


# DESIGN DRAWINGS-1

## DECLARED TOTAL R-VALUES (R<sub>T</sub>)

READ IN CONJUNCTION WITH INSTALLATION INSTRUCTIONS

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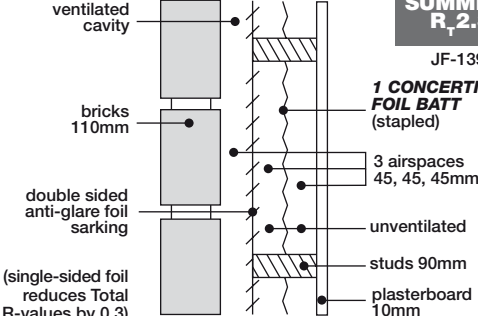
	<b>REFLECTIVITY</b> Aluminium Foil 97% (0.97) Anti-Glare Foil 80% (0.80)	<ul style="list-style-type: none"> <li>The Total R-value (R<sub>T</sub>) calculations are in accordance with AS/NZS 4859.1:2002/Amdt1:2006, and are based on a temperature difference between indoor and outdoor air temperatures of 6°C for winter and 12°C for summer.</li> <li>The contribution of <b>CONCERTINA FOIL BATTS</b> to Total R-value depends on installation and environmental conditions.</li> <li>The R-value will be reduced in the event of the accumulation of dust on upward facing surfaces and in those cavities that are ventilated.</li> <li>Anti-glare RFL foil sarking is based on double-sided (D/S) foil laminate in continuous roll form, anti-glare ink applied (eg. Bradford 733).</li> </ul>
	<b>EMITTANCE</b> Aluminium Foil 3% (0.03) Anti-Glare Foil 20% (0.20)	

### WALLS




#### BRICK VENEER (BV1)

**WINTER R<sub>T</sub> 2.6**  
**SUMMER R<sub>T</sub> 2.3**  
JF-139.21

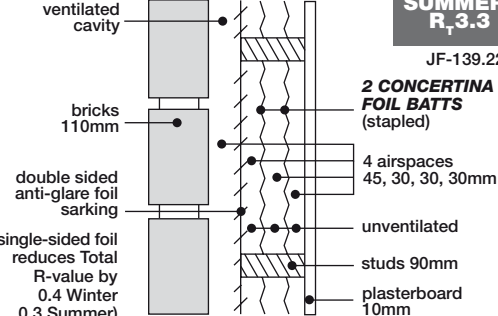


1 **CONCERTINA FOIL BATT** (stapled)

(single-sided foil reduces Total R-values by 0.3)

#### BRICK VENEER (BV2)

**WINTER R<sub>T</sub> 3.8**  
**SUMMER R<sub>T</sub> 3.3**  
JF-139.22



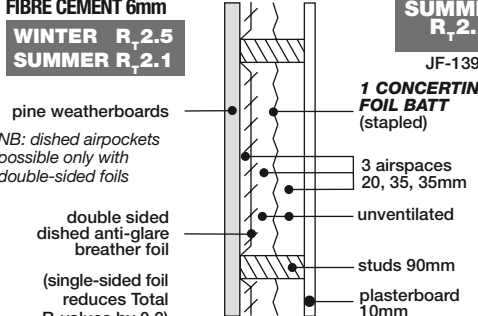
2 **CONCERTINA FOIL BATTS** (stapled)

(single-sided foil reduces Total R-value by 0.4 Winter 0.3 Summer)

#### WEATHERBOARD (WB1)

**WINTER R<sub>T</sub> 2.6**  
**SUMMER R<sub>T</sub> 2.2**  
JF-139.23

**FIBRE CEMENT 6mm**  
**WINTER R<sub>T</sub> 2.5**  
**SUMMER R<sub>T</sub> 2.1**



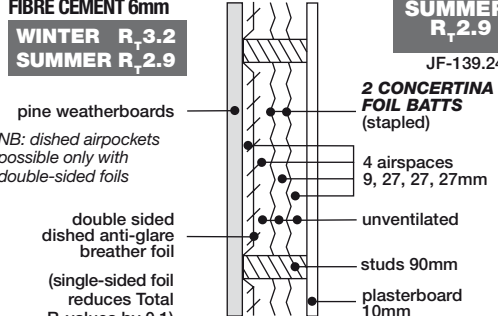
1 **CONCERTINA FOIL BATT** (stapled)

