

Watertight Concrete Solutions

Watertight Solution to help make your
structure BS 8102:2022 compliant





Master Builders Solutions

The Master Builders Solutions brand brings all of our expertise together to create chemical solutions for new construction, maintenance, repair and renovation of structures. Master Builders Solutions is built on the experience gained from more than a century in the construction industry. The know-how and experience of a global community of construction experts form the core of Master Builders Solutions.

We combine the right elements from our portfolio to solve your specific construction challenges. We collaborate across areas of expertise and regions and draw on the experience gained from countless construction projects worldwide. We leverage global technologies, as well as our in-depth knowledge of local building needs, to develop innovations that help make you more successful and drive sustainable construction.

The portfolio under the Master Builders Solutions brand encompasses concrete admixtures, cement additives, watertight concrete and solutions for underground construction.

Our comprehensive portfolio

Admixtures:

- Low Clinker Concrete Solutions
- Manufactured Concrete Solutions
- Precast Concrete Solutions
- Ready-Mixed Concrete Solutions
- Watertight Concrete Solutions

Underground Construction:

- Ground Engineering & Injection Solutions
- Mining Solutions
- Rock Bolting Solutions
- Sprayed Concrete Solutions
- TBM Solutions
- Waterproofing Solutions



MasterLife Watertight Concrete Solutions

- **Innovative pore blocker technology**
- **System warranty up to 25 years**
- **Single source system approach**
- **Full site support and training**
- **BS 8102:2022 & NHBC compliant**
- **BBA approved systems**

Water is the most destructive weathering element for concrete, masonry, steel and stone structures, damaging or destroying more buildings and structures than war or natural disasters. Whether above-ground or below ground, all buildings must be able to resist unwanted water in some respect, in the form of rainwater, moisture or hydrostatic pressure. Hydraulic civil structures face yet more challenges in withstanding the ongoing effects of constant immersion.

Good waterproofing, or water resistance, can be the key factor in ensuring a structure's longevity, yet the importance of this facet of structural design is not always given the attention it warrants. The majority of problems with water ingress occur in a relatively small proportion of a structure's surface area, often where design details meet. Careful consideration at the design stage can limit cracks, leaks and potentially serious structural damage over a structure's lifecycle, providing that trades work together at the construction stage to implement design details successfully.

Master Builders Solutions takes a holistic approach to waterproofing that covers both new-build and refurbishment solutions. Driven by the belief that prevention is better than cure, we address waterproofing from first principles, including admixtures for concrete, as well as offering retrofit solutions.





BS 8102:2022 Watertight Solutions

Type A – barrier protection & Type B – structurally integral protection

BS 8102:2022 Code of practice for protection of below ground structures against water ingress provides guidance on the methods which can be adopted to deal with, and prevent, the entry of water from the ground into a structure that is below ground level.

Grades of Waterproofing Protection

GRADE 1a Seepage and damp areas from internal and external sources are tolerable, where this does not impact on the proposed use of below ground structure.

GRADE 1b No seepage. Damp areas from internal and external sources are tolerable.

GRADE 2 No seepage is acceptable. Damp areas as a result of internal air moisture/ condensation are tolerable; measures might be required to manage water vapour/condensation.

GRADE 3 No water ingress or damp areas is acceptable. Ventilation, dehumidification or air conditioning necessary; appropriate to the intended use.

The agreed grade should meet with client's expectations for the intended use of the below ground space. Reducing the grade could increase the risk of not meeting the expectations of the client.

The grade of waterproofing protection should be agreed at the earliest stage. Reducing the grade increases the risk.

Seepage has been defined separately to damp, and specifically mentioned as either acceptable or unacceptable depending on the Grade of protection.

Types of Waterproofing Protection

BS 8102:2022 classifies three types of waterproofing protection.

Type A is a barrier protection against water ingress and is dependent on a separate barrier system. Typically, the range of materials available that can form a membrane include: Cementitious, Crystalline active, Bentonite, Liquid applied membranes and Sheet-applied membranes, which can be applied to a structure. We have chosen a membrane made from FPO (flexible polyolefin) sheet membranes. This is due to its proven reliability and ease of application to structures.

Type B is a structurally integral protection against water ingress and is provided by the structure itself. This type of waterproofing protection is actually integrated into the concrete structure. Typical products used include water-resisting admixtures for watertight concrete combined with appropriate joint sealing systems for connections, construction and movement joints. These must be complying with Table 9 of BS EN 934-2:2009 (Admixtures for concrete, mortar and grout) This system can be made maintainable.

Type C is a drained protection against water ingress. As the name suggests this is an internal cavity drain system, designed to manage water ingress that has entered the structure and takes it away before it reaches the habitable area. We generally use specific membranes and channels and where required, sumps and pumps to take the water away. This system is maintainable.

National House Building Council (NHBC) Risk-based Design

Chapter 5.4 (Waterproofing of basements and other below ground structures) requires that waterproofing design should be appropriate to the risk and generally assume exposure to a full height of water during the design life of the building. Where 'Grade 3 protection' is required, and the below ground wall retains more than 600mm, measured from the lowest finished floor level, the waterproofing design should include a combination of two of the Types of waterproofing systems.

