

5.10 LARGE OPENINGS

Very wide windows and large doors often span more than a full **Kingspan TEK Building System** wall panel. In this case, the plans may call for a more substantial beam or lintel that is inset into the panels as illustrated in Figure 12a, b, c, and d.

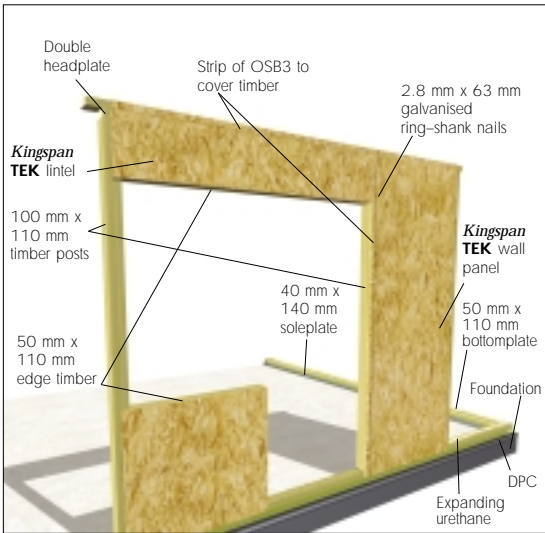


Figure 12a BEAMS OR LINTELS ABOVE WINDOW AND DOOR OPENINGS

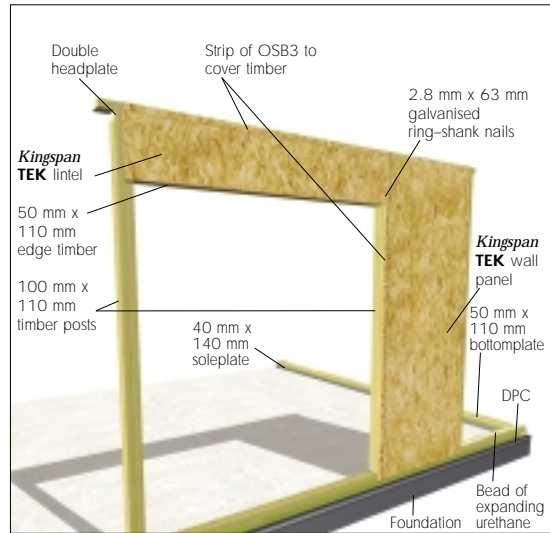


Figure 12c BEAMS OR LINTELS ABOVE WINDOW AND DOOR OPENINGS

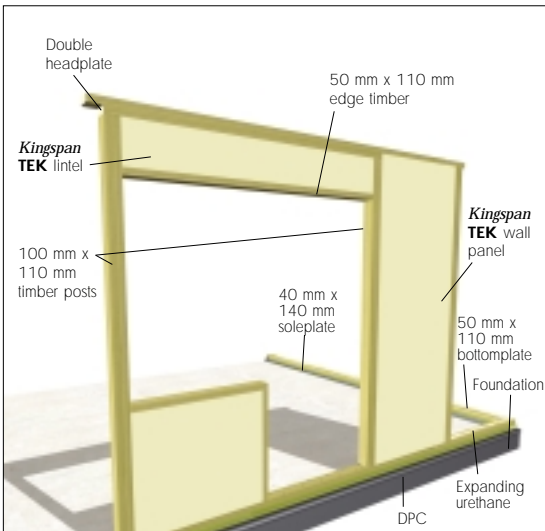


Figure 12b BEAMS OR LINTELS ABOVE WINDOW AND DOOR OPENINGS – CROSS SECTION

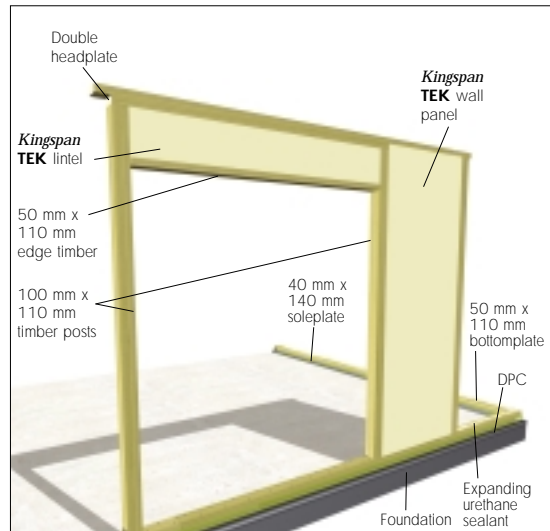


Figure 12d BEAMS OR LINTELS ABOVE WINDOW AND DOOR OPENINGS – CROSS SECTION

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6 WALL ASSEMBLY - ENTIRE WALL SECTIONS

6.1 SETTING OUT WALL PANELS PRIOR TO ASSEMBLY

Organise the *Kingspan TEK* Building System wall panels into their designated positions on a level surface, (e.g. if the wall panel is resting on a combination soleplate it will not be level and therefore cannot be pulled together as an entire wall section) external face up, to match the detailed construction drawings provided with each project, as illustrated in Figure 13a. At this stage leave a 25 mm gap between wall panels to aid assembly.

Hint: Prior to undertaking this method of *Kingspan TEK* Building System wall panel erection it is extremely important to plan the sequence of panel assembly so that site or building constraints can be accommodated.

