



Modern Construction

Modern construction techniques using lighter weight structurally strong manufactured timber members raise challenges for plumbers when the building designer and homeowner desire internal and external walls clean and free of clutter by exposed pipework.

Pipework executed with the precision befitting a sophisticated plant room may be beauty in the eye of a skilled tradesman but a hideous eyesore to the minimalist homeowner. Inevitably concealed pipework is going to clash with structural building members.

“No sweat!”, You may say. “Nothing a good set of hole saws, jig saw or reciprocating saw can’t fix.”

Yes it is physically possible to install sanitary plumbing pipework of any size through a series of timber joists or I Beams at the correct grade but what effect will this have on the building structural integrity?

» Catastrophic failure of that section of the building sooner or later as stresses placed on the floor cause it to “tear on the dotted line”.

Before you object that this is the product of a fertile imagination, *yes, it did happen right here on the Capricorn Coast!*

Structural building elements affected by holes in the wrong place may be:

Bracing walls – ply sheeting fastened to studs from bottom plate to top plate and along the wall a distance specified by engineer to as the name implies “brace the wall against lateral loads from wind and other influences”” .



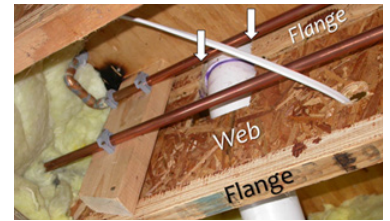
LVL – (Laminated Veneer Lumber) used instead of natural timber beams and joists having consistent structural strength per member such as hySPAN sized from 90mm x 35mm to 600mm x 75mm.



Engineered Wood Products - such as hyJOIST , Engineered timber I beams with either LVL timber or graded natural timber flanges and structural ply webbing for light weight yet structurally robust construction.



Examples of service holes compromising structural integrity



Notifiable Work Update – Period 1 Dec 2017 to 31 May 2018 for Livingstone Shire
 182 Calendar days (1.07 /day)...or 135 Working days (1.45 / working day)
 40 separate plumbers lodged 196 Form 4 comprised of:

Amt	Cat No.	Short Description
-	1	emergency work
98	2	extend, alter, replace or remove water supply piping
-	3	extend or remove fire service work associated with building approval under BA75
26	4	extend, alter, replace, remove exist sanitary drain for cl 1 / 10 building, <u>excl</u> combined drain
6	5	extend, alter, replace, remove exist sanitary plumbing class 2 to 9 building
48	6	install, replace, remove temperature control device
113	7	install, remove, replace a water heater
5	8	install, remove, replace a testable backflow prevention device
-	9	install, remove, replace a dual check valve with atmospheric port
-	10	replace greywater treatment plant for class 1 building
10	11	install a fixture in a class 1 building
12	12	relocate a fixture in a class 1 building
5	13	install or relocate fixture in class 2 to 9 building, no sanitary drainage
-	14	install or relocate fixture in class 10 building
1	15	seal sanitary drain upstream of connection point for sewerage provider’s sewer
-	16	seal existing water service downstream of water meter for class 2 to 9 building

It was noted from the statistics that, of the 113 water heater installations:

- ? 63 water heaters did not appear to require alterations to water pipe (category 2)
- ? 70 water heaters did not require installation of a tempering valve (category 6)

Reminder: Ensure that you declare ALL categories involved in the work carried out. If you are only declaring Category 7 please amend the Form 4 lodged through MyQBCC

How to avoid having a simple hole cause frame failure?

1. Ask the building contractor where service holes of the size you require are permitted in the particular structural member.
2. Redesign pipework to reduce necessity for holes in structural elements.
3. Consult manual for frame manufacturer for appropriate service hole locations and sizes
4. Install and use designIT Mobile App for service holes in hyJOIST.