Where Grade 2 waterproofing is required to walls retaining ground greater than 600mm, Type A systems that are not fully bonded should only be used as part of a combined system. Combined systems include:

- Type A and Type B
- Type A and Type C
- Type B and Type C

Where there is any doubt about use, Grade 3 protection should be provided. Grade 3 structures built with a Type A and Type B waterproofing system would typically be:

- Storage areas (moisture sensitive goods)
- Electrical plant rooms
- Ventilated residential units and offices
- Restaurants and commercial areas
- Leisure facilities
- Residential areas
- Computer rooms
- Archive Rooms

Grade 2 structures built with a Type A and Type B waterproofing system would typically be:

- Underground car parks
- Plant rooms
- Workshops
- Storage areas (moisture unaffected goods)

Master Builders Solutions have a complete product offering to help make your structure BS 8102:2022 compliant:

Type A:

MasterLife WP 754:

Pre-applied FPO waterproofing membrane with MasterSeal 934 Waterproofing tape

Type B:

MasterLife WP 799

Water resisting admixture for concrete

MasterLife WP 910 and MasterSeal 912 System

Hydros swelling waterbar and mastic (adhesive) for construction joints

MasterLife WP 900 & MasterRoc MP 307 CE System

Re-injectable hose waterstop and injection resin for construction joints

MasterLife WP 925

Swelling rings and plugs for formwork tie-holes



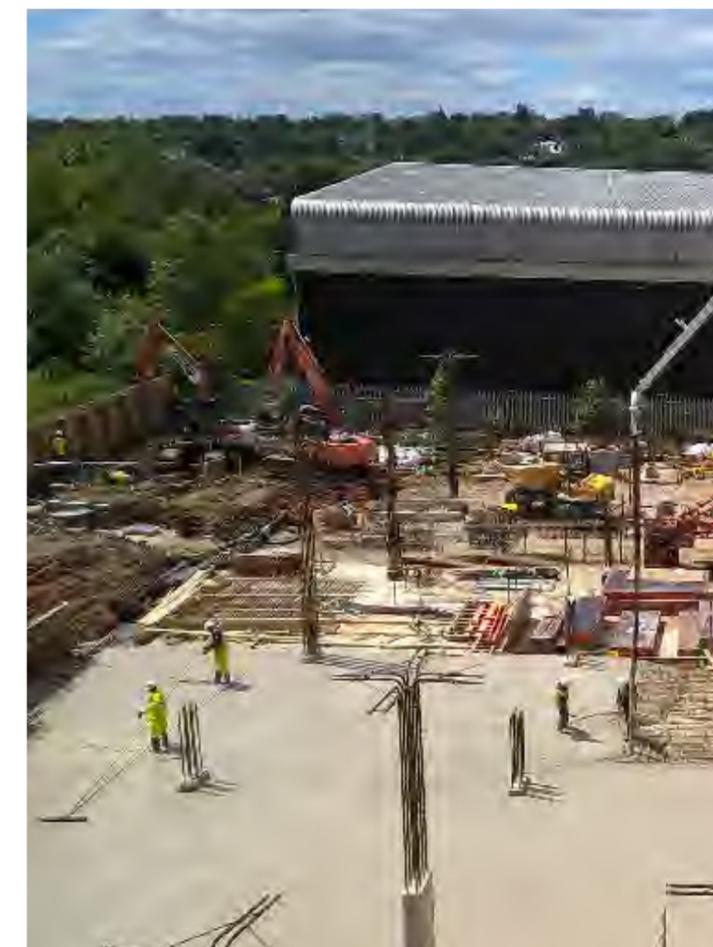
Grade 1



Grade 2



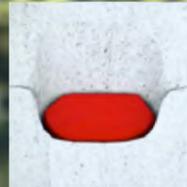
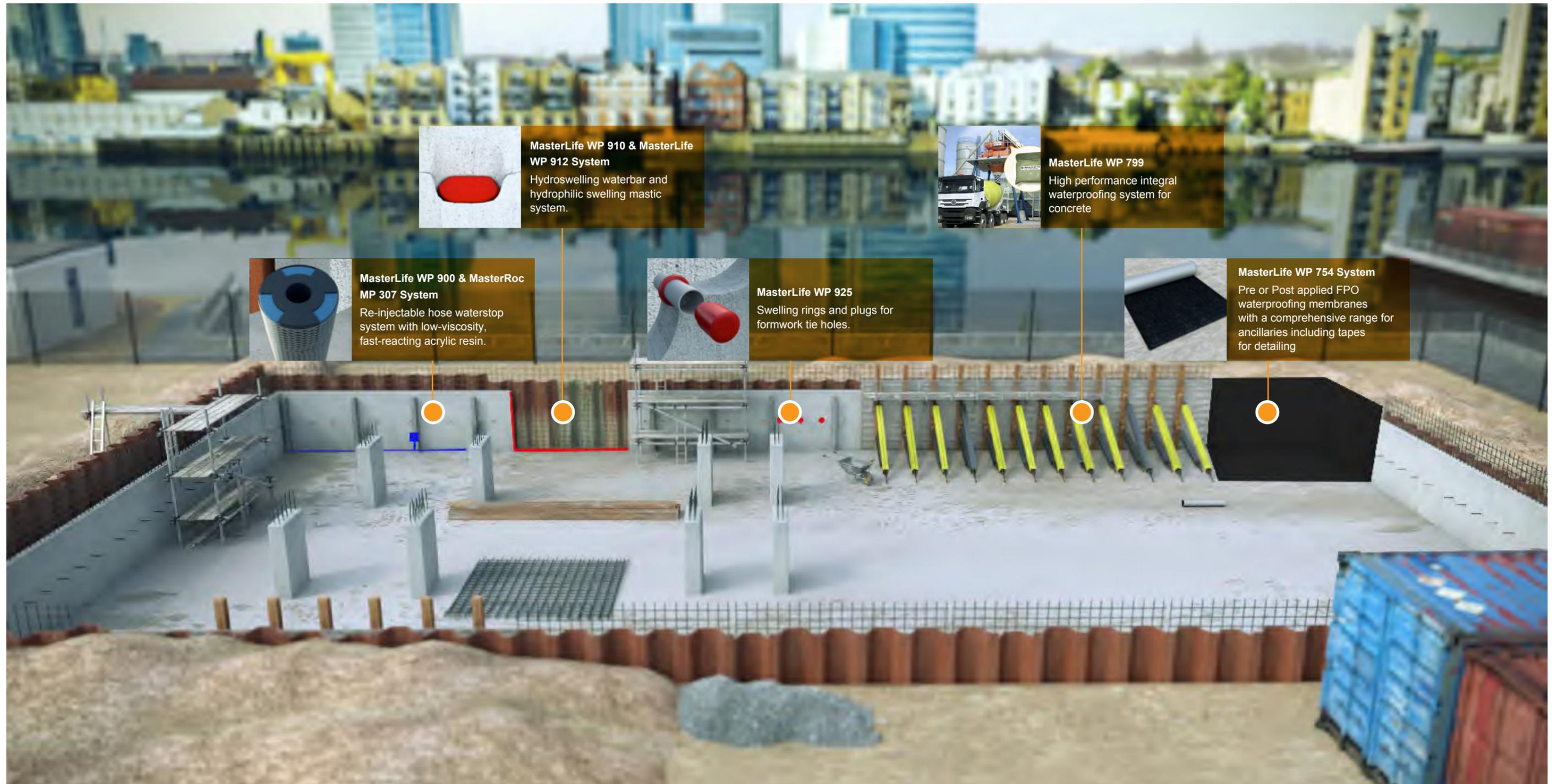
Grade 3





Our Products

Master Builders Solutions have a complete product offering to help make your structure BS 8102:2022 compliant



MasterLife WP 910 & MasterLife WP 912 System
Hydroswellung waterbar and hydrophilic swelling mastic system.



MasterLife WP 799
High performance integral waterproofing system for concrete



MasterLife WP 900 & MasterRoc MP 307 System
Re-injectable hose waterstop system with low-viscosity, fast-reacting acrylic resin.



MasterLife WP 925
Swelling rings and plugs for formwork tie holes.



