3 STRUCTURAL TIMBER

3.1 GENERAL

3.1.1 Scope

1 This part specifies requirements for wood framing, sheathing, subflooring, trusses, light timber construction and rough hardware as used in buildings.

2 Related Sections and Parts are as follows:

This Section

Part 1..... General
Part 2 ..... Wood Treatment
Part 4 ..... Architectural Timber
Part 5..... Joinery
Part 6..... Fasteners and Adhesives
Part 7..... Ironmongery

3.1.2 References

1 The following standards are referred to in this Part:

BS 1088.....Marine plywood. Requirements

BS 1186-1 .....Timber for and workmanship in joinery. - Specification for timber; (EN 942 Timber in joinery. General requirements)

BS 1186-2 .....Timber for and workmanship in joinery - Specification for workmanship

BS 1186-3 .....Timber for and workmanship in joinery - Specification for wood trim and its fixing

BS 1203.....Hot-setting phenolic and aminoplastic wood adhesives. Classification and test method

BS 4079.....Specifications for plywood for marine craft; (BS 1088 Marine plywood. Requirements)

BS 6566.....Plywood; (EN 313-2 Plywood. Classification and terminology – Terminology; EN 315 Plywood. Tolerances for dimensions; EN 636 Plywood. Specifications; CEN/TS 1099 Plywood - Biological durability - Guidance for the assessment of plywood for use in different use classes; EN 635-1 Plywood - Classification by surface appearance - Part 1: General; EN 635-2 Plywood - Classification by surface appearance - Part 2: Hardwood; EN 635-3 Plywood - Classification by surface appearance - Part 3: Softwood)

EN 635 .....Plywood; (EN 635-1 Plywood - Classification by surface appearance - Part 1: General; EN 635-2 Plywood - Classification by surface appearance - Part 2: Hardwood; EN 635-3 Plywood - Classification by surface appearance - Part 3: Softwood)

3.1.3 Submittals

1 The Contractor shall submit shop drawings showing framing connection details, fasteners, connections, dimensions, treatment and finishes in accordance with the relevant provisions of Section 1, General

3.1.4 Product Delivery, Storage and Handling

1 Protect lumber and other products from dampness both during and after delivery at site.

2 Pile lumber in stacks in such manner as to provide air circulation around surfaces of each piece. Stack plywood and other board products so as to prevent warping.

3 Locate stacks on a well drained area, supported at least six inches above grade and cover as necessary for protection from driving rain and prolonged sun exposure whilst providing ventilation.

3.2 FRAMING MATERIALS

3.2.1 Structural Timber

1 Unless otherwise specified, each piece of lumber is to bear the grade mark, stamp, or other identifying marks indicating grades of material, and rules or standards under which produced.

2 Structural members shall be:

(a) any species to be used as structural timber is to be grade listed as in BS 1186 Part 1

(b) the design of members and fastenings is to conform to BS 1186 Part 2.

3 Furring, blocking, nailers and similar items used for framing as structural timber shall conform to Tables 1.1 and 1.2, Quality of Timber.

4 Size references, unless otherwise specified, are nominal sizes, and actual sizes to be within manufacturing tolerances allowed by the standard under which the product is produced.

5 The moisture content of timber at the time of delivery and during site storage is to be as described in Clause 1.4.1-1 of Part 1 of this Section.

6 Framing timber is to have a minimum extreme fibre stress in bending of 7500 kPa unless otherwise approved by the Engineer.

3.2.2 Plywood (used for Rough Carpentry)

1 Each sheet of plywood is to bear the mark of a recognized association or independent inspection agency which will maintain continuing control over the quality of the plywood. The mark is to identify the plywood by veneer grade, group number, span rating where applicable, and glue type.

2 Plywood is to be free from bow, twist and warp.

3 The core in 3-ply is not to be more than 60% of the total thickness.

4 In plywood having more than 3 plies, the faces, and all plies with the grain running in the same direction as the faces, to have a combined thickness of between 40% and 60% of the total thickness of the plywood.

5 All plywood thicker than 10mm is to made of not less than 5 plies.

6 No face ply to be thicker than 3mm and no inner ply to exceed 5mm.

7 The direction of the grain of the veneer is to be at right angles in adjacent plies except in the case of boards comprising an even number of plies, when the grain of the center is to follow the same direction.

8 All plywood which is to be installed externally is to be manufactured using Type WBP adhesives to BS 1203, BS 1088 and BS 4079.

