PLANNING CONDITION 12

Issued 02/10/24

INDEX

SECTION 1: Green roofs and Terraces

1.1 General Arrangement Plans
1.2 Architects details
1.3 Subcontractor roof specifications
1.4 Drainage plans

A0 - Do not scale

General Notes

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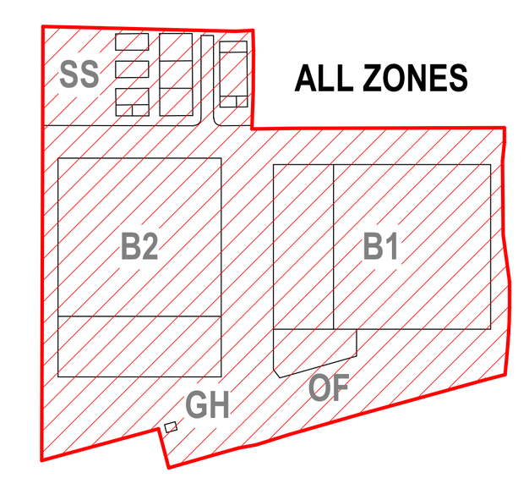
SCALE: 1:200
N

Key Plan



Key:

Boundary Line
Boundary Line Phase 1

Parking Provision:

65 No Total parking bays, of which:
- 61No. Standard bays
- 4No. WCH

Double Bay Active Electric Charging Points:
- 12 No. E/C Parking Bays
- 49 No. Future provision E/C

3No. Motorcycle Parking Bays

12No. Cycle Sheffield Racks
- 24 Cycle Parking Allowance

Rev	Details	By / Chkd / App	Date
P05	PLANNING ISSUE	VM	13/06/2024
P04	PLANNING ISSUE	VM	06/06/2024
P03	PLANNING ISSUE	PD	23/06/2023
P02	PLANNING ISSUE	WL	02/06/2023
P01	PLANNING ISSUE	WL	24/05/2023

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www.salusai.co.uk

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Project Title
London 4

Drawing Title
Building 1
Phasing - Day Final

Project Status
PLANNING

Discipline	Status Code
ARCHITECTURE	S4

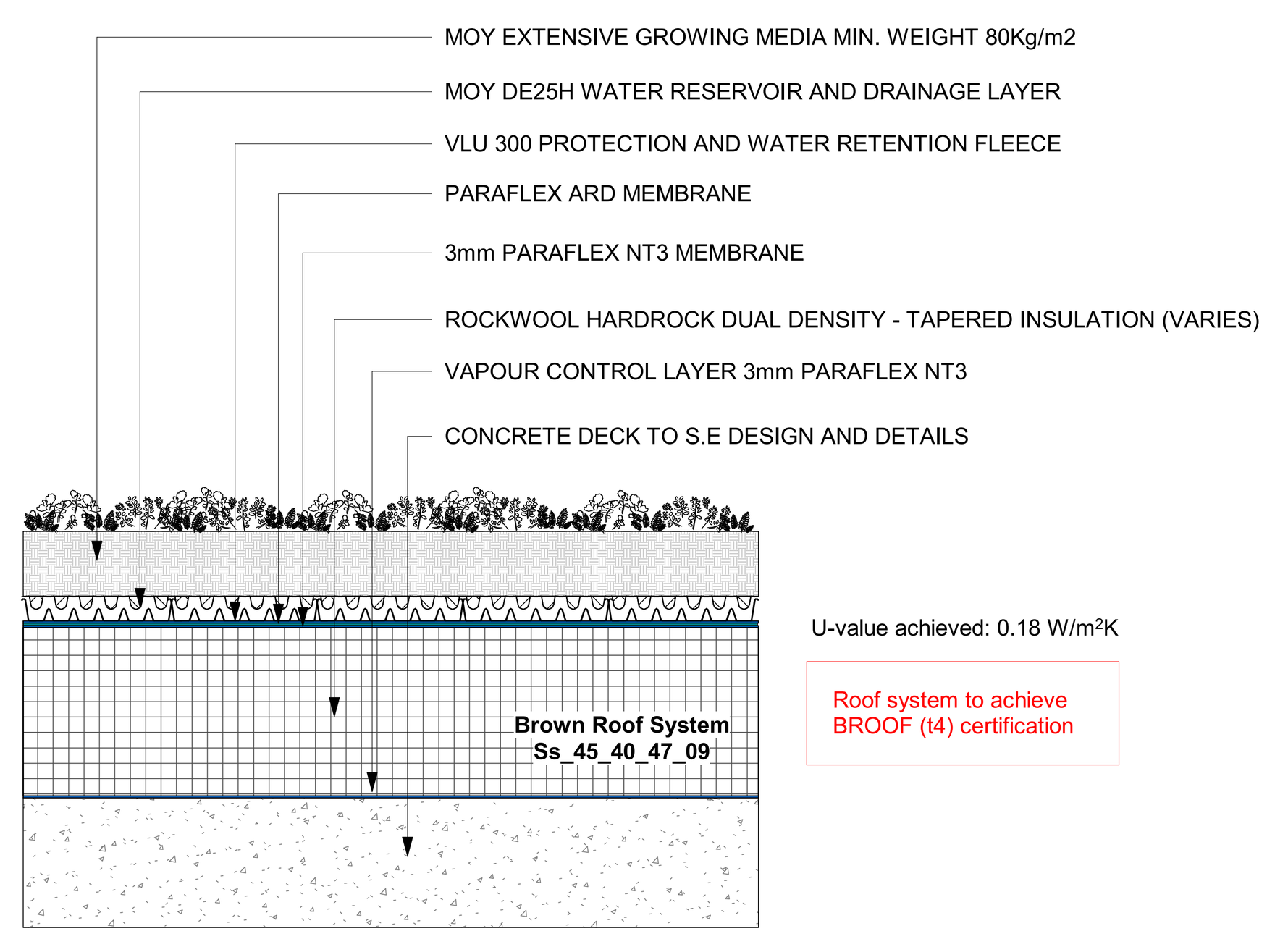
Project Number	Scale @ A0	Revision
0493	1:200	P05

Drawing Number
DCS20109-NWA-DC-B1-LP-DR-A-10512
Project — Originator — Functional Breakdown — Spatial Breakdown — Level — Form — Discipline — Number

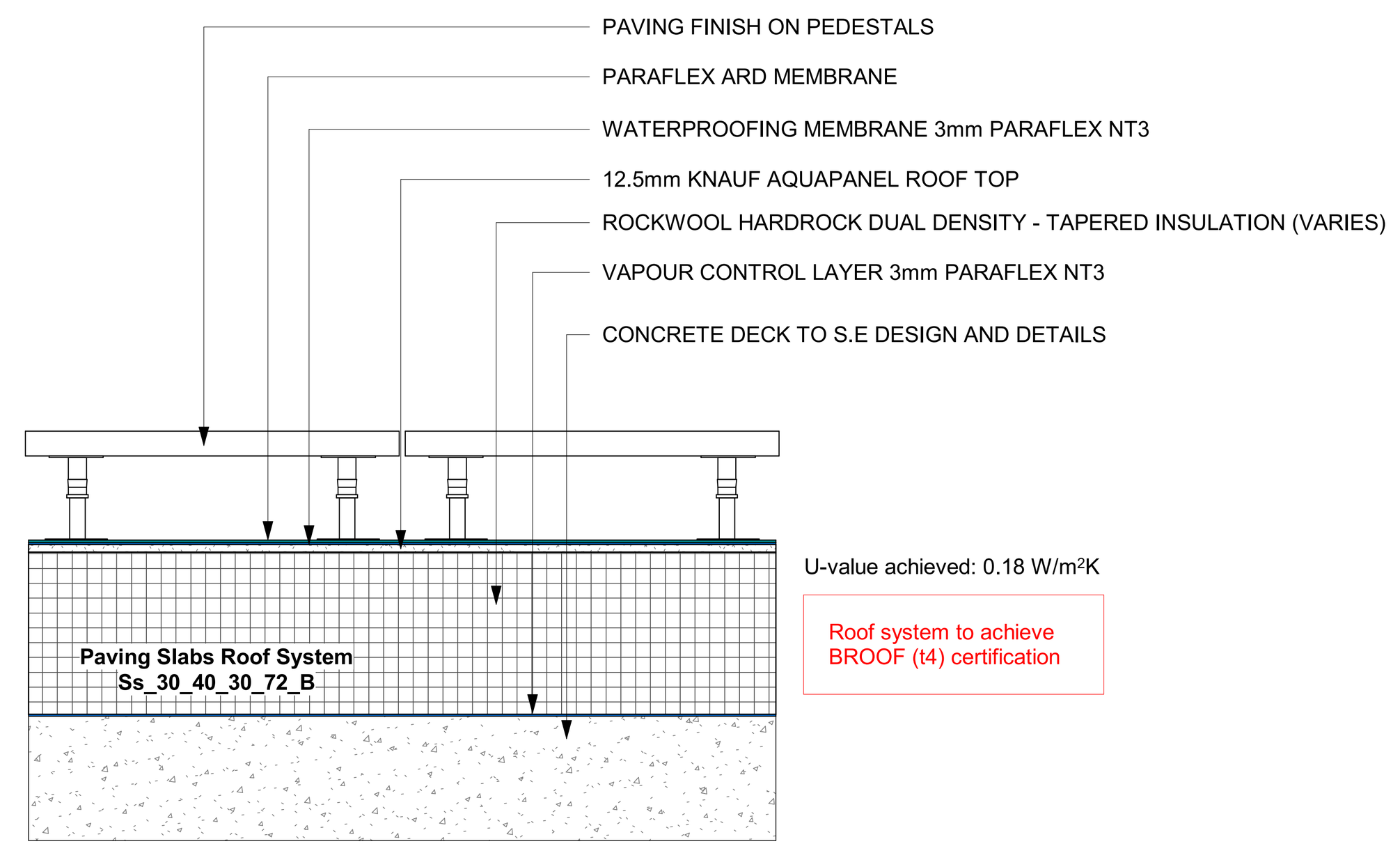
C:\Users\VictoriaMoreno\OneDrive - NWA\Documents\DCS20109-NWA-DC-LP-ZZ-M3-A-00004_P01.03_Planning File_29052024_victoria7U4BB.rvt 13/06/2024 16:14:41 © Black & White Engineering BWE_TB_A0v_Frame_LON4_v2

