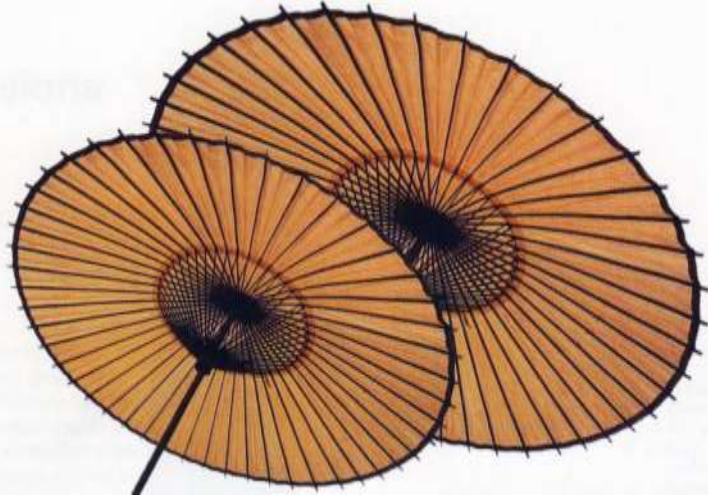
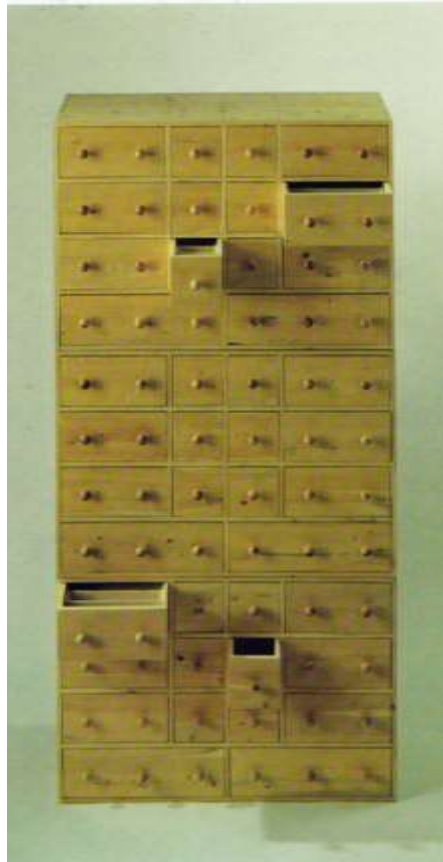
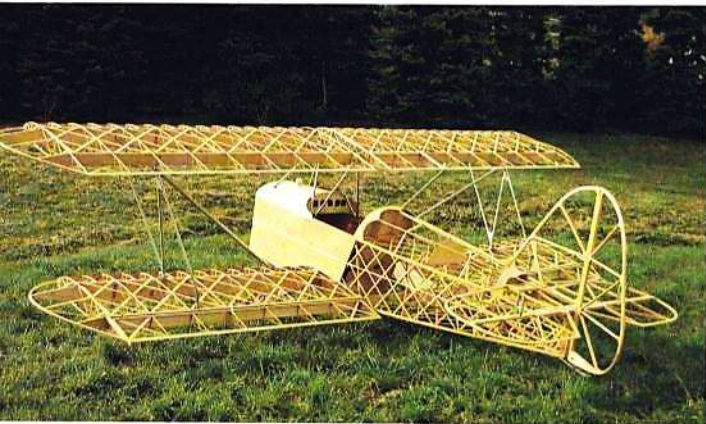
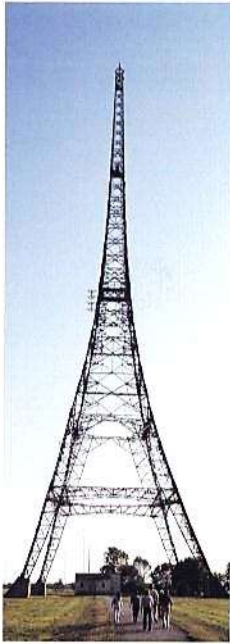


