

SWEDISH TIMBER HOUSES
ERECTION MANUAL



TYPE D
SCOTTISH RURAL

SWEDISH HOUSE
SWEDISH HOUSE SYSTEM
TYPE D. SWEDISH AND NORWEGIAN HOUSE

GENERAL

The house is of the three bedroom type with 2 bedrooms in roof space and a single storey outbuilding attached. It is intended for erection as a pair of semi-detached houses.

The materials supplied by Sweden comprise:

- (1) Prefabricated walls and partition panels complete with doors, windows and ironmongery.
- (2) Floor and ceiling joists, keel plates and rafters cut to length, notched and checked.
- (3) Floor and roof boarding in falling lengths.
- (4) Staircase and balustrades.
- (5) Architraves (cut to approximate lengths), skirtings and other trimmings in falling lengths.

The full list of materials supplied by Sweden is set out in a schedule of Parts which also details the code marking applicable to each part, to which reference is made in this manual and the erection drawings.

The parts will be erected upon foundations and between brick party walls, chimney stacks, etc. previously erected, due provision being made for the necessary trimming of joists and rafters round hearths and chimneys.

The following instructions relate only to the erection of timber portion of the house and do not cover foundations, brick-work, roof battens and covering (e.g. tiles), drainage, paths or fences.

The instructions are given in detail for the left hand house of a pair (viewed from front) but are equally applicable to the right hand counterpart. It is desirable that the right-hand house should be erected concurrently with or immediately following the left-hand house. In any case keel plates of house No. 2. should be laid before wall panels of house No. 1.

The following drawings and diagrams to be referred to with this Manual are as follows:

Erection Drawings

11. Plan of ground floor construction
12. Plan of ground floor wall panels
13. Plan of first floor construction
14. Plan of first floor wall panels
15. Plan of roof construction
16. Section through house and outbuilding
17. Front elevation of house
18. Rear elevation of house
19. Gable end elevations
20. Porch details
21. " " "
22. Details of ground floor wall construction

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Operations 4 and 5 may be deferred until final adjustments to wall panels have been made

Select external wall panels and corner posts for main building from stacks and lay on floor joists in position ready for erection.

Commence with I2 -17 fit around end of party wall and support by strut as shown in diagram No.2. Next raise panels 2-5 and 2-4 and skewnail to adjoining panel.

Panel 2-3 is then erected, skewnailed and supported internally and externally by timber struts as illustrated.

Erect and secure panel 2-2. Then remove temporary battens from groove in panel 2-16, open out flaps of impregnated paper, insert junction post 2-19 and nail to frame of panel.

Panels 2-1 and 2-16 should be erected together and secured with temporary timber angle stay fixed across tops of panel (see diagram No.2.)

Then set up and skewnail units 2-15, -14, -13, -12 and -11 together with junction posts 4-1 and first panel of internal spine wall 4-2 to act as stiffener.

Locate corner post 2-18 at angle of building and erect together with the adjoining wall panel 2-10.

Secure with temporary stay as previously described.

Next erect and fix panels 2-9, -8 and -7, strutting -8 internally and externally.

Fix panel R2-17 (of the right hand house) around end of party wall and support as previously described for I2-17.

Finally insert panel 2-6 and skewnail to adjoining panels.

The internal spine wall panels should now be erected on the width of floor board previously described.

Spike junction post 4-1 to angle of chimney breast, erect panels 4-9, -8, -7, -6, -5, -4 and -3 in order, skewnailing to each other and to junction post. Strut panels 4-5 and -7 temporarily to floor joists.

Check position, alignment and plumb of spine wall and skewnail bottom frame of panels to joists using No.2 3" nails at each alternate joist.

FIRST FLOOR CONSTRUCTION

The upper wall plates may now be laid. In doing so care must be taken to see that the lower wall panels are properly aligned and plumb. Remove temporary angle stays as required, but retain all raking struts.

Commence by laying wall plate 7-2, followed by 7-1, -3, -4, -5 and -6 in order. Next fix the two spine wall sections 7-8 and -7.

Fix plates to wall panels with 5" nails at 3' centres. At all halved joints No.2 5" nails to be used.

1st floor
Joists

The first floor joists should now be laid. These are located by spacer pieces fixed to wall plates and may be laid in the most convenient order. Skewnailed ends of joists to wall plates with 3" nails as for ground floor.

Select trimmers and bracing joists and secure to supporting members by means of the metal straps provided.

Ends of joists abutting over spine wall to be spliced as described for ground floor with splicing pieces 11-2.

2" nogging pieces 11-4 to be inserted between joists where shown on erection drawings to secure top of partitions.

Battens 11-5 to take edges of fibre board should be fixed at side of joists where shown on erection drawings No. D3.

OUTBUILDINGS

Keel plates

At this stage lay keel plates of outbuilding. Select units 1-34, -35 and -31 and lay along outer wall line. Follow with internal plates 1-32, -33 and -36 and set on raised concrete curbs.

Check dimension, alignment and level and see that plates are laid truly square. Check projection of 1/4" over outer foundation walls. After checking, nail halved joints with No. 4 2" nails.

Outer wall panels

Remove temporary battens in main wall panel 2-15, open out flaps of impregnated paper, insert junction posts 3-14 and nail to frame of panel 2-15 (see diagram No.5).

