NZBC H1 - Calculation Method

Client	Bhitani & Puri - Front
Address	24 Westmoor Blvd
	Rolleston

REFERENCE BUILDING

Component	Description	Area sq m	Construction R-value	Heat Loss	(Heat loss = Area/R-value)
Roof Type 1	Corrugated on trusses @ 900crs	77.05	3.30	23.35	
Roof Type 2	Trimed Insulation area	7.23	3.30	2.19	
Wall Type 1	70% Total Wall Area	72.37	2.00	36.18	
Wall Type 2		0.00	2.00	0.00	
Wall Type 3		0.00	2.00	0.00	
Floor	Concrete slab on ground	84.28	1.30	64.83	
Glazing (30%)	Double Glazed Windows	31.01	0.37	83.82	
Glazing (>30%)	Double Glazed Windows	0.00	0.33	0.00	
Sklights	Skylight	0.00	0.37	0.00	
				210.37	TOTAL LOSS

Note: Total area of glazing (including Skylights) must be 50% or less than the total wall area

PROPOSED BUILDING

Component	Description	Area sq m	Construction R-value	Heat Loss	(Heat loss = Area/R-value)
Roof Type 1	Corrugated on trusses @ 900crs	77.05	3.37	22.86	
Roof Type 2	Trimed Insulation area	7.23	2.07	3.49	
Wall Type 1	Brick Cladding	75.18	2.21	34.02	
Wall Type 2	Linea Cladding	9.87	2.16	4.57	
Wall Type 3		0.00	1.00	0.00	
Floor	Concrete slab on ground	84.28	1.28	65.84	
Glazing (30%)	Double Glazed Windows	18.33	0.30	61.10	
Glazing (>30%)	Double Glazed Windows	0.00	0.33	0.00	
Sklights	Skylight	0.00	0.37	0.00	
				191.89	TOTAL LOSS

Component	Description	Area sq m	
Wall Type	Total Area East, South & West	79.22	
Glazing (30%)	Total Area East, South & West	18.33	23.14%

Trimmed Insulation Area: (90mm Rafter & R3.6 batts 180mm)

Roof Pitch	Cut Height	Cut Width	% of batt cut	New R Value
15	80	372	44.44%	1.6
20	87	255	48.33%	1.74
25	95	182	52.78%	1.9
30	105	130	58.33%	2.1

H1 Solution

305mm Slab using RibRaft® 220mm Brick veneer no foundation insulation

The minimum R-value for this zone is 1.6

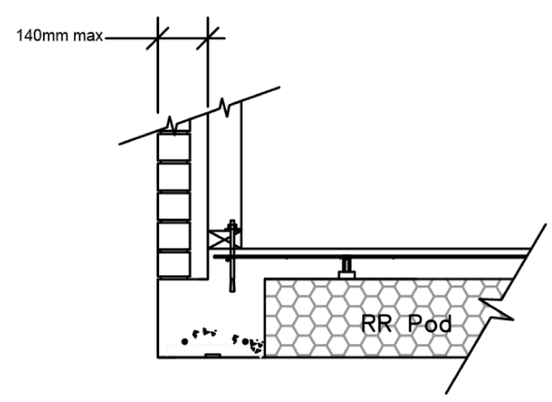
With a calculated A/P ratio of 1.9

The R-value for your selected solution is:

1.28

Exterior Area	84.28m²
Exterior Perimeter	42.11m
Embedded floor heating	No
Wall Width	90mm
No Edge Insulation Percentage	14.9%

For a full set of CAD drawings for RibRaft solutions, please refer to the Firth Resources web page
https://www.firth.co.nz/resources/drawings/
Check the RibRaft Foundations filter to show only relevant files.



8 220mm FIRTH RIBRAFT POLYPOD
BRICK VENEER
FIRTH RAFTMIX 20 OR 25MPa

Firth's H1 Online Solution Calculator uses the specification data entered by the user and applies the methodology, as described in the Building Code amendment H1 Energy Efficiency Acceptable Solution H1/AS1 - 5th Edition for all housing, and buildings (up to 300m²), to recommend concrete slab foundation insulation solutions using CodeMark certified Firth products and systems (only).

The recommended solution in this pdf document, can be used as part of a Building Consent application however, Firth accepts no liability for Building Code compliance or thermal performance of the house or building. Firth also accepts no liability through misrepresentation or improper use of the Firth H1 Online Solution Calculator to obtain or prove Building Code compliance.

Firth has worked to ensure the accuracy of the solution provided by its H1 Online Solution Calculator. Firth cannot guarantee the accuracy of the recommend solution under any other methodology than that described in H1/AS1 5th Edition.

Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "isothermal planes" method, the same method as used in NZS4214:2006.

