Concrete

Yeti-Anchor™ Installation Guide

Yeti-Anchor™ link sandwich panel layers, transferring forces to the structure, while allowing movement and reducing heat transfer for insulation.

Contents

2.14.1

Website
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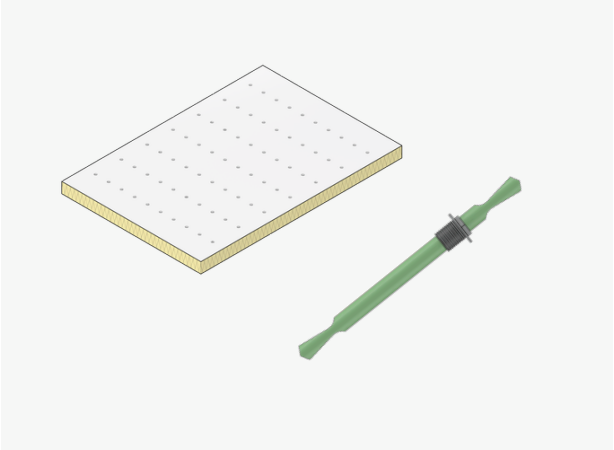
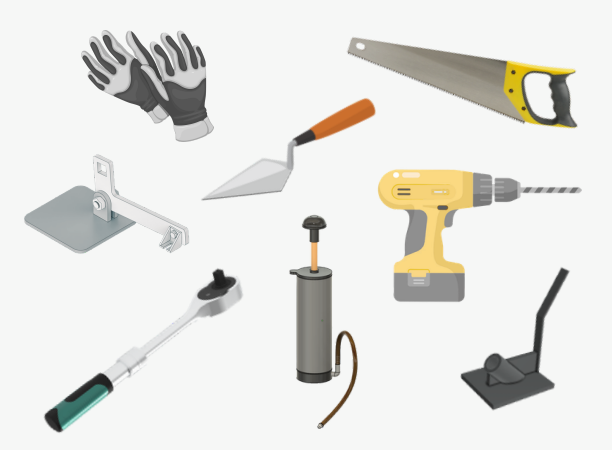
Installation

Yeti-Anchor™ Sandwich Panel Anchor

Components



Tools



Physical and Mechanical Properties

Properties	YETI-8	YETI-15
Cross Section Area	50.3mm²	177mm²
Area Moment of Inertia	201mm⁴	2,485mm⁴
Thermal Conductivity	0.7W/m.K	0.7W/m.K
Flexural Modulus ASTM D790	50,200 MPA	50,200 MPA
Tensile Strength D3039/D3039M	1,380 MPa	1,380 MPa

Design Notes:

- Yeti-Anchor™ are fire tested in accordance with ASTM E119 (receiving a 4 hour fire rating) and NFPA 285 (passed for flame spread). Reports available on request.
- ICC Evaluation Report ICC-ESR 3820

⚠ IMPORTANT

Yeti-Anchor™ present a trip and fall hazard when fixed into a concrete surface with one end exposed. Take extreme care when walking over a panel with Yeti-Anchor™ protruding during panel manufacture.

After the Yeti-Anchor™ is installed it is the responsibility of the panel manufacturer to ensure excellent concrete consolidation around the notched ends of the Yeti-Anchor.

It is in the sole responsibility of the contractor or installer to install the Yeti-Anchor™ in accordance with CFS installation procedures. CFS is not responsible for any liability resulting from a failure to follow these published installation procedures.

CFS makes no representations to the performance of any panel fabricated with the Yeti-Anchor™. The concrete wall panel manufacturer is solely responsible for the performance of all building system panels regardless of the installation procedure. Our recommendations should not be taken as inducements to infringe on any patent or violate any law, safety code or insurance regulation.

Please wear gloves when handling the Yeti-Anchor™ as sharp glass fibres maybe present on the surface.

Pushing the Yeti-Anchor™ directly through the insulation is strictly not recommended as the bond between the anchor and lower concrete layer may be contaminated by insulation fragments, thus compromising strength.

