

Waterproofing

Landscaping solutions from Rawell



Pre-hydrated, High Density Bentonite

RAWMAT® HDB Membranes and
RAWSEAL® HDB Waterstops
High Density Bentonite Landscaping solutions





Providing leading-edge solutions

Rawell Environmental Limited is one of the world's premier suppliers of bentonite-based waterproofing materials for landscaping projects involving water containment.

Our unique system of RAWMAT® HDB (High Density Bentonite) Membranes and RAWSEAL® HDB Waterstops delivers leading-edge solutions that offer a demonstrable range of advantages over conventional dry bentonite and other rival systems.

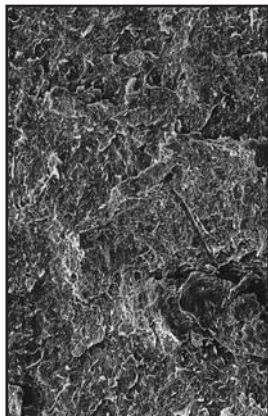
Founded in 1976 by current Chairman, Bryan Flynn, Rawell has built its success on years of experience in this market and a highly focused and proactive approach.

Our high-quality personal service and close attention to detail have won us an enviable international reputation. Rawell's customers enjoy total reassurance that our products will function with complete reliability for the whole life of the projects for which they are specified.

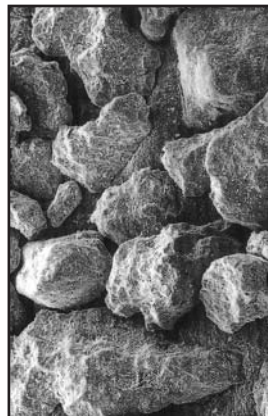
Rawell lining membranes have proved successful in creating highly functional and aesthetically pleasing solutions for a wide variety of water containment applications, ranging from vast storage reservoirs, lakes and canals to private water gardens and nature study ponds for schools.

The efficiency, flexibility and resistance to contamination offered by our products have led to them being specified by local authorities and companies of all sizes all over the world, with specific feature projects in Japan, China, Italy, Germany, Denmark and Ireland as well as the UK.

Satellite view of Wyoming, USA



Note dense surface of Pre-hydrated High Density Bentonite



Dry Bentonite, note voids around particles

What is Bentonite?

Bentonite is a natural inert clay formed from volcanic ash and found predominantly in Wyoming, USA. It absorbs water and can swell to form an impermeable mass that prevents the passage of liquid, these swell characteristics are harnessed to provide waterproofing properties.

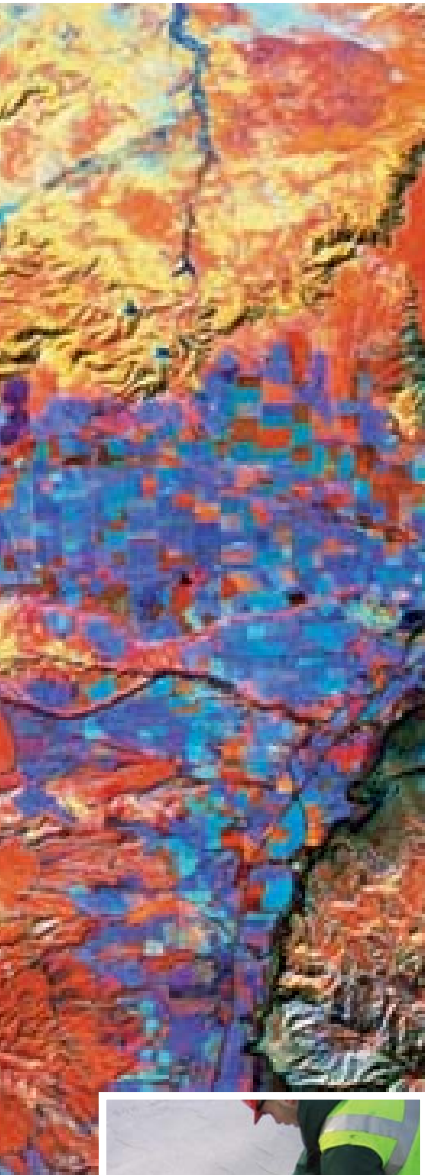
However, in-situ hydration of bentonite may leave the clay susceptible to chemical degradation.

Cracking and shrinking can be induced by ground contaminants and are well-known results of failure in dry bentonite systems.

To avoid this, Rawell has developed a revolutionary waterproofing material by using its own patented process to polymerise and pre-hydrate the bentonite. The clay is produced into rolls of membrane and lengths of waterstops.

The resulting pre-hydrated bentonite clay has extreme high density with exceptional resistance to ion exchange and chemical attack. The plasticine-like core also ensures no movement of clay in handling and no loss of the bentonite in cutting around penetrations. It also withstands minor movement through its ability to swell and ensure the continuity of the waterproofing system. This is what makes RAWMAT® HDB unique.





