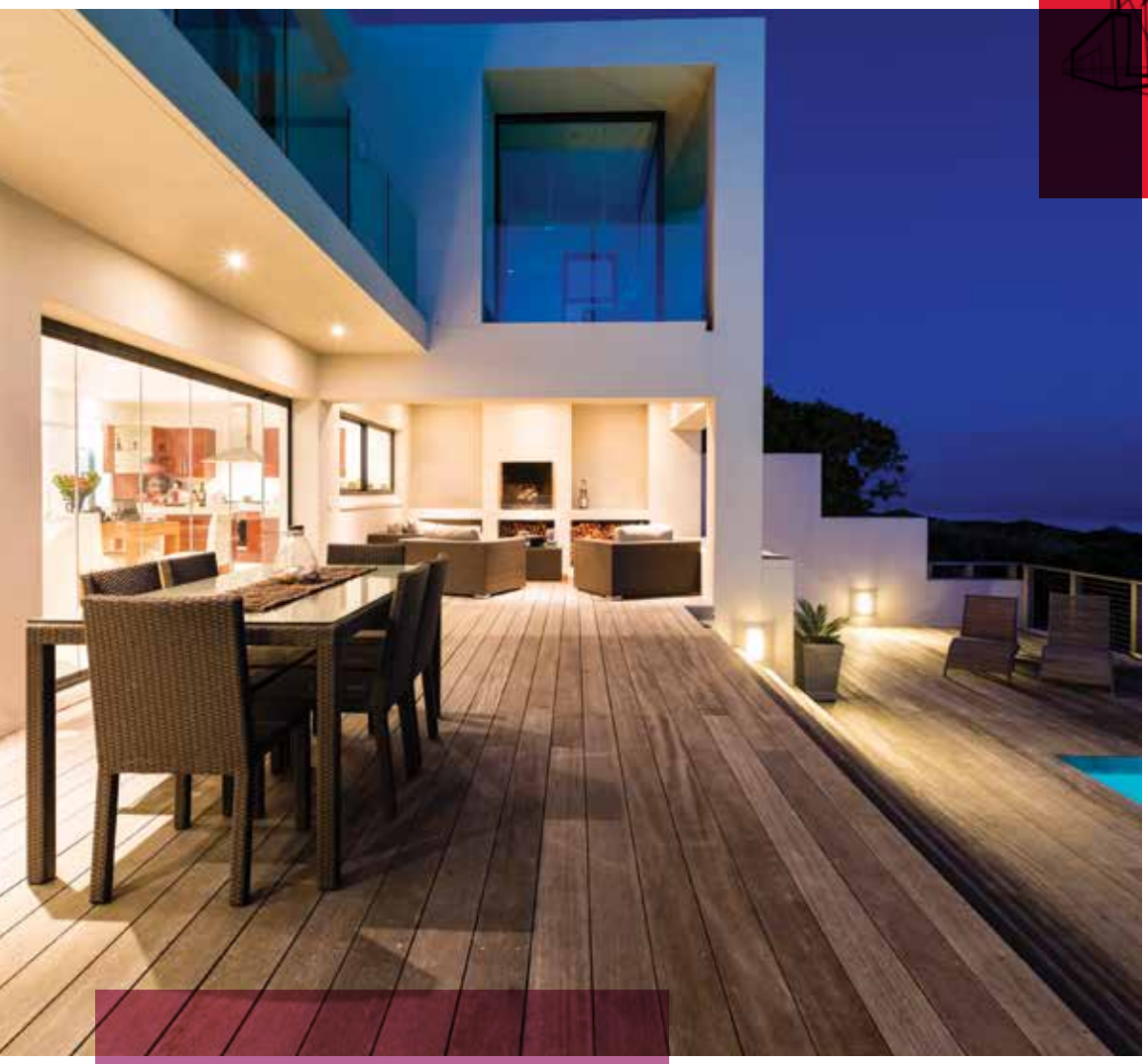
ROCKWOOL®

ROCKWOOL Comfortbatt®

Residential Installation Guide



Site preparation and PPE

Site preparation and personal protective equipment (PPE)

Insulating is a safe DIY project when the insulation is installed properly. Refer to the following tool checklist and tips before beginning insulation projects.

Gather the proper equipment, tools and protective clothing

Special equipment

- Portable work light
- Boards or sheets of plywood (provide a safe place to sit or kneel in an unfinished attic and a surface on which to cut the insulation)
- Insulation supports (for holding the insulation up under floors)
- Pole or rake (for pushing insulation into out-of-the-way places in attics/flat ceilings)

Basic tools

- Tape measure
- Utility knife or insulation saw – a knife with a serrated blade is best. Blades should be replaced periodically as they tend to dull during use.
- Straightedge or 2 x 4 (for cutting insulation)
- Lightweight, squeeze-type stapler (if installing faced insulation)
- Screw gun (drill) and appropriate fasteners

Protective gear

- Work gloves, loose-fitting, long-sleeved shirt,
- long pants and cap
- OSHA-approved safety glasses for overhead work
- Disposable dust respirator is recommended, but not required (NIOSH-certified – N95 or greater)

Air sealing

Proper air sealing should be completed prior to ROCKWOOL Comfortboard®, ROCKWOOL Comfortbatt®, insulation to ensure full performance of the insulation. Verify all holes and seams between sheet goods such as drywall, sheathing, and subflooring at the building envelope are sealed with the durable caulk, tape, and/or foam seals.

