Wykamol GROUP LIMITED

V3

Waterproofing and Gas Protection Design Guide

FOR ABOVE & BELOW GROUND APPLICATIONS

Contents

Regulations

What is BS 8102? Well, if you're dealing with a reputable basement waterproofing specialist, it's a name that you're likely to hear often.

It is essentially a document that outlines best practice when planning a basement waterproofing scheme, advising the designer on the various methods of waterproofing available and the correct way to 'specify' them for contractors, ensuring a successful and long-lasting installation.

Contractors are not legally bound by British Standards such as BS 8102 but, should there be a failure in the system due to shortcomings in the design, this is the 'code of practice' that would probably be referred to in any litigation proceedings.

The document was updated in 2009 from a previous version written in 1990, to reflect the popularity in residential basement conversions, an increase in deep urban constructions, and numerous advances in basement waterproofing technology. It also takes a more detailed look at the risks involved with below-ground spaces and how best to mitigate them in practice.

The purpose of BS 8102

The main goal behind BS 8102 is to guide designers in assessing the potential risk of water ingress to a below-ground structure and identify the most appropriate and adequate ways to safeguard against it. It identifies three types of protection – A, B and C – aimed at achieving different internal environments, suited to different uses of the underground space (for more information on the three types of protection, download the National House Building Council's guide to basements and waterproofing).

Potential defects

There are two main threats to the effectiveness of a basement waterproofing system, namely poor workmanship and/or defects caused by using materials that are inadequate for the job. BS 8102 outlines ways to negate such issues within the design scheme, and incorporate opportunities for simple remedial measures in the unlikely event that a defect still occurs.

Assessing risk

Besides advising designers to carry out an assessment identifying the likely risks of water ingress to an underground structure, BS 8102 also recommends that a desk study is undertaken, observing BS 5930 and BS EN1997, which covers:

- Geology and hydrogeology, including soil permeability, flood risk, radon, methane and other gases and contaminates present in the ground (e.g. chlorides and acids) – speak to our technical team on the risks of radon in basement conversions.
- Topography of the surrounding land (i.e. its geographical features) in relation to the underground structure.
- The highest likely level of the water table and the potential for a perched water table.
- Any missing ground gas/ground water information, to be ascertained by undertaking a site investigation, observing BS 59230 and BS EN1997.
- Analysis of the soil for drainage characteristics, to be determined in accordance with BS 8004.

Prepare for the worst

Taking account of the considerations above, the designer will be in a position to specify the most appropriate basement waterproofing system to achieve the required internal environment type. With any below-ground structure, however, there is always an increased risk of water ingress in exceptional circumstances, such as a burst water main or – increasingly often – a flash flood and, therefore, we would recommend that such 'worst case' scenarios are accounted for in any plans.

Other considerations

Besides the advice described above, BS 8102 also directs designers to design structures to 'full head' in earth retaining situations where:

- No detailed geological or hydrogeological information is available
- Soil investigations are inconclusive with regards to groundwater
- Ground drainage characteristics are unreliable
- Internal and/or external drainage measures are unreliable, unmaintainable and/or infiltration cannot be controlled

Designers should also remember that, even when comprehensive information is available regarding the site, it is their responsibility to specify measures to protect the structure against other sources besides underlying water tables.

These can include:

- The inflow of surface water, ranging from rainwater to wastage from burst water mains
- Water pressures acting on the external retaining wall system
- Water pressures below the slab base
- A successful waterproofing design should result in a system that can withstand a pre-determined head of water, or control the water before it reaches the structure.

Summary

The purpose of BS 8102 is to direct designers in making decisions that will result in successful basement waterproofing systems, capable of withstanding even the worst circumstances of water pressure and presence in the surrounding area. Should anything go wrong down the line, the system should allow for simple remedial measures that make minimal demands on time and money.

It is a code of practice that holds benefits for designers, specifiers, contractors and homeowners and Wykamol, wholeheartedly recommend that customers deal exclusively with companies that uphold its directions.

BS 8485 Mandatory Requirements For Gas Membrane Testing And Verification

In 2015 the British Standard for Good Practice on Gas Membrane Testing and Verification of Protection Systems for Buildings against Hazardous Ground Gases was updated, BS 8485:2015+A1:2019 supersedes all previous guidance.

BS 8485:2015+A1:2019 operating alongside the CIRIA 735 code of practice states Independent Gas Membrane Testing and Verification Programs are as important as the design and installation process.

BS 8485:2015+A1:2019 sets the codes of practice which govern the installation of gas proof membranes. Dependent on the various project risks and criteria Independent Inspection is mandatory.

NHBC Chapter 5.4 : Waterproofing of basements and other below ground structures

Chapter 5.4 moves beyond the point where the BS 8102 finished and recognised areas where there were still risks of failure. One particular area is their requirement for two systems or having two layers of protection. BS 8102:2009 referred to under section 6.2 Waterproof protection that 'one, or a combination, of the (3) types of waterproofing protection should be selected'.

The BS stops short of responsibility by "consideration should be given to the need for combined protection." NHBC took this important aspect further and determined to lessen risk of failure by requiring two forms of water resistance to deliver a robust design and provide surety to homeowners and insurers.

NHBC also recognised shortfalls in installation, notably failure of contractors and ground workers to install otherwise good products correctly. Under the new arrangements technicians are required to undertake training and be able to demonstrate competence.

Conclusion

Driving up of standards and improving outcomes in waterproofing will give confidence to consumers and end-users. They need to be assured they are investing in a building with dry basements which will add value to their property. Consumer confidence in the delivery of reliable underground spaces will result in more sales and opportunity for the industry.

Waterproofing Design Philosophy

Best Codes of Practice

BS8102:2009
Is the main design document used in the waterproofing industry, it is used by designers, manufacturers and specialist waterproofing contractors. This is the code of practice for protection of below ground structures against water from the ground. It is the design standard in our industry for waterproofing, covering design philosophy, site evaluation, water-resisting design, general construction issues, Types of waterproofing, A, B & C, the grades of waterproofing and remedial measures It is a guide for designers assessing potential risk of water ingress to below ground structures. Advises on how best to mitigate risks involved in below ground, also covers gas membranes and risks. It is not legally binding, but would be referred to in any litigation proceedings.

NHBC Chapter 5.4.
NHBC standards for waterproofing of basements and other below ground structures. It covers regulation and compliance, guidance and good practice and information and support for waterproofing.

BS8485:2015 + A1 2019.
This is the code of practice for the design of protective measures for Methane and Carbon Dioxide ground gases for new buildings. This document includes more detailed recommendations on the interpretation of gas monitoring, data and assignment of the gas screening value.

BRE BR211 Radon 2015.
Guidance on protective measures for new buildings, including supplementary advice for extensions, conversions and refurbishment projects. Also includes, what is Radon, National building regulation guidance, protective measures, and level of protection, technical approach, detailed protective measures, and information to be provided to the purchaser.

CL:Aire, BS8007:1987.
This document is a pragmatic approach to ground gas risk assessment. This bulletin also describes an alternative approach to ground gas risk assessment.

CIRIA Report C735.
This document covers good practice on the testing and verification of protection systems for buildings against hazardous ground gases. All standards to be familiar with and integrated into design for waterproofing & ground gas, when working with buildings, refurb and new below-ground structures). Wykamol were part of the new add on document, for failures and remediation of gas membranes when not installed correctly.

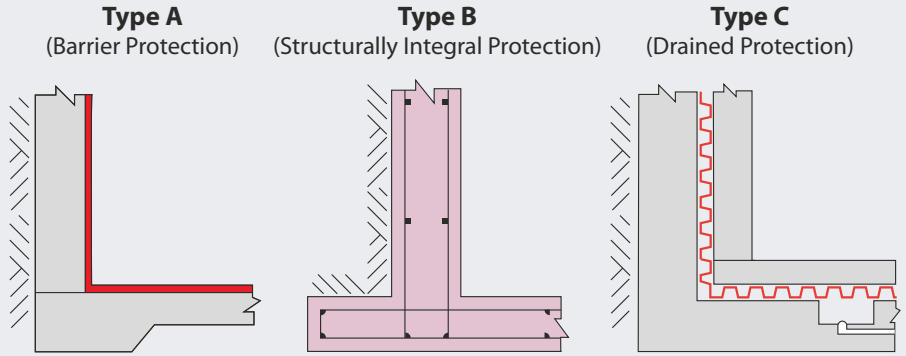
BS8007:1987.
This document is the code of practice for design of concrete structures for retaining aqueous liquids. The two main forms of additives are liquid and powder, together with rebar, water stops, shrinkage and cracking.

WHAT IS NEEDED

Waterproofing Protection

One or a combination, of the following types of waterproofing protection should be selected;

1. Type A (Tanked - Barrier Protection)
2. Type B (Structurally Integral Protection)
3. Type C (Drained Protection)



TYPE A (BARRIER) PROTECTION

Type A is a form of waterproofing defined within BS8102 2009 (Protection of below ground structures against water from the ground), as a barrier protection. Barrier-specific properties should also be evaluated, allowing for any predicted cracking from the structure. The waterproofing barrier should be capable of providing the appropriate protection against water and water vapour without disruption or decay. Although some barrier materials accept local strains and can accommodate a crack opening in the supporting structure, it should be noted that others might be damaged by differential movement or cracking.

The waterproofing barrier should, in most instances, be continuous around the structure. In order to maintain the continuity of the barrier, penetrations through walls or floors that are to be protected (e.g. openings for services, pipes, cables) should be avoided, wherever possible. Where it is essential to provide such openings, special treatment around the penetration should be provided and reference should be made to the manufacturer's instructions and specialist advice. Similarly, where fixings through the barrier are necessary, the manufacturer's instructions should be followed.

Movement joints below ground should not be used unless unavoidable; in such cases these should be waterproofed in accordance with the manufacturer's instructions. Where a waterproofing barrier is required for a structure supported on piled foundations, special consideration should be given to the detailing so that structural continuity is not compromised and reference should be made to the manufacturer's instructions.

Cementitious crystallization barriers are blends of Portland cement, treated quartz sands and active chemicals. They are supplied in powder form and are mixed with water to form a slurry, which is then applied directly to the prepared concrete surface.

The active chemicals combine with free lime and moisture present in the capillary tracts to form insoluble crystalline complexes which prevent water ingress. Cementitious crystallization barriers should be applied to either internal or external surfaces of the concrete structure by brush or spray. They are suitable for use on both new and existing structures. Surfaces should be prepared (in accordance with the manufacturer's instructions) so as to have a capillary open structure prior to the application of the barrier.

Cementitious crystallization barriers can be applied as a single coat slurry to hardened concrete or dry sprinkle and trowel-applied to fresh concrete. They can also be applied to concrete blinding immediately prior to the placing of overlaying concrete. The installation of cementitious multi-coat renders, mortars and coatings should, unless otherwise advised by the manufacturer, be left until as much as practicable of the structure's dead load has been applied.

The substrate should be prepared in accordance with the manufacturer's instructions prior to the application of the system. Details on the application method and rate, mixing, number of layers/coats and curing requirements should be sought from the manufacturer. Existing substrates and structural elements should be assessed for suitability to withstand any increase in applied loads from water pressure.

Waterproofing Design Philosophy

Continued

TYPE B – STRUCTURALLY INTEGRAL PROTECTION

Structures will generally be reinforced or pre-stressed concrete. Since they are specifically designed to be water-resistant, further waterproofing will be required only where additional control against free water or water vapour is considered necessary. In some instances, the additional protection may be used to safeguard the structure from aggressive chemicals. Any noticeable cracking or defect should be brought to the attention of the designer. A concrete structure, to be constructed as an integral water-resistant shell. To be designed in accordance with BS8007 to waterproof but not vapour proof. If the concrete was poured monolithically there would be no problem at the floor wall junction. Day joints are potential problem areas.

TYPE C – DRAINED PROTECTION

A 'Type C' System is a below ground, internal waterproofing system, comprising of membranes, drainage and, if required, pumping systems with battery backup and ancillary products. With this design, it is accepted that water could enter the building and an internal cavity is provided to depressurise and manage the water, which is why they are sometimes referred to as 'water management systems. Once collected, water can be discharged from the property either via gravity to open elevations or removed by mechanical means.

Because the waterproofing is not holding back water pressure, it is regarded by most waterproofing professionals as the safest form of waterproofing available. It is also the form of waterproofing that is the most maintainable and repairable. 'Type C' cavity drain waterproofing systems are suitable for use with all types of structure and to both new-build and for the refurbishment of existing structures where the waterproofing has failed.

The only risks to this form of waterproofing are where the drainage cavities become blocked, or where too much water is entering the structure for the system to deal with, or where there is no power for the pumping system. (a It is also the Wykamol recommendation (based on BS8102 and NHBC guidance) that a dual system is utilised for dryer grades, and we would generally only recommend for Grade 3 environments the Type A and Type C or Type B and C combinations, with the use of construction joint accessories. Our reasoning for this is that it is understood that Types A and B are both resisting the hydrostatic pressure and any defect will allow ingress.

When we are designing for habitable space, we will generally require a completely dry internal environment defined as a 'Grade 3' by the BS8102. Whichever combination of waterproofing is chosen to achieve the Grade 3 environment we would always recommend that one of the forms of waterproofing is an internal cavity drain membrane system (Type C). The choice of the other system is largely dictated by the type of structure. It is widely accepted that a well-designed Type C system will depressurise any water which enters the structure as a result of a defect and will manage it accordingly hence most application defects will never be subjected to water pressure if a full and well-designed system is used. The Type C system is acknowledged by most in the industry to be the most effective and trouble-free form of waterproofing as a standalone system and the fail-safe system in waterproofing designs where completely dry internal environments are required to be guaranteed.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Waterproofing is in our heritage

The Wykamol Group has been involved in waterproofing applications for over 40 years and was a founder member of the British Wood Preserving and Damp Proofing Association.

When it comes to waterproofing applications, the Wykamol Group has a huge range of products, from cement-based tanking powders to specialist epoxy coatings. In recent times however and since the changes to BS8102, cavity drain membranes have fast become the choice for most contractors in the UK marketplace.

Easy to use and less problematic than other solutions, these systems can be used in a variety of applications above and below ground. When specifying waterproofing in today's marketplace care must be taken to look at all implications and issues surrounding the property.

Being able to access systems to repair them if a problem arises is another reason that cavity drain membranes have gained popularity. This use, internally, as a dual system is fast becoming standard practice for professionals within the construction industry.

Cavity drain membranes have also become the number one choice for builders and developers tackling damp issues above ground. When dealing with salt and damp related issues, allowing the wall to breathe behind a cavity drain membrane has become the approach that most contractors take to such problems today; isolating any dampness issues within the structure.

Issues of dense renders and long drying times have been almost eliminated by the use of cavity drain membranes. There membranes are also useful in heritage projects. Specifiers may wish to return back to the original structure at a later date. Membranes give the professional that option as well as allowing the walls to breathe in structures where dense renders would cause issues.

We have a team of 11 professional technical experts across the country who can give advice and access problems of dampness in structures whether that is a basement in a flooding situation or a listed building with dampness issues above the ground. Wykamol is there to give advice and design a repair strategy that satisfies the owners requirements.

This brochure covers Type A waterproofing and gas protection as a combined system, Type A cementitious waterproofing, Type A Podium deck waterproofing and Type C cavity drain waterproofing these are all the solutions that we currently sell in the UK and European market places. **Please contact for any technical help.**

For a free inspection and diagnosis of the waterproofing protection you require, please contact us on 0800 400 6666.

Waterproofing a Building

In construction, a building or structure is waterproofed with the use of membranes and coatings to protect contents, and structural integrity.

In buildings, waterproofing is a fundamental aspect of creating a building envelope, which is a controlled environment. The roof covering materials, siding, foundations, and all of the various penetrations through these surfaces must be water-resistant and sometimes waterproof.

Walls are not subjected to standing water, and the water-resistant membranes used are designed to be porous enough to let moisture escape.

Damp proofing is another aspect of waterproofing. Masonry walls are built with a damp-proof course to prevent rising damp, and the concrete in foundations needs to be damp-proofed or waterproofed with a liquid coating, basement waterproofing membrane (even under the concrete slab floor where polyethylene sheeting is commonly used), or an additive to the concrete. Within the waterproofing industry, below-ground waterproofing is generally divided into two areas:

Tanking: This is waterproofing used where the below-ground structure will be sitting in the water table continuously or periodically. This causes hydrostatic pressure on both the membrane and structure and requires full encapsulation of the basement structure with a tanking membrane, under slab and walls.

Damp proofing: This is waterproofing used where the water table is lower than the structure and there is good free-draining fill. The membrane deals with shedding of water and the ingress of water vapour only, with no hydrostatic pressure.

Generally, this incorporates a damp-proof membrane (DPM) to the walls with a polythene DPM under slab. With higher grade DPM, some protection from short-term Hydrostatic pressure can be gained by transitioning the higher quality wall DPM to the slab polythene under footing, rather than at the footing face.




TYPE A
Waterproofing and Gas protection as a combined system

Wykamol stock a large range of waterproofing and gas combined membrane systems with full British board of agreement certifications

Our products have been developed to enable developers and contractors to protect new buildings against gases contained in contaminated land. They are designed in-line with current guidelines BS 8485 2015+A1:2019 in combination with our state of the art manufacturing facility. We offer sustainable and durable barrier systems, designed to protect the structure for the intended lifetime.

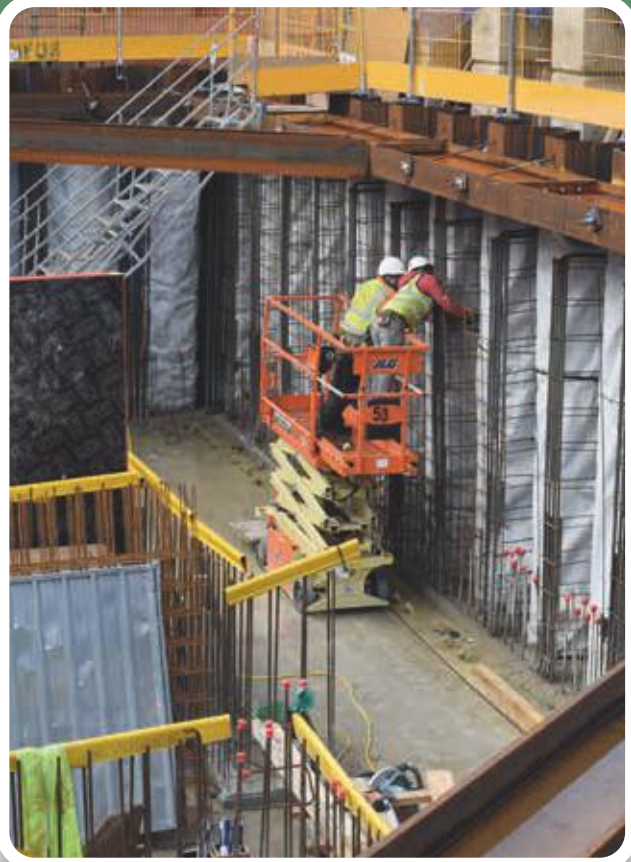
For developers of Brownfield and contaminated sites, the family of products – TITANFLEX, TITANTANK and TITANBOND – represent a major step forward in safeguarding projects against gaseous and chemical contamination.

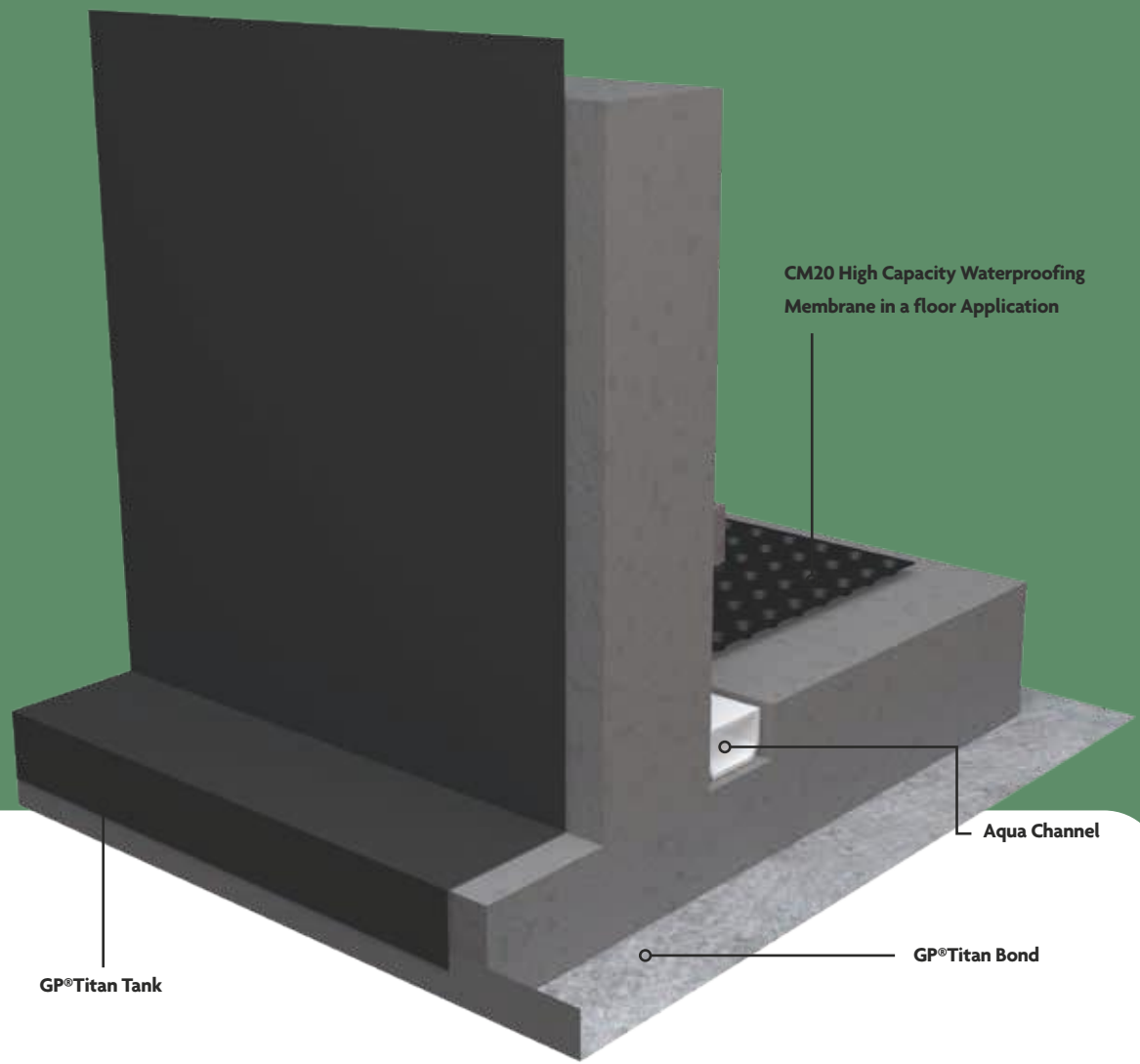
The gas protection membranes were developed in response to a change in Government guidance regarding ground gases and an increasing awareness of the detrimental effects to human health from hazardous chemicals residing in the ground below developments.

Radon is a colourless, odourless, radioactive gas that occurs in rocks and soils, some building materials and water. The ground is the most important source as radon can seep out and build up in houses and indoor workplaces. Wykamol are able to offer full Radon protection systems and basic radon protection systems using our range of approved membranes

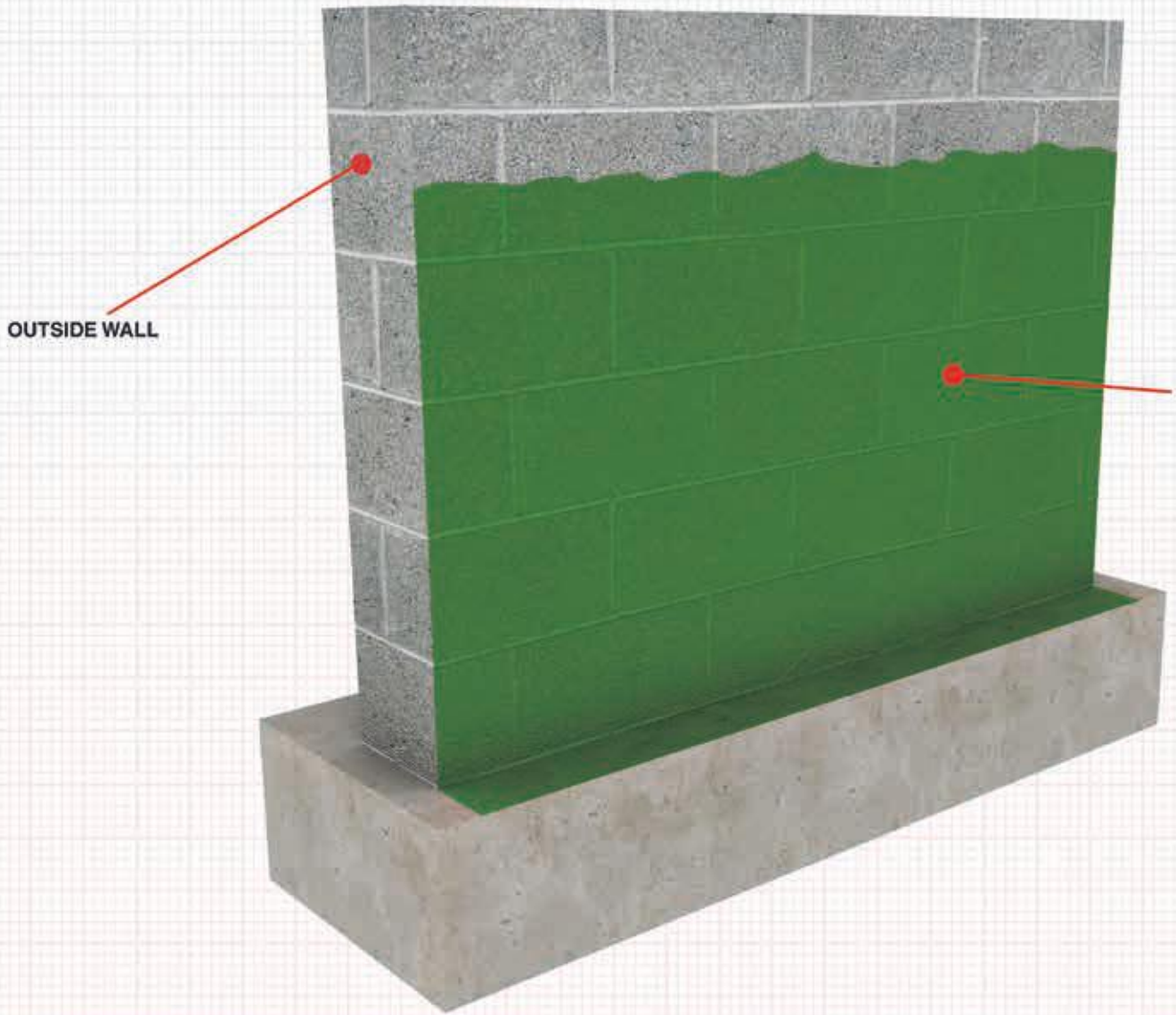
VOCs (Volatile Organic Compounds) and Hydrocarbons are dangerous to human health and can have long-term health effects. JUTA UK have embarked on extensive testing to arrive at best in class gas protection membranes, which fully conforms to the latest standards.

Diagram shows a ‘Type A’ waterproofing and Gas proofing application along with a ‘Type C’ maintainable system conforming to NHBC Chapter 5.4 and BS8102





DRAWINGS INDEX



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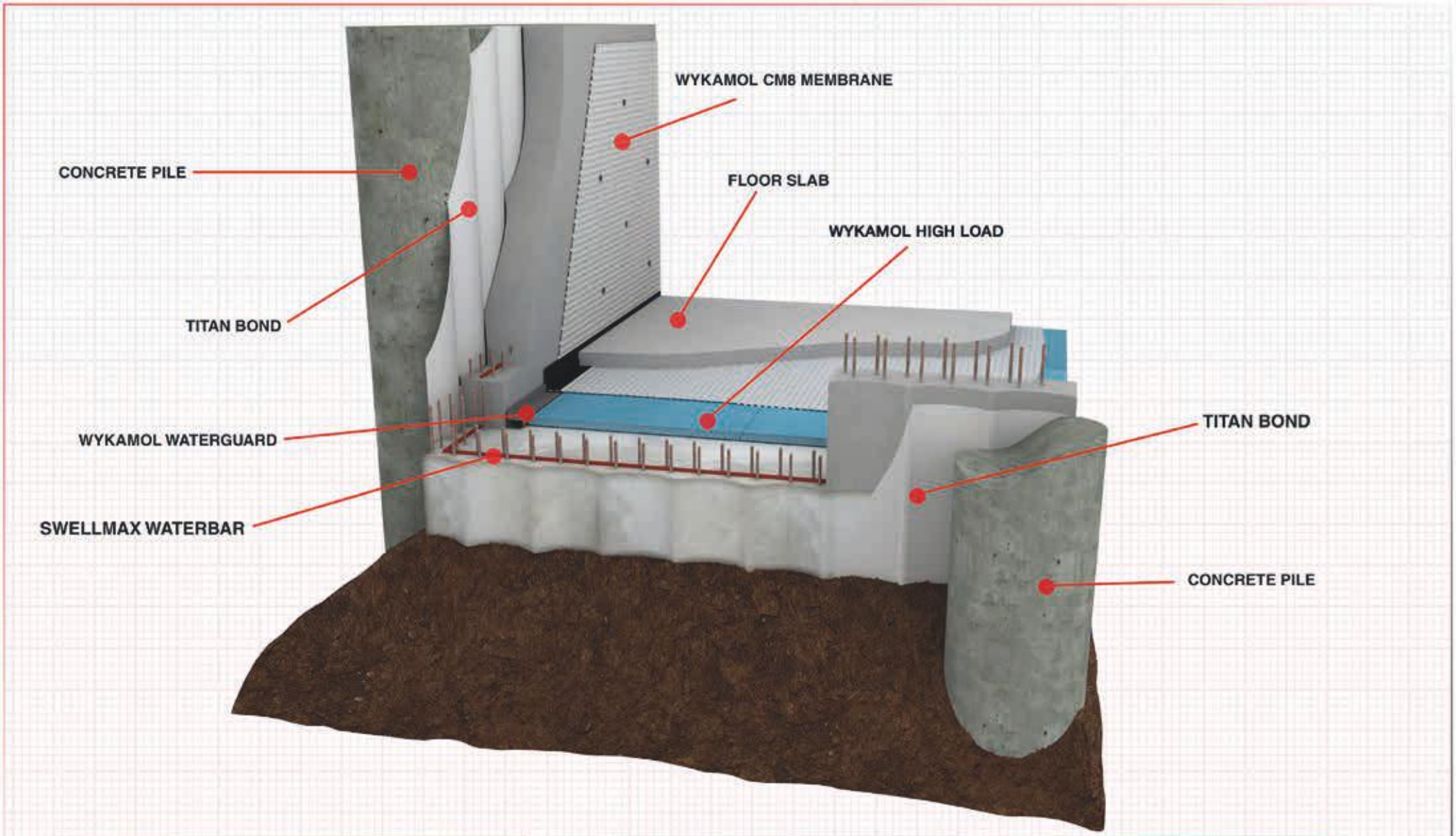
WYKAMOL M400 GAS PAINT

Drawing Detail Wp085

NOT TO SCALE

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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CONCRETE PILE

Drawing Detail Wp001

NOT TO SCALE

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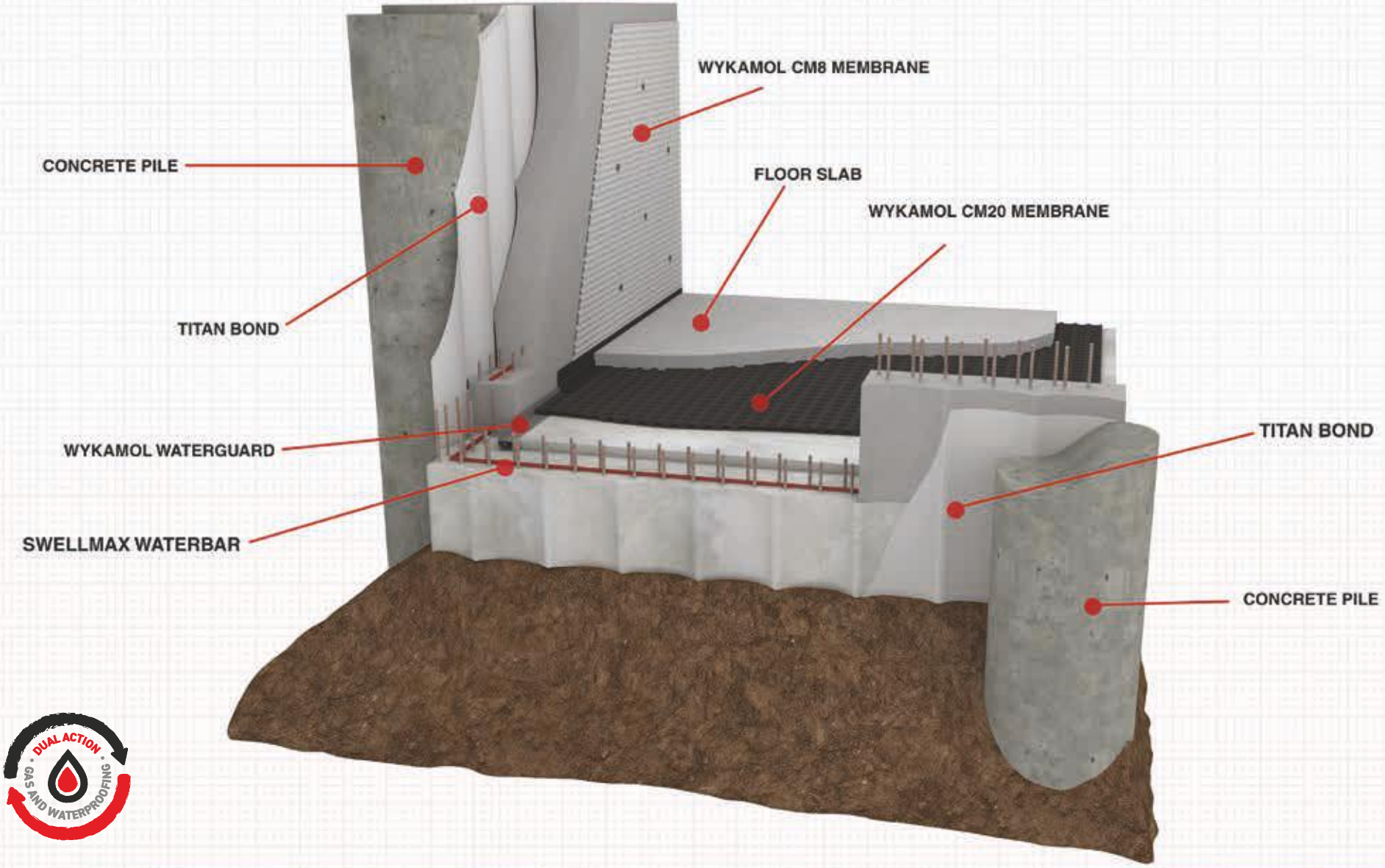

DUAL ACTION GAS AND WATERPROOFING

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CONCRETE PILE

Concrete pile dual gas and waterproofing detail

DRAWING DETAIL WP002

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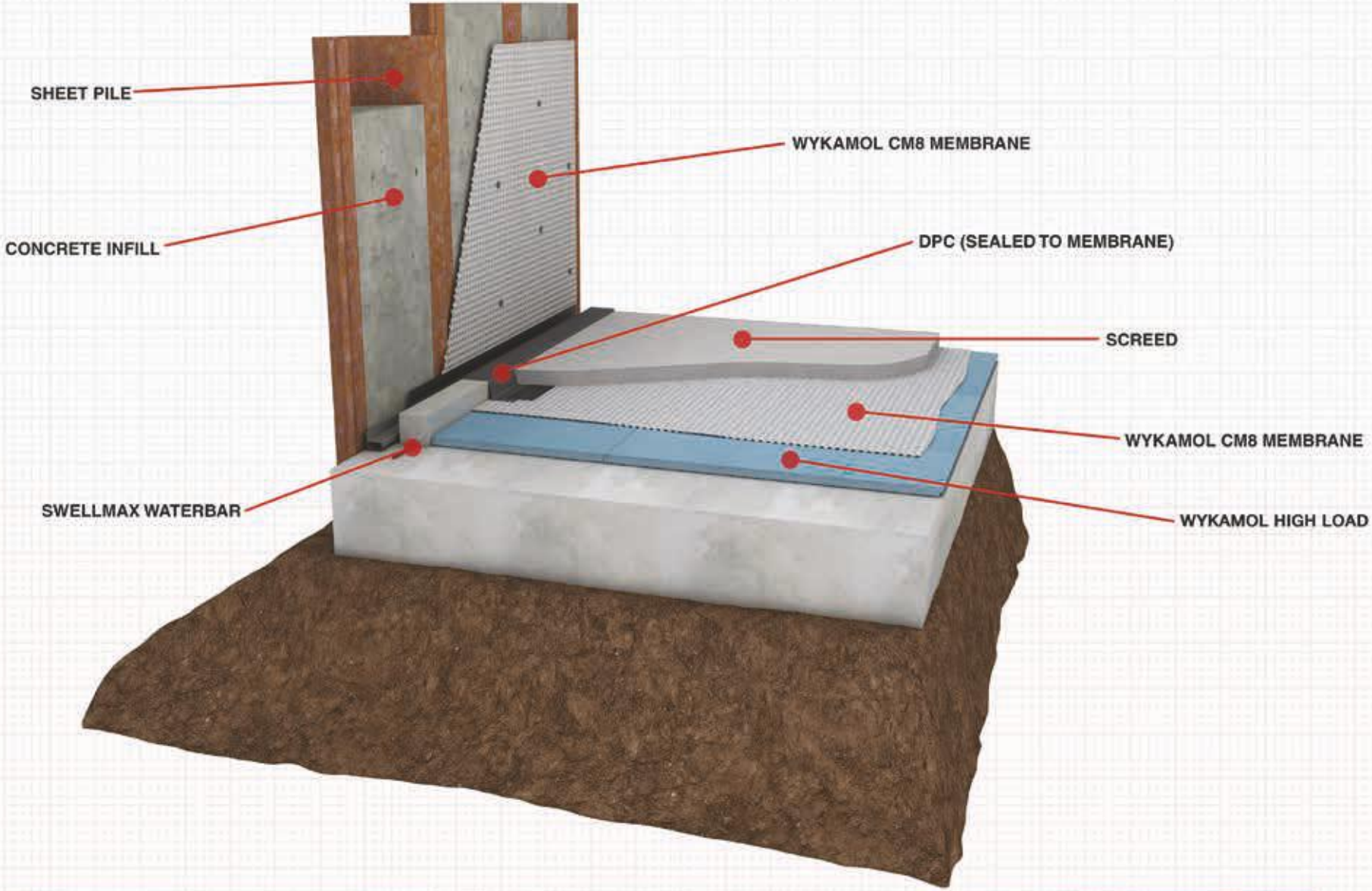

