

SCOPE

The Newton 403 HydroBond System Gas Barrier (hereinafter the "System") is a continuous waterproofing system for application to the underside of structural concrete rafts and to the outside of the walls of reinforced concrete, blockwork or Insulated Concrete Formwork (ICF) earth retained structures (ranging from domestic basements to large civil engineering projects) where a measure of protection against Radon gas is required.

DESCRIPTION

The System consists of Newton 403 HydroBond GB, hereinafter "403 HydroBond GB", and Newton HydroBond-LM (being either 108 HydroBond-LM or 109-LM depending on the desired method of application - but generically referred to hereinafter as "HydroBond-LM" unless a product specific reference is more appropriate). 403 HydroBond GB has a grey hydrophilic polymer coating constrained between a layer of waterproof LDPE to the outer face (which is light blue in colour) and a polypropylene locking fleece to the inner face (which is white in colour). 403 HydroBond GB includes a layer of aluminium foil to provide resistance to Radon gas. Where shuttering (temporary formwork) is to be removed as part of a project specific design, concrete walls can be subsequently waterproofed with the HydroBond-LM instead of 403 HydroBond GB.

SYSTEM ILLUSTRATION



THIRD-PARTY ACCEPTANCE

None requested by the Agrément holder.

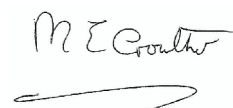
STATEMENT

It is the opinion of Kiwa Ltd., that the System is fit for its intended use, provided it is specified, installed and used in accordance with this Agrément.

Chris Vurley, CEng
Technical Manager, Building Products



Mark Crowther, M.A. (Oxon)
Kiwa Ltd. Technical Director



SUMMARY OF AGRÉMENT

This document provides independent information to specifiers, building control personnel, contractors, installers and other construction industry professionals considering the fitness for the intended use of the System. This Agrément covers the following:

- Conditions of use;
- Initial Factory Production Control, Quality Management System and the Annual Verification procedure;
- Points of attention for the Specifier and examples of details;
- Installation;
- Independently assessed System characteristics and other information;
- Compliance with national Building Regulations, other regulatory requirements and Third-Party acceptance;
- Sources, including codes of practice, test and calculation reports.

MAJOR POINTS OF ASSESSMENT

Watertightness - the System will resist the penetration of water and water vapour infiltration from the ground. See section 2.1.10.

Resistance to damage - the System must not be left exposed in service as it has no inherent properties in respect of resistance to damage. See section 2.1.10.

Behaviour in relation to fire - the System will not diminish the fire performance of earth retained concrete structures. See section 2.1.10.

Resistance to Radon gas - the System can be used to manage Radon gas in respect of gas-contaminated land. See section 2.1.10.

Durability - the System will provide a durable waterproof barrier membrane for the lifetime of the building; the expected lifespan of the building itself should be at least 60 years. See section 2.1.8.

CE marking - The product manufacturers have taken responsibility for CE marking of the products used in the System in accordance with all relevant harmonised European Product Standards. An asterisk (*) appearing in this Agrément indicates that data shown is given in the relevant product manufacturer's Declaration of Performance (DoP).

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CHAPTER 1 - GENERAL CONSIDERATIONS

1.1 - CONDITIONS OF USE

1.1.1 Design considerations

See section 2.1.

1.1.2 Application

The assessment of the System relates to its use in accordance with this Agrément and the Agrément holder's requirements.

1.1.3 Assessment

Kiwa Ltd. has assessed the System in combination with its relevant DoPs, test reports, technical literature and factory and site visits. Factory Production Control has been assessed.

1.1.4 Installation supervision

The quality of installation and workmanship must be controlled by a competent person who must be an employee of the installation company.

The System must be installed strictly in accordance with this Agrément and the Agrément holder's requirements.

1.1.5 Geographical scope

The validity of this document is limited to England, Wales, Scotland and Northern Ireland, with due regard to chapter 3 of this Agrément (CDM, national Building Regulations and Third-Party Acceptance).