Tips for controlling and reducing dust

Another important safety consideration when handling insulation is dust control. These recommended work practices help to minimize itching of the skin.

1. Store the material to protect against damage.
2. Unpack the material at the installation site.
3. Cut the insulation on a flat surface. Use a sharp knife with serrated edge. Don't use a saw, unless hard roof boards need to be cut.
4. Open a door or open a window to ensure good ventilation.
5. Organize workplace in a manner that makes all installation easy.
6. Cover open ventilation ducts to reduce particulate in the ducts.
7. In confined spaces with poor ventilation, use protective goggles and a dust mask.
8. Keep workplace clean. Prevent whirling dust. Use a vacuum cleaner, not a broom.
9. If skin irritation occurs, don't rub. Wash the area in cold water. Change clothes and wash on completing work.
10. Do not use compressed air for clean-up unless there is no other effective method. If compressed air must be used, other workers must leave the site.
11. Avoid unnecessary handling of scrap materials by placing them in waste disposal containers before removing them from the site.

Safe Occupancy

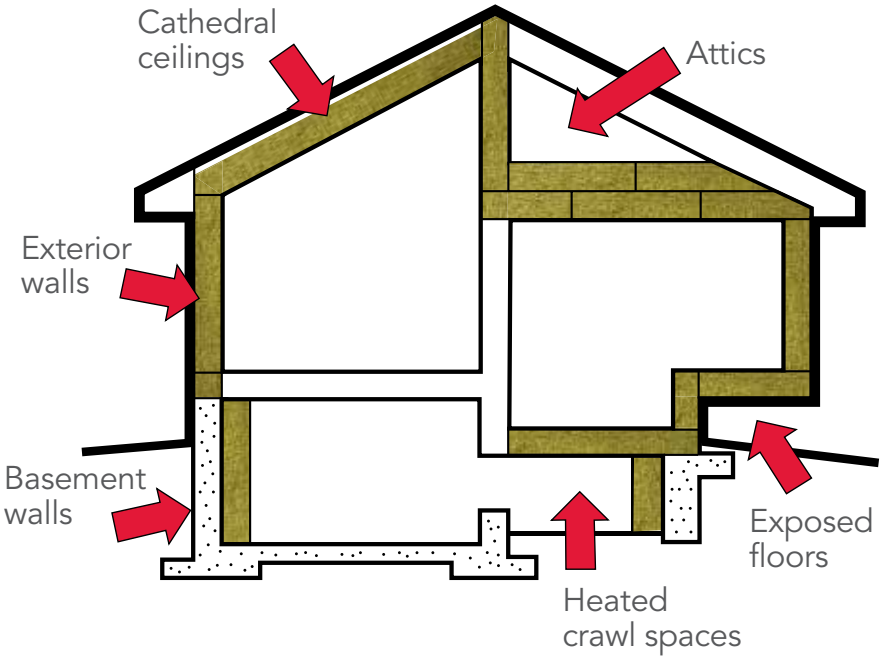
There are no re-entry / re-occupancy requirements for this project. You may re-enter the premises immediately following installation.

Safe Occupancy

Section 410-66, of the 1978 National electrical Code states: Recessed portions of enclosures, other than points of support, shall be spaced at least ½ inch from combustible materials. Thermal insulation shall not be installed within 3 inches of the recessed fixture enclosure, wiring compartment or ballasts and shall not be installed above the fixtures as to entrap heat and prevent free circulation of air unless fixture is otherwise approved for that purpose.

Insulation project scenarios

ROCKWOOL Comfortbatt® installed in exterior walls is a great way to save energy, but there are other applications that can make a big difference in your home's comfort. Insulating the exposed concrete walls in basement and heated crawl spaces, as well as increasing the insulation in your attic, are all effective ways to improve your home's energy efficiency.



How to Install ROCKWOOL Stone Wool Insulation
ROCKWOOL insulation cuts quickly and accurately with a knife for fitting around pipes, electrical boxes, wiring, ductwork, and between studs and joists that are less than a standard width.

Installation Equipment:
Wear long-sleeved, loose-fitting clothing and proper gloves for handling insulation. Tools needed:

- Tape measure
- Long serrated bread knife
- Straight edge
- Staple gun (when vapor barrier/retarder is required)
- Caulking gun and acoustical sealant
- Approved vapor barrier/retarder if required by local building codes

Are ROCKWOOL insulation products required to be installed by a trained or certified installer?

No! ROCKWOOL insulation products are available in standard dimensions. Insulation can be quickly & easily installed by builders, homeowners and DIYers.

Attic

If you want to increase home comfort and save energy year 'round, start by reducing the heat loss through the attic, the most cost-effective place to add insulation. If the current insulation has settled and isn't flush with the top of the joists, add an extra layer of ROCKWOOL Comfortbatt® thermal batt insulation to bring it up to the top of the joist.