Next erect and fix to junction post panel 3-5 corner post 3-13 and adjoining panel 3-4. Follow with panel 3-12 and 3-3.

Thereafter erect in order panel 3-2 and -1, corner post 3-11, gable panels 3-10 and -9, angle post 3-16 and wall panels 3-8 and -7.

Fix junction post 3-15 to main wall panel 2-14 as before described and finally insert wall panel 3-6.

Wall plates

Next lay wall plates 10-1 and -2 along top of wall panels (after checking that the latter are correctly aligned and plumb) and fix to panel tops with 5" nails at 3' centres. Angle stays to be removed during this operation.

Ceiling joists to outbuilding

Ceiling joists should now be laid. These are located by spacer pieces fixed to wall plates and may be fixed in the most convenient order. Skewnailed end of joists to wall plates with 3" nails as for main building. Also nail joist to inner face of small gable wall with No.2 4" nails at each panel joint.

Insert nogging pieces 11-4 between joists as shown on erection drawing No. D3 for fixing of internal partition.

Inner partitions

Nail junction post 5-1 to wall panel 3-9 and angle post 3-13, insert partition panels 5-2 and -3, and skewnailed at vertical joints and along floor plates.

Check that partition is truly aligned and plumb and skewnailed to ceiling joists and nogging pieces.

/PORCH

Fix temporarily $1\frac{1}{2}'' \times 1\frac{1}{2}''$ battens to outer face of wall panel 2-9. Upper edge to be at $4\frac{1}{2}''$ below underside of first floor joists. Then cut posts 6-1, and 6-2 to exact length and place them on dowels previously fixed to concrete slab in position indicated on erection drawing No. D11. Strut post temporarily.

Next hoist ceiling panel 6-3 into position resting on $1\frac{1}{2}'' \times 1\frac{1}{2}''$ temporary battens previously fixed and on posts. Nail frame of panel to outer face of wall with No.12 3" nails. Check that posts are plumb and skewnail frame of panel to top of post. Fix $2'' \times 6''$ nogging pieces 6-4 between rafters of main building to support rafters of porch. Then place the four rafters 6-5 on top of frame of ceiling panel and on nogging pieces, and nail to rafter and ceiling panel. Repeat operation at opposite gable end (6-7). Fix vergeboards 6-8 and 6-9 to each gable.

Erect balustrade panel 6-10 and fix to post 6-2 and to panel 2-8. Then fix support for seat 6-11 to dowel in concrete slab and secure seat 6-12 in position.

ROOF CONSTRUCTION

Select main gable wall panels 8-1, -2, -3, -4 and -5 and lay on first floor joists in positions convenient for erection.

The panels can be hoisted by hand without special tackle, but it may be of assistance to make use of a simple slide such as a short ladder or pair of smooth planks.

First erect panel 8-5 and strut temporarily to joists, keeping top of strut approximately 9" down from raking top of panel.

Next erect panel 8-4 and slide partially into position behind chimney stack. Immediately follow with erection of 8-3 and skewnail to panel 8-4. Then slide both panels along until 8-4 closes up to 8-5. Skewnail together. Strut panel 8-3 to joists close to side of chimney, keeping top of strut 9" down from raking top of panel. Complete gable end by erection of panels 8-2 and -1.

Nail rafters 13-1 and 13-2 to inner face of gable panels with No.2 4" nails at each panel joint and at ridge.

Trusses

Form full trusses to main roof with pre-cut rafter 13-2 and built up ties 13-5. Ends of ties should be fitted around rafters, locating by means of marks thereon and spiked with No.4 4" nails at each joint. Nails should be clinched. Secure halved joint at ridge with No.4 3" nails.

It may be found convenient to construct trusses on the ground and hoist them into position (see diagram No. 4.).

Alternatively a temporary ridge piece may be erected and the trusses built up in situ.

The special half-trusses over centre of dormer windows are formed with rafters 13-2, 13-3 and built up ties Nos.13-6. Rafters 13-10 to be added after dormer panels are erected.

Commence by erecting full truss nearest gable end. If pre-built and hoisted, feet of truss should be placed against ends of joist upon which it will finally rest. Raise truss to vertical position and lift feet of rafters onto ends of joists. Tie to gable end rafters with lengths of boarding and skewnail feet to ends of joist with No.2 4" nails.

Rafter 13-2, -14, -15 and tie 13-16 to be nailed to brick

Select short lengths of splicing battens 11-3 provided and fix to both sides of joint and rafter feet with No. 3 1/2" nails on each side.

Repeat remaining full brusses in similar fashion, holding in position with lengths of boarding equal to top of rafters.

Select half brusses over dormer supporting feet of short rafters 13-3 on 2" x 6" beam 13-2 and smallest busses; long rafters 13-4 being supported on ends of joint and fixed as previously described.

2" x 6" beam across top 13-5 of adjacent full brusses, and is spiked through and to underside of rafters.

Dormer

Select dormer chords (panels 8-6 and 8-7), hoist and set in position 1" clear of adjoining rafters.

Brace front panel of dormer 8-6 and skew nail to outer edge of chord panel. Similarly erect the other dormer using panels 8-9, -10 and -11.

Select short rafters 13-10 and spike to inner face of dormer chords flush with raking tops of panels. Insert rafter 13-11 between projecting top 13-6 of intermediate half bruss, nail through with No. 4 1/2" clinched nails, and secure at head to top of rafter 13-4 and at feet to end of dormer window frame with No. 2 5" nails.

