from finished sizes: To BS EN 1313-1 and National Annex.

- Sawn surfaces: Clause 6.
- Further processed surfaces: Clause NA2.

Non-structural hardwood cross section dimensions
Cross section dimensions specified are finished sizes.
Maximum permitted deviations from finished sizes: To BS EN 1313-2 and National Annex

- Sawn surfaces: Clause 6.
- Further processed surfaces: Clause NA3.

Warping of timber
Bow, spring, twist and cup: Not greater than the limits set down in BS 4978 or BS EN 14081-1 for softwood, and BS 5756 or BS EN 14081-1 for hardwood.

Preservative treatment
Standard: To Wood Protection Association (WPA) Commodity Specifications

- Softwood soffits, fascias and bargeboards: Commodity Specification C5.
- Constructional timbers: Commodity Specification C8.
- Timber frame housing (only applicable to structural framing to external walls): Commodity Specification C9.

Pre-finishing
Structural timber to be painted: Prime before delivery to site.
Structural timber to be clear finished: Keep clean and apply first coat of finish before delivery to site.

Joist hangers
Size: To suit joist, design load and crushing strength of supporting construction

EXECUTION

Selection and use of timber
Timber members damaged, crushed or split beyond the limits permitted by their grading: Do not use.
Notches and holes: Position in relation to knots or other defects such that the strength of members will not be reduced.
Scarf joints, finger joints and splice plates: Do not use without approval.

Processing treated timber
Cutting and machining: Carry out as much as possible before treatment.
Extensively processed timber: Re-treat timber sawn lengthways, thicknessed, planed, ploughed, etc.
Surfaces exposed by minor cutting and drilling: Treat with two flood coats of a solution recommended by main treatment solution manufacturer.

Moisture content
Moisture content of wood and wood based products at time of installation: Maximum:

- Covered and generally unheated spaces: 24%.
- Covered and generally heated spaces: 20%.
- Internal in continuously heated spaces: 20%.

Protection
Generally: Keep timber dry and do not overstress, distort or disfigure sections or components during transit, storage, lifting, erection or fixing.
Timber and components: Store under cover, clear of the ground and with good ventilation. Support on regularly spaced, level bearers on a dry, firm base. Open pile to ensure free movement of air through the stack.
Trussed rafters: Keep vertical during handling and storage.

Exposed end grain
Components: Seal exposed end grain of timber components before delivery to site.

Exposed timber
Planed structural timber exposed to view in completed work: Prevent damage to and marking of surfaces and arrises.

Jointing and fixing
Generally: Where not specified precisely, select methods of jointing and fixing and types, sizes and spacings of fasteners in compliance with section Z20.
Framing anchors:

- Fasteners: Galvanized or sherardized square twist nails. Size, not less than size recommended by anchor manufacturer.
- Fixing: Secure using not less than number/ type of fasteners recommended by anchor manufacturer.

Bolt/ Screw assemblies:

- Nuts and washers: Material grade and finish to suit bolts.
- Washer dimensions: Diameter/ side length in contact with timber surfaces to be minimum 3 times bolt diameter, with a thickness not less than 0.25 times bolt diameter.
- Bolted joints:
- Bolt spacing (minimum): To BS EN 1995-1-1, section 8.5
- Holes for bolts: Located accurately and drilled to diameters as close as practical to the nominal bolt diameter and not more than 2 mm larger.
- Washers: Placed under bolt heads and nuts that would otherwise bear directly on timber. Use spring washers in locations which will be hidden or inaccessible in the completed building.
- Bolt tightening: So that washers just bite the surface of the timber. Ensure that at least one complete thread protrudes from the nut. Check at agreed regular intervals up to Completion. Tighten as necessary.

Anticorrosion finishes for fasteners:

- Galvanizing: To BS 7371-6, with internal threads tapped and lightly oiled following treatment.
- Sherardizing: To BS 7371-8, Class 1.
- Zinc plating: To BS EN ISO 4042 and passivated.

Temporary bracing
Provision: As necessary to maintain structural timber components in position and to ensure complete stability during construction.

Additional supports
Provision: Position and fix additional studs, noggings and/ or battens to support edges of sheet materials and wall/ floor/ ceiling mounted appliances, fixtures, etc. shown on drawings.
Material properties: Additional studs, noggings and battens to be of adequate size and have the same treatment as adjacent timber supports.

Wall plates
Position and alignment: To give correct span and level for trusses, joists, etc
Bedding: Fully in fresh mortar.
Joints: At corners and elsewhere where joints are unavoidable use nailed half lap joints. Do not use short lengths of timber.

Installing joists
Generally:

- Centres: Equal, not exceeding designed spacing.
- Bowed joists: Install with positive camber.
- End joists: Positioned approximately 50 mm from masonry walls.

Joists on hangers:

- Hangers: Bedded directly on and hard against supporting construction. Do not use packs or bed on mortar.
- Joists: Cut to leave not more than 6 mm gap between ends of joists and back of hanger. Rebated to lie flush with underside of hangers.
- Fixing to hangers: A nail in every hole.

Trimming openings
Trimmers and trimming joists: When not specified otherwise, not less than 25 mm wider than general joists.

Trussed rafter installation
Erection: To Trussed Rafter Association (TRA) Technical handbook site installation guide and TRA Product data sheet PD3.
Trusses generally: Do not modify without approval.
Damaged trusses: Do not use.
Fixing: Truss clips and bottom chords of standard trusses and rafters of raised tie trusses bearing fully on wall plates.

- Bottom chords of standard trusses: Do not fix to internal walls until roofing is complete and cisterns are installed and filled.

Permanent bracing:

- Method of fixing: To every rafter, strut or tie with not less than two fasteners
- Lap joints: Extended over and nailed to at least two truss members.

Lateral restraint straps

Fixing to top of joists/ rafters/ ties: Ensure that cranked end is in tight contact with cavity face of wall inner leaf and is not pointing upwards.
Straps spanning joists/ rafters/ ties running parallel to wall: Fix noggings and packs tightly beneath straps.

- Size of noggings and packs: Minimum three quarters of joist/ rafter/ tie depth and 38 mm (minimum) thick.
- Notching: Notch joists so that straps fit flush with surface. Do not notch rafters/ ties.

Strutting to floor joists

Fixing: Strutting must not project beyond top and bottom edges of joists.
Outer joists: Blocked solidly to perimeter walls.

H10 PATENT GLAZING

GENERAL

Cross-reference

General: Read with A90 General technical requirements.

PRODUCTS

Patent glazing system

Standard:

- Sloping and vertical patent glazing: To BS 5516-1
- Access and openings: In accordance with BS 8213-1.

Detailed design of patent glazing system: Complete and submit before commencement of fabrication.
Related works: Coordinate with supporting structure and interfaces in detailed design.

Pane/ infill materials

General: Must have adequate resistance to thermal stress generated by orientation, shading, solar control and construction.
Glass: To BS 952-1 and relevant parts of

- BS EN 572-1, -2, -3, -5, -6 and -9 for basic soda lime silicate glass.
- BS EN 1096-1 to -4 for coated glass.
- BS EN 1863-1 and -2 for heat strengthened soda lime silicate glass.
- BS EN 12150-1 and -2 for thermally toughened soda lime silicate glass.
- BS EN 13024-1 and -2 for thermally toughened borosilicate glass.
- BS EN ISO 12543-1, -3, -4, -5, and -6 for laminated glass.

Pane dimensions: Within ± 2 mm of nominal size.
Quality: Clean and free from obvious scratches, bubbles, cracks, rippling, dimples and other defects.
Edges: Generally undamaged. Shells and chips not more than 2 mm deep and extending not more than 5 mm across surface are acceptable if ground out.
Heat soaking of thermally toughened glass:

- Requirement: Heat soak thermally toughened glass to reduce incidence of glass failure due to nickel sulfide inclusions.
- Heat soaking regime: To achieve a mean glass temperature of 290 ± 10°C for not less than two hours

Insulating glass units

Standard: To BS 5713 and Kitemark certified or CE marked to BS EN 1279-5.
Perimeter seals: Resistant to UV light degradation on exposed edges.

- Edge seal strength: To BS EN 1279-4

Perimeter taping: Not to be used.
Assembly and weather sealants: Compatible with perimeter seals.

Plastics glazing

Standards: To BS 5516-2 Annex A
Sheets: Accurately sized with clean, undisfigured and undamaged edges and surfaces.
Sealing and glazing materials: Compatible with sheets.

Infilling

Standard: To BS 5516-1.
Sheets: Accurately sized with undisfigured and undamaged edges and surfaces.

EXECUTION

Requirements generally

Extent of compliance: Entire patent glazing assembly, including flashings and junctions with adjacent parts of the building.
Deflections and other movements: Make full allowance.

Workmanship generally

Standard: To BS 5516-1 and -2.
Fixings: Concealed unless otherwise indicated on detailed drawings.

- Material: Compatible with building component and substrate.
- Metals: Isolate dissimilar metals to avoid electrolytic corrosion.

Allowance for thermal and building movement: Where appropriate.

- Movement joints: Do not bridge.

Fabrication: Machine cut and drill components in the workshop wherever possible.
Installation: Submit proposals before cutting and drilling into structure in positions other than shown on detailed design drawings.

Plastics glazing

Glazing bar edge cover to sheets: Adequate to prevent displacement due to thermal movement and flexing under load.

Water penetration
Requirement: Under site exposure conditions, water must not penetrate onto internal surfaces or into cavities not designed to be wetted.

H62 NATURAL SLATING

GENERAL

Cross-reference

General: Read with A90 General technical requirements.
Preservative treatment: Read with Z12 Preservative and fire retardant treatment.
Mortar: Read with Z21 Mortars.

PRODUCTS

Slates

Natural slates: To BS EN 12326-1 and -2.

- Width (minimum): The greater of half the length or 150 mm.

Battens, counterbattens and ridge/ hip fixing battens

- Timber species: In accordance with BS 5534, clause 4.11.1.
- Type: Sawn softwood.
- Permissible characteristics and defects: Not to exceed limits in BS 5534, annex D.
- Moisture content at time of fixing and covering: 22% (maximum).
- Preservative treatment: To Wood Protection Association Manual: Industrial wood preservation. Specification and practice.

Fasteners

Nails:

- Aluminium nails: To BS 1202-3.
- Copper nails: To BS 1202-2.
- Steel nails: To BS 1202-1 or BS EN 10230-1 as appropriate for specified type.

Hip irons

Standard: In accordance with BS 5534, clause 4.15.4.

- Material: Galvanized steel.

Mortar bedding and pointing

Mortar: 1:3 cement:sand.

- Plasticizing admixtures: Permitted.
- Bond strength: Provide resistance to uplift in accordance with BS 5534.

Slating underlay

Reinforced bitumen sheet: To BS 8747, Annex B
Breathable membrane: To BS EN 13859-1 or Agrément certified

EXECUTION

Slating generally

Standard: In accordance with applicable parts of BS 5534.
General: Fix slating and accessories to make the whole sound and weathertight at the earliest opportunity.
Setting out: To true lines and regular appearance, with neat fit at edges, junctions and features.
Fixings for accessories: As recommended by manufacturer.
Gutters and pipes: Keep free of debris. Clean out at completion.

Removing existing natural slating

General: Carefully remove slates, battens, underlay, etc. with minimum disturbance of adjacent retained slating.

Underlay

Handling: Do not tear or puncture.
Laying: Maintain consistent tautness.
Vertical laps: 100 mm wide (minimum), coinciding with supports and securely fixed.
Fixing: Fix with galvanized steel, copper or aluminium 20 x 3 mm extra large clout head nails.
At penetrations of pipes and components: Select from:

- Proprietary underlay seals or
- Cut underlay accurately and turn flanges up to give a watertight fit.

Ventilation paths: Do not obstruct.

Counterbattens

Fixing:

- On rigid sarking: Through rigid sarking into rafters at 300 mm (maximum) centres.
- On rafters: Into rafters at 300 mm (maximum) centres.
- On masonry: Fixing centres 400 mm (maximum) in straight vertical lines. Align on adjacent areas.

Battens
Setting out: Align parallel to ridge in straight horizontal lines to gauge of the slates. Align on adjacent areas.
Batten length (minimum): Sufficient to span over three supports.
Joints in length: Square cut, butt centrally on supports. Joints must not occur more than once in any group of four battens on any one support.
Unsupported underlay laps between battens: Provide additional battens.
Fixing: Fix each batten to each support. Splay fix at joints in length.

Slate fixing
Setting out: Align tails. Lay with an even overall appearance, with slightly open (maximum 5 mm) butt joints.

- Headlaps and sidelaps (minimum): To BS 5534. Suit slate size, roof pitch and exposure.
- Thickness: Consistent in any one course. Lay with thicker end as tail.
- Ends of courses: Maintain bond. Provide extra wide slates as necessary.
- Top course: Head-nail short course to maintain gauge
- Cut slates: As large as possible.

Fixing: Two nails to each slate. Centre fix through countersunk holes 20–25 mm from side edges.

Mortar bedding and pointing
Weather: Do not use in wet or frosty weather or when such weather is imminent.
Concrete and clay tile accessories to be bedded: Wet and allow surface water to drain off before fixing.
Finish: Finish neatly as work proceeds. Remove residue.

Edges, junctions and features
Fittings and accessories: Proprietary, not improvised.

- Exposed items: Match slate colour and finish.

Cut slates: Only where necessary. Give neat, close fitting joints and straight, clean edges.
Fixing: Fix edge slates and fittings securely to neat, true lines.
Flashings: Fix with or immediately after the slating. Dress down neatly.

Fire separating walls
Separating wall: Completely fill space between top of wall and underside of tiles with mineral wool quilt to provide fire stopping.
Boxed eaves: Completely seal air paths in plane of separating wall with wire reinforced mineral wool, 50 mm thick (minimum), fixed to rafters. Cut carefully to shape to provide fire stopping.

Ventilated eaves
Combined eaves fascia grille/ ventilator tray: Fix to carry underlay, form drip into gutter and provide free passage of air over insulation.
Fascia grille and/ or separate ventilation tray: Fix to provide free passage of air over insulation.

- Underlay support: Continuous to prevent water retaining troughs.
- Gutter: Dress underlay or underlay support tray to form drip into gutter.

Undercourse and first course slates: Fix with tails projecting 50 mm over gutter or to centre line of gutter, whichever dimension is less.

