Geo-Environmental

VERIFICATION REPORT

for land at

FREE WHARF PHASE 2,

BRIGHTON ROAD,

SHOREHAM-BY-SEA,

BN43 6RE

on behalf of

HG CONSTRUCTION



Report:	**VERIFICATION REPORT**
Site:	**FREE WHARF PHASE 2, BRIGHTON ROAD, SHOREHAM-BY-SEA, BN43 6RE**
Client:	**HG CONSTRUCTION**
Date:	**24/04/2024**
Reference:	**GE22259/VR/PHASE 2/APR24**
Version:	**1.0**
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Approved by:	[redacted] **LAURA LEGATE CGeol, CSci, BSc (Hons), MSc, FGS** **Environmental Director**

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Environmental Consultants | Geotechnical Engineers | Site Investigations

AMENDMENT RECORD

Revision ref.	Date	Reasons for amendment	Author's initials	Reviewed by	Approved by
1.0	24/04/2024	First issue for Phase 2	WH	FG	LL

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1.0 INTRODUCTION

1.1 General

Following a Phase I and Phase II assessment of the whole development site undertaken by GeoDyne Limited ('GeoDyne'), together with subsequent development of a Remediation Method Statement (RMS), detailed within reports listed below, Geo-Environmental Services Limited ('Geo-Environmental') was instructed by HG Construction ('the Client') to prepare a Verification Report in relation to the installation of gas protection measures within the residential development for Free Wharf Phase 2, Brighton Road, Shoreham-by-Sea, BN43 6RE ('the Site').

Previous Reports:

- Combined Phase I Desk Study and Initial Phase II Exploratory Investigation – ref: 31149 Combined Report, dated 28th September 2012, by GeoDyne.
- Remediation Method Statement – ref: 31149 RMS Report, dated 30th May 2019, by GeoDyne.

This report relates specifically to the installation and validation of remedial measures in relation to gas protection measures installed within Phase 2 only.

This report sets out the works undertaken to date to provide independent verification of the risk mitigation measures incorporated into the development to protect the development and end users thereof with respect to ground gases. This report provides final validation for works undertaken and independent inspection data compilation in relation to Phase 2 only.

1.2 Objectives

A desk study and ground investigation undertaken by GeoDyne identified the presence of potential hazards and through a risk assessment process a series of pollutant linkages were identified which require action to mitigate or otherwise reduce the risk. The RMS sets out the proposed remedial works to be undertaken on the subject site to support its development for a proposed residential end use.

This Verification Report (VR) presents the details and findings of inspection visits undertaken, throughout the construction period, by Geo-Environmental in respect to Phase 2 in relation to gas risk in order to demonstrate that the gas risk mitigation measures were implemented as set out in the RMS, within this Phase only.

1.3 Planning Permission

It is understood that outline planning permission has been approved for the whole site by Adur and Worthing District Councils under Planning Reference AWDM/1497/17 dated 9th August 2018 with the following conditions applied relating to land contamination:

03. Prior to commencement of enabling works, full details shall be submitted to and approved in writing by the Local Planning Authority, which includes the following:

- *Replacement of river wall sheet piling and construction of new permanent concrete river wall including associated permanent piling;*
- *Marine piling for river moorings and jetty;*
- *Boundary retaining walls and associated fencing / barriers;*
- *Excavation; remediation of possible contamination (including watching brief) and re-profiling of ground levels and piling mat;*
- *Diversion and laying of primary services, ducting and primary drainage; and*

- *Base layers of spine roads to assist with provision of clean access during main construction phase.*

Reason: To ensure that the proposed development is satisfactorily provided with required infrastructure in accordance with paragraph 156 of the National Planning Policy Framework.

2.0 BACKGROUND

This Verification Report has been produced in order to demonstrate that the works required and presented within the RMS have been carried out. The RMS for the site was developed following several phases of investigation works for the whole site, including a Phase I Desktop Study and Phase II intrusive investigation works undertaken and reported by GeoDyne (Ref:31149 Combined Report, September 2012).

Whilst a summary of these reports is presented below, reference should be made to the full reports for further details. The factual correctness of third-party information is assumed, and no liability is accepted for any errors in or omissions from such information or subsequent assessment based on such information.

2.1 Proposed Site Use

The site is being developed with a residential block of flats with associated car parking, infrastructure and soft landscaping.

2.2 Investigation and Assessment

A summary of the key findings of previous investigations and reports is presented below:

- At the time of the desk study and site investigation works (July 2012), the site comprised an irregularly shaped parcel of land adjacent to the River Adur, occupied by former industrial properties.
- The ground conditions encountered during the intrusive investigation comprised Made Ground, overlying Head Deposits, Tidal River Deposits and Storm Beach Deposits, with the Tarrant Chalk Member encountered at depth. The presence of the superficial deposits varied across the site.
- Made Ground was encountered across the site in all locations to depths of between 0.65m and 4.80m bgl and comprised brown to black clayey gravelly sand to sandy gravel. Gravel included flint, chalk, sandstone, mudstone, shale, brick, concrete, ash, slag and locally bitumen fragments, timber and metal. A hydrocarbon odour was noted in four locations (WS1, WS2, WS4 & WS10) and free product in WS1.
- Groundwater was encountered between 1.60m and 4.70m bgl within both the Made Ground and underlying natural strata. This is likely influenced by the changing tide due to the site's proximity to the River Adur.
- Monitoring wells were installed within eight boreholes. Spot monitoring was undertaken on four occasions between August and September 2012. Additional monitoring was carried out until October 2015.
- Groundwater was encountered within all of the monitoring wells during the return spot monitoring visits undertaken and was found to be present between depths of 1.49m and 4.90m bgl.
- The spot monitoring undertaken detected methane at concentrations in the range of 0% to 1.2%, carbon dioxide at concentrations in the range of 0.1% to 17.5% and oxygen in the range 0.1% to 20.3%. Atmospheric pressure was recorded between 1012mb and 1024mb during the visits undertaken and borehole flow rates ranged from -7.6l/hr to 12.3l/hr, potentially due to tidal influence.
- The spot monitoring and RMS undertaken by GeoDyne indicated the site's gassing regime, based on both hazardous gas flow and gas concentration, to be Characteristic Situation 2 (BS and CIRIA) for which gas protection measures would be required.
- With regards to soil, in the first instance, the results of the sample analysis were compared to the respective Tier 1 screening criteria for a residential public open space use. All of the results were noted to be below the respective assessment criteria with the exception of a hotspot of lead and benzo(a)pyrene was identified around WS17. Further investigation found Made Ground contaminated with arsenic, lead and various PAHs. In addition, asbestos was detected to two of the samples analysed.

2.3 Conceptual Site Model

The conceptual site model (CSM) developed as part of the risk assessment identified particular hazards, or potential hazards which were considered to require intervention (remediation) to mitigate the risk of harm.

2.4 Approach for Remediation, Monitoring and Validation

Remediation works were proposed to break the pathways of identified sources of contamination to receptor in relation to soil contamination and ground gas risks. The aim of the remediation was not necessarily to remove all contamination from the site but to provide betterment and to reduce the identified risk to an acceptable level with respect to relevant receptors, e.g. human health, the built environment and controlled waters.

3.0 GROUND GAS

3.1 Ground Gas Assessment

A ground gas assessment was undertaken across the whole site as part of the third-party Phase II intrusive investigation and subsequent RMS. Eight ground gas monitoring standpipes were installed on site to depths of up to 11.5m bgl. Ground gas spot monitoring was undertaken on six occasions, in line with current best practice guidance for a residential end use.

The spot monitoring undertaken detected methane at concentrations in the range of 0% to 1.2%, carbon dioxide at concentrations in the range of 0.1% to 17.5% and oxygen in the range 0.1% to 20.3%. Atmospheric pressure was recorded between 1012mb and 1024mb during the visits undertaken, and borehole flow rates ranged from -7.6l/hr to 12.3l/hr, potentially due to tidal influence.

A Tier 1 Ground Gas Risk Assessment (GGRA) incorporating the results of the desk study and ground investigation was undertaken. This risk assessment concluded that based on the relative borehole flow rates compared with the respective gas concentrations, that the entire site was classified as CS2.

3.2 Gas Protection Design Measures

The following gas protection measures were considered to be required to protect the development and end users thereof:

- Ventilated underground carpark;
- Installation of a gas resistant membrane (suitable for protection against carbon dioxide) laid across all areas of the floor outside of the car park area, i.e. lift pits, stairwells and service cupboards (as per the plans in Appendix B). All joints and service penetrations sealed to form a single integral membrane with taped, welded joints or liquid membrane. All joints should comprise a minimum 150mm overlap. It was recommended that membrane installation be undertaken by a suitability competent (e.g. NVQ qualified) installer;
- Minimum penetration of the slab by services and sealing of all penetrations and joints using 'top hats' or bespoke/site formed top hat seals;
- Inspection and verification of installed measures.

In accordance with NHBC policy, recycled plastics were not acceptable as part of the gas protection measures. Use of recycled plastics would result in plots being failed during validation and at CML stage.

3.3 Verification/ Independent Inspection

Gas protection measures on site have been installed by 4D Structures Ltd. Independent verification of gas protection measures at various stages of the development with respect to Phase 2 was undertaken by Geo-Environmental on behalf of HG Construction, and included several inspection visits undertaken between January and April 2024 as instructed by HG Construction, details of which are presented below:

- 30th January 2024 (lift pit);
- 7th February 2024;
- 20th February 2024;
- 1st March 2024;
- 20th March 2024;
- 8th April 2024

Figure 2 presents an area plan showing which area of the floor construction was covered by each of the above independent inspection visits.

The gas membranes were installed by 4D Structures within the base of the underground carpark. Two separate suppliers were utilised to provide the gas protection measures, PUDLO and Premcrete. PUDLO was the original supplier which was used to complete the lift pits. Products supplied by Premcrete were used across the remaining areas of the site requiring gas protection. The products used changed after the inspection of the lift pits due to issues with the original supplier.

A liquid membrane was painted onto services and around steel work, and then surrounded by the appropriate 120mm double sided tape. The membrane was then placed over the relevant areas, with separate sheets joined by 120mm double sided tape with an additional overlap of at least 60mm. Within the lift pits, membrane joints were heat welded. To prevent movement of the membranes, they were fixed in place and liquid membrane placed over all penetrations. Screed was placed atop placed membranes within several days of a successful validation visit.

Hydrorufe 8000 membrane was placed on the eastern outer wall of the carpark, with a protective barrier, before burial to protect against water and ground gases.

The gas resistant products installed within the lift pits comprised (details presented in Appendix C):

- PUDLO GP Ultra + (membrane);
- PUDLO GP Ultra Seal (tape);
- PUDLO Liquid GB.

The gas resistant products installed within the remainder of the Phase 2 area comprised (detail presented in Appendix D):

- Combi-Seal Plus (membrane);
- HYDROPRUFE 8000 (membrane);
- Combi-Seal Tape (tape);
- TWINSEAL Compound GR;
- HYDROPRUFE LG.

The gas mitigation measures were inspected by Geo-Environmental on several occasions over the course of the works to observe and record that the measures installed complied with the requirements as set out within the RMS. Visual inspection record sheets in line with the verification pro forma as set out in CIRIA C735 ‘Good practice on the testing and verification of protection systems for buildings against hazardous ground gases’, of the gas protection measures installed are enclosed in Appendix A.

4.0 DISCOVERY STRATEGY

A discovery strategy remains in place throughout the development works on this site. Geo-Environmental has not been made aware of any discoveries having been made to date in relation to the works validated herein and thus the strategy, as set out in the RMS did not require enacting, to the best of our knowledge. However, the strategy remains in place for the remainder of the development works.

5.0 VERIFICATION

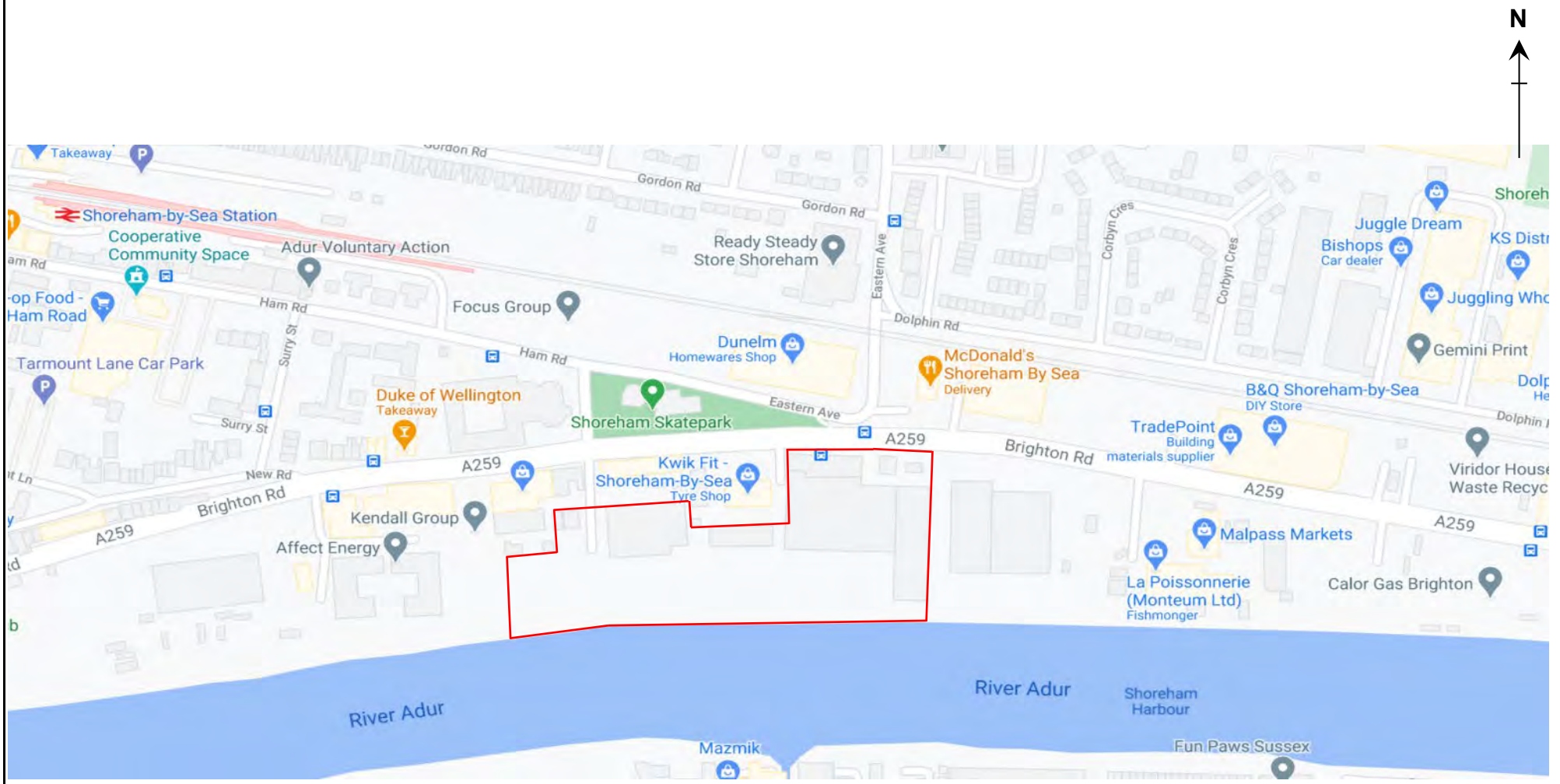
In accordance with the Client's instruction, Geo-Environmental undertook routine and independent inspection during key stages of the construction process. The risk mitigation measures in relation to gas protection remedial measures for Phase 2, have been inspected and were considered to comply with the requirements of the design and Remediation Method Statement at the point of inspection, or defects otherwise noted and subsequently rectified.

Please be aware that the independent inspection and validation of the gas protection measures installed presented within this report relates to the works undertaken up to the point of inspection and covered by the inspection. Geo-Environmental accepts no responsibility or liability for any works that have not been directly inspected or following the inspection that may have resulted in subsequent damage to the gas protection measures and membranes installed due to any failure to protect the membrane prior to or after screeding works on site.

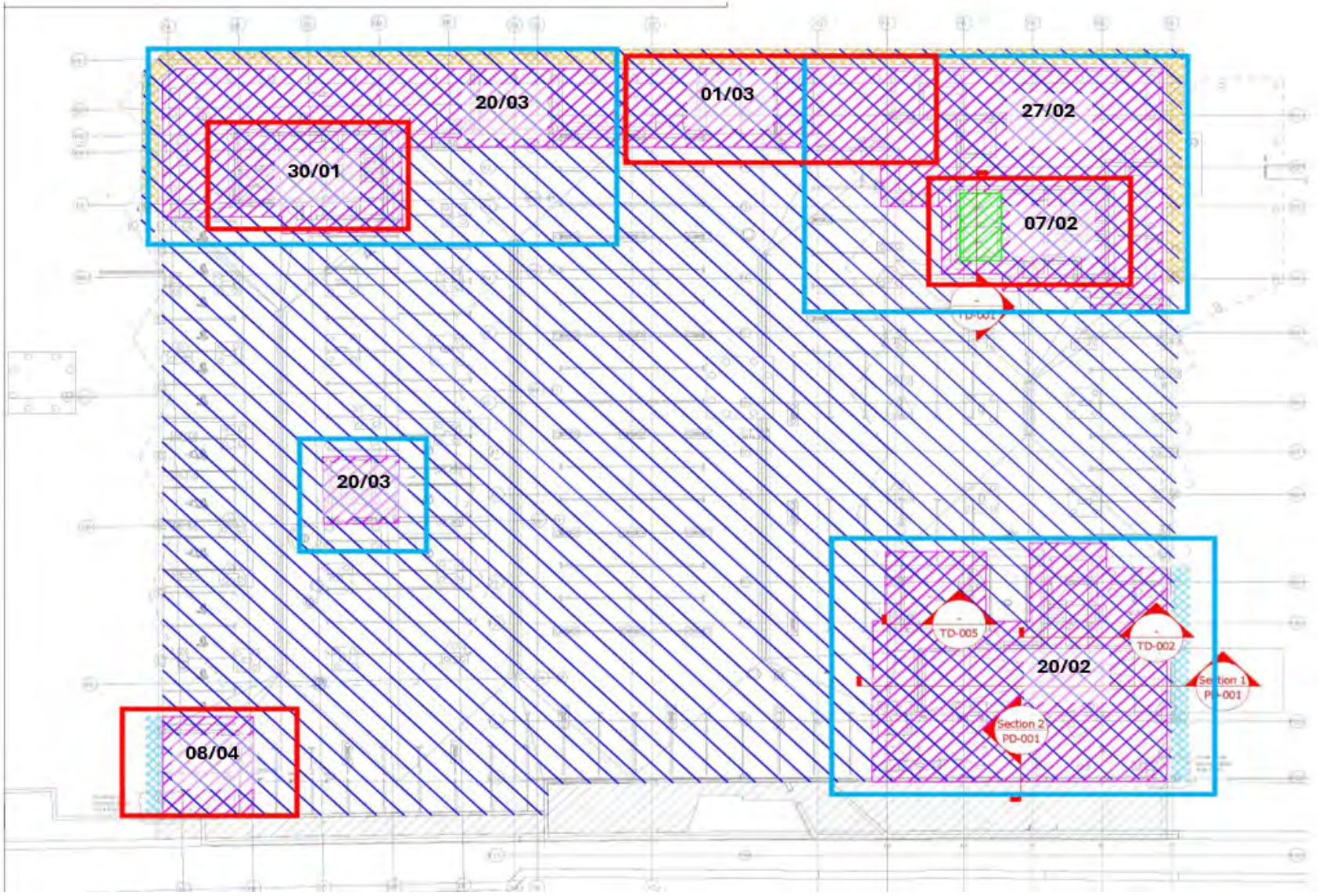
The report relates solely to the validation of the ground gas mitigation measures installed within Phase 2, with respect to gas protection measures within other Phases across the site will be presented under separate cover (or an updated report) in due course.

This report remains the property of Geo-Environmental and the Client has no rights to, or reliance upon this document or supporting documents until such time as payment has been received in full for all invoices for works undertaken in connection with this report.

FIGURES



Project:	Free Wharf, Brighton Road, Shoreham-by-Sea, BN43 6SA			**Title**	Site Location Plan
Client:	HG Construction			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE22259	**Revision:**	0		
Drawn:	FG	**Date:**	23/04/2024		
Figure:	1	**Scale:**	Not To Scale		



Project:	Free Wharf, Brighton Road, Shoreham-by-Sea, BN43 6SA			**Title**	Inspection Visit Plan
Client:	HG Construction			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE22259	**Revision:**	0		
Drawn:	FG	**Date:**	23/04/2024		
Figure:	2	**Scale:**	Not To Scale		

Geo-Environmental

APPENDIX A

Visual Inspection Records



Geo-Environmental

Project Name	Free wharf
Project No.	GE22259
Client	HG Construction
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	30/01/2024, 09:38
Site Engineer	
Tom Grace	tom.grace@gesl.net
Weather at time of inspection	Overcast, dry
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Flats
Plot No.	Phase 1
Foundation Type	Other
Other Details	Piled
Gas Protection Type	Passive
What is being inspected	[ ] Venting [X] Membrane [ ] Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Unable to inspect as sealed
1.2 Gas membrane type	GP ultra +
1.3 Gas membrane condition	Good condition
Jointing tape product	Membrane is sealed with bitumen liquid sealer and heat sealed
1.5 Lapping design	Membrane strips are overlapped and lapping detailing on foot of lift pit
1.6 Laps, welds and joints seals	All well sealed
1.7 Service seals	N/A

Engineer's Prelim Assessment (Mem)

Pass

4. PHOTOGRAPHS

Photographs

6 records

Photograph	*Photograph Title*

	Lift pit detailing
	Lift pi
	Bitumen liquid sealer

	Installation of membrane
	Membrane join detail
	Lift pit

5. PASS/FAIL

The gas protection measures inspected:	
Details of issues	
Approved by	
No users	
Date	

Project Name	Free Wharf
Project No.	GE22259
Client	HG Construction
Geo-Environmental Project Manager's Email	william.hughes@gesl.net
Date	07/02/2024, 12:57
Site Engineer	
William Hughes	william.hughes@gesl.net
Weather at time of inspection	Overcast
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Flats
Plot No.	Phase 2
Foundation Type	Other
Other Details	Piled
Gas Protection Type	Passive
What is being inspected	[ ] Venting [X] Membrane [ ] Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Unable to inspect as sealed
1.2 Gas membrane type	GP Ultra +
1.3 Gas membrane condition	Good
Jointing tape product	Bitumen liquid sealer and heat sealed
1.5 Lapping design	Membrane strips are overlapped and lapping detailing on foot of pit
1.6 Laps, welds and joints seals	All well sealed
1.7 Service seals	N/A

Engineer's Prelim Assessment (Mem)

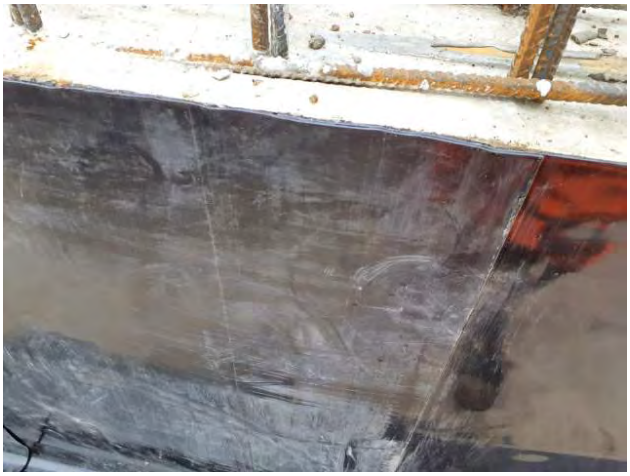
Pass

4. PHOTOGRAPHS

Photographs

6 records

Photograph	*Photograph Title*

	Lift pit detailing
	Joint overlap
	Liquid GB

	Detailing with covering
	Lift pit
	Lift pit

Geo-Environmental

Project Name	Free Wharf Phase 2
Project No.	GE22259
Client	HG Construction
Geo-Environmental Project Manager's Email	william.hughes@gesl.net
Date	20/02/2024, 08:19
Site Engineer	
William Hughes	william.hughes@gesl.net
Weather at time of inspection	Overcast
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Flats
Plot No.	Phase 2
Foundation Type	Other
Other Details	Piled
Gas Protection Type	Passive
What is being inspected	[ ] Venting [X] Membrane [ ] Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Good. Liquid membrane placed around steel and pipe
1.2 Gas membrane type	Combi-seal plus
1.3 Gas membrane condition	Good
Jointing tape product	120mm double sided tape with additional overlap
1.5 Lapping design	120mm double sided tape with additional overlap
1.6 Laps, welds and joints seals	All well sealed and/or underlain with liquid membrane
1.7 Service seals	Liquid membrane and double side tap join

4. PHOTOGRAPHS

Photographs

7 records

Photograph	*Photograph Title*

	Membranes being pl
	Additional overlap on membranes of 60mm

	120mm tape in place
	Detailing around rebar before placement of membrane

	After placement of membrane
	Liquid membrane over pipe
	Freshly placed liquid membrane

5. PASS/FAIL

The gas protection measures inspected:	Are acceptable & comply with the specification
Details of issues	
Approved by	
Jonathan Tingley	jonathan.tingley@gesl.net
Date	26/02/2024

Geo-Environmental

Project Name	Free Wharf Phase 2
Project No.	GE22259
Client	HG Construction
Geo-Environmental Project Manager's Email	william.hughes@gesl.net
Date	27/02/2024, 08:11
Site Engineer	
William Hughes	william.hughes@gesl.net
Weather at time of inspection	Overcast
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Flats
Plot No.	Phase 2
Foundation Type	Other
Other Details	Piled
Gas Protection Type	Passive
What is being inspected	[ ] Venting [X] Membrane [ ] Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Mostly covered, but what is visible in good condition
1.2 Gas membrane type	Combi-seal Plus
1.3 Gas membrane condition	Good
Jointing tape product	Combi-seal Tape
1.5 Lapping design	120mm double sided tape with additional overlap
1.6 Laps, welds and joints seals	All well sealed and underlain with liquid membrane
1.7 Service seals	N/A

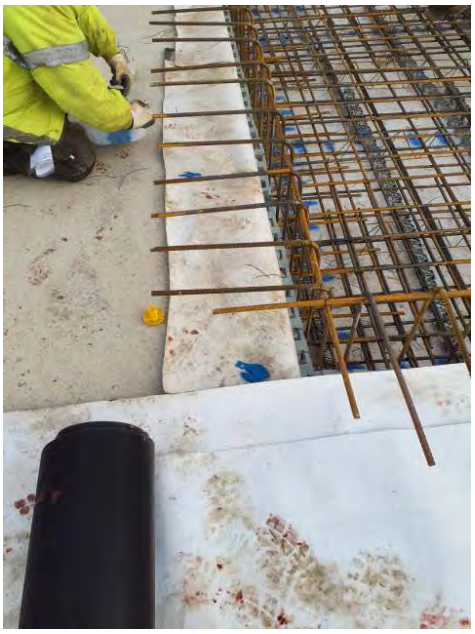
4. PHOTOGRAPHS

Photographs

6 records

Photograph	*Photograph Title*

	Detailing around metal work
	Detailing around rise being placed
	Red liquid membrane on next area

	Blue liquid membrane over fixings
	Tape being placed on liquid membrane
	Membrane

5. PASS/FAIL

The gas protection measures inspected:	Are acceptable & comply with the specification
Details of issues	
Approved by	
Jonathan Tingley	jonathan.tingley@gesl.net
Date	27/02/2024

Geo-Environmental

Project Name	Free Wharf Phase 2
Project No.	GE22259
Client	HG Construction
Geo-Environmental Project Manager's Email	william.hughes@gesl.net
Date	01/03/2024, 08:29
Site Engineer	
William Hughes	william.hughes@gesl.net
Weather at time of inspection	Overcast, just rained
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Flats
Plot No.	Phase 2
Foundation Type	Other
Other Details	Piled
Gas Protection Type	Passive
What is being inspected	[ ] Venting [X] Membrane [ ] Venting and Membrane

1. MEMBRANE

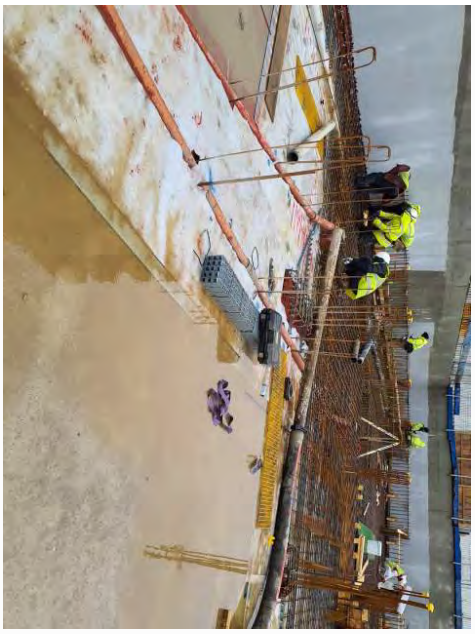
1.1 Condition of sub-grade and underside of membrane	Good condition
1.2 Gas membrane type	Combi-seal plus
1.3 Gas membrane condition	Good
Jointing tape product	Combi-seal tape
1.5 Lapping design	120mm double sided tape with additional overlap
1.6 Laps, welds and joints seals	All well sealed
1.7 Service seals	All well sealed and underlain with liquid membrane

4. PHOTOGRAPHS

Photographs

5 records

Photograph	*Photograph Title*

	Membrane placed
	Liquid membrane around pipes

	Fixing points sealed
	Liquid membrane

	Concrete poured over previous membrane

5. PASS/FAIL

The gas protection measures inspected:	Are acceptable & comply with the specification
Details of issues	
Approved by	
Jonathan Tingley	jonathan.tingley@gesl.net
Date	01/03/2024

Geo-Environmental

Project Name	Free Wharf Phase 2
Project No.	GE22259
Client	HG Construction
Geo-Environmental Project Manager's Email	william.hughes@gesl.net
Date	20/03/2024, 16:17
Site Engineer	
William Hughes	william.hughes@gesl.net
Weather at time of inspection	Sunny
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Flats
Plot No.	Phase 2
Foundation Type	Other
Other Details	Piled
Gas Protection Type	Passive
What is being inspected	[ ] Venting [X] Membrane [ ] Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Already covered at time of visit
1.2 Gas membrane type	Combi seal plus
1.3 Gas membrane condition	Good
Jointing tape product	Combi-seal tape
1.5 Lapping design	120mm double sided tape with additional overlap
1.6 Laps, welds and joints seals	All well sealed
1.7 Service seals	N/a

Engineer's Prelim Assessment (Mem)

Pass

4. PHOTOGRAPHS

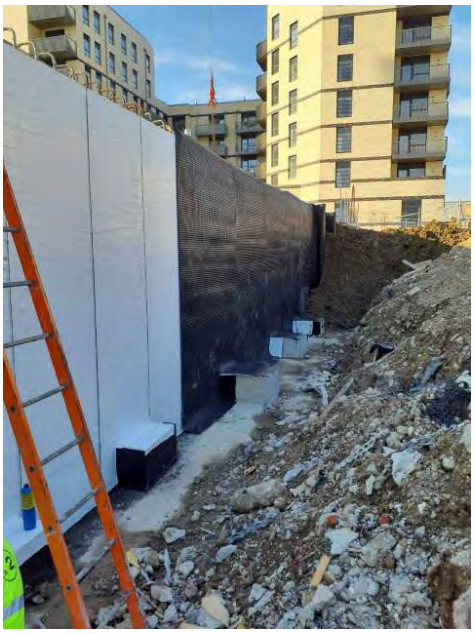
Photographs

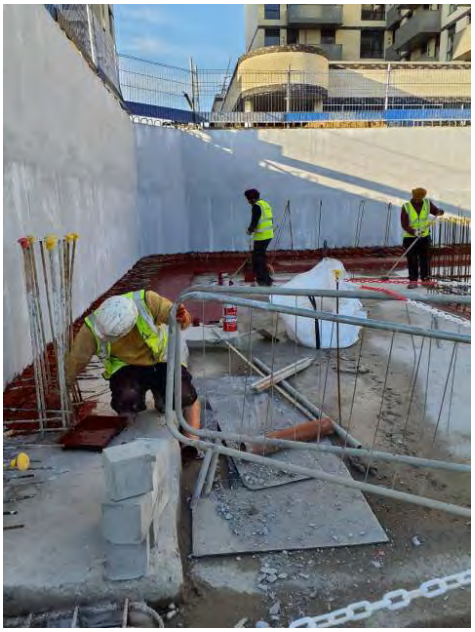
10 records

Photograph	*Photograph Title*

	Membrane in block E
	Freshly painted liquid membrane
	Stairs

	Lift pit
	Well joined seal
	Membrane placed

	Back wall protection
	Hydroplane 800 on back wall by road

	Backwall
	Liquid membrane being placed

5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

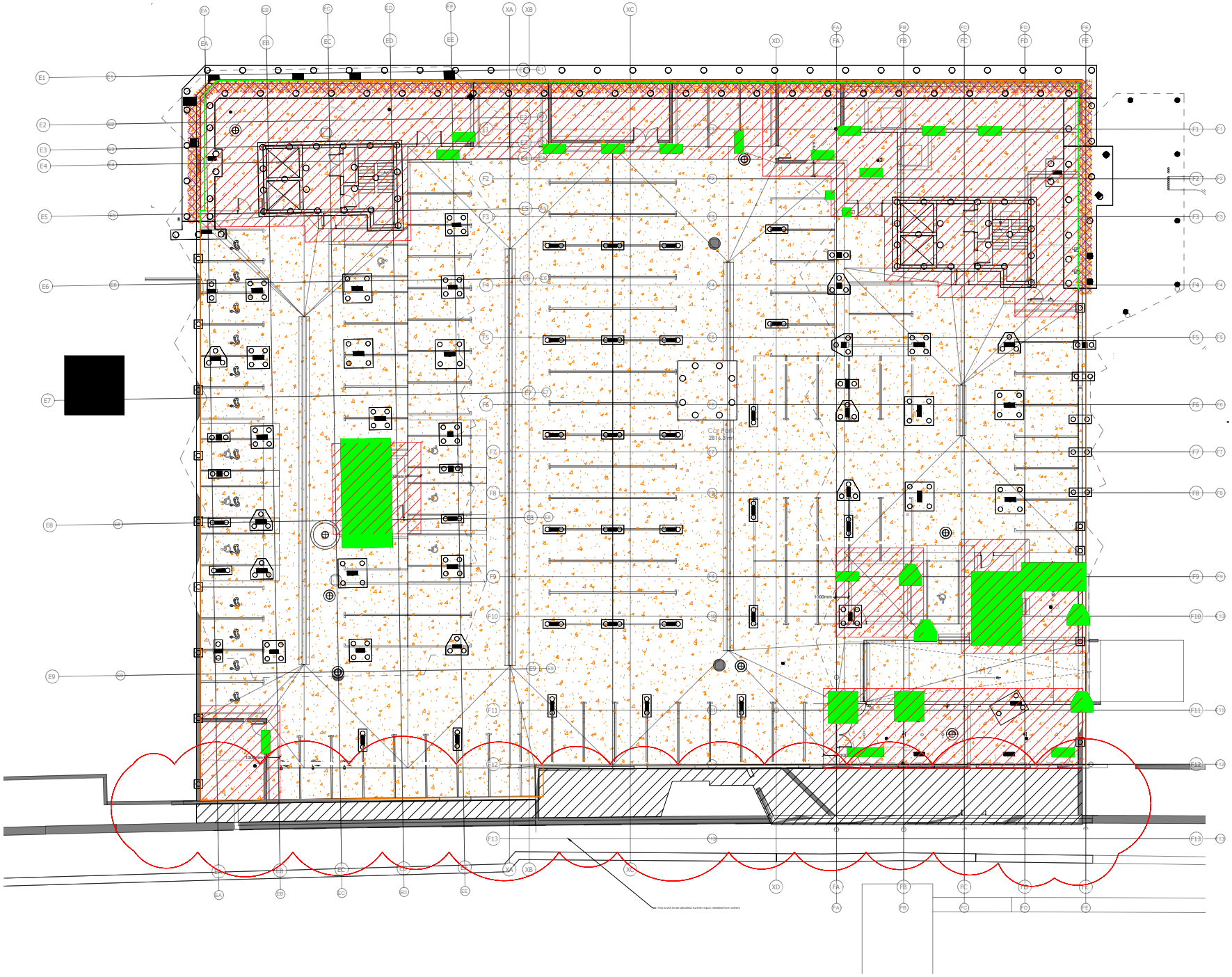
No users

Date

APPENDIX B

Construction Drawings





Key

- PUDLO CWP Modified Concrete
- PUDLO GP Ultra +
- PUDLO GP Ultra seal
- PUDLO Liquid GB

Secondary products not shown. Refer to section overlays for full detailing.

