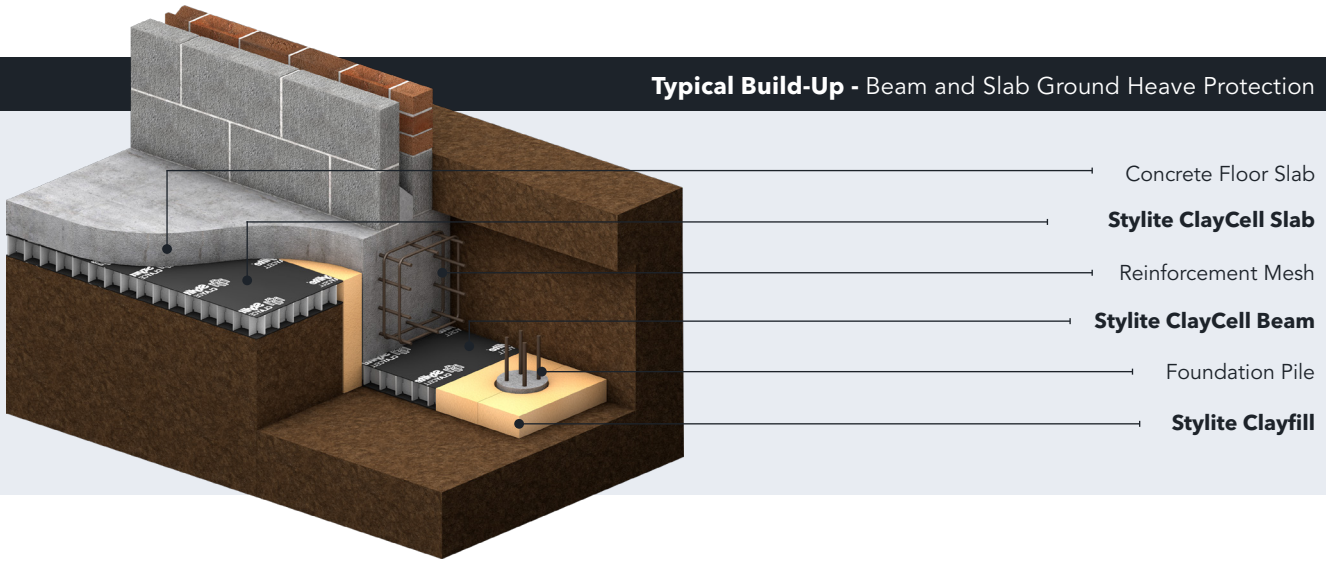
Stylite®

CLAYCELL GROUND HEAVE PROTECTION DATASHEET

Pr_25_71_29_62 / Pr_25_71_29_16 - 6_020221

spi
Expanding Possibilities

Typical Build-Up - Beam and Slab Ground Heave Protection



Standard Dimensions

All our Stylite ClayCell Boards are available in standard sizes with widths from 300mm up to 1200mm to suit varying foundation beams. The required thickness of the board will vary depending on the potential ground movement and the residual uplift limit of the foundation substrate. Please see specification tables for details on available thicknesses.

Design Standards

Stylite ClayCell Expanded Polystyrene is manufactured in accordance with **BS-EN-13163-2012+A2-2016.** Under a Quality Management System accredited to **ISO 9001:2015** and an Environmental Management System accredited to **ISO 14001:2015.**

ISO 14001 CERTIFIED UKAS British Assessment Bureau

ISO 9001 CERTIFIED UKAS British Assessment Bureau

Product Overview

Stylite ClayCell Ground Heave Movement Protection is a cross pattern Expanded Polystyrene board with a corrugated Polypropylene board bonded to both sides with the availability for a bonded insulation board option. The boards are utilised to protect foundations and concrete floor slabs from any ground heave movement. Ground heave movement pressures can be caused by the expansion of clay soils, excess water or overgrowth of tree roots. Stylite ClayCell can help absorb the pressure exerted onto the foundations. Each grade of product offers different safe and fail loads to allow a specific level of pressure before the boards collapse and create a void around the affected area.