Step 1

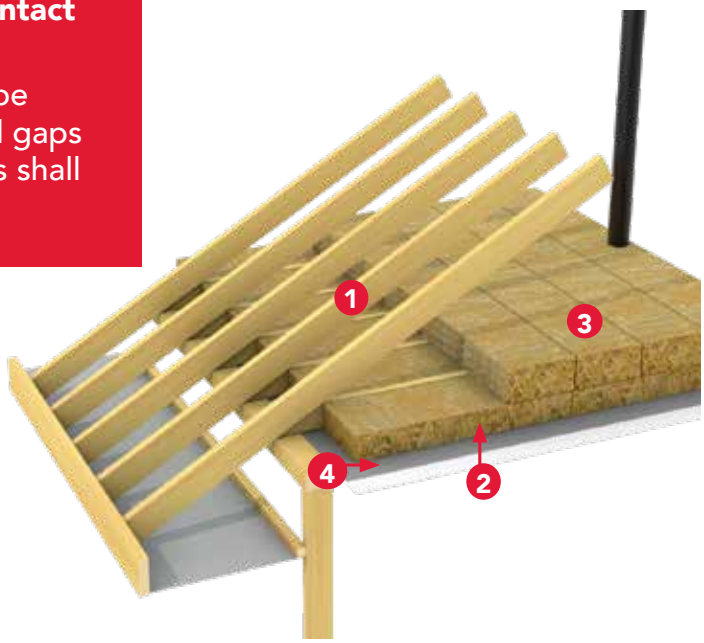
Install Comfortbatt® between joists. Butt ends tightly together to eliminate any gaps.

Step 2

For additional insulation, lay a second layer of insulation perpendicular to the first layer.

Can ROCKWOOL insulation be placed in contact with hot objects?

ROCKWOOL insulation products should not be placed in direct contact with hot surfaces and gaps and clearances in accordance with local codes shall be maintained.



1. 2" x 8" Roof Trusses
2. ROCKWOOL Comfortbatt® (R22)
3. ROCKWOOL Comfortbatt® (R28)
4. Vapour Control Layer*

For existing construction

When no insulation is present:

1. Install Comfortbatt® between joists
2. For additional insulation, lay a second layer of insulation perpendicular to the first layer.

When existing insulation is present:

- Level existing insulation to top of joist.
- Lay Comfortbatt on top of joists running perpendicular to the first layer.
- Ensure batts are butted against each other tightly.
- Fit batts closely to cross joists: cut batt if necessary; leave no space between layers.
- In a vented attic (refer to the Construction Details section), the installation of baffle (on-site or pre-formed) is recommended to allow adequate air flow. Consult with baffle manufacturer's installation guidelines for further information.
- Insulate attic hatch to same level as rest of attic.
- Apply weatherstripping to edge to reduce air leakage.
- Only insulate close to IC-rated electrical fixtures.
- Follow manufacturer's instructions and local building code to insulate around chimney.

Insert. Compress. Release.

Cathedral Ceiling

The rafters in cathedral ceilings are usually made of 2 x 10s or 2 x 12s and ROCKWOOL Comfortbatt® is ideal for insulating around those rafters.

Maintaining a minimum of two inch of air space between the insulation and roof deck is recommended to help prevent moisture damage and ensure long roof life.

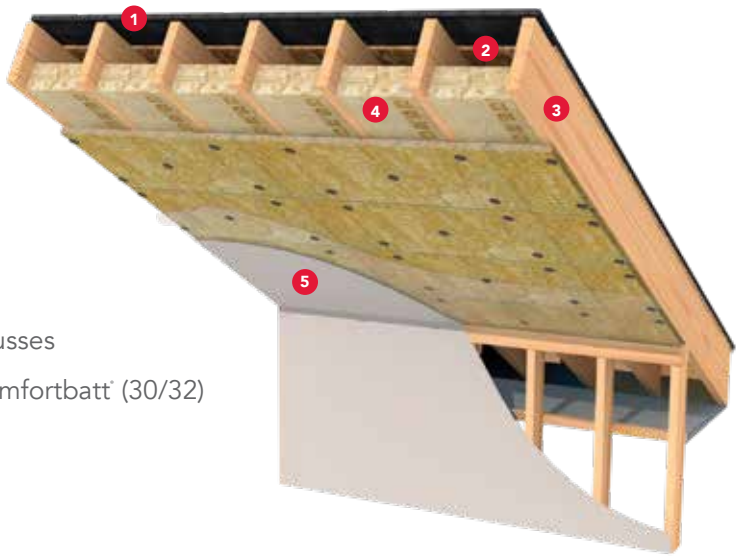
Step 1

In cathedral ceilings, the insulation should be stapled or held in place by pressure against the sides of the rafters.

Step 2

An air space between the insulation and roof sheathing, (most building codes call for a minimum of 2" of air space) ventilated at ridge and soffit, is desirable in cathedral ceilings.