PUDLO

Part of the DB Group

Revision History

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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Tel: +44 (0)1954 780300 Email: sales@pudlo.com
www.pudlo.com

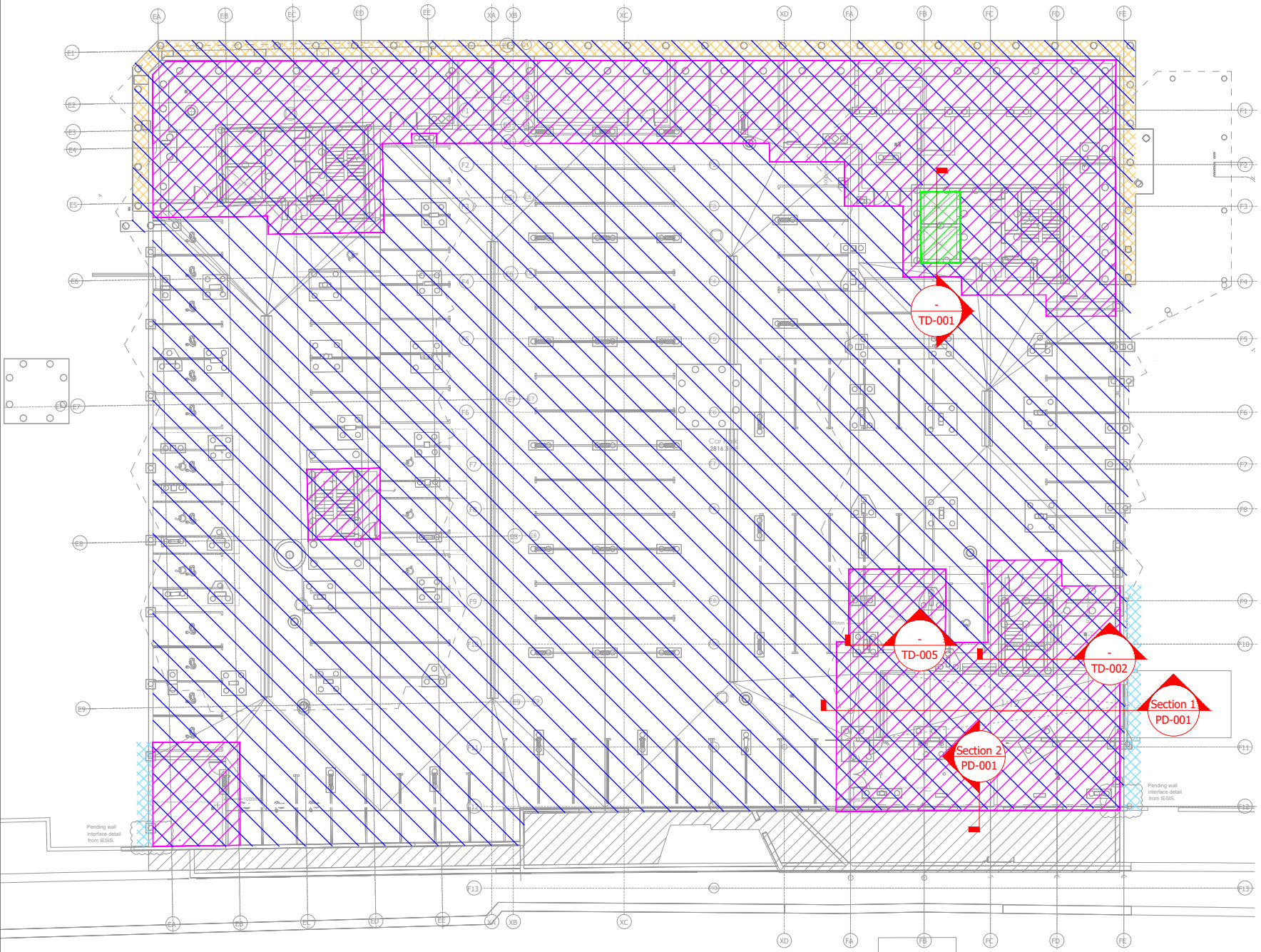
PUDLO SCOPE PLAN BASEMENT	Free Wharf Phase 2
For Information	1:100 on A0
4DS-FWP2-CA101	A
1 of 1
4D Structurals
A0	2022-05-23

Disclaimer:
PUDLO Limited is an owner with the installation of its products. The detail shows how PUDLO CWP Modified Concrete and how PUDLO ancillaries are to be installed. For site specific details and confirmation on extent of where PUDLO CWP Modified Concrete is used by Overlay Drawings, must be confirmed by an approved employee. Individual Contractor responsibility for design of the structure must ensure that details shown on PUDLO drawings match the latest construction issue drawings.

The information shown on this detail is given without obligation, or warranty. Please consultation or communication with PUDLO UK Group Ltd.

Important design notes:

- Grade 3 Environments also require ventilation appropriate to intended use of environment (BS 8102:2022 Table 2).
- Grade 3 waterproofing to extend 1m into Grade 1b areas



KEY

Keys below show products specified on the drawing

- Hydrocrete Concrete
- Pudlo CWP modified concrete, Hydroseal FX, Hydroprufe LG
- Combi-Seal & Hydrocrete
- Pudlo CWP, Pudlo GP Ultra Seal, Pudlo Geoflow, Hydroseal FX,
- Hydroprufe 8000, Hydrocrete, Hydroflow HM8

Conditions

This drawing is copyright of Premcrete. Permission for copying may be obtained from Premcrete.

This drawing must be read in conjunction with the relevant datasheets, BS 8102:2022 and BS 8485:2015+A1:2019 if appropriate.
This drawing has been prepared as a guide to assist with the installation of the products.
This drawing requires the approval of the designer of the structure.
It is the responsibility of the designer to ensure that any design decisions, made by others that have an impact on the waterproofing design are brought to the attention of the waterproof designer.
It is the responsibility of the designer of the structure to ensure that the details shown on this drawing match the construction drawings.
Drawing template is A3L.

Important Notes

The waterproofing design is designed to the Grades of Environment described below:
Grade 1A - Seepage and dampness from internal and external sources tolerable
Grade 1B - No seepage, however damp areas from internal and external sources tolerable
Grade 2 - No seepage through structure is acceptable however condensation and dampness are tolerable as a result of internal air moisture
Grade 3 - Ventilation, dehumidification or air conditioning are required appropriate to intended use in accord with BS 8102:2022 Table 2 to achieve a dry, habitable environment which is outside the scope of this design

Construction joints are required to be scabbled or retarded to ensure good concrete connection. An approved curing agent is to be applied to concrete immediately after pouring.
Laps between dissimilar waterproofing products to be 100mm unless otherwise annotated.
All substructure construction joints must have waterbar installed with a minimum of 75mm concrete cover. (Internal, non-retaining construction joints do not require waterbars).
Maximum pour size to be confirmed by Structural Engineers to maintain 0.3mm designed crack width. Liner wall pours should be cast 'hit and miss to ensure that shrinkage of concrete is compensated.
It is the responsibility of the installing contractor to ensure that good concrete practice is maintained at all times when pouring concrete.
If the design incorporates any of the following products:

- Hydrocrete should be a minimum of 200mm thick or 300mm if poured monolithically in conjunction with standard concrete.
- Hydroprufe Primer to be applied to concrete/ masonry substrate prior to the application of Hydroflow Corner Tape or Hydroprufe Detail Tape.
- Hydroseal Sealer to be applied to all surfaces prior to installing Hydroflow HP.
- High density insulation under Hydroflow HP20 should be fixed to substrate at a minimum of 5 fixings per sheet.

Rev	Date	Description	Dwn	Chk
C01	12/02/24	Construction Issue	JM	CT

Scale

Not to Scale

CONSTRUCTION ISSUE

This drawing is designed to achieve the following environment in accordance with BS 8102:2022

GRADE 1b & 3

Client

HG CONSTRUCTION

Project

FREE WHARF PHASE 2

Premcrete Drawing No

OP003465-GA-001

Title

GA PLAN SHOWING WATERPROOFING SCOPE

Date

12/02/2024

PREMCRETE

44 Macadam Way | West Portway Industrial Park
Andover | Hampshire | SP10 3XW
Tel: 02380 276166 | sales@premcrete.com
www.premcrete.com

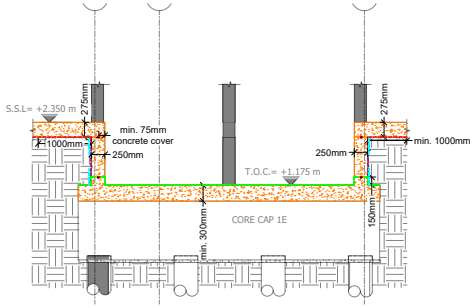
APPENDIX C

PUDLO Datasheets

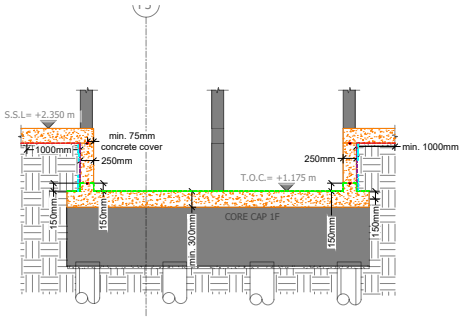


NOTES

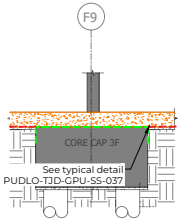
- **PUDLO CWP Modified Concrete** wall thickness should be a minimum of 200mm to qualify for **PUDLO** performance warranty.
- **PUDLO CWP Modified Concrete** slab thickness should be a minimum of 200mm to qualify for **PUDLO** performance warranty. This should be increased to 300mm when the **PUDLO CWP Modified Concrete** is poured as a topping to underlying fresh concrete.
- **PUDLO CWP Modified Concrete** stop ends, wall heads and kickers to be retarded with **PUDLO System Gel Retarder** (Part No. 4670-0063) for vertical surfaces, and **Liquid Retarder** (Part No. 4670-0062)for horizontal surfaces. Retarder to be jet-washed off prior to next pour to leave clean, exposed aggregate.
- Rebate to be formed in top of **PUDLO CWP Modified Concrete** kickers, wall-heads and stop-ends using **Surestop Void Former** (Part No.4671-0072). **Surestop BWB** to be pushed into the rebate and continuously adhered using **Surestop Adhesive** (Part No. 4671-0074). Ensure **Surestop BWB** is positioned to provide a minimum of 75mm concrete cover.
- **PUDLO CWP Modified Concrete** kickers to be 150mm high.
- **PUDLO** membranes to be protected from construction activities prior to final condition.
- **PUDLO Liquid GB** Min. 2 No. coats of **PUDLO Liquid GB** at least 1mm thick to achieve a compliant gas barrier to be applied across the top of the lift core and up and over the 150mm monolithic kicker terminating at the edge of the core.
- **PUDLO Ultra Tank** is to lap a minimum of 150mm on to the **PUDLO Liquid GB** using **PUDLO Ultra Tape**.



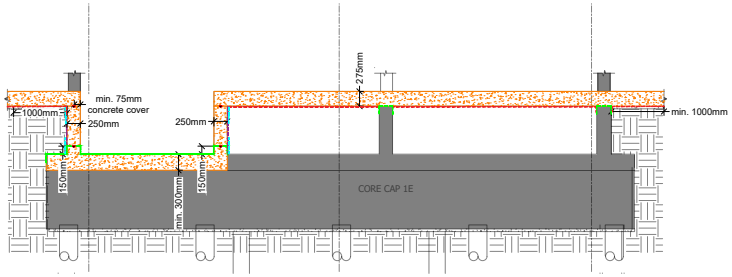
50 / 0961 SUBSTRUCTURE SECTION CORE CAP 1E 50-50
SCALE 1 : 50



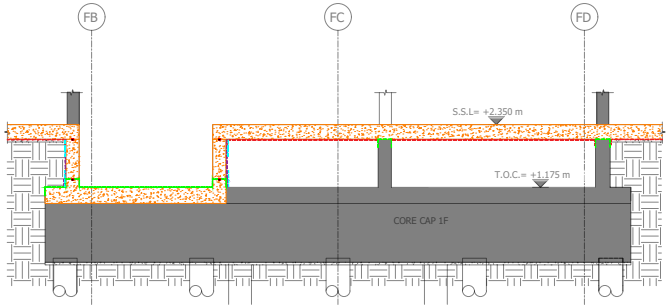
53 / 0963 SUBSTRUCTURE SECTION CORE CAP 1F 53-53
SCALE 1 : 50



57 SUBSTRUCTURE SECTION 57-57
SCALE 1 : 50



51 / 0961 SUBSTRUCTURE SECTION CORE CAP 1E 51-51
SCALE 1 : 50



54 SUBSTRUCTURE SECTION CORE CAP 1F 54-54
SCALE 1 : 50

Note:-

PUDLO GP Ultra Membranes offer gas protection against a number of ground gases in accordance with BS 8485:2015 +A1:2019, BRE211, C748 and C665. When using PUDLO GP Ultra Membranes the client/contractor **MUST** appoint a 3rd party independent gas specialist for verification/remediation and review of gas levels in accordance with CIRIA 735. Ground gas specification drawings **NEED** to be approved/validated by an independent gas inspector. Contact details can be provided on request.

Note:-

- All selvedge edges when using **PUDLO GP Ultra+** are to be sealed with **PUDLO Ultra Tape.**
- All Roll Ends when using **PUDLO GP Ultra+** are to be sealed with **PUDLO Ultra EXT Tape.**
- When VOC gases are present **ALL** tape jointing is to be superseded by HEAT WELDING completed by a GNVQ Lvl 2 qualified specialist.

Key

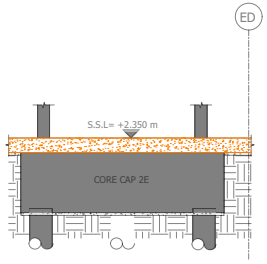
PUDLO CWP Modified Concrete (Part No.4600-0055)

Surestop BWB waterbar (Part No. 4671-0085)

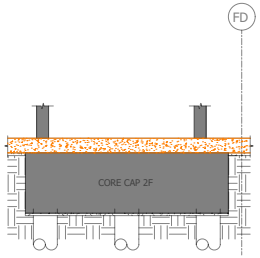
PUDLO Liquid GB (Part No. 4750-0020)

PUDLO GP Ultra + (Part No. 4750-0077)

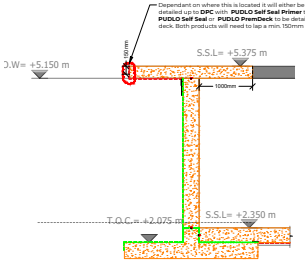
PUDLO GP Ultra EXT Tape (Part No. 4750-0079)



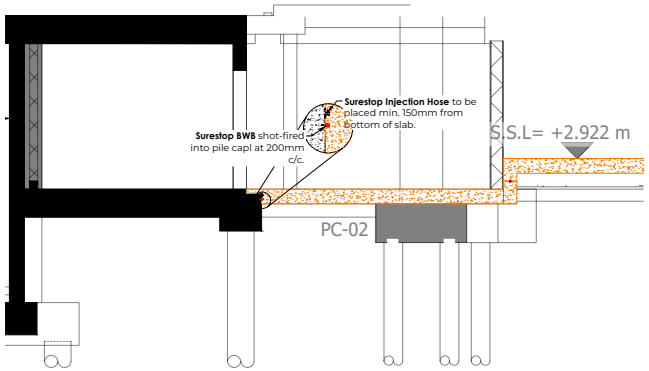
52 / 0974 SUBSTRUCTURE SECTION CORE CAP 2E 52-52
SCALE 1 : 50



55 / 0976 SUBSTRUCTURE SECTION CORE CAP 2F 55-55
SCALE 1 : 50



56 / 0971 SUBSTRUCTURE SECTION GROUND BEAM 56-56
SCALE 1 : 50



TYPICAL NEW TO EXISTING INTERFACE DETAIL
SCALE 1 : 50

Surestop Injection Hose

PUDLO
Part of the DBGroup

Revision History

DATE	DESCRIPTION	BY	CH	APP
01/12/23	Updated as required to refer the **PUDLO GP Ultra +** and **PUDLO GP Ultra Seal** and **PUDLO Liquid GB.**	LA	SW	MD
26/10/23	Amended as per 6x2023-150-XX-22-DR-S-2010 Coo	LA	SW	MD

DB Group (Holdings) Ltd
Wellington Way, Mead Park Melbourn
Cambridge, CB23 2TQ
Tel: +44 (0)1763 [illegible] Email: sales@pudlo.com
www.pudlo.com

DRAWING TITLE	PROJECT	
SUB STRUCTURE SECTIONS AND DETAILS OVERLAY	Free Wharf Phase Two	
STATUS	SCALE	
FOR INFORMATION	1:50 on A1	
DRAWING NUMBER	REVISION	SHEET No.
4DS-FWP2-007	A	1 of 1
CLIENT	4D Structures	
COPYRIGHT: Not to be reproduced without written permission	A1	PUDLO DB Group 07th July 2023 cd

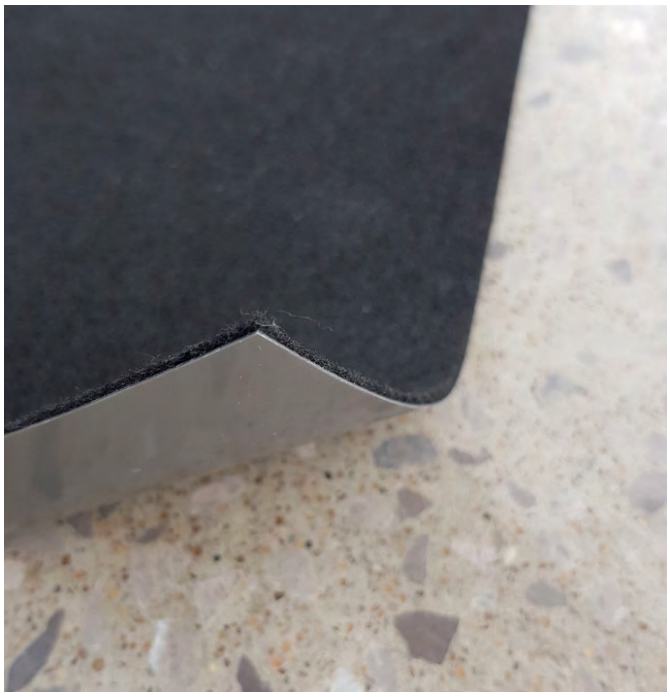
Note:-

This PUDLO detail is to assist with the installation of its products. The detail shows how PUDLO CWP Modified Concrete and how PUDLO ancillaries are to be installed. For site specific details and confirmation on extent of where PUDLO CWP Modified Concrete is used i.e. Overlay drawings, must be confirmed by structural engineers/contractor. Individual/Company responsibility for design of the structure must ensure that details shown on PUDLO drawings match the latest construction issue drawings.

The information shown on this detail is given without obligation, or warranty PRIOR to consultation or communication with PUDLO/DB Group Ltd.

PUDLO GP Ultra +

PUDLO GP Ultra+ is a pre-applied fully bonded waterproofing membrane incorporating a heavy duty virgin polypropylene geotextile. The geotextile is laminated to the membrane to provide a dual function; protecting the membrane from damage and providing a full bonded interface to poured concrete which has exceptionally high resistance to ground gases and VOCs.



USES

- Provides protection from gas including Cs, carbon dioxide, methane, radon, hydrocarbons, and VOCs and protects the structure from water ingress
- PUDLO GP Ultra+ is effective for all aspects of gas protection and where a Grade 1a and 1b to 3 (waterproofing) environment is required
- PUDLO GP Ultra+ can be used in horizontal or vertical applications
- PUDLO GP Ultra+ is suitable for all ground floor and basement constructions including lift pits, slabs, liner walls, capping beams and service penetrations
- PUDLO GP Ultra+ can also be used as single system

APPLICATION & INSTALLATION

Refer to PUDLO GP Ultra + installation manual

STORAGE & SHELF LIFE

- PUDLO GP Ultra+ has a shelf life of 12 months, when kept in dry conditions at a temperature of 5°C to 45°C

PRODUCT DIMENSIONS, COVERAGE & PACKAGING

- 1.9m x 25m roll. (47.5m²)

BENEFITS

- Delivers full surface contact between the membrane and the concretes
- Overlaps are sealed by hot air welding, heat welded laps or joint tape (depending on the type of ground gas present)
- Complies with the latest codes of practice by BRE211, CIRIA 748 and BS8485:2015+A1:2019
- Complies with NHBC's Traffic Light Guidance (green, amber and red) for below ground gases

ANCILLARY PRODUCTS

- PUDLO Ultra Tape (100mm selvedge overlap tape)
- PUDLO Ultra EXT Tape (300mm roll end tape)

HEALTH & SAFETY

PUDLO GP Ultra+ rolls are 35kg each and may need mechanical lifting

Please refer to PUDLO GP Ultra+ MSDS for more information

FIRE

PUDLO GP Ultra+ is a product that is both non-toxic and non-flammable.

Reaction to fire rating - E Class

FURTHER INFORMATION

For more accessories used with PUDLO GP Ultra +,
please contact: technical@dbgholdings.com

TECHNICAL DATA

Testing has been completed and carried out in accordance with the latest test criteria, under BS8485:2015 + A1:2019, BS8102:2022 and CIRIA C748, to determine the permeation rates for a range of carbon dioxide, Methane, Hydrocarbons and VOCs. Immersion testing has been completed for chemical resistance to EN 1441 and EN 14415.

PHYSICAL PROPERTIES

Characteristics	Test method	Unit	PUDLO GP Ultra +
Thickness	EN 1849-2	mm	2.0
Width	EN 1849-2	M	1.9
Length	EN 1849-2	M	25
Weight	EN 1849-2	g/m^2	650

HYDRAULIC PROPERTIES

Characteristics	Test method	Unit	PUDLO GP Ultra Tank
Water vapour rate	EN 1931	g/m2/day	0.11 – 0.18
Water tightness (60kPa)	EN 1928	-	PASS
Water tightness (196kPa – 20m water head)	EN 1928	-	PASS

PRODUCT NUMBER

4750/0017

Technical Data

Mechanical properties

Characteristics	Test method	Unit	PUDLO GP Ultra Tank
Resistance to static load	EN 12730	Kg	>20
Puncture Resistance	EN 12236	kN	>2.0
Tensile strength (MD)	EN 12311-1	N/50mm	> 550
Tensile strength (CMD)	EN 12311-1	N/50mm	>400
Tensile Elongation (MD/CMD)	EN 12310-1		>550%
Tear resistance (MD/CMD)	EN 12310-1	N	>300
Resistance to impact	EN 12691-B	mm	650
Reaction to fire	EN 13501-1	Class	E
Resistance to artificial ageing	EN 1296/ EN 1928	-	PASS
Resistance to chemicals	EN 1296/ EN 1928	-	PASS

Vapour permeability - 100% concentration

Characteristics	Test method	Unit	PUDLO GP Ultra Tank
Tranmission rate of benzene	EN ISO 15105-2	mg/m²/day	2250
Tranmission rate of toluene	EN ISO 15105-2	mg/m²/day	2370
Tranmission rate of ethyl benzene	EN ISO 15105-2	mg/m²/day	400
Tranmission rate of xylene (mpo)	EN ISO 15105-2	mg/m²/day	690
Tranmission rate of hexane	EN ISO 15105-2	mg/m²/day	95.25
Tranmission rate of vinyl chloride	EN ISO 15105-2	mg/m²/day	36.44
Tranmission rate of trichloroethene (TCE)	EN ISO 15105-2	mg/m²/day	1.44
Tranmission rate of tetrachloroethene (PCE)	EN ISO 15105-2	mg/m²/day	1.59

Technical Data

Gas permeability

Characteristics	Test method	Unit	PUDLO GP Ultra Tank
Methane permeability	EN ISO 15105-1	ml/m²/day/atm	0.13
Methane permeability (welded joint)	EN ISO 15105-1	ml/m²/day/atm	1.00
Carbon dioxide permeability	EN ISO 15105-1	ml/m²/day/atm	3.01
Transmission rate of vinyl choride gas	EN ISO 15105-1	ml/m²/day/atm	0.04
Radon permeability	K124/02/195	m²/s	1.0×10^{-12}

Certification 7 compliance

Organisation	Requirements
CE Mark	EN 13967
NHBC	Chapter 5.4 and traffic light system
BS 8485:2015 + A1-2019	Methane, carbon dioxide
CIRIA C748	VOC barrier
BS 8102:2022	Type A (barrier)

Supporting documents

- PUDLO GP Ultra Takn MSDS
- PUDLO GP Ultra Seal & Tank Installation Manual
- Product webpage - please see www.pudlo.com

**Table above, values are typical, with the exception of thickness, which is nominal. Typical indicates the mean value derived from the samples taken for any one test as defined in the BS EN ISO standard - usually the mean of five samples. Nominal is a guide*

PUDLO GP Ultra Seal



PUDLO GP Ultra Seal is a self-adhesive Membrane composed of self-adhesive version of PUDLO GP Ultra Tank and a layer of siliconized polypropylene release film

PUDLO GP Ultra Seal is a post applied fully bonded system used to protect structures against ground water and gases which may otherwise penetrate the structure.

USES

- PUDLO GP Ultra Seal protects structures from gas, including Radon, CO_2, Methane, Hydrocarbons, VOCs and Moisture
- PUDLO GP Ultra Seal can be used as a post applied waterproofing and damp-proof membrane

APPLICATION & INSTALLATION

Refer to PUDLO GP Ultra Seal installation manual

STORAGE & SHELF LIFE

- Rolls of PUDLO GP Ultra Seal should be stored horizontally, and pallets should not be stacked on top of one another.
- PUDLO GP Ultra Seal should be stored in a cool, dry place, protected from exposure to rain, sun, heat and cold temperatures prior to installation.
- Exposure to sunlight for extended periods of time could cause difficulty with removal of the polyethylene release film.

PRODUCT DIMENSIONS, COVERAGE & PACKAGING

- Roll size: 0.9m x 20m
- Each Roll covers an area of 18m^2, always make sure to include roll overlaps when measuring. Allow for a minimum of 100mm overlap when jointing two separate sheets.
- Product available in black

BENEFITS

- Easy to install
- Can be a fully welded system
- Can be used in all weather conditions due to its all-weather adhesive backing
- Conforms with the latest codes of practice from CIRIA 748 and BRE 211
- Conforms to with BS8485:2015 +A1:2019 protection from Methane and Carbon Dioxide

ANCILLARY PRODUCTS

- PUDLO Self Seal Primer (2 coats)

HEALTH & SAFETY

PUDLO GP Ultra Seal rolls are heavy - in excess of 20kg. Please refer to PUDLO GP Ultra Seal MSDS for more information.

