TDS | MSDS | DoP | **INSTALLATION GUIDE**

Newton HydroBond System

NEWTON HYDROBOND

Externally Applied Waterproofing System

NEWTON WATERPROOFING

Rev 5.1 - 05 July 2021

IMPORTANT

Please read the whole of this document before attempting installation of the system. This manual is designed to flow as a guide and there may be important information pertaining to your specific installation on later pages. We especially recommend the LIMITATIONS section on page 10 be read before commencing work.

INTRODUCTION

Newton 403 HydroBond® is a high performance, self healing, composite sheet membrane, available in two variants. Both membranes have a hydrophilic polymer coating sealed and constrained between a layer of waterproof LDPE to the outer face and a polypropylene locking fleece to the inner face. Newton 403 HydroBond-GB includes a further layer of aluminium to provide higher resistance to radon, carbon dioxide and hydrocarbon gases. Newton 402 CSS-M is similar to Newton 403 HydroBond, but does not include the self-healing polymer

When fitted above the raft support or to wall formwork, the membrane locking fleece is fully encapsulated into the newly placed concrete, becoming fully engaged and preventing water tracking. If the waterproof LDPE layer is punctured, the exposed hydrophilic coating expands, preventing water ingress, effectively sealing small holes that may be accidentally formed during fixing of the reinforcing steel or the pouring and compaction of the concrete.

SIZE & PACKAGING

Newton 403 HydroBond is supplied in rolls of 1.0 m x 20.0 m (20 m^2). Weight of roll is 24.3 kg

Newton 403 HydroBond-GB is supplied in rolls of 1.5 m x 20.0 m (30m^2). Weight of roll is 42.3 kg

Newton 402 CSS-M is supplied in rolls or 1.0 / 2.0 m x 20.0 m (20 /40 m^2). Weight of roll is 14.8 / 28.9 kg

METHODS OF APPLICATION

Newton 402 CSS-M and 403 HydroBond is placed to formwork ready for the placement of concrete. For concrete rafts and slabs, the membranes are fitted above a sound and uniform support such as a concrete blinding or compacted hardcore.

When installed to walls, Newton 402 CSS-M and 403 HydroBond are fitted to sound and uniform permanent formwork such as existing walls or faced-off piles. Please see page 4 for a list of suitable support substrates.

CONSTRUCTION

The construction should conform with current Building Regulations, British Standards and relevant Codes of Practice. New concrete should be designed by a Structural Engineer to EN 1992 (Formally BS 8110 & BS 8007) to be structurally capable for the intended use as an earth retained structure, resisting loading from earth as well as water pressure as recommended within BS 8102:2009.

IMPORTANT - PLEASE READ

Newton 403 HydroBond is available in two variants: Newton 403 HydroBond (code HB) and Newton 403 HydroBond-GB (code HBGB). Newton 402 CSS-M is supplied in one variant.

Where protection against ground gases is also required, please ensure that the 403 HydroBond-GB is used. Double check with the specifier before commencing work. Newton 402 CSS-M is also a radon barrier.

Read the Newton 403 HydroBond Data Sheet or Newton 402 CSS-M Data Sheet before commencing work.

PRODUCT INFORMATION & ANCILLARY PRODUCTS

The following products are required for a Newton 402 CSS-M or 403 HydroBond installation to below the raft or slab and for installation to wall permanent formwork:

- Newton 402 CSS-M (Product Code 402), 403 HydroBond (Product Code HB) or Newton 403 HydroBond-GB (Product Code HBGB)
- Newton HydroBond Tape - Double-sided adhesive tape - 20m length x 70mm width - Product Code HBT
- 2-C Sealing & Adhesive Compound - Two component adhesive paste for repairs and detailing. Product Code 2C
- Newton 314-BP - Sodium bentonite detailing powder - 25kg sacks - Product Code BP314

Where protection against ground gases is required, use Newton 403 HydroBond-GB - Product Code HBGB. For protection against radon gas, Newton 402 CSS-M is also suitable. See additional installation instructions on Page 10.