Product Benefits

- Protects foundations and concrete slabs from vertical ground heave movement
- Available in widths to suit typical foundations
- Variety of safe and fail loads making it easy to specify the correct product
- Suitable for installation with or without concrete blinding layer
- Inline with NHBC Technical Standards
- No reduction in performance over time
- Lightweight, quick & easy to install
- Minimal water absorption & permeability
- Resistant to moisture and rot

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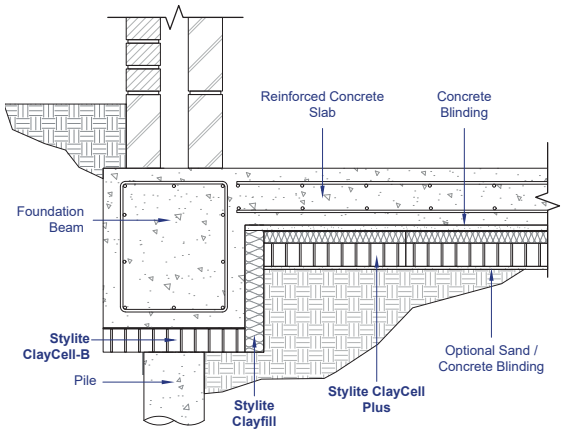
Typical Applications

Stylite ClayCell is used to protect foundations and concrete slab floors from any excessive verticle ground movement. The boards can be utilised under a foundation beam or under a concrete slab (insulated or uninsulated). They will successfully protect the concrete against any structural damage caused by ground movement. The boards are often used along with Stylite Clayfill Pile Collars and verticle beam faces.

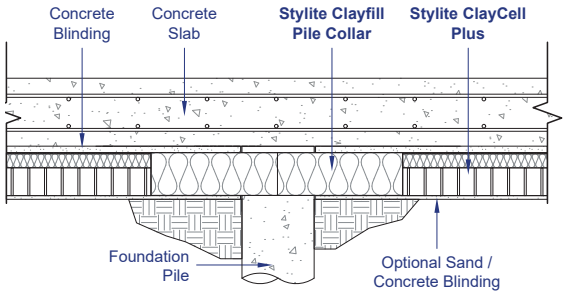
Typical Application

Pilled Ring Beam - Typical External Wall Junction



Typical Application

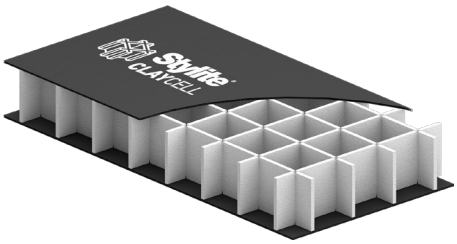
Pilled Ring Beam - Typical Pile Collar Build Up



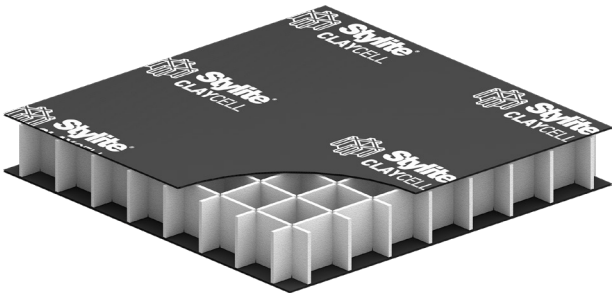
Product Options

Due to the different design considerations that have to be made when specifying a void former for ground heave precautions there are several different product options available. These are all available in a range of product grades which allow for different safe and fail loads.