Finally fix short rafter 13-4, secured at head to panels 8-6 and -11 and at feet to end of floor joists.

Vertical sliding

Construct vertical studding 13-7 and -8 to form walls to bedrooms and linen cupboard.

Secure to rafters and floor joists as shown on section drawing and trim at back of linen cupboard for hatch mark XI-1.

Outbuilding roof brusses

Form brusses to roof of outbuilding with built up ties 13-13 and pre-cut rafters 13-12. Ends of ties should be fitted around rafters, locking by means of screws through and spiked with No. 4 2" nails at each joint. Nails should be clinched. Secure halved joint at ridge with No. 4 2" nails.

As in the case of the main roof, brusses may be built up on the ground and hoisted into position.

Set rafters 13-12 against main gable wall and spike to the same with No. 2 1/2" nails at each section joint.

Repeat same operation at inner face of small gable wall.

Common cresting truss nearest to gable end as described for main building.

Secure in vertical position with lengths of roof boarding laid across top of rafters.

Select short lengths of splicing battens 11-3 provided and fix to both sides of joints and rafter feet with No. 3 1/2" nails to each side.

Reynolds' may be fixed to gable panels of both main and outbuilding.

First fix lower section and blocking pieces 14-9 and -10. Spike to upper frame of gable panels, top of blocking pieces being kept flush with raking top of panels.

The upper bargeboards 14-11 and -12 should be nailed through lower timber and also into ends of roof boarding after the latter is fixed. These operations can be carried out over-land. Fix similarly bargeboards to outbuilding (14, -17, -18, -19, -20 and -21).

Eaves Soffit

Nail inner soffit board 14-1, -2, -3 and -4 to end of rafters and skew nail lower edge to weather-boarding. Finally, secure outer soffit boards 14-5, -6, -7 and -8 in position as shown on erection drawing No. 14. Similarly fix soffit boards to eaves of outbuilding (14-13, -14, -15 and -16).

External roof boarding

Lay $3/8$ " roof boarding to both main and outbuilding roofs, also to dormers and porch. Continue as soon as possible with battening and tiling or other roof covering (not supplied with house-parts).

Flashings

Zinc or copper cover flashings are to be provided and fixed by Erection Contractor at junction of outbuilding roof with main gable wall (see diagram No. 2).

Lead or other soakers (or alternatively raking gutters) must be provided and fixed by erection contractor and turned up against weather-boarding.

The cover flashings should then be inserted in the raking groove in wall panels, pushed up under boarding and nailed in position with galvanised or copper nails. Provide and fix similarly zinc or copper cover flashings to cheeks of dormers, together with soakers or raking gutters.

GROUND FLOOR BOARDING

Remove interior struts to wall panels on ground floor and lay $1\frac{1}{2}$ " tongued and grooved boarding, secret nailing to joists with 2" nails.

GROUND FLOOR PARTITIONS

Fix vertical junction post 4-1 against outer wall panel 2-3 and at joint between 4-4 and -5, fixing with 3" nails at 2' vertical centres. Then set up panels 4-10, -11, -12 and -13 skew nailing at all joints with 2" nails located in pairs at 2'0" vertical centres.

Check that partition is correctly located, aligned and vertical. Then secure at head by skew nailing to joist over and at feet to floor boarding.

Next erect panel 4-14, -19, corner post 4-1 and panels 4-15, -16, junction post 4-1, panel 4-17, and -18. Secure in similar fashion except that heads of panels parallel to joists are secured by nailing through nogging pieces.

Erection of junction post 4-1 and of panel 4-20, -21, -22 and -23 should follow in order, secured as before to joists over.

At this point the staircase section should be brought in and assembled as described under the appropriate heading.

Thereafter panel 4-27 should be erected against outer stair truss and screwed up through fillet 18-3 (see erection drawing No. D11) into underside of trimming joist 7-16.

Next locate and fix under stair panel 4-24 and -25, secured by skew nailing as before.

Finally, place in position unit 4-26 and secure to adjoining panels, floor and first floor joists as before described.

The staircase is constructed in two parts.

First set lower portion 18-1 in position tight against external wall panel and partition panels 2-8, 4-20 and -21. Next erect upper section 18-2 with head of stringers resting against trimmer 7-19 and secure thereto with 4" nails; feet of stringers rest upon top tread of lower stair section.

Secure upper stair by nailing through outer and inner stringers (on underside of stair) to trimming joist and into framework of partition panel with 4" nails.

Similarly fix lower part of stair (18-1) by nailing to wall panel.

Fix wrought batten 18-3 to underside of trimming joist to take upper member of balustrade panel 4-27.

Fix additional wrought batten to underside of batten 18-3 between panel 4-27 and outer wall panel.

FIRST FLOOR BOARDING

Remove struts to gable wall panels and lay 1" boarding between studs as described for ground floor.

Trim floor boarding around hearths and to top nosing of staircase.

Form rough framing and platform for standard cupboard type E in bedroom No.2. and line externally with 1" floor boarding.

Form outer walls and ceilings to bedrooms and linen cupboard by nailing 3/4" boarding to inner face of studs, rafters and ties. Over lower part of staircase a strip of boarding should be nailed to underside of rafters on each side of stair.