Unventilated eaves
Gutter: Dress underlay or underlay support tray to form drip into gutter.
Underlay support: Continuous to prevent water retaining troughs.
Undercourse and first course tiles: Fix with tails projecting 50 mm over gutter or to centre of gutter, whichever dimension is less.

Mortar bedded verge with bedded undercloak
Underlay: Carry 50 mm onto outer leaf of gable wall and bed in mortar.
Undercloak of slates:

- Bedding: Mortar identical to that used in gable walling.
- Position: Level with underside of slating battens. Slope away from wall. Project 38–50 mm beyond face of wall.

Slating battens: Carry over undercloak and finish 100 mm from verge edge.
Verge slates:

- Bedding: Flush with undercloak on 75 mm wide bed of mortar.
- Fixing: Do not displace or crack mortar.

Mortar bedded verge with nailed undercloak

Underlay: Carry over full width of verge.
Undercloak: Matching natural slates:

- Position: Over underlay, level with underside of tiling battens, sloping towards verge.
- Projection beyond face of bargeboard/ fascia: 38–50 mm.
- Fixing: Nailed.

Slating battens: Carry over undercloak and finish 100 mm from verge edge.
Verge slates:

- Bedding: Flush with undercloak on 75 mm wide bed of mortar.
- Fixing: Do not displace or crack mortar.

Hips

Underlay: Lay courses over hip. Overlap 150 mm (minimum).
Mitred hips:

- Laying: Cut extra wide slates to form a straight, close mitred junction.
- Soakers: Interleave with mitred slates. Fix by turning down over head of mitred slates.

Mortar bedded hips:

- Cut and fix slates closely at junction.
- Bedding: On mortar, continuous to edges, and solid to joints. Finish joints neatly and flush.
- Fixing: Secure hip tiles to hip rafters or supplementary hip battens with self-sealing non-ferrous fixings.
- Bottom hip tiles: Shape neatly to align with corner of eaves.
- Hip irons: Fix to hip rafter or hip batten with (minimum) two zinc coated steel screws.

Valleys

GRP valleys:

- Underlay: Lay as recommended by GRP valley manufacturer.
- Roof slates: Cut extra wide slates neatly. Fix each side of valley gap.

Metal valleys:

- Underlay: Cut to rake. Dress over tilting fillets to lap onto metal valley. Do not lay underlay under metal.
- Roof slates: Cut extra wide slates neatly. Fix each side of valley gap.

Mitred valleys:

- Underlay: Cover valley with a strip of underlay 600 mm (minimum) wide. Underlap general underlay.
- Construction: Cut extra wide slates. Fix to form a straight, weathertight, close mitred junction.
- Soakers: Interleave with mitred slates. Fix by turning down over the head of mitred slates.

Abutments

Underlay: Turn up 100 mm (minimum) at abutments.
Side abutments:

- Abutment slates: Cut as necessary Fix close to abutments.
- Soakers: Interleave with abutment slates. Fix by turning down over head of abutment slates.

Top edge abutments:

- Maintaining headlap: Finish slating with a head-nailed short course.
- Top course slates: Fix close to abutment.
- Ventilated abutments: Provide air gap at abutment as recommended by ventilator manufacturer.

Roof windows

Underlay: Turn up 100 mm (minimum) against window surround. Cover with integral flashing/ soakers all round.
Roof slates: Cut as necessary. Fix closely all round.

Ridges

Maintaining headlap: Finish slating with head-nailed short course.
Dry ridge:

- Underlay: Lay courses over ridge. Overlap 150 mm (minimum).

Dry ventilated tile ridge:

- Underlay: Provide air gap at apex.

Mortar bedded tile ridge:

- Underlay: Lay from one side of ridge over apex to overlap top course of underlay at other side by 150 mm (minimum).
- Bedding: On mortar, continuous to edges, and solid to joints. Finish joints neatly and flush.
- Fixing: Secure ridge tiles to ridge boards or supplementary ridge battens with self-sealing non-ferrous fixings.

Mono-ridges

Dry mono-ridge:

- Underlay: Lay 100 mm (minimum) over apex.

Dry ventilated mono-ridge:

- Underlay: Provide air gap at apex.

Mortar bedded mono-ridges:

- Underlay: Lay 100 mm (minimum) over apex.
- Bedding: On mortar, continuous to sloping edges and solid to joints.
- Fixing: Secure vertical faces withself-sealing non-ferrous fixings.

Snowguards

Brackets: Fix to rafters on a line 100–150 mm above the roof edge.
Timber snowboard: Fix to brackets with 50 mm clearance over roof surface.
Slate work: Cut slates as necessary. Fit flashing and dress over roof finish.

Vertical slating edges and junctions

Bottom edges:

- Timber fillets: Fix to base. Tilt eaves course slates into correct vertical plane.
- Underlay: Dress over fillet.
- Flashings: Dress over fillet. Underlap underlay. Fix behind the bottom slating batten.
- Slates: Neatly align tails.

Top edges:

- Maintaining headlap: Finish slating with a head-nailed short course under abutment.
- Flashing: Fix under abutment. Dress down 150 mm (minimum) over top course of slates.

Side abutments:

- Abutment wall: Chase. Insert step flashing.
- Flashing: Return 75 mm (minimum) behind slating. Overlap underlay and battens. Turn back to form a vertical welt.
- Slates: Cut. Fix neatly to abutment.

Angles with soakers:

- Construction: Cut slates. Interleave with soakers. Fix to form a straight, weathertight, close mitred junction.
- Soakers: Nail to battens at top edge.

Junctions with roof verge:

- Additional slating battens: Fix parallel to and below verge.
- End slates: Splay cut extra wide slates at ends of courses to angle of verge rake. Fix to batten with cut edge parallel to and below verge.
- Adjacent slates: Cut to fit neatly.

H71B LEAD SHEET FLASHINGS AND WEATHERINGS

GENERAL

Cross-reference

General: Read with A90 General technical requirements.

PRODUCTS

Lead sheet

Rolled: To BS EN 12588.
Machine cast: Agrément certified.

- Tolerance (by weight): ±5%.

Marking: Colour marked for thickness.

Underlay

Geotextile: Needle punched nonwoven polyester.

Timber for use with leadwork

Softwood battens, fillets etc:

- Quality: Planed, free from wane, pitch pockets, decay and insect attack (ambrosia beetle excepted).
- Moisture content: 22% (maximum) at time of fixing and covering. Give notice if greater than 16%.
- Preservative treatment: Organic solvent as section Z12 and Wood Protection Association Commodity Specification C8.

Fasteners to timber substrates

Nails: Copper clout nails to BS 1202-2, table 2 or stainless steel (austenitic) clout nails.

- Shank: Annular ringed, helical threaded or serrated.
- Shank diameter: 2.65 mm (minimum) for light duty or 3.35 mm (minimum) for heavy duty.
- Length: 20 mm (minimum) or equal to substrate thickness.

Fasteners to concrete or masonry substrates

Screws: Brass or stainless steel to BS 1210, table 3 or 4.

- Diameter: 3.35 mm (minimum).
- Length: 19 mm (minimum).
- Washers and plastic plugs: Compatible with screws.

Clips

Material:

- Lead: Cut from sheets of same code as sheet being secured.
- Copper: To BS EN 1172, temper designation R220 in welts, seams and rolls, R240 elsewhere; dipped in solder if exposed to view.
- Stainless steel: To BS EN 10088, grade 1.4301(304), terne coated if exposed to view

Dimensions:

- Width: 50 mm where not continuous.
- Length: To suit detail.

Continuous clips

Sheltered/ moderate conditions:

- Lead: Cut from sheet of same thickness/ code as sheet being secured.
- Copper: Cut from sheet to BS EN 1172, temper designation R240, 0.6 mm (minimum) thick.
- Stainless steel: Cut from sheet to BS EN 10088, grade 1.4301(304), 0.38 mm (minimum) thick.

Severe/ very severe conditions:

- Lead: Cut from sheet two thicknesses/ codes more than sheet being secured.
- Copper: Cut from sheet to BS EN 1172, temper designation R240, 0.7 mm (minimum) thick.
- Stainless steel: Cut from sheet to BS EN 10088, grade 1.4301(304), 0.46 mm (minimum) thick.

EXECUTION

General

Standard: To BS 6915 and latest edition of 'Rolled lead sheet. The complete manual' published by the Lead Sheet Association.
Fabrication and fixing: To provide a secure, free draining and completely weathertight installation.
Operatives: Trained in the application of lead coverings/ flashings. Submit records of experience on request.
Preforming: Measure, mark, cut and form lead prior to assembly wherever possible.
Marking out: With pencil, chalk or crayon. Do not use scribers or other sharp instruments without approval.
Bossing and forming: Straight and regular bends, leaving sheets free from ripples, kinks, buckling and cracks.
Solder: Use only where specified.
Sharp metal edges: Fold under or remove as work proceeds.
Finished work: Fully supported, adequately fixed to resist wind uplift but also able to accommodate thermal movement without distortion or stress.

- Protection: Prevent staining, discolouration and damage by subsequent works.

Preparation of existing timber/ plywood substrates

Defective boards: Give notice.
Condition after preparation: Boards fixed securely. Protruding fastenings punched in. Surface finished evenly. Acceptably levelled. Gross irregularities removed or filled.

Underlay

Handling: Prevent tears and punctures.
Laying: Butt or overlap jointed onto a dry substrate.

- Fixing edges: With copper or stainless steel staples or clout nails.
- Do not lay over roof edges but do turn up at abutments.

Protection: Keep dry and cover with lead at the earliest opportunity.

Valley gutter lining (slate or tile roofs)

Laying: Over, and beyond, tilting fillets.
Fixing: Welted edges. Nailed top edge to each sheet. Bottom end dressed neatly into eaves gutter.

Ridge/ hip rolls (slate roofs)

Clips: At capping laps and 500 mm (maximum) centres (code 4 or 5 lead).

- Fixing: Nailed to top of ridge/ hip board before fixing core. Nail each side 50 mm (maximum) from capping edge. Slates drilled as necessary.

Core: Rounded timber.

- Shape: Tapered to a flat base 30 mm wide.
- Fixing: To ridge/ hip board with brass or stainless steel countersunk screws at 600 mm (maximum) centres, with base 5 mm (minimum) above slates.

Lead capping:

- Hip capping: Nail head of each length around core.
- Laps: 150 mm (minimum) for ridges, 100 mm (minimum) for hips.
- Cover: Wings of capping to extend 150 mm (minimum) on to roof.

Apron flashings

Lengths: 1500 mm (maximum).
End to end joints: Laps 100 mm (minimum).
Overlap to upstand: 75 mm (minimum).
Fixing: Lead wedges into bed joint, clips to lead upstand at laps and 500 mm centres.

Cover flashings (upstands of bitumen sheet or asphalt flat roofs)

End to end joints: Laps 100 mm (minimum).
Overlap to upstand: 75 mm (minimum).
Fixing: Lead wedges into bed joint, clips to lead upstand at laps and 500 mm centres.

Soakers and step flashings (slate or tile roofs)

Lead soakers:

- Length: Slate/ tile gauge + lap + 25 mm.
- Upstand: 75 mm (minimum).
- Underlap: 100 mm (minimum).

Lead step flashings:

- Lengths: 1500 mm (maximum).
- End to end joint: Laps 100 mm (minimum).
- Cover: Overlap to soaker upstands 65 mm (minimum).
- Fixing: Lead wedges at every course.

Step and cover flashings (single lap tile roofs) in sheltered/ moderate exposure locations

Lengths: 1500 mm (maximum).
End to end joints: Laps 100 mm (minimum).
Upstand: 85 mm (minimum).
Fixing: Lead wedges at every course. Clipped at 500 mm (maximum) centres along free edge.

Single step and cover flashings (single lap tile roofs) in exposed locations

Lead single step flashings:

- End to end joints: Laps 50 mm (minimum).
- Cover: Overlap to cover flashing upstands 65 mm (minimum).
- Fixing: Lead wedges at every step.

Lead cover flashings:

- Lengths: 1500 mm (maximum).
- End to end joints: Laps 100 mm (minimum).
- Upstand: 85 mm (minimum).
- Cover to roof : 150 mm (minimum) and over first full tile corrugation.
- Fixing: Turned over head of tiles. Clipped at 500 mm (maximum) centres along free edge. Upstand plugged and screwed to abutment in top third of each length only.

Step flashings with secret gutter

Lead step flashings:

- Lengths: 1500 mm (maximum).
- End to end joints: Laps 100 mm (minimum).
- Cover: Overlap to gutter lining upstand 65 mm (minimum).
- Fixing: Lead wedges at every course.

Lead secret gutter lining:

- Lengths: 1500 mm (maximum).
- Upstand: 65 mm (minimum) above tiles.
- Fixing: Dressed into secret gutter. Welted edge at side to be tiled. Nailed top edge to each sheet. Bottom end dressed neatly into eaves gutter.

Step and cover flashing with secret gutter

Lead step and cover flashings:

- Lengths: 1500 mm (maximum).
- End to end joints: Laps 100 mm (minimum).
- Upstand: 85 mm (minimum) with overlap to gutter lining upstand of 65 mm (minimum).
- Cover to roof: 150 mm (minimum).
- Fixing: Lead wedges at every course. Clipped at 500 mm (maximum) centres along free edge.

Lead secret gutter linings:

- Lengths: 1500 mm (maximum).
- Upstand: 65 mm (minimum) above tiles.
- Fixing: Dressed into secret gutter. Welted edge at side to be tiled. Nailed top edge to each sheet. Bottom end dressed neatly into eaves gutter.

Chimney flashings (slate or plain tile roofs)

Lead front apron:

- Length: Width of chimney plus 150 mm (minimum) underlap to each side flashing.
- Upstand: 75 mm (minimum).
- Fixing: Lead wedges into bed joint.

Lead soakers:

- Thickness: 1.25 or 1.32 mm (code 3).
- Length: Slate/ tile gauge + lap + 25 mm.
- Upstand: 75 mm (minimum).
- Underlap: 100 mm (minimum).

Lead step flashings:

- Lengths: 1500 mm (maximum).
- End to end joints: Laps of 100 mm (minimum).
- Front end: Turn 75 mm around chimney over apron.
- Cover: Overlap to soaker upstands of 65 mm (minimum).
- Fixing: Lead wedges at every course.