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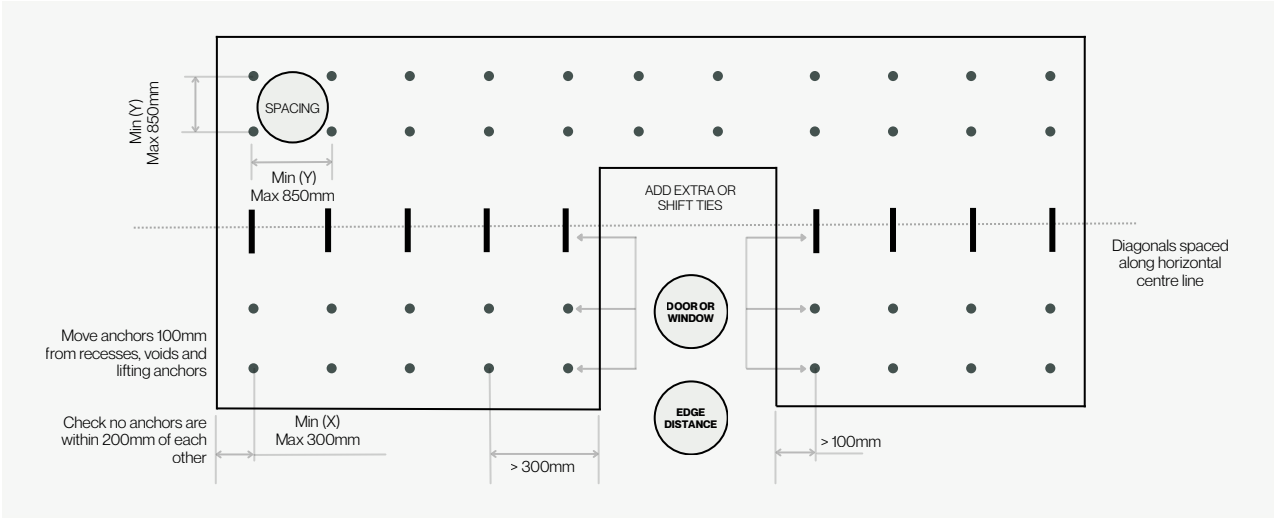
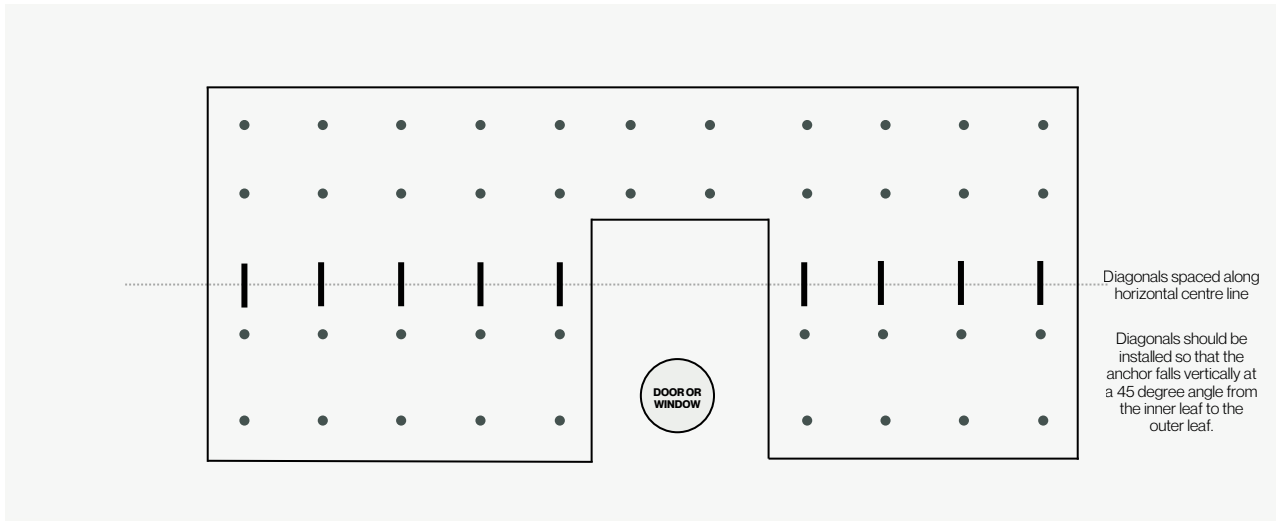
Layout Details

