

Halo® Subterra® & Subterra® Plus

HALO®

ADVANCED GRAPHITE INSULATION SYSTEM

INSTALLATION GUIDE



1.0 - PRECAUTIONS FOR HANDLING, STORAGE & INSTALLATION 5

 1.1 - JOBSITE STORAGE AND HANDLING 5

 1.2 - INSTALLATION..... 5

3.0 – PRODUCT DESCRIPTION 7

 FEATURES 7

 BENEFITS..... 8

 AVAILABLE SIZES..... 8

4.0 – APPLICATIONS 9

 4.1 - UNDER SLABS..... 9

 4.2 - FOUNDATION WALLS 10

5.0 – INSTALLATION..... 11

 5.1 - UNDER-SLABS 11

 5.2 - FOUNDATION WALLS 13

6.0 – PENETRATIONS 15

7.0 - INSPECTION & REPAIRS..... 16

For more information, or to contact a Halo representative, visit our website at www.BuildWithHalo.com and click “Contact Us”.

This manual will be updated regularly. Current updates will be available at www.BuildWithHalo.com.



1.0 - PRECAUTIONS FOR HANDLING, STORAGE & INSTALLATION

Precautionary measures taken in packaging, storage, transportation and installation of Halo products can help minimize the potential for damage to the products.

1.1 - JOBSITE STORAGE AND HANDLING

Halo products should be protected from reflective sunlight or prolonged solar exposure.

Always keep stored Halo products tarped or covered to protect from weather. Do not use a clear plastic covering film. If possible, store indoors.

1.2 - INSTALLATION

Until the building is enclosed with the wall, subfloor or roof sheathing, the following recommendations will help ensure installed Subterra products are protected from thermal expansion, and minimize damage due to reflective sunlight or prolonged solar exposure.

- Remove or cover any surface that is casting a reflection on installed Halo products, or shield the affected Halo products. (Reflections can also come through the building enclosure through openings or non-opaque areas, such as windows).
- Cover Subterra products if left exposed for more than 30 days. Faded printing on Halo laminates is normal and will not degrade the Halo properties.
- Ensure all butt joints are tightly fitted. See "5.6 - SEALING JOINTS AND FASTENER PENETRATIONS" on page 12.
- Immediately tape seal or temporarily cover all joints of inside corners until tape sealant is applied. Edges of Subterra products installed on subgrades and adjacent to Exterra or Interra should also be immediately covered until proper sealant method is applied along the perimeter between Subterra and Exterra or Intrerra.

For more information contact your local Halo representative or e-mail info@buildwithhalo.com.



2.0 – USEFUL TOOLS & MATERIALS

Recommended for sealing joints, penetrations, perimeter edges and flashing details.

- Halo Sheathing Tape
- Perma R Products Sheathing Tape
- Vapor barrier blue Tuck Tape,
- 3M peel and stick membrane,
- Expandable foam and
- Blueskin flashing tape (may require a primer for some surfaces)

Recommended for fastening or gluing

- Weather resistive construction glue, such as PL 300

Additional tools:

- Hammer and cordless drill
- Hole saw
- Utility knife and straight edge

3.0 – PRODUCT DESCRIPTION

FEATURES

Subterra products are rigid foam sheathing insulation faced with either a polypropylene laminate (referred to as **Subterra**) or a tougher woven polypropylene fabric (referred to as **Subterra Plus**).

The insulation is made of GPS - expanded polystyrene containing graphite, which provides up to 18% more R-value than conventional EPS (expanded polystyrene).

Subterra and Subterra Plus are both suited for residential and commercial projects. However, Subterra Plus is more resistant to heavy repetitive loading and construction traffic conditions.

Subterra and Subterra Plus is available in compressive strengths 16, 20, 25, 30, and 40 psi (110, 140, 172, 210, 276 kPa). Higher compressive strengths in excess of 40 psi (276 kPa) is also available upon request¹.



1. Check with your local Halo representative for available Subterra/Subterra Plus compressive strengths.

BENEFITS

When installed under slabs Subterra products offer the following functional benefits.

