08/01070/FUL

Hinckley. Bosworth B.C.
Building Planning Dept.

Discharge of Conditions
09/07857/PLN CON

Parva House
Mill Lane
Sheepy Parva
Atherstone
Warks.
CV9 3RL

30. 4. '09

Dear Sir/Madam,

To confirm choice of materials for the build of a free standing garage as approved by yourselves

Ian Papworth
IAN PAPWORTH

HINCKLEY & BOSWORTH BOROUGH COUNCIL

COUNCIL OFFICES, ARGENTS MEAD,
HINCKLEY, LEICESTERSHIRE LE10 1BZ
TEL: (01455) 238141 (EXT:)

V.A.T. REGISTRATION No.
115 3665 82

Mr Papworth.
Pova House
Mill Lane
Sheepy Pova

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INVOICE DATE	30.4.09.

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The Council's Official receipt

Samples with Alison.

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30 APR 2009
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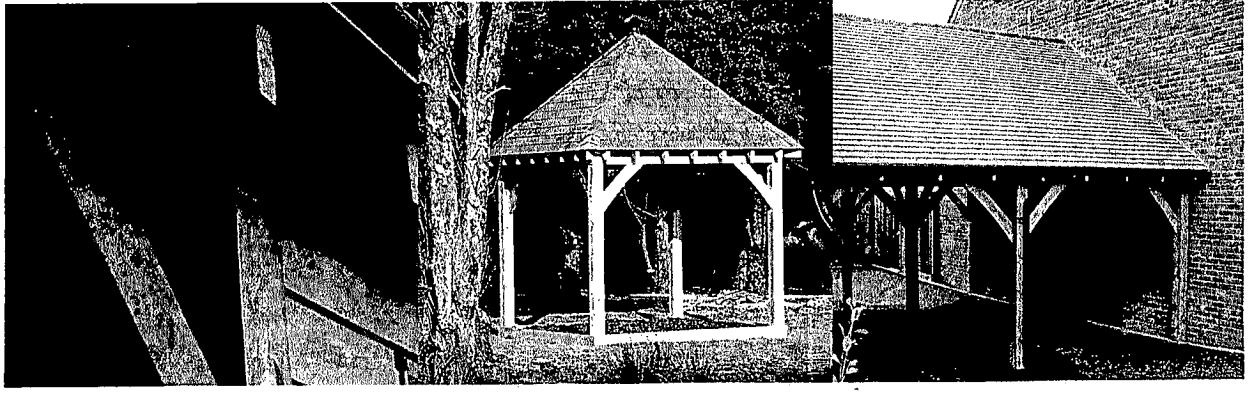
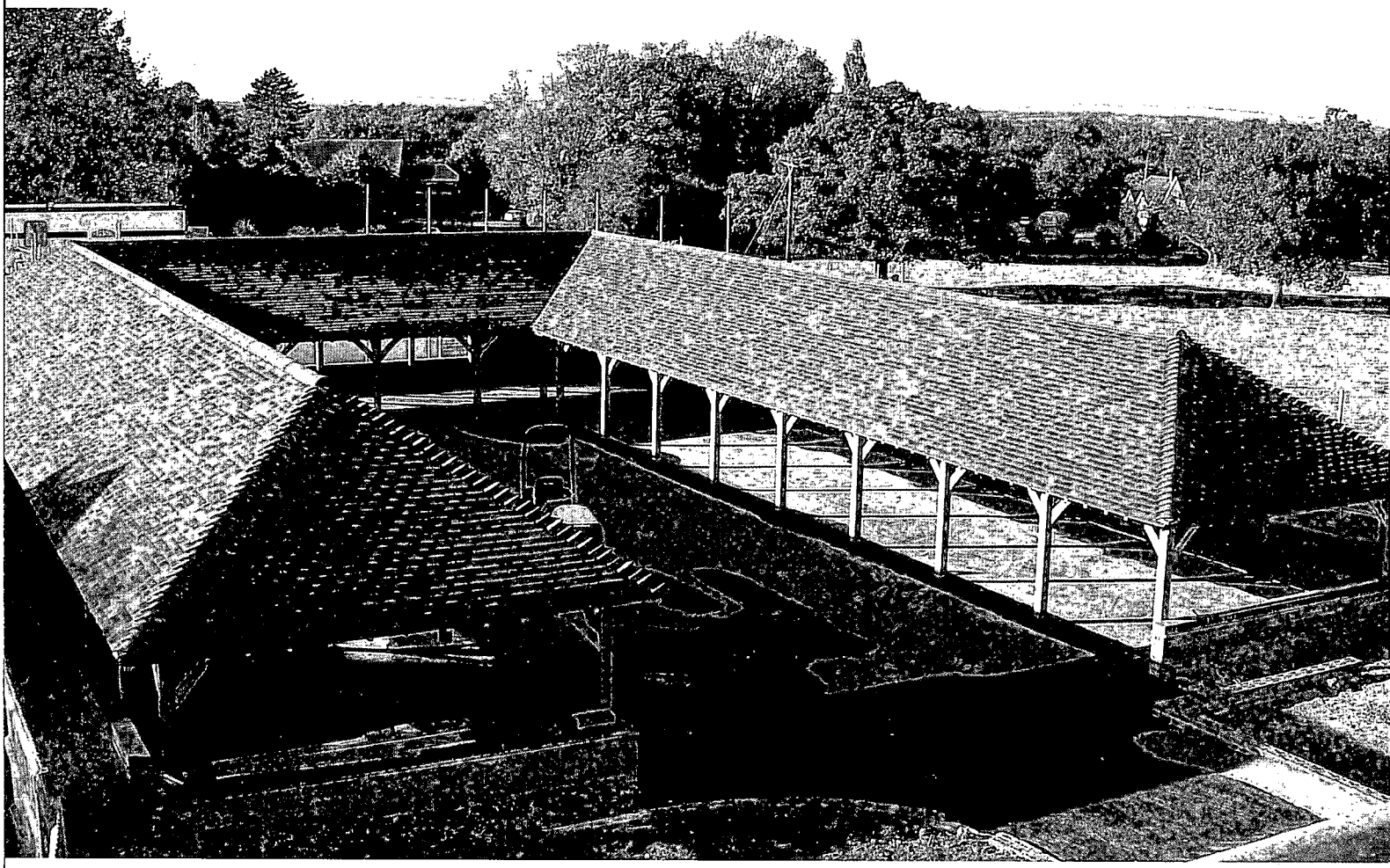


BEAMLOCK®

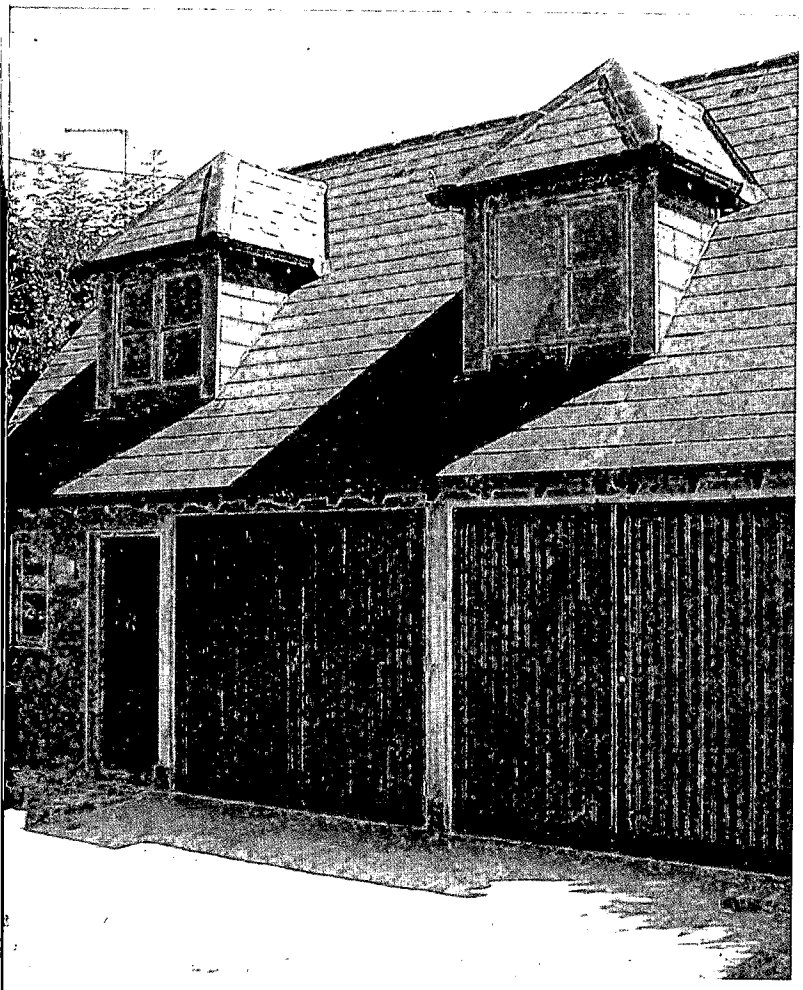
MODULAR TIMBER FRAME SYSTEM: TECHNICAL BROCHURE

finnforest



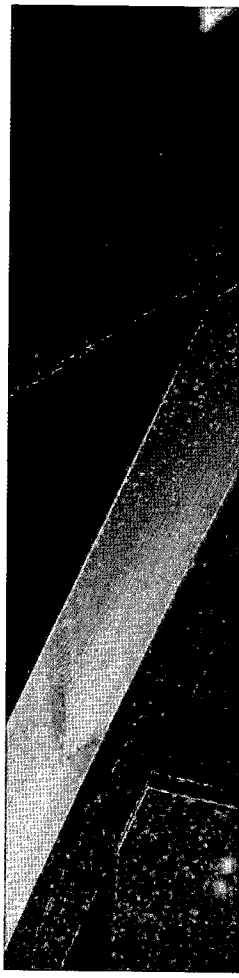
BEAMLOCK®

INTRODUCTION



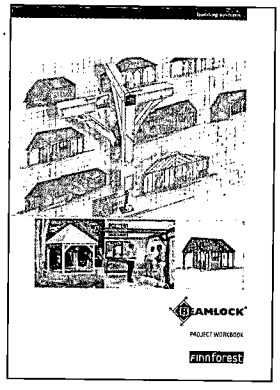
CONTENTS

Home and Garden Applications	4
Commercial Applications	6
Decking Solutions	8
Conservatory Solutions	10
Timber Framing Extensions	11
Timber	12
Building System	14
Components	16
Templates	18
Building Assembly Instructions	20
Geographical Product Approval Chart	28



The Beamlock System uses a modular connection that enables you to build quickly and easily, secure in the knowledge that our engineered components will fit together perfectly every time. With just the eight Beamlock components, and your imagination, you can build just about anything from a porch to a home extension.

Throughout this Technical Brochure, all measurements are approximated. For detailed measurements please refer to the Beamlock Project Workbook.



COMMERCIAL APPLICATIONS

Commercial applications range from temporary structures at trade shows and exhibitions to extensive storage and warehouse facilities.

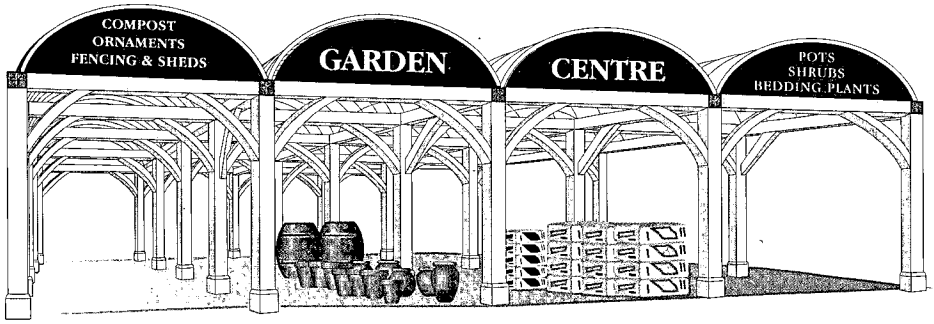
- 1 Outside Covered Areas
- 1 Sun Shelter
- 1 Stables
- 4 Garages
- 1 Car Ports



Temporary structure

Outside Covered Areas

4



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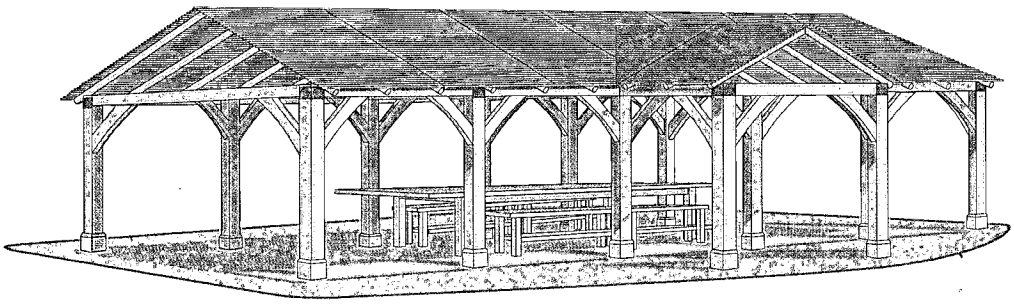

