WALKER ENGINEERING

(07) 3256 7008 • info@walkereng.com.au
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GUIDE FOR OWNERS AND BUILDERS

Tie-down upgrades: follow the load path

Wind doesn't just push a house sideways. It also lifts the roof. To hold the roof down, every part of the structure has to be fixed to the part below it, from the roof battens all the way to the footings. That unbroken chain is the **load path**. A tie-down upgrade checks every link in it and adds a fixing wherever one is missing.

One detail per connection

Each connection on the Tie-Down Upgrades sheets has more than one detail because houses are framed differently. You only need **one** per connection, repeated along that element. Start with our preferred detail and use an alternative only if your framing doesn't suit it.

For example, if the rafters are tied at the ridge with WE 6-1, you don't also need WE 6-2.

Don't skip a link

A roof tied to the walls achieves nothing if the walls aren't tied to the floor. The uplift has to reach the footings through every connection in the chain.

Your drawings govern

Fixings, spacings and which details apply are set on the drawings issued for your house, based on its wind classification. Bracing must comply with AS/NZS 2269 and AS 1684.2 and the manufacturer's specifications. Follow the tie-down note on those drawings for spacing. If none of the details suits what you find on site, call us before improvising a fixing.

The load path, roof to ground

Our preferred general load path. Use the alternatives only where your framing doesn't suit the preferred detail. Details are on the sheets that follow.

1. **Batten to rafter**
   Preferred: **WE 7-1**
2. **Rafter to rafter at the ridge**
   Preferred: **WE 6-1** or **WE 6-2**
3. **Rafter and ridgeboard to walls, strutting beams and ceiling joists**
   Preferred: **WE 5-1** and **WE 5-3**
   Alternative: WE 5-2
4. **Top plate to stud, and stud to bearer or bottom plate**
   Preferred: **WE 3-3**, **WE 4-1** or **WE 4-3**
   Alternative: WE 4-2
5. **Bottom plate and floor joist to bearer**
   Preferred: no separate detail. Step 4 ties the wall frame down to the bearer.
   Where required: WE 3-1 or WE 3-2
6. **Bearer to column or post**
   Preferred: **WE 2-3** (steel column)
   Alternatives: WE 2-1 timber post, WE 2-2 timber stump
7. **Column or post to footing**
   Preferred: **WE 1-1** (steel column)
   Alternatives: WE 1-2 timber post, WE 1-3 stump

How to use the sheets

1. Work down

Start at the roof battens and work down to the footings, one connection at a time. Don't skip any.

2. Use the preferred detail

At each step, use the preferred detail, or one alternative if your framing doesn't suit it, and repeat it along that element at the spacing on your drawings.

3. Check the chain

Before the roof, cladding or linings go back on, check every link has its fixing. If an inspection is required, leave the connections exposed until it's done.

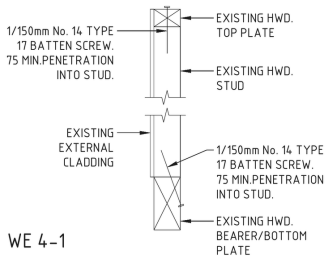
Not sure which detail suits your house?

Send us photos of the connection (roof space, wall frame or subfloor) with your job number and we'll tell you which detail to use. Call **(07) 3256 7008** or email **info@walkereng.com.au**.

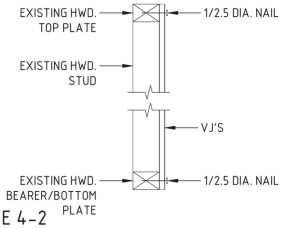
Roof and walls: WE 4 to WE 7

Steps 1 to 4

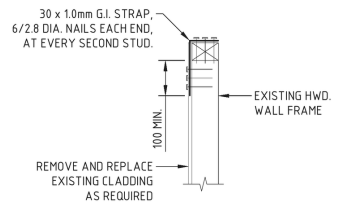
TOP PLATE TO STUD & STUD TO BEARER/BOTTOM PLATE



WE 4-1

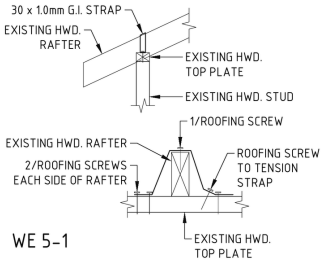


WE 4-2

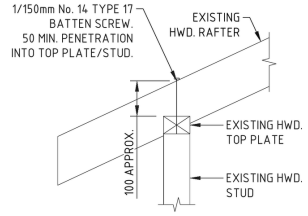


WE 4-3

RAFTER/RIDGEBOARD TO WALLS/ STRUTTING BEAMS/CEILING JOISTS

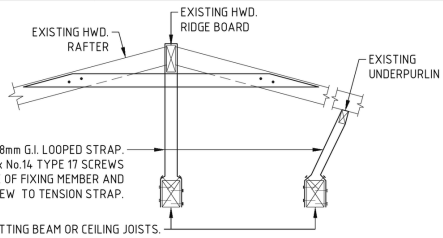


WE 5-1



WE 5-2

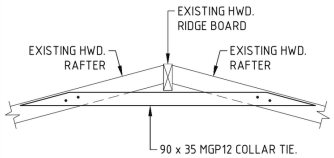
TIE-DOWN NOTE:
PROVIDE CONNECTION TO EVERY SECOND RAFTER, (AT MAX. 1200 CRS) AT ALL RIDGEBOARD AND UNDERPURLIN LOCATIONS (PROVIDED AT EVERY RAFTER FOR N4/C2 AT MAX. 600 CRS.).



