

## Technical Manual

**NEIL KOOT**

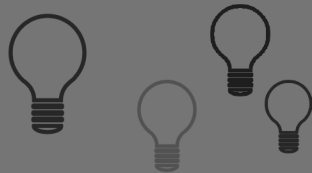
021 472 799

[neil@buildandlift.co.nz](mailto:neil@buildandlift.co.nz)

[www.buildandlift.co.nz](http://www.buildandlift.co.nz)

Building System Saving Time and Money  
by Improving Efficiency and Safety in the  
Building Industry

# IMPROVING BUILDING EFFICIENCY



This method is suitable for houses built on both concrete and wooden floors, including brick veneer houses.

## Cost and Labour Savings

- Labour savings across all aspects of building and finishing the roof structure.
- No scaffolding or edge protection required in most situations.
- No safety netting or fall protection required.
- No need for dwangs/nogs in the wall framing for soffit.
- Lift is plumb, no need to plumb frames.
- Spouting, solar panels, photovoltaic panels, gable end cladding, painting, etc. is all finished efficiently and safely close to ground level.
- The lift of the roof structure and fitting of the frames can be completed in one day.
- Easier to straighten and fix the bottom plate.
- Frames are fixed flush on the bottom plate.
- **LVL top plate acts as lintels for all window and door openings.**
- No lintel jack studs or individual lintels.
- Plumbing and other penetrations in the roof can be done early and accurately as the bottom plate is fixed to locate all interior and exterior walls.
- Frames are easier to build and lighter to handle (no lintels).
- Frames remain dry, eliminating movement in the timber.
- Wooden flooring is under cover sooner.
- Ply rigid air barrier provides structural bracing and immediate close-in of structure.
- Interior and exterior work can be completed in unison.

## Priceless Advantages

- Safer environment.
- Improves the work environment.
- Quality of work is improved as there is less chance of damage to trusses and roof cladding during construction.
- Future additions or alterations to window or door openings can be made anywhere in the exterior walls as the lintels are already in place.

## HEALTH AND SAFETY



Improve efficiency and safety in the building industry by minimising working at height and putting safety first, **taking away the temptation to take risks.**

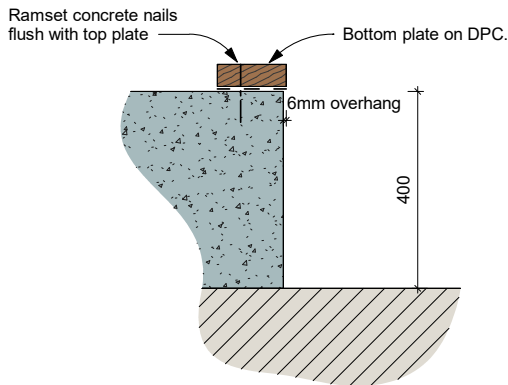
## Health and Safety Advantages

- Injury prevention
  - Easier to move around the work site without scaffolding.
  - Risk of tools and materials falling off scaffolding is eliminated.
  - Trusses are fitted close to ground level.
  - Passing roofing materials around scaffolding is eliminated, making it safer to handle.
  - The majority of the work is completed at waist height, significantly reducing the risk of back injury.
- Reduced fatigue
  - No need to climb scaffolding or lift materials over scaffolding.
  - Frames are lighter with no lintels.
- Council roof inspections can be done at ground level.



Save time and money, and build quicker and safer.

- ➡ All internal and external bottom plates are fixed to the floor with propriety concrete nails or concrete screws and washers (concrete screws/washers must be routed into the bottom plate to finish flush).
- ➡ Bottom plates must run continuously through all window and door openings (for jack support and location).
- ➡ Bottom plates are fixed for ease of locating and fixing frames.
- ➡ The bottom plate is to overhang the foundation or wooden floor by minimum 6mm and a clear face of 400mm down the side of the foundation (where the jacks sit).



