STRUCTURAL TIMBER

British Museum – Number 38 Russell Square

	24.8.18	Tender	AL	LK
Rev	**Date**	**Reason for Issue**	**By**	**Checked**

Our Ref: Job N°1756/702 **August 2018**
Alan Baxter Ltd

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1.00 GENERAL

Read in conjunction with Preliminaries and General Conditions.

The requirements of this specification take priority where they conflict with the relevant British Standard.

1.01 SCOPE OF WORK: structural timber works as shown on the Structural Engineer's drawings.

1.02 CO-ORDINATION: liaise with the Contract Administrator (C.A.) and provide details of the work as necessary to ensure co-ordination with the related building elements and services.

1.03 SETTING OUT: before commencing the installation of the structural timber work, check that the supporting structure is accurate in line and level and built in accordance with the drawings. Report any discrepancy to the C.A.

1.04 TIMBER FROM A SUSTAINABLE SOURCE – use timber certified by a credible, globally applicable forest certification scheme, such as the Forest Stewardship Council (FSC) or Pan European Forest Certification (PEFC). Invoices of all timber supplied should clearly state that the timber is certified and carry a code number that refers to the chain of custody certification number. Copies of invoices to be issued to the C.A. on request.

2.00 MATERIALS

2.01 TIMBER: use sawn softwood to BS EN 336 unless otherwise noted. Timber generally to be sawn to target sizes and tolerance class 1 noted in Table 1 in BS EN 336. Floor joists to target sizes and machined to tolerance class 2 on depth as noted in Table 2 in BS EN 336.

2.02 ALL EUROPEAN SOFTWOOD for general structural use to be machine stress graded in accordance with BS EN 14081.

2.03 TIMBER FOR GENERAL STRUCTURAL CARPENTRY: unless otherwise noted on the drawings, use timber of strength Class C24 to BS EN 338.

2.04 MOISTURE CONTENT: supply structural timber with moisture content below 19% and maintain moisture content below 19% throughout the works.

2.05 RESAWN TIMBER: do not use.

2.06 PLANED TIMBER: do not use.

2.07 STRUCTURAL PLYWOOD:

- Standard: to BS EN 636
- Service class to BS EN 1995-1-1: class 3
- Characteristic strength class to BS EN 12369-2: F40
- Bonding Quality to BS EN 314-2: class 3
- Nominal thickness: 18mm unless specified otherwise on the drawings

2.08 FIXINGS: use steel fixings and fasteners unless noted otherwise. All fixings, accessories and applied finishes to comply with relevant British Standards and British Standard Eurocodes.

a) ROUND PLAIN WIRE NAILS: to BS EN 14592
Finish: self-colour.

b) SQUARE TWISTED NAILS: to BS EN 14592
Finish (applied by manufacturer): sherardized to BS 7371-8, class 1.

c) WOOD SCREWS: to BS EN 14592
Finish (applied by manufacturer): zinc-plated to BS EN ISO 4042.

d) WOOD SCREWS: to BS EN 14592
Finish (applied by manufacturer): sherardized to BS 7371-8, class 1.

e) SQUARE HEAD COACHSCREWS: to BS EN 14592
Finish (applied by manufacturer): spin-galvanized to BS 7371-6 or self-colour as shown on the drawings.

f) BOLTS AND NUTS:
Steel Grade to BS 3692: 4.6 for bolts, 4 for nuts.
Finish: self-colour.

g) GALVANIZED BOLTS AND NUTS:
Steel Grade to BS 3692: 4.6 for bolts, 4 for nuts.
Finish (applied by manufacturer): spin-galvanized to BS 7371-6.

h) CUP-SQUARE-SQUARE COACHBOLTS AND NUTS:
Steel Grade to BS 4190: 4.6 for bolts, 4 for nuts.
Finish (applied by manufacturer): self-colour.

i) WASHERS:
Finish: to match bolt.