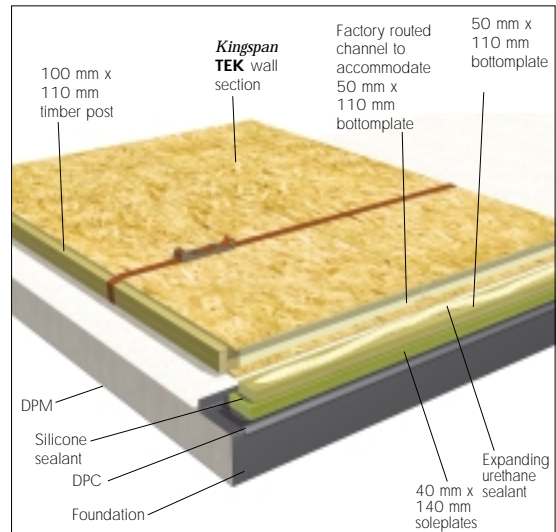


Figure 13c BRING WALL PANELS TOGETHER USING RATCHET STRAPS

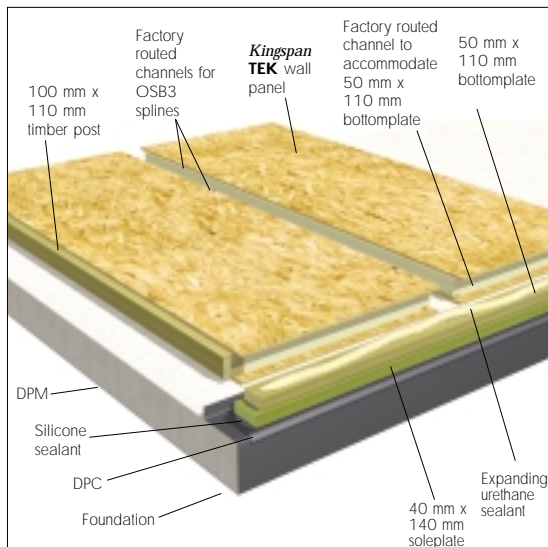


Figure 13a ENSURE WALL PANELS ARE LAID FLAT

6.2 JOINING PANELS USING OSB3 SPLINES

Slide the twin OSB3 splines into the *Kingspan TEK* Building System wall panel joints as illustrated in Figure 13b. Pull the wall panels together using a ratchet strap having made sure the OSB3 splines are not intruding into the 50 mm x 110 mm routed channel at the top and bottom of the wall panels.

For this method of assembly it is recommended (although not essential) that expanding urethane sealant be injected into the rout through appropriately sized holes, drilled into the joint at approximately 300 mm centres as illustrated in Figure 18 and described in section 6.10. (see page 17). This should be done at a convenient time after the wall panels have been fixed together from both sides (in accordance with the fixing specification in Table 1, section 2.6) and lifted into their final position.

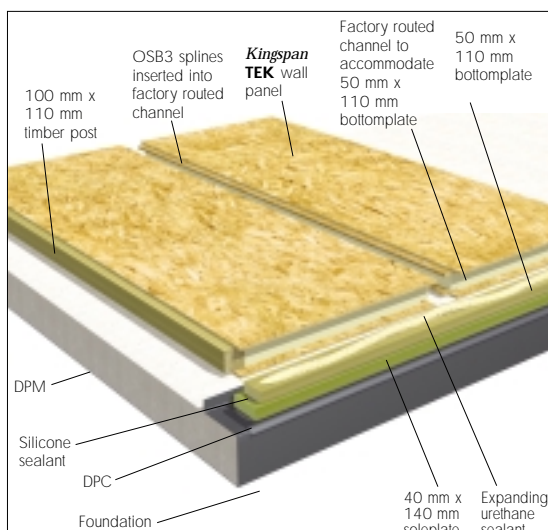


Figure 13b INSTALL OSB3 SPLINES

6.3 JOINING WALL PANELS USING TIMBER POSTS

Where timber posts are shown these should be inserted in accordance with section 5.3. Insert timber posts into these channels having applied expanding urethane sealant just before closing the joint. This is illustrated in Figure 14 below.

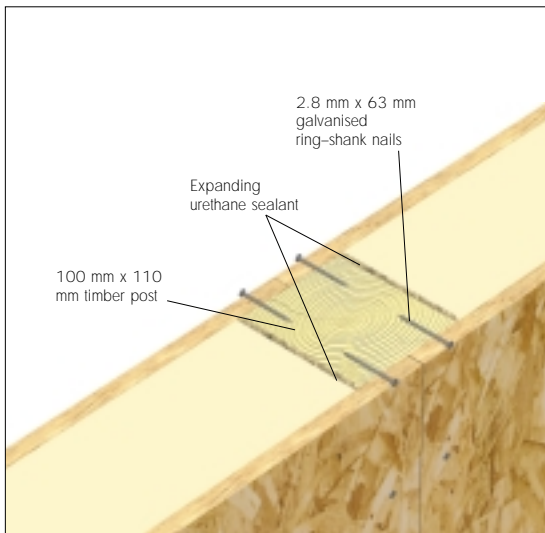


Figure 14 TIMBER POST JOINT

6.4 CLOSING JOINTS IN WALL SECTIONS

When using ratchet straps to close joints, it is imperative that the **Kingspan TEK Building System** wall panel edges are adequately reinforced or protected to prevent damage to the OSB3 facings, as illustrated in figure 13c.

Caution: Do not attempt to lift large *Kingspan TEK Building System* wall sections manually – use correct lifting procedures (See section 6.5).

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6.5 RAISING THE WALL

Apply a bead of expanding urethane sealant onto the bottomplate. Tilt the **Kingspan TEK Building System** wall section using either a crane or another appropriate piece of mechanical lifting equipment and following the contractor's method statement for safe working. Attach temporary wall braces as required. To ensure the wall section is plumb and remains so, brace wall ends on the outside edge as illustrated in Figure 15. Attaching the wall braces to the outside edge allows room on the floor surface for assembly of further wall sections.

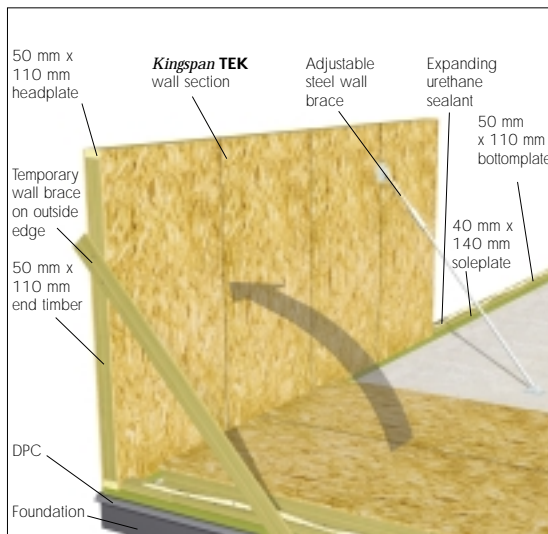


Figure 15 BRACING WALL SECTIONS

6.6 FIXING WALL PANELS TOGETHER AT CORNERS

Fix through the corners into the end timbers through pre-drilled 4 mm dia. holes in accordance with the fixing specification in Table 1, section 2.6 and illustrated in Figure 16a and b below. It is extremely important to apply two continuous beads of silicone sealant along these types of joint.