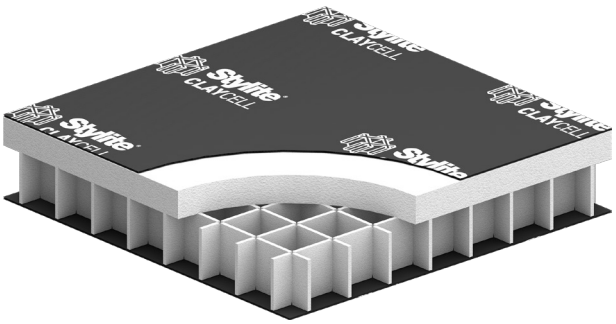
ClayCell-B Under Beam Ground Heave Protection
5mm Polypropylene top and a 5mm bottom sheet.
1200 x 300, 450, 600 or 1200 x 85, 155, 220 mm



ClayCell-S Under Slab Ground Heave Protection
10mm Polypropylene top and a 5mm bottom sheet.
1200 x 600 or 1200 x 90, 160, 225 mm



ClayCell-Plus Under Insulated Slab Ground Heave Protection
2mm Polypropylene top and 5mm bottom sheet.
1200 x 600 or 1200 x 220, 225, 315 mm.
The insulated slab board can accommodate variable target U-Values with insulation thickness ranging from 30mm up to 150mm in an EPS100 or Plustherm100. Contact us for a bespoke U-value calculation.



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Void Equivalent Thickness of Stylite GHP

The NHBC accepts cellular Expanded Polystyrene void formers as a suitable material to protect against ground movement in foundations and concrete slabs. The guidelines detail minimum void depths to allow for different levels of volume change in shrinkable soils. The thickness of Stylite ClayCell boards is dependant on the type of foundation or concrete slab being used and the ground heave potential ranging from low to high, which is determined by the soil plasticity index.

NHBC Volume Change Potential		
Ground Heave Potential	**Modified Plasticity Index** (%)	**NHBC Minimum Void** (mm)
Low	**10-20**	50
Medium	**20-40**	100
High	**40 +**	150

Stylite ClayCell Thickness			
Ground Heave Potential	**Beam** (mm)	**Slab** (mm)	**Plus** (mm)
Low	85	90	112 - 232
Medium	155	160	182 - 302
High	220	225	247 - 367

Compressible Fill for Horizontal faces - Stylite Clayfill

For the protection against horizontal ground movement Stylite Clayfill can be used. Stylite Clayfill is a low-density EPS compressible fill material specifically designed for horizontal ground heave movement.

Compressible Fill For Verticle Foundation Faces			
Ground Heave Potential	**Modified Plasticity Index** (%)	**NHBC Minimum Void** (mm)	**Stylite Clayfill Equivalent Thickness** (mm)
Low	**10-20**	0	0
Medium	**20-40**	25	50
High	**40 +**	35	75

Product Grades

Stylite ClayCell boards are intended to withstand a specific amount of force before they collapse. Each different grade of the product has a safe-load, a fail load (amount of upward pressure) and will support a specific amount of wet concrete. See below the different product grades.

Product Grade	Safe Load (kN/m²)	Fail Load (kN/m²)	Maximum Concrete Depth (mm)
7/10	7	10	0 - 99
8/12	8	12	100 - 260
9/13	9	13	261 - 300
10/15	10	15	301 - 340
13/18	13	18	341 - 460
18/24	18	24	461 - 660
24/32	24	32	661 - 900
30/40	30	40	901 - 1140

Specification Examples

Medium Shrinkage index 35 - Concrete Slab 230mm

Self Weight of Concrete Slab:

Dead Load - 0.23m x 25kN/m³ = 5.75 kN/m²

Live Load Allowance - 1.5 kN/m²

Total Safe Weight - 7.25 N/m²

[1.5* x 12 kN/m²] - [0.9* x 5.75 kN/m²] = 12.825 kN/m²

[Force to Fail Product] - [Force Caused by Concrete] = Residual Uplift (Ultimate Upward Pressure)

Required void of 100mm for soil plasticity index of 35 (Medium potential ground heave)

equivalent product depth - 160mm

The Specified product would be **Stylite ClayCell-160mm-B-812**

*Please note - specific partial safety factors should be used according to the relevant standards for the different foundation or slab applications.

The residual uplift has to be within the fail load limit or the force limit of the concrete slab or foundation. If the concrete can withstand the excess residual lift then the product can be safely specified.

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Specification Clause
You can use our generic specification clause below to include Stylite ClayCell in your design. For help with your specification you can contact our sales team.

