

K00290 Greenheys Redevelopment

Willmott Dixon Construction Ltd

Quality Control Management Strategy and As Built Records

Sustainable Urban Drainage System

(Blue Roof, Attenuation Tank, Underground Drainage)

Rev 01 06/05/2026

WILLMOTT DIXON

SINCE 1852

1. Overview

This document has been produced to provide the necessary information to discharge the following planning condition:

136934/FO/2023 Erection of 7-storey building including a full plant level; comprising office and laboratory floorspace (Use Class E); associated cycle parking, hard and soft landscaping, access and servicing and other associated works (varied by permissions 138222/JO/2023 and 141721/JO/2024.)

Condition 8 – Sustainable Urban Drainage Scheme

This Quality Control Management Strategy Document summarises the control measures which have been in place to manage the quality of the installation of the Sustainable Urban Drainage System (SUDS) at Greenheys.

This document also includes examples of design specification, quality plans and as built quality records related to the design and installation of the systems.

2. SUDS Elements

The Sustainable Urban Drainage System includes the following elements

- Blue Roof System
- Attenuation Tank
- Underground drainage

3. Supply Chain Partner Details

- The blue roof system has been installed by **Longworth**
- The attenuation tank has been installed by **Mayo Civils**
- The underground drainage has been installed by **Mayo Civils**

4. Pre-Commencement Requirements

Prior to the commencement of any works on site, the installing supply chain partner must provide the following information

- **Supply chain Package Quality Plan**
    - This is a key document which must be developed prior to the package starting on site. It sets out the plan for the completion of the works, including specification and design information, scope of works and quality hold points which must be followed during the course of the installation.
- **Quality Method Statement**
    - This document must be completed and issued for approval prior to the package starting on site. It sets out the agreed hold points which must be followed and recorded on the Quality Delivery checklists. The Quality Method Statement also covers competencies of operatives and

supervisors, any applicable 3rd party certifications, quality risks, approvals required prior to the commencement of works, install methodology, inspection and test plan and any other package specific details relating to quality.

These documents must be submitted to and approved by the package manager from the Willmott Dixon project management team prior to the commencement of any related works.

5. Requirements During Installation

Prior to the commencement of the installation of any products on site, the installing Supply Chain Partner must prepare the relevant Quality Delivery Checklists which are recorded on Field View.

The QD Checklists must be updated by the installing supply chain partner throughout all stages of the construction of that element of the works. The QD Checklists must be signed off by the supervisor from the Supply Chain Partner and the package manager from the Willmott Dixon Project Management Team.

6. Audit and Inspection

Willmott Dixon Construction Ltd have dedicated local and national Quality Teams. These teams coach and support Willmott Dixon employees and Supply Chain Partners in achieving a perfect product for our customers. They work to develop policies and initiatives to support installation and workmanship on products and installation.

During the construction of Greenheys, the project has been routinely inspected by the National Quality Team. These inspections are completed at key stages of work in order to ensure compliance with mandated poliocies and Willmott Dixon processes, providing a quality health check function to assist our project teams deliver a perfect product.

7. Requirements Post Construction

Prior to acceptance of the completed installation the Quality Delivery Checklist must be completed and signed off by the relevant person from the installing Supply Chain Partner and also the package manager from the Willmott Dixon Project Management team.

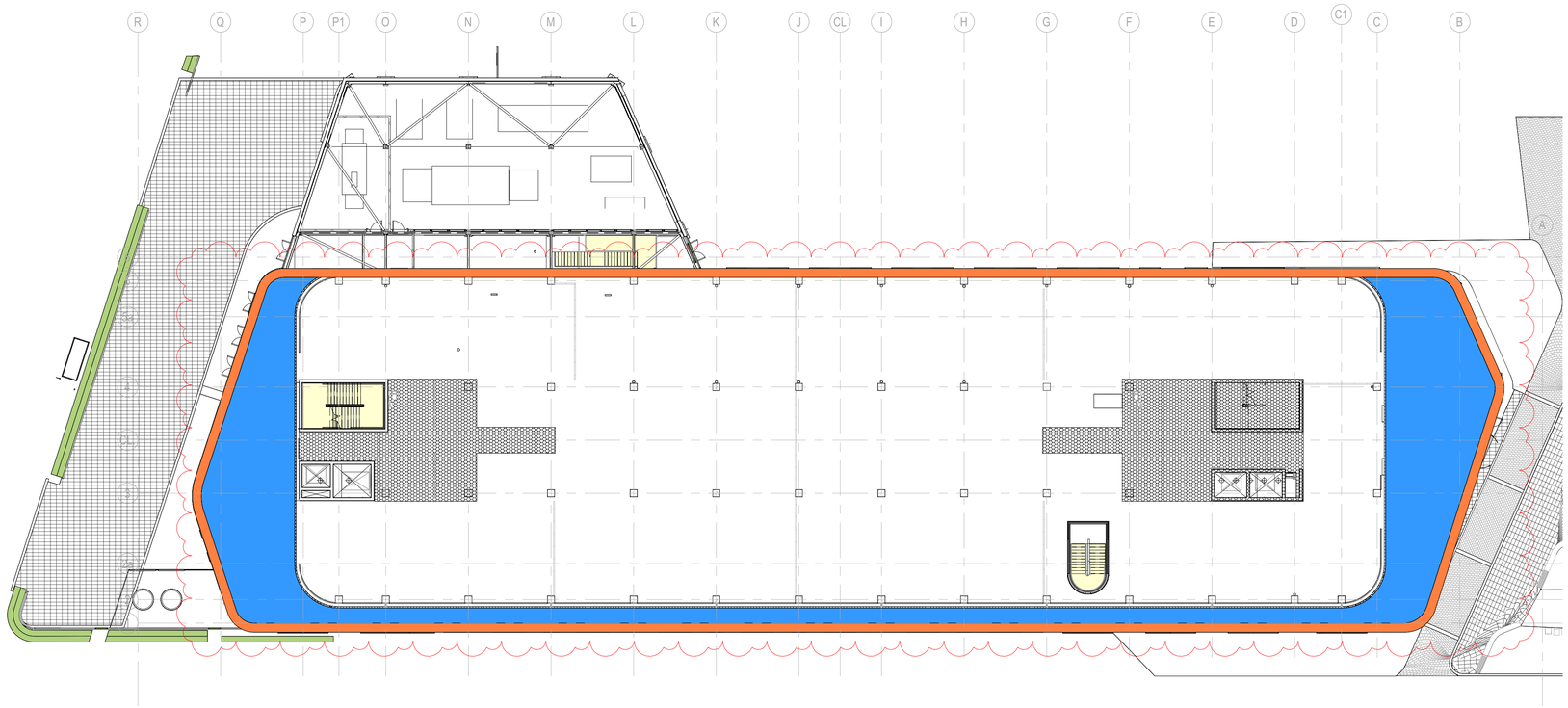
The completed QD Checklists for each element of works are saved on Fieldview.

8. Evidence

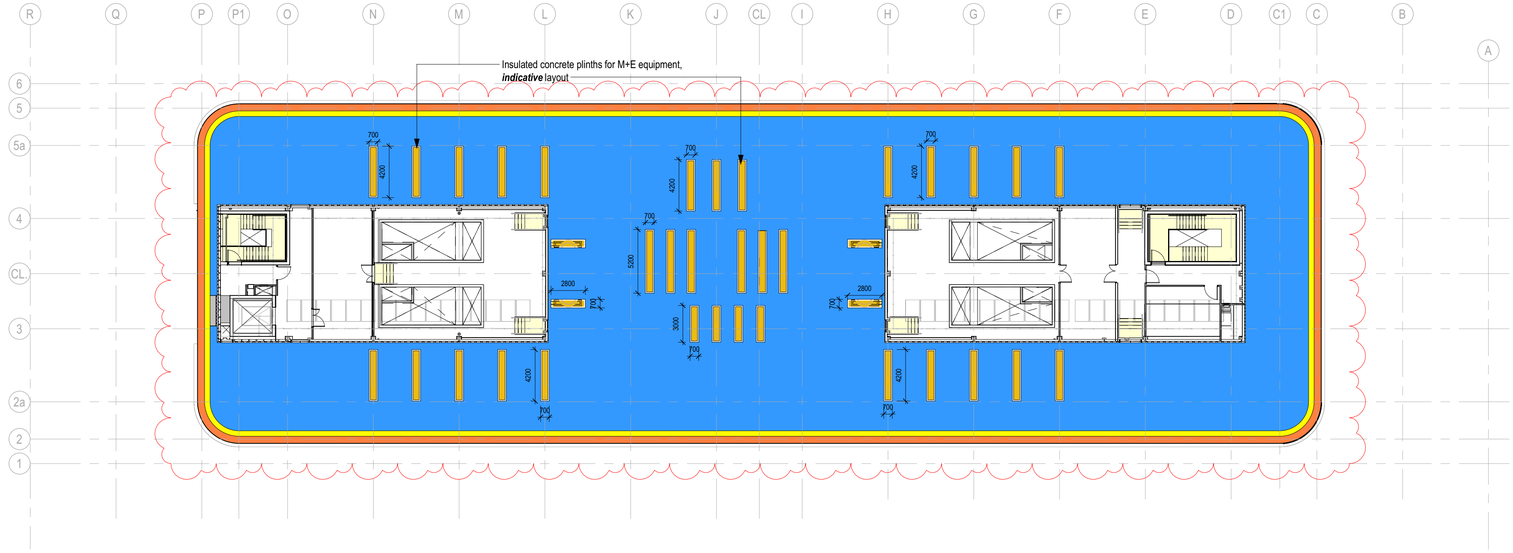
Installation records and design specification information related to the SUDS design is included in the appended information below.

9. Appended Information

- BDP Architects Blue Roof Plan
- Longworth Level 02 Blue Roof GA Drawing
- Longworth Level 06 Blue Roof GA Drawing
- Longworth Level 02 Blue Roof Spec Drawing
- Longworth Level 06 Blue Roof Spec Drawing
- Longworth Blue Roof Technical Submission
- Longworth Level 02 Roof System QD Checklist (incl Blue Roof)
- Longworth Level 06 Roof System QD Checklist (incl Blue Roof)
- DWC Structural Engineer Construction Record Drainage GA
- DWC Structural Engineer Attenuation Tank Design
- DWC Structural Engineer Attenuation Cover Slab Design
- BDP Architects Attenuation Tank Setting Out
- DWC Drainage Maintenance Plan
- Alderburgh Attenuation Tank Design
- Polystorm Attenuation Tank Data Sheet
- Mayo QD Checklist – Attenuation Tank
- Mayo Civils QD Checklist – GL6 Drainage
- Mayo Civils QD Checklist – Underslab Drainage



1 Level 02 - Blue Roof Area
1 : 250



2 Level 06 - Blue Roof Area
1 : 250

Blue Roof Area:

Level 02
Net Roof Area - 482.2m²
Net Coping Area - 202.5m²

Level 06
Net Roof Area - 1700.8m²
Net Coping Area - 160.2m²

Level 07
Net Coping Area - 101.2m²

BUILDING DESIGN PARTNERSHIP SHALL HAVE NO RESPONSIBILITY FOR ANY USE MADE OF THIS DOCUMENT OTHER THAN FOR THAT WHICH IT WAS PREPARED AND ISSUED.

ALL DIMENSIONS SHOULD BE CHECKED ON SITE. DO NOT SCALE FROM THIS DRAWING

ANY DRAWING ERRORS OR DIVERGENCIES SHOULD BE BROUGHT TO THE ATTENTION OF BUILDING DESIGN PARTNERSHIP AT THE ADDRESS SHOWN BELOW.

DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE FOLLOWING BEFORE WORK COMMENCES:

- THE CDM DESIGN ISSUES REGISTER
- THE BDP RISK SERIES OF DRAWINGS
- THE PROJECT CDM RISK REGISTER

SUBJECT TO DESIGN DEVELOPMENT, SURVEY, CONSULTANT INPUT & STATUTORY APPROVAL.

NOTES

REVISION	DESCRIPTION	DRAWN	CHECKED	DATE
P02	Coping areas and measurements added, new drawing legend added	OM	MH	23.04.24
P01	First Issue	SS	MH	15.04.24

KEYPLAN

CLIENT

MSP MANCHESTER SCIENCE PARTNERSHIPS

11 Ducie Street
PO Box 85
Piccadilly Basin
Manchester
M60 3JA
United Kingdom

T +44 [0]161 828 2200
www.bdp.com

BDP.

PROJECT TITLE: MSP Greenheys (Private & Confidential)

BDP JOB NUMBER: P3001624

DRAWING TITLE: Blue Roof Areas

SCALE: As indicated @ A1

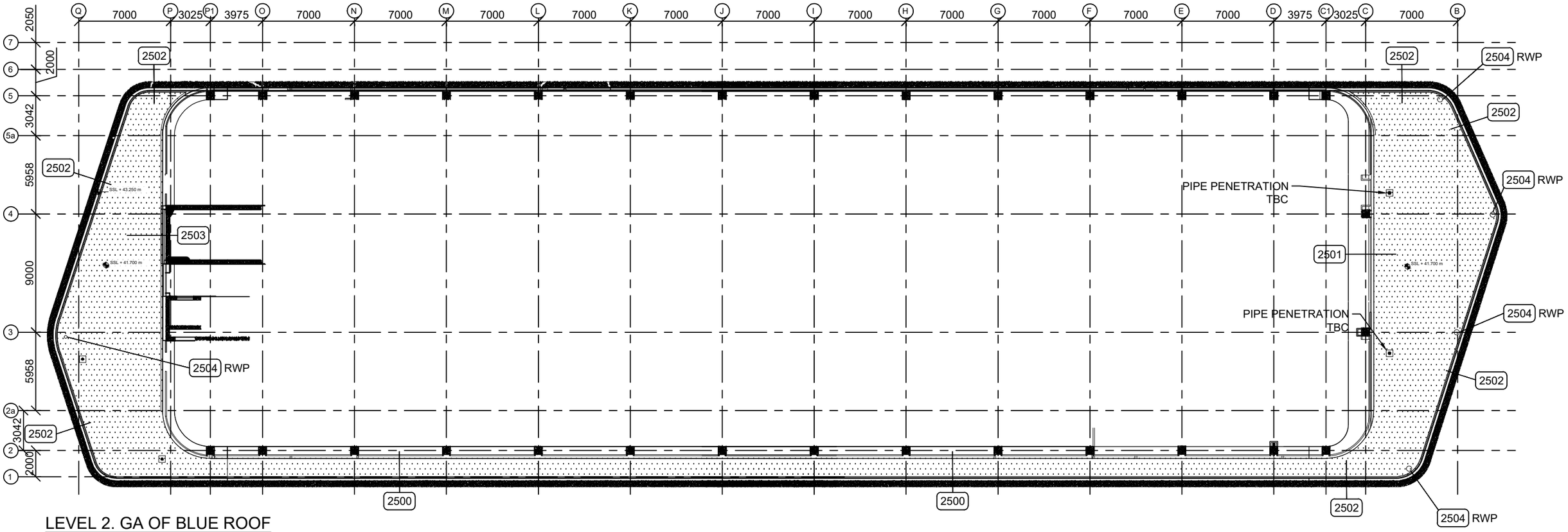
DATE FIRST ISSUED: 04/15/24

DRAWING No.: GRE-BDP-ZZ-XX-DR-A-27002

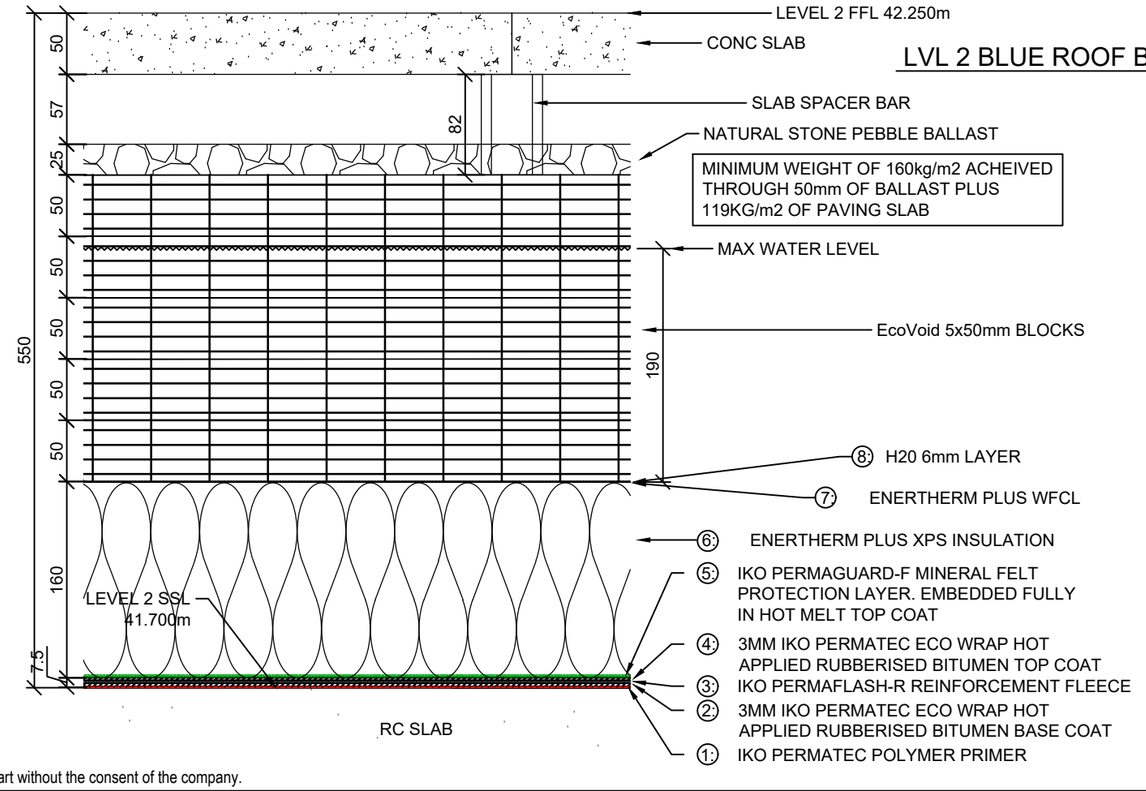
REVISION: P02

Do not scale from this drawing. All dimensions to be checked on site prior to commencement of works. Any discrepancies to be reported to the design office and project manager. If in doubt - Ask

GENERAL NOTES



LEVEL 2. GA OF BLUE ROOF



LVL 2 BLUE ROOF BUILD

C02	CONSTRUCTION RECORD	27/11/25
C01	ISSUED FOR CONSTRUCTION	28-04-25
P01	ISSUED FOR COMMENT	17-10-24

Drawing Issue Notes

CONSTRUCTION RECORD

Longworth

www.longworth-uk.com T: 0845 634 1370 E: info@longworth-uk.com

Client: WILMOTT DIXON

Project: GREENHEYS, MANCHESTER

Title: LEVEL 02 BLUE ROOF GA

Drawing Ref: GRE-LON-ZZ-02-DR-X-02000

Suitability: C02

Revision

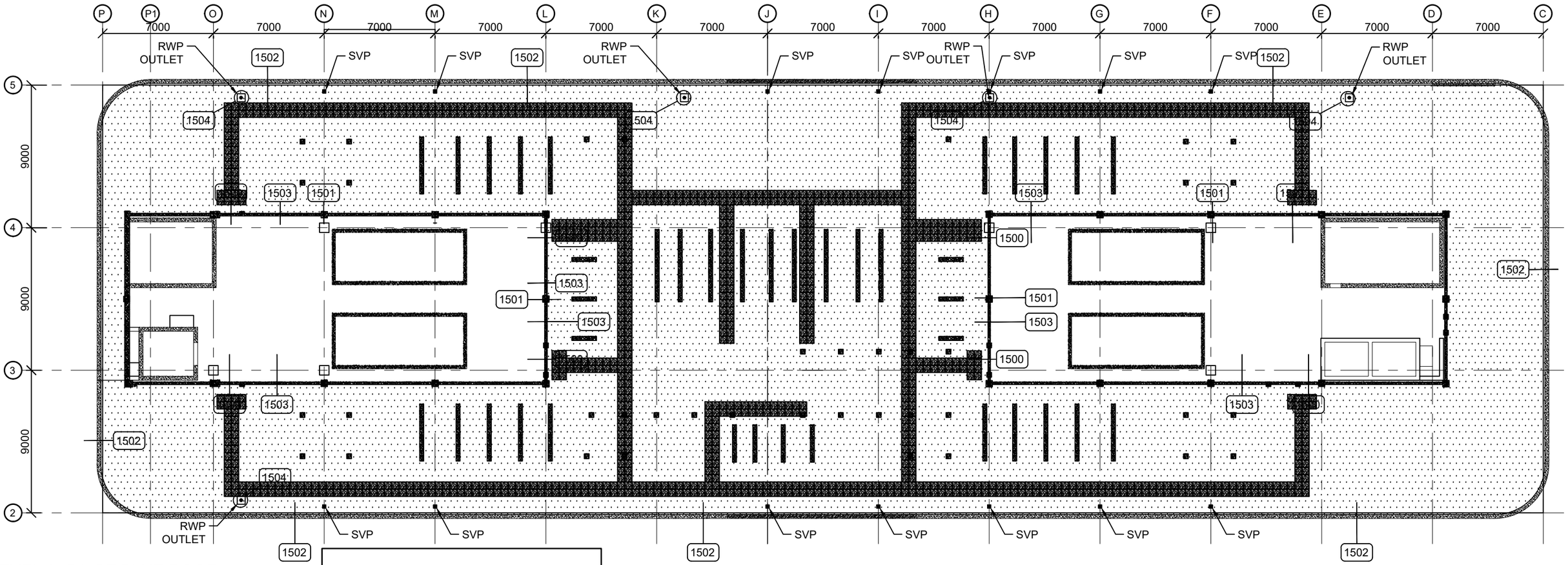
Drawn: MM Checked: MS Scale: 1:300 @A3

A3

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GENERAL NOTES

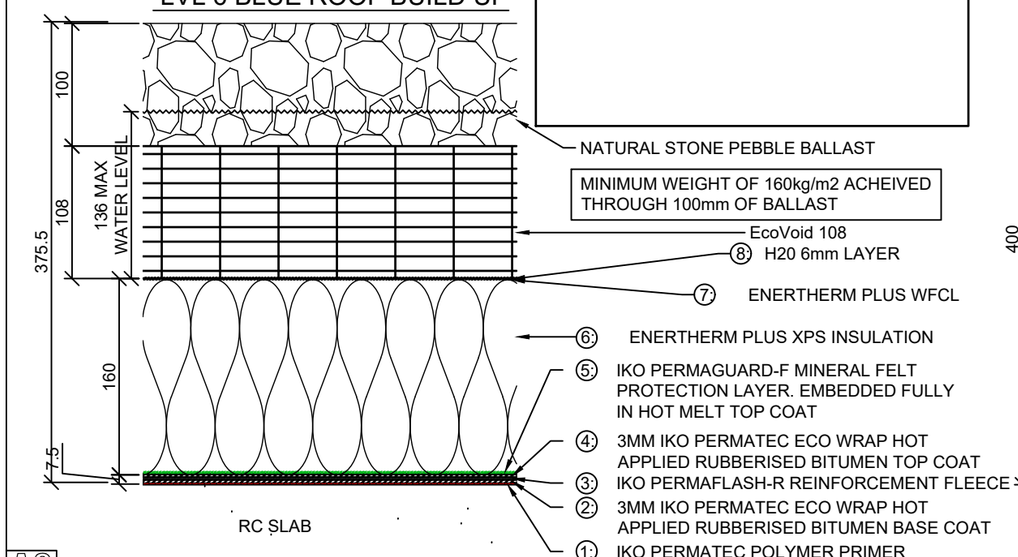


LEVEL 6. GA OF BLUE ROOF

.\Water Levels info.jpg

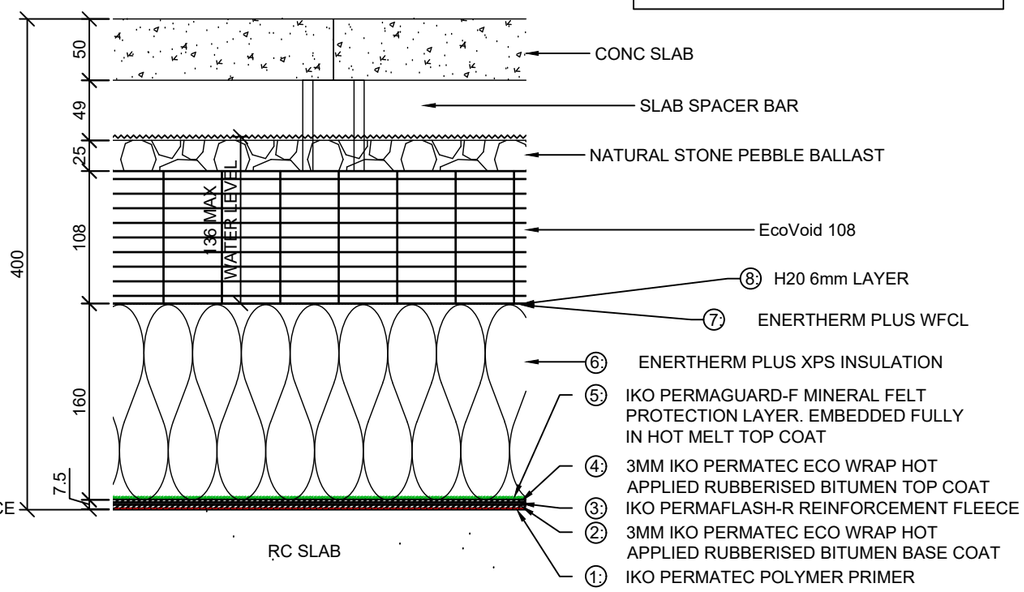
NB: WALKWAYS TO BE IDENTIFIED

LVL 6 BLUE ROOF BUILD UP



LVL 6 BLUE ROOF BUILD UP TO WALKWAYS

MINIMUM WEIGHT OF 160kg/m2 THROUGH SLABS/BALLAST TO BE MAINTAINED



C03	CONSTRUCTION RECORD	07/11/25
C02	WALKWAY ADDED. CONST. ISSUE	08-05-25
C01	ISSUED FOR CONSTRUCTION	28-04-25
P01	ISSUED FOR COMMENT	17-10-24

Drawing Issue Notes

CONSTRUCTION RECORD

Longworth

www.longworth-uk.com T: 0845 634 1370 E: info@longworth-uk.com

Client: WILMOTT DIXON

Project: GREENHEYS, MANCHESTER

Title: LEVEL 06 BLUE ROOF GA

Drawing Ref: GRE-LON-ZZ-06-DR-X-01000

Suitability: C03

Revision:

Drawn: MM Checked: MS Scale: 1:250 @A3

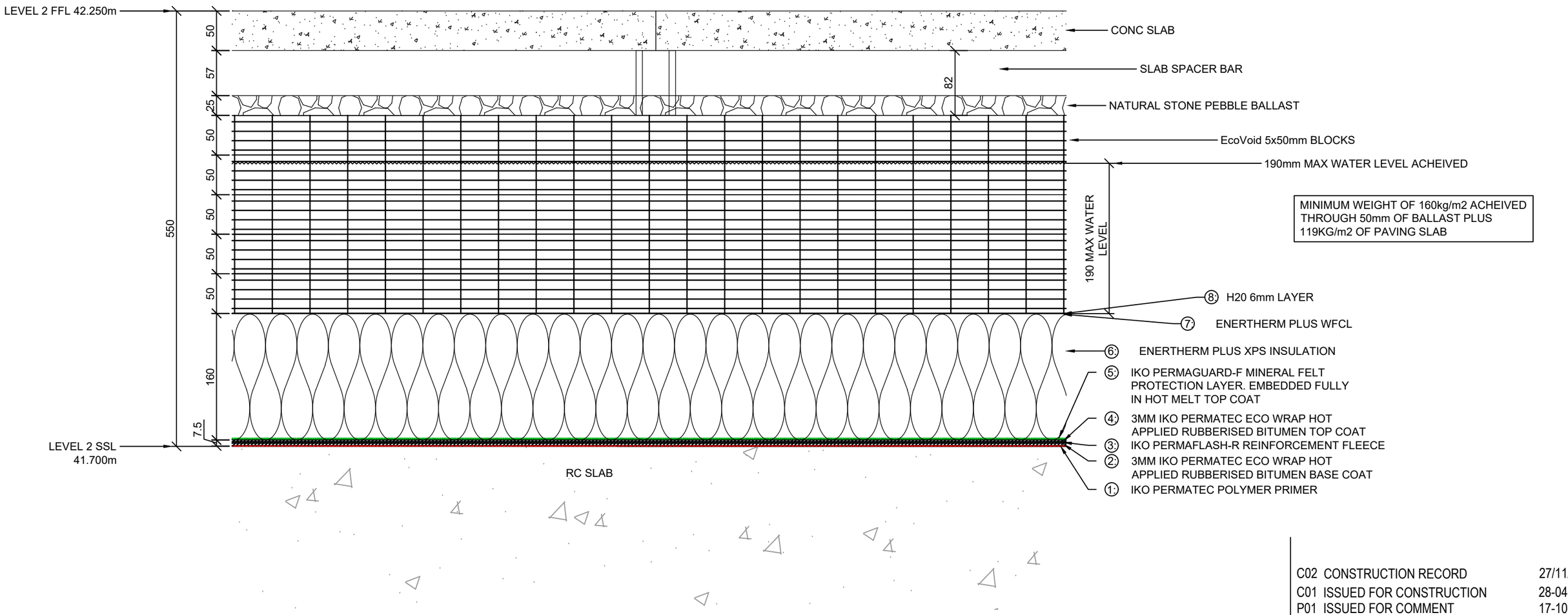
A3

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GENERAL NOTES

LVL 2 BLUE ROOF BUILD



C02 CONSTRUCTION RECORD	27/11/25
C01 ISSUED FOR CONSTRUCTION	28-04-25
P01 ISSUED FOR COMMENT	17-10-24

Drawing Issue Notes

CONSTRUCTION RECORD

Longworth

www.longworth-uk.com T: 0845 634 1370 E: info@longworth-uk.com

Client: WILMOTT DIXON

Project: GREENHEYS, MANCHESTER

Title:

LEVEL 02 BLUE ROOF SPECIFICATION

Drawing Ref: GRE-LON-ZZ-02-DR-X-02001

Suitability C02

Drawn: MM Checked: MS Scale: 1:5 @A3

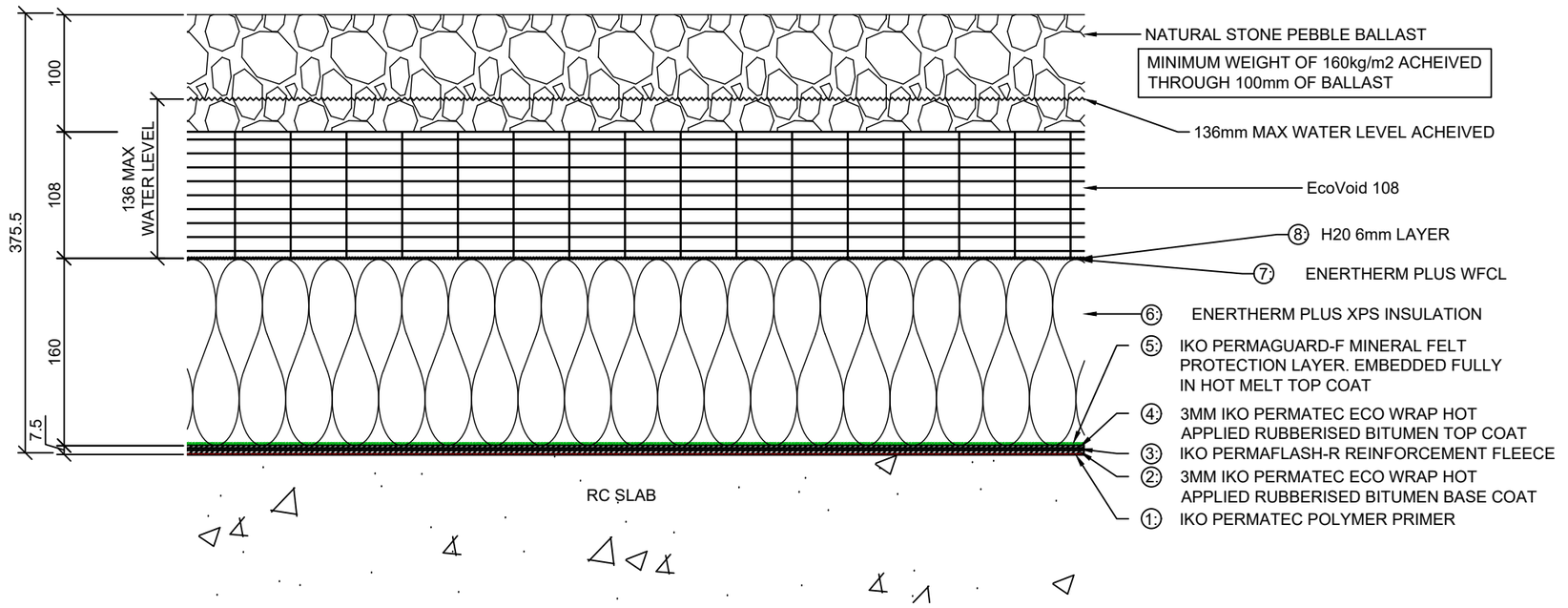
A3

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GENERAL NOTES

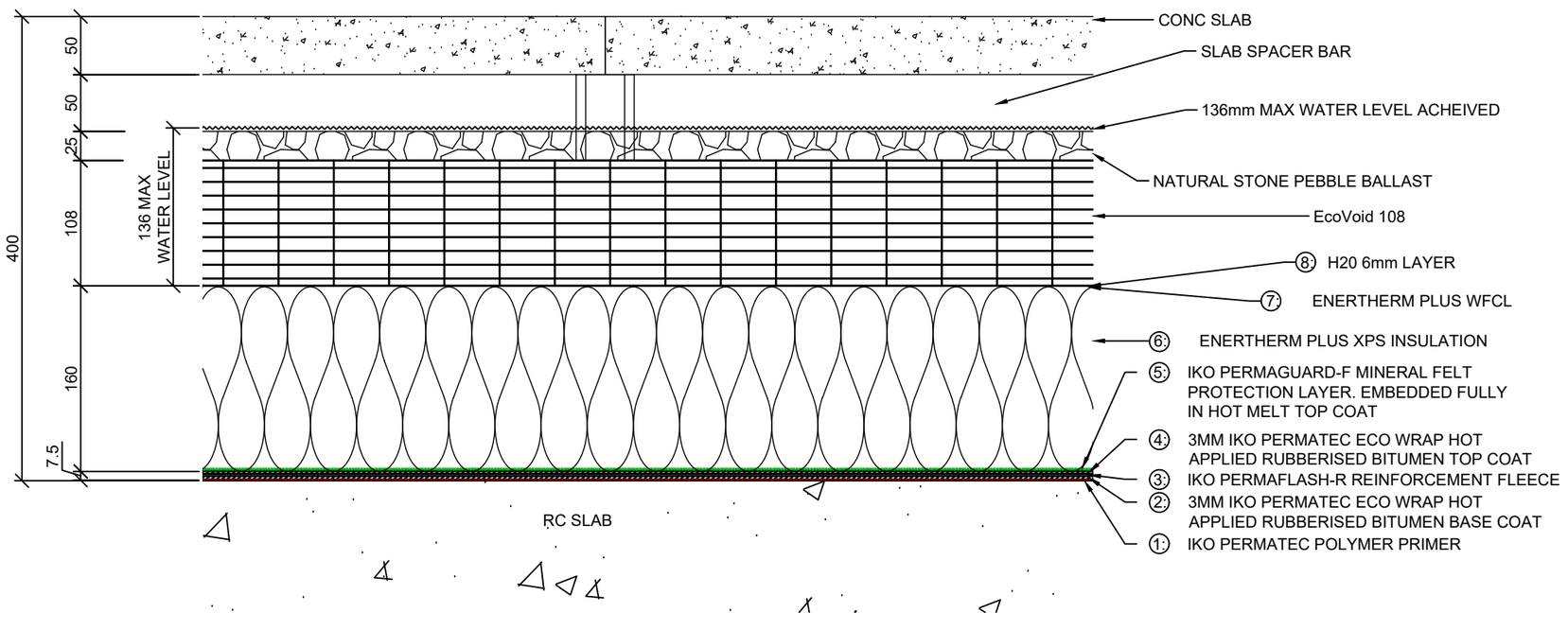
LVL 6 BLUE ROOF BUILD UP



.\Water Levels info.jpg

LVL 6 BLUE ROOF BUILD UP TO WALKWAYS

MINIMUM WEIGHT OF 160kg/m2 THROUGH SLABS/BALLAST TO BE MAINTAINED



C02	CONSTRUCTION RECORD	07/11/25
C01	ISSUED FOR CONSTRUCTION	28-04-25
P01	ISSUED FOR COMMENT	17-10-24

Drawing Issue Notes

CONSTRUCTION RECORD

Longworth

www.longworth-uk.com T: 0845 634 1370 E: info@longworth-uk.com

Client: WILMOTT DIXON

Project: GREENHEYS, MANCHESTER

Title:

LEVEL 06 BLUE ROOF SPECIFICATION

Drawing Ref: GRE-LON-ZZ-06-DR-X-01001

Suitability: C02

Revision

Drawn: MM Checked: MS Scale: 1:5 @A3

A3

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Wilmott Dixon

R1968 Greenheys



IKO Permatec & Blue Roof

TECHNICAL SUBMISSION

GRE-LON-ZZ-ZZ-GD-X-00009

P01	Issued for Comment	26/09/24
C01	Issued for Construction	12/05/25
C02	Construction Record	20/11/25

CONTENTS :

Section 1 – Specification Drawing

1.1 GRE-LON-ZZ-01-DR-X-00352
1.2 GRE-LON-ZZ-02-DR-X-02001
1.3 GRE-LON-ZZ-06-DR-X-01001

Section 2 – Product Information

2.1 IKO Specification
2.2 EGR Specification

Section 3 – Product Test Data [CWCT/Warrington Fire/IFC etc]

3.1 IKO Permatec Hotmelt Technical Datasheet

Section 4 – Product Certification [BBA/3rd Party Certs etc]

4.1 IKO Permatec BBA

Section 5 – Calculations [U-Value / Static / Engineer]

Included in Specification Documents
5.1 EGR Assessment

Section 6 – Company Information & Certificates
[ISO/Environmental/Sustainability/BES6001 etc]

6.1 IKO ISO Certification

SECTION 1

SPECIFICATION DRAWING

SECTION 2

PRODUCT INFORMATION

V2.2

IKO Permatec Hot-melt J31 Specification Proposal



Project Name: Revised Greenheys Laboratory

Address:

Manchester Science Park
Manchester 15 6GZ

IKO Specification Reference Number:
SF.0044990

Project Size: 2300 m²

On behalf of: Willmott Dixon Construction Ltd, Albert Street, Oldham OL8 3QL

Date of issue: ~~02/06/2023~~ ~~13/09/2023~~ ~~31/07/2024~~ **11/09/2024**

This proposal specification is valid for 12 months from the date of issue. If the project is not completed during this period, contact should be made with IKO Technical Services Department prior to the commencement of the works.

IKO SPECIFICATION - CONTENTS

CONTENTS

IKO Contacts
- IKO Area Business Manager
- IKO Technical Department

IKO project information
- IKO System Criteria
- IKO Specification Summary
- Preliminary Notes

IKO J31 Specification Proposal
- IKO Materials
- Preparation of Substrates
- Installation of IKO Waterproofing System
- Completion of the works

Additional Notes
- Client and Contractor notes

Appendixes
- Schedule of specification issue

IKO PROJECT CONTACTS

Dominic Bourke IKO Polytec Area Business Manager

T: 07970 373465 E: dominic.bourke@iko.com

IKO Technical department
Prospect Quarry
Grangemill
Matlock
DE44BW

Tel:01257256888

Email: gmtechnical@iko.com

The **IKO Permatec** system must be installed by operatives whom have undertaken and passed the **IKO Permatec** product induction programme and must carry an IKO Registered Installer Card.

A list of Registered Installers of the **IKO Permatec** system is held by your local IKO Business Manager

IKO SYSTEM CRITERIA

WATERPROOFING

IKO Permatec Hot-melt System: IKO Permatec is a hot applied monolithic waterproofing membrane, for use as a waterproofing layer in flat (including zero pitch), inverted, pedestrian access and other protected roofs with limited access.

The waterproofing system specified meets the minimum performance criteria as listed below:

- **Independent approval:** BBA certificate number 03/4009
- **Durability statement: IKO Permatec** Hot-Applied Monolithic Membrane Roofing System, when protected and subjected to normal service conditions, will provide an effective barrier to the transmission of moisture for the design service life of the roof in which it is incorporated.
- **NHBC standards:** installed, used and maintained in accordance with IKO recommendations and to NHBC Standards Chapter 7.1 Flat Roofs and Balconies.
- **Fire performance:**
  - Contact Technical Services
- **Manufactured:** all components manufactured within the UK
- **Installation: IKO Permatec** Hot-melt Liquid Waterproofing System
- **System components:** should be sourced through IKO including
  - IKO Permaguard-F
  - IKO Permaguard-PB
  - IKO Permaguard-M Torch-On (T-O)
  - IKO Enertherm PLUS Insulation & IKO Enertherm PLUS WCL
  - IKO Etherm Upstand Insulation Board
  - IKO Adhesives & primers
  - IKO Rainwater outlets
- **Approved Contractor:** Installing contractor must be IKO Approved to install **IKO Permatec**
- **Registered Installer:** the installer must carry a current and valid **IKO Permatec** hot melt Registered Installer Card

GUARANTEE

An IKO guarantee is available on this project and includes the following and is subject to:

- **On Site Monitoring:** inspected during the roofing works by an **IKO Technical Engineer**
- **Site Installation Reports:** A written and photographic record of each inspection undertaken by an **IKO Technical Engineer** to which is copied to the installing contractor and the client's representative.
- **Inspection and Sign Off:** by an **IKO Technical Engineer** upon completion to ensure the roofing works have been completed in accordance with this specification.
- **Guarantee: 25 year Single point guarantee** covering:
  - IKO Waterproofing material failure
  - IKO Specification and Design
  - Workmanship underwritten by the installing contractor
  - IKO Approved Contractor insolvency

IKO SPECIFICATION PROPOSAL - SUMMARY

Note: This table provides an outline summary of the proposed specification for this project. It is not intended to be fully comprehensive and must be read in conjunction with the full specification proposal.

ROOF AREA NAME	**Cold RT01-01 – No insulation – Plant area**
IKO SYSTEM COMPONENTS	**IKO Waterproofing system components and requirements**
Substrate	New Concrete Cast In-situ designed in accordance with BS6229.2018
Substrate Preparation (where required)	**IKO Permascreed –** Mastic Asphalt screed to level out uneven surfaces or create falls as required
Priming	**IKO Permatec Polymer Primer**
Waterproofing System	**IKO Permatec incorporating Permaflash-R reinforcement**
Protection Sheet	**IKO Permaguard-PB** to flat / **IKO Permaguard-M T-O** (exposed up-stands)
Surface Finishes	Paving on spacers and Gravel Ballast (20-40)

ROOF AREA NAME	**Inverted RT02-01 & RT6-01 - Inverted Blue Roof -Water Attenuated**			
IKO SYSTEM COMPONENTS	**IKO Waterproofing system components and requirements**			
Substrate	New Concrete Cast In-situ designed in accordance with BS6229.2018			
Substrate Preparation (where required)	**IKO Permascreed –** Mastic Asphalt screed to level out uneven surfaces or create falls as required			
Priming	**IKO Permatec Polymer Primer**			
Waterproofing System	**IKO Permatec incorporating Permaflash-R reinforcement**			
Protection Sheet	**IKO Permaguard-F/ IKO Permaguard-M T-O** (exposed up-stands)			
Insulation To Field Area	**IKO Enertherm XPS PLUS**			
	Thickness:	**160mm**	**U-Value**	**0.16 W/m²K**
WFRL	**IKO Enertherm PLUS WCL**			
Upstand Insulation (where required)	**IKO Etherm XPS Upstand Board & IKO Etherm MW Upstand Board** (non-combustible)			
Surface Finishes	Blue Roof - Ballast (20-40) & Paving			

PRELIMINARY NOTES

All reasonable care has been exercised in the undertaking of this specification to make it as comprehensive as possible. However it is not uncommon for situations on site to arise that may not have been immediately apparent and/or have been unforeseen during any survey. Such situations should normally be covered by way of a contract contingency sum allowance to provide protection to all contract parties against what may be termed a risk item. In the event such a 'risk' occurs on this project, it should be treated as a contract variation and be valued in accordance with the stipulated contract terms.

Installation

- All works must be undertaken in accordance with the IKO Specification, current Building Regulations, British Standards Code of Practice to provide a sound and secure, free draining and completely watertight waterproofing system. These include, but are not limited to:
  - BS 6229 - Flat roofs with continuously supported coverings.
  - BS 5250 - Code of practice for control of condensation in buildings.
  - BS EN 1991-1-4 Eurocode 1 - Actions on structures. General actions. Wind actions.
  - BS EN 12056-3 - Gravity drainage systems inside buildings. Roof drainage, layout and calculation.

Substrates

- Substrates to receive IKO Permatec waterproofing system should be in accordance with BS6229.2018
- Allowance should be made to remove any backfalls, hollows, depression or deflections which prevent effective drainage prior to the application of the first layer of waterproofing.

Drainage

- Drainage must be secure, free draining and weathertight at all times.
- Protect outlets and apertures from ingress of debris and remove protection to outlets during non-operating periods.
- Ensure rainwater outlets are adequately sealed and connected to the pipework.
- All rainwater outlets and drainage should be checked upon completion of the works to ensure that they are free flowing.

Construction and weight loading

- Any retained components from the existing structure must be sound and capable of accepting the imposed loading of the new waterproofing system and associated installation procedures. This should be confirmed by a suitably qualified person or structural engineer.

Suitability of substrate and adhesion test

- Must not impair waterproofing integrity.
- Adhesion tests should be undertaken by the installing contractor at locations over the whole area to ensure all areas are suitable for the application.
- A record of all test samples should be logged throughout the application process.

Use of building boards with A1 or A2 fire classification in flat roof applications

- The NFRC, SPRA and LRWA have worked with relevant manufacturers to produce a guidance document about the use of building boards with A1 or A2 reaction to fire classifications (formerly referred to as non-combustible and of limited combustibility, respectively) as structural flat roof decks; structural

abutment wall upstands (including parapets); and acoustic mass layers, thermal barriers, cover boards and/or recovery boards in flat roof overlays. Some of the materials being considered do not have third-party approvals for their proposed flat roofing application(s) and, in some cases, LABC Warranty, NHBC Warranty, Premier Guarantee and Zurich Municipal projects have advised against the use of such materials completely. The aim is to ensure that the correct guidance is available to respective members and specifiers, thereby preventing misleading and inappropriate product claims.

- By changing a material specification to include alternative components, the authorising party assumes design liability for the construction. There is a duty of care on the part of the designer* to ensure that any alternative components are ft for purpose; compatible with other components; and approved for use by all manufacturers and suppliers who would issue a warranty for the flat roofing system and/or its components, which otherwise may become invalid.
- Based upon the literature and test reports supplied by relevant manufacturers of building boards with A1 or A2 reaction to fire classifications, the following table's traffic light system indicates the flat roofing applications in which such products should not be used; may be used; or where caution should be exercised. The traffic light system and subsequent explanatory text are for guidance only. Designers, specifiers and contractors should request third-party approvals and/or written clarification from a manufacturer or supplier to confirm their products' suitability for use in a given flat roofing application prior to writing or changing a material specification. A detailed questionnaire is available in Annex 1. NB. At the date of publication, no contribution to this guidance document has been made by any manufacturers or suppliers of Calcium Silicate building boards.

Application	**Calcium silicate**	**Cement bonded particleboard**	**Fibre cement**	**Gypsum (mat reinforced)**	**Magnesium oxide**
Structural flat roof deck	🔴	🟠	🔴	🔴	🔴
Structural abutment/parapet	🔴	🟠	🔴	🔴	🔴
Acoustic mass layer	🔴	🟢	🟢	🟢	🟠
Thermal barrier	🔴	🟢	🟢	🟢	🟠
Cover board	🔴	🟢	🟢	🟢	🟠
Recovery board	🔴	🟢	🟢	🟢	🟠
	🔴 should not be used.	🟠 caution should be exercised.		🟢 may be used	

- While researching the guidance document, it became apparent that the names of the different types of building boards with A1 or A2 reaction to fire classifications are often abbreviated, used interchangeably and/or used incorrectly. For example, one may refer to a 'Cement' board, which creates confusion as to whether they are referring to a Cement-Bonded Particleboard or Fibre Cement

board. When working with such building boards, the reader is advised to clarify the exact type to avoid confusion and potentially incorrect specification.

Upstands, sills and thresholds

- All waterproofing to upstands, sills and thresholds must achieve a minimum height of 150mm above the finished roof level. The finished roof level is the top surface such as ballast, paving slabs, decking etc.
- Attention should be paid to window sills and door thresholds, brick and rendered upstands, cladding and tile abutments, plant and roof-light kerbs, pipes, retained fixed guardrails etc.
- On balconies and terraces with designed accessible thresholds a 75mm waterproofing upstand above the main water shedding layer to a cill is acceptable where the design meets NHBC standards and IKO requirements.
- IKO cannot take responsibility for water ingress over waterproofing details below the minimum height. See BS 6229.2018 for information on minimum height requirements.

DPCs and cavity trays

- All DPC/cavity trays must be a minimum 150mm above the finished roof level and above the termination of the waterproofing detailing.

Glazing and Roof-lights

- Waterproofing upstands to glazing and roof-light kerbs must achieve a minimum height of 150mm above the finished roof level.

Site storage

- Permaflash-R must be stored under cover in dry conditions and must not be installed if wet or damaged.
- Permaflash-D150 and D500 must be stored under cover away from direct sunlight.
- Adhesives and liquid products must be stored between 5 and 30°C and out of direct sunlight. Application performance will be improved if stored above 10°C before use.

Temporary weathering

- Day/night joints must be applied to all relevant details where the insulation/waterproofing integrity may be compromised due to the progress of the works or inclement weather.

Weather conditions

- Do not undertake the works in poor weather conditions, where the wind speeds are in excess of 7m/s or temperatures are below 0°C.
- Works in severe or continuously wet weather conditions should be suspended unless an effective temporary roof is provided over the working area.
- Progress of the works is to be organised to maintain the waterproofing integrity of the new system.

Waterproofing protection

- No solvents or other chemicals which could damage the waterproofing should be allowed to come into contact with the waterproofing system.
- Ensure that finished areas are adequately protected from damage by subsequent building operations and other trades.
- Failure to provide sufficient protection may result in additional works being necessary before any guarantee is issued.
- The new waterproofing must be adequately protected by the provision of paving slabs, promenade tiles etc. or other wearing surface.

- **Services, pipes, cables & lightning conductors**
- Cables should be secured with a proprietary cable fixing or cable tray system.
- Services and pipework should be positioned on a proprietary services support system.
- Lightning conductors should be secured without penetrating the installed waterproofing.

Plant & machinery

- Provide kerbs of sufficient height allowing for the proposed insulation thickness and surface finishes to ensure a waterproofing upstand to achieve a minimum height of 150mm above the finished roof level.
- Where plant items are being placed directly onto the new waterproofing system, ensure the waterproofing is adequately protected and the weight distributed sufficiently so as to not be detrimental to the waterproofing or insulation.

Prior to the application of the waterproofing

- Any hollows, depressions, deflections, back falls etc. found in the substrate must be rectified prior to installation of the waterproofing system.
- Remove all debris and sharp objects likely to damage the waterproofing membrane, and ensure the substrate is even, clean and dry.

Application of the waterproofing

- The installing contractor must use installing operatives that are competent with the use and installation requirement of the waterproofing components listed within the specification.
- Only installers who have undertaken and passed the IKO product induction programme should be undertaking the installation of the waterproofing components.

Waterproofing details

- All waterproofing details are to be formed in accordance and agreement with IKO installation recommendations. All waterproofing details should be detailed in accordance with IKO standard details or those issued by IKO as part of this specification.
- IKO cannot be responsible for any details not formed in accordance with IKO recommendations.

IKO SPECIFICATION PROPOSAL

TYPES OF COATING

J31 LIQUID APPLIED WATERPROOF COATINGS

To be read with preliminaries/ General Conditions and current IKO printed literature, including the IKO Permatec Design Guide and the IKO Permatec System Installation Guidelines.

110 **COLD ROOF COATING TO: RT01-01 – Plant area**

- Substrate: Roof slab designed in accordance with BS6229.2018. In-situ Concrete specified and produced in accordance with BS EN 206:2015 and installed in accordance with BS13670:2009 and the National Structural Concrete Specification.
  Normal Weight and Lightweight concretes are suitable substrates for Permatec. As defined in BS EN 2006:2015, Normal Weight and Lightweight concrete shall have a density of 2000kg/m^3 - 2600kg/m^3 and 800kg/m^3 - 2000kg/m^3 respectively.
  The concrete roof deck shall be finished with either a Basic or Ordinary Finish which are achieved with a Skip Float (Easy Float) or Power Float as appropriate. Decks suitable to receive **IKO Permatec** should be free from raised float marks or protruding aggregate which will cause thinning of the **IKO Permatec** system. Such blemishes will need to be ground flat prior to installing **IKO Permatec**.
  Preparation: As clauses 420, 710, 740A, 740B, 750A.
- NB: where the above conditions cannot be achieved, install minimum 10mm thick **IKO Permascreed** as a mastic asphalt levelling screed or to create drainage falls as required. As clauses 339,760B.
- Waterproof coating: **IKO Permatec Hot Melt System**. A UK manufactured hot melt waterproofing system containing a minimum of 43% recycled materials. BBA, ISO 14001 & BES 6001 Certified.
- System manufacturer: **IKO PLC**, Prospect Quarry, Grangemill, Derbyshire, DE4 4BW. Tel: 01257 256888. www.ikogroup.co.uk
- Primer reference: **IKO Permatec Polymer Primer**
  - Application: as clause 720A.
- Preliminary local reinforcement: as clause 750A.
- Coating reference: **IKO Permatec**
  - Application: As clause 722, 760A.
- Reinforcement: **IKO Permaflash-R**
- Thickness (nominal): 6mm in two 3mm coats, (incorporating reinforcement sheet) plus access protection sheet / surfacing as described below.
- Upstands and details:
  - Upstand detailing to be formed in **IKO Permatec**, as clause 770.
  - Form pitch pockets around all awkward penetrations fixed to the deck, as clause 771.
- Access Protection layer: **IKO Permaguard-PB,** 3.2mm tough protection layer. Installation as Clause 782
- Protection layer to all exposed upstands/details: **IKO Permaguard-M T-O**, A high performance torch applied SBS modified bitumen membrane with a 270g/m² polyester fibre carrier. It has a

black mineral finish on the upper surface and thermo-fusible film on the underside. Installation as Clause 781A.

- Surfacing: Gravel Ballast & Concrete Paving Slabs as denoted on the project drawings.
- Support pedestals for paving: **IKO paving support pad**. As clause 369
- Ballast: 20-40mm round washed ballast. As clause 365
- Concrete paving slabs: Minimum 40mm thick. Specified by others to the architect/landscape designers requirements as clause 370. Concrete paving slabs to be installed on to the specified proprietary paving pedestal support system. As clause 850
- Accessories:
  - New **IKO Roof Outlets** as Clause 311, set into a recess in the deck**.** Installation of the waterproofing to the outlets as Clause 772.

130 **INVERTED ROOF COATING TO: RT02-01 & RT6-01 - Blue Roof -Water Attenuated**

- Substrate: Roof slab designed in accordance with BS6229.2018. In-situ Concrete specified and produced in accordance with BS EN 206:2015 and installed in accordance with BS13670:2009 and the National Structural Concrete Specification.
  Normal Weight and Lightweight concretes are suitable substrates for Permatec. As defined in BS EN 2006:2015, Normal Weight and Lightweight concrete shall have a density of 2000kg/m^3 - 2600kg/m^3 and 800kg/m^3 - 2000kg/m^3 respectively.
  The concrete roof deck shall be finished with either a Basic or Ordinary Finish which are achieved with a Skip Float (Easy Float) or Power Float as appropriate. Decks suitable to receive **IKO Permatec** should be free from raised float marks or protruding aggregate which will cause thinning of the **IKO Permatec** system. Such blemishes will need to be ground flat prior to installing **IKO Permatec**.
  Preparation: As clauses 420, 710, 740A, 740B, 750A.
- NB: where the above conditions cannot be achieved, install minimum 10mm thick **IKO Permascreed** as a mastic asphalt levelling screed or to create drainage falls as required. As clauses 339,760B.
- Waterproof coating: **IKO Permatec Hot Melt System**. A UK manufactured hot melt waterproofing system containing a minimum of 43% recycled materials. BBA, ISO 14001 & BES 6001 Certified.
- System manufacturer: **IKO PLC**, Prospect Quarry, Grangemill, Derbyshire, DE4 4BW. Tel: 01257 256888. www.ikogroup.co.uk
- Primer reference **IKO Permatec Polymer Primer**:
  - Application: as clause 720A.
- Preliminary local reinforcement: as clause 750A.
- Coating reference: **IKO Permatec**
  - Application: As clause 722, 760A.
- Reinforcement: **IKO Permaflash-R**
- Thickness (nominal): 6mm in two 3mm coats, (incorporating reinforcement sheet) plus access protection sheet / surfacing as described below.
- Upstands and details:
  - Upstand detailing to be formed in **IKO Permatec**, as clause 770.
  - Form pitch pockets around all awkward penetrations fixed to the deck, as clause 771.

- Access Protection layer: **IKO Permaguard-F**, a 180g/m² polyester based bitumen, sand finished membrane. Installation as Clause 780.
- Protection layer to all exposed upstands/details: **IKO Permaguard-M T-O**, A high performance torch applied SBS modified bitumen membrane with a 270g/m² polyester fibre carrier. It has a black mineral finish on the upper surface and thermo-fusible film on the underside. Installation as Clause 781
- Insulation: As Clause 230 & 340. Installation as Clause 830.
- Insulation to upstands: Where required as Clauses 341A and 341B
- Water Flow Reducing Layer: **IKO Enertherm PLUS WCL** as Clause 342. Installation as Clause 831
- Surfacing: Water Attenuated - Gravel Ballast & Concrete Paving Slabs as denoted on the project drawings. **Also see notes below**
- Support pedestals for paving: **IKO paving support pad**. As clause 369
- Ballast: 20-40mm round washed ballast. As clause 365
- Concrete paving slabs: Minimum 40mm thick. Specified by others to the architect/landscape designers requirements as clause 370. Concrete paving slabs to be installed on to the specified proprietary paving pedestal support system. As clause 850

  NB: For buildings in sheltered regions or less than 10 storeys. A minimum load of 80Kg/m2 to resist wind uplift is required. This can be achieved with 50mm depth of 20 - 40mm washed rounded ballast or minimum 40mm thick concrete slabs. On buildings up to 15 storeys, the build-up above can still be used, but the perimeter must be loaded with paving slabs determined by reference to BS EN 1991-1-2: 2002. For other exposure conditions or tall buildings, specialist advice should be sought.
- Accessories:
  - New **IKO Roof Outlets** as Clause 311, set into a recess in the deck**.** Installation of the waterproofing to the outlets as Clause 772.

NOTES: Stone Ballast - 160kgs/m2 (20/40 pebbles to 100mm thick)

Paving - 160kgs/m2 (50mm paving slabs on non-adjustable pads + 25mm 15/20 pebbles)

Water attenuation - Level 6 is EcoVoid 108 blue roof. Level 2 is EcoVoid 258.

PERFORMANCE

210 **ROOF PERFORMANCE**

- General: lay the roof covering in accordance with IKO System Installation Guidelines and BS 8217 to provide a secure, free draining and completely weather tight roof.
  - Ancillary products and accessories, where not specified, to be types recommended for the purpose by IKO Technical Department.
  - Use operatives conversant in the application of Hot Melt Waterproofing systems and who have attended the IKO Specified system product induction. Submit evidence to IKO upon request.
  - Maintain a minimum of 50 % fully conversant operatives on site throughout the installation period.

230 **INSULATION**

- Requirement: Determine type and thickness of insulation and integral or separate overlay to satisfy the following criteria:
  - Thermal transmittance of roof (maximum): ***0.16 W/m²K***

  - Compressive strength of insulation (minimum) at 10% compression: 300Kpa
- Substrate surface: Suitably even, stable and robust to receive roof coatings.
- Insulation compliance: To a relevant British Standard.
- Insulation to have zero ODP and a GWP of less than 5.

PRODUCTS

310 **ANCILLARY PRODUCTS AND ACCESSORIES**

- Types: Recommended by coating manufacturer.