Note: If unfaced material is used, a separate vapor retarder should be applied facing the living area after the insulation has been installed.



1. Shingles
2. Sheathing
3. 2" x 10" Roof Trusses
4. ROCKWOOL Comfortbatt® (30/32)
5. Gypsum

Exterior walls

Exterior walls should be insulated as much as possible. If walls are constructed of 2 X 6 material, then ROCKWOOL Comfortbatt® R22/23 (5½") batts should be used. Do not attempt to squeeze 5.5" batts into a 2 X 4 stud wall.

Air sealing

Air sealing is important for controlling heat loss and reducing condensation risk. There must be a continuous uninterrupted airtight plane form wall elements to other components for the enclosure such as windows, roof and foundation assemblies. Sealing all joints, penetrations and transitions before installing insulation is critical in achieving airtightness.

Step 1

Insert the batt tight to the wood stud and top plate, eliminating any gaps, compress the batt to fit snug in the wall and release.

Step 2

Do not flatten the insulation as this reduces effectiveness.

Step 3

Install vapor barrier where required. While many contractors feel that polyethylene is the best choice, always consult your local building code.

ROCKWOOL Comfortbatt® Thermal Home Insulation keeps a home warm in the winter and cool in the summer for more comfortable living all year round.

Thermal insulation systems for residential exterior wall applications

As energy efficiency and thermal performance demands continue to increase, building codes, builders and homeowners are responding by increasing the R-Value of the building enclosure, in particular, the above grade exterior wall. Given that the cavity of the standard wood frame wall used in residential housing is already filled with insulation, the clear path forward to higher R-Values is to add additional continuous insulation on the exterior side of the wall.

ROCKWOOL Comfortboard 80 is a rigid stone wool insulation board fastened to the outside face of the exterior studs and on the outer face of the exterior sheathing, designed to provide increased thermal performance to the building envelope.

What makes ROCKWOOL Comfortboard 80 a superior exterior insulation sheathing?

High Drying Potential

Comfortboard 80 is a moisture-resistant, yet vaporpermeable insulation and will allow transient vapors to pass through without restriction. This unique vapor-permeable quality of ROCKWOOL stone wool insulation allows for an increased potential for drying without trapping moisture in the wall assembly.

Fire Resistance

ROCKWOOL Comfortboard 80 and ROCKWOOL Comfortbatt are noncombustible and fire resistant, able to withstand temperatures of 2150 F (1177 C), will not fuel the spread of a fire, or contribute any significant toxic smoke. Adding Comfortboard 80 on in your walls can increase the fire resilience of your home.

If the home is older and built with 2 x 4 studs for the exterior walls, never attempt to squeeze Comfortbatt R-24 into the wall cavity. Compressing the insulation will cause it to lose its effective R-Value – instead install ROCKWOOL Comfortbatt R-15.

Another option to improve the wall's thermal performance is to build out the studs by adding 2 x 2 strapping/furring to the existing edges of the 2 x 4 studs, which will create a 2 x 6 stud wall. Comfortbatt R-24 can then be added to the expanded deeper cavity and end up with increased insulation R-Value.

Vapor retarders in cold climates

Typically, a vapor retarder is installed on the warm side of the wall, over the insulation and studs. Use the least amount of staples that will hold the vapor retarder up, seal all vapor retarder seams with suitable tape to completely seal the wall. This reduces the chance of warm air getting into the wall cavity, where it can contribute to condensation and cause mold problems.

Basement walls

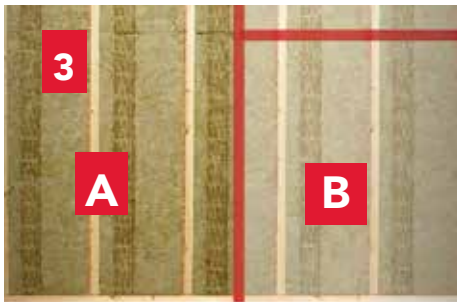
To reduce overall heating and cooling costs, it pays to insulate the interior foundation walls. R-Values can be increased by installing a combination of two ROCKWOOL insulation products: Comfortboard® 80 and Comfortbatt® thermal insulation. Before starting, check basement walls for signs of dampness. If damp, have the foundation checked for cracks. Ideally, wait a minimum of one year after construction to allow for the foundation to settle.

Step 1

Clean surface and remove all debris from concrete walls. Mechanically fasten Comfortboard 80 to the exterior concrete wall. Refer to the board insulation attachment guide for further guideance.

Step 2

Install 2 x 4 stud wall directly against Comfortboard 80, leaving no gaps or air space.



Step 3

A) Install 3.5-inch Comfortbatt thermal insulation between studs.

B) Install vapor retarder where required. Consult local area building codes for guidance on the use of a vapor retarder.

The combination of ROCKWOOL Comfortboard® 80 and ROCKWOOL Comfortbatt® ensures optimum long-term thermal performance from basement wall assembly.

Crawlspace

Many home and cottage owners can enjoy additional benefits by insulating their crawl spaces. In some cases, the most difficult aspect of insulating a crawl space is having enough room to work around to properly install the insulation. If the crawl space area is easy to get at, the installation of ROCKWOOL insulation is quite simple.