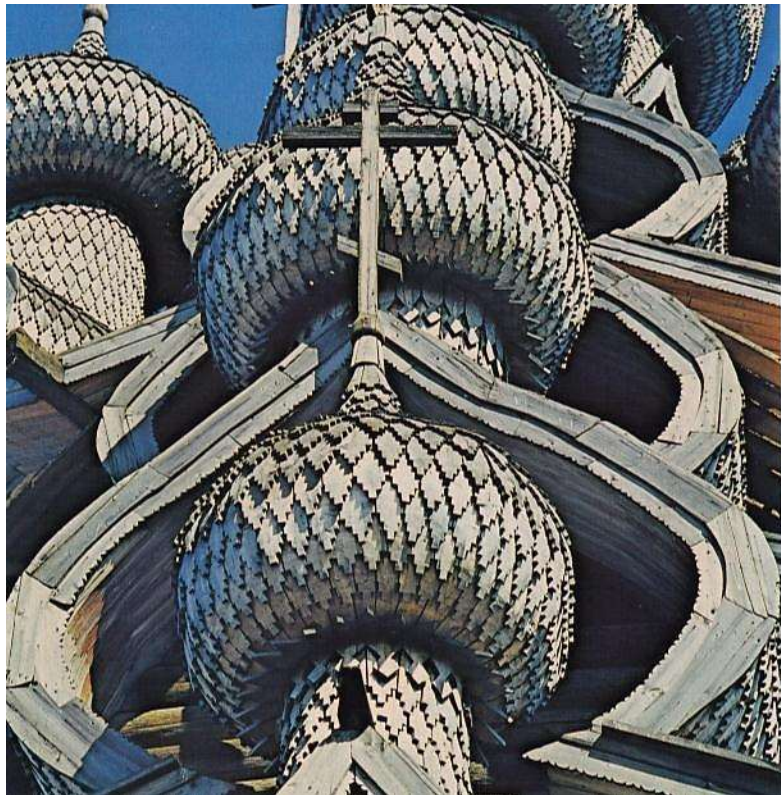
Το ξύλο - φορείς από ξύλο: εισαγωγή















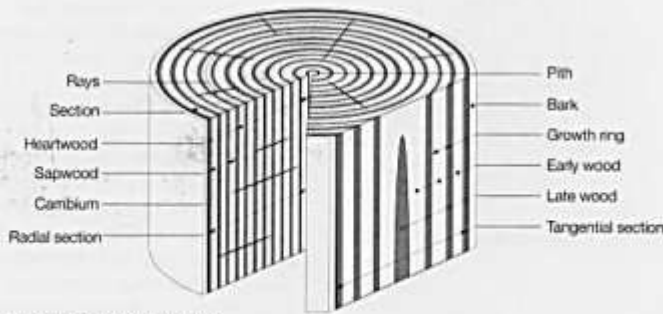


Fig. 1: Section through tree trunk

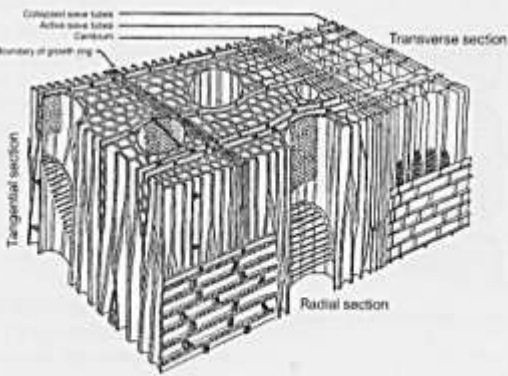
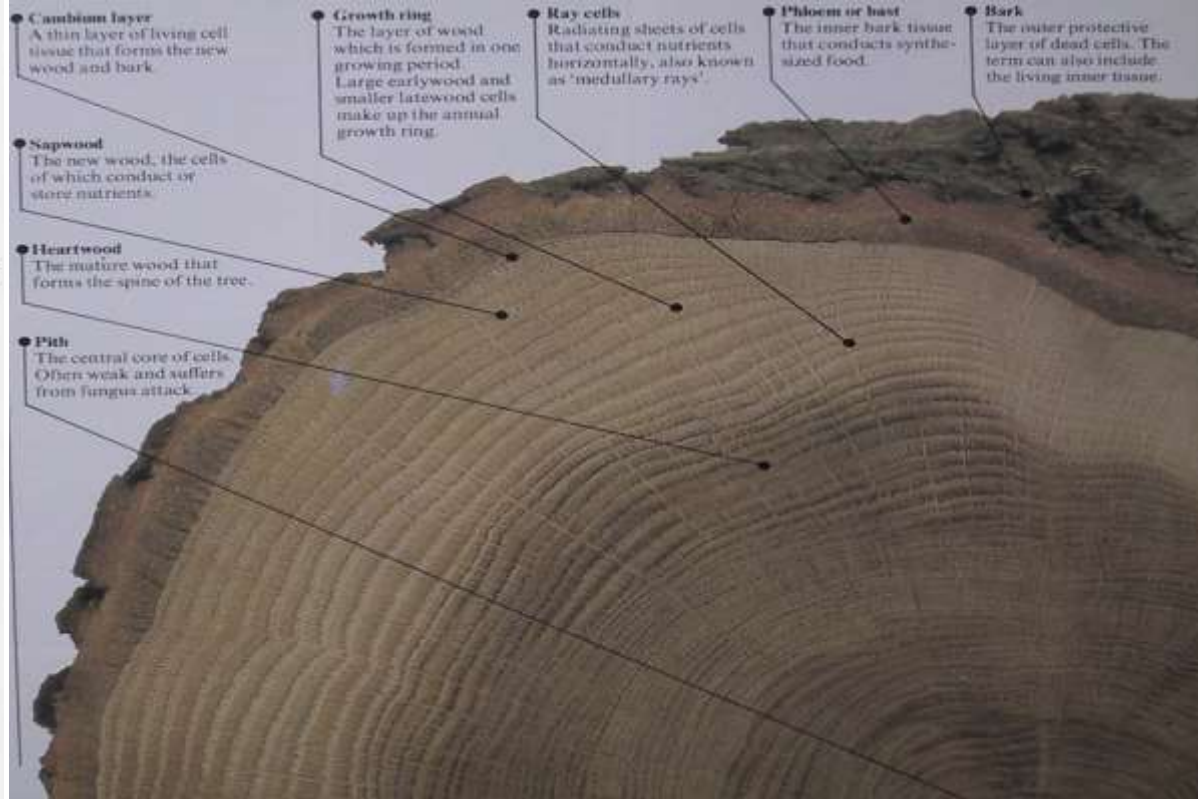


Fig. 2: Wood and inner bark of a deciduous tree (birch), after Mägdefrau, 1951

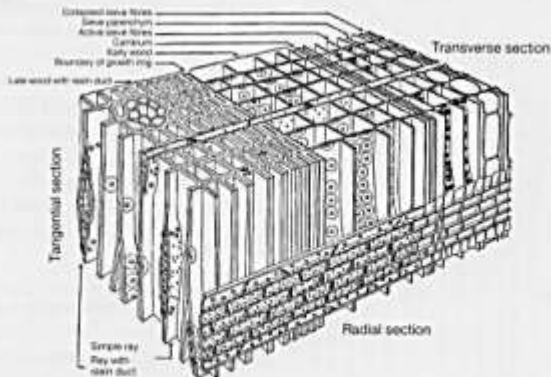


Fig. 3: Wood and inner bark of a coniferous tree (larch), after Mägdefrau, 1951

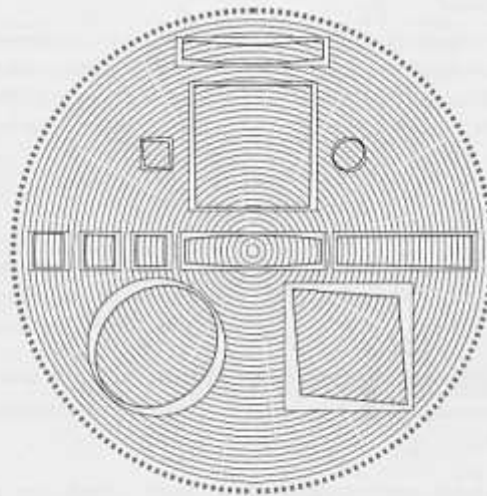


Fig. 8: Deformations of solid timber sections

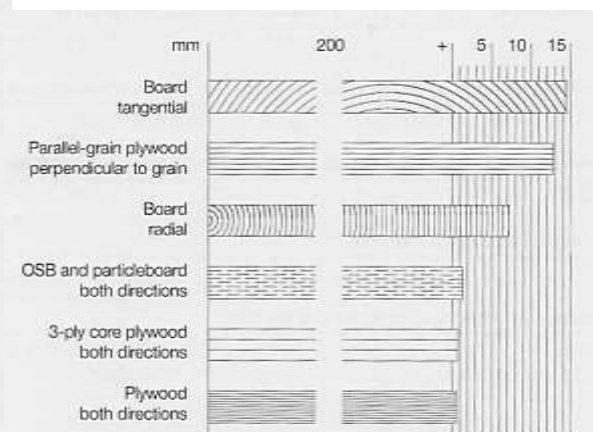










Fig. 9: Amount of swelling and shrinkage for boards, planks and wood-based products for a moisture difference of 20%

<p>Douglas fir <i>Pseudotsuga menziesii</i></p> <p>DGA</p> 	<p>Spruce <i>Picea abies</i></p> <p>FI</p> 	<p>Scots pine (European redwood) <i>Pinus sylvestris</i></p> <p>KI</p> 	<p>European larch <i>Larix decidua</i></p> <p>LA</p> 
<p>Applications</p> <p>Highly stressed internal uses, timber preservative required externally, floor coverings, shipbuilding, veneer for plywood, staves</p> <p>Important European building timber, internal uses, timber preservative required externally, frames, core and veneer for plywood, poles, crates, industrial uses</p> <p>Important European building timber, internal uses, timber preservative required externally, windows, furniture (solid and veneered), linings, mining uses, industrial uses, floor coverings</p> <p>Highly stressed internal and external uses, furniture, linings, fittings</p>			