MasterLife WP 754 System
Pre or Post applied FPO waterproofing membranes with a comprehensive range for ancillaries including tapes for detailing



MasterLife WP 754 System

Pre or Post applied FPO waterproofing membranes with a comprehensive range for ancillaries including tapes for detailing

How does MasterLife WP System work?

MasterLife WP 754 is a pre-applied sheet membrane waterproofing system consisting of highly flexible polyolefin (FPO) membrane and a designed non-woven fleece. This unique system provides a durable mechanical bond, which is created when the fleece is completely adhered to the fresh concrete. MasterLife WP 754 is cold applied and pre-applied, as it is installed without heat or open flames and before the steel reinforcement is placed and the concrete is poured.

What is MasterLife WP System used for?

MasterLife WP 754 is used for below grade concrete slabs, prefabricated construction, below grade walls with both single (blindsided forming) and double-faced formwork (open cut). MasterLife WP 754 is also used in the construction of Residential and Industrial Buildings such as housing, commercial, leisure facilities, manufacturing plants, warehouses and Engineered Structures, such as retaining walls, tunnel galleries, potable water tanks, waste water storage treatment plants and tanks.

What are the benefits of MasterLife WP System?

- No need for protection screed.
- Provides time and labour saving.
- Fast installation: layout, jointing and detailing.
- Weather resistant with temporary UV-stability during installation.
- No lateral water migration in the event of damage.
- Resistant to aggressive mediums in soil.
- Crack bridging ability.
- Overlapping areas are self-adhesive. No need for any extra tape to overlap.
- High elasticity at low temperatures.
- Resistant to 5 bar water pressure.
- High mechanical impact resistance.
- Joints can be welded.
- Low permeation rate to Methane (Methane permeability – ISO 15105-2:2003 39.8 ml/m².day.atm)
- Low transmittance rate to Radon (Radon transmittance (P) – RISE SP Method 3873 2.0x10⁻⁸ m/s)