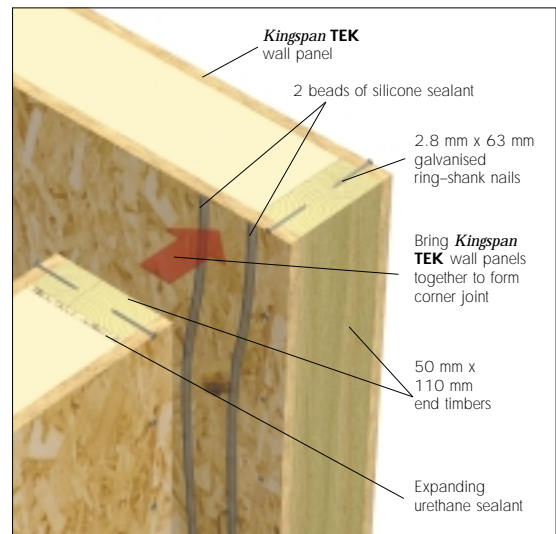


Figure 16a FORMATION OF CORNER JOINT IN WALL

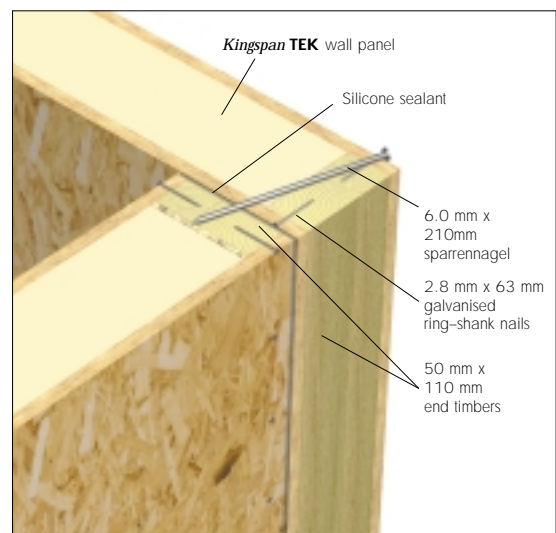


Figure 16b FIXING WALL PANELS TOGETHER AT CORNERS

6.7 INSTALLING HEADPLATES

Headplates tie the **Kingspan TEK** Building System wall panels together and provide a continuous solid surface to support the first floor construction. Headplate joints should be staggered so that they offset wall panel joints by a minimum of 300 mm. All OSB3 splines, timber posts and end timbers should not intrude into the routed channel that will accommodate the headplate. Expanding urethane sealant should be applied into the routed channel. The headplate should then be located within this channel and fixed in accordance with the fixing specification in Table 1, section 2.6 as illustrated in Figure 17.

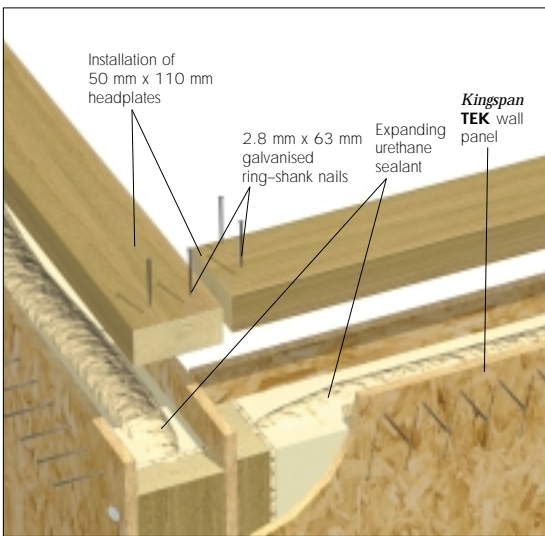


Figure 17 INSTALLING AND FIXING HEADPLATES

6.8 ASSEMBLY, NAILING AND RAISING OF FURTHER WALL SECTIONS

Further **Kingspan TEK** Building System wall sections should be constructed and erected in the same manner as described in sections 6.1 to 6.6.

Hint: Ensure **Kingspan TEK** Building System wall sections are erected in the correct sequence so as to optimise the use of working space and resource.

Particular care should be exercised when assembling the wall sections that include either window or door openings. In certain situations some additional temporary bracing members may be necessary, nailed across breaks in **Kingspan TEK** Building System wall panel edges.

6.9 SEALING PANEL JOINTS IN WALL SECTIONS

Drill 10 mm dia. holes at 200 mm centres along the **Kingspan TEK** Building System wall panel joints as shown in Figure 18. Introduce expanding urethane sealant into the hole so that it expands into the panel edge rout to create an airtight joint.

NB This operation should only be undertaken where application of the expanding urethane sealant cannot be done in advance,

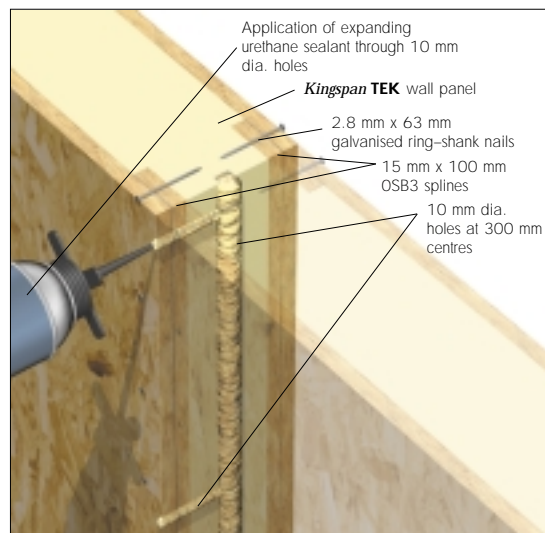


Figure 18 SEALING WALL PANEL JOINTS

Hint: Ensure that sufficient wall braces are used to stabilise the wall construction during the erection of the final storey and that these remain in place until the roof has been completed.

