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Data Sheet

External Drainage Membrane.

Introduction.

External Drainage Membrane provides a route for water to flow, under gravity, down the outside of a basement wall to a land drain that will take the water away so that there is never any pressure from ground water to try to penetrate a basement structure.

It is particularly important that external drainage membrane should not crush under the weight of backfill or the machinery placing backfill.

Features and Benefits.

1. This external drainage membrane needs a filter membrane fixing against it and over the edges so that no fines can get into the drainage channels. This will need to be procured and fixed separately. Details of suitable materials are given at appendix A.
2. The function of this external drainage membrane is to remove water as it approaches the side of a basement so that no pressure of water is exerted against the basement structure, so that the basement could not leak.
3. This product is not designed to be sealed at joints to become fully waterproof or gas proof. Though if gas found an easier way to the surface through the drainage rather than trying to penetrate basement concrete, then there would be additional benefit of gas protection.
4. Suitable for use with all substrate types.

5. Very simple and quick to fix. Some suggestions to make this even easier can be found in the installation section.
6. Particularly tough material. Cannot be torn by hand or even with a pair of pliers in each hand.
7. In conjunction with a suitable filter membrane, the product can be safely backfilled with earth or shingle.
8. HDPE is resistant to all chemicals normally found in the ground. HDPE does not oxidise. It does not conduct electricity. It generally has a service life (in the dark, protected from ultra violet light by backfill) exceeding 100 years.
9. Any chemical in the ground could normally only attack a basement through any crack or through its concrete after being dissolved in or carried by water. By removing water before it reaches the basement structure, external drainage membranes provide basements with a defence against deleterious chemicals.
10. As backfill settles it will take the external drainage membrane and filter membrane fixed with it downwards without harm or change to its effectiveness.
11. No protection board is necessary; however, backfilling should be supervised so that any tears caused by heavy contact by the machine are repaired to prevent soil fines getting into the drainage system.
12. Suitable temperature range for storage, installation and service life. Far greater than the minimum or maximum temperature range usual in Western Europe.

Notes.

1. The water diverted downwards by external drainage membranes needs to be managed to a depth or distance safely below basement floor slab level.
2. The advice of a geotechnical engineer should be sought regarding where drained water should leave the drainage system.
3. The first choice, if available, as to how water from the external drainage membrane/land drain is disposed of would be to a ditch at a lower level since this is likely to always work even in the most atrocious weather.
4. It might be that a suitable soakaway will deal with sufficient water most of the time. Advice should be sought from a geotechnical engineer about what size of soakaway at what depth will be required for each project.
5. A pumping chamber might be expected to break down from time. Expert advice should be sought.
6. The land drainage or other solution chosen to remove water away from the basement slab perimeter would normally need to be maintainable. Rodding points might be necessary. The advice of a drainage engineer and/or building control should be sought.
7. External drainage membrane is not suitable for de-watering permanently high water tables continually throughout its service life.

8. Backfill should be compacted a maximum of every 600mm in depth to properly compact the backfill throughout and reduce future settlement to, or near to, a minimum.

Description.

External Drainage Membrane from Basement Expert Ltd is a particularly robust HDPE sheet manufactured so that the sheet and studs are all equally thick and strong.

Comparison table:

	Basement Expert Ltd	Newton 410 Geodrain	Wykamol Geotex
Colour and material	Black HDPE	Black HDPE	Various HDPE
Density	1,100g/m ²	740g/m ²	900g/m ²
Material thickness	1mm	0.6mm	
Stud depth	8mm	9.6mm	8mm

Packaging.

External Drainage Membrane from Basement Expert Ltd is supplied in rolls 20m long with a studded width of 1.8m and an overall width of 1.9m. Tied with a single band.

Installation – Vertical Surfaces.

General. All construction should conform to current local building regulations and standards.

Preparation. There is no need for substrates to be clean or dry before fixing external drainage membrane. However, the site should be reasonably clear to allow a good workmanlike outcome.

Water table. It should be confirmed that a geotechnical engineer (or other responsible designer) has approved external drainage membrane for the project, or the extent to which it should be used on the project.

It could be beneficial to reducing potential water ingress into basement cracks and concrete, either as vapour or if the drainage is temporarily overwhelmed, to apply 3 coats of a blackjack waterproof paint to the substrate first. Basement Expert Ltd does not supply these. They are readily available from merchants.

If the membrane is to be fixed by screws and plugs, it might be that the holes and plugs are in place before the painting, so that there will be reduced concerns about water getting through damage to the paint after the membrane is fixed.