All three membranes can be installed in salt water locations.

SUITABLE SUBSTRATE

RAFT OR SLAB

- Concrete or sand blinding
- Compacted type 1 hardcore

The following can be placed above the blinding or hardcore prior to the installation of 403 HydroBond:

- Void former
- Closed cell flooring grade insulation
- Newton 410 GeoDrain

- Existing structure
- Secant or contiguous concrete piles
- Metal sheet piles
- Diaphragm walls
- King post wall
- Sufficiently stable ground such as clay or chalk. Please speak with our technical department for confirmation of suitability

PERMANENT FORMWORK

Where the permanent formwork has an irregular surface, such as a piled wall, 402 CSS-M and 403 HydroBond can be either fitted to follow the undulating face of the wall or the surface will need to be faced-off to leave a stable and uniform surface. Facing off undulating wall permanent formwork surfaces can be achieved using the following methods:

- Sprayed concrete
- Closed cell insulation
- Faced-off with shuttered and poured concrete
- Plywood sheets

Tools required (Please see page 8 regarding installation to permanent formwork):

- Craft knife or shears
- Tape measure
- Hammer & nails
- Hard roller
- Heat gun
- Scaffold pole or broom handle

TRAINING & COMPETENCY OF USER

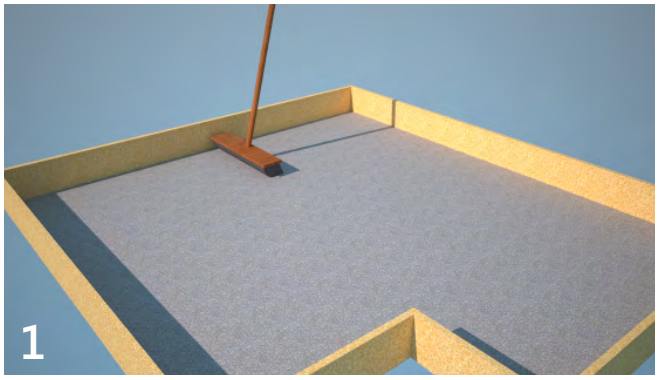
Newton 402 CSS-M and 403 HydroBond should be used by those with an understanding of the requirement to waterproof structures and the knowledge and training to use the product as part of a coordinated approach to the waterproofing of the structure, which in many cases will require further waterproofing products so as to achieve the required habitable grade as defined by BS 8102:2009.

Newton Waterproofing has a list of trained registered contractors who are capable of designing and installing a full waterproofing solution for your project. Please contact us for a list of contractors for your area.

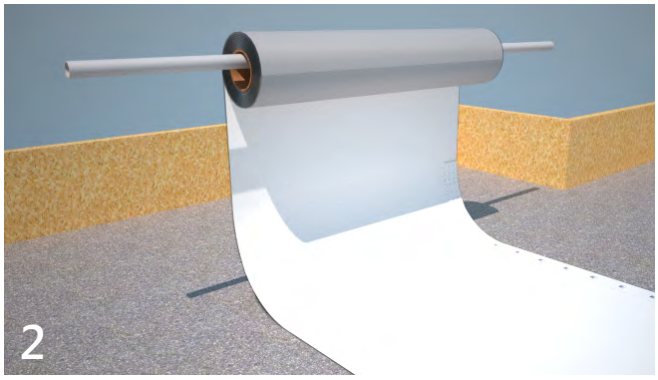
INSTALLATION - GENERAL INFORMATION

Newton 402 CSS-M and 403 HydroBond are manufactured with an adhesive edge to one edge of the fleece side of the membrane for overlapping and adhesion to adjacent lengths membrane. On non-fleece side there is a removable strip of film designed be removed prior to the overlapped joint being sealed.