Make soffit boarding over stair to be fixed to batten nailed to face of partitions. This operation to be carried out after spandrel panels 9-1, -2, -7 and -8 are erected.

FIRST FLOOR PARTITIONS

Begin by nailing a width of flooring along upper surface of ceiling joist at sides of staircase to make up thickness of floor boarding previously laid on remainder of joists. The board to be flush with face of joists on stair side.

Next erect spandrel panel 9-1 followed by panels 9-2, -3, -4 and -5. Skewnail to floor, ceiling and to each other as previously described. Then erect panels 9-7, -8, -9, -10 and -11 in similar fashion.

Finally erect and fix panel 9-6.

HATCH TO ROOF SPACE

Hatch and frame 21-1 to be fitted to rough framing in studding previously described.

MISCELLANEOUS

These members are supplied in approximate lengths. Fix in position indicated on erection drawings securing with 1 1/2" oval nails. Mark numbers of architraves and the windows or doors to which they relate are fully listed in schedule of parts.

Skirtings-

Supplied in falling lengths. Great care must be taken to cut these with as little waste as possible, and it is recommended that the longer runs should be fixed first.

Corruges and corner beads

Door furniture

Be-hang doors. Fix door handles and plates. Handles for front door are square-section and can be identified by their circular roses. First apply circular metal discs to each side of door and fasten with threaded bolts. Then insert spindle and fix roses and handles with small tap screws to each side of door.

Back door handles are round in section and are provided with elongated rectangular metal plate which must be affixed with wood screws provided. Fix loose handle with pin provided.

Handles to internal doors are of circular plastic material and - together with rectangular metal plates - are fixed as described for back door handle.

Coal boards

Fix battens for coal board 21-2 as shown on drawing No. 22. and insert board 21-3.

Internal vents

Fix internal ventilator hoppers into vent opening in bathroom and larder, providing suitable cord to operate spring hopper for the former.

General

Remove all temporary struts and nail weatherboarding to keel plate with 5" nails at 1'0" centres. Also nail lower end of weatherboarding of first floor panels to wall plate with 4" nails at 1'0" centres. Galvanised nails to be used.

Engineering Services

Installation of engineering and plumbing services must be carefully organised and timed to suit house erection programme.

For instance, services located below ground floor must be run before floor boarding is laid, but any delay in laying floor boardings will in turn hold up erection of cross partitions, staircase, etc.

Unless, therefore, engineering work proceeds in step with the general sequence of operations as laid down in this Manual, considerable delay will result.

It is suggested that engineers should enter the house whilst carpenters are working on the roof construction, and should run all necessary service lines below ground floor joists. Meanwhile, drilling of $\frac{1}{2}$ " diameter holes at mid-depth of first floor joists for electric cabling should be done.

Engineering services in first floor and roof space should then be proceeded with in turn, immediately followed by carpenters in laying ground and first floor boarding, erecting partitions and other consequent work.

APPENDIX 1
SPECIFICATION OF INTERNAL LININGS TO WALLS AND CEILINGS

TYPE D
DRAWINGS AND SCHEDULES

The drawings and schedules to be referred to with this Appendix are as follows.

Drawings

SDS/8 Elevations of walls
SDS/11 Plans of ceilings
SDS/14 Details of cove, fillets for wall and ceiling angles

Schedules

SDS/8 Schedule of sheets for walls
SDS/11 " " " " ceilings

The above drawings are prepared to assist the site contractor in the use of a maximum number of standard size sheets and to reduce cutting and waste to a minimum. In cutting the boards should be laid face uppermost and cut with a fine toothed saw, in order to preclude the possibility of rough edges.

All cut sheets should be carefully and clearly marked to ensure their correct placing in the houses in the positions as indicated on the drawings.

All dimensions for cutting to be taken from the actual job.

All hardboard and fibreboard should be stored in a cool moist atmosphere to prevent the boards from becoming dry. Boards should be stored in such a manner as to allow a free circulation of air. Storage space must be well ventilated.

Walls

1/8" Hardboard in 4'0" wide sheets.

Damping Down. Hardboard must be damped down the day before fixing, on no account should Hardboard be fixed immediately it is taken from the crates. The damping should be done by laying the first sheet face downwards and sprinkling the back lightly with water; laying the second sheet smooth face uppermost, and then laying the third sheet face downwards and sprinkling the back as for the first sheet. Repeat for total quantity required for next day's work.

If an excess of board is damped down and not used the following day it will be generally satisfactory if it is used within the next two or three days.

Cutting to Size. Boards may be cut to size either before or after damping down.

Nailing. Nails should be special hardboard pins, or 1" or 1" panel or gimp pins suitably rust proofed. Nailing must always commence in the middle of the board and working outwards to the edges. Boards 4'0" wide require two intermediate rows of nails 16" apart running lengthways of the board, nails to be at 12" centres along the edges. When these two rows are completed nail all edges at 6" centres starting from the middle of the long edges and working outwards.

Nailing to edges should be 1/2" from the edge.

The edges of the boards must be on no account tightly butted. Although it is permissible to fix the sheets at moderate contact, it is desirable to leave $\frac{1}{2}$ " space between sheets.

Cover Strips. Fix 2" x $\frac{1}{2}$ " Hardboard cover strip with rounded edges in the positions shown to the horizontal and vertical joints. Cover strip to be fixed with nails at 12" centres staggered all as described for hardboard sheets. Cover strips must also be damped down before use. Cover strips will be supplied in random lengths and are to be cut and fitted on site. Cover strips are supplied with the boards.