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7 INSTALLATION OF PRINCIPAL BEAMS WITHIN FLOORS AND ROOFS

7.1 GENERAL

Beams and purlins may be necessary to support roof and floor constructions. They can be supported directly by the **Kingspan TEK Building System** wall panel or in pockets with timber posts beneath. Figure 19 below identifies common locations for principal beams and purlins.

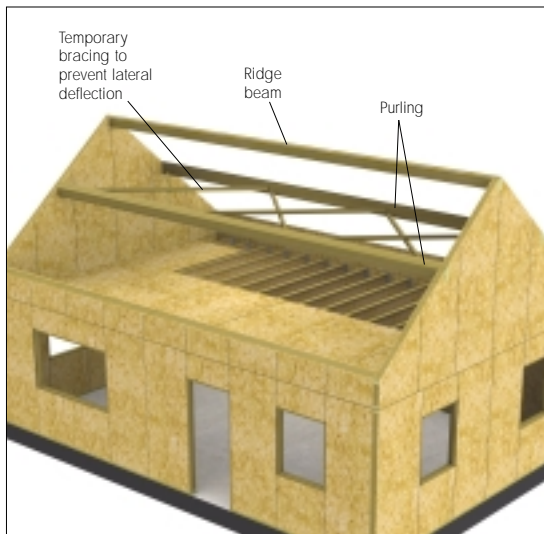


Figure 19 TYPICAL BEAM LOCATIONS

7.2 INSTALLING PURLINS/BEAMS

Purlins/beams are located within pockets cut into the **Kingspan TEK Building System** wall panels. A timber post below the pocket supports the purlin/beam. Timber posts and pockets are located on wall panel joints to facilitate routing and preparation of the beam pocket. Scabs are installed either side of the beam and should be fixed so they do not intrude on the routed channel of the wall panel. This is illustrated in Figures 20a and 20b.

All timber posts below pockets should be sealed in position using expanding urethane sealant and fixed in accordance with the fixing specification in Table 1, section 2.6.

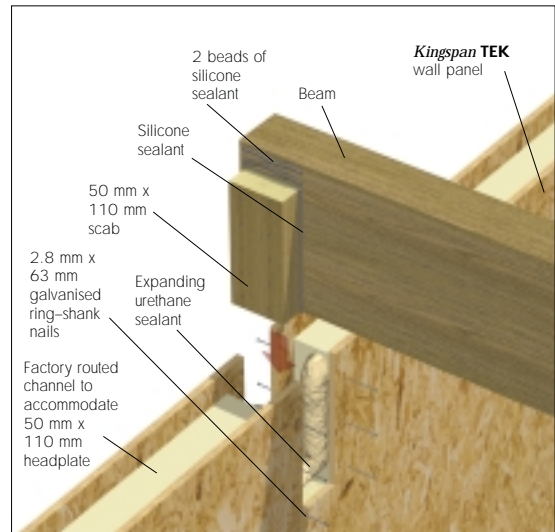


Figure 20a INSTALLATION OF A BEAM IN A WALL

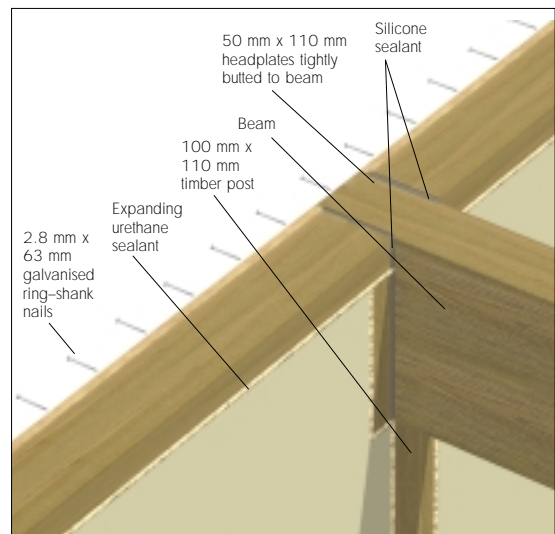


Figure 20b CROSS SECTION THROUGH WALL SHOWING INSTALLED BEAM

8 FIRST FLOOR DECK

8.1 HANDLING PANELS

All materials for floor construction shall be carefully lifted onto safe working platforms ready for installation using either a crane or other suitable mechanical lifting equipment. At all times refer to the contractors method statement for undertaking these types of procedures.

8.2 INSTALLING FLOOR BEAMS

Install as previously described in section 7.

8.3 POSITIONING AND FIXING JOIST HANGERS ONTO THE WALLS AND BEAMS

Mark out the location of all joists along the headplate of the ground floor wall panels and beams according to the design drawings. Fix joist hangers into the headplate and beams at the marked locations, as illustrated in Figure 21. At all times reference should be made to the joist hanger manufacturers recommended installation instructions. These can be found in Appendix E.

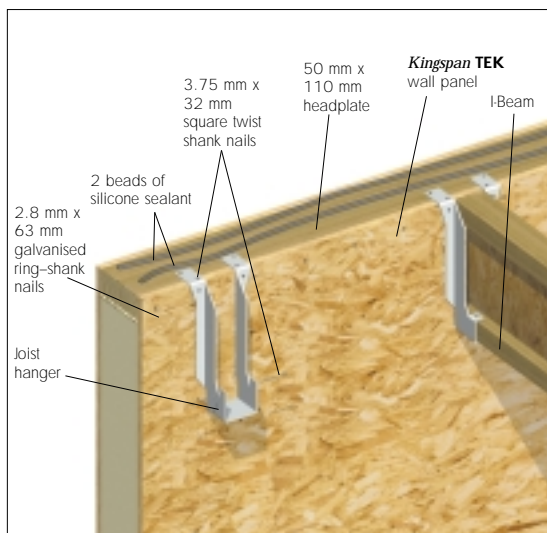


Figure 21 LOCATING AND FIXING JOIST HANGERS FOR FIRST FLOOR DECK

8.4 INSTALLING FLOOR JOISTS

Joists should be located into corresponding joist hangers and fixed in place in accordance with the manufacturers instructions. The top of the installed joists should be at the same height as the top of the headplate. This is illustrated in Figure 21.