INSTALLATION - BELOW RAFT

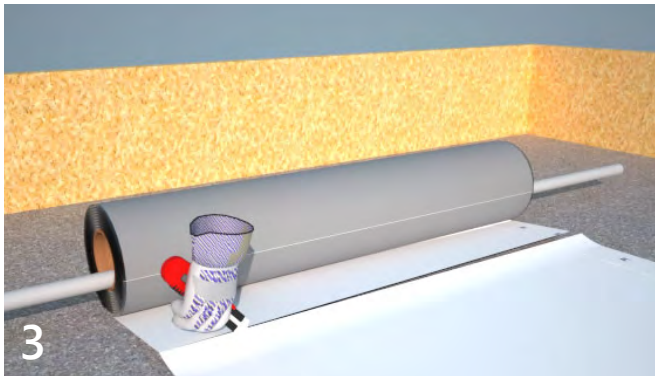


Sweep the support surface clean. Substrate should be smooth and firm. Concrete surfaces should be free of voids and sharp projections. Surface irregularities should be removed before installation. Voids must be filled with mortar, and holes filled with proprietary non-shrink mortar/grout.

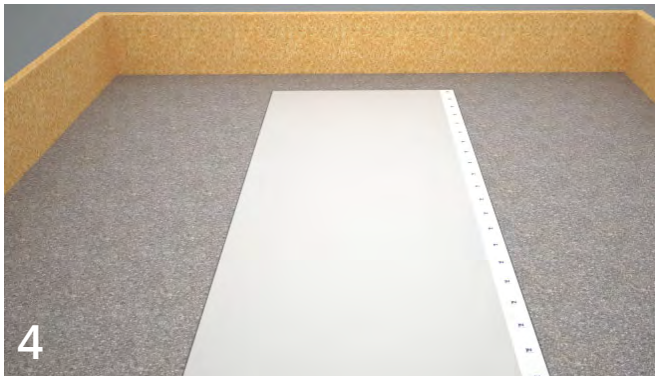


Unroll the membrane with the geotextile towards the concrete to be waterproofed (white fleece facing up) using a long scaffold pole or similar.

Schedule waterproofing installation to coincide with placement of concrete. Concrete must be placed within 10 days of installation.

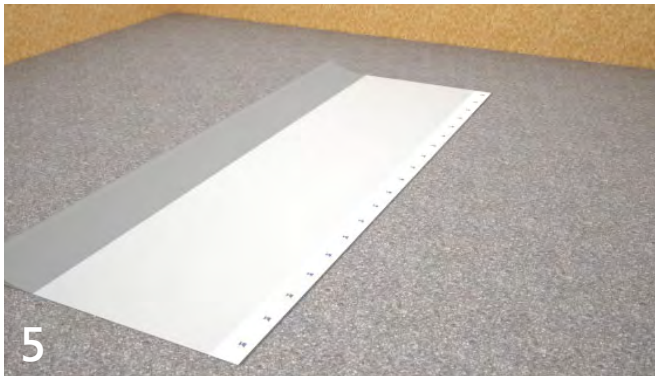


Measure the perimeter of the formwork to determine the length of the membrane required. Make provision for 70mm overlaps to each end joint of the 20m long membrane rolls. When cutting the membrane use a retractable craft knife or sharp shears whilst wearing safety gloves.

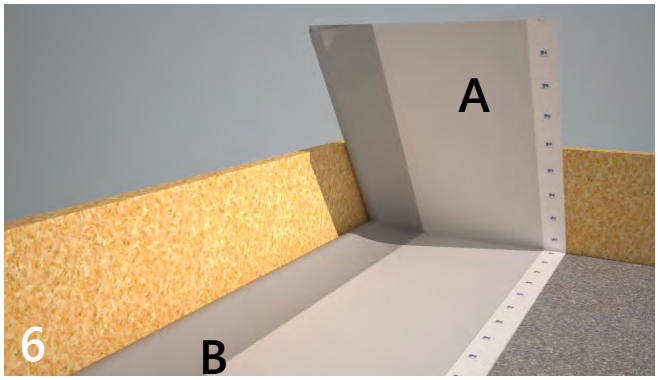


The membrane is fitted to within 50mm of the top of the vertical raft temporary formwork. Mark out the height of the fold onto the membrane, marking out twice the height of the upstand, creating a guide for the fold.