Lead back gutter:

- Length: Width of chimney plus 100 mm (minimum) overlap to each side flashing.
- Upstand: 100 mm (minimum).
- Gutter sole: 150 mm (minimum).
- Cover up roof: 225 mm (minimum).

Back gutter cover flashing:

- Length: Width of chimney plus 100 mm (minimum) overlap to each side flashing.
- Cover: Overlap to back gutter upstand 75 mm (minimum).
- Fixing: Lead wedges into bed joint.

Chimney flashings (single lap tile roofs)

Lead front apron:

- Length: Width of chimney plus 150 mm (minimum) underlap to each side flashing.
- Upstand: 75 mm (minimum).
- Fixing: Lead wedges into bed joint.

Side step and cover flashings:

- Lengths: 1500 mm (maximum).
- End to end joints: Laps 100 mm (minimum).
- Upstand: 65 mm (minimum).
- Cover to roof: 150 mm (minimum).
- Fixing: Lead wedges at every course. Clipped at 500 mm (maximum) centres along free edge.

Lead back gutter:

- Length: Width of chimney plus 100 mm (minimum) overlap to each side flashing.
- Upstand: 100 mm (minimum).
- Gutter sole: 150 mm (minimum).
- Cover up roof: 225 mm (minimum).

Back gutter cover flashing:

- Length: Width of chimney plus 100 mm (minimum) overlap to each side flashing.
- Cover: Overlap to back gutter upstand 75 mm (minimum).
- Fixing: Lead wedges into bed joint.

Chimney damp proof course above pitched roofs

Protection: Fully coated with high build bitumen based paint on surfaces to be embedded.

Dimensions:

- Plan area of chimney plus laps on perimeters: turned up 50 mm against stack in roof void, turned down 50mm over stack externally, through flue lining and turned up 25 mm all round internally

Laying: On a thin even bed of wet mortar.

- Next layer of overlying construction: Bed on mortar without delay and finish joint neatly.

Vertical tiling/ slating flashings
General:

- Length: 1500 mm (maximum).
- End to end joint laps: 100 mm (minimum).

Width:

- Bottom edge flashings: Adequate for underlap to underlay, dressing over tilting fillet, and welted drip or straight cut bottom edge.
- Top edge flashings: Adequate for underlap to abutment and dressing down over tiles/ slates 150 mm (minimum).
- Side abutment step flashings: Adequate for 75 mm (minimum) underlap with welted edge to tiles/ slates and 50 mm (minimum) cover to abutment.

Vertical tiling/ slating angle soakers
Lead: 1.25 or 1.32 mm (code 3).
Dimensions:

- Length: Tile/ slate gauge + lap + 25 mm.
- Underlaps: 150 mm (minimum).

Head fixing lead sheet
Top edge: Secured with two rows of fixings, 25 mm and 50 mm from top edge of sheet, at 75 mm centres in each row, evenly spaced and staggered.
Sheets less than 500 mm deep: May be secured with one row of fixings, 25 mm from top edge of sheet and evenly spaced at 50 mm centres.

Clips
Fixing clips: Secure each to substrate with two fixings 50 mm (maximum) from edge of lead sheet.
Fixing lead sheet: Welt clips around edges and turn over 25 mm.

Continuous clips
Fixing clips:

- Lead clips: Secure at 75 mm centres.
- Copper and stainless steel clips: Secure at 200 mm (maximum) centres.

Fixing lead sheet: Welt edge around continuous clip and dress down.

Wedge fixing into joints/ chases
Joint/ Chase: Rake out to a depth of 25 mm (minimum).
Lead: Dress into joint/ chase.

- Fixing: Lead wedges at 450 mm (maximum) centres, at every change of direction and with at least two for each piece of lead.

Wedge fixing into damp proof course joints
Joint: Rake/ cut out under damp proof course to a depth of 25 mm (minimum).
Lead: Dress lead into joint.

- Fixing: Lead wedges at 450 mm (maximum) centres, at every change of direction and with at least two for each piece of lead.

Screw fixing into joints/ chases
Joint/ chase: Rake out to a depth of 25 mm (minimum).
Lead: Dress into joint/ chase and up back face.

- Fixing: Into back face with stainless steel screws and washers and plastics plugs at 450 mm (maximum) centres, at every change of direction, and with at least two fixings for each piece of lead.

Forming details
Method: Bossing or leadwelding except where bossing is specifically required.
Leadwelded seams: Neatly and consistently formed.

- Seams: Do not undercut or reduce sheet thickness.
- Filler strips: Of the same composition as the sheets being joined.
- Butt joints: Formed to a thickness one third more than the sheets being joined.
- Lap joints: Formed with 25 mm laps and two loadings to the edge of the overlap.

Bossing: Carried out without thinning, cutting or otherwise splitting the lead sheet.

Drips with splash laps (gutter linings at pitches above 3°)
Underlap: Dress up full height of drip upstand.

- Fixing: Two rows of nails to lower level substrate, 25 mm and 50 mm from face of drip. At 75 mm centres in each row, evenly spaced and staggered. Seal over nails with a soldered or leadwelded dot.

Overlap: Dress over drip and form 75 mm splashlap.

- Fixing: Lead clips, leadwelded to underlap, with one per bay (minimum).

Drips without splash laps (gutter linings at pitches up to 3°)

Underlap: Dress into rebate along top edge of drip.

- Fixing: One row of nails at 50 mm centres on centre line of rebate.

Overlap: Dress over drip to just short of lower level.

J41 REINFORCED BITUMEN MEMBRANE ROOF COVERINGS

GENERAL

Cross-reference

General: Read with A90 General technical requirements.

PRODUCTS

Bitumen and bitumen membrane

Bitumen membrane: To BS 8747.
Bitumen dressing compound: To BS EN 12591.

- Restriction: For heat sensitive insulation materials, use cold bonding compounds.

Primers: As recommended by bitumen sheet manufacturer, or.
Bitumen cut back with volatile solvent. Characteristics when tested to BS EN 12846-2:

- Volatile solvent content (minimum): 40% by mass.
- Viscosity (maximum) (STV at 25°C, 4 mm orifice): 10s.

Cover strips to joints in rigid board substrates: Polyester reinforced bitumen membrane to BS 8747.

- Width: 150 mm.

Fasteners

Nails: To BS 1202 Specification for nails:

- Steel nails: To BS 1202-1.
- Copper nails: To BS 1202-2.

Insulation boards

Performance: Capable of resisting permanent deformation or damage when subjected to expected concentrated loads, with sufficient laminar strength to resist stress imposed by wind uplift forces.
Rigid urethane foam (RUF):

- Rigid polyisocyanurate (PIR) and rigid polyurethane (PU) laminated roofboards with bonded facings: To BS 4841-3.
- Rigid polyisocyanurate (PIR) and rigid polyurethane (PUR) foam boards: To BS EN 13165.

Mineral wool (MW): To BS EN 13162.
Expanded polystyrene (EPS): To BS EN 13163.
Extruded polystyrene (XPS): To BS EN 13164.
Phenolic foam (PF): To BS EN 13166.
Cellular glass (CG): To BS EN 13167.
Perlite boards (EPB): To BS EN 13169.
Expanded cork (ICB): To BS EN 13170.

Overlay boards

Oriented strand board (OSB): To BS EN 300, type OSB/3
Bitumen impregnated softboard: To BS EN 622-4
Plywood: To BS EN 636, section 8 (plywood for use in humid conditions).

- Quality: Naturally durable timber, free from preservatives.

Expanded cork (ICB): To BS EN 13170.

Protection

Precast concrete paving slabs: To BS EN 1339.

Timber trims, fillets etc.

- Quality: Planed. Free from wane, pitch pockets, decay and insect attack (except ambrosia beetle damage).
- Moisture content at time of covering: 22% (maximum).
- Restriction: Fillets under torch-on bitumen membranes to be non-combustible.

EXECUTION

Adverse weather

General: 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.

Applying primers

Surface coverage: Even and full.
Coats: Fully bond. Allow volatiles to dry off thoroughly between coats.

Applying bonding compounds

Temperature of compound: Suitable to achieve bond over whole surface. Do not overheat.
Heat sensitive insulation materials: Use cold bituminous adhesive or overlays recommended by the insulation manufacturer.

Suitability of substrates
Substrate generally: Secure, clean, dry, smooth, free from frost, contaminants, voids and protrusions.
Preliminary work: Complete including:

- Grading to correct falls.
- Formation of upstands, kerbs, box gutters, sumps, grooves, chases, expansion joints.
- Fixing of battens, fillets, anchoring plugs/ strips.

Moisture content and stability of substrate: Must not impair roof integrity.

Renewing existing coverings
Substrate: Do not damage.
Timing: Remove only sufficient coverings as will be renewed and made weathertight on same day.Chippings and paving tiles.
Edge trims. Replace with new as specified.
Rainwater outlet gratings. Set aside for reuse on completion.
Skirtings: Cut out and make good as for new work.

Laying overlay to metal deck
Setting out: Lay boards with staggered joints and long edges at right angles to troughs in deck.

- End joints: Centre over crowns of deck.

Fasteners:

- Type: Recommended by fastener manufacturer.
- Fastener heads: Flush with, or below board surface.

Joints in rigid board substrates
Cover strip: Lay centrally over substrate joints before laying vapour control layers or coverings. Adhere to substrate with bonding compound along edges only.

Laying vapour control layer
Joints in second layer (where applicable): Stagger by half a membrane.
Penetrations: Fully seal using bonding or taping methods recommended by manufacturer.
Edges of insulation at roof edges, abutments, upstands, kerbs, penetrations etc: Enclosed with vapour control layer:

- Treatment: Dressed up sufficiently, providing 50 mm (minimum) seal when overlapped by the roof covering; or turned back 150 mm (minimum) over the insulation and sealed down.

Laying warm deck roof insulation
Setting out:

- End edges: Adequately support.
- Joints: Butt together.
- End joints: Stagger.

Protection to exposed edges of insulation: Reduced thickness treated timber batten, outer edge chamfered at changes in level.
Completion: Boards must be in good condition, well fitting and stable.

Laying overlay to warm deck roof insulation
Setting out: Stagger to break joint with insulation.

- Joints: Butt together.

Laying reinforced bitumen membranes generally
Direction of laying: Unrolled up the slope.

- Where practicable, install so that water drains over and not into laps.

Side and end laps: Size and seal using materials and method recommended by bitumen membrane manufacturer.
Head and side laps: Offset.
Intermediate and top layer/ capsheet: Fully bond.
Successive layers: Apply without delay. Do not trap moisture.
Strips of bitumen membrane for 'linear' details: Cut from length of roll.
Completed coverings: Firmly attached, fully sealed, smooth, weatherproof and free draining.

Laying reinforced bitumen membranes on roofs pitched more than 5º
Timber battens: Fix flush with surface in substrates that will not securely accept nails.

- Locations: To BS 8217, table 5

Set out: Parallel to roof slope, with successive layers carried over ridges.

- Lengths (maximum): As recommended by reinforced bitumen membrane manufacturer.
- End laps: Half stagger and align on alternate bitumen membrane.

Additional fixing for bitumen membranes: As recommended by reinforced bitumen membrane manufacturer.

Nailing first layer of reinforced bitumen membranes to timber substrate
Setting out: Unroll, align and cut to length and work from one end. Minimize wrinkles.
Fixing centres:

- General area: 150 mm (maximum) grid centres.
- Perimeter of roof areas and at all side and head laps: 50 mm.

Partial bonding of reinforced bitumen membranes
Venting first layer: Loose lay, align and cut to length. Do not carry up angle fillets and vertical surfaces or through details.
- Long edges: Overlap 50 mm (minimum).
- Ends: Butt together.

Intermediate layer: Fully bond to first layer and through to substrate.

Pour and roll bonding of reinforced bitumen membranes
Bonding compound:
- Hot and fluid when bitumen membranes are laid.
- Application: Spread evenly so that a small quantity is squeezed out at each edge.

Bond: Full over whole surface, with no air pockets.
Excess compound at laps:
- First and intermediate layers. Spread out.
- Top layer/ Capsheet: Remove.

Torch-on bonding of reinforced bitumen membranes
Bond: Full over whole surface, with no air pockets.
Excess compound at laps of top layer/ capsheet: Leave as a continuous bead.

Cold applied and self-adhesive bonding of reinforced bitumen membranes
Bond: Full over whole surface, with no air pockets.

Laying mineral/ metal faced reinforced bitumen membranes
Lap positions and detailing of ridges, eaves, verges, hips, abutments, etc: Submit proposals.
Setting out: Neat, with carefully formed junctions.
Excess bonding compound at laps: Remove, whilst still warm.
Lap bonding of mineral faced bitumen membranes: Carry out only at prefinished margins or prepared 'black to black' edges.
Face of metal faced bitumen membranes: Do not mark, crease or stain.

Mechanical fixing of single layer reinforced bitumen membranes
Installing fasteners:
- Use manufacturer's recommended methods and equipment.
- Insertion: Correct and consistent.

Washers/ Pressure plates/ Bars:
- Distance from fixed edge: 10 mm (minimum).
- Fixing: Flush with membrane.

Welded jointing of single layer reinforced bitumen membranes
Side and end joints:
- Preparation: Clean and dry surfaces for full width of joint.
- Sealing: Hot air welded.

Condition at completion: Fully sealed, watertight and free draining.

Skirtings and upstands
Angle fillets: Fix by bitumen bonding or nailing.
Venting first layer: Stop at angle fillet. Fully bond in bitumen for 300 mm strip around perimeters. Overlap onto upstand with strips of glass reinforced bitumen membrane, fully bonded.
Other layers of bitumen membrane: Carry in staggered formation up upstand, with each layer fully bonded. Where practicable, carry top layer over top of upstand.
Upstands:
- At ends of rolls: Form with bitumen membrane carried up without using separate strip.
- Elsewhere: Form with matching strips of bitumen membrane, maintaining laps.
- Additional fixing of bitumen membranes: As recommended by bitumen membrane manufacturer.

Welted drips
General:
- Length: Form using maximum length strips.
- Height at external gutter: 75 mm (minimum).

Welt tail: Nail to face of drip batten. Fold neatly.
Welt: Bond together, carry 100 mm (minimum) onto roof. Overlap with top bitumen membrane.