Ceilings

$\frac{1}{2}$ " insulation board in 3'0" wide sheets (Joist at 18" centres). Bundles and crates should be opened and the boards thoroughly aired by standing round the rooms for at least 48 hours before fixing. Boards can be cut to size either before or after airing.

Nailing. For intermediate joists $1\frac{1}{2}$ " galvanised panel pins. For edges either $1\frac{1}{2}$ " galvanised panel pins or clout nails. The board should be fixed first to the centre joist, nailing to start in the middle of the sheet and working outwards, the nails to be driven at alternating angles spaced at 8" centres. The nails round the edges of the board should be 6" apart.

Cover strips. All joints to be covered with corrugated fibre strip. (Anaglypta or other approved) with large central corrugations. Cover strips supplied with boards.

Generally

Wherever possible plaster to brick walls should be finished before fixing ceilings or wall linings. If this is not possible care should be taken to prevent adhesion between the plaster and the boards by means of a trowel cut. If this is not done cracking is bound to occur.

Wood Moulds and Cover Fillets. The following items are supplied by Sweden.

- Cornice cover fillets
- Internal vertical angles, cover fillet
- Skirtings
- Architraves to doors and windows

The following items are supplied by M.O.W.

- Picture rails
- External angles, cover fillets
- Cover fillets to horizontal angles to lean to ceilings

All the above are supplied in random lengths and are to be cut (mitred where necessary) fitted and fixed by the Erection Contractor on site. Fixed with $1\frac{1}{2}$ " galvanised nails punched and filled.

Nails. All nails for fixing Hardboard and Fibre board will be supplied with the boards.

All nails for fixing the timber cover fillets and moulds (except for architraves and skirtings) are to be supplied by the Erection Contractor.

Finishing. In rubbing down Hardboard after its erection, if water is used it should be as sparingly as possible.

Note: Hardboard may be worked in a similar manner to timber, that is by drilling, planing, sanding, bevelling, etc.

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the heights and position indicated on fixing sheet.

Fit and fix shelves (W.T.11 and W.S.11) to bearers.

CUPBOARD SHELVING for Larder.

Fix shelf bearers (W.V.15, W.V.16, W.V.18 and W.V.19) to walls at the heights and positions indicated on fixing sheet. Fix cross battens (W.V.17) to ends of shelf bearers (W.V.16 and W.V.19), fit shelves (W.V.11, W.V.12, W.V.13 and W.V.14) as shown on fixing sheet.

CUPBOARD SHELVING for brooms and meters.

Fix shelf bearers (W.W.14, W.W.15 and W.W.16) to walls at the height and positions shown on fixing sheet.

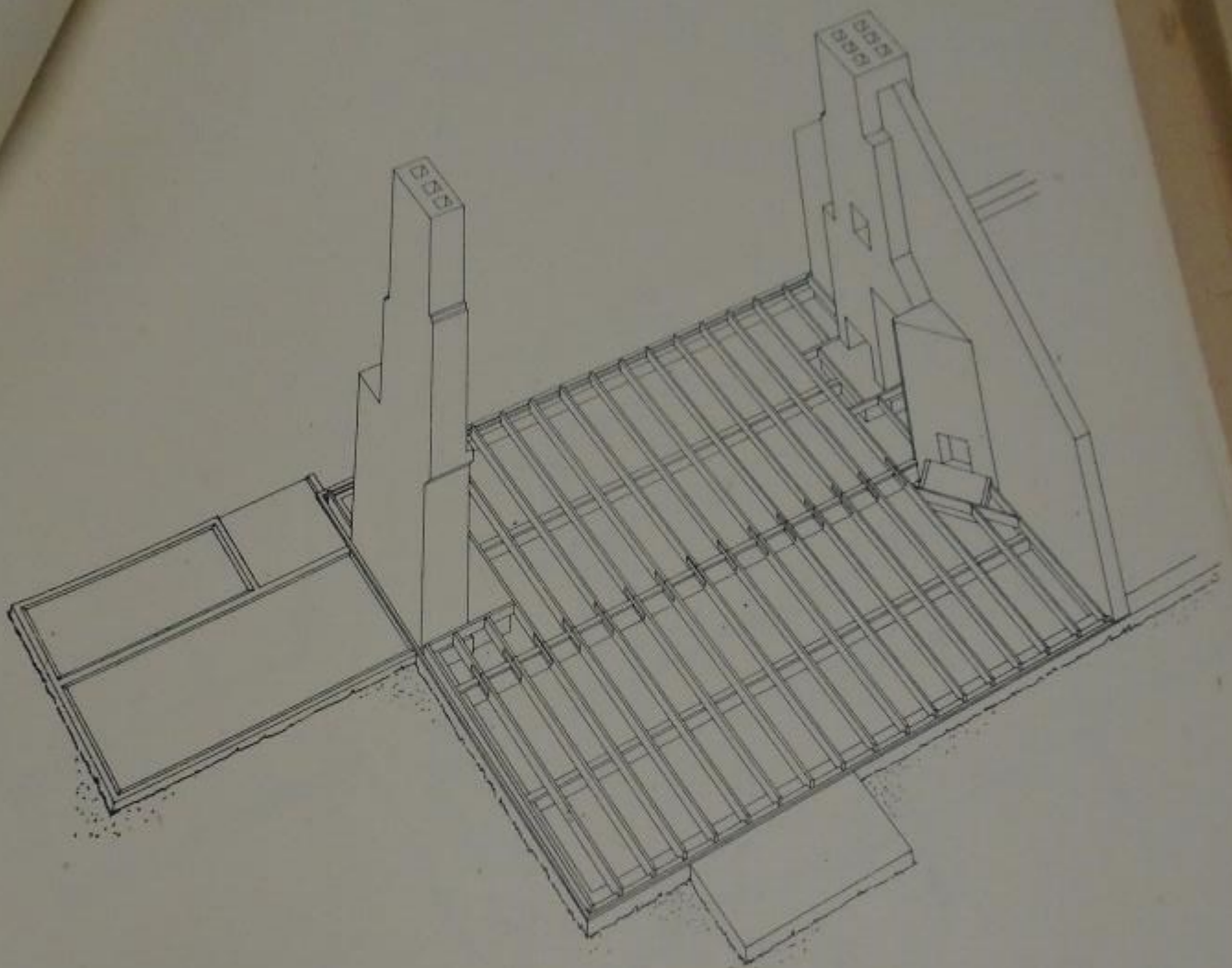
Fix broom clip blocks (W.W.17) to wall and division (W.W.13).