- Prevents the ingress of radon - 7 times more radon resistant than 6 mil polyethylene membranes.¹
- Replaces 6 mil polyethylene membranes as the air and vapor barrier.³
- Protects void forms under structural slabs
- Provides a water resistant barrier - resistant to over 2 feet of standing water.²
- Continuous insulation reducing heat loss through the slab.
- Flexible, resilient and durable against heavy loading and construction traffic conditions - will not warp.
- Provides a safe, non-slip, surface.
- Quick and simple installation - saves time and labour.
- Light in weight and easily cut to fit any space.

When installed as exterior insulation for foundation walls Subterra Products offer the following functional benefits.

- Protects waterproofing applied to foundation walls, and helps drain water away from the wall.
- Reduces damage to foundation walls that can be caused by freeze-thaw cycles over time.
- Provides continuous insulation.

AVAILABLE SIZES

Available in 4ft x 8ft sheets, 1/2", 3/4", 5/8", 1", 1.5" and 2" thickness. Custom sizes are available. Contact your local Halo representative for availability.

1. National Research Council of Canada's (NRC) Radon Diffusion Test, which shows Subterra Protection Board is more than 7 times Radon resistant than 6 mil polyethylene membranes.
2. In accordance with AATCC 127, Water Resistance: Hydrostatic Pressure Test, and AC71, Foam Plastic Sheathing Panels Used as Weather-resistant Barriers.
3. Independently evaluation of Subterra to the National Building Code of Canada by QAI (Quality Auditing Institute).



4.0 – APPLICATIONS

Subterra and Subterra Plus are used in residential, multi-residential, commercial, and industrial buildings completely insulating the building envelope below-grade.

Typical applications include:

- Exterior insulation against foundation walls
- Insulation under concrete slab-on-grades

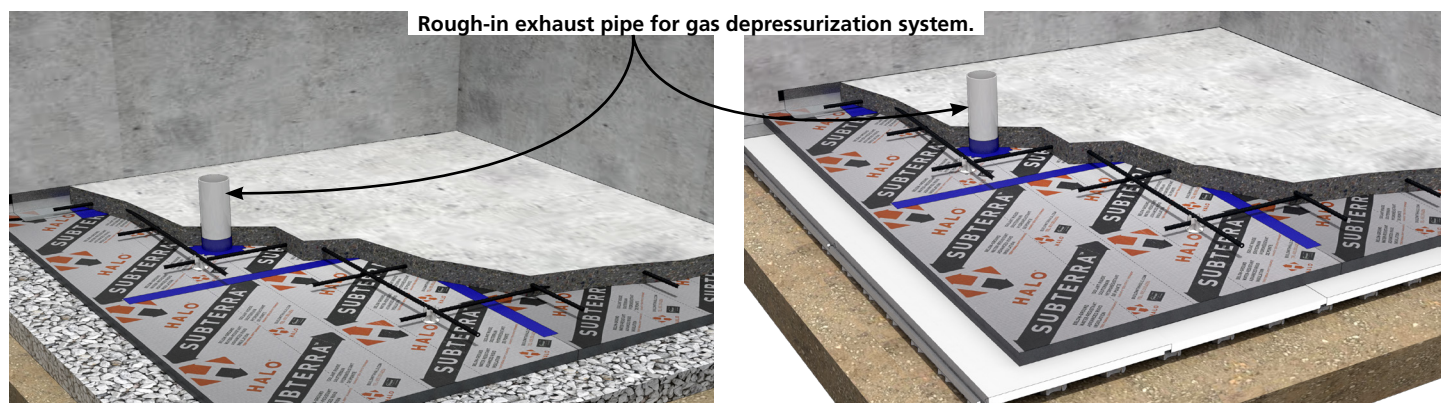
The following illustrations are typical for the installation of Subterra and Subterra Plus.

Installation may vary depending on project specific requirements. Before starting, make sure all installation complies with local building code requirements.