All bolts to be furnished with washers under bolt head (except cup-square-square coach bolts) and nut.

Washers in contact with steel to be normal diameter to BS 4320.

Washers in contact with timber to be extra-large diameter to BS 4320.

2.09 PROPRIETARY PRODUCTS: use all proprietary products in accordance with the manufacturers' recommendations and instructions.

Use the following proprietary products unless otherwise noted on the drawings:

a) JOIST HANGERS, NAIL PLATES, STRAPS, FRAMING ANCHORS, ANGLE BRACKETS AND TRUSS CLIPS:
Manufacturer: Expamet Building Products Limited.

All components to be manufactured from hot-dip pre-galvanized mild steel designated to BS EN 10346 DX510 and Z275, except `SPH' type joist hangers (which are for building into masonry) which are to have coating designation Z600.

b) EXPANDING BOLTS AND NUTS: (for fixing timber to existing masonry or concrete).
Finish (applied by manufacturer): zinc plated to BS EN ISO 4042.
Reference: Rawlbolt.
Manufacturer: The Rawlplug Company Ltd.

c) RESIN-BONDED FIXINGS: (for fixing timber to existing masonry or concrete).
Finish (applied by manufacturer): zinc-plated to BS EN ISO 4042.
Reference: Hilti_HY 270 .
Manufacturer: Hilti

d) JOIST GLOVES:
Manufacturer: Cavity Trays Ltd

Fix joist gloves to isolate the ends of joists where they are embedded in masonry construction which may be subject to dampness and as shown on the drawings. Obtain approval from the C.A. prior to installation.

3.00 PRESERVATIVE TREATMENT

3.01 PRESERVATIVE TREATMENT: treat all structural timber. Comply with BS 8417, BS 5707, BS EN 351-1 and BS EN 335 subject to treating timber in accordance with the minimum requirements specified in 3.02.

3.02 PRESERVATIVE TREATMENT:

a) For all internal and exterior timber in residential or commercial applications the timber shall be treated with an approved wood preservative in accordance with BS 8417 for a Use Class 3 application, service factor D, 60 years desired service life.

b) For external, above ground, uncoated exposed timber, the timber shall be treated with an approved, copper based preservative, in accordance with BS 8417 for a Use Class 3 application, service factor D, 30 years desired service life.

Submit details of proposed treatment to C.A. for comment.

3.03 GENERALLY:

a) Arrange for treatment by a specialist using a process licensed by the manufacturer of the preservative solution.

b) Processors must comply with the Wood Protection Association's 'Timber Treatment Installations - Code of Practice for Safe Design and Operation'.

c) For each batch of timber, provide a certificate of assurance that treatment has been carried out correctly and as specified.

d) Supply treated timber to site, surface dry, such that preservative is "fixed" in the timber and cannot leach out.

3.04 TREAT all timber surfaces exposed by site cutting and drilling with 2 flood coats of a preservative solution recommended by the main treatment manufacturer.

4.00 STRUCTURAL ENGINEERING REQUIREMENTS FOR GENERAL STRUCTURAL CARPENTRY

4.01 USE OF TIMBER: do not use timber members which are damaged, distorted, crushed or split beyond the limits permitted by their grading.

4.02 JOINING OF TIMBER: do not join timber members unless shown on the drawings.

4.03 NOTCHES AND HOLES: to be avoided wherever possible and to be the minimum sizes needed to accommodate services. Position well away from knots or other defects which significantly affect the strength of the timber. Location of notches and holes to be submitted to C.A. prior to construction.

4.04 NOTCHES IN SIMPLE UNTRIMMED JOISTS to be at the top unless shown otherwise on the drawings. Do not notch timbers which are 250mm or more in depth. Locate notches between 0.1 and 0.25 of the span from the support. Notch depth not to exceed 0.125 times the depth of the joist. Form by sawing down to a drilled hole.