311A **ROOF OUTLETS**

- Manufacturer: **IKO PLC**
- Reference: **Internal clamping ring outlet**
  - Type: Vertical/Threaded Spigot
  - Product code: TBA
  - Connection size: 75mm to 150mm
  - Grate Type: Domed/Flat/Terrace grate
  - Flow Performance: See data sheet
  - Type / grade: Cast Aluminium alloy
- Accessories: Flat grate, terrace grate, extension ring
- Functional life expectancy: TBA

311B **ROOF OUTLETS**

- Manufacturer: **IKO PLC**
- Reference: **Parapet roof outlet**
  - Type: Two-way outlet
  - Product code: TBA
  - Connection size: TBA
  - Grate Type: Flat grate
  - Flow Performance: See data sheet
  - Type / grade: Cast Aluminium alloy
- Accessories: threaded adaptor
- Functional life expectancy: TBA

311C **ROOF OUTLETS**

- Manufacturer: **IKO PLC**
- Reference: **Aluminium parapet overflow outlet**
  - Type: Chute horizontal – Hot melt systems
  - Product code: TBA
  - Connection size: TBA
  - Grate Type: TBA
  - Flow Performance: See data sheet
  - Type / grade: Cast Aluminium alloy
- Accessories: TBA
- Functional life expectancy: TBA

339 **IKO PERMASCREED**

- Manufacturer: **IKO PLC**
- Product reference: **IKO Permascreed L / IKO Permascreed M / IKO Permascreed H,** as required.
  - Layer Thickness: 10-25mm / 20-40mm / 35-mm-60mm as required

NB: **IKO Permascreed** can be installed in multiple layers to achieve the desired drainage falls or surface level

340 **INVERTED ROOF INSULATION**

- Standard: To BS EN 13164.
- Manufacturer: **IKO PLC**
- Product reference: **IKO Enertherm PLUS XPS**
  - Edges: Rebated
  - Thickness: ***160mm***

NB: In the absence of industry consensus on the most appropriate fx value to adopt for inverted blue roofs, a conventional correction factor of 0.001 has been used. Should a calculation with an alternative correction factor be required, the roof designer should consider the advice relating to blue roofs in BS 6229 and the advice of blue roof experts

341A **INVERTED ROOF INSULATION TO UPSTANDS** (where required)

- Material: To BS EN 13164 with factory applied modified mortar topping
- Manufacturer: **IKO PLC**
- Product reference: **IKO Etherm XPS Upstand Board**
  - Thickness: **56mm** (including 6mm modified mortar topping)

341B **NON-COMBUSTIBLE INVERTED ROOF INSULATION TO UPSTANDS** (where required to relevant buildings)

- Material: Stonewool with calcium silicate facing board
- Manufacturer: **IKO PLC**
- Product reference: **IKO Etherm MW Upstand Board**
  - Thickness: **56mm** (including 6mm calcium silicate facing board)

342 **WATER FLOW REDUCING LAYER**

- Material: Spun bonded polyethylene geotextile
- Manufacturer: **IKO PLC**
- Product reference: **IKO Enertherm PLUS WCL**
  - Dimensions: 100m x 3.0m

365 **STONE BALLAST**

- Type: Washed, round aggregate.
- Size: Graded 20-40 mm and free from fines and sharps.
- Spread as note below but never below a minimum depth of 50mm.

NOTES: Stone Ballast - 160kgs/m2 (20/40 pebbles to 100mm thick)

369 **PAVING SUPPORT PADS**

- Type: **IKO Paving support pad**
- Material: Solid polypropylene.
- Manufacturer: **IKO PLC**
- Product reference: 32300011
  - Size: 150mm dia x 15mm height

370 **PRECAST CONCRETE PAVING SLABS**

- Type: Precast concrete, hydraulically pressed.
- Standard: To BS EN 1339:2003.
- Manufacturer: TBC.
- Product reference: TBC.
  - Colour/ finish: TBC.
  - Size: ---mm x ---mm x Min --mm.
- Support system: IKO paving support pad. As clause 369

NOTES: Paving - 160kgs/m2 (50mm paving slabs on non-adjustable pads + 25mm 15/20 pebbles)

EXECUTION GENERALLY

400 **WORKMANSHIP**

- Workmanship must comply with current industry Codes of Practice and IKO Plc specification where otherwise stated. Non-compliant workmanship will not be permitted, even if the system is watertight. The client will be told that all such faults must be remedied, before the Guarantee is issued.

410 **ADVERSE WEATHER**

- General:
  - Do not lay coverings in high winds, wet or damp conditions or in extremes of temperature unless effective temporary cover is provided over working area.

412 **INCOMPLETE WORK:**

- End of working day: Ensure IKO Permaflash-R is fully covered with **IKO Permatec** compound and not left exposed at the end of each day or if rain is expected.

415 **GENERAL WORKMANSHIP REQUIREMENTS**

- Installation of the **IKO Permatec waterproofing system** may only be carried out by trained and certified operatives registered by IKO PLC and who carry current ID badges. These should be available for inspection at all times.
- All waterproofing materials and system components must be supplied by IKO PLC, unless otherwise stated. Any sub-standard materials or un-authorised alternatives will be rejected. Any building work which is the responsibility of the roofing contractor and has a bearing on the life of the **IKO Permatec** System must be carried out by properly trained and qualified tradesmen.
- Any structural damage, peculiarities or details discovered that might affect the performance of the **IKO Permatec** system, should be reported immediately to the client's representative and IKO PLC in order that they may assist in overcoming the problem.

- It is imperative that the IKO Registered contractor conforms to the workmanship criteria as listed above.
- Where building works are to be carried out by other trades, following completion of the waterproofing, the contractor must make adequate provision for supplying protection to prevent damage to the new waterproofing.
- If any items of plant/equipment are to be situated on the finished roof, a sacrificial layer of **IKO Permaguard-M** is to be loose laid beneath. This is to extend a minimum 250mm past the point of contact on all sides. In the case of heavy items it may be necessary to introduce a load-spreading slab, please contact IKO for further advice.

420 **SUITABILITY OF SUBSTRATE** (CONCRETE)

- Surfaces to be coated:
- Firmly fixed, clean, dry, smooth, free from frost, contaminants, loose material, voids, protrusions and organic growths.
- Compatible with coating system.
- Preliminary work: Complete (including formation of upstands, kerbs, box gutters, sumps, grooves, chases, expansion joints, and fixing of battens, fillets, anchoring plugs/ strips, etc.).
- Moisture content and stability: Must not impair integrity of roof.
- The rate at which concrete dries will depend on a number of factors but is mainly affected by climatic conditions and the water/cement ratio of the mix. Normal weight concrete typically retains 5% moisture when fully cured and because lightweight concrete aggregates are pre-wetted prior to manufacture, their retained moisture content will tend to be higher. This will not have a detrimental effect on the installation of Permatec, but may result in an extended drying time.
- In-situ concrete decks should be allowed to cure to ensure the concrete has achieved its structural design strength, usually 28 days, prior to installing the Permatec. However, with the agreement of the Principle Contractor, the installation of the **IKO Permatec** system can commence earlier subject to a visual inspection and successful Peel Tests witnessed by IKO.
- Where required the falls/cross-falls should comply with drainage requirements of BS 6229:2018. **IKO Permatec** is British Board of Agrément Certified for use on zero falls decks. In order to ensure a finished zero fall and to comply with the requirements of BS 6229 (Code of practice for Flat roofs with continuously supported flexible waterproof coverings), allowance must be made in the design and construction of the structural deck for deflection, and construction tolerances.
- The presence of surface laitance (a thin layer of residue left after water evaporation) or dusting of the concrete surface will affect the adhesion of **IKO Permatec** and must be avoided. Potential causes include:-
- Premature surface moisture loss - this can occur particularly in summer months if the surface is allowed to dry out before sufficient hydration of the cement has taken place.
- Excessive Bleed Water affecting the Water/Cement ratio at the surface
- Frost shortly following placement which will affect the surface paste integrity
- Rain shortly after placement – similar affect to excessive bleed water affecting the water/cement ratio at the surface. Usually noticeable within the finished surface as dimples.
- Curing techniques can also affect the **IKO Permatec** bond and procedures involving spray- on waxes should be avoided or if used will need to be removed prior to application.

- Laitance, dusting and curing materials are usually restricted to the surface only but will need to be removed in order for the **IKO Permatec** to achieve a suitable bond. Light mechanical brushing will normally be sufficient to prepare the surface. However, in more severe cases, shot blasting or scabbling will be required.
- Before priming and application of the membrane, the substrate shall be clean and dry, free from surface water, ice, snow or frost, dust, dirt, oil, grease, curing compounds or any foreign matter detrimental to the adhesion of the hot applied rubberised bitumen system.
- Voids, cracks, holes, honeycombs and other damaged horizontal or vertical surfaces shall be repaired before application of the membrane.
- The contractor shall review all surfaces to receive the membrane and report any discrepancies prior to installing the waterproofing system.
- The deck surface should be thoroughly primed with **IKO Permatec Polymer Primer** and allowed to dry before installing the Permatec Hot Melt System.

ROOF COATING SYSTEM

710 **ADHESION TESTS**

- Requirement: Carry out a trial coating to determine priming requirements and/or system suitability.
- Nature of test: The contractor shall carry out a "bond" test to each roof area prepared for waterproofing, by applying **IKO Permatec** hot rubberised bitumen to the deck to test for proper adhesion. This must be carried out strictly in accordance with the manufacturer's requirements, as set out in the **IKO Permatec** System Installation Guidelines.
- Test results: Submit and arrange for inspection.

720A **PRIMER**

- Application: **IKO Permatec Polymer Primer** is brushed, or roller applied uniformly to all concrete, brickwork or blockwork surfaces, receiving the new waterproofing, avoiding excessive application. Ponding of the primer is not recommended. Primer not usually needed on Plywood or Permascreed.
- The primer shall be thoroughly dry before applying the hot **IKO Permatec** hot melt coating. A peel/ adhesion test of IKO **IKO Permatec** hot-melt is recommended, see 710.

722 **MEMBRANE APPLICATION TO DETAILS**

- It is generally recommended that the **IKO Permatec** waterproofing should be applied to structural details first i.e. upstands, outlets, penetrations, etc. before the main deck area is waterproofed.

740A **JOINTS / CRACKS IN SUBSTRATE**

- Cracks less than 3.0mm wide - No specific preparation required
- Structural Joints 6-12mm / Shrinkage Cracks 3.0mm-6.0mm - Reinforcement Strip: **IKO Permaflash-D150** reinforcement bonded centrally over the crack/joint in a 3mm coat of **IKO Permatec.** Smooth out wrinkles and press into coating to exclude air. Lap joints in length, ensuring a minimum 75mm overlap.
- The **IKO Permatec** hot melt system is applied directly over the reinforcement strip as per specification.

740B **MOVEMENT JOINTS IN SUBSTRATE**

- Maximum 25mm wide gap (Maximum 50% total movement) – **IKO Permaflash-UN** bonded centrally over the movement joint gap in a 3mm coat of **IKO Permatec**. Smooth out wrinkles and press into is pressed into the expansion joint gap to form a minimum 10mm loop in the membrane. Lap joints in length, ensuring a minimum 150mm overlap fully sealed with **IKO Permatec**.
- The **IKO Permatec** hot melt system is applied directly over the reinforcement strip as per specification/IKO Instructions.

750A **PRELIMINARY LOCAL REINFORCEMENT**

- Where minor movement is anticipated or at transition joints between dissimilar materials, a strip of **IKO Permaflash-D150** should be bonded centrally over the joint in hot IKO Permatec. Smooth out wrinkles and press into **IKO Permatec** to exclude air. Lap all joints between lengths.

755 **MEMBRANE PREPARATION**

- **IKO Permatec** must be heated to the recommended application temperature in a purpose made Hot-melt melter, which ensures the uniform heating of the membrane. The melter must be equipped with a temperature gauge so the melter operator can continually monitor the temperature of the **IKO Permatec**.
- A mechanical sweep agitator within the melter keeps the melted material moving, further ensuring the uniform transfer of heat.
- The safe operating temperature for **IKO Permatec** ranges from 160°C to 180°C. Temperatures in excess of 190°c must be avoided.

760A **APPLICATION OF ROOF COATINGS**

- Apply first 3mm coat of **IKO Permatec** hot melt at a working temperature of between 160°C - 180°C, evenly to the deck. This layer of coating must be lapped onto the previously installed detailing at all abutment upstands, outlets, protrusions etc., in order to achieve a monolithic coating over the entire deck area. **IKO Permaflash-R** reinforcing layer to be rolled out and bedded into the **IKO Permatec** while it is still hot, to ensure it is fully bonded and ensuring partial bitumen bleed through.
- Overlaps to be a minimum of 75mm wide, ensuring that a layer of hot melt membrane is present between the layers. No **IKO Permaflash-R** should be left exposed at the end of each working day or if rain is expected
- Apply the second coat of **IKO Permatec** hot melt at a working temperature of between 160°C - 180 °C, evenly onto the **IKO Permaflash-R** reinforcing layer to a depth of 3 mm, providing a total nominal monolithic waterproofing layer of 6 mm.
- Continuity: Maintain full thickness of coatings around angles, junctions and features.
- Rainwater outlets: Form with watertight joints as clause 722.
- Drainage systems: Do not allow liquid coatings to enter piped rainwater or foul systems.

760B **APPLICATION OF IKO PERMASCREED**

- Laying IKO Permascreed:
- Standard: To BS 8218.
- Permascreed coating:
    - Apply in bays to required thickness.

- Nominal Thickness: Grade L - 10-25mm / Grade M - 20-40mm / Grade H - 35-mm-60mm

NB: **IKO Permascreed** can be installed in multiple layers to achieve the desired drainage falls or surface level

- Separating Membrane: **IKO Glass Fibre Tissue** where it is or becomes apparent that a separating layer is required
- Successive coats where required:
  - Apply without delay.
  - Stagger joints between bays in consecutive coats (minimum): 75 mm.
- Finish: Float finished even surface, smooth and free from imperfections.
- Blowing: Pierce and make good affected areas while mastic asphalt is still at working temperature.
- Condition of contact edges of previously laid bays: Warm and clean.
- Drainage systems: Do not allow **IKO Permascreed** to enter piped rainwater or foul systems.
- Condition at completion: Free draining without back falls.

770 **SKIRTINGS/ UPSTANDS**

- Preliminary reinforcement strip: The **IKO Permaflash-D150** (if required) must first be applied at all abutments, penetrations, outlets and fixings etc before the application of the IKO **IKO Permatec** system. (Ref clause 750). For further assistance refer to the **IKO Permatec** System Installation Guidelines or contact the IKO Technical Services.
- Waterproofing application:
- First layer: **IKO Permatec hot melt membrane** applied 3mm thick up the upstands and out onto the deck a minimum of 200mm.
- Reinforcement: **IKO Permaflash-R** reinforcing sheet to be embedded into the first coat of Permatec, up the upstands, and dressed down and out onto the flat by a minimum of 150mm Laps to be a minimum of 75mm. **IKO Permaflash-R** reinforcing sheet must be applied when the **IKO Permatec** is still hot in order to ensure a full adhesion. No IKO Permaflash-R should be left exposed at the end of each working day or if rain is expected
- Second layer: IKO **IKO Permatec** hot melt applied to the deck and upstand over the reinforcement layer, 3mm thick up the upstands and out onto the deck completely covering the IKO Permaflash-R.
- Protection layer to upstands: as specified above.
- Termination Bar: Proprietary Termination Bar to be used to fix and seal the waterproofing and Protection sheet which terminates on a vertical plane and is not going to be subsequently covered by a suitable flashing. Fixings to be at a minimum 300mm centres. Mastic Sealant to be applied in a neat bead both behind and along the top edge of the termination bar.

771 **PITCH POCKET DETAIL - FIXING INSTRUCTIONS**

- Fix the metal pitch pocket former to the deck in hot **IKO Permatec** around the protrusion. The size of the pitch pocket former should be such that there is at least a 20 mm margin inside between the pitch pocket and the protrusion and be deep enough to ensure a minimum of 10 mm covering of **IKO Permatec** over the fixings.
- The metal former is secured by straps of **IKO Permaflash-D150** bonded in hot **IKO Permatec**. If necessary, mechanical fixings can also be used to secure the former
- Infill the pitch pocket with **IKO Permatec** hot melt. Depending on the size several pours may be required, leaving the **IKO Permatec** to cool each time.

- **IKO Permaguard-F** should be applied to the top and sides of the pitch pocket and bonded to the surrounding flat to complete the detail

772 **DETAILING TO OUTLETS**

- Preparation: Metal rainwater outlets, fitted with clamping rings and pebble guards are recommended for use with **IKO Permatec**. They must be securely fixed to the deck and correctly connected to down pipes. The concrete around the outlet bowl and flange should be recessed to allow the outlet to be lower than the deck surface.
- Reinforcement: Prior to the installment of the full **IKO Permatec** system, **IKO Permaflash-D500** should be bonded in hot **IKO Permatec** to the substrate and into the bowl of the rainwater outlet. **IKO Permaflash-D500** should extend at least 100mm on to the substrate. Smooth out wrinkles and press into **IKO Permatec** to exclude air.
- First layer of coating: The first coat of **IKO Permatec** is then applied followed by the **IKO Permaflash-R** which should be embedded into the **IKO Permatec** whilst it is still hot. The **IKO Permaflash-R** should be continued into the bowl of the outlet.
- Second layer coating: The second coat of **IKO Permatec** is applied as soon as possible and must fully cover the **IKO Permaflash-R** reinforcement. Spread evenly, the second coat is also applied at a nominal thickness of 3mm. No **IKO Permaflash-R** should be left exposed at the end of each working day or if rain is expected
- Protection layer: The second coat of **IKO Permatec** must be covered by the **IKO Permaguard-F** protection layer as quickly as possible ensuring that the protection sheet is dressed sufficiently into the bowl of the outlet so to be trapped beneath the clamping ring.
- Completion: Fix and secure the clamping ring and grille.

780 **ACCESS PROTECTION LAYER (COATING PROTECTION)**

- Location: All areas except exposed details/upstands
- Material: **IKO Permaguard-F** a 180g/m², polyester based bitumen membrane, access/protection sheet to be rolled into the second layer of **IKO Permatec** hot melt coating while it is still hot.
- Laps: All laps to be a minimum of 75mm and properly sealed by ensuring that there is hot melt bitumen within the overlaps.

781 **COATING PROTECTION (UPSTANDS/DETAILING)**

- Location: All exposed Upstands and details.
- Material: **IKO Permaguard-M T-O** Protection layer to all exposed upstands/details: **IKO Permaguard-M T-O**, A high performance torch applied SBS modified bitumen membrane with a 270g/m² polyester fibre carrier. It has a black mineral finish on the upper surface and thermo-fusible film on the underside.
- To be applied by controlled torch application directly on to the second layer of **IKO Permatec** hot melt coating.
- Laps: All laps to be 75mm and torch sealed, ensuring there is a continuous extrusion of bitumen from all laps.

782 **TOUGH ACCESS PROTECTION LAYER (COATING PROTECTION)**

- Location: RT01-01 Cold plant deck Area. To the flat.
- Material: **IKO Permaguard-PB** a 3.2mm thick protection board, fabricated with a bituminous core and glass fibre reinforcement. It exhibits high strength, excellent puncture resistance and non-compressive nature.
- Installation: Installed into the second coat of Permatec Compound whilst it is still hot. Boards must be tightly butted and joints sealed with hot Permatec compound applied with a wide blade scraper.
- Product Code: 00910004 Board Weight: 7.3Kg Board Width x Length 1.22m x 1.22m

SURFACING

830 **LAYING INVERTED ROOF INSULATION**

- Preparation: Clear roof of other trades.
- Condition of substrate: Clean.
- Setting out: Loose lay insulation to brick pattern with staggered joints. Minimize cutting and avoid small pieces at perimeters and penetrations.
- Joints: Butt together.
- Projections, upstands, rainwater outlets, etc: Cut insulation cleanly and fit closely around.
- Completion: Boards in good condition, well-fitting and stable with no springing or rocking. Cover to prevent wind uplift and flotation as soon as practicable.

831 **WATER FLOW REDUCING MEMBRANE**

- Setting out: To be rolled out loose over the Insulation. The material should be dressed up all upstand abutments and details to the height of the surfacing.
- Laps: The material is to be lapped a minimum of 300mm.
- Surface finishes should be applied immediately after the vapour permeable water control membrane to ensure it is secure against wind uplift and physical damage.

840 **LAYING BALLAST**

- Gravel guards: Fit to outlets.
- Condition of substrate: Clean.
- Application: Do not pile to excessive heights. Spread evenly.
- Depth (minimum): 50mm.

845 **PROPRIETARY PEDESTAL SUPPORTS**

- Product ref: 32300011 – As clause 369
- Placement -
- Uninsulated areas: directly on to the **IKO Permatec** system
- Inverted insulation: directly on to water flow reducing layer / vapour permeable water control layer.
- Water attenuated areas: Over the water storage crate system in accordance with suppliers' guidance.
- Installation: Please refer to the manufacturer's technical literature and guidelines.

850 **LAYING PRECAST CONCRETE PAVING SLABS** – On spacers

- Condition of substrate: Clean
- Support: Slabs to be laid on the IKO proprietary support pads, adjusted in accordance with the manufacturer's recommendations to ensure a flush, level finished surface.
  - Setting out: Minimize cutting.
  - Joints: Open
  - Width: 5mm (as determined by the proprietary supports)
- Completion: Slabs must be level and stable. .

COMPLETION

910 **INSPECTION**

- Coating surfaces: Check for discontinuities.
- Defective areas: Apply another layer of coating and protection layer.
- Interim and final roof inspections: This is a requirement for guarantee and must to be carried out in strict accordance with the manufacturer's requirements. It is the responsibility of the approved contractor to advise the IKO Technical Engineer when the roof is ready for the Final Inspection.
- As part of the guarantee requirements, **all project starts** and/or pre-start meetings must be notified by the installing contractor a minimum of 10 working days before the project starts to customersupport@iko.com. Failure to notify IKO may invalidate any guarantee offer.
- The final inspection of the waterproofing and the Electronic roof integrity test (refer clause 920) must be carried out and approved by IKO prior to any subsequent coverings being installed. This is mandatory for the issue of the guarantee.
- Please also refer to preliminaries / general conditions.

920 **ELECTRONIC ROOF INTEGRITY TEST**

- Required for all buried waterproofing roof finishes.
  - Including green/blue roofs podiums, terraces and walkways where the waterproofing is in an inverted or buried application.
- Testing authority: **RAWTA (The Roofing and Waterproofing Test Association) or one that is recognised by IKO.**
- Timing of test: Upon completion of waterproofing, prior to insulation/finishes being applied. NB: for build-ups incorporation Foamglas t3+ insulation, testing is carried out on the Primary Waterproofing layer prior to the installation of the insulation.
- Condition of roof prior to testing:
  - Complete to a stage where integrity can be tested.
  - Surface: Clean.
- Test results and warranty: Waterproofing tested and PASSED to be confirmed within the report. Submit on completion of testing to IKO technical services department. Test report to provide no breaches within the waterproofing.

940 **COMPLETION**

- Roof areas: Clean and cleared
  - Outlets: Clear
  - Work necessary to provide a weathertight finish: Complete.
  - Storage of materials on finished surface: Not permitted.
  - Completed membrane: Do not damage. Protect from chemicals, traffic and adjacent or high level working. Provide protection from follow on trades.
  - Reduce access to the roof from all parties not associated with its installation, inspection or maintenance.
- Protection:
  - Protect the roof during the installation process and upon completion roof areas are adequately protected from damage by subsequent building operations.
  - The roof is not used as a working platform unless fully protected to the satisfaction of the CR.
  - No petroleum based solvents or other chemicals harmful to bitumen are allowed to come into contact with the roof surface.
  - No building materials are stored on the roof.
  - Prevent unauthorised access to the roof upon and after completion.
  - Provide a detailed risk assessment and method statement to any person accessing the roof within the term of the guarantee.
  - Ensure no unauthorised works to or affecting the waterproofing is undertaken without prior written consent from the guarantor.
- Final Inspection: IKO technical engineer to undertake a final inspection of the completed waterproofing, prior to the issue of the guarantee.

950 **GUARANTEE**

- Guarantee Period: 25 Years
- IKO will provide a guarantee upon satisfactory completion of the waterproofing works covering IKO waterproofing material failure, workmanship by the installing contractor and details designed or approved by IKO, subject to the works being undertaken by an IKO Approved contractor and installed by operatives whom have undertaken and passed the IKO product induction and the works completed in accordance with IKO recommendations.
- Guarantee application: to be made by the installing IKO contractor to customersupport@iko.com
- Guarantee issue: IKO guarantees to be issued to the installing contractor upon satisfactory completion.

ADDITIONAL NOTES

Specification

- All works are to be installed in accordance with the IKO Specification and recommendations, by an IKO Approved Contractor for the specified waterproofing system.
- Installers must be competent in the installation requirements of the system specified.

Materials

- Manufactured and marketed by IKO. www.ikogroup.co.uk
- Only materials within this specification and supplied by IKO will be covered by the IKO guarantee.
- Any system component that is used for this project that is not supplied or approved by IKO, will not be covered by the IKO guarantee, and will either be an exclusion within it, or the guarantee offer will be reduced or withdrawn.

Specification

- IKO specification must be followed.
- A copy of the IKO specification must be held on site by the installing contractor.
- IKO waterproofing details must be followed.
- Where this document is to be included within the clients/client's representative own specification documentation, a copy of such document must be forwarded to IKO Technical Services Department for final approval before commencement of the works.

Specification variations

- The appointed installing contractor must ensure that the waterproofing specification proposal meets the clients brief, is fully compliant with Building Regulations requirement and that the proposal meets the project requirements.
- IKO must be notified where any element of the proposed specification does not meet the project requirements. IKO will not be held liable for any design undertaken outside the scope of this proposal.
- Any element of the IKO specification that is not followed or changed without prior written consent from IKO, will constitute that under CDM they will become the designer and take responsibility for the design of waterproofing. This will include compliance with the Approved Documents of the Building Regulations, specifically relating to fire performance and thermal performance.
- Any changes made to the IKO specification before or during the undertaking of the works must be bought to the attention of IKO and the client/client's representative immediately.
- Variations to this proposal must be agreed in writing, by both the client's representative and IKO technical department. Where this has not been notified and agreed in writing, then the IKO guarantee offer may be withdrawn.
- Any costs incurred or saved due to variations must be agreed by all parties and the work not undertaken until agreed by all parties.

Workmanship

- IKO Contractor is responsible for their workmanship and the installation of the waterproofing materials throughout the term of the guarantee.

Installation

- Must be undertaken by a competent person who is familiar with the correct application techniques required to install the waterproofing system components in accordance with IKO recommendations.
- The works must comply with the requirements of the Health and Safety at Work Act and specific requirements as set out by the client. All risk assessments and method statements must be undertaken and recorded by the installing contractor.
- Before the works commence, the installing contractor should ensure that the surfaces to receive the new waterproofing system are acceptable and that the specification conforms to the clients requirements.
- Allowance should be made by the installing contractor for the extent of, volume and degree of difficulty in stripping and removal from site the existing waterproofing and associated build up.
- Any retained components from the existing structure must be sound and capable of accepting the imposed loading of the new waterproofing system and associated installation procedures.
- Where the installation has been undertaken that is not in line with either IKO recommendations or that of good practice, these items will not be covered by the IKO guarantee.

Applying for the guarantee

- Application for the guarantee is made by the IKO Contractor by completing the guarantee application form and forwarding to customersupport@iko.com The guarantee will then be forwarded to the IKO Contractor for forwarding to the client.

Cover flashings

- All cover flashings and the sealants used within the chase are seen as items that require maintenance within the term of the guarantee. As such these items are not covered as part of the guarantee.

Maintenance

- Maintenance must be undertaken in accordance with the terms of the guarantee.
- The waterproofing must be protected from any follow-on trades or other works that may affect the waterproofing.
- Once completed, access will be required for future inspections and maintenance. Maintenance of drainage outlets, plant items and services etc. will be required to ensure the long-term performance of the waterproofing system.
- The client is to ensure safe access is provided to allow maintenance.
- Unauthorised access should be prevented from all parties not associated with the installation of the waterproofing, inspection or maintenance.
- Designated walkways should be provided for maintenance and means of escape.
- Provide a detailed risk assessment and method statement to any person accessing the area within the term of the guarantee.
- Ensure no unauthorised works to or affecting the waterproofing are undertaken without prior written consent from the guarantor. Approval from the guarantor must be confirmed prior to any works being undertaken.
- No solvents or other chemicals harmful to the waterproofing system should be allowed to come into contact with the waterproofing.

Construction (Design and Management) Regulations 2015

- The Construction (Design and Management) Regulations (CDM) are the main set of regulations for managing the health, safety and welfare of construction projects, and are designed to help workers, contractors, designers and clients of construction businesses to plan and manage health and safety.
- CDM applies to **all** building and construction work and includes new build, demolition, refurbishment, extensions, conversions, repair and maintenance and includes all projects including domestic client projects
- The responsibilities of the client with legal duties under CDM include but are not limited to the following:
  - Appointment of a principle designer and principle contractor
  - Ensuring there are arrangements in place for managing and organising the project
  - Providing information to and communicating with the designer and contractor
  - Ensuring there is a written construction phase plan
  - Keeping a health and safety file, after the project is completed
  - Protecting members of the public, including all employees
  - Making sure all persons have the right skills, knowledge, training and experience
  - Making sure certain projects are notified to the HSE
- Refer to HSE guidance **Managing health and safety in construction – Construction (Design and Management) Regulations 2015 – (L153)** on the legal requirements for CDM 2015.

Health & safety guidance notes

- The Contractors nominated in conjunction with this specification must be approved to install IKO materials specified and therefore will be in possession of the Health & Safety data sheets relating to any hazardous products manufactured and marketed by IKO which have been included within this specification.
- It is assumed that the Contractor/s will be working to the guidelines of the relevant British Standard Codes of Practice (in particular BS 8000: 1989) and that relevant Health & Safety information will be obtained from the manufacturers of any components which are not manufactured by IKO.

Risk assessments and method statements

- Works must comply with the requirements of the Health and Safety at Work Act and any additional requirements of the Client.
- The contractor must ensure that the works are carried out in accordance with a written method statement for the project, which should be based on a project specific risk assessment. Prior to commencing work, the contractor must liaise with the client or building occupier to establish the nature of any hazards which exist and agree a system of work for adoption in accordance with health and safety requirements.
- In addition to the normal hazards associated with working at height and hot works, we recommend that particular attention be paid to the following aspects, although this list is not intended to be exhaustive, contractors and specifiers must assure themselves that all potential risks have been accounted for.
  - **Safe2Torch** – The installing contractor is to ensure they follow the Safe2Torch guidelines that are available from the NFRC.
  - **Gas flues** – determine whether flues are live, and if so establish working methods to ensure that flues are not covered or obstructed in any way.

- **Microwave transmitters** – establish safe working methods to prevent personnel from being exposed to microwave radiation.
- **Air Intakes** – precautions should be taken to prevent the ingress of fumes from the waterproofing works entering the building.

Rooflights/openings

- The Construction (Design and Management) Regulations places a duty on designers and specifiers to give proper consideration to eliminating or reducing risks at the design stage.
- The contractor for the works is required to provide a risk assessment and method statement for the safe working of personnel around rooflights and openings.
- HSG 33 *health and safety in roof work* draws attention to the responsibilities of those specifying rooflights and designers should consider the following:
  - Specifying rooflights that are non-fragile.
  - Fitting rooflights designed to project above the plane of the roof and which cannot be walked on (these reduce the risk but they should be capable of withstanding a person falling onto them)
  - Protecting rooflights, e.g. by means of mesh or grids fitted above or below the rooflight.
  - Specifying rooflights with a design life that matches that of the waterproofing system, taking account of the likely deterioration due to ultraviolet exposure, environmental pollution and internal and external building environment.