MasterLife WP 754 PO: Post-applied FPO waterproofing membrane

MasterLife WP 754 DT: Detail Tape for MasterLife WP 754

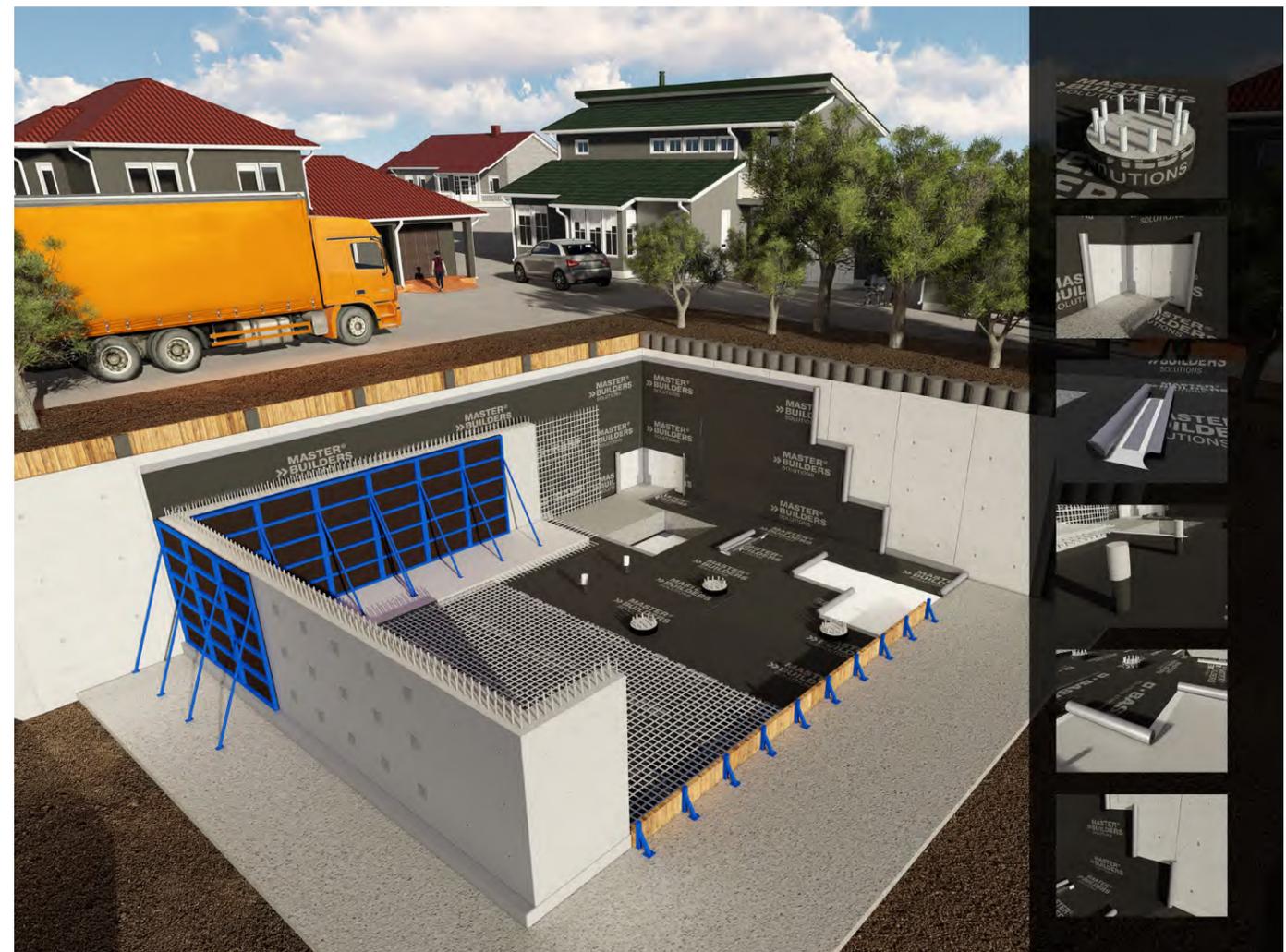
MasterLife WP 754 JT: Joint Tape for MasterLife WP 754

MasterLife WP 754 PC: Pile Cap Tape for MasterLife WP 754

MasterLife WP 754 RT: Repair Tape for MasterLife WP 754

MasterLife WP 754 IC: Inside Corner for MasterLife WP 754

MasterLife WP 754 OC: Outside Corner for MasterLife WP 754





MasterLife WP 799

High performance integral waterproofing system for concrete

How does MasterLife WP 799 work?