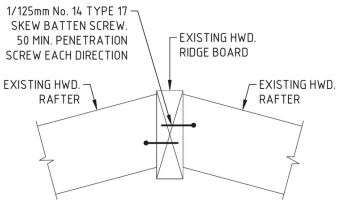
FIX TO TOP PLATE, STRUTTING BEAM OR CEILING JOISTS. FIX STRUTTING BEAM AND CEILING JOISTS TO TOP PLATE AS PER TYPICAL RAFTER TO TOP PLATE/UNDERPURLIN DETAIL.

WE 5-3

RAFTERS TO RAFTERS AT RIDGE

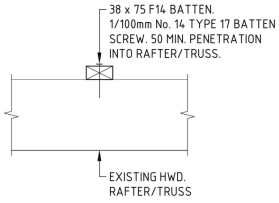


WE 6-1



WE 6-2

BATTEN TO RAFTERS

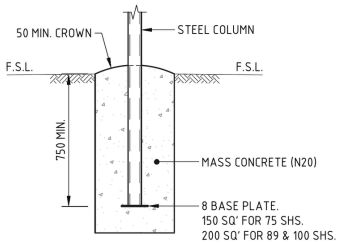


WE 7-1

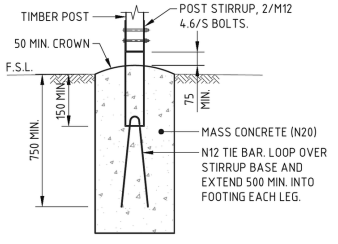
Floor and footings: WE 1 to WE 3

Steps 5 to 7

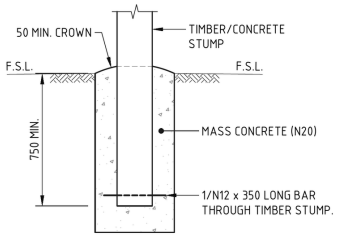
POST TO FOOTING



WE 1-1

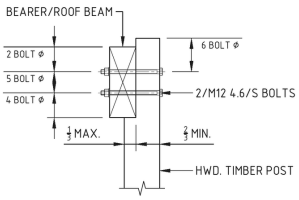


WE 1-2

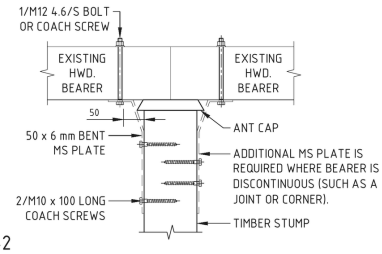


WE 1-3

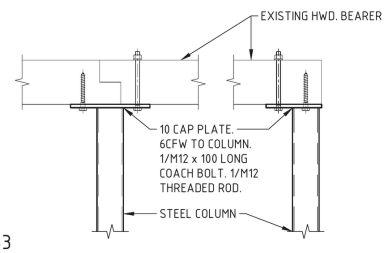
BEARER TO POST



WE 2-1

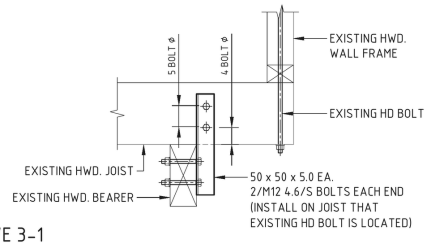


WE 2-2

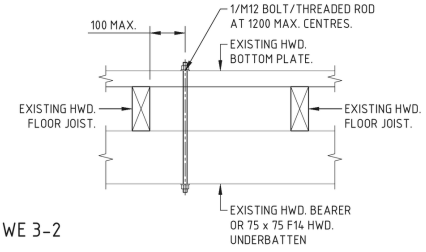


WE 2-3

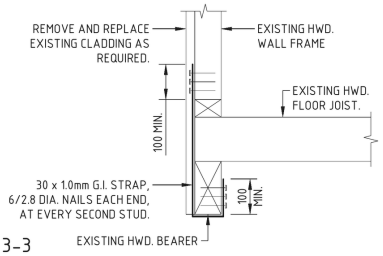
BOTTOM PLATE/FLOOR JOIST TO BEARER



WE 3-1



WE 3-2



WE 3-3