4.1 - UNDER SLABS

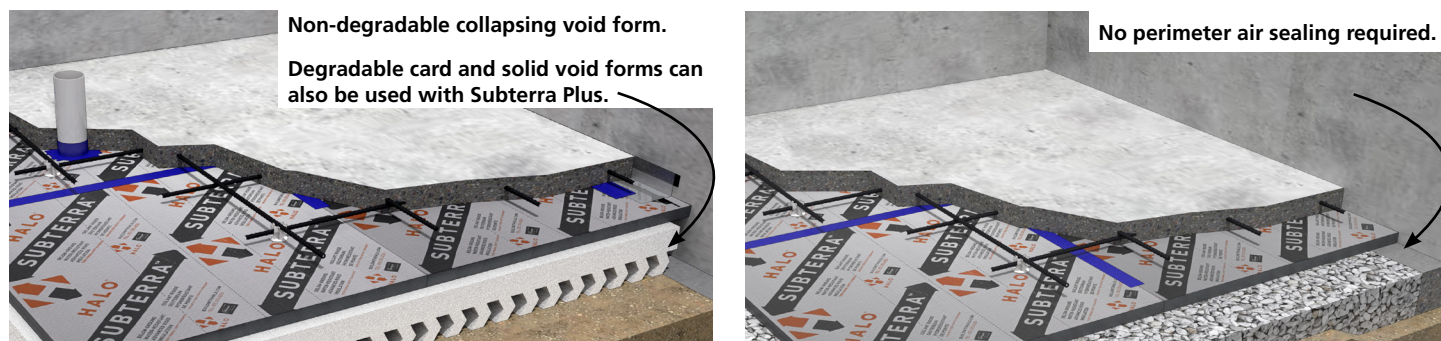
Subterra Plus is specifically required to prevent the ingress of gas to the interior, or when used as void form protection under structural concrete slabs. Refer to the Subterra Protection Board Installation Guide for more information.

Subterra or Subterra Plus can be used if the only requirement is to provide the vapor barrier.



Subterra Plus over granular substrate as part of the subfloor gas depressurization system.

Subterra Plus over proprietary subfloor gas depressurization system.



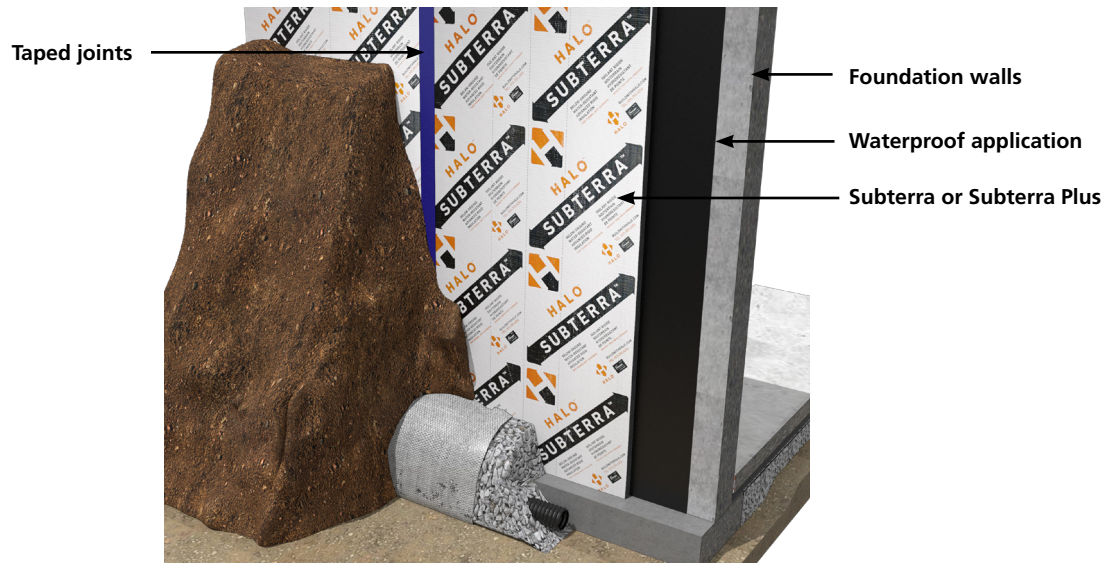
Subterra Plus as void form protection.