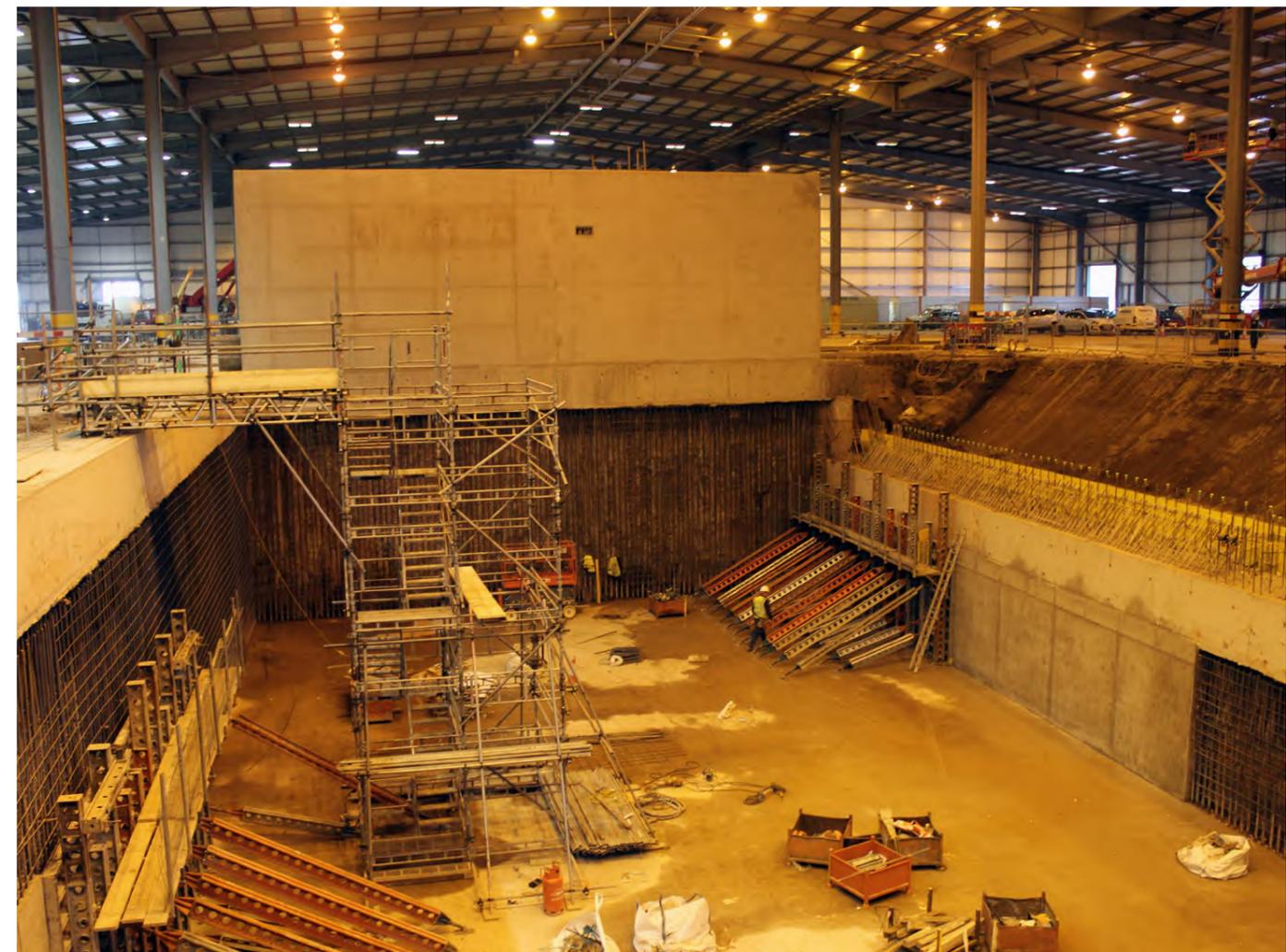
MasterLife WP 799 is a powdered "One Bag" version of Master Builders Solutions Watertight System. MasterLife WP 799 is a high performance integral waterproofing system for wet cast concrete incorporating combined waterproofing and superplasticising components. On completion of correct placing, compaction and curing, the system provides a waterproof structure with minimum effect on the original appearance and texture. MasterLife WP 799 is BBA certified under agrément certificate number 13/5029.

What are the benefits of MasterLife WP 799?

- Reduced water permeability.
- Reduced water penetration.
- Reduced water absorption.
- Reduced air permeability.

What is MasterLife WP 799 used for?

MasterLife WP 799 is used on concrete subjected to water pressure; below ground construction; retaining walls; water retaining structures; concrete walls and slabs; basements, walls, slabs and columns designed in accordance with BS EN 1992-3:2006; BS 8102:2022 (Table 1: Grades 1a to 3); BS EN 1992-1-1:2004+A1:2014; precast wet or dry concrete.





MasterLife WP 910 & Masterlife WP 912 System

Hydroswelling waterbar and hydrophilic swelling mastic system for construction joints.

How does the MasterLife WP 910 and MasterLife WP 912 System work?

MasterLife WP 910 is a hydroswelling waterbar, ready for installation, to waterproof joints in concrete structures. The product is based on a special polymer technology that acts by swelling on exposure to water, to form a seal and render the joints leak-proof. MasterLife WP 910 is bonded to the concrete using MasterLife WP 912 which is a one component, moisture curing pre-polymer which is reswellable when in contact with water, suitable for the permanent sealing of construction joints in concrete structures. MasterLife WP 910 and MasterLife WP 912 are BBA certified under agreement certificate number 18/5556.

What is the MasterLife WP 910 and MasterLife WP 912 System used for?

The MasterLife WP 910 and MasterLife WP 912 System is suitable for all construction joints subject to hydrostatic pressure, on one or both sides. Application areas include joints between abutments of concrete and rock, masonry, rafts and walls in tunnels and basements, steel and concrete pipes, H-king and precast elements.

What are the benefits of the MasterLife WP 910 and MasterLife WP 912 System?

- Swells in contact with water by up to 200%, preventing water ingress even when the joint width varies.
- Water molecules held by molecular attraction – captured water does not get transported through capillaries.
- The volume expansion effect is equally effective in fresh water and in high salt content water (sea water, brackish water).
- Resistant to chemicals, solvents, fuels and oils.
- Controlled swelling – minimise the risk of damage to concrete.
- Durable seal due to the inclusion of no air bubbles that can lead to the breakdown of the seal and allow leaks.
- Outstanding chemical resistance.
- Reversible swelling process.
- Resistant to micro-organisms formation.
- Can seal joints with up to 5 bar water pressure.





MasterLife WP 900 & MasterRoc MP 307 System

Re-injectable hose waterstop system with low-viscosity, fast-reacting acrylic resin for construction and cold joints in concrete

How does the MasterLife WP 900 and MasterRoc MP 307 CE System work?