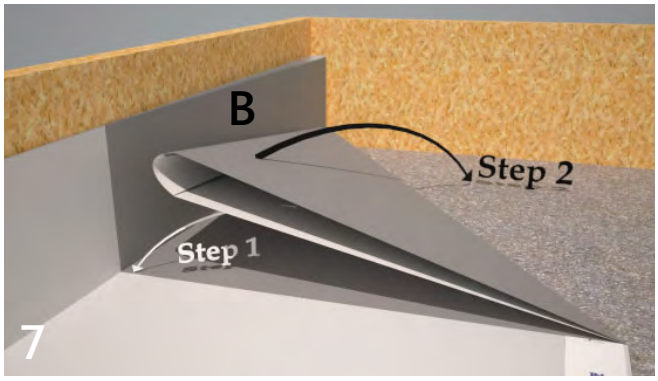
Stages 5 to 9 of page 6 require accurate folding of the material and involve a number of procedures that may not be obvious when first attempted. Practicing first with a piece of paper is recommended.



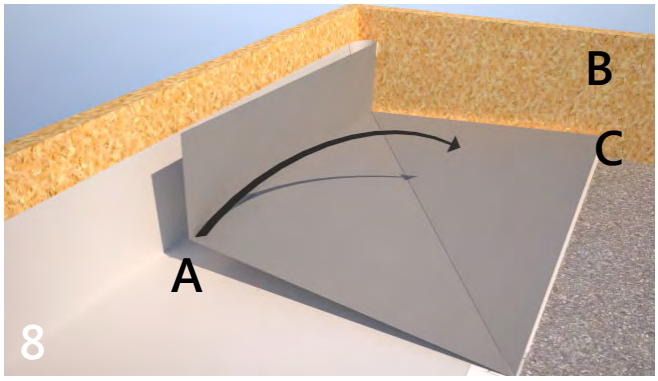
Fold along the guide created in the previous stage. Sharpen the crease with a hard roller.



At internal corners, make a crease at the change in direction. Once the crease is formed, lift up the flap marked A and invert the upstand marked B so that the upstand of the flap A is in front of the main sheet upstand as shown in Fig. 7.



Step one: Form a crease as shown. Stage 2: Fold back.



Holding the membrane at point A of the grey flap and fold back so that your hand is at point C. The upstand B of figure 7 should now be against the formwork at point B. At this stage only the white fleece should be facing upwards.

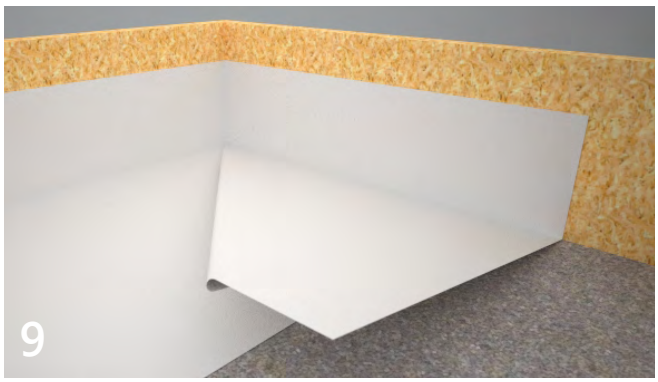
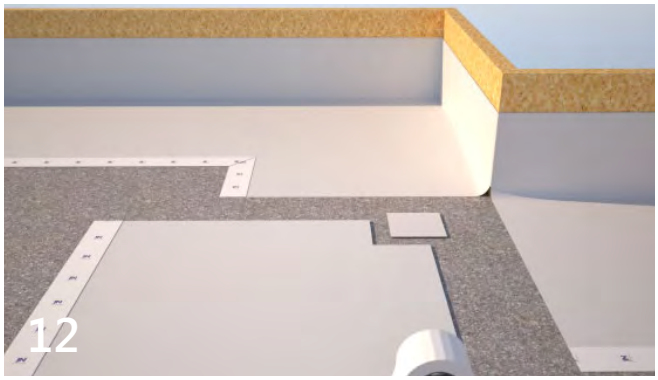


