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PASSIVE HOUSE

Plumbing and Drainage

PITFALLS, TIPS AND TRICKS

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Images courtesy of PHINZ

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1940 - 1993

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Auxiliary calculation rain water pipes

Nominal width:	**100**	mm
Insul. thickness:	**20**	mm
Thermal conductivity	**0.045**	W/(mK)
Interior pipe diameter:	0.100	m
Exterior pipe diameter:	0.140	m
α-Surface	6.80	W/(m²K)
Ψ–value	0.489	
Reduction factor	0.67	
Ψ–value	**0.327**	**W/(mK)**

To enter as group 15 thermal bridge

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Thermal bridge inputs

No.	Thermal bridge - denomination	Group No.	Assigned to group	Quantity	x (	Length [m]	-	Subtraction length [m]	)=	Length ℓ [m]	User determined psi value [W/(mK)]
1	Slab Perimiter	16	Perimeter thermal bridges	1	x (	37.55	-		) =	37.55	0.150
2	Steel Column	15	Thermal bridges Ambient	1	x (	2.76	-		) =	2.76	0.045
3	Wall External Corner	15	Thermal bridges Ambient	4	x (	5.39	-	-0.04	) =	21.68	-0.036
4	Midfloor Junction	15	Thermal bridges Ambient	1	x (	37.60	-		) =	37.60	0.040
5	Soil Stack	15	Thermal bridges Ambient	1	x (	5.45	-		) =	5.45	0.327

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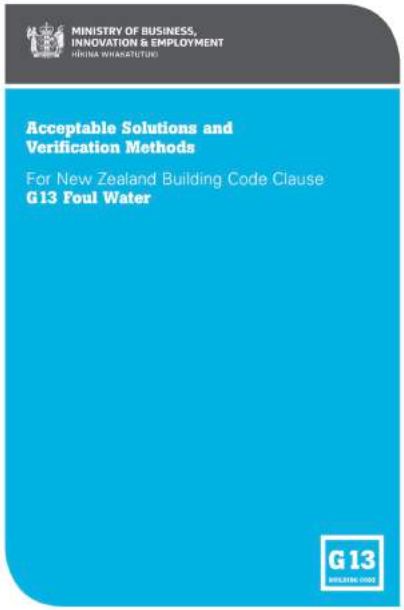
User determined psi value [W/(mK)]
0.150
0.045
-0.036
0.040
0.327

NZ & AUS PLUMBING AND DRAINAGE

Compliance Options



G13/AS1

AS/NZS 3500 Part 2

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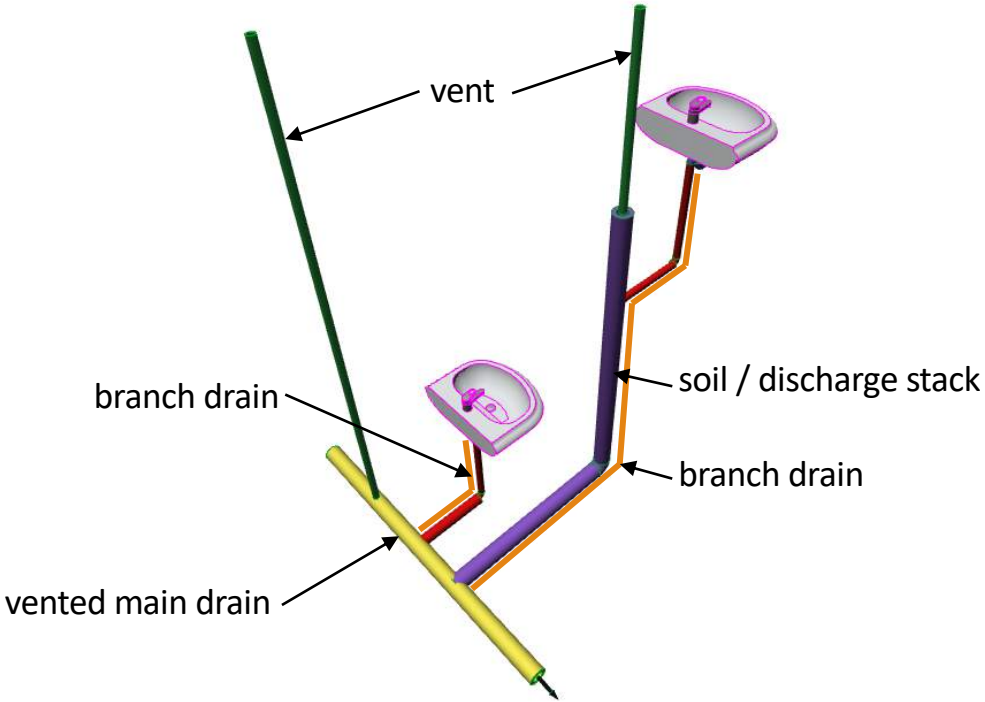
DEFINITIONS



