INSTALLATION GUIDELINES

1.0 General Notes

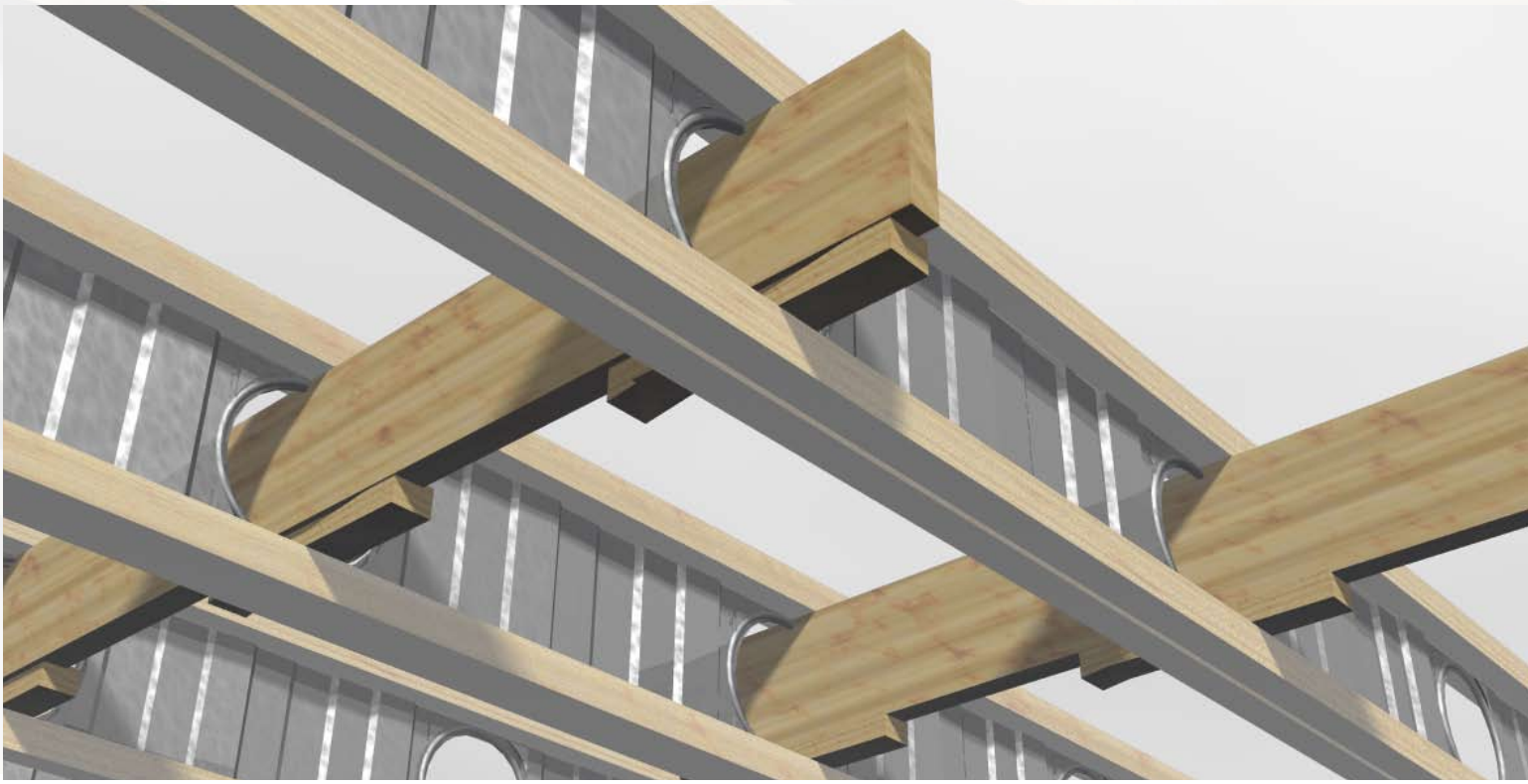
- TECBEAM® joists are engineered “I” beams with a continuous steel web and timber flanges.
- To meet the requirements of the BCA (Building Code of Australia), all installation work should comply with AS1684.2-1999 and with these guidelines.
- For details not covered in this brochure please refer to TECBEAM Australasia Pty Ltd or a structural engineer.
- These guidelines detail features unique to TECBEAM floor joists and are in addition to AS1684

2.0 Specifications

2.1 Strongbacks

Strongbacks significantly reduce vibration and are more effective than solid blocking.