FIRE

This product is not flammable

FURTHER INFORMATION

For more accessories used with PUDLO GP Ultra Seal, please contact: technical@pudlo.com

TECHNICAL DATA

PHYSICAL PROPERTIES

Characteristics	Test method	Unit	PUDLO GP Ultra Seal
Thickness	EN 1849-2	mm	1.2
Width	EN 1849-2	m	1 or 0.3
Length	EN 1849-2	m	20
Weight	EN 1849-2	g/m^2	1,350

HYDRAULIC PROPERTIES

Characteristics	Test method	Unit	PUDLO GP Ultra Seal
Water vapour rate	EN 1931	$g/m^2/day$	0.14
Water tightness (60kPa)	EN 1928	-	PASS
Water tightness (196kPa - 20m water head)*	EN 1928	-	PASS

**basement application*

MECHANICAL PROPERTIES

Characteristics	Test method	Unit	PUDLO GP Ultra Seal
Resistance to static load	EN 12730	kg	>20
Tensile strength (MD)	EN 12311-1	N/50mm	>550
Tensile strength (CMD)	EN 12311-1	N/50mm	>400
Tear resistance (MD)	EN 12310-1	N	>300
Tear resistance (CMD)	EN 12310-1	N	>300
Resistance to impact	EN 12691-B	N	650
Reaction to fire	EN ISO 11925-2	Class	E
Resistance to artificial ageing	EN 1296	-	PASS
Resistance to chemicals	EN 1847	-	PASS

TECHNICAL DATA

VAPOUR PERMEABILITY - 100% CONCENTRATION

Characteristics	Test method	Unit	PUDLO GP Ultra Seal
Transmission rate of benzene	EN ISO 15105-2	mg/m²/day	2250
Transmission rate of toluene	EN ISO 15105-2	mg/m²/day	2370
Transmission rate of ethyl benzene	EN ISO 15105-2	mg/m²/day	400
Transmission rate of xylene (mpo)	EN ISO 15105-2	mg/m²/day	690
Transmission rate of hexane	EN ISO 15105-2	mg/m²/day	98.25
Transmission rate of vinyl chloride	EN ISO 15105-2	mg/m²/day	36.44
Transmission rate of trichloroethene (TCE)	EN ISO 15105-2	mg/m²/day	1.44

GAS PERMEABILITY

Characteristics	Test method	Unit	PUDLO GP Ultra Seal
Methane permeability	EN ISO 15105-1	ml/m²/day/atm	0.13
Methane permeability (welded joint)	EN ISO 15105-1	ml/m²/day/atm	1.00
Carbon dioxide permeability	EN ISO 15105-1	ml/m²/day/atm	3.01
Transmission rate of vinyl chloride gas	EN ISO 15105-1	ml/m²/day/atm	0.04
Radon permeability	SP Method 3873	m²/s	3.0×10^{-12}

TECHNICAL DATA

DURABILITY & CHEMICAL RESISTANCE

Characteristics	Test method	Unit	PUDLO GP Ultra Seal
Chemical Resistance - SULPHURIC ACID (10% solution of Sulphuric Acid (H2SO4)) 50° for 56 days	EN 14414 – A	Tensile Strength	100%
		Result	PASS
Chemical Resistance - BASIC (Calcium Hydroxide saturated suspension) 50° for 56 days	EN 14414 – B	Tensile Strength	100%
		Result	PASS
Chemical Resistance - SOLVENTS (35% Diesel, 35% Paraffin, 30% Oil HD30 (vol) 50° for 56 days	EN 14414 – C	Tensile Strength	100%
		Result	PASS
Chemical Resistance - SYNTHETIC LEACHATE (Mixture of 14 acids, chlorides, sulphates and phosphate) 50°C for 56 days	EN 14414 – D	Tensile Strength	100%
		Result	PASS
Resistance to Leaching - HOT WATER (Deionised water) 50°C for 56 days	EN 14415 - A	Tensile Strength	100%
		Result	PASS
Resistance to Leaching - AQUEOUS ALKALINE (Saturated Calcium Hydroxide) 50°C for 56 days	EN 14415 - B	Tensile Strength	100%
		Result	PASS

**Table above, values are typical, with the exception of thickness, which is nominal. Typical indicates the mean value derived from the samples taken for any one test as defined in the BS EN ISO standard - usually the mean of five samples. Nominal is a guide value*

SUPPORTING DOCUMENTS

- PUDLO GP Ultra Seal MSDS
- PUDLO GP Ultra Seal & Tank Installation Manual
- Product webpage - please see www.pudlo.com

PRODUCT NUMBER

4750/0022

PUDLO Liquid GB

PUDLO Liquid GB is a styrene, butadiene, latex-based liquid system.

PUDLO Liquid GB prevents gas penetration for radon, carbon dioxide, methane, air and moisture into buildings.



USES

- PUDLO Liquid GB is used for the sealing of pile heads, prior to concrete slabs being cast across the top
- PUDLO Liquid GB is a barrier to moisture and can be used as a DPM on both floors and walls

APPLICATION & INSTALLATION

Refer to PUDLO GP Ultra + installation manual

STORAGE & SHELF LIFE

- Store tubs in dry conditions between 5°C and 30°C.
- Product has a 12-month shelf life

PRODUCT DIMENSIONS, COVERAGE & PACKAGING

A minimum dry-coated thickness of 1mm is needed to provide an adequate gas barrier

To achieve 1.0mm thickness, a total of 2kg/m^2 is required.

One 15kg tub will cover an area of 7.5m^2
15kg tubs – 33 tubs per pallet.

BENEFITS

- Easy to apply
- Provides an effective gas and moisture vapour barrier
- Packaged in 15kg tubs
- Roll, brush or spray applied
- Complies with the latest codes of practice by BRE211, CIRIA 748 and BS8485:2015+A1:2019
- Complies with NHBC's Traffic Light Guidance (green, amber, red) for below ground gases

ANCILLARY PRODUCTS

- PUDLO GP Ultra Range (all membranes)
- PUDLO GB Membrane Range

HEALTH & SAFETY

Appropriate care must be taken when manual handling the product. After use, please ensure all tools are clean.

Please use suitable PPE when applying PUDLO Liquid GB to avoid irritation to the eyes, skin.

FIRE

Please refer to PUDLO Liquid GB MSDS for more information

FURTHER INFORMATION

For further information on accessories that are used with PUDLO Liquid GB please contact: technical@pudlo.com.

TECHNICAL DATA

PHYSICAL PROPERTIES

Characteristics	Test method	Unit	PUDLO GP Ultra +
Applied thickness	-	mm	>1.0
Form supplied	-	-	Viscous liquid
Pack size	-	-	15kg
Colour	-	-	Pink / purple
Chemical composition	-	mm	Advances SBS with specialty additives

PHYSICAL PROPERTIES

Characteristics	Test method	Unit	PUDLO GP Ultra +
Water tightness	EN 1296, EN 1367, EN 1928	-	PASS
Methane permeability	BS EN ISO 15106-1	ml/m2/day/atm	<40
Radon permeability	Saarland University GER	mm	>1.0mm applied thick-ness provides a complete barrier to Radon

PRODUCT NUMBER

4750/0020

APPENDIX D

Premcrete Datasheets



PREMCRETE

PROJECT – TECHNICAL SUBMITTAL

STRUCTURAL WATERPROOFING | GAS PROTECTION

Revision date: 23/1/23

COMBI-SEAL PLUS

VOC-Resistant Waterproof Membrane

DESCRIPTION

COMBI-SEAL PLUS comprises of a high-density polyethylene membrane (HDPE) and non-woven, geotextile, cross laminated to produce a durable, pre applied membrane which will resist hydrocarbons, VOCs, ground gases and water. The membrane utilizes PREMCRETE APAN™ technology to produce a membrane which will effectively resist water pressure, gases and VOC's from within the ground. The composite membrane will restrict gas vapour transmission to less than 40ml/day/m2 in accordance with BS8485:2015+A1:2019. COMBI-SEAL PLUS is a highly chemical resistant membrane which ensures that the integrity of the membrane is secure even in the presence of aggressive chemicals. The textured profile of the membrane ensures an integral bond to the structure to which it is applied.

USES

COMBI-SEAL PLUS is a pre-applied VOC resistant waterproof membrane for basement construction, lift pits, concrete retaining walls and other structures which extend below ground where resistance to hydrocarbons, ground gases and water is required. COMBI-SEAL PLUS may also be used to protect ground floor slabs, particularly where a good integral bond is required to the underside of the concrete slab or where a clay heave board has been installed. COMBI-SEAL PLUS achieves two points when correctly installed in accordance with table 7 of BS 8485:2015+A1:2019.

PROCEDURE

Surface Preparation: The substrate should be well compacted hardcore or blinded with lean-mix concrete with surface free from excessive undulation or sharp projections which may puncture the membrane. Irregularities in the surface should be repaired with a suitable PREMCRETE repair mortar. If the membrane is to be installed to concrete foundation piles, then the piles should be prepared removing all loose soil and ensuring that the concrete is relatively flat. The surface should be prepared so that there are no voids which the membrane would have to span as this would render the active element of the membrane ineffective. The membrane must be fully encapsulated against a consistent surface for maximum performance.

Application to vertical surfaces: COMBI-SEAL PLUS, when pre-applied, should be installed to the inside face of the shuttering to be subsequently filled with concrete. The sheets should be installed with the white active fleece in contact with the freshly placed concrete and aligned vertically ensuring that all lap joints face down away from the concrete pour. COMBI-SEAL PLUS, when post-applied, must be installed against a consistent substrate and continuous compaction achieved against the membrane. Lap joints should be sealed using the COMBI-SEAL TAPE or the selvedge strip should be used by folding back the white fleece before removing the release paper from the tape before positioning the adjacent sheet of membrane. The lap joint should be rolled with a seam roller before folding the fleece back into place, this will provide two-fold protection at the lap joint. The membrane should be fixed mechanically through the selvedge or other taped zones using PREMCRETE METAL WASHER FIXINGS at 500mm centres. This will ensure the integrity of the gas barrier remains intact. Once the concrete has been placed the shutter may be removed, and the COMBI-SEAL PLUS will remain adhered to the concrete. The membrane should be protected using PREMCRETE PROTECTION BOARD 600 prior to backfill to ensure the membrane remains un-punctured. COMBI-SEAL PLUS should not be installed above the final ground level.

Application to horizontal surfaces: COMBI-SEAL PLUS, when pre-applied, should be laid with the white fleece facing the installer and in direct contact with the concrete where an active bond is required. There may be applications where COMBI-SEAL PLUS can be installed without direct concrete contact, however such applications must ensure consistency of loading on the membrane. This application is not suitable for where ground heave is to be considered within the design. Adjoining sheets should be lapped by a minimum of 150mm and sealed using PREMCRETE COMBISEAL TAPE or by making use of the selvedge (refer to above methodology). It is recommended to stagger the lap

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joints by 300mm to avoid 4 sheets lapping at one location. The membrane should be fixed mechanically through the selvedge or other taped zones using PREMCRETE METAL WASHER FIXINGS at 500mm centres. Typically, reinforcement spacer blocks should be placed along the length of the lap joint to ensure that the membrane is effectively loaded to prevent displacement during placement of the concrete. Service penetrations and pipes should be sealed using a HYDROPRUFE TOPHAT which is sealed to the underside of the COMBI-SEAL PLUS using HCR BUTYL TAPE. TWINSEAL COMPOUND GR should be applied around the circumference of the penetration to ensure the integrity of the joint. TWINSEAL COMPOUND GR may also be used to assist with the detailing of difficult junctions.

ANCILLARY PRODUCTS

COMBI-SEAL TAPE 150mm x 45m

METAL WASHER FIXINGS box of 100

HCR BUTYL TAPE 30mm x 30m

HYDROPRUFE DETAIL STRIP 150mm x 15m

PACKAGING & COVERAGE

Pack Size: 2m x 10m roll

Roll Weight: 30kg

Pallet Quantity: 20 rolls

Property	Test Method	Value
Weight	EN 1849-1	950 g/m^2
Thickness (20 kPa)	EN 1849-1	3mm (0.5mm HDPE, 2.5mm Geotextile)
Maximum Tensile MD	EN ISO 12311-1	930N/5cm
Maximum Tensile CD	EN ISO 12311-1	1456N/5cm
Elongation at break MD	EN ISO 12311-2	79%
Elongation at break CD	EN ISO 12311-2	83%
Tear Resistance MD (nail shank)	EN 12310-1	1010N
Tear Resistance CD (nail shank)	EN 12310-1	1030N
Water Tightness	EN 1928 B	PASS
Resistance to Impact	EN 12691	>450mm
Moisture/Vapour Transmission Rate	ISO 15106	0.134g/m^2/24Hr
Methane Permeability	ISO 15105-1	23ml/m^2/24Hr
Carbon Dioxide Permeability	ISO 15105-1	25ml/m^2/24Hr
Static Load Resistance	EN 12730 - B	20kg
Shear Resistance at Joints	EN 12317-2	402N
Further independent test certificates are available upon request relating to VOC resistance.		

STORAGE & SHELF LIFE

Store in cool, dry, frost-free conditions. The membrane should be protected against UV.

HEALTH & SAFETY

See separate material safety datasheet.

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BAB-20-144-P-A-UK
BDA Agrément®
Combi-Seal Plus
Ground VOC Barrier, Ground Gas Barrier and Damp Proof Membrane

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SCOPE OF AGRÉMENT

This Agrément relates to Combi-Seal Plus (hereinafter the 'Product') a ground volatile organic compound (hereinafter 'VOC') barrier, ground gas barrier and waterproof membrane for use in existing and new domestic and non-domestic buildings in the UK. The Product is for use when pre-applied below concrete slabs, in accordance with BS 8485, CIRIA C748, BS 8102 and BS EN 13967. Subject to correct detailing, the Product can contribute to protecting a building and its occupants from the ingress of ground VOCs, carbon dioxide and methane ground gases. The Product is suitable for use with vertical permanent shuttering and temporary formwork when tanking below-ground structures, in the protection of ground floors and for basement construction, lift pits, concrete retaining walls and other structures which extend below ground (in accordance with BS 8102 and BS EN 13967).

PRODUCT DESCRIPTION

The Product is a 3 mm thick flexible, chemically-resistant composite membrane manufactured in accordance with BS EN 13967. The upper surface of the Product is a white textured fleece; the underside is black and has a smooth finish. Where required, the Product sheets are overlapped by 150 mm and joints are bonded and sealed using Combi-Seal Tape or HCR Butyl Tape as appropriate.

PRODUCT ILLUSTRATION



THIRD-PARTY ACCEPTANCE

NHBC - for detailed information see section 3.3 (Third-Party Acceptance).

STATEMENT

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

Craig Devine
Operations Manager, Building Products

[redacted]

Alpheo Mlotha CEng FIMMM MBA
Head of Operations, Building Products

[redacted]

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SUMMARY OF AGRÉMENT

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

- Conditions of use;
- Production Control, Quality Management System and the Annual Verification Procedure;
- Product components and ancillary items, points of attention for the Specifier and examples of details;
- Installation;
- Independently assessed Product characteristics and other information;
- Compliance with national Building Regulations, other regulatory requirements and Third-Party Acceptance, as appropriate;
- Sources.

MAJOR POINTS OF ASSESSMENT

Moisture control - the Product, including taped lap joints, provides an effective barrier to (see section 2.2.9):

- the passage of liquid groundwater when subject to hydrostatic pressure up to and including 60 kPa;
- water vapour transmission from the ground.

Strength - the Product has adequate performance in respect of (see section 2.2.10):

- damage resistance to puncture, impact and static loading;
- tensile strength;
- tensile strength of lap joints;
- resistance to tearing.

Fire performance - the Product is classified as European Classification E (combustible), in accordance with BS EN 13501-1 (see section 2.2.11).

Resistance to chemicals and ground gases - the Product, including taped lap joints, can provide resistance to (see section 2.2.12):

- challenge VOC chemical liquids and vapours;
- methane and carbon dioxide ground gas.

Durability - the Product shall have a service life durability equivalent to that of the building into which it is incorporated (see section 2.2.13).

CE marking - the Agrément holder has responsibility for CE marking in accordance with all relevant harmonised European Product Standards (see section 2.2.14).

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CHAPTER 1 - GENERAL CONSIDERATIONS

1.1 - CONDITIONS OF USE

1.1.1 Design considerations
See section 2.2.

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

1.1.3 Assessment
Kiwa Ltd. has assessed the Product in combination with relevant test reports, technical literature, the Agrément holder's quality plan, DoPs and site visit as appropriate. The NHBC Standards have also been taken into consideration.

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

The Product shall be installed strictly in accordance with the instructions of the Agrément holder and the requirements of this Agrément.

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

1.1.6 Validity
The purpose of this BDA Agrément® is to provide for well-founded confidence to apply the Product within the Scope described. The validity of this Agrément is three years after the issue date, and as published on www.kiwa.co.uk/bda.

1.2 - PRODUCTION CONTROL AND QUALITY MANAGEMENT SYSTEM

Kiwa Ltd. has determined that the Agrément holder fulfils all obligations in relation to this Agrément, in respect of the Product.

The initial audit demonstrated that the Agrément holder has a satisfactory Quality Management System (QMS) and is committed to continuously improving their quality plan. Document control and record-keeping procedures were deemed satisfactory. A detailed Production Quality Specification (PQS) has been compiled to ensure traceability and compliance under the terms of this Agrément.

1.3 - ANNUAL VERIFICATION PROCEDURE - CONTINUOUS SURVEILLANCE

To demonstrate that the Product conforms with the requirements of the technical specification described in this Agrément, an Annual Verification Procedure has been agreed with the Agrément holder in respect of continuous surveillance and assessment, and auditing of the Agrément holder's QMS.

CHAPTER 2 - TECHNICAL ASSESSMENT

This Agrément does not constitute a design guide for the Product. It is intended as an assessment of safety and fitness for purpose only.

2.1 - PRODUCT COMPONENTS AND ANCILLARY ITEMS

2.1.1 Components included within the scope of this Agrément

The following components are integral to the use of the Product:

Item	Description
Combi-Seal Plus	roll membrane, 10 m x 2 m x 3.0 mm, minimum mass/unit area 940 g/m^2, roll coverage 20 m^2
Combi-Seal Foil Tape	single-sided self-adhesive foil tape for bonding and sealing Product lap joints, 150 mm x 45 m
HCR Butyl Tape	factory-applied 100 mm wide blue, selvedge, double-sided self-adhesive butyl jointing tape for bonding and sealing Product lap joints

2.1.2 Ancillary items falling outside the scope of this Agrément

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

Item	Description
Premcrete Protection Board 600	heavy-duty, for protecting the Product from mechanical damage and puncturing
Hydroprufe Tophats	pre-formed high-density polyethylene (hereinafter 'HDPE'), for ground gas-tight sealing around penetrations
jubilee clip	for sealing around Tophats
pre-formed corner units	HDPE, for detailing at internal and external corners
rigid polystyrene insulation	rigid polystyrene floor insulation boards
gas resistant damp proof course	damp proof course
Twinseal Compound	bentonite detailing paste
Premcrete Metal Washer Fixings	metal washer fixings, box of 100
Hydroprufe Detail Strip Tape	single-sided self-adhesive foil-faced jointing tape, 150 mm x 15 m, for sealing the Product around column penetrations, and for repairs/patching of the Product if damaged during installation

2.2 - POINTS OF ATTENTION TO THE SPECIFIER

2.2.1 Design responsibility

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

2.2.2 Applied building physics (heat, air, moisture)

A competent specialist shall check the physical behaviour of a project-specific design incorporating the Product and if necessary can offer advice in respect of improvements to achieve the final specification. The Specialist can be either a qualified employee of the Agrément holder or a suitably qualified consultant (in which case it is recommended that the consultant Specialist co-operates closely with the Agrément holder).

2.2.3 General design considerations

The project-specific design shall achieve complete integrity across the entire building footprint.

The application of the Product shall take account of possible differential movement in the floor due to ground settlement.

Long periods of outdoor weathering and exposure to ultraviolet (hereinafter 'UV') light will reduce the effectiveness of the Product.

Ground VOCs and gases

Design of ground VOC liquids and vapours and ground gas protective measures for buildings on contaminated land or in areas of risk shall be in accordance with the following minimum recommendations:

- BS 8485;
- BRE Report 414;
- CIRIA C665;
- CIRIA C716D;
- CIRIA C735;
- CIRIA C748;
- CIRIA R149.

The Specifier shall consider the site-specific ground gas regime and purpose criteria in BS 8485 (the number of buildings, construction period, the complexity of the design and the experience of the workforce).

Use a suspended (pre-cast or beam and block) concrete ground floor design or construct an open void beneath a ground-supported concrete ground floor when medium to high levels of ground gases or VOCs are present or when the production of ground gases still occurs. Ventilation beneath the concrete ground floor will dilute and disperse the ground gases to atmosphere. Sub-floor ventilation shall achieve at least one air exchange per day.

Service ducts shall be vented to prevent the possibility of ground gas accumulating in confined spaces.

The Product laps shall:
- be jointed and sealed by taping;
- form a continuous barrier with a gas-resistant damp proof course (hereinafter 'GRDPC') in a wall.

The Product shall not be taken through a masonry wall. A GRDPC shall be taken through the inner blockwork leaf and shall be incorporated below a cavity tray built into the outer brick leaf of a wall. The GRDPC shall be extended beyond the blockwork leaf by a minimum of 250 mm where it can be jointed to the Product.

Where the Product is used in conjunction with a cavity wall, a clear cavity of at least 225 mm below the GRDPC shall be maintained. This depth may be reduced to 150 mm below the GRDPC where weep holes are provided, and other necessary measures are taken to ensure that the cavity can drain freely. Where buildings are stepped down a sloping site, a GRDPC and the Product shall be linked so that all parts of each building are protected.

Waterproofing protection
A waterproofing design shall be in accordance with BS 8102.

The Product can act as a fully bonded Type A membrane in accordance with BS 8102, providing waterproofing protection Grades 1 and 2, and Grade 3 when part of a combined waterproofing solution.

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

On sites where NHBC Standards apply, additional waterproofing measures may be required as detailed in their technical requirements.

2.2.4 Project-specific design considerations
The project-specific design shall consider the service life durability required - see section 2.2.13.

The project-specific design shall take into account the requirements of the national Building Regulations - see section 3.2

For ground VOC barrier and ground gas barrier applications, a pre-installation walkover site survey is required to allow determination of the project-specific design. This shall include:
- an assessment of the ground conditions;
- a site investigation to determine the nature and extent of the conditions, including invasive geotechnical and contamination investigations, in accordance with BS EN 1997-2, BS EN ISO 14688-1 and BS EN ISO 22476-1; this on-site testing shall be supplemented by subsequent laboratory testing where necessary;
- investigating, assessing and managing risks from the inhalation of ground VOCs and ground gases in land affected by contamination (in accordance with CIRIA C665 and CIRIA C682);
- investigation for ground VOC and ground gas contamination, in accordance with BS 8576 and BS 10175.

A subsequent desktop study of the site shall be undertaken. This shall include:
- a review of the results of the pre-installation walkover site survey;
- assessment of the soils, geology, surface water, groundwater, and current and historical land uses;
- a ground gas risk assessment and site characterisation, in accordance with CL:AIRE RB 17 and CIRIA R152.

For waterproofing applications, a desktop study is required to allow determination of the project-specific design. This shall include an assessment of ground conditions and the groundwater table in accordance with BS 8102.

2.2.5 Permitted applications
Only applications designed according to the specifications given in this Agrément are permitted. In each case the Specifier will have to co-operate closely with the Agrément holder.

2.2.6 Installer competence level
The Product shall be installed strictly in accordance with the instructions of the Agrément holder and the requirements of this Agrément.

Installation can be undertaken by competent persons experienced in this sort of work.

2.2.7 Delivery, storage and site handling
The Product is delivered to site in suitable packaging, bearing the Product name, the Agrément holder's name and the BDA Agrément® logo incorporating the number of this Agrément. Each roll is supplied with installation instructions.

Store the Product in accordance with the Agrément holder's requirements. Particular care shall be taken to:
- avoid exposure to direct sunlight for extended periods of time;
- avoid exposure to high or low temperatures for extended periods of time;
- store in a well-ventilated covered area to protect from rain, frost and humidity;
- store away from possible ignition sources;
- store rolls of the Product horizontally on a flat surface and not stacked;
- keep rolls under cover and protected from mechanical damage.

Care shall be taken to avoid accidental damage to the Product when handling on-site.

2.2.8 Maintenance and repair
Once installed, the Product shall be covered by an insulation layer and/or screed layer and does not require maintenance.

When installed below or to the edges of a concrete ground floor or to vertical permanent shuttering or temporary formwork, the Product is covered by concrete or backfill and does not require maintenance.

Punctures shall be repaired prior to application of the insulation layer and/or screed layer, concrete ground floor or backfill. Simple punctures are repaired by using a patch of the Product, lapped and taped at least 150 mm beyond the puncture. Other repairs/patching of the Product can be carried out using Hydroprufe Detail Strip Tape. For advice in respect of repair consult the Agrément holder.

Performance factors in relation to the Major Points of Assessment

2.2.9 Moisture control

The Product, including taped lap joints, under positive hydrostatic pressure, has adequate:

- watertightness to provide a barrier to the passage of water from the ground into the internal environment, in accordance with BS EN 1928.

2.2.10 Strength

The Product has adequate:

- static puncture resistance, in accordance with BS EN ISO 12236. However, it can be punctured by sharp objects, therefore it shall be protected after installation and prior to the placement of concrete, and insulation and/or a screed layer;
- tensile strength and elongation properties, in accordance with BS EN 12311-1. The Product can stretch sufficiently underneath an insulation and/or screed layer to accommodate typical settlement of a concrete ground floor;
- shear resistance of tape bonded and sealed lap joints, in accordance with BS EN 12317-2;
- abrasion resistance, which is beneficial during installation;
- dimensional stability, in accordance with BS 4682-2;
- resistance to tearing (nail shank), in accordance with BS EN 12310-1;
- resistance to impact, in accordance with BS EN 12691;
- resistance to static loading, in accordance with BS EN 12730.

The Product remains flexible down to low temperatures, in accordance with MOAT 27.

The white textured fleece facing of the Product aids adhesion to wet concrete.

2.2.11 Fire performance

The Product is classified as European Classification E (combustible), in accordance with BS EN 13501-1. Once incorporated into a concrete ground floor, the Product is fully protected.

2.2.12 Resistance to chemicals and ground gases

The Product, including taped lap joints, will:

- restrict ground VOC liquid and vapour, methane and carbon dioxide ground gas ingress into buildings;
- meet the performance criteria for a ground gas resistant membrane as defined in BS 8485.

2.2.13 Durability

The Product shall have a service life durability equivalent to that of the building into which it is incorporated. The expected lifespan of the building itself should be at least 60-years.

The Product:

- will remain effective against the ingress of carbon dioxide and methane ground gas, liquid groundwater (when subject to hydrostatic pressure) and groundwater vapour, during the lifetime of the building;
- is chemically inert and is not affected by acids and alkalis under normal service conditions;
- has adequate durability in respect of the retention of physical tensile properties after heat and UV ageing, in accordance with BS EN 12311-2;
- is not compatible with products containing pitch;
- has adequate resistance to liquid chemicals, including water.

Long periods of outdoor weathering and exposure to UV light will reduce the effectiveness of the Product.

2.2.14 CE marking

The harmonised European standard for the Product is BS EN 13967.

2.3 - EXAMPLES OF TYPICAL DETAILS

Diagram 1 - Typical slab edge waterproofing detail

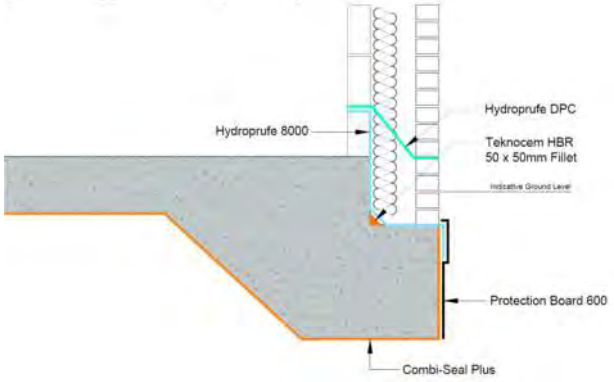


Diagram 2 - Typical section through lift pit

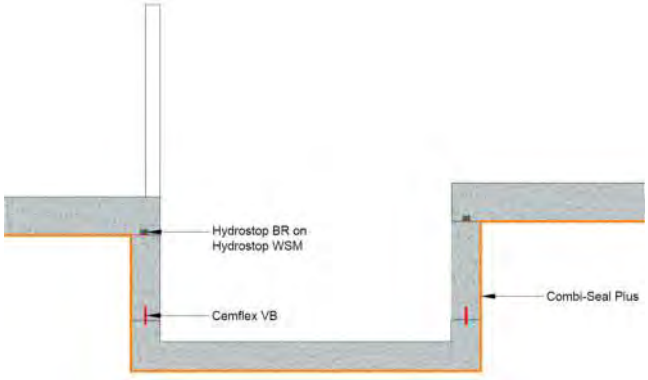


Diagram 3 - Typical cast in penetration detail

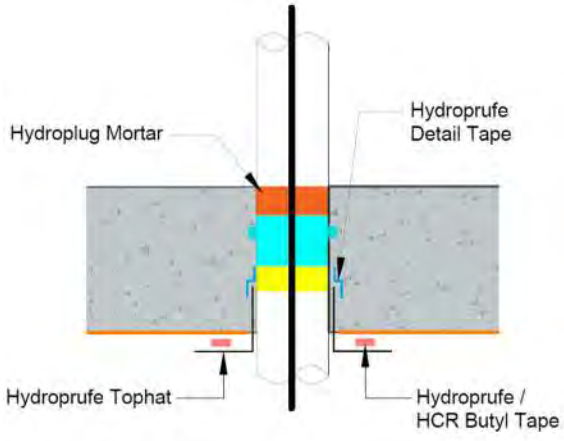


Diagram 4 - Typical box out penetration detail

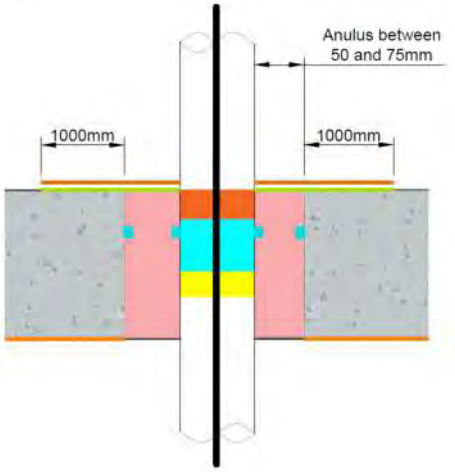


Diagram 5 - Typical box out penetration detail for multiple pipes

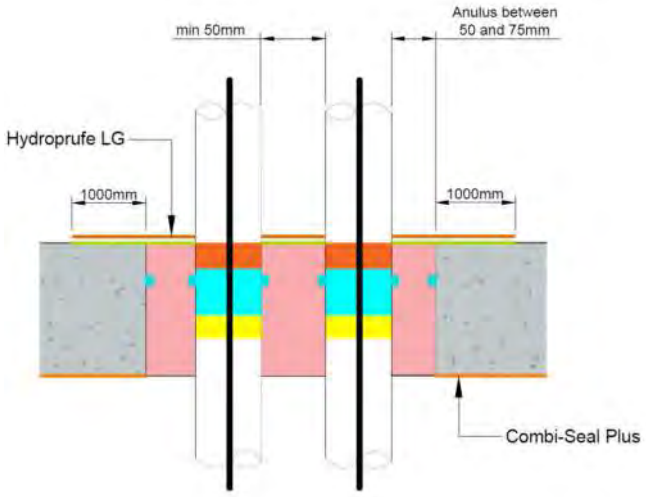
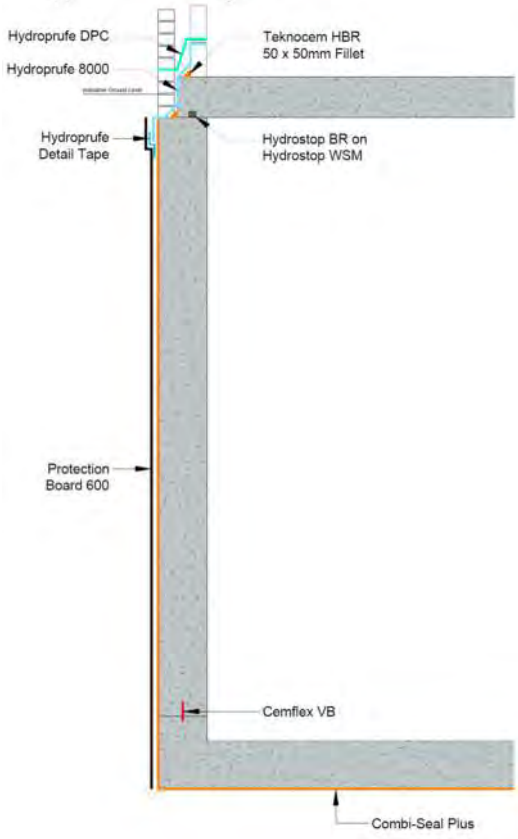


Diagram 6 - Typical section through basement liner wall



2.4 - INSTALLATION

The Product shall be installed strictly in accordance with the instructions (hereinafter 'Installation Manual') of the Agrément holder and the requirements of this Agrément.

2.4.1 Installer competence level
See section 2.2.6.

2.4.2 Delivery, storage and site handling
See section 2.2.7.

2.4.3 Project-specific installation considerations
The project-specific design has been determined from:
- a pre-installation survey and subsequent desktop study for ground VOC barrier and ground gas barrier applications;
- a desktop study for waterproofing applications.

The Product shall be installed in accordance with the Agrément holder's recommendations, BS 8000-0, BS 8000-4, BS 8102 and BS 8485 as appropriate.

The Product installation shall achieve complete continuity and integrity across the entire building footprint. The Product shall be sealed to a GRDPC in any perimeter wall and around service pipe penetrations. Special care shall be taken around penetrations and junctions to ensure the integrity of the seal.

Care shall be taken not to trap water vapour when a combination of damp proofing and vapour control layers (VCL) are used.

The surface of the Product to be taped shall be dry and free from dirt, dust and moisture. When the Product joints are taped, the air temperature shall not be below 5 °C or falling, to prevent the risk of surface condensation affecting the tape adhesion. When the weather is cold, rolls of HCR Butyl Tape shall be kept in a warm, dry place, to ensure the tape is workable and can be more easily applied.

Service ducts shall be vented to prevent the possibility of gas accumulating in confined spaces.