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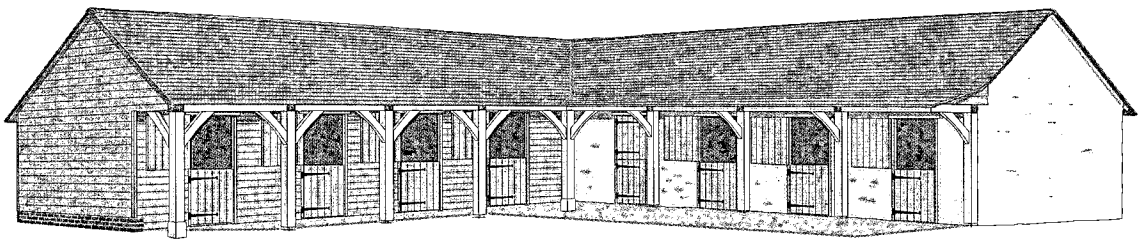
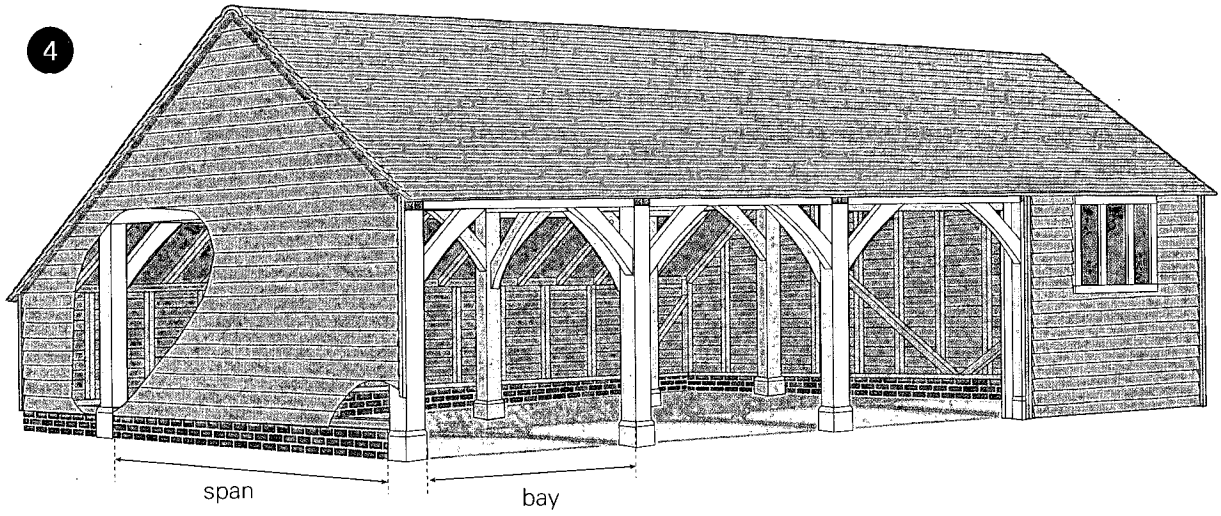


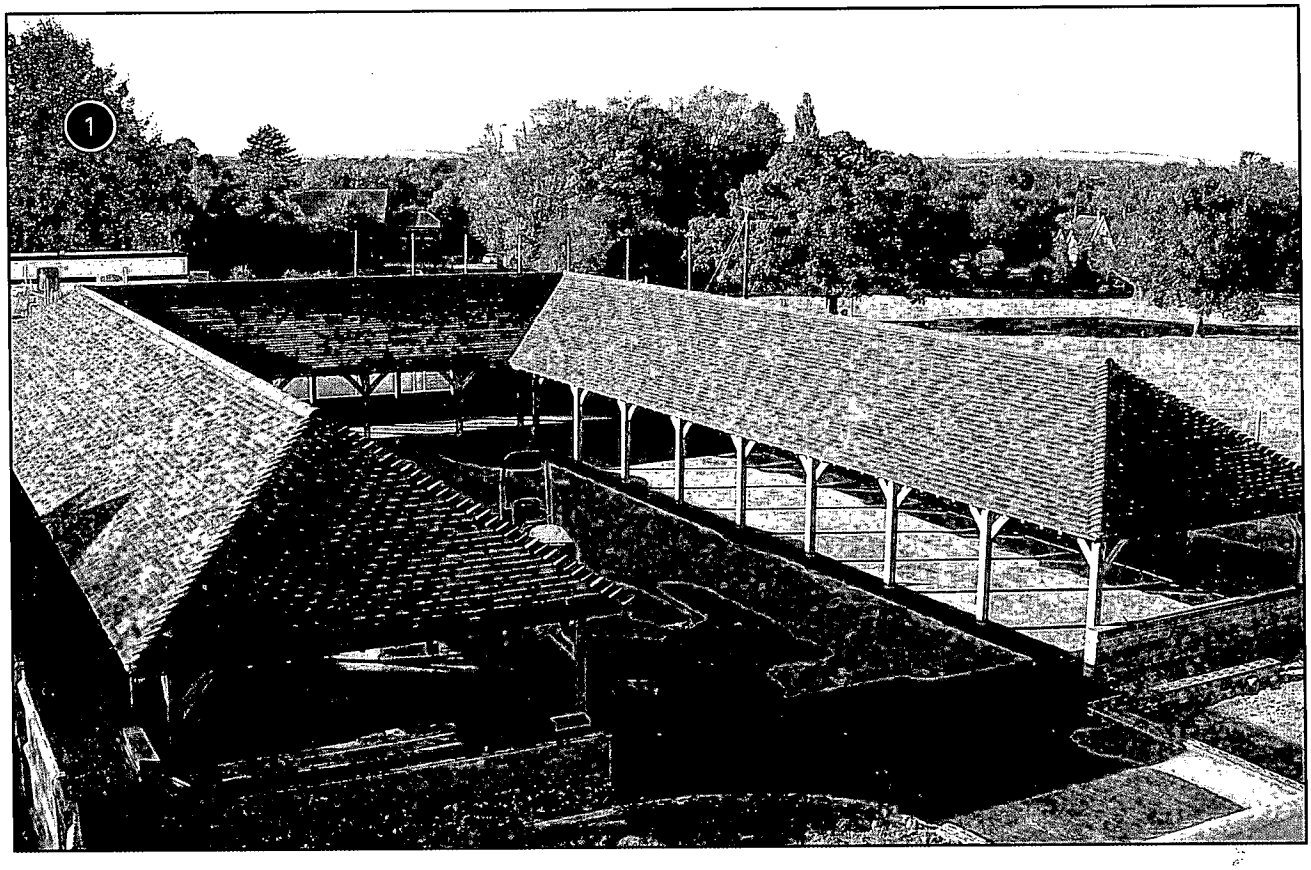
These proposed applications are purely for illustrative purposes only.

Garages and Stables



Please note: When referring to 'span' or 'bay' in this brochure, the bay is always on the elevation carrying the roof canopy or first floor load. Generally this will be shorter than the span.

These proposed applications are purely for illustrative purposes only.



DECKING SOLUTIONS

SUITABLE FOR DOMESTIC FLOOR LOADING



REDUCED GROUNDWORK

Beamlock cuts the groundwork by up to 50% as support posts can be as much as 4m apart. No need to worry about the structural support posts being at right angles, vertically or in line as the Beamlock System automatically creates a right angle along with any vertical adjustment.

MAKING THE BEST OF A SLOPING SITE / ENGINEERS - CONSULTATION - B REGS

No need for structural engineers / consultation fees when you are challenging a sloping site, as Beamlock has full building regulation approval on structural and fire performance up to 2.2m high. You have the choice of a continuous deck level due to 2.2m height possibility, as opposed to deck level changes, therefore making it more practical and usable. Where a post height is less than 2.2m please ask for details.

DESIGN

Due to the beam section size provided and the assembly process there is no need for an outside joist or frame joist. Also, on a sloping site, the requirement for the diagonal brace (above 1m post height) is not only a functional engineering element but also an architectural, attractive, heritage feature. This all results in a very attractive front elevation.

THE BEAMLOCK FRAME

No need to bolt together the main support beams prior to the decking sub base. The Beamlock frame is the main support frame and also the decking sub-base, unlike other conventional applications. The Beamlock section 138mm x 165mm avoids the need to bolt two joists together to carry an additional platform.

LONGER LASTING - AVOID WET TIMBER

None of the joists or full height structural support posts will be in contact with the ground. There is always a minimum of 50mm from the bottom of the support post to the concrete foundation.

LAYING THE DECK BOARDS

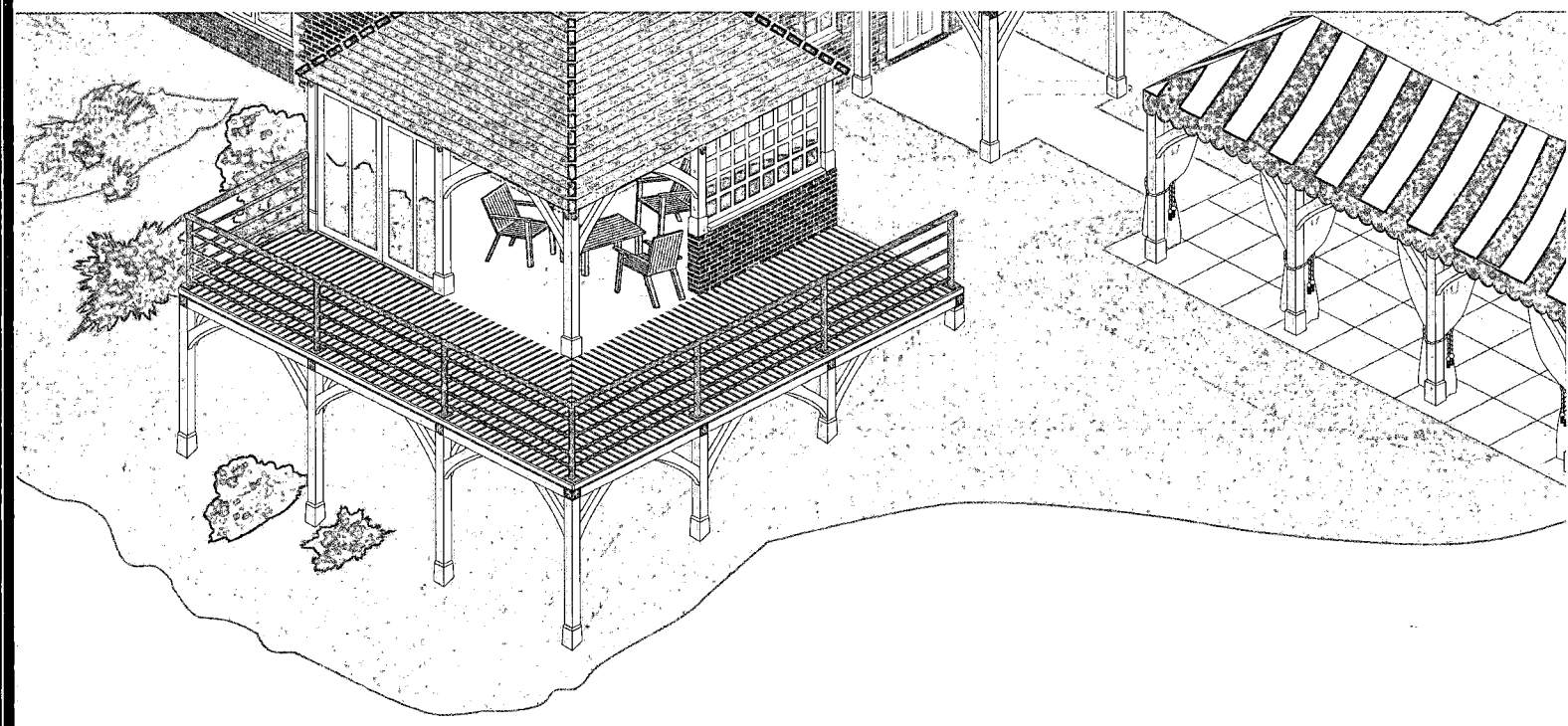
No need to consider where to place double joists as Beamlock 138mm horizontal plane provides plenty of surface area for when two deck boards meet.

KEEP TIMBERS CLEAN

Keep the timber post elements clean by having the advantage of assembly after completion of all groundworks.

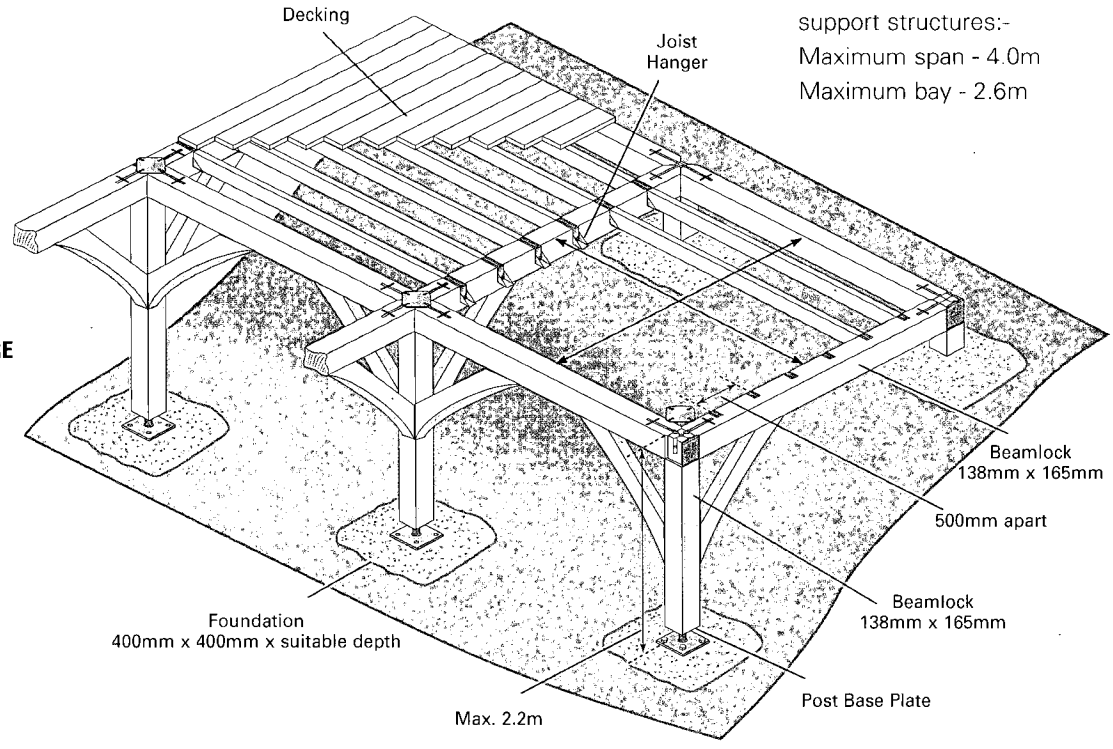
RAPID INSTALLATION

Due to the Beamlock connection system being simple and easy to fit, labour time has been reduced by up to as much as 75%.