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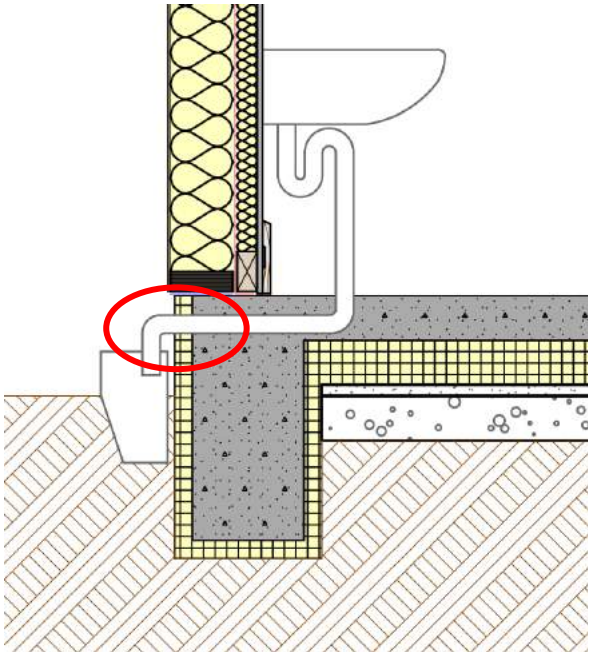
G13/AS1 CHALLENGES
Perimeter Thermal Bridges

4.5 Fixture discharge pipes serving waste water fixtures

4.5.1 *Waste water fixture discharge pipes* shall discharge either to:

a) A *gully trap*, in accordance with Figure 5 of G13/AS1 and Figure 3 of G13/AS2, or

b) A *discharge stack* as in Paragraph 4.7 and Figures 7 and 8.



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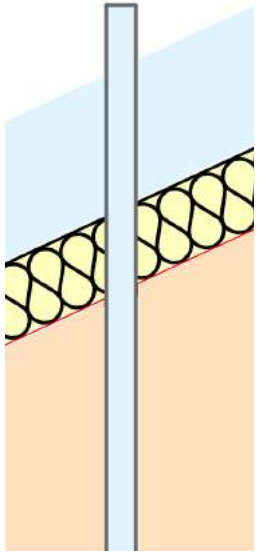
G13/AS1 CHALLENGES
Open Air Stack Vents

Stack vent: All stacks discharging to another stack or to a *drain* require an open vent, sized in accordance with Table 6. Venting with an *air admittance valve* is permitted only on second and subsequent stacks as at least one open vent (the stack vent, if acting as main *drain* vent) is required to ventilate the *drain*.



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AIR ADMITANCE VALVE - AAV

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AS/NZS 3500 ALTERNATIVES
Perimeter Insulation Thermal Bridge

3.10 UNVENTED BRANCH DRAINS

3.10.1 General

The requirements of this Clause (3.10) shall apply to—

(a) ground-floor connections to a vented drain installed on grade, located below or above the ground (see Clause 10.11); or