Assemble top shelf (W.W.11), division (W.W.13) and shelves (W.W.12) and fix to bearers.

CUPBOARD SHELVING in cupboard under stairs in hall.

Fix hanging rod and blocks (W.X.13 and W.X.14) at the height and position shown on the fixing sheet. Cut shelf bearer (W.X.12) into two pieces, one piece 9" long and fix both pieces as shown to take the shelf (W.X.11) which shall be fitted and fixed.

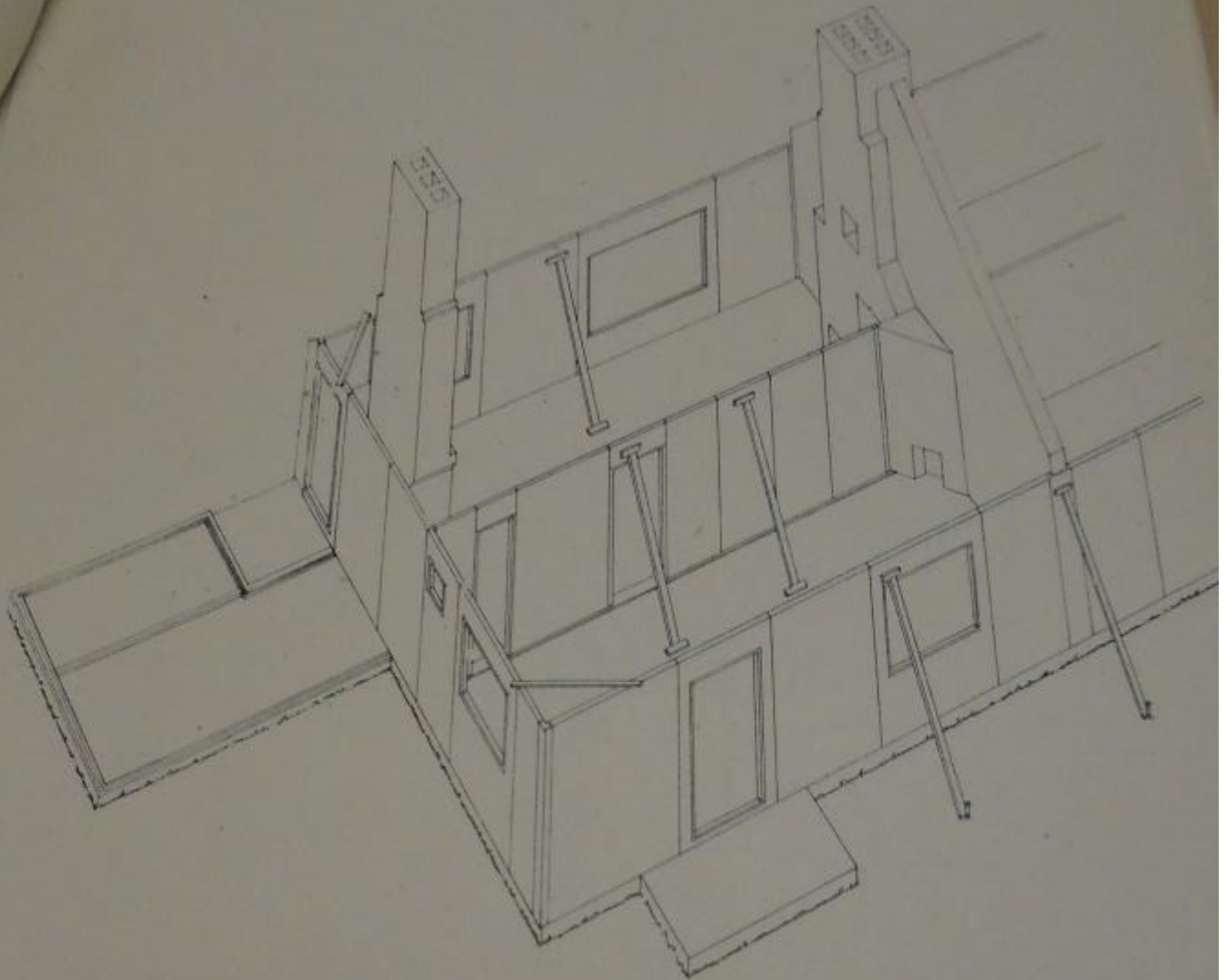
Fix three coat hooks (N.M.11) under shelf with six $\frac{1}{2}$ " x 8 Japanned wood screws R.H. (N.M.12).