Please note on all decking support structures:-
Maximum span - 4.0m
Maximum bay - 2.6m

DECKING STRUCTURE

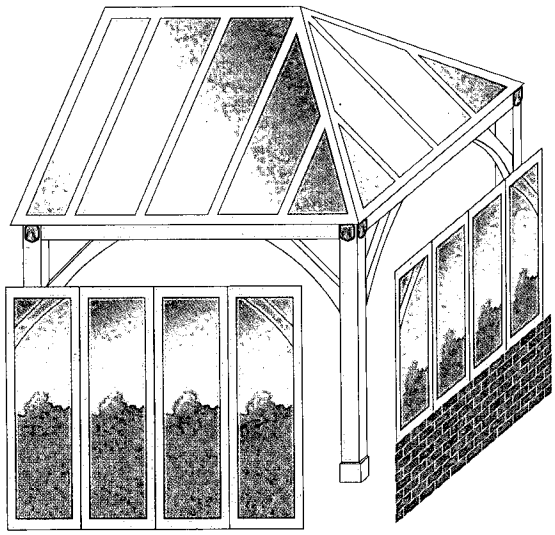


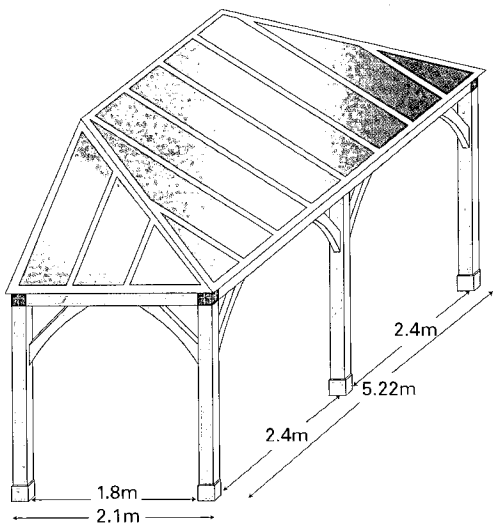
CONSERVATORY SOLUTIONS

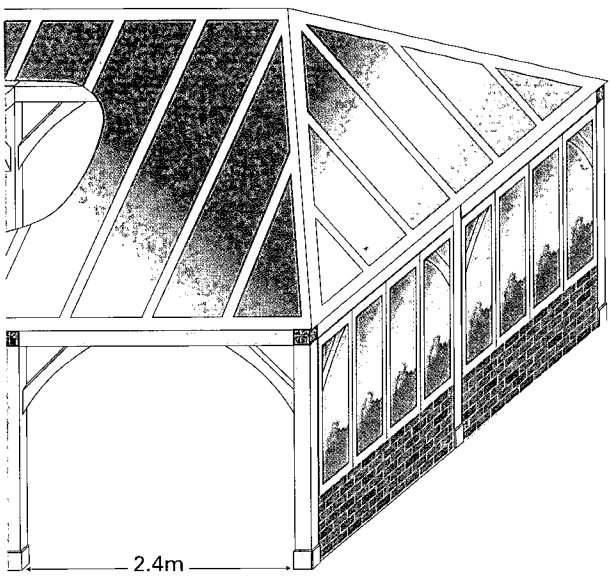
Beamlock has devised a simple solution for building conservatories. The modular Beamlock System fits perfectly with a range of standard windows and patio doors, making most parts of the conservatory available off the shelf.

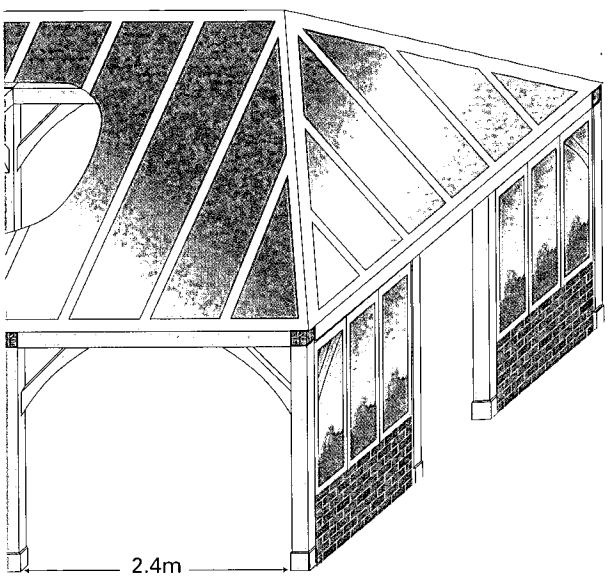
Beamlock posts and beams provide a solution to fit every design. You can choose between full length windows or part wall and windows. Braces can provide a decorative feature behind the windows. Cross beams enhance the interior design of the conservatory or extension.

Please note: When constructing more than one bay out from the house it is essential on conservatories that a structural wall is fixed to the Beamlock timber frame to a height of 600mm above DPC at the gable end.

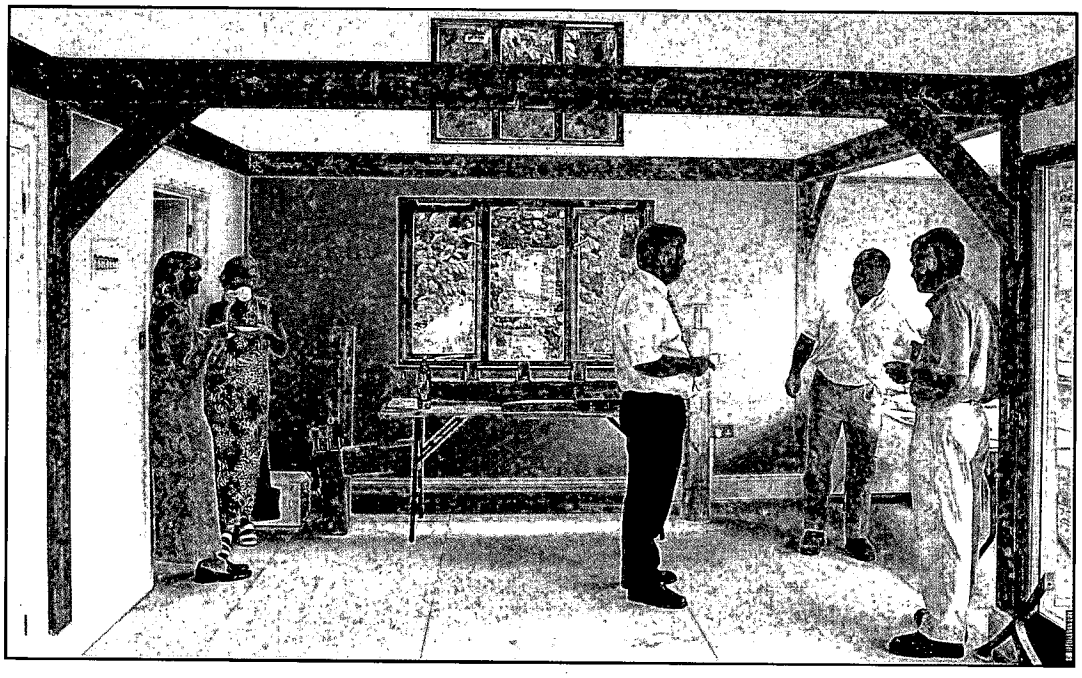




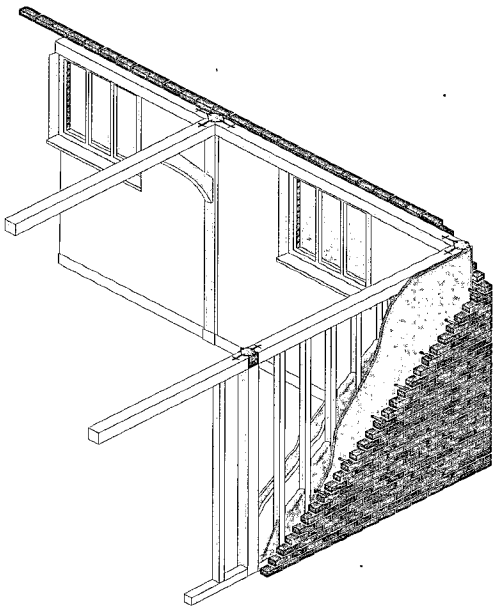




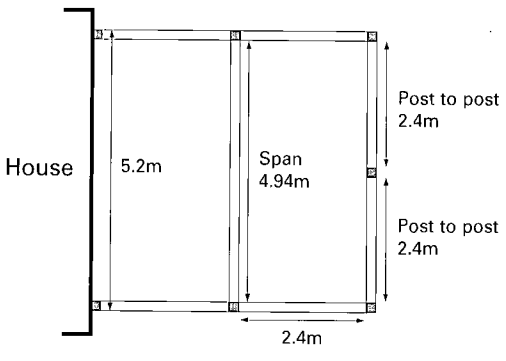
TIMBER FRAMING EXTENSIONS



- Quick and easy to assemble
- Ready finished 138mm x 165mm Pine Beams
- Ready to decorate finished Pine Beams
- Unmatched structural merits
- Posts supported by adjustable Base Plates



Conservatory/Extension 5.2m wide





TIMBER

TIMBER – FULL COMPLIANCE TO HAZARD CLASS 3A. SUITABLE FOR EXTERNAL USE, NOT IN GROUND CONTACT

All timber is supplied in accordance with the Pan European Forestry Scheme, the Beamlock System is produced using Pinus Sylvestrus (10,800 - 13,000 bending per N/mm^2, comparison Oak 10,500 - 14,500 bending N/mm^2).

It is made up using lamellas of pine laminated together, thus providing incredible strength (see "Stronger Than Oak Mortise and Tenon System").

1. Timber sections are dried in a climate-controlled kiln.
2. The lamellas are then laminated together to form a single solid beam using a high frequency hot press.
3. The beams are planed to section to achieve a tolerance of +/- 1mm.
4. The finished components are then treated to Hazard Class 3a using Vacsol Aqua double vacuum pressure impregnated preservative.

This manufacturing process ensures that all Beamlock timber components are of the highest quality, avoiding all the typical problems such as shrinkage, splitting and variation in size, normally associated with timber sections of these dimensions.
All external timbers must be coated with a proprietary brand of wood preserver, stain or paint within 6 months of installation to avoid UV light degradation of the treatment.

COLOUR AND FINISH

The timber colour is unaffected by the Vacsol Aqua treatment process, which leaves complete individual choice as to how the finished project can be decorated.

PRESERVATIVE TREATMENT OF TIMBER

All Beamlock timber has been treated with Vacsol Aqua double vacuum treatment, the most effective and environmentally sensitive treatment on the market with an anticipated service life of 60 years in Hazard Class 1 and 2 applications. Cutting of the timber on site is unavoidable. This will expose untreated timber and it is imperative that crosscut, notches and bored holes be liberally swabbed with Vacsele End Grain Preservative.

VACSOL AQUA

Vacsol Aqua is approved to standards and specifications of Building Regulations of England and Wales and Building Standards Scotland and the NHBC for many different applications and complies with the following standards:
C1-10 BWPDA, BS5707 (1997), BS5589 (1989), BS5268 Part 5 (1989) BS1186 (1986) BS5502, BS6566 Part 7.
The design life is for 60 years in Hazard Class 1 and 2.
The design life is for 30 years in Hazard Class 3a.

VACSOL AQUA

TREATED TIMBER

This table is based on the Hazard Classes as defined in the British and European Standards.

Biological Hazard Classes

Hazard Class	Hazard	Principle Biological Agency	Typical Service Situation	Examples
1	Above ground, covered. Permanently dry. Permanently <18% moisture content.	Insects	Internal with no risk of wetting nor condensation.	All timbers in normal pitched roofs except tiling battens and valley gutter members. Floor boards, architraves, internal joinery and skirtings. All timbers in upper floors not built into solid external walls.
2	Above ground, covered. Occasional risk of wetting. Occasionally >20% moisture content.	Fungi Insects	Internal with risk of wetting or condensation.	Tiling battens, frame timbers in timber frame houses, timber in pitched roofs with high condensation risk, timbers in flat roofs, ground floor joists, sole plates (above dpc), timber joists in upper floors built into external walls.
3	Above ground, not covered. Exposed to frequent wetting. Often >20% moisture content.	Fungi	A - External, above damp proof course (dpc) - **coated.** B - External, above damp proof course (dpc) - **uncoated.**	External joinery including roof soffits and fascias, bargeboards etc, cladding, valley guttering timbers, fence rails, gates, fence boards, deck boards, agricultural timbers not in soil/manure contact.

