Specification - BTC Shire House Flat Roof

05 February 2019

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C20 Demolition

5 SURVEY

- Scope: Before starting deconstruction/ demolition work, examine available information, and carry out a survey of:
  - the structure or structures to be deconstructed/ demolished,
  - the site on which the structure or structures stand, and
  - the surrounding area.
- Report and method statements: Submit, describing:
  - Form, condition and details of the structure or structures, the site and the surrounding area.

    Extent: Roof finishes, insulation and flashings - strip back to roof deck to flat roof areas being replaced (refer to Garland Report and Specification). Rooflights to be removed from flat roof areas. Kitchen extract to be removed. .
  - Type, location and condition of features of historical, archaeological, geological or ecological importance.
  - Type, location and condition of adjoining or surrounding premises that might be adversely affected by removal of the structure or structures or by noise, vibration and/ or dust generated during deconstruction/ demolition.
  - Identity and location of services above and below ground, including those required for the Contractor's use, and arrangements for their disconnection and removal.
  - Form and location of flammable, toxic or hazardous materials, including lead-based paint, and proposed methods for their removal and disposal.
  - Form and location of materials identified for reuse or recycling, and proposed methods for removal and temporary storage.
  - Proposed programme of work, including sequence and methods of deconstruction/ demolition.
  - Details of specific pre-weakening required.
  - Arrangements for protection of personnel and the general public, including exclusion of unauthorized persons.
  - Arrangements for control of site transport and traffic.
  - Special requirements: Protect areas at rooflights and perimeter of roof with guarding and coverings to prevent falls from height and water penetration during works .

10 EXTENT OF DECONSTRUCTION/ DEMOLITION

- General: Subject to retention requirements specified elsewhere, deconstruct/ demolish structures down to flat roof deck level but retain kerbs for rooflights. Rooflights, flashings, extract ducting and RWOs to be removed from flat roofs only. Tiling to upstands of flat roof perimeters to be removed (interior faces only). Ridge tiles to be set aside for reinstatement..

15 BENCH MARKS

- Unrecorded bench marks and other survey information: Give notice when found. Do not remove marks or destroy the fabric on which they are found.

20 FEATURES TO BE RETAINED

- General: Keep in place and protect the following: Chase to Listed Building (where lead flashing is dressed in to wall above flat roof). Protect interiors, particularly during removal of rooflights and ducting..

25 LOCATION OF SERVICES

- Services affected by the Works: Locate and mark positions.
- Mains services marking: Arrange with the appropriate authorities for services to be located and marked.

30 SERVICES DISCONNECTION ARRANGED BY CONTRACTOR

- Responsibility: Before starting deconstruction/ demolition arrange with the appropriate authorities for disconnection of services owned by those authorities and removal of associated fittings and equipment.

35 LIVE FOUL AND SURFACE WATER DRAINS

- General: Protect drains and fittings still in use. Keep free of debris and ensure normal flow during deconstruction/ demolition work.
- Damage: Make good damage arising from deconstruction/ demolition work. Leave clean and in working order at completion of deconstruction/ demolition work.

40 SERVICE BYPASS CONNECTIONS

- General: Provide as necessary to maintain continuity of services to occupied areas of the site on which the deconstruction/ demolition is taking place and to adjoining sites/ properties.
- Notice: Give adequate notice to adjoining owners and all affected occupiers if shutdown is necessary.

45 SERVICES TO BE RETAINED

- Damage to services: Give notice, and notify relevant service authorities and/ or owner/ occupier regarding damage arising from deconstruction/ demolition.
- Repairs to services: Complete as directed, and to the satisfaction of the service authority or owner.

50 WORKMANSHIP

- Standard: Demolish structures in accordance with BS 6187.
- Operatives: Appropriately skilled and experienced for the type of work. Holding, or in training to obtain, relevant CITB Certificates of Competence.
- Site staff responsible for supervision and control of work: Experienced in the assessment of risks involved and methods of deconstruction/ demolition to be used.

55 SITE HAZARDS

- Precautions: Prevent fire and/ or explosion caused by gas and/ or vapour from tanks, pipes, etc.
- Dust: Reduce by periodically spraying with an appropriate wetting agent, or contain.
  - Lead dust: Submit method statement for control, containment and clean-up regimes.
- Site operatives and general public: Protect from vibration, dangerous fumes and dust arising during the course of the Works.