Straight Anchors



Diagonal Anchors



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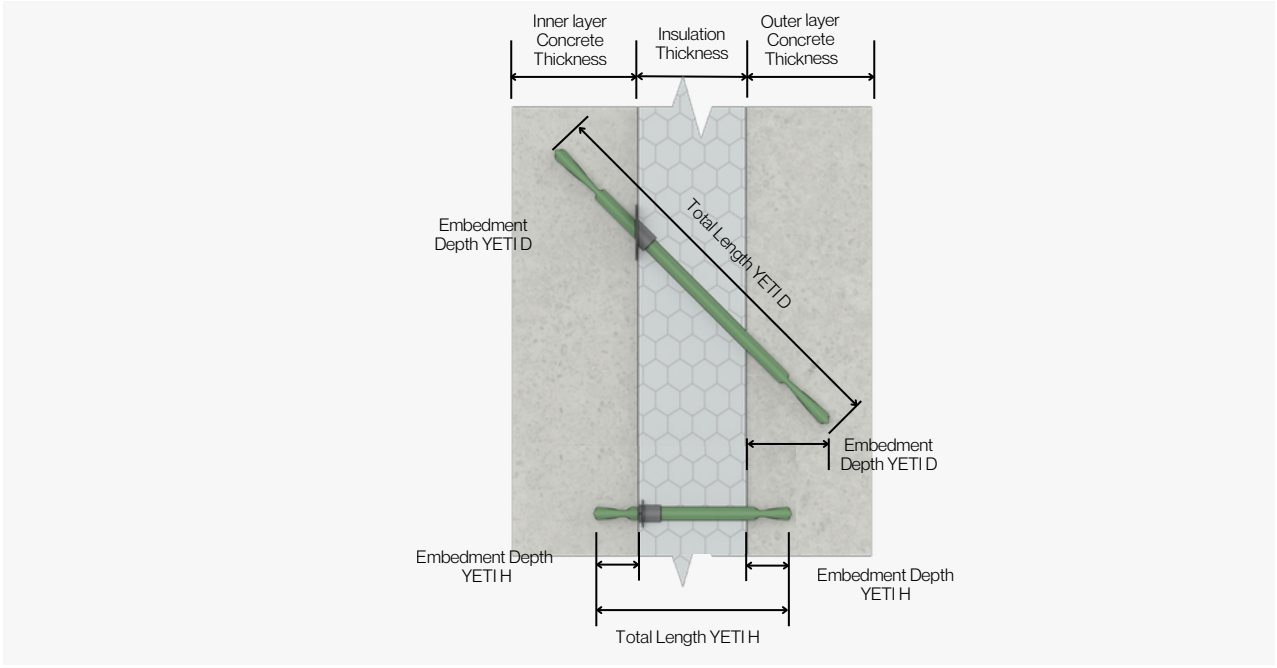
Installation

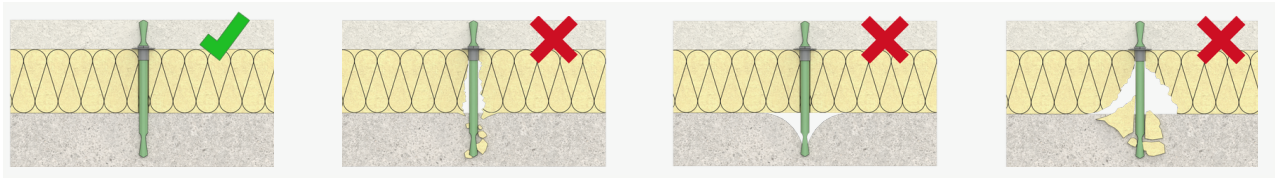
Factory Setting Out Notes

Code	Maximum Centres	Minimum Centres (Y)	Maximum Edge Distance	Minimum Edge Distance (X)
YETI-8-H-50	850mm	150mm	300mm	75mm
YETI-15-H-50	850mm	150mm	300mm	75mm
YETI-15-D-50	850mm	200mm	300mm	100mm
YETI-15-D-70	850mm	210mm	300mm	105mm