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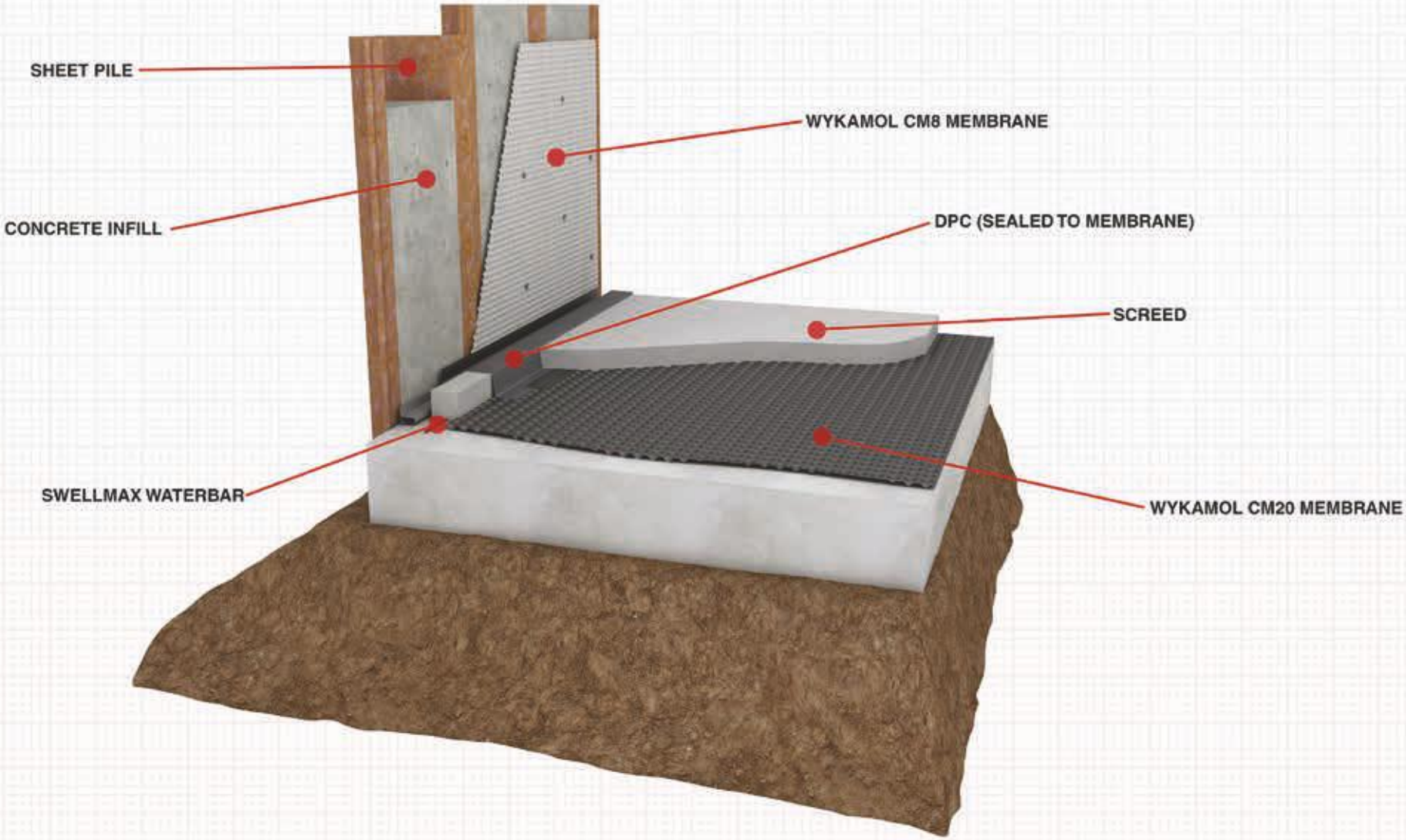
SHEET PILE

Sheet pile with cavity membranes and danopren

DRAWING DETAIL WP010

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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SHEET PILE

Sheet pile with cavity drain membranes

DRAWING DETAIL WP009

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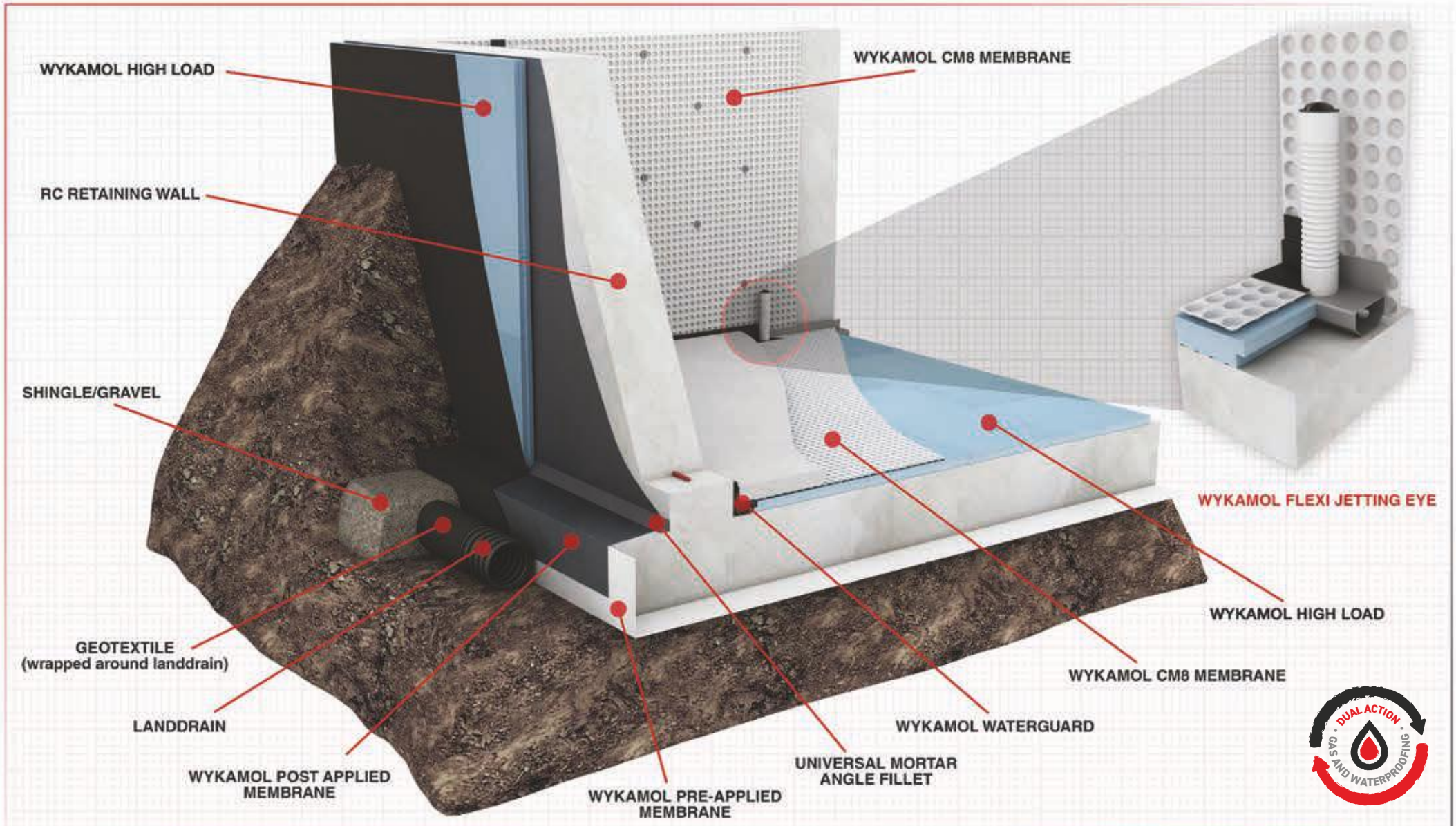

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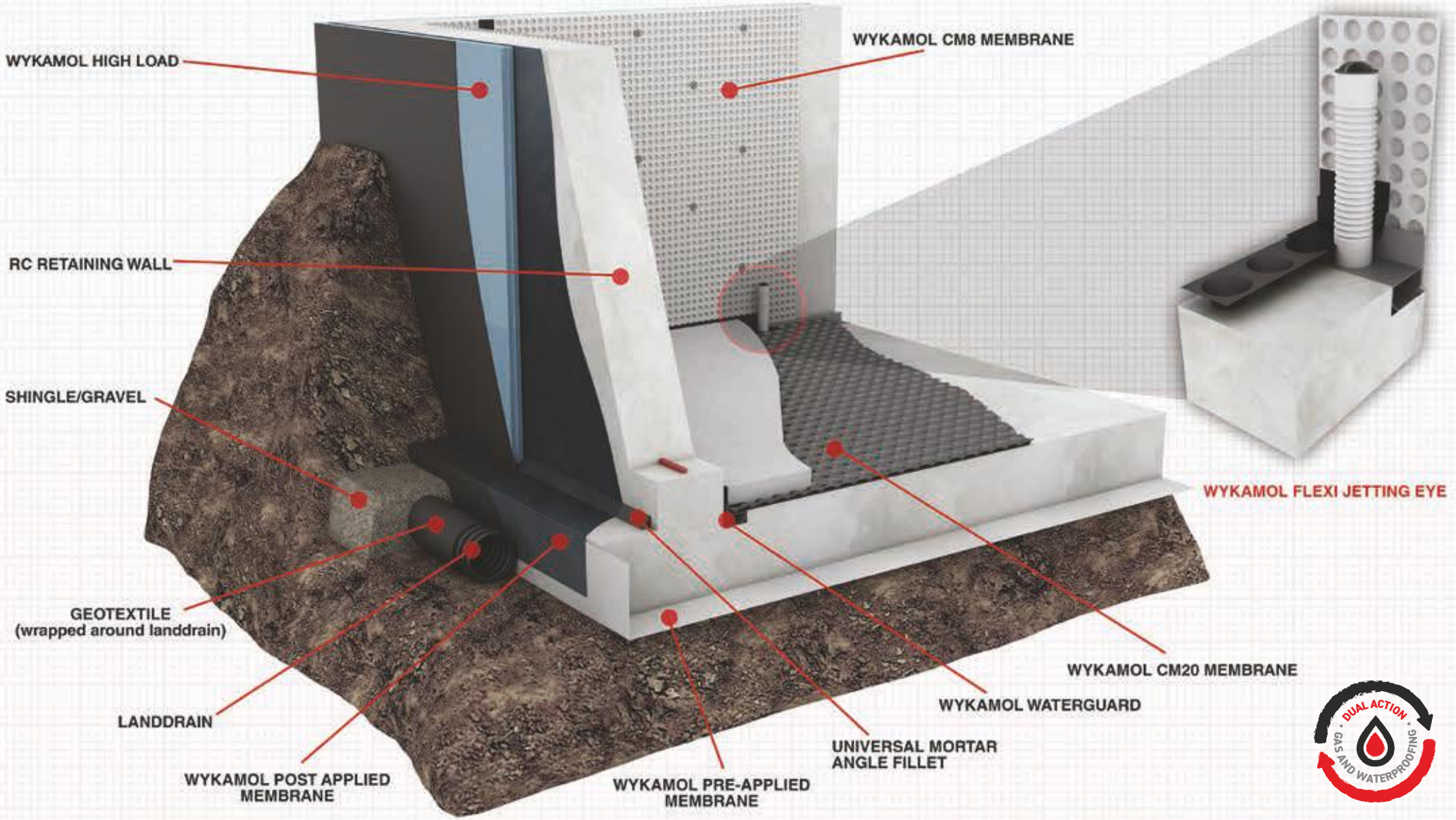
RC BASEMENT

RC basement with dual waterproofing and gas

DRAWING DETAIL WP035

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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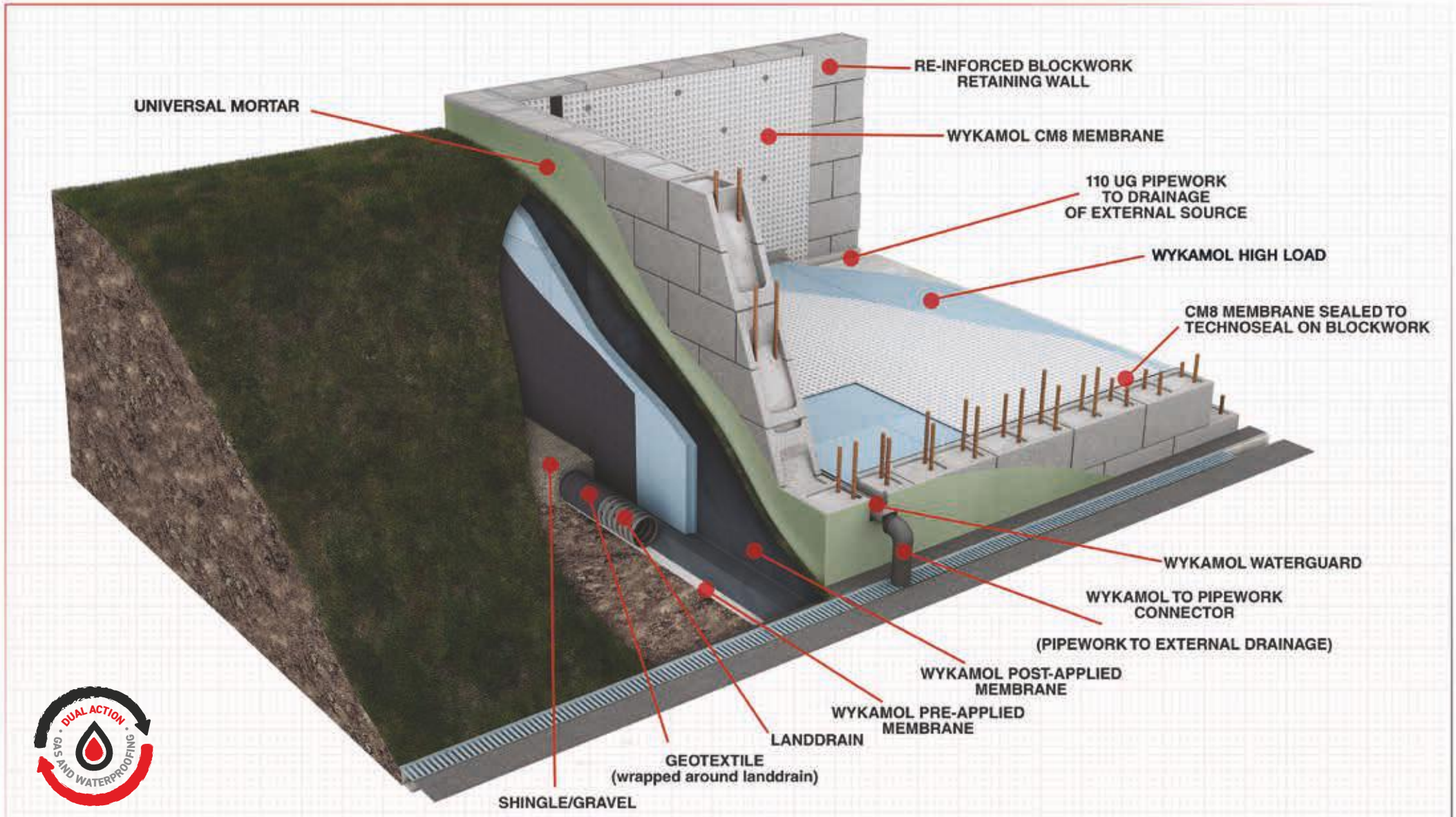
RC BASEMENT

RC basement with dual waterproofing and gas

DRAWING DETAIL WP036

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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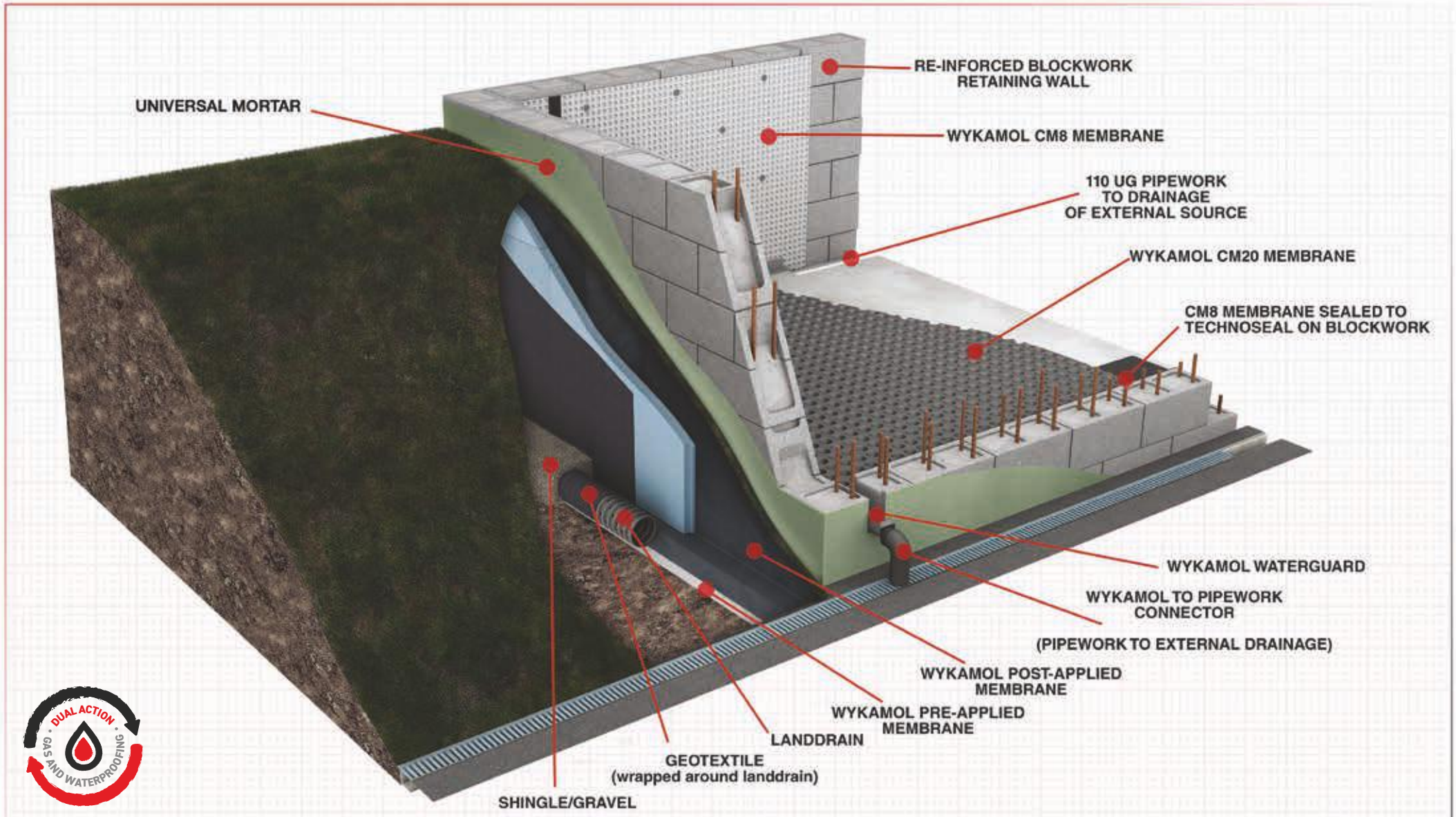
SLOPING SITE

Sloping site dual waterproofing

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system

DRAWING DETAIL WP039



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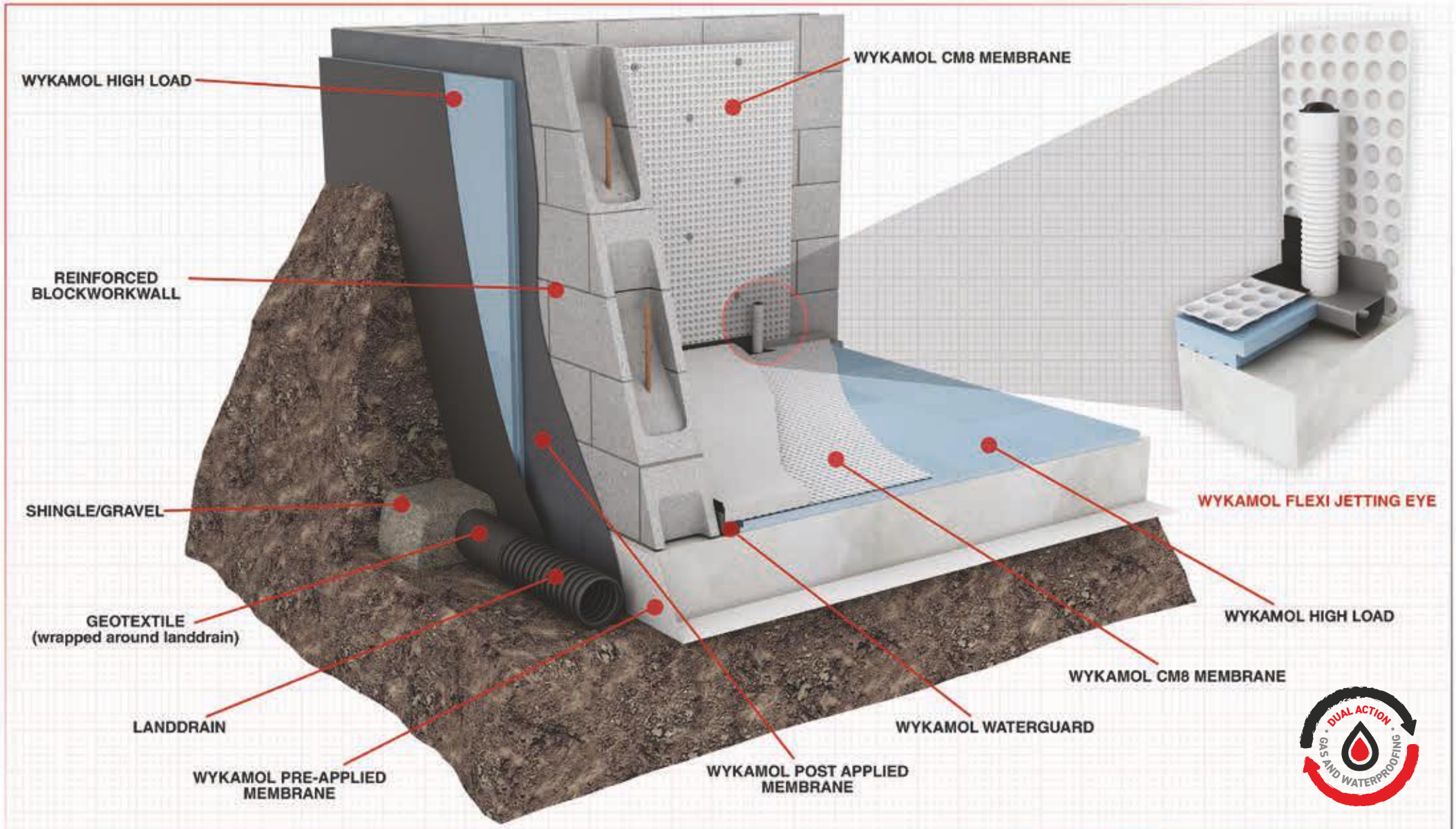
SLOPING SITE

Sloping site dual waterproofing

DRAWING DETAIL WP040

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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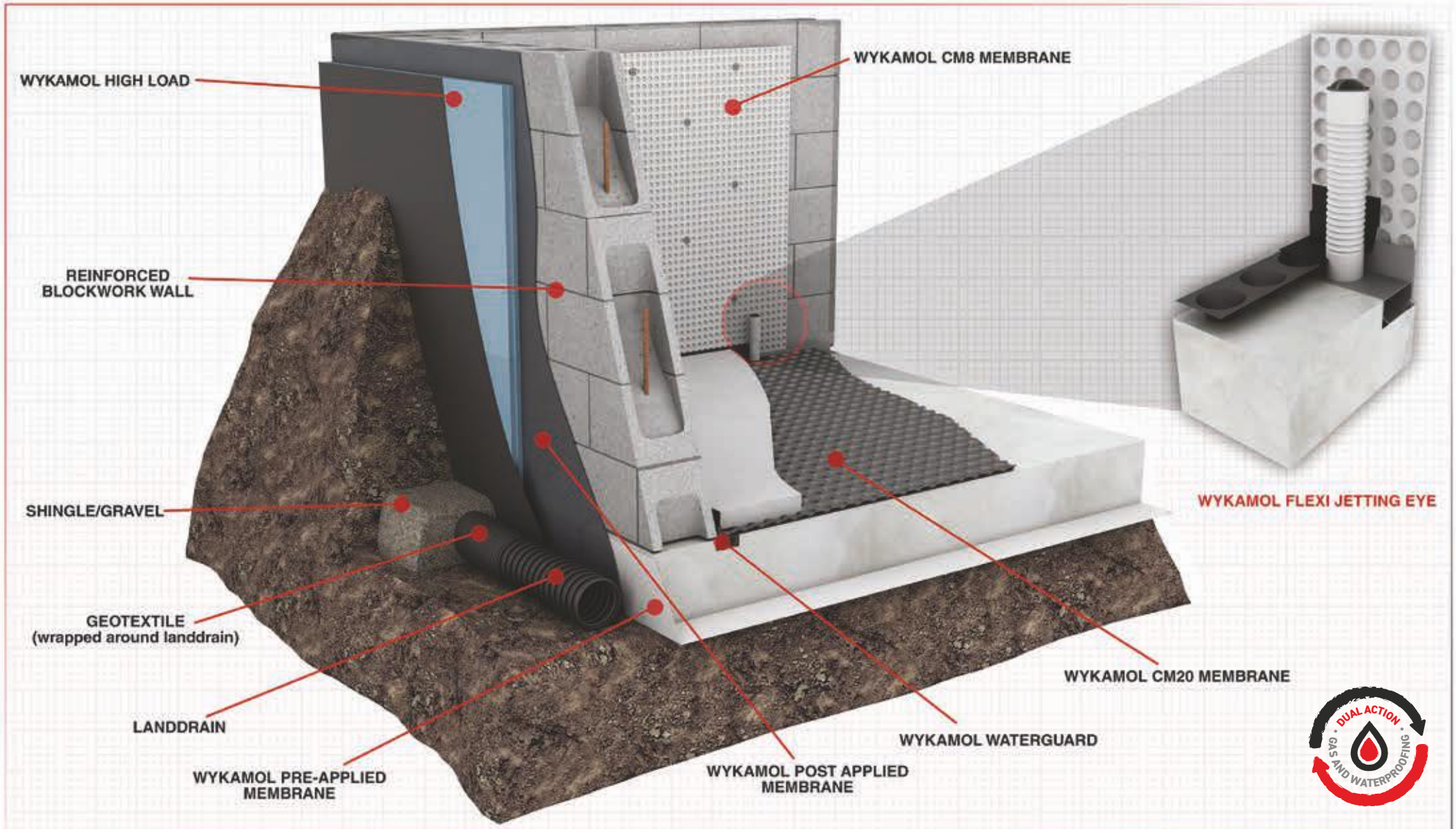
REINFORCED BLOCKWORK

Reinforced block basement dual waterproofing

DRAWING DETAIL WP032

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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REINFORCED BLOCKWORK

Reinforced block basement dual waterproofing

DRAWING DETAIL WP033

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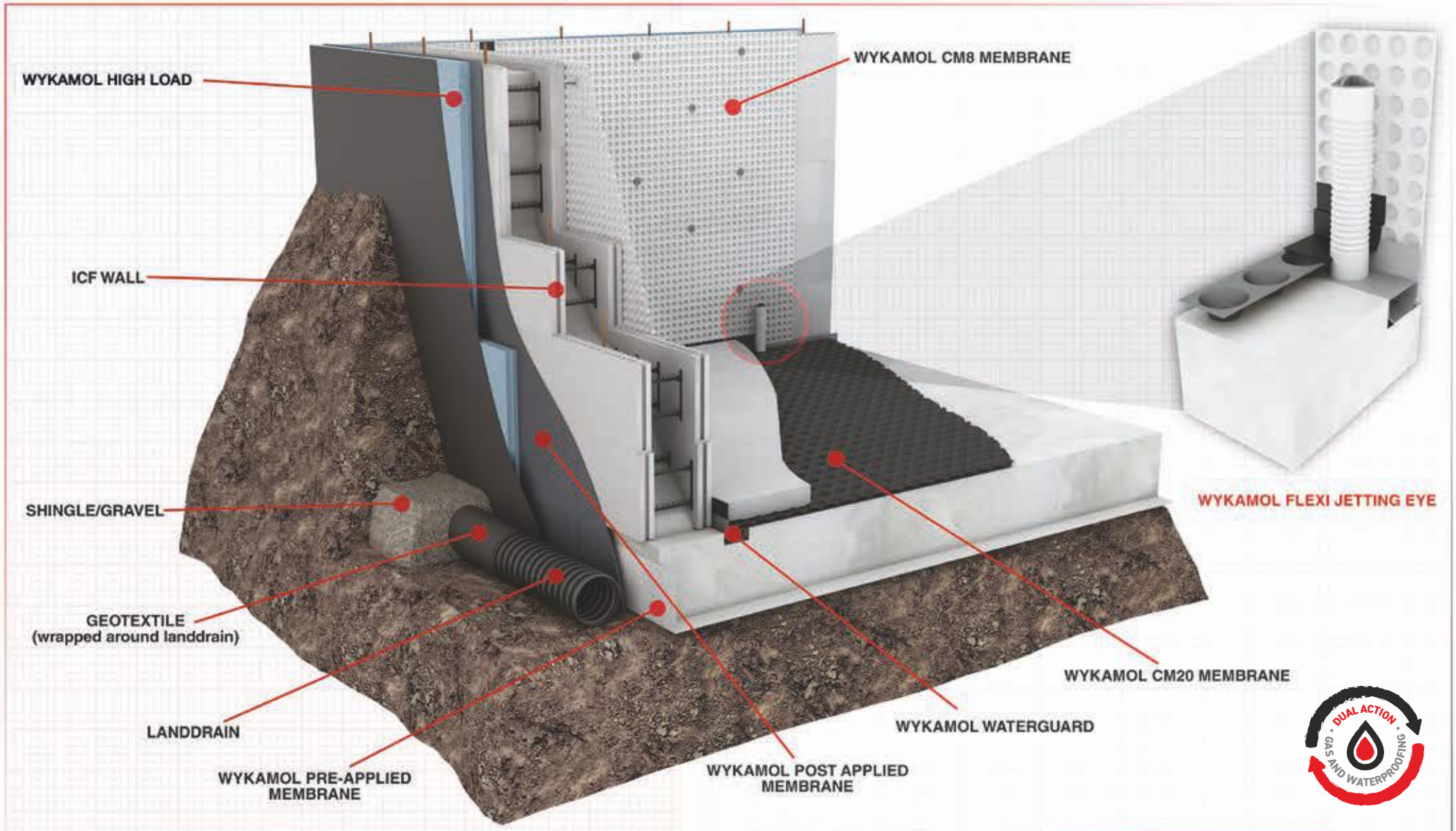

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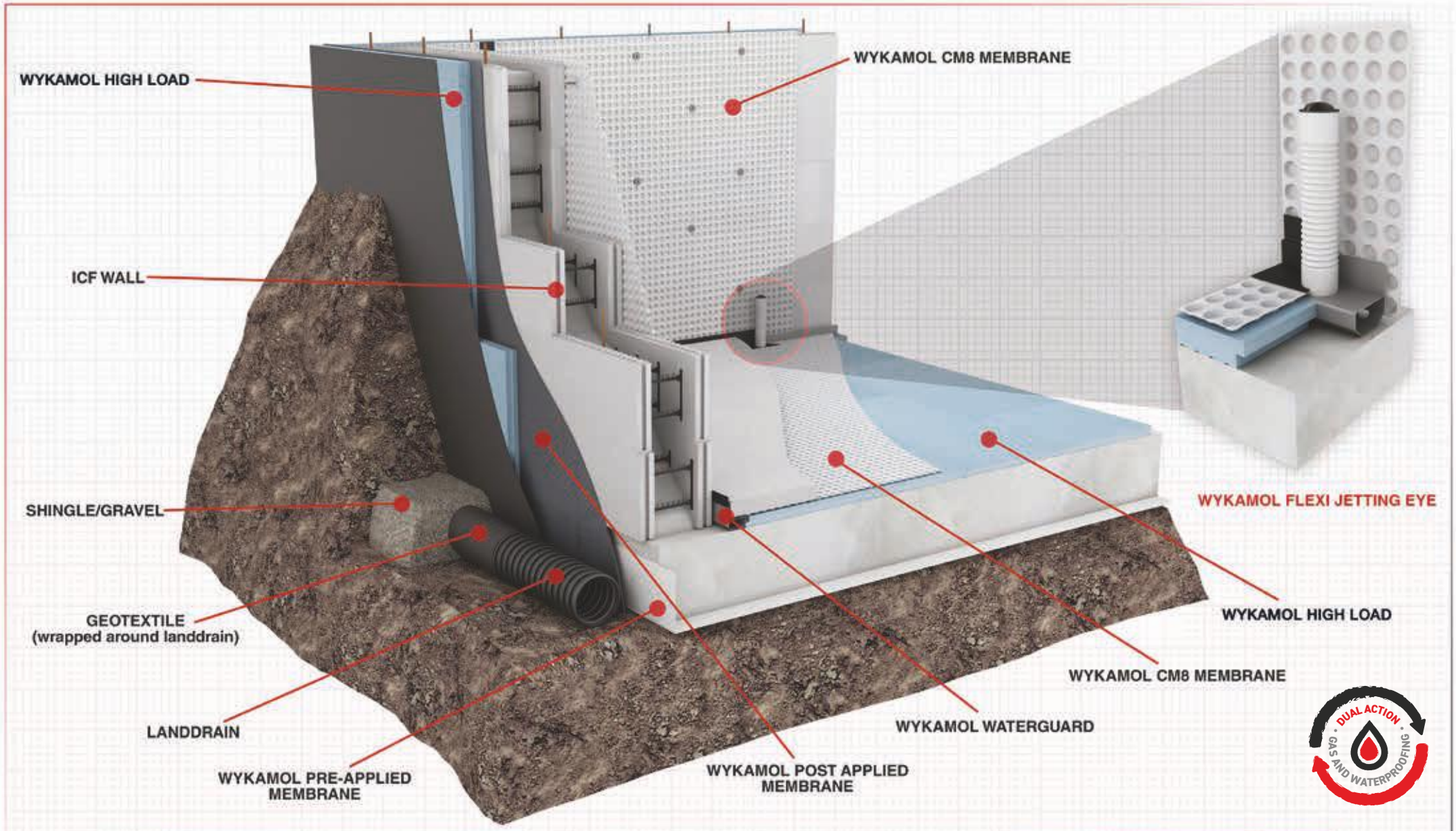
ICF BASEMENT

ICF basement with dual waterproofing

DRAWING DETAIL WP030

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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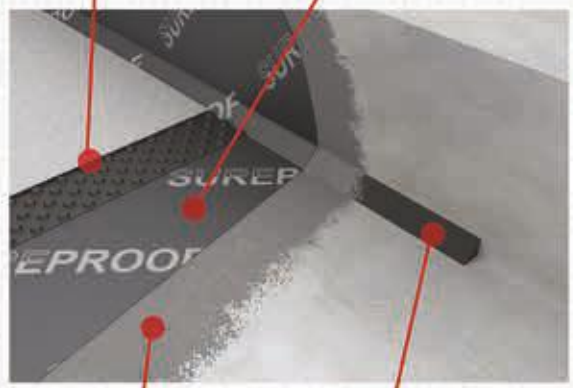
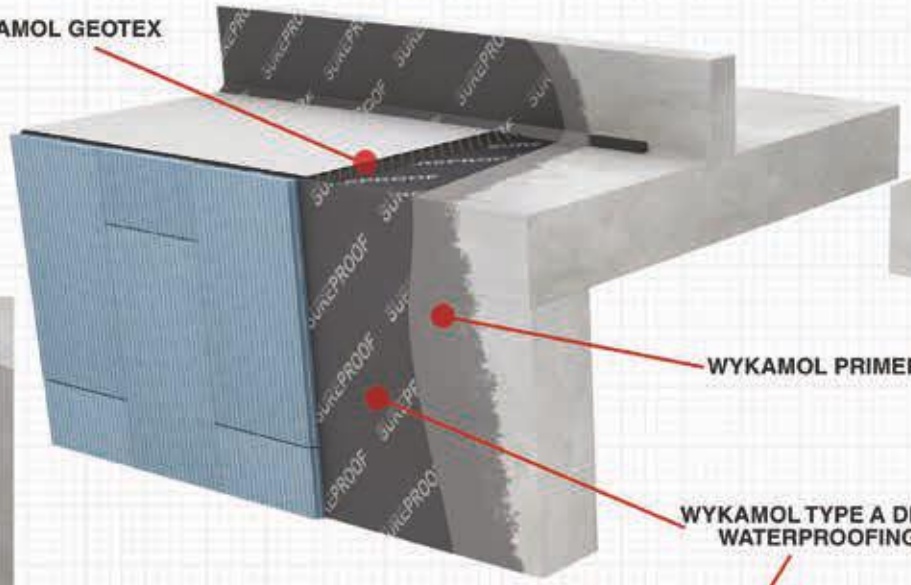
ICF BASEMENT

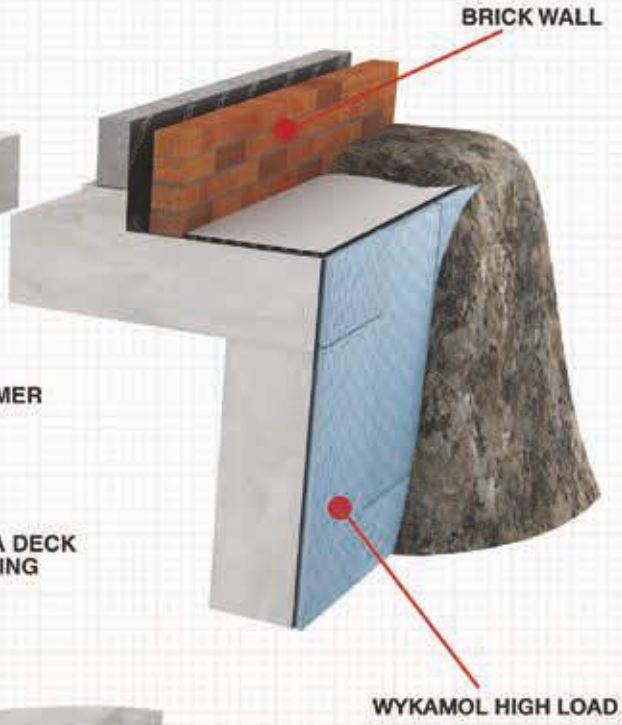
ICF construction dual waterproofing and gas

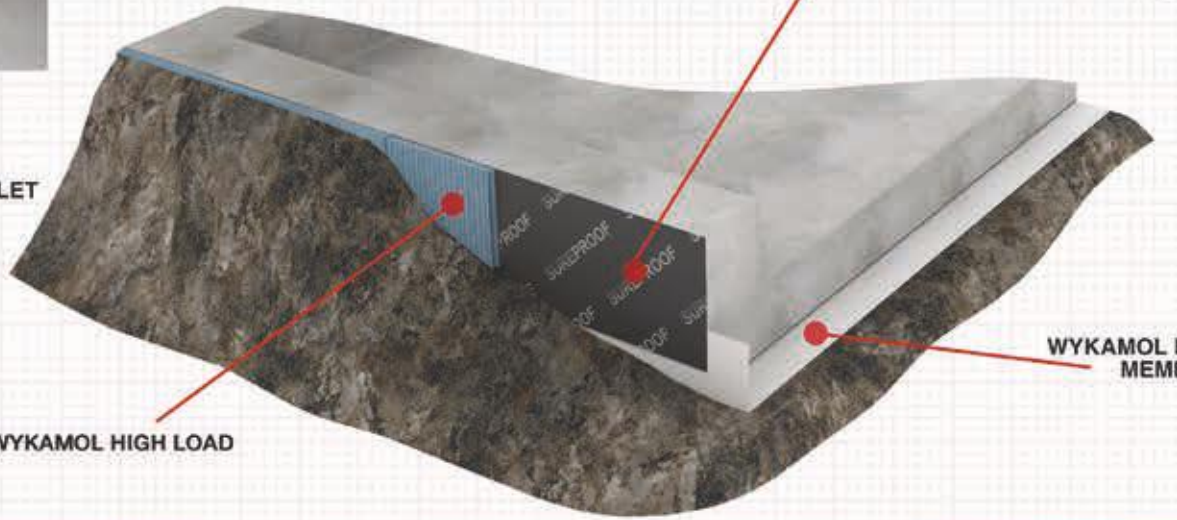
DRAWING DETAIL WP26

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system









DUAL ACTION · GAS AND WATERPROOFING ·

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MULTI HEIGHT

Multi height with deck waterproofing

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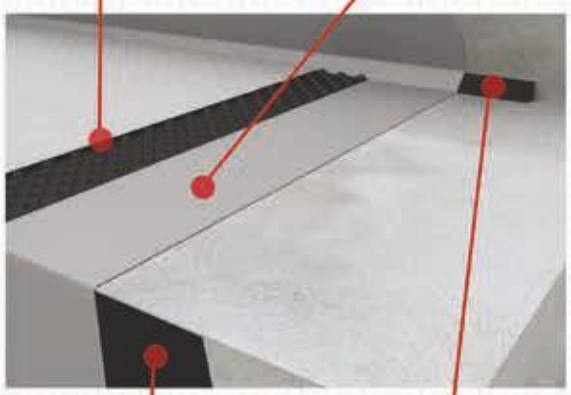
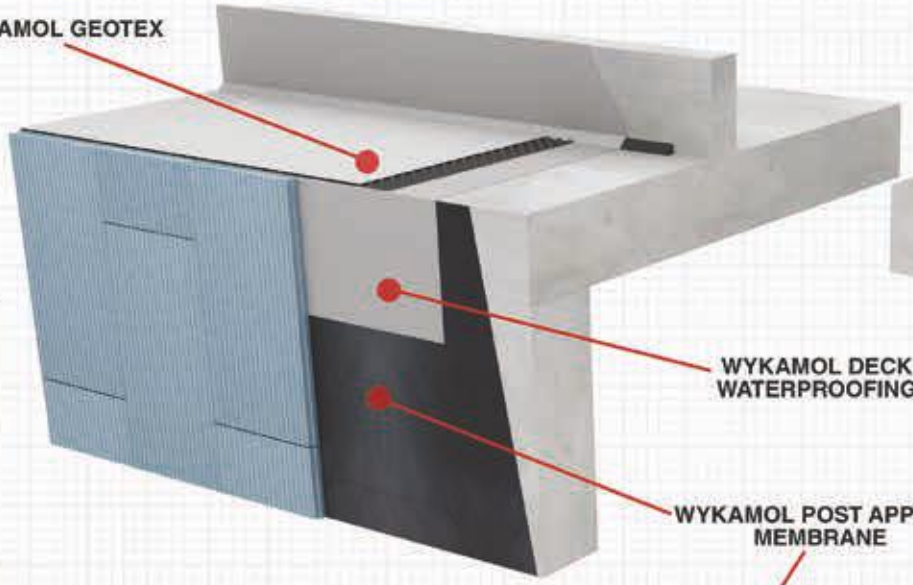
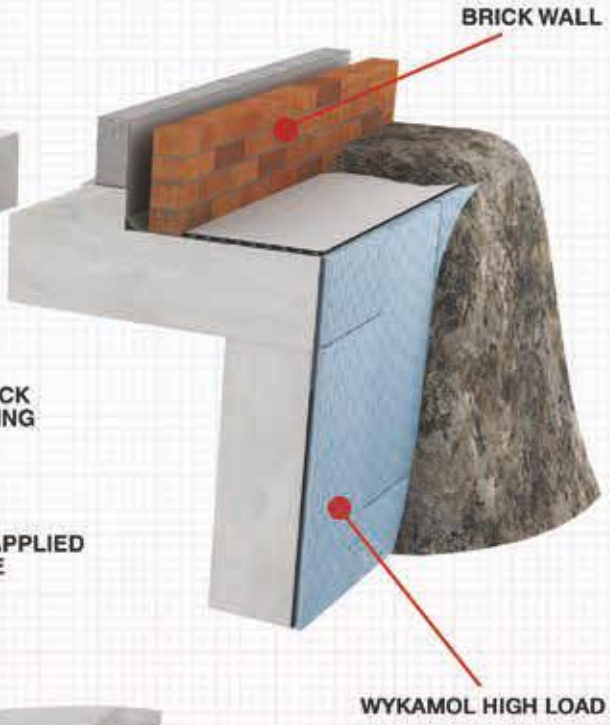
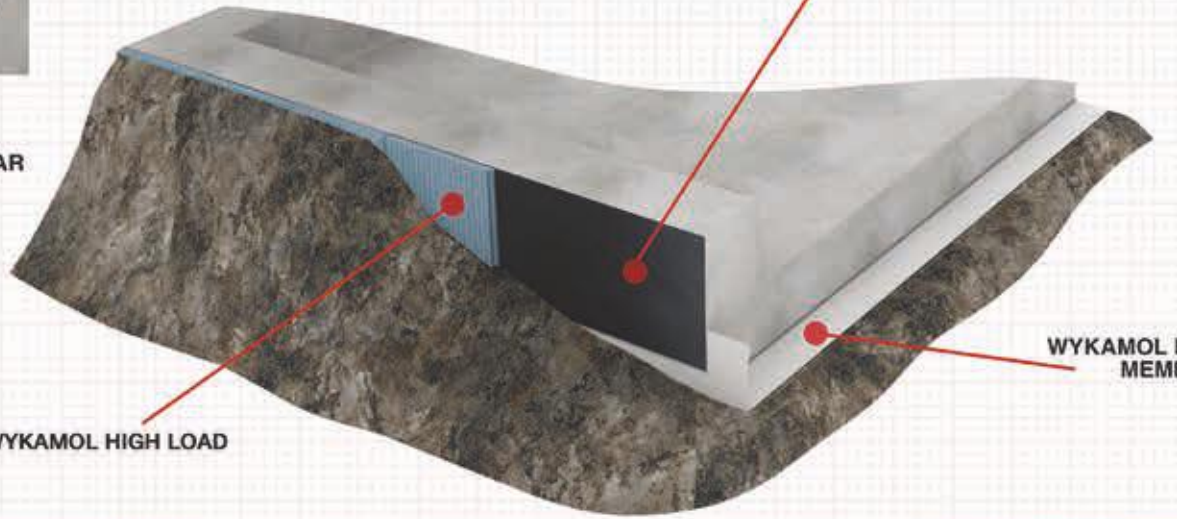
DRAWING DETAIL WP028









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MULTI HEIGHT

Multi height deck waterproofing with protection

DRAWING DETAIL WP025

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Waterstops or Waterbar

Waterstops or waterbars are flexible tape like elements of a concrete structure that prevent the passage of water through concrete joints.