1.2 Architects details

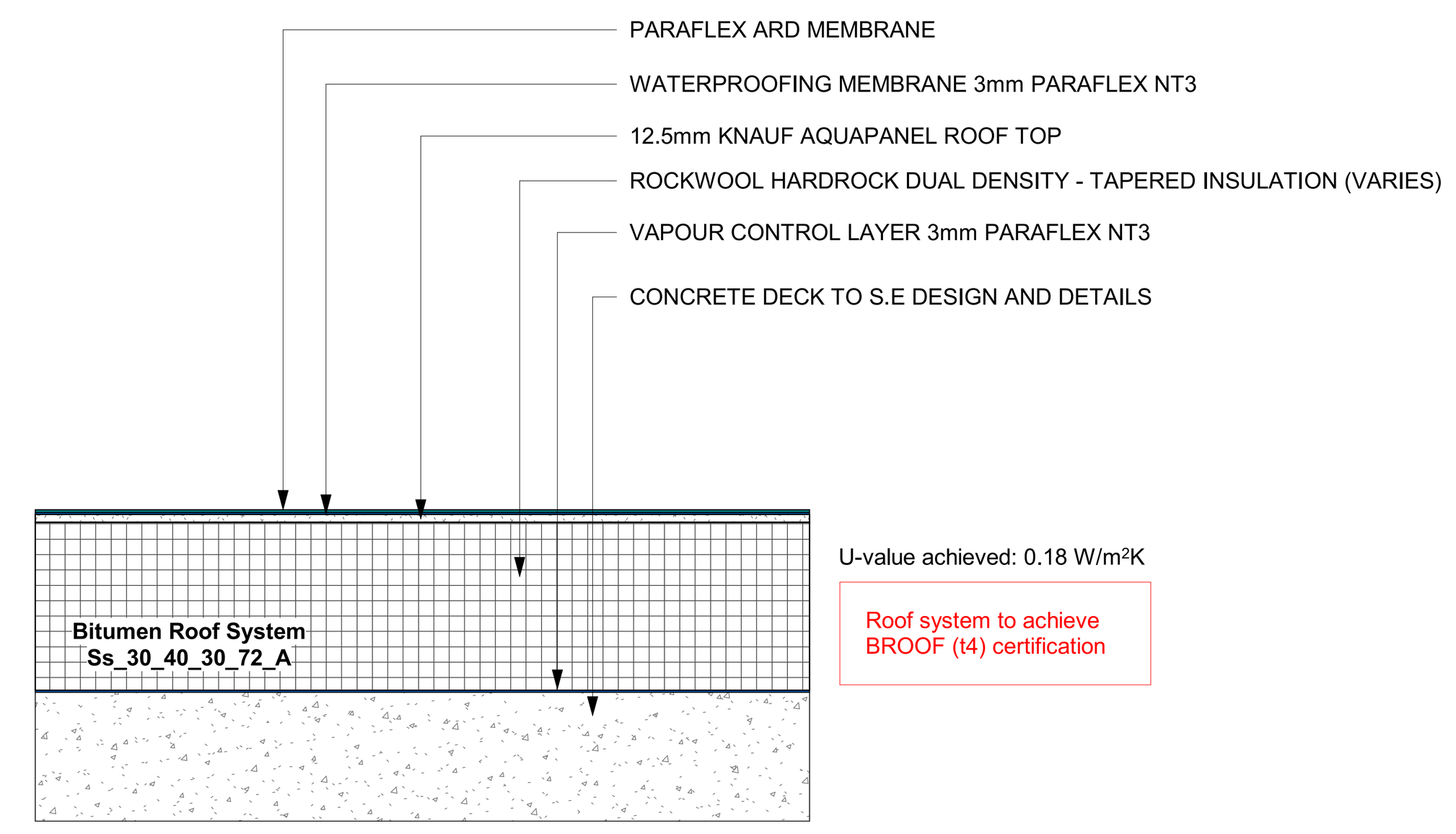
A0 - Do not scale



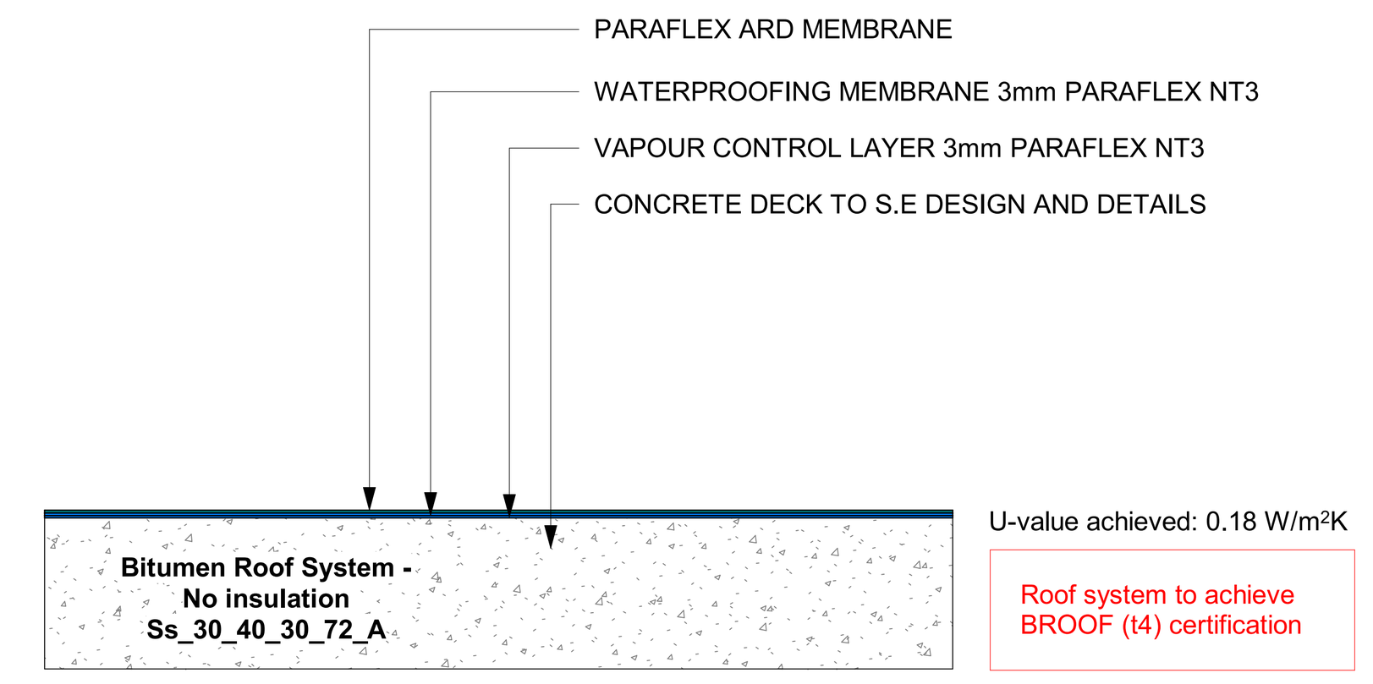
1 Brown Roof System
1 : 10



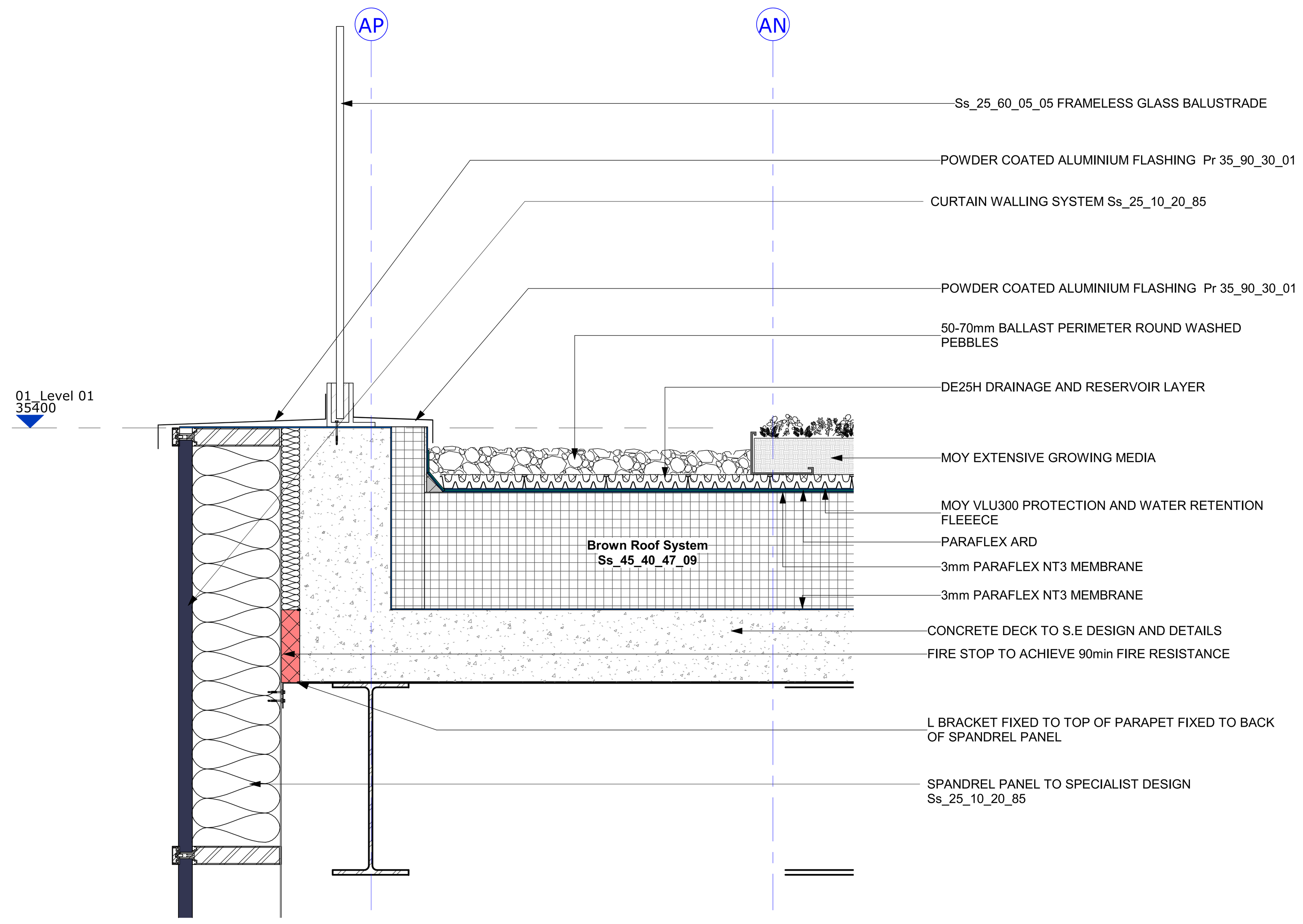
2 Paving Slabs Roof - Warm
1 : 10



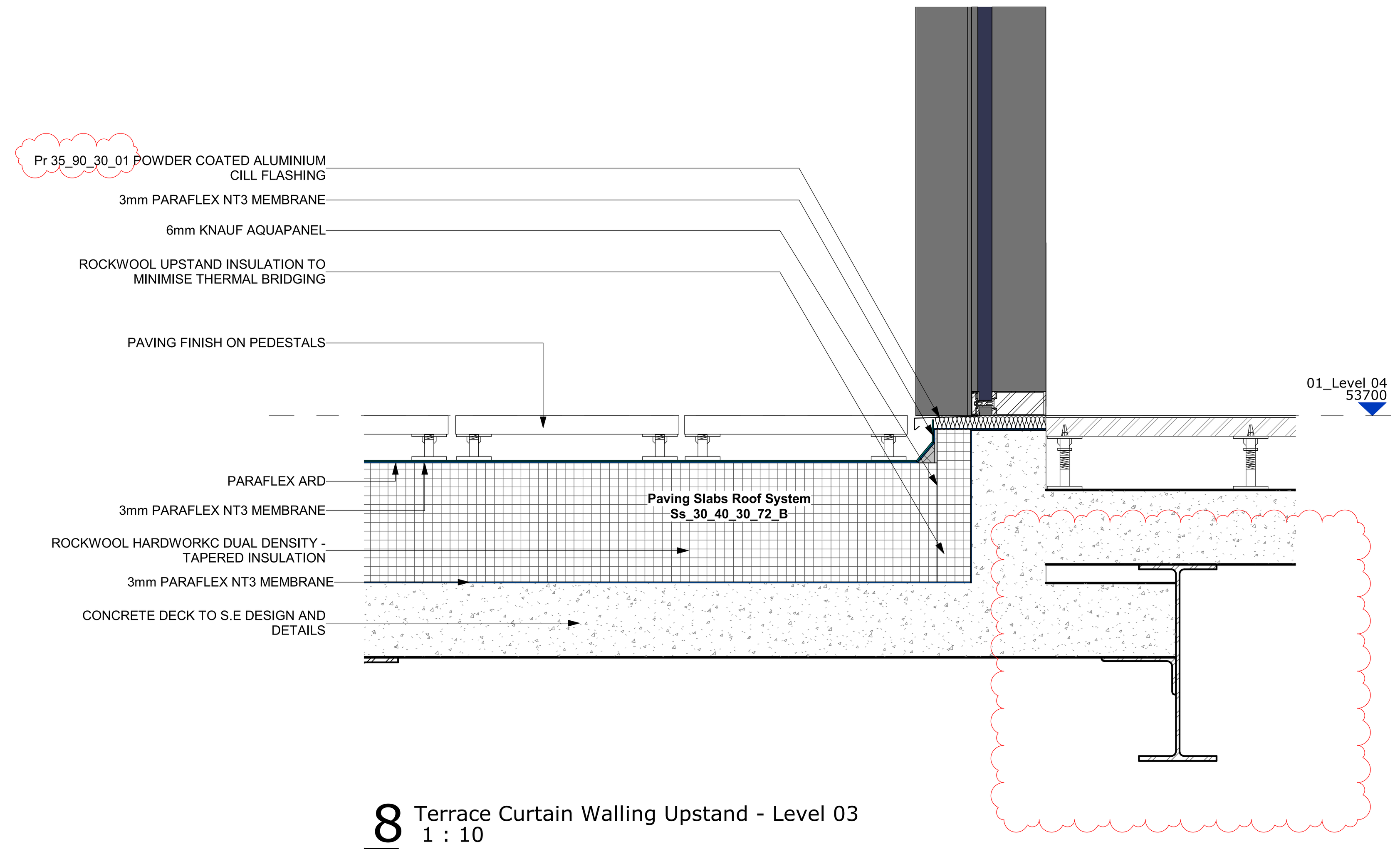
3 Bitumen Roof - Warm
1 : 10



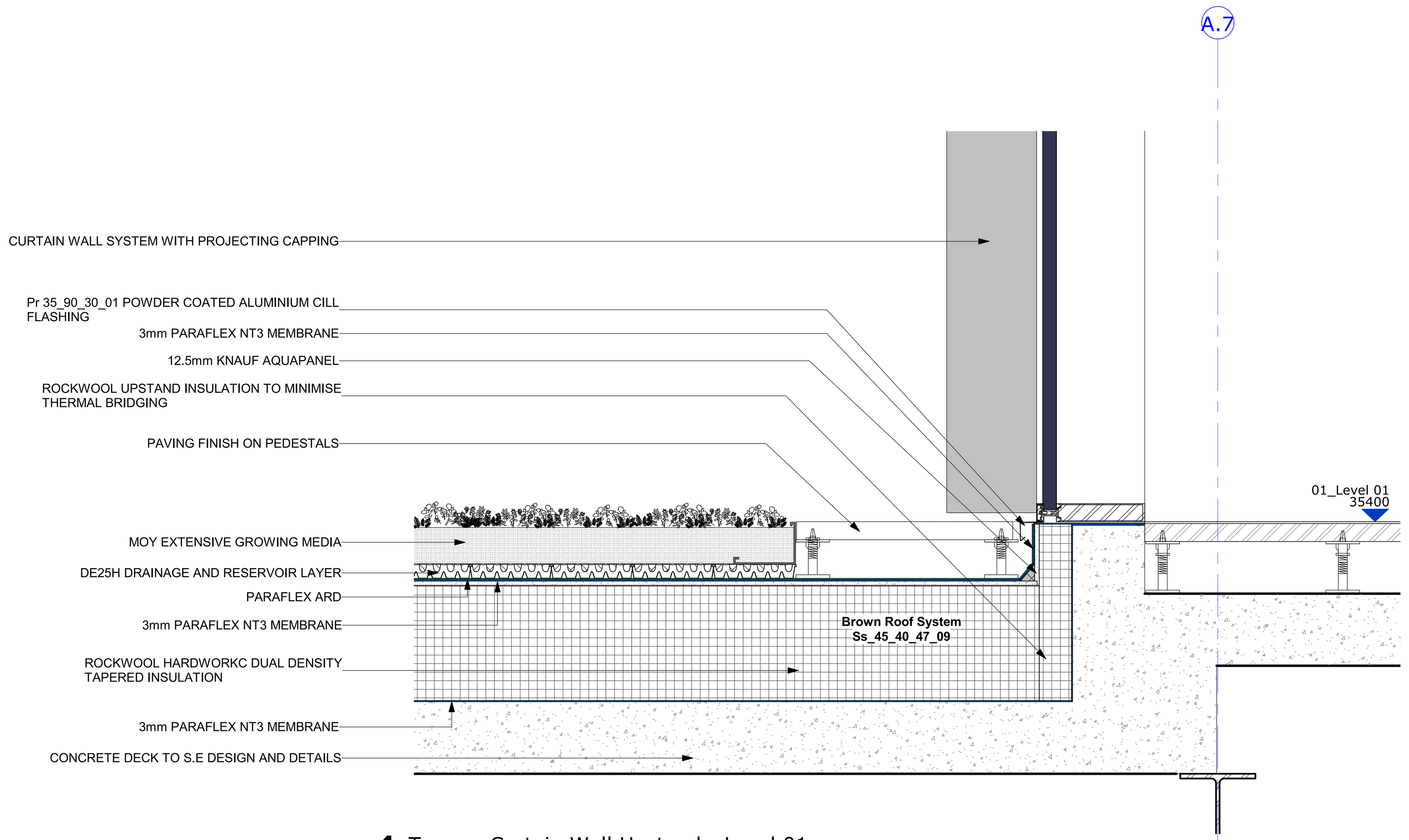
10 Bitumen Roof - Non insulated
1 : 10



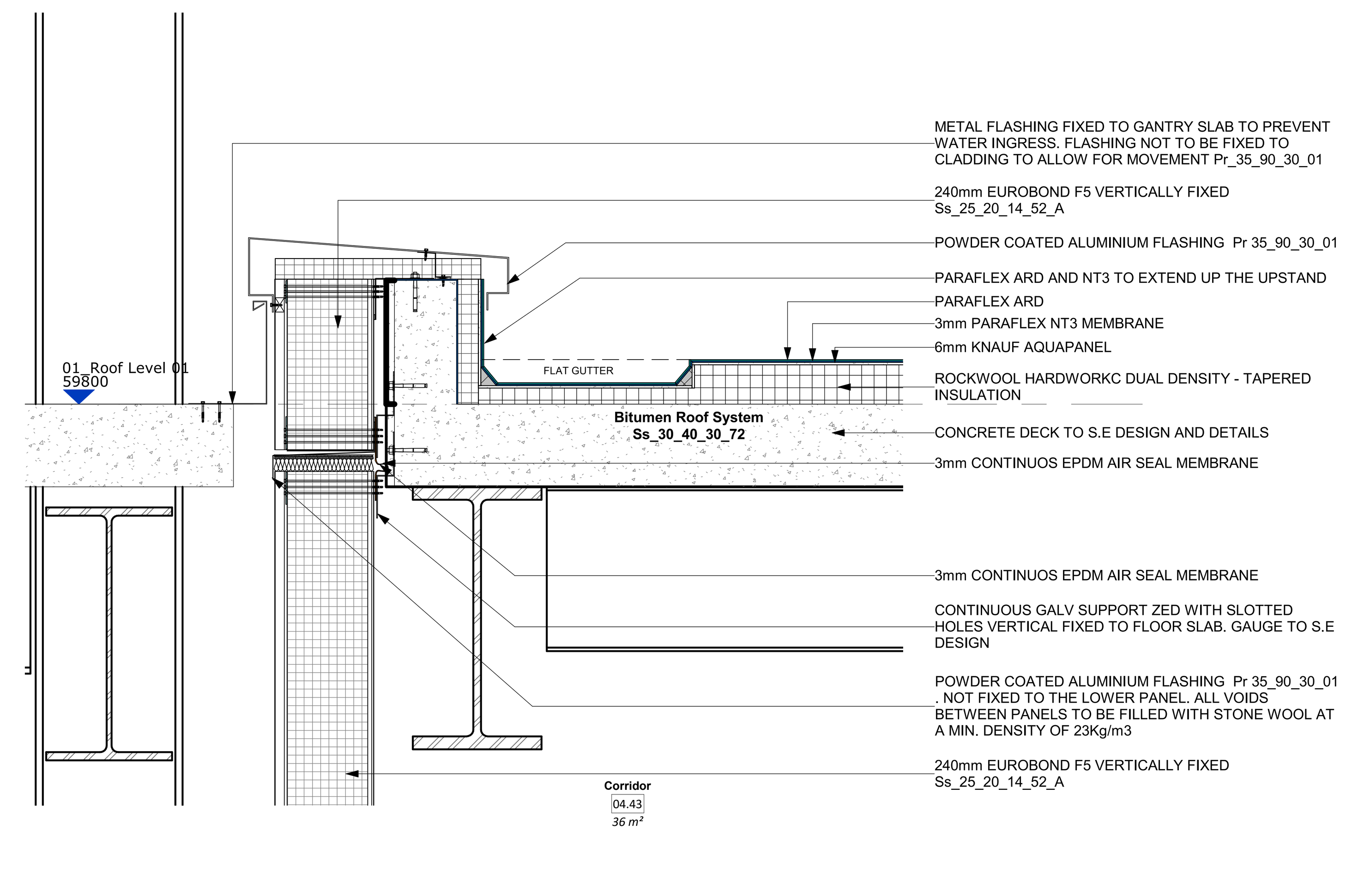
6 Terrace Edge Detail - Level 01
1 : 10



8 Terrace Curtain Walling Upstand - Level 03
1 : 10



4 Terrace Curtain Wall Upstand - Level 01
1 : 10



7 Typical - Gantry to Roof 01 Upstand
1 : 10

General Notes

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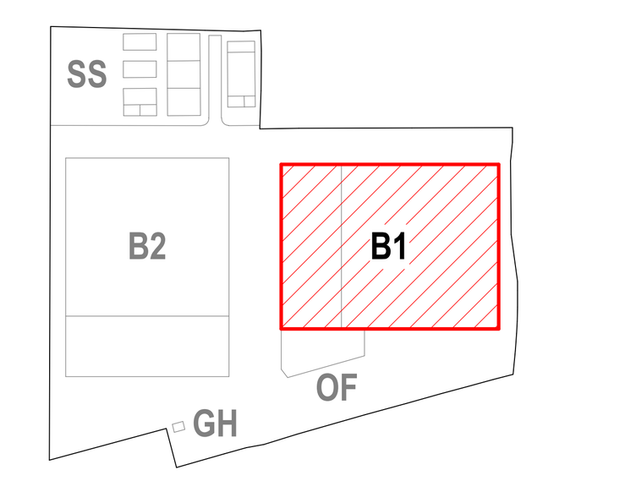
Key Plan



Rev	Details	By / Chkd / App	Date
P04	STAGE 4B ISSUE	VM	01/07/22
P03.01	STAGE 4A - PLANNING CHANGES	VM	21/03/22
P02.03	STAGE 3 - 100% ISSUE	DL/EB/VM	17/12/21

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Project Title
London 4

Drawing Title
Building 1
Roof Details Sheet 1

Project Status
STAGE 4B ISSUE

Discipline	Status Code
ARCHITECTURE	S4

Project Number	Scale @ A0	Revision
0493	As noted	P04

Drawing Number
DCS20109-NWA-DC-01-ZZ-DR-A-47500
Project — Originator — Functional Breakdown — Spatial Breakdown — Level — Form — Discipline — Number

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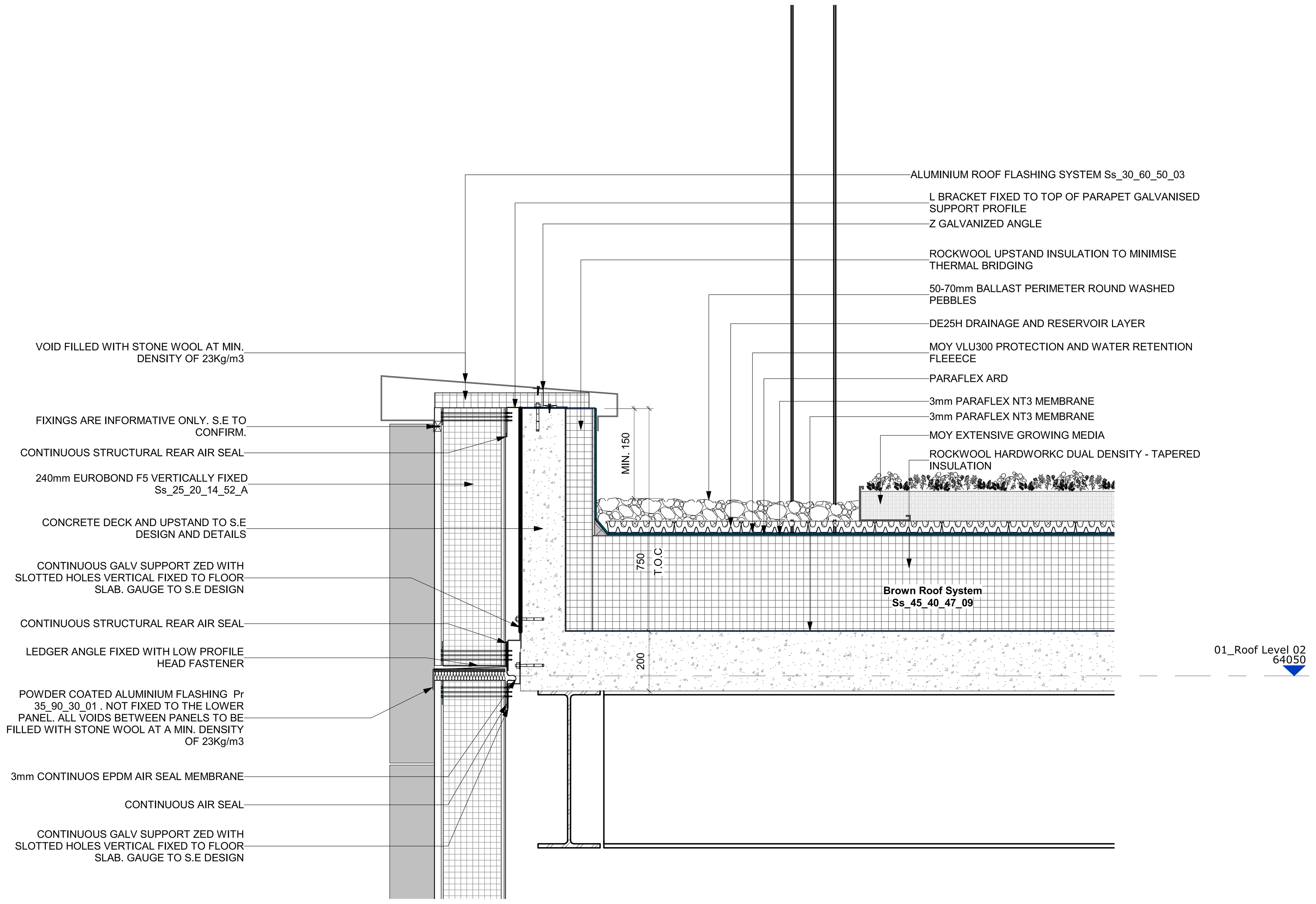
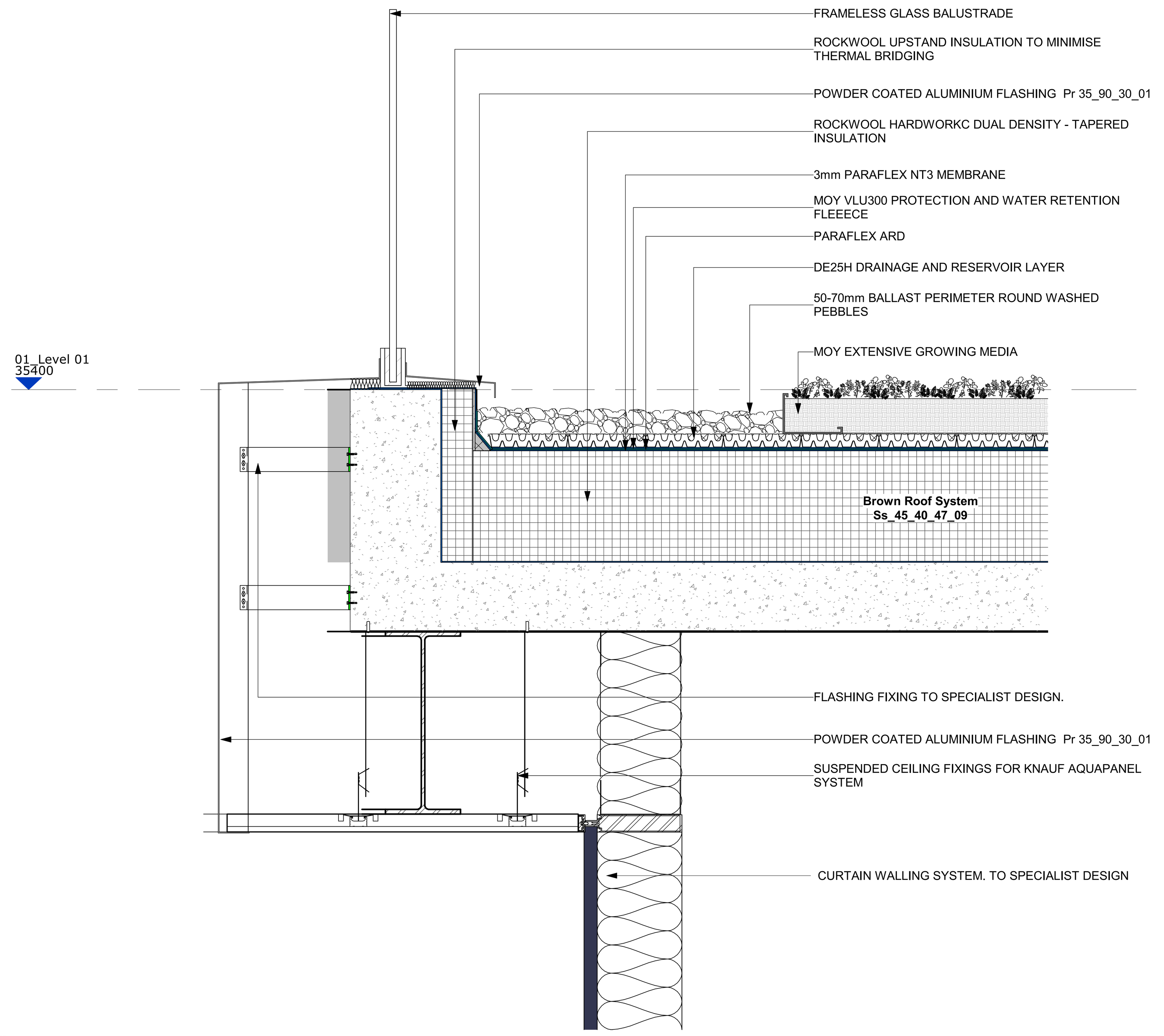
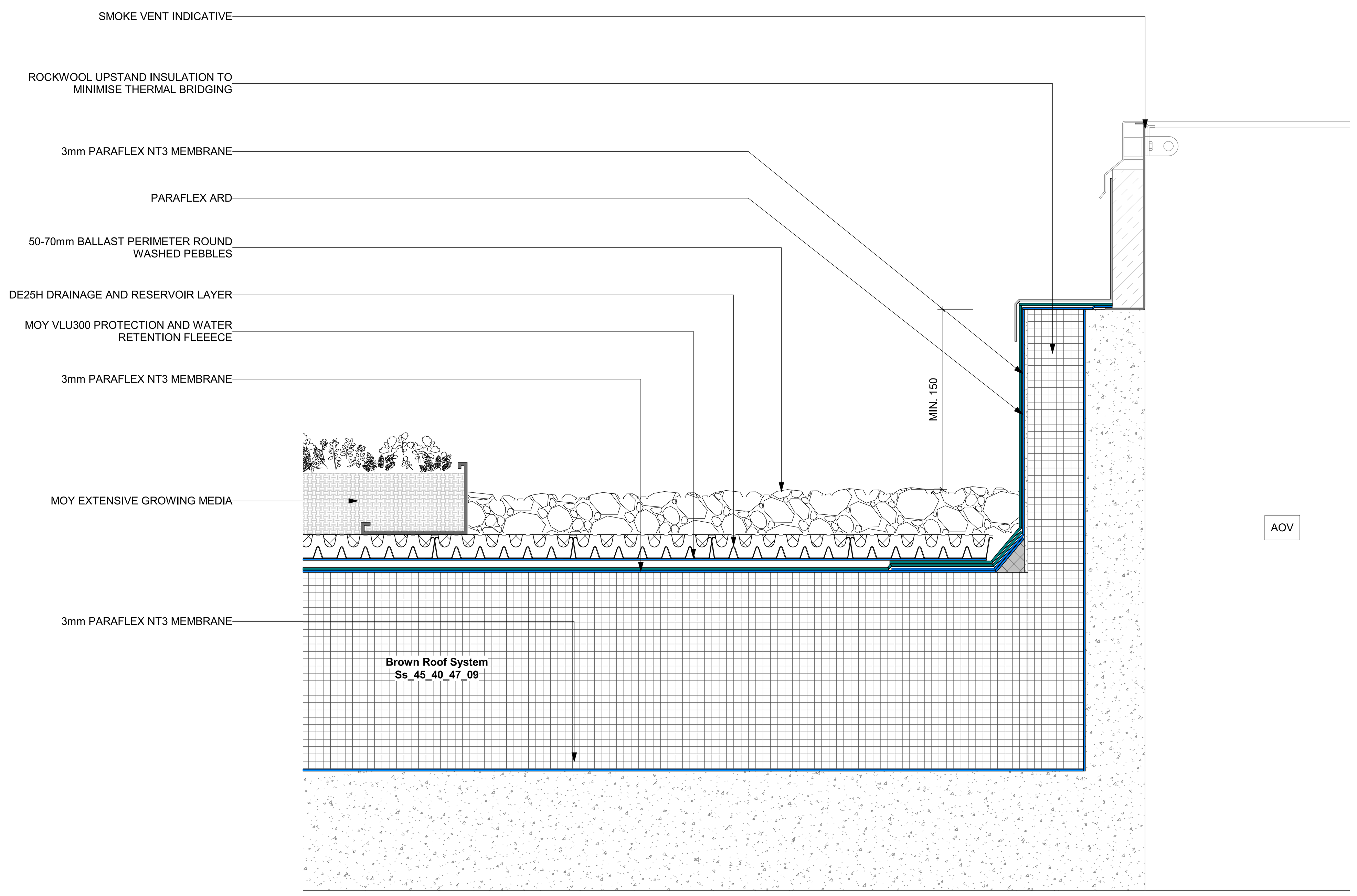