STRONGER THAN OAK

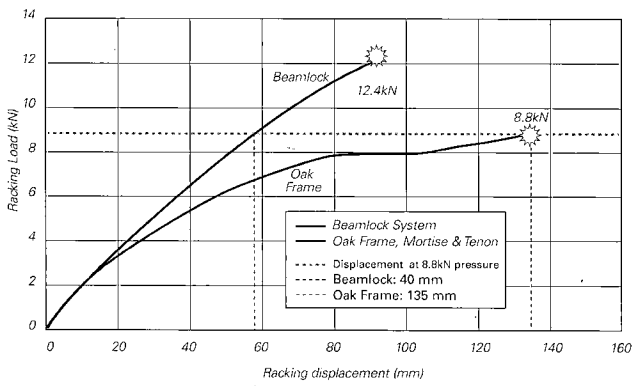
MORTISE AND TENON SYSTEM

The Beamlock Pine System has had extensive structural testing at the Building Research Establishment (BRE) Centre. To establish a fair comparison to mortise and tenon oak timber framing currently available from specialist companies, we decided to do an identical test.

The results are shown in the graph. This is all achieved by using the intelligent Beamlock connection system, a number of sophisticated, modern methods - from laminating timber in Finland to computer programming for cutting accurate timber sizes. The final result is a remarkably strong and simple, yet architecturally attractive system.

OFFICIAL TEST RESULTS

Comparison between Beamlock System and traditional mortise & tenon oak system



Conclusion: The Beamlock System is up to 35% stronger than traditional mortise & tenon oak system.

BUILDING SYSTEM



Compact storage and transport solutions.

The Beamlock building achieves a traditional look, with the security and reduced costs that only modern technical production methods can bring, leaving you to enjoy the beauty of traditional construction in a natural material.

Build times are significantly reduced with a perfect result every time, the Beamlock parts just connect using the pin provided. With just three major components, the Beamlock System is an easily understood assembly process. The modular concept also guarantees compact storage and transport solutions. Beamlock products are compliant to the most recent wind code BS6399.

BEAMLOCK CONNECTION

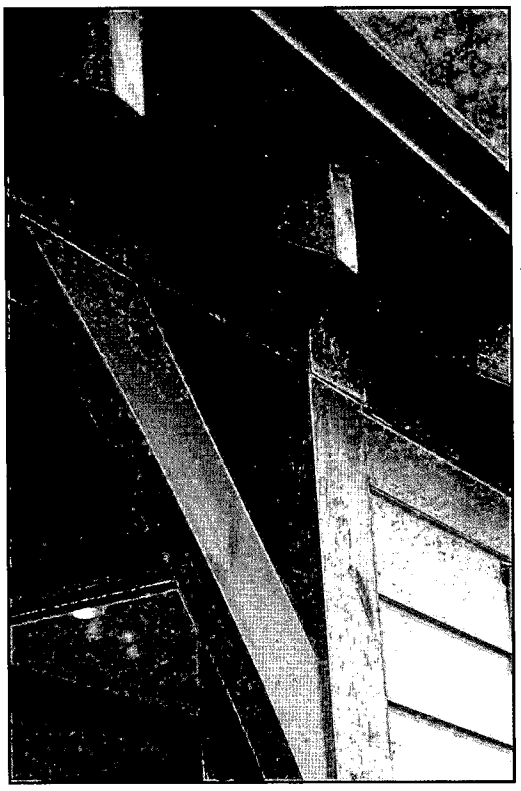
This is the ultimate in timber connection. It is designed not only for high strength (as tested at the B.R.E.), but also for use in our variable climate. Due to the fundamental connection relying on the steel plates and tubes matching up, the moisture changes in the wood do not cause any concern or inhibit the connection system from working efficiently and easily.

INSTALLATION ADVANTAGES

Two people can easily build a Beamlock structure with minimal tools and skills. Simple assembly means that you will benefit from the unique time saving design reducing build times and labour costs.

1/2 HOUR FIRE APPROVAL

Beamlock System complies to BS 476-21 half hour fire exposure, which is considered suitable for the support of upper floor loading. This negates the requirement for fire calculations if half hour fire determination is required.



WEIGHT AND CONSTRUCTION ADVANTAGES

Beamlock is a safe site product providing strength at easily managed weights. Posts and beams are supplied in easily transportable modular lengths to a maximum of 5m. There is no need for a crane or multi lift as two people can handle all components. Typically, on a 4m span, the Beamlock components weigh just 48kg.

KILN DRYING

All timber spends approximately 15 days in individual kilns drying out to 15% (+/- 3%) humidity. The timber contracts by about 10% and reduces in weight by about 40%. This is a great benefit in indoor applications as the Beamlock components will not split or move dramatically in the future when heat is applied.



BEAMLOCK CONNECTION

The Beamlock connection system is made with a combination of high tensile BZP, stainless steel (grade 304L) and aluminium components. The Beamlock design is durable and can achieve a service life of 60 years in internal dry environments and up to 30 years for external exposure.

EXTENDIBLE

The system allows easy extension at any time from a Beamlock post, allowing your buildings to grow with your needs and budget.

LAST MINUTE CHANGES

With such a flexible system you can decide on brace positions suitable for garage doors, patio doors or windows just before you put the building together.

TREATMENT

Factory pre-treatment ensures a hazard class 3 approval allowing the posts to be exposed to the elements.
Note: Class 3 approval is subject to further application of surface coatings.

FINISH

Beamlock components are supplied ready to decorate. They are planed to the highest joinery standards and need no extra preparation before painting or staining.

QUALITY

Beamlock is proud to guarantee consistent high quality manufacturing. We provide joinery grade timber machined to +/- 1mm.

TRUE 90° DEGREE ANGLES

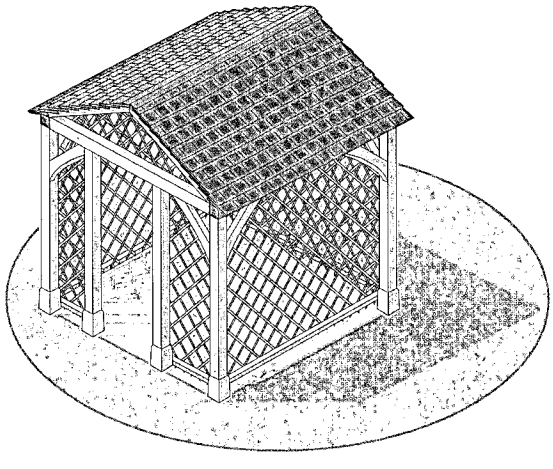
The Beamlock System automatically creates appropriate angles and upright. Due to the simplicity of the connection system, you cannot get the angles wrong!

END TENSION PLATE

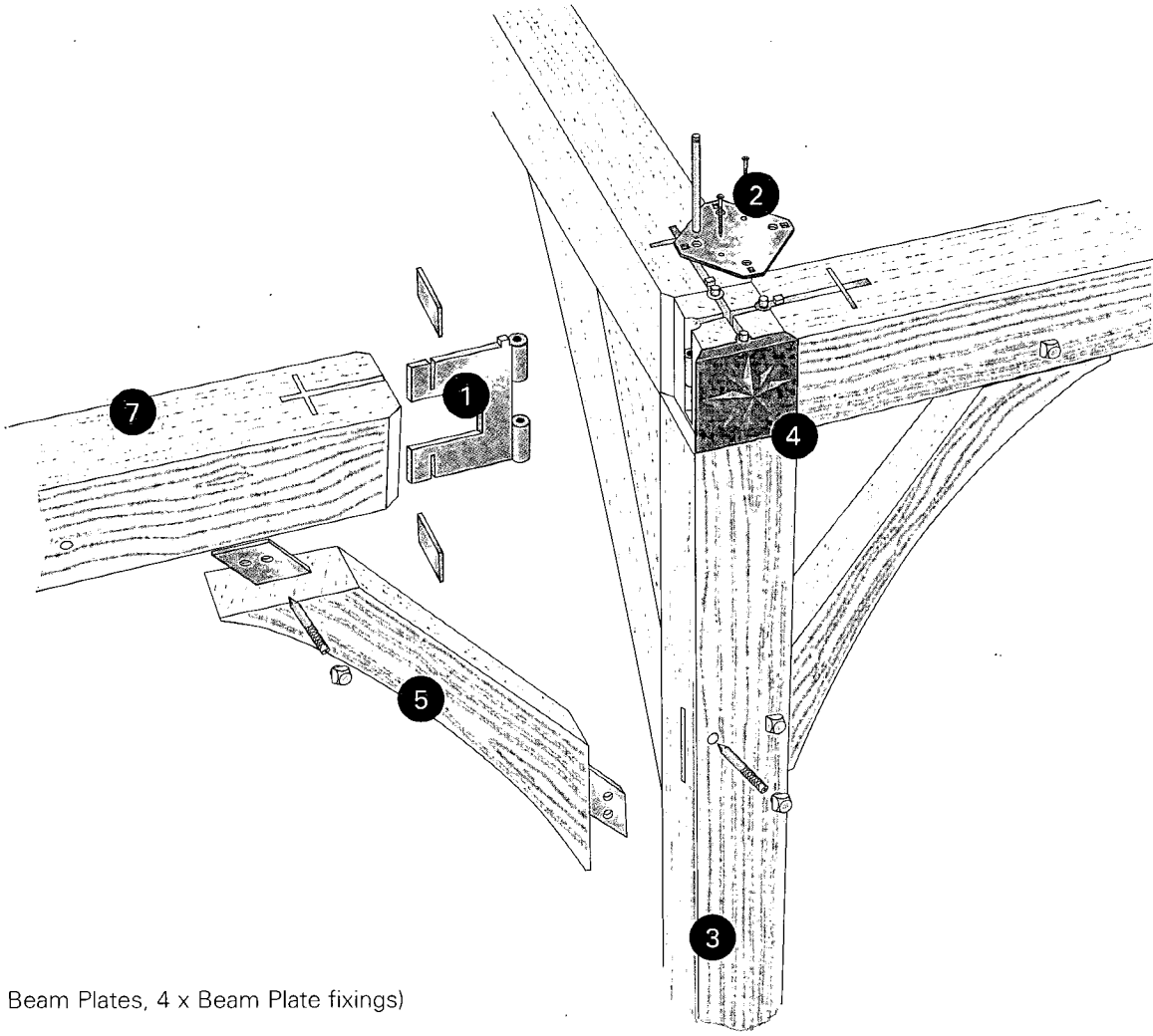
This attractive plate is also an essential technical component of the Beamlock System. Each unused face is finished off with the end plate which reduces the longitudinal stresses in the timber.



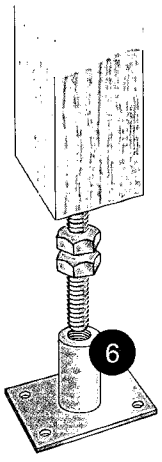
End Tension Plate



COMPONENTS



- 3 Beam Kit (2 x Beam Plates, 4 x Beam Plate fixings)
- 1 Post Kit
- 3 Post 2165mm (max eaves height 2.2m)
- 1 End Tension Plate
- 3 Brace
- 4 Base Plate
- 3 Beam (available in suitable lengths of 2628mm and 4968mm)

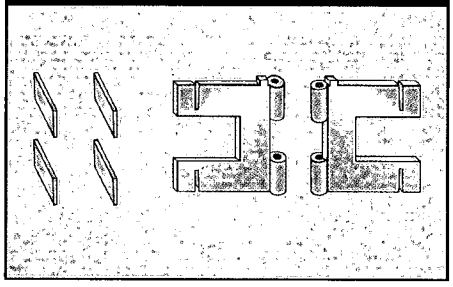


We have carefully selected post length and thought about beam dimensions to make sure that they are appropriate to fit with standard doors, windows, patio doors, garage doors, patio frames, garage frames, etc. However, to guarantee a fit for every possible alternative you can cut the beams to your chosen length. All you need to do is cut the beam to your chosen length, and by using the templates supplied, router the appropriate grooves and chamfers to fix the Beamlock beam connector.

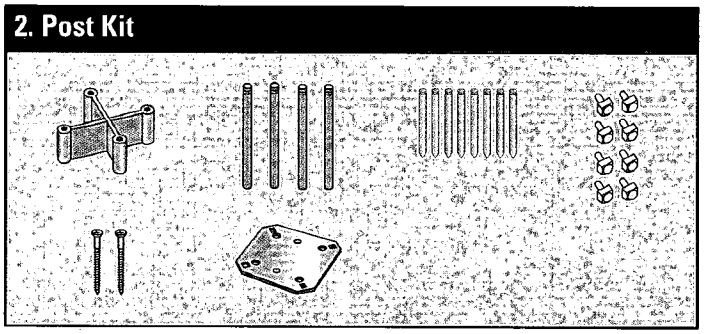
It's as simple as that..