60 ADJOINING PROPERTY

- Temporary support and protection: Provide. Maintain and alter, as necessary, as work proceeds. Do not leave unnecessary or unstable projections.
- Defects: Report immediately on discovery.
- Damage: Minimize. Repair promptly to ensure safety, stability, weather protection and security.
- Support to foundations: Do not disturb.

65 STRUCTURES TO BE RETAINED

- Extent: Refer to Garland Specification for flat roofs. Mansard roof not to be disturbed other than for insertion of upstands. Plinths for rooflights on flat roof areas to retain. Do not cut new chases for leadwork into Listed Building - re-use existing chases. Carefully remove ridge tiles from perimeter upstand to flat roof areas, for reinstatement..
- Parts which are to be kept in place: Protect.
- Interface between retained structures and deconstruction/ demolition: Cut away and strip out with care to minimize making good.

70 PARTLY DECONSTRUCTED/ DEMOLISHED STRUCTURES

- General: Leave partly in a stable condition, with adequate temporary support at each stage to prevent risk of uncontrolled collapse. Make secure outside working hours.
- Temporary works: Prevent overloading due to debris.
- Access: Prevent access by unauthorized persons.

71 DANGEROUS OPENINGS

- General: Provide guarding at all times, including outside of working hours. Illuminate during hours of darkness.
- Access: Prevent access by unauthorized persons.

75 ASBESTOS-CONTAINING MATERIALS – KNOWN OCCURENCES

- General: Materials containing asbestos are known to be present in the structure(s) to be demolished in the following locations: Adjacent to work areas, as noted in Asbestos Survey Reports appended..
- Removal: Not envisaged to be required. If this changes then notify CA in advance of preparation for works and provide RAMS.

76 ASBESTOS-CONTAINING MATERIALS – UNKNOWN OCCURENCES

- Discovery: Give notice immediately of suspected asbestos-containing materials when discovered during deconstruction/ demolition work. Avoid disturbing such materials.
- Removal: Submit statutory risk assessments and details of proposed methods for safe removal.

78 UNFORESEEN HAZARDS

- Discovery: Give notice immediately when hazards, such as unrecorded voids, tanks, chemicals, are discovered during deconstruction/ demolition.
- Removal: Submit details of proposed methods for filling, removal, etc.

85 SITE CONDITION AT COMPLETION

- Debris: Clear away and leave the site tidy on completion.
- Special requirements: for approval by CA - give notificaiton of atleast 3 working days.

90 CONTRACTOR'S PROPERTY

- Components and materials arising from the deconstruction/ demolition work: Property of the Contractor except where otherwise provided.
- Action: Remove from site as work proceeds where not to be reused or recycled for site use.

91 EMPLOYER'S PROPERTY

- Components and materials to remain the property of the Employer: Description: Ridge tiles from perimeter upstands of flat roof areas and to lower two tile courses of Mansard roof upstands, for reinstatement following flat roof membrane installation.
- Protection: Maintain until these items are removed by the Employer or reused in the Works, or until the end of the Contract.
- Specific limitations: Store in builder's compound securely and protect..

95 RECYCLED MATERIALS

- Materials arising from deconstruction/ demolition work: Can be recycled or reused elsewhere in the project, subject to compliance with the appropriate specification and in accordance with any site waste management plan.

C52 Fungus/ beetle eradication

5 SURVEY AND REPORT
- Survey generally:
  - Purpose: To ascertain nature and extent of fungal/ beetle attack. To ascertain sources and extent of any dampness.
  - Timing: Before starting eradication work carry out survey and submit survey report.
- Survey report content:
  - Description of method of investigation.
  - Factors affecting execution of the work: Identify problematic site conditions and restrictions including the presence of bats, barn owls, other protected species or breeding birds.
  - Laboratory results identifying attacking organisms. Plan and section drawings or annotated photographs, defining extent of attack.
  - Proposals for eradication treatments and procedures, including measures to halt damp penetration and promote drying out.
  - Measurements of wood moisture content, with identification of instances above 20%.
  - Identification of neighbouring buildings that may be involved in attack.
  - Associated work: Nature and extent of repair/ replacement work required to load bearing constructions and to the building fabric in general.
  - Other information: Any considered relevant.