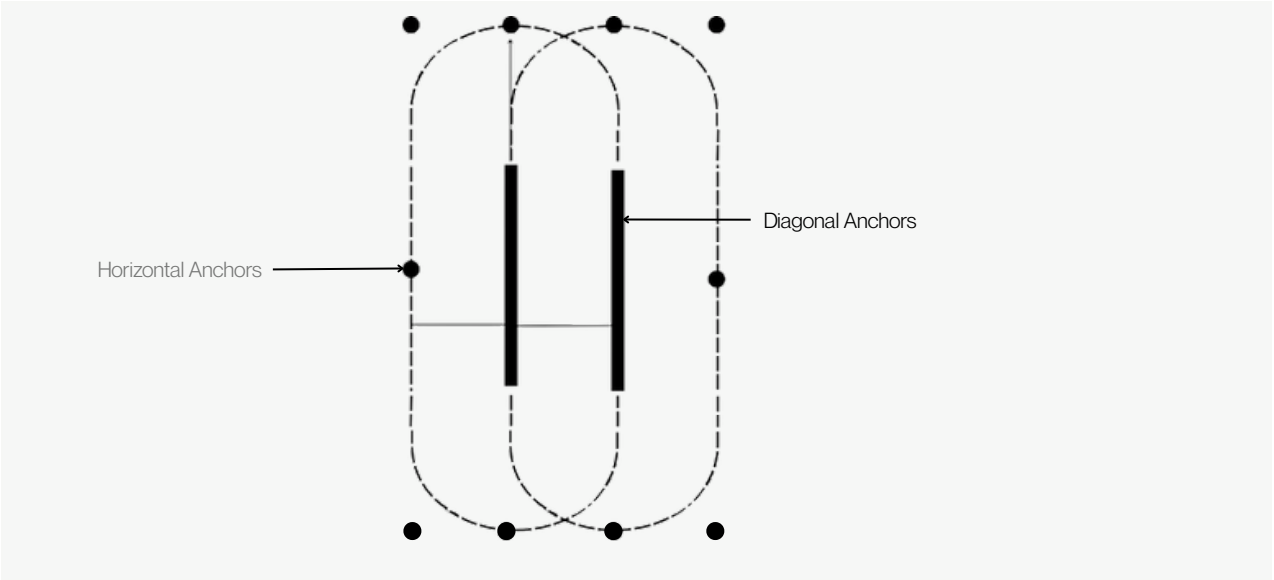
- Anchor setting out tolerance = 50mm in any direction provided the above is observed.
- In narrow sections (e.g. over windows) tighter setting out tolerances will be required. These anchors are added as extras in addition to calculated minimums.
- For rapid installation it is recommended that YETI anchors be pre-loaded within the insulation sheet prior to placing it onto poured concrete. The insulation board should be clean of dust and insulation fragments and loose fragments and films or papers should be removed. Installing anchors in the opposite direction to the direction of drilling insures that any papers or film layers that have been punched out and are loose and flattened down and trapped under the YETI collar.
- Should an anchor clash with the rebar, predrill the hole 50mm away from the original hole, while still observing rules 1-3 above.
- Do not drill through the existing hole at an angle to clear the bar.
- Always ensure that the surface of the insulation in contact with the concrete is free from blow out protrusions where the insulation has been drilled. This ensures full compaction of the concrete around the embedded anchor.
- It is recommended to drill the anchors a minimum of 50mm from the insulation sheet edges.

Embedment Guidelines





General Guidance For Placing Anchors



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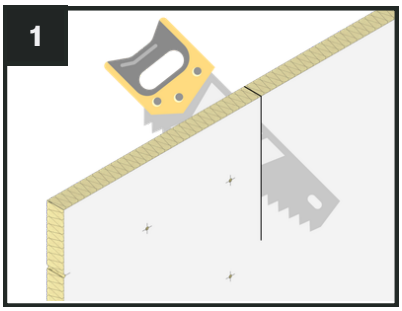
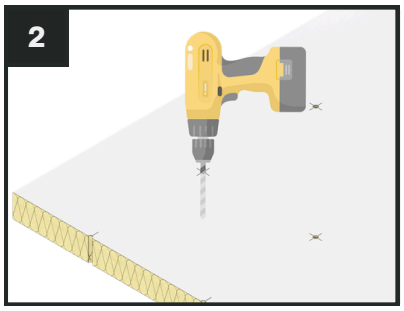
Installation

Pre-drilled Boards

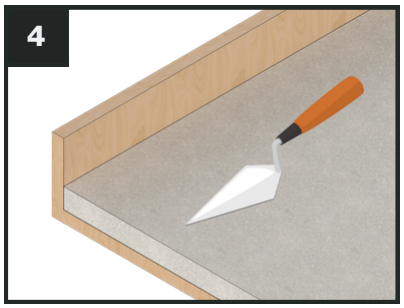


Preparation Of Cast-In Surface And Insulation Boards
Clean casting surfaces for exterior concrete placement. Place reinforcing steel/mesh on supports. Cut insulation boards to fit panel. Mark anchor positions with marker and string line.

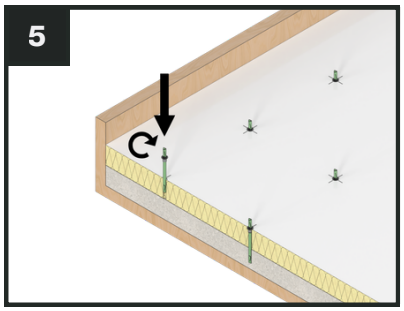


Drill Insulation Boards
Drill insulation in marked spots: 8mm bit for YETI-8, 14mm/16mm/20mm for YETI-15. Drill from outer layer side so that the foil and debris is pushed inside when the anchors are installed.
A minimum edge distance of 50mm avoids fragmentation of the insulation batts and possible voids. This should be pre-tested to understand material suitability.