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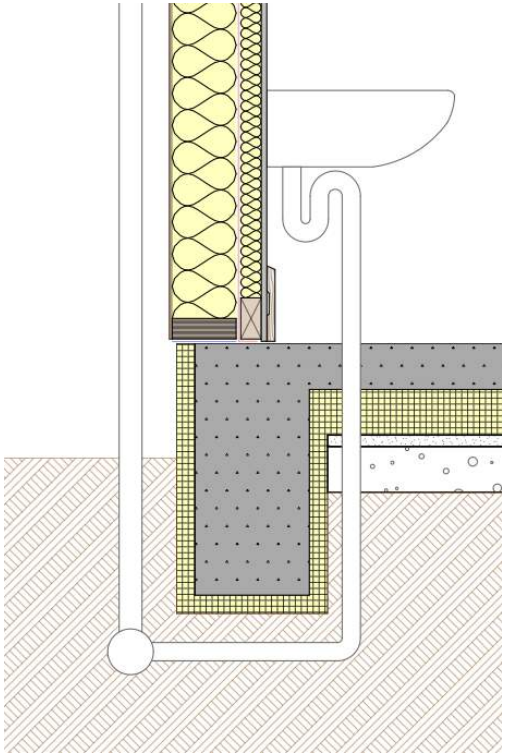
AS/NZS 3500 ALTERNATIVES
Perimeter Insulation Thermal Bridge



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AS/NZS 3500 ALTERNATIVES
Stack Vents

6.10.1 Air admittance valves

Air admittance valves conforming with AS/NZS 4936 may be used in sanitary plumbing systems for trap vents, group vents and stack vents and to ventilate branch drains. They shall not be used for the upstream venting of a main drain.

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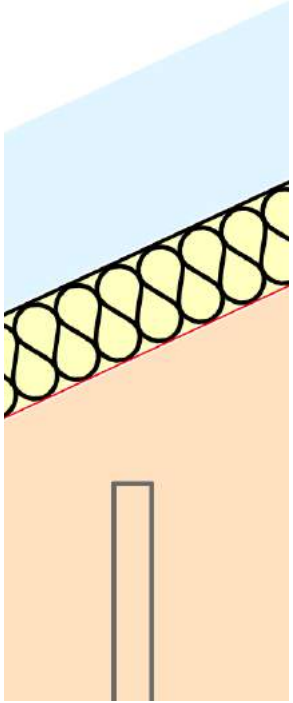
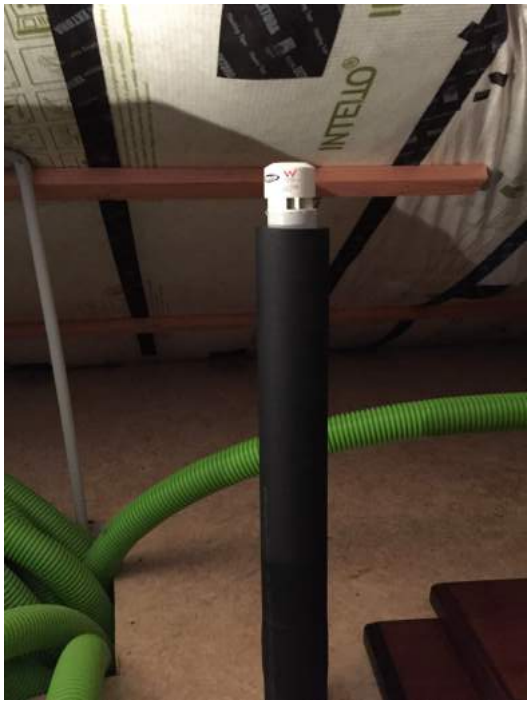
AS/NZS 3500 ALTERNATIVES
Stack Vents





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AS/NZS 3500 CRITERIA

STREET DRAIN INVERT LEVEL

- Can we achieve the falls necessary????

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AS/NZS 3500 CRITERIA

NO GULLY TRAPS

- Vented main drain
- Overflow Relief Gully

3.9 VENTING OF DRAINS

3.9.1 General

Vents in drains shall be provided—

(a) at both ends of any drain that incorporates a boundary trap;

(b) at the upstream end on any drain not incorporating a boundary trap;

(c) at the upstream end of any branch drain to which a fixture trap or floor waste gully is connected, if the distance from the weir of the trap to the vented drain exceeds 10 m;

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AS/NZS 3500 CRITERIA

AAV VENTED STACK

- Branch drain <= 10m long
- Drain vent (terminal vent) at upstream end of drain
- <10 storeys

3.10.3 Maximum length

The total length of an unvented branch drain, including the length of the fixture discharge pipe, shall be not greater than the following:

(a) 10 m from the vented drain to the weir of the trap, provided the length of the discharge pipe does not include a vertical drop, between the crown of the trap and the invert of the branch drain, exceeds—

  (i) 2 m for water closet pans with DN 80 discharge pipes;

  (ii) 1.5 m for basins and bidets fitted with 'S' traps; and

  (iii) 2.5 m for all other fixtures.