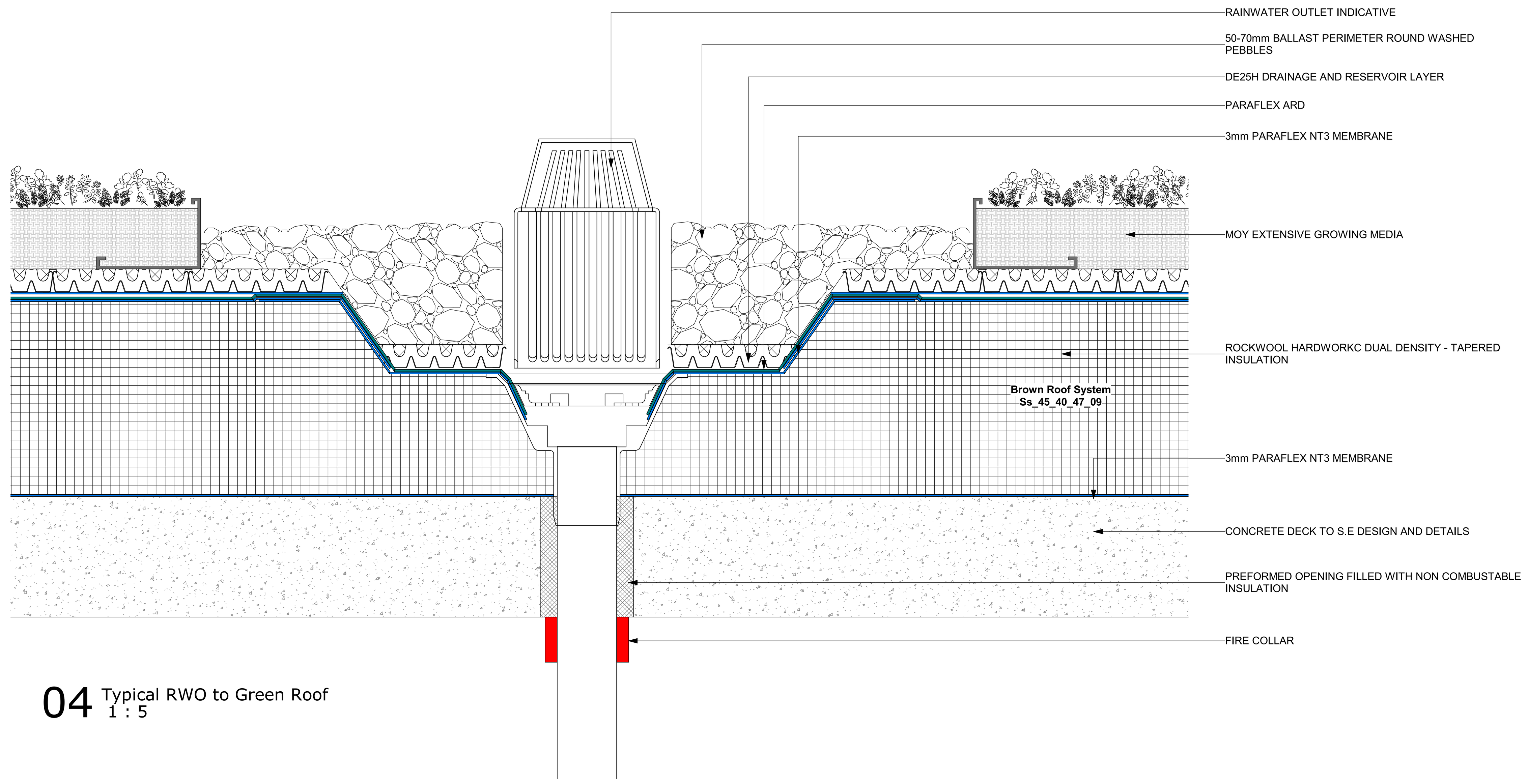
01 47500 - Typ Staircase Parapet
1 : 10



03 Recessed Curtain Wall DEtil
1 : 10



02 47500 - Typical AOV Upstand detail
1 : 5



04 Typical RWO to Green Roof
1 : 5

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SCALE: 1:200

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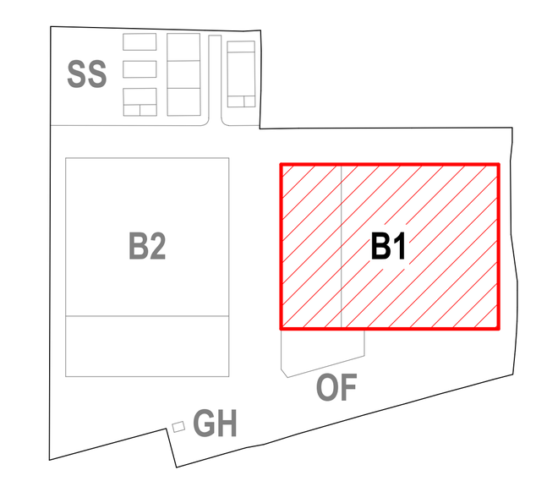
Key Plan



Rev	Details	By / Chkd / App	Date
P03.01	STAGE 4A - PLANNING CHANGES	VM	21/03/22
P03	STAGE 4A ISSUE	VM	22/02/22

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Project Title
London 4

Drawing Title
Building 1
Roof Details Sheet 3

Project Status
STAGE 4A ISSUE

Discipline	Status Code
ARCHITECTURE	S4

Project Number	Scale @ A0	Revision
0493	1:10	P03.01

Drawing Number
DCS20109-NWA-DC-ZZ-ZZ-DR-A-47502
Project — Originator — Functional Breakdown — Spatial Breakdown — Level — Form — Discipline — Number

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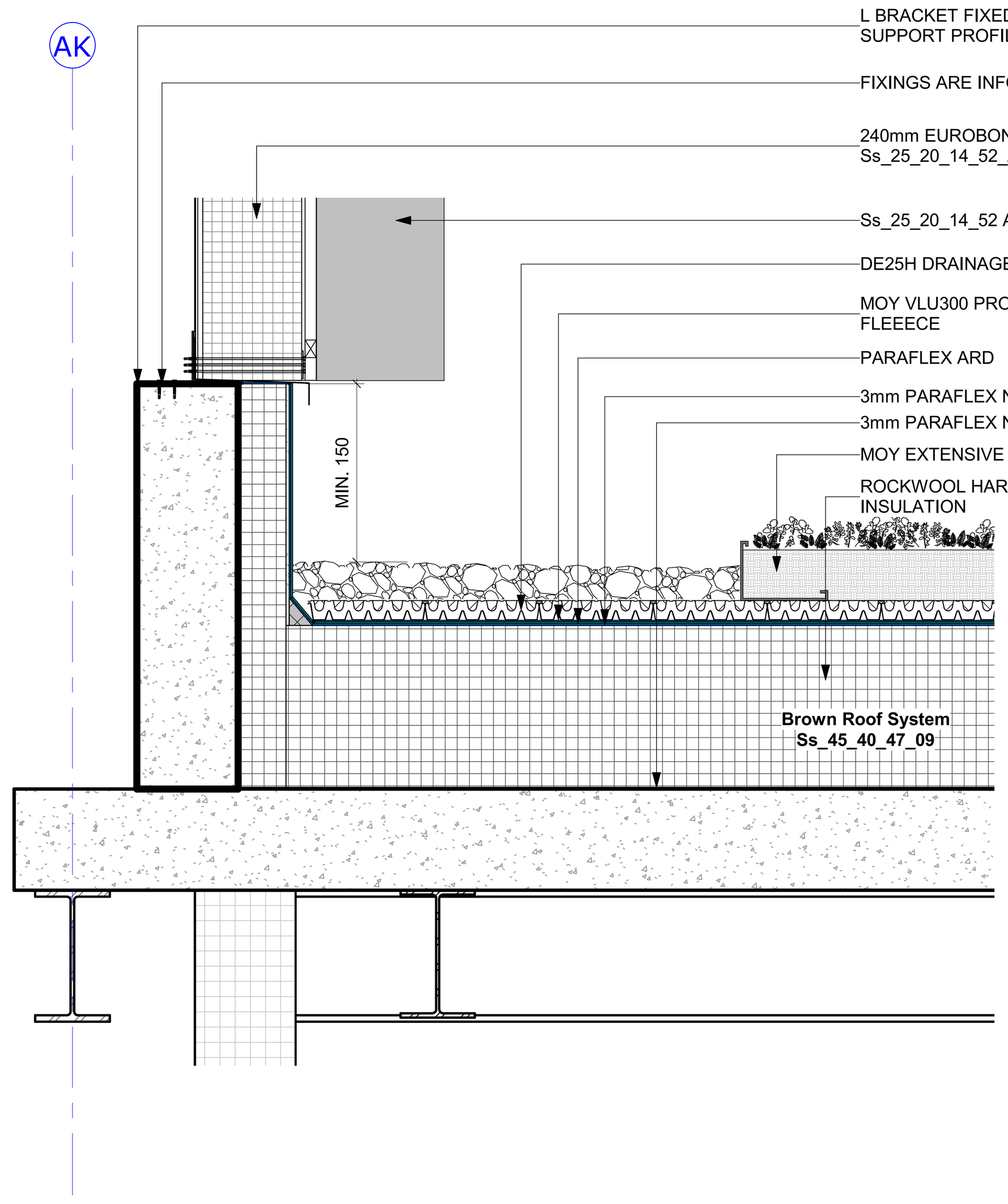
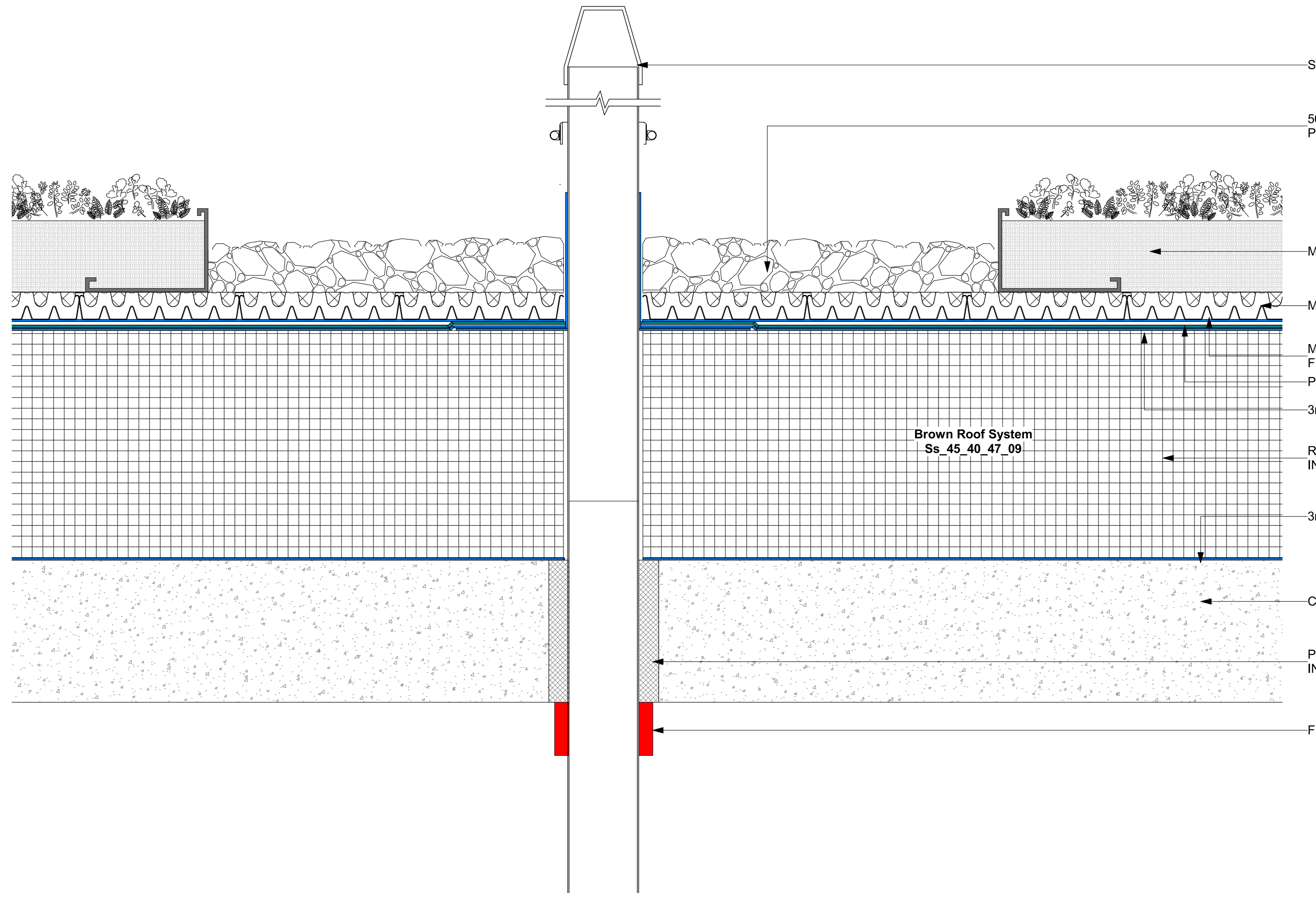
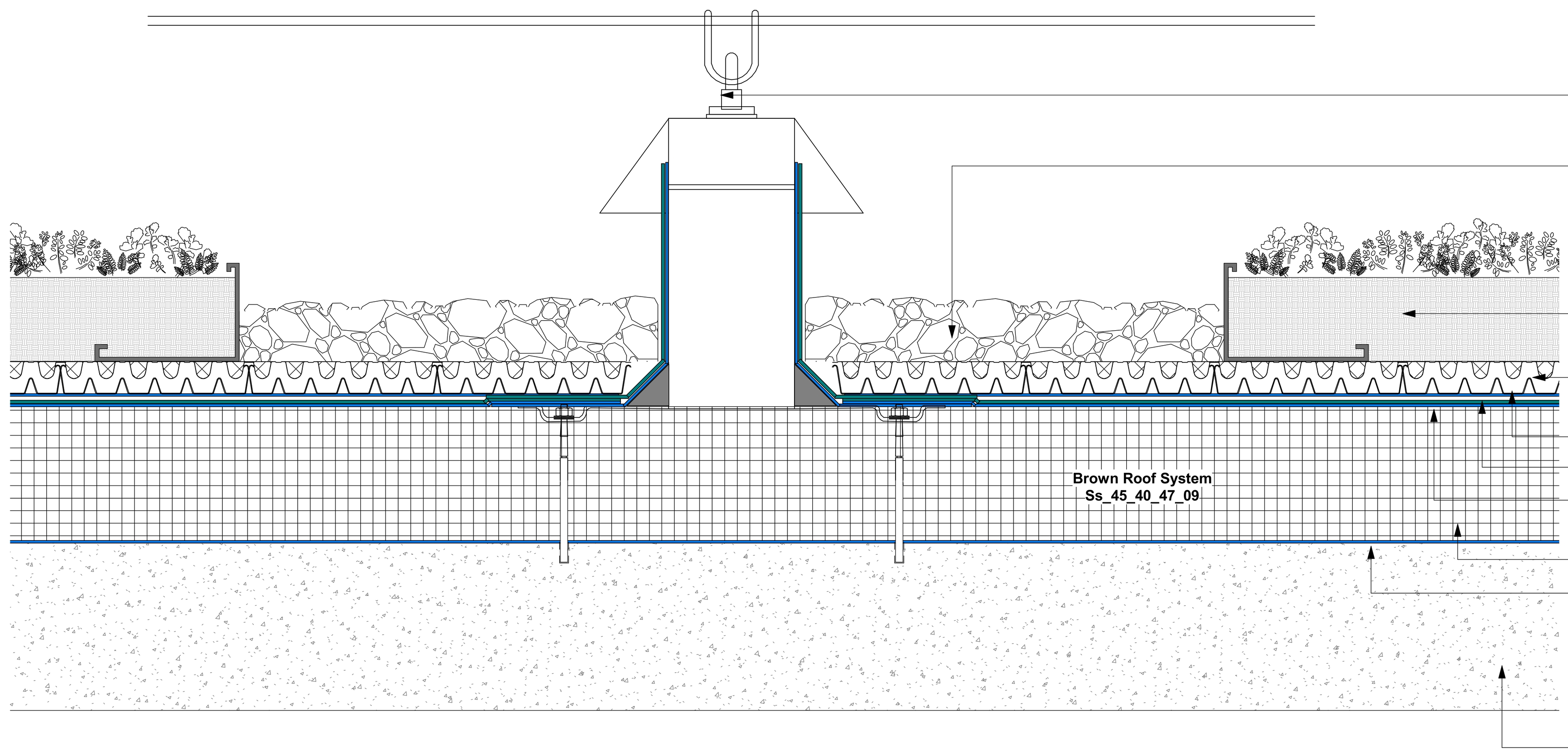


