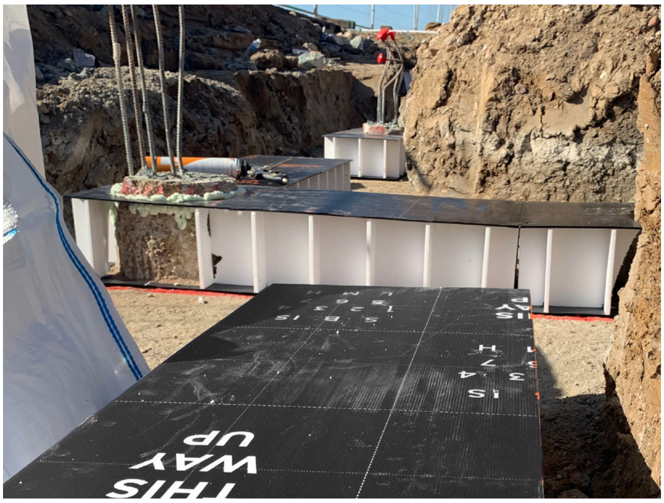
BEWI HeaveMaster GHP

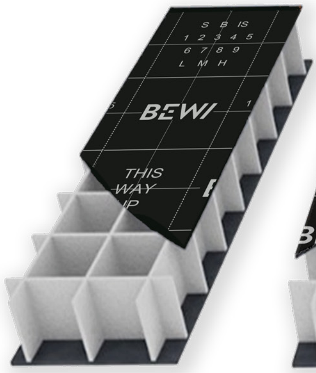
Technical Datasheet

BEWI HeaveMaster provides a stable platform to support a specified depth of wet concrete during construction and, a fully-tested cellular core that will collapse under the specified fail-load pressure to limit damage caused if upward pressure occurs.

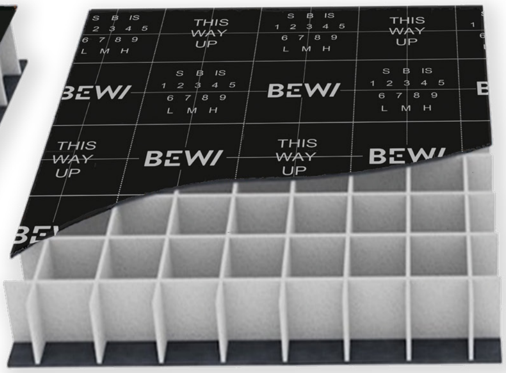
BEWI HeaveMaster GHP (Ground Heave Protection) cellular collapsible void formers are supplied in a range of grades and depths to suit your specification.

Each void former is engineered to protect the foundations of buildings against the damage caused by the upward pressure of clay or ground heave in a specific situation.

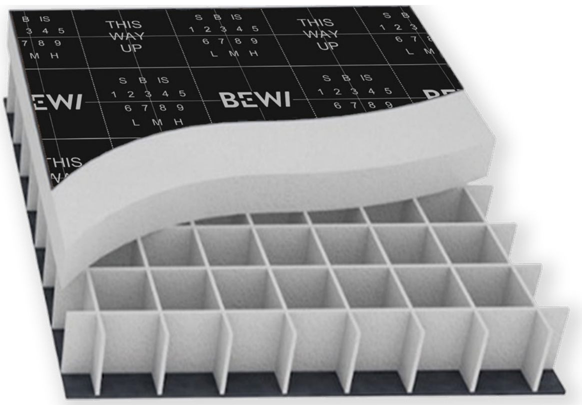




B (Beam)



S (Slab)



IS (Insulated Slab)

Key Benefits

- Protects buildings against upward pressure caused by ground heave
- BBA-certified
- Meets NHBC Technical Standards
- Board sizes aid a fast, easy installation
- Available with bonded EPS insulation board
- Lightweight boards limit H&S risk on site

Board characteristics:

Sizes	Slab board: 1200mm × 1200mm. Beam: 300mm - 1200mm widths.
Materials	Polypropylene Top Sheet: 2mm Insulated Slab 5mm Beam 10mm Slab Cellular Void Former: Expanded Polystyrene

For more information:
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BEWI HeaveMaster

BEWI HeaveMaster GHP are cellular-structured void formers, precision cut from EPS (expanded polystyrene).

The void formers are manufactured in a range of thicknesses to meet the application – Beam, Slab or Insulated Slab - requirement and the soil plasticity and predicted ground movement on the site (See tables).

Beam

The BEWI HeaveMaster GHP void formers are supplied in pre-cut widths from 300 – 1200mm in 25mm increments. Bespoke sizes are available on request.

Slab

The BEWI HeaveMaster Slab void formers are supplied in 1200mm × 1200mm sizes.

Testing and Quality Control

BEWI HeaveMaster GHP void formers are thoroughly tested to ensure each one will achieve the specific performance required. Our dedicated rig enables the testing of whole GHP void formers – not just a small part of the product – so we know that they function exactly as designed.