<p>Dark red meranti, <i>Shorea</i> spp. esp. <i>S. pauciflora</i> King MER</p> 	<p>Merbau <i>Intsia bijuga</i> etc. MEB</p> 	<p>Robinia <i>Robinia pseudoacacia</i> L. ROB</p> 	<p>Teak <i>Tectona grandis</i> TEK</p> 
<p>Its wide variation in properties makes it suitable for highly stressed internal and external uses, especially windows, doors, shipbuilding, park benches; light red meranti is suitable for linings, furniture and lightweight constructions</p> <p>Highly stressed uses with good dimensional stability, floor coverings, laboratory and work benches, shipbuilding</p> <p>Structural timber for highly stressed internal and external uses, stairs, floor coverings, piles (also without chemical timber preservative like the heartwood of oak)</p> <p>In solid and veneered forms for furniture, floor coverings, linings, internal and external uses with high dimensional accuracy, not permitted for loadbearing constructions, shipbuilding, laboratory fittings</p>			

<p>Pine <i>Pinus palustris</i>, <i>P. nigra</i>, <i>P. taeda</i> and 3 other <i>Pinus</i> species PIP</p> 	<p>Fir <i>Abies alba</i> TA</p> 	<p>Western hemlock <i>Tsuga heterophylla</i> HEM</p> 	<p>Western red cedar <i>Thuja plicata</i> Donn RCW</p> 
<p>As pitch pine (heartwood) for highly stressed internal and (with preservative) external uses, internal floor coverings, plywood; as red pine (sapwood) for internal uses</p> <p>As for spruce: internal uses, timber preservative required externally, fittings, linings, inner plies of plywood, crates, poles, industrial uses</p> <p>Moderately stressed internal uses, windows, linings, saunas, core and veneer for plywood</p> <p>Low-stressed internal and external uses with good dimensional stability, linings, shakes and shingles</p>			

<p>Maple <i>Acer pseudoplatanus</i>/<i>platanoides</i> L. AH</p> 	<p>Ekki (azobé) <i>Lophira alata</i> AZO</p> 	<p>Beech (European beech) <i>Fagus sylvatica</i> BU</p> 	<p>Oak <i>Quercus robur</i>, <i>Q. petraea</i> EI</p> 
<p>Applications</p> <p>For fittings and wood turning, especially decorative with wavy grain, furniture, kitchen equipment, musical instruments, parquet flooring</p> <p>Highly stressed uses in agriculture and hydraulic engineering, e.g. bridges, locks, ramps, underground railway sleepers, parquet flooring</p> <p>Moderate to highly stressed internal uses, parquet flooring, sleepers (impregnated), for wood turning, veneer for plywood, industrial uses</p> <p>Highly stressed, internal and external uses, parquet flooring, storage barrels; narrow-ringed quality: high-quality veneers</p>			

Είδη ξυλείας – αποθήκευση – ξήρανση



Ελαττώματα του ξύλου

Honeycomb checks occur inside the board when the outside stabilizes before the inside is dry. The inside shrinks more than the outside, which usually results in torn internal fibres.

Shakes are splits that occur in the structure of the wood due to growth defects or shrinkage stresses. Cup or ring shakes are splits that open between the annual-growth rings.

Bow

Twist or wind

Spring

Ingrown bark can mar the appearance and weaken the structure of the wood.

Surface checking usually occurs along the rays, and is usually caused by rapid drying of the surface.

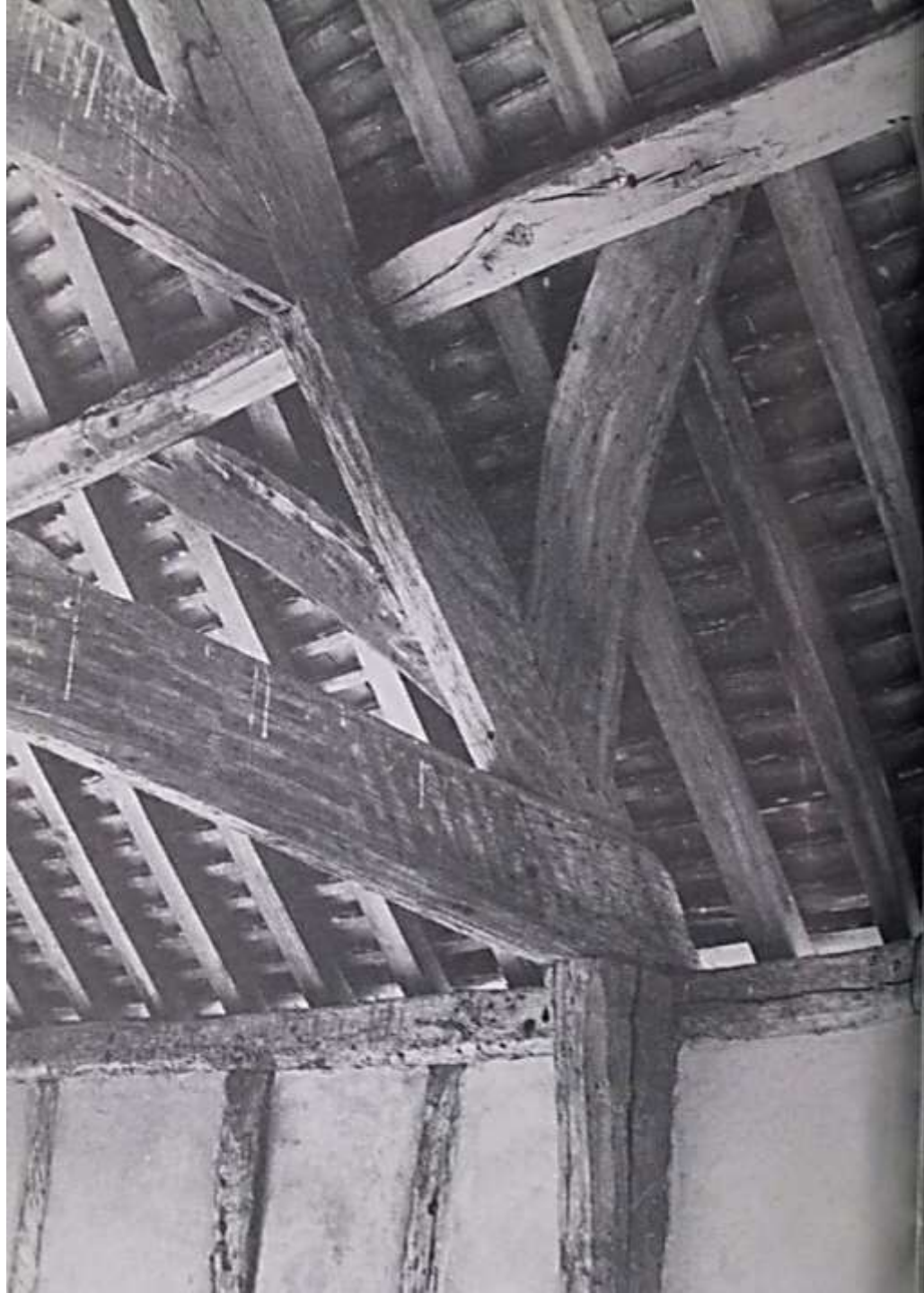
End splits are common and are caused by rapid drying of the exposed end. Sealing the ends with waterproof paint can prevent splitting.