In ground VOC barrier and ground gas barrier applications, the Product installation shall be subject to third-party independent verification by air leakage testing to provide validation, in accordance with CIRIA C735 and BS 8485.

2.4.4 Preparation
The following works may be required prior to installation of the Product:
- concrete ground floor surfaces shall be dry and free from protrusions, dust, dirt, moisture and frost;
- blind the surface over which the Product is to be applied with compacted soft sand (or similar material), to fill voids in a hardcore base;
- in waterproofing applications, repair any cracks and joints in concrete substrates and install a drainage system as appropriate, prior to application of the Product;
- irregularities in concrete substrates shall be repaired with a suitable Premcrete repair mortar.

If the Product is to be installed to concrete foundation piles, the piles shall be prepared by removing all loose soil and ensuring that the concrete is relatively flat.

Any surface over which the Product is to be applied shall be prepared so that there are no voids which the Product would have to span.

2.4.5 Outline installation procedure
The detailed installation sequence can be found in full in the Agrément holder's Installation Manual.

The key sequence for installation is:
- the Product shall be rolled out with the white textured fleece facing the concrete placement, ensuring that the sheet edges are aligned allowing adequate overlap for jointing between the sheets;
- all end and side lap joints shall be lapped a minimum of 150 mm and bonded using the selvedge HCR Butyl Tape or Combi-Seal Foil Tape. The joints shall be firmly compressed using a hand roller to ensure an adequate bond is achieved for complete adhesion and continuity;
- all junctions, service pipe penetrations and direction changes shall be properly detailed in accordance with the Agrément holder's instructions. Airtight seals shall be formed around all service pipe penetrations using Hydroprufe Tophats;
- external and internal corners shall be reinforced using Hydroprufe Detail Strip Tape and bonded using Combi-Seal Foil Tape. Where this is not possible and the three-dimensional shape corners required are complex, it is recommended that Pre-formed internal and external corner units are bonded to the Product using the selvedge HCR Butyl Tape or are sealed using Combi-Seal Foil Tape;
- it is recommended that lap joints are staggered by a minimum of 300 mm to avoid four sheets of the Product intersecting at one junction.

In pre-applied applications, a suitable drainage system may be incorporated, in accordance with the requirements of BS 8102.

Vertical permanent shuttering and temporary formwork surfaces:
- the Product shall be pre-applied to the inside face of permanent shuttering, temporary formwork or the adjoining structure using Premcrete Metal Washer Fixings to secure the leading edge of the Product to the shuttering/formwork. The Product shall be installed with the black (smooth) surface facing the shuttering/formwork and aligned vertically ensuring that all lap joints face down away from the concrete pour;
- lap joints shall be sealed using the selvedge HCR Butyl Tape or sealed using Combi-Seal Foil Tape. The lap joints shall be firmly compressed using a hand roller, during taping to ensure an adequate bond is achieved for complete adhesion and continuity;
- if mechanical fixings are used to secure the membrane in place prior to pouring concrete, Premcrete Metal Washer Fixings shall be fixed through the membrane selvedge prior to placing the adjacent sheet;
- the top edge of the Product shall be trimmed to approximately 20 mm below the top edge of the concrete;

- once the concrete has set, temporary formwork shall be removed, and the Product will remain adhered to the concrete. The Product shall be protected using Premcrete Protection Board 600 prior to backfilling, to ensure it remains un-punctured. The Product shall not be installed above the final ground level;
- ensure continuity of the Product with a GRDPC is maintained where appropriate.

Horizontal application to surfaces below or above a concrete ground floor:
- the Product may be fixed mechanically through the selvedge using Premcrete Metal Washer Fixings. Typically, reinforcement spacer blocks shall be placed along the length of lap joints to ensure that the Product is effectively loaded to prevent displacement;
- penetrations shall be sealed using Hydroprufe Tophats, which shall be taped to the underside of the Product using HCR Butyl Tape. In addition, a fillet of Twinseal Compound shall be applied around the penetration to ensure the integrity of the joint. Twinseal Compound may also be used to assist with the detailing of difficult junctions.

When underfloor heating is being installed, it is recommended that the Product is positioned between the concrete ground floor and insulation layer.

2.4.6 Finishing

The following finishing is required on completion of the installation:
- the Product shall be incorporated into a finished floor as soon as possible after installation.

Care shall be taken to ensure that the Product is not punctured, stretched or displaced during finishing.

When ambient temperatures are above 25 °C or rising, the Product shall be covered immediately after installation.

In vertical shuttering/formwork applications, the Product shall be protected using Premcrete Protection Board 600 prior to backfilling of the installation is carried out.

2.5 - INDEPENDENTLY ASSESSED PRODUCT CHARACTERISTICS

2.5.1 Moisture control

Test		Result
Watertightness, in accordance with BS EN 1928 Method B at 60 kPa	Plain membrane	Pass, dry
	Jointed membrane - taped lap joints (selvedge with HCR Butyl Tape)^	Pass, dry
	Jointed membrane - taped lap joints (Combi Seal Foil Tape)^	Pass, dry
Water vapour transmission rate, in accordance with BS EN ISO 15106-3	Plain membrane	0.134 g/m^2/day
	Jointed membrane - taped lap joints (selvedge with HCR Butyl Tape)^	0.152 g/m^2/day
	Jointed membrane - taped lap joints (Combi Seal Foil Tape)^	0.120 g/m^2/day

^ the taped lap joints were tested in accordance with the general principles of BS EN 1928 and BS EN ISO 15106-3 accordingly

2.5.2 Strength

Test			Result
Tensile strength and elongation of plain membrane, in accordance with BS EN 12311-1	Tensile stress	Machine direction	Mean 930.6 N/50 mm (> 500 N)
		Cross direction	Mean 1456.0 N/50 mm (> 1000 N)
	Elongation at break	Machine direction	Mean 83.2 % (> 60 %)
		Cross direction	Mean 78.6 % (> 50 %)
Shear resistance of tape bonded and sealed lap joints in accordance with BS EN 12317-2		Selvedge HCR Butyl Tape	Mean 407.77 N
		Combi Seal Foil Tape	Mean 184.59 N
Resistance to tearing (nail shank), in accordance with BS EN 12310-1		Machine direction	Mean 1010 N (> 500 N)
		Cross direction	Mean 1030 N
Impact resistance, in accordance with BS EN 12691 method A on hard concrete support			No leakage at 450 mm drop height
Resistance to static loading, in accordance with BS EN 12730 method B on hard concrete support			No leakage at 20 kg, pass
Peel adhesion resistance, in accordance with BRL 1511 and MOAT 64			Mean 91 N/50 mm
			Maximum 137 N/50 mm

2.5.3 Fire performance

Test	Result
Reaction to fire classification, in accordance with BS EN 13501-1	European Classification E (combustible)

2.5.4 Resistance to chemicals and ground gases

Test				Result
Elongation at break after exposure, in accordance with BS EN 14414	Method A	Sulfuric acid (10% solution)	Machine direction	98.2 %
			Cross direction	77.8 %
	Method B	Calcium hydroxide solution (saturated)	Machine direction	97.9 %
			Cross direction	86.0 %
	Method C	35 % diesel, 35 % paraffin, 30 % lubricating oil mixture HD30	Machine direction	99.7 %
			Cross direction	118.0 %
	Method D	Synthetic leachate	Machine direction	105.4 %
			Cross direction	121.7 %

Test		Result	
Methane permeability by differential-pressure method, in accordance with BS ISO 15105-1 at 23 °C	Plain membrane	≤ 22.7 ml/m²/day/atm	
	Jointed membrane - taped lap joints (selvedge with HCR Butyl Tape)^	≤ 22.2 ml/m²/day/atm	
	Jointed membrane - taped lap joints (Combi Seal Foil Tape)^	≤ 21.5 ml/m²/day/atm	
Carbon dioxide permeability by differential-pressure method, in accordance with BS ISO 15105-1 at 23 °C	Plain membrane	≤ 25.0 ml/m²/day/atm	
	Jointed membrane - taped lap joints (selvedge with HCR Butyl Tape)^	≤ 26.2 ml/m²/day/atm	
	Jointed membrane - taped lap joints (Combi Seal Foil Tape)^	≤ 22.4 ml/m²/day/atm	
Organic vapour transmission rate by equal pressure method, in accordance with BS ISO 15105-2 at 23 °C	Plain membrane	Ethyl Benzene	0.404 mg/m²/day
		Trichlorethene	0.001 mg/m²/day
		Xylene	0.385 mg/m²/day
		Naphthalene	0.000 mg/m²/day
		Benzene	0.315 mg/m²/day
		Toluene	0.351 mg/m²/day
		Hexane	0.199 mg/m²/day
		Tetrachlorethene	0.001 mg/m²/day
	Jointed membrane - taped lap joints (selvedge with HCR Butyl Tape)^	Ethyl Benzene	0.210 mg/m²/day
		Trichlorethene	0.001 mg/m²/day
		Xylene	0.200 mg/m²/day
		Naphthalene	0.000 mg/m²/day
		Benzene	0.188 mg/m²/day
		Toluene	0.185 mg/m²/day
		Hexane	0.105 mg/m²/day
		Tetrachlorethene	0.001 mg/m²/day
	Jointed membrane - taped lap joints (Combi Seal Foil Tape)^	Ethyl Benzene	0.137 mg/m²/day
		Trichlorethene	0.000 mg/m²/day
		Xylene	0.128 mg/m²/day
		Naphthalene	0.000 mg/m²/day
		Benzene	0.110 mg/m²/day
		Toluene	0.125 mg/m²/day
		Hexane	0.087 mg/m²/day
		Tetrachlorethene	0.000 mg/m²/day

^ the bonded and sealed lap joints were tested in accordance with the general principles of BS ISO 15105-1 and BS ISO 15105-2 accordingly

2.5.5 Durability

Test			Result
Maximum tensile stress of plain membrane, in accordance with BS EN 12311-1	After UV ageing	Machine direction	Mean 976.00 N/50 mm (> 500 N)
		Cross direction	Mean 1372.80 N/50 mm (> 1000 N)
	After heat ageing	Machine direction	Mean 1006.60 N/50 mm (> 500 N)
		Cross direction	Mean 1685.70 N/50 mm (> 1000 N)
Elongation at break of plain membrane, in accordance with BS EN 12311-1	After UV ageing	Machine direction	Mean 82.50 % (> 60 %)
		Cross direction	Mean 79.30 % (> 50 %)
	After heat ageing	Machine direction	Mean 86.80 % (> 60 %)
		Cross direction	Mean 74.10 % (> 50 %)

2.5.6 Other

Test		Result
Determination of thickness and mass per unit area, in accordance with BS EN 1849-1	Weight	Mean 0.95 kg/m²
	Thickness	Mean 3.08 mm
	Width	1992 mm
	Straightness	Maximum deviation 1.0 mm, pass
Visible defects, in accordance with BS EN 1850-2		No visible defects
Low temperature unrolling, in accordance with MOAT 27 at 0 °C		No identifiable defects
Low temperature flexibility, in accordance with BS EN 1109		No cracks, pass
Dimensional stability, in accordance with BS 4682-2	at 25-75 % RH	Length mean 0.02 %
		Width mean -0.04 %
	at 75-25 % RH	Length mean -0.01 %
		Width mean -0.04 %

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

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

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

3.2 - THE NATIONAL BUILDING REGULATIONS

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

This Agrément shall not be construed to confer compliance of any project-specific design with the national Building Regulations.

3.2.1 - ENGLAND
THE BUILDING REGULATIONS 2010 AND SUBSEQUENT AMENDMENTS

- C1(2) Preparation of site and resistance to contaminants - the Product can contribute to separating the occupants from contaminants in the ground
- C2(a) Resistance to moisture - floors/basements incorporating the Product can contribute to adequately protecting a building from ground moisture
- Regulation 7(1) Materials and workmanship - the Product is manufactured from suitably safe and durable materials for the application and can be installed to give a satisfactory performance

3.2.2 - WALES
THE BUILDING REGULATIONS 2010 AND SUBSEQUENT AMENDMENTS

- C1(2) Preparation of site and resistance to contaminants - the Product can contribute to separating the occupants from contaminants in the ground
- C2(a) Resistance to moisture - floors/basements incorporating the Product can contribute to adequately protecting a building from ground moisture
- Regulation 7(1) Materials and workmanship - the Product is manufactured from suitably safe and durable materials for the application and can be installed to give a satisfactory performance

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

3.2.3.1 Regulation 8(1) Durability, workmanship and fitness of materials

- The Product is durable and fit for its intended purpose

3.2.3.2 Regulation 9 Building standards - construction

- 3.1 Site preparation - harmful and dangerous substances - the Product can contribute to separating a building and occupants from harmful or dangerous substances
- 3.4 Moisture from the ground - floors/basements incorporating the Product can contribute to adequately protecting a building from moisture penetration from the ground
- 7.1(a)(b) Statement of sustainability - the Product can contribute to satisfying the relevant Requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard

3.2.3.3 Regulation 12 Building standards - conversions

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

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

- 23(a)(b) Fitness of materials and workmanship - floors/basements incorporating the Product are suitable and can be adequately prepared and applied
- Regulation 26(1)(b) Site preparation and resistance to contaminants - the Product can contribute to separating a building and occupants from harmful contaminants
- Regulation 28(a)(b) Resistance to moisture and weather - floors/basements incorporating the Product can contribute to adequately protecting a building from the passage of moisture from the ground and the weather

3.3 - THIRD-PARTY ACCEPTANCE

NHBC - In the opinion of Kiwa Ltd., the Product, if installed, used and maintained in accordance with this Agrément, can satisfy or contribute to satisfying the relevant requirements in relation to NHBC Standards, Chapters 4.1 Land quality - managing ground conditions, 5.1 Substructure and ground-bearing floors, and 5.4 Waterproofing of basements and other below ground structures.

CHAPTER 4 - SOURCES

- BS EN ISO 12236:2006 Geosynthetics. Static puncture test (CBR test)
- BS EN ISO 14688-1:2018 Geotechnical investigation and testing. Identification and classification of soil. Identification and description
- BS EN ISO 15106-3:2005 Plastics. Film and sheeting. Determination of water vapour transmission rate. Electrolytic detection sensor method
- BS EN ISO 22476-1:2012 Geotechnical investigation and testing. Field testing. Electrical cone and piezocone penetration test
- BS EN 1109:2013 Flexible sheets for waterproofing. Bitumen sheets for roof waterproofing. Determination of flexibility at low temperature
- BS EN 1849-1:2000 Flexible sheets for waterproofing. Determination of thickness and mass per unit area. Bitumen sheets for roof waterproofing
- BS EN 1850-2:2001 Flexible sheets for waterproofing. Determination of visible defects. Plastic and rubber sheets for roof waterproofing
- BS EN 1928:2000 Flexible sheets for waterproofing. Bitumen, plastic and rubber sheets for roof waterproofing. Determination of watertightness
- BS EN 1997-2:2007 Eurocode 7. Geotechnical design. Ground investigation and testing
- BS EN 12310-1:2000 Flexible sheets for waterproofing. Determination of resistance to tearing (nail shank). Bitumen sheets for roof waterproofing
- BS EN 12311-1:2000 Flexible sheets for waterproofing. Determination of tensile properties. Bitumen sheets for roof waterproofing
- BS EN 12311-2:2013 Flexible sheets for waterproofing. Determination of tensile properties. Plastic and rubber sheets for roof waterproofing
- BS EN 12317-2:2010 Flexible sheets for waterproofing. Determination of shear resistance of joints. Plastic and rubber sheets for roof waterproofing
- BS EN 12691:2018 Flexible sheets for waterproofing. Bitumen, plastic and rubber sheets for roof waterproofing. Determination of resistance to impact
- BS EN 12730:2015 Flexible sheets for waterproofing. Bitumen, plastic and rubber sheets for roof waterproofing. Determination of resistance to static loading
- BS EN 13501-1:2018 Fire classification of construction products and building elements. Classification using data from reaction to fire tests
- BS EN 13967:2012+A1:2017 Flexible sheets for waterproofing. Plastic and rubber damp proof sheets including plastic and rubber basement tanking sheet. Definitions and characteristics
- BS EN 14414:2004 Geosynthetics. Screening test method for determining chemical resistance for landfill applications
- BS ISO 15105-1:2007 Plastics. Film and sheeting. Determination of gas-transmission rate. Differential-pressure methods
- BS ISO 15105-2:2003 Plastics. Film and sheeting. Determination of gas-transmission rate. Equal-pressure method
- BS 4682-2:1988 Methods of test for dimensional stability of textile floor coverings. Determination of dimensional changes due to changes in ambient humidity
- BS 8000-0:2014 Workmanship on construction sites. Introduction and general principles
- BS 8000-4:1989 Workmanship on building sites. Code of practice for waterproofing
- BS 8102:2009 Code of practice for protection of below ground structures against water from the ground
- BS 8485+A1:2019 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings
- BS 8576:2013 Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds (VOCs)
- BS 10175:2011+A2:2017 Investigation of potentially contaminated sites. Code of practice. Code of practice
- BRE Report 414:2001 Protective measures for housing on gas-contaminated land
- CIRIA C665:2007 Assessing risks posed by hazardous ground gases to buildings
- CIRIA C682:2009 VOCs handbook: investigating, assessing and managing risks from inhalation of VOCs at land affected by contamination
- CIRIA C716D:2012 Remediating and mitigating risks from volatile organic compound (VOC) vapours from land affected by contamination
- CIRIA C735:2014 Good practice on the testing and verification of protection systems for buildings against hazardous ground gases
- CIRIA C748:2014 Guidance on the use of plastic membranes as VOC vapour barriers
- CIRIA R149:1995 Protecting development from methane: methane and associated hazards to construction
- CIRIA R152:1995 Risk assessment for methane and other gases from the ground
- CL:AIRE research bulletin RB 17:2012 A Pragmatic Approach to Ground Gas Risk Assessment
- NHBC Standards 2021

Remark: apart from these sources, technical information and confidential reports have been assessed; any relevant documents are in the possession of Kiwa Ltd. and kept in the Technical Assessment File of this Agrément. The Installation Manual for the Product may be subject to change, and the Agrément holder should be contacted for clarification of revisions.

CHAPTER 5 - AMENDMENT HISTORY

Revision	Amendment description	Amended by	Approved by	Date
-	First Issue	C Devine	C Vurley	March 2021
A	Issue with NHBC acceptance	C Devine	C Vurley	May 2021
B	Minor typographical corrections	C Devine	C Vurley	January 2022
C	Company rebranding; minor edit to section 2.4.3	E Taylor	C Devine	January 2023

CHAPTER 6 - CONDITIONS OF USE

This Agrément may only be reproduced and distributed in its entirety.

Where a National Annex exists in respect of a BS EN (or other) standard, its use is deemed mandatory wherever the original standard is referenced.

Kiwa Ltd. has used due skill, care and attention in the preparation of this BDA Agrément®.

Whilst all due diligence has been used, no liability or warranty is extended by Kiwa Ltd.

For full terms and conditions refer to Kiwa Ltd.

TWINSEAL COMPOUND GR

GAS-RESISTANT WATERPROOF SEALING COMPOUND

DESCRIPTION

TWINSEAL COMPOUND GR is an epoxy-based, waterproof sealing compound formulated to provide enhanced gas resistance to structures. It is designed for a variety of surface preparation and waterproofing sealing details for use with PREMCRETE Waterproof Membranes. Once applied, the TWINSEAL COMPOUND GR will form an impermeable chemical-cured connection to a wide variety of substrates. Its thixotropic consistency ensures ease of application to most substrates.

Property	Value
Consistency	Paste-like
Colour	Blue
Specific Gravity	1.4

USES

TWINSEAL COMPOUND GR is suitable for use on structural concrete and masonry. It is used for creating a waterproof seal around penetrations through PREMCRETE WATERPROOF MEMBRANES and other difficult junctions, where it is important to maintain the integrity of the membrane. It is particularly suitable for sealing membranes to waterproof and gas resistant coatings where the use of a lap tape is not suitable.

ADVANTAGES

- Provides effective watertight seal at difficult junctions.
- Resistant to Gas and VOC vapours.
- Produces effective seal between otherwise incompatible membranes.
- Easily applied by brush or trowel.

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TWINSEAL COMPOUND GR

GAS-RESISTANT WATERPROOF SEALING COMPOUND.

PROCEDURE

Surface Preparation: Surfaces to receive TWINSEAL COMPOUND GR should be dry and free from dust, dirt, grease, and other deleterious materials. All loose material should be removed. If TWINSEAL COMPOUND GR is to be applied to a waterproof coating, then the coating should be hardened before application of the TWINSEAL COMPOUND GR.

Mixing: The contents of the curing agent component should be poured into the base component tin and mixed thoroughly using a slow speed drill and paddle mixer until a homogeneous mix is achieved, which is uniform in colour and consistency. Special care should be taken to ensure that packs are not part mixed.

Application: When sealing between PREMCRETE Waterproof Membranes and a protruding pile head or pile cap interface, the membrane should be cut tightly to the profile of the concrete with TWINSEAL COMPOUND GR applied by brush as a 3 x 100mm application with 50mm connection onto the geotextile fleece of the membrane and 50mm onto the pile interface. When sealing PREMCRETE Waterproof Membranes onto a pile cap which is cast flush with the blinding level, TWINSEAL COMPOUND GR should be brush applied as a 1mm thick coating to the perimeter of the pile cap before lapping the Waterproof Membrane onto the pile cap perimeter, securing with the METAL WASHER FIXINGS and then sealing over with a further 2mm thick application of TWINSEAL COMPOUND GR.

Trowel finishing of the TWINSEAL COMPOUND GR is also acceptable.

Equipment Cleaning: Equipment should be cleaned using Premcrete Cleaning Solvent.

PACKAGING & COVERAGE

Pack Size: 5kg

Yield: 3.5ltrs

Coverage: Coverage will be 10m when applied as a typical 3 x 100mm.

STORAGE & SHELF LIFE

TWINSEAL COMPOUND GR should be stored in dry conditions at temperatures between 8°C and 30°C. Unopened containers have a shelf life in excess of 12 months.

HEALTH & SAFETY

See separate material safety datasheet.

The information provided in this data sheet is intended for general guidance only and is given in good faith based on Premcrete Ltd current knowledge and experience. No warranty in respect of fitness for a purpose, or any other liability whatsoever can be inferred from the information contained within this datasheet. Users should determine the suitability of the materials for their particular application and should always refer to the most recent issue of the product data sheet for the product concerned. All materials are supplied in accordance with Premcrete Ltd Sales Terms & Conditions (available upon request and on Company Website).

PREMCRETE

HYDROPRUFE LG

Liquid Gas Membrane

Property	Value
Colour	Red
Pot Life	50 mins @ 20°C
Adhesive Bond to Damp Concrete	>3.5MPa (Concrete Failure)
Viscosity	480 CPS @ 20°C
Flexural Strength	60 MPa
Water Absorption	<0.3% after 7 days
Methane Transmission Rate (OTR)/ml.mm/m². Day.atm	2.4
Carbon Dioxide Transmission Rate (OTR)/ml.mm/m². day.atm	1.4

DESCRIPTION

HYDROPRUFE LG is an epoxy based liquid gas membrane which is suitable for application to porous substrates to provide resistance to ground gases including methane and carbon dioxide. It is supplied as two-component pack, consisting of a base component and a curing agent suitable for mixing on site. When applied to the substrate it will also act as an adhesion promoter. The liquid applied membrane cures to form a resilient gas and VOC barrier, which is also resistant to water and ground moisture.

USES

HYDROPRUFE LG is suitable for application to structures including concrete and masonry to provide a seamless gas resistant membrane. It is particularly suitable for applications where it is not practicable to install a sheet gas membrane system, for example pile cap applications.

ADVANTAGES

- Excellent resistance to methane and carbon dioxide and VOC contaminants.
- Excellent adhesion to damp concrete.
- Low viscosity for easy application.
- Ease of application to complex structures.
- Solvent free and low odour.
- Test data confirming acceptability for use with pile caps.

PROCEDURE

Surface Preparation: Substrates to which the HYDROPRUFE LG is to be applied should be thoroughly cleaned and free from all loose material. Surface laitance should be removed by high-pressure jet-washing or mechanical abrasion where required. This will ensure that an adequate key is provided for the applied coating. All standing water must be removed prior to application. Whilst the coating is suitable for application to damp substrates the concrete should be given 2-3 hours to dry following jet-washing preparation. Any excessive substrate defects should be repaired using a suitable PREMCRETE repair product. The concrete sub-base should have a minimum compressive strength of 25MPa. The prepared substrate should be free from any live water ingress and if the substrate is very porous, such as concrete blockwork, a light dampening is recommended. A fine spray misting of water or a flick over with a slurry brush will be sufficient.

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Mixing: The contents of the curing agent components should be poured into the base component tin and mixed thoroughly using a slow speed drill and paddle mixer until a homogeneous mix is achieved, which is uniform in colour and consistency. Special care should be taken to ensure that packs are not part mixed.

Application: Horizontal substrates, such as pile caps, require a single 1 coat application at a minimum WFT (Wet Film Thickness) of 1mm. Vertical substrates should have two coats applied. Hydroprufe LG should be applied using a suitable brush, roller, or airless spray equipment and where a mechanical key is required to promote adhesion to subsequently cast concrete, then a quartz aggregate should be broadcast into the wet coating. Once the coating has dried, then the excess aggregate should be swept or blown from the surface.

Curing: Hydroprufe LG will be touch dry after 6hrs at 20°C and hard dry after 16hrs at 20°C.

Equipment Cleaning: Tools and equipment should be cleaned immediately using water.

PACKAGING & COVERAGE

Pack Size: HYDROPRUFE LG is supplied in 5Ltr and 15ltr units.

Coverage: Coverage will vary depending on substrate quality, therefore, consideration for decreased coverage on pile cap applications should be made. Based on a standard quality and porosity of concrete, coverage rates at 1mm thickness are as follows:

5ltr- 5m2

15ltr- 15m2

STORAGE & SHELF LIFE

HYDROPRUFE LG should be stored in dry conditions at temperatures between 10°C and 30°C. When stored in unopened containers the product will have a shelf life of 12 months.

HEALTH & SAFETY

See separate material safety datasheet.

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Revision date: 23/1/23

CEMFLEX VB

Active Metal Waterstop

DESCRIPTION

CEMFLEX VB comprises of a galvanized steel plate which is encapsulated with a unique coating that will react with the cement in the concrete to seal construction joints in reinforced concrete. When fresh concrete is placed around CEMFLEX VB the alkalinity of the concrete activates the coating causing it to activate and crystallise to gain an intimate, active bond with the concrete. Once the concrete is hardened around the waterstop the crystalline coating will remain active for the lifespan of the structure.

USES

CEMFLEX VB is used to provide an integral seal in both horizontal and vertical construction joints in concrete it is particularly suitable for sealing kicker joints in reinforced concrete wall construction. It may be used in areas where it is not possible to protect a hydrophilic waterstop from coming into contact with water before it is encased in concrete.

PROCEDURE

CEMFLEX VB is a pliable metal waterstop which may be easily shaped by hand to the desired profile. It should be cut using a suitable saw for cutting metal. The waterstop may be tied to the reinforcement prior to the concrete pour using CEMFLEX OMEGA holders ensuring that 30mm of the plate is embedded into the first pour of concrete. Alternatively, the CEMFLEX VB may be embedded into freshly placed concrete, once again ensuring that there is at least 30mm embedment. Adjacent lengths of the waterstop should be overlapped by a minimum of 150mm and the laps should be held together using CEMFLEX CLIPS. Two clips should be used to secure each lap. It is important to ensure that concrete placed around the waterstop is thoroughly compacted.

Property	Value
Dimensions	150mm x 1.25mm
Installation temperature	-10°C up to 40°C
Resistance to water pressure	Tested to resist 5 bar
Colour	Black

PACKAGING & COVERAGE

Pack Size: CEMFLEX VB is supplied in 2m lengths. There are 50 lengths per box.

STORAGE & SHELF LIFE

CEMFLEX VB should be stored in original packaging in cool dry conditions which are free from frost.

HEALTH & SAFETY

See separate material safety datasheet.

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Agrément Certificate
17/5412
Product Sheet 1 Issue 1

PREMCRETE WATERPROOFING SYSTEMS

CEMFLEX VB

This Agrément Certificate Product Sheet(1) relates to CEMflex VB, for use as part of a Type B (structurally integral) protection, as defined in BS 8102 : 2009, to waterproof construction joints in underground waterproof reinforced concrete structures.

(1) Hereinafter referred to as 'Certificate'.



CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production †
- formal three-yearly review †.

KEY FACTORS ASSESSED

Resistance to water pressure — the product provides an effective barrier to the passage of moisture from the ground (see section 6).

Durability — when fully enclosed in a concrete structure the product will remain effective as a waterstop for the life of the structure in which it is incorporated (see section 8).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

[redacted]

[redacted]

Date of First issue: 26 April 2017

John Albon — Head of Approvals
Construction Products

Claire Curtis-Thomas
Chief Executive

Certificate amended on 16 January 2023 to update company name.

The BBA is a UKAS accredited Inspection Body (No.4345).

This certificate has been amended on 16 January 2023 as part of a transition of The BBA Agrément Certificate scheme delivered under the BBA's ISO/IEC 17020 accreditation. Sections marked with the symbol † are not issued under accreditation.

Readers MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon

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Regulations

In the opinion of the BBA, CEMflex VB, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	C2(a)	Resistance to moisture
Comment:		The product can contribute to satisfying this Requirement. See section 6 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The product is acceptable. See section 8 and the Installation part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Durability, workmanship and fitness of materials
Comment:		The product is acceptable. See section 8 and the Installation part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	3.4	Moisture from the ground
Comment:		The product is an effective barrier to water, with reference to clauses 3.4.1[(1)(2)], 3.4.5[(1)(2)] and 3.4.7[(1)(2)]. See section 6 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The product can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation:	12	Building standards applicable to conversions
Comment:		All comments given for the product under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1[(1)(2)] and Schedule 6[(1)(2)]. (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2012

Regulation:	23(a)(i)(iii)(iv)(b)(i)	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 8 and the Installation part of this Certificate.
Regulation:	28(a)	Resistance to moisture and weather
Comment:		The product can contribute to satisfying this Regulation. See section 6 of this Certificate.

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See section: 3 Delivery and site handling (3.1) of this Certificate.

Additional Information

NHBC Standards 2017

NHBC accepts the use of CEMflex VB, provided it is installed, used and maintained in accordance with this Certificate, in relation to NHBC Standards, Chapter 5.4 Waterproofing of basements and other below ground structures (requiring proprietary waterproofing materials to comply with Technical Requirement R3). Where Grade 3 protection is required and the below ground wall retains more than 600 mm measured from the top of the retained ground to the lowest finished floor level, the product must be used in combination with either a Type A or Type C waterproofing protection as defined in BS 8102 : 2009. The Certificate holder should be consulted for approved Type A, B and C solutions.

Technical Specification

1 Description

1.1 CEMflex VB comprises a steel plate with a polymer-modified cementitious coating on both faces, for use as a waterstop at construction joints where crack movement is limited to ≤ 0.2 mm.

1.2 The product is supplied in strips 2.0 m long, with nominal cross-sectional dimensions of 150 x 1.2 mm.

1.3 Ancillary items necessary for installation of the product and included in this assessment are:

- CEMflex clips — used to secure lap joints in the product
- CEMflex Ω holder — used to tie CEMflex VB to steel reinforcement and secure it in place during the concrete pouring process.

2 Manufacture

2.1 The product is manufactured using batch blending and coating techniques.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of the manufacturer has been assessed and registered as meeting the requirements of EN ISO 9001 : 2008 by TÜV SÜD (Certificate 1210036327 TMS).

3 Delivery and site handling

3.1 CEMflex VB is supplied in wooden boxes with each box containing up to 50 pieces.

3.2 The product must be stored under cool, dry conditions and protected from contamination. When stored in accordance with the Certificate holder's instructions, the undamaged product will have an indefinite shelf life.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on CEMflex VB.

Design Considerations

4 Use

4.1 CEMflex VB is satisfactory for use as part of a Type B (structurally integral) protection, as defined in BS 8102 : 2009, to waterproof construction joints in underground waterproof reinforced concrete structures.

4.2 Concrete structures must be designed in accordance with BS EN 1992-3 : 2006 with calculated crack widths of ≤ 0.2 mm.

4.3 The product is not suitable for use in movement joints.

4.4 The product has not been assessed for use in corrosive environments, eg saline or acidic conditions, nor for use in contact with potable water (see also section 8 of this Certificate). The Certificate holder can advise on the product's suitability for a particular application.

5 Practicability of installation

The product must only be installed by contractors who have been trained and approved by the Certificate holder. Details of these are available from the Certificate holder.

6 Resistance to water pressure



6.1 When confined within the concrete structure, the product forms an effective barrier to water under pressure from the ground.