1 47500 - Admin Roof Cladding Detail
1 : 10



2 Typical RWO to Green Roof
1 : 5



3 Typical Fall Arrest Detail
1 : 5

Status A
Gowttham Ganendran - ISG Ltd
Oct 14, 2022, 9:53 AM GMT+1:00

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SCALE: 1:200

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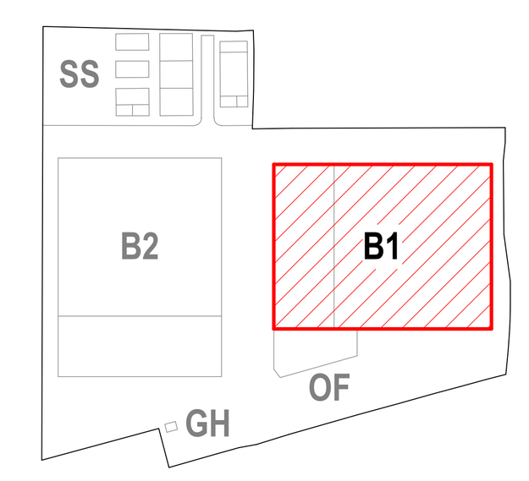
Key Plan



Rev	Details	By / Chkd / App	Date
P01	STAGE 4B ISSUE	VM	01/07/22

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www.controlrisks.com

Project Title
London 4

Drawing Title
Building 1
Rood Details Sheet 4

Project Status
STAGE 4B ISSUE

Discipline	Status Code
ARCHITECTURE	S4

Project Number	Scale @ A0	Revision
0493	1:5	P01

Drawing Number
DCS20109-NWA-DC-01-ZZ-DR-A-47503
Project — Originator — Functional Breakdown — Spatial Breakdown — Level — Form — Discipline — Number

© Black & White Engineering 30/06/2022 16:53:34 BWE_TB_A0v_Frame_LON4_v2

1.3 Subcontractor Roof specifications

TECHNICAL DATA SUBMISSION

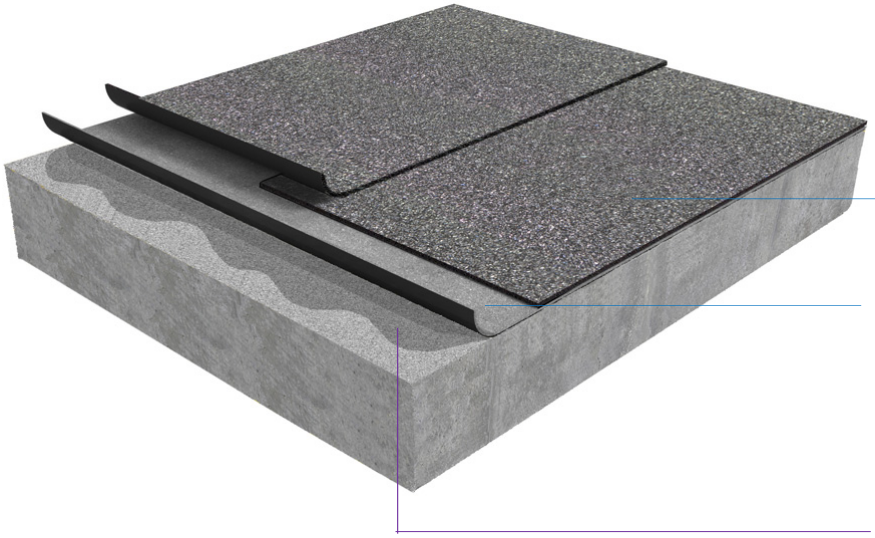
BUFR Cold Roof System

CONTENTS:

MAC GROUP OF COMPANIES

SPECIFICATION
SUMMARY

BUFR Cold Roof System



The above illustrates the primary roof build-up for this project.

Product / Component	Unit	Thickness	Length	Width	Approx Weight
Cap Sheet	1	3mm	8m	1m	4.5kg
Underlay	1	3mm	10m	1m	3.5kg
Impertene Bitumen Primer	1	N/A	N/A	N/A	20L TINS

MAC
GROUP OF COMPANIES

Cold roof Area

TECHNICAL DATA
SUBMISSION

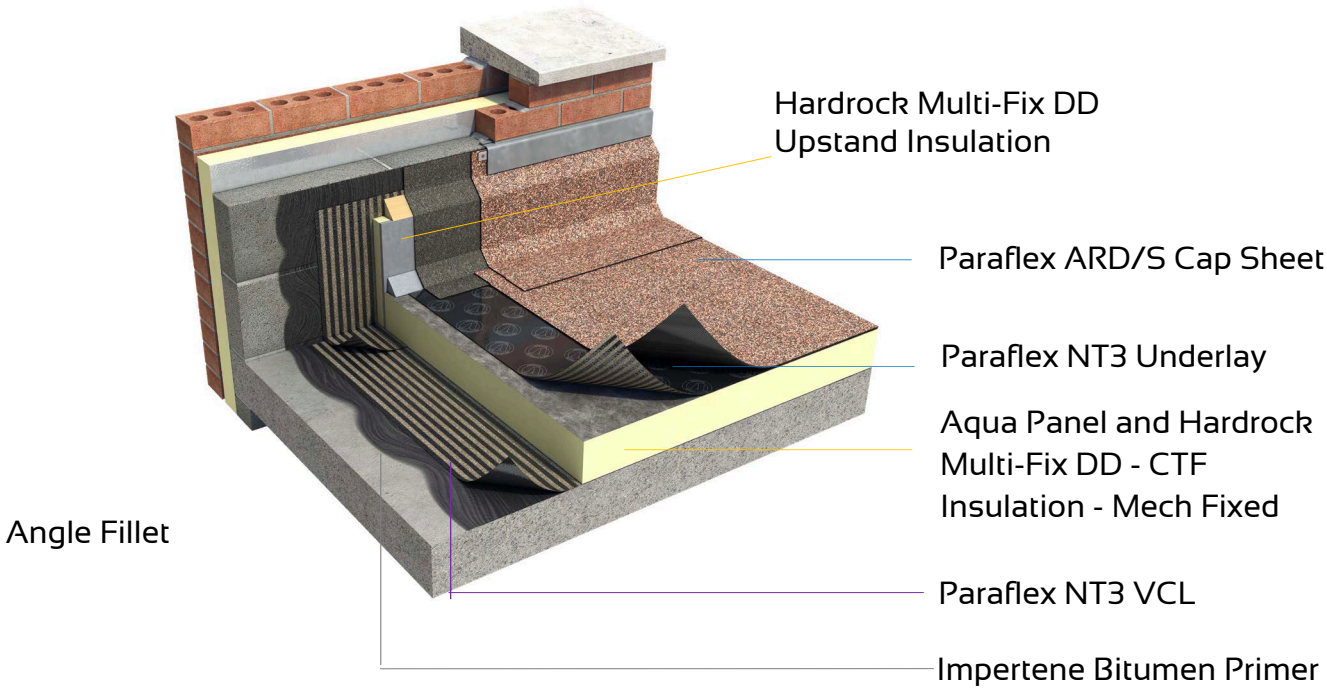
BUFR Warm Roof System

CONTENTS:

MAC
GROUP OF COMPANIES

SPECIFICATION SUMMARY

BUFR Warm Roof System



The above illustrates the primary roof build-up for this project.

Product / Component	Unit	Thickness	Length	Width	Approx Weight
Cap Sheet	1	3mm	8m	1m	4.5kg
Underlay	1	3mm	10m	1m	3.5kg
Aqua Panel	1	12.5mm	2400mm	1200mm	16.5kg
Insulation (Refer to CTF Section)	1	Varies	1000mm	1200mm	3.5kg at 100mm thick
VCL	1	3mm	10m	1m	3.5kg
Impertene Bitumen Primer	1	N/A	N/A	N/A	20L TINS

Main roof area

TECHNICAL DATA
SUBMISSION

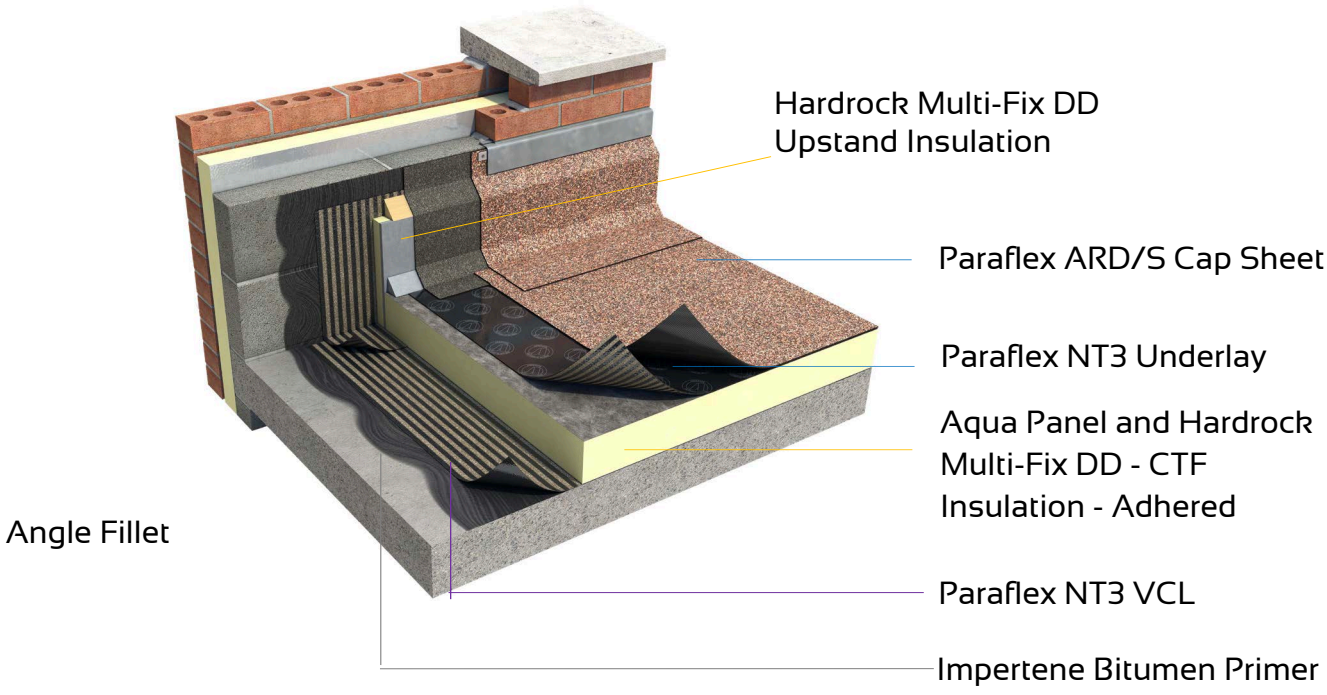
BUFR Warm Roof System

CONTENTS:

MAC
GROUP OF COMPANIES

SPECIFICATION SUMMARY

BUFR Warm Roof System



The above illustrates the primary roof build-up for this project.

Product / Component	Unit	Thickness	Length	Width	Approx Weight
Cap Sheet	1	3mm	8m	1m	4.5kg
Underlay	1	3mm	10m	1m	3.5kg
Aqua Panel	1	12.5mm	2400mm	1200mm	16.5kg
Insulation (Refer to CTF Section)	1	N/A	1000mm	1200mm	3.5kg at 100mm thick
VCL	1	3mm	10m	1m	3.5kg
Paving	1	50mm	600mm	600mm	43kg
Impertene Bitumen Primer	1	N/A	N/A	N/A	20L TINS

Paved Roof Area

TECHNICAL DATA
SUBMISSION

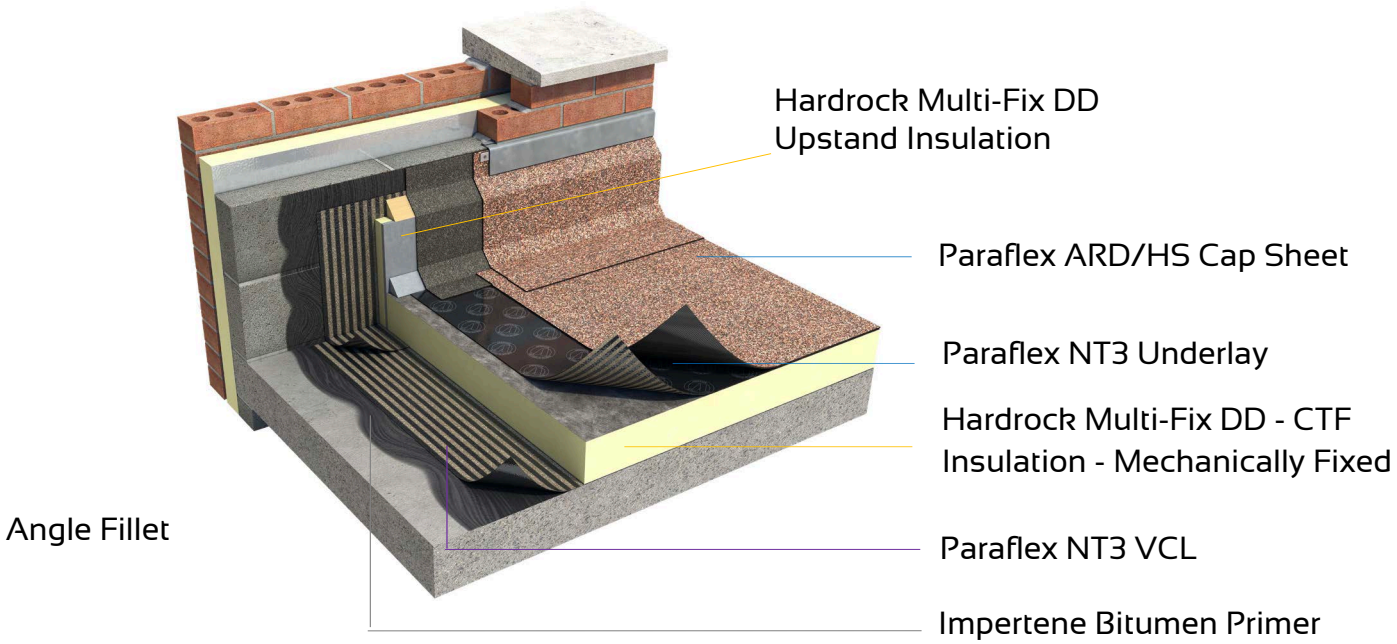
BUFR - Warm Roof System

CONTENTS:

MAC
GROUP OF COMPANIES

SPECIFICATION
SUMMARY

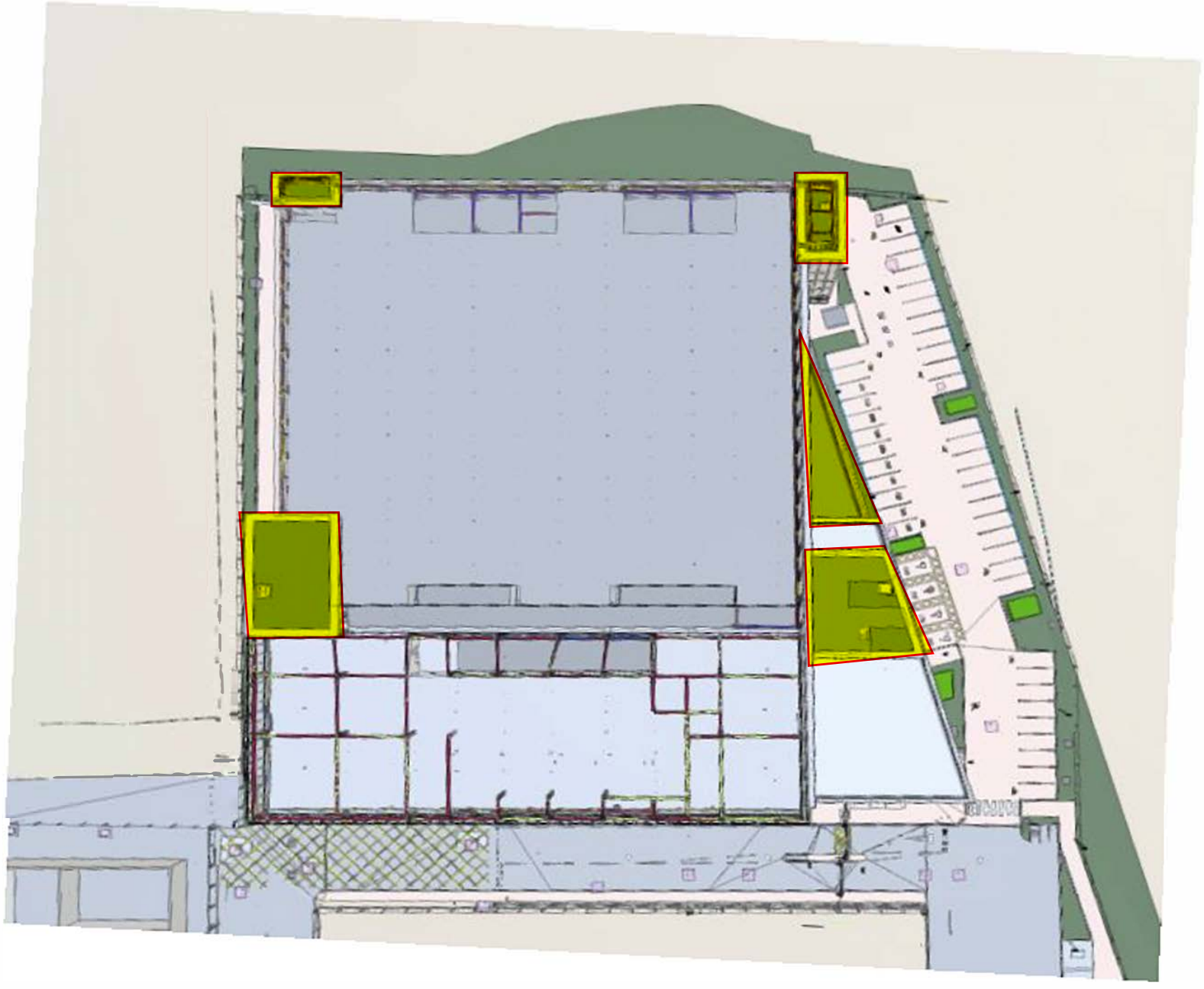
BUFR - Warm Roof System



The above illustrates the primary roof build-up for this project.

Product / Component	Unit	Thickness	Length	Width	Approx Weight
Cap Sheet	1	4.0mm	8m	1m	5.5kg
Underlay	1	3mm	10m	1m	3.5kg
Insulation	1	N/A	1000mm	1200mm	3.5kg at 100mm thick
VCL	1	3mm	10m	1m	3.5kg

Green Roof Area



Technical Data Sheet
Impertene Bitumen Primer

Limitations:

- Do not use in temperatures less than +5°C.
- It is the user's responsibility to ensure suitability for use. Safety Data Sheet available on request.
- Read the label carefully for essential health and safety information prior to use.

Technical Specification:

Composition	Based on organic solvent bitumens.
Product type	Single-component, ready to use. The product must not be diluted
Appearance	Black liquid.
Specific weight	g/dm3 950 (±50)
Viscosity Ford 4 cup at 20°C	15 ÷ 25 sec

Further Information:

In the event of further queries or problems concerning the use of this product, please contact MOY Technical Services.

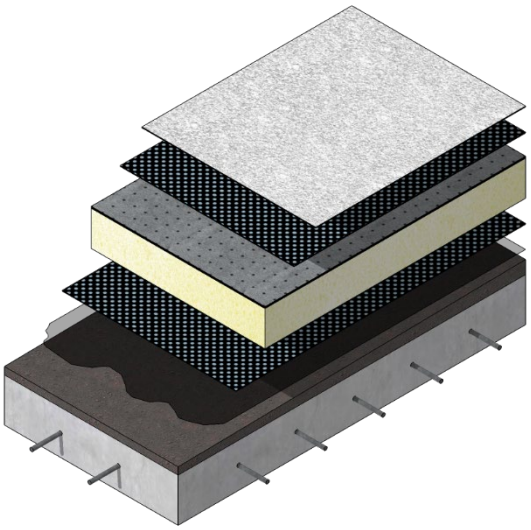
MOY Materials Ltd has taken care to ensure that the information provided in the literature is correct and up to date. However, it is not intended to form any part of a contract or provide a guarantee. Purchasers/intending purchasers should contact MOY Technical to check whether there have been any changes to the information since publication of the literature. Please ensure you have read the hazard labels and material safety data sheet before using this product.