Building Regulations

- It is the responsibility of the client or their representative to ensure compliance of the proposed specification with all relevant Building Regulations by consultation with Building Control. In the event of any doubt about the interpretation or application of the Building Regulations in relation to any particular new build or refurbishment works, clarification must be sought directly from Building Control.
- The Approved Documents of the Building Regulations (England and Wales):
  - Part B: Fire Safety
  - Part E: Resistance to the passage of sound
  - Part F: Ventilation
  - Part H: Drainage disposal
  - Part L: Conservation of fuel and power.
  - Part M: Access to and use of building
- The Building (Scotland) Regulations – Building Standards Technical Handbook
- IKO waterproofing specifications has been prepared on the basis of that to meet the current Approved Documents of the Building Regulations. Where it has been specified a thermal insulation thickness to which will not comply with current standards, it should be assumed that IKO have acted on the instruction of the client or their representative in this regard.

APPENDIXES

Project Name: Greenheys Laboratory **Date** 11/09/2024

	IKO J31 Specification document	✓					
							V2.3

Issue table:

Issue	Date Issued	Prepared By	Checked By	Revision Overview
001	02/06/2023	TD	MS	----------
002	13/09./2023	LC	ME	Cold plant area added with PB Protection Board and another roof switched to a metal panel system
003	31/07/2023	KM	ME	PB Board deleted, Water attenuation added. Switched XPS to PLUS. Extra ballast weight added.
004	**11/09/2024**	**DB**	**ME**	**Cold plant area protection layer switched back to Permaguard-PB as per original spec**

Eco Green Group

Unit 3 Rays Barn Farm Ingatestone, Essex

CM4 9EH

Project Name: Greenheys Building

Technical Submission

IKO EcoVoid Blue Roof System

258mm Blue Roof

- IKO H2O Flow Layer – 6mm
- IKO Filter Wrap
- IKO EcoVoid x 5 Layers 50mm

108mm Blue Roof

- IKO H2O Flow Layer – 6mm
- IKO Filter Wrap
- IKO EcoVoid x 2 Layers 50mm

Installers and Manufacturers: Eco Green Group

Prepared by : Kim Wilkinson
Date : 29/08/24
Rev : 00



SUSTAINABLE URBAN DRAINAGE SYSTEMS

Product Data Sheet

EGR H2O Flow 6X

Technical Data

1. Description	6mm HDPE cuspated drainage board
2. Applications	EGR H2O Flow 6X geocomposite has been designed to provide a passive venting system for gasses and liquids
3. Features	• Optimised for maximum strength and performance • UV stabilised • High crush resistance • Excellent flow rate

	Test	Unit	Mean Values		
4. Mechanical Properties – Geocomposite					
Compressive strength	EN ISO 25619-2	kPa	800		
Tensile strength (MD/CMD)	EN ISO 10319	kN/m	4		
5. Hydraulic Properties – Geotextile					
Water flor capacity in the plane (rigid/rigid)	EN ISO 12958	l/(m•s)	(i=1)	(i=0.5)	(i=0.1)
@ 20kPa			2.0	1.5	0.65
@ 100kPa			2.0	1.5	0.60
@200kPa			2.0	1.5	0.55
6. Physical Properties					
Thickness @ 2kPa	EN ISO 9863-1	mm	6		
Standard colour – Cuspate			Black		
Polymer – Cuspate			HDPE		

Notes:
a) Mean values indicate the arithmetic mean derived from the samples taken for any one test as defined in the standard – usually an overall mean of five samples. Mean values are subject to tolerances based on 95% confidence limits as published on the product CE declaration of performance

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7. Testing	All materials are tested every 6000m^2 in an UKAS accredited ISO 17025 laboratory to all mechanical properties prior to release.
8. Storage	The geocomposites are supplied in packaging designed to protect the product from damage during handling and storage and degradation as a result of UV exposure. The product should be kept in appropriate packaging until such time that it is required for installation. The product is clearly and indelibly marked with the product name along the edge of the roll at regular intervals no greater than 5m. The packaging is labelled clearly to identify the product supplied in accordance with EN ISO 10320: Geotextile and Geotextile related products – Identification on site. Use slings where provided. Product weights are given on roll tickets. Use equipment appropriate to weight and dimension. Store and handle in accordance with good occupational hygiene and safety practice.

	Unit	Values
9. Dimensions		
Standard roll length	m	100
Standard roll width	m	0.97
Approximate roll weight	Kg	100



SUSTAINABLE URBAN DRAINAGE SYSTEMS

Product Data Sheet

Filter Fleece

Product code: EGR F

Description

Filter fleece layer prevents contamination of substrate from entering the drainage components. UV stabilised and optimised for maximum strength and performance – not mass.

Composition

Nonwoven geotextile manufactured from 100% virgin polypropylene high tenacity fibres, needle-punched and heat treated

Application

Suitable for sedum, wildflower, biodiverse roofs, and podium and roof garden applications as part of an EGR system.

Fire Compliance

Product has been tested as part of a system to BS EN 13501-5:2016 and compliant to Broof(t4) classification.

Dimensions

10000 x 113mm (L x W)

Packaging

Supplied as rolls on a pallet

Technical Data	Test	Unit	Mean Values
Mechanical Properties			
Static puncture	EN ISO 12236	kN	1.4
Tensile strength (MD/CMD)	EN ISO 10319	kN/m	9.0 / 9.8
Tensile Elongation (MD/CMD)	EN ISO 10319	%	60 /65
Cone drop	EN ISO 13433	mm	32
Protection efficiency	EN ISO 13719	k/N/m^2	-
Filter Properties			
Apparent opening size	EN ISO 12956	µm	80
Water permeability V_{H50}	EN ISO 11058	l/(m^2•s)	100
Physical Properties			
Thickness @ 2kPa (nominal)	EN ISO 9863-1	mm	0.8
Standard colour			White
Polymer			100% polypropylene
Durability			
Weathering 50 MJ/m^2 (1 month)	EN ISO 12224		>90% Retained Strength
Oxidation resistance	EN ISO 13438		Predicted to be durable for service lives up to 50 years in natural soils with 4 ≤ pH ≤ 9 and soil temperatures ≤ 25˚C

Notes:

- Mean values indicate the arithmetic mean derived from the samples taken for any one test as defined in the standard – usually an overall mean of five samples. Mean values are subject to tolerances based on 95% confidence limits as published on the product CE declaration of performance.
- Nominal value (indicates an average manufacturing norm and not a controlled performance parameter)
- MD: Machine Direction (longitudinal to the roll)
- CMD: Cross Machine Direction (across the roll)
- Tensile testing is performed using extensometers.

The above information is issued in good faith and without warranty and is intended as a guide only. The information comprises typical data and does not constitute a specification.

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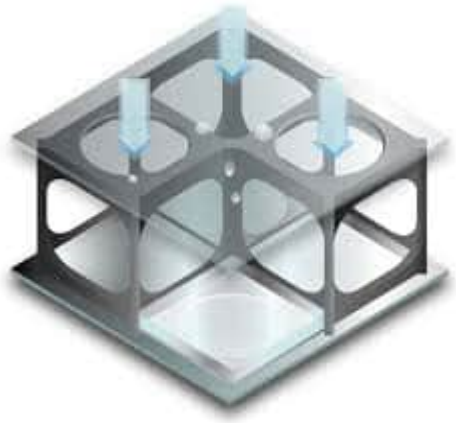


SUSTAINABLE URBAN DRAINAGE SYSTEMS

Product Data Sheet

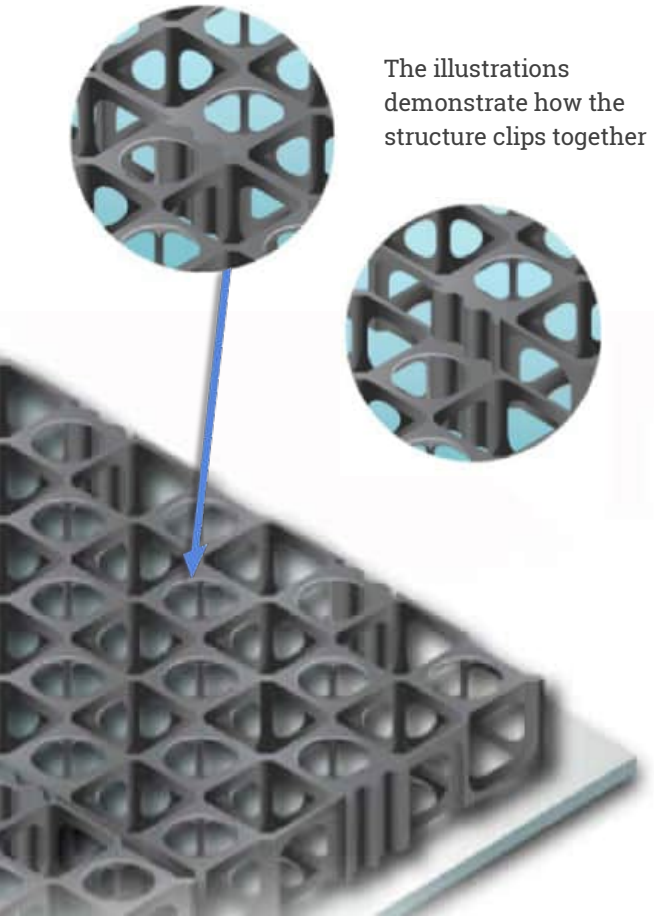
EGR EcoVoid 50

Load Bearing Blue Roof Attenuation Layer



- 3 x more permeable than stone sub-bases
- Lightweight, strong structure designed to support heavy traffic loading – including HA
- Reduces/removes stone requirements
- Unique and easy to install clipping system
- Works with and around other site installations
- Arranges exactly to project requirements

Close-up Illustrations



The illustrations demonstrate how the structure clips together

Technical Data

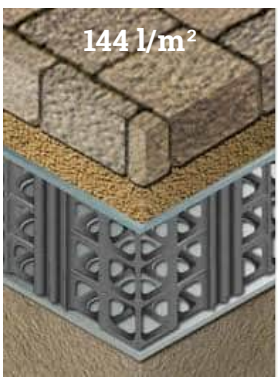
Compressive Strength (ASTM D1621)	125 T/m²
Weight (Empty)	3.5Kg/m²
Flow Rate per unit width (ASTM D1621)	180 L/min
Surface Area	96% Void
Long-term Unconfined Creep Test	42 day deadload 500 kN/m²
No displacement	No further creep

Suitable for Multi-layering

1-layer example

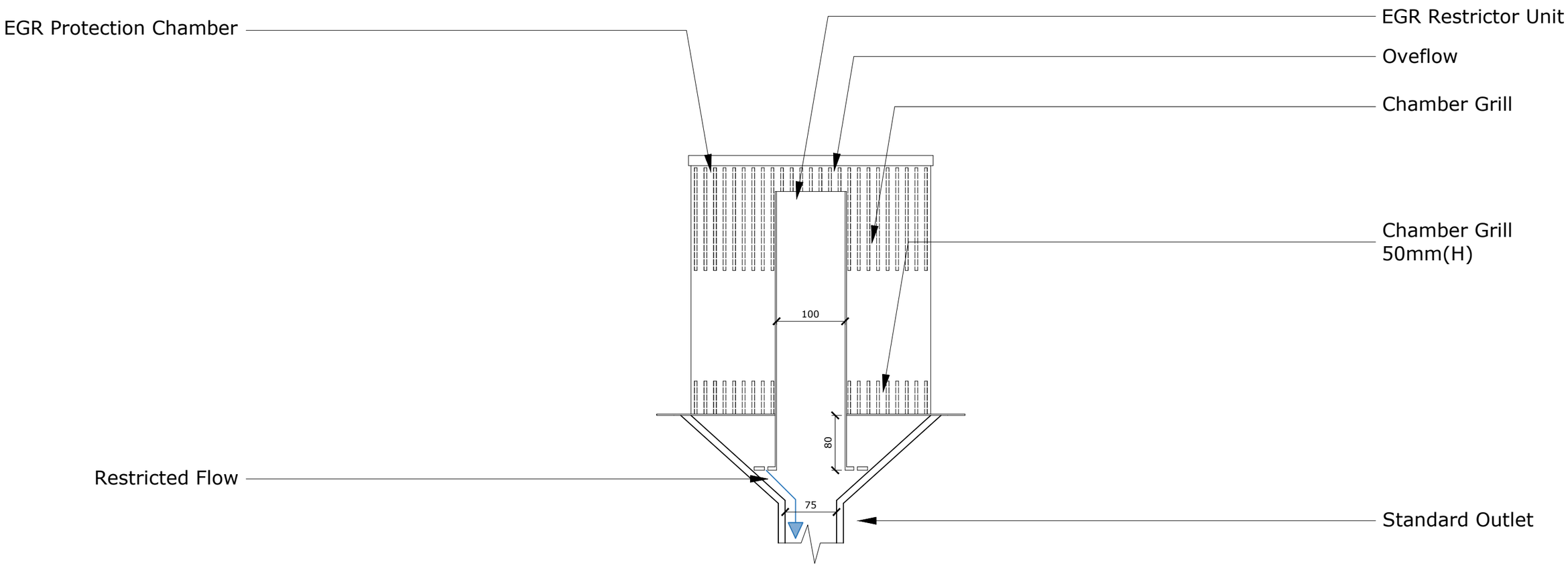


3-layer example



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DO NOT SCALE



ECO GREEN ROOFS	3 Rays Farm Barns Roman Road - Ingatestone Essex CM4 9EH		
Detail Name: EGR ALUTEC Typical Restrictor Unit with EGR Protector Chamber		Scale: 1:6@A3	Comments: -N/A
Drawing Number: EGR-001-RU-PC		Drawing Revision: 02	

Eco Green Roofs

SECTION 3

PRODUCT TEST DATA

Technical Data Sheet
October 2021

IKO PermaTEC Hot Melt Monolithic Waterproofing

Product Information

PermaTEC Hot Melt Monolithic Waterproofing Systems comprise of PermaTEC EcoWRAP or PermaTEC Anti-Root hot melt waterproofing compounds, which are specially formulated combinations of refined bitumen, synthetic rubbers, fillers and other additives, which are hot-applied in conjunction with carefully selected reinforcement/detailing fabrics and protection layers to give the ultimate waterproofing performance.

NB: PermaTEC Anti-Root is specifically designed for use in Extensive & Intensive Green Roof and Biodiverse Roof systems.

Installed by a nationwide network of Registered Installers, PermaTEC provides a fully bonded, tough, flexible, waterproof membrane for use on inverted, green, flat including completely flat protected roofs.PermaTEC is also suitable for use as a damp-proof membrane in solid concrete floors or as the waterproofing layer in a typical sandwich membrane used for above or below ground waterproofing in concrete, brick or blockwork structures.

Features and Benefits

- Hot applied system
- Suitable for zero fall roof decks
- BBA Certified No. 03/4009 (including PermaTEC Anti-Root)
- Outstanding durability – lasts the design life of the building
- Nominal membrane thickness of 6mm
- Tough and resistant to impact damage
- Excellent low temperature flexibility
- High bond strength to substrate - High tensile strength
- Homogenous and seamless
- Seamless application and rapid setting – resistant to rain, snow and frost immediately after application.
- Integral root protection. No need for separate anti root barriers. (PermaTEC Anti Root)
- Virtually no packaging to be disposed of (zero wrapper waste).

System Components

IKO PermaTEC Ecowrap Hot Melt Compound
A hot applied specially formulated combination of refined bitumen, synthetic rubbers, fillers and other additives.

Product Code	Block Weight	Blocks Per Pallet	Pallet Weight
24110080	12kg	80	960kg

IKO PermaTEC Anti-Root Hot Melt Compound
A hot applied specially formulated combination of refined bitumen, synthetic rubbers, fillers, other additives and anti-root chemicals. Used for green roof installations.

Product Code	Block Weight	Blocks Per Pallet	Pallet Weight
24116080	12kg	80	960kg

IKO PermaTEC Polymer Primer
IKO Permatec Polymer Primer is synthetic rubber based primer for use on concrete and other similar substrates prior to the installation of IKO Permatec Hot Melt Waterproofing System

Product Code	Drum Size	Coverage
24602500	25 Litres	4 m²/Litre

IKO PermaTEC High Penetration Primer
A brush or roller applied bituminous priming solution for the preparation of cementitious surfaces to receive PermaTEC monolithic membrane.

Product Code	Drum Size	Coverage
24600025	25 Litres	6-8 m²/Litre

IKO PLC, Prospect Quarry, Grangemill, Matlock Derbyshire DE4 4BW
Tel: 01257 256 888 GMtechnical@iko.com www.ikogroup.co.uk

IKO PermaFLASH-D150

A nominal 1.25mm thick flexible bitumen EPDM polymer detailing sheet which is installed as a reinforcement layer over cracks, construction joints, changes in materials and where minor movement may occur.

Product Code	Roll Weight	Roll Width	Roll Length
24150000	4.8kg	150mm	20m

IKO PermaFLASH-D500

A flexible bitumen EPDM polymer detailing sheet, which is installed as a reinforcement layer around rainwater outlets.

Product Code	Roll Weight	Roll Width	Roll Length
24500000	16kg	500mm	20m

IKO PermaFLASH-UN

A very flexible un-cured neoprene rubber reinforcement sheet for use as part of the IKO Permatec hot melt waterproofing system over construction joints and structural movement joints with a maximum width of 25mm and maximum 50% total movement. .

Product Code	Roll Weight	Roll Width	Roll Length
24600000	21kg	300mm	30m

IKO PermaFLASH-R

A 55g/ m^2 polyester reinforcement layer, installed between the two applications of PermaTEC EcoWrap or PermaTEC Anti- Root

Product Code	Roll Weight	Roll Width	Roll Length
24991000	11kg	1m	200m

IKO PermaGUARD-F

A sand surfaced 180g/m² polyester based bitumen membrane, installed as a protection layer in standard PermaTEC and PermaTEC Anti Root systems.

Product Code	Roll Weight	Roll Width	Roll Length
24010000	42kg	1m	20m

IKO PermaGUARD-M Torch On (T-O)

A high performance torch applied SBS modified bitumen membrane with a 270g/m² polyester fibre carrier. It has a black mineral finish on the upper surface and thermos-fusible film on the underside. It is installed as a protection layer to PermaTEC on exposed upstand details.

Product Code	Roll Weight	Roll Width	Roll Length
24030008	36kg	1m	8m

IKO Permaguard-HDPB (Heavy Duty)

A 3mm thick high density polymeric protection board, which is extremely tough and with high impact resistance for use in heavy duty situations. Permaguard-HDPB is installed into the second coat of Permatec Compound whilst it is still hot. Boards must be tightly butted and joints sealed with hot Permatec compound applied with a wide blade scraper.

Product Code	Board Weight	Board Width	Board Length
62530000	10.5kg	1m	2m

IKO Permaguard-PB

A 3.2mm thick protection board, fabricated with a bituminous core and glass fibre reinforcement. It exhibits high strength, excellent puncture resistance and non-compressive nature. Permaguard-PB is installed into the second coat of Permatec Compound whilst it is still hot. Boards must be tightly butted and joints sealed with hot Permatec compound applied with a wide blade scraper.

Product Code	Board Weight	Board Width	Board Length
00910004	7.3kg	1.22m	1.22m

IKO Roofgarden 4 APP AD/F

A high performance cap sheet consisting of a polyester base, coated with APP polymer modified bitumen. The bitumen coating contains a specially formulated anti-root treatment, which prevents the penetration of roots from a range of plants and shrubs. Use as the final layer in a roof garden waterproofing specification where PermaTEC Anti-root Hot Melt Compound is not adopted. It has a slate finish on the upper surface, and a thermofusible film on the underside.

Product Code	Roll Weight	Roll Width	Roll Length
01520321	43kg	1m	7.5m

IKO PLC, Prospect Quarry, Grangemill, Matlock Derbyshire DE4 4BW
Tel: 01257 256 888 GMtechnical@iko.com www.ikogroup.co.uk

Application

The PermaTEC Hot-Applied Monolithic Membrane Roofing System must be installed in accordance with the IKO System Installation Guidelines and IKO instructions on a dry and frost-free substrate. After rain or snow, the substrate must be allowed to dry before installation can commence. The installer can aid drying by any suitable means approved by the Certificate holder. Once applied, the membrane is not affected by rain, snow or frost.

To assess the suitability of an in-situ concrete substrate, bond tests must be carried out to ensure that adequate adhesion can be achieved. If bonding problems occur, advice must be sought from the IKO.

Prior to the application of the Permatec membrane, any defects in the substrate must be identified and repaired in accordance with IKO's instructions.

Cementitious substrates must be conditioned with IKO PermaTEC High Penetration Primer or IKO PermaTEC Polymer Primer and allowed to dry before application of the membrane.

The installed Permatec membrane must be covered by a protective layer immediately after installation,

Detailing must be formed in accordance with the IKO instructions.

Installation Procedure

Blocks of the Permatec compound are heated in a purpose made mechanically-agitated melter, which must be fitted with thermostats to regulate the compound temperature. .

The nominal temperature range for the molten membrane is 160°C to 180°C. The temperature of the Permatec compound should not exceed 190°C.

The molten membrane is discharged from the melter into a suitable container and applied to the roof, using a long-handled squeegee for horizontal surfaces and a suitable spreader for vertical surfaces.

At structural movement joints up to 25mm (maximum 50% total movement), PermaFLASH-UN reinforcement must be installed fully bonded in hot Permatec compound centrally over the movement joint.

At structural movement joints between 12 and 50 mm (maximum 50% total movement), a proprietary joint system must be installed. IKO should be consulted for suitable products.

At all non-monolithic changes in substrate materials, at structural/shrinkage cracks between 3 and 6 mm wide, at structural joints between 6 and 12 mm wide and where minor movement may occur, a reinforcement layer of PermaFLASH-D150 should be applied prior to applying the PermaTEC membrane.

At all board joints in plywood, calcium silicate and composite metal decks, a reinforcement layer of PermaFLASH-D150 or a minimum 150 mm wide strip of PermaFLASH-R must be applied prior to applying the PermaTEC membrane.

The first layer of the molten PermaTEC membrane should have a nominal thickness of 3 mm.

PermaFLASH-R polyester reinforcing scrim is embedded by lightly brushing it into the first layer of the membrane whilst it is still hot and tacky. The reinforcement overlaps must be at least 75 mm and fully sealed by the PermaTEC membrane.

The second layer of PermaTEC membrane, applied over the top of the reinforcement, should have a nominal thickness of 3 mm.

The membrane must be protected immediately with the specified PermaGUARD protection layer. This is carried out prior to applying the insulation, water control layer and the protective layer or other specified surface finish

Material Handling

Please refer to the IKO Safety Data Sheets available from www.ikogroup.co.uk..

Disclaimer

Whilst every precaution is taken to ensure that the information given in this literature is correct and up to date it is not intended to form part of any contract or give rise to any collateral liability, which is hereby specifically excluded.

IKO reserve the right to amend and/or withdraw this document without notice.

Intending purchasers of our materials should therefore verify with the company whether any changes in our specification, application details, withdrawals or otherwise have taken place since this literature was issued.

IKO PLC, Prospect Quarry, Grangemill, Matlock Derbyshire DE4 4BW
Tel: 01257 256 888 GMtechnical@iko.com www.ikogroup.co.uk

SECTION 4

PRODUCT CERTIFICATION

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Appley Bridge
Wigan
Lancashire WN6 9AB
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e-mail: technical.uk@iko.com
website: www.ikogroup.co.uk

BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
03/4009
Product Sheet 1

PERMATEC HOT MELT ROOFING AND WATERPROOFING SYSTEMS

PERMATEC ECOWRAP HOT MELT ROOFING SYSTEM

This Agrément Certificate Product Sheet(1) relates to the PermaTEC EcoWrap Hot Melt Roofing System, for use as a waterproofing layer in protected flat roofs (including zero fall), inverted roofs and blue roofs.

(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

Weathertightness — the system will resist the passage of moisture into the building (see section 7).

Properties in relation to fire — the use of the system can enable a roof to be unrestricted under the national Building Regulations (see section 8).

Resistance to wind uplift — the system will resist the effects of any wind suction likely to occur in practice (see section 9).

Resistance to mechanical damage — the system will accept the limited foot traffic and loads associated with installation and maintenance, and the effects of thermal or other minor movement likely to occur in service (see section 10).

Durability — under normal service conditions, the system will remain waterproof for the design service life of the roof in which it is incorporated (see section 12).

The BBA has awarded this Certificate to the company named above for the system described herein. This system 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 Seventh issue: 24 May 2019

John Albon
Chief Scientific Officer

Claire Curtis-Thomas
Chief Executive

Originally certificated on 24 September 2003

The BBA is a UKAS accredited certification body – Number 113.

The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

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

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

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Watford
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Regulations

In the opinion of the BBA, the PermaTEC EcoWrap Hot Melt Roofing System, 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:	B4(2)	External fire spread
Comment:		The system, when used with suitable surface protection, can enable a roof to be unrestricted under this Requirement. See section 8 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		The system will enable a roof to satisfy this Requirement. See section 7.1 of this Certificate.
Regulation:	7	Materials and workmanship (applicable to Wales only)
Regulation:	7(1)	Materials and workmanship (applicable to England only)
Comment:		The system is acceptable. See section 12 and the *Installation* part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Durability, workmanship and fitness of materials
Comment:		The use of the system satisfies the requirements of this Regulation. See sections 11.1 and 12 and the *Installation* part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	2.8	Spread from neighbouring buildings
Comment:		The system, when used with suitable protection, can be regarded as having low vulnerability and enable a roof to be unrestricted with reference to clause 2.8.1[(1)(2)] of this Standard. See sections 8.1 and 8.2 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The system will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1[(1)(2)] and 3.10.7[(1)(2)]. See section 7.1 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The system 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 system 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)(b)(i)	Fitness of materials and workmanship
Comment:		The system is acceptable. See section 12 and the *Installation* part of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		The system will enable a roof to satisfy the requirements of this Regulation. See section 7.1 of this Certificate.
Regulation:	36(b)	External fire spread
Comment:		The system, when used with suitable surface protection, can enable a roof to be unrestricted under the requirements of this Regulation. See section 8 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, 3.3 and 3.4) and 14 *Procedure* (14.3) of this Certificate.

Additional Information

NHBC Standards 2019

In the opinion of the BBA, the PermaTEC EcoWrap Hot Melt Roofing System, 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 7.1 *Flat roofs and balconies*.

Technical Specification

1 Description

1.1 The PermaTEC EcoWrap Hot Melt Roofing System is based on a formulated waterproofing membrane made from a combination of refined bitumen, synthetic rubbers and other additives. The membrane is applied in two layers to provide a waterproofing layer with a nominal coating thickness of 6 mm.

1.2 The membrane is used in conjunction with a range of reinforcement membranes, protection membranes and boards, including:

- PermaFLASH-R — a 55 g·m^{-2} polyester reinforcing scrim
- PermaFLASH-D150 — a 1.25 mm thick and 150 mm wide flexible detailing sheet, used as a reinforcement layer over cracks, construction joints and changes in materials, and where minor movement may occur
- PermaFLASH-D500 — a 1.25 mm thick and 500 mm wide flexible detailing sheet, used as a reinforcement at rainwater outlets
- PermaGUARD-F — a 180 g·m^{-2} sand-surfaced, polyester-based bitumen membrane protection layer
- PermaGUARD-M — a 180 g·m^{-2} slate-surfaced, high-performance torch-applied bitumen membrane protection layer for use on details which will not be covered by the surface finishes
- PermaGUARD-HDPB — a 3 mm thick high-density polymeric protection board
- PermaGUARD-PB — a 3.2 mm thick protection board fabricated with a bituminous core sandwiched between two layers of non-woven glassfibre reinforcement
- IKO PermaTEC High Penetration Primer — a brush- or roller-applied bituminous priming solution used in the preparation of cementitious surfaces prior to the application of the membrane
- IKO PermaTEC Polymer Primer — a brush- or roller-applied synthetic rubber-based priming solution used in the preparation of cementitious surfaces prior to the application of the membrane.

1.3 Other products which may be used with the system, but which are outside the scope of this Certificate, include:

- IKO Plasdrain — a range of drainage boards
- Inverted Roof Insulation Board — insulation used in inverted/protected roof specifications
- Upstand Insulation Board — insulation with a weather-resistant facing board, used for upstand detailing
- proprietary expansion joint systems
- PermaFLASH-UN — a 1.5 mm thick and 300 mm wide un-cured neoprene rubber reinforcement sheet used at construction joints and where minor structural movement is anticipated.

2 Manufacture

2.1 The PermaTEC EcoWrap compound is manufactured by heating and blending bitumen, process oils, fillers and other additives in a temperature-controlled cycle. Protection membranes are manufactured by traditional continuous coating processes, and other components of the system are purchased to agreed specifications.

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 IKO PLC has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by BSI (Certificate Q05233), BS EN ISO 14001 : 2015 by Lucideon (Certificate 24709) and BES 6001 : Issue 3.1 by Lucideon (Certificate 24703).

3 Delivery and site handling

3.1 The PermaTEC EcoWrap compound is delivered to site in 12 kg blocks covered with EcoWrap heat-dispersible film.

3.2 Reinforcing and protection layers are packaged with labels bearing the product trade name and should be stored under cover and kept dry.

3.3 IKO PermaTEC High Penetration Primer and IKO PermaTEC Polymer Primer are delivered to site in 25 litre cans.

3.4 The Certificate holder has taken the responsibility of classifying and labelling the system components under the *CLP Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures*. Users must refer to the relevant Safety Data Sheet(s).

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the PermaTEC EcoWrap Hot Melt Roofing System.

Design Considerations

4 Environmental information

4.1 The PermaTEC waterproofing membrane compound has a recycled content of 45% by mass of the total product.

4.2 The recycled materials are described as limestone filler and ground rubber crumb, the latter manufactured from post-consumer vehicular tyres. Post-consumer material is defined in BS EN ISO 14021 : 2016, and the Waste & Resources Action Programme (WRAP) '*Rules of Thumb*' Guide to Recycled Content in Construction Products.

4.3 The recycled content has been calculated in accordance with BS EN ISO 14021 : 2016 by expressing the input mass of recycled material as a percentage of the total input mass for the product.

4.4 The source and quantity of recycled material added to the product is verified by the BBA as part of post-Certification auditing.

5 Use

5.1 The PermaTEC EcoWrap Hot Melt Roofing System is satisfactory for use[1] as a waterproofing layer on flat roofs (including zero fall) with limited access in:

- inverted roof specifications
- protected roof specifications
- podium decks and walkways for pedestrian access
- blue roofs.

(1) The use of the system in green roof applications is covered by Product Sheet 3 of this Certificate.