1.1.6 Validity

The purpose of this BDA Agrément® is to provide for well-founded confidence to apply the System within the Scope described. The validity of this Agrément is three years after the issue date, and as published on www.kiwa.co.uk/bda. After this, the validity of this Agrément can be extended every three years after a positive review.

1.2 - INITIAL FACTORY PRODUCTION CONTROL (FPC)

- Kiwa Ltd. has determined that the Agrément holder has fulfilled all provisions of the specifications described in this Agrément in respect of the System.
- The initial FPC audit demonstrated that the Agrément holder has a satisfactory Quality Management System (QMS) and is committed to continuously improving their FPC operations.
- A detailed Production Quality Specification (PQS) has been compiled to ensure traceability and compliance under the terms of this Agrément.

1.3 - QUALITY MANAGEMENT SYSTEM (QMS)

- The Agrément holder:
 - has an effective and well maintained QMS in operation which covers the necessary clauses required for BDA Agrément®.
 - is committed to continually improving their FPC, QMS and associated procedures.
- Document control and production line procedures were deemed satisfactory, with sufficient evidence provided in support of BDA Agrément® requirements.

1.4 - ANNUAL VERIFICATION PROCEDURE - CONTINUOUS SURVEILLANCE

To demonstrate that the FPC is in conformity with the requirements of the technical specification described in this Agrément, the continuous surveillance, assessment and approval of the FPC will be done at a frequency of not less than once per year by Kiwa Ltd.

2.1 - POINTS OF ATTENTION TO THE SPECIFIER

2.1.1 Design responsibility

A Specifier may undertake a project specific design in which case it is recommended that the Specifier co-operates closely with the Agrément holder. The Specifier or installing contractor is responsible for the final as-built design.

In circumstances where the Agrément holder generates the final project specific design, the Agrément holder retains full design responsibility unless the design is subsequently modified by others.

2.1.2 Applied building physics (heat, air, moisture)

The physical behaviour of the building incorporating the System shall be verified as suitable by a competent specialist, who can be either a qualified employee of the Agrément holder or a qualified consultant. The Specialist will check the physical behaviour of the waterproofing design and if necessary can offer advice in respect of improvements to achieve the final specification. It is recommended that the Specialist co-operates closely with the Agrément holder.

2.1.3 General design considerations

The System is a fully bonded Type A membrane when classified to BS 8102. This contributes to provide waterproofing protection Grades 1 and 2; and Grade 3 when part of a combined waterproofing solution.

A project specific design must be undertaken by a Certificated Surveyor in Structural Waterproofing (CSSW) in accordance with BS 8102.

HydroBond-LM must be protected prior to any back-filling operations (using protection boards, rigid insulation boards or Newton 410 Geodrain).

2.1.4 Project specific design considerations

A pre-installation survey or full design drawings are required to allow determination of the project specific design.

2.1.5 Permitted applications

Only applications according to the specifications as given in this Agrément are allowed; in each case the Specifier will have to co-operate closely with the Agrément holder. 403 HydroBond GB is designed for pre-application (prior to pouring of concrete) to permanent formwork, whereas HydroBond-LM is designed for post-application to concrete, blockwork and ICF.

403 HydroBond GB may be designed for application to concrete adjacent to the following permanent formwork:

- concrete blinding;
- clay heave boards;
- compacted Type 1 hardcore;
- stable ground such as clay or chalk;
- protection boards;
- rigid insulation boards;
- Newton 410 GeoDrain drainage membrane;
- piled cut off walls;
- piles faced off with formwork boards.

HydroBond-LM may be designed for application after shuttering (temporary formwork) has been removed or where walls are built from the raft foundation.

2.1.6 Installer competence level

See 2.3.1.

2.1.7 Delivery, storage and site handling

See 2.3.2.

2.1.8 Durability

The System will provide a durable waterproof barrier membrane for the lifetime of the building; the expected lifespan of the building itself should be at least 60 years.

2.1.9 Maintenance and repair

The System must be fully protected in normal service use therefore no maintenance is required. For advice in respect of any repair and maintenance concerns, consult the Agrément holder.