Technical Data Sheet
Paraflex ARD/S

Product Description / Use:

Paraflex ARD/S is a modified bitumen SBS polymer waterproofing membrane intended for all waterproofing applications including; Flat Roofs, Terraces, Podiums, Car Parks and Bridge Decks, Tunnels, Foundations and Underground Structures.

The Paraflex range of waterproofing membranes, is FM approved and may be used in new build and refurbishment applications and is suitable for application in low temperature conditions. Paraflex remains flexible at low temperatures and exhibits high resistance to thermal stress.



Paraflex ARD/S is manufactured with a mineral slate or mineral stone granule coating to the upper surface of the membrane in various colours, offering UV protection and slip resistance. The membrane compound is reinforced with a synthetic non-woven continuous filament polyester fabric, enabling plasticity, elastic behaviour and superior resistance to mechanical damage. The lower face is coated with Termotene® fusible film which aids unrolling and facilitates torch bonding to various substrates.

The Paraflex SBS bitumen compound's special formulation ensures high mechanical performance, cold flexibility at temperatures down to –25°C and excellent fatigue strength.

Paraflex membranes contain no asbestos, tar or other dangerous substances.

Certification:

System Fire Testing:
Classification Standard BS EN 13501-5: 2016
Test Standard: CEN/TS 1187:2012

Determination of external fire performance is a system test which will be influenced by the components within the roofing system.

Whilst Paraflex ARD/S can be included in compliant $B_{ROOF\ (t4)}$ systems, always check with MOY Technical Services for the very latest information on fire testing carried out.

Technical Data Sheet
Paraflex ARD/S

Technical Specification:

Specifications	EN Standards	Unit of Measure	Tolerances (1)	Paraflex ARD/S (2,10)
Roll dimensions	1848-1	m	≥	8 x 1 (-1%)
Thickness	1849-1	mm	±5%	-
Mass per unit area	1849-1	kg/m²	±10%	4.5
Watertightness	1928-B	kPa	≥	60
Cold flexibility	1109	°C	≤	-25
Flow resistance at elevated temperature	1110	°C	≥	+100
L/T tensile strength	12311-1	N/5cm	±20%	800/600
L/T tensile elongation	12311-1	%	±15 (3)	50/50
L/T dimensional stability	1107-1	%	2	0.3
Static puncture	12730	kg	≥	NPD (4)
Dynamic puncture	12691-B	mm	≥	1250
L/T tear resistance	12310-1	N	±30%	160/180
Joint peel resistance	12316-1	N/5cm	±20 N	NPD (4)
Joint cut resistance	12317-1	N/5cm	±20%	NPD (4)
Durability after ageing:				
• Cold flexibility	1296-1109	°C	+15°C	-10
• Flow resistance at elevated temperature	1296-1110	°C	-10°C	+100
• UV Ageing	1297	-	-	NPD (4)
• Watertightness	1296-1928	kPa	≥	60
• Chemical resistance	-	-	-	NPD (4)
• L/T tensile strength	12311-1	N/5cm	±20%	700/500
• L/T tensile elongation	12311-1	%	±15 (3)	45/45
Steam permeability	1931	µ	≥	20,000
Root resistance	13948		-	NPD (4)
External fire behaviour	13501-5	EC (6)	-	NPD (9)
Fire reaction	13501-1	EC (6)	-	F
Solar Reflectance Index (SRI)	ASTM Standard E1980	%	-	82.1 (8)

Notes:

(1) In compliance with the applicable AISPEC/SITEB-MBP Guidelines.
(2) Upper finish in slate flakes standard colour Natural grey. Other colours may be available upon request Red, Green, White Reflecta.
(3) ±2 for Glass Mat reinforcements.
(4) Characteristic not determined because it is not relevant for use.
(5) RFG: Failure away from joint. Or ≥ 500.
(6) Euroclass.
(7) Internal report
(8) Only Reflecta White version, in heavy wind conditions
(9) Determination of external fire performance is a system test which can be influenced by system components, thus performance for each individual product cannot be given.
(10) Variation in coating between mineral slate flake and mineral stone granules may occur between batches.

Colour:
Paraflex ARD/S is available in a range of colours. Standard colours are Anthracite and Slate Grey. Other colours are available upon request; Red, Green, Bianco Reflecta. Some shade variation in colours may occur between rolls.

Technical Data Sheet
Paraflex ARD/S

Delivery form:
Rolls.

Storage:
Rolls must be stored in their original package, in vertical position and under cool and dry conditions between temperatures of +5 °C and +35 °C. They must be protected from direct sunlight, rain, snow and ice.

Shelf life:
They can be stored for up to 24 months in cool, dry conditions.

Safety:
Safety precautions to be taken when using this product is given in the Safety Data Sheet.

Disposal:
Information for this product is given in the Safety Data Sheet.

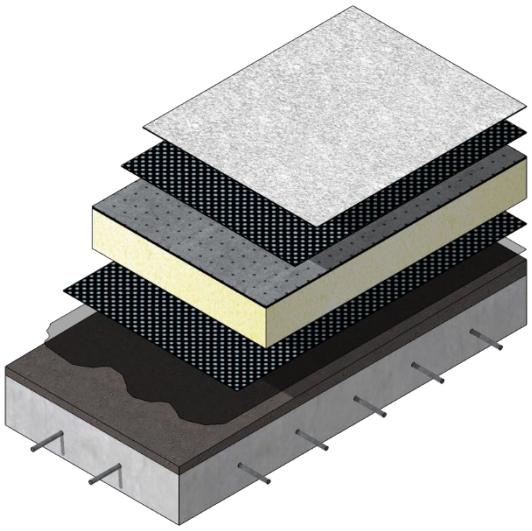
MOY Materials Ltd has taken care to ensure that the information provided in the literature is correct and up to date. However, it is not intended to form any part of a contract or provide a guarantee. Purchasers/intending purchasers should contact MOY Technical to check whether there have been any changes to the information since publication of the literature. Please ensure you have read the hazard labels and material safety data sheet before using this product.

Technical Data Sheet
Paraflex NT3

Product Description / Use:

Paraflex NT3 is a modified bitumen SBS polymer waterproofing membrane for use as a base layer or air and vapour control layer, under Paraflex waterproofing systems including; Flat Roofs, Green Roofs and Terraces, Podiums, Car Parks and Bridge Decks, Tunnels, Foundations and Underground Structures.

The Paraflex range of waterproofing membranes, is FM approved and may be used in new build and refurbishment applications and is suitable for application in low temperature conditions. Paraflex remains flexible at low temperatures and exhibits high resistance to thermal stress.



The membrane compound is reinforced with a synthetic non-woven continuous filament polyester fabric, enabling plasticity, elastic behaviour and superior resistance to mechanical damage. The lower face is coated with Termotene® fusible film which aids unrolling and facilitates torch bonding to various substrates.

The Paraflex NT3 SBS bitumen compound's special formulation ensures high mechanical performance, cold flexibility at temperatures down to –25°C and excellent fatigue strength.

Paraflex membranes contain no asbestos, tar or other dangerous substances.

Whilst it's primarily used as a base layer, it can also be used as an air and vapour control layer (AVCL) within a built-up warm roof, subject to the building use below. Buildings with high humidity conditions will require a foil faced vapour barrier (Sticker Helast VB 500 or Elotene DSN), or one with a foil lining within the membrane, like Vapobar 1 torch applied or Sticker Sanded AL (Foilcore), self-adhesive AVCL.

Certification:

System Fire Testing:
Classification Standard BS EN 13501-5: 2016
Test Standard: CEN/TS 1187:2012

Determination of external fire performance is a system test which will be influenced by the components within the roofing system.

Whilst Paraflex NT3 can be included in compliant $B_{ROOF\ (t4)}$ systems, always check with MOY Technical Services for the very latest information on fire testing carried out.

Technical Data Sheet
Paraflex NT3

Technical Specification:

Specifications	EN Standards	Unit of Measure	Tolerances (1)	Paraflex NT3
Roll dimensions	1848-1	m	≥	10 x 1 (-1%)
Thickness	1849-1	mm	±5%	3
Mass per unit area	1849-1	kg/m²	±10%	3.5
Watertightness	1928-B	kPa	≥	60
Cold flexibility	1109	°C	≤	-25
Flow resistance at elevated temperature	1110	°C	≥	+100
L/T tensile strength	12311-1	N/5cm	±20%	800/600
L/T tensile elongation	12311-1	%	±15 (2)	50/50
L/T dimensional stability	1107-1	%	2	0.3
Static puncture	12730	kg	≥	NPD (3)
Dynamic puncture	12691-B	mm	≥	NPD (3)
L/T tear resistance	12310-1	N	±30%	160/180
Joint peel resistance	12316-1	N/5cm	±20 N	NPD (3)
Joint cut resistance	12317-1	N/5cm	±20%	NPD (3)
Durability after ageing:				
• Cold flexibility	1296-1109	°C	+15°C	-10
• Flow resistance at elevated temperature	1296-1110	°C	-10°C	+100
• UV Ageing	1297	-	-	NPD (3)
• Watertightness	1296-1928	kPa	≥	60
• Chemical resistance	-	-	-	NPD (3)
• L/T tensile strength	12311-1	N/5cm	±20%	700/500
• L/T tensile elongation	12311-1	%	±15 (3)	45/45
Moisture resistance factor	1931	μ	-	83,700
Vapour resistance	1931	MN.s/g	-	1,175
Water vapour diffusion – equivalent air layer thickness Sd	1931	m	-	235
Root resistance	13948		-	NPD (3)
External fire behaviour	13501-5	EC (4)	-	NPD (5)
Fire reaction	13501-1	EC (4)	-	F

Notes:

(1) In compliance with the applicable AISPEC/SITEB-MBP Guidelines.
(2) ±2 for Glass Mat reinforcements.
(3) Characteristic not determined because it is not relevant for use.
(4) Euroclass.
(5) Determination of external fire performance is a system test which can be influenced by system components, thus performance for each individual product cannot be given.

Delivery form:
Rolls.

Storage:
Rolls must be stored in their original package, in vertical position and under cool and dry conditions between temperatures of +5 °C and +35 °C. They must be protected from direct sunlight, rain, snow and ice.

Technical Data Sheet
Paraflex NT3

Shelf life:
They can be stored for up to 24 months in cool, dry conditions.

Safety:
Safety precautions to be taken when using this product are given in the Safety Data Sheet.

Disposal:
Information for this product is given in the Safety Data Sheet.

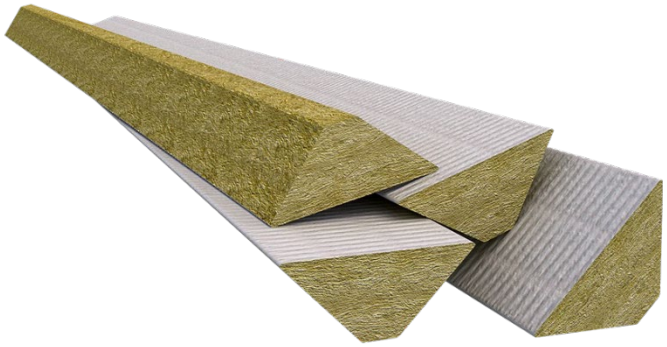
MOY Materials Ltd has taken care to ensure that the information provided in the literature is correct and up to date. However, it is not intended to form any part of a contract or provide a guarantee. Purchasers/intending purchasers should contact MOY Technical to check whether there have been any changes to the information since publication of the literature. Please ensure you have read the hazard labels and material safety data sheet before using this product.

Technical Data Sheet
HARDROCK® Multi-Fix Angle Fillets

Product Description / Use:
HARDROCK® Multi-Fix Angle Fillets have been designed to fully support the waterproof membrane at 90° abutments, providing a smooth transition between the horizontal and vertical interface.

The product is manufactured with an integral mineral-coated glass fibre fleece, which secures a strong bond between membrane and insulation for both hot and cold applied bituminous membrane systems.

Benefits:
- Can help to prolong the life of the waterproof membrane
- Excellent heat resistance; ideal for torch-applied bituminous systems
- Cost effective and easy to install
- Single-size solution compatible with bituminous membranes and GRP systems



Certification:

Reaction to Fire:
HARDROCK® Multi-Fix (DD) has a Euroclass rating of A2-s1, d0. (HARDROCK® Multi-Fix (DD) Underlay Slab has a Euroclass rating of A1).

System Fire Testing:
Test Standard: CEN/TS 1187: 2012
Classification Standard: BS EN 13501-5: 2016*

* Determination of external fire performance is a system test which will be influenced by the components within the roofing system.

Whilst HARDROCK® Multi-Fix (DD) can be included in compliant B_{ROOF} systems, always check with MOY Technical Services for the very latest information on fire testing carried out.

Applications:
For use with bituminous or GRP waterproofing systems in conjunction with HARDROCK® Multi-Fix flat roof insulation boards.

Technical Information:

Length (mm)	1200
Width (mm)	75
Thickness (mm)	30

Handling:
When handling Angle Fillets they should be properly supported along their length.

Technical Data Sheet
HARDROCK® Multi-Fix Angle Fillets

Installation:
HARDROCK® Multi-Fix Angle Fillets must be installed in dry conditions. With the white glass fleece facing outward, place the Angle Fillet along the 90° abutment at the interface between the horizontal and vertical surfaces and fix the Angle Fillet to the horizontal surface using a compatible adhesive. Angle Fillets can be cut easily using a fine-tooth saw.

Storage:
Angle Fillets should be stored under cover. Angle Fillets that have become wet should be allowed to fully dry out naturally before use, at which point they should regain their original properties.

Health & Safety:
The safety of stone wool is confirmed by current UK and Republic of Ireland health & safety regulations and EU directive 97/69/EC:ROCKWOOL fibres are not classified as a possible human carcinogen.

A Material Safety Data Sheet is available and can be downloaded to assist in the preparation of risk assessments, as required by the Control of Substances Hazardous to Health Regulations (COSHH).

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Technical Data Sheet
HARDROCK® Multi-Fix (DD)

Product Description / Use:
HARDROCK® Multi-Fix (DD) is a high density, non-combustible thermal insulation board which has also been tested for acoustic applications and fire resistance. It has been proven to improve the ability of lightweight flat roof systems to control both noise ingress and egress through the building envelope.

HARDROCK® Multi-Fix (DD) is a stone wool insulation board faced with a mineral-coated white fleece, compatible with a wide range of MOY adhered and mechanically fixed waterproofing systems - including bitumen, single-ply and liquid membranes, as well as green roof systems.

Benefits:
- Compatible with most MOY roofing systems
- The product presents no smoke hazard, and will not contribute to fire growth in any stages of a fire (including the fully developed stage of a fire)
- The product is deemed to be non-combustible in accordance with UK building regulations
- LPCB approved to highest classification, LPS1181: Part 1 EXT – A rated constructions
- Excellent acoustic reduction, absorption and impact (rain noise) performance
- Solutions to meet all BB93 (Education) and HTM08- 01 (Healthcare) acoustic requirements
- Acoustic solutions provide opportunity for additional BREEAM points
- Dimensionally stable
- Consistent thermal performance with no blowing agents. Zero ODP and GWP
- HARDROCK® Multi-Fix (DD) can be recycled and reprocessed, reducing landfill and costs
- Also available as a tapered insulation system, to create the falls in the roof (HARDROCK® Multi-Fix (DD) Tapered)

Certification:

For FM Approval must be used as part of an FM Approved Assembly.

Reaction to Fire:
HARDROCK® Multi-Fix (DD) has a Euroclass rating of A2-s1, d0. (HARDROCK® Multi-Fix (DD) Underlay Slab has a Euroclass rating of A1).

System Fire Testing:
Test Standard: CEN/TS 1187: 2012
Classification Standard: BS EN 13501-5: 2016*

* Determination of external fire performance is a system test which will be influenced by the components within the roofing system.

Whilst HARDROCK® Multi-Fix (DD) can be included in compliant $B_{ROOF\ (t4)}$ systems, always check with MOY Technical Services for the very latest information on fire testing carried out.

Technical Data Sheet
HARDROCK® Multi-Fix (DD)

Thermal Conductivity:
The thermal conductivity (or lambda value) shows how well a material can conduct heat. The lower the thermal conductivity, the better the insulator.

HARDROCK® Multi-Fix (DD) has a thermal conductivity of 0.039 W/mK.

Board Sizes:
- 1000 x 1200 mm

Thicknesses:
- HARDROCK® Multi-Fix (DD); 60 mm, 85 mm, 105 mm, 115 mm, 150 mm, 185 mm
- HARDROCK® Underlay Slab for multi-layer systems (DD); 150 mm.

Consult MOY Materials Ltd as thicknesses may be subject to availability and minimum order volumes

Weight:
HARDROCK® Multi-Fix (DD) has an approximate weight of 3.5 kg/m^2 at a thickness of 100mm.

Compressive strength:
Compressive strength is a material's ability to maintain its structural integrity when compressed. The higher the compressive strength the better the material is at maintaining its structural integrity.

The compressive strength of HARDROCK® Multi-Fix (DD) typically exceeds 70 kPa at 10% compression.

Technical Specification:
Detailed product characteristics for this product are given in Declaration of Performance [DoP].

Sustainability Information:
Relying on entrapped air for its thermal properties, HARDROCK® insulation does not contain gases that have ozone depleting potential (ODP) or global warming potential (GWP) and as such complies with the relatively modest threshold of GWP<5.

HARDROCK® Multi-Fix (DD) can be recycled and reprocessed reducing landfill and costs.

Installation and handling:
For information on installation and handling please refer to specific product guidance and the project specification.

Storage:
Insulation products must be kept dry and protected from wet weather during storage and installation.

Disposal:
In accordance with REACH health and environment regulations, there are no hazardous classifications associated with HARDROCK® mineral wool in respect to physical, health and environmental considerations, however information for this product are given in the Safety Data Sheet.

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Technical Data Sheet
AQUAPANEL® Cement Board Rooftop

Product Description / Use:
AQUAPANEL® Cement Board Rooftop is a lightweight cement board made of aggregated Portland cement with coated glass fibre mesh embedded in the front and back surfaces.

It is moisture and mold resistant, non-combustible and robust, adding structural strength and durability to the entire roofing system. It meets the requirements of category D, class 2 in compliance with EN 12467.

12.5mm thick and available in various board sizes.

The ends are cut square and edges are reinforced for extra strength (the EasyEdge®). The panel provides a solid base that withstands extreme weather conditions.

Characteristics:
- Recommended for accessible roofs
- Strong, robust, impact-resistant and durable
- High compressive strength
- Weather and 100% water-resistant
- Non-combustible (Class A1)
- Can be cut to shape using “score and snap” technique
- Simple and easy to install

Certification:

BBA-UKTA-0836-22/6407.
Can be used as part of an FM Approved system.

System Fire Testing:
Test Standard: CEN/TS 1187: 2012
Classification Standard: BS EN 13501-5: 2016 *

* Determination of external fire performance is a system test which will be influenced by the components within the roofing system.

Whilst AQUAPANEL® Cement Board Rooftop can be included in compliant B_{ROOF} systems, always check with MOY Technical Services for the very latest information on fire testing carried out.

Technical Data Sheet
AQUAPANEL® Cement Board Rooftop

Technical Properties:

Thickness (mm)	12.5	
Length (mm)	1200/2400/2250	2400
Width (mm)	900	1200
Weight (kg/m²)	approx. 16.5	
Dry bulk density (kg/m³) according to EN 12467	1150	
Bending strength (MPa) according to EN 12467	≥ 7	
Thermal conductivity (W/mK) according to EN ISO 10456	0.35	
Thermal expansion (10^{-6} K^{-1})	7	
Water vapour diffusion coefficient μ (-) according to EN ISO 12572	66	
Length variation 65% - 85% humidity (mm/m) according to EN 318	0.23	
Mold resistance	No growth (IBR certified)	
pH-Value	12	
Building material class according to EN 13501	A1 non-combustible	

Additional detailed product characteristics for this product are given in Declaration of Performance (DoP).

Application:
AQUAPANEL® Cement Board Rooftop is used in commercial low slope roofing systems. It enhances roof system performance in several ways and functions:

1. As a cover board installed between the insulation and the waterproofing layer.
   - protects roof insulation underneath
   - reduces stress on the membrane
   - Adds structural strength to the entire roof system
   - provides a robust basis for accessible and ballasted roofs

2. As a substrate board installed directly onto the steel deck acting as:
   - substrate for the vapor barrier
   - basis for the roofing constructors to work on

Installation and handling:
AQUAPANEL® Cement Board Rooftop is attached to the surrounding layers inside the roof system. It can be mechanically fastened or adhered with appropriate MOY adhesive. During the planning phase the wind loads must be considered.