Type in “designIT site” to download the app.
FREE download at time of this article

- Access Futurebuild installation details
- Specify service holes in hyJOIST
- Detail common rafter overhangs in hyJOIST and hySPAN
- Check or redesign bearers, joists and rafters as hyJOIST or hySPAN
- Save all results to devices

5. Obtain from SAI Global AS 1684.3 – 2010 Residential timber-framed construction Part 3: Cyclonic Areas

This standard sets out where holes and notches in all structural members such as:

- top and bottom plates, bearers and studs in solid timber construction Note: AS/NZS 3500.1:2018 section 5.4.2 and AS/NZS 3500.4:2018 section 4.5 reproduce sections and diagrams from AS 1684.3
- Appendix J - BUILDING PRACTICES FOR ENGINEERED WOOD PRODUCTS (EWPS)
6. Obtain and refer to the “ewpaa STRUCTURAL PLYWOOD WALL BRACING Limit States Design Manual” by means of a Google Search and download PDF document (See page 28 – Holes Through Plywood Bracing)
 7. When in doubt, don’t cut the hole until you remove all doubt! Your builder will thank you ... your liability insurance company will thank you ... You will thank yourself for not causing the unnecessary stress of a catastrophic failure!

The obligation of a plumbing contractor is emphasised by AS/NZS 3500.2:2015 clause 10.2.3:

“Where holes are formed in the framework to accommodate pipework, they shall be sized to allow free longitudinal movement of the pipework **without affecting the structural integrity of the framework.**”

Polythene pipe in chemical saturated ground

AS/NZS 3500.1:2015 2.3 states: “ Factors to be taken into account in the selection shall include, but are not limited to (c) The nature of the environment and the ground and the possibility of chemical attack and permeation therefrom.”

Note “permeation” is the penetration of a liquid, gas or vapour through a solid.

- Auspex PIPELINE MANUAL states under Precautions: “Always check with the manufacturer if the pipework is to be installed in a known contaminated area, in contaminated soils or may be subject to

chemical spills”

- Rehau RAUTITAN Water and Gas Technical Information manual states under 7.13 Installation below ground: “Laying of RAUTITAN pipes in contaminated soil (i.e. petrol, benzene, paint, solvent etc.) is not permitted.

! If chemical damage is likely to occur, e.g. from termite treatments, RAUTITAN pipes and fittings shall be adequately protected using a suitable conduit, e.g. PVC pipes or equivalent.

Also section 5 TRANSPORT AND STORAGE: Protect against chemicals ..”

Research in Australia by CSIRO as reported in the US Plastics Pipe Institute document

Change is in the wind!

- ◇ Plumbing and Drainage Act 2018
- ◇ National Construction Code Volume 3 (PCA) 2019
- ◇ AS/NZS 3500:2018

Details of implementation dates will be provided in coming issues.

“Recommended Practices Regarding Application of Pesticides and Termiticides near PEX Pipes TN-39/2013” states in part:

“Available data indicate that the solvents used in liquid pesticides/termiticides will soak into the ground and/or evaporate before they can pass through the wall of polyethylene water pipes. While this study showed no permeation of organic-based solvent pesticides through PE water pipes in a real-world application, other experiments have shown that it is possible for organic-based solvent pesticides to permeate through PE water pipes in certain conditions. This can be assumed to apply also to PEX pipes, though not necessarily at the same level, due to molecular differences. Therefore, caution is necessary when applying these products near or on PEX water pipes.”

What does this mean for plumbers?

There is need for caution when installing PEX and PE pipe where chemical termite treatment is or will be carried out.

Seek advice from manufacturers regarding appropriate sleeving, conduits, tapes or adhesives which will not permeate nor affect the PE/PEX product or use an alternate material such as appropriately installed copper piping through the affected area.

While this may be stating the obvious, apply solutions provided by a manufacturer only to that manufacturer’s product.

If you change product, obtain specific advice from that product’s manufacturer.

As a plumber, ensure that your client’s pipework provides them with clean, uncontaminated water for peace of mind.



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(including after-hours for emergencies)



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