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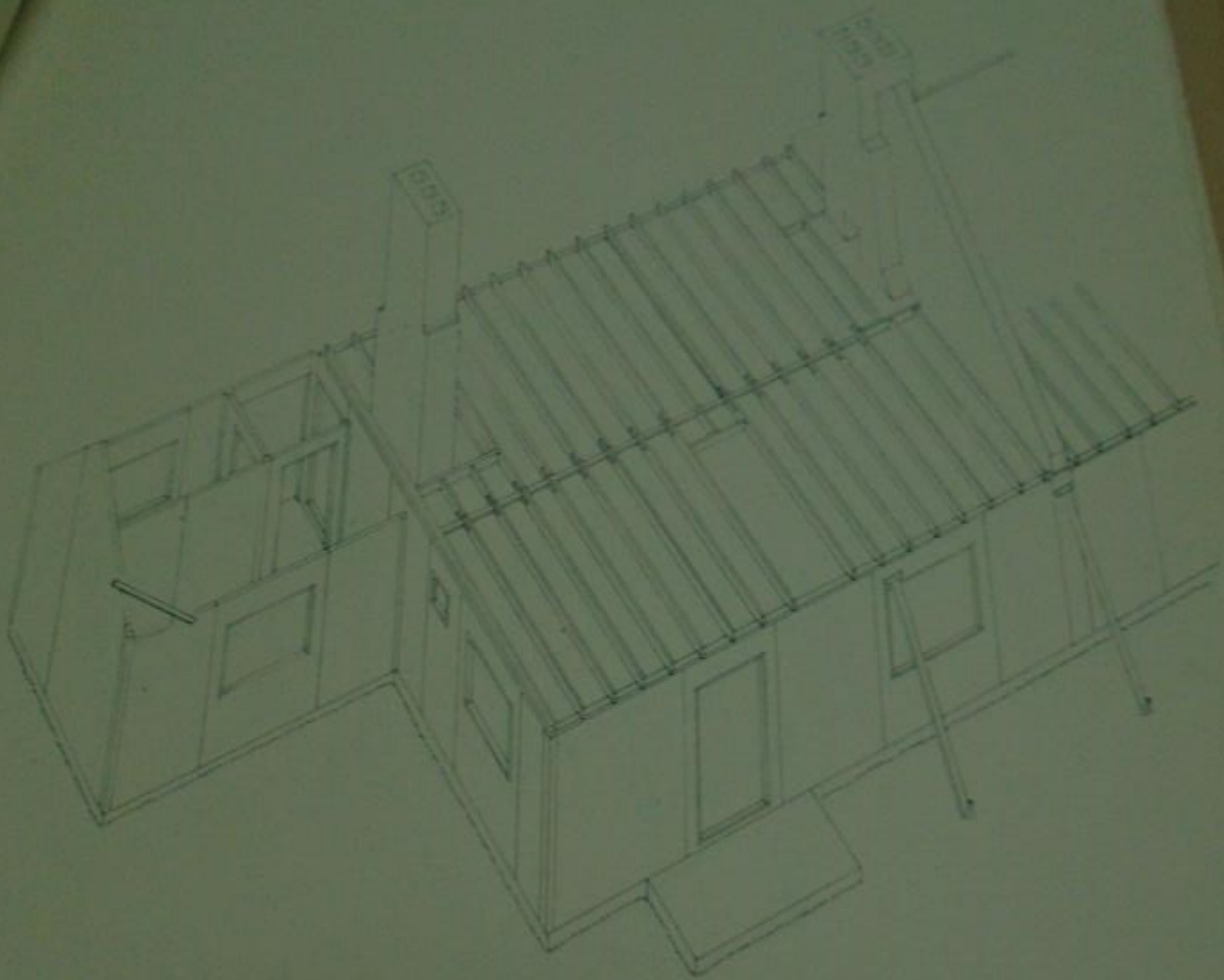
DIAGRAM 1