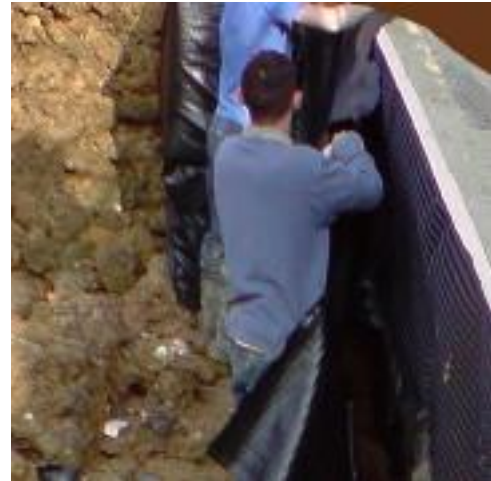
Another top tip would be for the concrete formwork to the basement wall to have some pieces or lengths of treated roofing batten fixed inside the formwork at appropriate height and spacing to remain after the formwork is struck and simply fix the membrane with screws into timber. The timber might be preserved further by blackjack paint but in any event after backfilling the membrane will not go anywhere even if the small pieces of timber rot away.



Clearly planning on site would increase the usefulness of small pieces of timber.

Installation of external drainage membrane.

The external drainage studs need to cover the basement wall from ground level down to where it meets the land drainage.



The drainage membrane will usually fold easily around external corners and into internal corners.

Vertical Joints.

No harm will come to the project if the membrane is cut into lengths that meet along a wall or at corners. Cutting the sheets will often make holding the drainage membrane in place until it is fixed much easier.

Horizontal joints.

The lowest sheet should be installed first with the flat edge upwards.

Subsequent sheets should then be fixed above the first sheet with the studded edge of the subsequent sheet overlapping the flat edge of the sheet already in place.

Technical Support.

Technical support is available from Basement Expert Ltd. Contact details at the top of this document.

Appendix A.

Choice of geotextile filter membrane.

The membrane chosen should be of the non-woven type so that where two layers overlap water will still get through.

Any geotextile filter membrane designed for use beneath road or railway construction will be strong enough for use against external drainage membrane.

Installation of geotextile filter membrane.

The rule to understand is the filter membrane's job is to let water through to the drainage system but to keep soil fines out.

Therefore, covering the external drainage membrane should not be considered in isolation. The filter needs to surround the land drainage and extend up and all over the wall until it is tucked over and behind the external drainage membrane.

However, the filter membrane can be cut and overlapped.

Filter membrane should always be overlapped at joints at least 600mm to allow for any movement later.

Overlap filter membrane 600mm over land drainage where the filter is applied in two pieces.

One simple approach is to cut a length of filter membrane about 2m longer than a wall. Then to cut that along its length a piece wide enough

- To start at the slab edge and go under the land drain
- Then go over the land drain after that is in place
- Then cover the wall
- And finally fold over the top of the drainage board.



Or you can surround the land drain in one piece then cover the wall with another and overlap them 600mm across the top of the land drain.

The extra metre at both ends can be used to overlap with the next sections of membrane and land drainage.

When the geotextile filter membrane is folded over and behind the top of the external drainage membrane, it will usually be necessary to remove the screw fixing the external drainage membrane at the top. Then fold the filter behind. Then re-fix fixing both to the wall.

Carry this out one screw at a time working along the wall. Or wait until the backfill is near to the top already holding all the materials in place.



It might be considered easier to put the land drainage in before the walls are formed to provide something higher to stand on.

Note that the perforated pipe through the land drainage is itself usually covered in geotextile filter membrane.



Wrapping the geotextile filter membrane over the top of the wall, tucking it behind and fixing it back with a screw strip through what is now 3 layers is preferable to a top cover strip that, because it is relatively rigid, suffers damage and fails far more readily, especially where it is trying to cover two sheets of drainage board overlapped at joints.



This photo is from the Wykamol Kontract Geotextile Membrane Data Sheet.

Clearly this photograph shows an error in judgement because the drainage layers go over the basement wall beneath the house wall and the house ground floor.

The bottom of the ground floor will be beneath ground so there would likely be a tendency for water to get over the basement wall easily instead of down inside the drainage.

In comparison, we have long argued for an upstand at the top of the wall so that the retaining wall continues to above outside ground level.

The external drainage membrane need only go up to the external brickwork in most cases.

The external drainage membrane will not have any need to go under the future brickwork since the backfill will hold it firmly against the wall.