5.2 Pedestrian access roofs are defined for the purpose of this Certificate as those not subject to vehicular traffic.

5.3 Limited access roofs are defined for the purpose of this Certificate as those subjected only to pedestrian traffic for maintenance of the roof covering, cleaning of gutters, etc. Where traffic in excess of this is envisaged, additional protection to the membrane must be provided (see section 10).

5.4 Flat roofs are defined for the purpose of this Certificate as those having a minimum finished fall of between 1:80 and 1:6. For design purposes, twice the minimum fall should be assumed, unless a detailed analysis of the roof is available, including overall and local deflection, direction of falls etc. Zero fall roofs are defined for the purpose of this Certificate as those having a finished fall which can vary between 0 and 0.7°.

5.5 Structural decks to which the system is to be applied must comply with the relevant requirements of BS 6229 : 2018 and must be suitable to transmit the dead and imposed loads experienced in service.

5.6 Imposed loads, dead loads and wind loading are calculated by a suitably experienced and competent individual in accordance with BS EN 1991-1-1 : 2002, BS EN 1991-1-3 : 2003 and BS EN 1991-1-4 : 2005, and their UK National Annexes.

5.7 Drainage systems must be correctly designed and provision made for access for maintenance purposes. Blocked drains can cause waterlogging of the drainage and soil layers, thereby increasing dead loads.

5.8 Insulation materials used in conjunction with the system must be suitable for use within inverted roofs in accordance with the manufacturer's instructions.

5.9 Additional guidance for inverted roof specifications is given in BBA Information Bulletin No 4 *Inverted roofs — Drainage and U value corrections*.

5.10 For zero fall roofs, it is particularly important to identify the correct drainage parts, to ensure that drainage is sufficient and effective. Reference should be made to the appropriate clauses of the Liquid Roofing and Waterproofing Association (LRWA) Note 7 — *Specifier Guidance for Flat Roof Falls*, which generally requires surface drainage falls in most situations.

6 Practicability of installation

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

7 Weathertightness



7.1 The membrane will adequately resist the passage of moisture into the building and enable a roof to comply with the relevant requirements of the national Building Regulations.

7.2 The system is impervious to water and will achieve a weathertight roof capable of accepting minor movement.

8 Properties in relation to fire



8.1 The system, when used in protected or inverted roof specifications, including an inorganic covering listed in the Annex of Commission Decision 2000/553/EC, can enable a roof to be unrestricted under the national Building Regulations.

8.2 The designation of other specifications should be confirmed by:

England and Wales — test or assessment in accordance with Approved Document B, Appendix A, clause 1

Scotland — test to conform to Mandatory Standard 2.8, clause 2.8.1

Northern Ireland — test or assessment by a UKAS-accredited laboratory, or an independent consultant with appropriate experience.



8.3 Exposed areas of the system, when used with one of the surface finishes detailed in Approved Document B, Appendix A, Table A5, part iii (England and Wales) and Technical Booklet E, Table 5.6, part iv (Northern Ireland) (listed below), would be deemed to be unrestricted:

- bitumen-bedded stone chippings covering the whole surface to a depth of not less than 12.5 mm
- bitumen-bedded tiles of non-combustible materials
- sand and cement screed
- macadam.

9 Resistance to wind uplift

The system will resist the effects of wind suction likely to occur in service.

10 Resistance to mechanical damage

The system can accept the limited foot traffic and light concentrated loads associated with installation and maintenance. Reasonable care should be taken to avoid puncture by sharp objects or concentrated loads. Where traffic in excess of this is envisaged, such as for maintenance of lift equipment, a walkway should be provided.

11 Maintenance



11.1 Roofs covered with the system must be the subject of annual inspections and maintenance in accordance with BS 6229 : 2018, Chapter 7, to ensure continued satisfactory performance.

11.2 Maintenance should include checks and operations to ensure that the system and drainage outlets are free from the build-up of silt and other debris, and that protection layers, eg walkways, are in good condition.

11.3 In the event of the system being contaminated by oil, grease or other chemicals, the advice of the Certificate holder must be sought.

11.4 Damage to the system must be repaired as soon as possible (see section 15).

12 Durability



The PermaTEC EcoWrap Hot Melt Roofing System, when protected and subjected to normal service conditions, will provide an effective barrier to the transmission of moisture for the design service life of the roof in which it is incorporated.

Installation

13 General

13.1 The PermaTEC EcoWrap Hot Melt Roofing System must be installed in accordance with the Certificate holder's instructions and this Certificate, on a dry and frost-free substrate. After rain or snow, the substrate must be allowed to dry before installation can commence. The installer can aid drying by any suitable means approved by the Certificate holder. Once applied, the membrane is not affected by rain, snow or frost.

13.2 To assess the suitability of a substrate to receive the membrane, bond tests must be carried out to ensure that adequate adhesion can be achieved. If bonding problems occur, advice must be sought from the Certificate holder.

13.3 Prior to the application of the membrane, defects in the substrate such as cracks, irregularities and other areas of potential weakness must be repaired using an approved repair mortar, and the substrate cleaned in accordance with the Certificate holder's instructions. Additional membrane may be used to fill minor depressions in the substrate.

13.4 Cementitious substrates must be conditioned with IKO PermaTEC High Penetration Primer or IKO PermaTEC Polymer Primer in accordance with the Certificate holder's instructions and allowed to dry before application of the membrane.

13.5 The membrane is covered by a protective layer immediately after installation, in accordance with the Certificate holder's instructions.

13.6 Detailing must be formed in accordance with the Certificate holder's instructions.

14 Procedure

14.1 Blocks of the membrane compound are heated in a mechanically agitated melter, which must have a double jacket containing either air or a heat-transfer mineral oil, and be fitted with thermometers to measure the melt and air/oil temperatures.

14.2 The nominal temperature range for the molten membrane is 160 to 180°C. The temperature of the melt must not exceed 190°C.

14.3 The molten membrane is discharged from the melter into a suitable container and applied to the roof, using a long-handled squeegee for horizontal surfaces and a suitable spreader for vertical surfaces.

14.4 At structural movement joints between 12 and 50 mm (maximum 50% total movement), a proprietary joint system must be installed. The Certificate holder should be consulted for suitable products.

14.5 At all non-monolithic changes in substrate materials, at structural/shrinkage cracks between 3 and 6 mm wide, at structural joints between 6 and 12 mm wide and where minor movement may occur, a reinforcement layer of PermaFLASH-D150 should be applied prior to applying the PermaTEC EcoWrap membrane.

14.6 At all board joints in plywood, calcium silicate and composite metal decks, a reinforcement layer of PermaFLASH-D150 or a minimum 150 mm wide strip of PermaFLASH-R must be applied prior to applying the PermaTEC EcoWrap membrane. The advice of the Certificate holder should be sought.

14.7 The first layer of the molten PermaTEC EcoWrap membrane should have a nominal thickness of 3 mm.

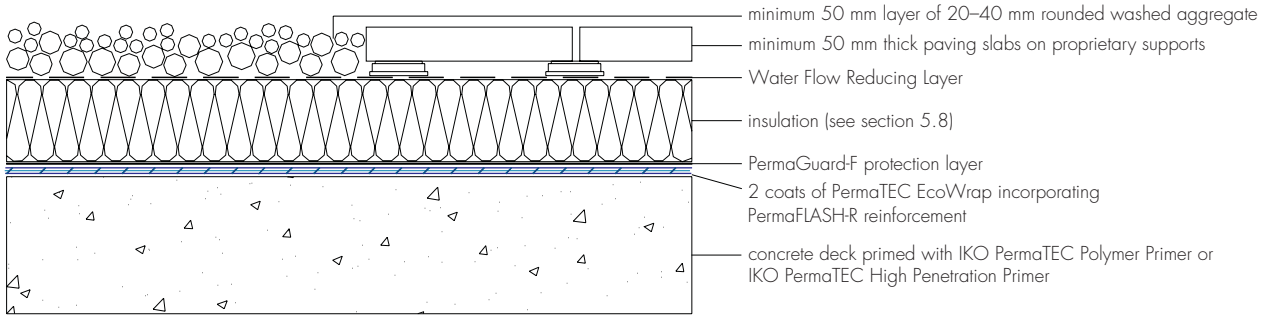
14.8 PermaFLASH-R polyester reinforcing scrim is embedded by lightly brushing it into the first layer of the membrane whilst it is still hot and tacky. The reinforcement overlaps must be at least 75 mm and fully sealed by PermaTEC EcoWrap membrane.

14.9 The second layer of PermaTEC EcoWrap membrane, applied over the top of the reinforcement, should have a nominal thickness of 3 mm.

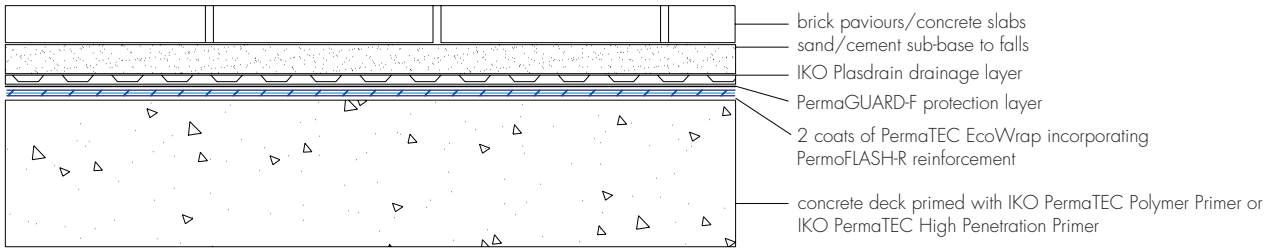
14.10 The membrane must be protected immediately with the specified PermaGUARD protection layer. This is carried out prior to applying the insulation, water control layer and the protective layer or other specified surface finish (see Figure 1 for typical design specifications).

Figure 1 Typical design specifications

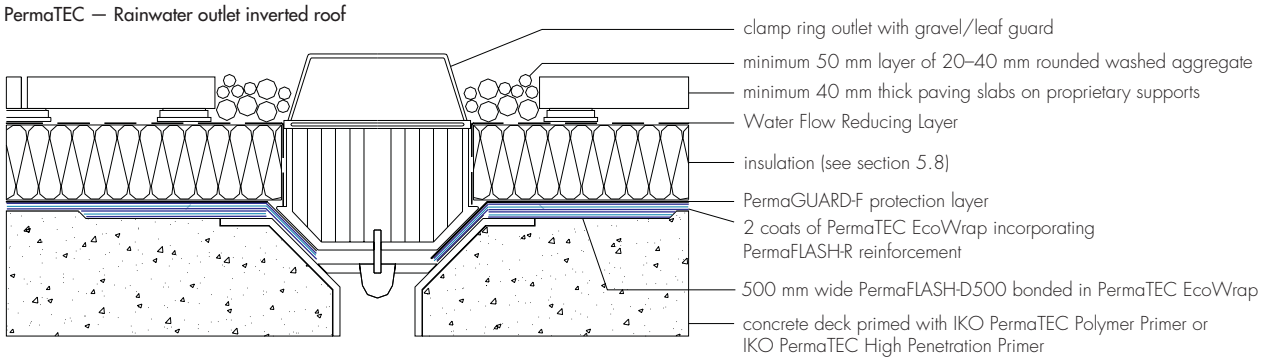
PermaTEC — Typical inverted roof



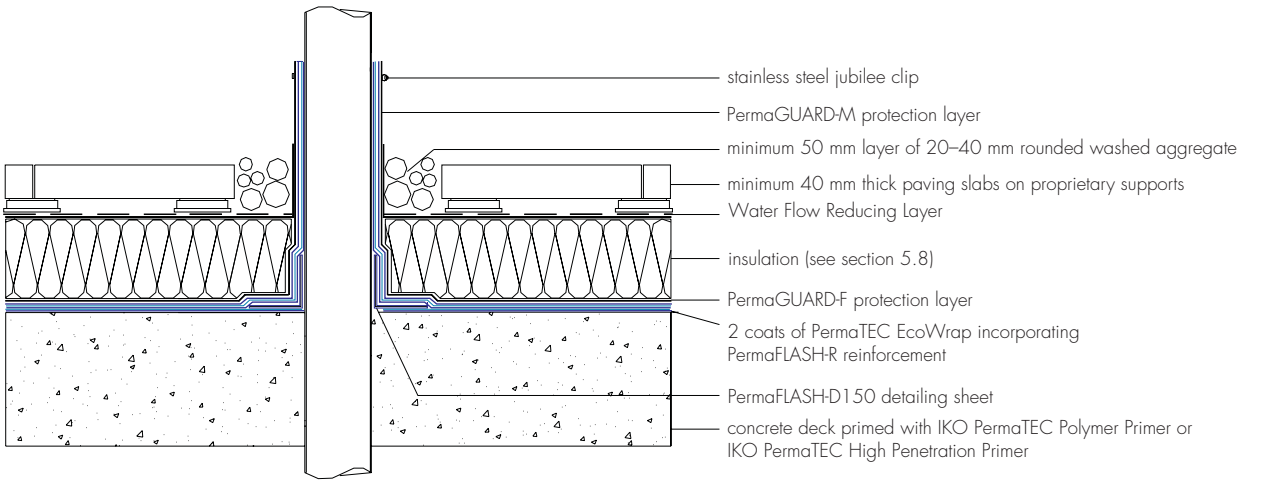
PermaTEC — Typical uninsulated podium deck



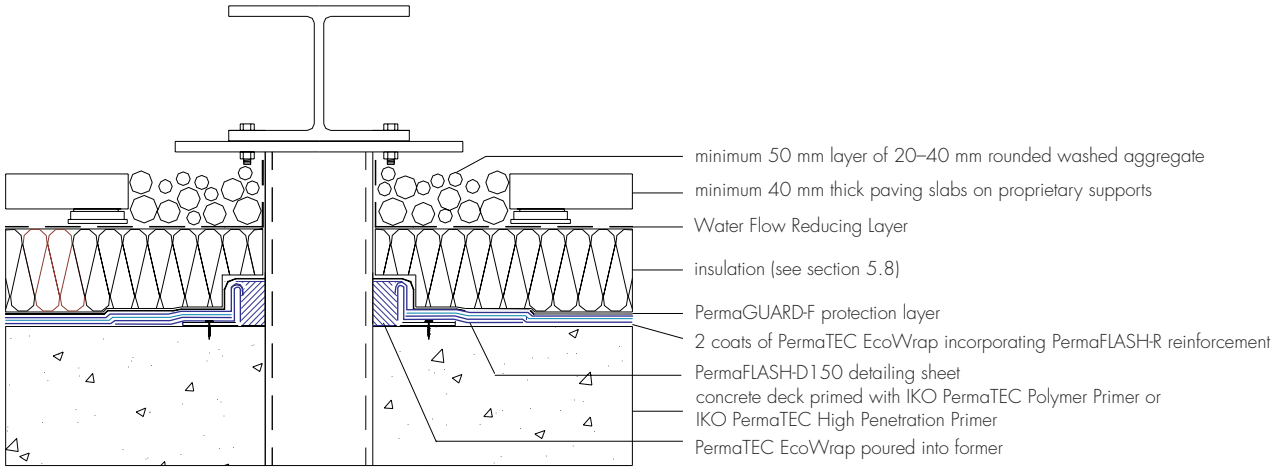
PermaTEC — Rainwater outlet inverted roof



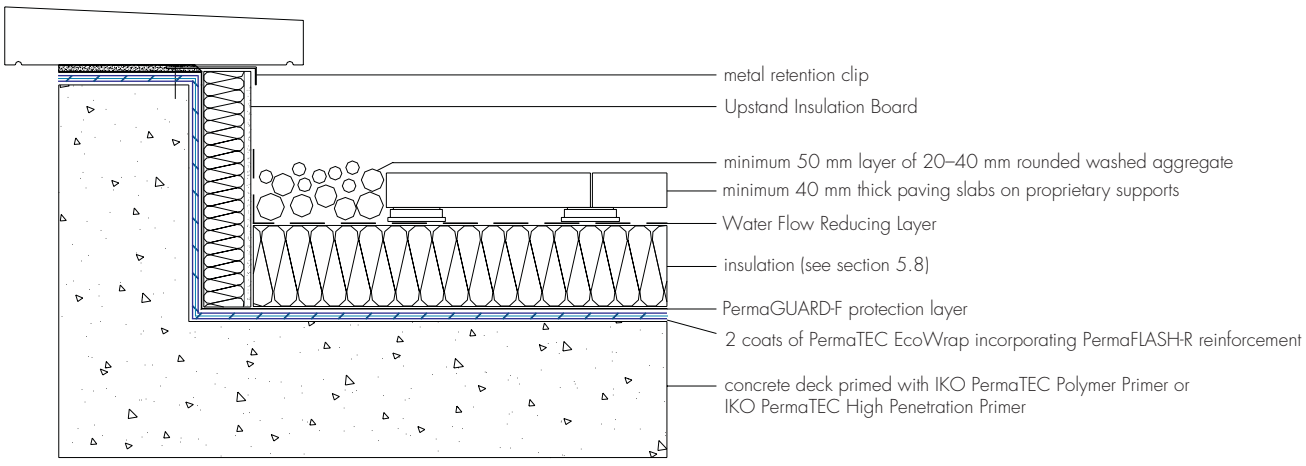
PermaTEC — Cold metal penetration



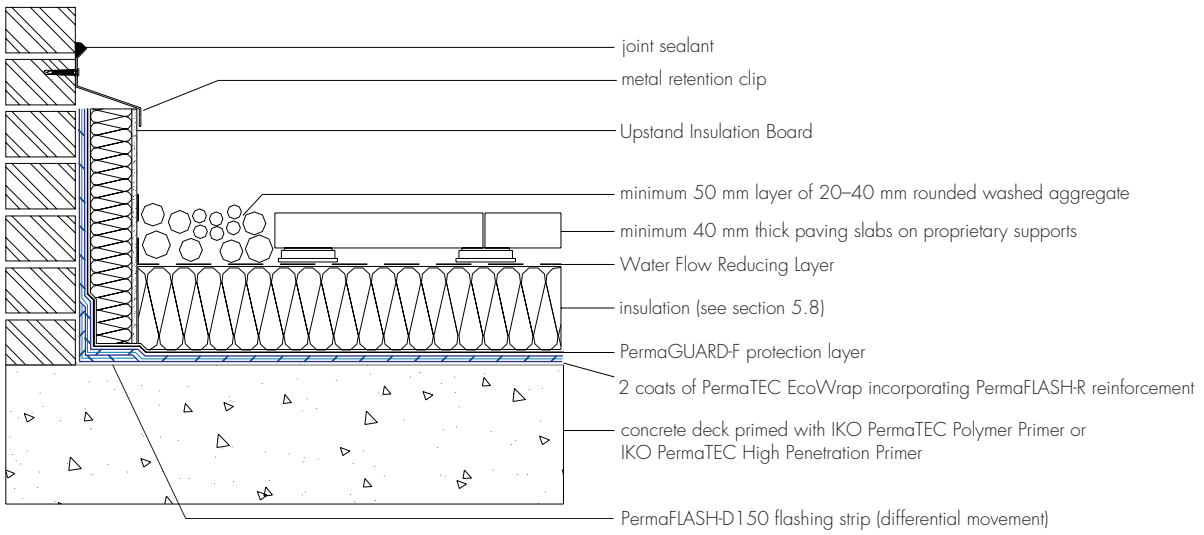
PermaTEC — Pitched pocket



PermaTEC — Typical parapet coping detail



PermaTEC — Typical upstand detail



15 Repair

15.1 Any damage to the system must be repaired as soon as possible to ensure that the integrity of the waterproofing is maintained. The advice of the Certificate holder should be sought.

15.2 Where maintenance or repair of any of the roof components above the waterproofing system is necessary, care must be taken to avoid damage to the membrane. If damage to the membrane occurs, then it should be repaired in accordance with the Certificate holder's instructions.

15.3 In the event that the system is contaminated by chemicals, oils and greases, the advice of the Certificate holder should be sought.

Technical Investigations

16 Tests

16.1 Characterisation tests were carried out on the PermaTEC EcoWrap compound to establish fines, penetration, flow and resilience.

16.2 Characterisation tests were carried out on PermaFlash-R and Permaflash-D to establish thickness, mass per unit area and tensile properties.

16.3 Tests were conducted on samples of the system and/or system components, and the results assessed to determine:

- water vapour permeability
- watertightness
- low temperature flexibility
- resistance to fatigue
- resistance to dynamic indentation (system including Permaguard-PB protection)
- resistance to static indentation (system including Permaguard-PB protection)
- effect of heat ageing
- effect of exposure to surface water.

17 Investigations

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 6229 : 2018 *Flat roofs with continuously supported coverings — Code of practice*

BS EN 1991-1-1 : 2002 *Eurocode 1 : Actions on structures — General actions— Densities, self-weight, imposed loads for buildings*
NA to BS EN 1991-1-1 : 2002 UK National Annex to *Eurocode 1 : Actions on structures — General actions— Densities, self-weight, imposed loads for buildings*
BS EN 1991-1-3 : 2003 + A1 : 2015 *Eurocode 1 — Actions on structures — General actions — Snow loads*
NA to BS EN 1991-1-3 : 2003 + A1 : 2015 UK National Annex to *Eurocode 1 : Actions on structures — General actions — Snow loads*
BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 : Actions on structures — General actions — Wind actions*
NA to BS EN 1991-1-4 : 2005 UK National Annex to *Eurocode 1 : Actions on structures — General actions — Wind actions*

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

BS EN ISO 14001 : 2015 *Enviromental management systems — Requirements with guidance for use*

BS EN ISO 14021 : 2016 *Environmental labels and declarations — Self-declared environmental claims (Type II environmental labelling)*

BES 6001 : Issue 3.1 *Framework Standard for Responsible Sourcing*

18 Conditions

18.1 This Certificate:

- relates only to the product/system 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.

18.2 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.

18.3 This Certificate will remain valid for an unlimited period provided that the product/system 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.

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

18.5 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:

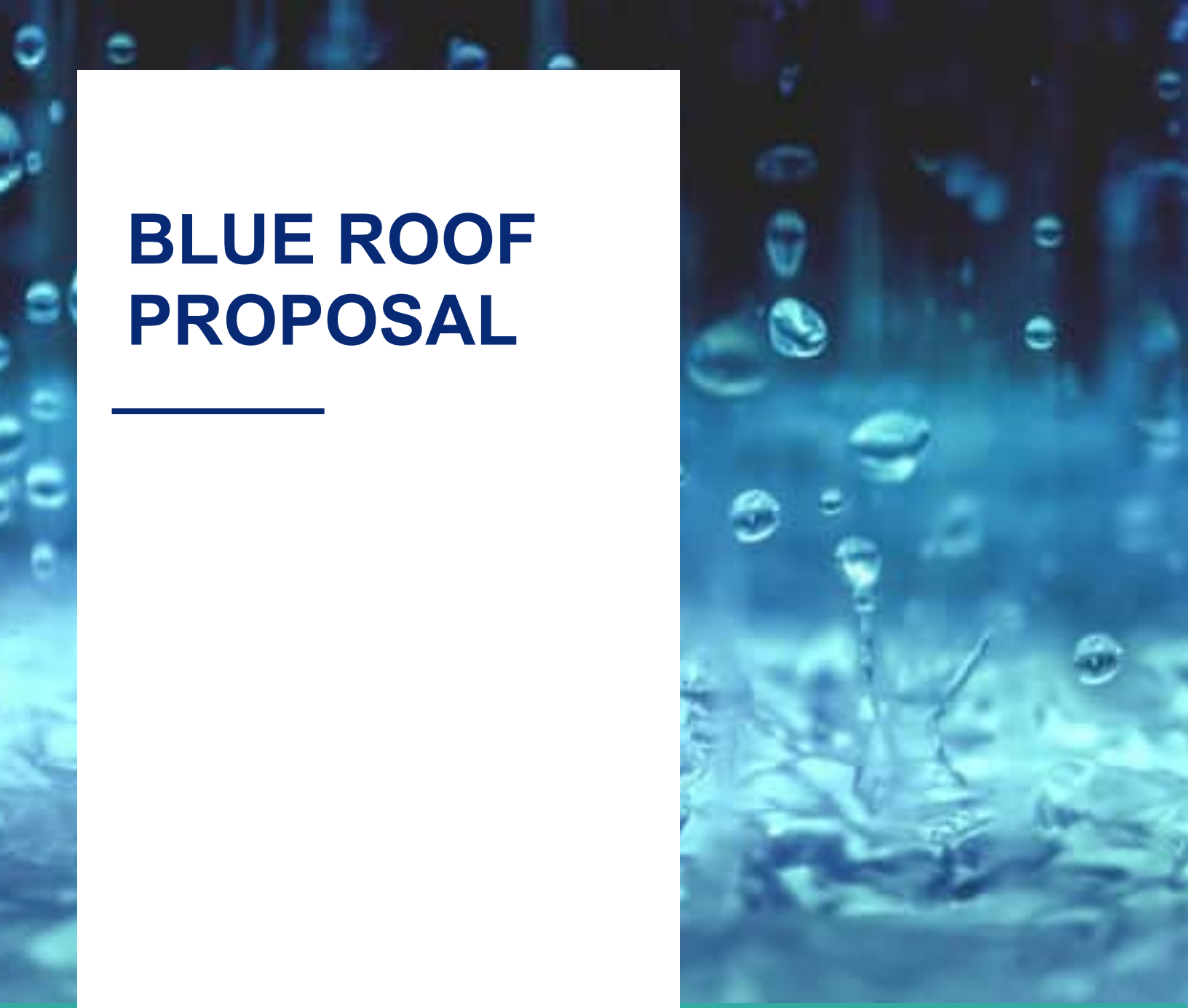
- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including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

18.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system 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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SECTION 5

CALCULATIONS



BLUE ROOF PROPOSAL

Oct 2024 Rev 04

Greenheys, Manchester

Eco Green Roofs

Design Data

We have used the following information in undertaking our assessment.

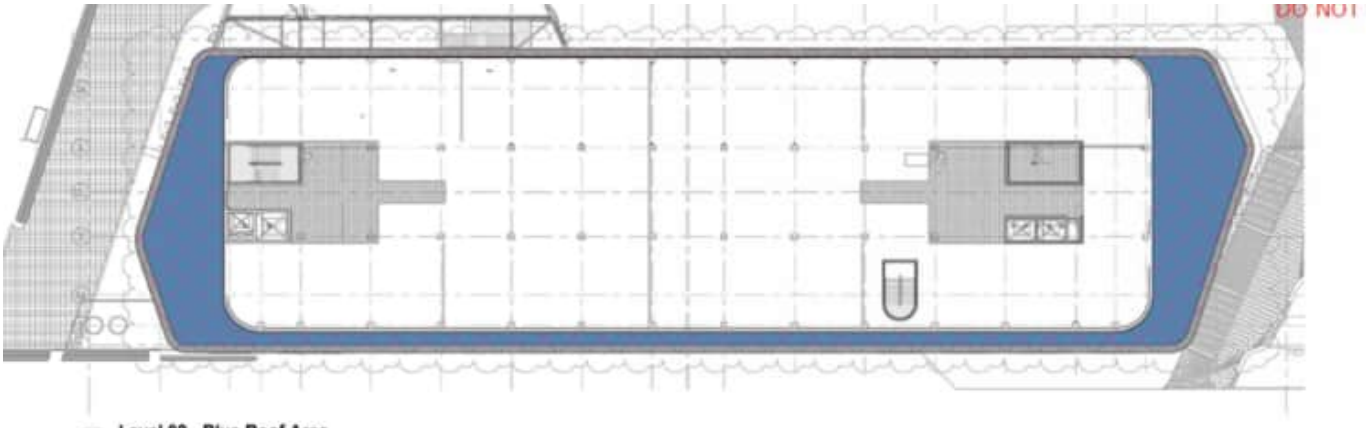
PARAMETER	DATA
Return Period	1:100 YEARS
Climate Change Allowance	0%
Location (For **FSR** Data)	Manchester
Restricted Flow Rate	See individual roof calculations
Approximate Catchment Area	Refer to individual roofs
Approximate Storage (Blue Roof) Area	Refer to individual roofs
Estimated Void Ratio of storage zone	90% (2)

Notes

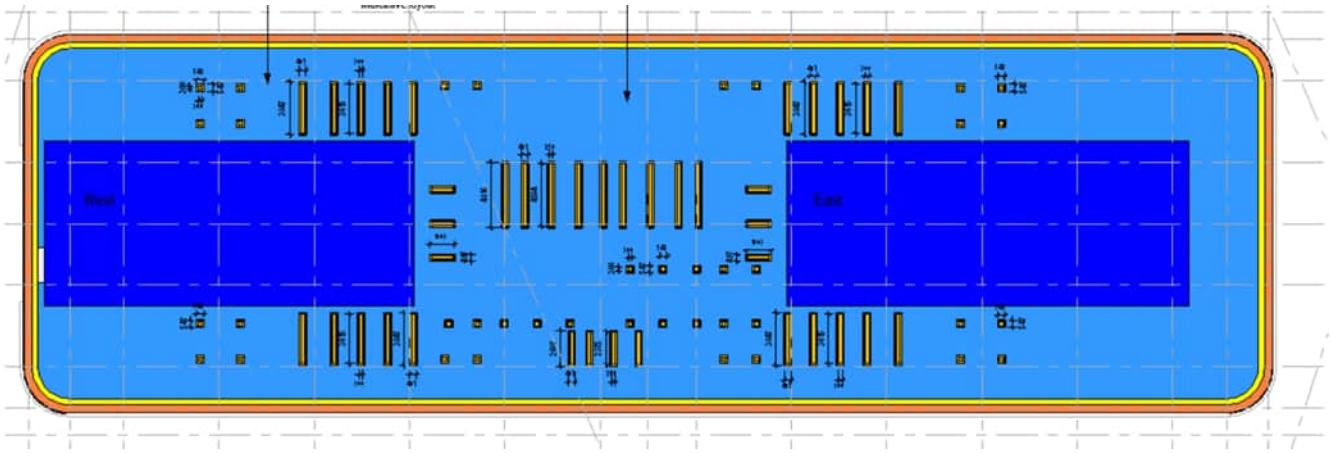
1 – Our blue roof storage area assessment includes an allowance for bases and plinths where they are indicated on the plan drawings. It is important that EGR are made aware of any additional items to be placed on the roof in order for the calculations to be adjusted as may be necessary. Unless requested, no allowance has been made for any future reduction in the available storage zone by tenants plant for example. This should be communicated to the end user to prevent uncalculated loss of storage volume.

2 – This allows for the structure of the storage components detailed in this proposal together with a small allowance for siltation and a limited use of aggregate around penetrations.