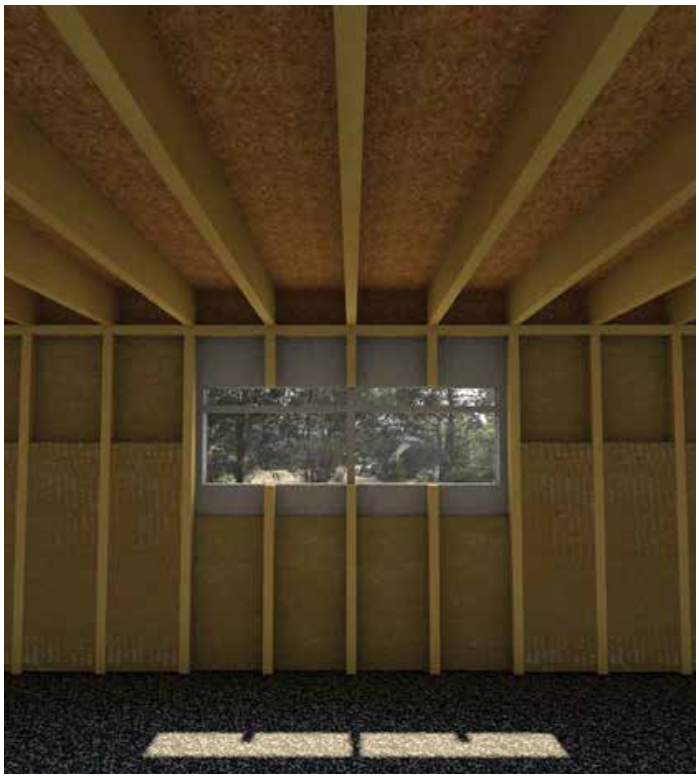
Typically, there are two types of crawl spaces – they are defined by either being vented or non-vented. The difference in how the two crawl space types are insulated is defined by either applying insulation to the exterior wall, or to the ceiling/floor between the heated living space and the crawl space.

ROCKWOOL Insulation: a two-tiered solution to insulating crawl spaces

ROCKWOOL has two thermal insulation products for interior crawl space wall assemblies:

ROCKWOOL Comfortboard® 80 (Insulation Sheathing) and ROCKWOOL Comfortbatt®. When used in tandem within the 2 x 4 stud wall cavity, these two products help create a drier, more comfortable space.

A vented crawl space can be notorious for dampness, but ROCKWOOL insulation is water-repellent, moisture-resistant yet vapor-permeable. The permeance of ROCKWOOL products allows moisture vapor to pass through the insulation without being trapped. In the unfortunate event of basement leak where the insulation becomes wet, ROCKWOOL insulation quickly dries out and maintains its R-Value. ROCKWOOL won't absorb water and is not susceptible to mold.



Comfortboard® 80 and the effects of thermal bridging

Before recommending the Good, Better, Best R-Values for the crawl space wall assembly, we need to understand thermal bridging – the process that describes a material's capacity to conduct heat from one material to another.

In a typical crawl space, cold air transfers from the outside concrete foundation through the wood studs and eventually into the living space. The studs perform as the conduit or "thermal bridge", lowering the R-Value of the wall assembly. A continuous layer of insulation such as Comfortboard 80 installed against the studs reduces this thermal bridging, blunting the effect of thermal bridging between the concrete and the studs.

Vented crawl space installation

Vented simply refers to the space having air vents, typically more than one, and they are generally located across from one another at the upper part of the foundation wall. The vents allow for an air exchange, helping to eliminate dry rot, moisture build-up, and other conditions that can develop in these enclosed spaces. This type of venting would be very common in older homes.

A vented crawl space is treated in the same manner as a cantilever, or insulating a room where the underside is exposed. The underside of the floor is insulated by adding batt insulation between the floor joists.

Step 1

Seal all joints and penetrations with caulk and where required by local building codes, install a vapor retarder to the underside of the sub-floor before insulating.

Step 2

Insert, Compress and Release to install ROCKWOOL Comfortbatt thermal insulation between the floor joists.

Step 3A

Permanently hold the insulation in place by installing strapping on the underside of the floor joists perpendicular to the insulation. Attach minimum 2 pieces of strapping using appropriate screw, nails or staples. Some options for strapping include wood, plastic, wire and chicken wire mesh. At least one piece ofstrapping should be installed for every 8 inches of insulation.

Step 3B

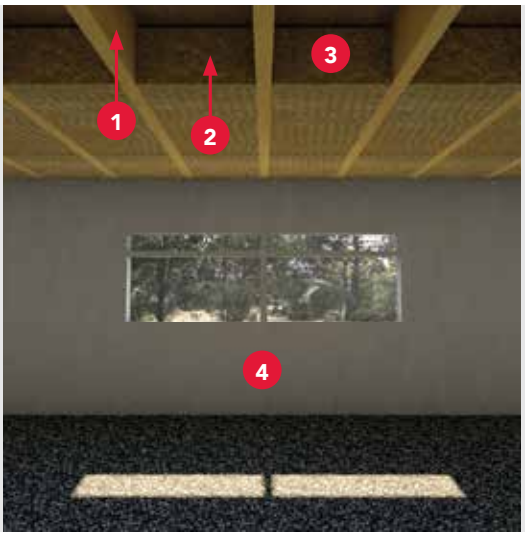
Install an impermeable, foil faced insulating sheathing (taped or sealed joints).