Concrete joints are most liable to seepage. They are designed as fluid tight diaphragm embedded in or running along the joints. The join is as watertight as the waterbar that join them.

PVC Waterstops

For sizeable concrete structures like retaining walls, basements, reservoirs and tunnels joints are inevitable. It can be construction or expansion joints or both. Joints in direct contact with water need the protection of a waterbar. They are hydrophilic or impervious strips cast into the concrete at the joints to prevent the passage of water.

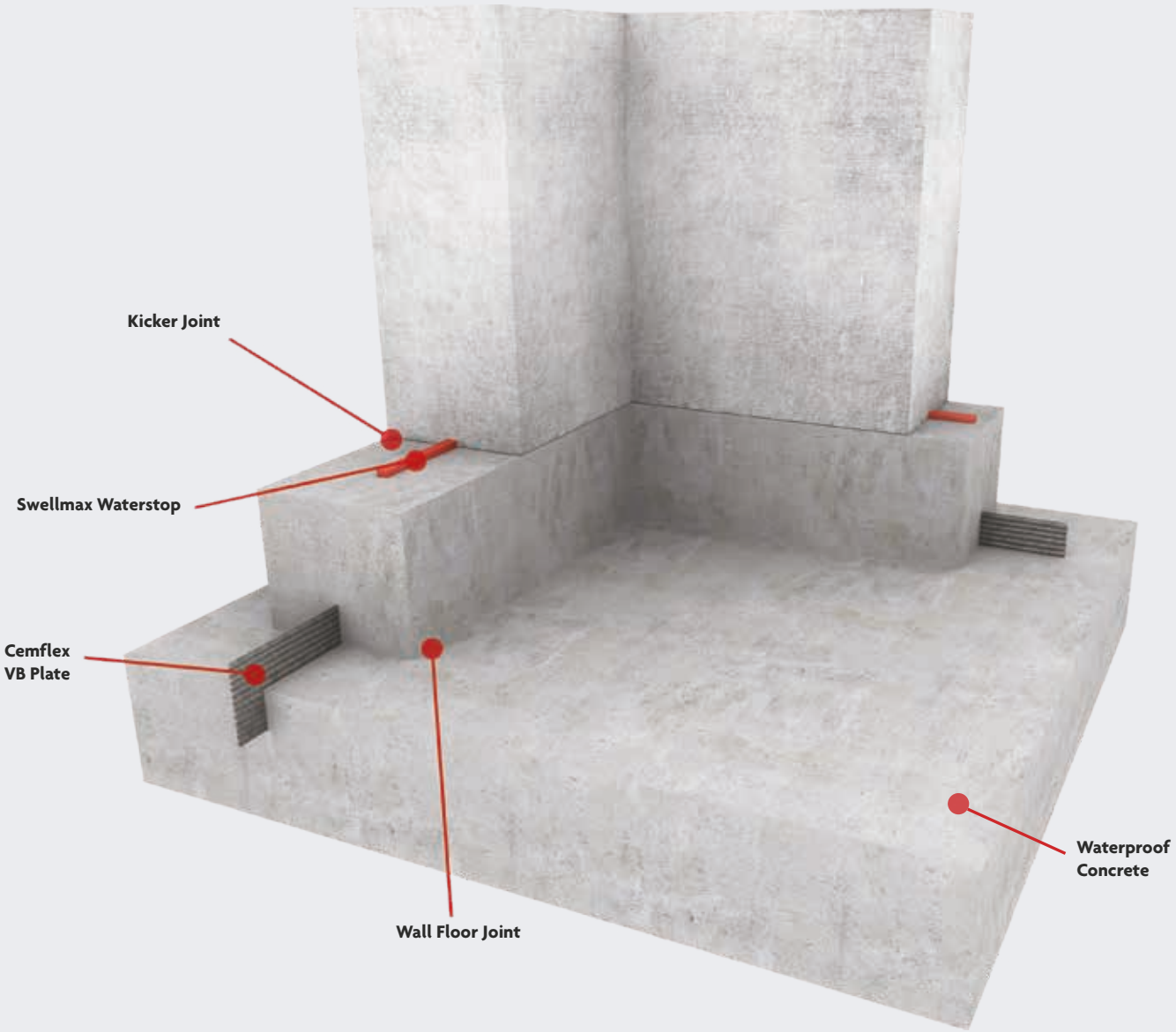
Placing Waterstops

Waterstops placed centrally provide efficient barrier to penetration of water from either face of slab or a wall. It should be carefully fixed in the formwork before concreting. On the other hand externally placed waterbars are easy to fix by nailing through "outboard" flange. These prevent passage of water from outside of the structure. External waterstops are usually used in piled wall basement construction. The primary functions of a waterbar is to act as a waterproofing seal in the joint. It allow movement of two sections independently of each other without restraint (free of tension). PVC waterstops are always be joined by welding by heating and never by lapping. Waterbars are supplied in rolls.

Applications of Waterstops or Waterbars

Waterstops used in construction industry provides waterproofing. Waterbar is used in water and transportation industry to improve the quality of construction. Common structural applications are in:

- Water and sewage disposal projects.
- Liquid containments.
- Dams, channels, tunnels and tanks.
- Box culverts and locks.
- Wall and slabs.
- Primary and secondary containments structures.
- Bridges and decks abutments.
- Basements and foundations


Kicker Joint
Swellmax Waterstop
Cemflex
VB Plate
Wall Floor Joint
Waterproof
Concrete

TYPE A

Cementitious Liquid Waterproofing (Barrier Protection)

Structures will often be of masonry construction; plain or reinforced concrete may be used. The latter may be in-situ or precast.

The structure is regarded as having no integral protection against water ingress and so relies on the applied waterproofing system to provide the necessary control.

Masonry walls may need a cement rendering or flush pointing to produce an acceptable surface for subsequent application of the waterproofing system chosen. The waterproofing system will, depending on its type, tolerate certain construction cracks or minor defects.

Fine hairline cracks up to 0.3mm wide in reinforced construction will generally be acceptable. Any larger or unusual cracks should be brought to the designer's attention to allow for possible remedial action before the waterproofing system is installed.

If applying the waterproofing system that is not relying on an adequate key to the substrate then it will need to be loaded (loading requires an independent wall to be constructed, and pokered concrete be poured to sandwich the waterproofing system onto the substrate.)

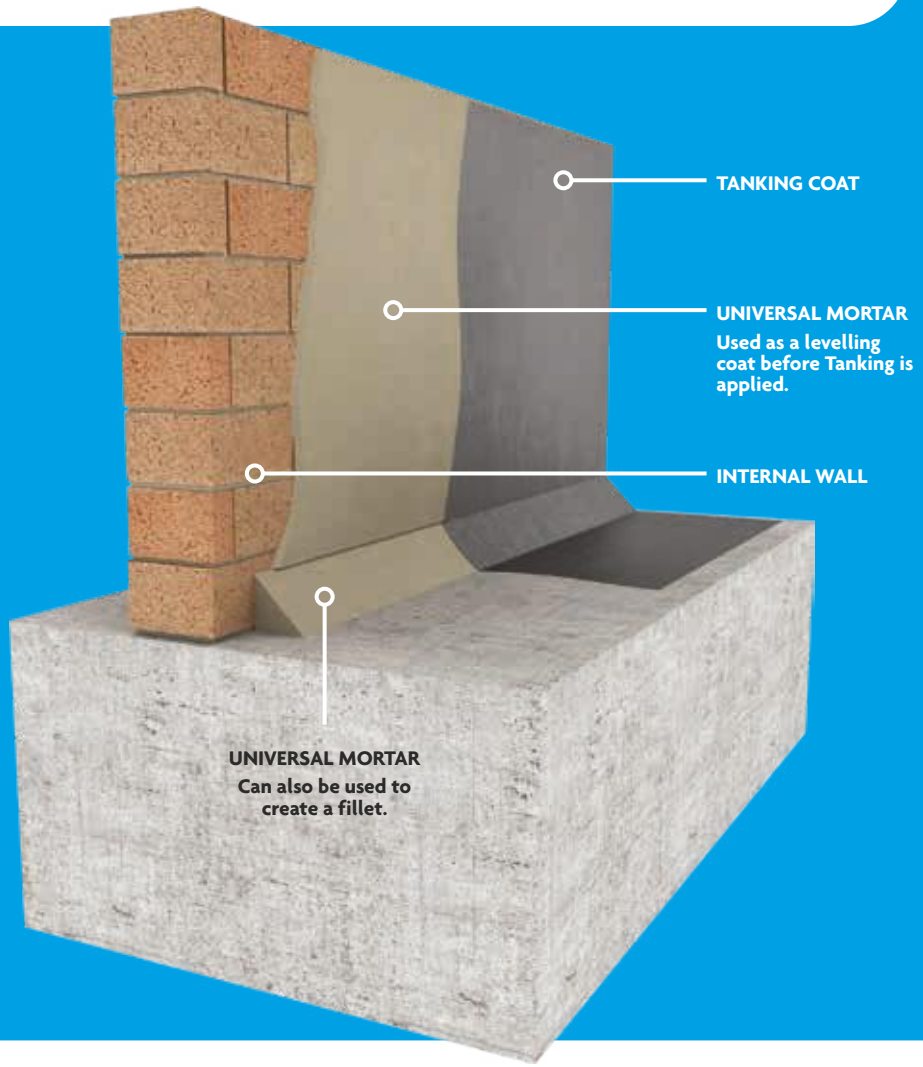
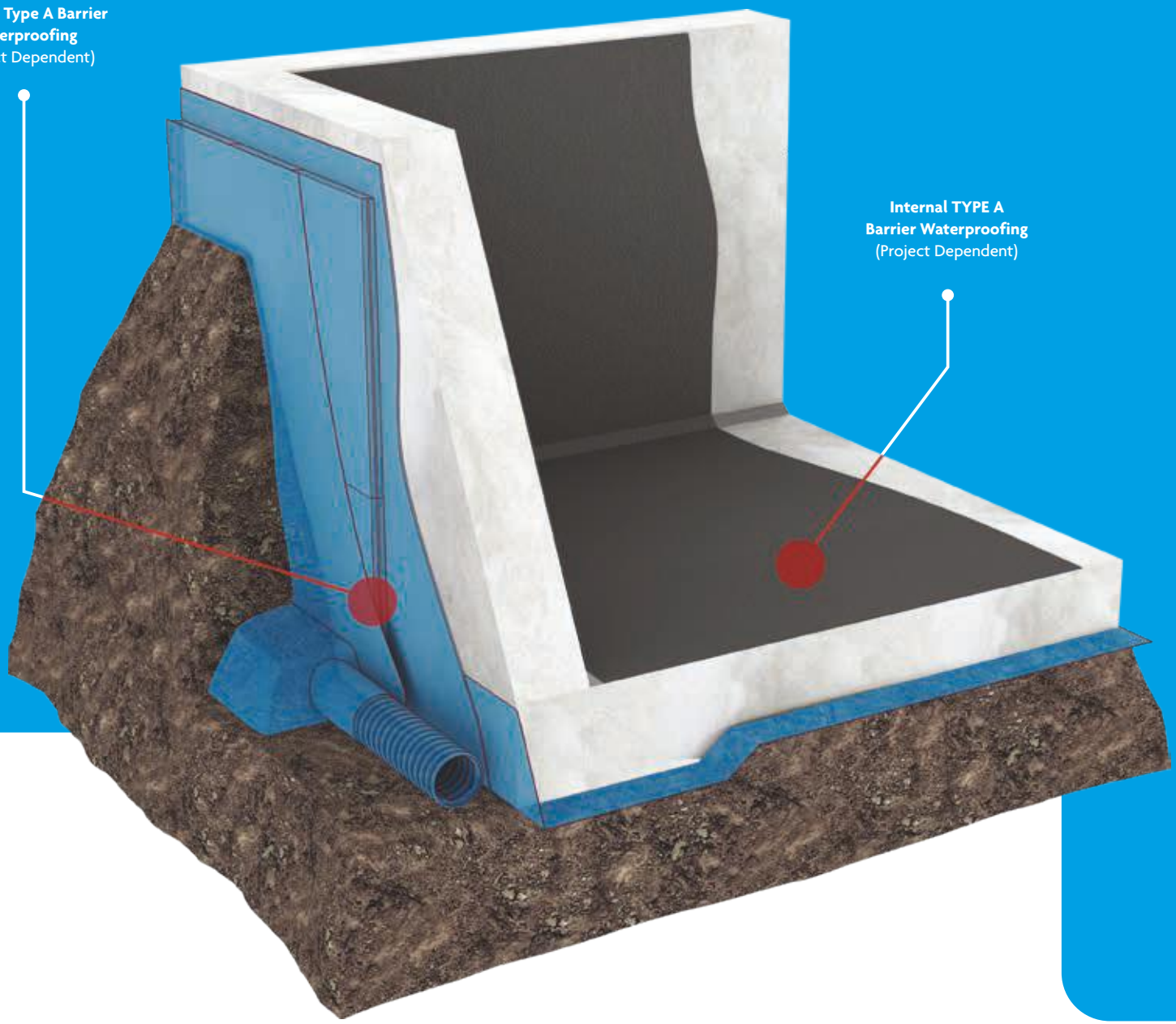


Diagram shows a 'Type A' Barrier waterproofing



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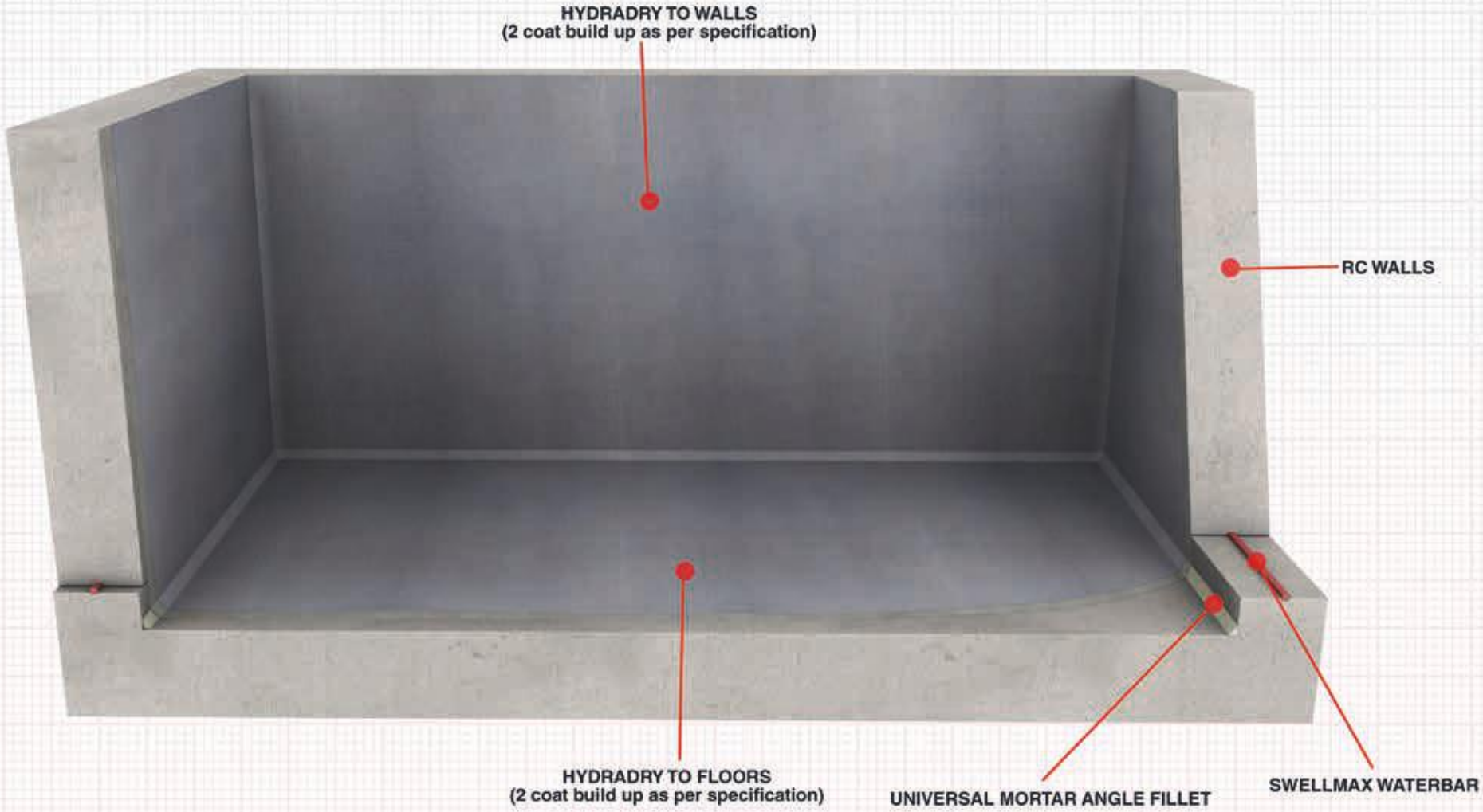

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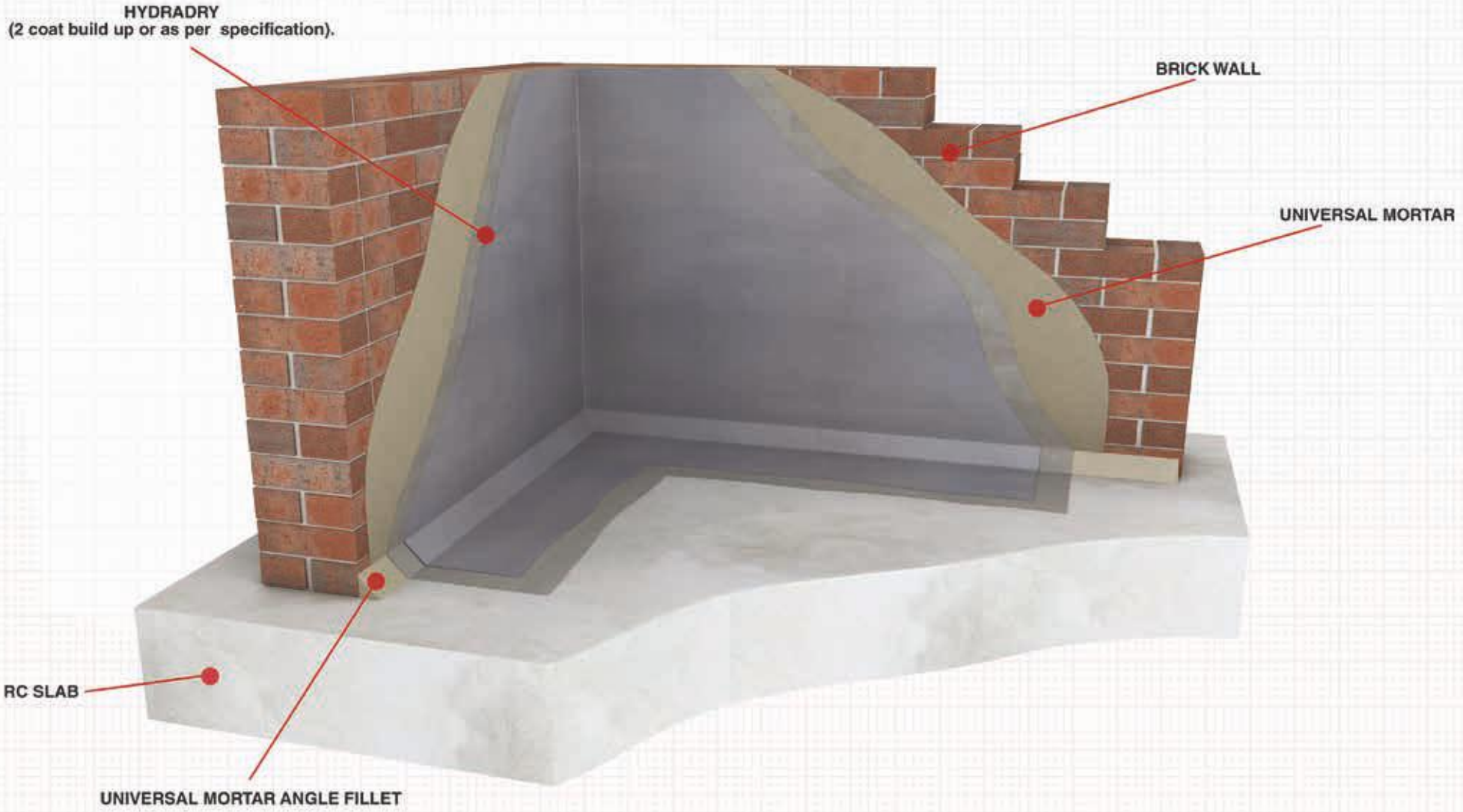
RC BASEMENT
HYDRADRY

Drawing Detail Wp0106

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system

NOT TO SCALE



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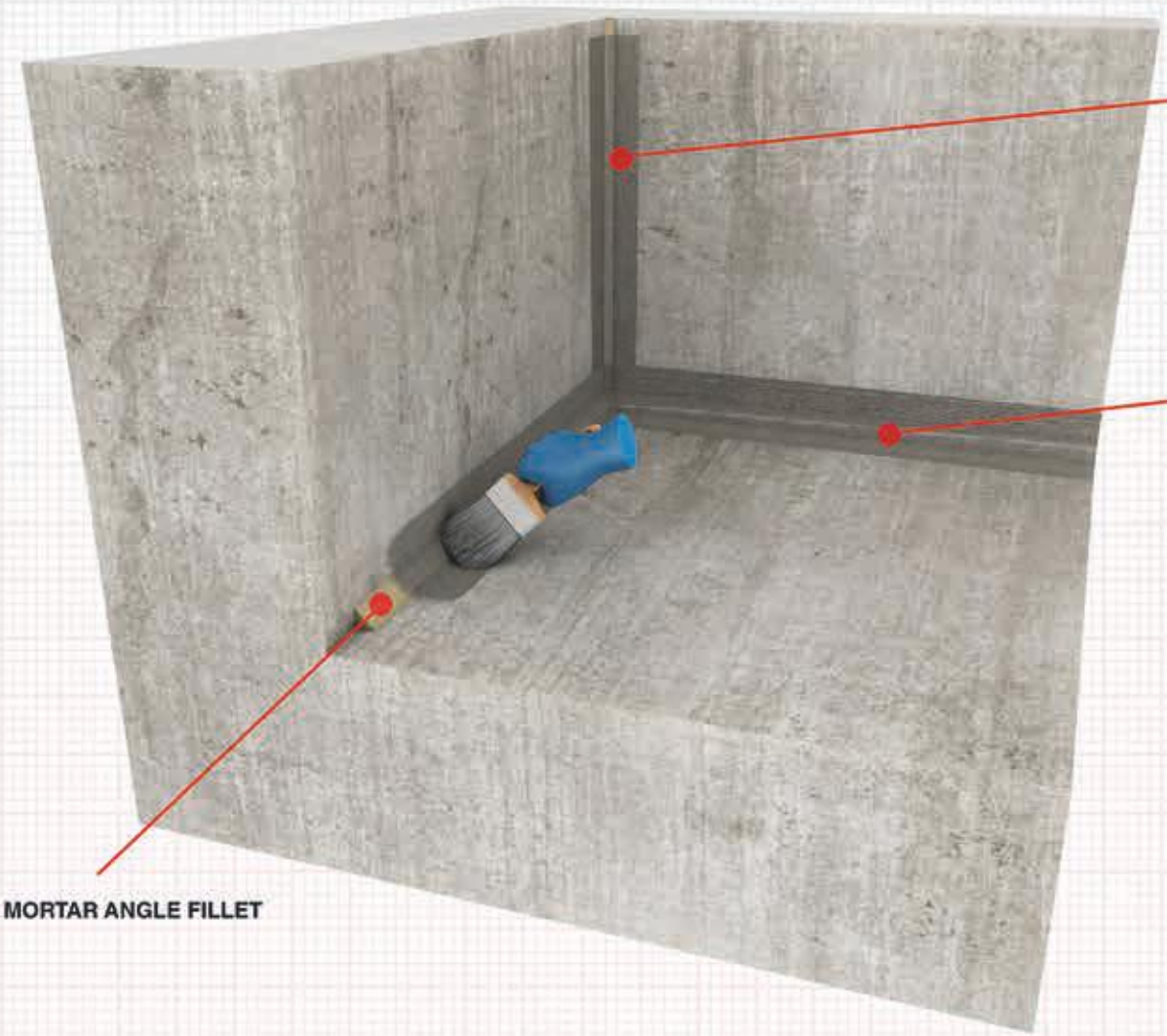
BRICK BASEMENT
WITH WATERPROOFING SLURRY
Drawing Detail Wp077

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



WYKAMOL HYDRAFLEX
(Brushed into Vertical corner joint/expansion joints)

WYKAMOL HYDRAFLEX
(Brushed into Wall floor joint/expansion joints)

UNIVERSAL MORTAR ANGLE FILLET

FINISHED WITH HYDRADRY
ACROSS WALLS AND FLOORS TO CREATE TYPE A WATERPROOFING

ALTERNATIVELY

HYDRAFLEX CAN BE USED ACROSS WALL AND FLLORS TO FINISH

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HYDRAFLEX
Drawing Detail Wp0124

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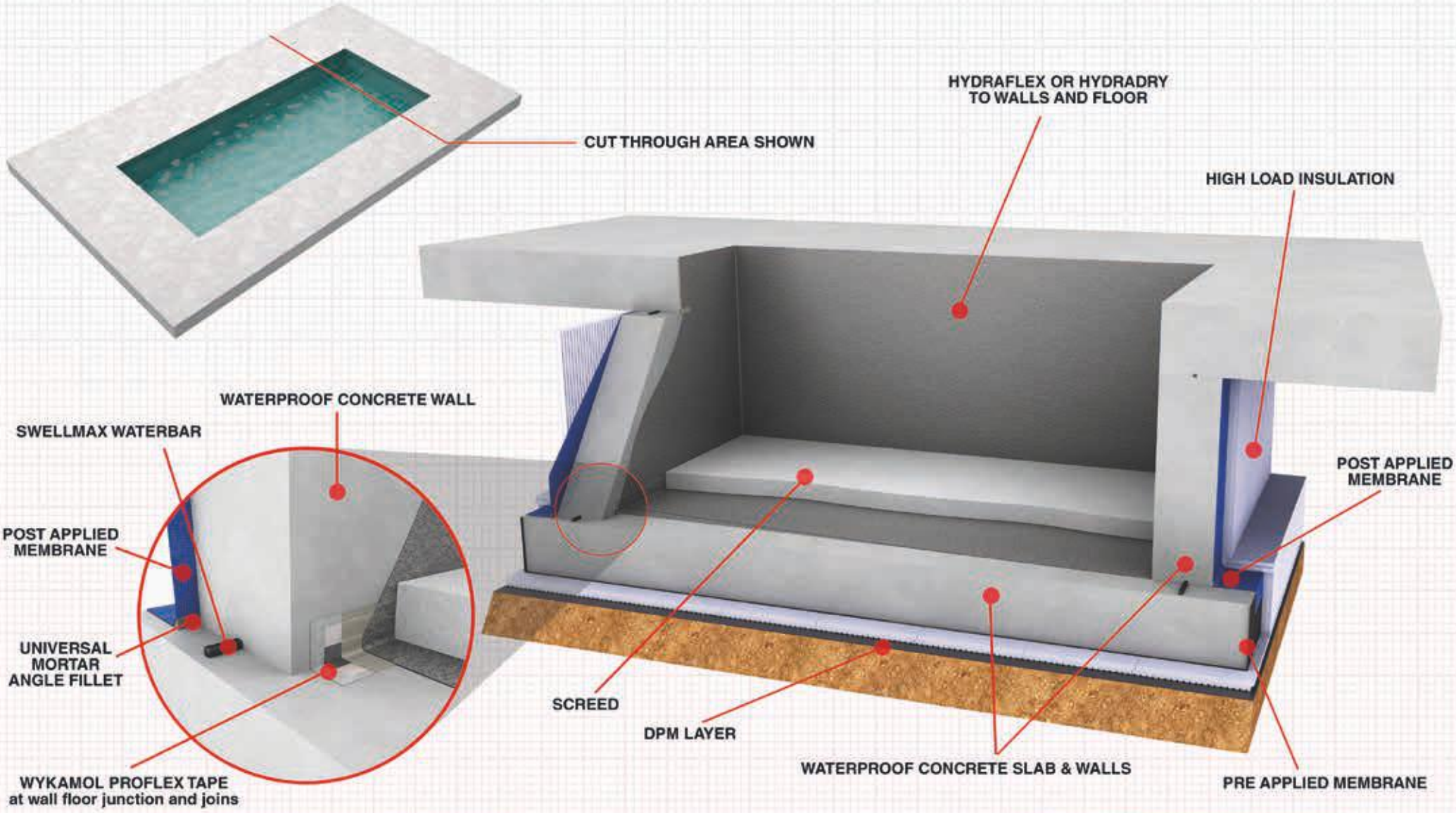

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SWIMMING POOL
Drawing Detail Wp0154
NOT TO SCALE

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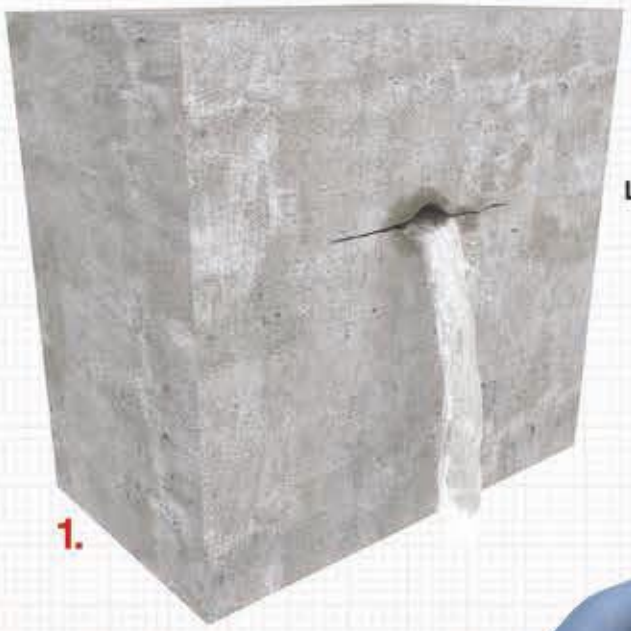
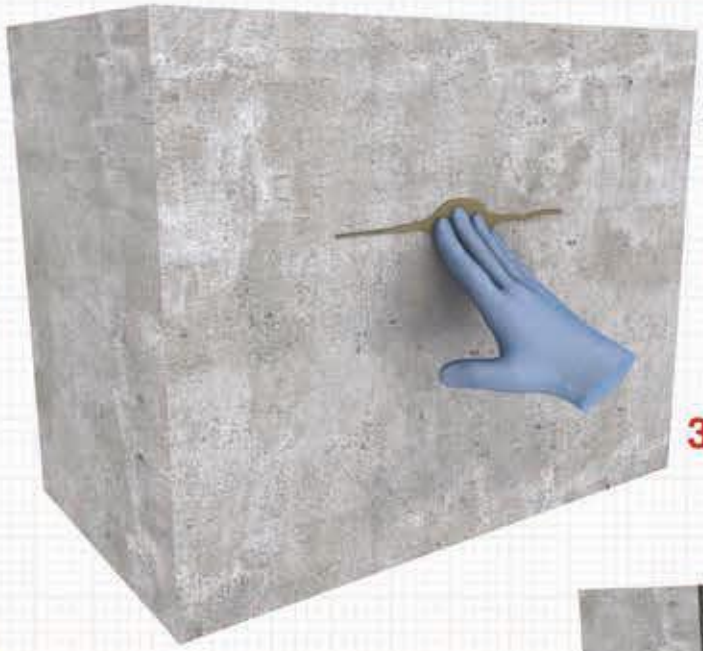


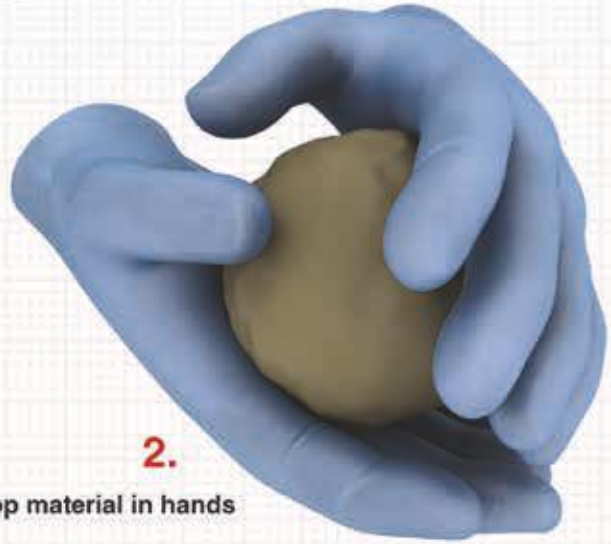
Leaking area

1.



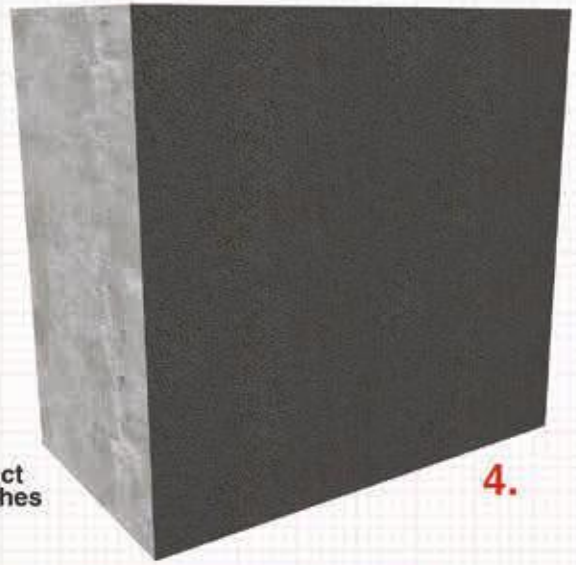
Push waterstop material into crack or leaking area until full sealed and leak has been stopped

3.



2.

Roll Waterstop material in hands



Seal over area with Hydradry or contact Wykamol for further options and finishes

4.