In addition, we have a rigorous ongoing quality testing programme which ensures that the performance of BEWI HeaveMaster GHP void formers can always be relied upon.

Polypropylene Top Sheet

All BEWI HeaveMaster GHP void formers are supplied with a bonded polypropylene top sheet. The thickness of the top sheet is tailored to suit the application requirement.

Polypropylene Bottom Sheet

All BEWI HeaveMaster GHP void formers are supplied with a bonded polypropylene bottom sheet. This bottom sheet helps provide a firm and flat surface for installation over suitably prepared level and even substrates.

The bottom sheet is 2mm for all applications.

Bespoke Products

For projects with special requirements, such as a concrete thickness of over 1940mm, BEWI will design a bespoke void former to meet your unique requirements. Please contact your Technical Sales Manager to discuss details.

Influence Factors and Required Void Former Depth

NHBC Shrinkage Category	Low	Medium	High
Soil Plasticity Index PI %	10-20	20-40	40-60
Predicted Ground Movement (mm)	50	100	150

Depth (mm) of cellular EPS structure to meet NHBC and site requirements

Beam	90	155	220
Slab	95	160	225
Insulated Slab*	87#	152#	217#
XD (Extra Deep)	100	200	300

* You can order the insulation layer in any thickness to meet your project U-value requirements

\# + Insulation Thickness

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Product Grades

BEWI HeaveMaster GHP is supplied in nine different performance grades to meet the required safe-load and fail-load performances for different thicknesses of concrete (see table).

Each grade, from 1 to 9, supports a specified depth of wet concrete during construction and the subsequent collapse required in the event of upward pressure.

BEWI HeaveMaster Insulated Slab

In cases where insulation is also required beneath the slab, BEWI HeaveMaster GHP IS (Insulated Slab) can be utilised to provide combined ground movement protection and insulation from a single product.

The Insulated Slab will achieve a specified thermal performance. The insulation boards are supplied in white EPS or for an improved thermal performance grey HP EPS can be supplied.

Depending on the thickness of the insulation board, U-values as low as 0.15 W/m²K can be achieved. The U-value table over shows examples of the U-values that can be achieved with the different depths of white or HP EPS.

The U-value of a completed floor will depend on the insulation thickness, the perimeter/area ratio and the floor construction (see table).

Drainage

The cellular Expanded Polystyrene (EPS) core is designed to include drainage slots in every node (where four faces meet).

The slots allow water that could be trapped in the collapsed cells to escape as the void former compresses.

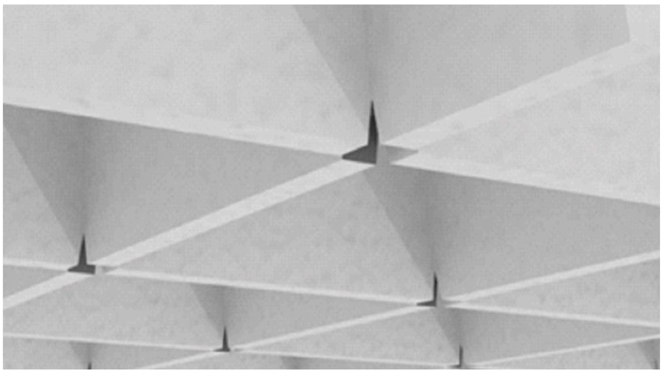
Product Grades

Product Grade	Maximum Concrete Depth (mm)	Safe-load (kN/m2)	Fail-load (kN/m2)
1	220	7	10
2	300	9	13
3	340	10	15
4	460	13	18
5	660	18	24
6	900	24	32
7	1140	30	40
8	1540	40	50
9	1940	50	65

HeaveMaster Insulated Slab U-values W/m²K

P/A ratio	100mm EPS thickness		150mm EPS thickness	
	70	70HP	70	70HP
0.4	0.22	0.20	0.17	0.15
0.6	0.24	0.22	0.19	0.16
0.7	0.25	0.23	0.19	0.17
0.9	0.27	0.24	0.20	0.17

Note – example U-values are based on the following:
150mm reinforced concrete slab with thermal conductivity 2.500W/mK.
EPS 70 with thermal conductivity 0.038W/mK.
EPS 70 HP with thermal conductivity 0.032W/mK.



Cellular EPS with drainage slots

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How to specify HeaveMaster GHP

1) Choose application type

Selection of the appropriate product type is according to its intended use: S (Slab), B (Beam) or IS (Insulated Slab).

2) Choose the right grade for concrete thickness

The appropriate product grade is selected according to the maximum thickness of wet concrete that the product will be required to support during construction

S (Slab)

B (Beam)

IS (Insulated Slab)

Maximum Concrete Depth (mm)	220	300	340	460	660	900	1140	1540	1940
Product reference	1	2	3	4	5	6	7	8 XD	9 XD

3) Choose product depth

The appropriate product depth is selected such that its specified deformation under fail load is equal to, or greater than, the maximum anticipated ground movement owing to clay heave as established from site investigations.