12 ASSOCIATED WORK
- Work shown to be necessary by survey: Carry out as part of main contract works.

15 DRYING OUT OF BUILDING FABRIC
- Drying conditions: Establish as soon as possible.
- Drying methods: Submit proposals.

26 FUNGAL ATTACK
- Dry rot:
  - Fruiting bodies: Spray with fungicide. Remove carefully and clean affected surfaces.
  - Infected materials to be removed: Remove carefully without disturbance or damage to adjacent building fabric; dispose of safely.
- Wet rot:
  - Decayed timber to be removed: Cut out until sound timber is reached.
- Infected/ decayed material to be retained: Obtain instructions.

30 BEETLE INFESTATION
- Infected timber: Cut, scrape and trim back to sound timber. Remove debris immediately and dispose of safely.

37 TIMBER PRESERVATIVES/ MASONRY FUNGICIDES GENERALLY
- Products: Registered by the Health and Safety Executive (HSE) and listed on the HSE website under non-agricultural pesticides.
- Application: In accordance with statutory conditions of approval given on product labels and manufacturer's recommendations.

42 TIMBER PRESERVATIVE TREATMENT GENERALLY
- Preservative type: Agrément certified retreatment system.
- Tint: Required.
- Treatment method: To suit type, scale and location of fungal/ beetle attack.

70 GUARANTEE

- Type: Insured protection. Administered by an independent insurance protection company.
  - Guarantee period from completion of installation (minimum): 20 years.
- Documentation: Provide certificates/ guarantees at completion of treatment.

G20 Carpentry/ timber framing/ first fixing

2 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.

5 STRUCTURAL SOFTWOOD FOR STRUCTURAL USE GENERALLY

- Grading standard: To BS 4978, BS EN 14081-1, or other national equivalent and so marked.
  - Timber of a target thickness less than 100 mm and not specified for wet exposure: Graded at an average moisture content not exceeding 20% with no reading being in excess of 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'.
- Strength class to BS EN 338: C24.
- Treatment: Fire retardant impregnation to NBS section Z12 and Wood Protection Association Commodity Specification FR4.

10 UNGRADED SOFTWOOD FOR INTERNAL NONSTRUCTURAL USE

- Quality of timber: Free from decay, insect attack (except pinhole borers) and with no knots wider than half the width of the section.
- Surface finish: Regularized.
- Treatment: Fire retardant impregnation to NBS section Z12 and Wood Protection Association Commodity Specification FR3.

15 PLYWOOD FOR PARAPET GUTTER BOARDS & DECK REPAIRS

- Standard: To an approved national standard.
- Service class to BS EN 1995-1-1: Class 3.
- Nominal thickness: 19 mm.
- Appearance class to BS EN 635: II.
- Bonding quality to BS EN 314-2: Class 3.
- Finish: Sanded.
- Treatment: Refer to Clause 5.

30 SELECTION AND USE OF TIMBER

- Timber members damaged, crushed or split beyond the limits permitted by their grading: Do not use.

32 NOTCHES, HOLES AND JOINTS IN TIMBER

- 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.

35 PROCESSING TREATED TIMBER

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

40 MOISTURE CONTENT

- Moisture content of wood and wood based products at time of installation: Not more than:
  - Covered in generally unheated spaces: 24%.
  - Covered in generally heated spaces: 20%.
  - Internal in continuously heated spaces: 20%.

43 BOLTED JOINTS

- Bolt spacings (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.
- Bolt tightening: So that washers just bite the surface of the timber. Ensure that at least one complete thread protrudes from the nut.
  - Checking: At agreed regular intervals. Tighten as necessary.

50 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: Timber to be of adequate size and have the same treatment as adjacent timber supports.

H61 Fibre cement slating

3 ROOF SLATING TO UPSTANDS OF FLAT ROOF AREAS

- Substrate: existing plywood on rafters.
- Pitch: to suit existing.
- Underlay: Vapour permeable underlay to BS EN 13859, Class W1.
  - Recycled content: Contractor's choice.
  - Head-lap (minimum): 150 mm.
- Battens:
  - Size: to suit spacing of existing supports.
  - Fixing:
- Slates: To BS EN 492, type NT (nonasbestos).
  - Manufacturer: Submit proposals.
    Product reference: Submit proposals.
  - Shape: Rectangular.
  - Colour: to match existing, if any are broken during removal.
  - Size: to match existing.
  - Head-lap (minimum): 100 mm.
  - Fixing: Two nails each slate.