ROCKWOOL insulation products for vented crawl spaces

Better R-30

2 x 10 Joists + R30/R32
(or attach 1 x 2 furring/strapping strip to 2 x 8 joist to build up the joist cavity depth)

1. 2 x 10 Joists
2. Vapor Control Layer*
3. ROCKWOOL Comfortbatt® (R30/32)
4. Foundation Wall



* Consult your local authority having jurisdiction on the proper location and installation for the vapor barrier/retarder.

Can ROCKWOOL insulation be placed in contact with hot objects?

ROCKWOOL insulation products should not be placed in direct contact with hot surfaces and gaps and clearances in accordance with local codes shall be maintained.

Non-Vented crawl space installation

A non-vented crawl space is defined as having a heating or cooling source, or some other source that conditions the air within the crawl space. Conditioning the room helps to minimize moisture build-up in the space, and helps to avoid the growth of mold.

A non-vented crawl space is insulated in the same manner as a conditioned basement. The exterior foundation is framed in with studs, and the insulation is then installed between the studs.

Dirt floors of a non-vented crawl space should be covered with a suitable vapor barrier before insulating. All joints of the vapor retarder shall overlap by 6 inches (153 mm) and be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (153 mm) up the stem wall and shall be attached to the stem wall. Walls of a non-vented crawl space should be insulated in exactly the same manner as a basement wall.

Step 1

Mechanically fasten ROCKWOOL Comfortboard 80 to the exterior wall.

Step 2

Install 2x4 stud wall directly against ROCKWOOL Comfortboard 80.

Step 3

Install ROCKWOOL Comfortbatt thermal insulation between studs.

Step 4

Where required by local building code, staple vapor retarder to studs then tape and seal joints.

Non-Vented crawl space systems

Basements and non-vented crawl space walls – Header (rim-joist)

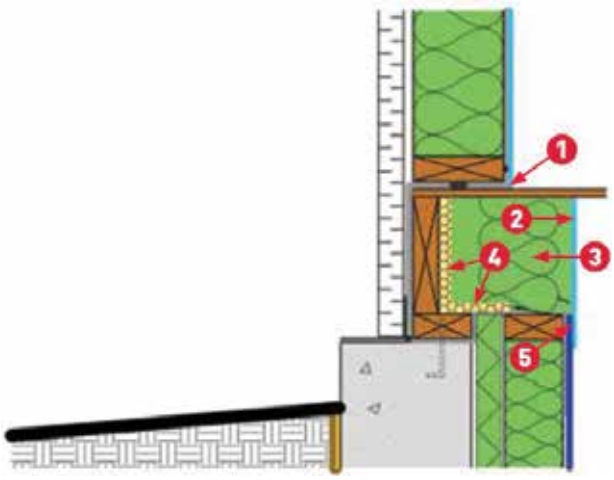
If the basement / crawlspace header (rim-joist) needs to be insulated see Basement Header and Bottom Plate Details diagram:

1. Caulk or spray-foam any gaps and cracks,
2. Install R22/R23 ROCKWOOL Comfortbatt* thermal insulation into the rim-joist,
3. Where required by local building code, staple vapor retarder to floor assembly and connect to header wrap (if present)

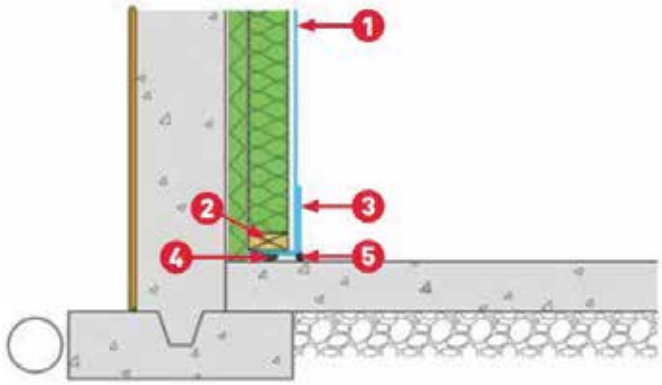
Basement and non-vented crawl space walls – bottom plate

The bottom plate of an insulated wood stud wall installed against a basement or crawl space wall needs to be damp-proofed and sealed.

1. At the bottom plate install a thick bead of caulking on the concrete (or vapor-retarder) floor.
2. Staple 12" of vapor barrier to the bottom of the wall bottom plate.
3. Install wood stud wall
4. Where required by local building code, connect the interior vapor retarder with the 12" vapor barrier at the bottom plate and seal with tape.