Soil Plasticity Index PI (%)	NHBC Shrinkage Category	Predicted ground movement (mm)	GHP Slab Depth	GHP Beam Depth	XD Depth	Product reference
10 - 20	Low	50	95	90	100	L
20 - 40	Medium	100	160	155	200	M
40 - 60	High	150	225	220	300	H

Examples of your specification or product order for Jablite Ground Heave Protection:

Design Example 1: Slab

Order/Specification S 1 M. This is arrived at by the following steps:

Table 1) S	=	Slab
Table 2) 1	=	Concrete depth between 100 - 220mm
Table 3) M	=	NHBC shrinkage category product depth

Design Example 2: Beam

Order/Specification B 5 H. This is arrived at by the following steps:

Table 1) B	=	Beam*
Table 2) 5	=	Concrete depth between 461 - 660mm
Table 3) H	=	NHBC shrinkage category product depth

** Beam sizes include 300, 450 and 600mm as standard, alternatives available on request.*

Design Example 3: Insulated slab

Order/Specification: IS 2 L + 150mm HP insulation. This is arrived at by the following steps:

Table 1) IS	=	Insulated Slab
Table 2) 2	=	Concrete depth between 221 - 300mm
Table 3) L	=	NHBC shrinkage category
150mm HP insulation	=	Required depth of insulation to achieve the specified U-value 0.17 W/m^{2}K on a P/A ratio of 0.7

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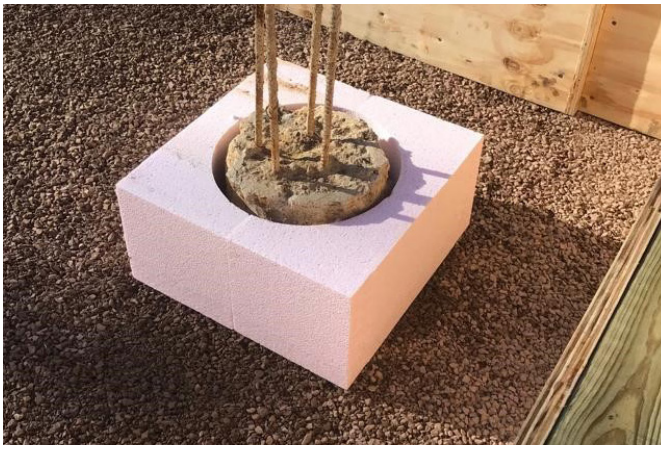
BEWI ClayMaster Pile Collars

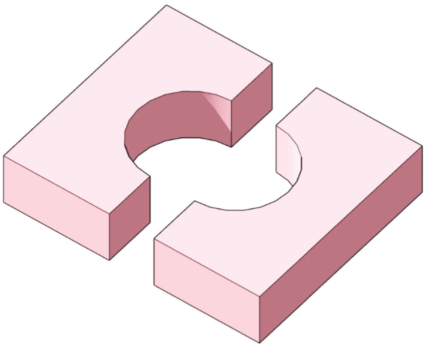
BEWI ClayMaster Pile Collars are designed to:

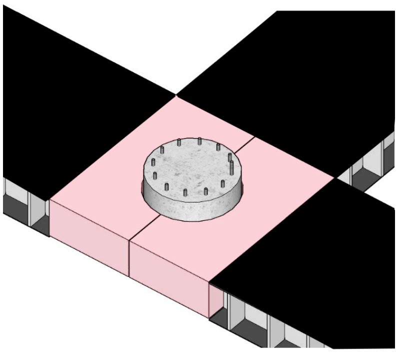
- Speed up the application process (no need to cut material on site)
- Protect the structure against ground heave
- Work with BEWI GHP ground heave
- Minimise gaps around foundation piles

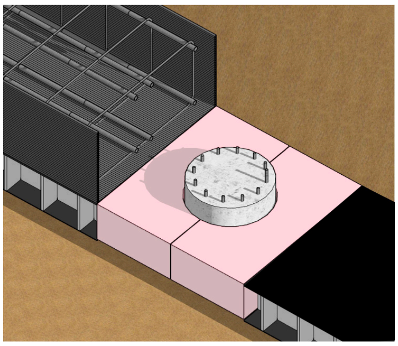
BEWI ClayMaster Pile collars are an integral part of the (BEWI) HeaveMaster system. They are supplied in bespoke sizes to meet the project requirements.

Please see ClayMaster datasheet for further information.









Lifetime Performance

BEWI HeaveMaster boards have a design life that is equivalent to the lifetime of a construction.

Building Regulations

BEWI HeaveMaster meets the relevant requirements in the following Building Regulation:

- BR (England and Wales)
- BR (Scotland)
- BR (Northern Ireland)
- Construction Regulations
- Construction Regulations (Northern Ireland)

NHBC Standards

BEWI HeaveMaster meets the relevant requirement in relation to NHBC Standards Chapter 4.2 Building near trees, 4.3 Strip and trench foundation, 4.4 Raft, pile and beam foundation.

Health & Safety

BEWI HeaveMaster Boards are lightweight, making them easy to handle on site. The boards can be off loaded and moved around the site manually.

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