COMPONENTS LISTS

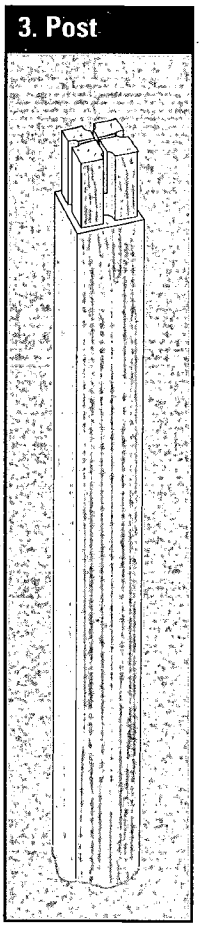
1. Beam Kit



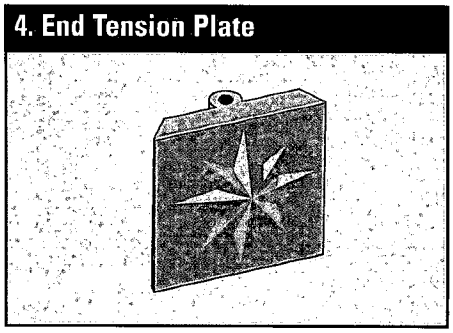
2. Post Kit



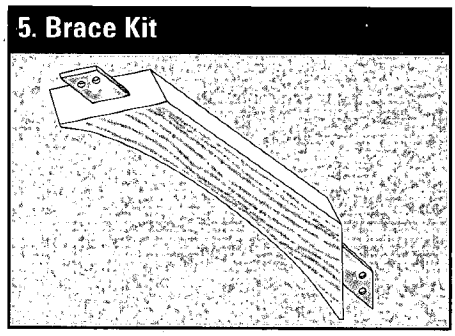
3. Post



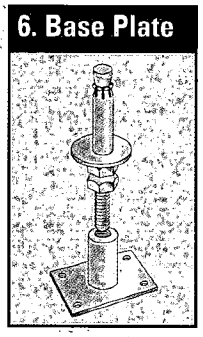
4. End Tension Plate



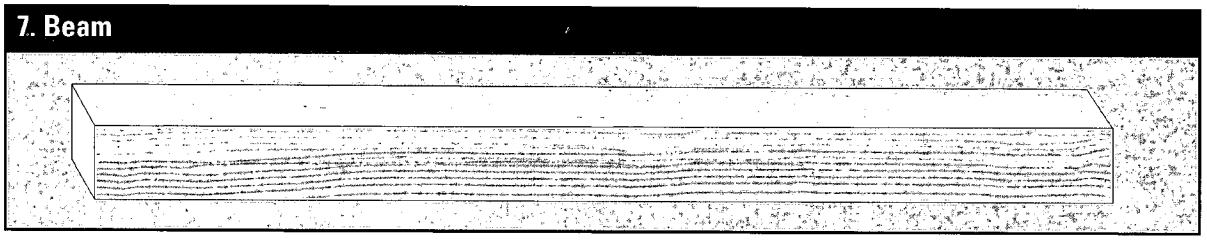
5. Brace Kit



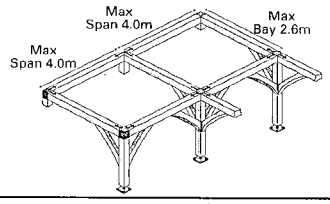
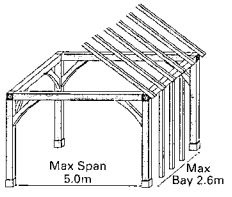
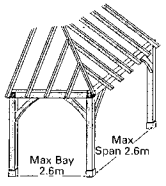
6. Base Plate



7. Beam



Performance Chart

Span	Brace	Typical Applications	Example
0 - 4.0m	Yes	Decking: Maximum 4m along fixed elevation, with a post height up to 2.2m. If post heights shorter than 2.2m are required please ask for details.	
0 - 2.6m	Yes	Multiple bays from fixed elevation, post height 2.2m.	
0 - 5.0m	Yes	Maximum span 5m, maximum bay 2.6m Introduce central post 138x138mm for domestic floor loading. Braces can be replaced by structural stud work.	
0 - 2.6m	Yes	Maximum 2.6m span for roof loading when unsupported by studwork or other post support.	

If bracing is omitted from the Beamlock timber frame structure then separate structural calculations for the use of studwork or infill panels with a minimum structural capability as those recommended on pages 26 and 27.

TEMPLATES

The templates are provided within a box along with the simple step by step instructions for Beamlock pre-assembly and assembly.

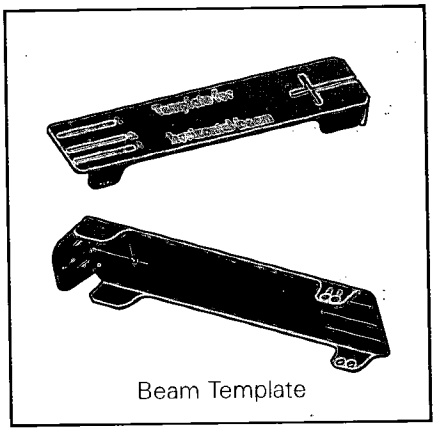
Beamlock templates make the preparation extremely quick as there is no measuring to be done.

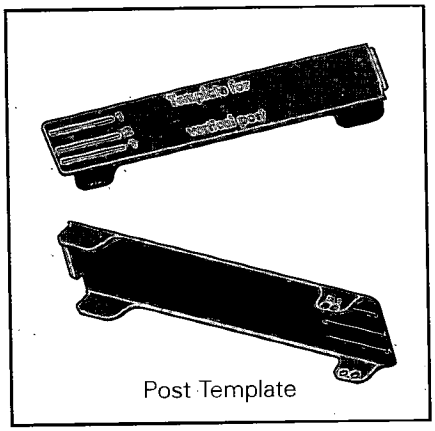
Just choose the appropriate slots and holes for your application, draw around the chosen mortises and complete by slow, gradual routing passes until you reach the appropriate depth.
Also, to help create a vertical saw cut to the beam, clip and fix the beamcut template and saw following the guide.

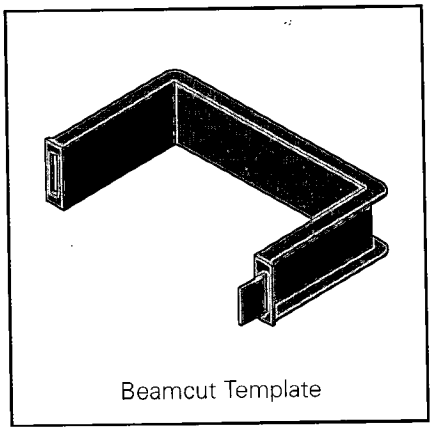
It's as simple as that!

Tools Required

- Saw / Circular Saw
- ¼" Shank Router Bits
  6.3mm for Beam Plates
  7mm for Braces
  Cone Router for 45° chamfer
- Rotary Drill
  12mm wood drill bit
- Hammer
- Tape Measure
- Beamlock Templates
- 34mm Spanner


Beam Template

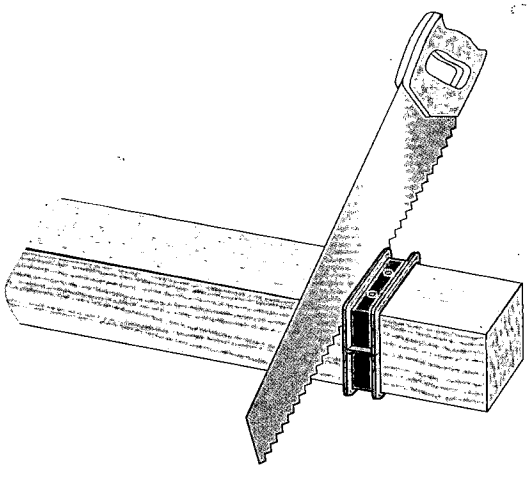

Post Template

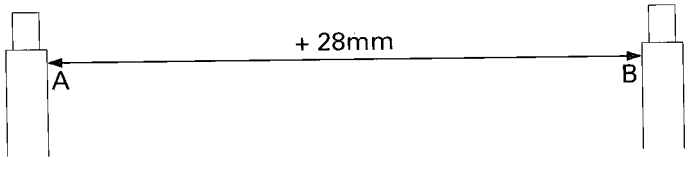

Beamcut Template

PREPARATION OF POSTS AND BEAM

Stage 1

Cut beam to required length: (you may not need to cut the beam). Determine, by measuring between point A and B and adding 28mm for the shoulders of the posts (use the two part beamcut template if required).



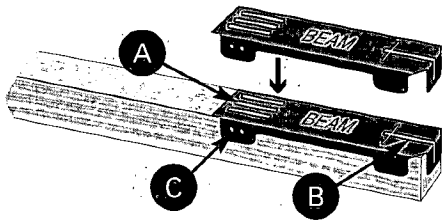


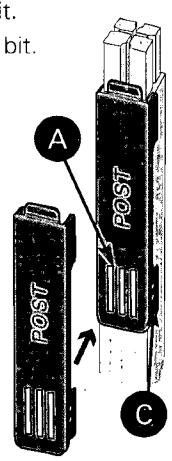
Stage 2

Creating mortises in posts and beams:
Template kit is available to mark out the posts and beams to accept Beamlock fixings. Fix template kit on beam or post end and secure. Draw around the appropriate slots relating to the beam plate or brace. Remember to determine the correct brace positions relative to window and door positions. The braces can either be fitted to the front, centre or back face of the posts and beams. Using a 7mm router bit, gradually route out one of the slots marked A to a depth of 65mm (see template supplied). With a 6.3mm router bit, gradually route out slots B to a depth of 41mm. Drill out the appropriate holes C to fit nail pegs for braces, **ensuring that you drill from the side closest to the groove created for the brace.** After routing ensure all timber debris is removed from the grooves, any sawdust left in the grooves will restrict the positioning of the beamplates.

Mortise A is created using a 7mm router bit.
Mortise B is created using a 6.3mm router bit.

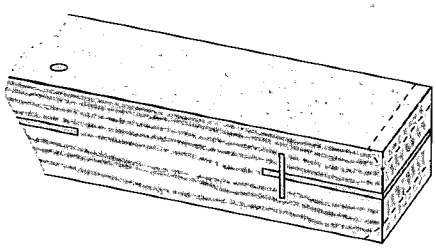
1. Route to a depth of 65mm
2. Route to a depth of 41mm
3. Drill to a depth of 70mm





Stage 3

Beam 45° vertical bevel:
After you have finished the appropriate mortises for the beamplate and brace positions. Mark, using template and cut the beam ends at 45° using the cone router cutter.

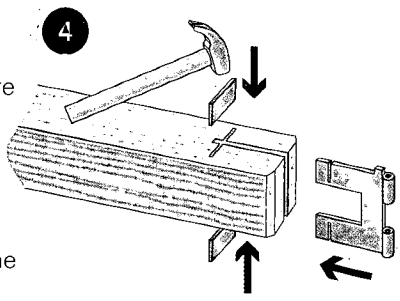


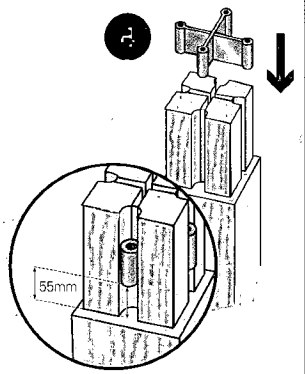
Stage 4

Insert the Beamlock fixings:

4 Beamplate: with the nib at top. The locking plates are hammered in until flush. When fitting the beamplate ensure it is struck at the centre point and not the rounded sections. This helps the correct positioning of the beamplate and will ensure the rounds are not distorted.

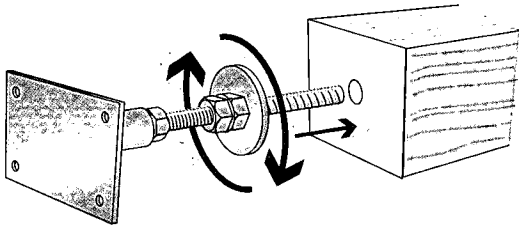
B Cruciform: the cruciform is hammered into position until the lower edge is 55mm above the shoulder of the post as shown.





Stage 5

Finally, before building assembly affix base plate to post: fix the base plate into the hole provided at the base of the post, tighten the top nut clockwise with a 34mm spanner for six full rotations of 360 degrees.



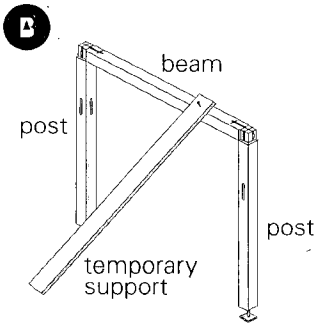
BUILDING ASSEMBLY INSTRUCTIONS

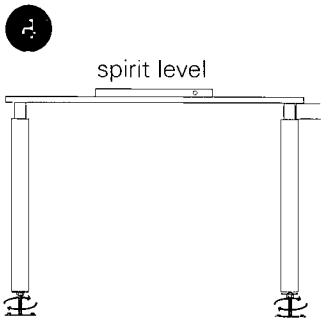
Stage 1

Assemble first pair of posts:

B Lay two posts on flat surface and fix beam by hammering pin into post connection, locking the beamplate into the cruciform. Place the 'goal' posts vertically in the setting out positions and temporally support (with e.g. scaffold board).

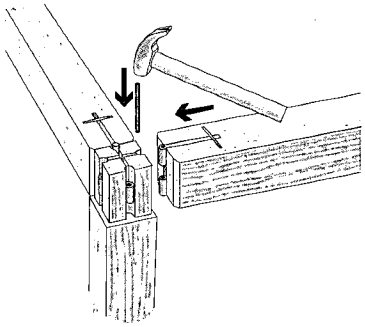
B Check that the post tops are horizontal using a spirit level and straight edge or other means. All post tops must be at the same level. Establish desired eaves height by adjusting base plates.