4.05 HOLES, if required, to be drilled horizontally through the joists and located equidistant from the top and bottom surfaces of the joist. Hole diameters to be no more than 0.25 times the depth of joist and not less than 3 times larger diameter apart unless otherwise shown on the drawings.

4.06 TIMBER BLOCKING:

a) For floor joist and rafter spans less than 2.5m provide blocking within 200mm of supports.

For floor joist and rafter spans of 2.5m up to 4.5m provide blocking at mid-span and within 200mm of supports.

For floor joist and rafter spans exceeding 4.5m provide blocking at one third span positions and within 200mm of supports.

b) In floors and ceilings, use blocking a minimum of 75% of the depth of the timber joists and fix at centre of joist unless otherwise shown on the drawings.

c) In roofs, use blocking 50mm shallower than rafters and fix flush with soffits of rafters.

d) Fix all blockings tightly to timber joists by skew-nailing with a minimum four nails each end. Provide folding wedges between edge joists and adjacent construction unless otherwise noted on the drawings.

4.07 TEMPORARY BRACING: provide temporary bracing, as necessary, to ensure proper fit and stability during construction.

5.00 WORKMANSHIP

5.01 QUALITY OF WORK: comply with recommendations for workmanship in BS 8000-0, BS 8000-5 and BS EN 1995-1-1.

Use proprietary products in accordance with the manufacturer's recommendations and as shown on the drawings.

5.02 PROTECT completed structural timber work against damage. Inform C.A. of any damage before replacement.

5.03 WALL PLATES: position and align to give the correct span and level. Wall plates to be fully bedded on fresh mortar. Wall plates to be in lengths not less than 3m and provided with half lap joints.

5.04 INSTALLING JOISTS ON HANGERS:

a) Bed hangers directly on, and hard against, supporting construction. Do not use packs or bed on mortar. Cut joists to leave not more than 6mm gap between ends of joists and back of hangers. Use timber wedges to infill gaps.

b) Rebate joists to lie flush with underside of hangers. Fix joists to hangers with a nail in every hole.

c) Pack sides of joists where internal width of joist hanger is more than 4mm greater than width of timber member.

5.05 STRAPS, JOIST HANGERS AND FRAMING COMPONENTS GENERALLY: fix to timber sections/components and masonry with the type and number of fixings recommended by the manufacturer, where not shown on the drawings.

5.06 VERTICAL TIE-DOWN STRAPS: unless otherwise shown on the drawings, position at not more than 1200mm centres and fix securely to timber plate with not less than two 50mm x 10 gauge sherardized nails and to masonry with minimum four 50mm x 12 gauge sherardized screws evenly spaced into plugged holes. Strap to be at least 1m long. At least one screw to be within 150mm of bottom end of strap.

5.07 LATERAL RESTRAINT STRAPS:

a) Provide and fix at no more than 1200mm centres unless otherwise shown on the drawings. Ensure that cranked end is in tight contact with cavity face of wall inner leaf and is not pointing upwards.

b) Fix noggings and packs beneath straps which span across joists/rafters/ties running parallel to wall. Noggings and packs to fit tightly and be not less than three quarters of joists/rafter/tie depth. Notch joists so that straps fit flush with surface. Do not notch rafters/ties.

c) Fix straps to joists/rafters/ties with not less than three 50mm x 12 gauge sherardized countersunk screws, evenly spaced.

6.00 INSPECTION AND TESTING

6.01 INSPECTION: give C.A. reasonable opportunity to inspect structural timber works before covering up.

6.02 MOISTURE CONTENT: when instructed by the C.A., test timber sections using an electrical moisture meter to manufacturer's recommendations. Test 5%, but not less than 10 lengths, of each cross-section in the centre of the length. 90% of values obtained to be less than the maximum stated.

6.03 GRADING: when instructed by the C.A., arrange for the Timber Research and Development Association (TRADA) to visually grade structural timber on site.