2.1.10 Performance factors in relation to the Major Points of Assessment

Watertightness - the System will resist the penetration of water from the ground. The 403 HydroBond GB membrane has a hydrophilic coating which expands when in contact with water, giving the System the ability to self-heal. Prior to the pouring of concrete, holes and cuts should be repaired according to the Agrément holder's instructions. Small holes formed during the pouring and compaction of the concrete will self-heal. 403 HydroBond GB must be confined to ensure a watertight seal is achieved in service.

Resistance to damage - the System must not be left exposed in service as it has no inherent properties in respect of resistance to damage. However, once confined, the System is resistant to damage due to the swelling capacity of 403 HydroBond GB. The System is suitable for use under normal site conditions, prior to confinement. Temporary protection must be applied where there is heavy plant movement, storage of materials or aggressive site activity (hot works etc.)

Behaviour in relation to fire - the System will not diminish the fire performance of earth retained concrete structures and can contribute to meeting the requirements of the national Building Regulations. The use of the System will not affect the fire rating of walls when assessed in accordance with BS 476-3.

Resistance to Radon gas - the System can be used to manage Radon gas in respect of gas-contaminated land. The System should be part of a project specific design installed in accordance with BS 8485. Newton HydroBond Tape must be used to seal the 75mm wide lapped joints between membrane sheets. See 2.3.6.

Buildings in areas of risk from Radon should be constructed in accordance with the recommendations of BRE report BR211: Radon: Guidance on protective measures for new buildings.

Buildings on gas-contaminated land should be constructed in accordance with the recommendations of:

- BRE report BR212: Construction of new building on gas-contaminated land;
- BRE report BR414: Protective measures for housing on gas-contaminated land.

If resistance to Radon gas is a requirement of the project specific design, please consult the Agrément holder for advice.

2.2 - EXAMPLES OF DETAILS

Figure 1 - typical property line construction (concrete slab and basement wall interface)