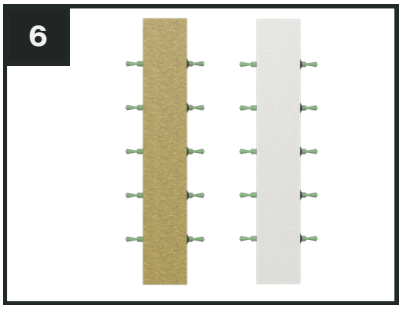
Clean the Hole
Clean the hole using compressed air to remove all insulation and concrete dust.



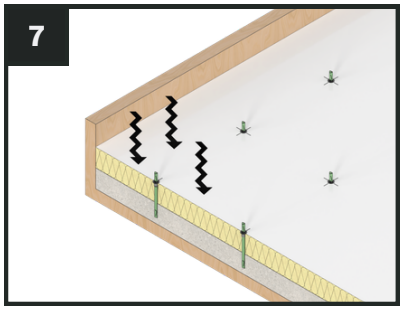
Placement Timing
Place concrete in forms and vibrate concrete as necessary. The installer must ensure that the concrete has not reached initial set before anchors are installed within 15-20 minutes after placement of concrete to ensure the concrete mix is still plastic.



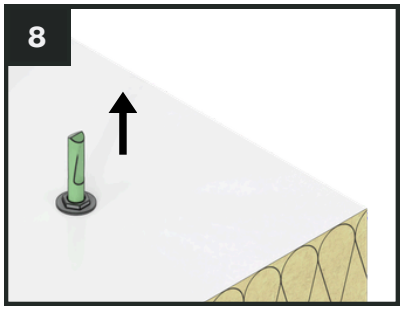
Install Anchors
Immediately insert the Yeti-Anchors through pre-drilled holes in insulation into wet concrete, until the plastic collar is flush with the board. Twist the anchor 90° and wiggle it to ensure full concrete coverage of the embedded end. Do not install anchors in panel joints.



Alternative Anchor Installation
Alternatively, pre-load the anchors in the insulation prior to placing the insulation onto the first concrete layer. The anchors should be pre-loaded in the opposite direction to the drilling direction. Pushing anchors the same direction as the drill hole pushes the debris and foil layers out in to the concrete around the anchor.

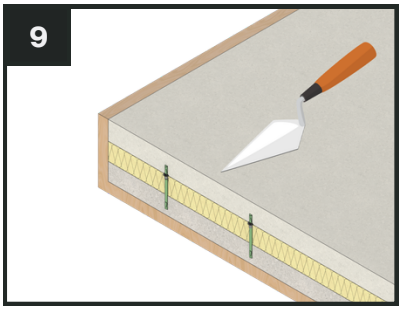


Concrete Consolidation Around Anchors
Check consolidation by removing 10% of installed anchors (minimum 5), including some from corners and insulation sheet centres. Wet concrete slurry should be present on the whole of the embedded end. Replace the anchor in the same hole and reconsolidate. Check for partial piercing of the insulation board and insulation fragments in the concrete then reinstall the anchor and take further consolidation measures.**



Check Consolidation
Avoid disturbing the anchors and the insulation layer after the concrete layer has reached initial set.

SEE NOTES ON TESTING COMPACTION BEFORE SECOND POUR



Pour The Top Layer Of Concrete
Pour top concrete layer after adding reinforcement and hardware.

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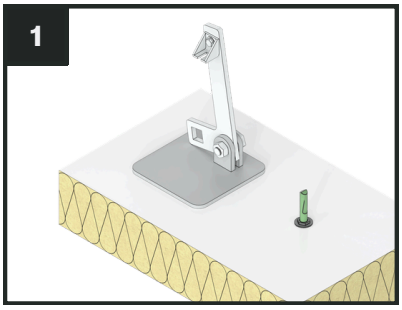
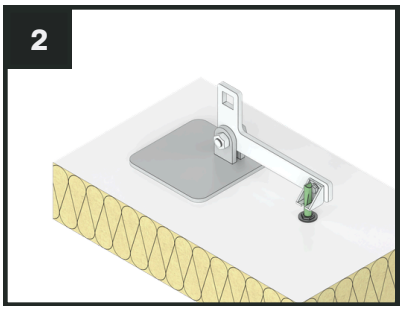
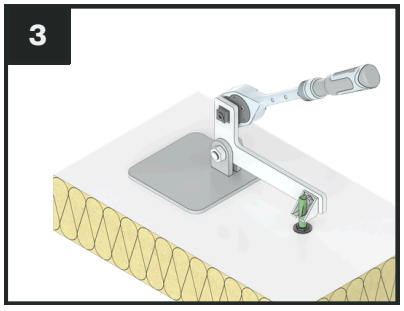
Testing Compaction Before Second Pour