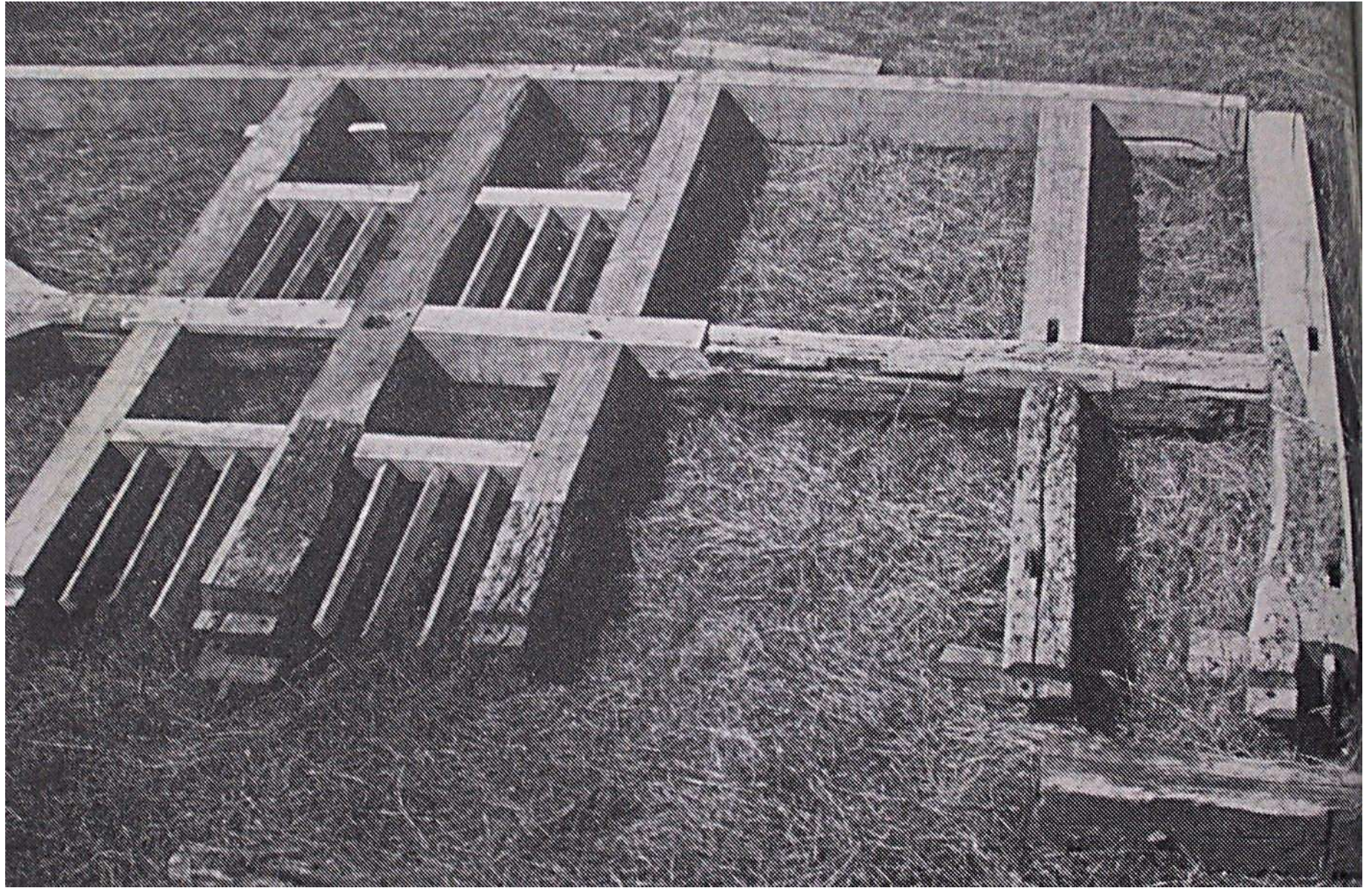
Bowing or warping is caused by stacking boards badly and introduces stresses which make the wood difficult to cut. 'Reaction' wood is also prone to cast when dried or cut.

Dead or encased knots are the remains of dead branches, the stumps of which are overgrown by new growth rings. Dead knots tend to fall out when the wood dries. The grain of the wood surrounding a knot is irregular, which makes it hard to work.











Log



Board



Trio beam (duo beam similar)



3-ply core plywood



Solid softwood section



Solid structural timber KVH®



Glued laminated timber (glulam)



5-ply core plywood



Solid hardwood section



Four-piece beam



Profiled boards



Laminated veneer lumber (LVL)



Structural veneer lumber (SVL)



Oriented strand board (OSB)



Hardboard
(front and rear faces)



Bitumen-impregnated wood fibreboard



Plywood



Particleboard



Medium board
Medium density fibreboard (MDF)



Plasterboard



Blockboard



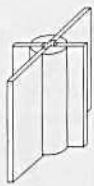
Wood-wool slab



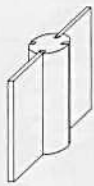
Porous wood fibreboard



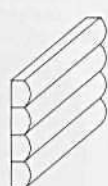
Cement fibreboard



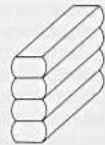
Compound column made from planar members and quartered log



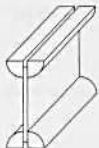
Log column with relieving and connection grooves



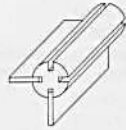
Wall made from halved logs



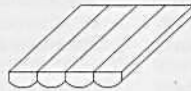
Wall made from edge-sawn logs



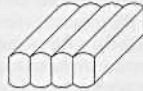
Solid web beam with flanges made from a quartered log



Log beam with relieving and connection grooves



Floor/roof made from halved logs



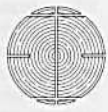
Floor/roof made from edge-sawn logs



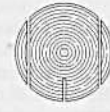
Quartered log



Log beam with relieving and connection grooves

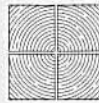


Halved log, edge-sawn, with relieving grooves

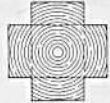


Log, edge-sawn, with relieving grooves

Logs, squared logs



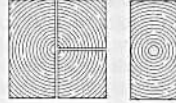
Quartered squared log



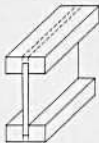
Log beam with relieving and connection grooves



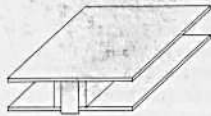
Squared section with relieving and connection grooves



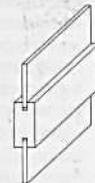
Split-heart squared log, boxed heart section



Solid web beam with flanges made from squared sections



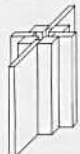
Floor/roof made from squared sections exposed on the underside plus planking, boarding or wood-based panels