(b) 10 m from the weir of a disconnector gully.

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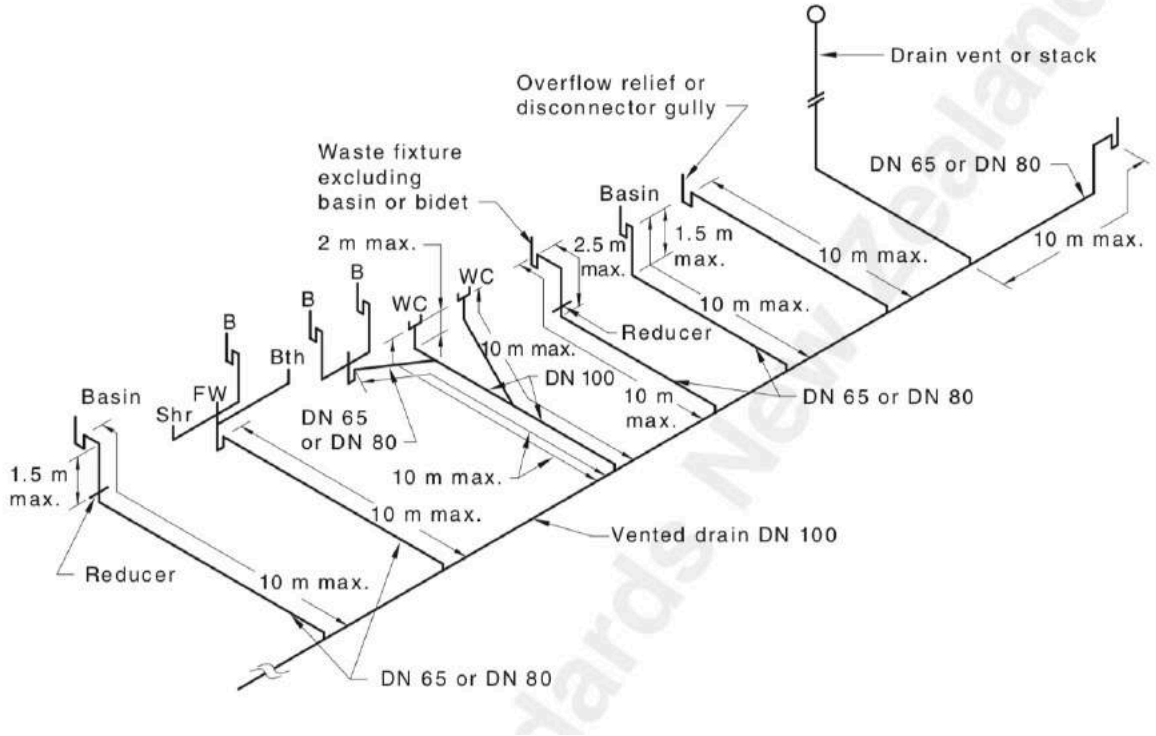
AS/NZS 3500 CRITERIA



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DHW STORAGE LOSSES

Storage heat losses

		Storage 1
Selection of storage tank		2-DHW only
Storage necessary for HP		x
Solar DHW connection		
Heat loss rate	W/K	3.0
Storage volume	litre	300
Standby fraction	-	