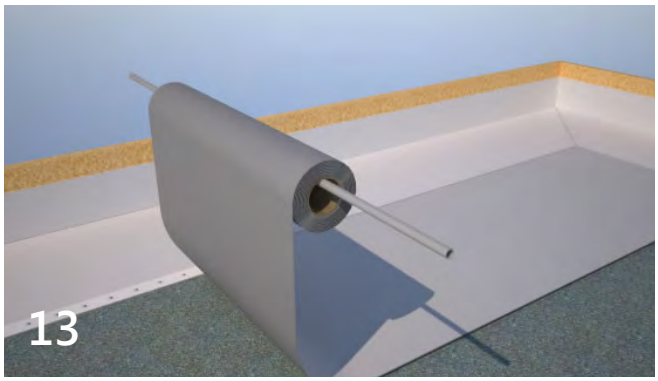
Fig. 9 shows the completed corner. At this stage only the white fleece should be seen. The fold is to the right hand side of the joint and the membrane is triple thickness.

Seal the 45 degree joint with the double sided HydroBond tape. Use a hard roller to ensure a firm bond of the tape to the between the two surfaces of membrane.

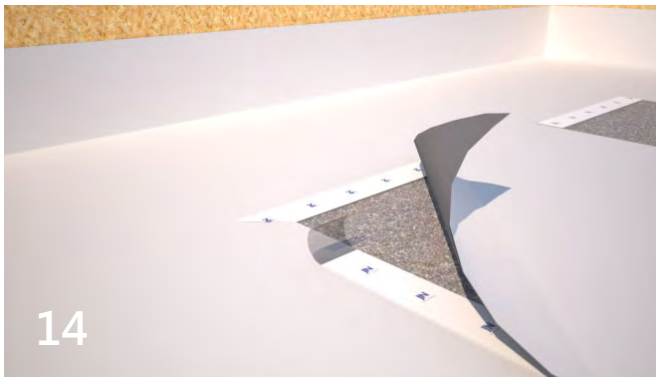
Nail the membrane to the formwork leaving the nails exposed to give a key for the concrete and to ensure that the formwork can be easily removed. The nails are cut flush with the membrane after the formwork is removed. A dab of 106 FlexProof or 109-LM can be used over the small hole, although the membrane will self-heal.



For external corners, cut a square of membrane and from a corner of that square, cut out a small square of about 75mm x 75mm. Fit the square to the corner and when in place, tape the square under the membrane already in place.



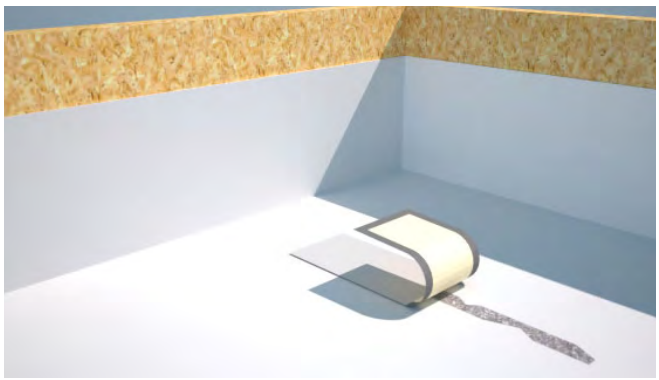
Once all the perimeter of the substrate has been completed, ensure that all edges of the membrane above the floor support have either an adhesive edge or have been prepared with the double sided HydroBond Tape. Unroll strips of membrane, overlapping the membrane that is already in place by 70mm.



To complete the overlapped joints, peel off BOTH OF the protective release linerS from THE FRONT AND REAR SIDES ALONG the adhesive edge of the HydroBond Tape and press the laps together. Use a hard roller to ensure the laps are fully and constantly adhered.