Analysis



1 Level 02 - Blue Roof Area



Calculation Output Summary

Roof Reference	**Level 6**	**Level 2**	
Allocated Outflow (l/s)	1.48	0.7	
Blue Roof Area (m2)	1621	482	
Void Ratio	90%	90%	
Total Catchment (m2)	2763	1285	For Level 2, due to the shape of the blue roof attenuation area a degree of façade contribution has been allowed for
Max Design Depth (H-max) mm	102	156	
Overflow Set Height (mm)	102	156	Suggested height for internal and external overflows / exceedance paths
Potential Overflow Depth (mm)	137	191	= HMax + the head required to operate the overflow at the design flow rate
Overflow method	Integral standpipe & external	Integral standpipe & external	
Recommended Overflow Rate (l/s)	55	27	
Half Empty Time (hrs)	14	13.4	
Storage Volume (m3)	149	67.5	
No. of Outlets	4	5	
No. of orifices per outlet	2	1	
Flow Control Orifice Size (dia)	19mm	15mm	

Overflows and Exceedance Paths

A critical element of a blue roof is an effective way of dealing with excess water that may derive from a blockage or a storm that exceeds the design criteria, which may lead to ingress into the building or structural failure. This facility should be sized to accommodate a full storm flow.

EGR have not been party to the development and detailed design of this element and at the time of this report have not had sight of the provision. In making our assessment we have assumed that all blue roof areas are provided with adequate exceedance path / overflow provision to support that provided integral to our outlet.

Waterproofing Details

It is necessary to maintain an adequate freeboard above the maximum blue roof storage level. We have assumed that the first point of waterproofing breach is no less than 150mm above the maximum blue roof water level.

Fire Spread

Occasionally, it is necessary to consider the potential of fire spread through rainwater goods / blue roof components. We have assumed that the configuration has been reviewed by the project Fire Engineer and no special measures are required.

Assumptions and Clarifications

Underground Drainage

We assume that the rainwater system is free flowing and is provided with a vented interceptor trap separating any foul flows / sewer gases from the blue roof system.

Structural Loadings

EGR have not undertaken any structural calculations and we assume that the maximum accidental loading has been calculated by others. For blue / green roofs this should include the maximum water depth to working overflow level, the saturated green roof media, potentially snow loading and any additional items such as M&E plant, furniture and so on.

Overflows / Exceedance Paths

It is critical that overflow points are provided and are adequate in capacity to protect the building should the system capacity be exceeded or become blocked. The provision and design of this overflow system is not covered by the EGR works.

Available Storage Volume

The available storage volume has been assessed from the information available as outlined earlier in this report. Anything placed / mounted on the roof is likely to reduce this volume and is important that this be reviewed, and any changes informed to EGR in order to reassess the calculations.

Maintenance

The orifices used in the flow control mechanism are easily blocked. Regular maintenance of the system is therefore essential.

SECTION 6

COMPANY INFORMATION AND CERTIFICATIONS

Corporate Certificate of Registration

LUCIDEON

This is to certify that the Environmental Management System of

IKO Plc

Appley Lane North, Appley Bridge, Wigan, Lancashire, WN6 9AB

Meets the requirements of

ISO 14001:2015

Scope of Registration

The Environmental Management System for the Design, Development, Manufacture and Supply of Roofing Membrane, Felts and Waterproofing Systems.

The Manufacture and Supply of Bitumen Based, Hot Applied, Waterproofing Products, Sheathing Felt and Related Accessories.

Additional Locations are listed on the subsequent pages.

Signed for and on behalf of Lucideon CICS Limited

[redacted]

Authorised Signatory

UKAS MANAGEMENT SYSTEMS 0008

Certificate No:	24709	Date of Issue:	01 November 2022
Issue No:	1: 01 November 2022	Date of Expiry:	31 October 2025

Certification to an Environmental Management System has been maintained since July 2015.

The use of the Accreditation Mark indicates accreditation in respect of those activities covered by the accreditation certificate no.0006

This Certificate of Registration is granted subject to conformance with the conditions of contract governing the registration.

Further clarifications regarding this certificate may be obtained by consulting the organisation.

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Staffordshire ST4 7LQ, UK

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support@lucideon.com
www.lucideon.com
Reg. England 1871628

IKO Plc

LUCIDEON

Additional locations which meet the requirements of ISO 14001:2015

Site Name	Site Scope
Appley Bridge	The Environmental Management System for the Design, Development, Manufacture and Supply of Roofing Membrane, Felts and Waterproofing Systems.
Grangemill	The Manufacture and Supply of Bitumen Based, Hot Applied, Waterproofing Products and Sheathing Felt for Mastic Asphalt Application. The Supply of Related Accessories, Liquid Compounds, Primers and Finishing Coats.
Clay Cross	The Design, Development, Sales and Manufacture of Polymeric Roofing Products & Associated Fittings. The Stockholding and Supply of Liquid Damp Proofing and Roofing Materials.

UKAS MANAGEMENT SYSTEMS 0006

Certificate No:	24709	Date of Issue:	01 November 2022
Issue No:	1: 01 November 2022	Date of Expiry:	31 October 2025

Certification to an Environmental Management System has been maintained since July 2015.

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support@lucideon.com
www.lucideon.com
Reg England 1871628

Certificate of Registration

LUCIDEON

This is to certify that the Health and Safety Management System of

IKO Plc

Appley Lane North, Appley Bridge, Wigan, Lancashire, WN6 9AB

Meets the requirements of

ISO 45001:2018

Scope of Registration

The Manufacture, Storage and Distribution of Water Proofing Materials and Related Products and the Associated, Maintenance and Company Administration Functions at the following Manufacturing Sites:

Appley Bridge
Clay Cross
Grangemill

Signed for and on behalf of Lucideon CICS Limited

[redacted]

UKAS MANAGEMENT SYSTEMS 0006

Certificate No:	24873	**Date of Issue:**	03 June 2022
Issue No:	1: 03 June 2022	**Date of Expiry:**	02 June 2025

Certification to a Health and Safety Management System has been maintained since June 2019.

The use of the Accreditation Mark indicates accreditation in respect of those activities covered by the accreditation certificate no.0006

This Certificate of Registration is granted subject to conformance with the conditions of contract governing the registration.

Further clarifications regarding this certificate may be obtained by consulting the organisation.

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Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 9001:2015

This is to certify that:

IKO PLC
Appley Bridge North
Appley Bridge
Wigan
WN6 9AB
United Kingdom

Holds Certificate Number: Q 05233

and operates a Quality Management System which complies with the requirements of ISO 9001:2015 for the following scope:

The design, development, manufacture and supply of a range of roofing membranes, torch on roofing membranes, underslating, damp proof courses, bitumen impregnated felt and bridge deck water proofing, insulation, paints and bituminous compounds.

The design, development, sales and manufacture of polymeric extruded products. Cloaks and insulated damp proof coursing. The stockholding and supply of liquid damp proofing and roofing materials.

The manufacture and supply of mastic asphalt, bituminous compounds and related products.

For and on behalf of BSI:

[redacted]

Matt Page, Managing Director Assurance - UK & Ireland

Original Registration Date: 1986-12-12
Latest Revision Date: 2022-08-19

Effective Date: 2022-08-21
Expiry Date: 2025-08-20

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This certificate was issued electronically and remains the property of BSI and is bound by the conditions of contract.
An electronic certificate can be authenticated online.
Printed copies can be validated at www.bsigroup.com/ClientDirectory

Information and Contact: BSI, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP. Tel: + 44 345 080 9000
BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.
A Member of the BSI Group of Companies.

Certificate No: Q 05233

Location	Registered Activities
IKO PLC Appley Bridge North Appley Bridge Wigan WN6 9AB United Kingdom	The design, development, manufacture and supply of a range of roofing membranes, torch on roofing membranes, underslating, damp proof courses, bitumen impregnated felt and bridge deck water proofing, insulation, paints and bituminous compounds.
IKO PLC Coney Green Road Clay Cross Chesterfield S45 9HZ United Kingdom	The design, development, sales and manufacture of polymeric extruded products. Cloaks and insulated damp proofing coursing. The stockholding and supply of liquid damp proofing and roofing materials.
IKO PLC Prospect Quarry Water Lane Nr. Matlock DE4 4BW United Kingdom	The manufacture and supply of mastic asphalt, bituminous compounds and related products.

Original Registration Date: 1986-12-12

Effective Date: 2022-08-21

Latest Revision Date: 2022-08-19

Expiry Date: 2025-08-20

This certificate was issued electronically and remains the property of BSI and is bound by the conditions of contract.
An electronic certificate can be authenticated online.
Printed copies can be validated at www.bsigroup.com/ClientDirectory

Information and Contact: BSI, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP. Tel: + 44 345 080 9000
BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.
A Member of the BSI Group of Companies.

QD Checklist-P1-Hot Melt System

level 2 full system installation. Locations were the mast climbers to sit on to be fully protected by plywood

Form Reference	F451169.7
Owned By	Darius Urbonas (Longworth Building Services Ltd)
Date	12/11/2024 08:38:31
Status	Completed & Signed Off
Project Name	K00290 - Greenheys Building, Bruntwood
Location	Level 2 Terrace Roof>Roofs>QUALITY DELIVERY

Form Location	Level 2 Terrace Roof
Supply Chain	Longworth Building Services Ltd
Area of Works/Location	level 2 full system installation. Locations were the mast climbers to sit on to be fully protected by plywood

General

#	Work Section	Element	Date Planned	Date Accepted
1	Roof covering works	Roof Finishes	12/11/2024	12/11/2024

Prepare and Plan

#	Check Item	No & Revision	S/C Initial	WD Initial
1	Confirm Specification	IKO hot melt / EGR system	DU	AB
2	Confirm Drawing	Drawing Register attached - SEE 4P FOR LATEST REV (CONSTRUCTION STATUS)	DU	AB

#	Document Name	Created By	Date	
1	IKO-Permatec-Installation-Guide.pdf	Pdf	Abi Belfield (Willmott Dixon Construction)	12/11/2024 09:33:55
2	Screenshot 2024-11-12 093627.png	Unknown	Abi Belfield (Willmott Dixon Construction)	12/11/2024 09:36:59
2	GRE-LON-ZZ-02-DR-X-02501.pdf	Pdf	Abi Belfield (Willmott Dixon Construction)	12/11/2024 09:38:33
2	GRE-LON-ZZ-02-DR-X-02500.pdf	Pdf	Abi Belfield (Willmott Dixon Construction)	12/11/2024 09:38:33
2	GRE-LON-ZZ-02-DR-X-02504.pdf	Pdf	Abi Belfield (Willmott Dixon Construction)	12/11/2024 09:38:33
2	GRE-LON-ZZ-02-DR-X-02503.pdf	Pdf	Abi Belfield (Willmott Dixon Construction)	12/11/2024 09:38:33
2	GRE-LON-ZZ-02-DR-X-02502.pdf	Pdf	Abi Belfield (Willmott Dixon Construction)	12/11/2024 09:38:33

Apply & Control

Check substrate is sufficiently cured (usually 28 days) laid to specified falls & tolerance, free from laintance & dust, dry, frost free & has no oil contamination	Yes

Images



12/11/2024 10:21:00



12/11/2024 10:21:06



12/11/2024 10:21:13



12/11/2024 10:21:20

Check substrate has acceptable lightly brushed finish with high spots ground flat prior to commencing. Minor depressions can be filled with additional Hot Melt Compound	Yes

Document Name	Type	Created By	Date
IRI-O-0050510-Royal-School-Manchester-The-Seashell-Trust-MAC-11-Nov-2024-Jack-Ashworth.pdf	Pdf	Abi Belfield (Willmott Dixon Construction)	12/11/2024 09:40:31

Carry out Peel tests to ensure that concrete substrate is suitable to receive Hot-Melt System	Yes

Images



13/11/2024 08:08:11



21/11/2024 13:48:22



21/11/2024 13:48:24



21/11/2024 13:48:27



21/11/2024 13:48:31



21/11/2024 13:48:34



21/11/2024 13:48:38



21/11/2024 13:48:41



21/11/2024 13:48:44

Document Name	Type	Created By	Date
Untitled.msg	Unknown	Abi Belfield (Willmott Dixon Construction)	20/11/2024 16:42:04
2 Level - Peel test mark up.pdf	Pdf	Darius Urbonas (Longworth Building Services Ltd)	21/11/2024 13:57:38

Check outlets are fixed at correct height and that the substrate around the outlet is lower than the deck surface	Yes

Images



12/11/2024 08:44:30



12/11/2024 08:44:34



03/12/2024 11:40:46



03/12/2024 11:40:46



03/12/2024 11:40:46



03/12/2024 11:40:47



03/12/2024 11:40:47



03/12/2024 11:40:47

Check that all Ambient Temperatures have been reached	Yes
Check that the roof has been cleared of any debris and water before putting down primer.	Yes

Images



12/11/2024 15:43:51



12/11/2024 15:43:55



12/11/2024 16:07:59



12/11/2024 16:08:13



13/11/2024 08:04:14



13/11/2024 08:04:53


20/11/2024 14:59:28


20/11/2024 14:59:29


20/11/2024 14:59:29

HOLD POINT - Check primer is dry before commencing laying Hot-Melt Compound	

[redacted]

Darius Urbonas (Longworth Building Services Ltd)	Abi Belfield (Willmott Dixon Construction)
15/11/2024 10:33:06	03/12/2024 15:23:15

Check substrate has been primed & received approx 3mm of Hot-Melt Compound to flat area, upstands & detailing to the required height (150mm above finishes)	Yes

Images


15/11/2024 11:30:09


15/11/2024 14:22:07


15/11/2024 14:22:08


18/11/2024 13:21:03


21/11/2024 11:37:44


21/11/2024 11:37:49


21/11/2024 11:37:54


21/11/2024 11:38:00


21/11/2024 12:35:58


21/11/2024 12:36:05


03/12/2024 11:54:15


11/12/2024 13:53:33


11/12/2024 13:53:33


11/12/2024 13:53:34


11/12/2024 13:53:34

Check the reinforcement layer has been laid into the 1st layer of compound with 75mm side laps & fully sealed by 2nd layer of3mm thick Hot-Melt Compound	Yes

Images


21/11/2024 12:34:29


29/11/2024 13:23:11


29/11/2024 13:23:11


29/11/2024 13:23:12


29/11/2024 13:23:13


29/11/2024 13:23:14


29/11/2024 14:31:02


29/11/2024 14:31:02


29/11/2024 14:31:03


03/12/2024 15:23:30


03/12/2024 15:23:39


03/12/2024 15:24:18


11/12/2024 13:54:09


11/12/2024 13:54:09


11/12/2024 13:54:09


11/12/2024 13:54:10


11/12/2024 13:54:10


12/12/2024 09:24:56


12/12/2024 09:24:56


12/12/2024 09:24:56


12/12/2024 09:24:57

	Yes

Images


21/11/2024 13:58:56


21/11/2024 13:59:00


21/11/2024 13:59:03


21/11/2024 13:59:06


21/11/2024 13:59:08


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22/11/2024 12:21:34


22/11/2024 12:21:42


22/11/2024 12:21:49


22/11/2024 12:21:51


22/11/2024 12:21:54


22/11/2024 12:21:57


22/11/2024 12:22:01







22/11/2024 12:22:02 22/11/2024 12:22:04 22/11/2024 12:22:07



22/11/2024 12:22:10

Check temperature of Hot-Melt Compound does not exceed max or min specified	Yes

Images







15/11/2024 11:37:10 28/11/2024 09:12:40 29/11/2024 13:21:49

Comments	Created By	Date
The temperature of IKO Permatec must not exceed 190°C	Darius Urbonas (Longworth Building Services Ltd)	15/11/2024 11:39:46

Check all details have been sufficiently weathered & recorded, with lapping on junctions & sealing, of joints all to manufacturers specifications	Yes

Images







03/12/2024 11:38:37 03/12/2024 11:38:38 03/12/2024 15:36:27







03/12/2024 15:36:40 11/12/2024 15:37:18 11/12/2024 15:37:26



11/12/2024 15:37:42

Check protection layer has been lapped by 75mm on all laps & 75mm onto the junction with flat at upstands	Yes

Images



28/11/2024 09:14:12



28/11/2024 09:14:13



28/11/2024 09:14:13



28/11/2024 09:14:14



28/11/2024 09:14:14



28/11/2024 09:14:15



28/11/2024 09:14:15



28/11/2024 09:14:16



28/11/2024 09:14:16



28/11/2024 09:14:17



29/11/2024 14:30:34



29/11/2024 14:30:34



03/12/2024 15:25:08



03/12/2024 15:34:06



03/12/2024 15:34:24



03/12/2024 15:34:48



03/12/2024 15:35:11

Check weathered upstand height is 150mm above final roof finishes & that all Hot Melt Compound is protected	Yes

Images



29/11/2024 13:25:31



29/11/2024 13:25:31



29/11/2024 13:25:32

Check thickness of applied Hot-Melt Compound every 25m2 as specified	Yes

Images



29/11/2024 14:31:26



29/11/2024 14:31:26



29/11/2024 14:31:27



29/11/2024 14:31:27



29/11/2024 14:31:57

Check all protrusions are in place e.g. handrail upstands & have been properly weather (pitch pockets etc)	Yes
Check all ridges & perimeters are sufficiently weathered with specified lapping & fixings where required	Yes

Check for any ponding, slumping or pitting in the roof finish once complete	Yes
HOLD POINT - Electrical water-tightness test to finished bitumastic roof system, prior to protection placement	

Darius Urbonas (Longworth Building Services Ltd)

19/08/2025 13:08:57

HOLD POINT - Protection put in place as specified by manufacturer	

[redacted]

Abi Belfield (Willmott Dixon Construction)

20/08/2025 09:10:09

HOLD POINT - Electrical re-test after protection removed	

Darius Urbonas (Longworth Building Services Ltd)

19/08/2025 13:09:10

Check Specified insulation installed as required with entire area covered (no cold spots)	Yes

Reference	Description	Date	Status	Issued To Package	Issued To Organisation
T410688.226	visible joints on straight areas make sure they line up or change to full cp board so not able to see joints	20/08/2025 09:11:41	Signed Off	Cladding	Longworth Building Services Ltd

Images



20/08/2025 09:11:41



20/08/2025 09:11:41

Images



20/08/2025 09:10:14



20/08/2025 09:10:23



20/08/2025 09:10:36

Install water control layer, ensuring that laps are as indicated on layer material & is dressed into outlets	Yes

Images



19/08/2025 14:27:55



19/08/2025 14:27:55



19/08/2025 14:27:55



19/08/2025 14:27:56



19/08/2025 14:27:56



19/08/2025 14:27:57



19/08/2025 14:27:57



19/08/2025 14:27:58



19/08/2025 14:27:58



19/08/2025 14:27:59



05/09/2025 13:05:57



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05/09/2025 13:06:23


09/09/2025 10:32:38


09/09/2025 10:32:39


09/09/2025 10:32:39

Where required, ensure that paving slabs are laid on specified paving support pads with no small cuts	No

Images


09/09/2025 10:33:06


09/09/2025 10:33:07


09/09/2025 10:33:07


24/09/2025 08:49:59


24/09/2025 08:50:05


24/09/2025 08:51:13


24/09/2025 09:01:27


24/09/2025 09:01:32


27/10/2025 09:07:12



27/10/2025 09:07:13

Install specified round washed gravel ballast to depth of min. 50mm	N/A

Bespoke Items/Additional checks	
#	**Checks carried out**
1	delivery notes material check
2	IKO inspections
3	d150 laps
4	upstand to level 2

Images

#1



13/11/2024 09:34:21

#3



21/11/2024 12:35:08



21/11/2024 12:35:18



21/11/2024 12:35:25

#4



24/04/2025 08:25:15



24/04/2025 08:25:16



24/04/2025 08:25:16


24/04/2025 08:25:16


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19/08/2025 14:28:53


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19/08/2025 14:28:57

19/08/2025 14:28:57

19/08/2025 14:28:58

#	Document Name	Created By	Date	
2	IRI-O-0050510-Greenheys-Longworth-11-Nov-2024-Jack-Ashworth.pdf	Pdf	Abi Belfield (Willmott Dixon Construction)	18/11/2024 08:34:34
2	IRI-O-0050510-Greenheys-Longworth-15-Nov-2024-Jack-Ashworth.pdf	Pdf	Abi Belfield (Willmott Dixon Construction)	18/11/2024 08:34:36
2	IRI-O-0050510-Royal-School-Manchester-The-Seashell-Trust-MAC-11-Nov-2024-Jack-Ashworth.pdf	Pdf	Abi Belfield (Willmott Dixon Construction)	18/11/2024 08:34:38
2	IRI-O-0050510-Greenheys-Longworth-16-Dec-2024-Jack-Ashworth.pdf	Pdf	Darius Urbonas (Longworth Building Services Ltd)	18/12/2024 10:59:51
2	IRI-O-0050510-Greenheys-Longworth-2-Dec-2024-Jack-Ashworth.pdf	Pdf	Darius Urbonas (Longworth Building Services Ltd)	18/12/2024 11:00:20

Complete for Quality

#	Check Item	S/C Initial	WD Initial	Type of Evidence
1	Works adequately protected	DU	AB	
2	Work area cleaned	DU	AB	

Closure

All Evidence available & actions closed S/C	

Darius Urbonas (Longworth Building Services Ltd)

05/09/2025 13:04:57

All Evidence available & actions closed	

[redacted]

Darius Urbonas (Longworth Building Services Ltd)

09/02/2026 11:56:37

Date Closed	01/09/2025
Approval to pay	Approved

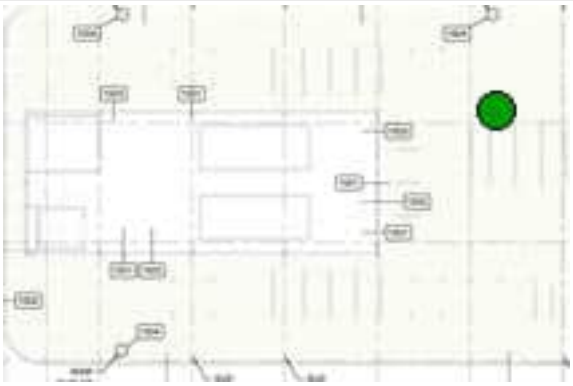
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WhatsApp Video 2024-11-15 at 10.23.52_64996df8.mp4	Unknown	Darius Urbonas (Longworth Building Services Ltd)	15/11/2024 10:34:26
peeel test by IKO 2024-11-15 at 10.23.52.mp4	Unknown	Darius Urbonas (Longworth Building Services Ltd)	15/11/2024 10:34:55
IRI-O-0050510-Greenheys-Longworth-2-Dec-2024-Jack-Ashworth.pdf	Pdf	Darius Urbonas (Longworth Building Services Ltd)	03/12/2024 11:46:54

WILLMOTT DIXON SINCE 1852

QD Checklist-P1-Hot Melt System

Level 6 eco green roof west

Form Reference	F451169.69
Owned By	Darius Urbonas (Longworth Building Services Ltd)
Date	03/02/2025 11:19:07
Status	Completed & Signed Off
Project Name	K00290 - Greenheys Building, Bruntwood
Location	West Area>Level 6 Roof>Roofs>QUALITY DELIVERY



Form Location	West Area
Supply Chain	Longworth Building Services Ltd
Area of Works/Location	Level 6 eco green roof west

General

#	Work Section	Element	Date Planned	Date Accepted
1	Roof covering works	Roof Finishes	03/02/2025	03/02/2025

Prepare and Plan

#	Check Item	No & Revision	S/C Initial	WD Initial
1	Confirm Specification	IKO Permatec Installation Guide / Eco Green Roof	DU	AB
2	Confirm Drawing	GRE LON ZZ 06 DR X 01000 - 01504	DU	AB

#	Document Name	Created By	Date	
2	GRE-LON-ZZ-06-DR-X-01000_LEVEL 06 BLUE ROOF GA_Suitable for Review & Comment S3_P01_0.pdf	Pdf	Abi Belfield (Willmott Dixon Construction)	11/04/2025 11:40:45
2	GRE-LON-ZZ-06-DR-X-01001_LEVEL 06 BLUE ROOF SPECIFICATION_Suitable for Review & Comment S3_P01_0.pdf	Pdf	Abi Belfield (Willmott Dixon Construction)	11/04/2025 11:40:47
2	GRE-LON-ZZ-06-DR-X-01500_LEVEL 06 BLUE ROOF PLANTROOM THRESHOLD DETAIL_Suitable for Review & Comment S3_P01_0.pdf	Pdf	Abi Belfield (Willmott Dixon Construction)	11/04/2025 11:40:49
2	GRE-LON-ZZ-06-DR-X-01501_LEVEL 06 BUE ROOF PLANTROOM UPSTAND TO COLUMN DETAIL_Suitable for Review & Comment S3_P01_0.pdf	Pdf	Abi Belfield (Willmott Dixon Construction)	11/04/2025 11:40:51
2	GRE-LON-ZZ-06-DR-X-01502_LEVEL 06 BLUE ROOF PARAPET UPSTAND DETAIL_Suitable for Review & Comment S3_P01_0.pdf	Pdf	Abi Belfield (Willmott Dixon Construction)	11/04/2025 11:40:52
2	GRE-LON-ZZ-06-DR-X-01503_LEVEL 06 BLUE ROOF PLANTROOM UPSTAND DETAIL_Suitable for Review & Comment S3_P01_0.pdf	Pdf	Abi Belfield (Willmott Dixon Construction)	11/04/2025 11:40:54
2	GRE-LON-ZZ-06-DR-X-01504_LEVEL 06 BLUE ROOF RWP OUTLET DETAIL_Suitable for Review & Comment S3_P01_0.pdf	Pdf	Abi Belfield (Willmott Dixon Construction)	11/04/2025 11:40:55

Apply & Control

Check substrate is sufficiently cured (usually 28 days) laid to specified falls & tolerance, free from laintance & dust, dry, frost free & has no oil contamination	Yes

Images



18/03/2025 09:06:33

Check substrate has acceptable lightly brushed finish with high spots ground flat prior to commencing. Minor depressions can be filled with additional Hot Melt Compound	Yes

Images



26/03/2025 14:09:43

Carry out Peel tests to ensure that concrete substrate is suitable to receive Hot-Melt System	Yes

Images



18/03/2025 11:11:37



18/03/2025 11:11:42



18/03/2025 11:11:46



18/03/2025 11:11:51

Check outlets are fixed at correct height and that the substrate around the outlet is lower than the deck surface	Yes

Images





21/03/2025 12:29:22 | 26/03/2025 14:10:27 | 26/03/2025 14:10:45

Check that all Ambient Temperatures have been reached	Yes
Check that the roof has been cleared of any debris and water before putting down primer.	Yes
HOLD POINT - Check primer is dry before commencing laying Hot-Melt Compound	

[redacted]

Abi Belfield (Willmott Dixon Construction)
21/03/2025 08:09:44

[redacted]

Darius Urbonas (Longworth Building Services Ltd)
26/03/2025 15:19:52

Images




21/03/2025 08:10:21 | 26/03/2025 14:11:46

Check substrate has been primed & received approx 3mm of Hot-Melt Compound to flat area, upstands & detailing to the required height (150mm above finishes)	Yes

Images





19/05/2025 14:17:34 | 19/05/2025 14:17:35 | 19/05/2025 14:17:53

Check the reinforcement layer has been laid into the 1st layer of compound with 75mm side laps & fully sealed by 2nd layer of3mm thick Hot-Melt Compound	Yes

Images


18/03/2025 12:54:34


18/03/2025 12:54:54


18/03/2025 12:55:03


18/03/2025 12:55:15


21/03/2025 08:10:39


21/03/2025 12:30:05


21/03/2025 12:30:06


26/03/2025 14:14:10


26/03/2025 14:14:10


26/03/2025 14:14:11


26/03/2025 14:14:11


26/03/2025 14:14:11


26/03/2025 14:14:11


26/03/2025 14:14:12

Check temperature of Hot-Melt Compound does not exceed max or min specified	Yes
Check all details have been sufficiently weathered & recorded, with lapping on junctions & sealing, of joints all to manufacturers specifications	Yes

Images


26/03/2025 14:39:52


03/04/2025 15:49:54


03/04/2025 15:49:54


03/04/2025 15:50:39


03/04/2025 15:50:39


03/04/2025 15:50:40

Check protection layer has been lapped by 75mm on all laps & 75mm onto the junction with flat at upstands	Yes

Images


26/03/2025 14:13:22


26/03/2025 14:13:22


26/03/2025 14:13:22


26/03/2025 14:13:23


26/03/2025 14:13:23


26/03/2025 14:13:23

Check weathered upstand height is 150mm above final roof finishes & that all Hot Melt Compound is protected	Yes

Images


26/03/2025 14:40:55


26/03/2025 14:40:56


26/03/2025 14:40:56


03/04/2025 15:49:18


03/04/2025 15:49:18


03/04/2025 15:49:19


03/04/2025 15:49:19

Check thickness of applied Hot-Melt Compound every 25m2 as specified	Yes

Images


02/04/2025 09:04:07


02/04/2025 09:04:41

Check all protrusions are in place e.g. handrail upstands & have been properly weather (pitch pockets etc)	N/A
Check all ridges & perimeters are sufficiently weathered with specified lapping & fixings where required	Yes

Images


02/04/2025 09:05:15


02/04/2025 09:05:21


02/04/2025 09:05:26


02/04/2025 09:05:33

Check for any ponding, slumping or pitting in the roof finish once complete	Yes

Images



26/03/2025 14:15:06



26/03/2025 14:15:07



26/03/2025 14:41:17



26/03/2025 14:41:17

HOLD POINT - Electrical water-tightness test to finished bitumastic roof system, prior to protection placement	



Darius Urbonas (Longworth Building Services Ltd)

11/04/2025 11:51:17

Abi Belfield (Willmott Dixon Construction)

11/04/2025 11:51:23

Document Name	Type	Created By	Date
Membrane Condition Survey Report Greenheys Project Manchester 2.pdf	Pdf	Darius Urbonas (Longworth Building Services Ltd)	28/04/2025 10:41:32

HOLD POINT - Protection put in place as specified by manufacturer	N/A

N/A ()

28/04/2025 10:39:42

HOLD POINT - Electrical re-test after protection removed	N/A

N/A ()

28/04/2025 10:39:43

Check Specified insulation installed as required with entire area covered (no cold spots)	Yes

Images



02/04/2025 08:00:48



02/04/2025 08:00:53



03/04/2025 15:35:38



03/04/2025 15:35:39



03/04/2025 15:35:39



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04/04/2025 15:16:45



28/04/2025 10:40:22



28/04/2025 10:40:22



28/04/2025 10:40:23



28/04/2025 10:40:23



28/04/2025 10:40:24



12/05/2025 13:45:48



12/05/2025 13:45:49


19/05/2025 14:16:50


19/05/2025 14:16:52

Install water control layer, ensuring that laps are as indicated on layer material & is dressed into outlets	Yes

Images


28/04/2025 10:30:04


28/04/2025 10:30:08


28/04/2025 10:30:13


28/04/2025 10:30:26


28/04/2025 10:30:38


12/05/2025 13:44:42


12/05/2025 13:44:43


21/05/2025 08:52:07


21/05/2025 08:52:07


21/05/2025 08:52:08


21/05/2025 08:52:08


21/05/2025 08:52:09



21/05/2025 08:52:09

Where required, ensure that paving slabs are laid on specified paving support pads with no small cuts	Yes

Images



19/08/2025 14:20:31



19/08/2025 14:20:31



19/08/2025 14:20:32



19/08/2025 14:20:32



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19/08/2025 14:20:46



19/08/2025 14:20:46



19/08/2025 14:20:47

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19/08/2025 14:20:47

Install specified round washed gravel ballast to depth of min. 50mm	Yes

Images



20/11/2025 12:03:31



20/11/2025 12:03:32



20/11/2025 12:03:32



20/11/2025 12:03:32



20/11/2025 12:03:33



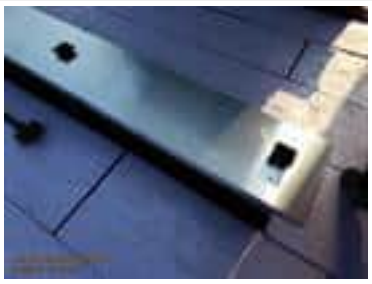
20/11/2025 12:03:33

Bespoke Items/Additional checks

#	Checks carried out
1	top hat and anti vibration pads

Images

#1



03/04/2025 08:21:13



03/04/2025 08:21:23



03/04/2025 08:21:32



03/04/2025 08:21:39

Complete for Quality				
#	**Check Item**	**S/C Initial**	**WD Initial**	**Type of Evidence**
1	Works adequately protected	DU	AB	
2	Work area cleaned	DU	AB	

Closure	
All Evidence available & actions closed S/C	

[redacted]

Darius Urbonas (Longworth Building Services Ltd)

02/07/2025 13:00:35

All Evidence available & actions closed	

[redacted]

Abi Belfield (Willmott Dixon Construction)

02/07/2025 13:00:39

Date Closed	28/07/2025
Approval to pay	Approved

Images



23/04/2025 08:02:05



23/04/2025 08:02:05

Document Name	Type	Created By	Date
Membrane Condition Survey Report Greenheys Project, Manchester 6.pdf	Pdf	Darius Urbonas (Longworth Building Services Ltd)	19/05/2025 14:14:36

Underground storage attenuation tanks:-
Current design requires 160m² of 0.8m deep attenuation crates (approx 128m³) - Current configuration is for 1 tank: 30m x 5.5m on plan. Crates to have 100mm 6H sand blinding + 100mm MOT Type 1 + 175mm thick Grade C28/35 concrete slab with 2 layers A393 mesh. Finishes above to Landscape Architects details.