(single-sided foil reduces Total R-values by 0.3)

#### WEATHERBOARD (WB2)

**WINTER R<sub>T</sub> 3.3**  
**SUMMER R<sub>T</sub> 2.9**  
JF-139.24


**FIBRE CEMENT 6mm**  
**WINTER R<sub>T</sub> 3.2**  
**SUMMER R<sub>T</sub> 2.9**



2 **CONCERTINA FOIL BATTS** (stapled)

(single-sided foil reduces Total R-values by 0.1)

### TIMBER FLOORS

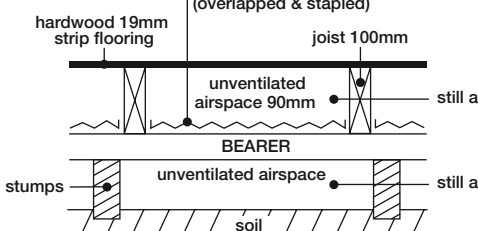


#### GROUND FLOOR ENCLOSED BUILDING PERIMETER (TF1)

**WINTER R<sub>T</sub> 3.0**  
**SUMMER R<sub>T</sub> 1.5**  
JF-139.011

(BV walls/clad walls with close weave shade cloth behind base boards)

Perforated **CONCERTINA FOIL BATT** for floors (overlapped & stapled)

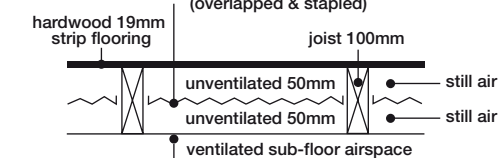


hardwood 19mm strip flooring, joist 100mm, unventilated airspace 90mm, BEARER, stumps, unventilated airspace, soil

#### SUSPENDED FLOOR OPEN BUILDING PERIMETER + CLOSED JOIST CAVITIES (TF2)

**WINTER R<sub>T</sub> 2.8**  
**SUMMER R<sub>T</sub> 1.2**  
JF-139.012

Perforated **CONCERTINA FOIL BATT** for floors (overlapped & stapled)



hardwood 19mm strip flooring, joist 100mm, unventilated 50mm, unventilated 50mm, ventilated sub-floor airspace

Continuous lining material to create a still air joist cavity (with gaps or perforation holes for drainage and breathing)  
Example: standard RFL roll foil - foil side down

### ROOF - CEILINGS



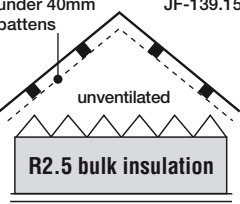
**CONCERTINA FOIL BATTS**

- laid on bulk insulation - not stapled
- triangular foil airspaces formed

#### METAL ROOF - PITCHED

(MR1)

**WINTER R<sub>T</sub> 4.4**  
**SUMMER R<sub>T</sub> 4.9**  
JF-139.15



unventilated

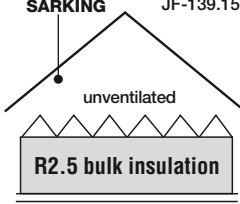
R2.5 bulk insulation

R3.5 bulk WINTER R<sub>T</sub> 5.4  
R4.0 bulk WINTER R<sub>T</sub> 6.0  
R3.5 bulk SUMMER R<sub>T</sub> 5.9  
R4.0 bulk SUMMER R<sub>T</sub> 6.3

(MR2)