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WATERSTOP DETAIL

Drawing Detail Wp080

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TYPE A
Podium Deck Waterproofing (Hydradek PU)

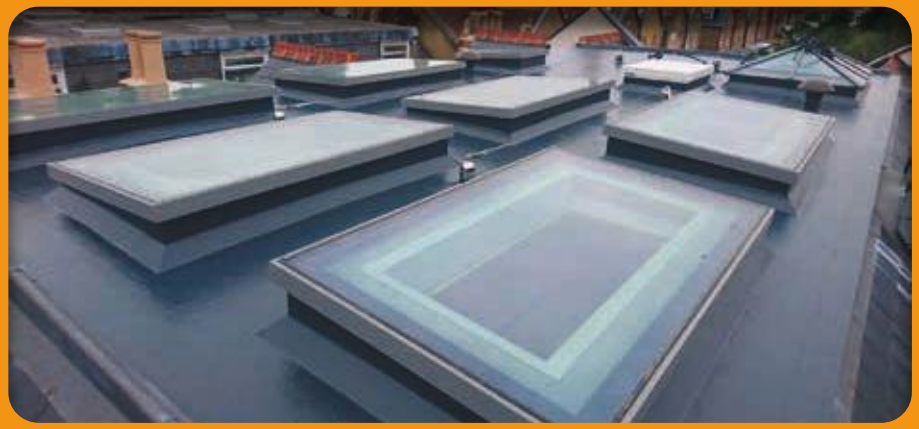
Waterproofing a concrete or similar deck over a non-critical area such as a car park, podium decks are elevated platform decks generally used as infill between buildings and or other structures.

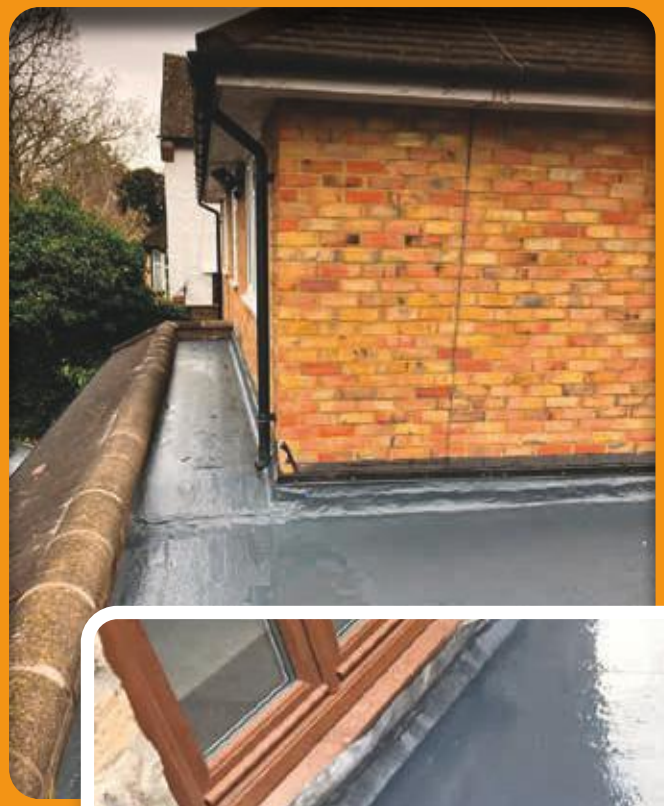
The requirement to water proof is to protect the parent substrate allowing for usage of the deck. Roof water proofing is not included as this requires a number of additional requirements. Substrate Podium decks are generally made of concrete, concrete plank block and beam.

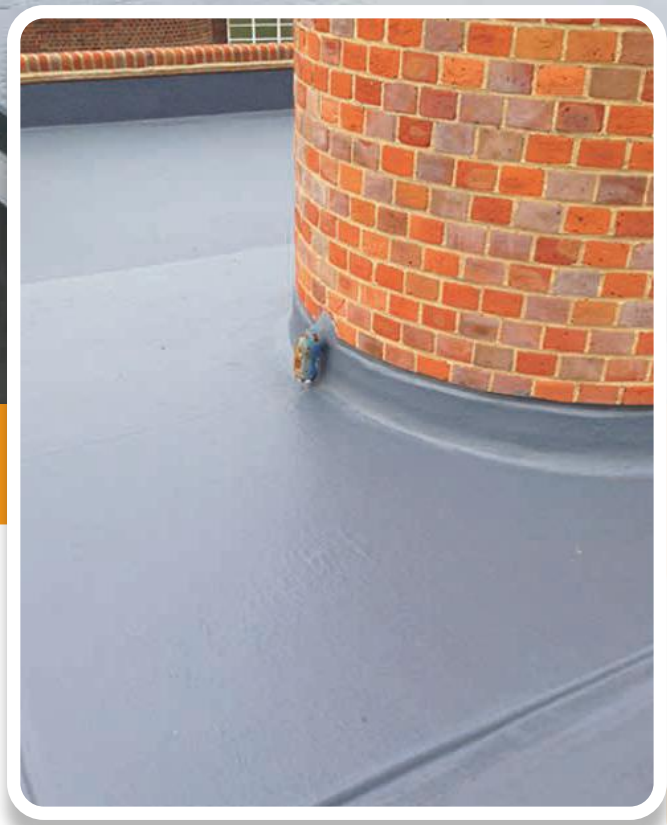
Choice of waterproofing: There are many different types of materials that can be used to water proof the deck and the choice will depend on the project requirements and will include:

a. Seamless resins; epoxy, polyurethanes, polyuria's, MMA, some of which can be fast curing.
b. Sheet membranes, bitumen based both hot and cold applied PVC and EPDM based sheets.
c. Cement based crystallization slurries. Choice will depend on service life, durability, installation requirements or limitations, new or refurbishment, final use, application type, hand, spray, rolled, etc.

Usage Podium decks are external platforms between and/or attached to building structures and can be utilised for car parks, leisure spaces, recreational spaces, patio terraces and gardens. A podium deck provides a number of options for usage for the building owner.







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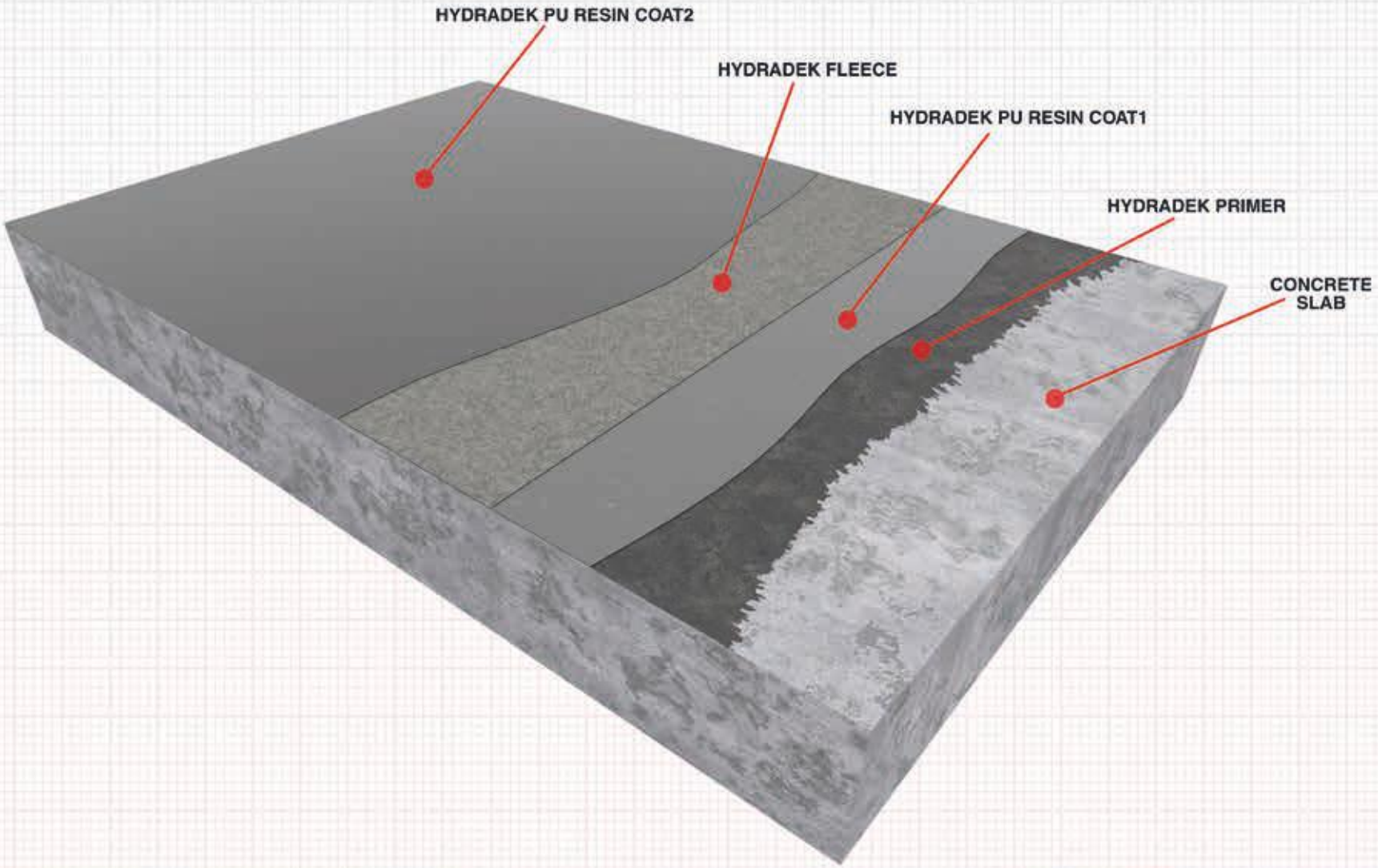

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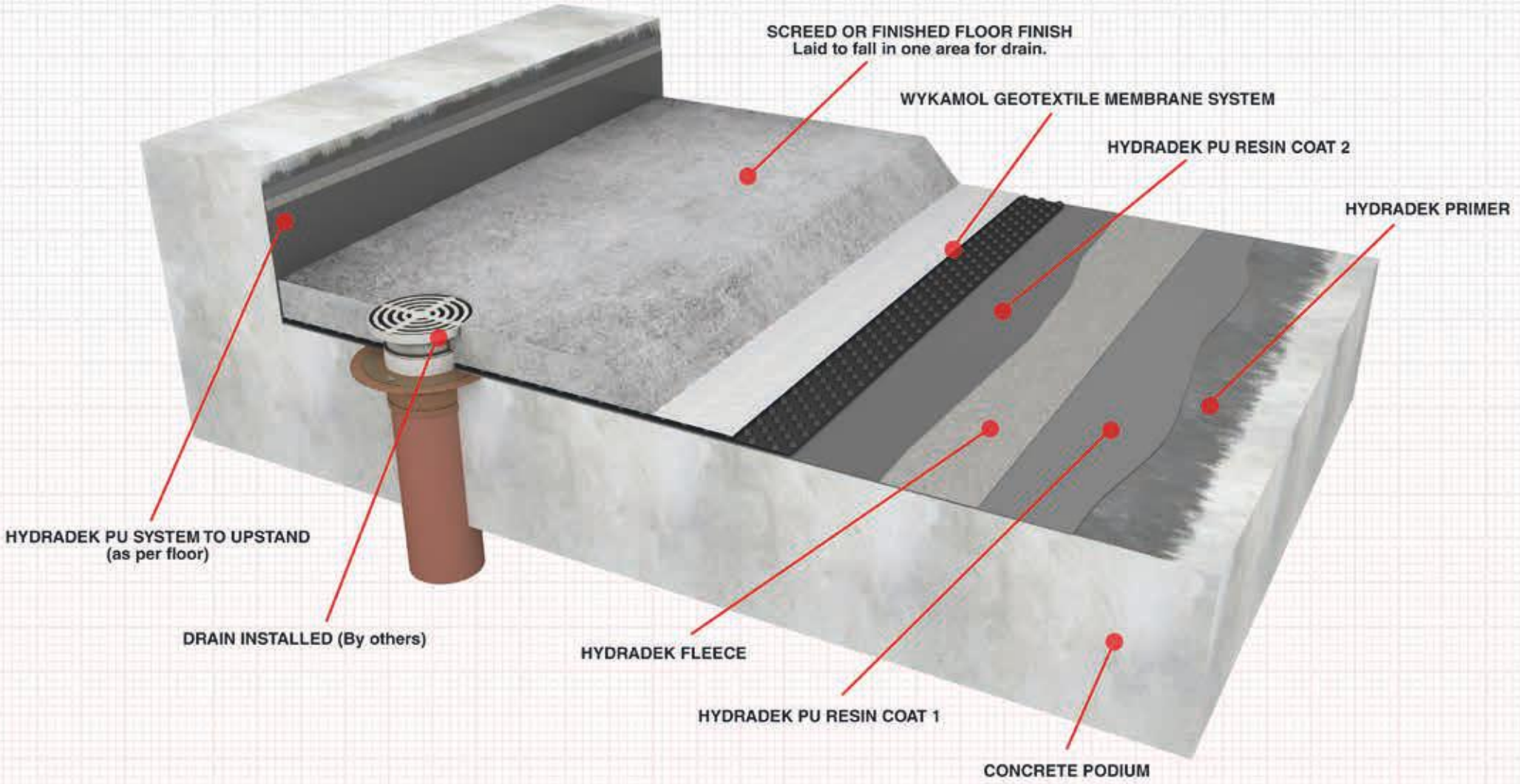
WYKAMOL HYDRADEK
Drawing Detail Wp0142

NOT TO SCALE



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HYDRADEK PODIUM
Drawing Detail Wp0150

NOT TO SCALE

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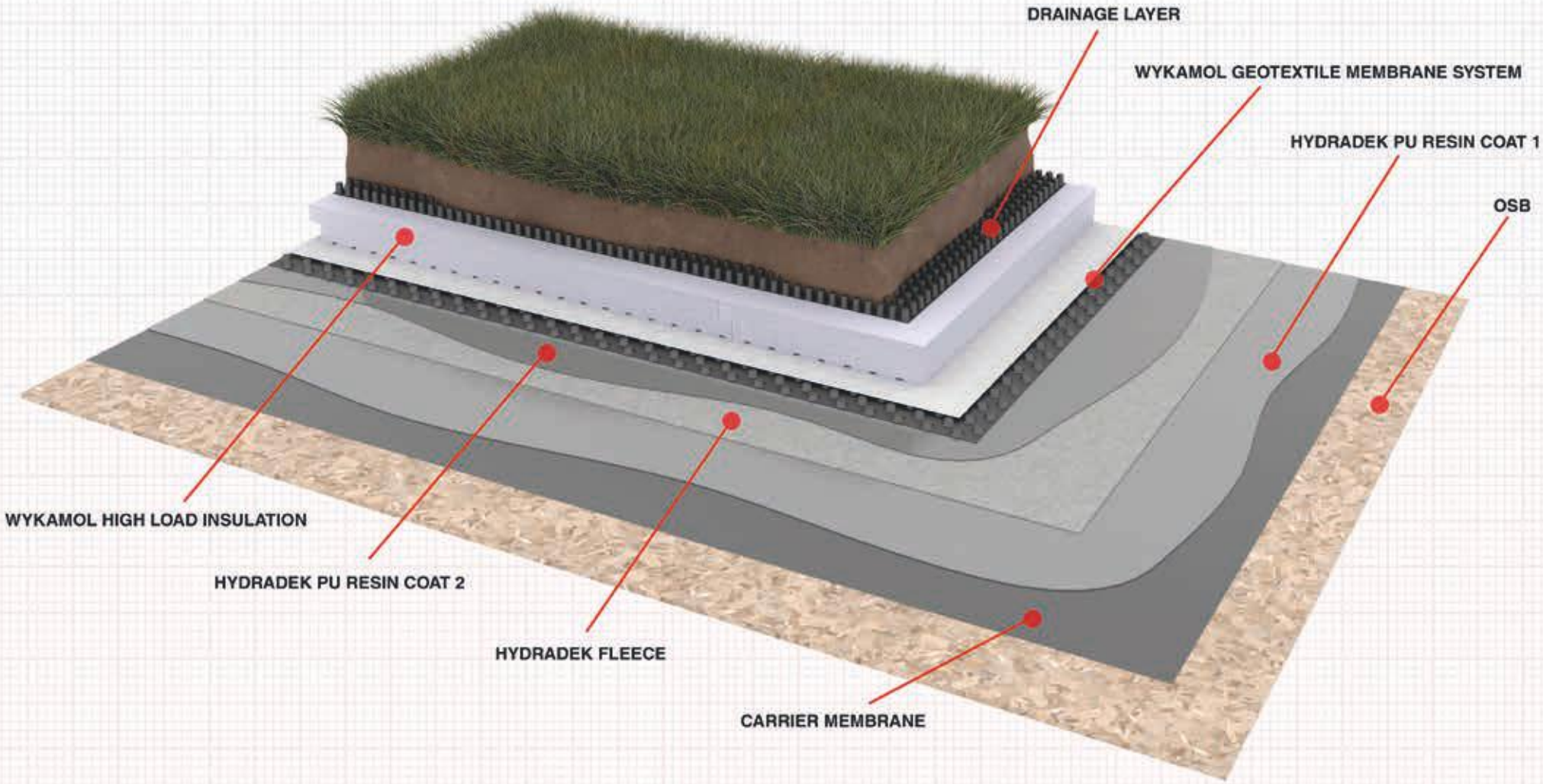

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TYPICAL WYKAMOL GREEN ROOF DETAIL
Drawing Detail Wp0153

NOT TO SCALE

TYPE A
Joint Tapes and Adhesives

High performance joint & crack sealing system for joint and crack sealing for construction joints, expansion (movement) joints and connection joints or cracks.

The system allows variable and high levels of movement in one or more directions, maintaining a high-quality watertight seal. EP Proflex Adhesive is an epoxy resin-based solvent-free, thixotropic, structural two-part building adhesive and repair mortar.

Designed to give excellent moisture tolerance and water resistance, EP Proflex Adhesive is designed for use at temperatures of 50C and 300C. Specifically developed with a lower mixed viscosity for easier workability at low temperatures and excellent adhesion to damp surfaces, which is usually common within the building industry.

The Adhesive bonds well to most building materials including concrete, stone, brick, wood, glass and metal. Due to its excellent adhesion, it can also be used for adhering building materials, including brick slips, onto glass reinforced plastic (GRP) bases.

Application Areas

- Joint waterproofing tape for walls
- Floor junctions
- Construction joints
- Movement joints
- Expansion joints
- Structural joints
- Connection joints

Characteristics/Advantages

- 3:1 mixing ratio by weight or volume
- Thixotropic, ideal for vertical and overhead applications
- Ideal for repairing corners and edges
- Gap, joint and crack filling
- No shrinkage
- Impermeable to liquids
- Bonds to damp surfaces
- Excellent adhesion even on damp surfaces
- High impact resistance and mechanical strength
- Good colour for easier colour matching

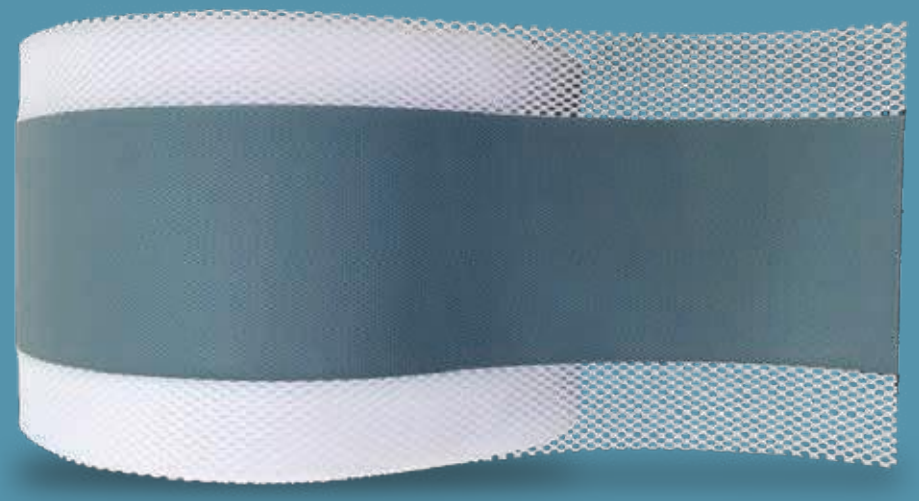
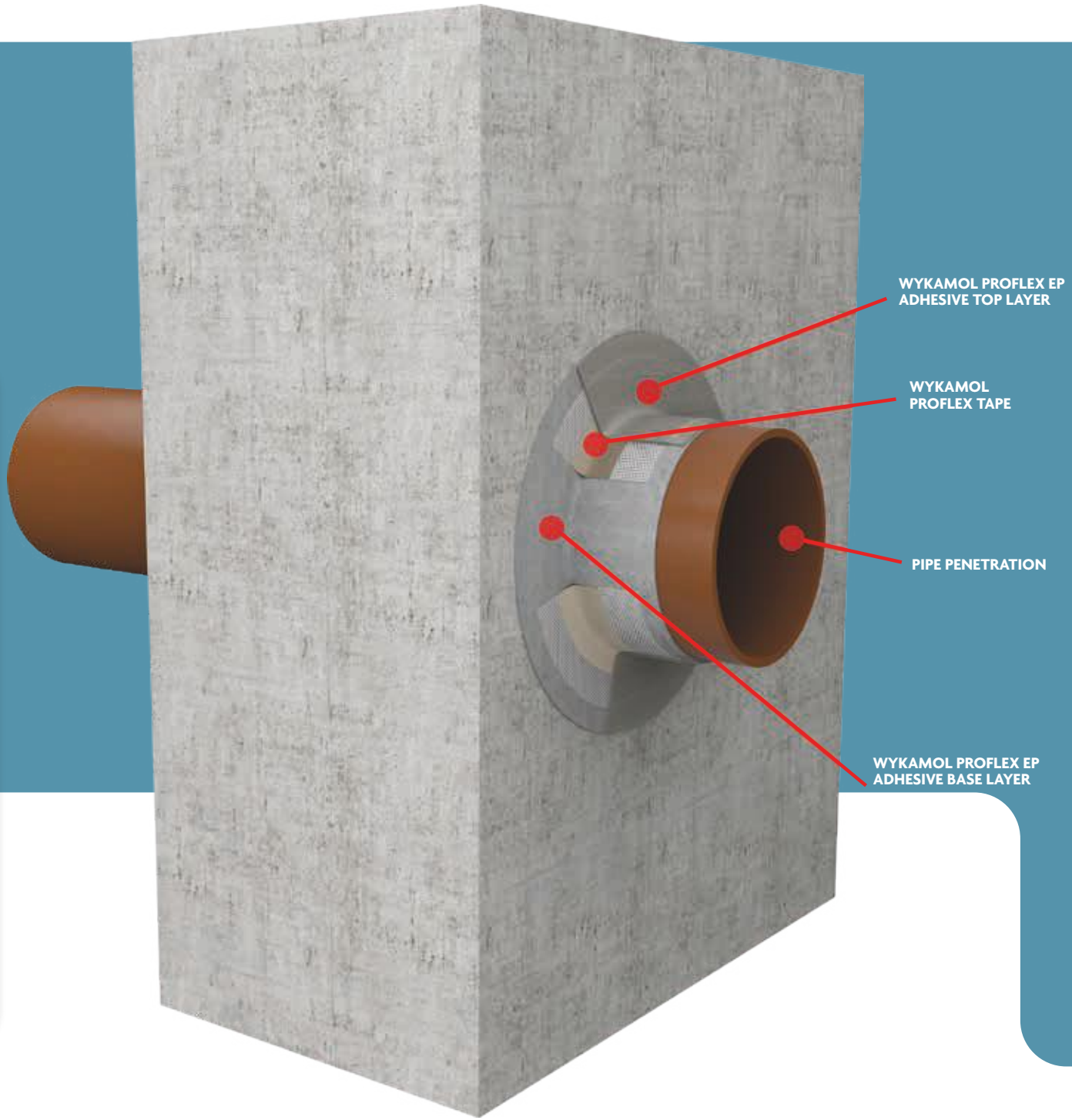


Diagram shows a ‘Type A’ Pipe penetration joint adhesive



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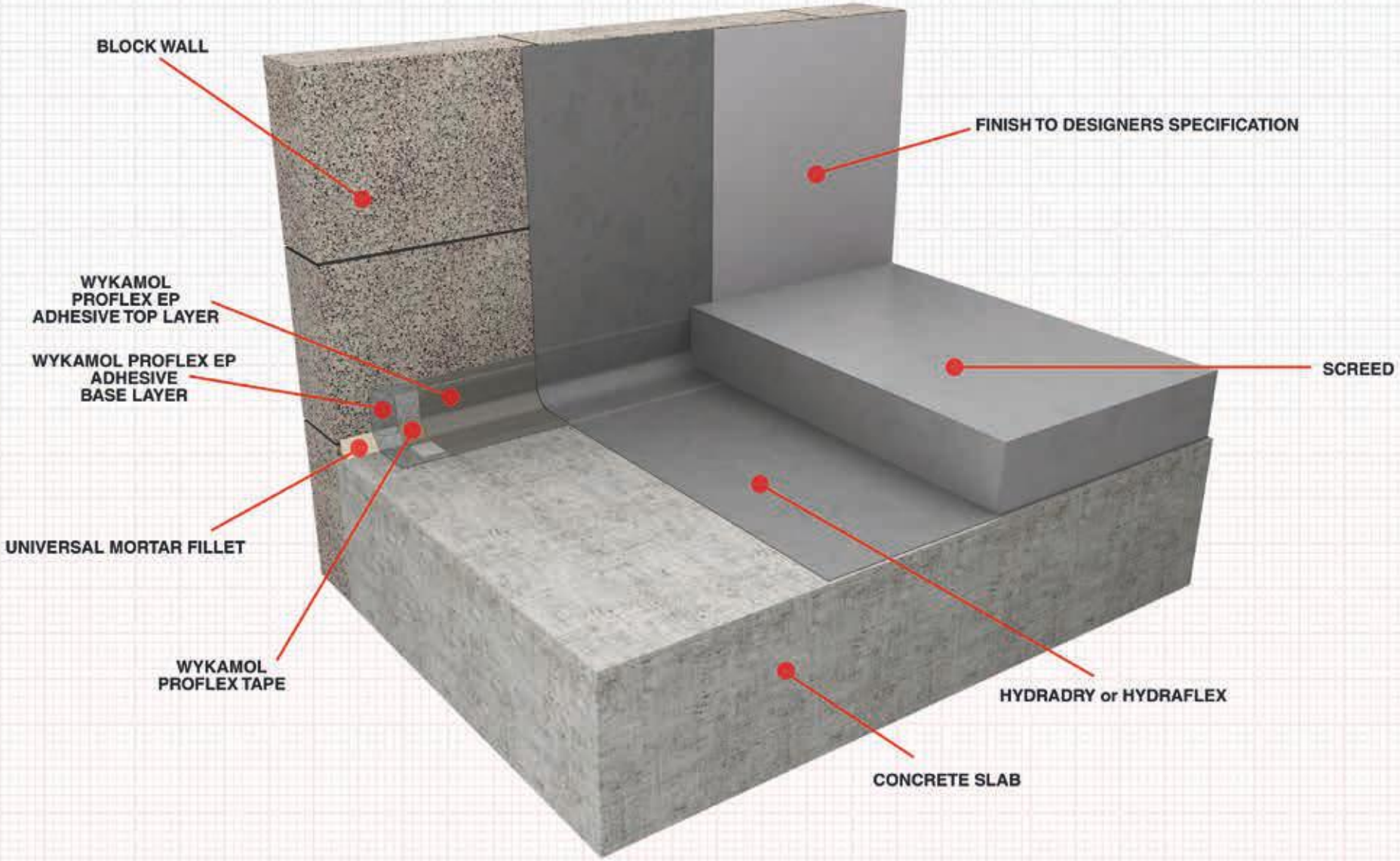

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TYPICAL WYKAMOL TANKING DETAIL

Drawing Detail Wp0151

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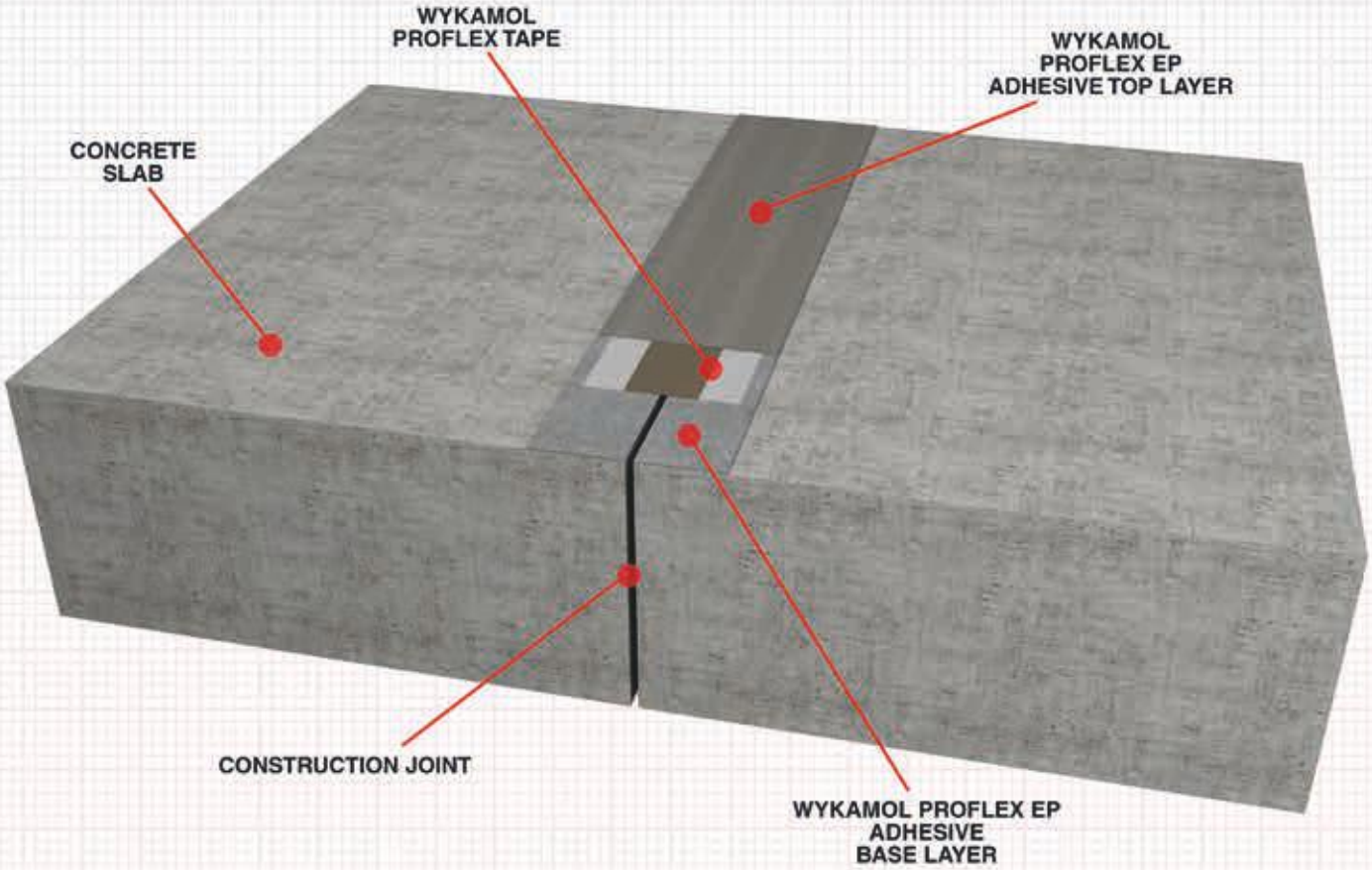

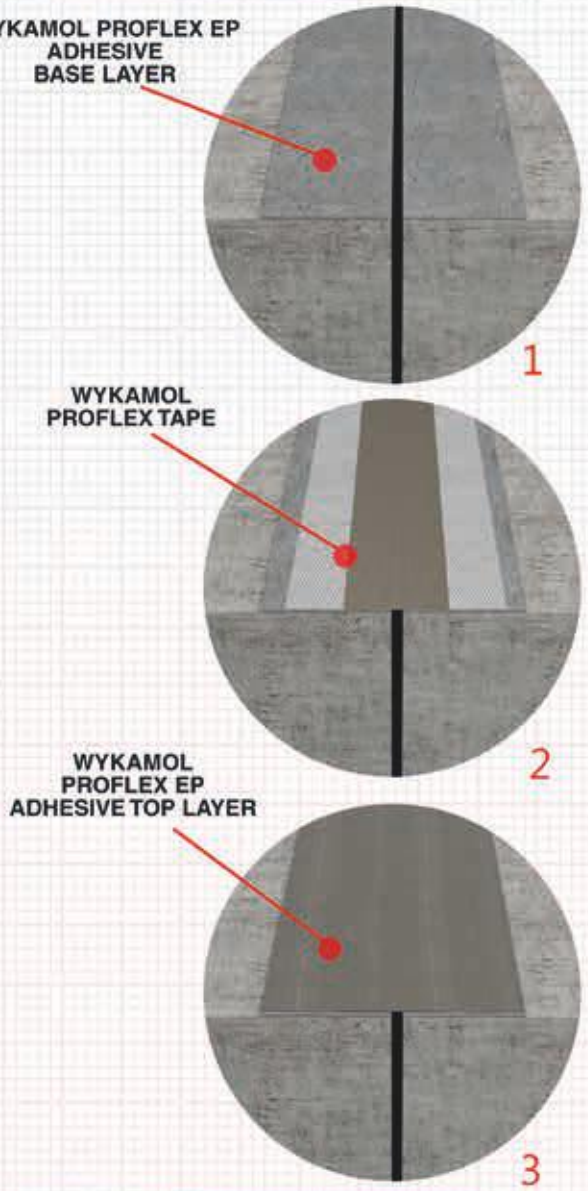

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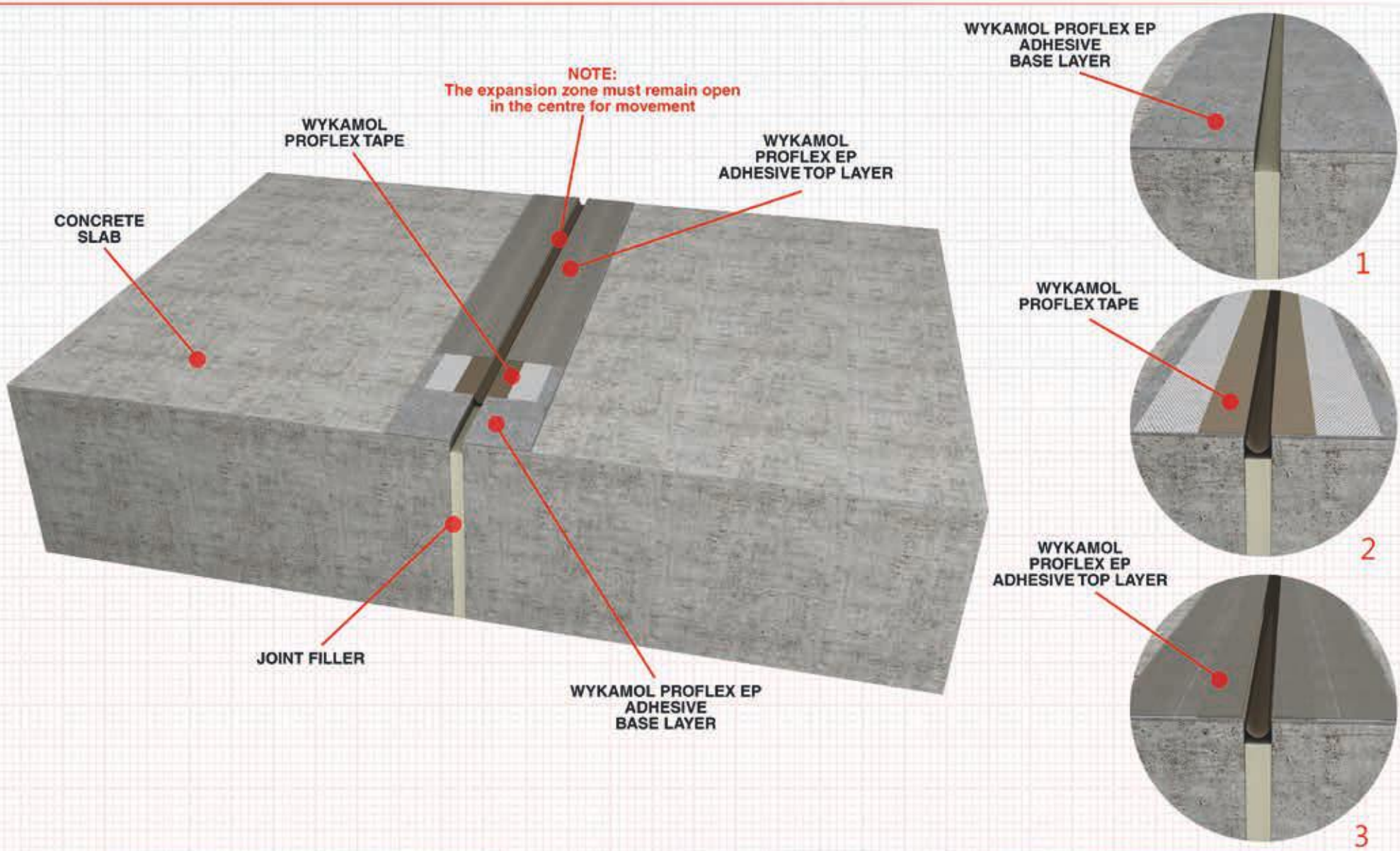
WYKAMOL
PROFLEX CONSTRUCTION JOINT
Drawing Detail Wp0139

NOT TO SCALE



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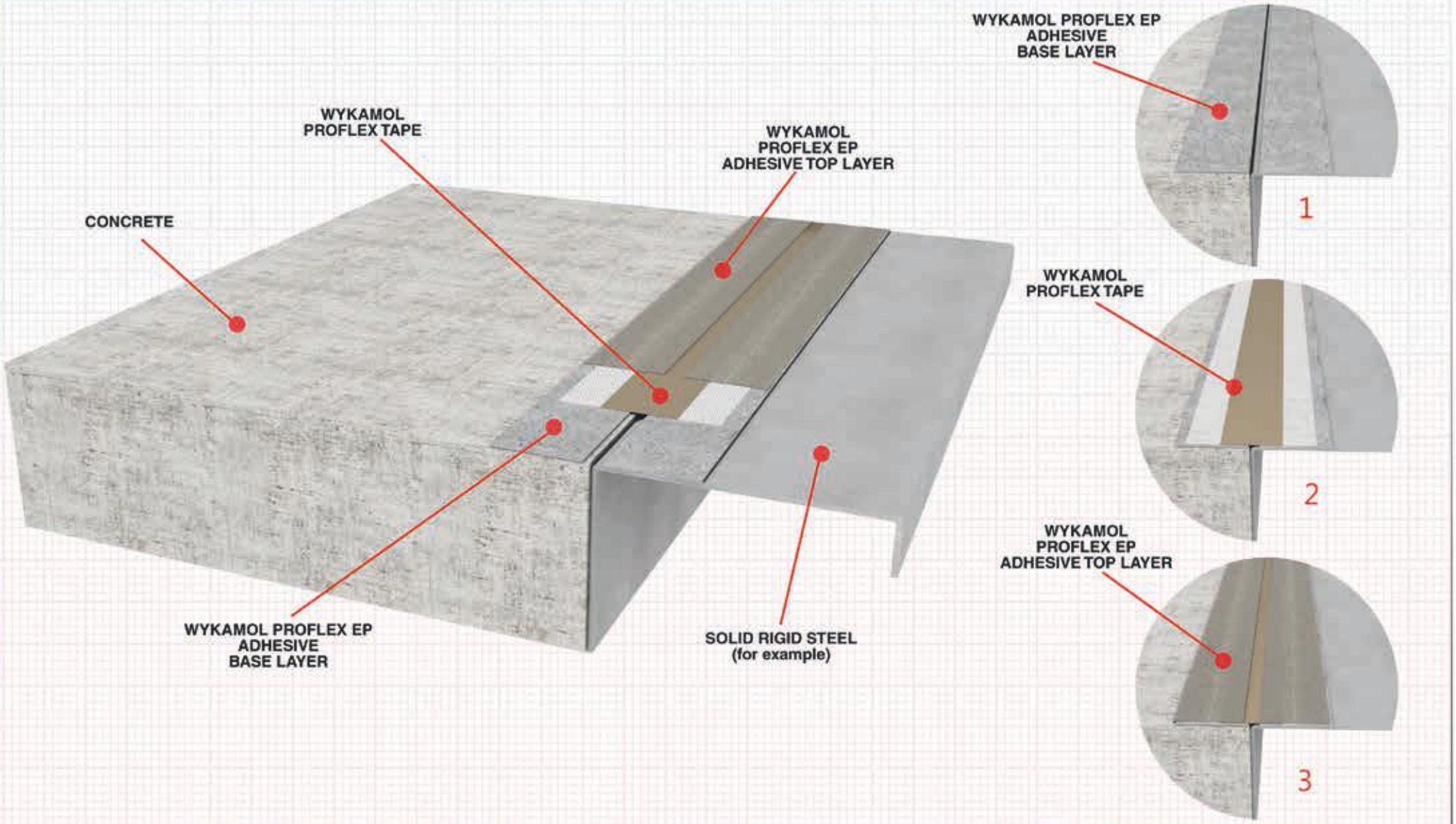
WYKAMOL PROFLEX LARGE MOVEMENT JOINT