Where floor joists bear directly over an internal wall, the joist should be fixed in position using 2 No. 3.35 mm x 75 mm nails or as per joist manufacturers instructions (see Appendix E).

For all other details and specifications refer to the appropriate manufacturers installation details and instructions.

8.5 RIMBOARD/PLATFORM FRAME INSTALLATION

Mark out the joist positions and fix the joists in place at these locations by fixing through the bottom flange into the headplate, ensuring that sufficient space is left for the rimboard (usually between 32 and 60 mm thick). Attach the rimboard to the ends of the joists and fix through the rimboard into the headplate in accordance with the fixing specification in Table 1, Section 2.6. During assembly, use silicone to seal between the rimboard and the headplate. This is illustrated in Figure 22.

For all other details and specifications refer to the joist manufacturers installation details and instructions (see Appendix E).

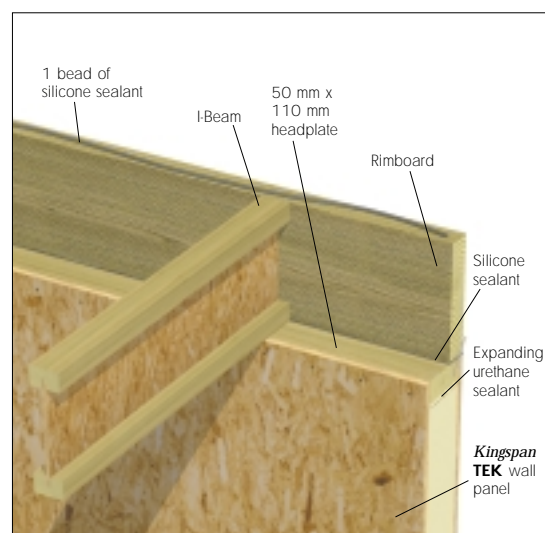


Figure 22 LOCATING AND FIXING RIMBOARDS FOR FIRST FLOOR DECK

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8.6 INSTALLING FIRST FLOOR DECK

With the first floor joists in place, the 18 mm tongue and groove OSB3 deck is then installed.

Lay the OSB3 sheets in a staggered pattern, perpendicular to the joists and flush with the outside of the external OSB3 facing/rimboard. Immediately prior to installing the OSB3 sheets located around the perimeter of the building a thin layer of silicone sealant should be applied to the top surface of the headplate/rimboard to provide an airtight seal. This is illustrated in Figures 23a and 23b.

Fix the OSB3 sheets to the joists and headplate/rimboard in accordance with the fixing specification in Table 1, section 2.6. At all times this should be in accordance with the deck manufacturers installation instructions (see Appendix E).

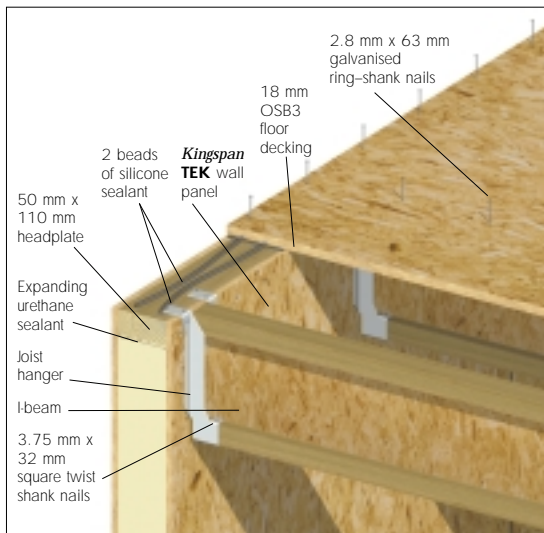


Figure 23a INSTALLATION OF JOIST HANGARS

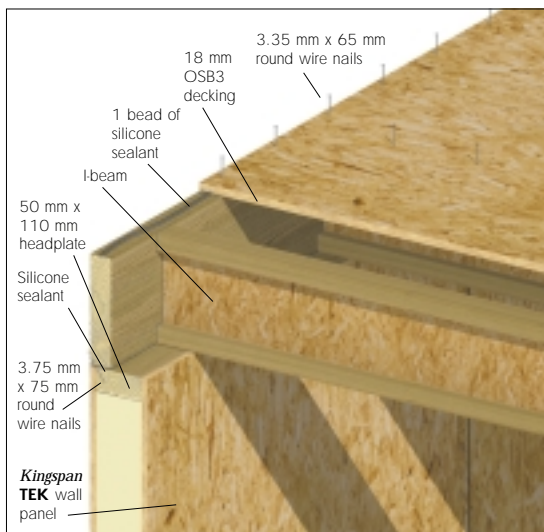


Figure 23b INSTALLATION OF RIMBOARD

8.7 FIXING BOTTOMPLATES FOR UPPER STOREY WALLS

The bottomplates should be fixed through the OSB3 deck into the headplate/rimboard in accordance with the fixing specification in Table 1, section 2.6. The outer edge of the bottomplate should be inset 15 mm from the edge of the OSB3 deck so that the external OSB3 face of the upper storey **Kingspan TEK Building System** wall panels will be flush. This is illustrated in Figures 24a and 24b.