Fixing perimeter trims
First / Intermediate layers bitumen membrane: Lay over roof edge upstand. Project free edge 25 mm from wall or fascia.
Trim:

- Setting out: 3 mm (minimum) clear from wall or fascia.
- Fixing: 30 mm from ends and at 300 mm (maximum) centres.
- Jointing sleeves: Fixed one side only and with 3 mm expansion gaps.
- Corner pieces: Purpose made.

Completion of trims:

- Contact surfaces: Prime.
- Joints: Cover with 150 mm long pads of bitumen membrane, bonded to trim.

Completion of bitumen membrane:

- Top layer/ Capsheet: Butt joint to rear edge of trim.
- Cover strip: Fully bond to trim and top layer/ capsheet of bitumen membrane. Carry over roof edge upstand and lap 75 mm onto roof.

Installing roof ventilators
Priming:

- Substrate below vents: Do not prime or apply bonding compound.
- Vent skirts: Prime before sheeting, if recommended by manufacturer.

Laying inverted roof insulation
Condition of substrate: Clean.
Setting out: Loose lay with staggered joints.

- Cutting: Minimize.
- Small cut pieces: Avoid at perimeters and penetrations.
- Joints: Butt together.

Projections, upstands, rainwater outlets, etc: Cut insulation cleanly and fit closely around.
Completion:

- Boards must be in good condition, well fitting and stable.
- Cover as soon as practicable to prevent wind uplift and flotation.

Laying stone ballast
Condition of substrate: Clean.
Outlets: Fit gravel guards.
Previously laid materials: Protect during laying of ballast.
Laying: Spread evenly. Do not pile to excessive heights.

Laying precast concrete paving slabs
Condition of substrate: Clean.
Setting out: Minimize cutting.
Completion: Slabs must be level and stable.

Laying paving tiles
Condition of substrate: Clean.
Setting out: Minimize cutting.
Contact surfaces: If recommended by tile manufacturer, prime and then allow to dry
Bonding compound: Avoid excess compound being squeezed over tile face.
Joints: 3 mm generally, 25 mm between bays.
Bays:

- Bay size (approximate): 9 m².
- Bay joint locations: Submit proposals.

Applying chippings
Condition of substrate: Clean.
Outlets: Fit gravel guards.
Completion: Remove loose excess chippings without exposing dressing compound.

Applying solar reflective paints
Surface coverage: Even and full.
Coats: Fully adhered.

Inspection
Interim and final roof inspections: Submit reports.

Electronic roof integrity test

Testing authority: Contractor.
Timing of test: At completion.
Condition of roof prior to testing:

- Complete to a stage where integrity of membrane can be tested.
- Surface: Clean.

Test results and warranty: Submit on completion of testing.

Completion

Roof areas: Clean.
Outlets: Clear.
Work necessary to provide a weathertight finish: Complete.
Storage of materials on finished surface: Not permitted.
Completed membrane: Do not damage. Protect from chemicals, traffic and adjacent or high level working.

J42 SINGLE LAYER POLYMERIC SHEET ROOF COVERINGS

GENERAL

Cross-reference

General: Read with A90 General technical requirements.

PRODUCTS

Cover strips to joints in rigid board substrates

Polyester reinforced bitumen membrane: To BS 8747.

Overlay to metal deck

Plywood: To BS EN 636 section 8 (plywood for use in humid conditions)

- Quality: Naturally durable timber, free from preservatives.

Oriented strand board: To BS EN 300, type OSB/3

Precast concrete paving slabs

Standard: To BS EN 1339, hydraulically pressed.

Timber trims, etc

Quality: Planed. Free from wane, pitch pockets, decay and insect attack except ambrosia beetle damage.
Moisture content at time of covering: 22% (maximum).

Warm deck roof insulation generally

Expanded polystyrene board (EPS): To BS EN 13163.
Extruded polystyrene board (XPS): To BS EN 13164.
Mineral wool (MW) board: To BS EN 13162.
Phenolic foam (PF) board: To BS EN 13166
Rigid polyisocyanurate foam (PIR) roofboard: To BS 4841-4.
Rigid polyurethane foam (PU) board: To BS EN 13165.

Inverted roof insulation

Extruded polystyrene board (XPS): To BS EN 13164.

EXECUTION

Adverse weather

General: Do not lay membrane at temperatures below 5°C or in wet or damp conditions unless effective temporary cover is provided over working area.
Unfinished areas of roof: Keep dry and protect edges of laid membrane from wind action.

Incomplete work

End of working day: Provide temporary seal to prevent water infiltration.
On resumption of work: Cut away tail of membrane from completed area and remove from roof.

Applying primers

General: Use primer where recommended by membrane manufacturer.
Surface coverage: Even and full.
Coats: Fully bonded. Allow volatiles to dry off thoroughly between coats.

Substrates

Surfaces to be covered: Secure, clean, dry, smooth, free from frost, contaminants, voids and protrusions.
Preliminary work: Complete, including grading to correct falls and formation of upstands, kerbs, box gutters, sumps, grooves, chases, expansion joints and fixing of battens, fillets, anchoring plugs/ strips, etc.
Moisture content and stability of substrate: Must not impair integrity of roof.

Renewing existing coverings

Substrate: Do not damage.
Timing: Only remove sufficient coverings as will be renewed and waterproofed on same day.

Laying metal deck overlay

Setting out: Lay boards with staggered joints and long edges at right angles to troughs in deck.

- Joints: Plywood overlays, allow 1 mm per metre panel size; OSB overlays, allow 2 mm per metre panel size.
- End joints: Centre over crown of deck.

Fasteners:

- Type: As fastener manufacturer's recommendations for the purpose.
- Fastener heads: Flush with, or below board surface.

Laying vapour control layer

Laying: Flat and smooth.
Upstands, kerbs and other penetrations: Enclose edges of insulation. Fully seal at abutment by bonding or taping.

Laying warm deck roof insulation
Setting out:

- End edges: Adequately supported.
- Joints: Butted together.
- End joints: Staggered.

Boards at completion: In good condition, well fitting and secure.

Mechanical fixing of waterproof membrane
Laying membrane: Loose, do not wrinkle or stretch.
Installing fasteners:

- Use manufacturer's/ supplier's recommended methods and equipment.
- Insertion: Correct and consistent.

Washers/ pressure plates/ bars:

- Distance from fixed edge (minimum): 10 mm.
- Fixing: Flush with membrane.

Sheet overlaps: Extend beyond washers/ pressure plates by: 50 mm (minimum).
Surface condition at completion: Fully sealed, smooth, weatherproof and free draining.

Adhesive bonding of waterproof membrane
Laying membrane: Do not wrinkle or stretch.
Surface condition at completion: Fully sealed, smooth, weatherproof and free draining.

Welded jointing of waterproof membrane
Laying membrane: Loose, do not wrinkle or stretch.
Side and end joints:

- Preparation: Clean and dry surfaces beyond full width of joint.
- Sealing: Weld together.

Surface condition at completion: Fully sealed, smooth, weatherproof and free draining.

Adhesive jointing of waterproof membrane
Side and end joints:

- Preparation: Prime, clean and dry surfaces beyond full width of joint and lap.
- Sealing: Apply continuous even coverage of adhesive to both surfaces. Mate and roll together. Do not wrinkle or stretch membrane.

Surface condition at completion: Fully sealed, smooth, weatherproof and free draining.

Tape jointing of waterproof membrane
Side and end joints:

- Preparation: Prime, clean and dry surfaces beyond full width of joint.
- Sealing: Apply self adhesive tape. Mate and roll together. Do not wrinkle or stretch membrane.

Surface condition at completion: Fully sealed, smooth weatherproof and free draining.

Perimeter of membrane
General: Secure membrane at roof edge conditions, changes of plane, curb flashings, upstands to roof lights, etc. with mechanical fasteners.

Perimeter details
Thermoplastic membranes:
Upstands, edge trims, drips, kerbs, etc: Select method compatible with membrane, either:

- Secure preformed metal sections to roof structure with mechanical fasteners.
- Form flashings from waterproof membrane material.

Roof membrane: Select method compatible with membrane, either:

- Dress over perimeter profile. Overlap beyond fasteners to manufacturer's/ supplier's recommendations.
- Terminate in horizontal plane immediately adjacent to change in direction and secure with mechanical fasteners.

Flashings: Dress over perimeter profile. Overlap horizontal roof membrane beyond perimeter securement to manufacturer's/ supplier's recommendations.
Sealing: Select method compatible with membrane, either:

- Weld together.
- Bond with adhesive and weld at overlap.
- Mechanically fix and weld at overlap.

Elastomeric membranes:
Upstands, edge trims, drips, kerbs, etc: Preformed from waterproof membrane material.
Reinforcing strip: Lay at edge of horizontal roof plane.

- Securing: Mechanically fasten.

Roof membrane: Dress over perimeter profiles.

- Sealing: Bond to substrate and to secured perimeter reinforcing strip.

Roof penetrations
Thermoplastic membranes:
Roof membrane: Cut around penetrations and secure to deck.
Flanged sleeve:

- Installation: Dress over and around penetration.
- Roof membrane overlap to flange (minimum): 50 mm beyond fasteners.
- Protection to top edge of sleeve: Flashing or weathering cravat.

Elastomeric membranes:
Roof membrane: Cut around penetrations.
Flanged sleeve:

- Installation: Dress over and around penetration.
- Seating: Flush to roof membrane.
- Roof membrane overlap to flange (minimum): 75 mm beyond fasteners.

Laying inverted roof insulation
Condition of substrate: Clean.
Setting out: Loose lay with staggered joints.

- Cutting: Minimize.
- Small cut pieces: Avoid at perimeters and penetrations.
- Joints: Butt together.

Projections, upstands, rainwater outlets, etc.: Cut insulation cleanly to fit closely around.
Completion:

- In good condition, well fitting and stable.
- Cover to prevent wind uplift and flotation as soon as practicable.

Laying stone ballast
Condition of substrate: Clean.
Gravel guards: Fit to outlets.
Previously laid materials: Protect whilst laying ballast.
Laying: Spread evenly. Do not pile to excessive heights.

Laying precast concrete paving slabs
Condition of substrate: Clean.
Setting out: Minimize cutting.
Joints: Open.
Completion: Slabs level and stable.

Inspection
Interim and final roof inspections: Submit reports.

Electronic roof integrity test
Testing authority: Approved independent testing body or the roofing contractor
Timing of test: Before covering of membrane or prior to, and on completion of access by other trades.
Condition of roof prior to testing:

- Waterproof membrane complete to a stage where integrity can be tested.
- Surface: Clean.

Test results and warranty: Submit on completion of testing.

Completion
Roof areas: Clean.

- Outlets: Clear.

Work necessary to provide a weathertight finish: Complete.
Storage of materials on finished surface: Not permitted.
Completed membrane: Do not damage. Protect from traffic and adjacent or high level working.

L10 WINDOWS ROOFLIGHTS SCREENS AND LOUVRES

GENERAL

Cross-reference

General: Read with A90 General technical requirements.
Sealants: Read with section Z22 Sealants.
Joinery workmanship: Read with section Z10 Purpose made joinery.

PRODUCTS

Moisture content of windows, screens, louvres and subframes on delivery to site

External joinery: 12–19%.
For unheated buildings: 12–16%.
For buildings with heating providing room temperatures in the range 12–21°C: 9–13%.
For buildings with heating providing room temperatures in excess of 21°C: 6–10%.

Windows

Aluminium:

- Standard: To BS 4873.
- Factory applied powder coatings: To BS 6496.

PVC-U windows (white and surface covered):

- Standard: Manufactured to BS 7412 from extruded profiles.
- Manufacturer: Registered under a quality assurance scheme operated by a certification and inspection body accredited by the United Kingdom Accreditation Service (UKAS).
- Operation and strength characteristics: To BS 6375-2.

Steel:

- Standard: To BS 6510.
- Operation and strength characteristics: To BS 6375-2.
- Factory applied powder coatings: To BS EN 13438.

Wood:

- Standard: To BS 644.
- Manufacturer: Registered under a third party quality assurance scheme.
- Operation and strength characteristics: To BS 6375-2.
- Certification: All wood being traded in the EU should be 'legal' under the European Timber Regulation (EUTR). For public procurement projects the UK Timber Procurement Policy may be applicable, and evidence should be submitted as appropriate (contact CPET for advice).

Glazing

Safety glazing:

- Standard: In accordance with BS 6262-4 as appropriate for installation.

Wood members for purpose made windows, screens, louvres and subframes

Timber: Generally to BS EN 942.
Appearance class to BS EN 942:

- For opaque finish: Glazing beads, drip mouldings and the like, class J10; all other members, J40 or better.
- For clear finish: Glazing beads, drip mouldings and the like, Class J2; other members, as specified.

Knots on arrises and finger jointing in timber: Not permitted where exposed to view.
Adhesives:

- Polyvinyl acetate (PVAC) to BS EN 204, class D4.
- Thermosetting resin to BS EN 12765, class C4.

EXECUTION

Protection of components

General: Do not deliver to site components that cannot be installed immediately or placed in clean, dry floored and covered storage.
Stored components: Stack vertical or near vertical on level bearers, separated with spacers to prevent damage by and to projecting ironmongery, beads, etc.

Priming/ sealing

Wood surfaces inaccessible after installation: Prime or seal before fixing components.

Corrosion protection

Protective coating: Two coats of bitumen solution to BS 6949 or an approved mastic impregnated tape.

- Timing of application: Before fixing components.

Building in
General: Not permitted unless specified.

- Brace and protect components to prevent distortion and damage during construction of adjacent structure.

PVC-U windows
Installation standard: To BS 8213-4

Replacement windows installation
Standard: To BS 8213-4.

Window installation
General: Install into prepared openings, without twist or diagonal racking.
Gap between frame edge and surrounding construction (maximum):

- Steel windows: 3 mm.
- Timber and PVC-U windows: 10 mm.

Fixing of wood frames
Positions of fasteners unless predrilled:

- Distance from ends of each jamb: 150 mm (maximum).
- Adjacent to each hanging point of opening lights.
- Centres: 450 mm (maximum).

Fixing of steel frames
Positions of fasteners unless predrilled:

- Distance from ends of each jamb: 50–190 mm.
- Adjacent to each hanging point of opening lights.
- Centres: 900 mm (maximum).

Windows fixed direct into openings: After fixing, fill back of steel frame with waterproof cement fillet.

Fixing of aluminium frames
Positions of fasteners unless predrilled:

- Distance from ends of each jamb: 250 mm (maximum).
- Adjacent to each hanging point of opening lights.
- Centres: 600 mm (maximum).