A unique range of benefits

RAWMAT® HDB has been developed through extensive research and experience over many years to overcome the difficulties associated with other systems when used in landscaping applications.

This unique product allows the designer to achieve a natural and aesthetically pleasing appearance while complex edge details can be completed easily and effectively.

As well as its long list of advantages over conventional dry bentonite systems, RAWMAT® HDB affords specific benefits against compacted clay and 'plastic' solutions.

The natural sodium bentonite in RAWMAT® HDB membranes is pre-hydrated with a patented polymer solution which provides a permanent protection to the ionic fingerprint of the clay. This protects it from exchange and subsequent breakdown in ground contaminants and thus overcomes a major drawback widely associated with other bentonite systems. As a result RAWMAT® HDB provides the reassurance of a long-term barrier to water and vapours as well as being fully resistant to salts, fertilisers and other such contaminants which may find their way into the water.

In addition, the geotextile carriers have been carefully chosen to allow the creation of a bentonite seal between the membrane and any structure or penetration passing through it, thus preventing the tracking of liquid out of the water feature in such potentially tricky areas. This allows the construction of water features which incorporate a variety of edge details and focal points.

All joints are self-sealing at the overlap, with no wicking of liquid either here or through the geotextile carrying fabrics.

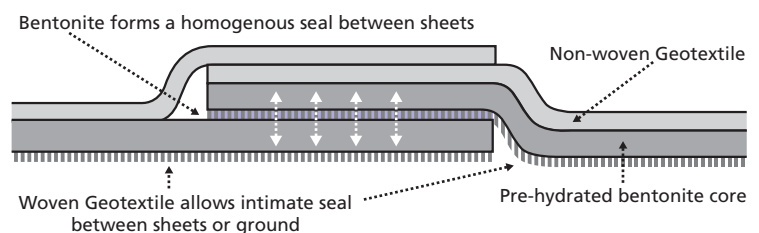
Practical and cost-effective

RAWMAT® HDB comes in rolls which are easy to handle and can be installed quickly and simply by unskilled labour in any weather. It offers consistent quality and is flexible and robust when faced with the difficulties of day-to-day site conditions. RAWMAT® HDB brings significant cost savings over other systems for installation, handling and transportation.

RAWMAT® HDB avoids the need for sand blindings below the membrane or sand cushions above and protective geotextiles are not required. In addition, the use of RAWPASTE mastic and RAWSEAL® TR 35 fillet ensures extremely simple sealing of inlets, overflows, fountains and weirs without the need for complex and expensive accessories.

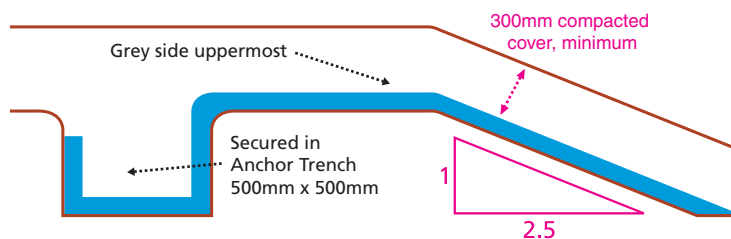


RAWMAT® HDB - Type P





Anchor Trench Detail



Advantages over dry bentonite products

- Unique factory pre-hydration process and QC checks avoid performance uncertainty and guarantee effectiveness
- Patented vacuum extrusion creates non granular plasticine-like consistency - bentonite cannot fall out
- Pre-hydration of bentonite with liquid polymers protects RAWMAT® HDB against ionic exchange
- Immediate gas and vapour barrier guaranteed thanks to pre-hydration process
- Self-sealing overlaps - no additional bentonite required and no leakage through laps
- Delivered to site as an impermeable membrane
- Does not breakdown through cation exchange

Advantages over compacted clay

- Consistent factory-controlled quality
- Can be repaired simply on site if damaged
- Easier to install on slopes
- Lower transport costs
- Requires only lightweight machinery to install
- Can be installed in most weather conditions
- Does not crack if it dries out
- Fixed costs are calculable and time is predictable
- For lower permeability
- Unaffected by either freeze/thaw or wet/dry cycles

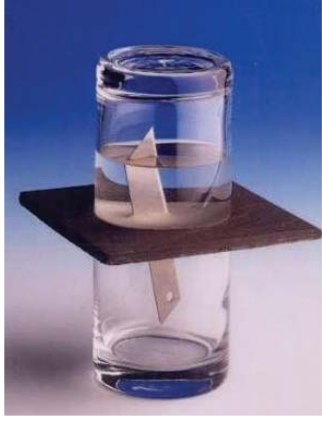
Advantages over 'plastic' materials

- Simply rolls out - watertight overlaps are easily achieved without welding
- Installed without need for specialist labour or equipment
- Can be laid in most weather conditions and unaffected by sand/dust
- Does not normally require protective geotextiles
- Simply sealed around pipes and penetrations
- Has ability to self-heal punctures - relatively vandal-resistant
- Easily repaired if membrane is damaged during construction
- No temperature restrictions for installations