Squared-section beam with relieving and connection grooves



Floor/roof made from concealed squared sections plus planking, boarding or wood-based panels



Compound column made from planar members and quartered squared log



Wall made from squared sections exposed on both sides plus planking



Squared-section column with relieving and connection grooves



Wall made from concealed squared sections plus planking



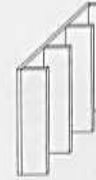
Edge-glued timber wall



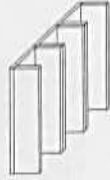
Cross-laminated timber wall



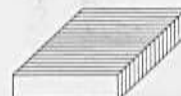
Board system wall



Ribbed wall



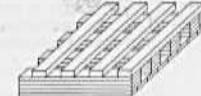
Channel-section wall



Edge-glued timber floor or roof



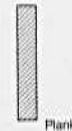
Cross-laminated timber floor or roof



Board system floor



Box-section floor or roof



Plank



Boards



Tongue and groove board



Tongue and groove board with close V-joint



Tongue and groove board with open V-joint

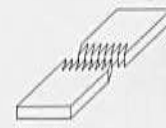


Tongue and groove weather-board



Battens Strip Moulding

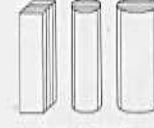
Logs, squared logs



'Endless board' with finger joint



Glued laminated timber, rectangular section



Glued laminated timber, square and round sections



Parallel open planking



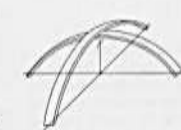
Parallel planking



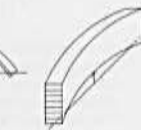
Diagonal open planking



Diagonal planking



'Endless boards' in single curvature



Glued laminated timber with upward camber



Glued laminated timber, plane and space frames



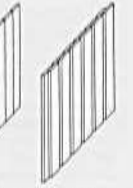
Vertical parallel open planking



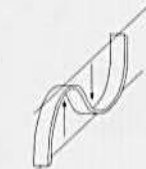
Diagonal open planking



Vertical planking with profiled boards



Overlapping planking



'Endless boards' in double curvature



Glued laminated timber with downward camber



Glued laminated timber in single curvature and with twist



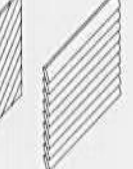
Horizontal parallel open planking



Horizontal planking with profiled boards



Diagonal planking

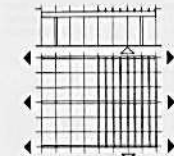


Weatherboarding

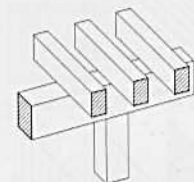
Continuous beams



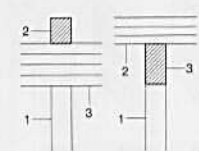
- Primary beams on columns
- Secondary beams on primary beams
- Single-storey structures



- Cantilevers possible in both beam directions

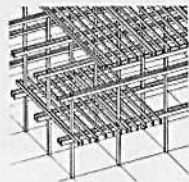


- Loadbearing junction requiring minimal connectors as beams are laid on top
- Simple geometry for facade and fitting-out
- Different structural depths and details at facade junctions and fitting-out around primary and secondary beams

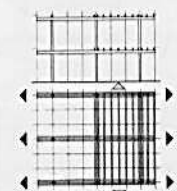


1 column, 2 secondary beam, 3 primary beam

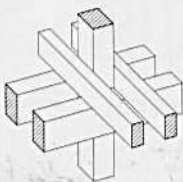
Continuous columns, primary and secondary beams; primary and secondary beams in pairs



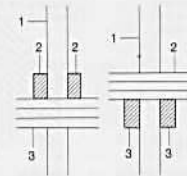
- Primary beams attached to column sides
- Secondary beams laid on top
- Two- or multi-storey structures



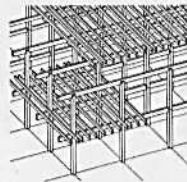
- Cantilevers possible in both directions



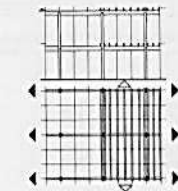
- Primary and secondary beams in pairs
- Junction between main beam and column more complicated
- Complex geometry for facade and fitting-out



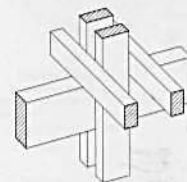
Continuous columns, primary and secondary beams; columns and secondary beams in pairs



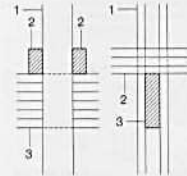
- Primary beams attached to column sides
- Secondary beams laid on top
- Columns in pairs



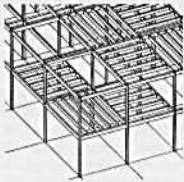
- Cantilevers possible in both directions



- Columns and secondary beams in pairs
- Junction between main beam and column more complicated
- Complex geometry for facade and fitting-out



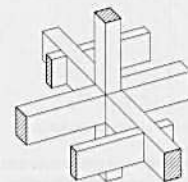
Continuous columns, primary and secondary beams at same level



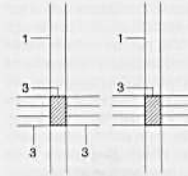
- Primary beam fixed to side of column
- Secondary beam fixed to side of main beam



- Cantilevers not possible
- Uniform loading on primary beams by alternating direction of secondary beams



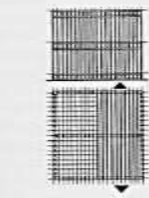
- More complicated junctions between primary beam and column, secondary beam and primary beam
- Simple geometry for fitting-out and facade



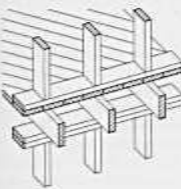
Panel construction (timber-frame construction, platform construction)



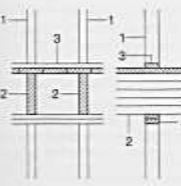
- Bracing by means of planking to post-and-rail construction
- Floors laid on top, storey-height posts



- Cantilevers possible in direction of beam

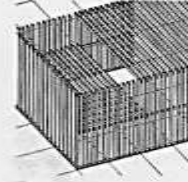


- Finely structured arrangement, normally with nailed connections
- Simple geometry for fitting-out and facade

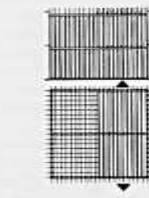


1 column, 2 beam, 3 sole plate, 4 header, 5 wall, 6 floor

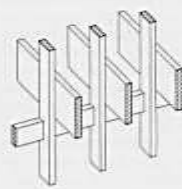
Timber-frame construction (platform construction, balloon-frame construction)



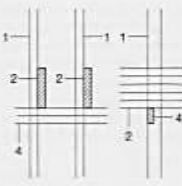
- Bracing by means of planking to post-and-rail construction
- Floor joists connected to sills, posts > storey height



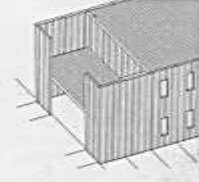
- Cantilevers possible in direction of beam