1. Header Wrap (Installed from foundation wall to under main floor bottom plate)
2. Fasten vapor retarder to floor assembly (sub floor and floor joist as needed)
3. R22 ROCKWOOL Comfortbatt to cover the foam to top of insulated wall (thermal protection of foamed plastics)
4. Spray foam/caulking air sealant to act as an air barrier
5. Connect vapour retarder to header wrap at top plate



1. Vapour retarder
2. Pressure treated bottom plat
3. 12" of vapour retarder; staple to bottom of bottom plate; tape over poly that runs down the interior face of the wall
4. Thick acoustic caulking bead for air seal between bottom plate & floor slab
5. Interior acrylic caulking sealant at the sub floor/plate joint as alternative to under bottom plate

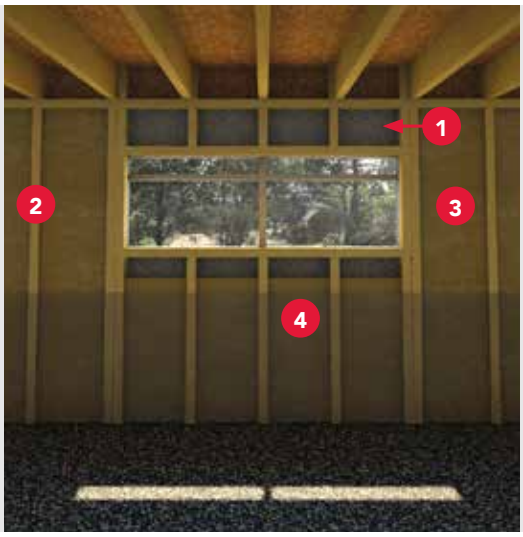
* Consult your local authority having jurisdiction on the proper location and installation for the vapor barrier/retarder.

ROCKWOOL insulation products for non-vented crawl spaces

Good: R-15

2 x 4 Studs + R14/R15

1. Foundation Wall
2. 2 x 4 Studs
3. ROCKWOOL Comfortbatt® (R14/15)
4. Vapour Control Layer*



Better: R-21

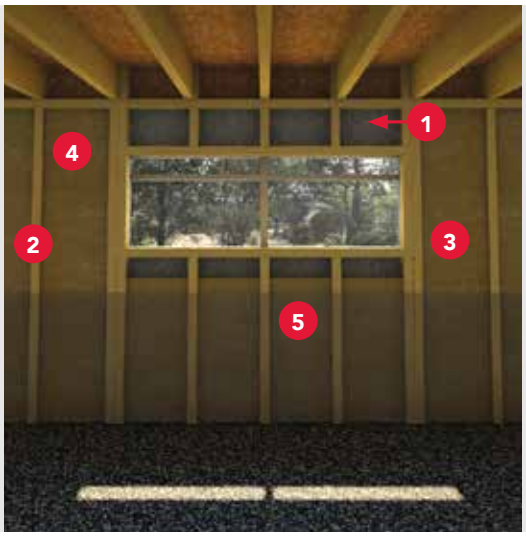
2 x 4 Studs + R6 Board
+ R14/R15 Batt

1. Foundation Wall
2. ROCKWOOL Comfortboard® 80 (R6)
3. 2X4 Studs
4. ROCKWOOL Comfortbatt® (R14/15)
5. Vapor Control Layer*

Best: R-23/26

2 x 4 Studs + R8 or
R 12 Board + R14/R15 Batt

1. Foundation Wall
2. ROCKWOOL Comfortboard® 80 (R8 or R12)
3. 2X4 Studs
4. ROCKWOOL Comfortbatt® (R14/15)
5. Vapor Control Layer*



Attachment of Board Insulation

Board Products
ROCKWOOL stone wool board products, such as ROCKWOOL Comfortboard® 80, should be permanently attached using mechanical fasteners, insulation pins or appropriate attachment measures based on the end-use application.

Mechanical Fasteners
For the permanent attachment of ROCKWOOL board insulation, ROCKWOOL recommends the boards be mechanically attached using mechanical fasteners with minimum 2" diameter washers.

Impaling Pins
Mechanically attached impaling pins are an acceptable attachment method for plain board insulation. Adhesive-backed impaling pins can also be considered for the permanent attachment of ROCKWOOL board insulation. In this case, ROCKWOOL recommends seeking validation from the attachment and/or adhesive manufacturer to determine if the impaling pins can adequately support the insulation and that the adhesive is compatible with the substrate upon which it will be adhered.

Adhesive Directly Applied to ROCKWOOL Boards
ROCKWOOL does not recommend the use of adhesives directly applied to ROCKWOOL board insulation for permanent attachment. However, a construction grade adhesive can be used for the temporary attachment of ROCKWOOL boards, before connections are installed for permanent attachment. Construction grade adhesives must be compatible with ROCKWOOL stone wool (mineral wool) boards and the intended substrate so that the adhesive does not damage the substrate or negatively affect its performance.

Number of Fasteners or Impaling Pins
When supporting ROCKWOOL semi-rigid and rigid insulation boards using only mechanical fasteners or impaling pins, ROCKWOOL recommends a minimum of 5 attachments per board. When ROCKWOOL boards are installed within a cladding attachment system, fastening requirements may vary based on the end-use application. Fasteners should be numerous enough and of large enough cross section to prevent tear-through of the insulation under expected conditions. Fore more information, refer to ROCKWOOL's Board Insulation Attachment Guide.