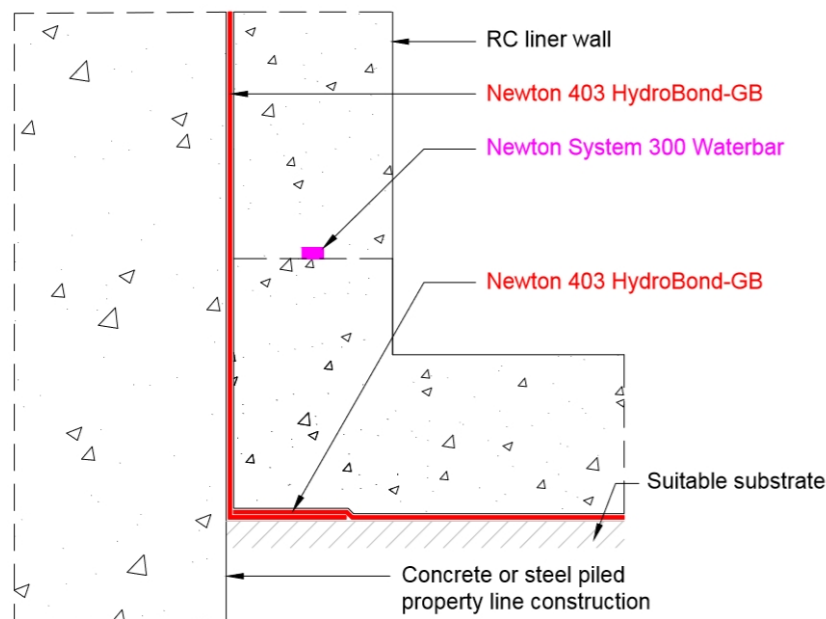


Figure 2 - typical ICF/slab connection with back-filling protection detail

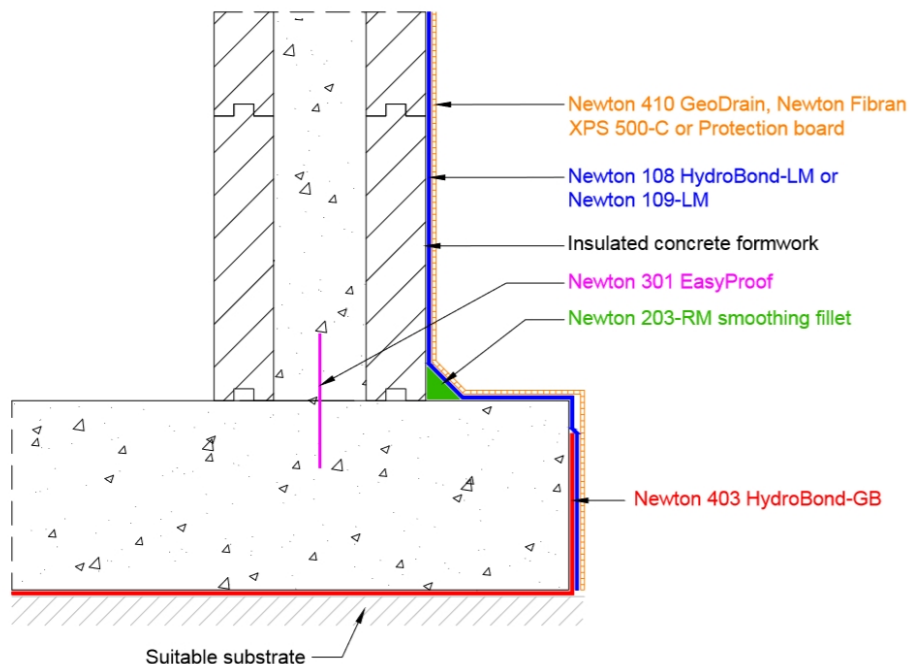


Figure 3 - typical movement joint detail

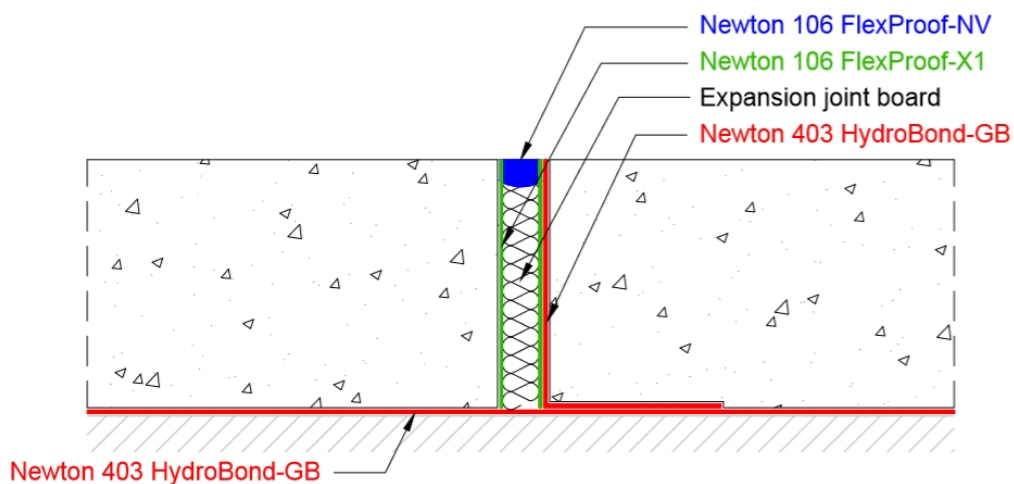


Figure 4 - typical pipe penetration detail

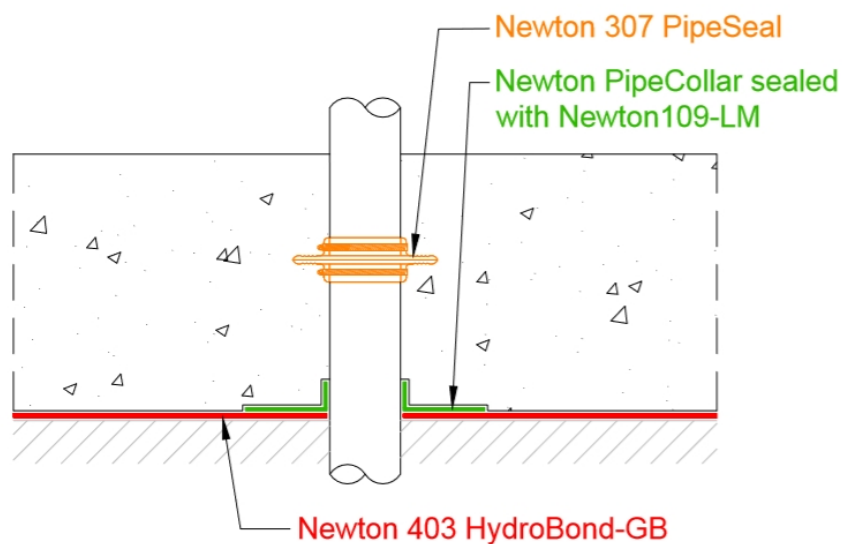
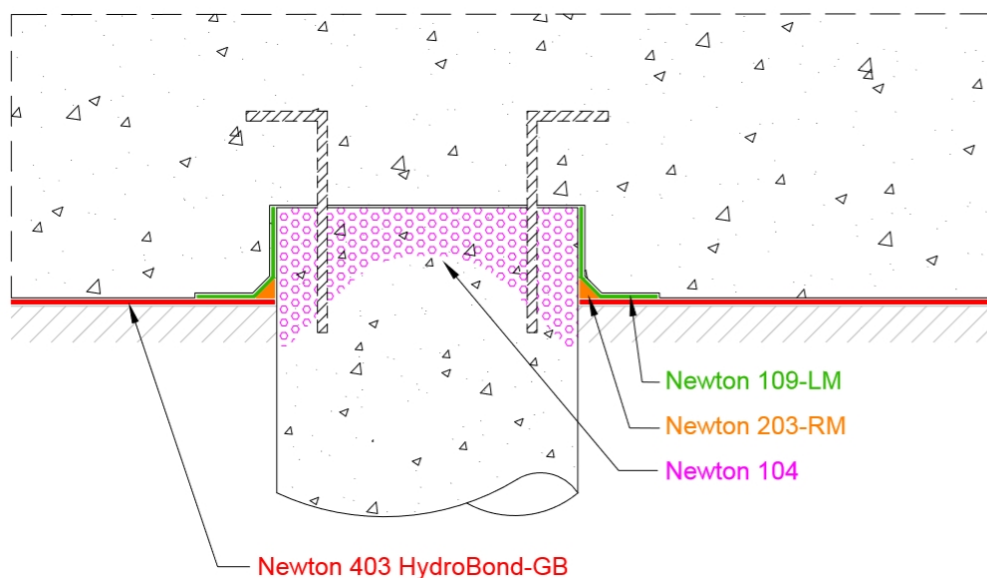


Figure 5 - typical foundation pile head detail



2.3 - INSTALLATION

2.3.1 Installer competence level

The System shall be installed strictly in accordance with the instructions of the Agrément holder and the requirements of this Agrément. Installation shall be by contractors with employees trained and approved by the Agrément holder.

2.3.2 Delivery, storage and site handling

The System is delivered to site in rolls and storage containers, palletised and packaged for delivery as necessary. The System should be handled with care to avoid damage and should be kept in dry frost-free conditions, stored off the floor in ventilated areas, and should not be exposed to direct sunlight for prolonged periods. Do not use the System components if contaminated or damaged.

2.3.3 General

403 HydroBond GB is laid by hand. 108 HydroBond-LM must be applied with an industrial mechanical sprayer; 109-LM can be applied by a hand-held airless spray, roller or brush.

2.3.4 Installation - pre-installation requirements

All surfaces to be waterproofed shall be structurally stable, clean, dry and free from release agents, dust, laitance, oils, paints or other forms of contamination. Holes and voids must be filled with a suitable non-shrink mortar and sharp projections must be removed.

2.3.5 Preparation

Prior to application, the weather conditions must be assessed to determine whether work should proceed or not.

Horizontal surfaces must be free of standing water during the installation of the System.