**WINTER R<sub>T</sub> 3.9**  
**SUMMER R<sub>T</sub> 4.3**  
JF-139.151

NO FOIL SARKING



unventilated

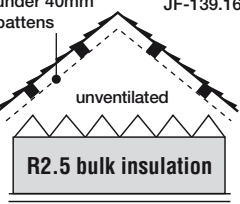
R2.5 bulk insulation

R3.5 bulk WINTER R<sub>T</sub> 5.0  
R4.0 bulk WINTER R<sub>T</sub> 5.5  
R3.5 bulk SUMMER R<sub>T</sub> 5.2  
R4.0 bulk SUMMER R<sub>T</sub> 5.7

#### TILE ROOF

(TR1)

**WINTER R<sub>T</sub> 4.3**  
**SUMMER R<sub>T</sub> 4.7**  
JF-139.16



unventilated

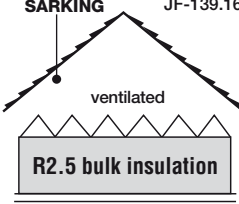
R2.5 bulk insulation

R3.5 bulk WINTER R<sub>T</sub> 5.3  
R4.0 bulk WINTER R<sub>T</sub> 5.8  
R3.5 bulk SUMMER R<sub>T</sub> 5.6  
R4.0 bulk SUMMER R<sub>T</sub> 6.1

(TR2)

**WINTER R<sub>T</sub> 3.6**  
**SUMMER R<sub>T</sub> 4.3**  
JF-139.161

NO FOIL SARKING



ventilated

R2.5 bulk insulation

R3.5 bulk WINTER R<sub>T</sub> 4.7  
R4.0 bulk WINTER R<sub>T</sub> 5.2  
R3.5 bulk SUMMER R<sub>T</sub> 5.3  
R4.0 bulk SUMMER R<sub>T</sub> 5.7

**SUMMARY OF RESULTS**

**DRAFT 25/08/2009**

JMF Calc.	Wren Ref.		Total R		Added R	
			"s"	"w"	"s"	"w"
			Summer	Winter	Summer	Winter
<b>WALLS</b>						
139.21	BV1	BRICK VENEER WALL WITH ANTIGLARE DOUBLE-SIDED RFL WRAP, AND A WREN CONCERTINA FOIL BATT MIDWAY BETWEEN 90MM STUDS	R2.26	R2.63	R0.83	R0.97
139.22	BV2	BRICK VENEER WALL WITH ANTIGLARE DOUBLE-SIDED RFL WRAP, AND TWO WREN CONCERTINA FOIL BATTS BETWEEN 90MM STUDS	R3.29	R3.77	R1.86	R2.11
139.23	WB1	PINE WEATHERBOARD WALL WITH DISHED BREATHER ANTIGLARE RFL WRAP AND ONE WREN CONCERTINA FOIL BATT BETWEEN 90MM STUDS	R2.18	R2.55	R0.89	R1.09
139.24	WB2	PINE WEATHERBOARD WALL WITH DISHED BREATHER ANTIGLARE RFL WRAP AND TWO WREN CONCERTINA FOIL BATTS BETWEEN 90MM STUDS	R2.92	R3.30	R1.79	R2.02
<b>FLOORS</b>						
139.011	TF1	BARE 19MM T&G FLOOR WITH ONE LAYER OF WREN PERFORATED CONCERTINA FOIL BATTS™ (100MM REFLECTIVE AIR GAP)	R1.45	R2.99	R0.55	R1.97
139.012	TF2	BARE 19MM T&G FLOOR, 50MM REFLECTIVE CAVITY, WREN PERFORATED CONCERTINA FOIL BATTS™, 50MM REFLECTIVE CAVITY, SINGLE-SIDED RFL & VENTILATED SUBFLOOR	R1.18	R2.76	R0.76	R2.24
<b>ROOFS</b>						
139.15	MR1	PITCHED METAL ROOF, 40MM SEMIREFLECTIVE AIR SPACE, AG RFL, UNVENTILATED REFLECTIVE ATTIC, WREN CONCERTINA FOIL BATT™ ON R2.5 BULK INSULATION, 10MM PLASTERBOARD	R4.90	R4.37	R1.12	R0.96
139.151	MR2	PITCHED METAL ROOF, UNVENTILATED REFLECTIVE ATTIC, WREN CONCERTINA FOIL BATT™ ON R2.5 BULK INSULATION, 10MM PLASTERBOARD	R4.31	R3.92	R1.36	R0.88
139.16	TR1	TILED ROOF, 40MM SEMIREFLECTIVE AIR SPACE, AG RFL, UNVENTILATED REFLECTIVE ATTIC, WREN CONCERTINA FOIL BATT™ ON R2.5 BULK INSULATION, 10MM PLASTERBOARD	R4.68	R4.26	R0.55	R0.53
139.16v	TR2	TILED ROOF, VENTILATED REFLECTIVE ATTIC, WREN CONCERTINA FOIL BATT™ ON R2.5 BULK INSULATION, 10MM PLASTERBOARD	R4.30	R3.61	R1.16	R0.75