20 REMOVING EXISTING SLATING

- General: Carefully remove slates, battens, underlay, etc. with minimum disturbance of adjacent retained slating.
- Undamaged slates: Set aside for reuse.

25 UNDERLAY

- Laying: Maintain consistent tautness.
- Vertical laps (minimum): 100 mm wide, coinciding with supports.
- Fixing: Galvanized steel, copper or aluminium 20 x 3 mm extra large clout head nails.
- Eaves: Where exposed, use an external grade (UV resistant) underlay or a proprietary eaves support product.
- Penetrations: Use proprietary underlay seals or cut underlay neatly.

30 BATTENS/ COUNTERBATTENS

- Timber: Sawn softwood.
  - Standard: In accordance with BS 5534, Annex D.
  - Moisture content at time of fixing and covering (maximum): 22%.
- Preservative treatment: As section Z12 and Wood Protection Association Commodity Specification C8.
  - Type: Organic solvent.

32 BATTEN FIXING

- Batten length (minimum): Sufficient to span over three supports.
- Joints in length: Butt centrally on supports. Joints must not occur more than once in any group of four battens on one support.
- Additional battens: Provide where unsupported laps in underlay occur between battens.

35 SLATE FIXING

- General: Fix slating and accessories to make the whole sound and weathertight at earliest opportunity.
- Exposed fittings and accessories: To match slate colour and finish.
- Setting out: To true lines and regular appearance. Lay slates to a half lap bond with not more than 5 mm gaps. Align tails.
- Cut slates: Cut only where necessary, to give straight, clean edges.
- Ends of courses: Use extra wide slates to maintain bond and to ensure that cut slates are as large as possible.
- Top courses: Cut top two slate courses to maintain gauge. Head-nail top course.
- Fixings: Nails/ rivets as recommended by slate manufacturer.

40 MORTAR BEDDING/ POINTING

- Mortar: As section Z21.
  - Mix: In accordance with BS 5534, 1:3 cement:sand, with plasticizing admixtures permitted.
- Weather: Do not use in wet or frosty conditions or when imminent.
- Slates and accessories to be bedded or pointed: Coat relevant surfaces with a suitable bonding agent.
- Appearance: Finish neatly and remove residue.

42 FIRE SEPARATING WALLS

- Separating wall: Completely fill space between top of wall and underside of slates with mineral wool quilt to provide fire stopping.
- Boxed eaves: Completely seal air paths in plane of separating wall with wire reinforced mineral wool, not less than 50 mm thick, to provide fire stopping.

53 BEDDED VERGES WITH NAILED UNDERCLOAK

- Underlay: Carry over full width of verge.
- Undercloak: Fibre cement sheet, nail fixed, sloping towards verge and projecting 38-50 mm beyond face of wall.
- Slating battens: Carry onto undercloak and finish 100 mm from verge edge.
- Verge closer battens: Fix between ends of slating battens.
- Verge slates: Bed flush with undercloak on 75 mm wide bed of mortar. Point with a struck weathered profile, 5 mm back from verge slates.

55 DRY CAPPED HIPS

- Underlay: Lay courses over hip. Overlaps (minimum) 150 mm.
- Roof slates: Cut and fix closely at hip.
- Dry hip cappings:
  - Product reference: Submit proposals.
  - Fixing: Screw to hip battens.
  - Joints in length: Apply sealant strip.
  - Bottom hip cappings: Shape neatly to align with corner of eaves.

56 MITRED HIPS

- Underlay: Lay courses over hip. Overlaps (minimum) 150 mm.
- Mitred slates: Cut double width slates and fix to form a straight, close mitred junction.
- Soakers: Interleave and turn down over head of mitred slates.

68 MITRED VALLEYS

- Underlay: Lay strips not less than 600 mm wide centred on valleys. Overlap with general roof underlay.
- Mitred slates: Cut double width slates and fix to form a straight, close mitred junction.
- Soakers: Interleave and turn down over head of mitred slates.

70 SIDE ABUTMENTS

- Underlay: Turn up not less than 100 mm at abutments.
- Abutment slates: Cut as necessary. Fix close to abutments.
- Soakers: Interleave and turn down over head of abutment slates.

71 TOP EDGE ABUTMENTS

- Underlay: Turn up not less than 100 mm at abutments.
- Top slate courses: Fix close to abutments.