Subterra or Subterra Plus installed as a vapor barrier.



4.2 - FOUNDATION WALLS

Place Subterra or Subterra Plus directly against the concrete or masonry foundation wall with the longest edge vertically, and the bottom edge resting on top of the footing.



5.0 – INSTALLATION

The following instructions are typical for the installation of Subterra and Subterra Plus for under-slab and foundation wall applications. For installation as void form protection or as a radon barrier refer to the Subterra Protection Board Installation Guide.

Installation may vary depending on project specific requirements. Before starting, make sure all installation complies with local building code requirements.

5.1 - UNDER-SLABS

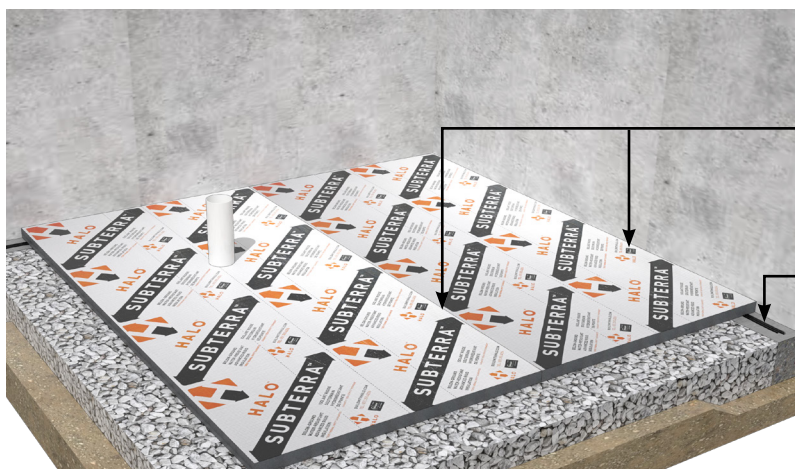
STEP 1 - Level and Compact The Base Material:

Level and compact the earth or granular material under the slab. Inspect the surface to ensure there are no protrusions that could prevent Subterra from being placed level and flush to the base material.



STEP 2 - Install Subterra or Subterra Plus:

Install Subterra or Subterra Plus over the base material covering the entire area of the concrete pour. The orientation of Subterra can be placed in any direction.



Butt all joints tightly together and to the perimeter of the slab area. Use a straight edge to measure and cut pieces to maintain a snug fit between boards.

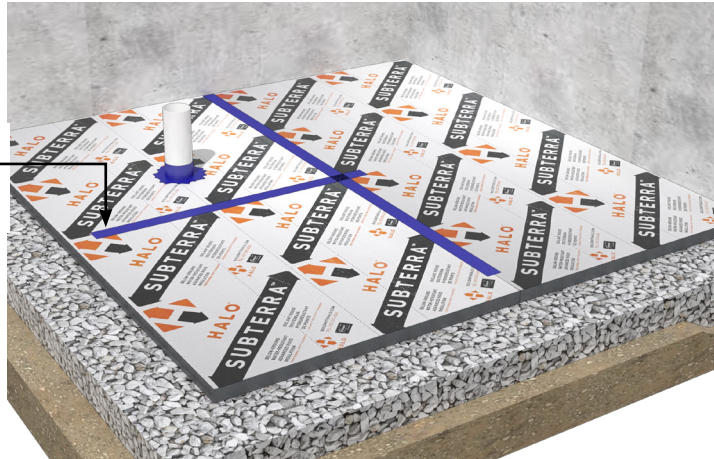
Apply acoustic sealant between footing and Subterra around the perimeter.