NOTES: The above shows Total R determinations based upon AS/NZS 4859.1:2002/Amdt 1 2006, Materials for the thermal insulation of buildings. The insulation thermal resistance is calculated for the Australian air temperature differences (winter: 18°-12°C = 6K, summer: 36°-24°C = 12K) per AS/NZS 4859.1:2002/Amdt 1 2006.

"Added R" is the additional Total R solely due to the presence of Wren Foil Batts, applicable for the specific case.

Results current as at 25/08/2009

# CONCERTINA *FOIL BATT*<sup>™</sup>

## INSTALLATION INSTRUCTIONS – CEILINGS ROOFS

FEB 2016

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### FOIL BATT LAID ON TOP OF BULK INSULATION: BATT OR LOOSE-FILL

(*FOIL BATT* primary function: to reduce downward radiant heat flow)

This combination insulation is typically for dual cold and hot Winter and Summer climates. Further information:

<http://www.concertinafoilbatts.com/foilfacts.htm>

#### 1. Select appropriate *FOIL BATT* pack size to suit ceiling joist / truss centres

- 450 centres - one 1350 x 600 
- 600 centres - two 1350 x 425 
- 900 centres - two 1350 x 600 

2. Expand *FOIL BATT* sheets and lay on top of bulk insulation (batt or loose-fill) – stapling is not advisable and allows future removal of *FOIL BATT* for any reason. Joists will mostly remain visible for roof access. Maintain upright equal triangular profile for maximum thermal performance, ie concertinas are not shallow and not compressed. Thermally effective upward and downward foil airspaces are formed, which is not the case with conventional roll foil laid flat making contact on bulk insulation.

#### 3. Overlapping and coverage of *FOIL BATT*

End to end overlaps – allow minimum 50mm.

- 450 centres – one *FOIL BATT* makes perfect fit
- 600 & 900 centres – two *FOIL BATT*s are laid together with one excess concertina available for side by side overlapping, which is not essential but will create a complete and interlocking grid pattern of *FOIL BATT*s which may be useful in highly ventilated roof spaces. For summer radiant heat flow down, *FOIL BATT*s do not have to make tight fitting air-seals because there is no “convective heat” gain downwards (see BCA notes).

4. Cut or tear *FOIL BATT* to fit around vertical roofing members joining the ceiling. NB: 100% coverage is not essential against radiation heat flow down.

### ATTIC ROOMS, CATHEDRAL & FLAT ROOFS FOIL BATT STAPLED BETWEEN RAFTERS

(*FOIL BATT* primary function: to reduce downward radiant heat flow)

In confined cavities one or two layers of *FOIL BATT* can be stapled taut between rafters, with effective 50-100mm spacing airgaps. If summer radiant heat flow down is the dominant concern, then bulk insulations should not be used because radiation will rapidly penetrate the resistance capabilities of the fibres (ie which are tested at max. 33degC)



**CONCERTINA FOIL BATT** PROTECTING AIRCONDITIONING DUCTWORK FROM HIGH INTENSITY ROOF SPACE RADIATION (50 - 70° C)

### ELECTRICAL SAFETY

#### CEILINGS

Concertina Foil Batts (CFB), are electrically conductive as are all foil insulations, and under no circumstances should they be stapled in ceilings. Safe to lay down loose, overlap in accordance with Installation Instructions. Taping CFB is optional if roof space wind effects at roof edges exists and causes possible dislodgement.