Fixing of PVC-U frames
Positions of fasteners unless predrilled:

- Distance from ends of each jamb: 150–250 mm (maximum).
- Fasteners at critical points: Adjacent to each hanging point of opening lights, but no closer than 150 mm to a transom or mullion centre line.
- Centres: 600 mm (maximum).

Fixing of composite frames
Positions of fasteners unless predrilled:

- Distance from ends of each jamb: 150 mm (maximum).
- Adjacent to each hanging point of opening lights.
- Centres: 600 mm (maximum).

Ironmongery
Assembly and fixing: Careful and accurate.
Fasteners: With matching finish. Do not damage ironmongery and adjacent surfaces.
Completion: Check, adjust and lubricate as necessary. Ensure correct functioning.

L20 DOORS/ SHUTTERS/ HATCHES

GENERAL

Cross-reference

General: Read with A90 General technical requirements.
Purpose made joinery: Read with Z10.
Preservative/ fire retardant treatment: Read with Z12.
Fixings/ adhesives: Read with Z20.
Sealants: Read with Z22.

PRODUCTS

Door facings: laminate

Standard: To BS EN 438-1 and -7.
Grade: Horizontal:

- Standard general purpose: HGS.
- Flame retardent general purpose: HGF.
- Post forming general purpose: HGP.

Door facings: plywood

Bonding quality: To BS EN 314.
Surface appearance:

- Hardwood: To BS EN 635-2.
- Softwood: To BS EN 635-3.

Conditions of use: To BS EN 636

External wood matchboarded doors

Standard: Generally to BS 459.

Fire performance

Fire resistant doorsets and shutter assemblies:

- Type testing: To BS 476-22 or BS EN 1634-1

Smoke control doorsets and shutter assemblies:

- Type testing: To BS 476-31.1 or BS EN 1634-3

Intumescent seals:

- Type testing: To BS 476-23

Testing authority: UKAS accredited.

Metal door frames

Steel frames: Generally to BS 1245.

Metric internal and external wood doorsets, door leaves and frames

Coordinated sizes: To BS 4787.

Safety glazing to door leaves and sidelights

Standard: To BS 6206 for safety plastics and BS EN 12600 for safety glass.
Location: To BS 6262-4.

Single leaf external doorsets to dwellings

Security: To BS 8220-1.

- General performance requirements: To British Standards Institute (BSI) publication, PAS 23-1
- Enhanced security requirements: To BSI publication, PAS 24

Wood framed panel doors

Timber quality: To BS EN 942

Wood preservative treatment

Service life: Not less than 30 years.
External softwood doors and frames: Wood Protection Association (WPA) commodity specification C5
External hardwood doors and frames: WPA commodity specification C10

Adhesives for wood doors and frames

- Polyvinyl acetate (PVAC) to BS EN 204.
- Thermosetting resin to BS EN 12765, class C4.

EXECUTION

Protection of components

General: Do not deliver to site components that cannot be installed immediately or placed in clean, dry, floored and covered storage.
Stored components: Stacked on level bearers, separated with spacers to prevent damage by and to projecting ironmongery, beads, etc.

Protection of timber surfaces inaccessible after installation

Protective coating: Primed or sealed before fixing components.

Protection of metallic surfaces inaccessible after installation

Relevant conditions: External or damp (high humidity) internal.
Copper alloys: Avoid direct contact with aluminium, iron, steel or zinc (including galvanizing).
Aluminium alloys: Avoid direct contact with:

- Timber treated with copper, zinc or mercury based preservatives.
- Unseasoned oak, sweet chestnut, Douglas fir, western red cedar.
- Iron and steel unless galvanized.
- Copper, copper alloys and rainwater run off from these materials.
- Concrete, mortars, plasters or soil, especially when embedded.
- Paints containing copper or mercury based fungicides, graphite or lead.

Protective coating as separating layer: Two coats of bitumen solution to BS 6949, an approved mastic impregnated tape or submit proposals.

- Timing: Before fixing components.
- Constraint: Only to surfaces not exposed on completion.

Building in

General: Not permitted except where specifically stated.
Components specified for building in:

- Bracing and protection: Prevent distortion and damage of built-in frames during erection of adjacent structure.
- Damp proof courses associated with built in wood frames: Fixed to backs of frames using galvanized clout nails.

Fixing of wood frames

Spacing of fixings (frames not predrilled): Maximum 150 mm from ends of each jamb and at 600 mm maximum centres.

Fire resisting and/ or smoke control doors/ doorsets

Installation: In accordance with instructions supplied with the product conformity certificate, test report or engineering assessment.
Gaps between frames and supporting construction: Filled as necessary in accordance with requirements for certification and/ or door/ doorset manufacturer's instructions.

L30 STAIRS LADDERS AND BALUSTRADES

GENERAL

Cross-reference

General: Read with A90 General technical requirements.
Purpose made joinery: Read with Z10.
Purpose made metalwork: Read with Z11.
Preservative and fire retardant treatment: Read with Z12.
Fasteners and methods of fixing: Read with Z20.

PRODUCTS

Adhesives

PVAC: To BS EN 204

Loft ladders

Standard: To BS EN 14975.

Stairs

Generally:

- Straight stairs: To BS 5395-1.
- Helical and spiral stairs: To BS 5395-2.
- Industrial stairs, permanent ladders and walkways: To BS 5395-3 and BS EN ISO 14122-4.
- Closed riser wood stairs: To BS 585-1 and -2 (both obsolescent but still current).

Wood components

Standard: Classification of quality to BS EN 942.

EXECUTION

Moisture content of wood components

Temperature and humidity: Monitor and control internal conditions to achieve specified moisture content in wood components at time of installation.

Priming, sealing and painting

Surfaces inaccessible after assembly/ installation: Before fixing components, apply full protective or decorative treatment/ coating system.

Corrosion protection of dissimilar metals

Components/ substrates/ fasteners of dissimilar materials: Isolate using washers/ sleeves or other suitable means to separate materials to avoid corrosion and/ or staining.

Installation generally

Structural members: Do not modify, cut, notch or make holes in structural members, except as indicated on drawings.
Temporary support: Do not use stairs, walkways or balustrades as temporary support or strutting for other work.

L40 GENERAL GLAZING

GENERAL

Cross-reference

General: Read with A90 General technical requirements.

PRODUCTS

Glass

Standards: To BS 952-1 and -2 and relevant parts of

- BS EN 572 for basic soda lime silicate glass.
- BS EN 1096 for coated glass.
- BS EN 1748-1 for borosilicate glass.
- BS EN 1748-2 for ceramic glass.
- BS EN 1863 for heat strengthened soda lime silicate glass.
- BS EN 12150 for thermally toughened soda lime silicate safety glass.
- BS EN 12337 for chemically strengthened soda lime silicate glass.
- BS EN 13024 for thermally toughened borosilicate safety glass.
- BS EN ISO 12543 for laminated glass and laminated safety glass.

Panes/ sheets: Clean and free from obvious scratches, bubbles, cracks, rippling, dimples and other defects.

- Edges: Generally undamaged. Shells and chips not more than 2 mm deep and extending not more than 5 mm across the surface are acceptable if ground out.

Heat soaking of thermally toughened glass

Heat soaking regime: Glass specified as 'heat soaked' to BS EN 14179-1 and -2 must be subjected to a heat soaking regime designed to reduce the incidence of failure due to nickel sulfide inclusions.

- Heat soaking period (minimum): Submit proposals.
- Mean glass temperature: 290°C ±10°C.

Certified evidence of treatment: Submit.

Impact resistance

Plastics: To BS 6206
Glass: To BS EN 12600.

Fire resistance

Test standards: To BS 476-22 or BS EN 1364-1

Mirrors

General: Silvered to give maximum reflection, free from distortion, tarnishing, discoloration, scratches and other defects visible in the designed viewing conditions.
Standard: To BS EN 1036-2.
Fixing: To BS 6262-6, clause 8.3 for glass mirrors and clause 8.4 for plastic mirrors.

Glazing sealants

Type G to BS EN 11600.

Insulating glass units

CE marked to BS EN 1279-5.

EXECUTION

Workmanship

Glazing generally: To BS 6262-1, -2, -3, -4, -6 and -7.
Integrity: Glazing must be wind and watertight under all conditions with full allowance made for deflections and other movements.
Dimensional tolerances: Panes/ sheets to be within ±2 mm of specified dimensions.
Materials:

- Compatibility: Glass/ plastics, surround materials, sealers primers and paints/ clear finishes to be used together to be compatible. Avoid contact between glazing panes/ units and alkaline materials such as cement and lime.
- Protection: Keep materials dry until fixed. Protect insulating glass units and plastics glazing sheets from the sun and other heat sources.

Preparation:

- Surrounds, rebates, grooves and beads: Clean and prepare before installing glazing.

Removal of glazing for reuse
Existing glass/ plastics and glazing compound, beads, etc: Remove carefully, avoiding damage to frame, to leave clean, smooth rebates free from obstructions and debris.
Deterioration of frame/ surround: Submit report on defects revealed by removal of glazing.

- Affected areas: Do not reglaze until instructed.

Reusable materials: Clean glass/ plastics, beads and other components that are to be reused.

Bead fixing
With pins:

- Pin spacing: Regular at maximum 150 mm centres, and within 50 mm of each corner.
- Exposed pin heads: Punched just below wood surface.

With screws:

- Screw spacing: Regular at maximum 225 mm centres, and within 75 mm of each corner.

Single glazing putty fronted
Glazing installation:

- Glass: Located centrally in surround using setting and location blocks, and secured with glazing sprigs/ cleats/ clips at 300 mm centres.
- Finished thickness of back bedding after inserting glazing (minimum): 1.5 mm.
- Front putty: Finished to a smooth, neat triangular profile stopping 2 mm short of sight line. Surface lightly brushed to seal putty to glass and left smooth with no brush marks.

Sealing putty: Seal as soon as sufficiently hard but not within 7 days of glazing. Within 28 days apply either the full final finish, suitably protected until completion and cleaned down and made good as necessary, or two coats of primer/ sealer applied locally to the compound, to be followed nearer completion with the full specified finish.
Opening lights: Keep in closed position until putty has set sufficiently to prevent displacement of glazing when opened.

Single glazing bead fixed with glazing compound
Glazing installation:

- Glass: Located centrally in surround using setting and location blocks and distance pieces.
- Finished thickness of back bedding after inserting glazing (minimum): 3 mm.
- Front bedding: Applied to fill voids.
- Beads: Bedded in glazing compound and fixed securely.
- Visible edge of glazing compound: Finished internally and externally with a smooth chamfer.

Single glazing bead fixed with tapes and capping sealant
Glazing installation:

- Glass: Located centrally in surround using setting and location blocks.
- Glazing tape: Top edge approximately 6 mm short of sight line on external side of glazing, to allow for capping sealant. Corners butt jointed with no gaps.
- Thickness of glazing tape bed (minimum): 3 mm on both sides of glazing after compression.
- Beads: Bedded in sealant, pressed firmly into position to compress tape, and fixed securely.
- Excess tape on internal side: Carefully trimmed to a smooth chamfer.
- Capping sealant: Applied to fill void between bead and glazing and finished to a smooth chamfer.

Single glazing bead fixed with extruded gaskets
Glazing installation:

- Glass: Located centrally in surround using setting and location blocks.
- Gaskets and beads: Installed as recommended by frame manufacturer.
- Gasket fit at corners: Tight, without gaps.

Insulating glass units bead fixed with extruded gaskets
Glazing installation:

- Insulating unit: Located centrally in surround using setting and location blocks.
- Gaskets and beads: Installed as recommended by frame manufacturer.
- Gasket fit at corners: Tight, without gaps.
- Drainage and ventilation holes: Unobstructed.

Insulating glass units bead fixed with cellular adhesive sections
Glazing installation:

- Insulating unit: Located centrally in surround using setting and location blocks.
- Glazing sections/ strips/ tapes: Applied to rebate upstands and beads in positions recommended by manufacturer.
- Beads: Installed using sufficient pressure to compress inner and outer sections/ strips/ tapes and fixed securely.
- Drainage and ventilation holes: Unobstructed.

Insulating glass units bead fixed with loadbearing tapes and sealant capping
Glazing installation:

- Insulating unit: Located centrally in surround using setting and location blocks.
- Glazing sections/ strips/ tapes: Applied to rebate upstands and beads finishing approximately 5 mm short of sight line to allow for capping sealant.
- Beads: Installed using sufficient pressure to compress inner and outer sections/ strips/ tapes and fixed securely.
- Capping sealant: Applied to both sides of glass unit and finish to a smooth chamfer.
- Drainage and ventilation holes: Unobstructed.

Insulating glass units bead fixed with solid bedding
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.

Single glazing into grooves with sealant capping
Glazing installation:

- Glass: Located centrally in grooves using setting blocks and distance pieces of appropriate thickness.
- Backing strip: Expanded polyethylene, inserted at head and jambs, ensuring a tight fit and allowing a minimum distance of 6 mm between strip and sight line.
- Sill beads: Fixed securely with backing strip between bead and glazing.
- Capping sealant: Applied to fill recesses on both sides of glass and finished to a smooth chamfer.

Internal tape glazing
Glazing installation: Beads bedded dry to rebate and glazing tape/ section and fixed securely. Tape trimmed flush with sight line on both sides.

Mirrors
Installation: Fixed accurately and securely without overtightening fasteners, to provide a flat surface giving a distortion free reflection.

Window film
Application: Carried out by a firm approved by the film manufacturer in accordance with manufacturer's recommendations.

- Evidence of applicator's competence and experience: Submit on request.
- Sample area: Complete as part of the finished work, in an approved location and obtain approval of appearance before proceeding.
- Ambient air temperature at time of application: Above 5°C.

Installed film: Fully adhered to the glass with no peeling, and free from bubbles, wrinkles, cracks or tears.

- Further contact with applied films: Avoid until bonding adhesive has cured.
- Cleaning and maintenance instructions: Submit copies.

Manifestation
Factory application: Acid etching or engraving to be carried out by the glass manufacturer or by a firm approved in accordance with manufacturer's recommendations.
Site application: Adhesive film or transfers to be applied by a firm approved by film manufacturer and in accordance with manufacturer's recommendations.