Final SW manhole to have flow restrictor to limit run-off to Greenfield level of 3.3l/s under 1 in 100 year + 45% CC

Corn Brook
Approx Invert of 3300x1805 culvert here = 31.66m

225Ø pipe to have Class Z conc bed+surround to full length under carriageway to chamber SW10.

Max Invert of 225Ø = 33.050m

Attenuation tank has concrete protection slab to full area and extending 0.5m all around perimeter. No planting or excavations are to be carried out in the area of the protection slab.

30x5.5m SW attenuation in 0.8m deep crates below ground with concrete protection slabs over

UU 1204
CL -34.30
IL -TBC

34.3m

Foul water to discharge to UU Chamber 2204

UU 2204
CL -34.30
IL -32.49

Culvert 3300 wide x 1805 high

225Ø stub from SW3 to allow for future Pencroft Way changes. Separate consent to discharge to Corn Brook from MCC would be needed should this ever be connected.

FFL=35.150

Existing ACO drains removed and new Gatic drain connected to Base manhole B-S1

B-S1

PENCROFT WAY

Grass

Gravel

RWP

Proposed Underground Drainage Layout
1:200 at A0

KEY

- F1 — New private FOUL chamber
- S1 — New private SURFACE WATER chamber
- New private FOUL drain + flow direction (Hepworth Supersleve/Hepsleve or Ridgiewer) - Class S Bedding (Class Z under building)
- New private SURFACE WATER drain + flow direction (Hepworth Supersleve/Hepsleve or Ridgidrain) - Class S Bedding (Class Z under building)
- Existing ADOPTED combined sewer
- gatic — GATIC 150mm wide SLOT DRAIN (Medium duty) with D400 cover (U.N.O.) - 200mm C28/35 concrete bed+surround with trapped, roddable sump outlet and access points
- aco — ACO MULTIDRAIN with stainless steel SLOTTTOP CHANNEL 150mm wide slot drain (Medium duty) with D250 cover (U.N.O.) - 150mm C28/35 concrete bed+surround with trapped, roddable sump outlet and access points.
- MD — MEDIUM DUTY (GRADE C250)
- HD — HEAVY DUTY (GRADE D400)
- MAC MAC — 300Ø x 600dp MINI ACCESS CHAMBER (To foul or surface water) (Hepworth code Ref':- SDAC1/1)
- TG — FLOOR GULLY, TRAPPED WITH RODDABLE OUTLET
- PU — POP-UP IN FLOOR
- SO — SILT PIT WITH OUTLET AND + MD COVER TO BE TRAPPED AND RODDABLE
- AP — ACCESS POINT AND MD COVER
- svp — SOIL VENT PIPE
- RWP — RAIN WATER PIPE
- WaStop (or similar) Non return valve to all freezer hall pipework before it enters the foul drainage system.
- Approx location of crane bases as advised by Willmott Dixon

GENERAL NOTES

Do not scale this drawing.

Contractor to check all dimensions and report all errors and omissions to the engineer.

1. All external setting out to be confirmed on Architects drawings.
2. Manhole IL's relate to outgoing main pipe. Where incoming pipes are of a smaller diameter to the outgoing pipes they are to be positioned with pipe soffits level UNO.
3. All pipes under the building to be given Class Z conc bed + surround. In addition all pipes in vehicle paved areas where the cover is less than 750mm are to be given a Class Z concrete bed + surround. Typically pipes to have Class S bedding.
4. For exact location of all SVP's, RWP's and Pop-Ups refer to M+E/Architect drawings.
5. All foul pipes to be 100Ø at min 1:60 fall unless noted otherwise.
6. All surface water pipes to be 150Ø unless noted otherwise.
7. Attenuation system and flow restrictor are based upon a max. discharge from the SW system being limited to 'Greenfield' run-off. This MUST be approved by the Local Authority and United Utilities prior to any works being carried out.
8. Legend refers to clay pipelines. Alternative twin wall pipes can be used, as DW Consulting Specification - contractor to choose.
9. For details of drainage refer to drawing GRE-DWC-ZZ-XX-DR-C-10002, 10003, 10004, 10005 & 10010.

FINAL CONSTRUCTION ISSUE

THIS DRAWING IS BASED ON THE LATEST CONSTRUCTION ISSUE AND INCORPORATES ANY CHANGES / MODIFICATIONS ADVISED TO US BY THE CONTRACTOR

NEW FOUL CHAMBER SCHEDULE

MH REF.	C.L. (m) TBC	I.L. (m)	MH TYPE & DETAIL No	MH SIZE	COVER & FRAME SIZE & TYPE	REMARKS
F1	35.150	33.950	CONC	1200 dia.	600 x 600 MD	
F3	35.150	34.150	CONC	1200 dia.	600 x 600 MD	Double sealed internal cover.
F4	35.150	34.100	CONC	1200 dia.	600 x 600 MD	Double sealed internal cover.
F5	35.150	34.050	CONC	1200 dia.	600 x 600 MD	Double sealed internal cover.
F6	35.150	34.150	CONC	1200 dia.	600 x 600 MD	Double sealed internal cover.
F7	35.150	34.100	CONC	1200 dia.	600 x 600 MD	Double sealed internal cover.
F8	35.150	34.025	CONC	1200 dia.	600 x 600 MD	Double sealed internal cover.
F9	35.150	33.925	CONC	1200 dia.	600 x 600 MD	Double sealed internal cover.
F10	35.000	33.850	CONC	1200 dia.	600 x 600 MD	
F11	35.000	33.650	CONC	1200 dia.	600 x 600 MD	
F12	35.000	33.585	CONC	1200 dia.	600 x 600 MD	
F13	35.000	33.530	CONC	1200 dia.	600 x 600 MD	
F14	35.000	33.475	CONC	1200 dia.	600 x 600 MD	
F15	35.000	33.425	CONC	1200 dia.	600 x 600 MD	
F16	35.000	33.375	CONC	1200 dia.	600 x 600 MD	
F17	35.000	33.315	CONC	1200 dia.	600 x 600 MD	
F18	35.150	33.265	CONC	1200 dia.	600 x 600 MD	
F19	35.000	33.050	CONC	1200 dia.	600 x 600 HD	
F20	35.000	32.950	CONC	1200 dia.	600 x 600 HD	
F21	34.850	32.860	CONC	1200 dia.	600 x 600 HD	
F22	34.800	32.830	CONC	1200 dia.	600 x 600 HD	
F23	34.700	32.775	CONC	1200 dia.	600 x 600 HD	
F25	35.150	33.350	CONC	1200 dia.	600 x 600 HD	Double sealed internal cover.
F26	35.150	33.150	CONC	1200 dia.	600 x 600 HD	Double sealed internal cover.
F27	35.150	33.205	CONC	1200 dia.	600 x 600 HD	
UU Manhole 2204	34.300**	32.490**	Extg.	Extg.	Extg.	

NEW SURFACE WATER CHAMBER SCHEDULE

MH REF.	C.L. (m) TBC	I.L. (m)	MH TYPE & DETAIL No	MH SIZE	COVER & FRAME SIZE & TYPE	REMARKS
SW1						
SW2	35.150	34.150	CONC	1050 dia.	600 x 600 MD	Recessed cover for finishes
SW3	35.150	34.050	CONC	1050 dia.	600 x 600 MD	Recessed cover for finishes
SW4	35.150	33.850	CONC	1050 dia.	600 x 600 MD	Recessed cover for finishes
SW5	35.150	33.575	CONC	1200 dia.	600 x 600 MD	Recessed cover for finishes
SW6	34.625	33.300 pipes 33.000 sump	CONC	1200 dia.	600 x 600 HD	Silt pit manhole - 300mm deep. All pipe inverts level
SW7	34.850	33.800	PPIC	475 dia.	450 x 450 MD	
SW9	35.000	33.275 pipes 32.975 sump	CONC	1200 dia.	600 x 600 HD	Silt pit manhole - 300mm deep. All pipe inverts level
SW10	34.600	33.225 pipes 32.775 sump	CONC	1500 dia.	750 x 600 HD	450mm deep silt pit manhole with flow control fitted in MH. Flow restricted to greenfield runoff of 3.3l/s. All pipe inverts level. Ref DW drawing 10003

* Denotes proposed levels to be confirmed on site

** Denotes existing sewer levels to be confirmed on site

Note:
All manhole covers in external hard surfacings, and all internal covers are to be recessed to receive finishes to match their location

Note:
ALL Cover Levels to be confirmed following final confirmation of external surface levels. ALL invert levels are based upon INTERPOLATED levels of the existing adopted surface and foul runs outside the site boundary.

Note:
Location of all RWP's, Foul Pop-Ups and internal gullys etc. are T.B.C by BDP / SL

Rev	Detail	By	Chk	Date
AB	Final Construction Issue.	CC		06.25
C07	Note added re IL pipes to go under trenches and re-route sw pipe. MH's P25 & P26 lowered to go under deeper trench.	CC		14.10.24
C06	Notes added re- Spur to manhole S3, protection slab to attenuation tank and confirmation of the location of Gatic drain outlets.	CC		11.7.24
C05	Updated to suit MCC requirements.	CC		23.5.24
C04	Additional freezer hall drainage added. Chambers moved as needed and added. Invert levels checked throughout.	CC	CC	19.4.24
C03	Updated to suit changes to GF layout and pop up locations. Drainage rerouted around crane base to west elevation	CC	CC	27.3.24
C02	Pop ups and svp positions changed to suit latest layouts. Foul drainage changed & manholes added to suit confirmed crane base positions.	CC	CC	13.2.24
C01	First Construction Issue	rm	CC	18.12.23
P05	Renumbered	rm	CC	12.12.23
P04	Redrawn to suit WD request	rm	CC	11.12.23

DW Consulting LLP

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Hookstone Road
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Tel: 01423 855930

Client
Bruntwood SciTech

Project
Greenheys Redevelopment
Manchester Science Park

Drawing Title
Proposed Underground Drainage Layout & Details

Drawing Status
Final Construction

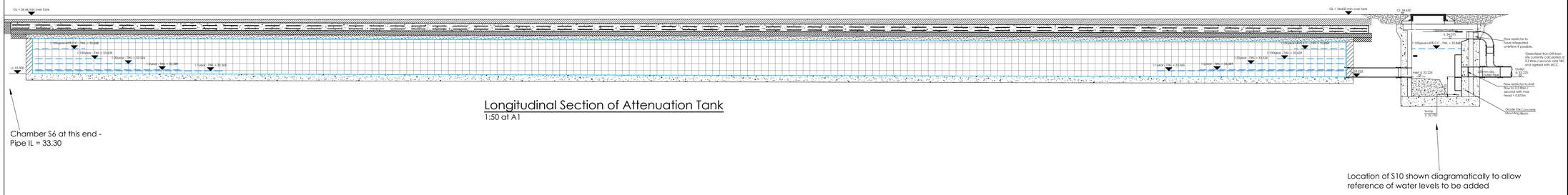
Drawing No.
GRE-DWC-ZZ-XX-DR-C-10001

Scale	Sheet Size	Revision
1:200	A0	AB

Date	Drawn	Checked	Auth
Feb'23	rm	cc	cc

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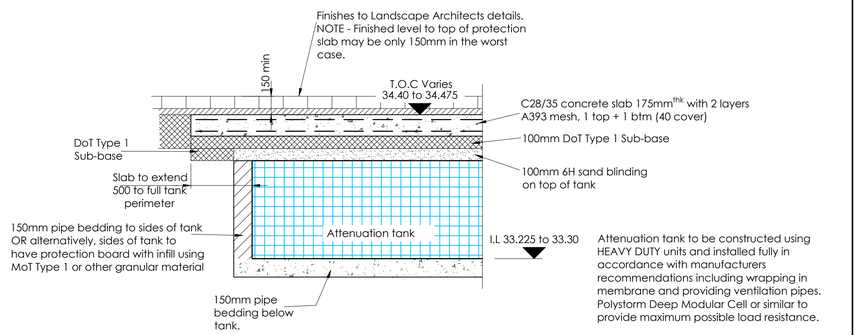
DWC-MCR-ZY-1:1SCR - GREENHEYS.DGN WED AUG 28 08:20:20 BST 2024 GRE-DWC-ZZ-XX-DR-C-10001.dgn



Longitudinal Section of Attenuation Tank
1:50 at A1

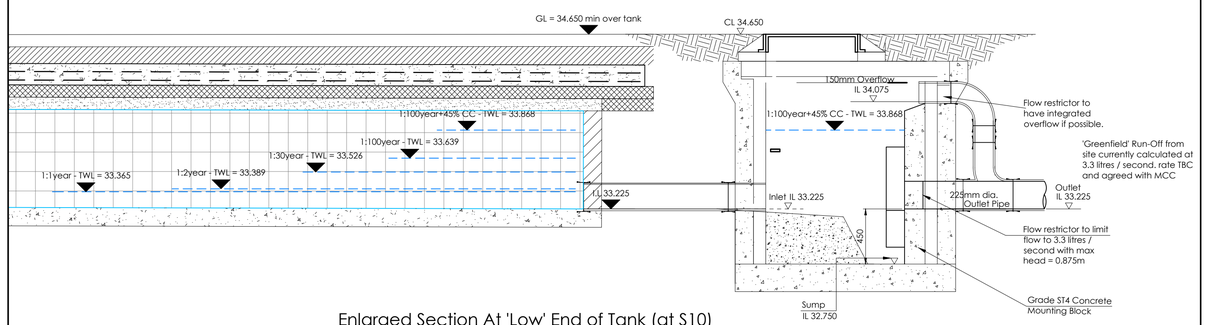
Chamber S6 at this end - Pipe IL = 33.30

Location of S10 shown diagramatically to allow reference of water levels to be added



Attenuation tank to be constructed using HEAVY DUTY units and installed fully in accordance with manufacturers recommendations including wrapping in membrane and providing ventilation pipes. Polystorm Deep Modular Cell or similar to provide maximum possible load resistance.

Detailed Section Thro' Attenuation Tank And Protection Specification
1:25 at A1



Enlarged Section At 'Low' End of Tank (at S10) Showing TW Levels for Various Storm Conditions
1:25 at A1

Location of S10 shown diagramatically to allow reference of water levels to be added

GENERAL NOTES

Do not scale this drawing.

Contractor to check all dimensions and report all errors and omissions to the Engineer.

1. All external setting out and levels to be confirmed on Architects drawings.
2. Manhole IL's relate to outgoing main pipe. Where incoming pipes are of a smaller diameter to the outgoing pipes they are to be positioned with pipe soffits level UNO.
3. Attenuation system and flow restrictor are based upon a max. discharge from the SW system being limited to 'Greenfield' run-off. This MUST be approved by the Local Authority and United Utilities prior to any works being carried out.
4. For details of drainage refer to drawing GRE-DWC-ZZ-XX-DR-C-10002, 10003, 10004, 10005 & 10010.

FINAL CONSTRUCTION ISSUE

THIS DRAWING IS BASED ON THE LATEST CONSTRUCTION ISSUE AND INCORPORATES ANY CHANGES / MODIFICATIONS ADVISED TO US BY THE CONTRACTOR

Rev	Detail	By	Auth	Date
AB	Final Construction Issue.	cc		30.06.25

Revisions

DW Consulting LLP

Marsland House, Marsland Road, Sale, M33 3AQ
Tel: 0161 969 4144
www.dwllp.com

Hornbeam House, Hornbeam Park, Hookstone Road, Harrogate, HG2 8QT
Tel: 01423 855930

Client: **Bruntwood SciTech**

Project: Greenheys Redevelopment
Manchester Science Park

Drawing Title: Attenuation Tank
Longitudinal Section and Levels Details

Drawing Status: Final Construction

Drawing No.: GRE-DWC-ZZ-XX-DR-C-10006

Scale	Sheet Size	Revision
1:50 1:25	A1	AB

Date	Drawn	Checked	Auth
Feb'24	rm	cc	cc

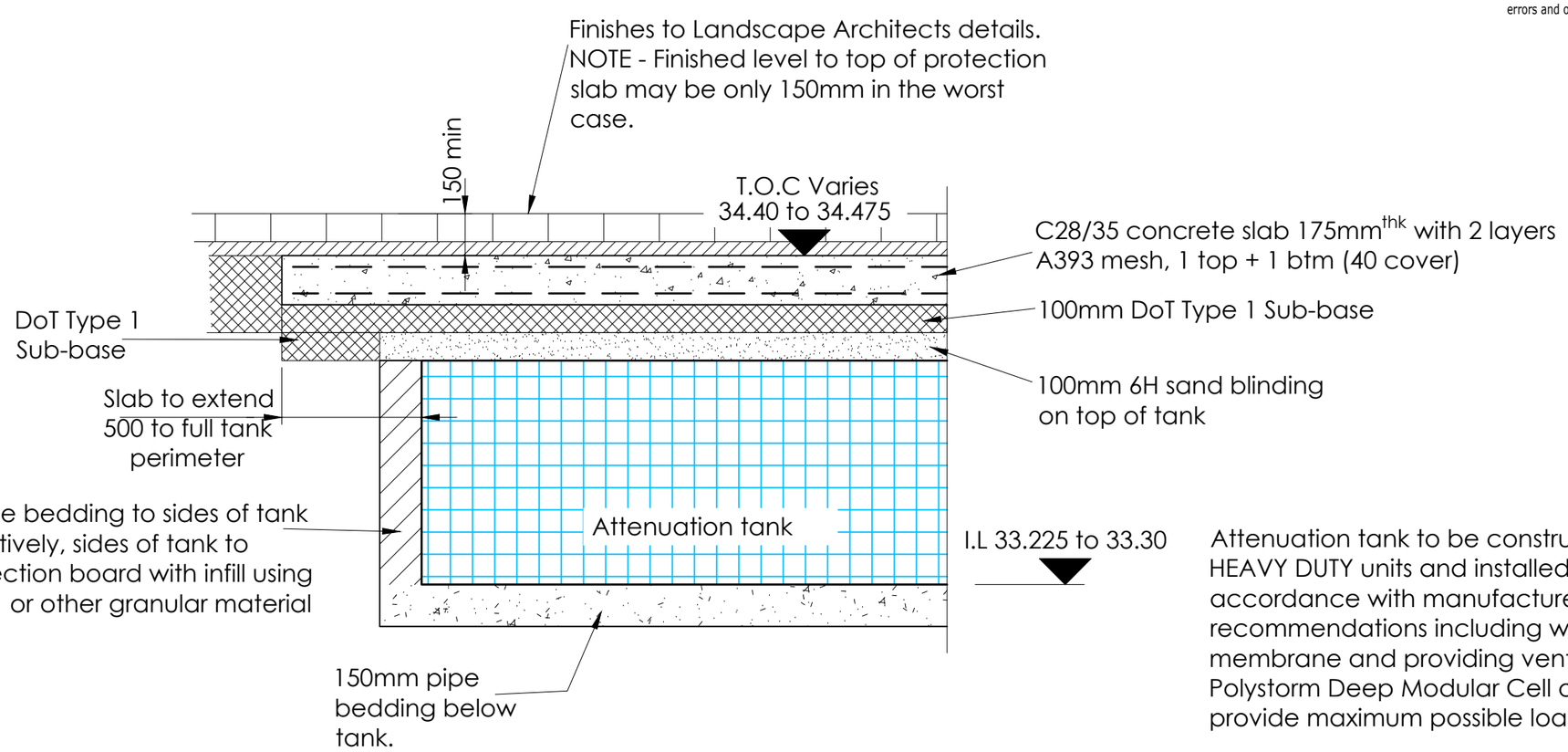
DWG INFO: P:\1.5639 - GREENHEYS\DW INFO\A1 20-05-2025\DW\ISSUED\2025-03-31 FINAL CONSTRUCTION ISSUE DWGS\GRE-DWC-ZZ-XX-DR-C-10006

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GENERAL NOTES

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Contractor to check all dimensions and report all errors and omissions to the engineer.



Attenuation tank to be constructed using HEAVY DUTY units and installed fully in accordance with manufacturers recommendations including wrapping in membrane and providing ventilation pipes. Polystorm Deep Modular Cell or similar to provide maximum possible load resistance.

Detailed Section Thro' Attenuation Tank And Protection Specification

1:25 at A1

FINAL CONSTRUCTION ISSUE

THIS DRAWING IS BASED ON THE LATEST CONSTRUCTION ISSUE AND INCORPORATES ANY CHANGES / MODIFICATIONS ADVISED TO US BY THE CONTRACTOR

Rev	Detail	By	Chk	Date
AB	Final Construction			30.6.25
C02	Additional levels added			22.2.24

Revisions

Client: **Bruntwood SciTech**

Project: Greenheys Redevelopment

MSP

Drawing Status: Final Construction

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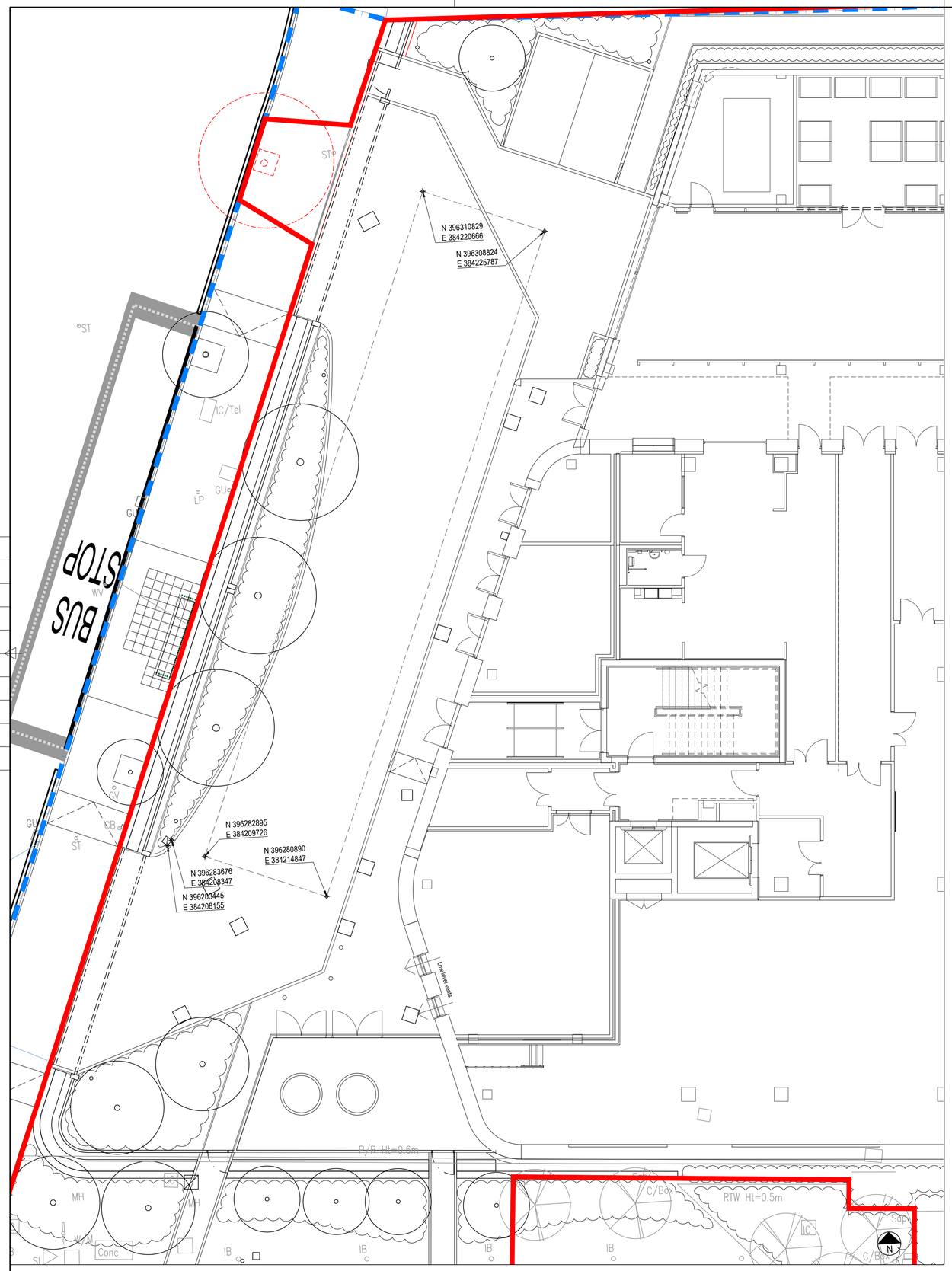
Tel: 01423 855930

Drawing Title: Attenuation Tank Cover Slab Works

Drawing No.	GRE-DWC-ZZ-XX-DR-C-10005
Scale	1:25
Sheet Size	A3
Revision	AB
Date	Feb'23
Drawn	rm
Checked	cc
Auth	cc

DWG INFO: P:\15639 - GREENHEYS\DW INFO AT 20-05-2025\DW\ISSUED\2025-03-31 FINAL CONSTRUCTION ISSUE DWGS\GRE-DWC-ZZ-XX-DR-C-10005

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ANY DRAWING ERRORS OR DIVERGENCES SHOULD BE BROUGHT TO THE ATTENTION OF BUILDING DESIGN PARTNERSHIP AT THE ADDRESS SHOWN BELOW.

NOTES

ATTENUATION TANK SETTING OUT TAKEN DIRECTLY FROM DW DRAWING GRE-DWC-ZZ-XX-DR-C-10001 "PROPOSED UNDERGROUND DRAINAGE LAYOUT & DETAILS" REVISION C02.

BDP TAKE NO RESPONSIBILITY FOR THE SETTING OUT ACCURACY OF BELOW GROUND STRUCTURES / TANK DESIGNED BY OTHERS.

DW CONSULTING LLP ARE TO CONFIRM ACCEPTANCE OF ALL SETTING OUT ASSOCIATED WITH THE ATTENUATION TANK AND CONFIRM THAT IT IS IN ACCORDANCE WITH THEIR DESIGN.

REVISION	DESCRIPTION	DRAWN	CHECKED	DATE
C01	ISSUED FOR CONSTRUCTION	IF	JF	12.03.24
	FIRST ISSUE			

KEY PLAN

CLIENT

BDP.