- Where joists are within 1m of their maximum span, install a line of strongbacks mid-span.
- Where joists span over 6.0m two rows of strongbacks are recommended, placed at approximately the one-third points of the span.
- Strongbacks must be tightly wedged at each joist; it is recommended wedges are glued and nailed.
- Note: strongbacks must be dry (m.c.< 15%) before securing wedges. For normal loads and spans use 140x45 F7 for T25 joists and 190x45 F7 for T30 joists: install where shown on the floor framing plan.
- Strongbacks can also be designed to act as internal support beams: this feature can eliminate the requirement for bulkheads.
- Where concentrated loads occur: place a strongback through the web hole closest to the load point and long enough to fix through at least two joists on each side of the load point (see also “Web Stiffeners”).
- Check designs with TECBEAM Australasia Pty Ltd or a structural engineer.



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2.2 Plywood Load Spreaders

Where joists are offset from wall studs Plywood Load Spreaders ("rim boards") can be used instead of extra studs, wall plate blocking or double wall plates.

- Load Spreaders should be min. 12mm F11 construction plywood, cut to the exact joist depth and fitted tight between the wall plate and the flooring.
- Install joists set back 15mm from the outside face of the wall frame. Support each offset joist with min. 8/40x2.8mm nails through the plywood into the end of each joist. Load Spreaders should span at least three studs.
- Where joists carry loads in addition to normal residential floor loads, extra fixings may be required to support the joists; refer to a structural engineer.
- Plywood Load Spreaders also act as bracing, eliminating end blocking, separate bracing or cross strapping.
- Where used for end bracing only, the 15mm setback is not required; fix with min. four nails per joist.

2.3 Blocking & Bracing

TECBEAM® joists do not require intermediate blocking where there is full floor sheeting and ceiling lining.

Provide strongbacks, solid blocking or herringbone bracing as required in the following locations:

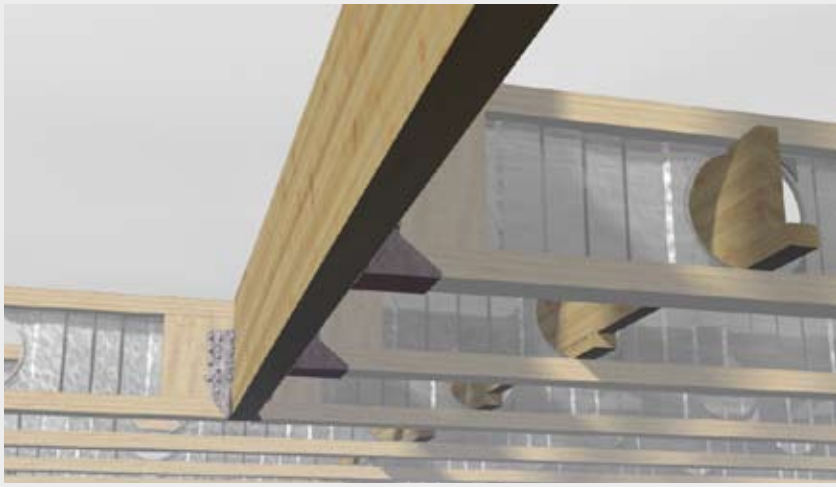
- Along all support lines: max. spacing 1.8m crs.
- At cantilevers: along the support line (fulcrum point) and also in alternate bays at the outer end, if no trimmer is used.
- In continuous spans: where there is no suitable ceiling to act as bracing, fix either blocking, strongbacks or bracing in the shorter span 1.8m from the intermediate support.

2.4 Web Stiffeners

Web Stiffeners are required at:

- both ends of TECBEAM® joists;
- at supports;
- where concentrated loads exceed 370kg;
- under exterior parallel load bearing walls.

- Web Stiffeners should be at least 70x35 seasoned timber, tight fitting between the timber flanges.
- Nail a pair of web stiffeners together through the steel web with a minimum six 65x3.0mm nails.
- Where beams finish at or within 20mm of a web hole add a second pair of web stiffeners nailed together through the steel web. Max. gap between the pairs of web stiffeners is 100mm.



Web stiffener connection for a trimmer beam to Tecbeam joists. Note the strongback shown is used to share the floor load with the joists behind the trimming joist.

2.5 Cantilevered Balconies

- Cantilevered Balconies can be constructed by installing balcony joists through the web holes.

- The balcony joist “back span” should be at least twice the length of the cantilever. Fix with wedges, as for strongbacks.

- Always check the design with TECBEAM Australasia Pty Ltd or a structural engineer. An additional joist may be required at the fulcrum point.