6.2 The product was tested at a crack width of 0.25 mm and remained watertight at the maximum hydrostatic water pressures given in Table 1.

Table 1 Resistance to hydrostatic water pressure and overlap distance

Minimum overlap (cm)	Maximum water pressure (bar)
5	2.0
20	5.0

6.3 An appropriate safety factor(1) must be applied to the maximum water pressure given in Table 1, and the use of additional waterproof protection should be considered, depending on the specific risks associated with any particular structure.

(1) A typical safety factory will be 2.5.

7 Maintenance

As the product is confined within the structure and has suitable durability, maintenance is neither possible nor required.

8 Durability



8.1 CEMflex VB will function effectively as a waterstop and provide an effective barrier to water under pressure for the life of the structure in which it is incorporated.

8.2 The durability of the product may be affected if it is dislodged or damaged during or following installation, therefore care must be taken to ensure that the product remains in position and is not dislodged when concrete is poured over it, nor damaged during subsequent actions, eg vibration.

8.3 The durability of the product may be affected under corrosive conditions, eg saline or acidic conditions, causing corrosion of the steel plate. The Certificate holder must be consulted before the product is used under these and other conditions where contamination of the ground water is present.

Installation

9 General

9.1 Installation of CEMflex VB must be carefully planned to ensure that the product is properly routed and located, in order to achieve the specified minimum embedment depth and lap joint overlaps along the entire installation.

9.2 A minimum of 3 cm of the waterstop must be embedded into the concrete either side of the construction joint, and lap joints must be secured with CEMflex clips. A minimum of 6 cm concrete coverage must be ensured either side of the product.

10 Procedure

10.1 The product is positioned so that, if possible, it lies centrally along and perpendicular to the construction joint, and is fixed in position using CEMflex Ω holders and steel wire.

10.2 The placement must ensure that when the base slab is poured the product is embedded into the wet concrete by at least 3 cm, maximum 12 cm.

10.3 The concrete must be carefully compacted around the product to eliminate air voids, taking care not to dislodge it.

10.4 Alternatively, the product can be pressed into the poured concrete, ensuring that at least 3 cm is embedded into the concrete.

10.5 Lap joints must be at least 5 or 20 cm, depending on the water pressure expected (see Table 1). Laps must be secured using CEMflex clips applied from the top edge, one clip for a 5 cm lap and two clips for a 20 cm lap.

10.6 The product can be easily bent by hand and formed to follow curves or around corners.

10.7 When placed and before the concrete has set, the installation must be inspected to ensure that the minimum embedment depth and overlap length have been observed and that the overlaps remain secured. Any adjustments must be made at this point before the concrete has set.

10.8 Prior to enclosing the product in concrete, the installation must be inspected for damage and any necessary repairs made. The Certificate holder must be consulted for advice if any section of the installed product has suffered significant damage.

10.9 The product is fully enclosed in concrete, ensuring that the product is embedded by a minimum 3 cm on the upper side of the construction joint.

10.10 The concrete must be well compacted to minimise the risk of air voids remaining present at the product/concrete interface, and allowed to set.

Technical Investigations

11 Tests

Tests were conducted on samples of CEMflex VB and the results assessed to determine:

- product characteristics
- bond strength to fresh concrete
- resistance to hydrostatic water pressure.

12 Investigations

12.1 Visits were made to sites in progress to assess the practicability of installation.

12.2 Test data from an independent laboratory was examined relating to resistance to water pressure, product characteristics and bond strength to fresh concrete.

12.3 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS EN 1992-3 : 2006 Eurocode 2 — Design of concrete structures — Liquid retaining and containing structures

BS 8102 : 2009 Code of practice for protection of below ground structures against water from the ground

EN ISO 9001 : 2008 Quality management systems — Requirements

Conditions of Certificate

Conditions

1 This Certificate:

- relates only to the product that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

3 This Certificate will be displayed on the BBA website, and the Certificate Holder is entitled to use the Certificate and Certificate logo, provided that the product and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product or any other product
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product
- actual installations of the product, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to UKCA, UKNI or CE marking.

6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product which is contained or referred to in this Certificate is the minimum required to be met when the product is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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HYDROSTOP BR

Hydrophilic Rubber Waterstop

DESCRIPTION

HYDROSTOP BR is a hydrophilic synthetic rubber waterstop with a sodium bentonite component. It is designed to swell when in contact with water to provide an effective watertight seal in construction joints in concrete. Expansion of the waterstop creates a positive pressure against the faces of the construction joint in cast in-situ concrete, creating a joint which is resistant to hydraulic pressure. HYDROSTOP BR has a swelling capacity in excess of 400% of its original size. The sodium bentonite component provides extra protection. The expansive clay will penetrate and effectively seal any shrinkage cracks that may form in concrete.

USES

HYDROSTOP BR is used for the integral sealing of both horizontal and vertical construction joints in cast in-situ concrete. It is also suitable for sealing around pipe penetrations and other components where an active seal against water ingress is required. It may be used in the place of conventional PVC water bars as an effective method of preventing the passage of water at construction joints, however it should not be used for the sealing of movement or expansion joints. Structures include, basements, tunnels, culverts, swimming pools, lift pits, retaining walls and other structures which require resistance to water.

COMPLIANCE

HYDROSTOP BR is approved by the British Board of Agrément.

ADVANTAGES

- Provides an active seal to construction joints for the lifetime of the structure.
- Swells by 400% when in contact with water.
- Sodium bentonite component will fill small cracks and fissures.
- Easy installed by semi-skilled labour.
- Easily installed to form complex joint shapes.
- Design life at least equal to that of the structure where it is incorporated.

Property	Value
Colour	Black
Swelling Ratio	> 400%
Density	1.58kg/dm^3
Weight	0.79kg/m
Installation Temperature	-10°C to 50°C
Dimensions	25mm x 20mm

PROCEDURE

Surface Preparation: The substrate to which the HYDROSTOP BR is to be applied, should be clean, dry and free from deleterious materials. The surface should be smooth and free from excessive surface undulation. Installation during heavy rain is not recommended as this may cause premature activation of the waterstop. The surface of the joint should be scabbled prior to the application of the waterstop.

Application: HYDROSTOP BR should be applied to the substrate using HYDROSTOP WSM as an adhesive. Apply HYDROSTOP WSM as a sufficient size bead to the concrete to achieve a 3 x 25mm application under the HYDROSTOP BR and ensure complete contact with the adhesive. Based on this coverage each unit of

www.premcrete.com | 02380 276166 | sales@premcrete.com
44 Macadam Way, West Portway, Andover, Hampshire, SP10 3XW

HYDROSTOP WSM will cover 8 metres. HYDROSTOP BR should be nailed at 300mm centres using HYDROSTOP RETAINING PINS.

Adjacent strips of HYDROSTOP BR should be parallel lapped by 100mm to ensure a complete seal is achieved. Internal and external corners should be formed by cutting the HYDROSTOP BR and butt jointing. Do not bend the HYDROSTOP BR around corners, as this will affect the integrity of the seal achieved. Allow the HYDROSTOP WSM adhesive to cure overnight before subsequent concrete pour.

It is important to ensure that the HYDROSTOP BR is positioned so that there is at least 75mm concrete cover. The installed HYDROSTOP BR should be protected from rain damage until the concrete is placed. It is extremely important that when the concrete is placed it is well compacted around the waterstop, as any voids will allow the water to track around the installed waterstop.

PACKAGING & COVERAGE

Pack Size: 6 rolls of 5m per box

STORAGE & SHELF LIFE

HYDROSTOP BR should be stored in dry cool conditions.
When stored in good conditions the product has a shelf life in excess of 24 months.

HEALTH & SAFETY

See separate Material Safety Datasheet

The information provided in this data sheet is intended for general guidance only and is given in good faith based on Premcrete Ltd current knowledge and experience. No warranty in respect of fitness for a purpose, or any other liability whatsoever can be inferred from the information contained within this datasheet. Users should determine the suitability of the materials for their particular application and should always refer to the most recent issue of the product data sheet for the product concerned. All materials are supplied in accordance with Premcrete Ltd Sales Terms & Conditions (available upon request and on Company Website).

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Agrément Certificate
15/5265
Product Sheet 1 Issue 2

PREMECRETE HYDROPHILIC WATERSTOP

HYDROSTOP BR

This Agrément Certificate Product Sheet(1) relates to Hydrostop BR, a flexible, hydrophilic bentonite waterstop, made from a combination of synthetic rubber and sodium bentonite clay, for use at construction joints and penetrations in underground waterproof reinforced concrete structures.

(1) Hereinafter referred to as 'Certificate'.



CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production†
- formal three-yearly review†.

KEY FACTORS ASSESSED

Resistance to water pressure — the product provides an effective barrier to the passage of moisture from the ground (see section 6).

Durability — when fully enclosed in a concrete construction the product will remain effective for the life of the structure in which it is incorporated (see section 8).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

[redacted]

Hardy Giesler
Chief Executive Officer

Date of Second issue: 19 May 2020

Originally certificated on 21 October 2015

Certificate amended on 16 January 2023 to update company name.

The BBA is a UKAS accredited Inspection Body (No.4345).
This certificate has been amended on 16 January 2023 as part of a transition of The BBA Agrément Certificate scheme delivered under the BBA's ISO/IEC 17020 accreditation. Sections marked with the symbol † are not issued under accreditation.
Readers MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.
Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon

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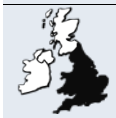
Regulations

In the opinion of the BBA, Hydrostop BR, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

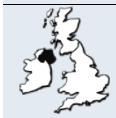
Requirement:	**C2(a)**	**Resistance to moisture**
Comment:		The product provides an effective barrier to water. See section 6 of the Certificate.
Regulation:	**7(1)**	**Materials and workmanship**
Comment:		The product is acceptable. See section 8.1 and the *Installation* part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)**	**Durability, workmanship and fitness of materials**
Comment:		The product is acceptable. See section 8.1 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	3.4	Moisture for the ground
Comment:		The product provides an effective barrier to water under hydrostatic pressure, with reference to clauses 3.4.1[(1)(2)], 3.4.5[(1)(2)] and 3.4.7[(1)(2)]. See section 6 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The product can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation:	**12**	**Building standards applicable to conversions**
Comment:		All comments in relation to the product under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1[(1)(2)] and Schedule 6[(1)(2)].

(1) Technical Handbook (Domestic).
(2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	**23(a)(i) (iv) (b)(i)**	**Fitness of materials and workmanship**
Comment:		The product is acceptable. See section 8.1 and the *Installation* part of this Certificate.
Regulation:	**28(a)**	**Resistance to moisture and weather**
Comment:		The product is an effective barrier to water to water under hydrostatic pressure. See section 6 of this Certificate.

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 3 *Delivery and site handling* (3.1 and 3.3) of this certificate.

Additional Information

NHBC Standards 2020

In the opinion of the BBA, Hydrostop BR, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 5.4 *Waterproofing of basements and other below ground structures* (requiring proprietary waterproofing materials to comply with Technical Requirement R3).

Unless it can be demonstrated that the water table is permanently below the underside of the slab, the system must be used within a Type B(1) waterproofing protection system in combination with either a Type A(1) or C(1) waterproofing protection where Grade 3(1) protection is required, and the below ground wall retains more than 600 mm (measured from the top of the retained ground to the lowest finished floor level).

(1) As defined in BS 8102 : 2009.

Technical Specification

1 Description

1.1 Hydrostop BR is a black, flexible, hydrophilic waterstop, based on synthetic rubber and sodium bentonite, with cross-sectional dimensions of 25 by 20 mm.

1.2 Ancillary items used in the installation of the product and included in this assessment are:

- Hydrostop mesh — galvanized steel mesh for supporting Hydrostop BR during placement of concrete. The product has a mesh size of 25 by 10 mm
- masonry fixing nails — 40 mm long with 10 mm diameter washers.

2 Manufacture

2.1 Hydrostop BR is manufactured by a batch-blending process. The resulting compound is extruded into strips.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The product is manufactured in Belgium and is marketed and distributed in the UK by Seymour Global Ltd t/a FIS Construction Products, Seymour House, Mayflower Close, Chandlers Ford Eastleigh SO53 4AR.

2.4 The management system of the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015.

3 Delivery and site handling

3.1 Hydrostop BR is supplied in 5 m rolls packaged in cardboard boxes, each containing six rolls and having a gross weight of approximately 24 kg. Boxes can be supplied on pallets containing a maximum of 30 boxes.

3.2 The product must be stored under cover, clear of the ground and protected from UV, moisture, frost and other sources of contamination at a temperature between 5 and 25°C.

3.3 Hydrostop mesh is supplied in 1 metre lengths packaged in cardboard boxes, each containing 30 strips and weighing 4 kg.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Hydrostop BR.

Design Considerations

4 Use

4.1 The product is satisfactory for use as a Type B (structurally integral) protection, (as defined in BS 8102 : 2009), to waterproof construction joints and penetrations in underground waterproof reinforced concrete structures.

4.2 The product is not suitable for use in movement joints, eg expansion joints.

4.3 The product swells on contact with water and must be fully confined within the concrete structure to form an effective seal.

4.4 The unconfined product will expand by over 300 % by volume in neutral pH water. The expansion under alkaline, acidic water conditions will be less but adequate to enable the product to form an effective seal when fully confined. Users are required to contact the Certificate holder for advice in individual cases.

4.6 The product will shrink on drying but will re-hydrate on wetting without detriment to its ability to swell.

4.7 The ability of the product to expand and form an effective seal can be affected by the groundwater chemistry, especially saline conditions. A detailed study of this aspect must be carried out to establish the presence of any contamination. The Certificate holder must be consulted for advice on specific applications, service conditions and groundwater chemistry.

4.8 The product will develop significant pressure when confined within a concrete structure and must be covered by at least 75 mm of concrete from each edge to minimise the risk of damaging the concrete.

4.9 Care must be taken to ensure that the product remains in position and is not dislodged when concrete is poured over it, nor damaged during subsequent actions, e.g. vibration.

5 Practicability of installation

5.1 The product is designed to be installed by a competent general builder, or a contractor, experienced with this type of product.

5.2 To avoid premature swelling, the product must be protected from contact with water until enclosed in the structure and must not be placed during rain or when rain is forecast.

6 Resistance to water pressure



6.1 When confined, the product forms an effective barrier to water under hydrostatic pressure from the ground in water-resistant reinforced concrete construction joints.

6.2 The product was tested at a maximum hydrostatic water pressure of 3.0 bar and remained watertight.

6.3 An appropriate safety factor must be applied to the maximum water pressure given in section 6.2, and the use of additional waterproof protection should be considered, depending on the specific risks associated with any particular structure. Advice should be sought from the Certificate holder for specific applications.

7 Maintenance

As the product is confined within the structure and has in-situ durability, maintenance is neither possible nor required.

8 Durability



8.1 Hydrostop BR will function as a waterstop and provide an effective barrier to water under hydrostatic pressure for the life of the structure in which it is incorporated.

8.2 The durability of the product may be affected if dislodged or damaged during or following installation, therefore care must be taken to ensure that the product remains in position and is not dislodged when concrete is poured over it, nor damaged during subsequent actions, eg vibration.

Installation

9 General

9.1 Hydrostop BR must be applied to sound substrates that are clean, dry and free from surface contamination.

9.2 Application to particularly rough surfaces must be avoided. Freshly-placed concrete can be smoothed with a wooden batten to form a shallow rebate along which the product can be placed.

9.3 Dust, dirt and other debris must be removed using a stiff brush and/or suitable mechanical means.

10 Procedure

Placing

10.1 Hydrostop BR is unrolled and placed onto the concrete surface to sit centrally between the inner and outer rows of reinforcing bars.

10.2 A minimum of 75 mm concrete coverage must be ensured around all edges.

10.3 Roll ends are butted together to ensure a complete watertight seal is created; ends should not overlap.

Fixing

10.4 Hydrostop mesh is placed over the product and fixed using masonry nails with 10 mm diameter washers at a maximum 300 mm centres.

10.5 When fixing the product around penetrations, it must be secured with steel ties and/or a contact adhesive. The Certificate holder should be consulted for suitable products.

Enclosure

10.6 Prior to enclosing Hydrostop BR, the placed product must be inspected for damage and premature swelling. Damaged and/or swollen product must be replaced at this stage.

10.7 Concrete is poured to enclose the product, compacting well around the waterstop but taking particular care not to dislodge or damage the strip during the process.

Technical Investigations

11 Tests

Tests were carried out on Hydrostop BR and the results assessed to determine:

- characteristics
- resistance to hydrostatic pressure
- unrestrained swelling characteristics under alkali, neutral, saline and acidic water conditions
- effect of wet/dry cycles on swelling characteristics
- load developed when restrained.

12 Investigations

12.1 An assessment was made of the practicability of the product.

12.2 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS 8102 : 2009 *Code of practice for procreation of below ground structures against water from the ground*

BS EN ISO 9001 : 2015 *Quality management systems - Requirements*

Conditions of Certificate

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- any works and constructions in which the product is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to UKCA, UKNI or CE marking.

6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product which is contained or referred to in this Certificate is the minimum required to be met when the product is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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HYDROSTOP WSM

HYDROPHILIC MASTIC SEALANT

DESCRIPTION

HYDROSTOP WSM is a gun-applied mastic sealant for application where a swellable mastic is required to provide an effective watertight seal in confined applications. The hydrophilic properties of HYDROSTOP WSM display good consistency in swell rate during repeated wet/dry cycles. When it is confined by concrete it will create a positive pressure against the face of the concrete joint which will prevent the passage of water.

USES

HYDROSTOP WSM is used as an adhesive for bonding HYDROSTOP BR to concrete substrate. It is also used as a hydrophilic sealant for providing an effective seal in difficult areas which preclude the use of the hydrophilic water stop. It is used for sealing around pre-cast segments, metal beams, service penetrations and as an effective mastic for the bonding of HYDROSTOP BR to HYDROBAR PVC WATERSTOPS.

ADVANTAGES

- Provides an effective seal to a variety of substrates.
- Swells in excess of 200 % to produce a water tight seal.
- Durable performance for the life time of the structure.
- Fast curing enabling concrete to be placed within 24 hr.
- Good adhesion to a variety of substrates.
- Design life at least equal to that of the structure where it is incorporated.

Property	Value
Colour	Grey
Hardness Shore A	30
Cure Rate	3mm / 24 hr
Swell Ratio	200%

PROCEDURE

Surface Preparation: The surface to which the HYDROSTOP WSM is to be applied should be free from all loose material. The substrate should be relatively smooth. HYDROSTOP WSM may be applied to damp concrete however no surface water should be present.

Application: HYDROSTOP WSM is applied in a foil sachet which may be fitted into a bulk sealant gun. The foil sachet should be cut before applying as a traditional sealant. Where the HYDROSTOP WSM is to be used as an adhesive for the HYDRSTOP BR a minimum 10mm bead should be applied to embed the water bar into. Where the HYDROSTOP WSM is to be used to provide an effective seal in its own right, then a 15mm diameter bead should be extruded onto the substrate, ensuring there is no break in the bead.

LIMITATIONS

HYDROSTOP WSM should not be used for expansion joints or joints where significant repetitive movement is expected. HYDROSTOP WSM should only be used where there is more than 75mm concrete cover. HYDROSTOP WSM should not be used as a sealant in general building applications.

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PACKAGING & COVERAGE

Pack Size: 600ml

Coverage: A 600ml sachet will extrude a 2.7m bead at 15mm diameter.

STORAGE & SHELF LIFE

HYDROSTOP WSM should be stored in clean dry conditions at temperatures between 8°C and 25°C.

HEALTH & SAFETY

See separate material safety datasheet.

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HYDROSTOP WS10

HYDROPHILIC RUBBER WATERSTOP

DESCRIPTION

HYDROSTOP WS10 is swellable hydrophilic waterstop which will swell upon contact with water. When installed into a confined joint the expansion of the waterstop exerts a positive pressure against both faces of the concrete to achieve a watertight seal which is resistant to hydraulic pressure. HYDROSTOP WS10 will swell up to 200% which makes it particularly suitable for sealing smaller sections of concrete. The installed waterstop has a delayed initial swell which prevents premature swell.

USES

HYDROSTOP WS10 is designed for use in both horizontal and vertical construction joints in cast in-situ concrete. It may also be used for the sealing of joints between pre-cast elements however care should be taken to ensure that the waterstop is in proper contact with the concrete elements. HYDROSTOP WS10 is used for sealing construction joints where resistance to hydrostatic water pressure is required to achieve a watertight structure. Such applications include, basement construction, culverts, tunnels, retaining walls, lift pits and other water resisting structures.

ADVANTAGES

- Easy application to complex shapes, due to small dimension.
- Good swell capacity upon contact with water.
- Delayed swell composition.
- Suitable for use in conjunction with HYDROBAR PVC waterstops.
- Design life at least equal to that of the structure where it is incorporated.

Property	Value
Application Temperature	6°C to 30°C
Working life	50 mins @ 20°C
Application Thickness	10 to 80mm
Compressive Strength	21MPa @ 1 day 40MPa @ 7 days 48MPa @ 28 days
Water Permeability Coefficient	5.98×10^{-15} m/sec
Oxygen Diffusion Coefficient	2.65×10^{-4} cm^2 /sec

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HYDROSTOP WS10

HYDROPHILIC RUBBER WATERSTOP



PROCEDURE

Surface Preparation: The substrate to which the HYDROSTOP WS10 is to be applied, should be clean, dry and free from deleterious materials. The surface should be smooth and free from excessive surface undulation. Installation during heavy rain is not recommended as this may cause premature activation of the waterstop. The surface of the joint should be scabbled prior to the application of the waterstop.

Application: HYDROSTOP WS10 should be applied to the substrate using HYDROSTOP WSM as an adhesive. Apply a 10mm bead to the concrete and press the waterstop firmly into the HYDROSTOP WSM ensuring complete contact with the adhesive. HYDROSTOP WS10 should be nailed at 300mm centres using HYDROSTOP RETAINING PINS. Adjacent strips of HYDROSTOP WS10 should be parallel lapped by 100mm to ensure a complete seal is achieved. Internal and external corners should be formed by cutting the HYDROSTOP WS10 and butt jointing. Do not bend the HYDROSTOP WS10 around corners, as this will affect the integrity of the seal achieved. Allow the HYDROSTOP WSM adhesive to cure overnight before subsequent concrete pour.

It is important to ensure that the HYDROSTOP WS10 is positioned so that there is at least 50mm concrete cover. The installed HYDROSTOP WS10 should be protected from rain damage until the concrete is placed. It is extremely important that when the concrete is placed it is well compacted around the waterstop, as any voids will allow the water to track around the installed waterstop.

LIMITATIONS

HYDROSTOP WS10 should not be installed in movement or expansion joints.

PACKAGING & COVERAGE

Pack Size:
HYDROSTOP WS10 is supplied in a 3mm x 20mm x 12m roll.

STORAGE & SHELF LIFE

It is important to ensure that HYDROSTOP WS10 is protected from wet conditions when stored in unopened containers. It will have a shelf life in excess of 1 year.

HEALTH & SAFETY

See separate material safety datasheet.

PREMCRETE

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Structural Waterproofing | Gas Protection | Concrete Repair Technical Grouts | Joint Sealants | Protective Coatings | Admixtures

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HYDROPRUFE 8000

GAS RESISTANT SELF-ADHESIVE MEMBRANE

DESCRIPTION

HYDROPRUFE 8000 is a high performance, cold applied waterproof and gas resistant self-adhesive membrane manufactured from an aluminium/polyethylene laminate coated on one surface with a layer of polymer modified Bitumen adhesive. It is suitable for application to masonry concrete and other substrates to provide an effective barrier to both water and ground gases.

USES

HYDROPRUFE 8000 is used as a self-adhesive membrane for application to substructures where resistance to both groundwater and ground gases is required. HYDROPRUFE 8000 provides adequate resistance to methane, carbon dioxide and radon gas. It is designed for application to basements, underground carparks, tunnels, lift pits and other substructures, where full protection is required.

ADVANTAGES

- Rapid and easy cold application to substrates.
- Aluminium laminate provides superior resistance to ground gas.
- Conforms to BS 8485:2015-A1:2019
- Effective resistance to a 6 M head of water when fully supported.
- Excellent adhesion to a wide variety of substrates.

PROCEDURE

Surface Preparation: The substrate to which the membrane is to be applied, should be smooth and free from excessive undulation and sharp projections, which may puncture the membrane. Concrete substrate should be dry and free from dust and other deleterious materials. A mortar corner fillet should be formed at any internal corner junctions to allow ease of application of the membrane. Allow the mortar fillet to harden before application of the membrane.

Priming: Apply HYDROPRUFE PRIMER by roller, brush or spray application at a nominal rate of 6-8m^2 per ltr and allow to completely dry before the application of the membrane commences.

Application: The release paper should be removed from the first 500mm of the HYDROPRUFE 8000 membrane before being pressed firmly into position to ensure no air pockets are formed. Application of the roll is then completed by continuing to remove the release paper and applying pressure to ensure the membrane is well bonded to the substrate. Adjacent sheets of membrane should lap by a minimum of 50mm, this lap is an addition to any over-lap onto the selvedge. Prior to lapping onto an adjacent sheet, the release strip protecting the selvedge should be removed. Joints should be firmly rolled to ensure a watertight seal between the 2 sheets. The membrane should be immediately protected using PREMCRETE PROTECTION BOARD 600 to prevent damage during backfill or by following trades.

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PREMCRETE

HARMONISED TECHNICAL SPECIFICATION

EN 13967:2013 PRODUCT TYPE T

PROPERTIES

Property	Test Method	Value
Water tightness to liquid water	EN 1928	Pass
Resistance to Static Load	EN 12730	20kg Pass
Tensile Properties, Maximum Tensile Stress CD	EN 12311-2	≥ 2N/mm^2
Tensile Properties, Maximum Tensile Stress MD	EN 12311-2	≥ 2N/mm^2
Tensile Properties, Elongation at Break CD	EN 12311-2	≥ 120%
Tensile Properties, Elongation at Break MD	EN 12311-2	≥ 120%
Durability of Watertightness against ageing	EN 13967:2012+A1:2017	Pass
Durability of Watertightness against Chemicals	EN 13967:2012+A1:2017	Pass
Resistance to Impact	EN 12691	≥ 500m
Resistance to tear (Nail Shank) CD	EN 12301 -1	≥ 100N
Resistance to tear (Nail Shank) MD	EN 12310 -1	≥ 100N
Reaction to Fire	EN 13501	Class F (Euro Class)
Joint Strength	EN 12317-2	≥ 30N
Water Vapour Transmission (Density Flow rate)	EN 1931	0.013 g/(day●m²)
Water Vapour Transmission (Resistance factor, µ)	EN 1931	2380000g µ
Thickness	EN 1849-2	1.00mm
Mass	EN 1849-2	1100 g/M^2
Methane GTR	ISO 15105-1	<10 ml/m^2.day
Carbon dioxide GTR	ISO 15105-1	<10 ml/m^2.day
Radon Diffusion		5.0 X 10-14m^2 /s
Roll Weight		33kg

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PACKAGING & COVERAGE

Pack Size: HYDROPRUFE 8000: 1.05m x 28.6m roll.

HYDROPRUFE PRIMER: 5ltr and 25ltr cans.

ANCILLARY PRODUCTS

PROTECTION BOARD 600

HYDROPRUFE PRIMER

HYDROPRUFE TOPHAT

HYDROPRUFE PRE-FORMED CORNER PIECE

HYDROPRUFE DETAIL STRIP

STORAGE & SHELF LIFE

The membrane must be stacked vertically and in dry well-ventilated buildings, away from direct sunlight.

HEALTH & SAFETY

See separate material safety datasheet.

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Revision date: 20/12/22

HYDROPRUFE PRIMER

BITUMINOUS PRIMER

DESCRIPTION

HYDROPRUFE PRIMER is a moisture tolerant primer for application to porous substrates where a high level of adhesion is required. The primer contains a moisture displacing component enabling application to be made where necessarily to damp or green concrete.

USES

HYDROPRUFE PRIMER is suitable for priming concrete and masonry substrates prior to the application of PREMCRETE self-adhesive waterproof membranes it is also suitable for application to porous substrates to increase adhesion of HYDROPRUFE BUTYL TAPES.

ADVANTAGES

- Strengthens bond between substrate and membrane adhesive.
- Binds friable concrete to provide stable surface for membrane application.
- Moisture tolerant

PROCEDURE

Surface Preparation: Substrate should be swept clean and be free from dust and other deleterious materials. The substrate should be free from presence of surface water and should feel dry to touch. The substrate should be relatively smooth to enable maximum adhesion of the subsequently applied membrane. Wherever possible new concrete should ideally be allowed to cure for up to 28 days.

Application: HYDROPRUFE PRIMER should be applied by roller, brush or spray application. It should be applied until the substrate is thoroughly wetted out. Exceptionally porous substrate may require two coats of primer.

Equipment Cleaning: Tools and equipment should be cleaned immediately using PREMCRETE CLEANING SOLVENT.

PACKAGING & COVERAGE

Pack Size: 5ltr and 25ltr packs.

Coverage: A 25ltr pack will cover approximately 150 m^2 depending on substrate porosity and profile.

STORAGE & SHELF LIFE

HYDROPRUFE PRIMER should be stored in sealed containers in a well ventilated building away from direct sunlight. HYDROPRUFE PRIMER gives off a flammable vapour and should be stored in accordance with local hazard requirements.

HEALTH & SAFETY

See separate material safety datasheet.

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Revision date: 23/1/23

PROTECTION BOARD 600

HEAVY DUTY PROTECTION BOARD

DESCRIPTION

PROTECTION BOARD 600 is a tough bituminous polyester reinforced protection board. It is designed for use in conjunction with PREMCRETE waterproof and gas resistant membranes to protect against puncture. It is a particularly robust board which will not puncture even in extreme conditions.

USES

PROTECTION BOARD 600 should be installed against the waterproof or gasproof membrane before back filling takes place. The boards should be adhered to the installed membrane using PREMCRETE DOUBLE SIDED TAPE. It can be easily cut and shaped to provide impact resistance to any surface.

ADVANTAGES

- Weather and rot proof.
- Tough yet flexible sheet.
- Excellent puncture resistance.
- Good resistance to chemicals.

PROCEDURE

Application: Where PROTECTION BOARD 600 is to be used for the protection of vertically applied membranes then PREMCRETE DOUBLE SIDED TAPE should be used to adhere the PROTECTION BOARD 600 to the installed waterproof membrane. Lap joints should be tapped with PREMCRETE HCR GIRTH TAPE to prevent displacement during backfill. For installation to horizontally applied membranes then the boards should be laid on to the membrane and the joints should be taped with PREMCRETE HYDROPRUFE HCR GIRTH TAPE to prevent displacement during concrete pour.

PACKAGING & COVERAGE

Pack Size: PROTECTION BOARD 600 is supplied in a 2m x 1M sheet.
Coverage: 1 sheet of PROTECTION BOARD 600 will cover $2m^2$

STORAGE & SHELF LIFE

PROTECTION BOARD 600 should be stored away from direct sunlight, in clean conditions, when stored in correct conditions the product will have a shelf life in excess of 12 months.

HEALTH & SAFETY

See separate material safety datasheet.

Property	Value
Length	2 M
Width	1 M
Thickness	3mm
Water Permeability	Impermeable

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TEKNOCEM HBR

HIGH-BUILD STRUCTURAL MORTAR

Property	Value
Compressive Strength	19MPa @ 1 Day 34MPa @ 7 Days 44MPa @ 28 Days
Flexural Strength	4MPa @ 7 Days 8MPa @ 28 Days
Density	1710Kg/ m^3
Working Life	Approximately 20mins @ 20°C
BS EN 1504-3 Compliant	R3
Maximum Thickness	200mm
Minimum Thickness	10mm

DESCRIPTION

TEKNOCEM HBR is a polymer-modified fibre-reinforced cementitious repair mortar. The mortar incorporates shrinkage compensating additives making it suitable for structural repair applications. The mortar can be applied to vertical and overhead substrates and is easily finished using a steel trowel to obtain a fair faced appearance. The mortar consists of a unique blend of lightweight fillers which enable effective high-build repairs to be carried out on vertical and overhead applications without the freshly placed mortar slumping. TEKNOCEM HBR is chloride free making it suitable for application where steel reinforcement is present. The hardened mortar possesses low absorption properties offering good resistance to the effects of freeze-thaw action. Conforms to the requirements of BS EN 1504-3 Class R3.

USES

TEKNOCEM HBR is used for the repair and reinstatement of structural concrete where a high-build mortar is required for application to vertical and overhead substrates. Its high strength properties make it suitable for the repair of structural elements and where high early strengths are required.