9 All plywood which is to be installed internally is to be manufactured using Type BR adhesives to BS 1203.

10 Face plies for Class 1 finish are to be of one or two pieces of firm, smoothly cut veneer. When of two pieces, the joint should be approximately at the center of the board and the veneers are to be matched for color. The veneer is to be free from knots, unless specified as a feature, insect holes, splits, dote, glue stain, filling or inlaying or any other kind of defect. No end joints are permissible.

11 Face splits for Class 2 finish are to present a solid surface free from open defects. Occasional splits not wider than 0.8mm at any point and not longer than one tenth of the length of any panel of slightly open joints may be filled with a suitable filler. Neatly made repairs consisting of inserts of the same species as the veneer, which present solid, level, hard surfaces and are bonded with an adhesive equivalent to that used for bonding the veneers are permissible. No end joints are permissible.

3.2.3 Rough Hardware - General

1 Rough hardware includes items for structural timber construction such as frame cramps, ties, anchors, framing connectors, joist hangers and similar items.

3.2.4 Workmanship for Structural Timber

1 Timber for carpentry work is to be finished sawn to the sizes shown on the drawings. A tolerance of +3.0 mm to -0.5 mm is permissible.

2 Joints are to be constructed so that they will transmit the loads and resist the stresses to which they will be subjected. The surfaces should be in good contact over the whole area of the joint before fastenings are applied. Unless otherwise specified all joints are to be secured with a suitable type and sufficient number of nails.

3 Holes for bolts are to be drilled from both sides of the timber. No nails, screws or bolts are to be placed in split ends. If splitting is likely holes for nails are to be predrilled at diameters not exceeding four-fifths of the nail.

4 Temporary bracing is to be provided to maintain structural timbers in position and to ensure stability during construction.

5 All cutting for services to be the minimum required to accommodate the services and comply with the following:

(a) notches shall be “U” shaped and be formed by straight cuts to drilled holes

(b) notches and holes not to be positioned in a member where the remainder of the cross section contains a knot or other defect which would affect the strength

(c) notches in joists are to be located at the top and not be deeper than one eight of the depth of the joist located within one quarter of the span from the centre of bearing. Holes in joists are to be located through the centre of the depth i.e., on the neutral axis.

6 Joists are to extend a minimum of 75 mm beyond the nearest edge of the supporting plate or member and be laid in parallel lines.

7 Where joists are to be notched over supports, the depth of the notch should not exceed two-fifths of the depth of the joist. The bearing surface of the notch is to be cut smooth and true in relation to the surface on which it bears.

8 A clear 12 mm to be maintained around all joists if they extend into blockwork walls and they are to receive an additional liberal coating of preservative on all surface adjacent to walls. A 50 mm gap is to be left between joists and flanking walls.

9 Herring-bone strutting is to be constructed of 50 x 38 mm pieces nailed to form a system of crossing diagonals in a straight line transversely across the joists. Each diagonal strut is to be wedged tightly between the top and bottom edges of adjacent joists before being secured by nails.

3.2.5 Non-Structural Framing

1 Timber sections, stud partitions, bulkheads, etc., are to be accurately cut so that they fit together tightly without distortion. Each joint is to be fixed with at least two nails.

2 All timber sections to be fixed plumb, level and square to ensure that the lining material can be positioned accurately and securely to give flat surfaces, free from undulations.

3 The spacing of members should not exceed the permissible span of the lining material as recommended by the manufacturer. All edges of the lining material to be supported except where other methods of supporting the edges are provided e.g., tongued and grooved joints.

4 Holes for services to pass through the center of timber sections and the diameter of the hole should not exceed one third the width or thickness of the timber.

5 Additional supports are to be provided for appliances and fixtures.

6 Framing, grounds and bearers are to be fixed to the substrata at maximum 450mm centers using masonry nails unless described as “plugged and screwed” or “bolted”.

3.2.6 Plywood Sheeting

1 Wall and roof sheeting is to comply with the relevant provisions of EN 635 and BS 6566.

2 Wall Sheeting: Panels 1200 mm wide and 87 mm thick are to have supports at 400 mm centres if constructed without corner bracing and framing. Panels 100 mm thick are to have supports at 600 centres, if constructed without corner bracing or framing.

3 Roof Sheeting: Panels 87mm thick or greater shall have supports at 400 mm centres minimum.

END OF PART