- Sample area: Complete as part of the finished work, in an approved location, and obtain approval of appearance before proceeding.
- Ambient air temperature at time of film/ transfer application: Above 5°C.

Installed film: Fully adhered to the glass with no peeling, and free from bubbles, wrinkles, cracks or tears.

- Further contact with applied films: Avoid until bonding adhesive has cured.
- Cleaning and maintenance instructions: Submit.

M20B RENDERED AND ROUGHCAST COATINGS

GENERAL

Cross-reference

General: Read with A90 general technical requirements.

PRODUCTS

Component materials for cement gauged render mortars

Lime:sand, ready-mixed: Lime to BS EN 459-1, type CL 90. Sand to BS EN 13139, grading 0/2 or 0/4 (CP or MP) with category 2 fines.
Sand: To BS EN 13139; grading 0/2 or 0/4 (CP or MP) with category 2 fines.
Coarse aggregates: Single size to BS EN 12620.
Lime: To BS EN 459-1; type CL 90S
Air entraining (plasticizing) admixtures: To BS EN 934-2 and compatible with other mortar constituents.
Pigment for coloured mortars: To BS EN 12878.
Cement: Common Portland to BS EN 197-1; from CEM 1, slag CEM II/S, fly ash CEM II/V or W.
White cement: Portland to BS EN 197-1, CEM 1.
Sulfate resisting cement: Portland to BS EN 197-1.
Masonry cement: To BS EN 998-1

Component materials for lime:sand render mortars

Nonhydraulic ready prepared lime putty: Slaked directly from CL 90 (high calcium) quicklime to BS EN 459-1.
Natural hydraulic lime (NHL): To BS EN 459-1.
Sand: To BS EN 13139; grading to approval.

Beads, stops and lath

Internal: Galvanized steel to BS EN 13658-1.
External: Stainless steel to BS EN 10088-1, grade 1.4301 (304).

Isolating membranes

Building paper: To BS 1521.

Dry dash finish

Coarse aggregate: To BS BS EN 12620. Well washed.

EXECUTION

Admixtures

Suitable admixtures:

- Other than air entraining (plasticizing) admixtures to BS EN 934-2: Submit proposals.

Prohibited admixtures: Calcium chloride and any admixture containing calcium chloride.

Mixing

Render mortars (site-made):

- Batching: By volume. Use clean and accurate gauge boxes or buckets.
- Mix proportions: Based on damp sand. Adjust for dry sand.
- Lime:sand: Mix thoroughly. Allow to stand, without drying out, for at least 16 hours before using.

Mixes: Of uniform consistence and free from lumps. Do not retemper or reconstitute mixes.
Contamination: Prevent intermixing with other materials.

Preparation of lime putty for lime:sand render mortars

Type: Slaked directly from CL 90 quicklime to BS EN 459-1, using an excess of water

- Maturation: In pits/ containers that allow excess water to drain away.
- Density of matured lime putty: 1.3-1.4 kg/litre.

Maturation period before use (minimum): 90 days.
Storage: Prevent drying out or wetting. Protect from frost.

Cold weather

General: Do not use frozen materials or apply coatings to frozen or frost bound backgrounds.
External work: Avoid when air temperature is at or below 5°C and falling or below 3°C and rising. Maintain temperature of work above freezing until coatings have fully hardened.

Hair reinforcement

Proportions (approximate): 5 kg hair to 1 m³ of coarse stuff.
Condition: Clean, free from grease and other impurities. Well teased before adding to the mix.
Mix: Well distributed throughout with no balling into lumps.

- Storage period for haired mortar: 4 weeks (maximum).

Suitability of substrates
Soundness: Free from loose areas and significant cracks and gaps.
Cutting, chasing, making good, fixing of conduits and services outlets and the like: Completed.
Tolerances: Permitting specified flatness/ regularity of finished coatings.
Cleanliness: Free from dirt, dust, efflorescence and mould, and other contaminants incompatible with coatings.

Stipple key
Mix proportions (cement:sand): 1:1.5-2.
Consistency: Thick slurry, well stirred.
Application: Brushed and stippled to form deep, close-textured key.
Curing: Controlled to achieve a firm bond to substrate.

Bonding agent
General: Apply evenly to substrate to achieve effective bond of render coat. Protect adjacent joinery and other surfaces.

Removing defective existing render
Render for removal: Detached, hollow, soft, friable, badly cracked affected by efflorescence or otherwise damaged:
Removing defective render: Cut out to regular rectangular areas with straight edges.

- Horizontal and vertical edges: Square cut or slightly undercut.
- Bottom edges to external render: Do not undercut.
- Render with imitation joints: Cut back to joint lines.

Cracks:

- Fine hairline cracking/ crazing: Leave.
- Other cracks: Submit proposals.

Dust and loose material: Remove from exposed substrates and edges.

Dampproof lathing
Fixing and sealing accessories: As recommended by the dampproof lathing manufacturer.
Fixing: Secure and firm to provide a continuous, keyed backing for coatings.
Joints between lathing sheets and junctions with services, windows and other openings: Prevent penetration and bridging of cavity by coatings.

Beads and stops generally
Location: External angles and stop ends, except where specified otherwise.
Corners: Neat mitres at return angles.
Fixing: Secure, using longest possible lengths, plumb, square and true to line and level, ensuring full contact of wings with substrate.
Finishing: After coatings have been applied, remove surplus material while still wet, from surfaces of beads/ stops exposed to view.

Crack control at junctions between dissimilar solid substrates
Locations: Where dissimilar solid substrate materials are in same plane and rigidly bonded or tied together but defined movement joints are not required.
Crack control materials:

- Isolating layer: Building paper.
- Metal lathing: Stainless steel ribbed expanded metal.

Installation: Fix metal lathing over isolating layer. Staggerfixings along both edges of lathing.
Width of installation over single junctions:

- Isolating layer: 150 mm.
- Lathing: 300 mm.

Width of installation across face of dissimilar background material (column, beam, etc. with face width not greater than 450 mm):

- Isolating layer: 25 mm (minimum) beyond junctions with adjacent substrate.
- Lathing: 100 mm (minimum) beyond edges of isolating layer.

Rendering generally
Application of coatings: Firmly and in one continuous operation between angles and joints. Achieve good adhesion.
Appearance of finished surfaces: Even and consistent. Free from rippling, hollows, ridges, cracks and crazing.
Accuracy: Finish to a true plane, to correct line and level, with angles and corners to a right angle unless specified otherwise, and with walls and reveals plumb and square.
Drying out: Prevent excessively rapid or localised drying out.

Flatness/ surface regularity of rendering to receive ceramic tiles
Sudden irregularities: Not permitted.
Deviation of render surface: Measure from underside of a 2m straight edge placed anywhere on surface.

- Permissible deviation: 3 mm (maximum).

Dubbing out for rendering
General: Correct substrate inaccuracies.
Thickness of any one coat: 16 mm (maximum).

- Total thickness: 20 mm (maximum), otherwise obtain instructions.

Mix: As undercoat.
Application: Achieve firm bond. Allow each coat to set sufficiently before the next is applied. Comb surface of each coat.

Undercoats generally
General: Rule to an even surface. Comb to provide a key for the next coat. Do not penetrate the coat.
Undercoats on metal lathing: Work well into interstices to obtain maximum key.

Thrown undercoats for lime:sand roughcast (harling)
Application of undercoats and dubbing out: Throw from a casting trowel or scoop.
Finishing: Press back to give an even finish without smoothing the surface.

Final coat finish
Plain floated finish: Even, open texture free from laitance.
Scraped finish: Scraped to expose aggregate and achieve an even texture.
Roughcast (harling) finish: Left as cast with an even thickness and texture.
Dry dash finish: Achieve firm adhesion to an even overall appearance. After throwing aggregate tap particles lightly into coating.

Curing and drying renders generally
General: Prevent premature setting and uneven drying of each coat.
Curing coatings: Keep each coat damp by covering with polyethylene sheet and/ or spraying with water.

- Curing period (minimum): 3–4 days.
- Final coat: Hang sheeting clear of the final coat.

Drying: Allow each coat to dry thoroughly, with drying shrinkage substantially complete before applying next coat.
Protection: Protect from frost and rain.

Curing and drying nonhydraulic lime:sand render
General: Prevent premature setting and uneven drying of each coat.
Curing coatings: Keep each coat damp by covering with damp hessian and polythene sheeting hung clear of coating. Spray with water until sufficiently firm.
Shrinkage: Thoroughly consolidate/ scour each coat one or more times as necessary to control shrinkage.

Substrates for waterproof renders
Leaks: Prevent leaks from cracks, porous patches and other defective areas subject to water pressure and liable to admit water.
Holes for fasteners: Minimize. Form and seal before coatings applied. Do not make any holes after coatings have been applied.

Application of waterproof renders
General: Achieve good adhesion and effective waterproofing.
Joints: Minimize.

- Joints in successive coatings: Stagger by 100 mm (minimum) and splay edges. Do not locate joints at angles.

Internal angles: Form fillets after applying first coat. Form smooth round coves after applying final coat.
Cross scratching/ combing coatings: Prohibited.

M60 PAINTING AND CLEAR FINISHING

GENERAL

Cross-reference

General: Read with A90 General technical requirements.

PRODUCTS

Coating materials

Preparation materials: Types recommended by their manufacturers and the coating manufacturer for the situation and surfaces being prepared.
Knotting: To BS 1336.
Primers:

- Aluminium primer for woodwork: To BS 4756.
- Calcium plumbate: To BS 3698.
- Metallic zinc rich primer: To BS 4652
- Water/ Organic solvent based primers for wood: To BS 7956
- Cold applied bitumen based coatings (excluding use in contact with potable water): To BS 6949

Paint manufacturer selected by contractor: Submit names before commencement of any coating work.

Other materials

Biocides: Types listed as surface biocides in current Health and Safety Executive (HSE) online publications covering non-agricultural approved pesticides.

EXECUTION

Handling and storage

Coating materials: Deliver in sealed containers, labelled clearly with brand name, type of material and manufacturer's batch number.
Materials from more than one batch: Give notice. Store separately and allocate to distinct parts or areas of the work.

Protection

'Wet paint' signs and barriers: Provide where necessary to protect other operatives and general public, and to prevent damage to freshly applied coatings.

Preparation generally

Standard: To BS 6150.
Substrates: Sufficiently dry in depth to suit coating.
Efflorescence salts: Remove.
Dirt, grease and oil: Remove. Give notice if contamination of surfaces/ substrates has occurred.
Surface irregularities: Abrade to a smooth finish.
Joints, cracks, holes and other depressions: Fill with stoppers/ fillers. Work well in and finish off flush with surface. Abrade to a smooth finish.
Dust, particles and residues from abrasion: Remove.
Water based stoppers and fillers:

- Apply before priming unless recommended otherwise by manufacturer.
- If applied after priming, patch prime.

Oil based stoppers and fillers: Apply after priming.
Junctions of walls and ceilings with architraves, skirtings and other trims: Fill with water based acrylic filler.
Doors, opening windows and other moving parts:

- Ease, if necessary, before coating.
- Prime resulting bare areas.

Fixtures and fittings:Before commencing work: Remove from surfaces to be coated.
Existing ironmongery: Refurbishment: Remove old coating marks. Clean and polish.

- Hinges: Do not remove.
- Replacement: Refurbish as necessary; refit when coating is dry.

Organic growths:

- Dead and loose growths and infected coatings: Scrape off and remove from site.
- Treatment biocide: Apply appropriate solution to growth areas and surrounding surfaces.
- Residual effect biocide: Apply appropriate solution to inhibit re-establishment of growths.

Wall coverings:

- Retained wallcoverings: Check that they are in good condition and well adhered to substrate.
- Previously covered walls: Wash down to remove paper residues, adhesive and size.

Previously coated surfaces generally

Preparation: To BS 6150, 11.5
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.
Contaminated surfaces: Give notice of:

- Coatings suspected of containing lead.
- Substrates suspected of containing asbestos.
- Significant rot, corrosion or other degradation of substrates.

Retained coatings: Thoroughly clean to remove dirt, grease and contaminants. Abrade gloss coated surfaces to provide a key.
Partly removed coatings: Apply additional preparatory coats to restore original coating thicknesses. Abrade junctions to give a flush surface.
Completely stripped surfaces: Prepare as for uncoated surfaces.

Previously coated surfaces

Burning off:

- Risk assessment and action plan: Prepare, and obtain approval before commencing work.
- Adjacent areas: Protect from excessive heat and falling scrapings.
- Exposed resinous areas and knots: Apply two coats of knotting.
- Removed coatings: Dispose of safely.

Galvanized, sherardized and electroplated steel:

- White rust: remove.

Pretreatment: Apply one of the following: 'T wash'/ mordant solution to blacken whole surface; or, etching primer recommended by coating system manufacturer.
Steel:

- Defective paintwork: Remove to leave a firm edge and clean bright metal.
- Sound paintwork: Abrade to provide key for subsequent coats.
- Corrosion and loose scale: Abrade back to bare metal.
- Residual rust: Treat with a proprietary removal solution.
- Bare metal: Apply primer as soon as possible.
- Remaining areas: Degrease.

Preprimed steel:

- Areas of defective primer, corrosion and loose scale: Abrade back to bare metal. Reprime as soon as possible.

Wood:

- Degraded or weathered surface wood: Abrade to remove.
- Degraded substrate wood: Repair with sound material of same species.
- Exposed resinous areas and knots: Apply two coats of knotting.

Preprimed wood:

- Areas of defective primer: Abrade back to bare wood and reprime.

Uncoated surfaces
Aluminium, copper and lead:
- Surface corrosion: Remove and lightly abrade surface.
- Pretreatment: Etching primer if recommended by coating system manufacturer.

Concrete:
- Release agents: Remove. Repair major surface defects.

Masonry and render:
- Surface contaminants, loose and flaking material: Remove.

Plaster:
- Nibs, trowel marks and plaster splashes: Scrape off.
- Overtrowelled 'polished' areas: Abrade lightly.

Plasterboard:
- Depressions around fixings: Fill with stoppers/ fillers.

Plasterboard to receive textured coating:
- Joints: Fill, tape and feather out with materials recommended by textured coating manufacturer.

PVC-U:
- Dirt and grease: Remove. Do not abrade surface.

Steel - manual cleaning:
- Oil and grease: Remove.
- Corrosion, loose scale, welding slag and spatter: Abrade to remove.
- Residual rust: Treat with a proprietary removal solution.
- Primer: Apply as soon as possible.