Note:

- Newton 108 HydroBond-LM must be applied at an ambient temperature of 3 °C and rising;
- Newton 109-LM must be applied at an ambient temperature of 5 °C and rising;
- Application of HydroBond-LM must not be undertaken if precipitation is expected within the next hour;
- When spraying HydroBond-LM during windy conditions special care must be given to limit spray haze and measures should be taken to avoid contamination of adjacent surfaces.

2.3.6 General procedure - outline of key elements of the installation procedure

Generally, 403 HydroBond GB should be laid out to cover the largest area to be waterproofed, prior to forming corners and completing detailing. Joints should be lapped by 150 mm and taped with 75 mm wide Newton HydroBond Tape in accordance with the Agrément holder's requirements.

2.3.7 Finishing - concrete pouring

Concrete must be poured onto 403 HydroBond GB prior to the expiry of a 28-day period from its application to the substrate formwork.

Concrete should not be poured onto an ice layer or frozen 403 HydroBond GB fleece layer.

2.4 - INDEPENDENTLY ASSESSED SYSTEM CHARACTERISTICS

Criteria	403 HydroBond GB
Installation temperature	- 10 to + 40 °C
Service temperature	- 40 to + 100 °C
Identification properties according to BS EN 1848-2 and BS EN 1849-2	
Nominal dimensions (rolls)	20.0 m x 1.5 m
Minimum thickness	1.74 mm
Minimum mass	1.410 kg/m ²
Colour	light blue outer/grey core/white fleece
Swelling capacity - one side - BS ISO 1817	
At 20 °C, linear	28 % (L/L)
At 20 °C, by volume	111 % (V/V)
At 5 °C, linear	12 % (L/L)
At 5 °C, by volume	39 % (V/V)
Reaction to fire classification	
Reaction to fire classification BS EN 13501-1	Euroclass E*
Moisture control	
Watertightness at 400 kPa/ 72h according to BS EN 1928	watertight
Resistance to chemicals	
Watertightness - 28 days immersion Ca(OH) ₂ @ 2 kPa/24 h according to BS EN 1847 & BS EN 1928	watertight
Compatibility with bitumen according to BS EN 1548 and BS EN 1928	
After 28 days storage in at 2 kPa/24 h	watertight
Tensile properties according to BS EN 12311-2	
Tensile strength, machine direction	≥ 350 N/(50 mm) ⁻¹
Tensile strength, transverse machine direction	≥ 265 N/(50 mm) ⁻¹
Joint strength of glued seam (long edge) - shear resistance BS EN 12317-2	
Shear resistance	≥ 100 N/(50 mm) ⁻¹
Resistance to tearing according to BS EN 12310-1	

Criteria	403 HydroBond GB
Nail shank	≥ 135 N
Resistance to static loading according to BS EN 12730	
20 kg imposed load	watertight
Peel strength on concrete MOAT 64	
Fixed	≥ 200 N/(50 mm) ⁻¹
Criteria	Newton 108 HydroBond-LM
Installation temperature	+ 3 to + 35 °C
Service temperature	- 15 to + 40 °C
Identification properties	
Average thickness, as applied to main concrete wall sections	1.0 mm (application @ 1.6 L/m ²)
Average thickness, as applied to blockwork and ICF wall sections	2.0 mm (application @ 3.2 L/m ²)
Average thickness, as applied to all other conditions (e.g. joints, changes of direction etc.)	2.0 mm (application @ 3.2 L/m ²)
Reaction to fire classification	
Reaction to fire classification BS EN 13501-1	Euroclass E*
Moisture control	
Watertightness according to BS EN 15814	class W2B* (watertight)
Criteria	Newton 109-LM
Installation temperature	+ 5 to + 35 °C
Service temperature	- 15 to + 40 °C
Identification properties	
Average thickness, as applied to main concrete wall sections	1.0 mm (application @ 1.6 L/m ²)
Average thickness, as applied to blockwork and ICF wall sections	2.0 mm (application @ 3.2 L/m ²)
Average thickness, as applied to all other conditions (e.g. joints, changes of direction etc.)	2.0 mm (application @ 3.2 L/m ²)
Reaction to fire classification	
Reaction to fire classification BS EN 13501-1	Euroclass E*
Moisture control	
Watertightness according to BS EN 15814	class W2B* (watertight)
Criteria	The System
Radon diffusion coefficient in accordance with method K124/02/95, method C, ISO/DIS 11665-10	
403 HydroBond GB Radon diffusion coefficient D (m ² /s) without joint	1,0.10 ⁻¹²
403 HydroBond GB Radon diffusion coefficient D (m ² /s) with 75 mm joint	1,5.10 ⁻⁹
Radon diffusion coefficient in accordance with method K124/02/95, method C, ISO/DIS 11665-13	
Newton HydroBond-LM Radon diffusion coefficient D (m ² /s) without joint	2,1.10 ⁻¹¹