Drawing Detail Wp0140

NOT TO SCALE



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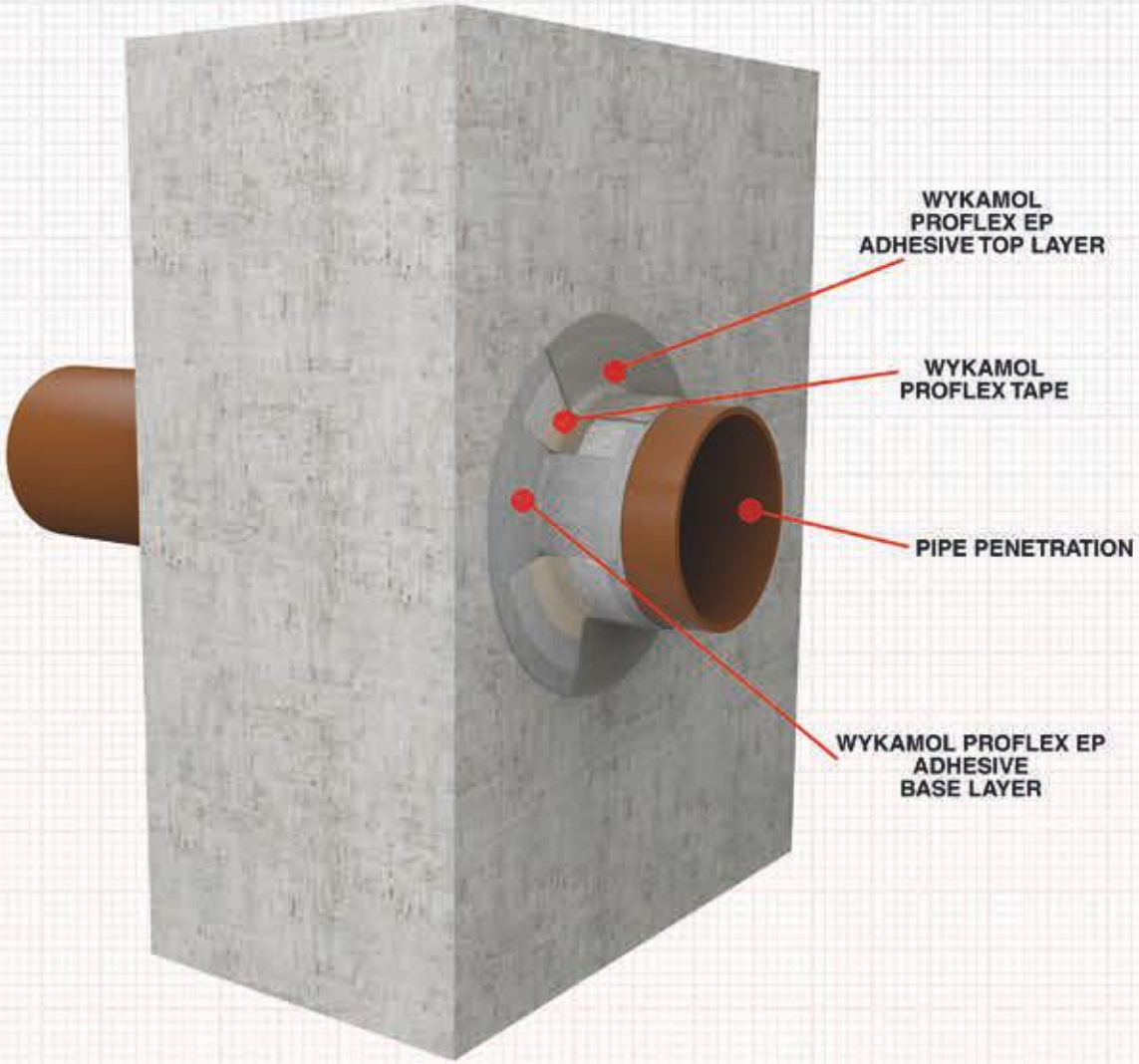
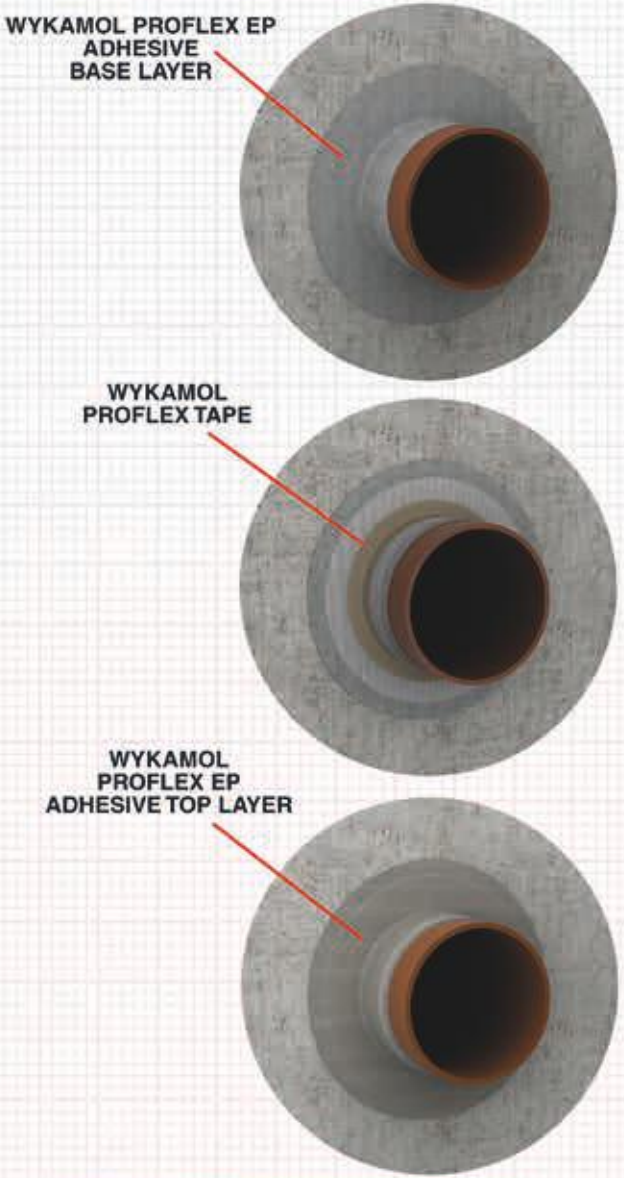
WYKAMOL
PROFLEX CONNECTION JOINT
Drawing Detail Wp0138

NOT TO SCALE





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WYKAMOL
PROFLEX PIPE PENETRATION
Drawing Detail Wp0145

NOT TO SCALE

TYPE C
Cavity Drain Membranes

Type C construction relies on water being resisted by the structural elements and any water that penetrates the external shell of the structure being collected in a cavity formed between the external wall and an internal lining/wall.

There is permanent reliance on this cavity to collect groundwater seepage and direct it to a suitable discharge point, e.g. drains or a sump for removal by gravity drainage or mechanical pumping.

The amount of free water entering the cavity will depend on the volume of external water and its hydrostatic pressure, and on the resistance of the structure itself to water ingress. Designers need to consider any risk associated with a constant supply of possible contaminated water to the structure.

Such systems typically remove water via a mechanical sump pump system, or occasionally by gravity to low ground or drains externally where properties are formed into sloping sites. However, the need to control ground gases, e.g. radon, may not allow the use of gravity drainage. In all cases, consideration should be given to the point at which water discharges, understanding that the effectiveness of the system is reliant on removal of water, so an appraisal of this factor is required.

Type C pumped systems should be engineered to cope with worst-case water ingress. If drainage capacity is exceeded, this may result in dampness or flooding.

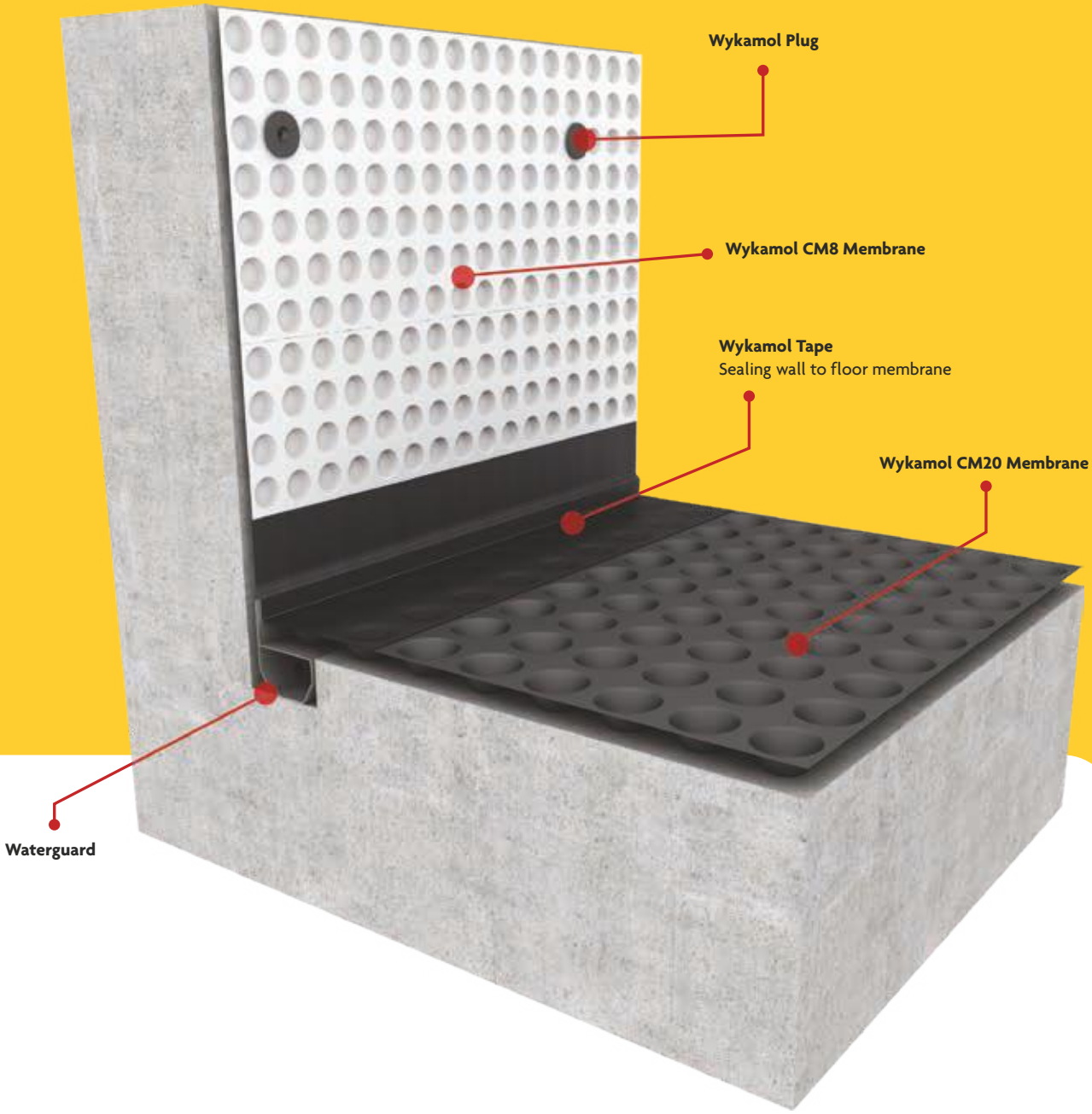
Type C systems are designed to control and manage leakage and seepage into a structure where water ingress is unacceptably high, the water resistance of the structure should be improved by remedial measures prior to the installation of the system.

Backup pumps and alarms should in most situations be included, particularly where the consequences of failure are great. It should also be noted that:

- Type C systems require a maintenance schedule, as failure of mechanical pumps could result in flooding;
- Blockage of the cavity by silt or lime or other contaminants could result in flooding. (The design of the system should allow for clearing of silt should blockages occur in the system including discharging drains.)
- Maintenance should be undertaken by a specialist, making assessment of the requirement to upgrade and replace pumps as necessary.

When combining systems in order to minimise the risks or negate the need for remedial measures, consideration should be given to the compatibility of the combining systems.

Diagram shows a 'Type C' Cavity Drain Membranes



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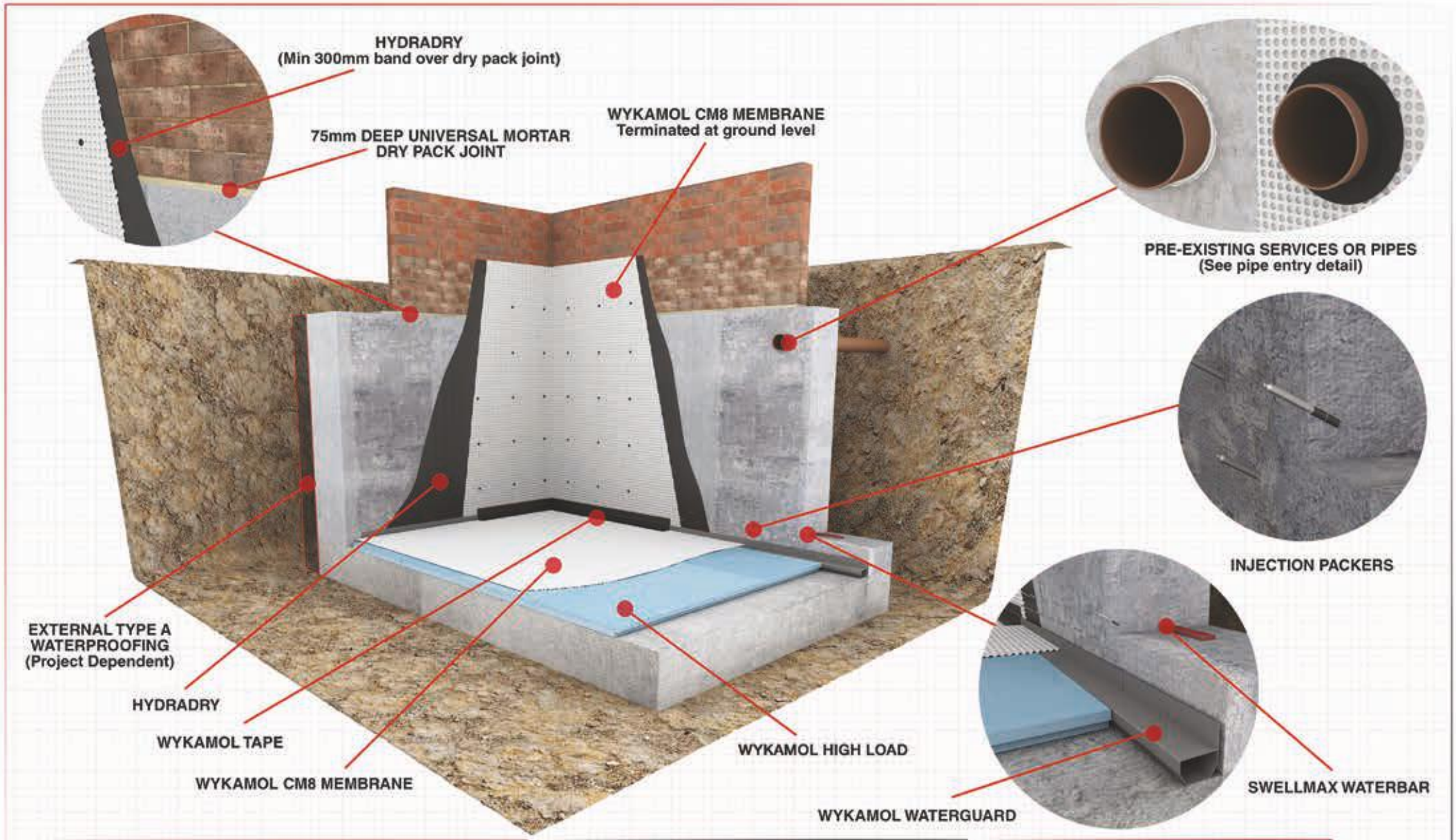

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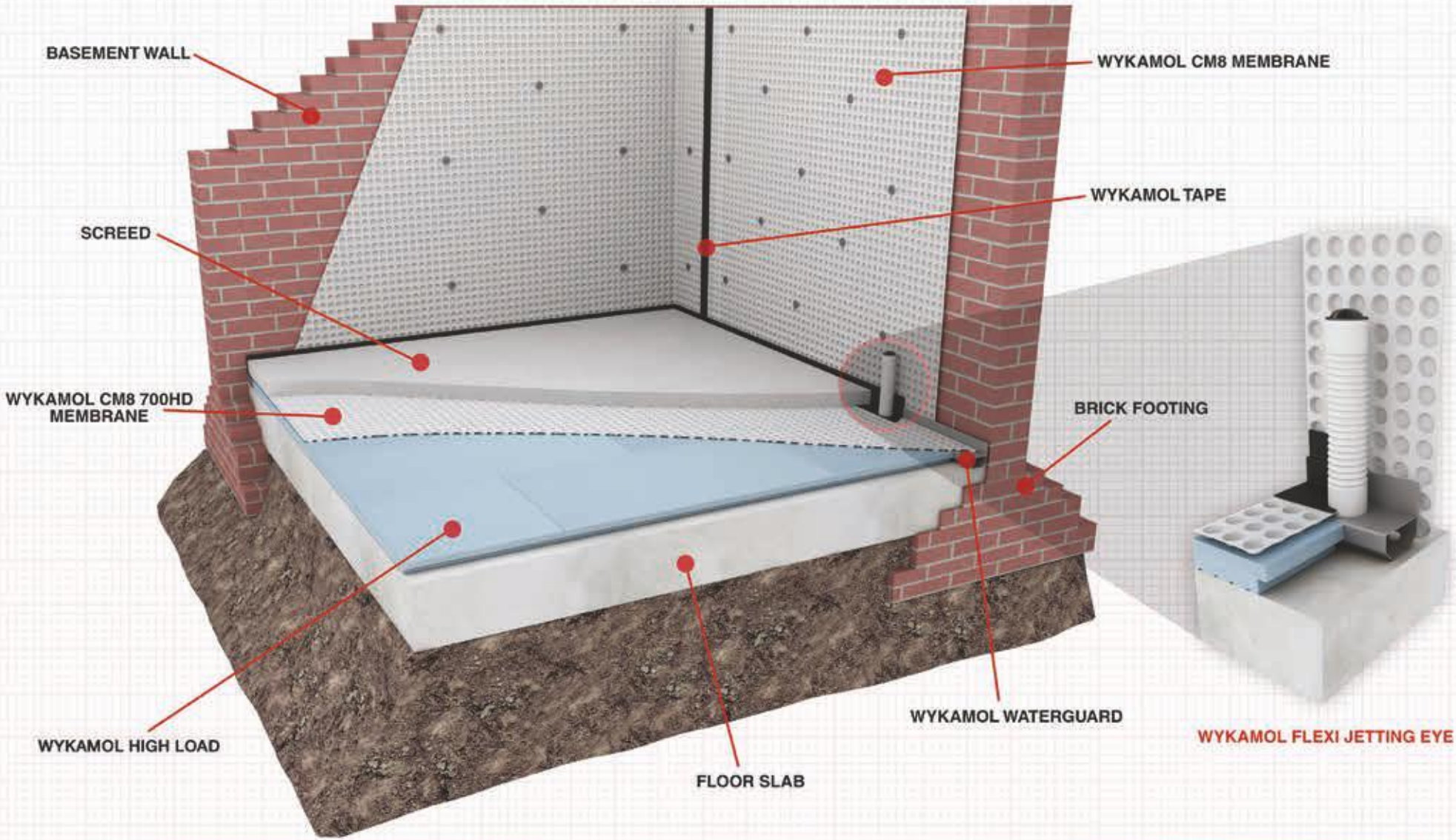
UNDERPINNED DETAIL

Showing Type-C Membranes
and High-load insulated spacer

DRAWING DETAIL WP056

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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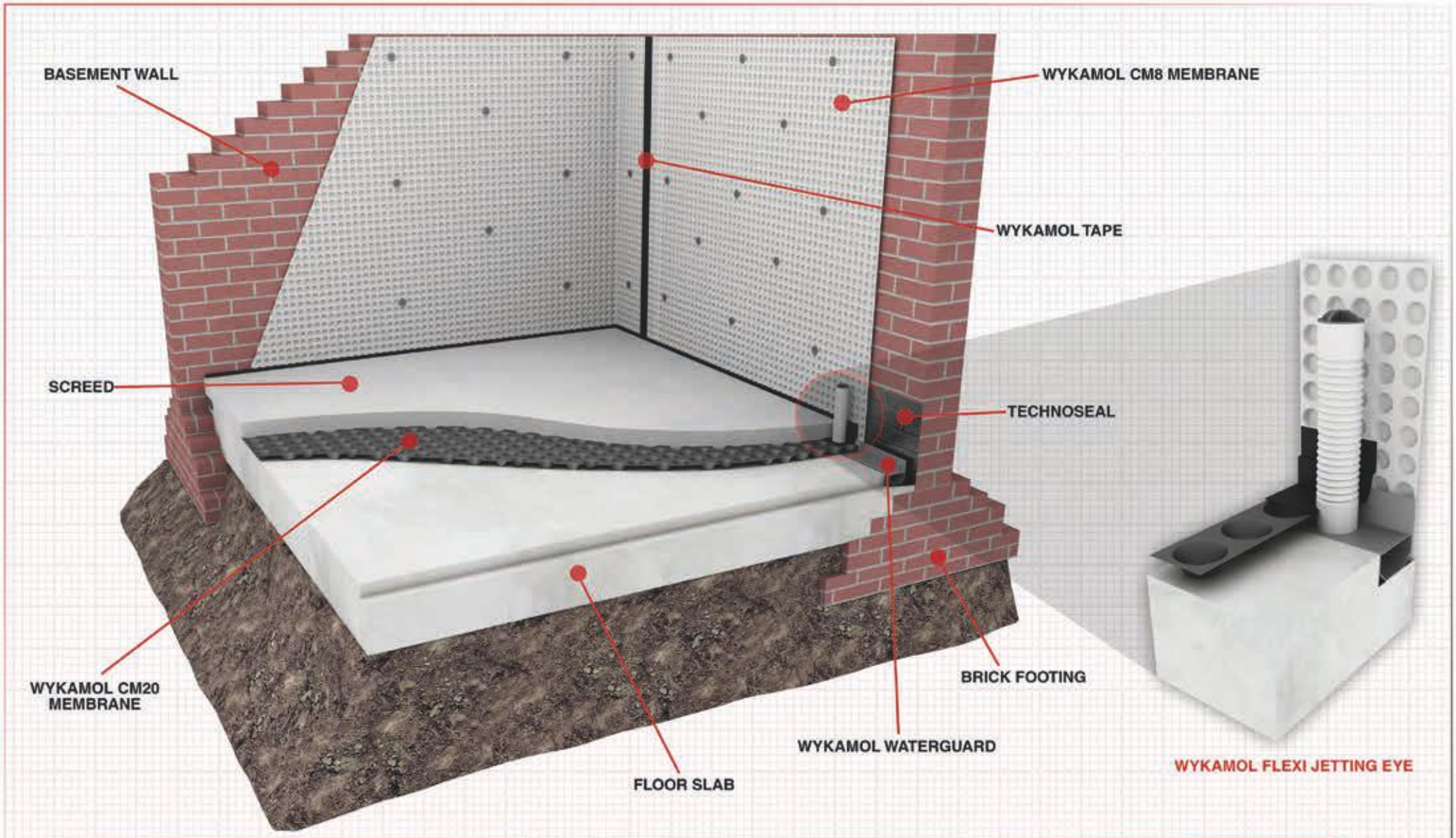
BRICK BASEMENT

With danopren and 8mm membranes

DRAWING DETAIL WP011

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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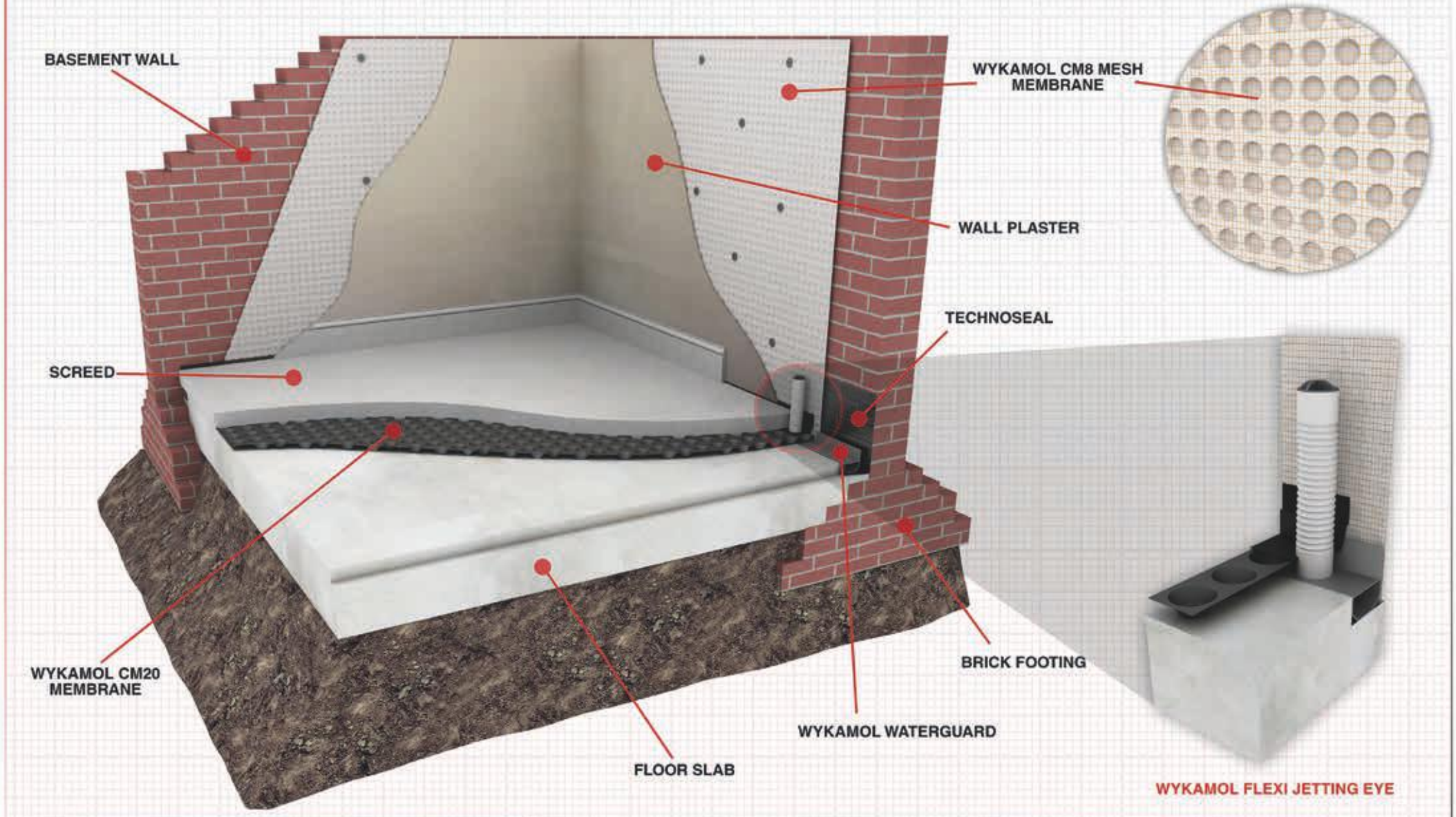
BRICK BASEMENT

Using 8mm and 20mm heavy duty membrane

DRAWING DETAIL WP012

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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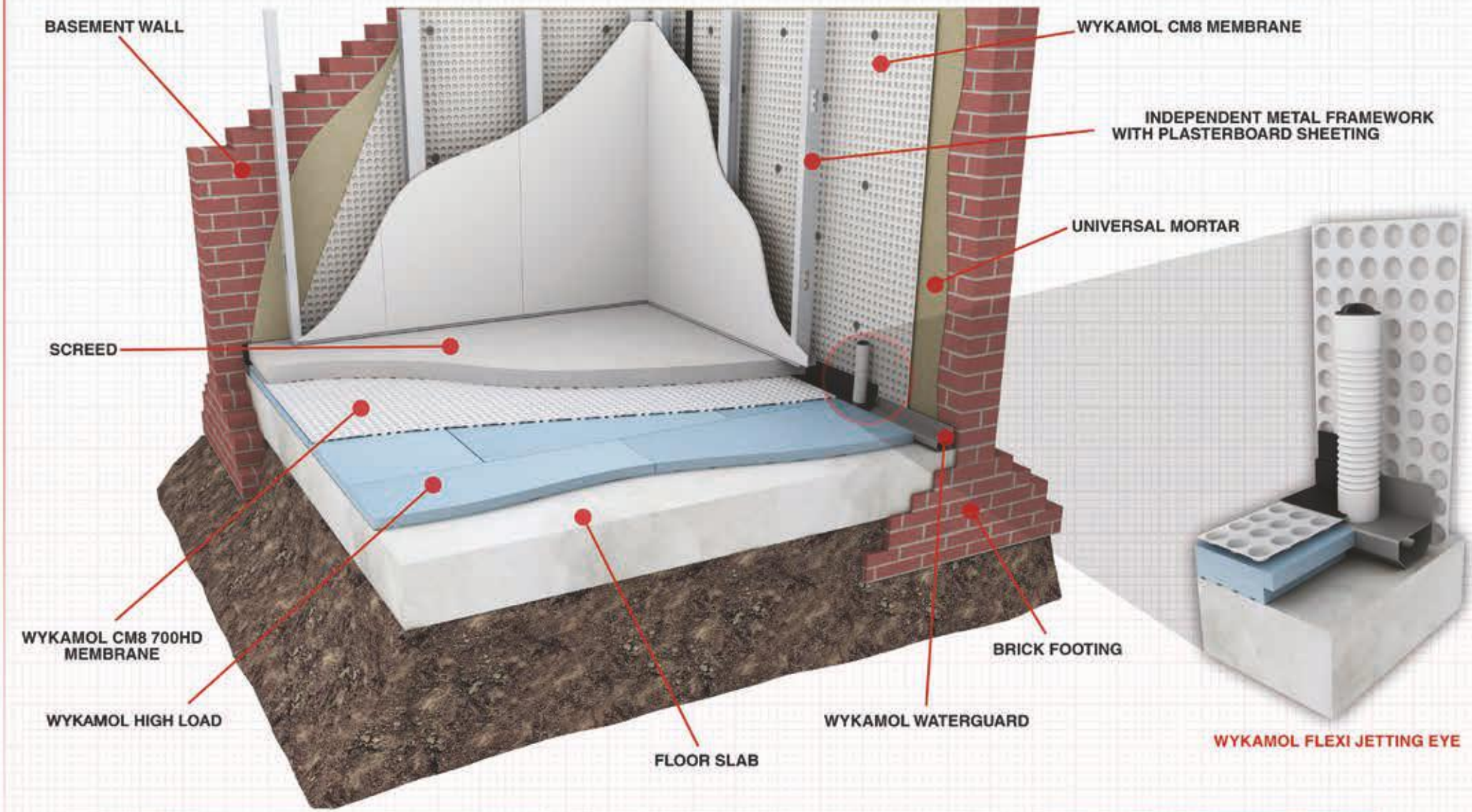
BRICK BASEMENT

with 8mm mesh and 20mm heavy duty membrane

DRAWING DETAIL WP013

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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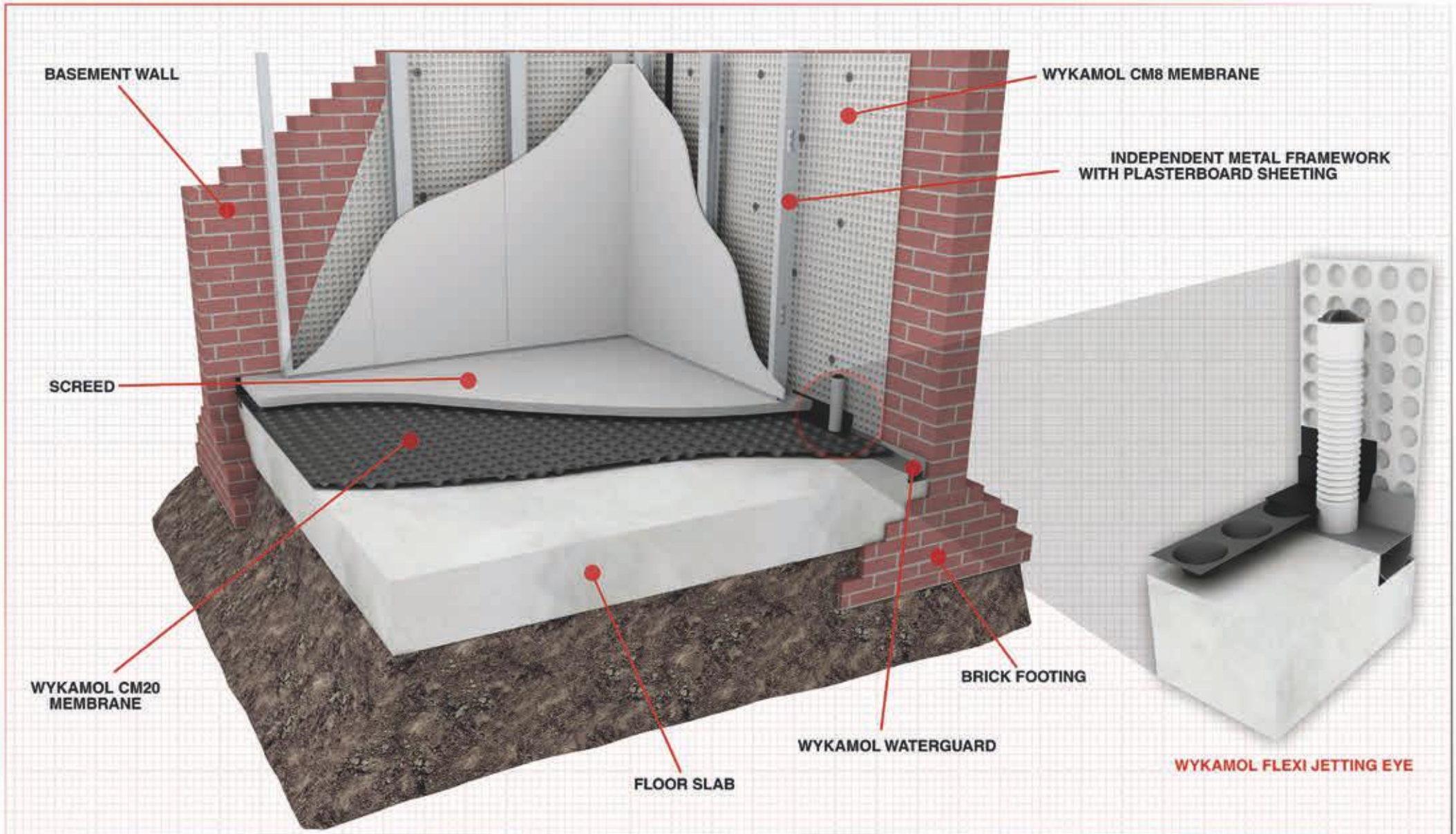
BRICK BASEMENT

With metal dry-lining system
and danopren on floor

DRAWING DETAIL WP055

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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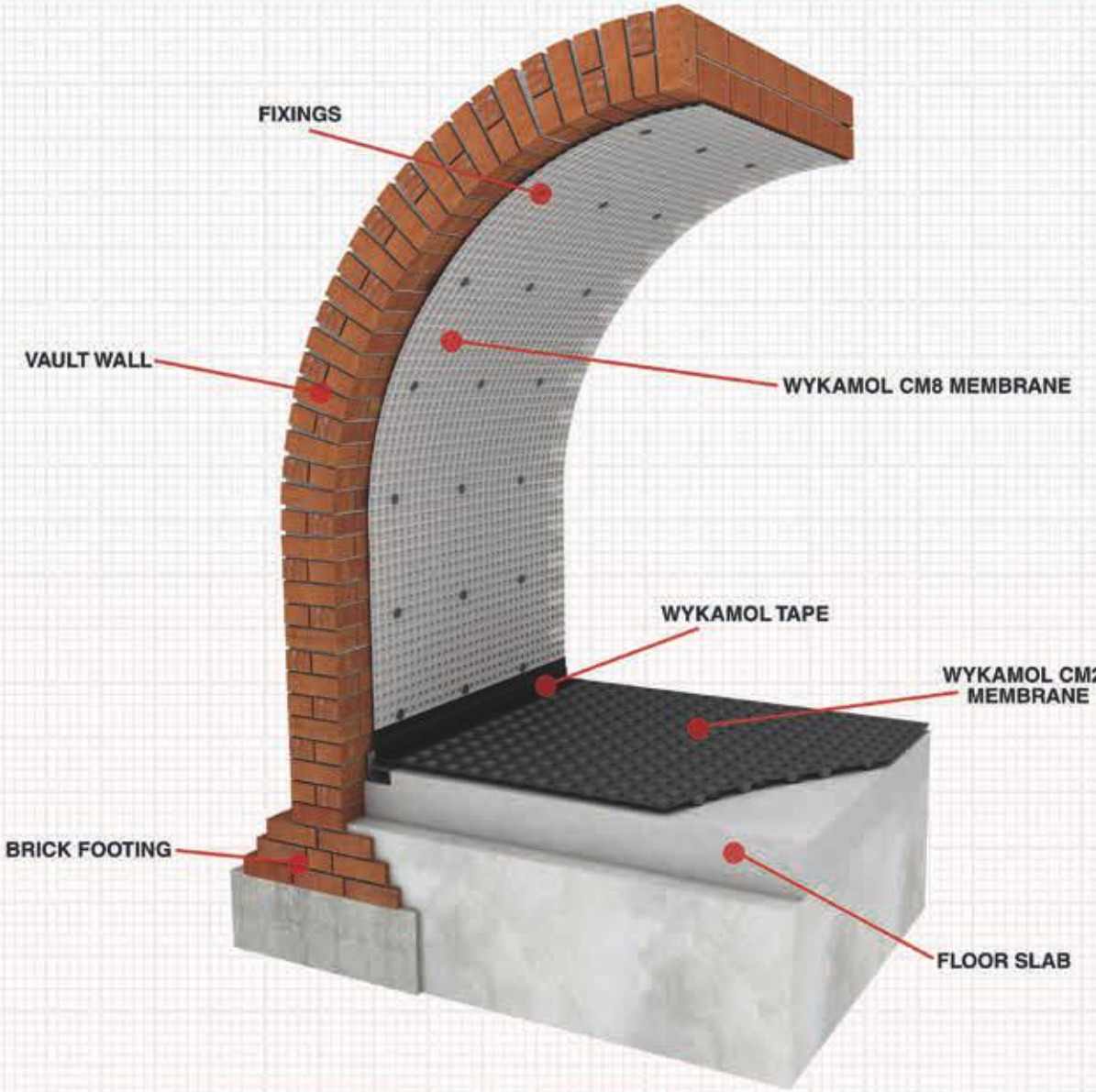
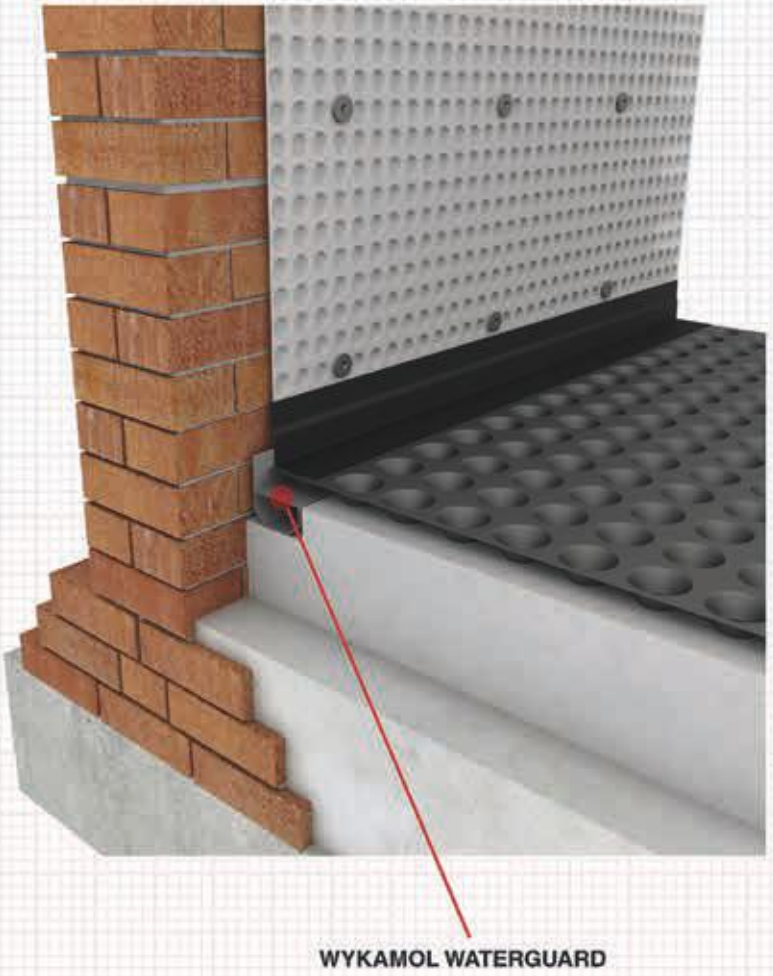
BRICK BASEMENT