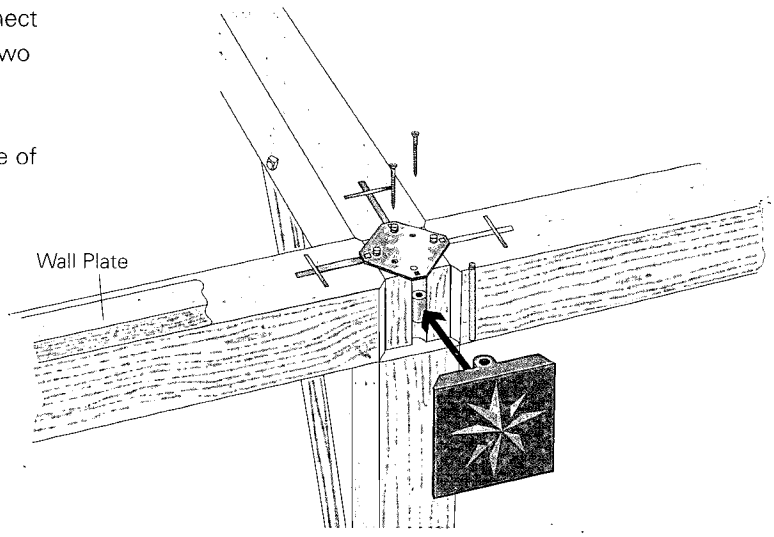
Stage 2

Lower beam into position and fix by hammering fixing pin (apply grease to all pins for ease of insertion/removal) to post connection. Place top plate into position before any further pins are inserted. Continue by tapping pins through top plate into appropriate position.



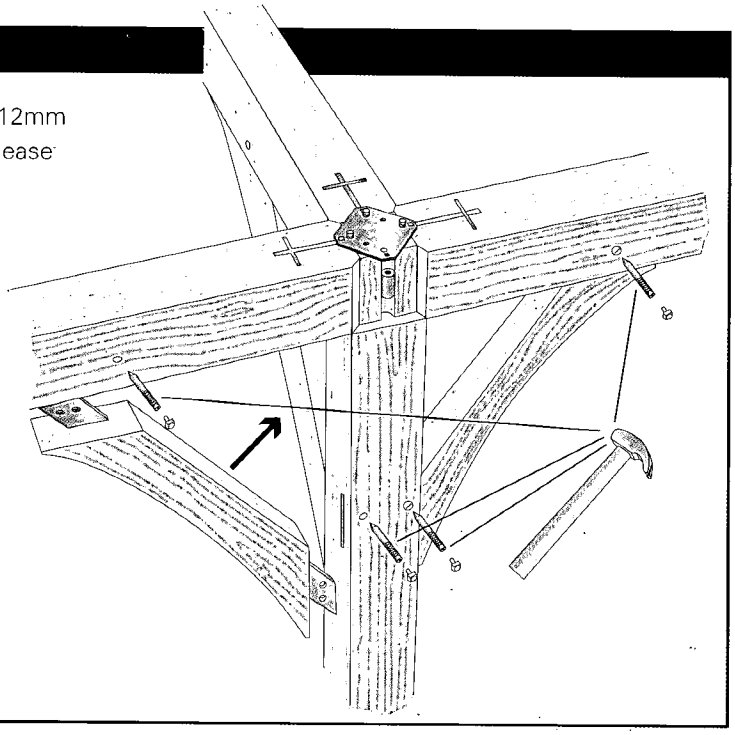
Stage 3

Fix the end plates by using fixing pins to connect to the post cruciform. Secure top plate with two 100mm wood screws.
Recommended - Fix preservative treated 47x100mm wall plates flush to the outer edge of the beam.



Stage 4

Offer up brace into mortises and fix with Beamlock 12mm brace pins (apply grease to all nail pegs and pins for ease of insertion/removal).



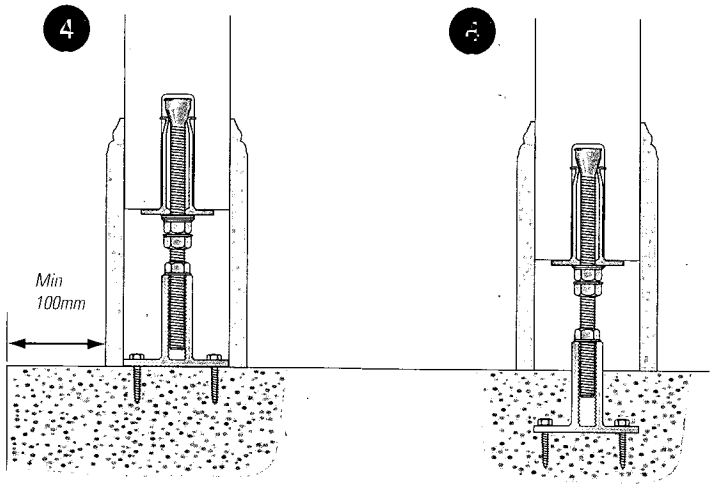
Stage 5 - Important - Base Plate Fixing

The height-adjustable Beamlock base plate is an integral part of the Beamlock Building System and must be fixed to a suitable base (e.g. concrete or brickwork). The fixing of each column base plate should be according to the following:

- Resistance to vertical uplift should be greater than 5.5kN
- Resistance to horizontal shear should be greater than 3.5kN
- The above are working loads and should be factored according to the manufacturer's recommendations
- Chemical fix anchor bolts M10 to an appropriate depth should be provided to all holes in the column base plate and fitted in accordance with the manufacturer's instructions to resist the required loading
- Ensuring a suitable foundation and pull out capacity of the substance should be the contractor's responsibility.

A *Surface Mounted*

B *Below Surface*

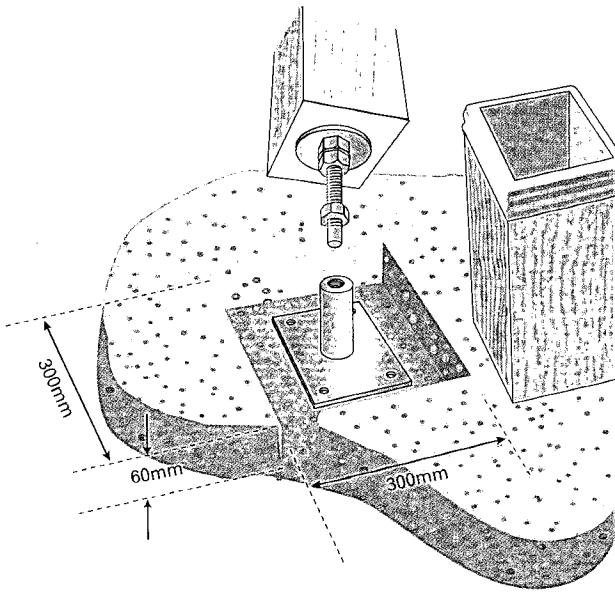


ADJUSTABLE POST SUPPORT

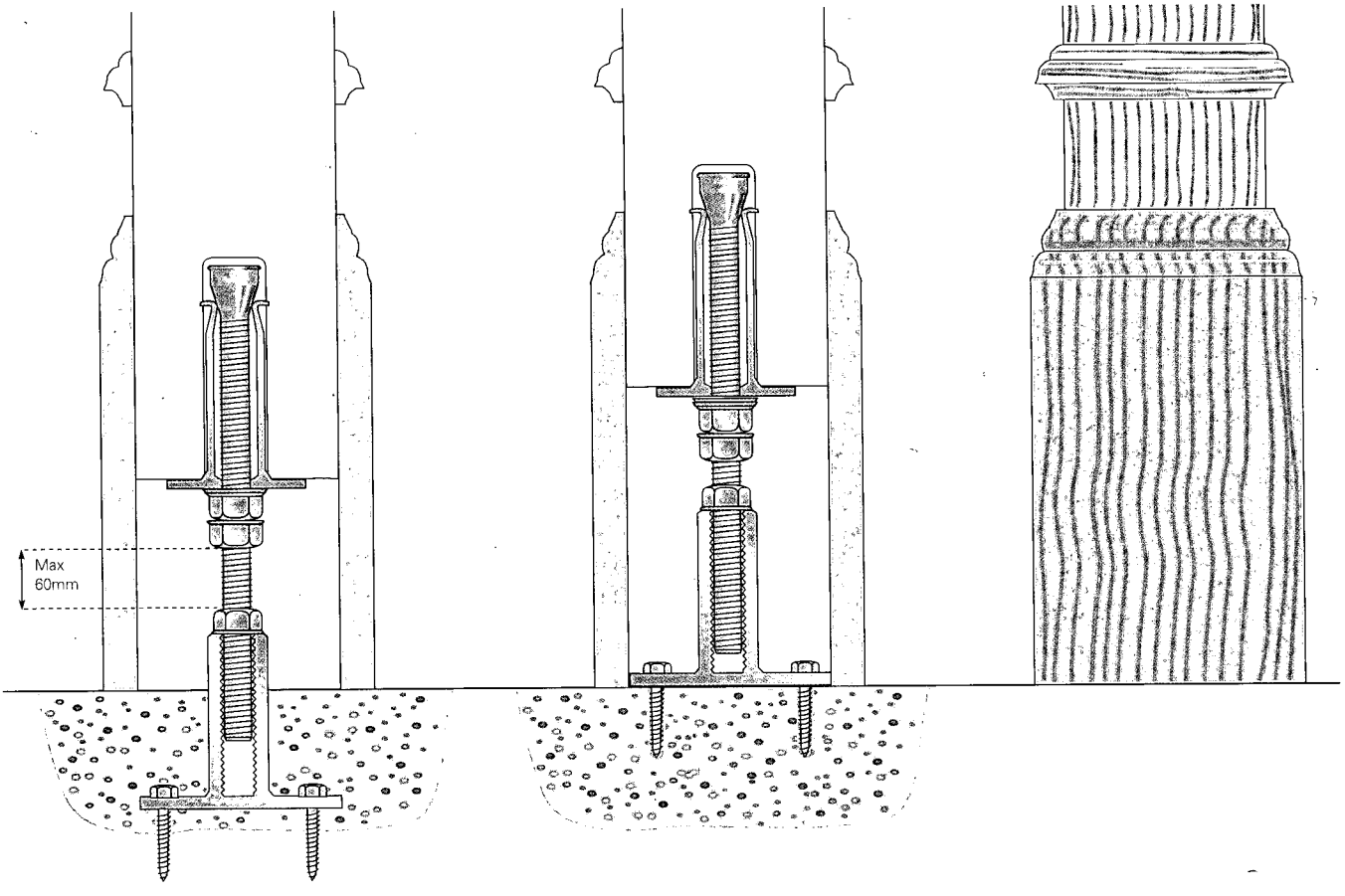
The Beamlock System includes a comprehensive and unique post to ground fixing solution. There are two choices of fixing. (An additional 60mm can be achieved from the same post length giving a maximum eaves height of 2210mm.)

1. New purpose built ground bearing over-site, (partially cover in concrete).
2. On an existing suitable surface, drill and fix.

This specially engineered base plate is designed to maximise full support up to 10 tons, (tension pulling strength 1.3 tons) and at the same time positively fix the post to the ground below. An additional benefit is the 60mm of height of the base plate for an over-site that may not be level, an ideal solution, especially in garages and stables where frequent washing occurs.
Anchor bolts must be designed to resist the minimum unfactored loads referenced elsewhere in this manual.



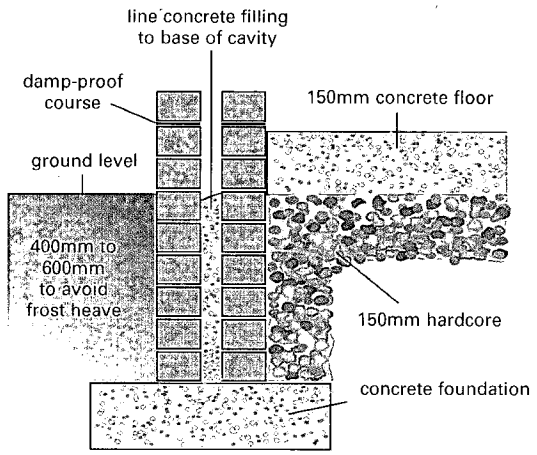
The post support ensures that the timber post is kept out of the ground.



FOUNDATION REQUIREMENTS

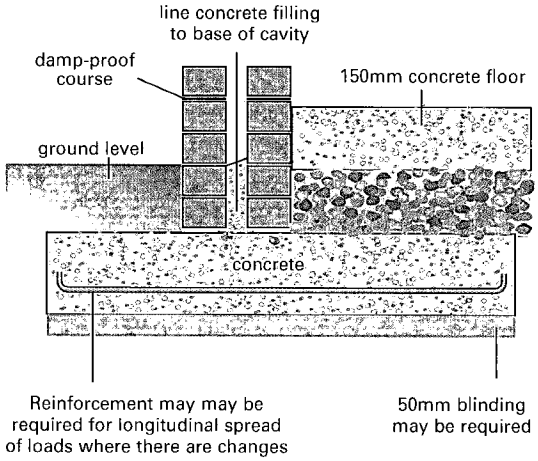
Please refer to your local builder for full advice on a suitable foundation type, however we enclose some guidelines. Typically a foundation type is decided upon by relevant information such as soil conditions, frost heave, proximity to surrounding vegetation, landscape contour (slope of site), fresh landfill, clay, sandstone, loamy soil, water table and structural load. These are all relevant issues that may affect the foundation type (strip, trench, raft or pad foundation). Excavation depth and width, concrete thickness and proximity of concrete to finished ground level is also very important in selecting the correct foundation type for your site to save costs within the ground.