76 DRY CAPPED RIDGES

- Underlay: Lay courses over ridge. Overlap (minimum) 100 mm.
- Dry ridge cappings:
  - Product reference: to match existing.
  - Fixing: Screw to top slating battens.
  - Joints in length: Face away from prevailing wind. Apply sealant strip.
- Ridge terminals: Submit proposals.

90 VERTICAL SLATING BOTTOM EDGES

- Slating substrate work: Fix timber tilting fillet to support bottom course of slates in correct vertical plane. Fix flashing to tilting fillet.
- Underlay: Dress over flashing.
- Undercourse and bottom course slates: Fix with tails neatly aligned.

91 VERTICAL SLATING TOP EDGES

- Top slate courses: Fix under abutment and make weathertight with flashing dressed down not less than 150 mm.

92 VERTICAL SLATING SIDE ABUTMENTS

- Slating substrate work: Chase abutment wall and insert stepped flashing.
  - Flashing: Return not less than 75 mm behind slating, overlapping underlay and battens, turn back to form a vertical welt.
- Abutment slates: Cut and fix neatly.

93 VERTICAL SLATING ANGLES WITH SOAKERS

- Angle slates: Cut double width slates and fix to form a straight, close mitred junction.
- Soakers: Interleave with angle slates. Fix by nailing to battens at top edge.

H71 Lead sheet coverings/ flashings

27 SOAKERS FOR MITRED HIPS TO SLATE/ PLAIN TILE ROOFS

- Lead:
  - Thickness: 1.25 or 1.32 mm (Code 3).
- Dimensions:
  - Length: Slate/ tile gauge + lap + 25 mm.
  - Underlap: Not less than 150 mm.

30 APRON FLASHINGS AT ROOF ABUTMENTS

- Lead:
  - Thickness: 1.75 or 1.80 mm (Code 4).
- Dimensions:
  - Lengths: Not more than 1500 mm.
  - End to end joints: Laps not less than 100 mm.
  - Upstand not less than 75 mm.
  - Cover to abutment: Not less than 150 mm.
- Fixing:
  - Top edge: Lead wedges into bed joint.
  - Bottom edge: Clips.
    Material: Lead.
    Spacing: At laps and 500 mm centres.

35 COVER FLASHINGS

- Lead:
  - Thickness: 1.75 or 1.80 mm (Code 4).
- Dimensions:
  - Lengths: Not more than 1500 mm.
  - End to end joints: Laps of not less than 100 mm.
  - Cover: Overlap to upstand not less than 75 mm.
- Fixing:
  - Top edge: Lead wedges into bed joint.
  - Bottom edge: Clips.
    Material: lead.
    Spacing: at laps and 500mm centres.

54 VERTICAL TILING/ SLATING BOTTOM EDGE FLASHINGS

- Lead:
  - Thickness: 1.75 or 1.80 mm (Code 4).
- Dimensions:
  - Lengths: Not more than 1500 mm.
  - End to end joints: Laps not less than 100 mm.
  - Width: Adequate for underlap to underlay, dressing over tilting fillet, and welted drip or straight cut bottom edge.

57 VERTICAL SLATING ANGLE SOAKERS

- Lead:
  - Thickness: 1.25 or 1.32 mm (Code 3).
- Dimensions:
  - Length: Tile/ slate gauge + lap + 25 mm.
  - Underlaps: Not less than 150 mm at any point.

60 MATERIALS AND WORKMANSHIP GENERALLY

- Lead production method:
  - Rolled, to BS EN 12588.
  - Machine cast: BBA certified.
- Identification: Colour marked for thickness/ code, weight and type.
- Workmanship standard: To BS 6915 and latest editions of 'Rolled lead sheet. The complete manual' published by the Lead Sheet Association.
- Fabrication and fixing: To provide a secure, free draining and weathertight installation.
- Marking out: Do not use scribers or other sharp instruments to mark out lead without approval.
- Solder: Use only where specified.
- Finished leadwork: Fully supported, adequately fixed to resist wind uplift but also able to accommodate thermal movement without distortion or stress.
- Patination oil: Apply smear coating to all visible lead, evenly in one direction and in dry conditions.

62 LEADWELDING

- In situ leadwelding: Not permitted.

64 NEEDLE PUNCHED NONWOVEN POLYESTER GEOTEXTILE UNDERLAY

- Manufacturer: Contractor's choice.
  - Product reference: Submit proposals.
- Weight: 200 g/m².
- Recycled content: Submit proposals.