STEP 3 - Tape Seal All Joints and Penetrations:

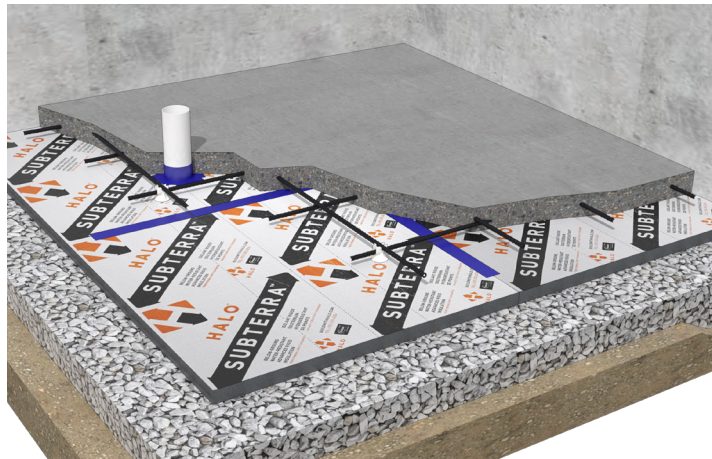
For sealing penetrations see "6.0 – FASTENING EXTERRA" on page 18.

Use sheathing tape to seal all joints. Gaps between joints larger than 1/4" should be foam filled and tape sealed.



STEP 4 - Pour The Slab:

Prior to concrete placement, inspect the condition of the Subterra boards and all sealed joints and penetrations. See "7.0 - INSPECTION & REPAIRS" on page 20.

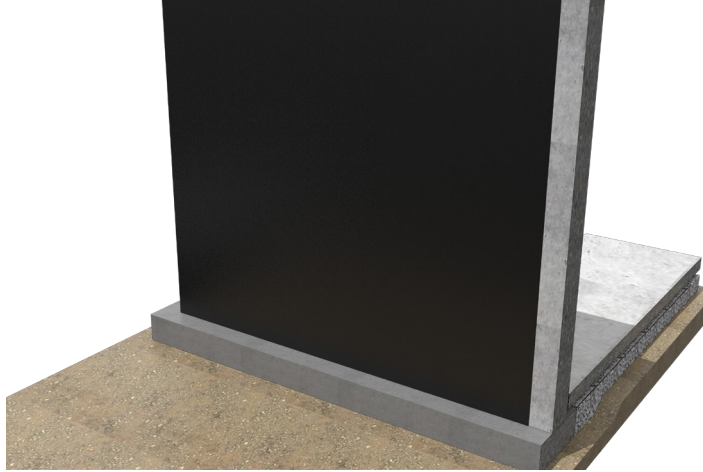


5.2 - FOUNDATION WALLS

STEP 1 - Prepare the foundation wall:

Prior to placing Subterra or Subterra Plus the foundation wall should be treated with waterproofing.

- Remove any protrusions that can damage or prevent Subterra from laying flat against the foundation wall.
- For existing foundation walls remove the backfill away from the foundation wall and remove any loose dirt and debris from the wall.



STEP 2 - Install Subterra or Subterra Plus:

For new construction allow the waterproofing to set, if required, before applying Subterra.

- Use weather resistant construction glue compatible with EPS, such as PL 300, to secure Subterra or Subterra Plus to the wall. If the wall is too rough or uneven concrete screws with washers can be used along with adhesives to help secure Subterra or Subterra Plus.

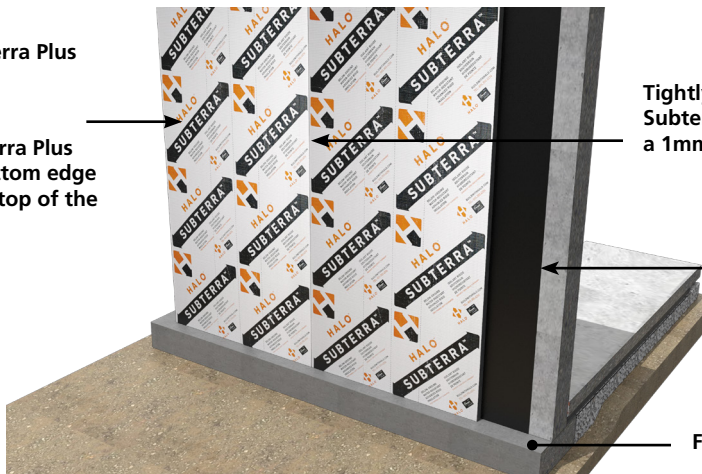
Placed Subterra or Subterra Plus over the waterproofing.