MEMBRANE REPAIR

Repair damage by ensuring the area is clean and dry and free from dust. Repair small punctures (12mm or less) and cuts by applying a patch of membrane centred over the damaged area and secure with HydroBond Tape, pressing firmly using a hard roller to ensure a good bond. Overseal the outer edge of the patch with Newton Mesh Tape. Use a hard roller and a heat gun to fully adhere the Mesh Tape into the membrane fleece.



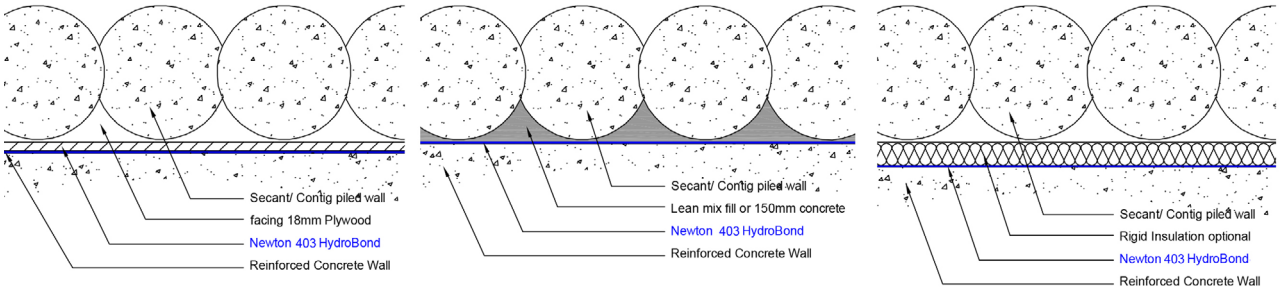
Repair holes and large punctures by applying a patch of membrane, which extends 150mm beyond the damaged area. Seal all edges of the patch with HydroBond Tape, pressing firmly using a hard roller to ensure a good bond. Overseal the outer edge of the patch with Newton Mesh Tape. Use a hard roller and a heat gun to fully adhere the Mesh Tape into the membrane fleece.

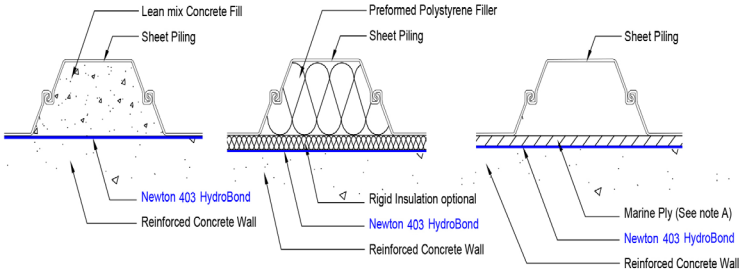
Where exposed adhesive edges have lost adhesion or laps have not been fully sealed, ensure the area is clean and dry and reseal with HydroBond Tape, resealing the lap and rolling firmly with a hard roller. Overtape with Newton Mesh Tape.

INSTALLATION - PERMANENT WALL FORMWORK

Where the permanent formwork has an irregular surface, such as a piled wall, Newton 402 CSS-M and 403 HydroBond can be either fitted to follow the undulating face of the wall or the surface will need to be faced-off to leave a stable and uniform surface. The membranes should be fitted with the adhesive edge uppermost ready for the next adjoining strip of membrane. Install to the wall permanent formwork before the installation to the floor support. Installation should be continued upwards until the membrane is terminating above ground and/or to a designed termination point ready for further detailing.

FACED-OFF PILES





The adjacent drawings show examples of facing off secant and sheet piling ready for the application of 403 HydroBond. The same detailing applies for 402 CSS-M.

For further information on these drawings or for the facing off of other irregular substrate, please contact our technical department on 01732 360095.

UNDULATING WALL PERMANENT FORMWORK

If not faced-off, on contiguous piling ensure that soil columns between piles are cut back to no less than one third of the pile diameter, to create a fixing cleavage, and reduce the likelihood of soil dislodging behind the membrane.