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PROCEDURE

Surface Preparation: The perimeter of the repair should be saw cut to a depth of 10mm and all loose and damaged concrete should be carefully removed back to sound substrate. Any steel reinforcement within the repair area should be fully exposed around the full circumference of the bar. Exposed steel should be cleaned back to clean bright steel by means of grinding or grit blasting. Any surface contaminants should be removed by suitable means to ensure a good quality clean substrate that has a strength in excess of 20 MPa.

Substrate Priming: Typically, substrates do not require the use of a separate substrate primer, the substrate should just be fully saturated with water, taking special care to ensure no standing water is present before application of the mortar. Particularly porous substrates may require the use of TEKNOPRIME 842.
Exposed steel reinforcement should be primed using TEKNOPRIME 841.

Mixing: TEKNOCEM HBR should be mixed using a forced action paddle mixer or pan mixer. Clean water should be poured into the mixing vessel at a rate of 3.75 litres depending on the desired consistency. The mortar should be mixed until a uniform homogenous mix is achieved. Once mixing is complete the mortar application should begin immediately to ensure maximum workability of the mortar.

Application: TEKNOCEM HBR can be trowel applied as a render, once a good contact coat has been applied to the substrate. Obtaining a good contact coat to the sub-base is essential to ensure the cohesion of the mortar once placed, particularly in vertical and overhead situations. If repairs are to be carried out around rebar, then it is important to hand place the mortar to ensure good compaction around the rebar without any voids. The mortar can be placed in thicknesses between 10mm and 200mm. Support may be required depending on the exact profile that is to be achieved. In thicker sections the mortar may be placed in layers, ensuring that each layer is firm and stable, and a keyed surface has been provided before adding the next layer.

Curing: Once placed the TEKNOCEM HBR should be cured in accordance with standard concreting practices. The surface should be cured using CUREAID AC to prevent shrinkage cracking occurring. The freshly applied mortar should be protected from strong, direct sunlight using suitable sheeting.

PACKAGING & COVERAGE

Pack Size: 25kg

Yield: 14.5ltrs per 25kg pack.

Coverage: A 25kg bag will cover 1.4m^2 @ 10mm thickness.

STORAGE & SHELF LIFE

TEKNOCEM HBR should be kept in clean dry conditions at temperatures between 8°C and 30°C. When stored in unopened bags, the product will have a shelf life of 12 months.

HEALTH & SAFETY

See separate material safety datasheet.

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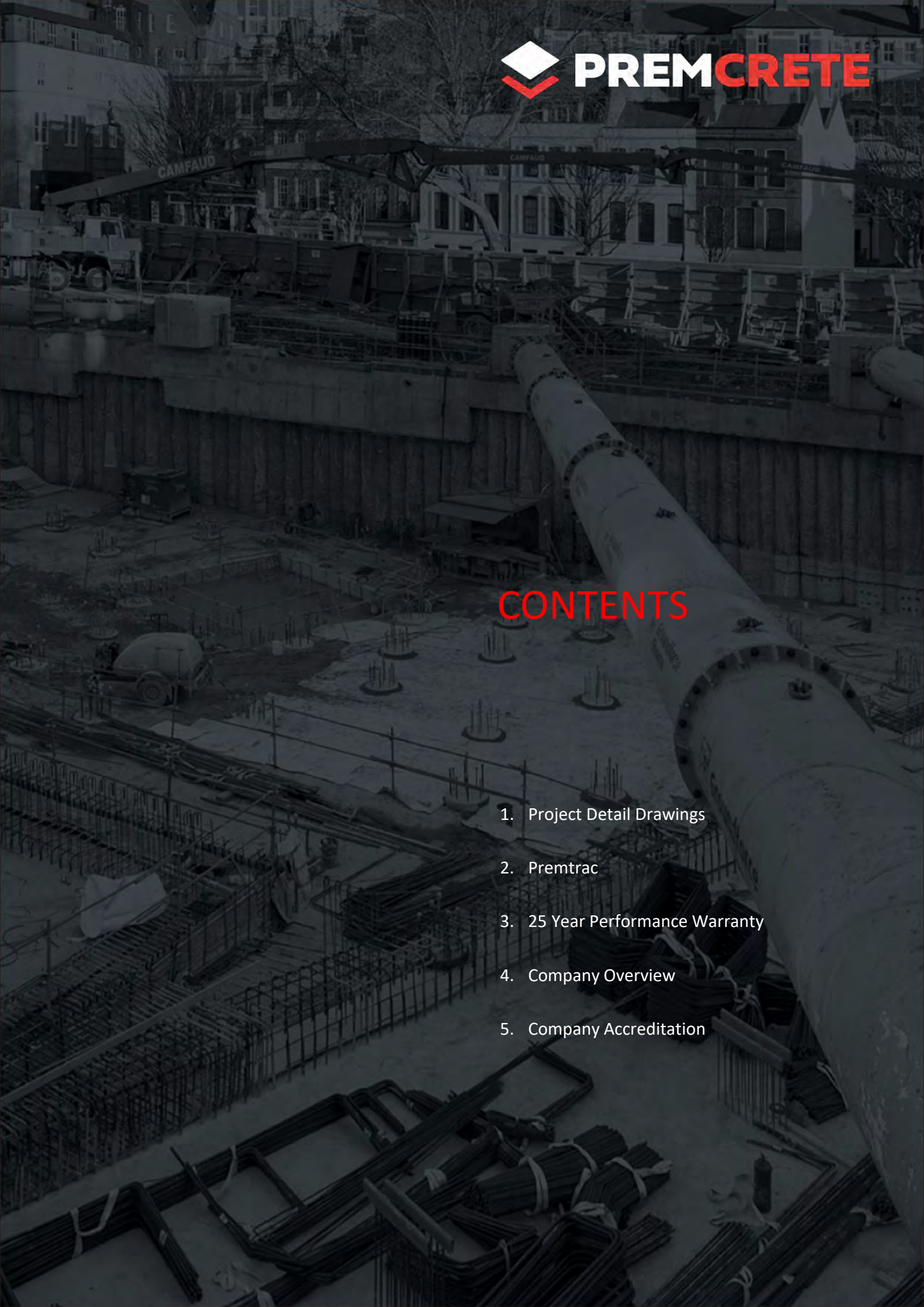
SUB-STRUCTURE DESIGN STRATEGY PROPOSAL



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2. Premtrac
3. 25 Year Performance Warranty
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PROJECT DETAIL DRAWINGS

PREMCRETE

PREMCRETE

Drawing Register

DATE OF ISSUE	
DAY	13
MONTH	02
YEAR	24

Title & Ident	Drawing No.	
GA PLAN SHOWING WATERPROOFING SCOPE	OP003465-GA-001	C01
WATERPROOFING TO BUILDING SECTIONS SHEET 1	OP003465-PD-001	C01
TYPICAL SECTION THROUGH LIFTPIT WITH DEEP BASE	OP003465-TD-001	C01
TYPICAL SECTION THROUGH LIFTPIT/CORE DETAIL WITH VOIDFORMER	OP003465-TD-002	C01
TYPICAL WATERPROOFING DETAILS SHEET - HYDROCRETE	OP003465-TD-003	C01
TYPICAL WATERPROOFING DETAILS SHEET - COMBI-SEAL	OP003465-TD-004	C01
TYPICAL SECTION THROUGH PILECAP	OP003465-TD-005	C01
TYPICAL MANHOLE DETAILS	OP003465-TD-006	C01

DISTRIBUTION

Client	X

Comments:

CONSTRUCTION

Project:

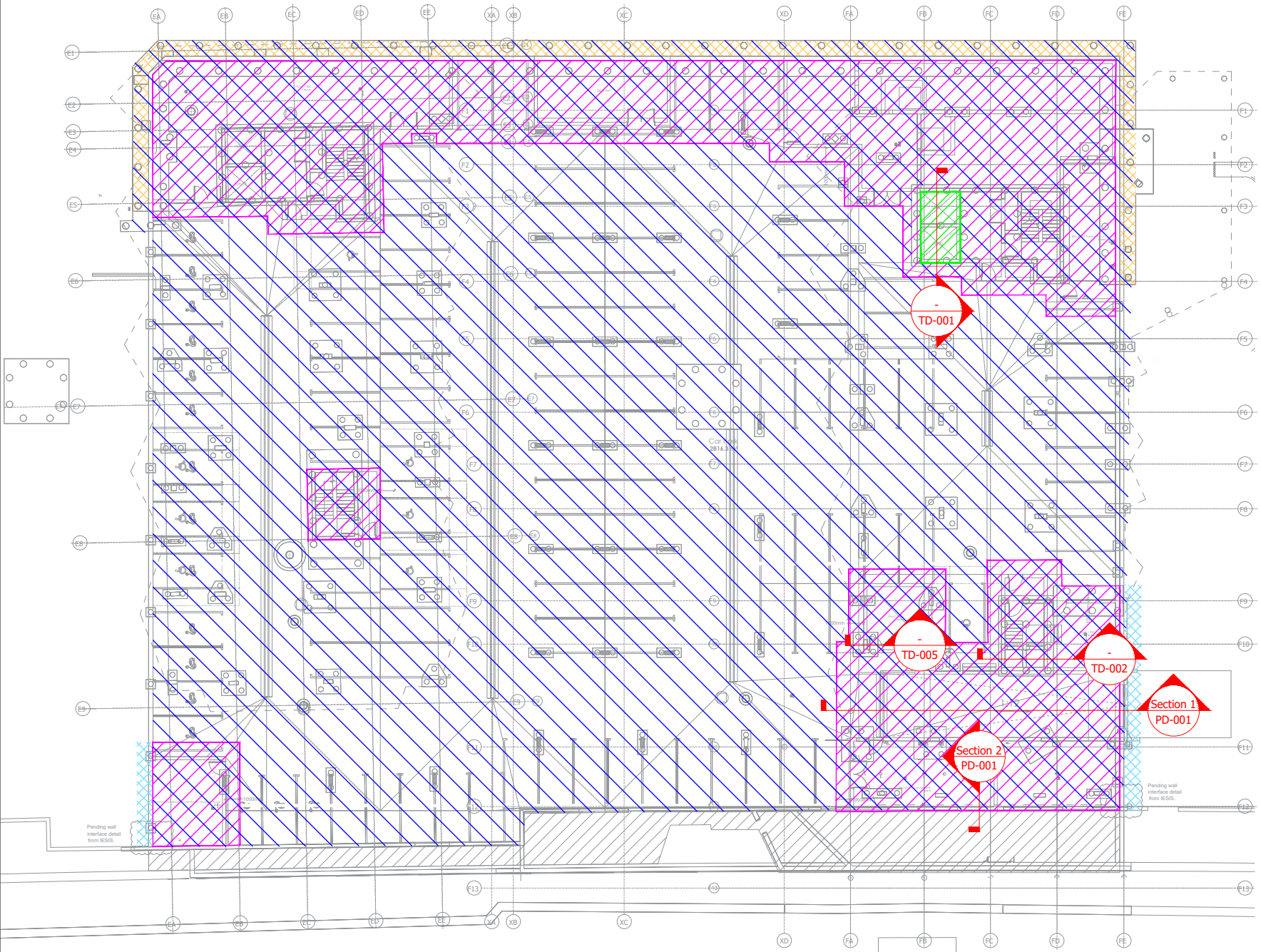
FREE WHARF PHASE 2

HG CONSTRUCTION

Design Register No. **OP003465**

Important design notes:

- Grade 3 Environments also require ventilation appropriate to intended use of environment (BS 8102:2022 Table 2).
- Grade 3 waterproofing to extend 1m into Grade 1b areas



KEY

Keys below show products specified on the drawing

- Hydrocrete Concrete
- Pudlo CWP modified concrete, Hydroseal FX, Hydroprufe LG
- Combi-Seal & Hydrocrete
- Pudlo CWP, Pudlo GP Ultra Seal, Pudlo Geoflow, Hydroseal FX,
- Hydroprufe 8000, Hydrocrete, Hydroflow HM8

Conditions

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This drawing must be read in conjunction with the relevant datasheets, BS 8102:2022 and BS 8485:2015+A1:2019 if appropriate.
This drawing has been prepared as a guide to assist with the installation of the products.
This drawing requires the approval of the designer of the structure.
It is the responsibility of the designer to ensure that any design decisions, made by others that have an impact on the waterproofing design are brought to the attention of the waterproof designer.
It is the responsibility of the designer of the structure to ensure that the details shown on this drawing match the construction drawings.
Drawing template is A3L.

Important Notes

The waterproofing design is designed to the Grades of Environment described below:
Grade 1A - Seepage and dampness from internal and external sources tolerable
Grade 1B - No seepage, however damp areas from internal and external sources tolerable
Grade 2 - No seepage through structure is acceptable however condensation and dampness are tolerable as a result of internal air moisture
Grade 3 - Ventilation, dehumidification or air conditioning are required appropriate to intended use in accord with BS 8102:2022 Table 2 to achieve a dry, habitable environment which is outside the scope of this design

Construction joints are required to be scabbled or retarded to ensure good concrete connection. An approved curing agent is to be applied to concrete immediately after pouring.
Laps between dissimilar waterproofing products to be 100mm unless otherwise annotated.
All substructure construction joints must have waterbar installed with a minimum of 75mm concrete cover. (Internal, non-retaining construction joints do not require waterbars).
Maximum pour size to be confirmed by Structural Engineers to maintain 0.3mm designed crack width. Liner wall pours should be cast 'hit and miss to ensure that shrinkage of concrete is compensated.
It is the responsibility of the installing contractor to ensure that good concrete practice is maintained at all times when pouring concrete.
If the design incorporates any of the following products:

- Hydrocrete should be a minimum of 200mm thick or 300mm if poured monolithically in conjunction with standard concrete.
- Hydroprufe Primer to be applied to concrete/ masonry substrate prior to the application of Hydroflow Corner Tape or Hydroprufe Detail Tape.
- Hydroseal Sealer to be applied to all surfaces prior to installing Hydroflow HP.
- High density insulation under Hydroflow HP20 should be fixed to substrate at a minimum of 5 fixings per sheet.

Rev	Date	Description	Dwn	Chk
C01	12/02/24	Construction Issue	JM	CT

Scale

Not to Scale

CONSTRUCTION ISSUE

This drawing is designed to achieve the following environment in accordance with BS 8102:2022

GRADE 1b & 3

Client

HG CONSTRUCTION

Project

FREE WHARF PHASE 2

Premcrete Drawing No

OP003465-GA-001

Title

GA PLAN SHOWING WATERPROOFING SCOPE

Date

12/02/2024

PREMCRETE

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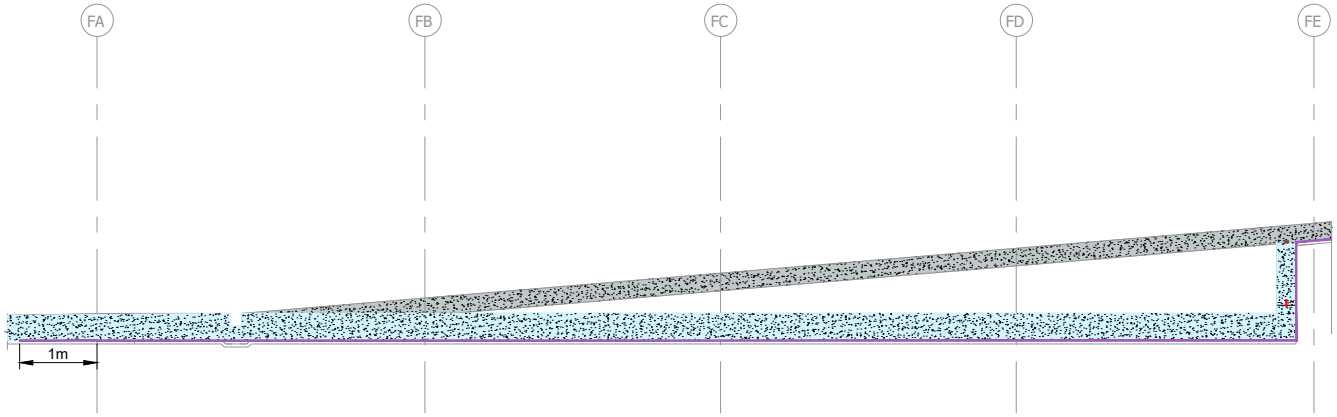
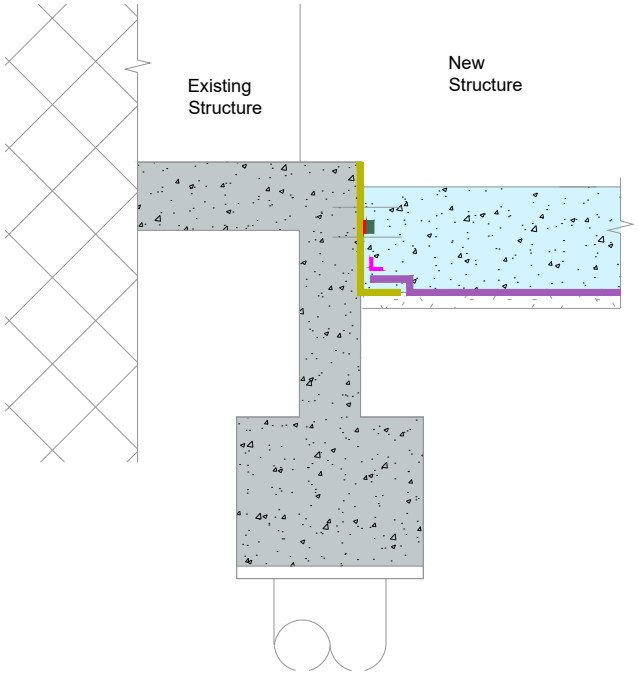
Important design notes:

- Grade 3 Environments also require ventilation appropriate to intended use of environment (BS 8102:2022 Table 2).



Section 1



Section 2

KEY

Keys below show products specified on the drawing

Hydrocrete Concrete	
Hydrostop BR on Hydrostop WSM	
Cemflex VB	
Combi-Seal	
Pudlo Liquid GB	
Twinseal GR 3mm Application	
Hydrostop BR on Hydrostop WSM	
Standard Concrete to Structural Liner Wall / Slab	

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It is the responsibility of the designer to ensure that any design decisions, made by others that have an impact on the waterproofing design are brought to the attention of the waterproof designer.
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Drawing template is A3L.

Important Notes

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Grade 2 - No seepage through structure is acceptable however condensation and dampness are tolerable as a result of internal air moisture
Grade 3 - Ventilation, dehumidification or air conditioning are required appropriate to intended use in accord with BS 8102:2022 Table 2 to achieve a dry, habitable environment which is outside the scope of this design

Construction joints are required to be scabbled or retarded to ensure good concrete connection. An approved curing agent is to be applied to concrete immediately after pouring.
Laps between dissimilar waterproofing products to be 100mm unless otherwise annotated.
All substructure construction joints must have waterbar installed with a minimum of 75mm concrete cover. (Internal, non-retaining construction joints do not require waterbars).
Maximum pour size to be confirmed by Structural Engineers to maintain 0.3mm designed crack width. Liner wall pours should be cast 'hit and miss to ensure that shrinkage of concrete is compensated.
It is the responsibility of the installing contractor to ensure that good concrete practice is maintained at all times when pouring concrete.
If the design incorporates any of the following products:

- Hydrocrete should be a minimum of 200mm thick or 300mm if poured monolithically in conjunction with standard concrete.
- Hydroprufe Primer to be applied to concrete/ masonry substrate prior to the application of Hydroflow Corner Tape or Hydroprufe Detail Tape.
- Hydroseal Sealer to be applied to all surfaces prior to installing Hydroflow HP.
- High density insulation under Hydroflow HP20 should be fixed to substrate at a minimum of 5 fixings per sheet.

Rev	Date	Description	Dwn	Chk
C01	12/02/24	Construction Issue	JM	CT

Scale

Not to Scale

CONSTRUCTION ISSUE

This drawing is designed to achieve the following environment in accordance with BS 8102:2022

GRADE 3

Client

HG CONSTRUCTION

Project

FREE WHARF PHASE 2

Premcrete Drawing No

OP003465-GA-001

Title

WATERPROOFING TO BUILDING SECTIONS SHEET 1

Date

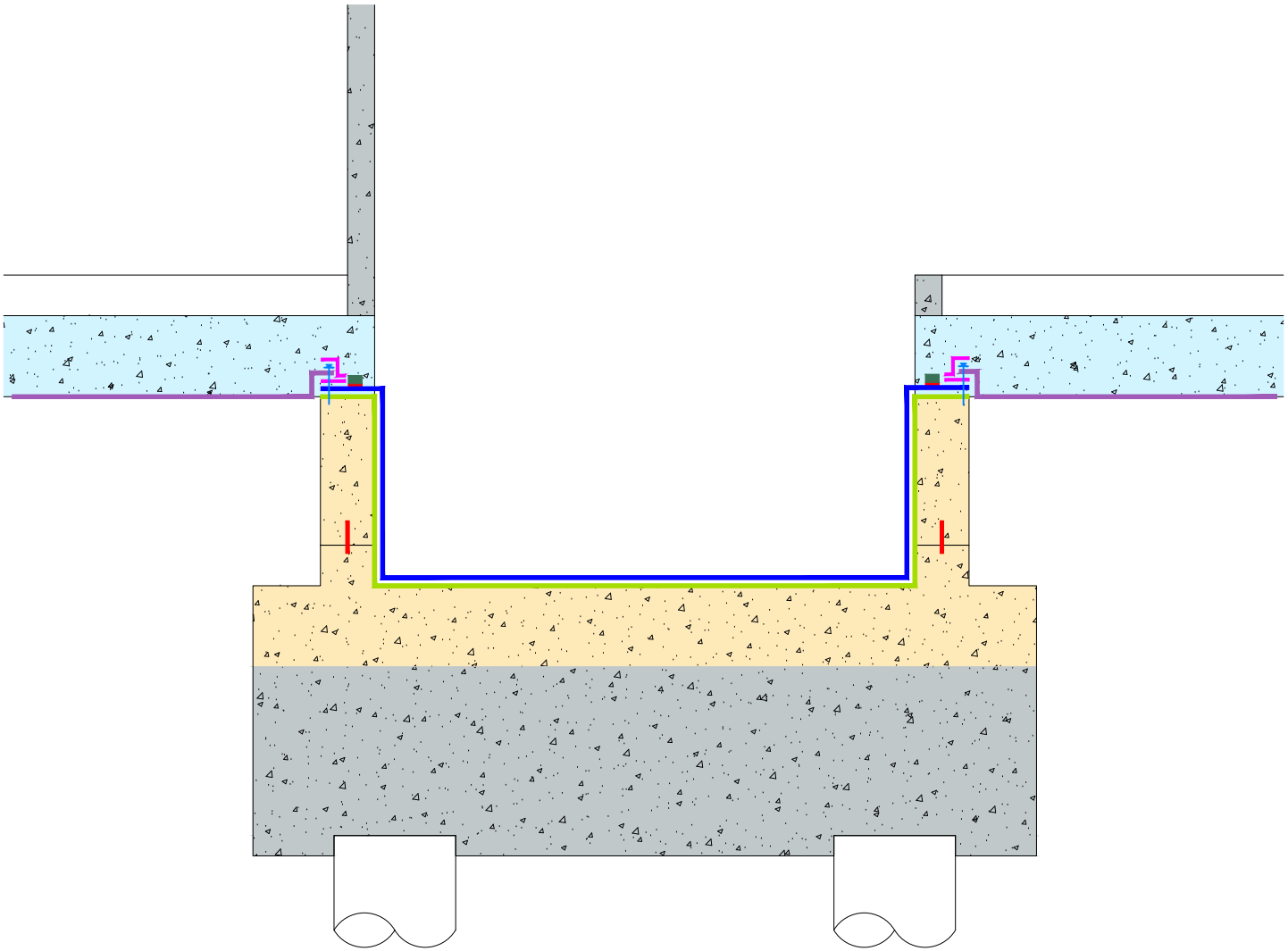
12/02/2024

PREMCRETE

44 Macadam Way | West Portway Industrial Park
Andover | Hampshire | SP10 3XW
Tel: 02380 276166 | sales@premcrete.com
www.premcrete.com

Important design notes:

- No seepage through structure acceptable for Grade 2 Environment, however condensation and dampness are tolerable as a result of internal air moisture.



KEY

Click on product names to access technical information

- Combi-Seal
- Hydroprufe LG
  0.7-1.2mm quartz aggregate to be broadcast into coating where concrete connection is required (0.5kg per 1m²)
- Hydroseal FX
- Shot Fired Fixing
- Twinseal GR 3mm Application
- Hydrocrete Concrete
- Pudlo CWP Modified Concrete
- Standard Concrete to Structural Liner Wall / Slab
- Hydrostop BR on Hydrostop WSM
- Cemflex VB

Conditions

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This drawing must be read in conjunction with the relevant datasheets, BS 8102:2022 and BS 8485:2015+A1:2019 if appropriate.
This drawing has been prepared as a guide to assist with the installation of the products.
This drawing requires the approval of the designer of the structure.
It is the responsibility of the designer to ensure that any design decisions, made by others that have an impact on the waterproofing design are brought to the attention of the waterproof designer.
It is the responsibility of the designer of the structure to ensure that the details shown on this drawing match the construction drawings.
Drawing template is A4L.

Important Notes

The waterproofing design is designed to the Grades of Environment described below:
Grade 1A - Seepage and dampness from internal and external sources tolerable
Grade 1B - No seepage, however damp areas from internal and external sources tolerable
Grade 2 - No seepage through structure is acceptable however condensation and dampness are tolerable as a result of internal air moisture
Grade 3 - Ventilation, dehumidification or air conditioning are required appropriate to intended use in accord with BS 8102:2022 Table 2 to achieve a dry, habitable environment which is outside the scope of this design

Construction joints are required to be scabbled or retarded to ensure good concrete connection.
An approved curing agent is to be applied to concrete immediately after pouring.
Laps between dissimilar waterproofing products to be 100mm unless otherwise annotated.
All substructure construction joints must have waterbar installed with a minimum of 75mm concrete cover. (Internal, non-retaining construction joints do not require waterbars).
A maximum ratio of 3:1 is required for any liner wall pours. Liner wall pours should be cast 'hit and miss to ensure that shrinkage of concrete is compensated.
It is the responsibility of the installing contractor to ensure that good concrete practice is maintained at all times when pouring concrete.
If the design incorporates any of the following products:

- Hydrocrete should be a minimum of 200mm thick or 300mm if poured monolithically in conjunction with standard concrete.
- Hydroprufe Primer to be applied to concrete/ masonry substrate prior to the application of Hydroflow Corner Tape or Hydroprufe Detail Tape.
- Hydroseal Sealer to be applied to all surfaces prior to installing Hydroflow HP.
- High density insulation under Hydroflow HP20 should be fixed to substrate at a minimum of 5 fixings per sheet.

Rev	Date	Description	Dwn	Chk
C01	12/02/24	Construction Issue	JM	CT

CONSTRUCTION ISSUE

This drawing is designed to achieve the following environment in accordance with BS 8102:2022

GRADE 2

Client
HG CONSTRUCTION

Project
FREE WHARF PHASE 2

Title
TYPICAL SECTION THROUGH LIFTPIT WITH DEEP BASE

Premcrete Drawing No
OP003465-TD-001

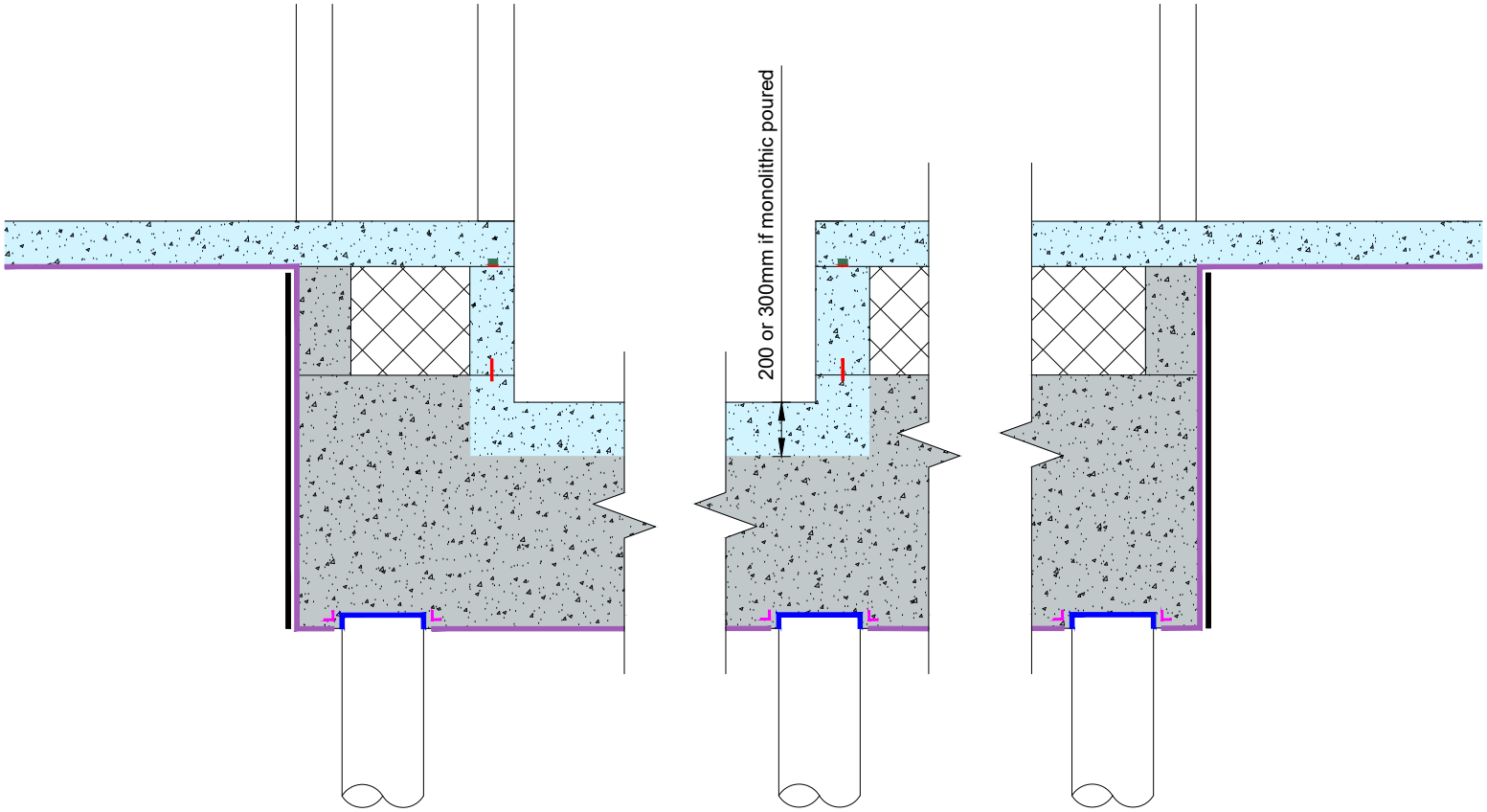
Date
12/02/2024

Scale
Not to Scale

PREMCRETE
44 Macadam Way | West Portway Industrial Park
Andover | Hampshire | SP10 3XW
Tel: 02380 276166 | sales@premcrete.com
www.premcrete.com

Important design notes:

•



KEY

Click on product names to access technical information

- Standard Concrete
- Hydrocrete Concrete
- Hydrostop BR on Hydrostop WSM
- Cemflex VB
- Combi-Seal
- Hydroprufe LG 0.7-1.2mm quartz aggregate to be broadcast into coating where concrete connection is required (0.5kg per 1m²)
- Protection Board 600
- Twinseal GR 3mm Application

Conditions

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Drawing template is A4L.

Important Notes

The waterproofing design is designed to the Grades of Environment described below:
Grade 1A - Seepage and dampness from internal and external sources tolerable
Grade 1B - No seepage, however damp areas from internal and external sources tolerable
Grade 2 - No seepage through structure is acceptable however condensation and dampness are tolerable as a result of internal air moisture
Grade 3 - Ventilation, dehumidification or air conditioning are required appropriate to intended use in accord with BS 8102:2022 Table 2 to achieve a dry, habitable environment which is outside the scope of this design

Construction joints are required to be scabbled or retarded to ensure good concrete connection.
An approved curing agent is to be applied to concrete immediately after pouring.
Laps between dissimilar waterproofing products to be 100mm unless otherwise annotated.
All substructure construction joints must have waterbar installed with a minimum of 75mm concrete cover. (Internal, non-retaining construction joints do not require waterbars).
A maximum ratio of 3:1 is required for any liner wall pours. Liner wall pours should be cast 'hit and miss to ensure that shrinkage of concrete is compensated.
It is the responsibility of the installing contractor to ensure that good concrete practice is maintained at all times when pouring concrete.
If the design incorporates any of the following products:

- Hydrocrete should be a minimum of 200mm thick or 300mm if poured monolithically in conjunction with standard concrete.
- Hydroprufe Primer to be applied to concrete/ masonry substrate prior to the application of Hydroflow Corner Tape or Hydroprufe Detail Tape.
- Hydroseal Sealer to be applied to all surfaces prior to installing Hydroflow HP.
- High density insulation under Hydroflow HP20 should be fixed to substrate at a minimum of 5 fixings per sheet.