Install Subterra or Subterra Plus vertically so that the bottom edge of Subterra is sitting on top of the footing.

Tightly butt edges of Subterra or Subterra Plus creating no more than a 1mm (1/32") gap between joints.

Waterproofing

Footing

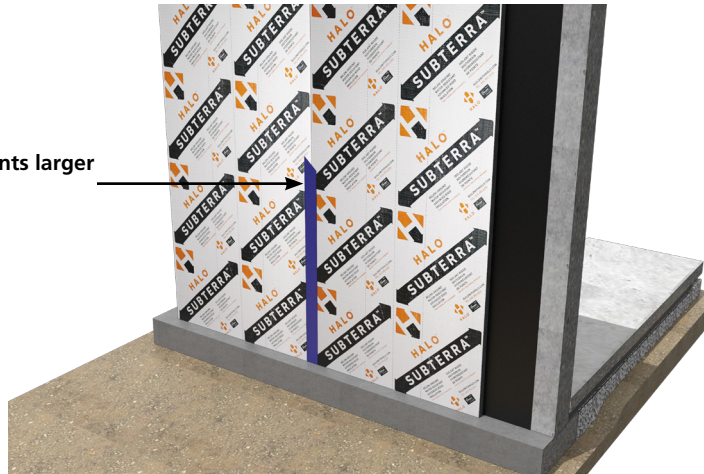


STEP 3 - Sealing Joints:

Seal and tape all joints between Subterra or Subterra Plus boards.

- Seal all joints with sheathing or flashing tape. In cold weather applications, a primer may be required to ensure proper adhesion of the tape or flashing to Subterra or Subterra Plus. Water based primers are suitable for temperatures up to -4°C (25°F). For colder temperatures solvent based primers are recommended.
- Seal around window and vent openings with sheathing or flashing tape. Sealing around openings will eliminate potential moisture entering within the wall assembly.

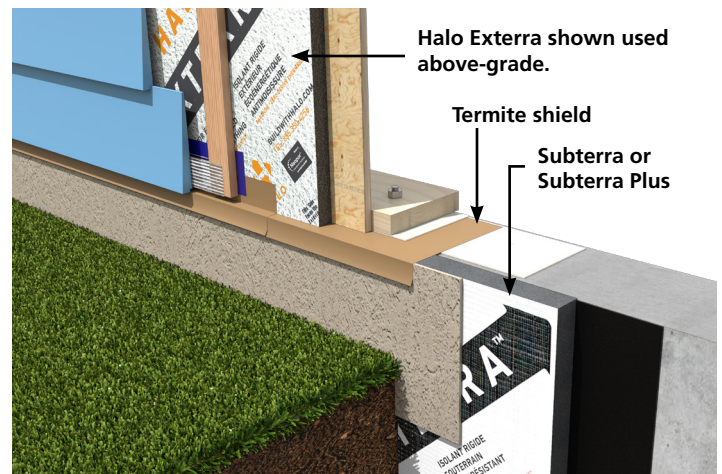
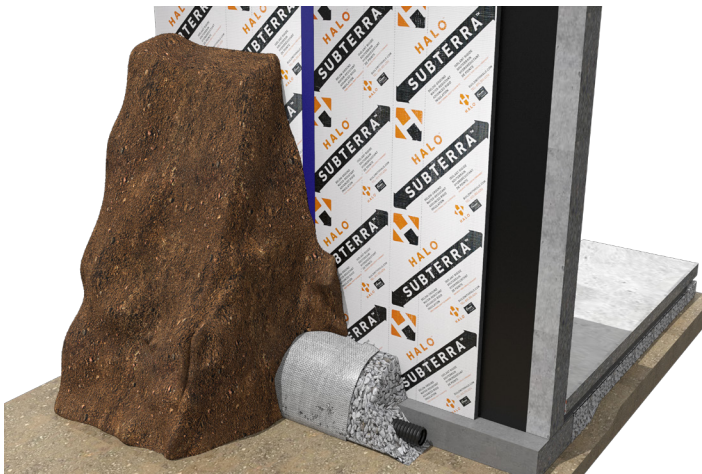
Foam fill and tape over joints larger than 1/8".