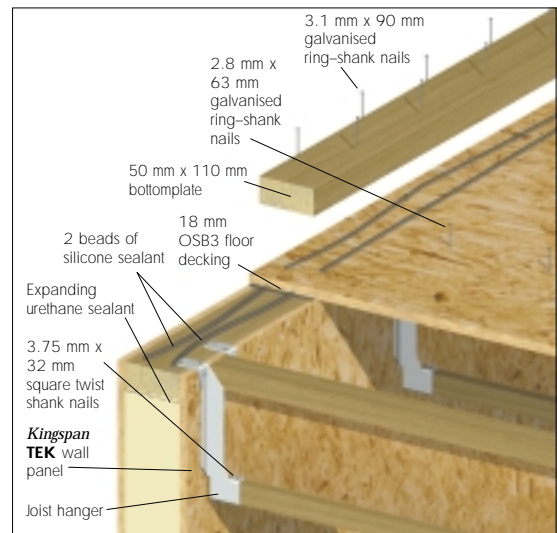


Figure 24a INSTALLING BOTTOMPLATE OVER FIRST FLOOR DECK (JOIST HANGER DETAIL)

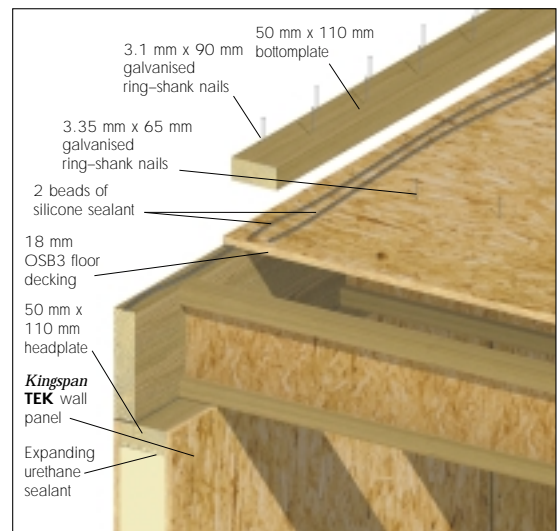


Figure 24b INSTALLING BOTTOMPLATE OVER FIRST FLOOR DECK (RIM BOARD DETAIL)

Caution: Temporary handrails or guarding should be placed around all free edges and stairwells.

9 INSTALLING UPPER STOREY WALL PANELS, ATTIC JOISTS AND ROOF BEAMS / PURLINS

9.1 HANDLING PANELS

All materials should be carefully lifted into position on safe working platforms ready for installation, using either a crane or other appropriate mechanical lifting equipment. At all times refer to the contractors method statement for undertaking these types of procedures.

9.2 ERECTION OF WALL PANELS

Using a similar process as that described for **Kingspan TEK Building System** ground floor walls, additional storeys may be constructed.

The uppermost **Kingspan TEK Building System** wall panels are often fitted with additional bevelled wallplates to match the roof slope. All wall panels require either a standard headplate or specially cut bevelled headplate, fixed into the factory cut rout in accordance with the fixing specification in Table 1, section 2.6.

Hint: When erecting **Kingspan TEK Building System** gable wall panels, always start from the centre (e.g. in line with the ridge beam) so when the ridge beam is installed it is straight.

Ensure that all wall panels are fully assembled and permanently fixed in position prior to moving onto the next stage of the erection. Once the first floor walls have been erected, the scaffolding can be completed to full height.

Hint: Ensure that sufficient wall braces are used to stabilise the wall construction during the erection of the final storey and that these remain in place until the roof has been completed.

9.3 INSTALLING FLOORS FOR ROOM-IN-ROOF CONSTRUCTION

In buildings with a room-in-roof floor, the floor construction should be installed in the normal way ensuring that the deck is fully fixed to the perimeter headplate. A bevelled wallplate should then be fixed in position as shown in the detail below to provide an attachment for the roof panels. This is illustrated in Figure 25.

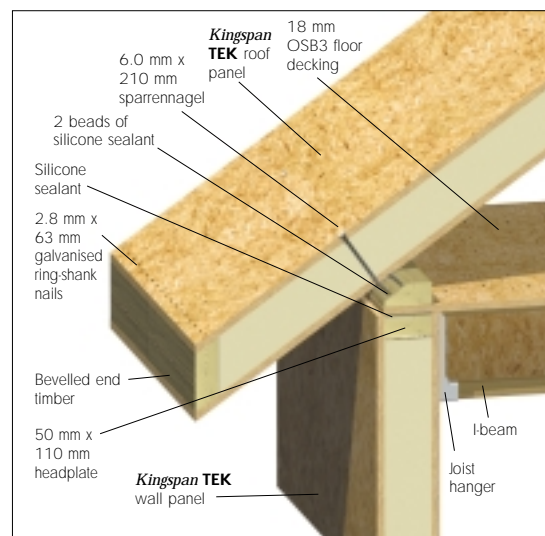


Figure 25 ROOM-IN-ROOF FLOOR DETAIL

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9.4 INSTALLATION OF PURLINS/RIDGE BEAMS

Kingspan TEK Building System gable wall panels often support purlins and/or a ridge beam. These beams are installed in exactly the same way as they were for first floor beams (See section 7). Installation of purlins and ridge beams is illustrated in Figure 26.

For more complicated roof designs that incorporate hip or valley beams, reference should be made to the particular project specification. Care should be taken to ensure that all beams are connected together using the correct fixing or connector.

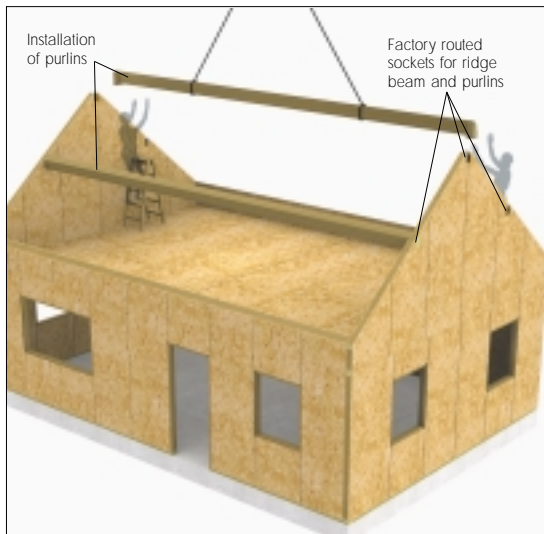


Figure 26 INSTALLING RIDGE BEAMS/PURLINS

9.5 INSTALL TEMPORARY BRACES FOR PURLINS AND RIDGE BEAM

All roof beams should be held firmly in position using temporary bracing as illustrated in Figure 27 to prevent lateral deflection during the erection of the **Kingspan TEK** Building System roof sections. Bracing should be spaced at no more than 3.0 m centres. This temporary bracing can be removed once all roof sections have been fixed in their final positions.