MasterLife WP 900 is a blue flexible PVC hose available in two sizes. The hose comprises of a solid core and lateral openings covered by neoprene strips, all banded by an open webbed nylon mesh. MasterLife WP 900 is used in conjunction with MasterRoc MP 307 CE which is a highly reactive two-component acrylic resin with a low viscosity for good penetration. When combined, this product cures quickly, forming a rubber-like resin with the ability to withstand certain ground and crack movement. MasterRoc MP 307 CE acrylic resin is especially designed for concrete repair and is CE certified according to EN 1504-5. construction joints in concrete structures.

What is the MasterLife WP 900 and MasterRoc MP 307 CE System used for?

The MasterLife WP 900 and MasterRoc MP 307 System is designed to replace waterbars for use in concrete structures which contain joints, other than expansion joints and subject to hydrostatic pressure on one or both faces of the structure. The systems use prevents the passage of water through concrete joints in any sub-base concrete construction, water reservoirs/tanks, canals, dams, sewage treatment plants, liquid storage vessels, and water excluding or retaining structures.

Using this system also provides a complete maintenance solution if any leaks occur in the future and makes BS 8102:2022 Type B – structurally integral protection construction maintainable throughout the lifetime of the structure.

What are the benefits of the MasterLife WP 900 and MasterRoc MP 307 CE System?

- Eliminates costly design, welding and installation of waterbar.
- Water cannot penetrate treated joint and rebar, unlike traditional installation where water is in contact with the reinforcement up to the waterbar.
- The installed system assures a watertight structure.
- Fast easy installation procedures even to complicated design detail.
- Proven and predictable performance.
- Joints can be tested for watertightness before backfilling or membrane tanking operations.
- System enables retro-injection, to stop leaks caused subsequently by settlement or structural movement at the construction joint.
- Completely maintenance free.
- Possible to retro-fit against existing structures.
- Environmentally preferable – harmless in contact with ground water.
- Low viscosity allows deep penetration into very fine fissures and cracks.
- Good assimilation to ground movements or settlements.
- Durability of more than 10 years.
- Water tightness up to more than 12 bar (174 psi [1.2 MPa]).
- Non-corrosive.
- Not sensitive to water and closely retains its original shape (maximum change of mass -15% to +20%)





MasterLife WP 925

MasterLife WP 925 swelling rings and plugs for formwork tie holes.

How does MasterLife WP 925 work?

MasterLife WP 925 are hydroswellable rings and plugs, ready for installation, to waterproof formwork tie holes. The products are based on a special polymer technology that acts by swelling on exposure to water, to form a seal and render the tie holes watertight.

What is MasterLife WP 925 used for?

MasterLife WP 925 hydroswellable rings and plugs are suitable for waterproof formwork tie holes. Application areas include:

Water retaining structures:

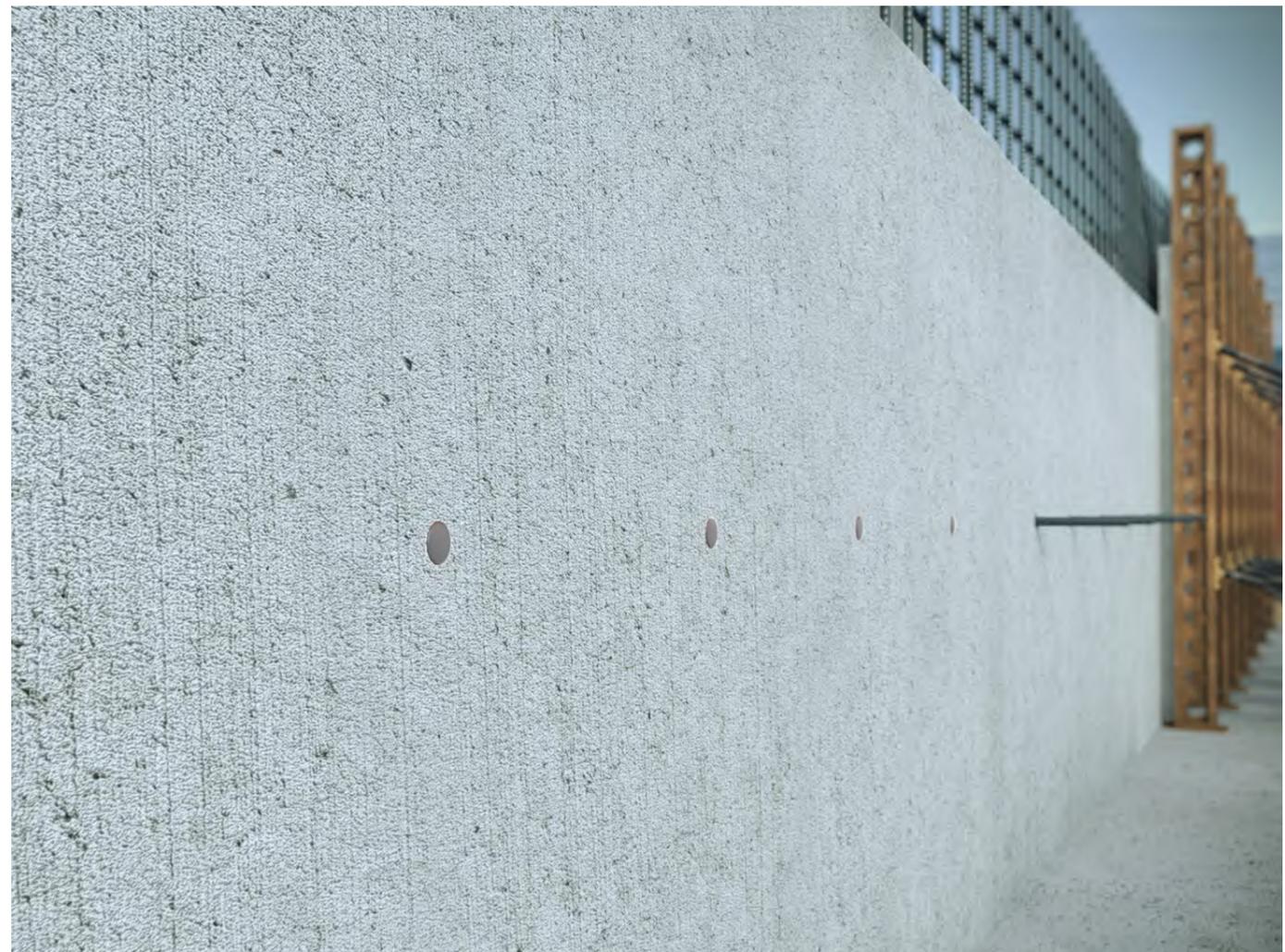
- Water tanks
- Reservoirs
- Dams
- Water Treatment Plants
- Sewage Treatment Plants
- Swimming pools
- Bund Walls