AQUAPANEL® Cement Board Rooftop is suited for a variety of rigid roof insulation and waterproofing membranes like single-ply, modified bitumen or liquid applied membranes. Consult the project specific specification or MOY Technical Services for details.

Storage:
Always carry boards upright using a board trolley or on a pallet using a forklift truck. When setting the boards down, make sure that corners and edges are not damaged.

The supporting surface must be able to carry the weight of the boards. A pallet of AQUAPANEL® Cement Board Rooftop 12.5mm applies a floor loading from about 900 to 1450 kg (as delivered).

AQUAPANEL® Cement Board Rooftop must be protected from the effects of moisture and weather before installation. Boards that have become damp must be dried on both sides before use.

Technical Data Sheet
AQUAPANEL® Cement Board Rooftop

Allow time for the boards to acclimatise to the ambient temperature and moisture conditions before installation. The material, ambient air and background temperature must not be below +5°C.

Disposal:
Information for this product is given in the Safety Data Sheet.

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Marshalls
Creating Better Spaces

Landscape House, Premier Way,
Lowfields Business Park,
Elland HX5 9HT
Tel: 03704 11 22 33

T: 01422 312000
F: 01422 312943
E: grouptechnicalservices@marshalls.co.uk
W: www.marshalls.co.uk/commercial

Standard Pimple 600 x 600 x 50

Date Created: 24/11/22

Standard Pimple - Natural

Available in a range of colour and size options, Marshalls' Standard Pimple Paving provides a durable, functional and flexible paving solution that excels in urban environments.

With innovative fibre technology and raised pimples on its surface, Marshalls' Standard Pimple Paving offers maximum skid and slip resistance, and goes beyond industry standards for hardwearing stone.

Available in a range of thicknesses catering for different loading requirements, Standard Pimple Paving is an ideal choice for areas with high pedestrian traffic - such as train stations and urban park spaces. Marshalls' Standard Pimple Paving complies with BS EN 1339:2003.

DESCRIPTION	
Appearance	Solid unit with pimple surface
Manufacturing Process	Hydraulically pressed concrete
Base Raw Material	Concrete
Governing Manufacturing Standards	All data where relevant to be established in accordance with BS EN 1339 : 2003
Type	Solid unit with pimple surface
UKCA Marking/DOP	https://www.marshalls.co.uk/declarations
NBS Specification	Q25 315

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E: grouptechnicalservices@marshalls.co.uk
W: www.marshalls.co.uk/commercial

Standard Pimple 600 x 600 x 50

Date Created: 24/11/22

PHYSICAL PROPERTIES

Work Dimensions (mm)	598 x 598 x 50
Nominal Dimensions (mm)	600 x 600 x 50
Tolerances on Work Dimensions (mm)	Length ±2mm, width ±2mm, thickness ±3mm
Abrasion Resistance (mm)	≤ 23mm (Wide Wheel Abrasion Test)
Durability (Freeze-thaw)	≤ 1.0 kg/m² as a mean with no individual value > 1.5 kg/m²
Material Density	2300 kg/m³ (typically)
Slip/Skid Resistance (polished)	Mean polished skid resistance value (PSRV) : > 45
Slip/Skid Resistance (unpolished)	Mean unpolished skid resistance value (USRV) : > 45.
Thermal Conductivity (K value)	Design data as defined to BS EN 13369 : 2013
Transverse/FlexuralSplit/Breaking	Characteristic bending strength of 4.0 MPa with no individual result less than 3.2 MPa

SPECIFICATION

Approx unit weight (kg)	43
Emission of Asbestos	No content
External Fire Performance	Deemed to satisfy. See commission decision 2000/553/ECU
Reaction to fire	Class A1,See commission decision 2000/605/EC
Materials Control	UKCA Marked to BS EN 1339 : 2003 Concrete Flags

SUSTAINABILITY

Breeam	These units can achieve an "A" rated system when used in conjunction with the correct sub-base components
Carbon Footprint	13 kg CO2

APPLICATION

Suitability	Laid in accordance with BS7533-4 : 2006
Loading Classification	Category 6 - 0.5msa Adopted highways and commercial/industrial developments used by a moderate number of commercial vehicles. Pedestrian areas subjected to regular overrun of commercial vehicles. Industrial premises. Petrol station forecourts.

SITE WORKS

Coverage (m2)	2.8

SUPPLY

Units Per Pack	20
Av. pack weight (kg)	860
Packaging	All packs are suitable for crane off-load

FURTHER INFORMATION

Cleaning & Maintenance	Available on request
Efflorescence	Any product containing cement during its early life may exhibit a temporary white discolouration known as efflorescence. This is not a product fault and will gradually disappear with exposure to natural weathering and trafficking
Weathering	It should be appreciated that with all products weathering and site conditions can cause shade variation to appear across the surface of individual units. This does not in any way affect the performance of the units and any such variation will diminish over a period of time as the product matures.
Product Evolution	The evolution of new product design is continuous and information is subject to change without notice. Customers should check with the supplier to ensure that they have the latest details. Marshalls reserve the right to amend the technical information as deemed necessary and in accordance with the relevant national and international standards without notice
Contact Us	For technical information on the design, specification and construction when utilising the product, contact Group Technical Services on 0370 411 2233

RPA
Self-levelling Adjustable Paving Pedestal

Overview

The RPA self-levelling adjustable paving pedestal supports all types of calibrated paving up to an impressive height of 1000mm.

- 'Ball and socket' floating head allows slope correction of up to 10.5% (6°)
- Spacer tabs provide consistent spacing between slabs. 'Snap off' design allows for easy removal.
- Adjustable thread allows millimetre perfect adjustment
- Height extension collar raises the height by 100mm
- Holes in base allow drainage and fixing to substrates
- Base can be cut down to allow for placement against wall abutment

Performance

Material	Polypropylene (recyclable)
Biological/chemical	Resistant to moulds, algae, alkali, bitumen
Compression	2100kg (certified compression data available on request)
Base diameter	210mm / 220mm
Head diameter	130mm
Spacer tab thickness	2mm / 4mm (standard) / 6mm / 8mm / 10mm
Working temperature	-40°C to 120°C
Reaction to fire	BRoof(t4) in accordance with EN 13505:2018 when used as part of the complete TerraSmart Pedestal System

Got questions?

Speak to one of our expert advisors

Visit **www.rynogroup.co.uk** or call us today on **+44 (0)203 967 3500** or reach out on **sales@rynogroup.co.uk.**

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Compression tests

Code	Height of the specimen (mm)	Maximum load (N)	Maximum load (Kg)	Deflection at max load (mm)
RPA-1	48	21,485	2,190	10.2
RPA-2	60	26,360	2,687	10.7
RPA-3	90	28,797	2,935	12.0
RPA-4	135	27,111	2,764	11.2
RPA-5	180	29,817	3,039	12.7
RPA-6	250	29,464	3,003	14.8
RPA-7	350	29,049	2,961	15.9
RPA-8	450	28,440	2,899	18.2
RPA-9	550	28,856	2,942	22.3
RPA-10	650	28,226	2,878	24.0
RPA-11	750	28,757	2,931	24.6
RPA-12	850	26,777	2,730	26.3
RPA-13	950	26,791	2,731	26.9

Sizes

Code	Adjustable height range
RPA-1	40-56mm
RPA-2	50-70mm
RPA-3	70-110mm
RPA-4	110-160mm
RPA-5	150-210mm
RPA-6	200-300mm
RPA-7	300-400mm
RPA-8	400-500mm
RPA-9	500-600mm
RPA-10	600-700mm
RPA-11	700-800mm
RPA-12	800-900mm
RPA-13	900-1000mm

Accessories

Edge spring clip

The edge spring clip fits on top of paving supports around the periphery of paved areas to ensure uniform spacing against wall abutments, helping ensure rapid drainage. By tensioning the tile bed, it counteracts creepage and movement.

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Head shock pads

Head shock-absorbent gaskets fit on top of the paving supports, cushioning tiles and removing the possibility for grit to cause grinding between tile and pedestal head.

Base shock pads

Base shock-absorbent membrane pads can be installed under the pedestal/support base to enhance acoustic properties, or to provide additional protection to the waterproof system.

Compatible Systems

Pave

TerraSmart™ Pedestal

Straightforward, robust paving system for waterproofed substrates, **where non-combustibility isn't required**

Got questions?

Speak to one of our expert advisors

Visit **www.rynogroup.co.uk** or call us today on **+44 (0)203 967 3500** or reach out on **sales@rynogroup.co.uk.**

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Technical Data Sheet
VLU-300 Protection Fleece

Product Description / Use:
VLU-300 Protection Fleece is a rotproof multicoloured mechanical protection layer made of 100% synthetic fibres and thermally treated on both sides. A loose laid layer, which can be used in some applications as a separation/cushion layer, or for the protection of the waterproofing layers, such as reinforced bitumen membrane, single ply or cold applied liquid waterproofing systems.

Installation and Handling:
Loose laid with a minimum 100mm overlap.

For information on installation and handling, refer to specific product guidance and the project specification.

Technical Specification:

Characteristics	Dim.	VLU-300
Surface weight	g/m²	300
Thickness	mm	1.8
Tensile strength MD	kN/m	2.7
Tensile strength CMD	kN/m	3.7
Elongation MD	%	75-90
Elongation CMD	%	65-85
Static puncture test (CBR)	kN	1
Characteristic opening size O90	mm	0.134
Water permeability	mm/s	95
Robustness class	GRK	2
Method of production		Heat treated on both sides

Specifications are subject to change without notice.

Delivery Form:
100 m²/roll; packaging weight: 30 kg/roll.

Storage:
Ideally, store inside a building. If, however, outside storage cannot be avoided, then rolls should be stacked clear of the ground and covered with an opaque polythene sheet or weatherproof tarpaulin.

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For Adhered Applications Please Source A Suitable Adhesive.
For Further Information Please Contact the MOY Materials Technical Department On 01245 707 449

ALL OFF CUTS MUST BE SAVED UNTIL PROJECT IS COMPLETE - ALLOWANCES HAVE BEEN MADE FOR ROOF LIGHT DEFLECTOR(S)

Notes(s):

Contractor To Confirm Sizes And Heights On Site Prior To Delivery Of The Proposed Tapered Scheme

Scheme Designed On The Assumption Of A Flat Level Deck.

U Value Calculation(s) Based On A

200mm Concrete

Deck Construction.

Drawn & Designed From The Following Source(s):

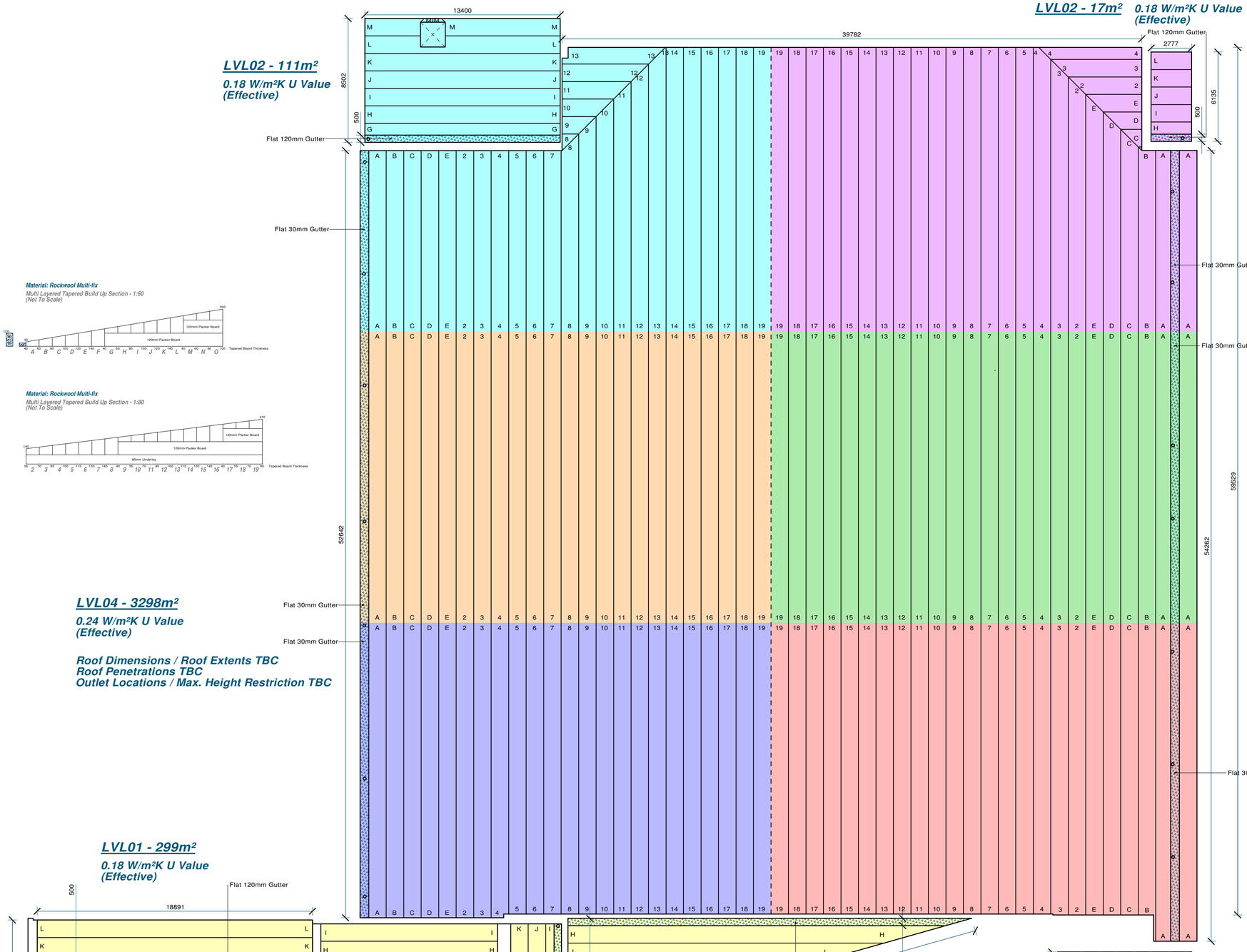
DCS20109-NWA-DC-B1-04-DR-A-20240
DCS20109-NWA-DC-B1-06-DR-A-20260 (1)
DCS20109-NWA-DC-B1-01-DR-A-20210

TAPERED BOARD LEGEND

Schedule	Thickness	Fall
Type: Rockwool Multi-fix		
A	40 - 60	1:60
B	60 - 80	1:60
C	80 - 100	1:60
D	100 - 120	1:60
E	120 - 140	1:60
F	140 - 160	1:60
G	160 - 180	1:60
H	180 - 200	1:60
I	200 - 220	1:60
J	220 - 240	1:60
K	240 - 260	1:60
L	260 - 280	1:60
M	280 - 300	1:60
N	300 - 320	1:60
O	320 - 340	1:60
2	140 - 155	1:80
3	155 - 170	1:80
4	170 - 185	1:80
5	185 - 200	1:80
6	200 - 215	1:80
7	215 - 230	1:80
8	230 - 245	1:80
9	245 - 260	1:80
10	260 - 275	1:80
11	275 - 290	1:80
12	290 - 305	1:80
13	305 - 320	1:80
14	320 - 335	1:80
15	335 - 350	1:80
16	350 - 365	1:80
17	365 - 380	1:80
18	380 - 395	1:80
19	395 - 410	1:80
Flat 30	30	
Flat 120	120	
Flat 300	300	

Material: Rockwool Multi-fix
Multi Layered Tapered Build Up Section - 1:60 (Not To Scale)

Material: Rockwool Multi-fix
Multi Layered Tapered Build Up Section - 1:80 (Not To Scale)



0 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m 11m
1:150@A1

Flat Infill

Flat Gutters (May Hold Water)

Roof Area: 4010m²	Fall: 1:80 & 1:60
U Value*: SEE DRAWING	Material: Tapered Rockwool Multi-Fix

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DO NOT SCALE from this drawing. Only figured dimensions are to be taken from this drawing.
This drawing assumes there are no hollows or backfalls in the roof deck, unless shown.
The Contractor must verify all dimensions on site before commencing any work or shop drawings.
Unloading and storage of materials is the responsibility of the Contractor. Insulation products must always be stored in dry conditions. Day joints should be sealed at the end of each day.
Materials should be installed in accordance with the relevant codes of practice and this drawing. Where practical, boards should be laid with staggered joints. Raise upstands/kerbs/rooflights etc. to suit as necessary. Treated timber battens of 5mm less than the insulation thickness, should be provided and installed to protect exposed insulation edges by the Contractor. Quotations are based on the scheme as shown in this drawing and include infill boards and gutter/sump boards where shown. Fillets/upstand boards/flat boards are excluded unless specifically shown in our quotation. Any materials required over and above the quantities given, will be charged accordingly. all boards are supplied as either full or half boards as shown. Sufficient material will be supplied to allow for square, raking cutting, and mitres which are not conventional 90° as supplied. All part boards should be retained and used whenever possible. all cutting to be carried out on site by the Contractor. The Contractor must report any discrepancies before commencing work. If this drawing exceeds the quantities taken in any way, the Technician is to be informed before work is initiated.
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Alterations to the scheme must not be completed without MOY Materials referencing

Whilst the information on this drawing is to the best of our knowledge,in terms of truth and accuracy, all liability for errors and omissions, damage or loss resulting here from is hereby excluded.

Tapered insulation drawings maybe drawn outside of the guidance in BS:6229:2018 due to building and design constraints. In the event that any element of the drawing does not comply with BS:6229:2018, please seek approval from the project design team and/or specifier

Tapered insulation scheme should be fully installed in accordance with this layout. Please note that all offcuts of tapered insulation boards should be used within the scheme. These are not deemed as waste boards by MOY Materials. Any onsite changes made that differ from attached layout, MOY Materials hold no liability and Additional material is subject to additional cost and transport charge at the current rate.

* All U Value Schemes Are Calculated And Compliant To BS EN ISO 6946:2017 Annex E Where Applicable

Call Off 1: 590m²

Call Off 2: 565m²

Call Off 3: 585m²

Call Off 4: 565m²

Call Off 5: 560m²

Call Off 6: 561m²

Call Off 7: 584m²

Provisional Scheme Subject To Comment
Dimensions TBC
Outlet Locations TBC

Rev	Date	Notes	By
H	13/06/23	Slight Drawing Changes	NL
G	12/06/23	Updated To New Roof Plans	BR
F	16/03/22	Additional Roof Areas	EH
E	03/02/22	Gutter Location Changed	BR
D	11/10/21	Area Omitted + Drainage Added	NT
C	08/10/21	Addional Areas Added To Scheme	HP
B	06/10/21	Roofs Added - U Values Adjusted	NT
A	01/10/21	Drawing Issued For Approval & Comment	-

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Status: **PRELIMINARY**

Drawing Title: Colt London

Scale	Date
1:150	01/10/21
Sheet Size: A1	Drawn By: B.R
Drawing Number: TP8106_21.01	Rev.: H

TECHNICAL DATA SUBMISSION

Sky Garden Living Roof Systems

CONTENTS:

MAC GROUP OF COMPANIES

SPECIFICATION
SUMMARY

Sky Garden Sedum Blanket

Sky Garden Extensive Substrate

Sky Garden Drainage Board & Filter Fleece

Sky Garden Protection Fleece

Sky Garden Border & Ballast

Sky Garden Aluminum Separation

Retention Edge

The above is for illustration purposes only.