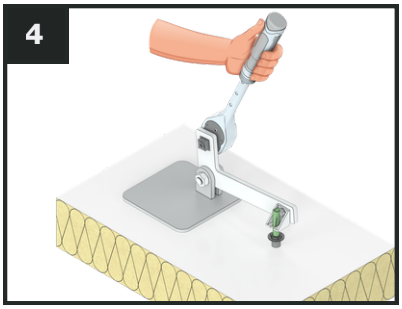
Place the Tester
Set the pull tester on the insulation surface next to the anchor.



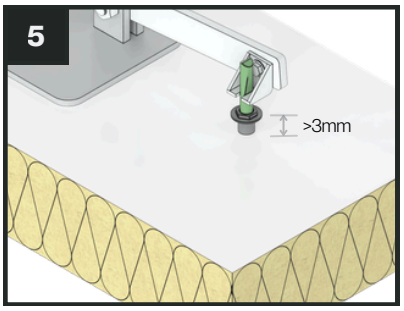
Engage the Anchor
Slide the Yeti-Anchor™ into the forked collar of the tester.



Attach Torque Wrench
Connect the wrench to the other end of the pull tester.



Apply Load
Slowly pull the torque wrench by hand. Stop when the wrench clicks or breaks over (reaches 100 N·m). This applies a maximum pull force of 830 N (~ 85 kg-force) on the anchor.



Check the Anchor
If the anchor moves more than 3mm, it has failed. For any Yeti-Anchor™ that failed the pull test or was damaged, a new anchor must be installed. Mark and replace all failed anchors using the retrofit method (resin anchor).

⚠ TESTING CONDITIONS

5% of anchors **MUST** be tested per panel at this stage.

Testing must take place only once concrete reaches 25% of its 28-day strength and the installer is responsible for carrying out this test.

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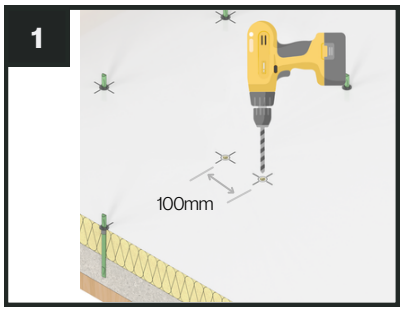
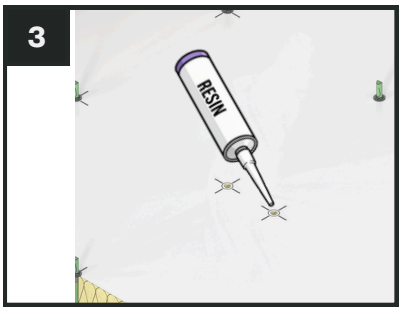
Retrofit and Repair Procedure

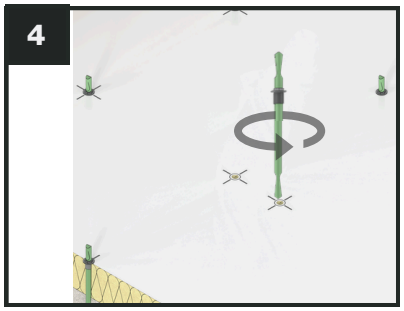


Drill a New Hole
Though the insulation and concrete, drill a hole 100mm from the location of the failed anchor.
10mm diameter and 50 mm deep for YETI-8
18mm diameter and 50 mm deep for YETI-15

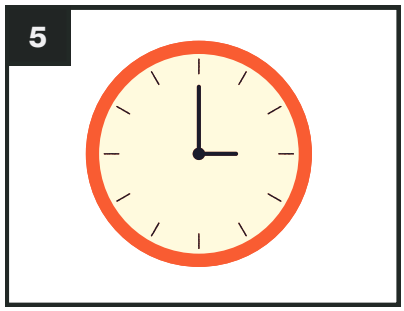
Clean the Hole
Clean the hole using compressed air to remove all insulation and concrete dust.



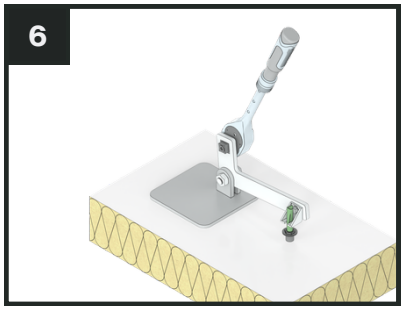
Fill Hole with Resin
Following the relevant instructions, fill the hole with FIS VT 380C resin.