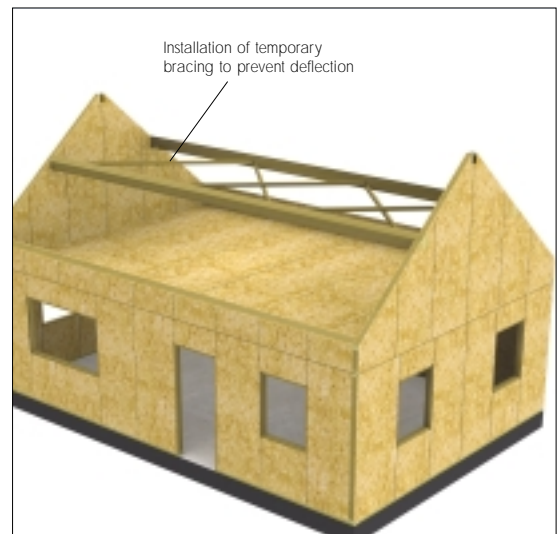


Figure 27 TEMPORARY BRACING TO PURLIN AND RIDGE BEAMS

10 PREFABRICATION AND INSTALLATION OF ROOF SECTIONS

10.1 LIFTING ROOF SECTIONS INTO POSITION

Kingspan TEK Building System roof sections should be lifted into position using a crane fitted with an adjustable chain as illustrated in Figures 28a and 28b.

Hint: Attach timber battens to the internal face of the **Kingspan TEK** Building System roof sections immediately above the lines of support to act as locators when positioning the roof and to facilitate attachment to the walls/beams. This is illustrated in Figure 28b.

Caution: Lifting and positioning roof sections or panels onto the roof manually should not be attempted.

To lift **Kingspan TEK** Building System roof sections, drill four holes (25 mm – 40 mm diameter) through the roof section making sure that the holes will not end up over a supporting wall or purlin. Insert a lifting strap into each hole, as illustrated in Figure 28a. The straps should spread the load through the use of a 50 mm x 50 mm x 500 mm solid timber located beneath the roof section.

Caution: Under no circumstances should any site personnel stand underneath or in line with a roof section panel being hoisted onto a roof.

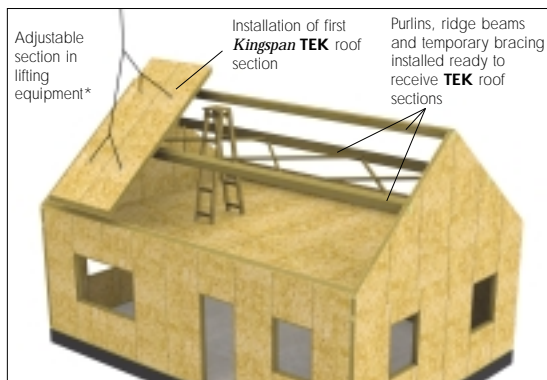


Figure 28a LIFTING AND POSITIONING ROOF SECTIONS ONTO THE ROOF WITH A CRANE

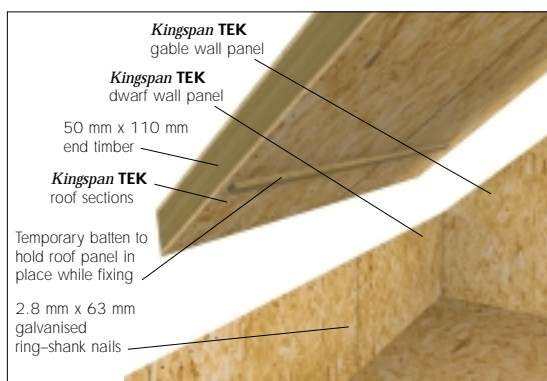


Figure 28b TIMBER BATTENS ON INTERNAL FACE OF ROOF SECTION

*Set correct angle once. Following roof sections can be set without further adjustments unless change in roof pitch.

10.2 PREPARATION OF ROOF STRUCTURE TO RECEIVE ROOF PANELS

Apply two beads of silicone sealant to all gable wall headplates, bevelled wallplates, bevelled headplates of dwarf walls and the bevelled faces of the ridge beam.

10.3 INSTALLATION OF ROOF SECTIONS

Hint: Silicone sealant should always be applied between surfaces that are to be joined rather than along the edges of joints once fixed.

All **Kingspan TEK** Building System roof sections should be accurately lifted into position (at the pitch of the roof) avoiding excessive sway. Care should be taken when lowering the roof section into position to avoid wiping off the silicone sealant.

Hint: **Kingspan TEK** Building System roof section joint locations should be marked on the purlins, ridge beams, wallplates and bevelled headplates of dwarf walls, so that the roof sections can be quickly positioned and aligned.

Roof sections should ideally be fixed in opposing pairs in order to control lateral loading and deflection as illustrated in Figure 29, although practically this is not always possible. Also, ensure you apply two beads of silicone along the ridge between the roof sections to ensure the joint is airtight. This is illustrated in Figure 29.

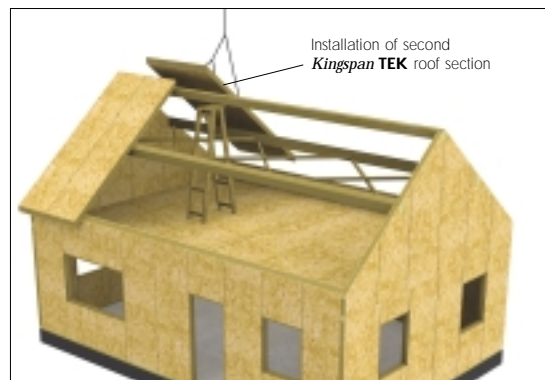


Figure 29a INSTALLATION OF ROOF SECTIONS



Figure 29b FIRST OPPOSING PAIR OF ROOF SECTIONS INSTALLED

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10.4 FIXING THE FIRST ROOF SECTION IN PLACE

The **Kingspan TEK** Building System roof section should then be lifted into place so that the timber battens bear onto the sides of all bearing points as illustrated in Figures 28a and 28b.