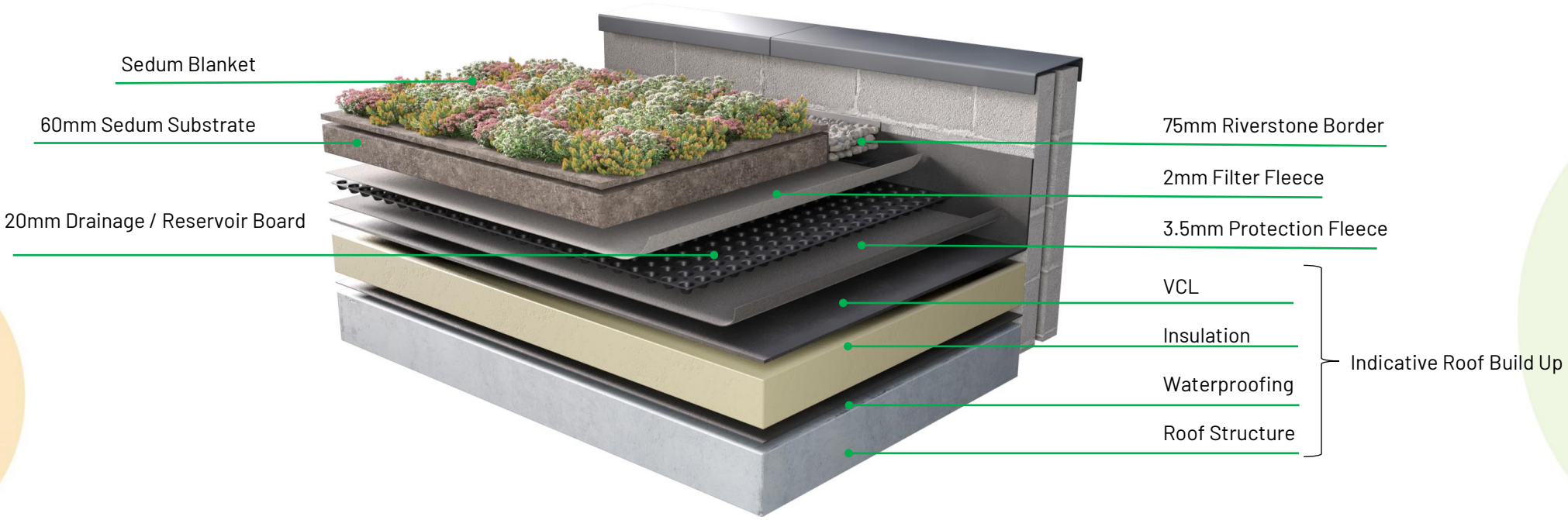
Roof System Element	Unit	Thickness	Length	Width	Weight (kg/m^2)
SEDUM BLANKET	1	20MM	N/A	N/A	10-30KG
EXTENSIVE SUBSTRATE	1	60MM	N/A	N/A	55-74KG per bag
DRAINAGE BOARD WITH FILTER FLEECE	1	20MM	50M	0.97M	1-5.2KG
PROTECTION FLEECE	1	3.5MM	N/A	N/A	0.3KG
RIVERSTONE	1	20-40MM	N/A	N/A	22kg per bag
ALUMINIUM SEPARATION	1	100MM	N/A	N/A	N/A

MAC
GROUP OF COMPANIES

Version 1.0

SYSTEM DIAGRAM

SKY GARDEN SEDUM BLANKET SYSTEM



SkyGarden GREEN SOLUTIONS

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Gloucestershire,
GL20 8DN

01242 620905

London Office

Kemp House,
152 City Road,
London. EC1V 2NX

02035 030927

Email - enquiries@sky-garden.co.uk

Q37 Details

Protection Fleece

- 3.5mm non-woven geotextile

Drainage Layer

- 20mm Drainage reservoir board

Filter Fleece

- 2mm (nominal) non-woven geotextile

Separation Detail

- 1.5mm Aluminium profile 100mm (H) x 80mm (W)

Growing Medium

- Extensive Substrate. Depth to specification

Sedum Blanket

- 8-12 Sedum species in pre-grown mat

Indicative Build-up Height – 103.5mm

Indicative Dry Weight - 67kg (60mm Substrate Depth)

Indicative Saturated Weight – 109kg (60mm Substrate Depth)

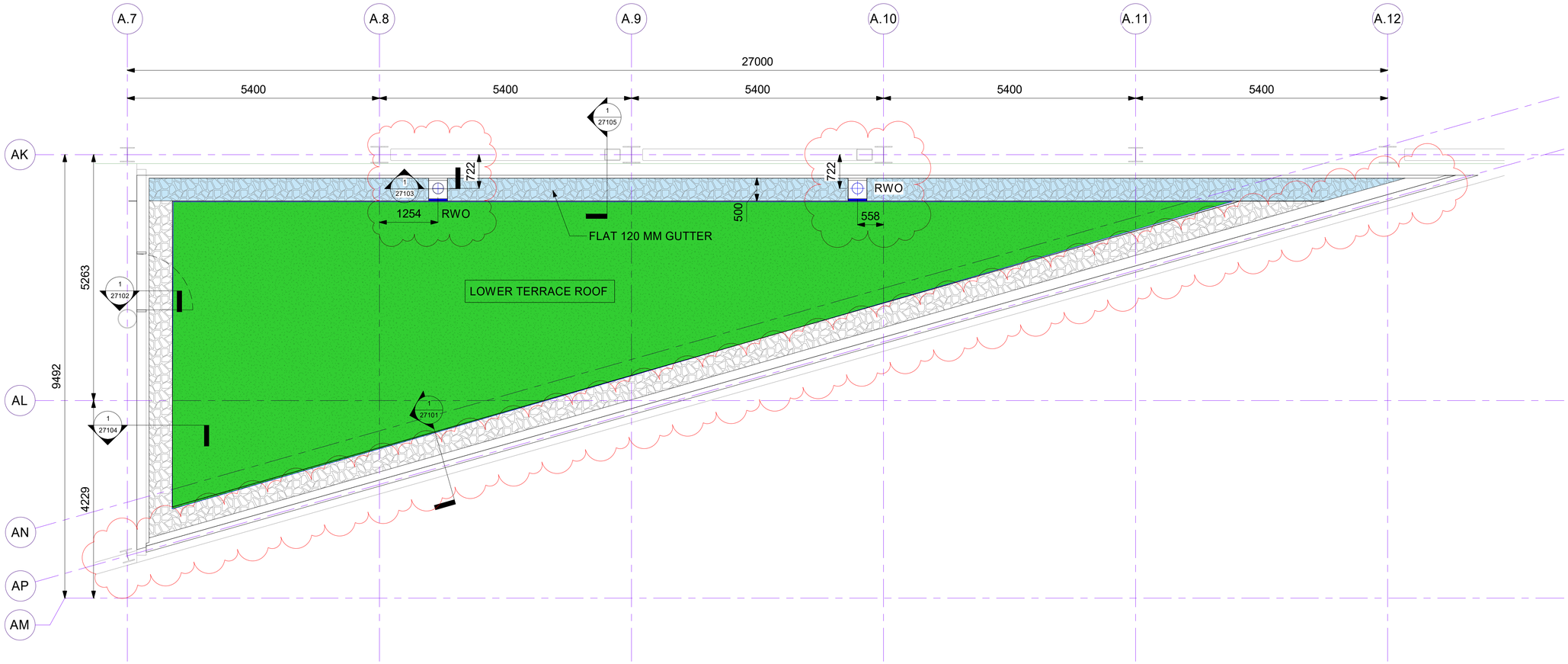
System Name
Sedum Blanket System

Drawn By:
DH

Scale:
Do not scale

Drawing Reference
SBSD01

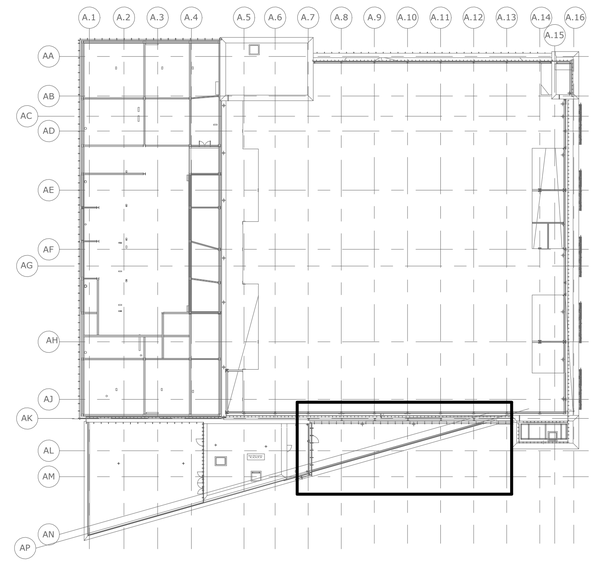
A1 - Do not scale



1 LEVEL 01 ROOF - GA PLAN
1 : 50

LEGEND

- STONE BALLAST
- GREEN ROOF SYSTEM
- FLAT 120 MM GUTTER
- RWO



KEY PLAN
1 : 500

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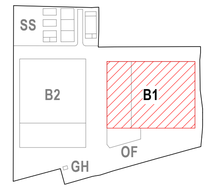
Key Plan



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ROOFING & CONTRACTING LIMITED

Rev	Details	By / Chkd / App	Date
P02	S4 - FOR APPROVAL	SR/HA/XX	03/04/2024
P01	S3-FOR REVIEW AND COMMENT	SR/HA/XX	09/02/2024

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Security Consultant

Control Risks
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www.controlrisks.com

Project Title
Colt London 4

Drawing Title
LEVEL 01 ROOF - GA PLAN

Project Status
WIP

Discipline	Status Code
ROOFING	S4

Project Number	Scale @ A1	Revision
DCS20109	As indicated	P02

Drawing Number
DCS20109-MRC-DC-B1-01-DR-X-27200
Project — Originator — Functional — Spatial — Level — Form — Discipline — Number Breakdown Breakdown

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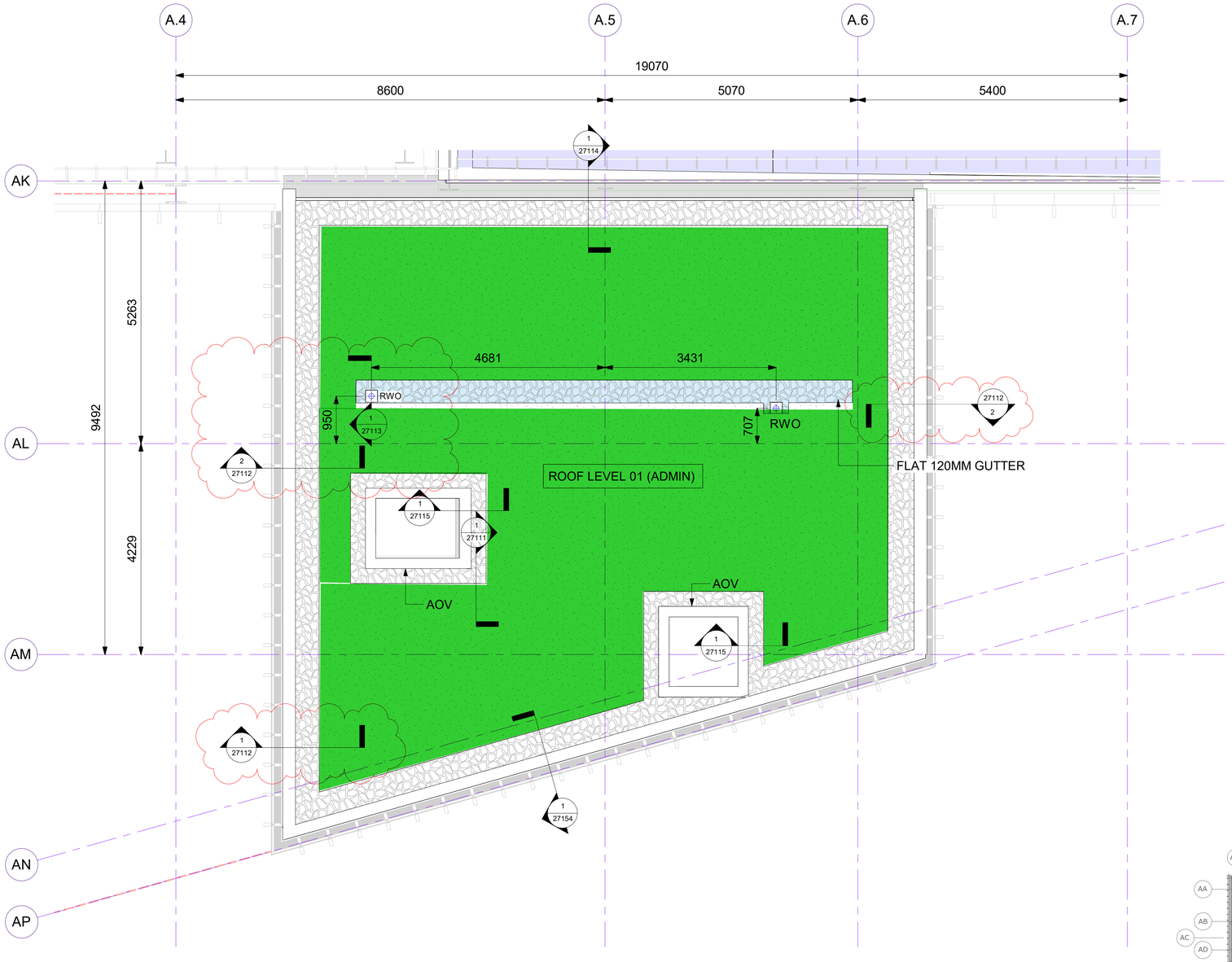
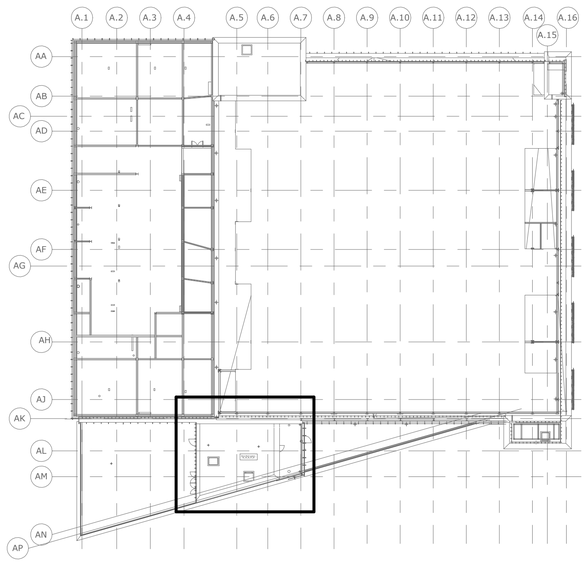


LEGEND

- STONE BALLAST
- GREEN ROOF SYSTEM
- FLAT 120 MM GUTTER
- RWO



1 ROOF LEVEL 01 (ADMIN) GA PLAN

1 : 50

KEY PLAN

1 : 500

General Notes

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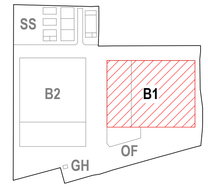
SCALE: 1:200

N

Key Plan



MAC ROOFING & CONTRACTING LIMITED

Rev	Details	By / Chkd / App	Date
P02	S4 - FOR APPROVAL	GK / HA /XX	27/03/2024
P01	S4 - FOR APPROVAL	GK / HA / XX	12/02/2024

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Project Title
Colt London 4

Drawing Title
ADMIN BUILDING GREEN ROOF SYSTEM GA PLAN

Project Status
WIP

Discipline	Status Code
ROOFING	S4

Project Number	Scale @ A1	Revision
DCS20109	As indicated	P02

Drawing Number
DCS20109-MRC-DC-B1-05-DR-X-27204

Project — Originator — Functional — Spatial — Level — Form — Discipline — Number Breakdown Breakdown

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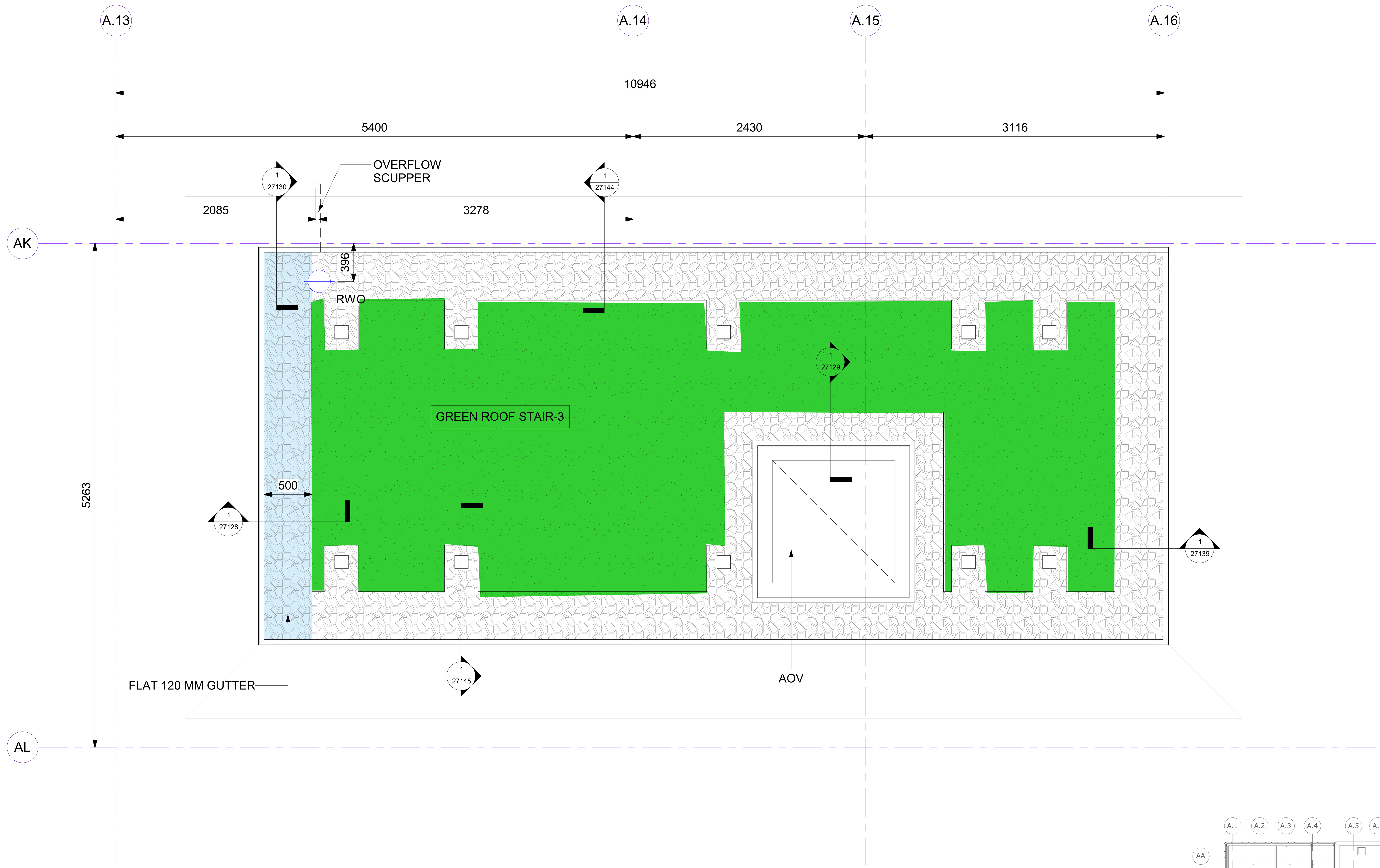
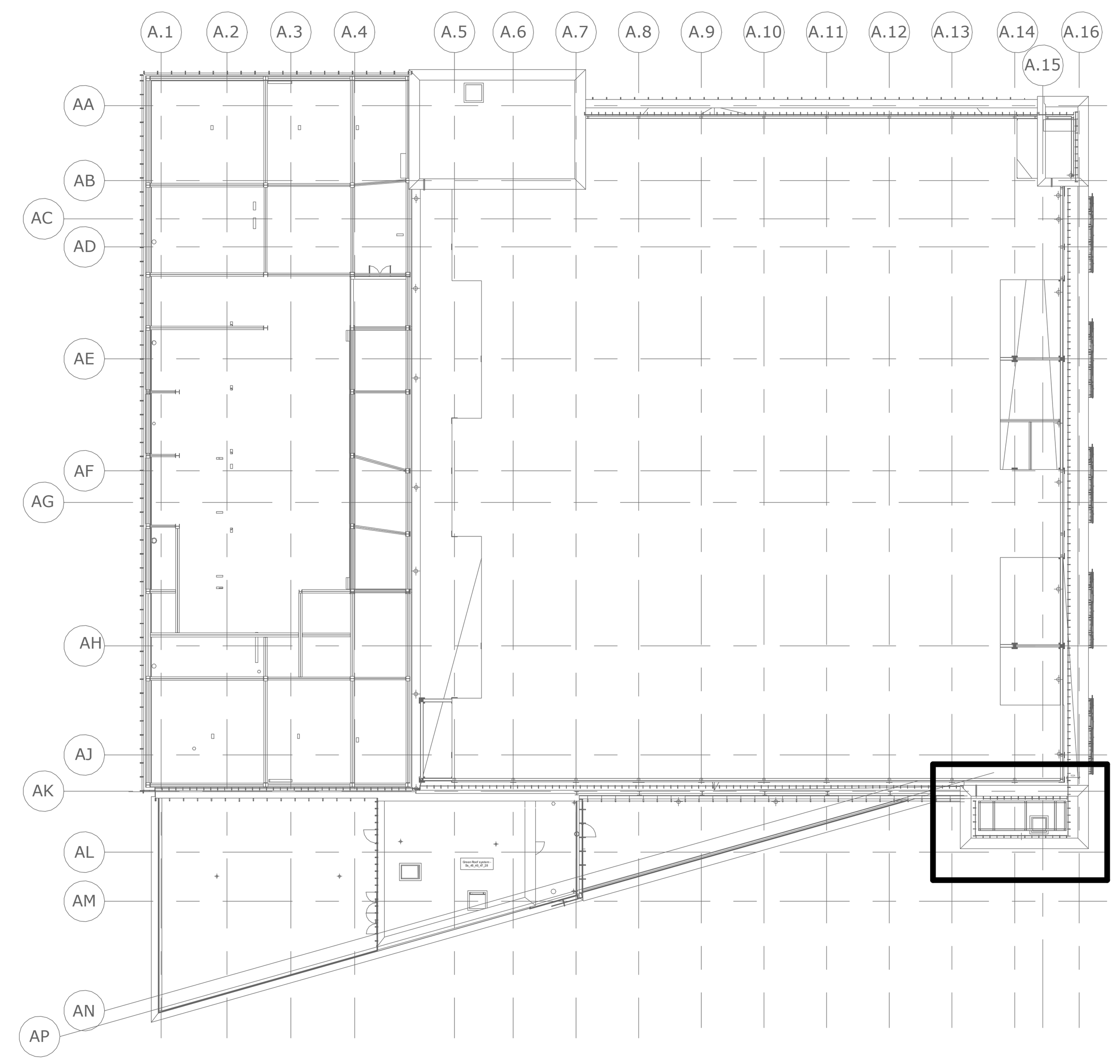