Strip Foundation



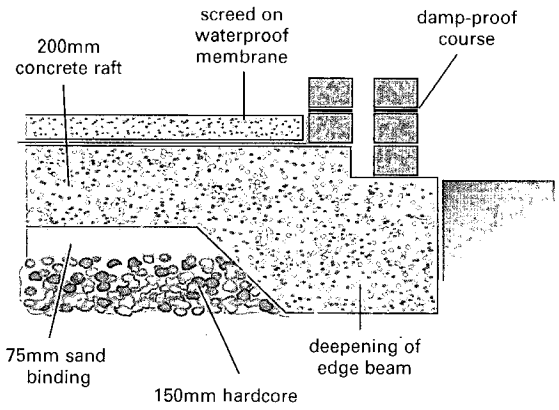
(indicative only)

Pad Foundation



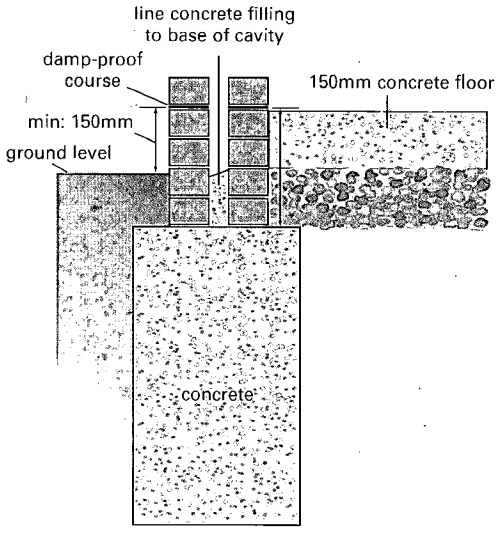
(indicative only)

Raft Foundation



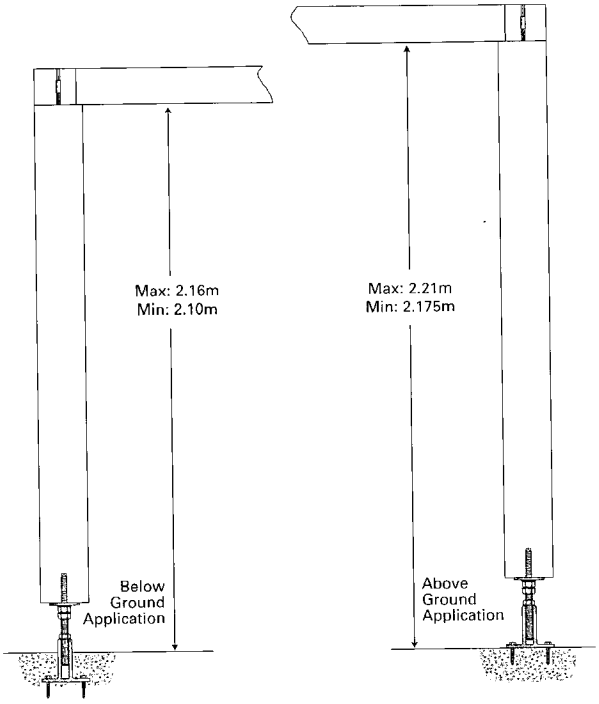
(indicative only)

Trench Fill Foundation

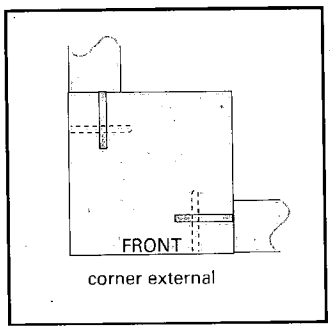


(indicative only)

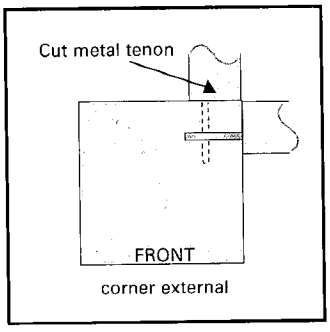
POST SECTIONS



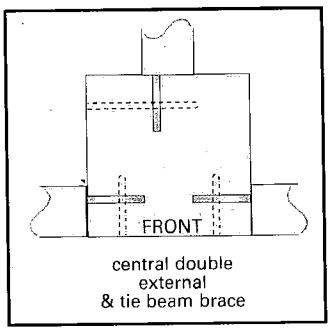
BRACE PINS POSITIONS



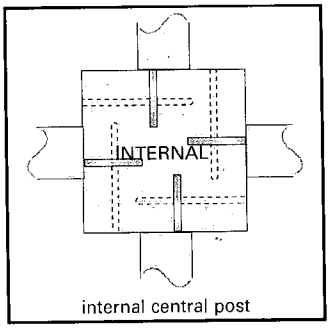
corner external



corner external



central double
external
& tie beam brace



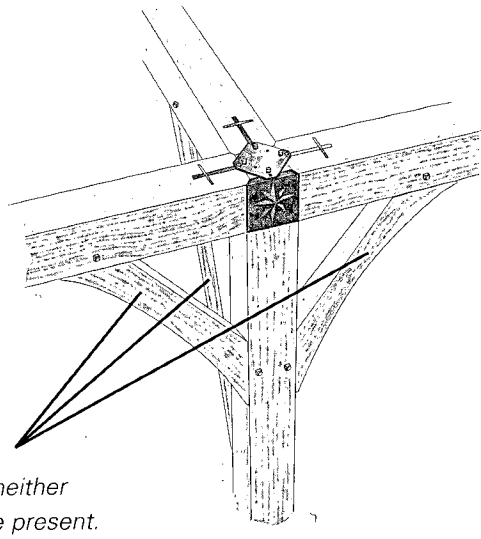
internal central post

STRUCTURAL BEAM TO POST FRAMING REQUIREMENTS

THE BEAMLOCK SYSTEM

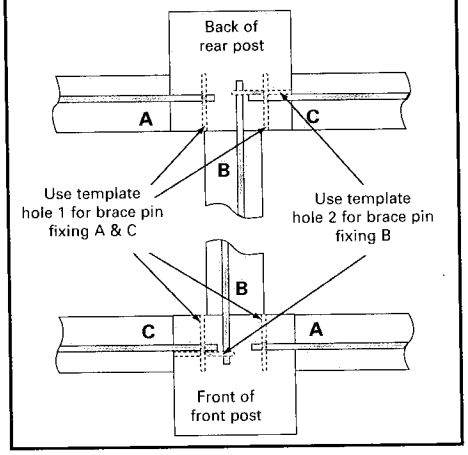
The Beamlock System has been designed to comply with the most recent wind code (BS6399). We highlight a variety of framing solutions that are all pre-approved within limitations assessed by BRE Certification/BRE Limited and therefore do not require further structural justification providing the Beamlock System is used, thus saving professional fees and also enabling you to plan a project quickly.

To assess whether the geographical position of the proposed building has a windspeed which will comply with our structural pre-approved certification please follow the general guide on page 26.



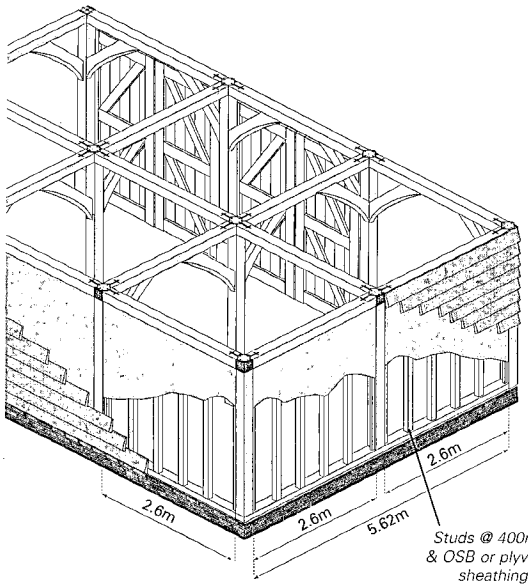
Braces are essential on all independent posts where neither studwork nor sheathing are present. (Exception being support posts, see illustration C, page 25).

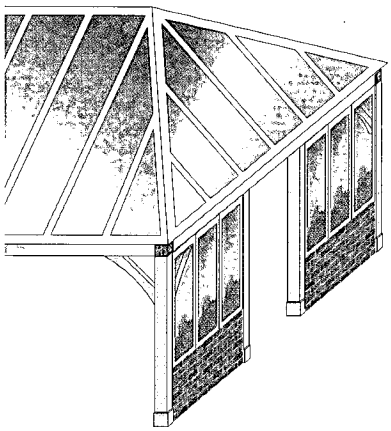
Fitting Sequence (plan view)



BUILDING CROSS SECTIONS

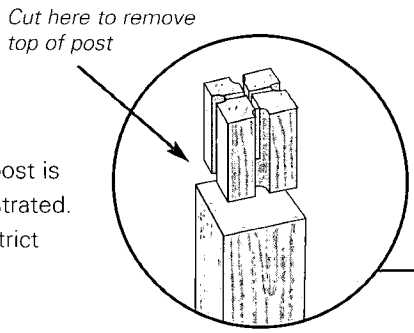
No structural calculation required within limitations assessed by BRE Certification/BRE Limited, compliant to most recent wind code BS6399.
Beam Suitability Proposals 1200mm and 1800mm
Uses: Porches, lean-to's, main frame extensions and gazebos.
Beam Suitability Proposals 2400mm, 2600mm, 3740mm, 4940mm
Uses: Extensions, conservatories, garages, gazebos, stables, sunshelters, garden rooms, outbuildings and commercial.

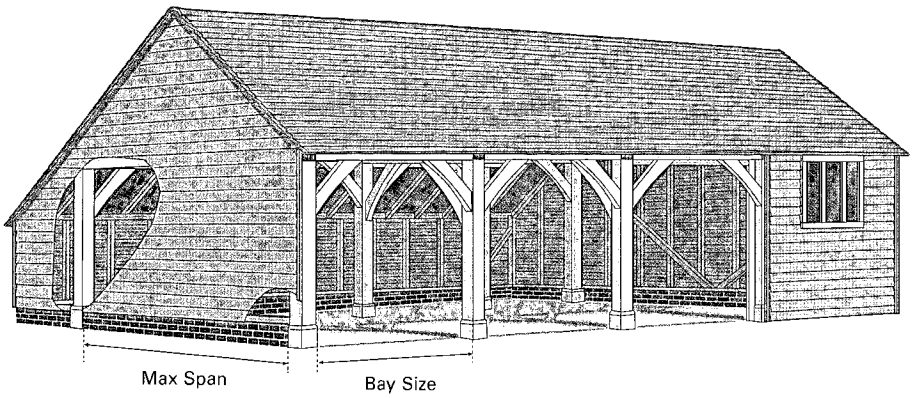




SUPPORT POST

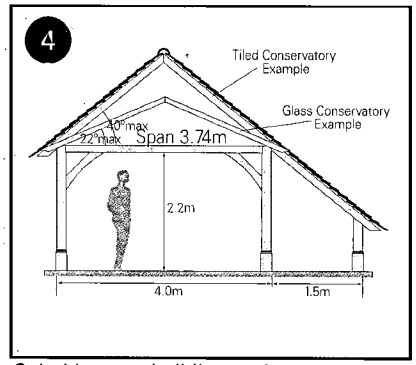
Braces are not required when the post is used as a support post only, as illustrated. Attach beam to support post to restrict lateral movement.



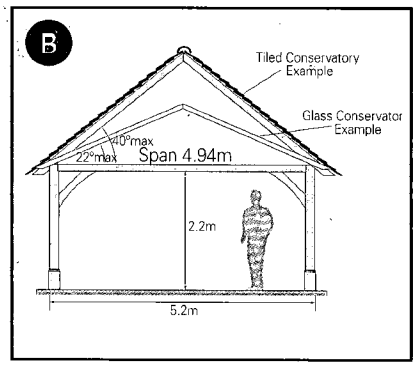


EXAMPLES OF CROSS SECTIONS

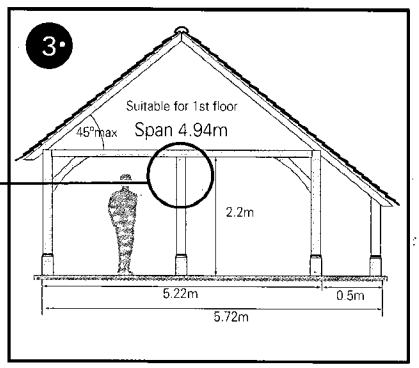
The examples are for illustrative purposes only.