75 TIMBER FOR USE WITH LEADWORK

- Quality: Planed, free from wane, pitch pockets, decay and insect attack (ambrosia beetle excepted).
- Moisture content: Not more than 22% 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.

76 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.
  - Turn up at abutments.
- Wood core rolls: Fixed over underlay.
- Protection: Keep dry and cover with lead at the earliest opportunity.

78 FIXING LEAD SHEET

- Top edge: Secured with two rows of fixings, 25 and 50 mm from edge.
- Fixings:
  - Nails to timber substrates: Copper clout nails to BS1202-2 , or stainless steel (austenitic) clout nails to BS 1202-1.
    Shank type: Annular ringed, helical threaded or serrated.
    Length: Not less than 20 mm or equal to substrate thickness.
  - Screws to concrete or masonry substrates: Brass or stainless steel to BS 1210.
    Diameter: Not less than 3.35 mm.
    Length: Not less than 19 mm.
    Washers and plastics plugs: Compatible with screws.

80 CLIPS

- Material:
  - Lead clips: Cut from sheets of the same thickness/ code as sheet being secured.
  - Copper clips: Cut from 0.70 mm thick sheet to BS EN 1172, temper R220 (soft) or R240 (half hard) depending on position, dipped in solder if exposed to view.
  - Stainless steel: Cut from 0.38 mm sheet 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.
- Fixing clips: Secure each to substrate with either two screw or three nail fixings not more than 50 mm from edge of lead sheet. Use additional fixings where lead downstands exceed 75 mm.
- Fixing lead sheet: Welt clips around edges and turn over 25 mm.

83 WEDGE FIXING INTO JOINTS/ CHASES

- Joint/ chase: Rake out to a depth of not less than 25 mm.
- Lead: Dress into joint/ chase.
  - Fixing: Lead wedges at not more than 450 mm centres, at every change of direction and with at least two for each piece of lead.
- Sealant: Submit proposals.
  - Application: As section Z22.

98 WELTED JOINTS

- Joint allowance: 50 mm overlap, 25 mm underlap.
- Copper or stainless steel clips: Fix to substrate at 450 mm centres.
- Overlap: Welt around underlap and clips and lightly dress down.

J41 Reinforced bitumen membrane roof coverings

10 BUILT-UP REINFORCED BITUMEN WARM DECK ROOF COVERING

- Substrate: Plywood deck.
  - Preparation: Primer - refer to Garland Specification.
- Vapour control layer: Reinforced bitumen membrane to BS 8747, class S1P1. Refer to Garland Specification.
- Insulation: CE marked PIR insulation to Garland Specification.
- Recycled content: Not applicable.
  - Edges: Rebated.
  - Thickness: Tapered - as per Garland Specification.
- Waterproof covering:
  - System manufacturer: Garland Company UK Ltd.
  - First layer: Agrément certified SBS modified bitumen membrane, polyester reinforced.
    Attachment: Torch-on bonding or hot air in fire risk areas.
  - Intermediate layer: Agrément certified SBS modified bitumen membrane, polyester reinforced.
    Attachment: Torch-on bonding or hot air in fire risk areas.
  - Top layer/ Capsheet: Agrément certified SBS modified bitumen membrane, polyester reinforced.
    Colour: Grey.
    Attachment: Torch-on bonding or hot air in fire risk areas.
- Surface protection: Mineral.
- Accessories: As per Garland Specification.

15 ROOFING GENERALLY

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

30 TIMBER TRIMS, ETC

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

35 JOINTS IN RIGID BOARD SUBSTRATES

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

40 LAYING VAPOUR CONTROL LAYER

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

45 LAYING WARM DECK ROOF INSULATION

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

50 LAYING REINFORCED BITUMEN MEMBRANES GENERALLY

- Bonding: Continuous.
  - Pour and roll bonding: Use hot compound. Remove excess compound at laps of top layer/ capsheet.
  - Torch-on bonding: Leave a continuous bead of compound at laps of top layer/ capsheet.
- Laps:
  - Direction: Install membranes so that water drains over and not into laps.
  - Side and end laps: Minimum 75 mm and fully sealed.
  - Head and side laps: Offset.
- Successive layers: Apply without delay. Do not trap moisture.
- Details: Weathertight. Form with adequate overlapping, staggering of laps and full bonding.