STEP 4 - Backfilling:

Carefully place the backfill against the foundation wall to required grade.

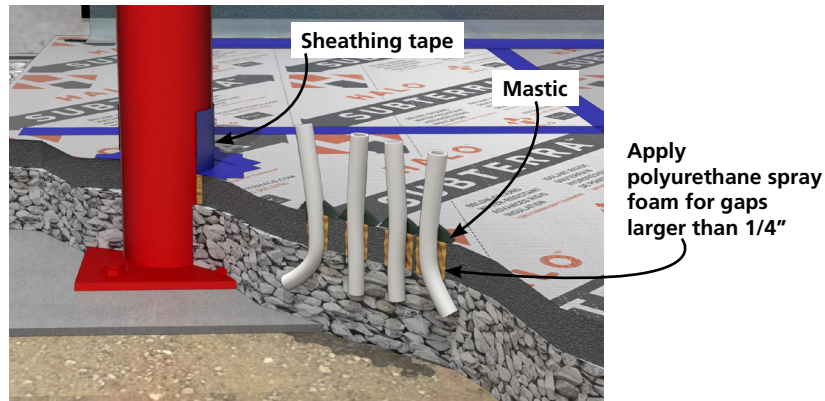
- Seal the top of Subterra with a compatible sealant to prevent moisture from getting behind the Subterra sheathing.
- Protect Subterra that is exposed above-grade with compatible parging materials such as Stuccoflex or Styroflex.
- Provide a termite shield detail to protect the insulation and wall assemblies in areas of high termite infestation.



6.0 – PENETRATIONS

Penetrations through Subterra or Subterra Plus, such as utilities or columns can be simply sealed with sheathing tape or a mastic sealant to maintain the continuity of the air and moisture barrier.

Gaps larger than 1/4" between Subterra or Subterra Plus and the penetration should be foamed filled before tape sealing to maintain continuous insulation.



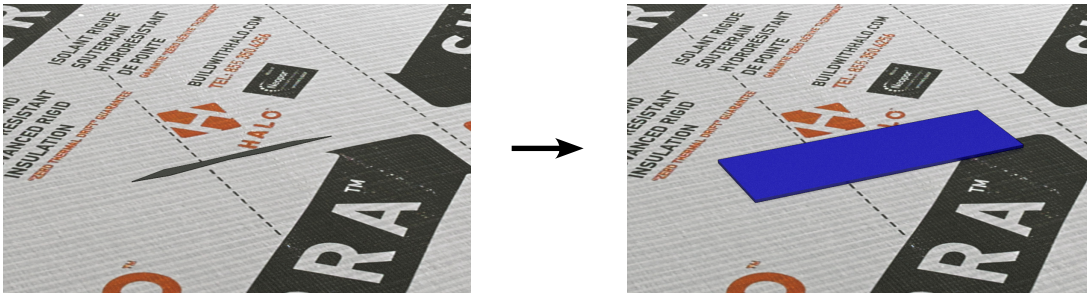
7.0 - INSPECTION & REPAIRS

Subterra and Subterra Plus are designed to be extremely durable and resilient against heavy construction traffic. However, inspecting the condition of installed Subterra boards prior to the concrete pour will ensure proper installation is maintained.

Inspect installed Subterra boards sufficiently in advance of concrete placement to ensure

- taped seams are not broken
- joints, penetrations and perimeter are properly sealed
- damaged areas are marked and properly repaired.

In most cases repairing damaged Subterra boards simply requires tape sealing over the damaged area.



If the foam and laminate are damaged then removing the damaged section and replacing with a new section will be required.