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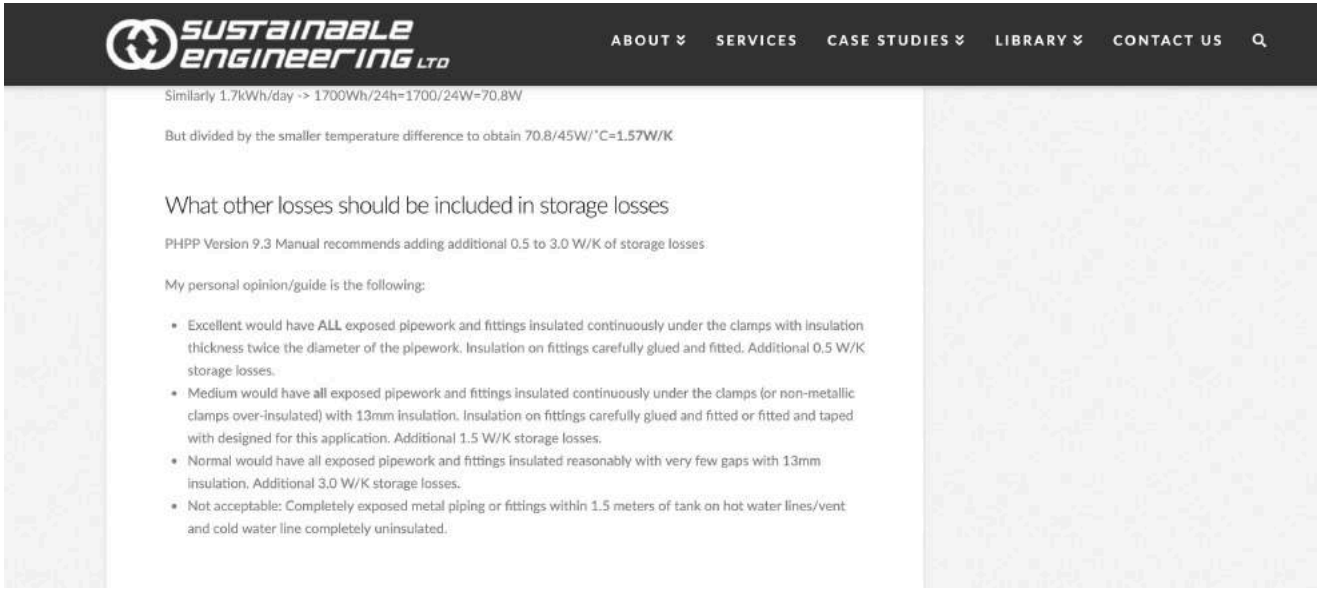
PIPE INSULATION IN PHPP



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IMPLEMENTATION

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IMPLEMENTATION

Have you designed in enough space for sufficient insulation?!?!

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DOCUMENTATION

AIRTIGHT BUILDING PROJECT

This is an airtight building project. Penetrations to the exterior envelope and airtightness layer, other than those shown in this documentation, are not permitted.

Any damage incurred to either the envelope, airtightness layer or any products that compromise either must be referred to the Designer and Consulting Engineer for resolution. All products specified must be stored, handled and installed only in accordance with the manufacturer's / supplier's instructions and as shown within this documentation.

No substitute products or alternative construction methods are acceptable unless approved in writing by the Designer.

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DOCUMENTATION

PLUMBING AND DRAINAGE

This is a Certified Passive House. The design of the plumbing and drainage system is critical to the thermal performance of the completed building and its ability to be certified as a Passive House.

Ensure that the plumbing, waste and drainage system is installed exactly as detailed.

No substitute or alternative methods, systems or means of compliance with the NZBC are acceptable unless approved in writing by the Designer.