60 PARTIAL BONDING OF REINFORCED BITUMEN MEMBRANES

- Venting first layer: Loose lay. Do not carry up angle fillets and vertical surfaces or through details.
  - Long edges: Overlap minimum 50 mm.
  - Ends: Butt together.

70 SKIRTINGS AND UPSTANDS

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

L10 Windows/ Rooflights/ Screens/ Louvres

5 TIMBER PROCUREMENT

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

45 ROOFLIGHTS

- Manufacturer: Refer to Garland Specification.
  - Product reference: As above.
- Type: Dome.
- Frame: Integral with rooflight.
  - Finish: To complement roof finish.
  - Colour: To complement roof finish.
- Kerb: Timber by main contractor.
- Thermal performance (U-value maximum): Manufacturer's standard.
- Fire performance (minimum): AA, AB or AC designation when tested in accordance with BS 476-3
- Glazing details: Polycarbonate .
- Other requirements: Anti-burglar bars and Insulated kerb.
- Fixing: As per manufacturer's requirements.

65 PRIMING/ SEALING

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

70 FIRE RESISTING FRAMES

- Gap between back of frame and reveal: Completely fill with intumescent mastic or tape.

75 SEALANT JOINTS

- Sealant:
  - Manufacturer: Refer to Garland Specification.
    Product reference: as above.
  - Colour: grey.
  - Application: As section Z22 to prepared joints. Finish triangular fillets to a flat or slightly convex profile.

80 IRONMONGERY

- Fixing: In accordance with any third party certification conditions applicable. Assemble and fix carefully and accurately using fasteners with matching finish supplied by ironmongery manufacturer. Do not damage ironmongery and adjacent surfaces.
- Checking/ adjusting/ lubricating: Carry out at completion and ensure correct functioning.

90 REPLACEMENT WINDOW INSTALLATION

- Standard: To BS 8213-4.

N25 Permanent access and safety equipment

20 SINGLE POINT ANCHORAGE DEVICES FOR SECURING PORTABLE LADDERS

- Standard: To BS EN 795.
- Manufacturer: Submit proposals.
  - Product reference: Submit proposals.
- Type: submit proposals.
- Material/ Finish: stainless steel.
- Locations: allow for two locations for access to flat roof areas, to be agreed on site.
- Installation: In accordance with BS 7883.
- Other requirements: Provide with each anchor:
  - A backing disc giving the manufacturer's name and telephone number and the date of installation.
  - A certificate of compliance with testing and examination requirements of BS EN 365.

GENERAL REQUIREMENTS

50 SAFETY

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

60 FIXING ANCHOR INSTALLATION

- Site drilling or cutting into structure/ fabric: Permitted only in approved locations.
- Distance between all fixing devices and edges of supporting material: Not less than recommended by fixing manufacturer.

70 MARKING OF ANCHOR DEVICES

- Provision: Provide on or near each anchor device a label or other clear marking giving:
  - Manufacturer's name and telephone number.
  - Serial number and year of manufacture of device.
  - Maximum number of personnel that may be attached to the device at any one time.
  - Requirements for energy absorbers, ground clearance, etc.
- Anchor devices intended solely for use with personal protective equipment: Indicate restriction of use by pictogram or other suitable marking on or near the device.

R10 Rainwater drainage systems

26 RAINWATER OUTLETS
- Manufacturer: Garland Company UK Ltd.
  - Product reference: Refer to Garland Specification.
- Type of grate: Supplied with Garland Roof Outlet with rubber O ring as a seal.
- Outlet: Type and direction to suit pipework, with adaptors and connections recommended for the purpose by outlet manufacturer.
- Accessories: Gravel guards.
- Fixing: Support plate and clamp.

50 INSTALLATION GENERALLY
- Discharge of rainwater: Complete, and without leakage or noise nuisance.
- Components: Obtain from same manufacturer for each type of pipework and guttering.
- Allowance for thermal and building movement: Provide and maintain clearance as fixing and jointing proceeds.
- Fixings and fasteners: As section Z20.

60 GUTTERS LAID TO FALL
- Setting out: 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 not more than 50 mm below the roof.
- Joints: Watertight.
- Roofing underlay: Dressed into gutter.

70 PIPEWORK
- Fixing: Securely, plumb and/ or true to line with additional supports as necessary to support pipe collars, particularly at changes in direction.
- Cut ends of pipes and gutters: Clean and square with burrs and swarf removed.