Turn off power first.

Conduct an inspection prior to installation.

No safety switch, no install.

Old (non white) cables, no install.

Have a visual check of wiring any possible defects, no install and call electrician.

Safety first, if in doubt call an electrical contractor.

#### 2014 Royal Commission – Home Insulation Program

*Report findings included evidence from the electrical industry that there was extensive non-conformance, as well as non-policing, of the “Wiring Rules” AS/NZS 3000, where electrical cabling was running over the tops of ceiling joists. Cabling is meant to be protected from “mechanical damage”, eg not walked on, punctured by stapling, tripping hazard. Most common safety technique is for cabling to be clipped to sides of ceiling joists, and not over tops of joists. Conclusion: roll form foil stapled into electrical cables = safety risk, whereas loose segmented foil batt type products were not considered a safety risk. Verified in evidence by MEA, Master Electricians Australia.*

#### FLOORS, WALLS, ROOF RAFTERS

When fitting Concertina Foil Batts (CFB), turn off power first, and avoid any pre-existing cabling by 50mm. If in any doubt, seek electrical advice.

Floors – staple to sides of timbers, above or below any cabling.

Walls – position in front or behind power points with clearance openings for non-conduction. Plastic shrouds not necessary.

Rafters – staple to sides of timbers, overlapped approx 50mm.

#### METHOD OF FIXING

Metal staple gun fixing is acceptable, adopting commonsense avoidance of all electrical cabling. Use of plastic staple guns is not a guarantee of safety, and mandatory only when fixing conductive foil insulations in ceilings.

#### DOWNLIGHTS

Maintain downlight clearances, same as for bulk insulations.

Note: Foil insulations have free circulation of air and do not contribute to heat build-up in electrical cabling (AS 3008.1.1).

# CONCERTINA FOIL BATTS™

## INSTALLATION INSTRUCTIONS - WALLS & FLOORS

FEB 2016

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### WALLS

#### 1. Measure.

Place compressed *FOIL BATT* between top (or bottom) plate and nogging and mark length.

#### 2. Cut.

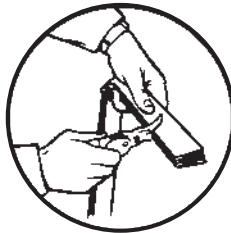
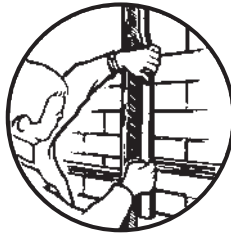
*FOIL BATT* should be cut square and make a close fit with contact to top timber, so as to prevent rotational air movement between cavities. Tight fit at bottom not necessary. One batt should fit each cavity. Any overlaps should be sealed by stapling or taping.

#### 3. Fix.

The *FOIL BATT* is fitted so that there is an approx. 45mm closed air gap between the *FOIL BATT* and plasterboard, and an additional 45mm insulating air gap between the *FOIL BATT* and the normal foil wrap. Minimum airspace width 20mm (NB: no foil airspace with fibre batts.)

(a) Staple one flange of the *FOIL BATT* to a stud side with approximately 5-6 staples.

(b) Expand *FOIL BATT* and staple free edge to opposite stud, creating a shallow concertina profile - with narrow stud centres, gather up excess folds. For sloping top plates and uneven noggins, first staple *FOIL BATT* to the longest stud, then expand and staple to other stud. Crush and staple excess batt to the underside of the top timber. Trim away excess foil.