- Finely structured arrangement, normally with nailed connections
- Simple geometry for fitting-out and facade



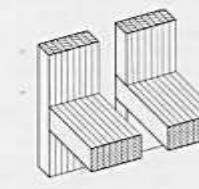
Edge-glued timber



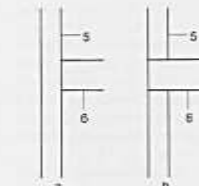
- Self-bracing plate effect
- Wall equal to height of building: floor suspended; storey-height wall: floor laid on top



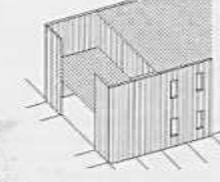
- Cantilevers possible in one direction



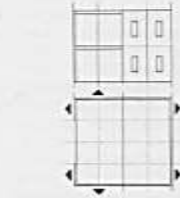
- Simple geometry for fitting-out and facade
- Standard mechanical connectors
- a Floor suspended
- b Floor laid on top



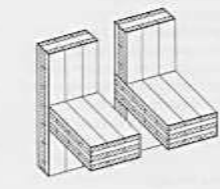
Cross-laminated timber



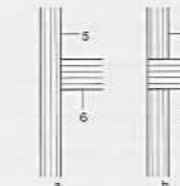
- Self-bracing plate effect
- Wall equal to height of building: floor suspended; storey-height wall: floor laid on top

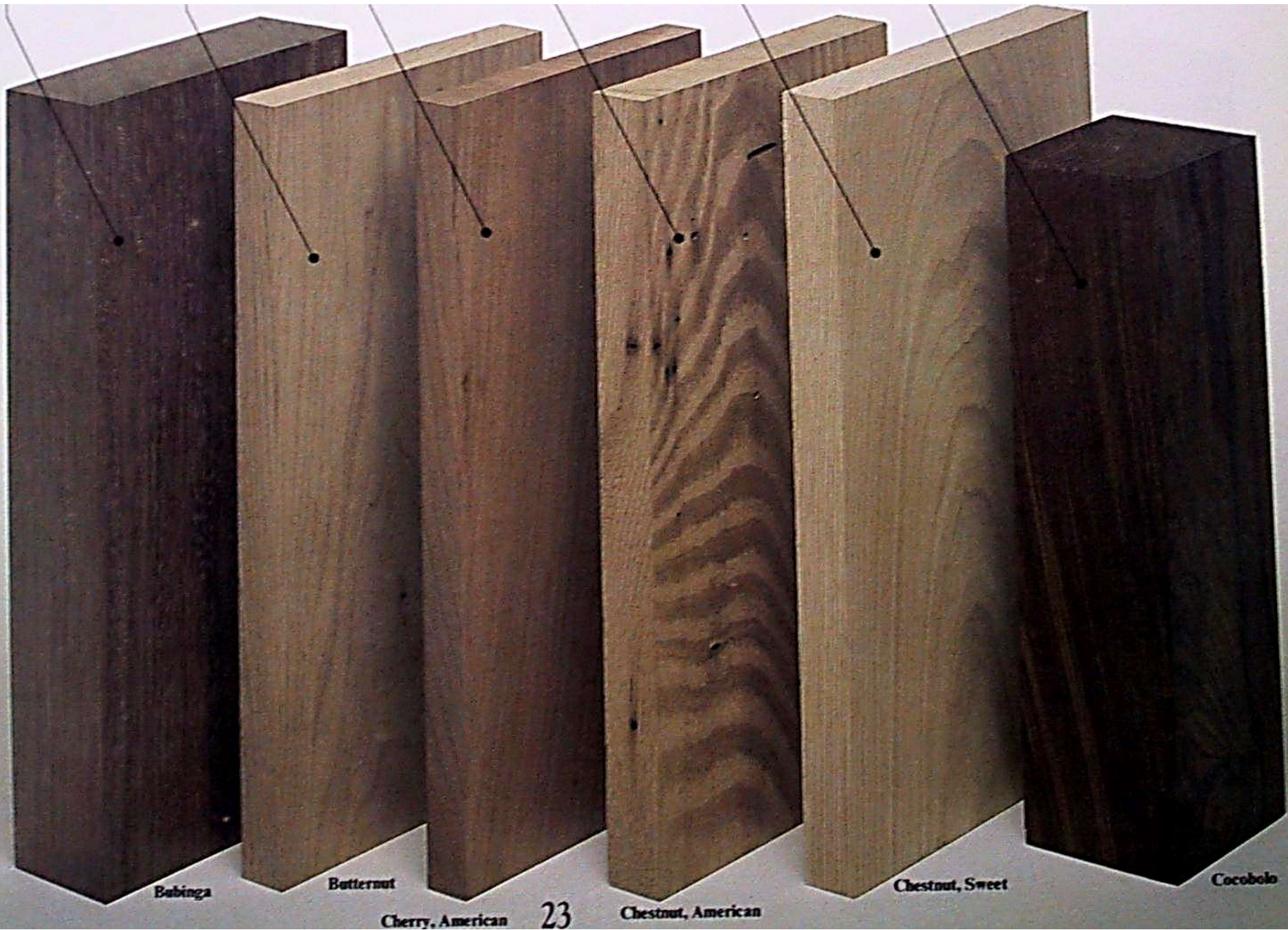


- Cantilevers possible in both directions



- Simple geometry for fitting-out and facade
- Standard mechanical connectors
- a Floor suspended
- b Floor laid on top