Rev	Date	Description	Dwn	Chk
C01	12/02/24	Construction Issue	JM	CT

CONSTRUCTION ISSUE

This drawing is designed to achieve the following environment in accordance with BS 8102:2022

GRADE 2

Client
HG CONSTRUCTION

Project
FREE WHARF PHASE 2

Title
TYPICAL SECTION THROUGH LIFTPIT/CORE DETAIL WITH VOID FORMER

Premcrete Drawing No
OP003465-TD-002

Date
12/02/2024

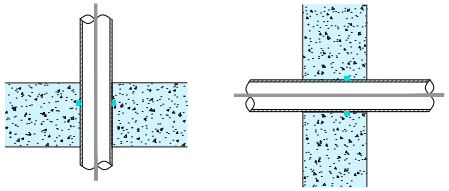
Scale
Not to Scale

PREMCRETE
44 Macadam Way | West Portway Industrial Park
Andover | Hampshire | SP10 3XW
Tel: 02380 276166 | sales@premcrete.com
www.premcrete.com

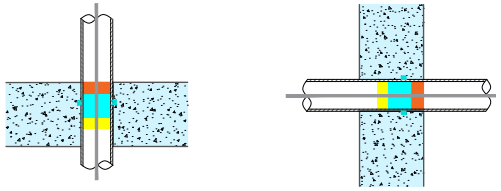
Important design notes:

- Site photographs of all service penetrations to be uploaded to Premtrac prior to pouring concrete. Allow sufficient time for Premcrete to review and QC check.
- Where multiple pipes are cast together, a minimum distance of 50mm should be maintained between pipes.
- Hydroplug System is typically installed by follow on contractors, not groundworker, once M&E works are fully installed.
- Hydroplug System is not covered under warranty once installed. Hydroplug Sealing Kit only applicable for service penetrations.
- Grade 1B is the equivalent of the Grade 2 referred to in BS 8102:2009 Table 2.

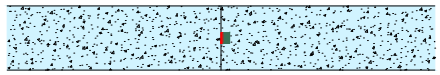
Typical cast-in pipe penetration detail



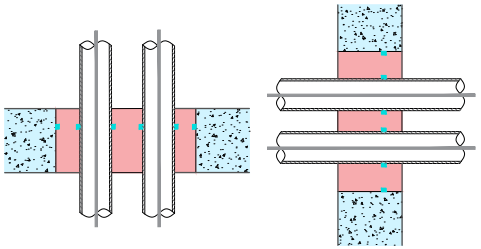
Typical cast-in service penetration detail



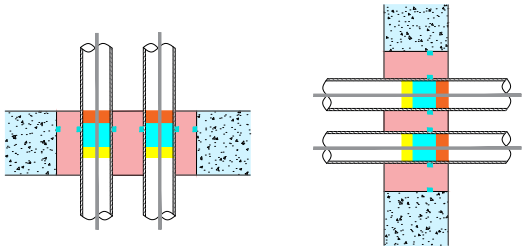
Typical construction joint detail and membrane lap



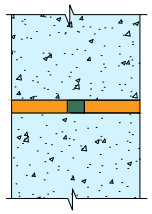
Typical box-out pipe penetration detail



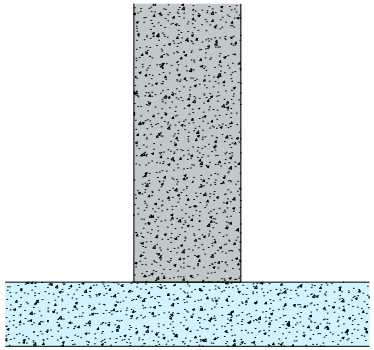
Typical box-out service penetration detail



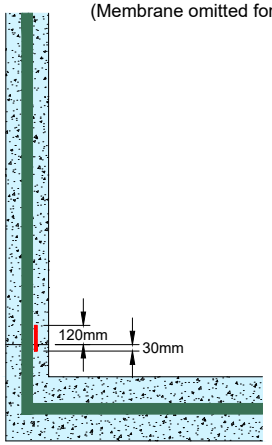
Tie hole sealing detail



Typical internal column detail



Typical construction joint through retaining wall-slab (Membrane omitted for clarity)



KEY

Keys below show products specified on the drawing

- Hydroplug Foam
- Hydroplug Paste
- Hydroplug Mortar
- Hydroprufe EP or Teknocem LA
- Service inside sleeve
- Tie Hole Sealer
- Hydrostop BR on Hydrostop WSM
- Hydrostop WS10
- Cemflex VB
- Standard Concrete to Structural Liner Wall / Slab
- Hydrocrete Concrete

Conditions

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This drawing has been prepared as a guide to assist with the installation of the products.
This drawing requires the approval of the designer of the structure.
It is the responsibility of the designer to ensure that any design decisions, made by others that have an impact on the waterproofing design are brought to the attention of the waterproof designer.
It is the responsibility of the designer of the structure to ensure that the details shown on this drawing match the construction drawings.
Drawing template is A3L.

Important Notes

The waterproofing design is designed to the Grades of Environment described below:
Grade 1A - Seepage and dampness from internal and external sources tolerable
Grade 1B - No seepage, however damp areas from internal and external sources tolerable
Grade 2 - No seepage through structure is acceptable however condensation and dampness are tolerable as a result of internal air moisture
Grade 3 - Ventilation, dehumidification or air conditioning are required appropriate to intended use in accord with BS 8102:2022 Table 2 to achieve a dry, habitable environment which is outside the scope of this design

Construction joints are required to be scabbled or retarded to ensure good concrete connection. An approved curing agent is to be applied to concrete immediately after pouring.
Laps between dissimilar waterproofing products to be 100mm unless otherwise annotated.
All substructure construction joints must have waterbar installed with a minimum of 75mm concrete cover. (Internal, non-retaining construction joints do not require waterbars).
Maximum pour size to be confirmed by Structural Engineers to maintain 0.3mm designed crack width. Liner wall pours should be cast 'hit and miss to ensure that shrinkage of concrete is compensated.
It is the responsibility of the installing contractor to ensure that good concrete practice is maintained at all times when pouring concrete.
If the design incorporates any of the following products:

- Hydrocrete should be a minimum of 200mm thick or 300mm if poured monolithically in conjunction with standard concrete.
- Hydroprufe Primer to be applied to concrete/ masonry substrate prior to the application of Hydroflow Corner Tape or Hydroprufe Detail Tape.
- Hydroseal Sealer to be applied to all surfaces prior to installing Hydroflow HP.
- High density insulation under Hydroflow HP20 should be fixed to substrate at a minimum of 5 fixings per sheet.

Rev	Date	Description	Dwn	Chk
C01	12/02/24	Construction Issue	JM	CT

Scale

Not to Scale

CONSTRUCTION ISSUE

This drawing is designed to achieve the following environment in accordance with BS 8102:2022

GRADE 1B

Client

HG CONSTRUCTION

Project

FREE WHARF PHASE 2

Premcrete Drawing No

OP003465-TD-003

Title

TYPICAL WATERPROOFING DETAILS SHEET - HYDROCRETE

Date

12/02/2024

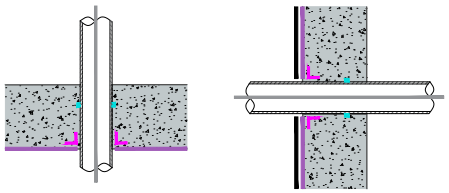
PREMCRETE

44 Macadam Way | West Portway Industrial Park
Andover | Hampshire | SP10 3XW
Tel: 02380 276166 | sales@premcrete.com
www.premcrete.com

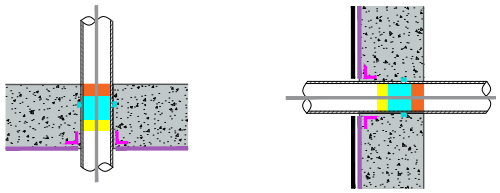
Important design notes:

- Site photographs of all service penetrations to be uploaded to Premtrac prior to pouring concrete. Allow sufficient time for Premcrete to review and QC check.
- Where multiple pipes are cast together, a minimum distance of 50mm should be maintained between pipes.
- Hydroplug System is typically installed by follow on contractors, not groundworker, once M&E works are fully installed.
- Hydroplug System is not covered under warranty once installed. Hydroplug Sealing Kit only applicable for service penetrations.
- Grade 1B is the equivalent of the Grade 2 referred to in BS 8102:2009 Table 2.

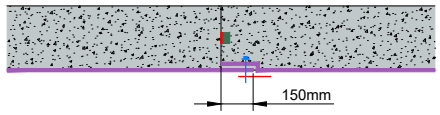
Typical cast-in pipe penetration detail



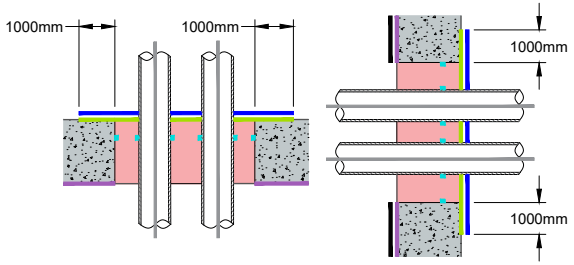
Typical cast-in service penetration detail



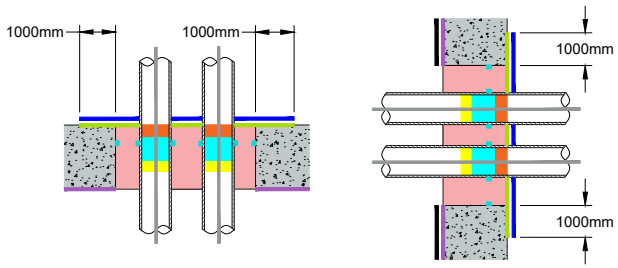
Typical construction joint detail and membrane lap



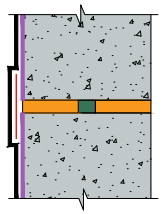
Typical box-out pipe penetration detail



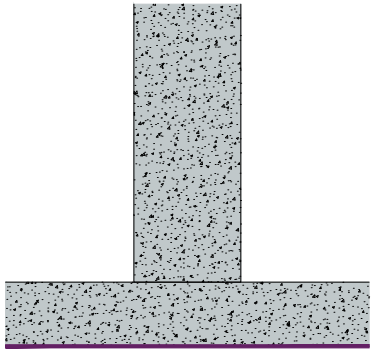
Typical box-out service penetration detail



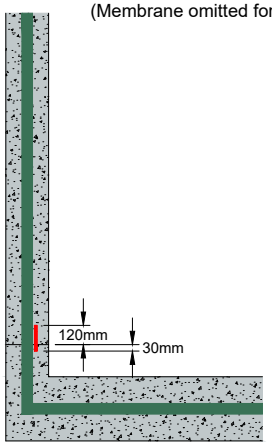
Tie hole sealing detail



Typical internal column detail



Typical construction joint through retaining wall-slab (Membrane omitted for clarity)



KEY

Keys below show products specified on the drawing

- Hydroplug Foam
- Hydroplug Paste
- Hydroplug Mortar
- Hydroprufe EP or Teknocem LA
- Service inside sleeve
- Tie Hole Sealer
- Hydrostop BR on Hydrostop WSM
- Hydrostop WS10
- Cemflex VB
- Standard Concrete to Structural Liner Wall / Slab
- Combi-Seal
- Hydroprufe LG 0.7-1.2mm quartz aggregate to be broadcast into coating where concrete connection is required (0.5kg per 1m²)
- Hydroseal FX
- Protection Board 600
- Combi-Seal Tape
- Twinseal GR 3mm Application
- Shot Fired Fixing

Conditions

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This drawing has been prepared as a guide to assist with the installation of the products.

This drawing requires the approval of the designer of the structure.

It is the responsibility of the designer to ensure that any design decisions, made by others that have an impact on the waterproofing design are brought to the attention of the waterproof designer.

It is the responsibility of the designer of the structure to ensure that the details shown on this drawing match the construction drawings.

Drawing template is A3L.

Important Notes

The waterproofing design is designed to the Grades of Environment described below:
Grade 1A - Seepage and dampness from internal and external sources tolerable
Grade 1B - No seepage, however damp areas from internal and external sources tolerable
Grade 2 - No seepage through structure is acceptable however condensation and dampness are tolerable as a result of internal air moisture
Grade 3 - Ventilation, dehumidification or air conditioning are required appropriate to intended use in accord with BS 8102:2022 Table 2 to achieve a dry, habitable environment which is outside the scope of this design

Construction joints are required to be scabbled or retarded to ensure good concrete connection. An approved curing agent is to be applied to concrete immediately after pouring.

Laps between dissimilar waterproofing products to be 100mm unless otherwise annotated.

All substructure construction joints must have waterbar installed with a minimum of 75mm concrete cover. (Internal, non-retaining construction joints do not require waterbars).

Maximum pour size to be confirmed by Structural Engineers to maintain 0.3mm designed crack width. Liner wall pours should be cast 'hit and miss to ensure that shrinkage of concrete is compensated.

It is the responsibility of the installing contractor to ensure that good concrete practice is maintained at all times when pouring concrete.

If the design incorporates any of the following products:

- Hydrocrete should be a minimum of 200mm thick or 300mm if poured monolithically in conjunction with standard concrete.
- Hydroprufe Primer to be applied to concrete/ masonry substrate prior to the application of Hydroflow Corner Tape or Hydroprufe Detail Tape.
- Hydroseal Sealer to be applied to all surfaces prior to installing Hydroflow HP.
- High density insulation under Hydroflow HP20 should be fixed to substrate at a minimum of 5 fixings per sheet.

Rev	Date	Description	Dwn	Chk
C01	01/02/21	Construction Issue	JM	CT

Scale: Not to Scale

CONSTRUCTION ISSUE

This drawing is designed to achieve the following environment in accordance with BS 8102:2022

GRADE 1B

Client: HG CONSTRUCTION

Project: FREE WHARF PHASE 2

Premcrete Drawing No: OP003465-TD-004

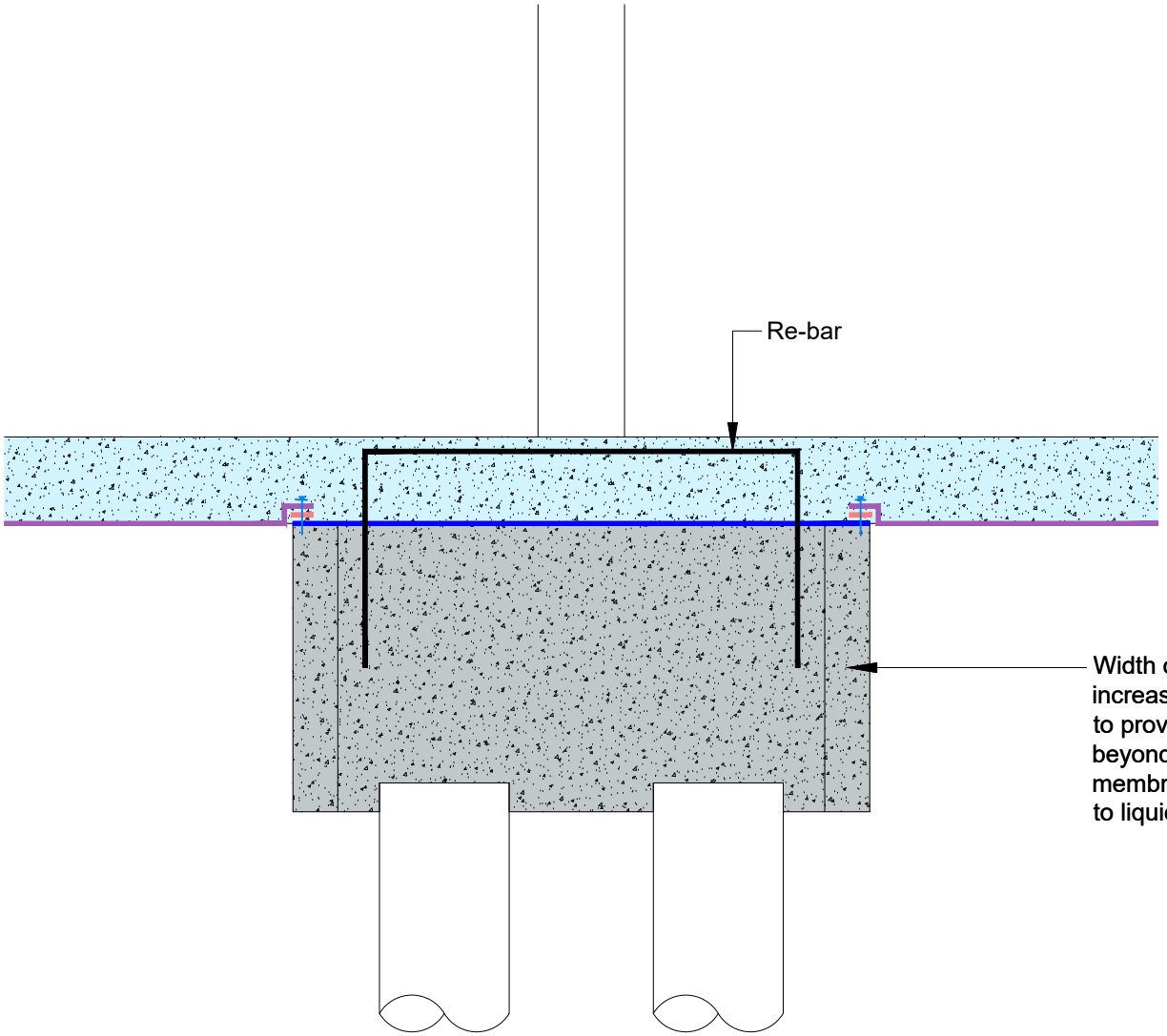
Date: 12/02/2024

Title: TYPICAL WATERPROOFING DETAILS SHEET - COMBI-SEAL

PREMCRETE
44 Macadam Way | West Portway Industrial Park
Andover | Hampshire | SP10 3XW
Tel: 02380 276166 | sales@premcrete.com
www.premcrete.com

Important design notes:

- Grade 3 Environments also require ventilation appropriate to intended use of environment (BS 8102:2022 Table 2).



KEY

Click on product names to access technical information

- Combi-Seal
- Hydroprufe LG 0.7-1.2mm quartz aggregate to be broadcast into coating where concrete connection is required (0.5kg per 1m²)
- Hydroprufe HCR Butyl Tape
- Shot Fired Fixing
- Hydrocrete Concrete
- Standard Concrete to Structural Liner Wall / Slab

Conditions

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Drawing template is A4L.

Important Notes

The waterproofing design is designed to the Grades of Environment described below:
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Grade 3 - Ventilation, dehumidification or air conditioning are required appropriate to intended use in accord with BS 8102:2022 Table 2 to achieve a dry, habitable environment which is outside the scope of this design

Construction joints are required to be scabbled or retarded to ensure good concrete connection.
An approved curing agent is to be applied to concrete immediately after pouring.
Laps between dissimilar waterproofing products to be 100mm unless otherwise annotated.
All substructure construction joints must have waterbar installed with a minimum of 75mm concrete cover. (Internal, non-retaining construction joints do not require waterbars).
A maximum ratio of 3:1 is required for any liner wall pours. Liner wall pours should be cast 'hit and miss to ensure that shrinkage of concrete is compensated.
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- Hydroseal Sealer to be applied to all surfaces prior to installing Hydroflow HP.
- High density insulation under Hydroflow HP20 should be fixed to substrate at a minimum of 5 fixings per sheet.

Rev	Date	Description	Dwn	Chk
C01	12/02/24	Construction Issue	JM	CT

Client
HG CONSTRUCTION

Project
FREE WHARF PHASE 2

Title
TYPICAL SECTION THROUGH PILECAP

Premcrete Drawing No
OP003465-TD-005

Date
12/02/2024

Scale
Not to Scale

PREMCRETE
44 Macadam Way | West Portway Industrial Park
Andover | Hampshire | SP10 3XW
Tel: 02380 276166 | sales@premcrete.com
www.premcrete.com

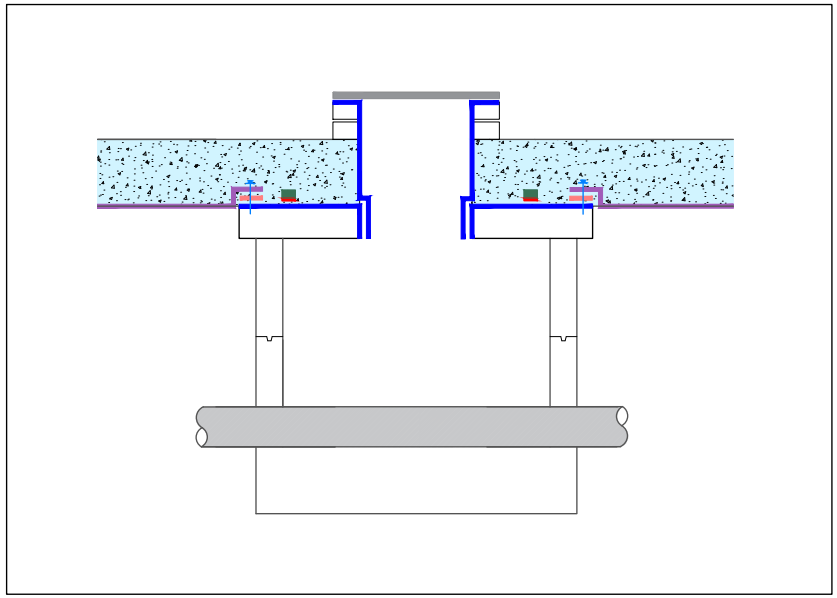
CONSTRUCTION ISSUE

This drawing is designed to achieve the following environment in accordance with BS 8102:2022

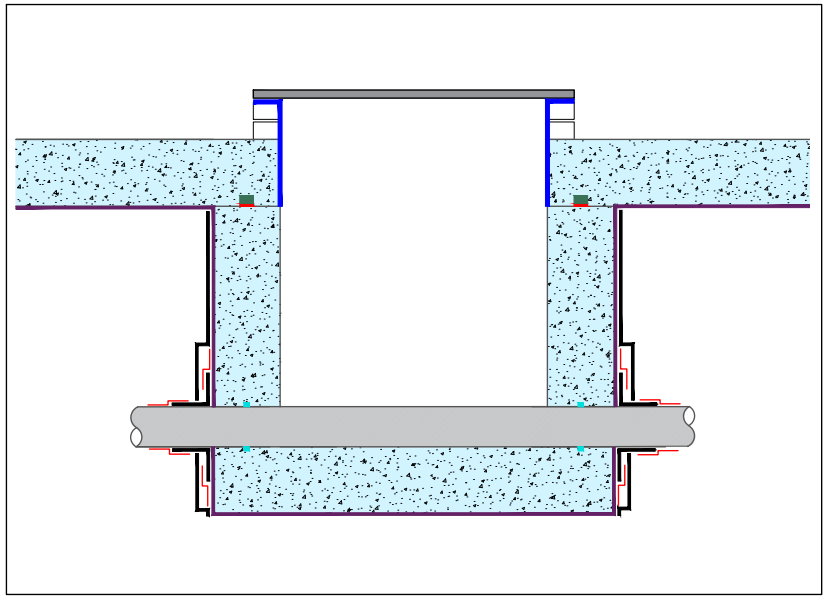
GRADE 3

Important design notes:

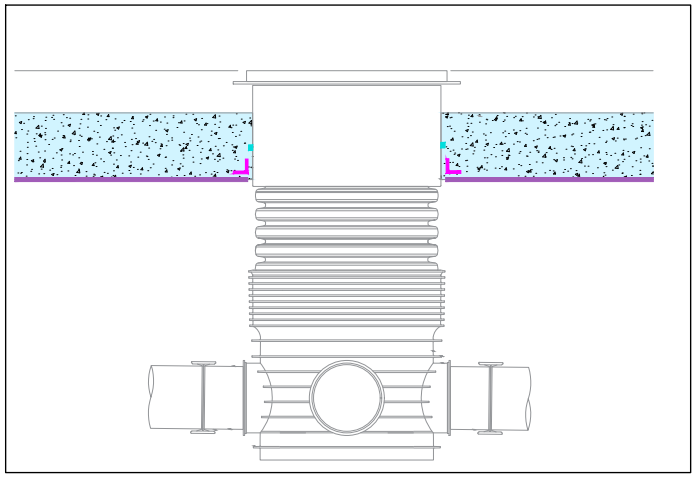
- Grade 3 Environments also require ventilation appropriate to intended use of environment (BS 8102:2022 Table 2).



PRE-CAST MANHOLE



CAST IN SITU MANHOLE



PLASTIC INSPECTION CHAMBER

KEY

Keys below show products specified on the drawing

- Hydroprufe / HCR Butyl Tape
- Hydroprufe Tophat
- Combi-Seal Tape
- Protection Board 600
- Shot Fired Fixing
- Twinseal GR 3mm Application
- Hydroprufe LG 0.7-1.2mm quartz aggregate to be broadcast into coating where concrete connection is required (0.5kg per 1m²)
- Hydrostop BR on Hydrostop WSM
- Hydrostop WS10
- Hydrocrete Concrete

Conditions

This drawing is copyright of Premcrete. Permission for copying may be obtained from Premcrete.

This drawing must be read in conjunction with the relevant datasheets, BS 8102:2022 and BS 8485:2015+A1:2019 if appropriate.
This drawing has been prepared as a guide to assist with the installation of the products.
This drawing requires the approval of the designer of the structure.
It is the responsibility of the designer to ensure that any design decisions, made by others that have an impact on the waterproofing design are brought to the attention of the waterproof designer.
It is the responsibility of the designer of the structure to ensure that the details shown on this drawing match the construction drawings.
Drawing template is A3L.

Important Notes

The waterproofing design is designed to the Grades of Environment described below:
Grade 1A - Seepage and dampness from internal and external sources tolerable
Grade 1B - No seepage, however damp areas from internal and external sources tolerable
Grade 2 - No seepage through structure is acceptable however condensation and dampness are tolerable as a result of internal air moisture
Grade 3 - Ventilation, dehumidification or air conditioning are required appropriate to intended use in accord with BS 8102:2022 Table 2 to achieve a dry, habitable environment which is outside the scope of this design

Construction joints are required to be scabbled or retarded to ensure good concrete connection. An approved curing agent is to be applied to concrete immediately after pouring.
Laps between dissimilar waterproofing products to be 100mm unless otherwise annotated.
All substructure construction joints must have waterbar installed with a minimum of 75mm concrete cover. (Internal, non-retaining construction joints do not require waterbars).
Maximum pour size to be confirmed by Structural Engineers to maintain 0.3mm designed crack width. Liner wall pours should be cast 'hit and miss to ensure that shrinkage of concrete is compensated.
It is the responsibility of the installing contractor to ensure that good concrete practice is maintained at all times when pouring concrete.
If the design incorporates any of the following products:

- Hydrocrete should be a minimum of 200mm thick or 300mm if poured monolithically in conjunction with standard concrete.
- Hydroprufe Primer to be applied to concrete/ masonry substrate prior to the application of Hydroflow Corner Tape or Hydroprufe Detail Tape.
- Hydroseal Sealer to be applied to all surfaces prior to installing Hydroflow HP.
- High density insulation under Hydroflow HP20 should be fixed to substrate at a minimum of 5 fixings per sheet.

Rev	Date	Description	Dwn	Chk
C01	12/02/24	Construction Issue	JM	CT

Scale: Not to Scale

CONSTRUCTION ISSUE

This drawing is designed to achieve the following environment in accordance with BS 8102:2022

GRADE 3

Client: HG CONSTRUCTION

Project: FREE WHARF PHASE 2

Premcrete Drawing No: OP003465-TD-006

Title: TYPICAL MANHOLE DETAILS

Date: 12/02/2024

PREMCRETE
44 Macadam Way | West Portway Industrial Park
Andover | Hampshire | SP10 3XW
Tel: 02380 276166 | sales@premcrete.com
www.premcrete.com

2

PREMTRAC PRODUCT TRAINING & QUALITY CONTROL

PREMCRETE

PRODUCT TRAINING

1

Upon commencement, the Premcrete Project Manager that has been assigned to your project will spend as much time as required to ensure that your operatives are fully conversant with the design produced for the project and how the products are to be installed.

2

The technical data sheets are explained to the operatives and any special characteristics and/or limitations of the product are specifically highlighted.

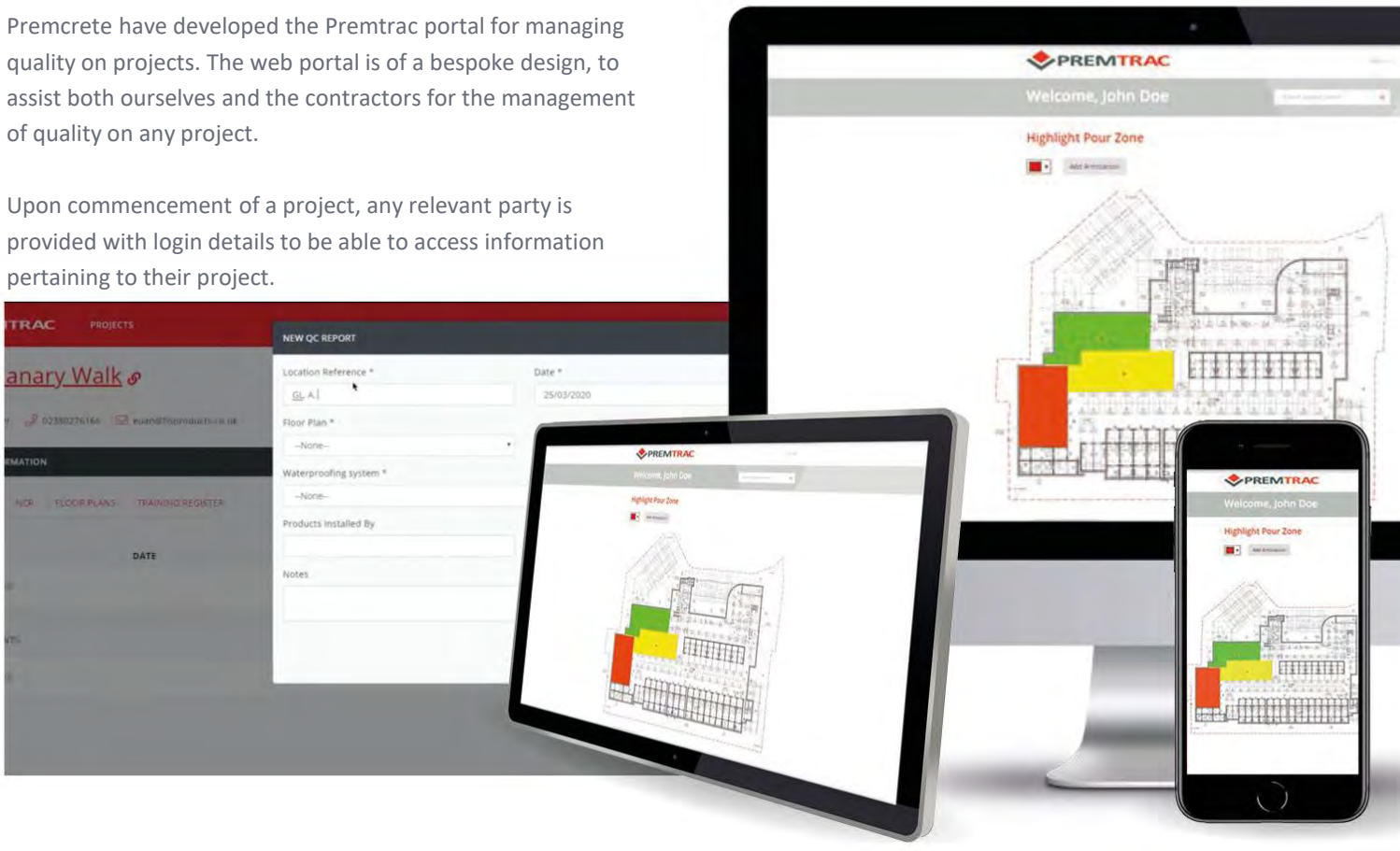
3

A training register is compiled listing the named people that are trained for the use of the products on your site. This is uploaded onto the Premtrac portal which is used for managing quality on your project.

PREMTRAC - QUALITY CONTROL PORTAL

Premcrete have developed the Premtrac portal for managing quality on projects. The web portal is of a bespoke design, to assist both ourselves and the contractors for the management of quality on any project.

Upon commencement of a project, any relevant party is provided with login details to be able to access information pertaining to their project.