*FOIL BATTS* in walls are not a sarking-type product, i.e. should not be exposed to the weather - wind or rain. External wall cladding is normally in place first, and batts are fitted after all electrical and plumbing work is completed (i.e. just before plastering).

*FOIL BATTS* are simply placed in front or behind plumbing, whichever side is clearest for stapling, and cut to fit over taps or pipes where necessary.

### FLOORS

#### PERFORATED CONCERTINA FOIL BATTS

1. **Staple *FOIL BATTS*** 90mm down on sides of floor joists (approx. 6 staples) with a maximum airspace depth of 100mm to achieve the maximum R-value for winter. *FOIL BATTS* are expanded creating a shallow concertina profile and held taut with staple in flange corners, to minimise sagging. With narrow joist centres gather up excess folds. For 200mm "I" beams, *FOIL BATTS* are stapled at 100mm depth. *FOIL BATTS* are self supporting.

2. **Overlap adjoining *FOIL BATTS*** by a minimum 50mm. No cutting is needed. Sealed overlaps are not necessary as heat flow is downward radiation in winter, i.e. there is no convective winter heat loss from floors (refer 7 still air).

3. ***FOIL BATTS* to be installed as flooring is laid** and not be exposed to wind or rain. Open joist ends should be covered if necessary for protection from wind and rain during construction, eg dampcourse type material. Install *FOIL BATTS* preferably after electrical, plumbing and ductwork are completed.

4. **Upward *FOIL BATT* surface** is clean, bright and free of all sawdust and debris to obtain best thermal performance, i.e. level the tops of joists first before fitting *FOIL BATTS*, then fit the flooring.

5. **Drainage.** *FOIL BATTS* perforations are specifically designed for platform sheet flooring, where roof is not on. Holes are in concertina valleys to allow quick draining of any rain penetrating the floor during construction, as well as any moisture formed by possible condensation (low risk generally).

6. **Timbers can breathe** because of *FOIL BATTS* deep airspaces and unsealed overlaps. Be aware that alternative insulations will require substantial perforations for drainage and breathing.

7. **Still air.** The stated Total R-values are dependent on the creation of still air and zero air velocity beneath timber floors for both the airspace above and below *FOIL BATTS*.

Enclosed building perimeters achieve this still air with:

(i) Brick veneer or cavity brick construction - automatically creates still air. Ventilator plates are too small to permit high air speed entry and exit.

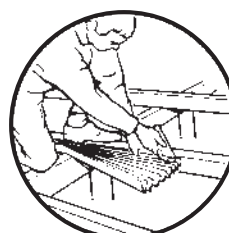
(ii) Weatherboard or fibro-cement cladding - minimise gaps between base boards and fix black close-weave shade cloth behind boards as a wind break. No air speed.

Open building perimeters (eg pole frame houses) require a perforated floor joist underlining to create still air and ensure breathing and drainage (eg building paper/foil). With 100mm joists, create two 50mm *FOIL BATT* airspaces which are surrounded by still air.

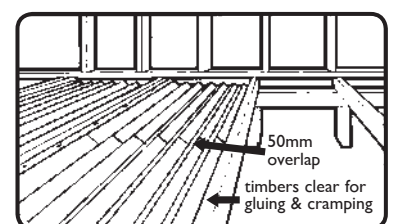
8. **Existing Floors.** Perforated or non-perforated *FOIL BATTS* can be used. If there is a risk of condensation, then ensure that perforation holes are closest to the ground by reversing the folds of the stapling flanges.

9. **Coverage.** In winter under floor insulation does not require a 100% complete coverage, eg *FOIL BATTS* do not need to make a tight or close fit around ductwork.

#### STAPLING



#### INSTALLED



### GENERAL SAFETY INFORMATION

- *FOIL BATTS* are non-hazardous / non-toxic
- No personal protective equipment required unless installing over irritant fibrous insulations.
- UV protective sunglasses and sunscreen should be used when installing in direct sunlight (eg new floor construction with no roof in place).