With metal dry-lining system and
8 and 20mm heavy duty membrane

DRAWING DETAIL WP022

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system





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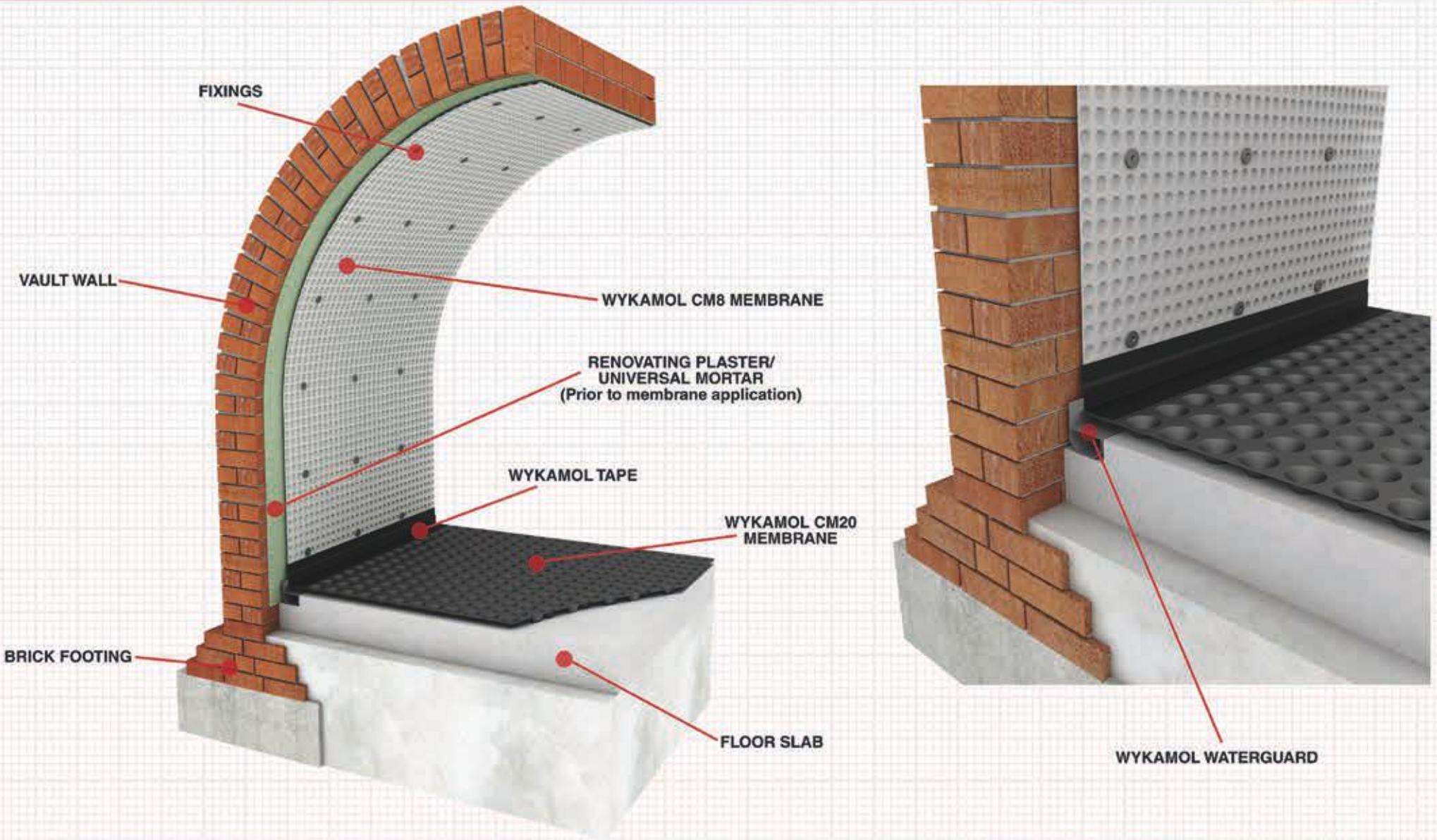
BRICK BASEMENT VAULT

Drawing standard basement vault detail

DRAWING DETAIL WP019

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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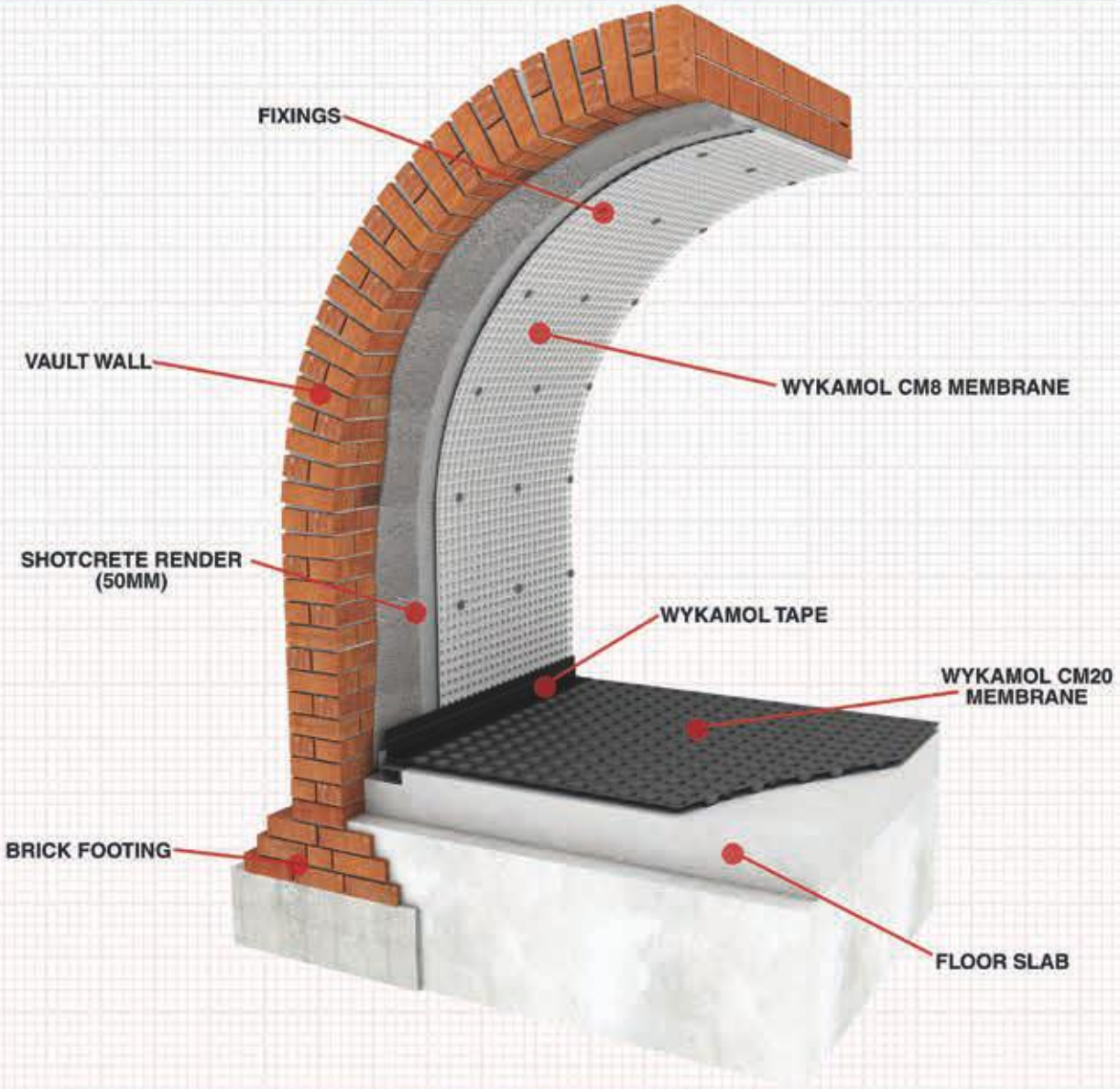
BRICK BASEMENT VAULT

Vault with primary resistance and membrane

DRAWING DETAIL WP023

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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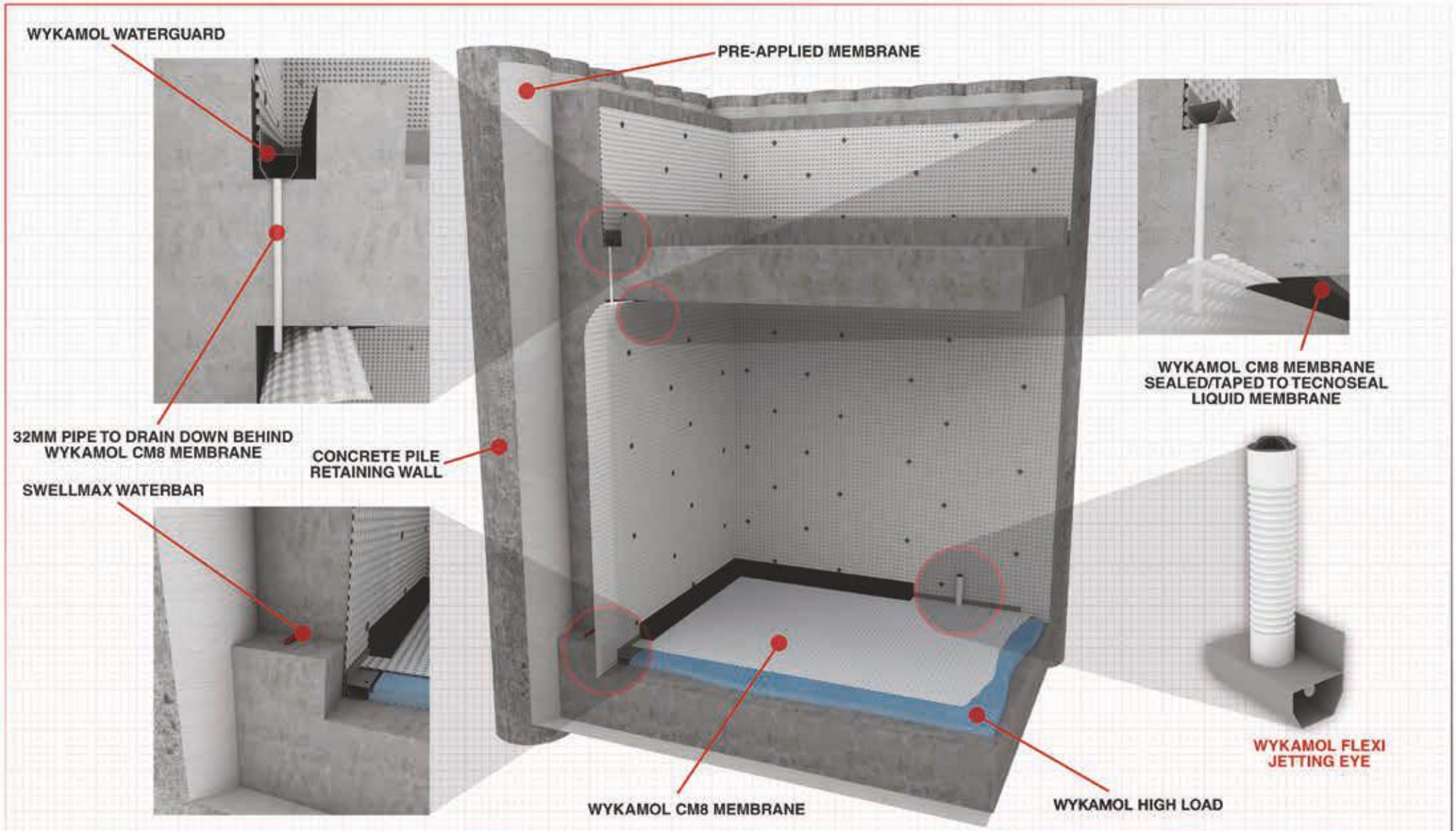
BRICK BASEMENT VAULT

Vault with 8mm and 20mm heavy duty membrane

DRAWING DETAIL WP024

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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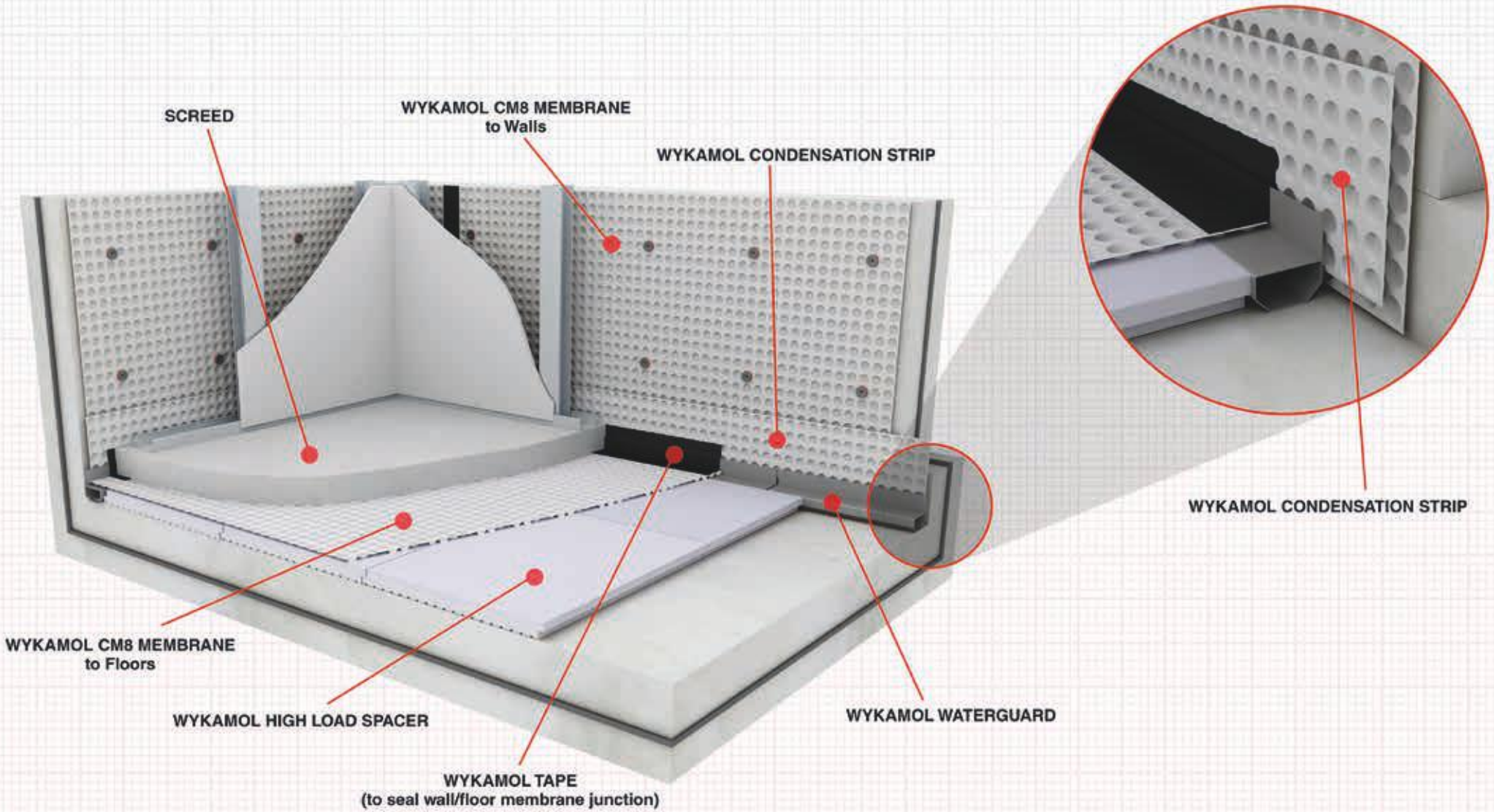
DOUBLE HEIGHT
Drawing Detail Wp041

NOT TO SCALE



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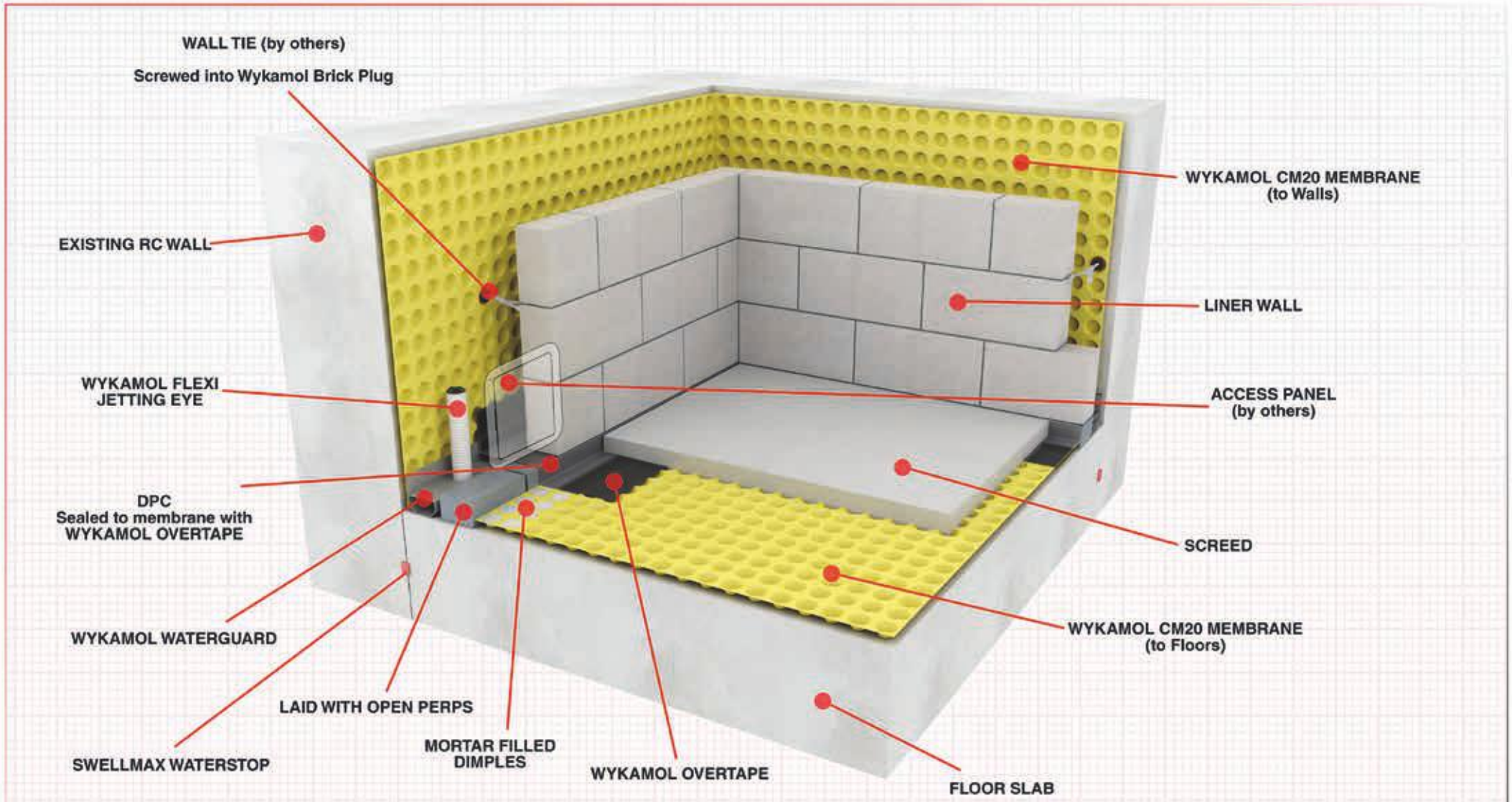
WYKAMOL CONDENSATION STRIP 2

Drawing Detail Wp0144

NOT TO SCALE

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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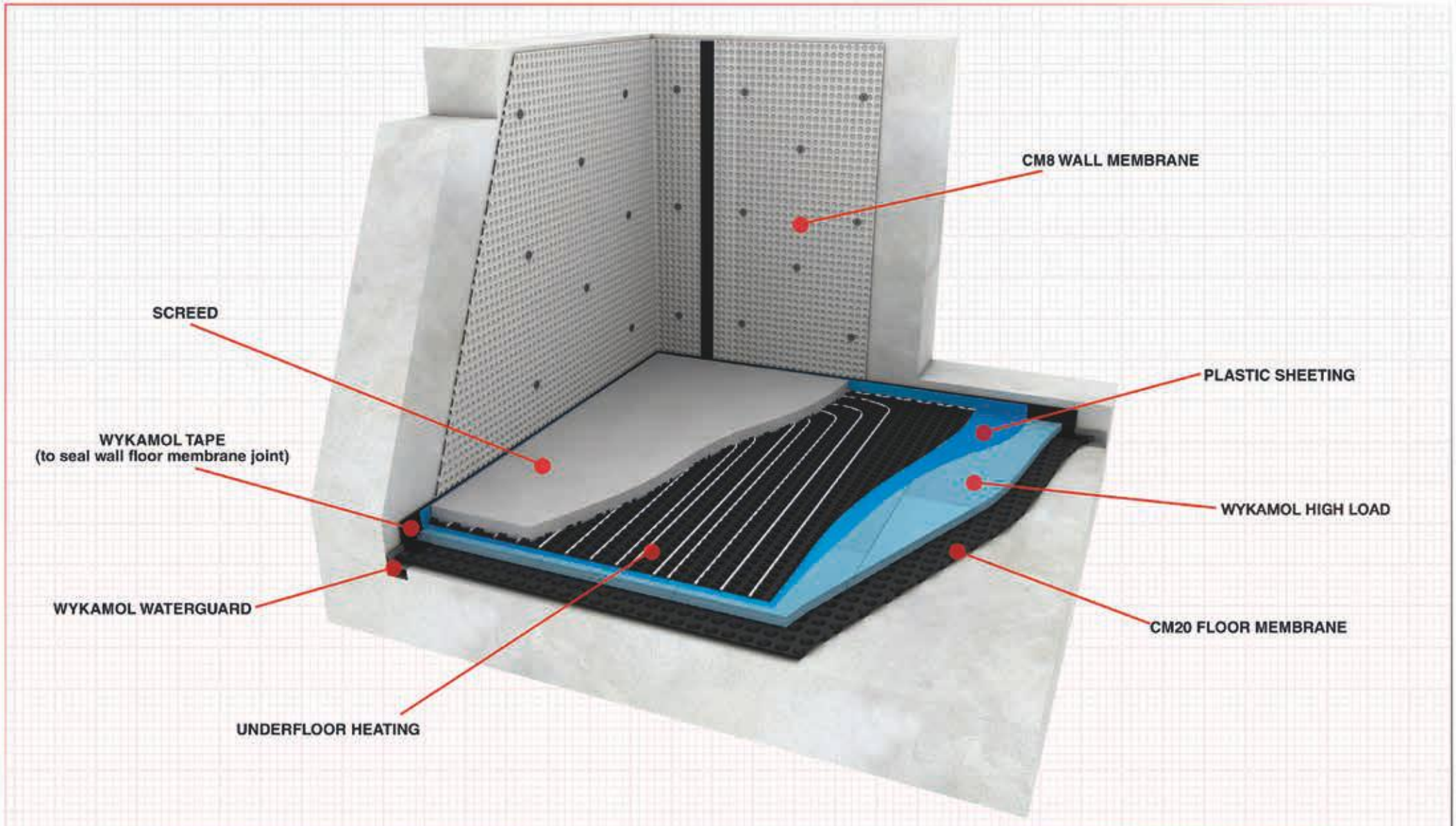
CM20 CAVITY DRAIN DETAIL
Drawing Detail Wp0126

NOT TO SCALE



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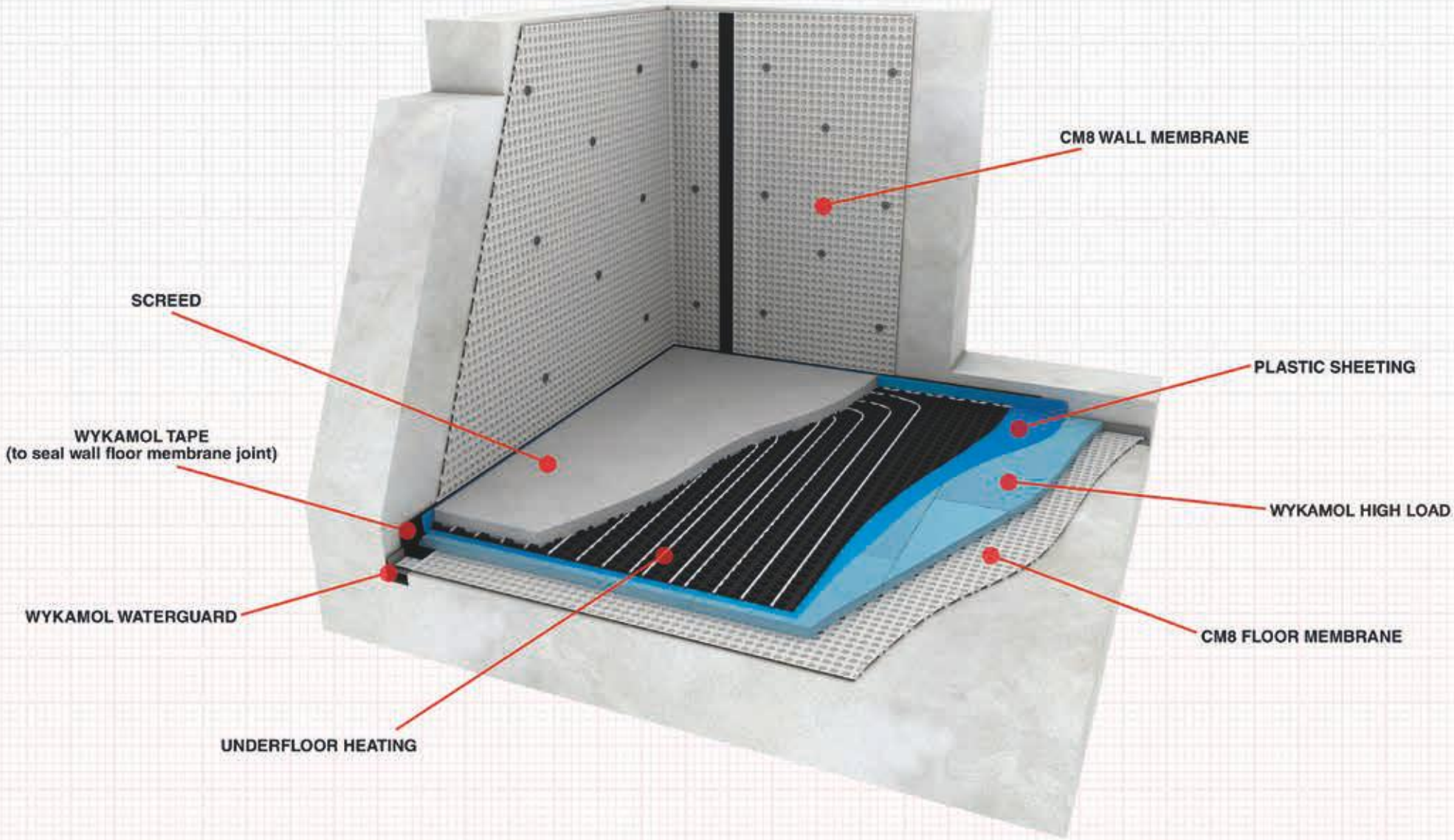
UNDERFLOOR HEATING SYSTEM 2

Drawing Detail Wp096

NOT TO SCALE

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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UNDERFLOOR HEATING SYSTEM

Drawing Detail Wp095

NOT TO SCALE

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system

TYPE C
Cavity Drain Ancillaries

The Type C cavity drain membrane ancillaries are an important part of the system and are used to fix the membranes in place, seal all joints, overlaps and create stop ends.

They include, From above ground damp proof plaster fixings, high engineered waterproof fixings with seals, butyl Corner Detail, Overseal tape, flange tape, rope, Fibre/fleece or fibre tape for mesh/plaster membranes and anti-lime inhibitors. Butyl products have good adhesion to a wide range of substrates once primed with Technoseal.

Sealed fixings/Brick plugs
They ensure a water tight application of the Wykamol Cavity Drain Membrane Systems. Wykamol Brick plugs are of a high quality and can be used in a range of applications and on multiple substrate types. The tailor-made Thermoplastic Elastomer seal ensures application of the membrane is water tight.

Plaster plugs
To be used with the mesh/plaster membranes for damp proofing

Corner detail Tape.
150mm wide tape mostly used for sealing membrane at wall/floor junctions, can be used as an overtape for joint on wall & floor membranes.

Overseal tape
75mm wide commonly used to overseal joints on wall & floor membranes.

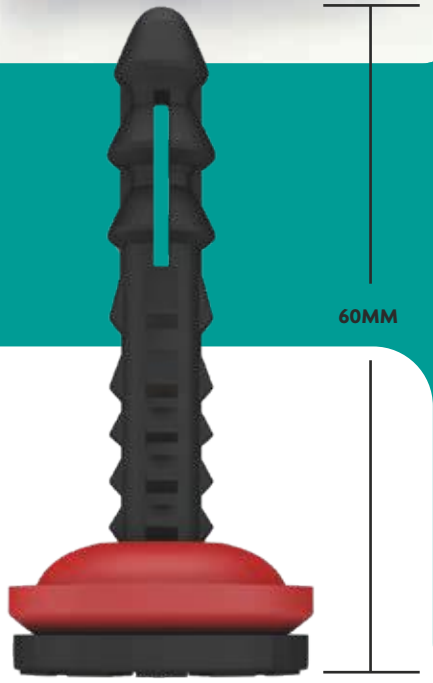
Double sided flange tape
28mm wide tape for sealing flange joints on membranes.

Rope
10mm bead tape used mostly for stud joints on membranes and creating gaskets around pipes, also used to create seals around the sealed fixings.

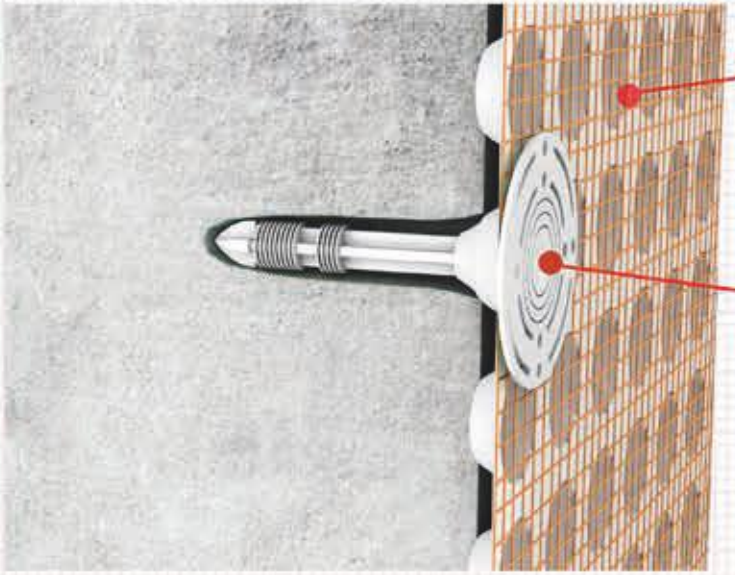
Fibre/fleece tape
115mm wide tape used on mesh/plaster membranes with a mesh/fibre on the surface to allow continuous plastering.

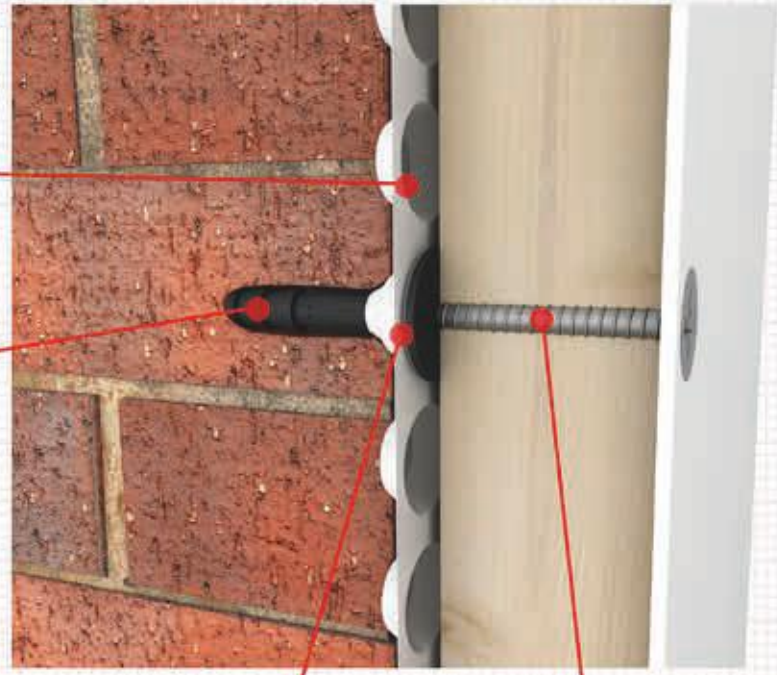
Anti-Lime Inhibitor
Anti-Lime Sealer is applied to concrete surfaces prior to the installation of the Wykamol Cavity Drain Membrane System to prevent the 'leaching' of free lime from the concrete slabs.