Document Control

All documents relating to the design and installation of the waterproofing are uploaded to the portal and are easily accessed.

Information includes the following:

- technical datasheets
- method statements
- technical drawings
- photographs
- safety datasheets
- training registers

This section of the Premtrac portal serves as a useful central location for the storage of all information relating the project and ensures that all parties are viewing and working from the most up to date information.

As new documents are uploaded all parties receive a notification.

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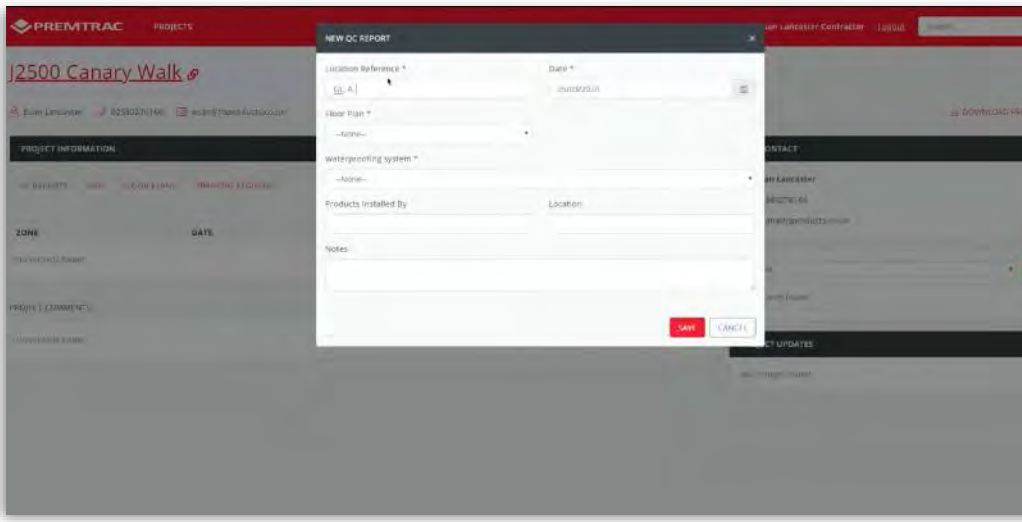
PREMTRAC - QUALITY CONTROL PORTAL

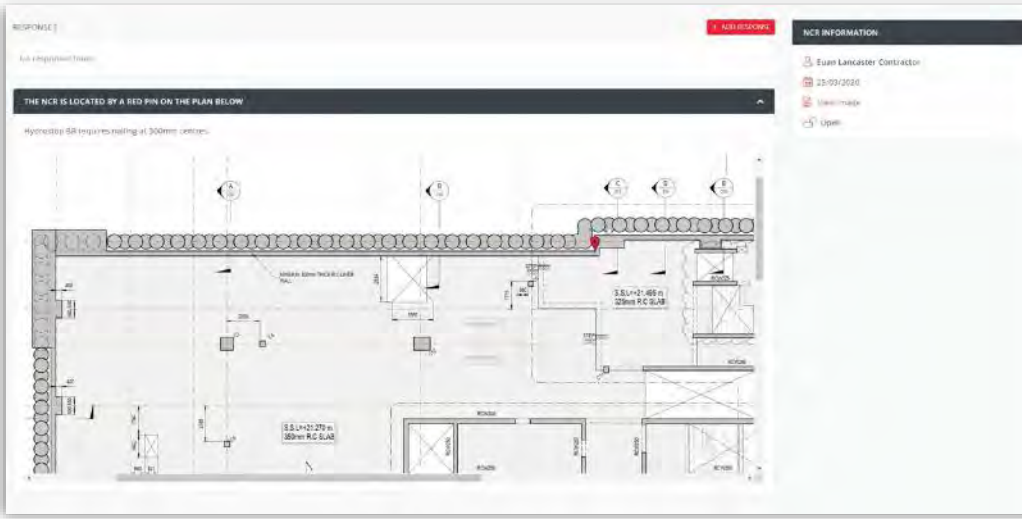
Communications

All critical project related communications are uploaded onto the portal for all to view and for an accurate record to be kept of the date etc

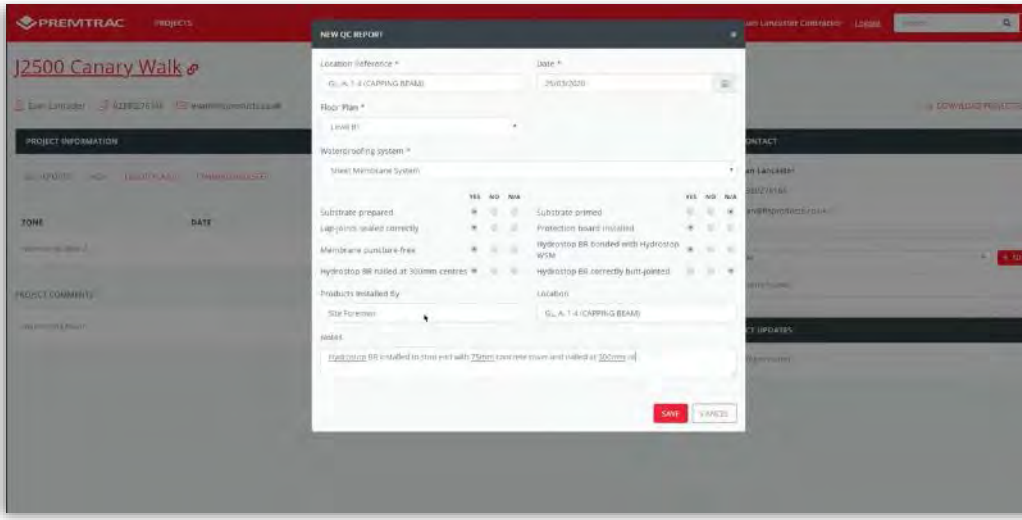


Contractor Quality Control

As the installation of the waterproofing system progresses, the contractor should login to the Premtrac portal and notify Premcrete of upcoming concrete pours and the like so as to keep the Premcrete technicians updated as to when site visits are required. Once the waterproofing is completed. in a specific zone then the nominated person on site, responsible for monitoring the quality of the installation, will complete the QC report on the system using the Tablet provided by Premcrete.



The Contractor's Quality Checker is responsible to mark up on the floor plan the zone of work that has been completed, within Premtrac, and then complete the electronic quality report. Photographs are then attached to specific points on the floorplan showing the quality of workmanship. Once completed, it is saved and can then be viewed on the portal as linked to the specific zone. The floorplan can be "drilled into" to access photographs and QC reports for any given zone as the work is completed.



When any report is completed, everyone linked to the project receives a notification email with a link to the report. The Premcrete technician responsible for the project can then monitor the installation as it proceeds.

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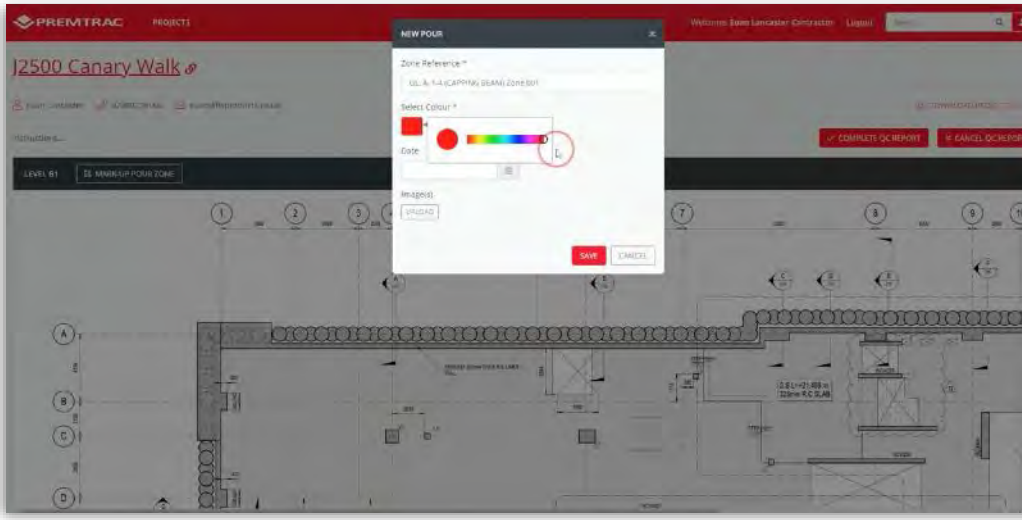
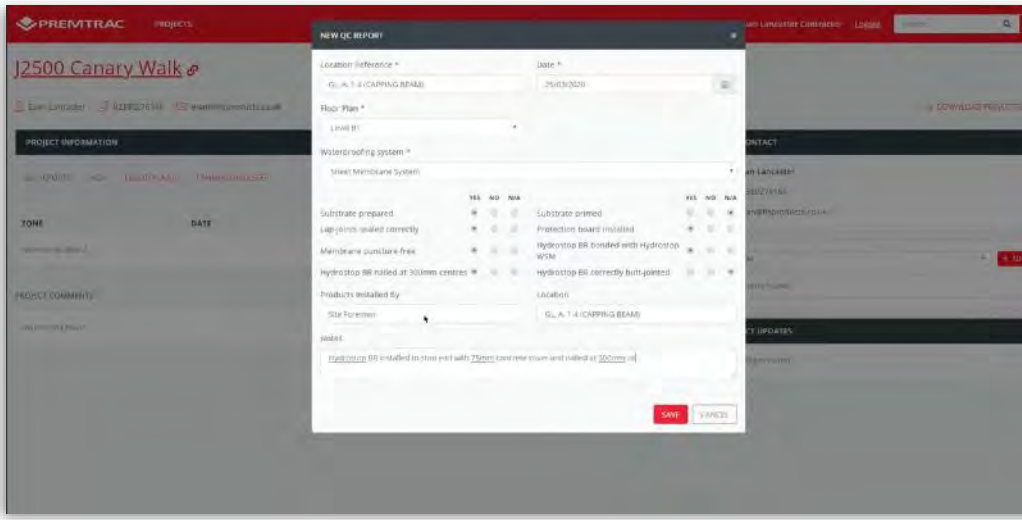


Premcrete Quality Control

Premcrete technicians visit site frequently (with particular emphasis at the outset of the project) to monitor the installation of the waterproofing system. Premcrete complete a QC report for each visit, in the same way as described above. Again, all reports are fully traceable, and photographs are attached to the floor plan accordingly.



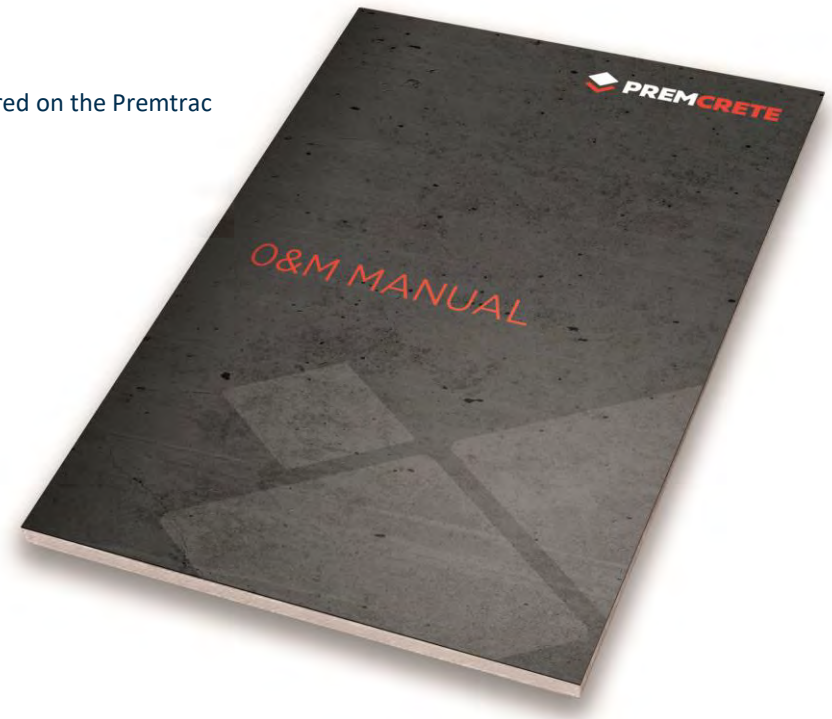
Non-Conformance Reports

Any non-conformances that are found by Premcrete during site visits are recorded using the Premtrac system. An electronic report and photographs of the issue is recorded by Premcrete using the NCR module within Premtrac. This is issued to the contractor who is then responsible to close out the NCR report by correcting the issue and submitting photographic evidence that the issue has been resolved. The Premcrete technician receives an electronic copy of the report and can then close out the NCR once complete. There is a register on Premtrac showing all NCRs and what date they have been closed out.

Project Completion

Once the project has been completed, all information stored on the Premtrac Portal can be downloaded as a single zip-folder for use in compiling the O & M manual. Information included in the final download is as follows:

- Technical datasheets
- Method statements
- Technical drawings
- Photographs
- Safety datasheets
- Training registers
- QC Reports
- Non-Conformance Reports
- Non-Conformance close-out Reports
- Floor plan with cross reference to QC
- Reports and photographs
- All Project Correspondence.



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3

25 YEAR PERFORMANCE WARRANTY

PREMCRETE

It is anticipated on this project that Structural Waterproofing Contracts will install the Combi-Seal Plus and Keltbray Structures will be responsible for the placement of the Hydrocrete Watertight Concrete and most likely the ancillary waterbars too.

In such instances it is paramount that a single system for managing the Quality Control is maintained across the split Works Packages to have complete traceability of Quality Control Reporting, ensuring the client is not impacted by potential gaps. Premcrete operate the Premtrac Quality Control Portal which provides a robust, single location for all waterproofing installation sign offs.

Whilst all projects will operate their own quality control system, the benefits of having an independent portal for streamlining all communications for quality control are significant.

Examples are list below:



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We hereby confirm to you (as beneficiary) that the installed Premcrete Waterproofing and Gas Protection System, made up of the following listed components will perform in accordance with the appropriate technical datasheets (subject to the terms and conditions):



PREMCRETE SYSTEM COMPONENTS

EXAMPLE
EXAMPLE

Project Name

Notes

Completion Date

Name of beneficiary

For PREMCRETE Ltd:

Name

Job title

Signature

Date

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WARRANTY

Terms & Conditions

I Premcrete (The Company) warrants that if within 25 years of the date of supply (as evidenced by the date of invoice) the Premcrete Waterproofing System allows the migration of visible water beyond that which the system is designed to prevent (as assessed in accordance with the Premcrete technical literature or other written communication relating to the system components or the job in question) and the Grade of Waterproofing Protection (in accordance with BS 8102:2022 Table 2) that was outlined in the Company's waterproofing design, is not achieved then the Company will replace or repair the Product subject to these terms and conditions.

II The liability of the Company shall be limited to the cost of the defective Product or the cost of carrying out any necessary repairs to the Product supplied, whichever is the smaller.

III The Company shall have no liability if the Products have not been installed properly, it being damaged during or after installation, not maintained in accordance with the manufacturer's guidelines or as a result of a design failure of the structure to which the Product has been installed. Specifically, the Company shall have no liability if the migration of visible water is due to poor compaction of the concrete or cracks in the structure greater than 0.3mm wide

IV The Company shall have no liability if the Product has been damaged as a result of fire, explosion, vibration, structural movement, acts of God or any other causes that are not a direct consequence of the failure of the installed Product to perform in accordance with the Product's relevant technical datasheets.

V This warranty is to be read in conjunction with the Product's technical datasheets of the components that form the Premcrete system.

VI Remedial work, if deemed necessary, will be carried out by and at the expense of the Company, in the way in which the Company directs. The Company shall not be responsible for securing any necessary approvals from the building occupants who may be affected by the repairs or for removing any obstructions from the affected area to enable the Company to carry out such remedial work.

VII Where remedial injection works are undertaken on behalf of the Contractor, and subsequent works shall also be their liability.

VIII The Company shall have no liability in contract or tort for any direct, indirect or consequential loss as a result of the failure of any of the Products or the warranties herein and all liability is hereby expressly excluded. Nothing in this clause shall exclude liability for death or personal injury.

IX The Company's liability is subject to (a) any failure in any of the Products being notified to the Company within 14 days of discovering the failure and (b) all invoices in respect of the Products having been paid in full.

X This warranty will become null and void if any repairs to the installed Premcrete waterproofing system are made without prior consent from Premcrete.

XI The warranty relates to the property and is transferable should the property change ownership.

XII This warranty shall be construed in accordance with English law and the English courts shall have exclusive jurisdiction.

WWW.PREMCRETE.COM
02380 276166
SALES@PREMCRETE.COM

44 MACADAM WAY,
WEST PORTWAY, ANDOVER
HAMPSHIRE SP10 3XW

4

COMPANY OVERVIEW

PREMCRETE

PROJECT TEAM

Your dedicated project team
Structured for your peace of mind



Clive Tuffin
Key Account Manager



Ryan Leary
Technical Co-Ordinator



Jacob Morton
Head of Design



Roger Mitchell
Technical Sales



Kimberley Moore
Customer Service Manager



Mihail Combel
Site Technician

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TEAM PAGE



Clive Tuffin
Key Account Manager



Ryan Leary
Technical Co-Ordinator



Jacob Morton
Head of Design



Roger Mitchell
Technical Sales



Kimberley Moore
Customer Service Manager



Mihail Combel
Site Technician



Dean Mitchell
Design Technician



Jacob Coles
Technical Sales



Jason Devenish
Key Account Manager



Kyle Woodcock
Key Account Manager



Pawel Pawlik
Operations Manager



Andy Martin
Technical Manager



Neil Thomas
Key Account Manager

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OUR VISION

To become the most respected in our field

OUR MISSION

To be a trusted partner, that is depended upon to consistently provide outstanding technical and Commercial support

THE SINGLE SOURCE **PROVIDER**

PREMCRETE PLEDGE

- CERTIFIED SURVEYOR OF STRUCTURAL WATERPROOFING — CS SW
- PROFESSIONAL £5 MILLION INDEMNITY
- PREMCRETE APPROVED 25 YEAR WARRANTY

OUR VALUES

Integrity

Transparent, reliable, and standing behind our warranty and Premcrete Pledge.

Passion

A team motivated by complex projects and thriving upon exceeding customer expectations.

Innovation

Continuous improvement of our products and services to enhance efficiency.

© Premcrete 2023

ADVANTAGES

DESIGN
Preconstruction design team providing commercially minded solutions

AGILITY
The ability to move fast to accommodate project

COMMERCIAL SUPPORT
Industry leading insights enable us to provide detailed support material

INDEPENDENT
The only British manufacturer of pre-applied Membranes

PREM360

PREMCRETE, POWERED BY PREM360 TO DELIVER UNMATCHED 'WRAP-AROUND' SUPPORT TO STRUCTURAL CONSULTANTS, ARCHITECTS, DEVELOPERS, MAIN CONTRACTORS, GROUNDWORKERS AND RC FRAME CONTRACTORS.

THE PREM360 PROJECT CIRCLE EXPLAINED



- FEASIBILITY STUDY
- CONCEPT DESIGN & BUDGET QUOTATIONS
- TENDER SUPPORT
- VALUE ENGINEERED DESIGN SOLUTIONS
- SUSTAINABLE DESIGN SOLUTIONS
- DESIGN SUPPORT STRATEGY

- £5 MILLION COVER
- CSSW QUALIFIED DESIGN TEAM
- PROJECT SPECIFIC DETAILING
- DESIGN SUPPORT
- PREMTRAC PORTAL
- INFORMATION VAULT

- INSTALLATION TRAINING
- INSTALLATION THROUGH SPECIALIST CONTRACTORS
- HANDS-ON SUPPORT
- PREMTRAC QUALITY CONTROL

- IN HOUSE MANUFACTURE
- STOCK COMMITMENT
- SERVICE TEAM
- COMMERCIAL REPORTING
- 25 YEAR WARRANTY

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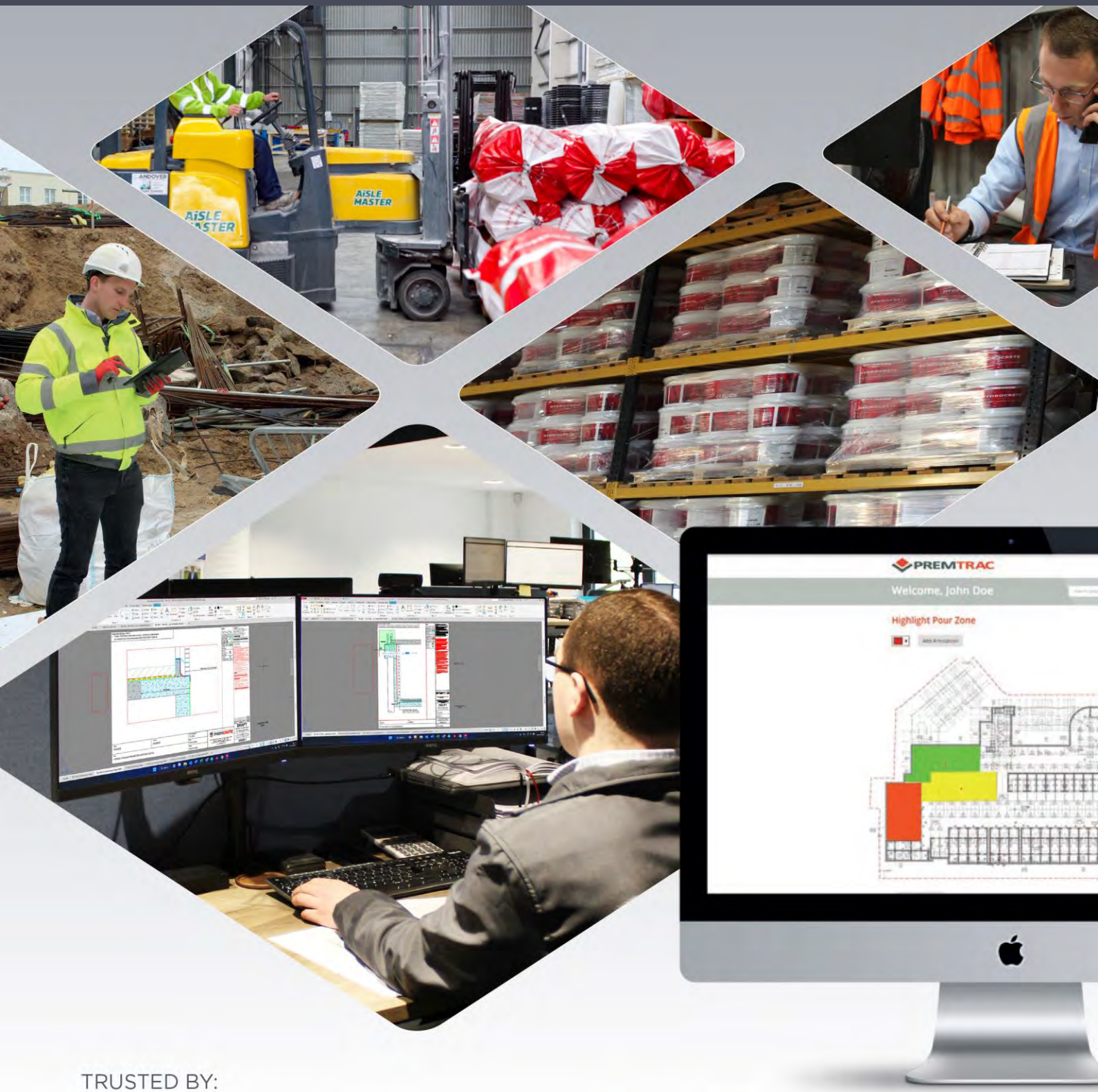
COMPANY OVERVIEW



TRUSTED BY:

GCL GROUND CONSTRUCTION LIMITED · JRL GROUP · Hill · Toureen Group · CAREY LONDON LIMITED · KIER · CAREYS WE CARE · McLAREN

MORGAN SINDALL · MULTIPLEX · LONDON SQUARE · keltbray · MB MODEBEST · lendlease · Berkeley Group · Fairview NEW HOMES Ltd. · Galliard Homes · mace

united living · M · HEYROD · BOWMER +KIRKLAND · vermont · HOWARD CIVIL ENGINEERING · CIDON · BUILDERS SISK CONTRACTORS

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PREMCRETE

5

COMPANY ACCREDITATION

PREMCRETE

INSURANCE COVER

ae insurance brokers limited

First Floor, Chancery House
Premier Way, Romsey
Hampshire SO51 9DJ

Tel: 023 805 58200
Fax: 023 805 58400
www.aeinsurancebrokers.co.uk

To Whom It May Concern

5th January 2024

Dear Sirs,

Premcrete Limited

We are pleased to confirm that our client has the following insurance cover in force:

Business Combined

Insurer:	Covea Insurance
Policy No.	PC03 021741799
Expiry Date:	22nd September 2024
Property Owners Liability:	£5,000,000
Employers Liability:	£10,000,000
Public Liability:	£5,000,000
Products Liability:	£5,000,000 (in the aggregate)

Professional Indemnity Insurance

Insurer:	HCC Tokio Marine
Policy No.	PI21E1001940
Expiry Date:	22nd September 2024
Limit of Indemnity:	£5,000,000 any one claim and in the aggregate including defence costs
Excess:	£10,000 each and every claim including costs and expenses

Insurer:	Prosure via Citynet Insurance Brokers Ltd
Policy No.	TWS04295(184396806)
Expiry Date:	22nd September 2024
Limit of Indemnity:	£5,000,000 in excess of £5,000,000
Business Description	Design and supply of structural waterproofing and gas proofing systems. Reseller and manufacturer of specialist construction materials

Total Professional Indemnity Limit of Indemnity £10,000,000

The information provided is based on the insurance arrangements at the time of writing. Alterations may be made during the period of cover. The expiry date shown represents the normal expiry date of the policy. In some circumstances, cancellation could occur before the normal expiry date.

Yours faithfully,

Stella Goulding
stellagoulding@aeins.co.uk

Registered Office: First Floor, Chancery House, Premier Way, Romsey, Hampshire SO51 9DJ
Registered in England No: 1680500
Authorised and regulated by the Financial Conduct Authority

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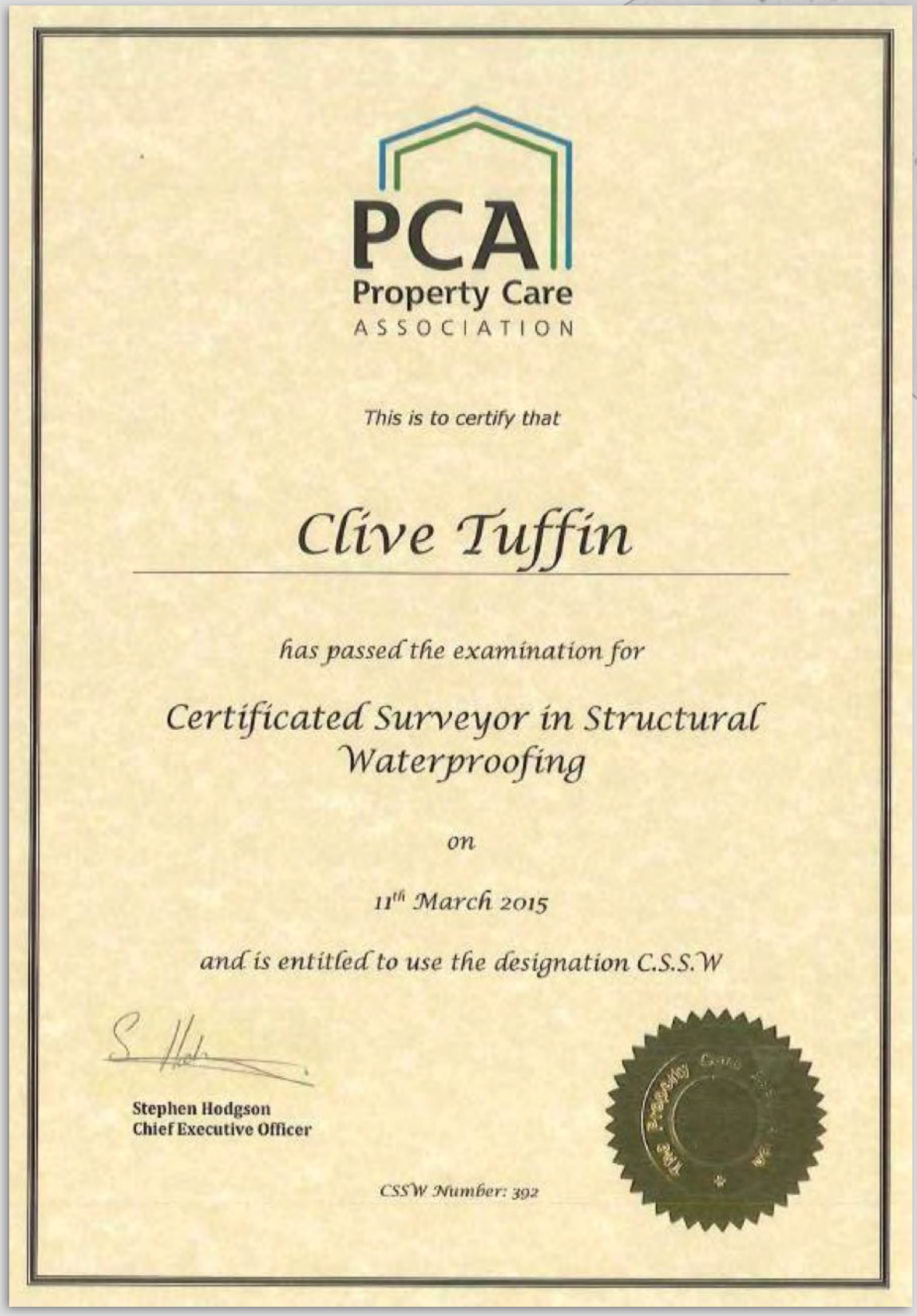
CSSW APPROVAL



PCA
Property Care
ASSOCIATION

This is to certify that

Clive Tuffin

has passed the examination for

Certificated Surveyor in Structural Waterproofing

on

11th March 2015

and is entitled to use the designation C.S.S.W

Stephen Hodgson
Chief Executive Officer

CSSW Number: 392

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CSSW APPROVAL

PCA
Property Care
ASSOCIATION

This is to certify that

Glenn Tuffin

has passed the examination for

Certificated Surveyor in Structural Waterproofing

on

07th July 2015

and is entitled to use the designation C.S.S.W

Stephen Hodgson
Chief Executive Officer

CSSW Number: 402

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ACHIEVEMENT CERTIFICATION



ABBE Quality Accredited

Certificate of Achievement

This is to certify that

Jacob Morton

has been assessed as meeting the required level of competence for all the units necessary to achieve the full award

ABBE/PCA Level 3 Certificated Surveyor in Structural Waterproofing (CSSW)

PCA Property Care ASSOCIATION

Signed :

Professor Julian Beer, Chair of ABBE Board

Steve Hodgson, Chief Executive Officer of PCA

Date: 28/11/2022

Candidate Registration No : 0000044163 Certificate Issue No : 153341

Scan code on reverse to authenticate that this is a genuine paper

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ACHIEVEMENT CERTIFICATION



ABBE Quality Accredited

Certificate of Unit Achievement

This is to certify that

Jacob Morton

has been assessed as meeting the following units of competence which form part of an accredited qualification

Surveyor in Structural Waterproofing - Written Examination

Legal, Health and Safety Aspects for the Investigation and Control of Timber and Dampness in Buildings - Written Examination

Surveyor in Structural Waterproofing - Interview

Signed :

Professor Julian Beer, Chair of ABBE Board

Date: 28/11/2022

Candidate Registration No : 0000044163 Certificate Issue No : 153332

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ACHIEVEMENT CERTIFICATION



ABBE Quality Accredited

Certificate of Achievement

This is to certify that

Andrew Martin

has been assessed as meeting the required level of competence for all the units necessary to achieve the full award

ABBE/PCA Level 3 Certificated Surveyor in Structural Waterproofing (CSSW)

PCA Property Care ASSOCIATION

Signed :

Professor Julian Beer, Chair of ABBE Board

Steve Hodgson, Chief Executive Officer of PCA

Date: 14/06/2023

Candidate Registration No : 0000042487

Certificate Issue No : 157382

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ACHIEVEMENT CERTIFICATION



ABBE
Quality Accredited

Certificate of Unit Achievement

This is to certify that

Andrew Martin

has been assessed as meeting the following units of competence which form part of an accredited qualification

Surveyor in Structural Waterproofing - Written Examination

Legal, Health and Safety Aspects for the Investigation and Control of Timber and Dampness in Buildings - Written Examination

Surveyor in Structural Waterproofing - Interview

Signed :

Professor Julian Beer, Chair of ABBE Board

Date: 14/06/2023

Candidate Registration No : 0000042487 Certificate Issue No : 157378

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