The roof section should then be fixed along the gable headplate, bevelled wallplate, bevelled headplate in internal support walls and any intermediate/ridge beams or purlins in accordance with the fixing specification in Table 1, section 2.6*. This fixing process is illustrated in Figures 30 -33 below.

*Refer to structural calculations for any variations in fixing centres.

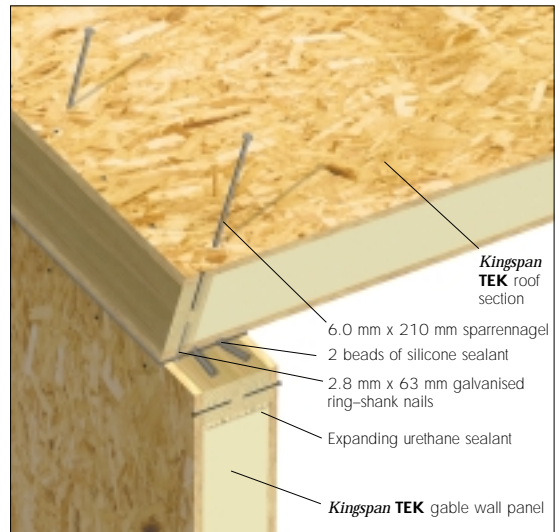


Figure 31b FIXING ROOF SECTION INTO GABLE WALL (NO OVER HANG)

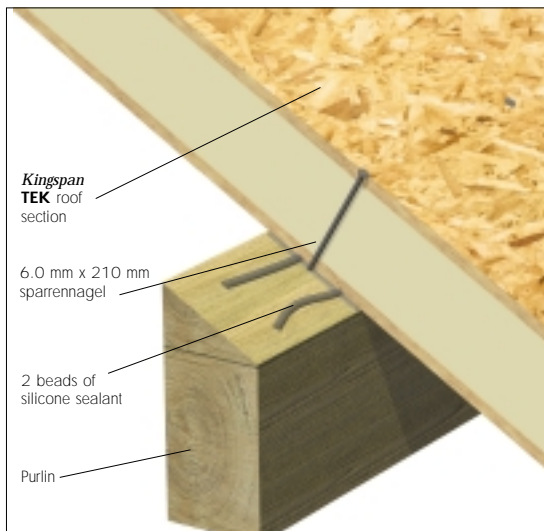


Figure 30 FIXING ROOF SECTION INTO PURLIN

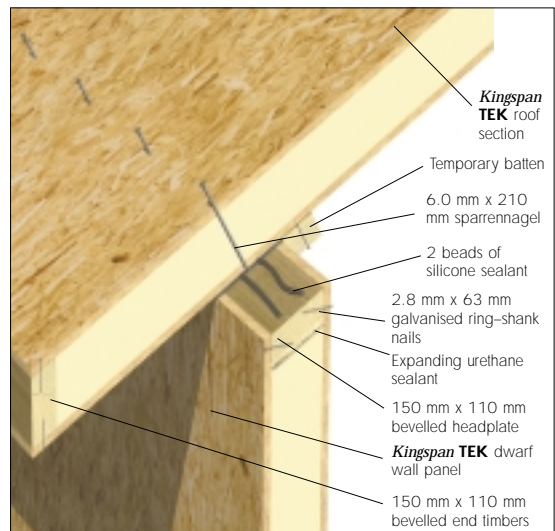


Figure 32 WALL/ROOF INTERSECTION SHOWING ANGLED HEADPLATE DETAIL

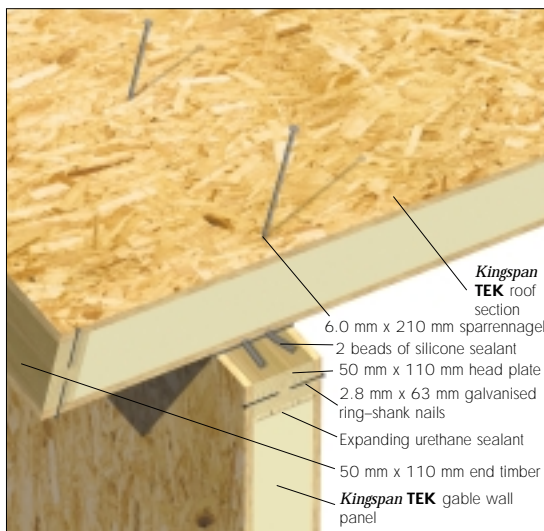


Figure 31a FIXING ROOF SECTION INTO GABLE WALL (OVER HANG)

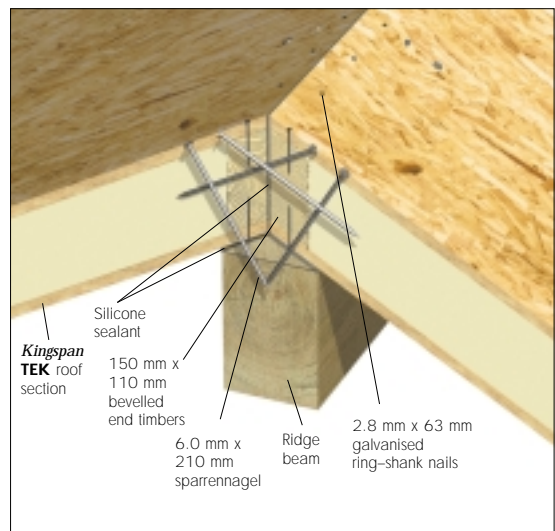


Figure 33 FIXING ROOF SECTION AT THE RIDGE