2.6 Perimeter Walls

Instead of installing solid timber double joists along perimeter load bearing walls: install a Tecbeam joist with extra web stiffeners, maximum stiffener spacing:

- 1350 crs. for metal roofs;
- 900 crs. for a tile roof up to 10m span;
- 600 crs. for heavier loads.

2.7 NON LOAD-BEARING INTERNAL WALLS CROSSING THE FLOOR JOISTS

For a single wall, where joist spans are within 300mm of the maximum allowable span one of the following measures is required:

- add an extra joist every 1.8m. or,
- reduce joist spacing, eg 600 to 450mm crs., or 450 to 350mm crs., or,
- select the next joist size

- For additional walls crossing joists check with TECBEAM Australasia Pty Ltd or a structural engineer.

2.8 NON LOAD-BEARING INTERNAL WALLS PARALLEL TO FLOOR JOISTS

For TECBEAM® joists at 600mm crs:

- If the span is within 500mm of the maximum span add an extra joist under the wall.

For TECBEAM® joists at 450mm crs:

- If the span is within 900mm of the maximum span add an extra joist under the wall.

- Where a wall falls between joists and the span is 900mm or more under the max. span, the wall can be supported on short strongbacks or blocking.

- Where an extra joist is required to support an internal wall running parallel to the joists it is recommended to install a strongback 2.0m long, at mid-span, centred about the extra joist.

3.0 Connection & Fixing Details

Generally, standard timber framing connectors and framing methods are suitable with TECBEAM® joists. Where use is made of the high load capacity of TECBEAM® joists, heavy-duty connectors may be necessary (refer to a structural engineer).
For details of the most common connections, refer to the Autocad drawings available from Tecbeam Australasia.

3.1 Notching

Notching of beam flanges is permissible only at the end supports. The following restrictions apply:

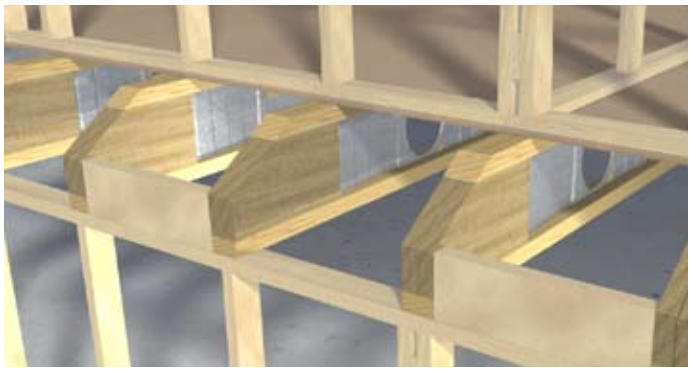
- Bottom Flanges: TECBEAM® joist bottom flanges can be notched up to 15mm and no longer than 100mm. For greater notching refer to a structural engineer.

- Top Flanges: can be notched full depth and up to half the width of the web stiffener.

3.2 Angle Cutting

Angle cutting to the top edge is permissible at the joist ends where an extended timber web stiffener has been fitted.

Angle cuts up to half the joist depth and 400mm long are permitted. Refer to TECBEAM Australasia Pty Ltd for details.



3.3 Hole Alignment & Docking

It is important to line up the web holes in the designated floor areas so that strongbacks and services can be installed. TECBEAM® joists are manufactured with a “Common End” detail at one end.

To ensure web holes are in alignment in each framing area install TECBEAM® joists with all the “Common Ends” along one straight support line.

The “Common End” has a pair of either 140mm or 190mm wide web stiffeners fitted, and the steel web set back 75 or 90mm respectively. This feature provides for timber only docking and notching up to 70 or 85mm respectively at the common end.

3.4 Connection to Steel Beams

For steel beams in the same plane as the joists, alternative connections are:

- fit the joist inside the beam, and notch if required (note the limitations under notching).

- pack out the steel beam with solid timber, bolt to web and fit joist hangers. Note: this is an eccentric connection, check that beam rotation is prevented.

- weld steel cleats, or fix angles to the beam web, install bolts through the joist web stiffener. For normal floor loads, use 2 M10 bolts.

3.5 Connection to timber beams

Generally, connections are made with joist hangers for normal floor loads. Where joists carry higher loads, eg a double joist at stair void, use a joist hanger on one joist and a steel angle bracket and 2 M12 bolts on the other joist. For more connections, refer to the Autocad details, available from Tecbeam Australasia.