Use shot fired nails to install the membrane so that it is tightly fitted into the undulations of the formwork. Ensure that the membrane is fully supported by the formwork. Pay particular attention to the joints which should be fully adhered by either the adhesive edge or the double sided HydroBond Tape.

INSTALLATION ABOVE FLOOR SUPPORT

To faced-off formwork, install as instructed within page 5 to page 7. Use HydroBond Tape or the adhesive edge to make the final seal between the upturned membrane to that already installed to the walls.

To undulating wall formwork, cut the membrane into 500mm wide strips to the measure of the perimeter, plus 70mm end overlaps, plus a small error margin. Fold to make a 250mm upstand. To force the upstand to the shape of the piles you will need to cut and splay the fold above the floor support to allow it to lay flat. Once the floor splayed membrane is laying flat, tape the upstand to the membrane already fitted to the undulating wall with HydroBond Tape.

At the interface with the wall, cut the floor membrane to the shape of the undulations and lay over the top of the cut splays. Seal the floor membrane to the splays with Newton 106 FlexProof. Overtape the joints with Newton Mesh Tape. Seal all other joints with the adhesive edge or HydroBond Tape and then overseal all joints with Newton Mesh Tape.

UNDER CONCRETE FLOOR SLABS

Newton 402 CSS-M and 403 HydroBond are suitable for use below concrete floor slabs, giving the benefit of a fully bonded membrane to protect the slab from water ingress via shrinkage cracks. It should be understood however that the slab is poured within walls and so a break is created that prevents the whole of the structure being waterproofed by a continuous HydroBond System. Therefore the walls will need to be waterproofed separately with the products mentioned on page 2.

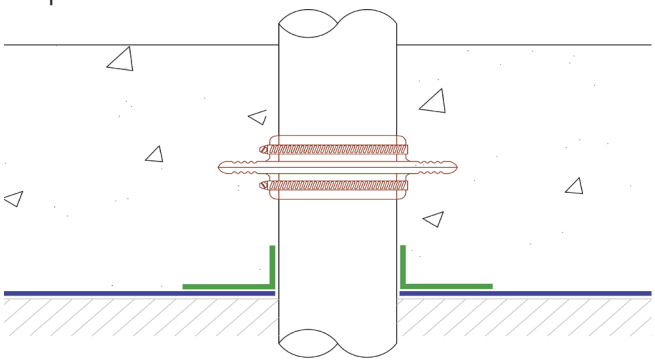
The slab support should be as described in the 'Suitable Substrate' section on page 4, and the walls should be faced-off with concrete to allow for installation of a waterbar. The slab should be structurally capable for the intended use as a basement slab as described in the 'Construction' section on page 2. Install the membrane above a sound and uniform substrate with 70mm overlaps between adjacent lengths of membrane using either the adhesive edge or HydroBond Tape to form the sealed laps.

DETAILING

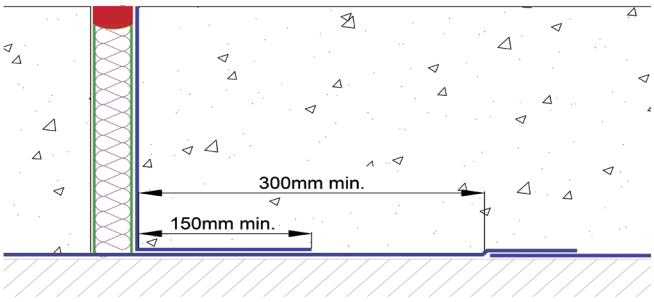
There are many potential detailing issues that may need to be overcome with a membrane system that completely encapsulates the structure. Newton Waterproofing have a library of many possible details and our technical team will be happy to confirm the appropriate detail for you. Below are a selection of common details. The additional products required for these details are:

- Newton 104 - Crystalline waterproofing powder - Bags of 25kg - Product Code CW104
- Newton 307 PipeSeal - EDPM Pipe Flange - Product Code SX307
- Newton PipeCollar - Fabric reinforcement collar - 110mm diameter - Product Code PC110