80 INTERNAL PIPEWORK TEST - ENGLAND, WALES, IRELAND AND NORTHERN IRELAND
- Preparation: Temporarily seal open ends of pipework with plugs.
- Testing: Connect a 'U' tube water gauge and 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 not less than 3 minutes.

Z10 Purpose made joinery

10 FABRICATION

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

20 CROSS SECTION DIMENSIONS OF TIMBER

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

30 PRESERVATIVE TREATED WOOD

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

40 MOISTURE CONTENT

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

50 FINISHING

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

Z12 Preservative/ fire retardant treatment

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

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

25 PRESERVATIVE TREATMENT SOLUTION STRENGTHS/ TREATMENT CYCLES
- General: Select to achieve specified service life and to suit treatability of specified wood species.

40 ORGANIC SOLVENT PRESERVATIVE TREATMENT
- Solution:
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.
  - Application: Double vacuum + low pressure impregnation, or immersion.
- Moisture content of wood:
  - At time of treatment: As specified for the timber/ component at time of fixing.
  - After treatment: Timber to be surface dry before use.

47 BORON COMPOUND PRESERVATIVE TREATMENT
- Solution:
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.
  - Application: High pressure impregnation.
- Moisture content of wood:
  - At time of treatment: Not more than 28%.
  - After treatment: Timber to be surface dry before using.

50 FIRE RETARDANT TREATMENT
- Solution type: INT 1 for interior areas and EXT for exterior areas.
  - Manufacturer: Contractor's choice.
    Product reference: Submit proposals.
  - Application: Vacuum + pressure impregnation.
- Moisture content of wood:
  - At time of treatment: As specified for the timber/ component at time of fixing.
  - After treatment: Timber to be redried slowly at temperatures not exceeding 65°C to minimize distortion and degradation.

70 MAKING GOOD TO PROTECTION TREATMENT ON-SITE
- Fire retardant/ preservative solution: Compatible with off-site treatment.
- Application: In accordance with preservative manufacturer's recommendations.

Z20 Fixings and adhesives

10 FIXINGS AND FASTENERS GENERALLY

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

25 FASTENER DURABILITY

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

30 FIXINGS THROUGH FINISHES

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

35 PACKINGS

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

40 CRAMP FIXINGS

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

50 PELLETED COUNTERSUNK SCREW FIXINGS

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

55 PLUGGED COUNTERSUNK SCREW FIXING

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

60 APPLYING ADHESIVES

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

Z21 Mortars

10 MORTAR MIXES
- Specification: Proportions and additional requirements for mortar materials are specified elsewhere.

20 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 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.

25 SAND FOR LIME:SAND MASONRY MORTARS
- Type: Sharp, well graded.
  - Quality, sampling and testing: To BS EN 13139.
  - Grading/ Source: As specified elsewhere.

30 READY-MIXED LIME:SAND FOR CEMENT GAUGED MASONRY MORTARS
- Standard: To BS EN 998-2.
- Lime: Nonhydraulic to BS EN 459-1.
  - Type: CL 90S.
- Pigments for coloured mortars: To BS EN 12878.

40 CEMENTS FOR MORTARS
- Cement: To BS EN 197-1 and CE marked.
  - Types: Portland cement, CEM I.
    Portland limestone cement, CEM ll/A-LL.
    Portland slag cement, CEM II/B-S.
    Portland fly ash cement, CEM II/B-V.
  - 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:
  - Types: To BS EN 197-1 Sulfate resisting Portland cement, CEM I/SR and CE marked.
    To BS EN 197-1 fly ash cement, CEM ll/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.

50 ADMIXTURES FOR SITE MADE MORTARS
- Air entraining (plasticizing) admixtures: To BS EN 934-3 and compatible with other mortar constituents.
- Other admixtures: Submit proposals.
- Prohibited admixtures: Calcium chloride, ethylene glycol and any admixture containing calcium chloride.

60 MAKING MORTARS GENERALLY

- 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.
- Contamination: Prevent intermixing with other materials.

70 MAKING HYDRAULIC LIME:SAND MORTARS

- Mixing 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.

Z22 Sealants

31 JOINTS At external abutments where fittings pass through roof
- Primer, backing strip, bond breaker: Types recommended by sealant manufacturer.

EXECUTION

61 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.

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

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