2.5 - ANCILLARY ITEMS

Note: Ancillary items detailed in this section may be used in conjunction with the System but fall outside the scope of this Agrément:

- Newton HydroBond Tape - double sided adhesive tape to seal lap joints;
- Newton 104 - optional detailing accessory - crystalline waterproofing powder;
- Newton 106 FlexProof-X1 - optional detailing accessory - paste for repairs & detailing;
- Newton 106 FlexProof NV - optional detailing accessory for movement joints;
- Newton 106 FlexProof Detailing Paste - optional detailing accessory;
- Newton 203-RM - optional detailing accessory - fast setting and curing mortar to quickly form 45° angled fillets at junctions between walls and floors;
- Newton 300 System Waterbars - generic reference to another Newton product group;
- Newton 306 SwellMastic - optional detailing accessory;
- Newton 307 PipeSeal - wall collar;
- Newton 309-M - contact adhesive - optional detailing accessory;
- Newton 314-BP - optional detailing accessory - bentonite powder - hydrophilic detailing powder for sealing the edges of 403 HydroBond to vertical surfaces;
- Newton 408 DeckDrain - drainage membrane to move water around the structure on horizontal sites;
- Newton 410 GeoDrain - drainage membrane to move water around the structure on sloping sites;
- Newton 901-P - low viscosity pre-primer for concrete and screed;
- Newton 902-P - primer for use over 901-P;
- Newton 908 LiquaBond - waterproofing accessory, densifier and bonding admixture for screeds and render;
- Newton 914-RT - reinforcement of the membrane at joints and around protrusions;
- Newton GeoTex - filtration textile usually used when welded to the Newton 410 GeoDrain, but sometimes used loose in its own right;
- Newton PipeCollar - optional detailing accessory - fabric reinforcement collar for 110 mm diameter pipes;
- Newton Fibran XPS 500-C - insulated protection and drainage board;
- Expansion joint board - generic reference to ground workers detailing accessory;
- Protection board - generic reference to a common component used on site - specification and use will depend on the project specific design.

CHAPTER 3 - CDM, NATIONAL BUILDING REGULATIONS AND THIRD-PARTY ACCEPTANCE

3.1 - THE CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS 2015 AND THE CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS (NORTHERN IRELAND) 2016

Information in this Agrément may assist the client, Principal Designer/CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

3.2 - NATIONAL BUILDING REGULATIONS

In the opinion of Kiwa Ltd., the System, if installed and used in accordance with Chapter 2 of this Agrément, can satisfy or contribute to satisfying the relevant requirements of the following national Building Regulations.

3.2.1 - ENGLAND REQUIREMENTS: THE BUILDING REGULATIONS 2010 AND SUBSEQUENT AMENDMENTS

- C2 Resistance to moisture - the System can contribute to satisfying this Regulation.
- Regulation 7 Materials and workmanship - the System is manufactured from suitably safe and durable materials for its application and can be installed to give a satisfactory performance.

3.2.2 - WALES REQUIREMENTS: THE BUILDING REGULATIONS 2010 AND SUBSEQUENT AMENDMENTS

- C2 Resistance to moisture - the System can contribute to satisfying this Regulation.
- Regulation 7 Materials and workmanship - the System is manufactured from suitably safe and durable materials for its application and can be installed to give a satisfactory performance.