Waterproofing

Landscaping solutions from Rawell



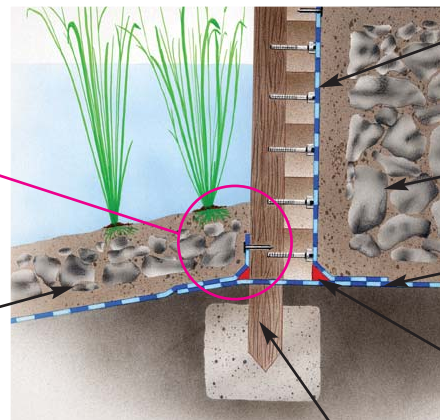
A safe and stable product

RAWMAT® HDB membranes achieve impressive hydraulic conductivity readings even in the presence of high levels of soluble calcium and magnesium.

The product's composite structure is very stable and can be subjected to repeated freeze/thaw and wet/dry cycles without reducing its waterproofing properties.

This factory pre-hydrated high-density bentonite system has not lost any of the benefits of high swelling smectite clay and consequently RAWMAT® HDB retains the ability to self-heal if punctured.

The products are non-toxic and chemically inert, posing no health and safety issues - in Japan they are used to line irrigation ponds for rice fields. The material can also be safely used for fish farms and offers no threat to wildlife.



RAWMAT® HDB nailed to timber sleepers

Compacted backfill


RAWMAT® HDB

RAWSEAL® TR35 Fillet

300mm Minimum protective cover

Timber post through RAWMAT® HDB

For details of Rawell products and services visit www.rawell.com where you can find more information suited to your specific needs, or call +44 (0) 151 632 5771



The secure system for landscaping projects

RAWMAT® HDB membrane linings are used extensively in landscaping applications all over the world. This unique system of pre-hydrated natural sodium bentonite is ideal for providing practical and aesthetic solutions and particularly effective in overcoming difficult ground conditions or meeting arduous design criteria. Applications range from the creation of wetlands and balancing lagoons to water courses, river repairs and re-lining. The scope and scale may range from massive lakes down to golf course water hazards or small private garden ponds. Rawell lining membranes have been used to create water features on many prestigious office developments for major commercial clients as well as centrepiece features for housing developments across the world from the UK to China.

The system's proven resistance to potential contaminants has allowed the creation of lakes on top of landfill sites as well as the construction of canals through contaminated land.

Other successful projects have included the re-lining of canals and the creation of completely new waterways. RAWMAT® HDB is also a natural choice for creating lagoons for drinking, irrigation or aquaculture in countries where water supplies are crucial to the population and the economy as its chemically inert natural sodium bentonite core ensures that the water's purity remains unaffected.

This unique solution ensures the best of both worlds. Specifiers can rely on simple but natural-looking features which are easily incorporated into a variety of water-holding applications, while contractors value the time and money saved in installation and the ability to self-heal minor puncturing. The ultimate winner is the client, who benefits from the highest quality solution at a highly competitive price - and with shorter programmes than any other system. See Case Histories or Projects List to find out about the worldwide range of landscaping projects that have benefited from the use of pre-hydrated bentonite.

Waterproofing

Landscaping solutions from Rawell

For details of Rawell products and services visit www.rawell.com where you can find more information suited to your specific needs, or call +44 (0) 151 632 5771

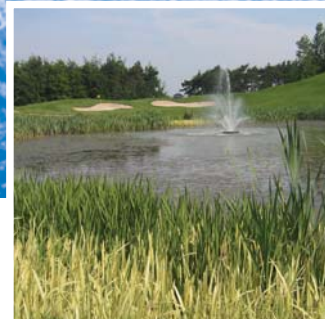
Rawell Environmental Limited,
Carr Lane, Hoylake, Wirral, Merseyside
CH47 4AZ, United Kingdom

Tel. +44 (0) 151 632 5771

Fax. +44 (0) 151 632 0252

E-mail. postmaster@rawell.com

Web. www.rawell.com



Rawell actively seeks close involvement with architects, engineers, contractors and clients throughout the project, from feasibility study to final construction. We are able to provide expertise born of wide experience to help resolve difficult or complex application problems at any stage.

Rawell reserves the right to change product specification and instructions without notice. The information contained herein is to the best of our knowledge, true and accurate; it is of an illustrative nature only and does not form any contract or intended contract with any purchaser or installer, and supersedes previous information.

Rawell Environmental Limited is a wholly owned subsidiary of Rawell Group Holdings Ltd.

World Patents • RAWMAT® and RAWSEAL® are registered trademarks of Rawell Group Holdings Ltd. 02/04 ©