Wood:
- General: Abrade to a smooth, even finish with arrises and moulding edges lightly rounded or eased.
- Heads of fasteners: Countersink sufficient to hold stoppers/ fillers.
- Resinous areas and knots: Apply two coats of knotting.

Existing frames
Previously painted window frames:
- Paint encroaching beyond glass sight line: Remove.
- Putty:

Loose and defective putty: Remove.
Putty cavities and junctions between previously painted surfaces and glass: Clean thoroughly.
Finishing: Patch prime, reputty as necessary and allow to harden. Seal and coat as soon as sufficiently hard.
External sealant pointing:
- Defective sealant pointing: Remove.
- Joint depth: Approximately half joint width; adjust with backing strip if necessary

Existing gutters
Dirt and debris: Remove from inside of gutters.
Defective joints: Clean and seal with suitable jointing material.

Coating generally
Application standard: To BS 6150, Clause 9.
Conditions: Maintain suitable temperature, humidity and air quality during application and drying.
Surfaces: Clean and dry at time of application.
Thinning and intermixing of coatings: Not permitted unless recommended by manufacturer.
Overpainting: Do not paint over intumescent strips or silicone mastics.
Priming coats: Thickness to suit surface porosity. 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.

Coating of concealed surfaces
Workshop coating of joinery: Apply coatings to all surfaces of components.
Site coating of joinery: After priming/ sealing, apply additional coatings to surfaces that will be concealed when component is fixed in place.
Site coating of metal surfaces: Apply additional coatings to surfaces that will be concealed when component is fixed in place.
Bottom edges of external doors: Prime/ seal and coat before hanging doors.

Coating of wood

End grain: Before assembly, seal with primer or sealer, as appropriate. Allow to dry

Staining:

- Sealer: Apply if recommended by stain manufacturer.
- Application: In flowing coats and brush out excess stain to produce uniform appearance.

Varnishing:

- First coat: For solvent based varnishes, thin with white spirit. Brush well in and lay off, avoiding aeration.
- Subsequent coats: Rub down lightly along the grain between coats.

Coating for glazing elements

Bead glazed coated wood: Before glazing, apply first two coats to rebates and beads.

Setting glazing compounds:

- Sealer: Apply two coats to rebates.
- Setting: Allow compound to set for seven days.
- Sealing: Within a further 14 days, seal with a primer as recommended by the glazing compound manufacturer. Fully protect glazing compound with coating system as soon as it is sufficiently hard. Extend finishing coats on to glass up to sight line.

P20 UNFRAMED ISOLATED TRIMS SKIRTINGS AND SUNDRY ITEMS

GENERAL

Cross-reference

General: Read with A90 General technical requirements.

PRODUCTS

Wood architraves, skirtings, window boards and trims

Quality of wood and fixing: To BS 1186-3
Moisture content at time of fixing: To BS EN 942

- Exterior trim: 12–19%.
- Interior trim to continuously heated rooms, temperatures of 12–19ºC: 9–13%.
- Interior trim to continuously heated rooms, temperatures of 20–24ºC: 6–10%.

Sheet materials

Fibreboards:

- Hardboard: To BS EN 622-2.
- Medium board: To BS EN 622-3.
- Dry processed boards (Medium density fibre board): To BS EN 622-5.

Particleboards: To BS EN 312
Plywood:

- Appearance class, hardwood: To BS EN 635-2.
- Appearance class, softwood: To BS EN 635-3.
- Bond quality: To BS EN 314-2.

Plastics veneered board: To BS 4965.

- Durability class: D2.
- Laminate grade: VG.

EXECUTION

Installation

Straight runs: Form in single lengths wherever possible.
Location and method of forming running joints: Submit proposals.
Joints at angles: Mitre, unless shown otherwise.
Position and level of trims: Submit proposals.

P21 DOOR AND WINDOW IRONMONGERY

GENERAL

Cross-reference

General: Read with A90 General technical requirements.

PRODUCTS

Ironmongery selected by contractor

Source: Single co-ordinated range. Submit details of selected range, manufacturer and/ or supplier.

Samples

Timing: Before placing orders with suppliers obtain list of required samples from Contract Administrator
Submission: Submit labelled examples of required samples.
Conformity: Retain samples on site for the duration of the contract. Ensure conformity of ironmongery as delivered with labelled samples.

Ironmongery for fire doors

Relevant products: Ironmongery fixed to, or morticed into, the component parts of a fire resisting door assembly.
Compliance: Ironmongery included in successful tests to BS 476-22 or BS EN 1634-1 on door assemblies similar to those proposed.

- Certification: Submit evidence of successful testing by CERTIFIRE or other UKAS accredited laboratory.

Melting point of components (except decorative non functional parts): 800°C (minimum).

Door bolts

Standard: To BS EN 12051.

Door closing devices (controlled)

Overhead closers and floor springs: To BS EN 1154

- Door closing devices to fire/ smoke control doors: CE marked.

Door coordinators

Standard: To BS EN 1158

- Door co-ordinators to fire/ smoke control doors: CE marked.

Door hinges

Single axis door hinges: To BS EN 1935

- Hinges to doors on escape routes and fire/ smoke control doors: CE marked.

Door latches

General: To BS EN 12209.

Door lever handles and knobsets

Standard: To BS EN 1906.

Door locks

General: To BS EN 12209.
Thief resistant: To BS 3621, Kitemark certified.

Door track and running gear

Standard: To BS EN 1527.

Electromagnetic hold open devices

Standard: To BS 5839 or to BS EN 1155

Electromagnetic hold open/ swing-free devices

Standard: To BS EN 1155

- Electromagnetic devices to fire/ smoke control doors: CE marked.

Emergency/ Panic exit devices

Emergency exit devices: To BS EN 179.
Panic exit devices: To BS EN 1125

- Emergency/ Panic exit devices for locked doors on escape routes: CE marked.

Letter plates

Standard: To BS EN 13724.

Padlocks

Standard: To BS EN 12320.

Pull handles

Standard: To BS 8424.

Window hinges

Single axis hinges to access windows (window doors): To BS EN 1935

EXECUTION

Overhead door closers

Operational adjustment:

- Variable power: Matched to size, weight and location of doors.
- Latched doors: Override latches and/ or door seals when fitted.
- Unlatched doors: Hold shut under normal working conditions.
- Closing against smoke seals of fire doors: Positive. No gaps.

Floor springs

Operational adjustment:

- Variable power: Matched to size, weight and location of doors.
- Latched doors: Override latches and/ or door seals when fitted.
- Unlatched doors: Hold shut under normal working conditions.

Closing against smoke seals of fire doors: Positive. No gaps.

Electromagnetic hold open/ swing-free devices

Means of release: Alarm system and/ or failure of power supply.
Test switch: Located in a convenient position adjacent to door
Operational adjustment for devices with integral closer:

- Variable power: Matched to size, weight and location of doors.
- Latched doors: Override latches and/ or door seals when fitted.
- Unlatched doors: Hold shut under normal working conditions.

Door coordinators

Application: To all single swing double doors with rebated meeting stiles and fitted with self closers.

Uncontrolled door closers

Operation:

- Power: To suit the size and weight of doors to which they are fitted.
- Unlatched doors: Hold closed under normal conditions.

P31 HOLES, CHASES, COVERS AND SUPPORTS FOR SERVICES

GENERAL

Cross-reference

General: Read with A90 General technical requirements.

EXECUTION

Ducts, chases and holes generally

General: Wherever possible, form during construction rather than by cutting.

Holes and chases in concrete

Holes larger than 10 mm diameter and chases: Cast in.
Holes smaller than 10 mm diameter: Drilling is permitted.

Holes in structural steelwork

General: Cutting and drilling are not permitted.

Holes, recesses and chases in masonry

Locations: Select 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 block: 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. Do not spall, crack or otherwise damage surrounding structure.

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 the same joist: 100 mm apart horizontally (minimum).
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: Locate on neutral axis.

- 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 columns: 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.

Floor ducting and trunking

Fixing: Pack ducting and trunking level and true before screeding.

Pipe sleeves

Sleeves: Extend through full thickness of wall or floor. Position accurately.

- Generally: Clearance around service pipe: 20 mm (maximum) or diameter of service, whichever is the lesser.
- Installation: Bed solid.

Exposed to view: Finish bedding and sealing neatly.

Access covers/ gratings and frames

Vertical positioning of frames: Level, or marry in with levels of surrounding surfaces.
Permissible deviation in level of external covers and frames: +0 to -6 mm.

COMPLETION

Meter cabinets

Keys: At completion, hand over to Employer.

R10 RAINWATER DRAINAGE SYSTEMS

GENERAL

Cross-reference

General: Read with A90 General technical requirements.

Completion of design

Standard: To BS EN 12056-3, clauses 3–7 and National Annexes
Collection and distribution of rainwater: Complete, and without leakage or noise nuisance.

PRODUCTS

Gutters

Aluminium: Agrément certified or otherwise submit proposals.
Cast iron:

- Half round: To BS 460.
- Other than standard half round sections: To BS 460 except for shape

PVC-U: To the relevant parts of BS EN 607 and BS EN 1462, Kitemark certified.

Pipework

Aluminium: Agrément certified or otherwise submit proposals.
Cast iron - flexible couplings: To BS EN 877, Agrément certified
Cast iron spigot and socket:

- Round: To BS 460.
- Shape other than round: To BS 460 except for shape.

PVC-U:

- External: To BS EN 12200-1, Kitemark certified.
- Sealed: To BS EN 1329-1 or BS 4514, Kitemark certified.

Insulation to internal gutters and pipelines

Fire performance: Class 1 spread of flame when tested to BS 476-7.

EXECUTION

Preparation

Work to be completed before commencing work specified in this section:

- Below ground drainage. Alternatively, make temporary arrangements for dispersal of rainwater without damage or disfigurement of the building fabric and surroundings.
- Painting of surfaces which will be concealed or inaccessible.

Installation generally

Electrolytic corrosion: Avoid contact between dissimilar metals where corrosion may occur
Plastics and galvanized steel pipes: Do not bend.
Allowance for thermal and building movement: Provide and maintain clearance as fixing and jointing proceeds.
Protection:

- Fit purpose made temporary caps to prevent ingress of debris.
- Fit access covers, cleaning eyes and blanking plates as the work proceeds.

Fixing and jointing gutters

Brackets: Securely fixed.

- Additional brackets: Where necessary to maintain support and stability, provide at joints in gutters and near angles and outlets.

Roofing underlay: Dressed into gutter.

Setting out eaves gutters

Setting out to level: Level and as close as practical to the roof.
Setting out to falls: To true line and even gradient to prevent ponding or backfall. Position high points of gutters as close as practical to the roof and low points 50 mm (maximum) below the roof.
Outlets: Aligned with connections to below ground drainage.

Installing rainwater outlets

Fixing: Secure. Fix before connecting pipework.
Junctions between outlets and pipework: Accommodate movement in structure and pipework.

Fixing pipework
Pipework: Fix securely, plumb and/ or true to line.
Branches and low gradient sections: Fix with uniform and adequate falls to drain efficiently.
Externally socketed pipes and fittings: Fix with sockets facing upstream.
Additional supports: Provide as necessary to support junctions and changes in direction.
Vertical pipes:

- Provide a loadbearing support at least at every storey level.
- Tighten fixings as work proceeds so that every storey is self supporting.
- Wedge joints in unsealed metal pipes to prevent rattling.

Wall and floor penetrations: Isolate pipework from structure.

- Pipe sleeves: As section P31.
- Masking plates: Fix at penetrations if visible in the finished work.

Expansion joint pipe sockets: Fix rigidly to buildings. Elsewhere, provide brackets and fixings that allow pipes to slide.

Jointing pipework and gutters
General: Joint with materials and fittings that will make effective and durable connections.
Jointing differing pipework and gutter systems: Use adaptors intended for the purpose.
Cut ends of pipes and gutters: Clean and square. Remove burrs and swarf. Chamfer pipe ends before inserting into ring seal sockets.
Jointing or mating surfaces: Clean and, where necessary, lubricate immediately before assembly.
Junctions: Form with fittings intended for the purpose.
Jointing material: Strike off flush. Do not allow it to project into bore of pipes and fittings.
Surplus flux, solvent jointing materials and cement: Remove.

Cutting coated pipework and gutters
Cutting: Recoat bare metal.

Fixing insulation to internal pipelines and gutters
Fixing: Secure and neat. Provide continuity at supports and leave no gaps. Fix split pipe insulation with the split on 'blind' side of pipeline.
Timing: Do not fit insulation until completion of pipe airtightness or leakage testing.

Electrical continuity – pipework
Joints in metal pipes with flexible couplings: Clips (or suitable standard pipe couplings) supplied for earth bonding by pipework manufacturer to ensure electrical continuity.

Internal pipework test – England, Wales, Ireland and Northern Ireland
Preparation: Temporarily seal open ends of pipework with plugs
Test apparatus: Connect a 'U' tube water gauge and air pump to pipework via a plug.
Testing: Pump air into pipework until gauge registers 38 mm.
Required performance:

- Allow a period for temperature stabilization, after which the pressure of 38 mm is to be maintained without loss for at least 3 minutes.

Internal pipework test – Scotland
Standard: To BS EN 12056-2, National Annex NG

Gutter test
Preparation: Temporarily block all outlets
Testing: Fill gutters to overflow level and after 5 minutes closely inspect for leakage.

Z10 PURPOSE MADE JOINERY

GENERAL

Cross-reference

General: Read with A90 General technical requirements.

EXECUTION

Fabrication

Joinery components, timber and workmanship: To BS 1186-2
Sections: Formed out of solid.
Lengths and profiles: Accurate.
Sections after machining: Free from twist and bowing.
Surfaces after machining: Smooth and free from tearing, wooliness, chip bruising and other machining defects.
Joints: Tight, close fitting.
Components: Rigid. Free from distortion.
Screws: Provide pilot holes.
Screws of 8 gauge (4mm diameter) or more and screws into hardwood: Provide clearance holes.
Screw heads: Sunk at least 2 mm below surfaces visible in completed work.
Adhesive: Compatible with wood preservatives applied and end use of timber.

Permitted deviations from timber finished sizes (maximum)

Softwood:

- Sawn sections: To BS EN 1313-1, clause 6.