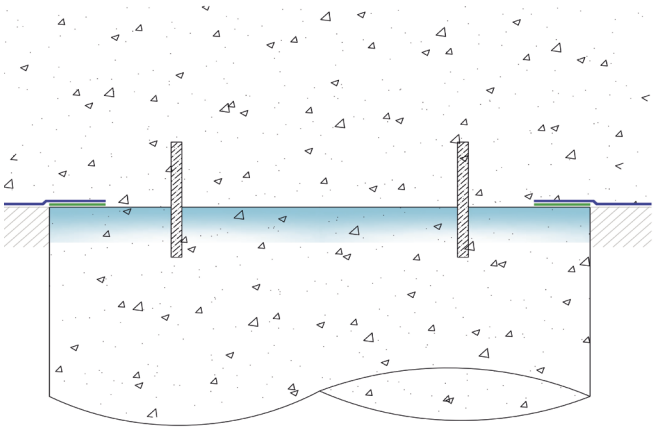
Pipe Protrusion



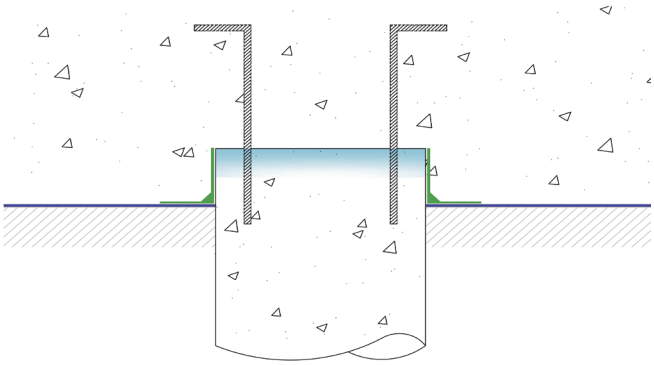
Movement joint



Interface with Pile



Interface with Small Pile



Newton 104
2-C Sealing & Adhesive Compound
Newton 403 HydroBond or Newton 402 CSS-M
Newton 106 FlexProof-NV

ADDITIONAL SEALING - 403 HYDROBOND-GB

Watertight does not mean gas-tight. Gas molecules are much smaller than water or even water-vapour molecules. Third party testing has proven that a watertight lap is not a gas-tight lap. Therefore in order that the average gas transmission rates for methane and carbon dioxide of the Newton HydroBond-GB System comply with the requirement of BS 84851 article 7.2.4: <40.0 ml.(m2·d·atm)$^{-1}$ (average) for sheet and joints (tested in accordance with the manometric method in BS ISO 15105-12), careful sealing of the laps is required.

The membrane has been reengineered for this purpose using a pre-manufactured double taped lap along the edge. The release film on the rear stops the area of adherence getting wet and muddy on site. When both release films are removed together the adhesive surfaces on front and rear connect to provide a water tight joint which has also been tested to required gas standards.

NOTE: In inclement conditions ensure the area is not excessively wet or under water prior to application. In all situations, but especially when cold, the gentle use of a hot air gun favours a superior bond

- It is always recommended that concrete continuity spacers be used to support the steel reinforcement and that where possible these are laid along the laps rather than perpendicular/across them

LIMITATIONS

Horizontal installation surfaces should be free of excessive standing water, particularly where concrete under blinding is not utilised. Newton 403 HydroBond can be installed in most inclement weather conditions, providing the quality/accuracy of the installation is not affected e.g. 403 HydroBond floating, hydrophilic waterbars submersed, etc. Newton 403 HydroBond is not designed for unconfined above-ground waterproofing applications.

Newton 403 HydroBond is engineered for use under reinforced structural concrete rafts or slabs of 150mm thick or greater. Do not install 403 HydroBond in horizontal split-slab, plaza deck and roof applications that will receive a poured concrete wear surface or other solid topping.

NEWTON WATERPROOFING

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