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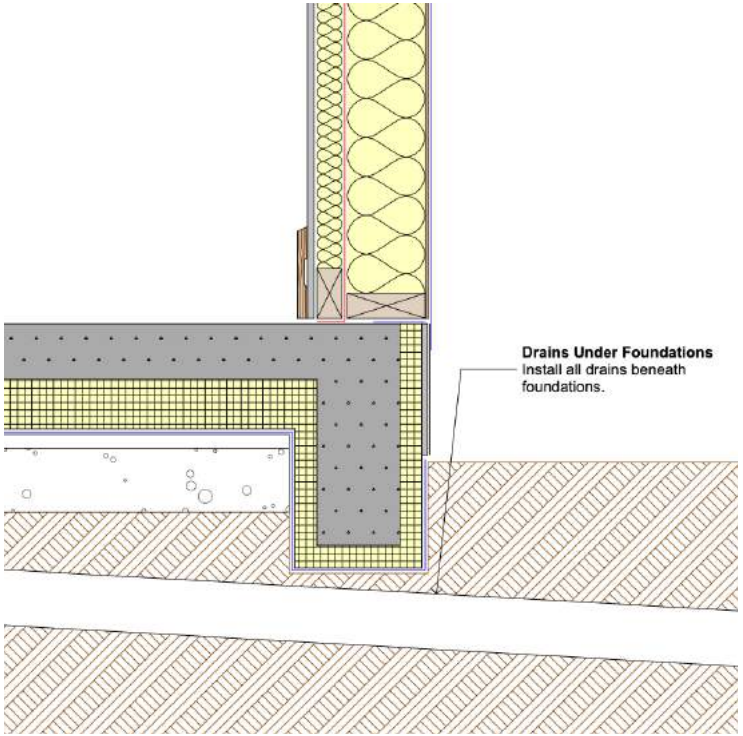
DOCUMENTATION



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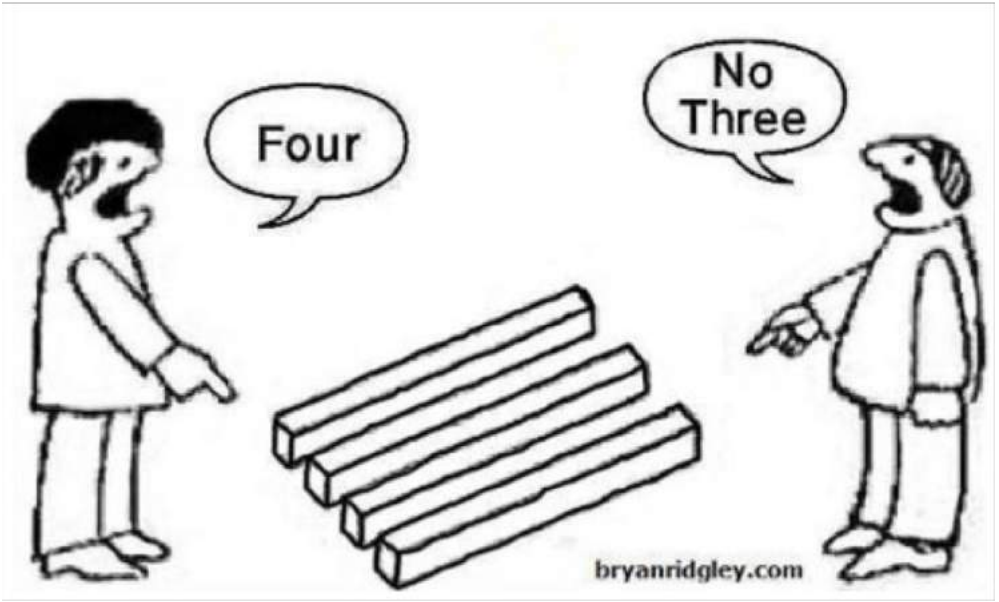
RESPONSIBILITY



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RESPONSIBILITY

Certified Passive House

Declaration of Construction Supervisor

The Passive House Project

123 Some Street
Suburbia
Christchurch

The finished building corresponds to the materials in this certification folder with no exceptions.

The signatories below are responsible for the correctness of the information provided.

Date:	**9 February 2019**
Company:	**Main Contractor Limited**
Role(s):	**Construction Supervisor**
Name:	**Good Builder**

Signature: 

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PASSIVE HOUSE PLUMBING
A DESIGN problem and a TEAM solution

Everyone has to be on board

Get the team together before you start on-site

- Designer
- Passive House Consultant
- Main Contractor
- Plumber
- Electrician
- Client

EVERYONE must understand their performance and workmanship requirements for a Passive House!

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RECOMMENDATIONS

1. Design the problem out
2. Assume a soil stack thermal bridge in your initial PHPP model
3. Document clearly; make it OK for contractors on-site to ask questions
4. Ensure the entire construction team understands!

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Frank Zappa
1940 - 1993