Water excluding structures:

- Basements
- Underground car parks
- Tunnels & Subways
- Retaining walls

What are the benefits of MasterLife WP 925?

- Fast and easy to install
- Swells in contact with water by up to 200% - providing excellent sealing capabilities
- Resistant to chemicals, solvents, fuels and oils
- Controlled swelling – minimise the risk of damage to concrete
- Outstanding chemical resistance
- Reversible swelling process
- Resistant to micro-organisms formation





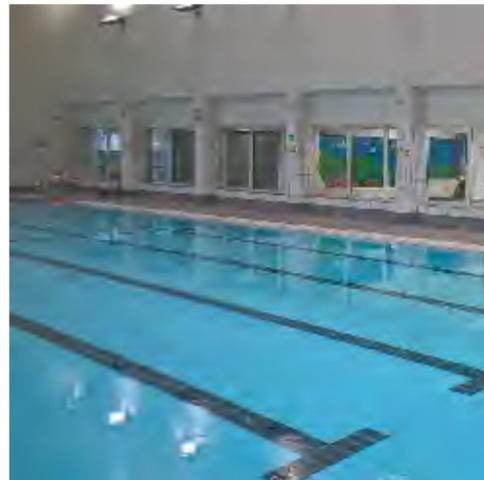
Project References

A selection of projects around the United Kingdom



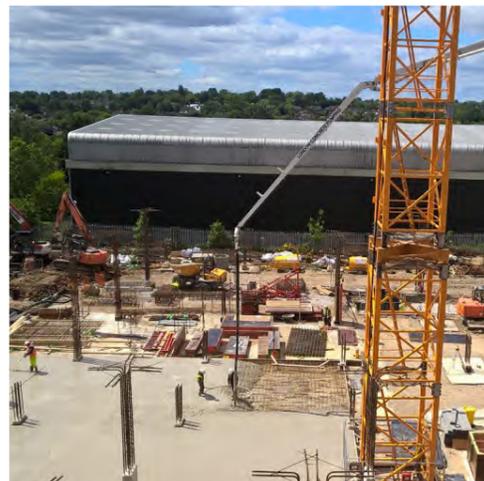
Harbour Central, Canary Wharf, London

Harbour Central is a spectacular, brand new development on the Isle of Dogs. This impressive development includes five residential buildings and a leisure complex and is situated less than 10 minutes from the heart of Canary Wharf, one of the two financial nerve centres of London. The focal point of Harbour Central is the magnificent, 41-storey Maine Tower with 642 private apartments. The basement, containing underground parking using a car stacker system, was constructed using approximately 6000m³ of concrete with MasterLife WP 799 high performance integral waterproofing system. MasterLife WP 910 and 912 hydroswellable waterbars and mastic system was also used to waterproof the construction joints in the concrete.



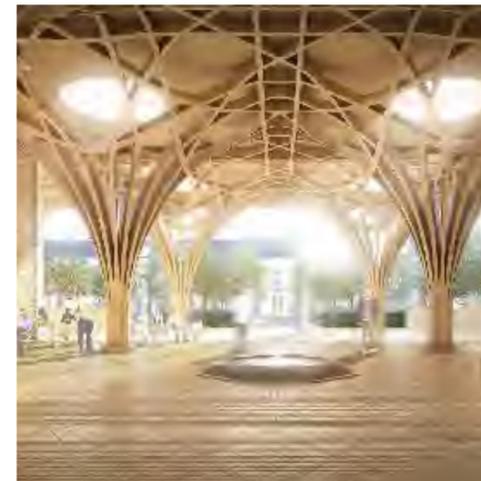
The Castle Leisure Centre, London

MasterLife WP 799 waterproofing admixture was used to waterproof the main pool, child's pool, and plant rooms. MasterLife WP 910 and MasterLife WP 912 ensured that all construction remained watertight. MasterLife WP 925 tie-hole solution waterproofed all tie-holes left from the formwork system ensuring each one was sealed permanently. Both pools, once constructed, were filled and tested to BS 8007 for watertightness for a period of 28 days, which both pools passed.