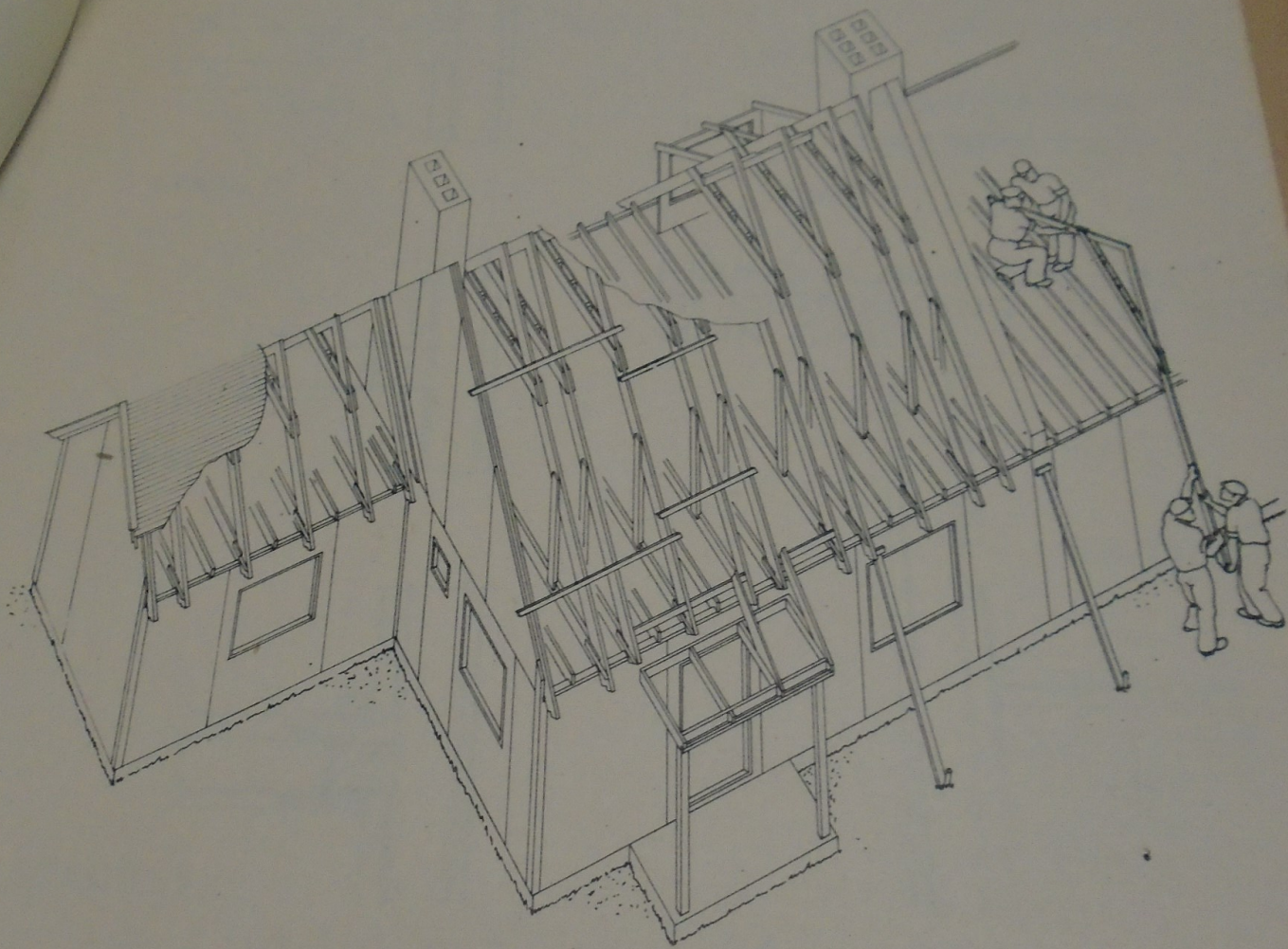
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DIAGRAM 2



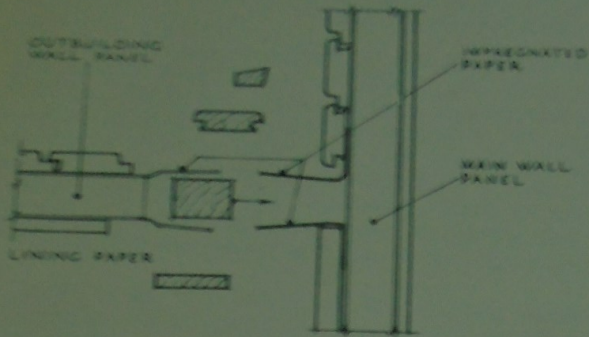


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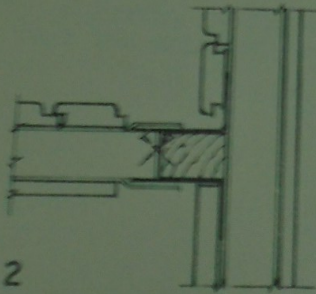
DIAGRAM 4



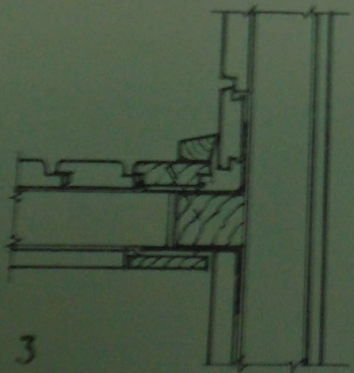
JUNCTION OF WALL OF
OUTBUILDING WITH MAIN
GABLE WALL



STAGE 1

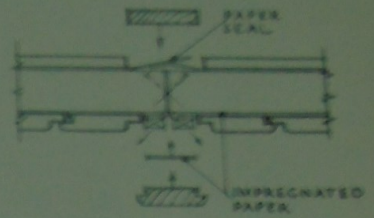


STAGE 2

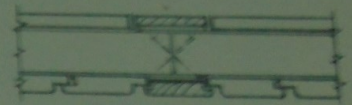


STAGE 3

JUNCTION OF MAIN
WALL PANELS



STAGE 1



STAGE 2

RAKING FLASHING AT JUNCTION
OF OUTBUILDING ROOF WITH
MAIN GABLE