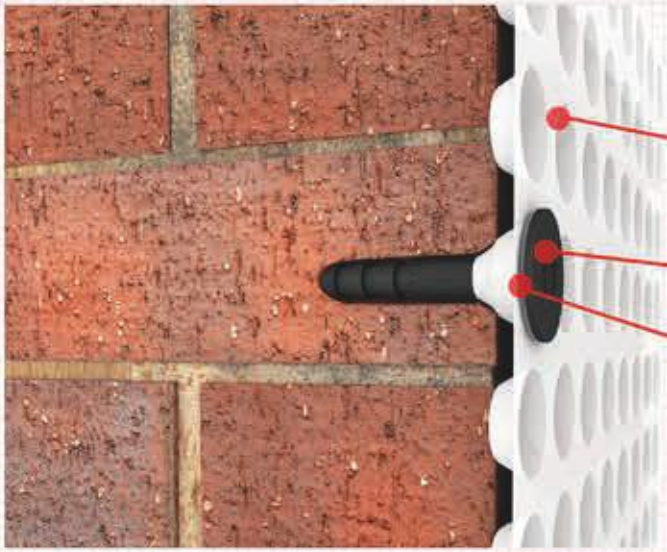

WYKAMOL BRICK PLUG
WYKAMOL BRICK PLUG SEAL


60MM

DRAWINGS INDEX







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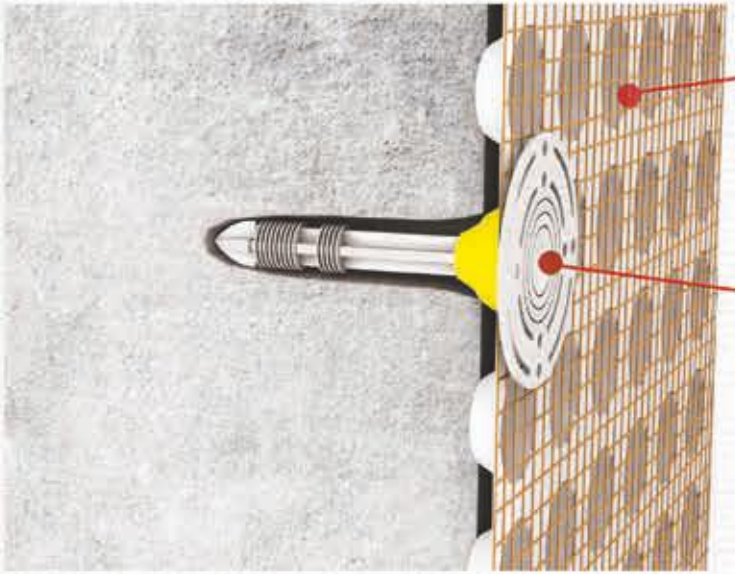
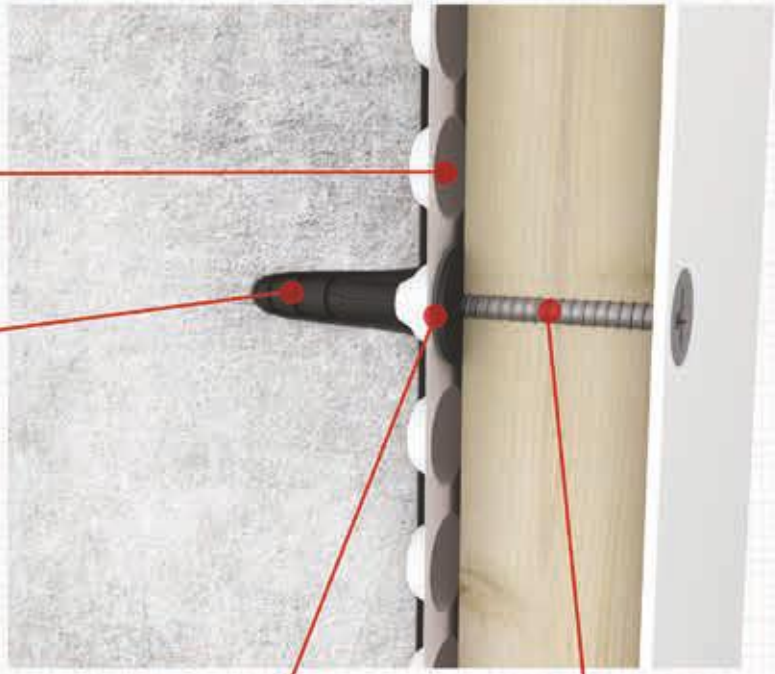
Membrane Sealing

Drawing Detail Wp046

NOT TO SCALE

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system





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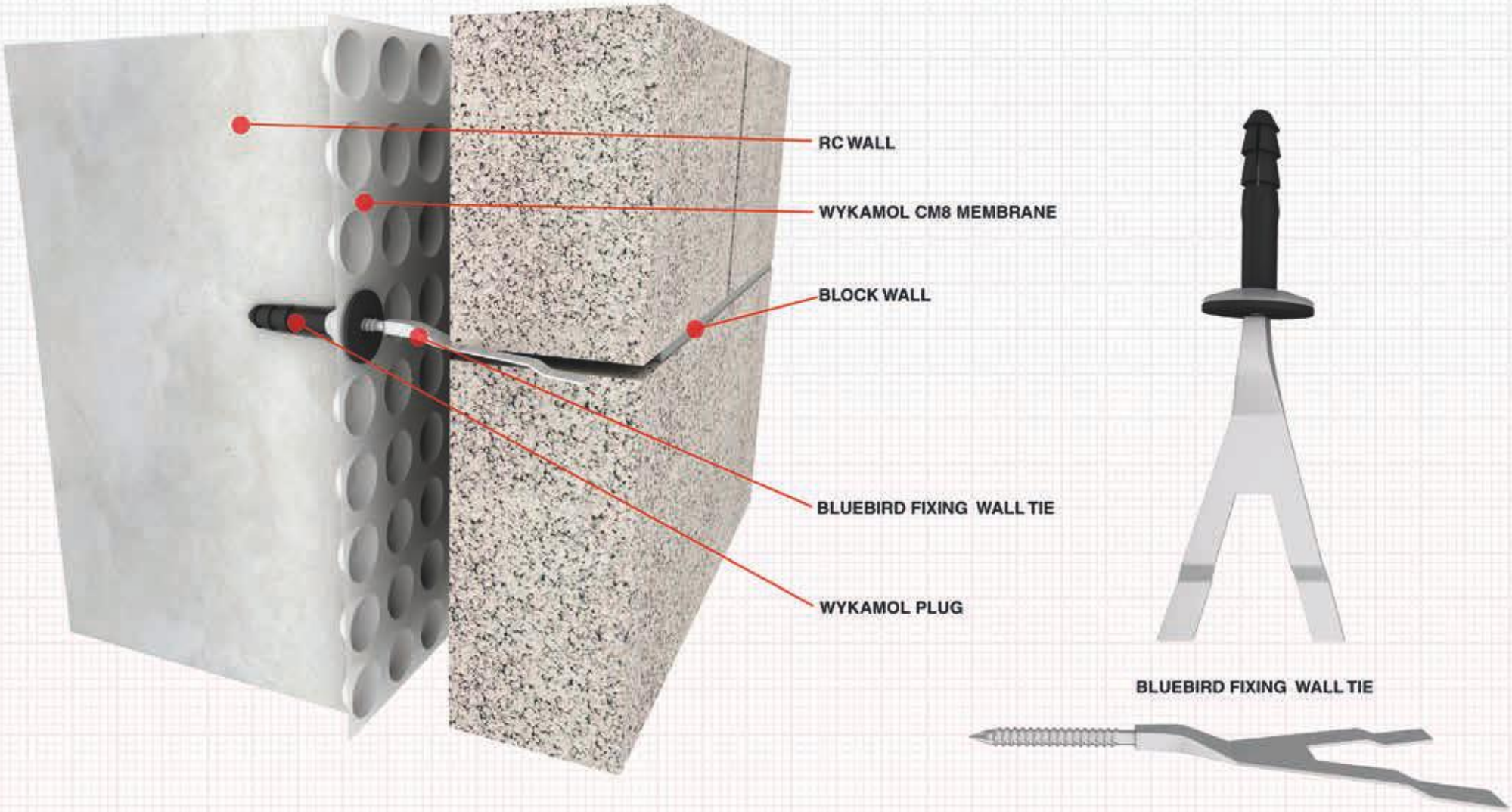
Membrane Sealing

Drawing Detail Wp047

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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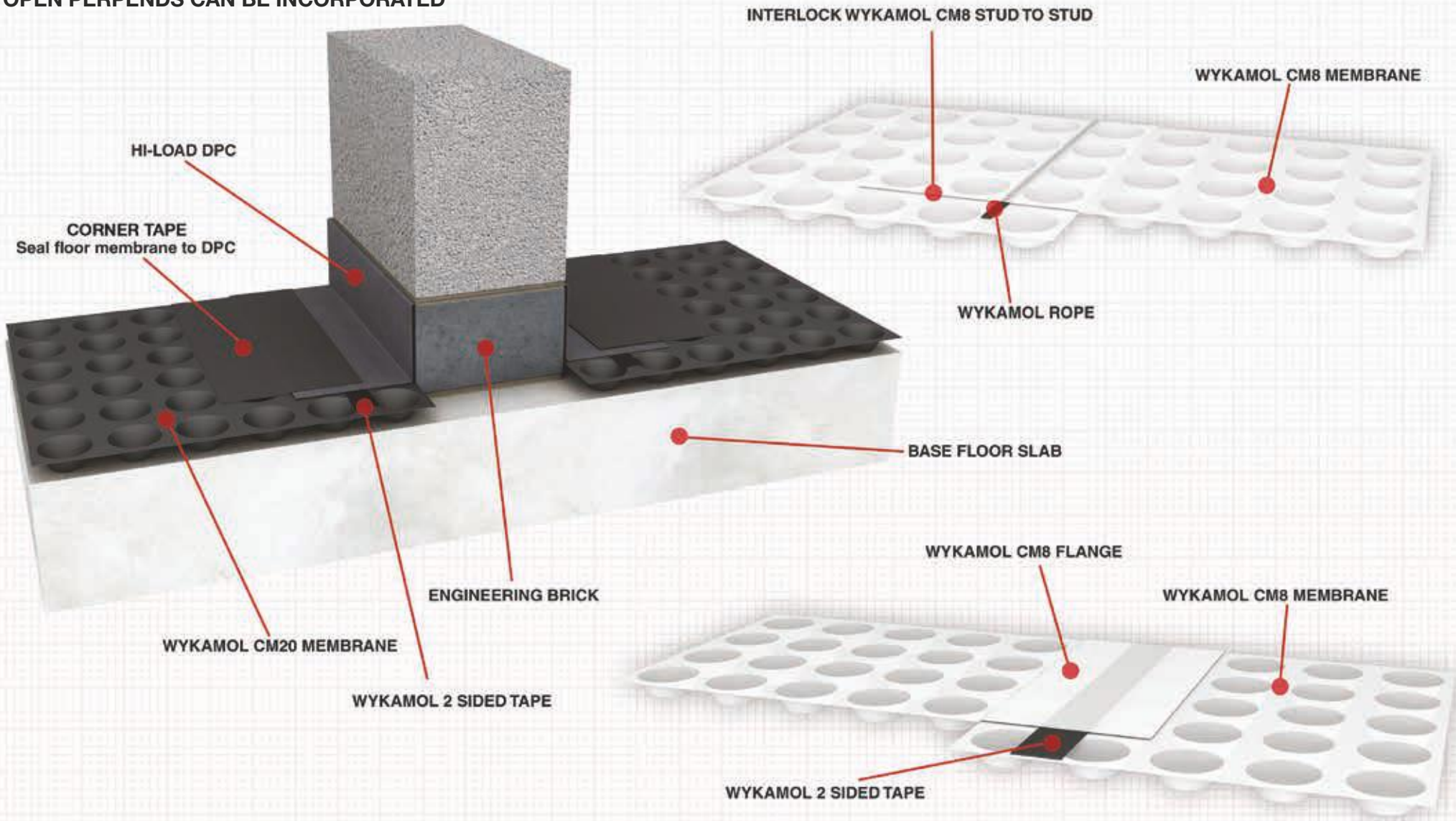
Bluebird Fixing Wall Tie

Drawing Detail Wp0149

NOT TO SCALE

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system

OPEN PERPENDS CAN BE INCORPORATED



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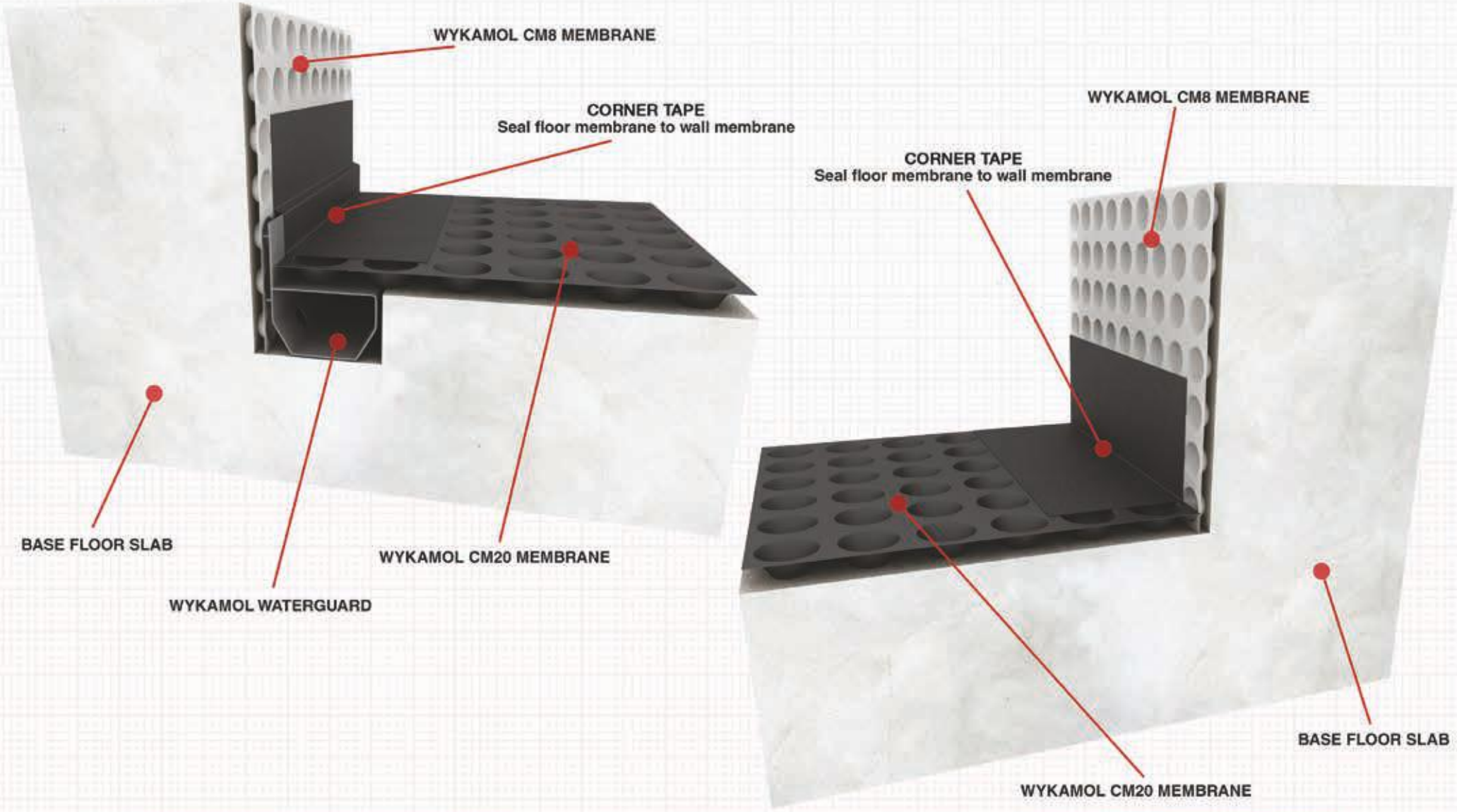
Membrane Sealing
Drawing Detail Wp043

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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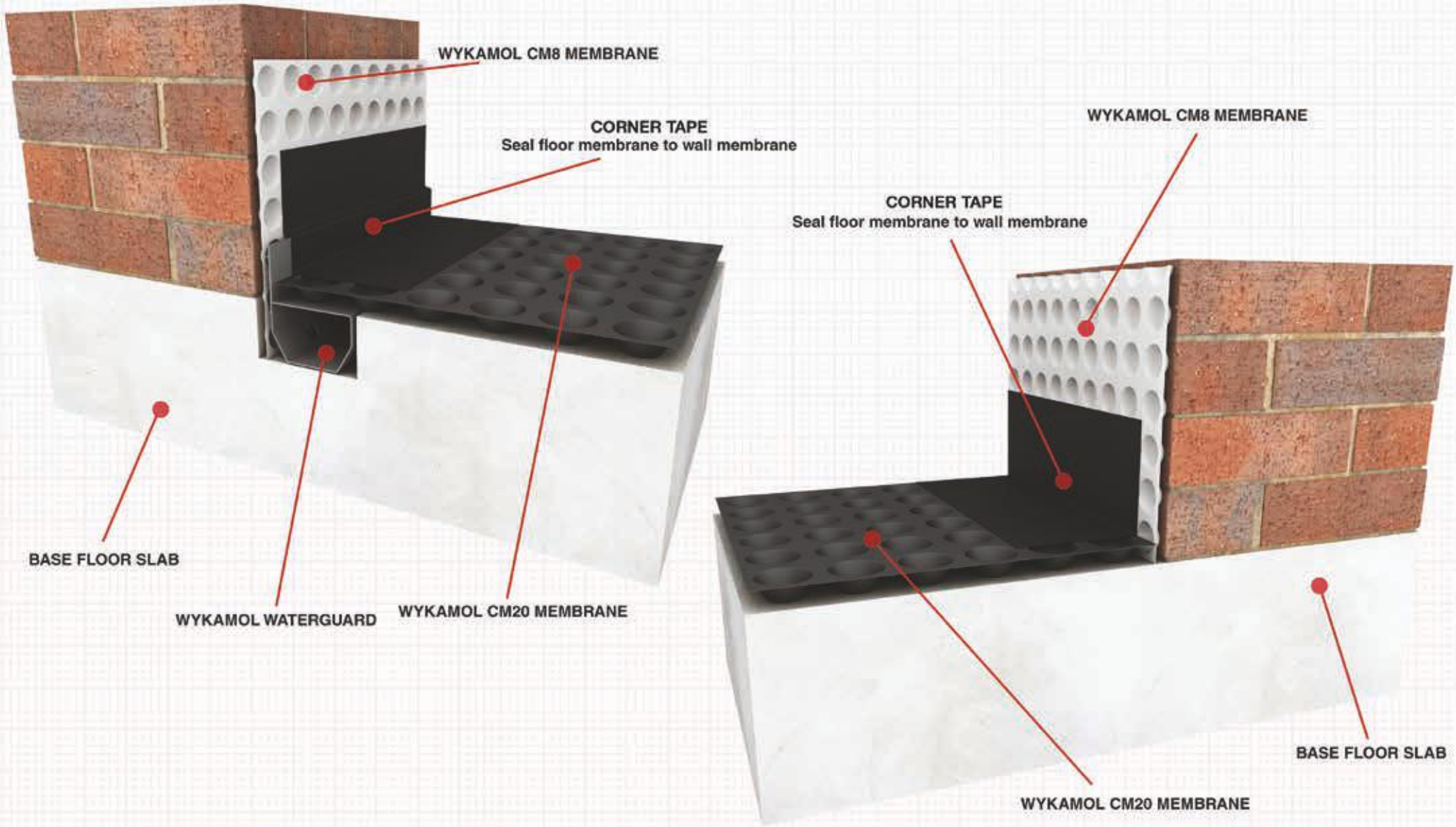
Membrane Sealing

Drawing Detail Wp044

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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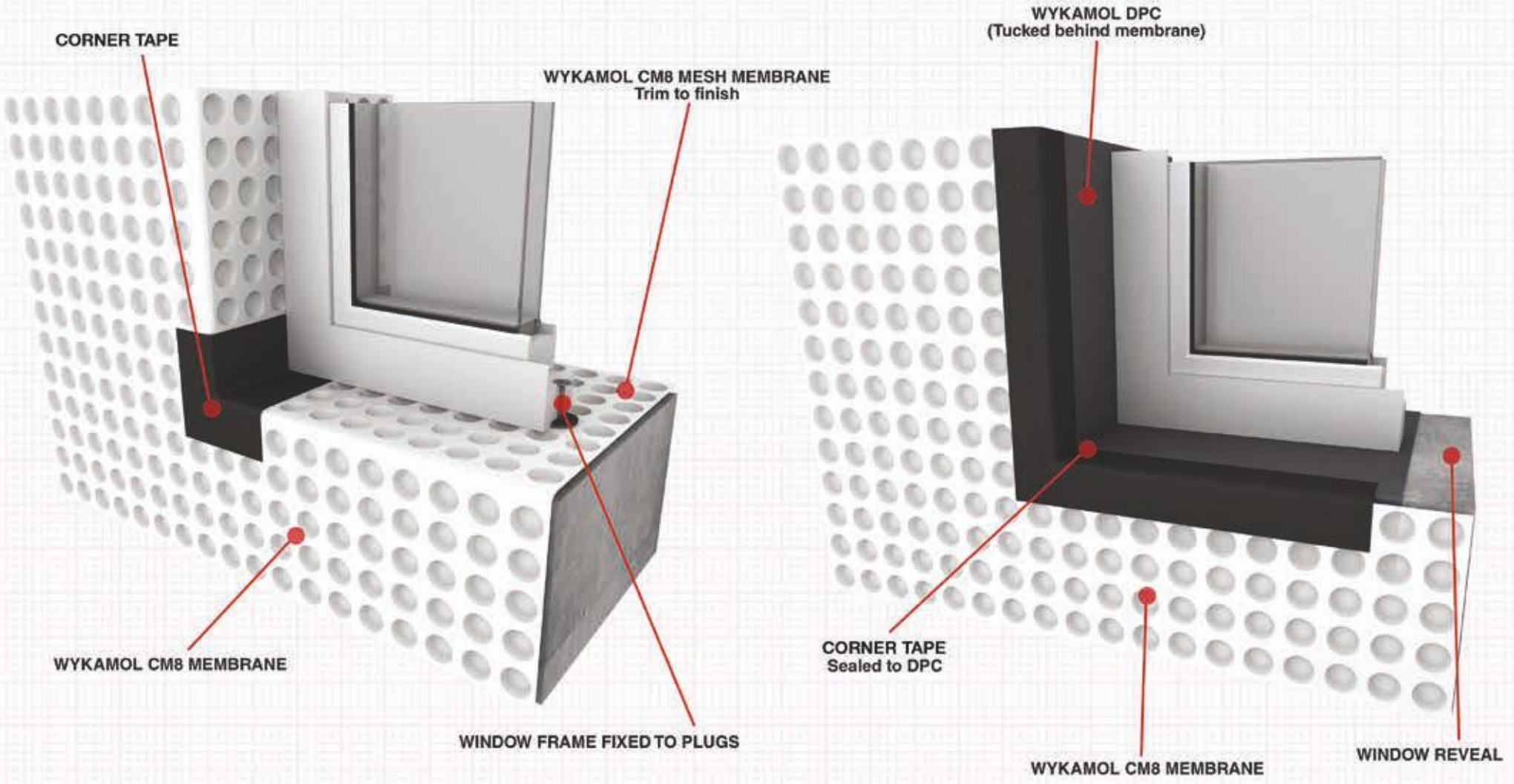
Membrane Sealing
Drawing Detail Wp051

NOT TO SCALE

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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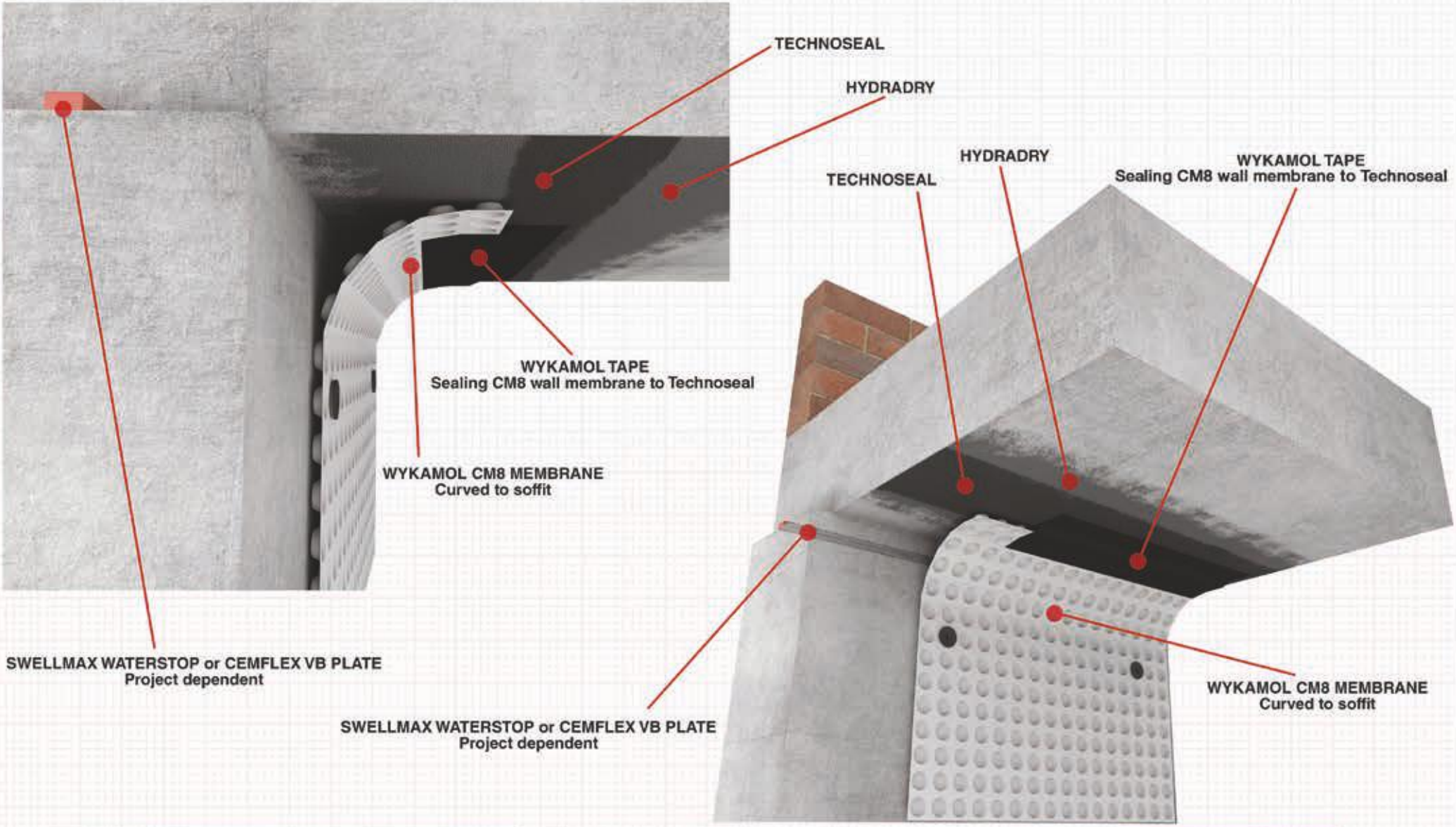
Window Reveal

Drawing Detail Wp049

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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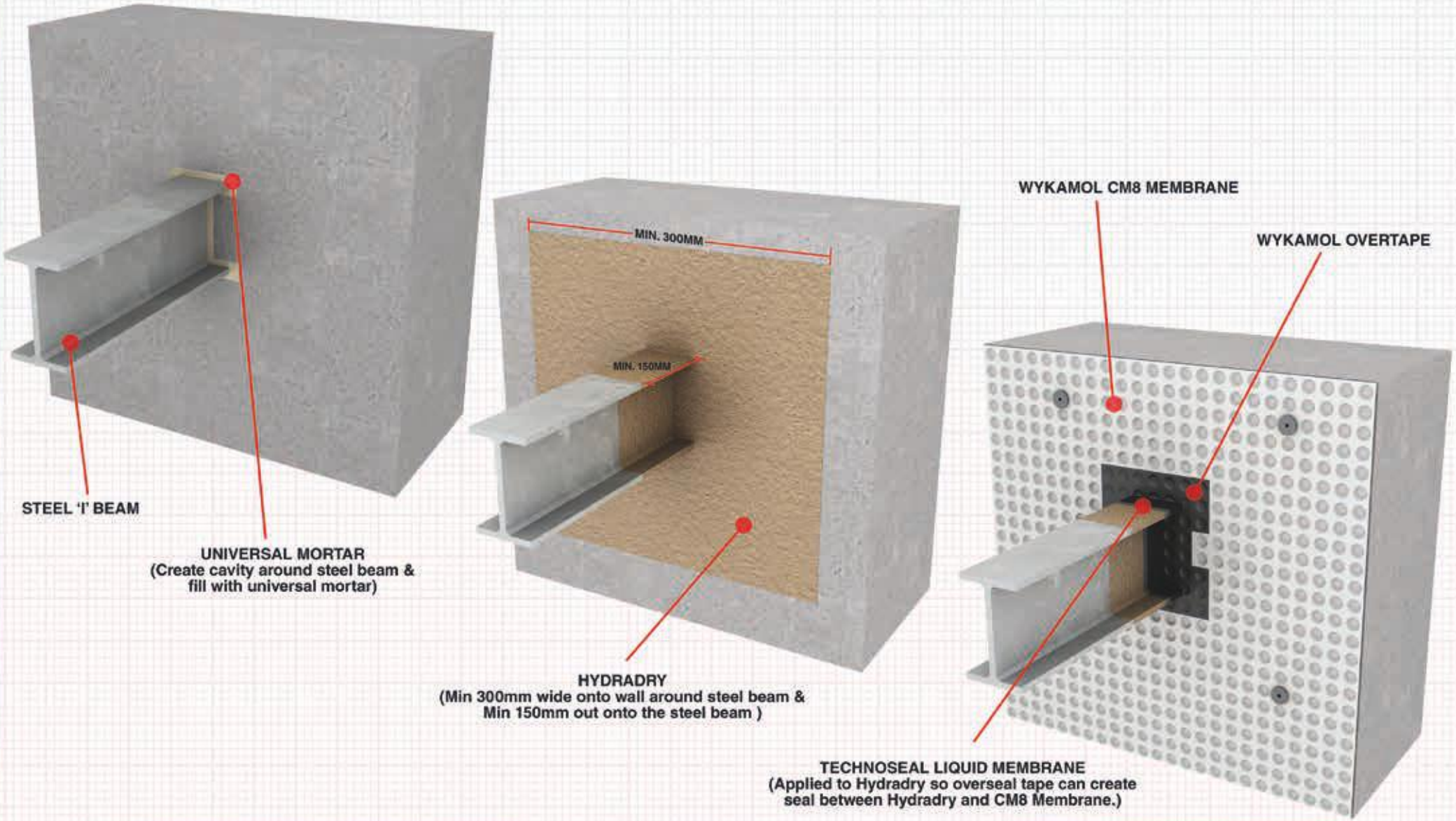
SOFFIT DETAIL

Drawing Detail Wp052

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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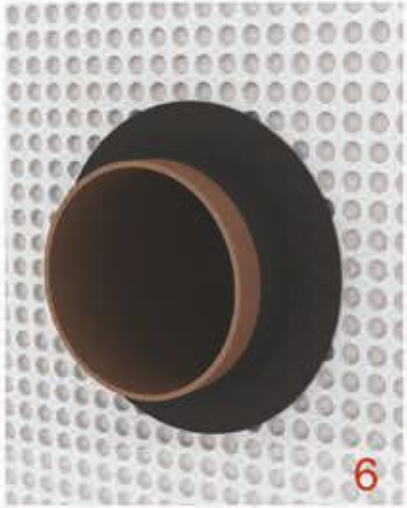
Existing Steel Beam
Drawing Detail Wp0119

NOT TO SCALE

1. Pipe entry through basement retaining wall
2. Chased out 20mm channel around perimeter of pipe
3. Fill Channel will Cem Active 805 Mastic

4. Prime the Pipe with Technoseal and then using Wykamol rope wrap around the perimeter of pipework.
5. Cut Wykamol CM8 wall membrane around pipe, and push into Wykamol rope(step 4) to create a seal
6. Using Wykamol overseal tape seal Wykamol CM8 wall membrane to the pipe to complete fully sealed pipe penetration



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PIPE ENTRY

Drawing Detail Wp042

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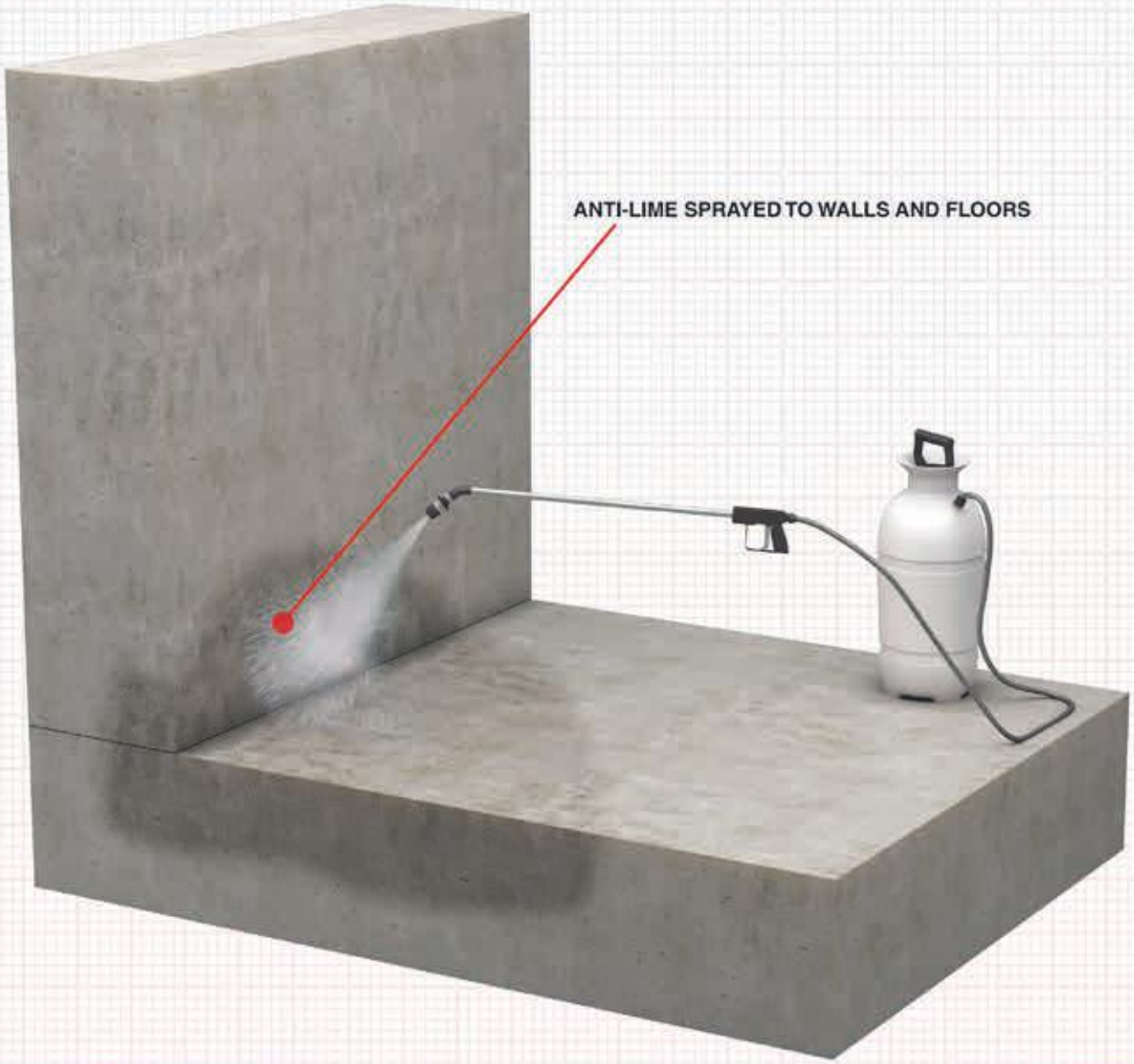

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ANTI-LIME

Drawing Detail Wp086

NOT TO SCALE

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DRAINAGE
and Sump Stations

Part of the basement waterproofing system is the sump pump and it is an essential component so that the basement does not flood.

The other key part of the waterproofing system that it works in conjunction with the basement drainage channels. These two elements work together to deal with any potential water ingress problems and keep the basement environment dry.

The design of the sump pump discharge line is an important part to prevent clogs from occurring and ensures that the system works at optimum efficiency. The problems that affect what happens outside of the basement effects the amount of water that can enter the basement and cause flooding.
It is important to ensure that water is kept away from the foundation of the property so that it will not lead to leaks inside of the basement.

If water from the sump pump's discharge line is discharged in the wrong location it can lead to problems with the discharged water that has been pumped out finding its way back into the basement.

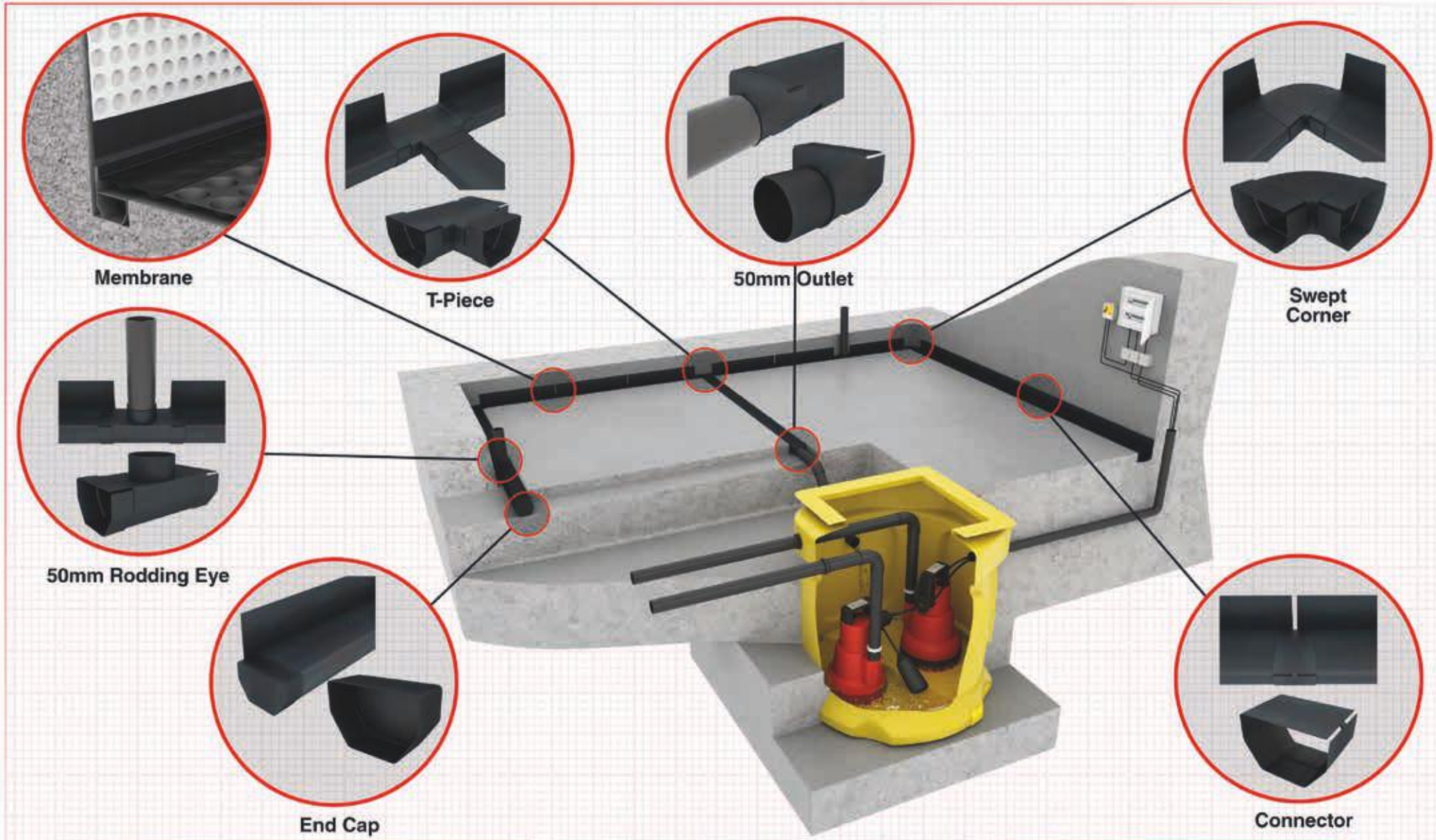
How do Perimeter Drainage Channels Work with Sump Pump System?

Perimeter drainage channels are, as the name suggests, installed around the perimeter of the basement They have several holes in the channel which allow water from the cavity drain membrane to enter the channel.