**Fig 1:** Bottom plate positioned.

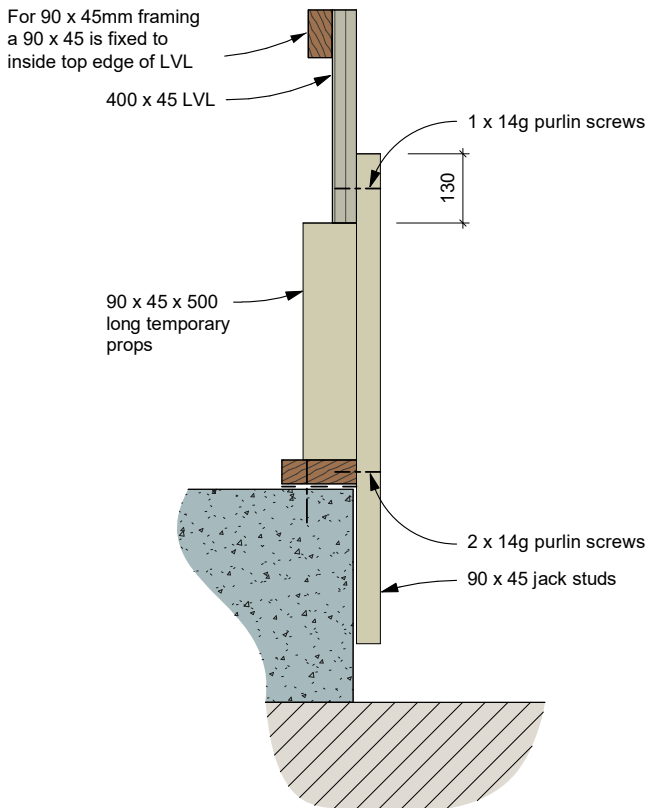
- ➡ LVL (400x45) is set up 545mm off the finished floor. Level, straight and plumb, directly over the bottom plate.

This is for a floor to underside of truss height 2500mm or less.

- ➡ The LVL is held in place by temporary 90x45mm props that are 500mm long, and a 90x45mm jack stud down the face of the LVL and foundation. The jack stud must be no more than 130mm up the face of the LVL.

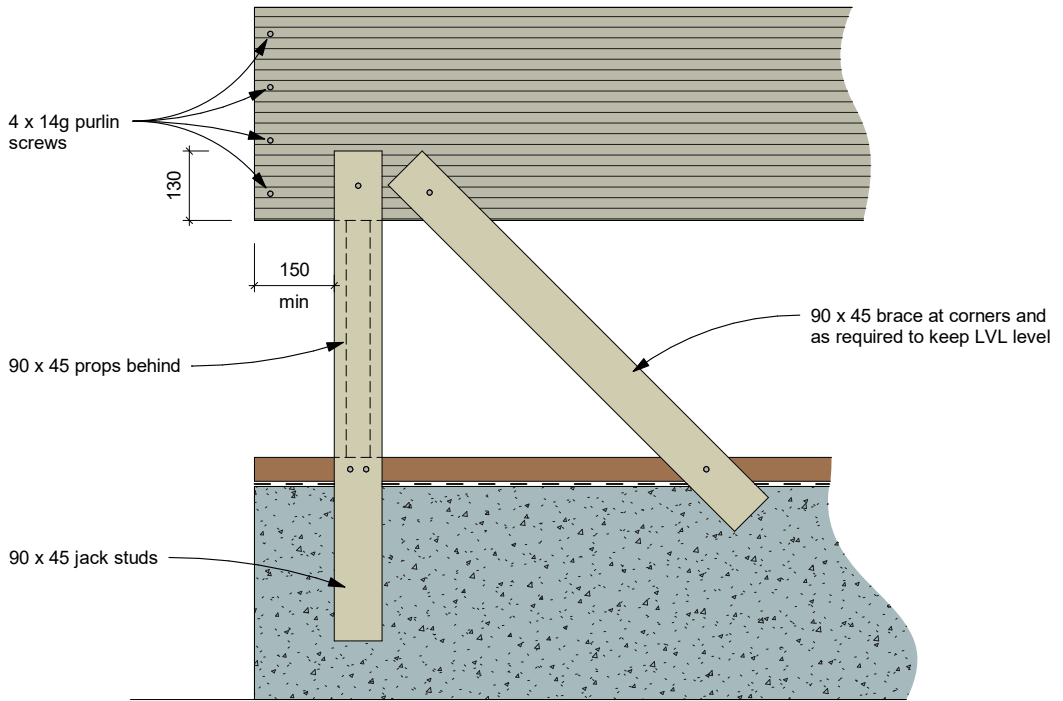
The LVL is temporarily braced back to the bottom plates as necessary to keep straight and rigid.

- ➡ The LVL is not necessary on gable ends. Frames can be standard full height frames on gable ends.