I have recently implemented some changes to the way assemblies with multiple adjacent insulation layers such as truss roofs with a second layer of insulation are calculated. Check out the details here.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

- Floors ○
- Walls ○
- Roofs ◉

Date: 03/07/2023

Element Name (optional) **3.37** m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed truss Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : generic - Metal corrugate Iron with building paper
R-value: 0.01

Insulation :

Timber Frame & Cavity :
90mm rafters or joists @ 900mm, battens covered with insulation

Roof Frame Area: 5.0%	*Cavity Area: 95.0%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : 3.6

Roof Lining : generic - gypsum Plasterboard 13mm
R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights
Ceiling Area [m²]: 84.28 Number of downlights: Clearance from lamp holder side [m]:

[Print Page]

Construction R-value Calculator

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Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

- Floors ○
- Walls ○
- Roofs ◉

Date: 03/07/2023

Element Name (optional) **2.07** m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed truss Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : generic - Metal corrugate Iron with building paper

R-value: 0.01

Insulation :

Timber Frame & Cavity :

90mm rafters or joists @ 900mm, battens covered with insulation

Roof Frame Area: 5.0%	*Cavity Area: 95.0%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : 1.9

Roof Lining : generic - gypsum Plasterboard 13mm

R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights

Ceiling Area [m²]: 7.23 Number of downlights: Clearance from lamp holder side [m]:

[Print Page]

NZBC H1 - Calculation Method

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Address	24 Westmoor Blvd
	Rolleston

REFERENCE BUILDING

Component	Description	Area sq m	Construction R-value	Heat Loss	(Heat loss = Area/R-value)
Roof Type 1	Corrugated on trusses @ 900crs	107.72	3.30	32.64	
Roof Type 2	Trimed Insulation area	8.55	3.30	2.59	
Wall Type 1	70% Total Wall Area	82.02	2.00	41.01	
Wall Type 2		0.00	2.00	0.00	
Wall Type 3		0.00	2.00	0.00	
Floor	Concrete slab on ground	116.27	1.30	89.44	
Glazing (30%)	Double Glazed Windows	35.15	0.37	95.01	
Glazing (>30%)	Double Glazed Windows	0.00	0.33	0.00	
Sklights	Skylight	0.00	0.37	0.00	
				260.69	TOTAL LOSS

Note: Total area of glazing (including Skylights) must be 50% or less than the total wall area

PROPOSED BUILDING

Component	Description	Area sq m	Construction R-value	Heat Loss	(Heat loss = Area/R-value)
Roof Type 1	Corrugated on trusses @ 900crs	107.72	3.37	31.96	
Roof Type 2	Trimed Insulation area	8.55	2.07	4.13	
Wall Type 1	Brick Cladding	88.14	2.21	39.88	
Wall Type 2	Linea Cladding	1.10	2.16	0.51	
Wall Type 3		0.00	1.00	0.00	
Floor	Concrete slab on ground	116.27	1.43	81.31	
Glazing (30%)	Double Glazed Windows	27.94	0.30	93.13	
Glazing (>30%)	Double Glazed Windows	0.00	0.33	0.00	
Sklights	Skylight	0.00	0.37	0.00	
				250.93	TOTAL LOSS

Component	Description	Area sq m	
Wall Type	Total Area East, South & West	87.37	
Glazing (30%)	Total Area East, South & West	16.05	18.37%

Trimmed Insulation Area: (90mm Rafter & R3.6 batts 180mm)

Roof Pitch	Cut Height	Cut Width	% of batt cut	New R Value
15	80	372	44.44%	1.6
20	87	255	48.33%	1.74
25	95	182	52.78%	1.9
30	105	130	58.33%	2.1

H1 Solution

305mm Slab using RibRaft® 220mm Brick veneer no foundation insulation

The minimum R-value for this zone is 1.6

With a calculated A/P ratio of 2.3

The R-value for your selected solution is:

1.43

Exterior Area	116.27m²
Exterior Perimeter	47.73m
Embedded floor heating	No
Wall Width	90mm
No Edge Insulation Percentage	13.2%

For a full set of CAD drawings for RibRaft solutions, please refer to the Firth Resources web page
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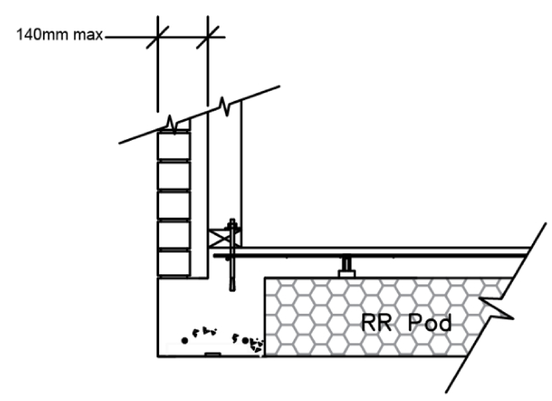

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Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

- Floors ○
- Walls ○
- Roofs ◉

Date: 03/07/2023

Element Name (optional) **3.37** m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed truss Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : generic - Metal corrugate Iron with building paper

R-value: 0.01

Insulation :

Timber Frame & Cavity :

90mm rafters or joists @ 900mm, battens covered with insulation

Roof Frame Area: 5.0%	*Cavity Area: 95.0%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : 3.6

Roof Lining : generic - gypsum Plasterboard 13mm

R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights

Ceiling Area [m²]: 116.2 Number of downlights: Clearance from lamp holder side [m]:

[Print Page]

Construction R-value Calculator

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Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel.

- Floors ○
- Walls ○
- Roofs ◉

Date: 03/07/2023

Element Name (optional) **2.07** m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed truss Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : generic - Metal corrugate Iron with building paper

R-value: 0.01

Insulation :

Timber Frame & Cavity :

90mm rafters or joists @ 900mm, battens covered with insulation

Roof Frame Area: 5.0%	*Cavity Area: 95.0%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : 1.9

Roof Lining : generic - gypsum Plasterboard 13mm

R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights

Ceiling Area [m²]: 8.55 Number of downlights: Clearance from lamp holder side [m]:

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