3.2.3 - SCOTLAND REQUIREMENTS: THE BUILDING (SCOTLAND) REGULATIONS 2004 AND SUBSEQUENT AMENDMENTS

3.2.3.1 Regulations 8 (1)(2) Fitness and durability of materials and workmanship

- The System is manufactured from acceptable materials and is considered to be adequately resistant to deterioration and wear under normal service conditions, provided it is installed in accordance with the requirements of this Agrément.

3.2.3.2 Regulation 9 Building Standards - Construction

- 3.4 Moisture from the ground - the System can contribute to satisfying this Regulation.
- 3.15 Condensation - the System can be designed and constructed to inhibit surface or interstitial condensation.
- 7.1(a)(b) Statement of Sustainability - the material of the System can contribute to satisfying the relevant Requirements of Regulation 9, Standards 1-6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this standard; in addition, the System can contribute to a construction meeting a higher level of sustainability as defined in this Standard.

3.2.3.3 Regulation 12 Building Standards - Conversions

- All comments given under Regulation 9 also apply to this Regulation, with reference to Schedule 6 of the Building (Scotland) Regulations 2004 and subsequent amendments, clause 0.12 of the Technical Handbook (Domestic) and clause 0.12 of the Technical Handbook (Non-Domestic).

3.2.4 - NORTHERN IRELAND REQUIREMENTS: THE BUILDING REGULATIONS (NORTHERN IRELAND) 2012 AND SUBSEQUENT AMENDMENTS

- 23(a)(i)(iii)(b) Fitness of materials and workmanship - the System is manufactured from materials which are considered to be suitably safe and acceptable for use as described in this Agrément.
- 27 Subsoil drainage - the System can contribute to satisfying this Regulation.
- 28 Resistance to moisture and weather - the System can contribute to satisfying this Regulation.
- 29 Condensation - the System can be designed and constructed to inhibit surface or interstitial condensation.

3.3 - THIRD-PARTY ACCEPTANCE

None requested by the Agrément holder.

CHAPTER 4 - SOURCES

- BS EN 1504-2:2004 Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 2: Surface protection systems for concrete
- BS EN 13501-1:2007+A1:2009 Fire classification of construction products and building elements. Classification using test data from reaction to fire tests
- BS EN 13967:2012+A1:2017 Flexible sheets for waterproofing. Plastic and rubber damp proof sheets including plastic and rubber basement tanking sheet. Definitions and characteristics
- BS EN 15814: 2011+A2:2014 Polymer modified bituminous thick coatings for waterproofing. Definitions and requirements
- BS EN 15820:2011 Polymer modified bituminous thick coatings for waterproofing - Determination of watertightness

- BS ISO 1817:2015 Rubber, vulcanized - Determination of the effect of liquids
- BS ISO 3374:2000 Reinforcement products. Mats and fabrics. Determination of mass per unit area
- BS ISO 15105-1:2007 Plastics - Film and sheeting - Determination of gas-transmission rate - Part 1: Differential-pressure methods
- BS 8102:2009 Code of practice for protection of below ground structures against water from the ground
- BS 8485:2015+A1:2019 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings
- ISO/DIS 11665-10 Measurement of radioactivity in the environment - Air: radon-222 - Part 10: Determination of diffusion coefficient in waterproof materials using activity concentration measurement
- ISO/TS 11665-13:2016 Measurement of radioactivity in the environment - Air: radon-222 - Part 13: Determination of the diffusion coefficient in waterproof materials: membrane two-side activity concentration test method
- EOTA TR 007 Determination of the resistance to static indentation
- ETAG 005:2004, parts 1, 2 and 7 Guideline for European Technical Approval of Liquid Applied Roof Waterproofing Kits

Remark: apart from these sources confidential reports may also have been assessed; any relevant reports are in the possession of Kiwa Ltd. and kept in the Technical Assessment File of this Agrément; the Installation Guides are current at the time of publication and may be subject to change, the Agrément holder should be contacted for clarification of revision.

CHAPTER 5 - AMENDMENT HISTORY

Revision	Amendment Description	Amended By	Approved By	Date
-	First Issue	C Vurley	C Forshaw	December 2019