**Fig 2:** LVL located and held in place.

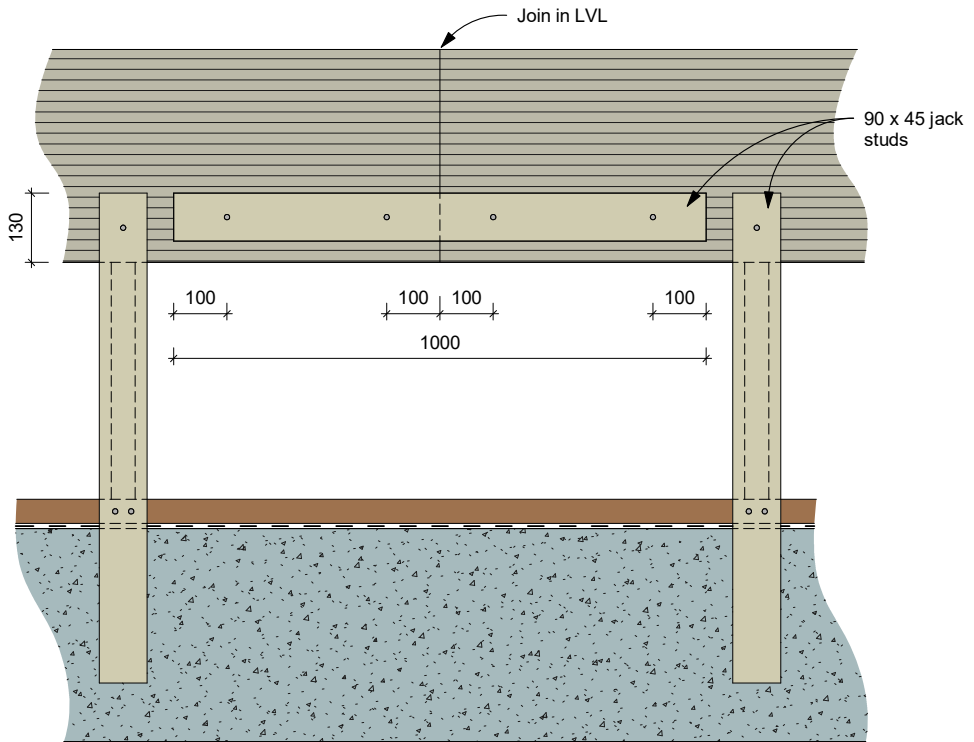
- ➡ The jack studs/props must be kept a minimum of 150mm from all internal and external corners.
- ➡ The LVL is screwed together with a minimum of 4x 14g x 100mm Purlin screws on all internal and external corners.



**Fig 3: Corner position**

- ➡ Full lengths of LVL must be used wherever possible.

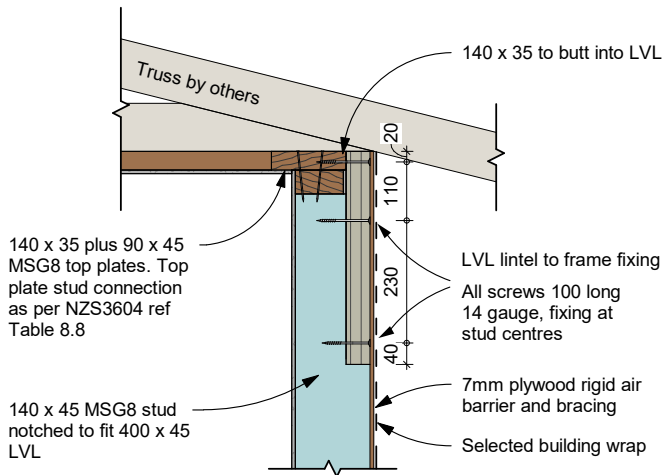
LVL joints should be temporarily strapped with a 90x45mm plate approximately 1 metre long, with 2x 14g x 100mm Purlin screws in each side. Top of plate to be 130mm from bottom of LVL.