Bubinga

Butternut

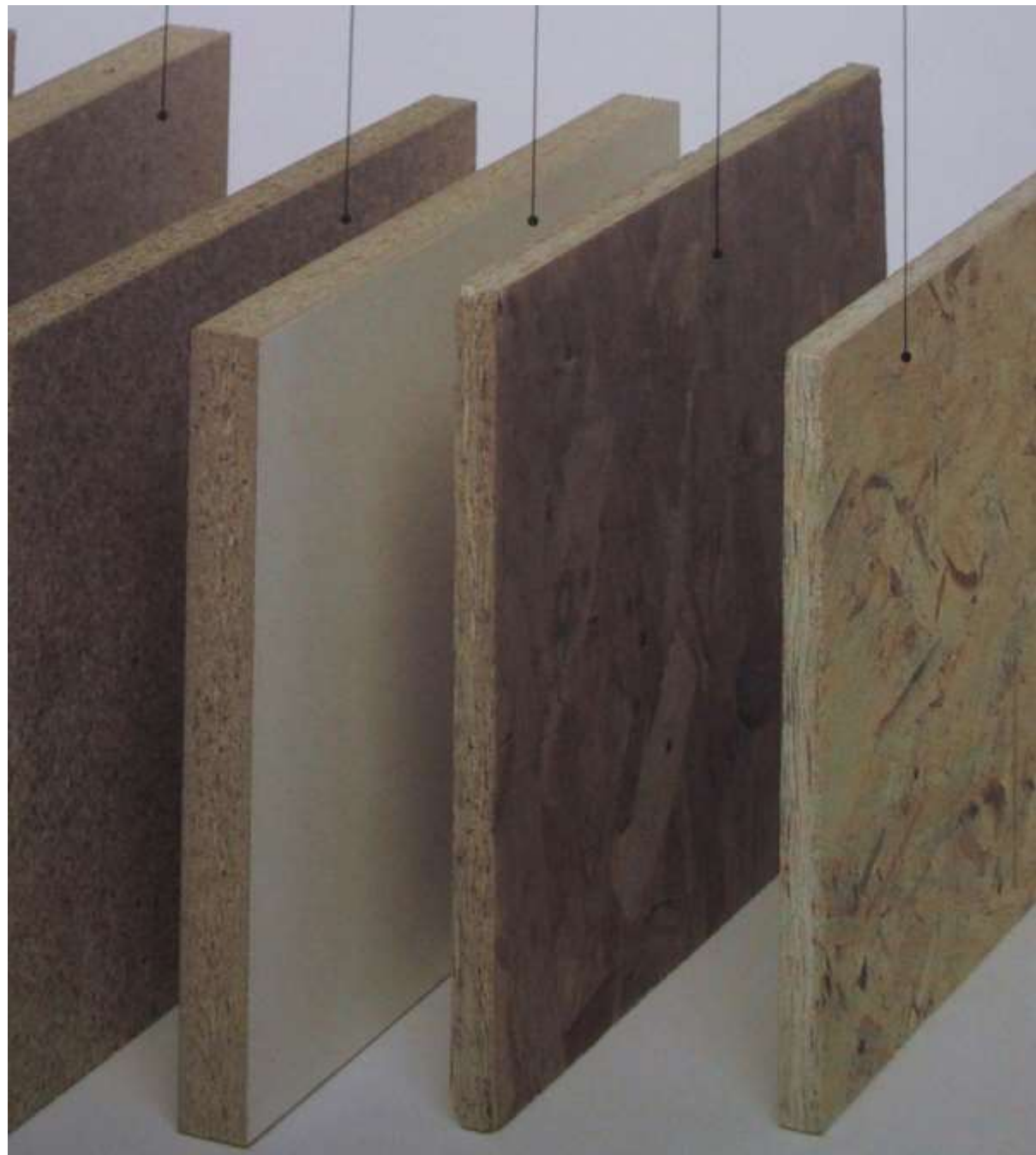
Cherry, American

23

Chestnut, American

Chestnut, Sweet

Cocobolo





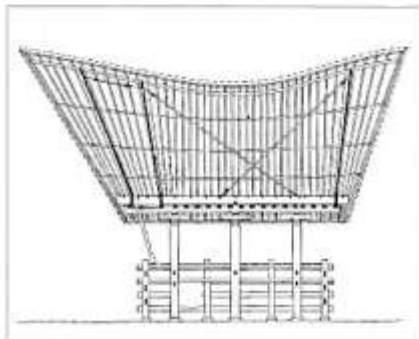
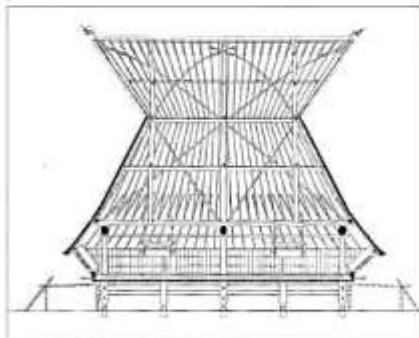
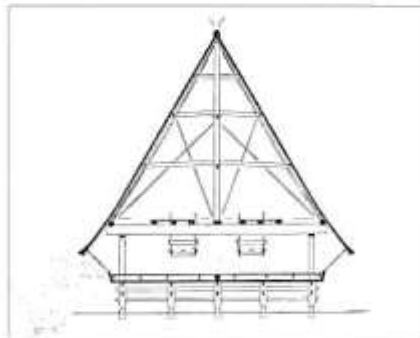
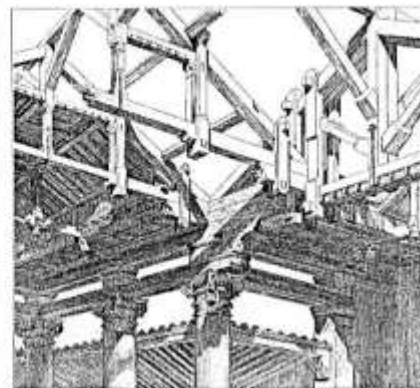
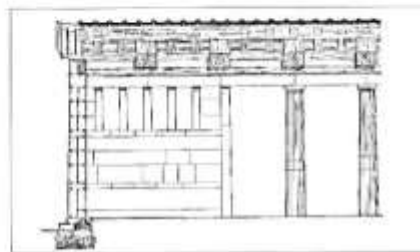
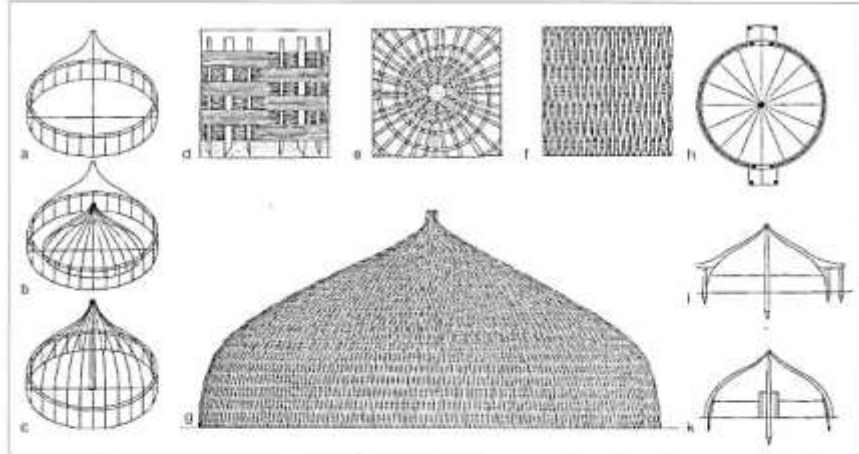
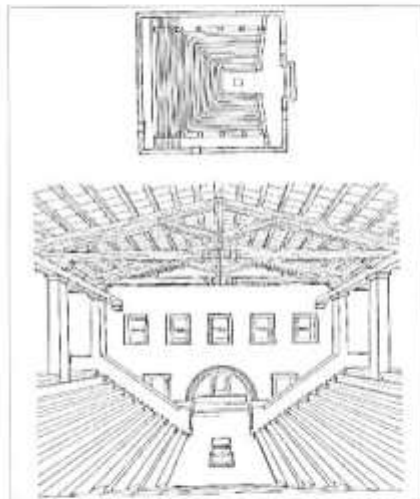
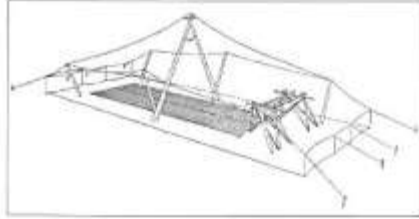
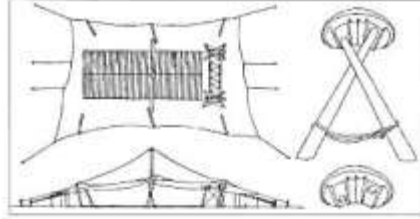
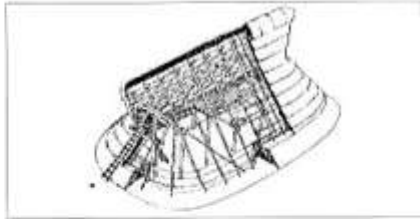
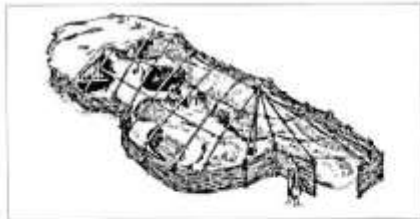
Medium boards