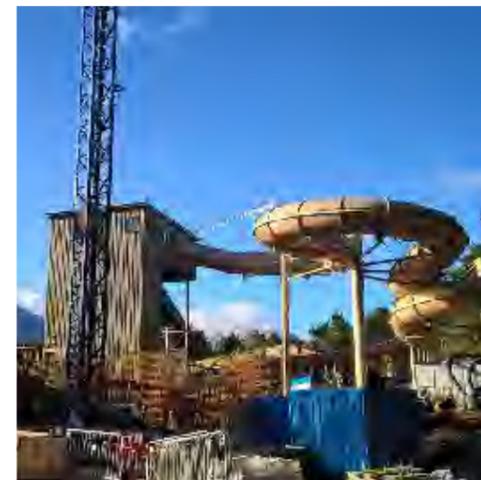
Northway House – Redrow Homes, Barnet

Refurbishment and redevelopment of a 1970s office building converted into 145 dwellings including a 167 space basement car park. The main challenge on this project was completely waterproofing the sub-grade basement car park. Master Builders Solutions Watertight Concrete Solution was the answer. MasterLife WP 799 admixture was used in the concrete with MasterInject 900 system also installed. This system was chosen as it provides a complete maintenance solution if any leaks occur in the future and makes BS 8102:2022 Type B – structurally integral protection construction maintainable throughout the lifetime of the structure.



New eco-friendly mosque, Cambridge

A major project to construct a new, environmentally-friendly mosque in Cambridge used Master Builders Solutions Watertight Concrete System to waterproof its basement car park. At a cost of approximately £15 million, the mosque has two worship halls, which will be able to hold around 1000 men and women in prayer. Green features incorporated in the project design included vegetation on the roof, a water recycling scheme and natural lighting to reduce the need for artificial light. The mosque features complex timber geometry and includes a basement, designed as a car park with approximately 80 car parking spaces. The basement contains approximately 2500m³ of concrete, supplied by Aggregate Industries, using MasterLife WP 799 high performance integral waterproofing system. MasterLife WP 910 and MasterLife WP 912 ensured that all construction remained watertight and MasterLife WP 925 tie-hole solution waterproofed all tie-holes left from the formwork system ensuring each one was sealed permanently.



Center Parcs, Sherwood Forest - £15m revamp for Subtropical Swimming Paradise

Center Parcs indoor waterpark facility was extended to include new raft rides, toddler pools, a children's adventure cove and a high-octane Tropical Cyclone ride, complete with zero-gravity drop. The water park, which opened in 1987 and was extended in 2002, needed a concrete that could deliver lasting water-resistance and protection from water ingress and damp, as well as high strength to withstand the stresses of the new ride. DBM Construction, working for principal contractor SDC, chose to use Aggregate Industries' watertight concrete, which uses MasterLife WP 799 admixture containing both waterproofing and superplasticising components. MasterLife WP 910 hydroswellable waterbars and ancillary jointing components completed the solution. In total, Aggregate Industries supplied over 2,000m³ of Watertight concrete, providing reduced water and air permeability and reduced water penetration and absorption, as well as quicker installation and cost efficiencies.



Deep Recovery Facility, Sellafield

Master Builders Solutions Watertight System has been used in the construction of a pond holding 6.5 million litres of water, where work methods likely to be suitable for real-life situations at Sellafield Limited can be tested. This includes possible scenarios involved in decommissioning the world's largest open-air nuclear fuel storage pond (NFSP). The new facility has been constructed to a depth of 6 meters to replicate the depth of one of the ponds on Sellafield Limited's site. A travelling crane has been incorporated into the design and will be modified to simulate limited recovery operations.



Master Builders Solutions for the Construction Industry

MasterAir®

Complete solutions for air entrained concrete

MasterCast®

Solutions for the manufactured concrete product industry

MasterCem®

Solutions for cement manufacture

MasterCO₂re™

Solutions for low-clinker concrete

MasterEase®

Low viscosity for high performance concrete

MasterFinish®

Solutions for formwork treatment and surface improvement

MasterFiber®

Comprehensive solutions for fiber reinforced concrete

MasterGlenium®

Solutions for high performance concrete

MasterKure®

Solutions for concrete curing

MasterLife®

Solutions for enhanced durability

MasterMatrix®

Advanced rheology control for concrete

MasterPel®

Solutions for hydrophobization, anti-efflorescence and surface protection

MasterPolyheed®

Solutions for mid-range concrete

MasterPozzolith®

Solutions for water-reduced concrete

MasterRheobuild®

Solutions for high strength concrete

MasterRoc®

Solutions for underground construction and surface improvement

MasterSet®

Solutions for set control

MasterSphere®

Solutions for guaranteed freeze-thaw resistance

MasterSuna®

Solutions for sand and gravel in concrete

MasterSure®

Solutions for extraordinary workability retention

Master X-Seed®

Advanced accelerator solutions for concrete

Unveil the Power of MasterCO₂re™ : Intelligent Cluster System for Low-clinker Concrete Production

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