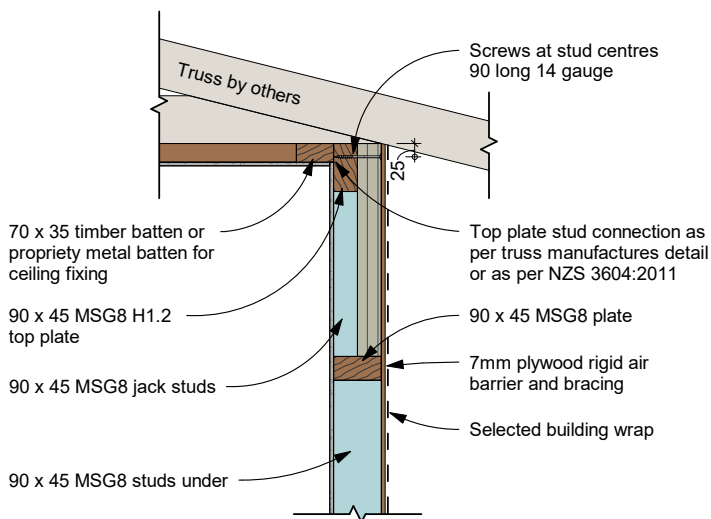
**Fig 4:** Joining of LVL's

- ➡ For 90x45mm framing, a 90x45mm plate on edge is fixed to inside top edge of the LVL.
- ➡ For 140mm framing, studs are rebated to accommodate LVL.
- ➡ For 140x45mm framing, a 90x45mm top plate is fixed 35mm below top of LVL, as shown in Fig 5.
- ➡ Trusses and top plates are fixed as per manufacturers specification and/or NZS 3604:2011.
- ➡ Purlins spacing is best at 450 centres for safety.
- ➡ For a hip roof, once the LVL's have been set up, one LVL can be temporarily taken down for ease of fitting trusses.
- ➡ Spanning capacity of LVL lintels as per manufacturers structural LVL tables.



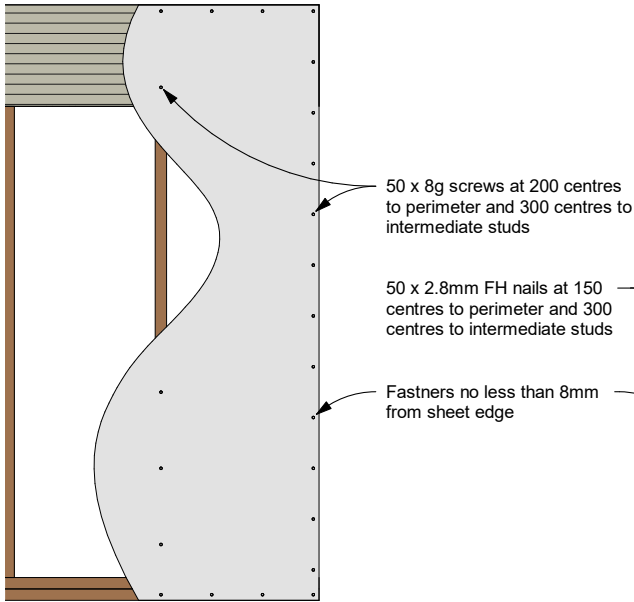


**Fig 5: 140mm framing detail (preferred)**

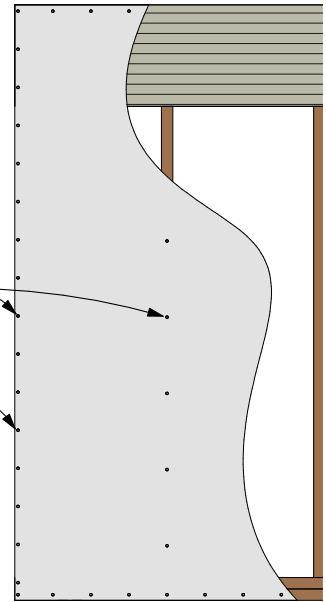


**Fig 6: 90mm framing detail**

## Detail of Ply to LVL Connection



**Fig 7:** Screw fixing Ply



**Fig 8:** Nail fixing Ply

- ➡ Once lifted, locking pins are put in the jacks to prevent movement of the lifting platforms.
- ➡ The frames are fitted (with the help of the roof-lifting crew). These are easily and quickly located and fixed to the bottom plate.
- ➡ The roof is lowered and the frames are braced.
- ➡ Jacks are removed.
- ➡ The lifting of the roof structure and the fitting of frames should be completed in one day for a typical house up to 300m<sup>2</sup>
- ➡ Roof and bottom plate fixing installed as per NZS 3604.

# BRACING



- ➡ No additional straps, tie downs or panel fixings are required.
- ➡ Bracing should be evenly distributed throughout building.
- ➡ Use plasterboard (or other sheet linings) as normal for internal wall bracing.

| BRACING UNITS |             |             |           |
|---------------|-------------|-------------|-----------|
| Type          | Min. Length | BU's - Wind | BU's - EQ |
| PBL-1         | 0.4         | 75          | 70        |
| PBL-2         | 1.2         | 75          | 80        |