Selection of Fasteners or Impaling Pins
Fasteners or impaling pins should be:

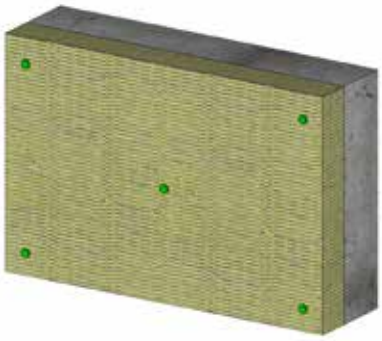
- Chosen in accordance with the substrate type,
- Capable of withstanding applied pull-out and shear-loads,
- Sufficiently durable to withstand the environment to which they will be exposed.

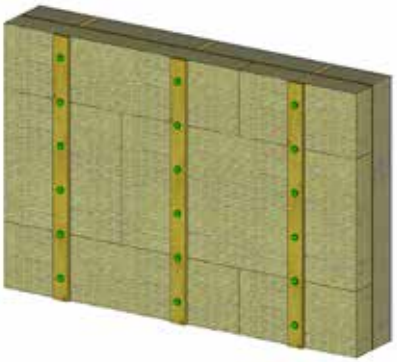
Fastener Depth
Embedded fastener depth will vary based on substrate. As a general rule, embed a minimum of 1.5" deep in wood studs and concrete. Extend at least 3 full threads past the flange of steel studs. Anti-unwinding fasteners (or alternative precautions) should be used for metal frame construction. The embedment should be validated with the fastener manufacturer.

Fastening Patterns for Plain Board Insulation

The dimension of the insulation boards dictates the minimum number of attachments required and their fastening pattern. This section provides examples for insulation boards up to 48" in length installed over a solid wall and a wood/metal stud wall. For more information refer to ROCKWOOL's Board Insulation Attachment Guide.

Strapping fastening patterns for ROCKWOOL rigid board insulation should be specified based on the backup assembly and project specific loads (weight of cladding). Long screw fasteners must penetrate framing members like studs and this effects the potential horizontal spacing of the fasteners and strapping. For additional guidance on the installation and information on the performance of ROCKWOOL rigid board insulation with strapping, please refer to Comfortboard® 80 Installation Guide and Performance of Strapping Attachment on Walls with Long Screws Through ROCKWOOL Rigid Insulation.





Disclaimer and Limitation of Liability

Fastening connections should be designed to withstand all the combined applied loads, including but not limited to dead-load and wind-load. Where applicable, consideration should be given to seismic-load, and live-load (not covered in this guide).

Failure to include safety factors or adequately design for applied loads can result in failure of mechanical attachment. The determination of the specific design requirements and safety factors regarding a fastener system is the sole responsibility of the installer and/or end user. ROCKWOOL Inc assumes no responsibility whatsoever for any failure of insulation attachment or related fastening systems.

The statements and data contained in this document are for general information purposes ONLY. They are NOT specific technical recommendations as to any particular design or application and the ultimate determination as to product suitability is the sole responsibility of the installer or end user. Although the information contained herein, including ROCKWOOL product descriptions, is believed to be correct at the time of publication, accuracy cannot be guaranteed and results may vary depending on the particular design and/or application.

ROCKWOOL fully reserves the right to make product specification changes, without notice or obligation, and to modify or discontinue any of its products at any time. In no event, shall ROCKWOOL be liable for any direct, indirect, or consequential damages of any kind arising from information contained in this bulletin, including, but not limited to, claims for loss of profits, business interruption, or damages to business reputation. This limitation of liability shall apply to all claims whether those claims are based in contract, tort, or any legal cause of action.

When penetrating or adhering to a water-resistive barrier (WRB), ROCKWOOL recommends referring to the attachment and membrane manufacturers to secure additional direction on installation method and material compatibility.

As ROCKWOOL does not supply fasteners or adhesives, it is the responsibility of the manufacturers of the fastenings or adhesives to comment on the performance of their products when managing the loads of ROCKWOOL insulation materials and other assembly components. ROCKWOOL makes no representations or warranties, express or implied, with respect to its recommendations for attaching the semirigid and rigid board products with fastenings and all warranties are disclaimed.

At the ROCKWOOL Group, we are committed to enriching the lives of everyone who comes into contact with our solutions. Our expertise is perfectly suited to tackle many of today's biggest sustainability and development challenges, from energy consumption and noise pollution to fire resilience, water scarcity and flooding. Our range of products reflects the diversity of the world's needs, while supporting our stakeholders in reducing their own carbon footprint.

Stone wool is a versatile material and forms the basis of all our businesses. With more than 11,000 employees in 39 countries, we are the world leader in stone wool solutions, from building insulation to acoustic ceilings, external cladding systems to horticultural solutions, engineered fibres for industrial use to insulation for the process industry and marine and offshore.

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