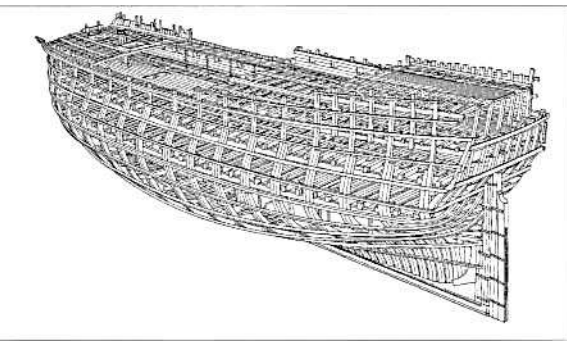
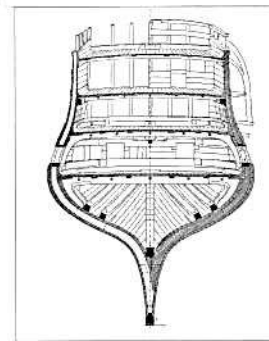
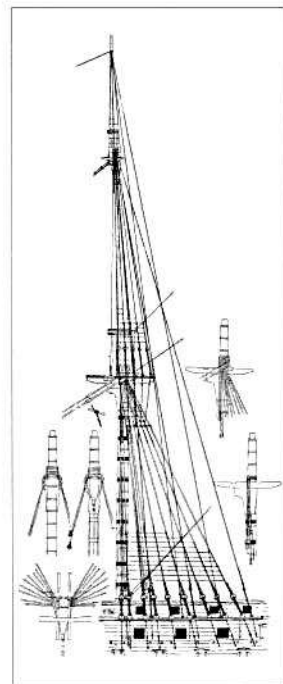
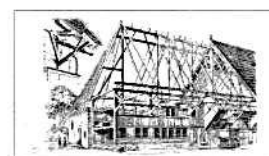
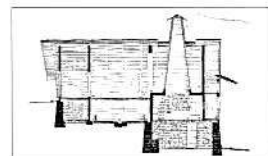
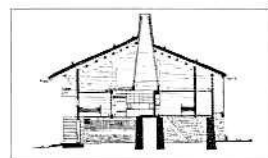
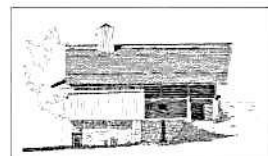
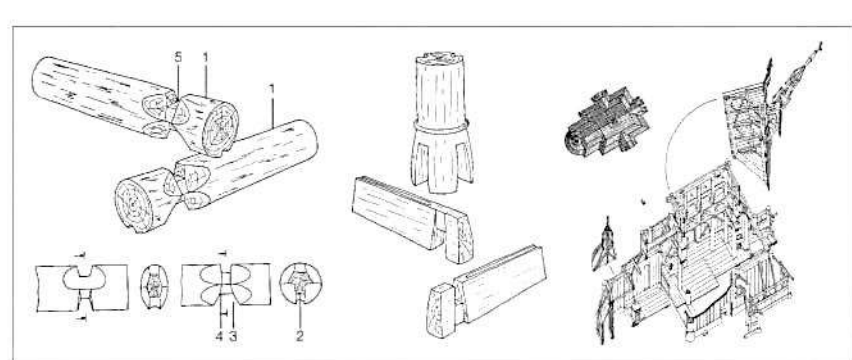
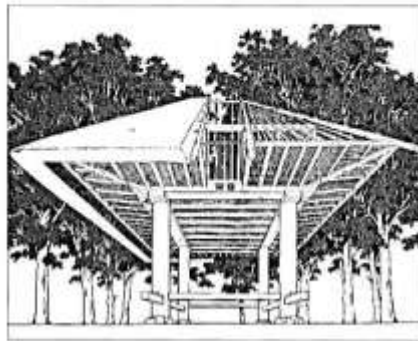
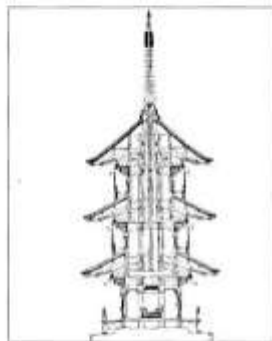
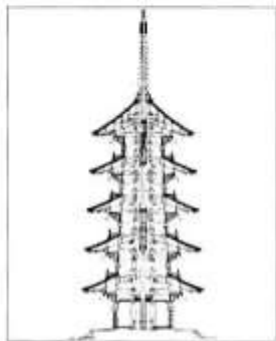
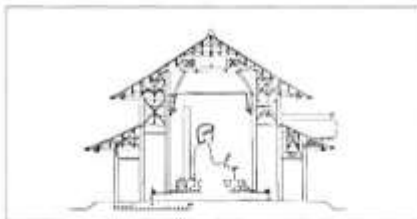
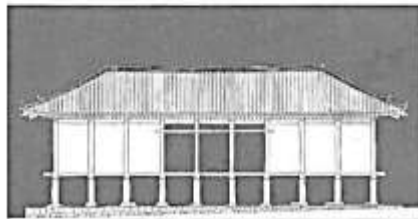
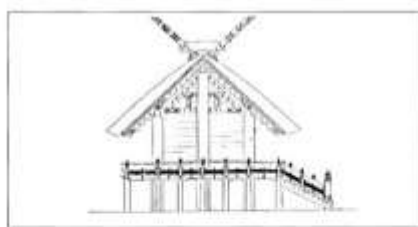
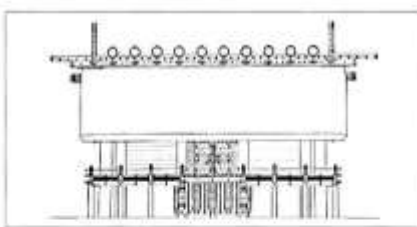
- 1 High-density (HM) board
- 2 Low-density (LM) board
- 3 Medium-density fibreboard (MDF)
- 4 Oak-veneered MDF board



Hardboards

- 5 Standard hardboard
- 6 Tempered hardboard
- 7 Embossed hardboard
- 8 Decorative-faced hardboard
- 9 Perforated hardboard





BRUNNEN
GARDNER