Hardwood:

- Sawn sections: To BS EN 1313-2, clause 6.
- Further processed sections: To BS EN 1313-2, clause NA3.

Dimensions on drawings: Finished sizes.

Preservative treated wood

Cutting and machining: Completed as far as possible before treatment.
Extensively processed treated timber: Re-treat timber sawn along length, ploughed, thicknessed, planed or otherwise extensively worked.
Surfaces exposed by minor cutting and drilling: Treat with two flood coats of a solution recommended by main treatment solution manufacturer.

Moisture content

Wood and wood based boards: Maintained within specified range during manufacture and storage.

Finishing

Joinery finish: Smooth, flat surfaces suitable to receive finishes.
Arrises: Eased.
End grain of external components: Before assembly, sealed with primer or sealer and allowed to dry.

Z11 PURPOSE MADE METALWORK

GENERAL

Cross-reference

General: Read with A90 General technical requirements.

PRODUCTS

Coatings and coated products

To iron and steel:

- Vitreous enamelled carbon steel and cast iron building components: To BS EN 14431.
- Sherardized coatings on carbon steel and cast iron: To BS 4921.
- Powder organic coatings to galvanized steel for external architectural purposes: To BS 6497 or BS EN 13438.
- Zinc electrodeposited coatings with supplementary treatment on iron or steel: To BS EN 12329.
- Cadmium electrodeposited coatings on iron or steel: To BS EN 12330.
- Nickel, nickel/ chromium, copper/ nickel and copper/ nickel/ chromium electrodeposited coatings: To BS EN 12540 (also applicable to zinc alloys, copper and copper alloys).
- Hot dip galvanized coatings on fabricated iron and steel: To BS EN ISO 1461.

To aluminium and aluminium alloys:

- Anodic oxidation coatings on wrought aluminium for external architectural applications: To BS 3987.
- Liquid organic coatings to aluminium alloy for external architectural purposes: To BS 4842.
- Powder organic coatings to aluminium alloy for external architectural purposes: To BS 6496.
- Welding:

General guidance for arc welding: To BS EN 1011-1.
Arc welding of ferritic steels: To BS EN 1011-2.

Materials generally

Prefinished metal: Do not damage or alter appearance of finish.
Fasteners: To appropriate British Standard and, unless specified otherwise, of same metal as component, with matching coating or finish.

EXECUTION

Fabrication generally

Contact between dissimilar metals in components that are to be fixed where moisture may be present or occur: Avoid.
Finished components: Rigid and free from distortion, cracks, burrs and sharp arrises.

- Moving parts: Free moving without binding.

Corner junctions of identical sections: Mitred unless specified otherwise.

Cold formed work

Profiles: Accurate with straight arrises.

Welding/ Brazing generally

Surfaces to be joined: Thoroughly cleaned.
Tack welds: Use only for temporary attachment.
Joints: Made with parent and filler metal fully bonded 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.
Traces of flux residue, slag and weld spatter: Removed.

Welding of steel

Preferred method: Metal arc welding.

- Alternative methods: Submit proposals.

Finishing welded/ brazed joints visible in completed work

Butt joints: Smooth and flush with adjacent surfaces.
Fillet joints: Neatly executed and ground smooth where specified.

Preparation for application of coatings

General: Fabrication complete, and fixing holes drilled before applying coatings.
Paint, grease, flux, rust, burrs and sharp arrises: Removed.

Galvanizing

Vent and drain holes: Provide in approved locations and submit proposals for sealing after galvanizing.

Powder coating

Applicator requirements:

- Approved by the powder coating manufacturer.
- Currently certified to BS EN ISO 9901.

Anodizing

Processor requirements:

- Approved by the Aluminium Finishing Association.
- Currently certified to BS EN ISO 9901.

Z12 PRESERVATIVE AND FIRE RETARDANT TREATMENT

GENERAL

Cross-reference

General: Read with A90 General technical requirements.

EXECUTION

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.

WPA Commodity Specifications

Standard: Wood Protection Association (WPA) publications 'Industrial flame retardant treatment of wood and wood-based panel products' and 'Manual: Industrial wood preservation. Specification and practice'.
Solution strengths and treatment cycles: Select to achieve specified service life and to suit timber treatability.

Copper-organic preservative treatment

Type: Copper azole (CuAz), alkaline copper quaternary (ACQ) or equivalent.
Application: High pressure impregnation.
Moisture content of wood at time of treatment (maximum): 28%.
Condition of treated timber before use: Dry.

Water-based organic preservative treatment

Application: Vacuum pressure process.
Colour: Colourless.
Usage: Unsuitable for use in ground or seawater contact.
Incorporation of treated timber into the Works: Timber is wet immediately after treatment and must be stored at the treatment plant until in a condition ready for transporting.

Copper chromium arsenic (CCA) preservative treatment

Usage: European legislation restricts new treatment. Submit proposals if use of recycled timber treated with CCA is intended. Copper chromium based preservative treatment (other than CCA).
Type: Chromated copper (CC), copper chromium phosphate (CCP), copper chromium borate (CCB) or equivalent.
Application: High pressure impregnation.
Moisture content of wood at time of treatment (maximum): 28%. After treatment, allow timber to dry before using.
Condition of treated timber before use: Dry and at moisture content specified elsewhere.
Incorporation of treated timber into the Works: Do not use for minimum 14 days after treatment.

Organic solvent preservative treatment

Colour: Colourless.
Usage: Do not use near animals, plants or foodstuffs, or in association with bituminous/ coal tar based materials.
Application: Double vacuum + low pressure impregnation, or immersion.
Moisture content of wood at time of treatment: As specified for the component at time of fixing.
Condition of treated timber before use: Surface dry.

Water based microemulsion preservative treatment

Application: Double vacuum + low pressure impregnation.
Moisture content of wood at time of treatment: As specified for the component at time of fixing.
Condition of treated timber before use: Surface dry.

Boron compound preservative treatment

Usage: Do not use in timber subject to continual wetting.
Application: High pressure impregnation.
Moisture content of wood at time of treatment (maximum): 28%.
Condition of treated timber before use: Dry.

Fire retardant treatment

Application: Vacuum + pressure impregnation.
Moisture content of wood at time of treatment: Not to exceed: 28% for large cross sectional timber, 22% for timber boarding and 15% for board material.
Condition of treated timber before use: Free from mud, dirt, dust, paint, polish and other surface finish; or bark. Material to be free from all signs of active attack by wood-destroying fungi and insects.
Post-treatment: Redried slowly at temperatures not exceeding 60°C to minimize degradation and distortion.

Z20 FIXINGS AND ADHESIVES

GENERAL

Cross-reference
General: Read with A90 General technical requirements.

Definitions
In this section the following definitions are used:

- Fixing: The act of securing an object to another object or background, e.g. Fix A to B with screws at 200 mm centres.
- Fixings: Systems that fix objects together, composite connection items comprising, e.g. nuts, bolts, washers, spacers, cover caps.
- Fasteners: Components that fix objects together, e.g. screws, nails.

PRODUCTS

Fasteners generally
Materials: To have bimetallic corrosion resistance and atmospheric corrosion resistance appropriate to fixing location.
Appearance: Submit samples on request.

Packings
Material: Noncompressible, corrosion resistant, rot proof.
Area of packings: Sufficient to transfer loads.

Masonry fixings
Light duty: Plugs and screws.
Heavy duty: Expansion anchors or chemical anchors.

Pelleted countersunk fixings
Pellets: Cut from matching timber, grain matched.

Plugs
Type: Proprietary types to suit substrate, loads to be supported and conditions expected in use.

Adhesives generally
Standards:

- Hot-setting phenolic and aminoplastic: To BS 1203.
- Thermosetting wood adhesives: To BS EN 12765.
- Polyvinyl acetate thermoplastic adhesive: To BS 4071.

Pelleted countersunk fixings
Pellets: Cut from matching timber, grain matched.

Powder actuated fixing systems
Types of fastener, accessories and consumables: As recommended by tool manufacturer
Tools: To BS 4078-2, Kitemark certified
Operatives: Trained and certified as competent by tool manufacturer.

EXECUTION

Fixing generally
Types, sizes and quantities of fasteners/ packings and spacings of fixings: Selected to retain supported components without distortion and loss of support.
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 plastics washers/ sleeves to avoid bimetallic corrosion.
Penetration of fasteners and plugs into substrate: To achieve a secure fixing
Appearance: Fixings to be in straight lines at regular centres.

Fixing packings
Function: To take up tolerances and prevent distortion of materials/ components.
Limits: Do not use packings beyond thicknesses recommended by fixings and fasteners manufacturer.
Locations: Not within zones to be filled with sealant.

Fixing cramps
Cramp positions: 150 mm (maximum) from each end of frame sections and at 600 mm (maximum) centres.
Fasteners: Fix cramps to frames with screws of same material as cramps.
Fixings in masonry work: Fully bedded in mortar.

Pelleted countersunk fixings
Finished level of countersunk screw heads: 6 mm (minimum) below timber surface.
Pellets: Cut from matching timber, match grain and glue in to full depth of hole.
Finished level of pellets: Flush with surface.

Plugged countersunk screw fixing
Finished level of countersunk screw heads: 6 mm (minimum) below timber surface.
Plugs: Glue in to full depth of hole.
Finished level of plugs: Projecting above surface.

Powder actuated fixing systems
Powder actuated fixing tools, method of use: To BS 4078-1
Operatives: Trained and certified as competent by tool manufacturer.

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

Z21 MORTARS

GENERAL

Cross-reference

General: read with A90 General technical requirements.

PRODUCTS

Admixtures for site made cement gauged and hydraulic lime:sand masonry mortars

Air entraining (plasticizing) admixtures: To BS EN 934-3 and compatible with other mortar constituents.
Prohibited admixtures: Calcium chloride, ethylene glycol and any admixture containing calcium chloride.

Cements for mortar

Cement: To BS EN 197-1 and CE marked

- Type: Portland cement, CEM I. Portland limestone cement, CEM II/A-L or CEM II/A-LL. Portland slag cement, CEM II/B-S, Portland fly ash cement, CEM II/B.
- Strength class: 32.5, 42.5 or 52.5.

White cement: To BS EN 197-1 and CE marked

- Type: Portland cement, CEM I.
- Strength class: 52.5.

Sulfate resisting Portland cement.

- Type: To BS EN 197-1 Sulfate resisting Portland cement, CEM I/SR and CE marked. To BS EN 197-1 fly ash cement, CEM II/B-V and CE marked.
- Strength class: 32.5, 42.5 or 52.5.

Masonry cement: To BS EN 413-1 and CE marked, class MC 12.5.

Lime:sand for cement gauged masonry mortars

Ready mixed:

- Standard: To BS EN 998-2.
- Lime: Nonhydraulic to BS EN 459-1, type CL 90S.
- Pigments for coloured mortar: To BS EN 12878.

Site made:

- Permitted use: Where a special colour is not required and in lieu of factory made ready-mixed material.
- Lime: Nonhydraulic to BS EN 459-1, type: CL 90S.
- Mixing: Thoroughly mix lime with sand, in the dry state. Add water and mix again. Allow to stand, without drying out, for at least 16 hours before using.

Retarded ready to use cement gauged masonry mortars

Standard: To BS EN 998-2.
Lime for cement:lime:sand mortars: Nonhydraulic to BS EN 459-1.

- Type: CL 90S.

Pigments for coloured mortars: To BS EN 12878.
Time and temperature limitations: Use within limits prescribed by mortar manufacturer.

- Retempering: Restore workability with water only within prescribed time limits.

Sand for lime:sand masonry mortars

Type: Sharp, well graded.

- Quality, sampling and testing: To BS EN 13139

Sand for site made cement gauged masonry mortars

Standard: To BS EN 13139.

- Grading: 0/2 (FP or MP). Fines content where the proportion of sand in a mortar mix is specified as a range (e.g. 1:1: 5 – 6): Lower proportion of sand, use category 3 fines. Higher proportion of sand, use category 2 fines.

Sand for facework mortar: Maintain consistent colour and texture. Obtain from one source.

EXECUTION

Making cement gauged mortars

Batching: By volume. Use clean and accurate gauge boxes or buckets.

- Mix proportions: Based on dry sand. Allow for bulking of damp sand.

Mixing: Mix materials thoroughly to uniform consistency, free from lumps.

- Mortars containing air entraining admixtures: Mix mechanically. Do not overmix.

Working time (maximum): Two hours at normal temperatures.
Contamination: Prevent intermixing with other materials.

Ready prepared lime putty

Type: Slaked directly from CL 90 quicklime to BS EN 459-1, using an excess of water

- Maturation: In pits/ containers that allow excess water to drain away.
- Density of matured lime putty: 1.3–1.4 kg/L.

Maturation period before use (minimum): 30 days after slaking.

Making lime:sand mortars

Batching: By volume. Use clean and accurate gauge boxes or buckets.
Mixing: Mix materials thoroughly to uniform consistency, free from lumps.

- Site prepared nonhydraulic lime:sand mortars: Use roller pan mixer. Mix materials thoroughly by compressing, beating and chopping. Do not add water. Maturation period before use (maximum) 7 days.
- Site prepared hydrated hydraulic lime:sand: Follow the lime manufacturer's recommendations for each stage of the mix. Water quantity, only sufficient to produce a workable mix. Working time, within limits recommended by the hydraulic lime manufacturer.

Contamination: Prevent intermixing with other materials, including cement.

Ready to use nonhydraulic lime:sand mortars

Type: Select from:

- Lime putty slaked directly from quicklime to BS EN 459-1 and mixed thoroughly with sand.
- Quicklime to BS EN 459-1 slaked directly with sand.

Maturation period before use (maximum): 7 days.

Z22 SEALANTS

GENERAL

Cross-reference

General: Read with A90 General technical requirements.

PRODUCTS

Joints

Design: To BS 6093.

Sealants

Classification and requirements: To BS EN ISO 11600

Non-cellular gaskets

Standard: To BS 4255-1.

Components

Backing strips, bond breakers, primers: Types recommended by sealant manufacturer.

EXECUTION

Suitability of joints

Presealing 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.

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

- 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.

Applying sealants

Substrate: Dry (unless recommended otherwise) and unaffected by frost, ice or snow.
Environmental conditions: Mix and apply primers and sealants within temperature and humidity ranges recommended by manufacturers. Do not dry or raise temperature of joints by heating.
Sealant application: Unless specified otherwise, 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.