The collected water is then dispersed from the drainage channel into the sump chamber. Once the water has been collected in the sump chamber, it is then pumped out of the basement to a safe evacuation point. The advantages of having a perimeter drainage channel fitted are the following:

- Where there are areas of the waterproofing system have failed, the perimeter drainage channel is used to solve these issues
- The perimeter drainage channel helps to relieve the pressure from groundwater to assist in maintaining a dry habitable basement

DRAWINGS INDEX



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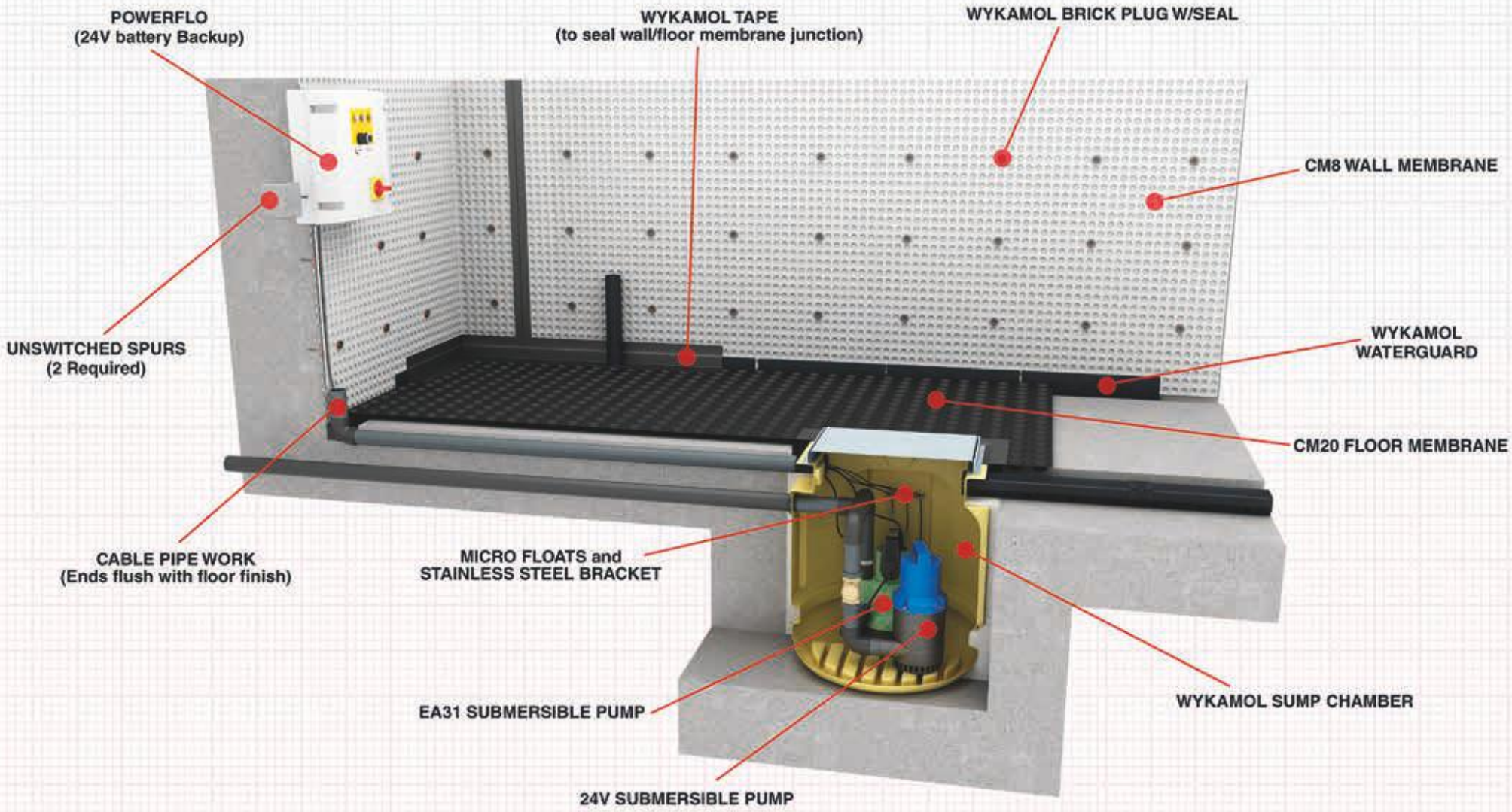
TYPICAL WYKAMOL CHANNEL LAYOUT
Drawing Detail Wp0152

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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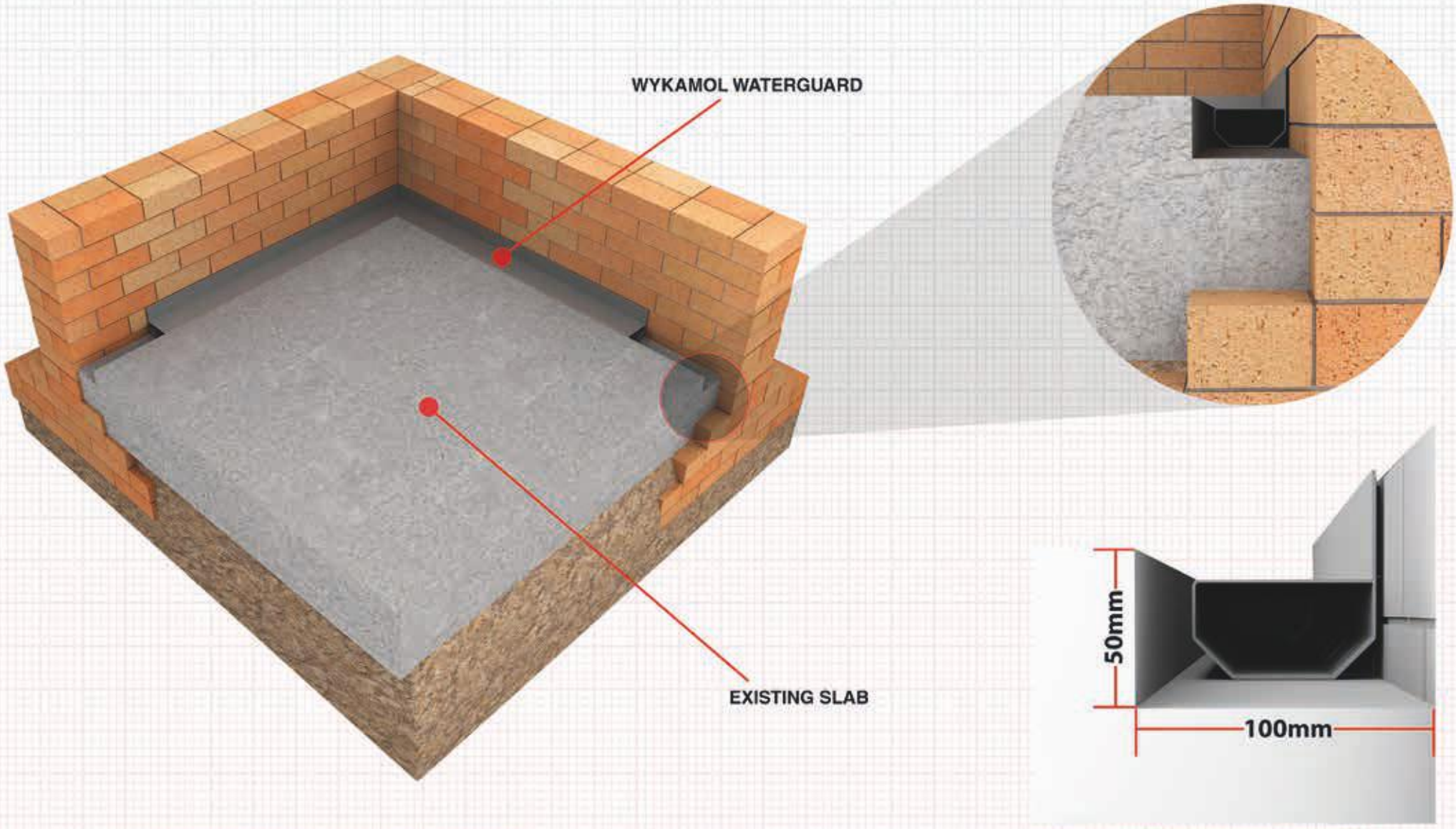
WYKAMOL SUMP & BATTERY BACKUP

Drawing Detail Wp0135

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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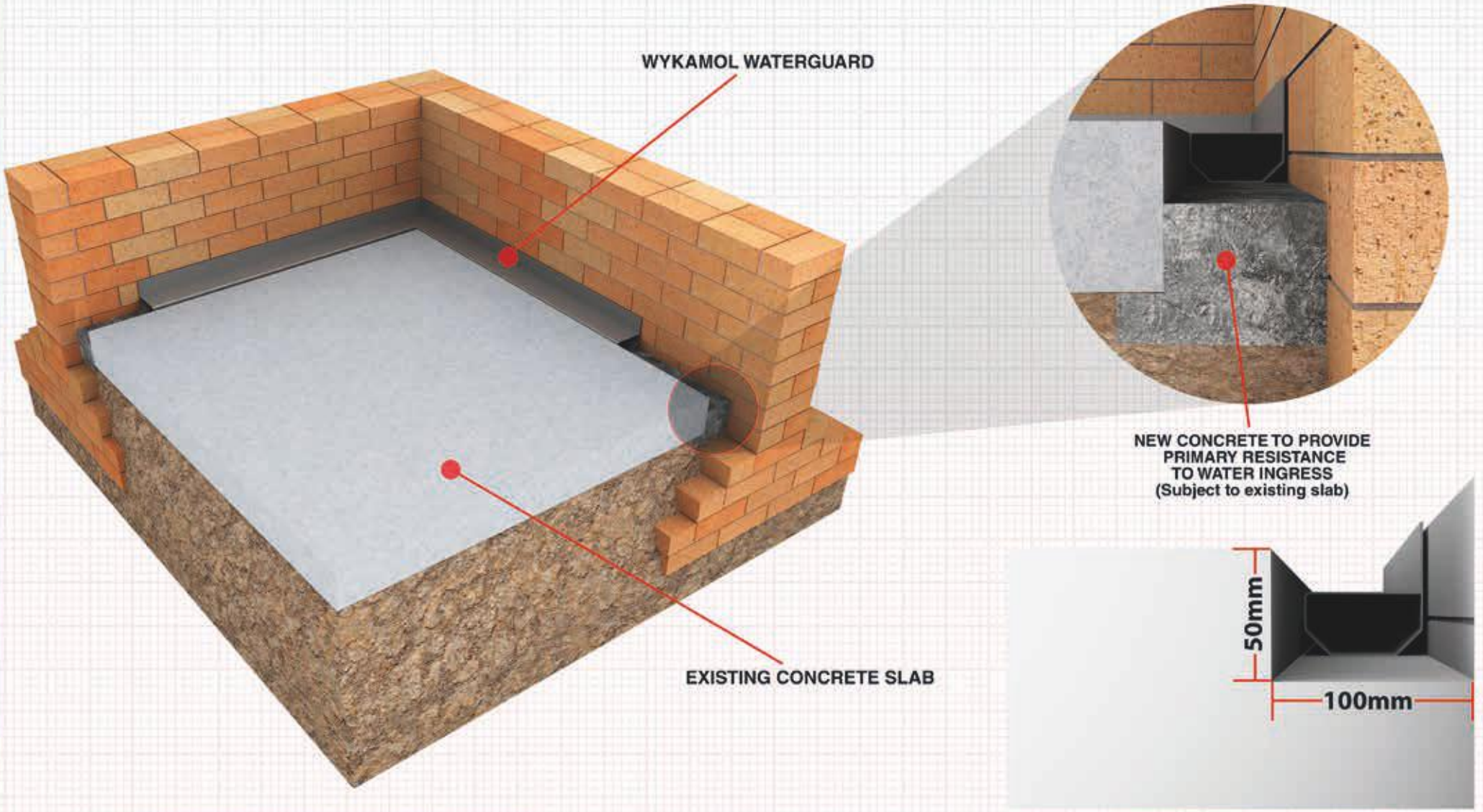
EXISTING SLAB P.C. DETAIL

Drawing Detail Wp0116

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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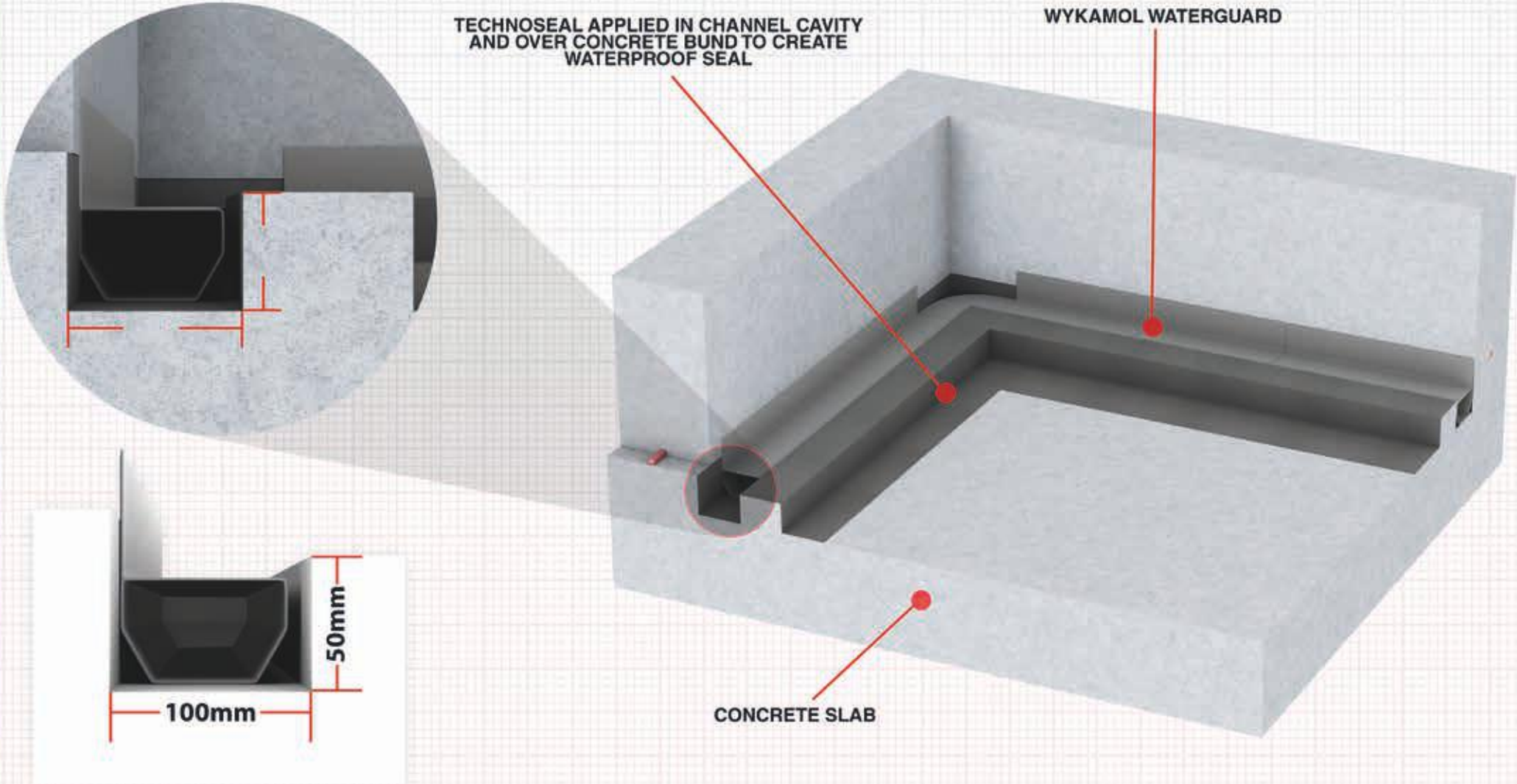
EXISTING SLAB WITH CUTOUT P.C. DETAIL

Drawing Detail Wp0107

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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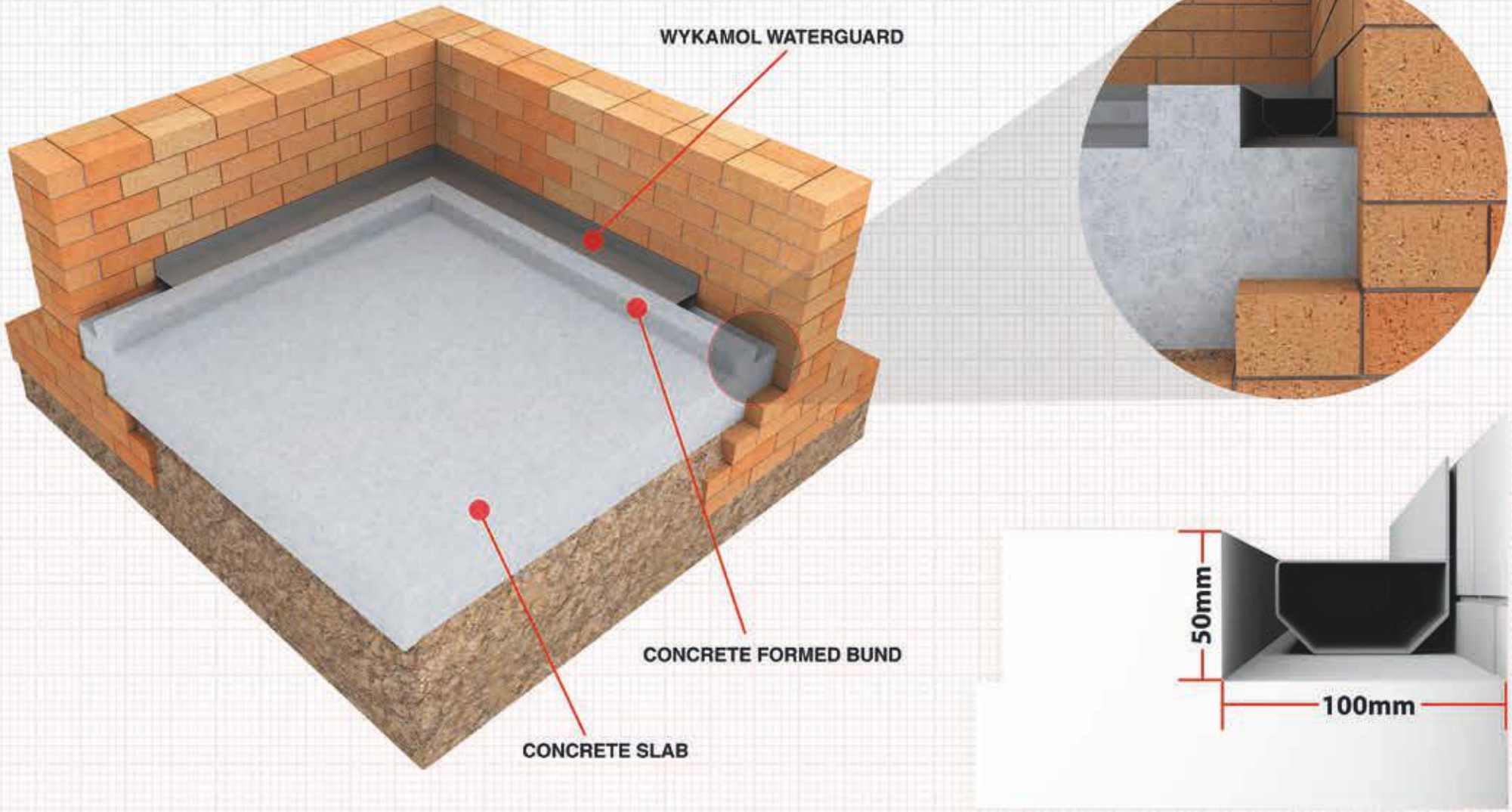
CONCRETE BUND P.C. DETAIL

Drawing Detail Wp0114

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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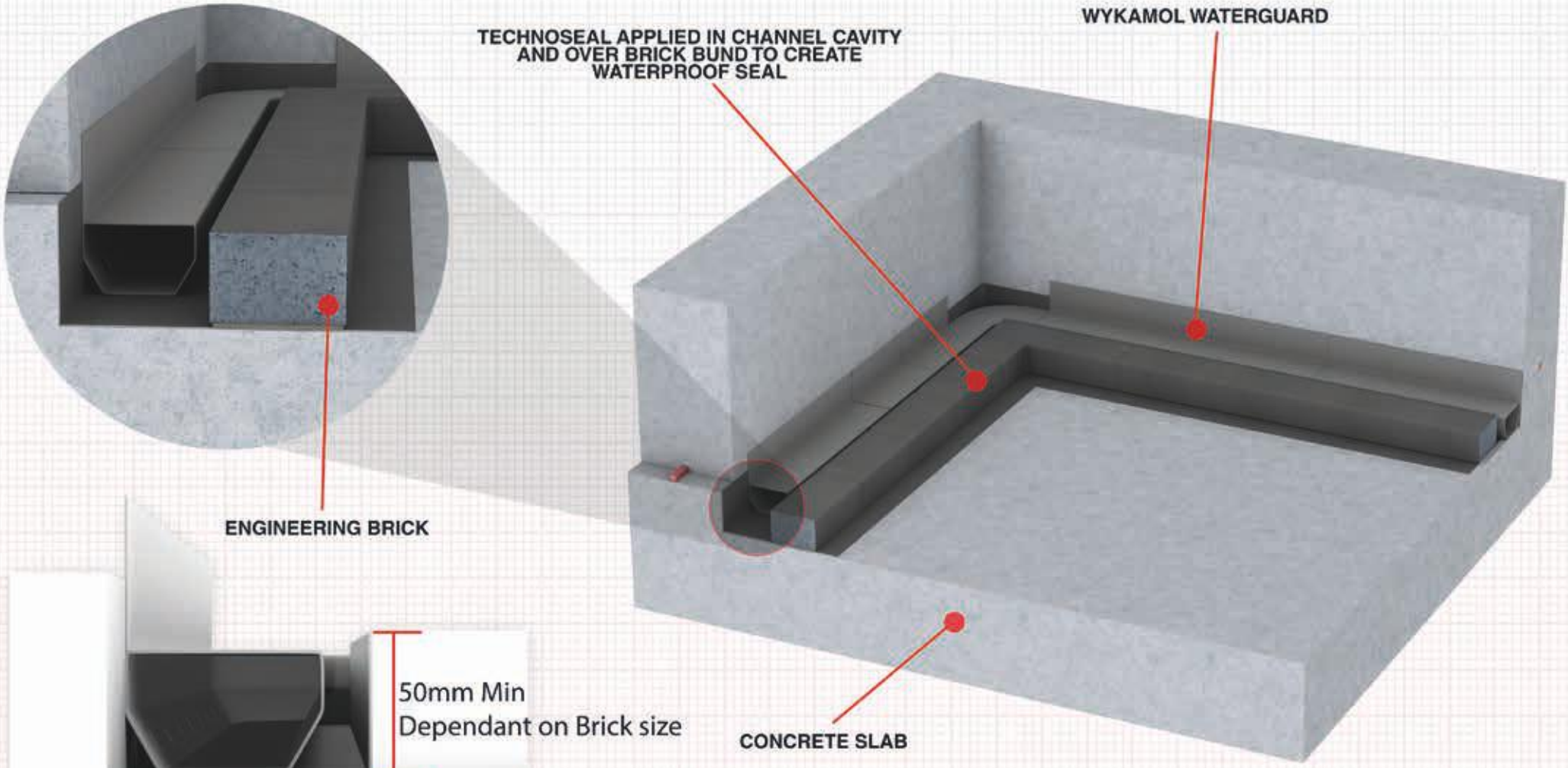
BUND P.C. DETAIL

Drawing Detail Wp0110

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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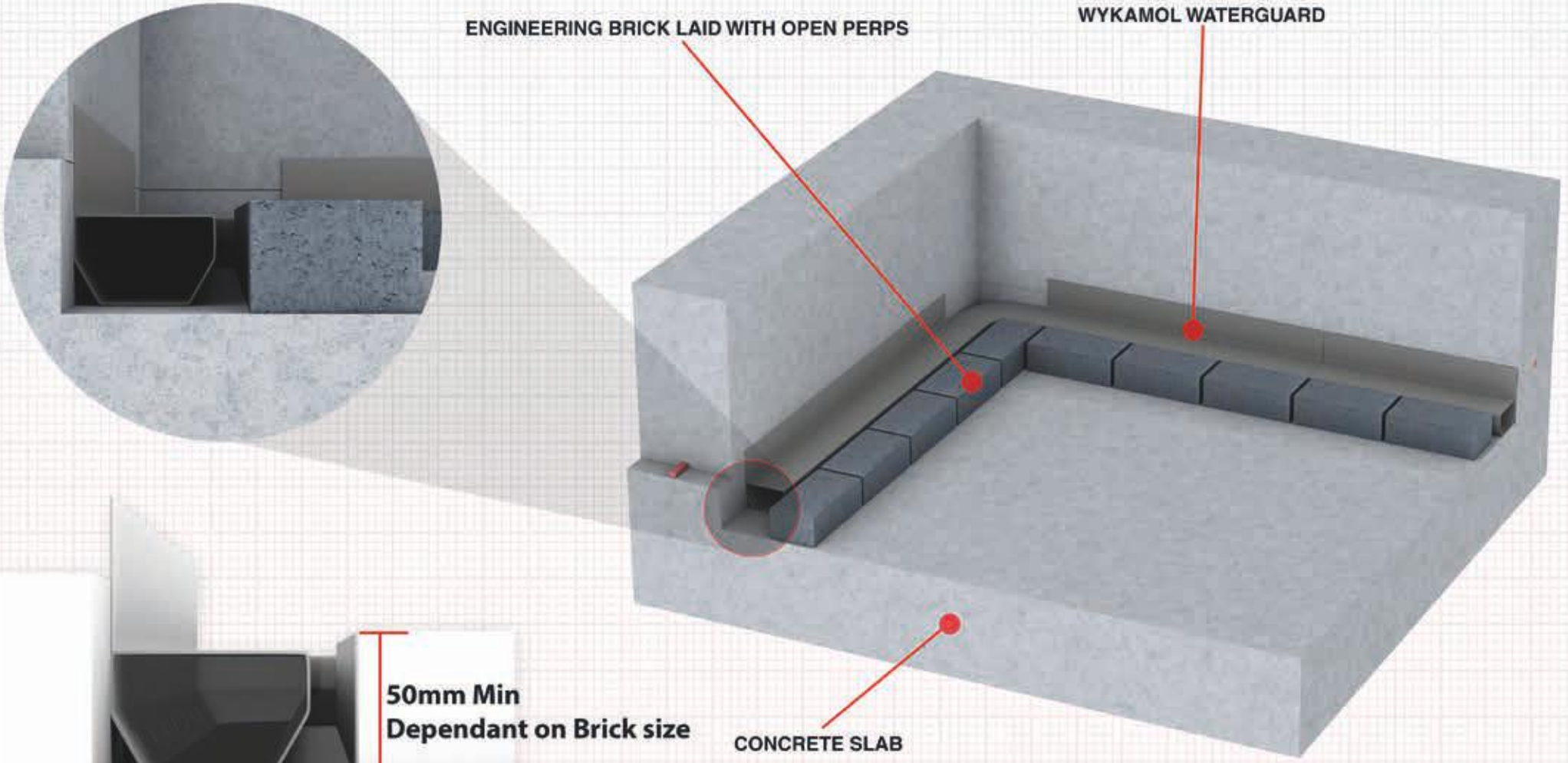
ENGINEERING BRICK BUND P.C. DETAIL

Drawing Detail Wp0113

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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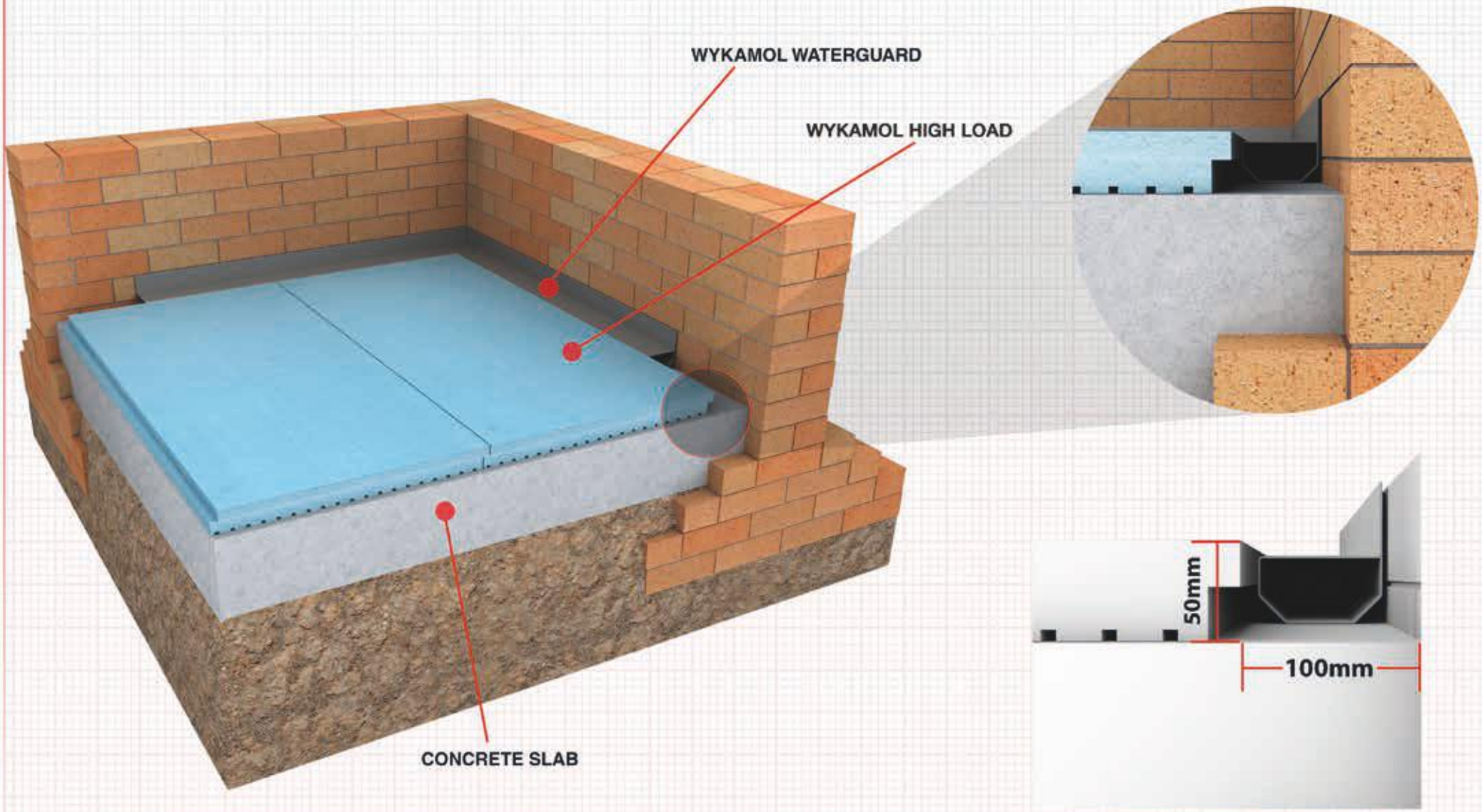
ENGINEERING BRICK P.C. DETAIL

Drawing Detail Wp0112

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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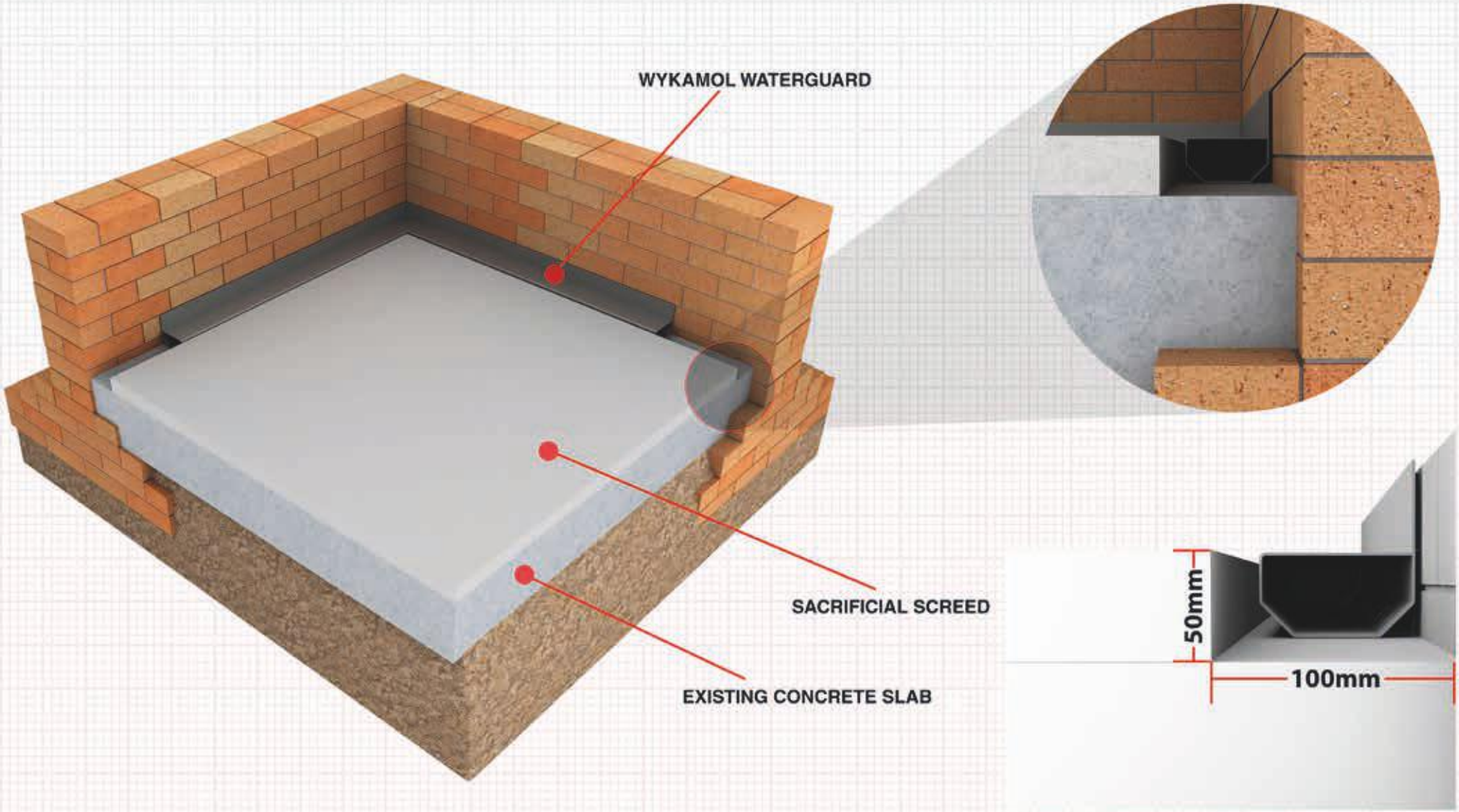
WYKAMOL HIGH LOAD SPACER P.C. DETAIL

Drawing Detail Wp0111

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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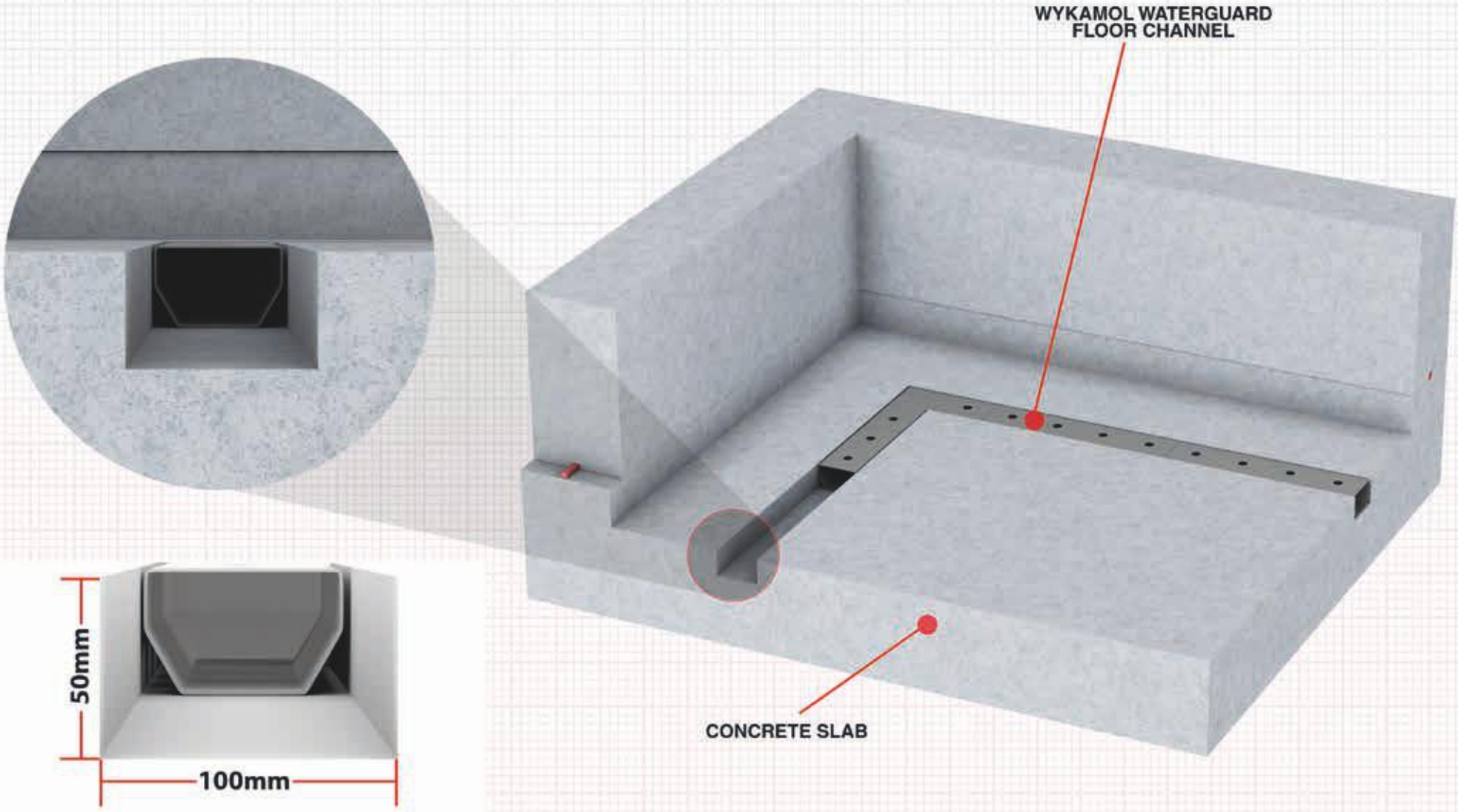
SACRIFICIAL P.C. DETAIL

Drawing Detail Wp0109

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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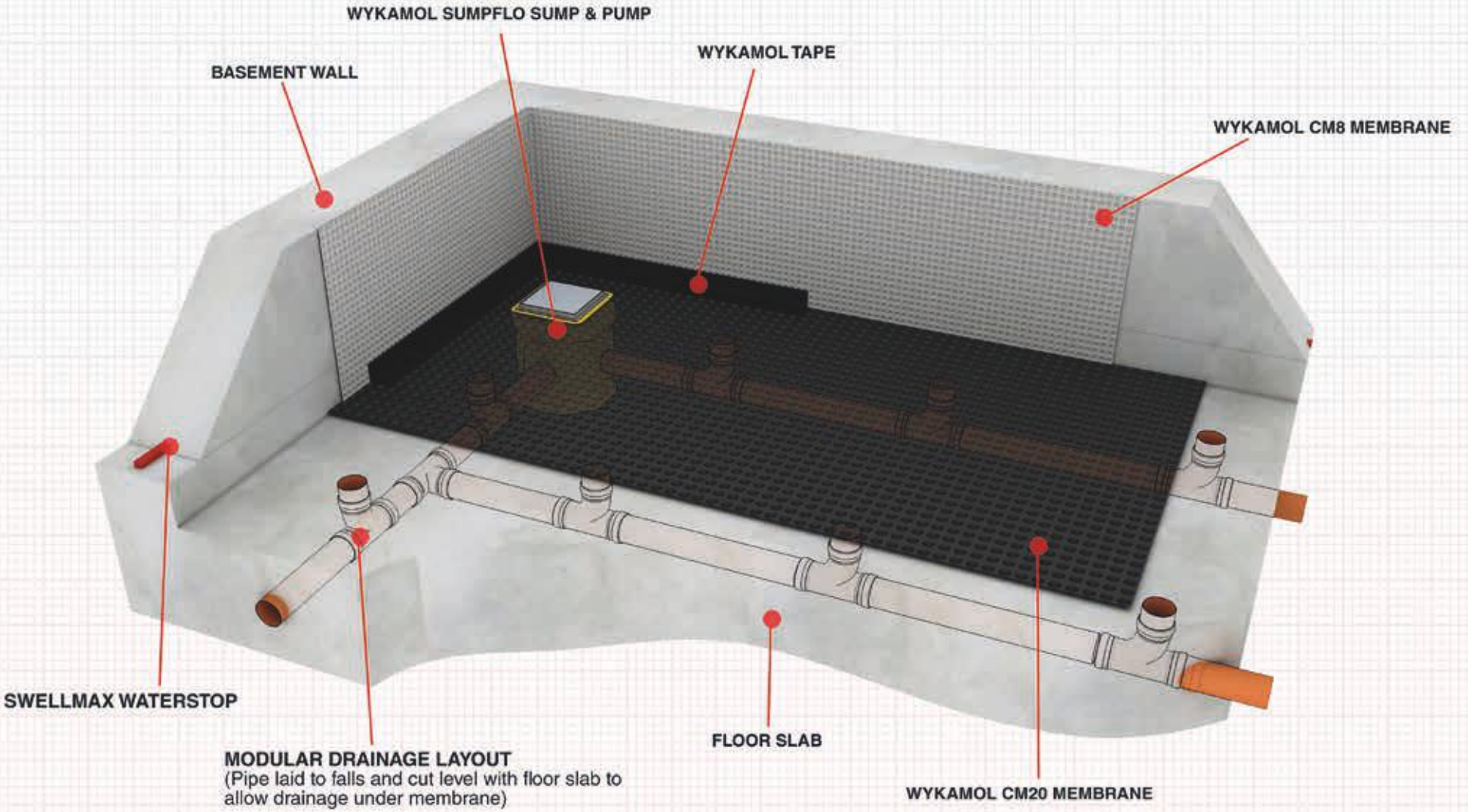
PREFORMED CHANNEL F.C. DETAIL

Drawing Detail Wp0115

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system



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MODULAR DRAINAGE LAYOUT

Drawing Detail Wp079

Please spray all new concrete areas with Microsealer anti-lime treatment to stem the flow of free lime movement, which can potentially block the drainage system

NOTES

Waterproofing and Gas Protection Design Guide

FOR ABOVE & BELOW GROUND APPLICATIONS

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