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P.O. Box 85, Piccadilly Basin
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www.bdp.com

PROJECT TITLE
Greenheys Development

PROJECT NUMBER
P3001624

DRAWING TITLE
LANDSCAPE SETTING OUT
ATTENUATION TANK

SCALE @ A1
1:100

DATE
MAR '24

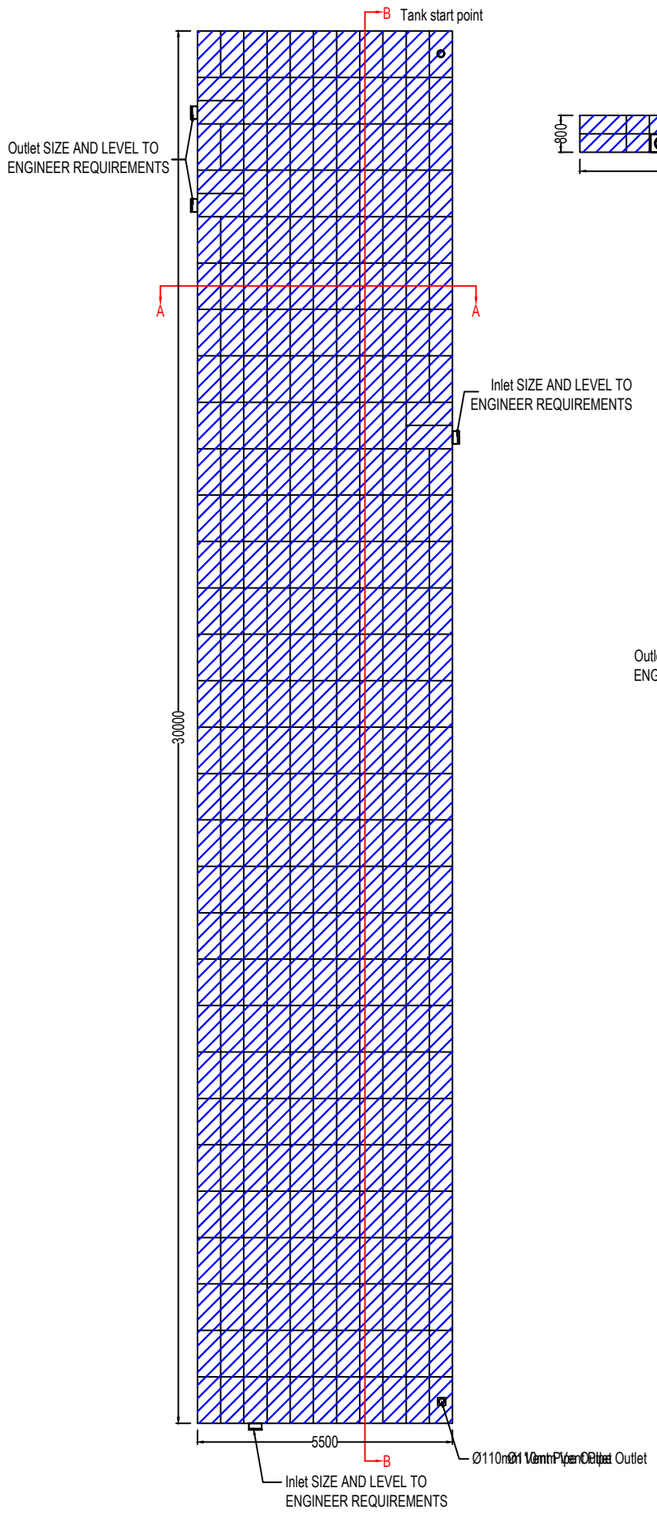
DRAWING No.
GRE-BDP-ZZ-XX-DR-L-00703

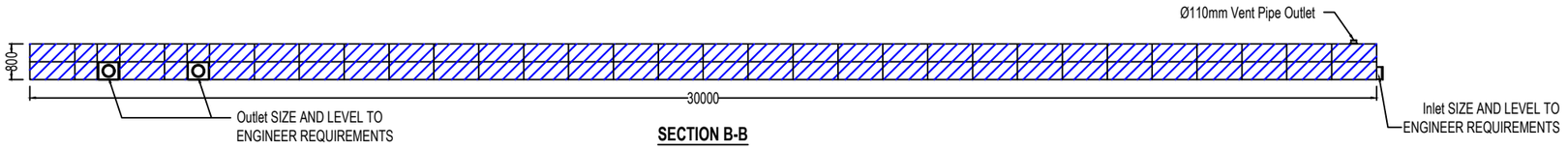
REVISION
C01

Drainage Maintenance Plan

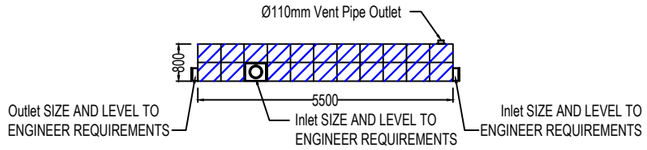
Contract: **GREENHEYS** **Manchester Science Park** Contract No: **DW2325** Client: **Bruntwood SciTech**
Date: 10.06.2024
Designer: C Corrigan

Ref No.	Element	Potential Risk	Maintenance Required	Timescale	Action By
1	Surface water flow restrictor	Blocking of surface water flow restrictor could cause backing up of surface water system causing surface water to discharge un-attenuated via the overflow in the final manhole chamber.	• Surface water restrictor to be checked on a regular basis, as required by the manufacturer and at least once per year and in particular after autumn leaf falls. Any debris to be removed. • Flow restrictor manhole to be checked for silt and debris every 6 months and fully cleaned / pumped out to remove all silt & debris which has accumulated in its sump.	Every 6 months. Especially November & April	MSP
2	Surface water attenuation tank system	Silting up of attenuation tank causing a reduction in attenuation capacity	• Attenuation tank to be flushed out from the upstream manhole in accordance with the manufacturer's recommendations and typically at least once per year and in particular after autumn leaf falls.	Annually	MSP
3	Gullys and Drainage Channels	Gully's and drainage channels blocking	• All gully's and drainage channels to be checked for debris at least every 6 months and cleaned out at least once per year to prevent debris entering the attenuation system	6 month check. Annually cleaned out	MSP
4	Silt Traps	Silt traps filling up allowing debris into drainage pipes and in particular the attenuation system	• All silt traps to be checked at least every 6 months and cleaned out at least once per year to prevent silt & debris entering the drainage and attenuation systems.	6 month check. Annually cleaned out	MSP
5	All below ground drainage pipes	Pipes silting up or becoming blocked by debris.	• All drainage chambers should be checked at least once per year to check for potential silting or blockages. • Pipes to be jetted clean if silting / blockages are suspected. • Irrespective of indication of silting / blockage, all underground pipes to be jet cleaned every 5 years.	12 month check and cleaned if required. Full clean every 5 years.	MSP
6	Blue Roof	Blocking of surface water outlets and storage cells.	• All drainage outlets and the storage cells are to be maintained in accordance with the manufacturer's details / specification.	As manufacturers spec but checked & cleaned out at least every 6 months.	MSP
7	Blue Roof	Crushing Storage Cells	• No plant or other items to be installed onto the roof except in designated plant locations to prevent any localised overloading of the blue roof storage cells. Any items that are required to be installed must be load checked by the structural engineer prior to installation.	All times	MSP





SECTION B-B

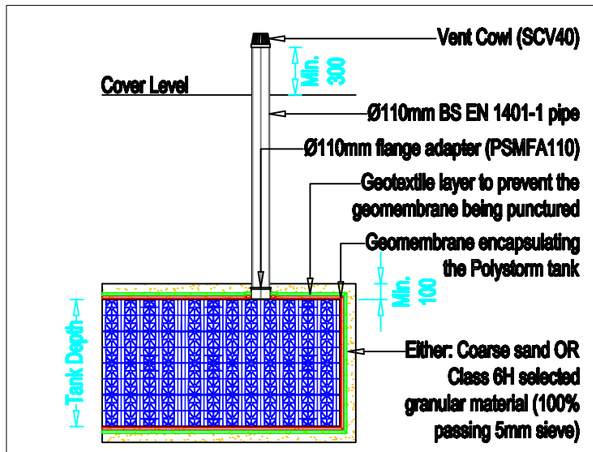


SECTION A-A

PROPOSED POLYSTORM STRUCTURE	
Plan Area	165m²
Tank Volume	132m³
Storage	125.4m³
Polystorm-Deep Units	660 (PSM5)

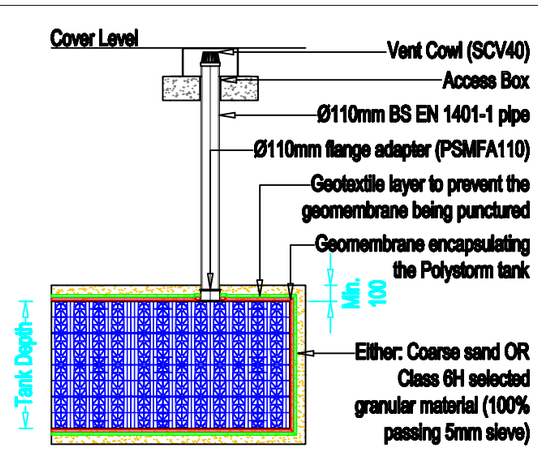
LEGEND:

Polystorm-Deep Units (PSM5)



ATTENUATION TANK VENTILATION SYSTEM - OPTION 1)

Scale (N.T.S)



ATTENUATION TANK VENTILATION SYSTEM - OPTION 2)

Scale (N.T.S)

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8. PLEASE REFER TO POLYSTORM & POLYSTORM LITE TECHNICAL GUIDE.
9. THE PROPOSED POLYSTORM STRUCTURE GENERAL ARRANGEMENT HAS BEEN BASED ON PROVIDING THE MINIMUM STRUCTURE VOLUME STATED ONLY. NO STRUCTURAL OR HYDRAULIC ASSESSMENT HAS BEEN MADE OF THE SUITABILITY OF THE PROPOSED POLYSTORM STRUCTURE FOR THE PROPOSED APPLICATION, NOR HOW IT WILL INTEGRATES INTO THE PROPOSED DRAINAGE SYSTEM.
10. ALL MEMBRANE JOINTS TO BE WELDED RATHER THAN GLUED.

R1	15/02/24	TANK MODULE UNIT HAS CHANGED FROM PSM1A TO PSM5

Notes :- All the Dimensions by Millimeters

ALDERBURGH LTD
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PROJECT

GREENHEYS REDEVELOPMENT, MANCHESTER SCIENCE PARK

ATTENUATION TANK

TITLE

DETAILS OF ATTENUATION/STORAGE TANK DETAILS USING POLYSTORM PSM5 MODULES

Scale	Drawn	Checked
N.T.S.	AY	KD

Date	Drawing No.	Revision
30/01/2024	PSM - 2.0	R1

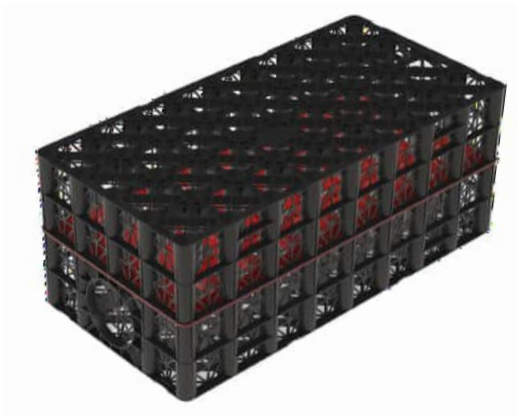
Polystorm Deep Modular Cell

Data Sheet

PRODUCT INFORMATION P1 ISSUE 2 - JAN 2019

Product code: PSM5

Polystorm Deep has been designed for use in trafficked applications such as lorry parks and industrial access roads. It has a vertical compressive strength of 61 tonnes/m² and a lateral compressive strength of 14.6 tonnes/m². This allows for deeper burial, and consequently higher volumes of water capture and storage. It can be buried deeper than any other Polystorm cell and can be value engineered as part of a hybrid system.



Applications

The Polystorm Deep modular cells are combined to form a structure that receives rainwater collected from roofs or surface drains. The rainwater is then either attenuated by the structure, when wrapped in an impermeable membrane, or infiltrated by the structure, when wrapped in a permeable geotextile.

Key Benefits

- Vertical compressive strength of 61 tonnes/m² and highest lateral compressive strength of any Polystorm unit
- Ideal for retention, attenuation and infiltration applications with a suitable geomembrane or geotextile
- Designed for trafficked conditions which require deep burial depths
- Allows flexibility of shape – ideal for narrow strips or use in restricted areas
- Can be used as part of a value engineered hybrid system in trafficked applications with Polystorm-R and Polystorm Xtra
- Can be used as part of a value engineered hybrid system for non-trafficked applications with Polystorm Lite and Polystorm-R
- Undergone testing in accordance to BBA certification
- Integrated inlet and outlet
- 3D flow throughout the structure
- 95% void ratio
- Light in weight yet robust – excellent Health & Safety and installation benefits
- 100% recyclable
- 50 years creep limited life expectancy
- Manufactured from over 82% recycled material

Technical Support

Detailed guidance and assistance is available.
For further information, please contact our Technical Team on +44 (0) 1509 615100 or email civils@polypipe.com or visit www.polypipe.com/civils-technical-hub

ELEMENT	VALUE
PHYSICAL PROPERTIES	
Length	1m
Width	0.5m
Depth	0.4m
Total volume	0.2m3
Unit weight	11kg
Unit storage volume	0.19m3 (190 litres)
Void ratio	95%
SHORT TERM COMPRESSIVE STRENGTH	
Vertical	Maximum 610kN/m² *
Lateral	Maximum 146kN/m² *
SHORT TERM DEFLECTION	
Vertical	60kN/m² per mm
Lateral	10.1kN/m² per mm
OTHER PROPERTIES	
Maximum burial depths: Heavy trafficked Light trafficked Non-trafficked	 7.9m** 8.2m** 8.4m**

Each unit includes 4 Clips and 2 Shear Connectors.

* Compressive strength at yield, maximum recommended value for design purposes.

** Based on ground conditions being dense sand and gravel with no groundwater present using the calculation methodology detailed within CIRIA C680 (2008). Where ground conditions differ please consult our water management solutions technical department on +44 (0) 1509 615100.

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Polystorm Deep Modular Cell

Data Sheet

Polystorm Deep Modular Cell can be utilised in these SuDS techniques

TECHNIQUES													
Blue-Green Roofs	Podium Decks	Trees	Sports Pitches	Cycle Paths	Permeable Paving (sub base & podium)	Bioretention & Rain Gardens	Attenuation Storage Tanks	Infiltration	Swales	Filter Drains	Detention Basins	Ponds & Wetlands	Filter Strips
			✓			✓	✓	✓	✓	✓	✓	✓	

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Polypipe

WILLMOTT DIXON SINCE 1852

QD Checklist-P1-Drainage

Attenuation tank and Capping Slab

Form Reference	F383650.14
Owned By	Abi Belfield (Willmott Dixon Construction)
Date	03/04/2024 15:19:36
Status	Completed & Signed Off
Project Name	K00290 - Greenheys Building, Bruntwood
Location	Attenuation Tank>Enabling Works>QUALITY DELIVERY

Form Location	Attenuation Tank
Supply Chain	N/A
Area/Location of Works	Attenuation tank and Capping Slab

General

#	Work Section	Element	Date Planned	Date Accepted
1	Enabling Works	Below Ground Drainage	03/04/2024	03/04/2024

Prepare and Plan

#	Check Item	No & Revision	S/C Initial	WD Initial
1	Confirm Specification	GRE DWC ZZ XX DR C 100001	MF	AB
2	Confirm Drawing	GRE DWC ZZ XX DR C 100001	MF	AB

#	Document Name	Created By	Date
2	GRE-DWC-ZZ-XX-DR-C-10001 (2).pdf	Pdf	Abi Belfield (Willmott Dixon Construction)	24/06/2024 09:12:31

Apply & Control

Check that Building Control, the Adopting Authority and the Environment Agency have no adverse comments on the Structural Engineers drawings and Specification	Yes
Camera Survey of Existing Drainage carried out	N/A
Check that a Temporary Works design has been carried out to deeper excavations and shoring equipment is available	Yes
Check the arrangements in place for dealing with Groundwater	Yes
Ensure SCP method statements for jetting/cleaning drainage/manholes include environmental protection to prevent accidental discharge from site	Yes
Check that arrangements are in place for dealing with/disposing of non inert excavated material	Yes
Checks carried out to ensure no clashes at crossovers of drainage and with other services	Yes
Check all other Underground Services are recorded and checked for Integrity & the positions are marked on site	Yes
Check that the pipes are as per the specification and size	Yes
Check the Trench excavation is to the correct line, depth, width and with correct support system	Yes
Check pipe gradient/falls	Yes
Check that all branches and junctions are marked on site, protected and marked up on drawings	Yes
For all Manhole Checks refer to the 'Manholes and Chambers' checklist	Yes
Check pipe bed material, initial backfill material and main backfill material and that the materials have been placed in layers and compacted as per the specification	Yes

Images


05/04/2024 11:25:39


05/04/2024 11:25:51

Check that the Air test carried out to the drainage run is accepted by Building Control	Yes
Water test to manholes	Yes
HOLD POINT - Ensure that all necessary environmental protection measures are in place during jetting or drain cleaning prior to handover to avoid discharging contaminated water	N/A

N/A ()

24/06/2024 09:05:28

Check all Pipework and Manholes are secured to prevent unwanted debris	Yes
Check that the Structural Engineer/Building Control have no remaining issues and that the CCTV survey carried out to the installation is made available to both	Yes
Finally, ensure that none of the bungs used for testing have been left in place. This is a recurring issue for WD and has to be checked for all runs	Yes

Bespoke Items/Additional Checks

#	Checks carried out
1	attenuation tank
2	Photos of ongoing attenuation tank install uploaded to QD Checklist from Sharepoint 05/05/2026

Images

#1


05/04/2024 12:56:02


05/04/2024 12:56:09


05/04/2024 12:56:31


15/04/2024 20:18:42


15/04/2024 20:18:42


15/04/2024 20:18:43



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01/05/2024 11:47:13



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#2



05/05/2026 21:41:11



05/05/2026 21:41:11



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05/05/2026 21:41:14


05/05/2026 21:41:15

Complete for Quality				
#	**Check Item**	**S/C Initial**	**WD Initial**	**Type of Evidence**
1	Works adequately protected	mf	SM	photos
2	Work area cleaned	mf	SM	photos

Images

#1



01/05/2024 11:48:50



01/05/2024 11:48:51



01/05/2024 11:48:51



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01/05/2024 11:48:55

#2



01/05/2024 11:49:51



01/05/2024 11:49:52

Closure	
All Evidence available & actions closed S/C	

[redacted]

Mike Flanagan (Mayo Civils)

01/05/2024 11:50:05

All Evidence available & actions closed	

[redacted]

Abi Belfield (Willmott Dixon Construction)

12/08/2024 09:46:51

Date Closed	28/06/2024
Approval to pay	approved

Images



15/04/2024 09:24:31



04/07/2024 09:25:23



04/07/2024 09:25:23



04/07/2024 09:25:23

Comments	Created By	Date
STATUS CHANGE: QA form updated due to puilita qa forms	syrus mcloughlin (Willmott Dixon Construction)	04/07/2024 09:26:47

Document Name	Type	Created By	Date
Copy of Greenheys - Attenuation tank QA.xlsx	Excel	syrus mcloughlin (Willmott Dixon Construction)	10/04/2024 14:41:43
Attenuation installation cert Greenheys.pdf	Pdf	syrus mcloughlin (Willmott Dixon Construction)	03/05/2024 09:15:25
Polystorm PSM1A Data Sheet.pdf	Pdf	syrus mcloughlin (Willmott Dixon Construction)	04/07/2024 10:14:57

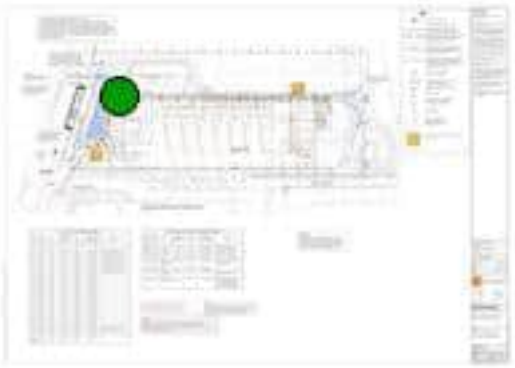
Polystorm PSM5 Deep Data Sheet.pdf	Pdf	syrus mcloughlin (Willmott Dixon Construction)	04/07/2024 10:14:59
PSM1A - 2.0 - RP - R1 - GREENHEYS REDEVELOPMENT MANCHESTER SCIENCE PARK - OPTION 1 (002).pdf	Pdf	syrus mcloughlin (Willmott Dixon Construction)	04/07/2024 10:15:01
GRE-DWC-ZZ-XX-DR-C-10005 (2).pdf	Pdf	syrus mcloughlin (Willmott Dixon Construction)	04/07/2024 17:03:51
GRE-DWC-ZZ-XX-DR-C-10006 (1).pdf	Pdf	syrus mcloughlin (Willmott Dixon Construction)	04/07/2024 17:03:53

WILLMOTT DIXON SINCE 1852

QD Checklist-P1-Drainage

below ground drainage external along GL 6

Form Reference	F403471.39
Owned By	Scott Billington (Mayo Civils)
Date	04/07/2024 10:00:13
Status	Completed & Signed Off
Project Name	K00290 - Greenheys Building, Bruntwood
Location	Drainage - Mayo>Substructure>QUALITY DELIVERY



Form Location	Drainage - Mayo

Images



16/08/2024 11:01:40

Supply Chain	Mayo Civils
Area/Location of Works	below ground drainage external along GL 6

Document Name	Type	Created By	Date
GRE-DWC-ZZ-XX-DR-C-10001 (2).pdf	Pdf	Scott Billington (Mayo Civils)	16/07/2024 12:51:35
GRE-DWC-ZZ-XX-DR-C-10002 (1).pdf	Pdf	Scott Billington (Mayo Civils)	16/07/2024 12:51:38

General

#	Work Section	Element	Date Planned	Date Accepted
1	Sub-Structure Works	Below Ground Drainage	04/07/2024	04/07/2024

Prepare and Plan

#	Check Item	No & Revision	S/C Initial	WD Initial
1	Confirm Specification	GRE-DWC-ZZ Structural specification section R	SB	AB
2	Confirm Drawing	GRE-DWC-ZZ-XX-DR-C-10001 Proposed underground drainage layout & details	SB	AB

#	Document Name	Created By	Date
2	GRE-DWC-ZZ-XX-DR-C-10001 (4).pdf	Pdf	Abi Belfield (Willmott Dixon Construction)	11/07/2024 08:58:56

Apply & Control

Check that Building Control, the Adopting Authority and the Environment Agency have no adverse comments on the Structural Engineers drawings and Specification	Yes
Camera Survey of Existing Drainage carried out	N/A

Comments	Created By	Date
No Existing drainage - all new proposed drainage	Abi Belfield (Willmott Dixon Construction)	11/07/2024 08:59:42

Check that a Temporary Works design has been carried out to deeper excavations and shoring equipment is available	Yes

Comments	Created By	Date
Held on TW file	Alexander Boys (Willmott Dixon Construction)	10/07/2024 09:53:57

Check the arrangements in place for dealing with Groundwater	Yes

Comments	Created By	Date
Water pumps located on site to clear groundwater	Alexander Boys (Willmott Dixon Construction)	10/07/2024 09:54:47

Ensure SCP method statements for jetting/cleaning drainage/manholes include environmental protection to prevent accidental discharge from site	Yes

Comments	Created By	Date
Saved on SharePoint	Alexander Boys (Willmott Dixon Construction)	10/07/2024 09:54:29

Check that arrangements are in place for dealing with/disposing of non inert excavated material	Yes
Checks carried out to ensure no clashes at crossovers of drainage and with other services	Yes
Check all other Underground Services are recorded and checked for Integrity & the positions are marked on site	N/A

Comments	Created By	Date
No underground services	Abi Belfield (Willmott Dixon Construction)	11/07/2024 09:01:16

Check that the pipes are as per the specification and size	Yes

Document Name	Type	Created By	Date
Surface water schedule.png	Unknown	Abi Belfield (Willmott Dixon Construction)	11/07/2024 09:10:38

Check the Trench excavation is to the correct line, depth, width and with correct support system	Yes
Check pipe gradient/falls	Yes
Check that all branches and junctions are marked on site, protected and marked up on drawings	Yes
For all Manhole Checks refer to the 'Manholes and Chambers' checklist	Yes
Check pipe bed material, initial backfill material and main backfill material and that the materials have been placed in layers and compacted as per the specification	Yes

Images



15/07/2024 16:31:50

Check that the Air test carried out to the drainage run is accepted by Building Control	Yes
Water test to manholes	Yes

HOLD POINT - Ensure that all necessary environmental protection measures are in place during jetting or drain cleaning prior to handover to avoid discharging contaminated water	



Scott Billington (Mayo Civils)

16/08/2024 10:25:57



Gary Dearden (Willmott Dixon Construction)

22/04/2025 16:12:58

Check all Pipework and Manholes are secured to prevent unwanted debris	Yes
Check that the Structural Engineer/Building Control have no remaining issues and that the CCTV survey carried out to the installation is made available to both	Yes
Finally, ensure that none of the bungs used for testing have been left in place. This is a recurring issue for WD and has to be checked for all runs	Yes

Bespoke Items/Additional Checks

#	Checks carried out
1	Images and checks for surface water saved on fieldview reference F403471.39
2	Pop up quality checks for locations captured on record of work checks
3	Full pre handover CCTV survey and jet of drainage completed wc27/05/2026. Survey included in handover documentation uploaded to Viewpoint

Complete for Quality

#	Check Item	S/C Initial	WD Initial	Type of Evidence
1	Works adequately protected	SB	SM	
2	Work area cleaned	SB	SM	

Closure

All Evidence available & actions closed S/C	

Andrew Eland (Willmott Dixon Construction)

05/05/2026 21:45:15

All Evidence available & actions closed	

Andrew Eland (Willmott Dixon Construction)

05/05/2026 21:45:20

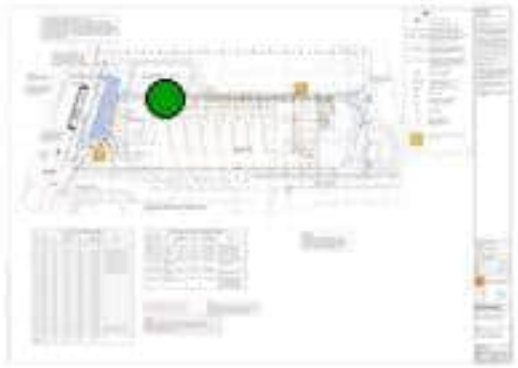
Date Closed	05/05/2026
Approval to pay	Approved

WILLMOTT DIXON SINCE 1852

QD Checklist-P1-Drainage

Internal Foul and Surface water drainage to entire Ground Floor

Form Reference	F403471.40
Owned By	Scott Billington (Mayo Civils)
Date	04/07/2024 10:01:23
Status	Completed & Signed Off
Project Name	K00290 - Greenheys Building, Bruntwood
Location	Drainage - Mayo>Substructure>QUALITY DELIVERY



Form Location	Drainage - Mayo

Images



16/08/2024 11:02:07

Supply Chain	Mayo Civils
Area/Location of Works	Internal Foul and Surface water drainage to entire Ground Floor

Document Name	Type	Created By	Date
GRE-DWC-ZZ-XX-DR-C-10001 (2).pdf	Pdf	Scott Billington (Mayo Civils)	15/08/2024 09:51:40

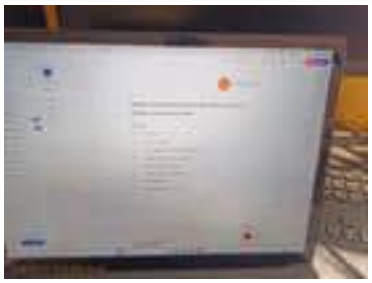
General

#	Work Section	Element	Date Planned	Date Accepted
1	Sub-Structure Works	Below Ground Drainage	04/07/2024	04/07/2024

Prepare and Plan

#	Check Item	No & Revision	S/C Initial	WD Initial
1	Confirm Specification	GRE-DWC-ZZ Structural specification section R	SB	AB
2	Confirm Drawing	GRE-DWC-ZZ-XX-DR-C-10001 Proposed underground drainage layout & details	SB	AB

Images
#1



05/07/2024 13:02:42

#2



08/07/2024 16:34:35

#	Document Name	Created By	Date	
1	DW2325 Greenheys Structural Specification WS4_Updated WS4 Structural Specifications_S3 - Suitabl.pdf	Pdf	Scott Billington (Mayo Civils)	15/08/2024 09:52:23
2	GRE-DWC-ZZ-XX-DR-C-10001 (2).pdf	Pdf	Scott Billington (Mayo Civils)	15/08/2024 09:52:39

Apply & Control			
Check that Building Control, the Adopting Authority and the Environment Agency have no adverse comments on the Structural Engineers drawings and Specification	Yes		
Comments		Created By	Date
Building control inspection at various points of drainage install 12/07/24		Alexander Boys (Willmott Dixon Construction)	05/07/2024 13:05:08
Camera Survey of Existing Drainage carried out	N/A		
Comments		Created By	Date
No existing drainage in area		Scott Billington (Mayo Civils)	15/08/2024 09:56:36
Check that a Temporary Works design has been carried out to deeper excavations and shoring equipment is available	Yes		
Comments		Created By	Date
Held in TW file		Alexander Boys (Willmott Dixon Construction)	05/07/2024 13:05:47
All excavations shallower than 1.5m. Steps/ batters installed where appropriate		Scott Billington (Mayo Civils)	15/08/2024 09:57:27
Check the arrangements in place for dealing with Groundwater	Yes		
Comments		Created By	Date
Water pumps located on site to clear groundwater		Alexander Boys (Willmott Dixon Construction)	05/07/2024 13:06:19
Ensure SCP method statements for jetting/cleaning drainage/manholes include environmental protection to prevent accidental discharge from site	Yes		
Comments		Created By	Date
Saved on SharePoint		Alexander Boys (Willmott Dixon Construction)	10/07/2024 09:47:54
Check that arrangements are in place for dealing with/disposing of non inert excavated material	Yes		

Comments	Created By	Date
Example of muck away ticket attached	Scott Billington (Mayo Civils)	15/08/2024 10:00:02

Document Name	Type	Created By	Date
8262-0-MV69 MHY-17-07-2024.pdf	Pdf	Scott Billington (Mayo Civils)	15/08/2024 09:59:46

Checks carried out to ensure no clashes at crossovers of drainage and with other services	Yes
Check all other Underground Services are recorded and checked for Integrity & the positions are marked on site	Yes
Check that the pipes are as per the specification and size	Yes

Images



15/08/2024 10:09:26

Check the Trench excavation is to the correct line, depth, width and with correct support system	Yes
Check pipe gradient/falls	Yes

Images



16/07/2024 11:18:11



16/07/2024 11:18:12



16/07/2024 11:18:13

	Yes

Images



15/07/2024 16:32:34



15/08/2024 10:24:49



15/08/2024 10:24:49



15/08/2024 10:24:49



15/08/2024 10:24:50



15/08/2024 10:24:50



15/08/2024 10:24:50

Check that all branches and junctions are marked on site, protected and marked up on drawings	Yes

Images



04/09/2024 07:47:57



04/09/2024 07:49:38



04/09/2024 07:49:46

For all Manhole Checks refer to the 'Manholes and Chambers' checklist	Yes

Images



15/08/2024 10:09:53



15/08/2024 10:09:53



15/08/2024 10:25:16



15/08/2024 10:25:16

Check pipe bed material, initial backfill material and main backfill material and that the materials have been placed in layers and compacted as per the specification	Yes

Comments	Created By	Date
10mm Limestone pipe bedding used on all pipework and Gen 3 Concrete used for manholes and pipework shallower than 900mm	Scott Billington (Mayo Civils)	15/08/2024 10:02:22

Check that the Air test carried out to the drainage run is accepted by Building Control	Yes

Comments	Created By	Date
Building control inspections carried out	Scott Billington (Mayo Civils)	15/08/2024 10:02:52

Water test to manholes	No

HOLD POINT - Ensure that all necessary environmental protection measures are in place during jetting or drain cleaning prior to handover to avoid discharging contaminated water	

Scott Billington (Mayo Civils)
15/08/2024 10:03:07

syrus mcloughlin (Willmott Dixon Construction)
15/08/2024 12:56:23

Check all Pipework and Manholes are secured to prevent unwanted debris	Yes
Check that the Structural Engineer/Building Control have no remaining issues and that the CCTV survey carried out to the installation is made available to both	

Comments	Created By	Date
CCTV to be carried out at the end of the job	Scott Billington (Mayo Civils)	15/08/2024 10:04:59

Finally, ensure that none of the bungs used for testing have been left in place. This is a recurring issue for WD and has to be checked for all runs	Yes

Bespoke Items/Additional Checks

#	Checks carried out
1	Images and checks for foul drainage saved on fieldview reference F410688.47
2	Full CCTV Survey and jet of drainage completed wc 27/04/2026. Survey included in completion docs on Viewpoint

Complete for Quality

#	Check Item	S/C Initial	WD Initial	Type of Evidence
1	Works adequately protected	SB	SM	
2	Work area cleaned	SB	SM	

Closure

All Evidence available & actions closed S/C	

Scott Billington (Mayo Civils)
15/08/2024 10:04:26

All Evidence available & actions closed	

Andrew Eland (Willmott Dixon Construction)
05/05/2026 21:48:55

Date Closed	05/05/2026
Approval to pay	Approved