Insert New Anchor
Place a new Yeti-Anchor into the resin hole with a twisting motion (like a screw) to ensure full resin contact.



Resin Curing
Allow the resin to cure fully as per the manufacturer's instructions before applying any load.



Retest
After allowing curing time for resin, retest using the pull out test.

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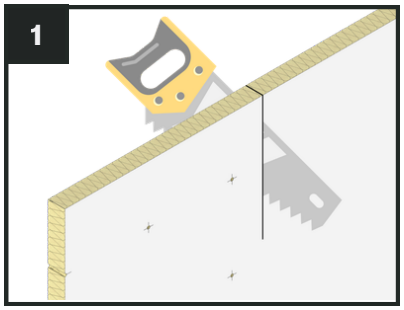
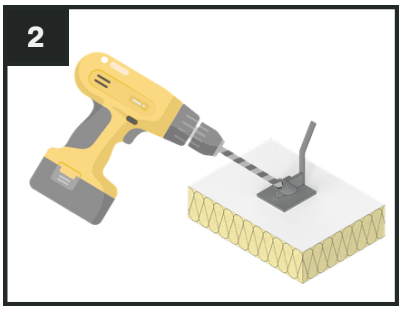
Installation

Using The Yeti Anchor Installation Tool For Diagonal Connectors

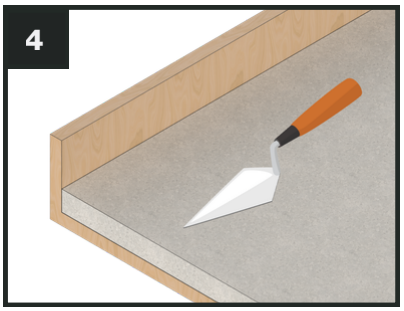


Cut Insulation to Size
Cut insulation boards to fit panel. Mark anchor positions with marker and string line.



Drill Diagonal Holes
Drill marked points with a 14mm bit for the YETI-15-D, using the Yeti Anchor Installation Tool.

Clean Holes
Clean the hole using compressed air to remove all insulation and concrete dust.



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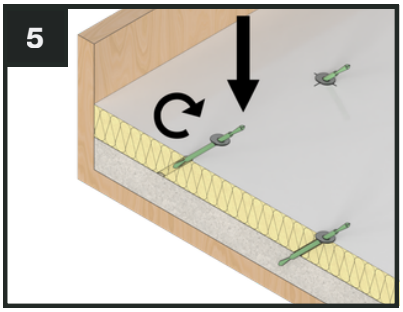

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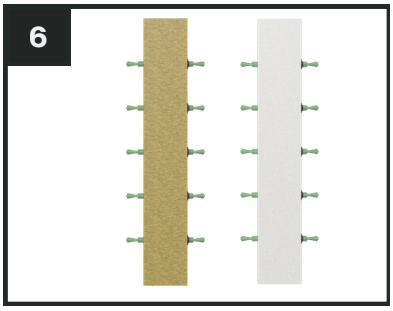

Alternative Anchor Installation
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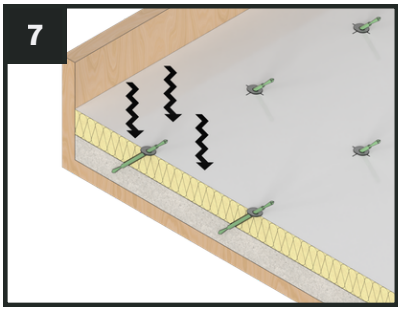

Concrete Consolidation Around Anchors
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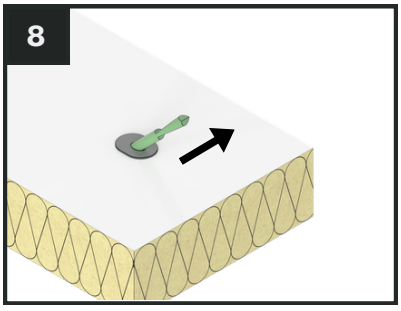
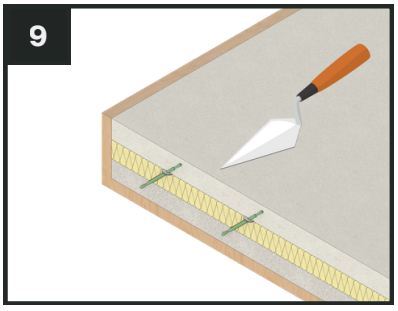


Check Consolidation
Avoid disturbing the anchors and the insulation layer after the concrete layer has reached initial set.