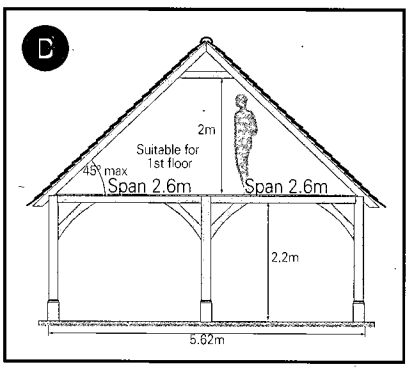
Suitable span building code C1, E1, G1 and G2



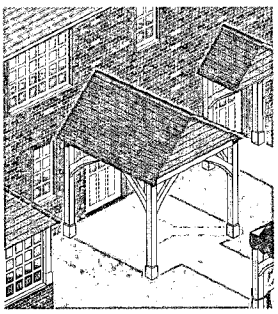
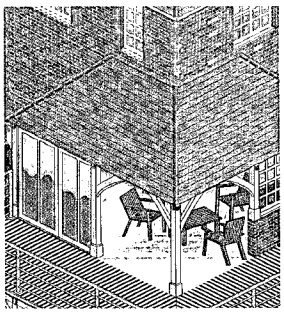
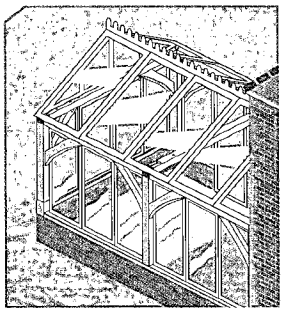
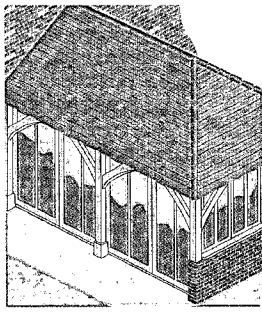
Suitable span building code C1, E1 and G1

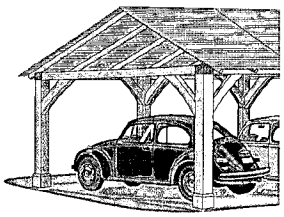
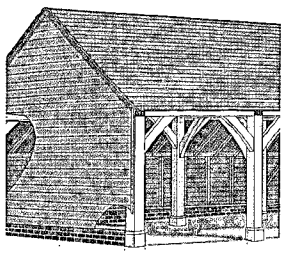
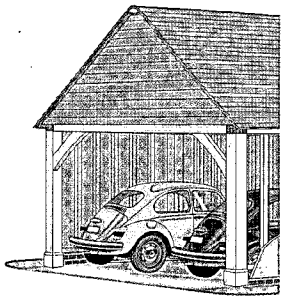
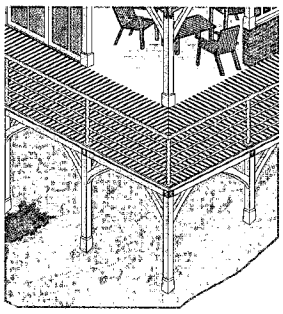


Suitable span building code C1 and G2



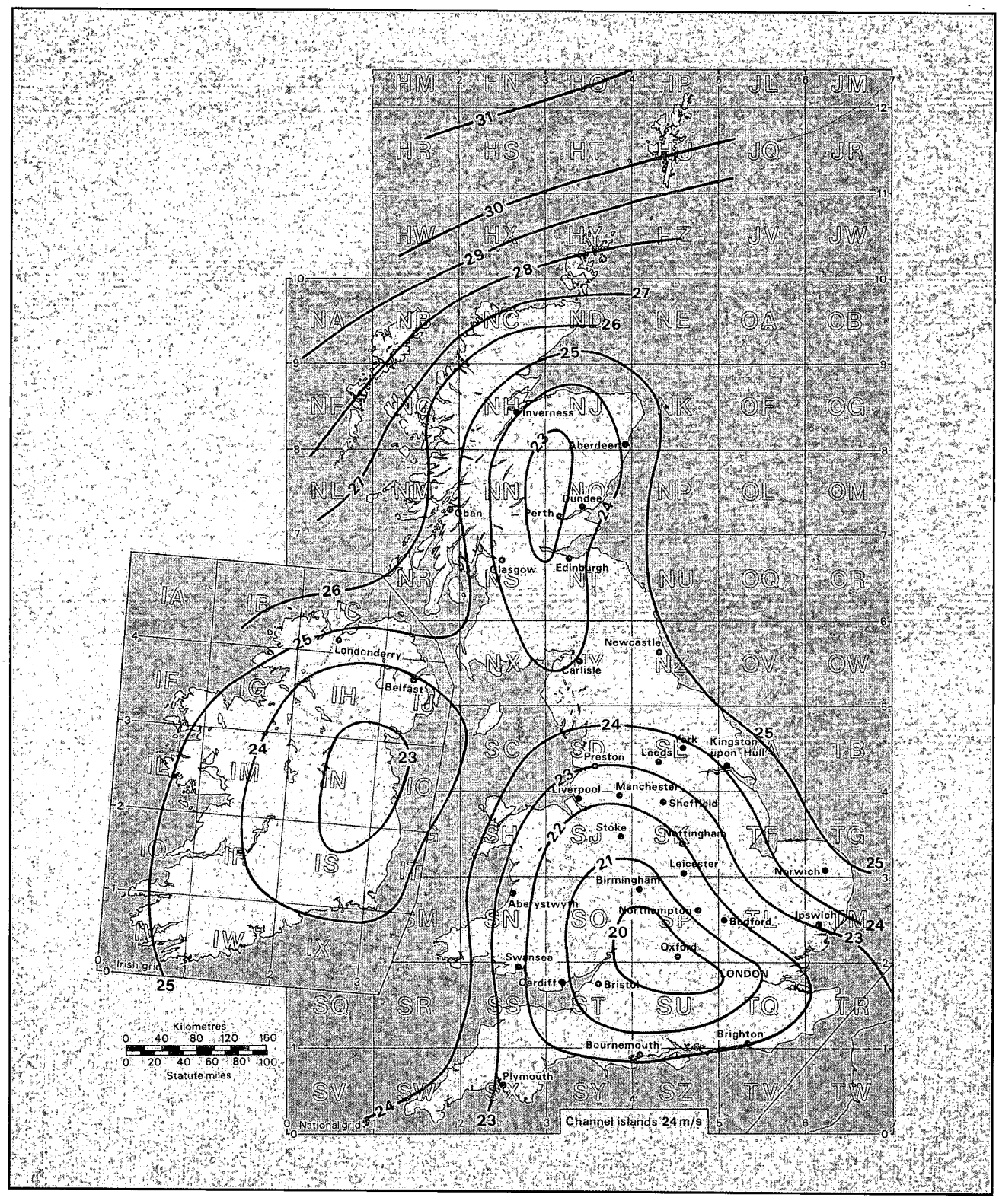
Suitable span building code G2

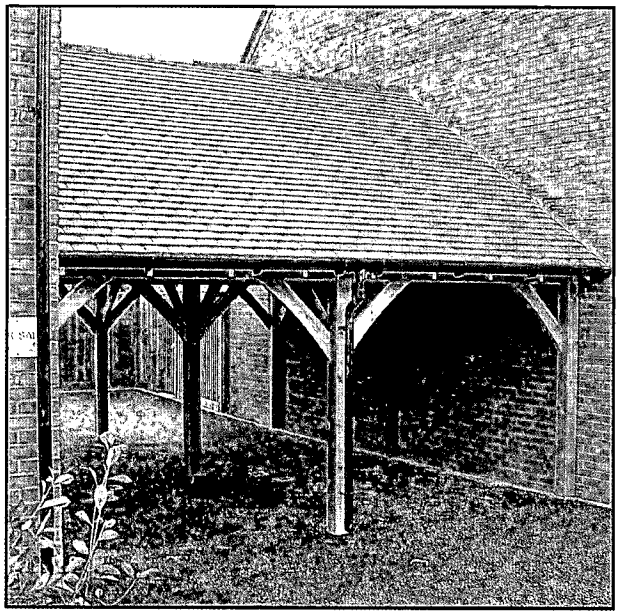
Building Code	P1	L1	C1	E1
Proposed Application	Porch	Lean To	Glass Roof Conservatory	Extension
Typical Application				
Frame Specification	Braces on all posts. Attached to property.	Braces on all posts. Attached to property.	Braces on all posts. Maximum 22 degree roof pitch. Attached to property with 16mm chemical fixing anchor.	Braces on all independent posts. Tile or slate roof 40 degree maximum pitch. Attached to property with 16mm chemical fixing anchor. 47x150mm ceiling joist. 12.5mm plasterboard for ceiling.
Max Span	4.0m	2.4m	4.94m	4.94m
Bay Size	2.4m	2.6m	2.6m	2.6m
Max No. of Bays	2 from house	1 from house	3 from house	3 from house
Windline (up to)	Maximum altitude	Maximum altitude	Maximum altitude	Maximum altitude
21	458m (✓)	420m (✓)	410m (✓)	410m (✓)
22	380m (✓)	350m (✓)	333m (✓)	333m (✓)
23	310m (✓)	270m (✓)	262m (✓)	262m (✓)
24	240m (✓)	200m (✓)	197m (✓)	197m (✓)
25	179m (✓)	140m (✓)	136m (✓)	136m (✓)

G1	G2	G3	D1
Freestanding Structure (no walls)	Freestanding Structure open on one side only	Freestanding Structure open on one side only with facility for up and over door	Decking
			
Braces on all posts. Proposals e.g. open garaging, outside covered area, gazebos, sunshelters. Rooftiles, slates, composites or bamboo with maximum 40 degrees pitch.	Braces on all independent posts. 47x100mm studs at 600mm c/s nailed to the Beamlock frame. 11mm OSB to be nailed to the stud framework using 3.75x50mm wire nails at 100mm c/s. 47x150mm joists at 400mm c/s to span maximum of 2.6m. 12.5mm Plasterboard for ceiling. Rooftiles, slates, composites or bamboo with maximum 40 degrees pitch.	Braces on all independent posts. 47x100mm studs at 600mm c/s nailed to the Beamlock frame. 11mm OSB to be nailed to the stud framework using 3.75x50mm wire nails at 100mm c/s. 47x150mm joists at 400mm c/s to span maximum of 2.6m. 12.5mm Plasterboard for ceiling. Rooftiles, slates, composites or bamboo with maximum 40 degrees pitch.	Brace on all posts. Attached to wall on one elevation or more with 16mm chemical fixing. Suitable for domestic floor loading. Intermediate joist 47x150mm @ 400mm c/s.
4.94m	4.94m	4.94m	4.0m
2.6m	2.6m	2.6m	2.6m multiple bay
10 from house or independent	10 from house or independent	2 bays	10 bays
Maximum altitude	Maximum altitude	Maximum altitude	Maximum altitude
405m (✓)	505m (✓)	425m (✓)	480m (✓)
325m (✓)	425m (✓)	350m (✓)	400m (✓)
250m (✓)	350m (✓)	275m (✓)	345m (✓)
190m (✓)	280m (✓)	280m (✓)	280m (✓)
130m (✓)	218m (✓)	150m (✓)	195m (✓)

GEOGRAPHICAL PRODUCT APPROVAL CHART

If you know your altitude and can identify the windline you are within look at the table on the previous two pages for a guide only. If it has a tick (✓) in the box you can use the Beamlock System following the principle guidelines shown under specification, which is all pre-approved within limitations assessed by BRE Certification/BRE Limited under current building regulations.

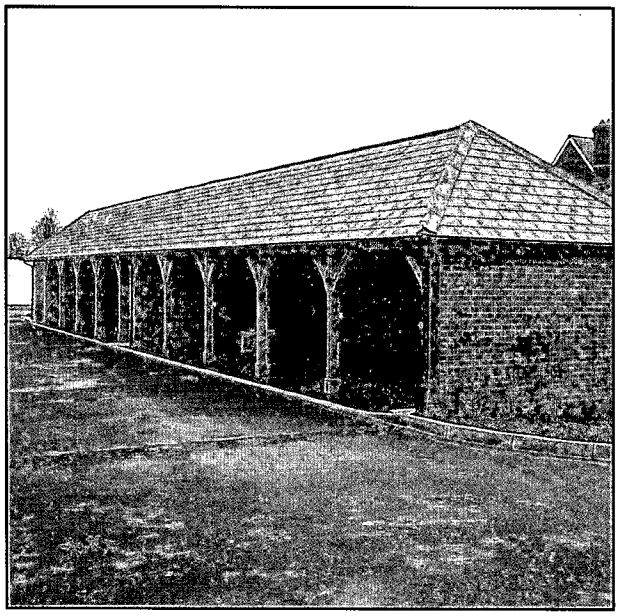




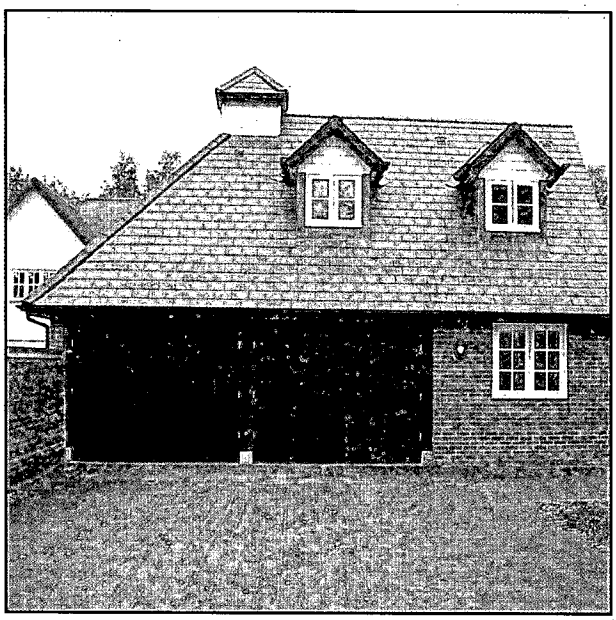
Covered walkway



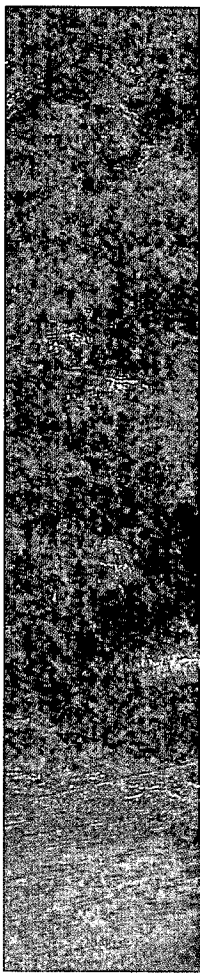
Pergola



Garages



3 bay structure with first floor loading



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Wood is the only building material that is truly renewable, if well managed. Forest certification schemes give assurance that the timber is legal and from sustainable sources. Finnforest UK sources certified timber over uncertified and is an approved Chain of Custody supplier.

Finnforest is associated with the wood. for good. campaign.

FF739 March 2004.

The photographs in this brochure are for illustration purposes only: Finnforest reserves the right to change the range without notice.

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