Refer to clauses:
The Ground Heave Protection shall be Stylite Claycell Board - ClayCell-__mm thick, S/B/Plus, grade (eg.7/10). manufactured to BS EN 13163-2012+A2-2016 by Styrene Packaging & Insulation Ltd (SPI). The product is to be installed in accordance with SPI's recommendations and installation guide.

Refer to clauses:
E20 Formwork for in situ concrete
182 Collapsible Board Substructure Formwork

Durability
Expanded Polystyrene is rot proof, not affected by bacteria, moulds or fungi, and will not provide nutrient value for insects or vermin. Expanded Polystyrene does not lose any performance over time and will remain an effective insulation for the life of the building.

Compatibility
Expanded Polystyrene should be kept away from hydrocarbons, solvents and volatile substances, however, Expanded Polystyrene is compatible with most chemicals and materials found in common construction environments. For more information, a full list of chemical behaviours is available on our website.

Stylite Expanded Polystyrene should not come into contact with any PVC cables. This is to avoid plasticizer migration which causes PVC cables to become brittle and fragile. Any PVC cables should be protected within a suitable conduit or with a suitable air gap.

Care should be taken when specifying which waterproofing system to use with which EPS board product. For extra guidance please contact our sales or technical team.

Moisture Resistance & Breathability
Stylite Expanded Polystyrene is hydrophobic and highly resistant to the absorption of water but will allow a very minimal amount of water vapour transfer. Expanded Polystyrene is often utilised with a suitable damp proof membrane or vapour control layer to avoid any unwanted water ingress.

Reaction To Fire Classification
Stylite Expanded Polystyrene will achieve a reaction to fire Euroclass F. We supply our warm roof insulation in FRA grades which contain a Fire Retardant Additive and achieve a reaction to fire Euroclass E. However, the classification achieved when installing in a building will be considerably better, for example when using a rigid board bonded product or when used in conjunction with fire-rated plasterboard.

Sustainability
Our Stylite Expanded Polystyrene does not contain HFC's, CFC's or HCFC's. Expanded Polystyrene has a Global Warming Potential (GWP) of zero and a low O-Zone Depletion Potential (ODP).

Our Expanded Polystyrene is 100% recyclable. For more information on our recycling policy, you can contact our office to find out more, or alternatively visit our website.

BRE Green Guide Rating
Expanded Polystyrene achieves a green guide rating from **A+**. For a full overview of grades and ratings please see technical specifications overleaf.

Delivery & Storage
The boards are delivered to site in packs, wrapped in polythene. They must be protected from prolonged exposure to sunlight and UV rays. Packs should be stored either undercover or protected with opaque light-coloured polythene sheeting. The products must be stored fully supported and flat on a firm, level base, to prevent the boards from bowing. Care should still be taken to ensure EPS does not come into contact with any source of ignition.

Safety
Expanded Polystyrene is non-toxic, non-irritant and odourless, making it completely safe to handle. It can be cut on-site using a fine tooth saw or a hot wire cutter.

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The following properties apply to the Stylite ClayCell Plus product option, showing which grades are available for the insulation.

Physical Properties	EPS 100	PlusTherm
Thermal Conductivity (W/mK)	**0.036**	**0.030**
Compressive Strength @ 10% (kPa)	100	100
Long Term Compressive Creep Strength (kPa)	30	30
Bending Strength (kPa)	150	150
Water Vapour Permeability (mg Pa.h.m)	0.009 - 0.020	0.009 - 0.020
Water Vapour Diffusion Resistance (μ)	30-70	30-70
Reaction to Fire - Standard EPS	F	E
Reaction to Fire - FRA EPS	E	E
Length Tolerance	L2	L2
Width Tolerance	W2	W2
Thickness Tolerance	T2	T2
Flatness Tolerance	P5	P5
Squareness	S2	S2

Please note: The information contained within this datasheet is true and accurate at the date of issuance and is subject to change without prior notice. It is for guidance only the proper use and application of this product is the responsibility of the user.

All Stylite Expanded Polystyrene is manufactured to the following standards - **BS EN 13163:2012+A2:2016 - BS EN 13501-1.**

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