SEE NOTES ON TESTING COMPACTION BEFORE SECOND POUR



Pour The Top Layer Of Concrete
Pour top concrete layer after adding reinforcement and hardware.

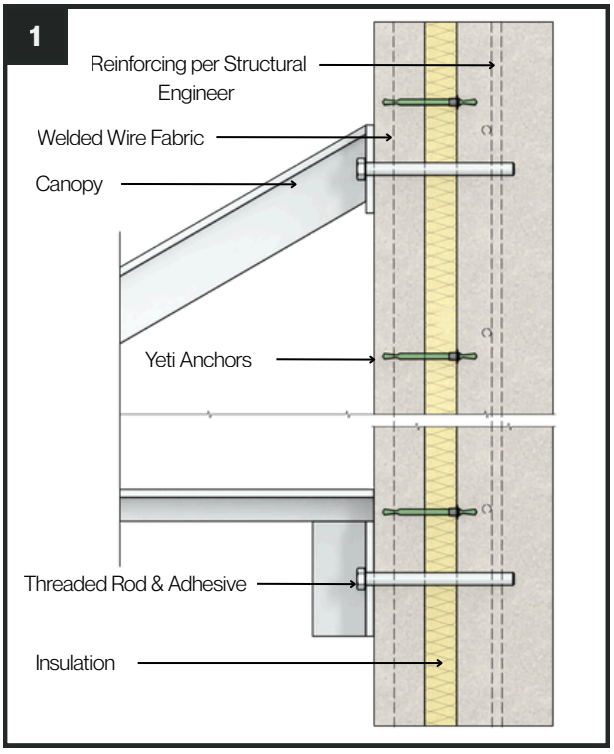
Design Notes:
The following should be avoided:

- Insulation fragments in the concrete and around the notched Yeti-Anchor end (these may have been pushed out or dislodged by the Yeti-Anchor)
- Deformed insulation boards caused by the Yeti-Anchor pushing through the insulation lower film/membrane – sudden penetration can result in the film/membrane becoming loose
- Cones of insulation punched out on the lower face of the insulation and in to the concrete during installation

**The panel manufacturer takes all responsibility and liability for insulation choice, its compatibility with this installation method, and the full cover & consolidation of the concrete around the n
end of the anchor.

Externally Attached Elements

1



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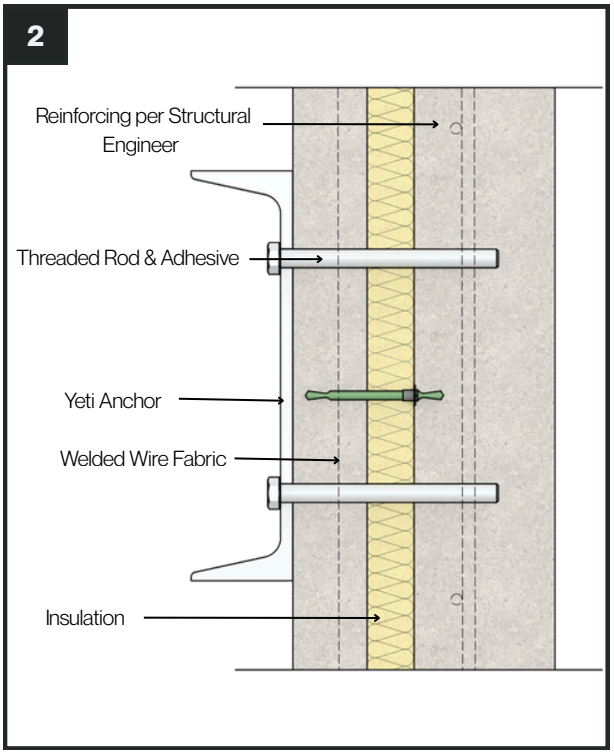

Design Notes:
For lightweight canopies or other attached loads fixed to the outer leaf, this may be possible to fix to the outer leaf with CFS cast in fixing inserts incorporated during production.
The load would then be transmitted via the Yeti connectors to the inner leaf. The feasibility of this very much depends on the weight and centre of gravity position of the attached canopy. Please submit to CFS your details for evaluation and inclusion in design.

For heavy canopies we would suggest that these are directly fixed back to the inner wall of the sandwich panel with independent connectors. It is not permitted to attach any canopy or other member that applies load to the outer leaf subsequent to the casting of the sandwich panel unit.

Thank You

Contact us today for a quote or if you have any questions

Location
CFS Unit 14-16
Westfield Estate
Henley Road
Medmenham
SL7 2TA

Version
1.0