LEGEND

- FLAT 120 MM GUTTER
- GREEN ROOF SYSTEM
- STONE BALLAST
- RWO

1 ROOF LEVEL 2 STAIRCASE 3 GA PLAN
1 : 25



KEY PLAN
1 : 500

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SCALE: 1:200
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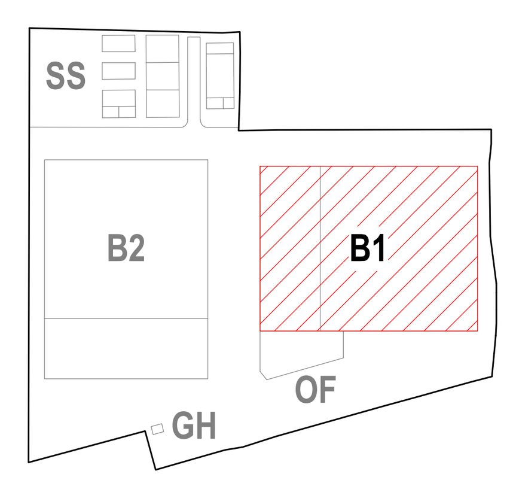
Key Plan



MAC
ROOFING & CONTRACTING LIMITED

Rev	Details	By / Chkd / App	Date
P02	S4 - FOR APPROVAL	SR/HA/XX	28/03/2024
P01	S3-FOR REVIEW AND COMMENT	GK/HA/XX	09/02/2024

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www.controlrisks.com

Project Title
Colt London 4

Drawing Title
GREEN ROOF STAIR 3 - GA PLAN

Project Status
WIP

Discipline: ROOFING
Status Code: S4

Project Number: DCS20109
Scale @ A1: As indicated
Revision: P02

Drawing Number
DCS20109-MRC-DC-B1-06-DR-X-27209

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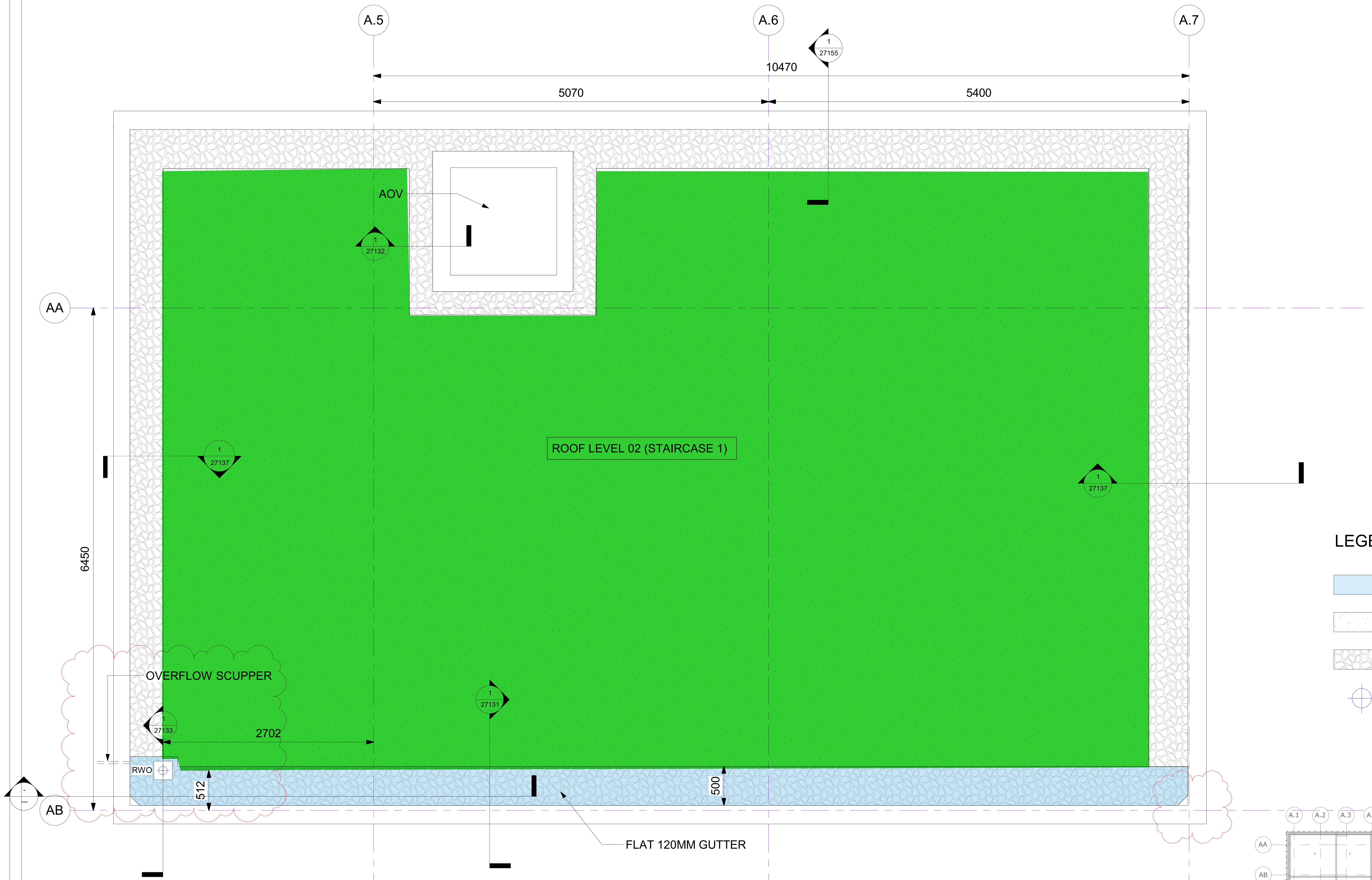
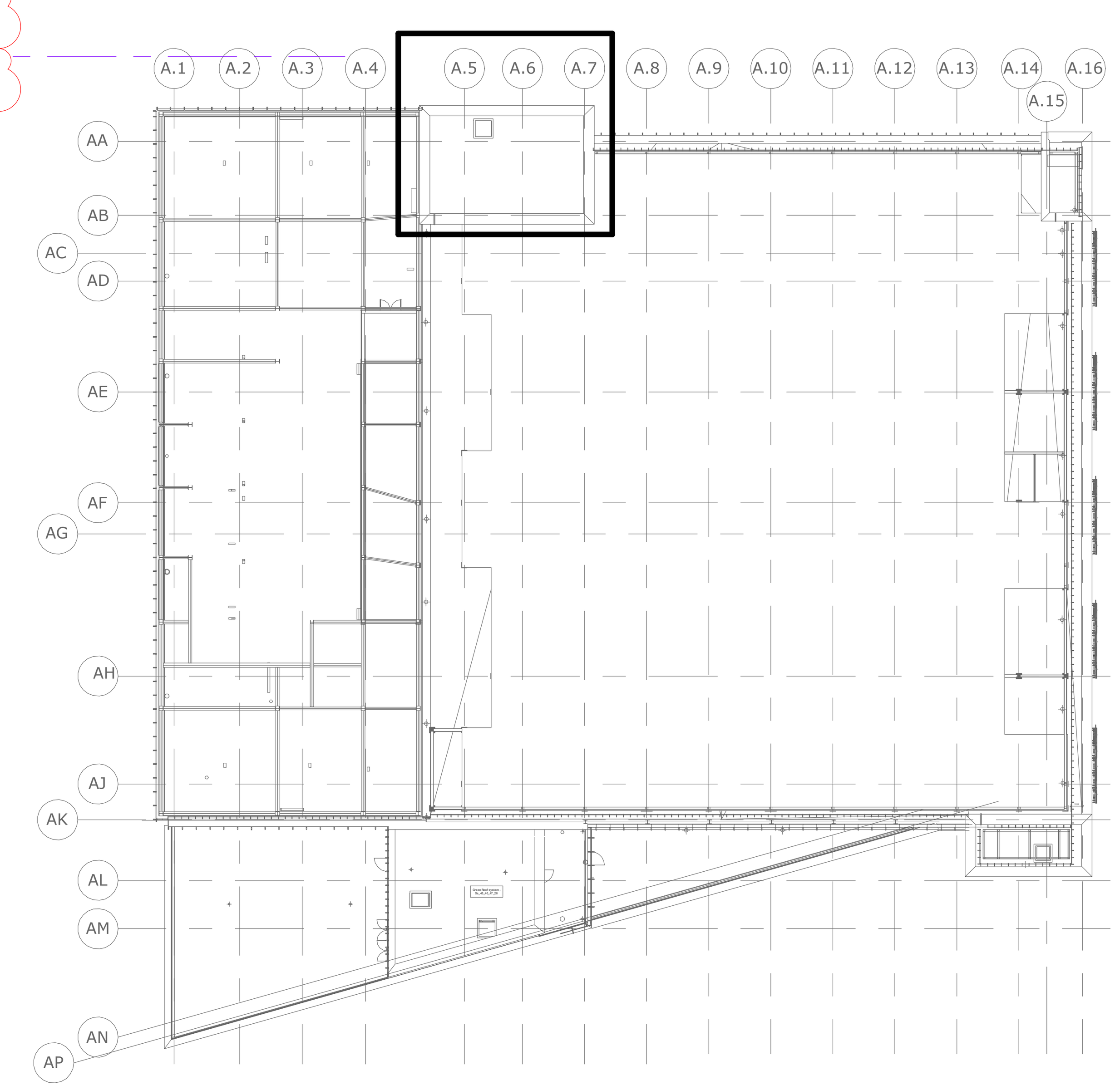


LEGEND

- FLAT 120 MM GUTTER
- GREEN ROOF SYSTEM
- STONE BALLAST
- RWO

1 ROOF LEVEL 02 -STAIRCASE 1 GA PLAN
1 : 30



KEY PLAN
1 : 500

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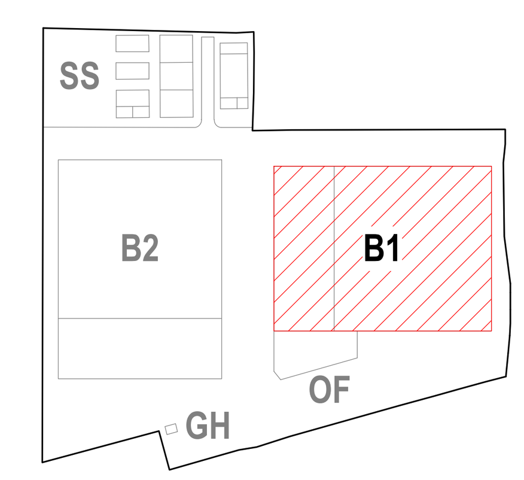
Key Plan



MAC
ROOFING & CONTRACTING LIMITED

Rev	Details	By / Chkd / App	Date
P02	S4 - FOR APPROVAL	SR/HA/XX	28/03/2024
P01	S3-FOR REVIEW AND COMMENT	SR/HA/XX	08/02/2024

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Project Title
Colt London 4

Drawing Title
ROOF LEVEL 02 (STAIR 1) GREEN ROOF- GA PLAN

Project Status
WIP

Discipline
ROOFING

Status Code
S4

Project Number
DCS20109

Scale @ A1
As indicated

Revision
P02

Drawing Number
DCS20109-MRC-DC-B1-06-DR-X-27211
Project — Originator — Functional Breakdown — Spatial Breakdown — Level — Form — Discipline — Number

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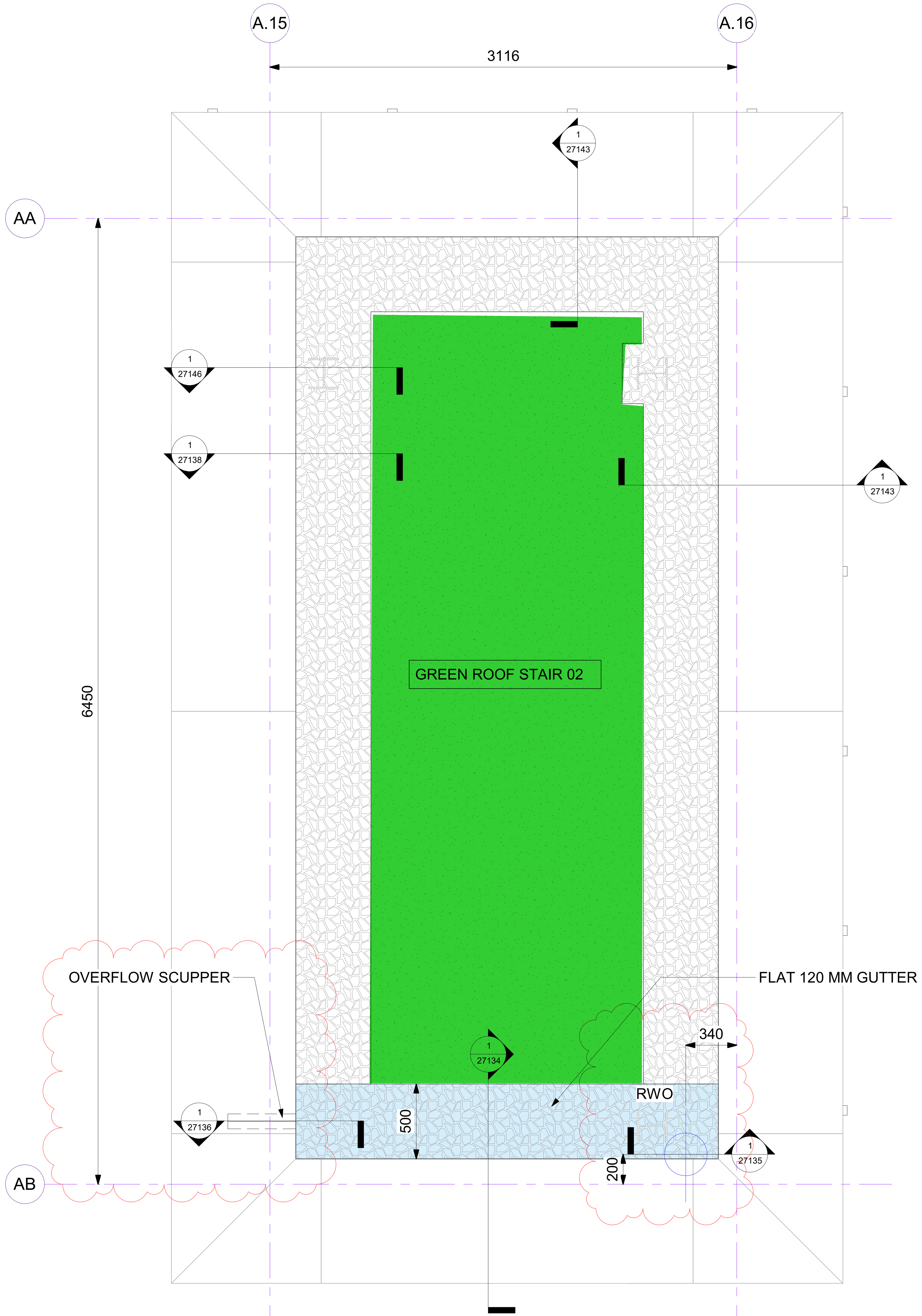
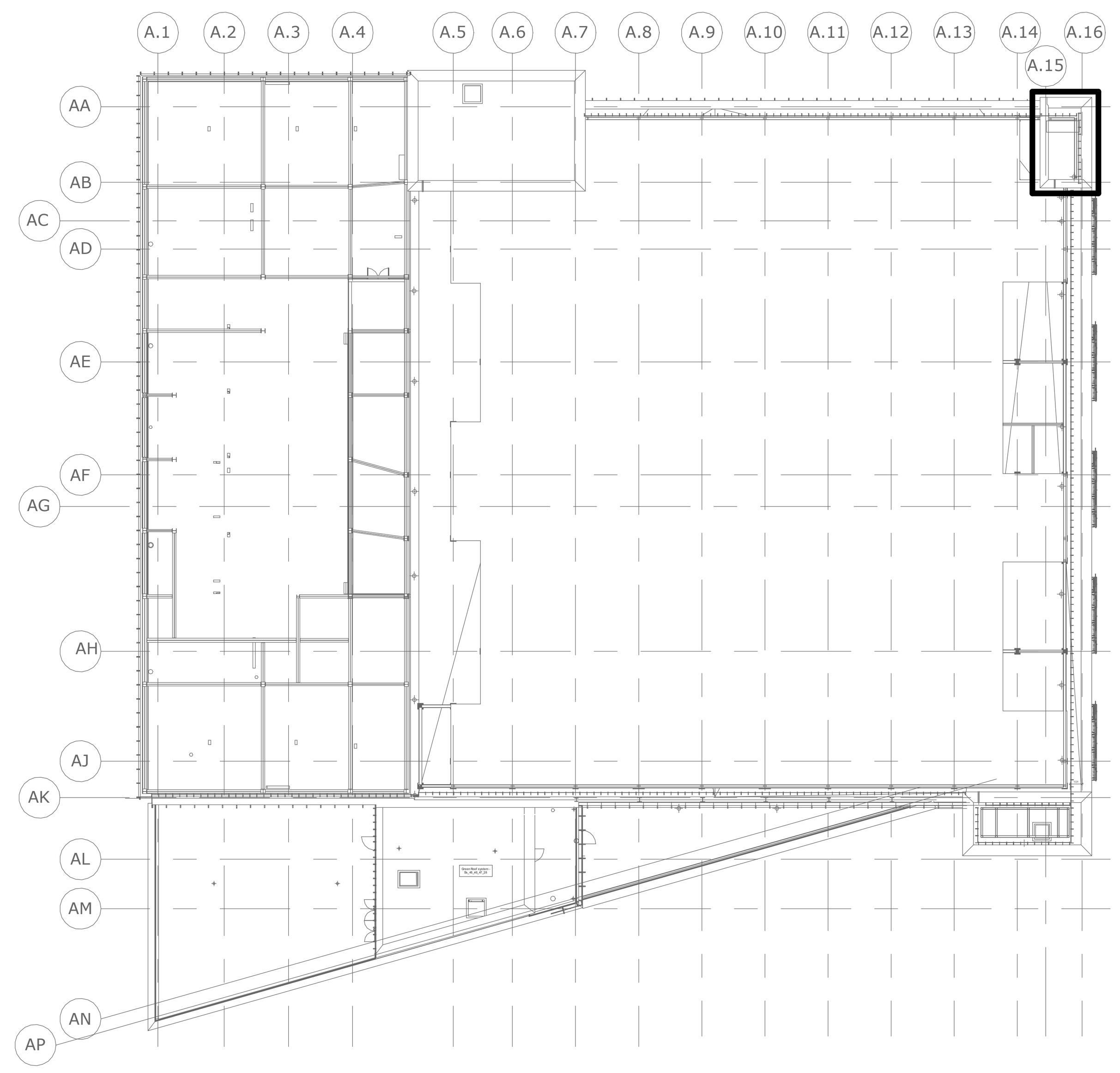


1 ROOF LEVEL 02 GREEN ROOF STAIR 2- GA PLAN

1 : 20

LEGEND

- STONE BALLAST
- GREEN ROOF SYSTEM
- FLAT 120 MM GUTTER
- RWO



KEY PLAN

1 : 500

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SCALE: 1:200

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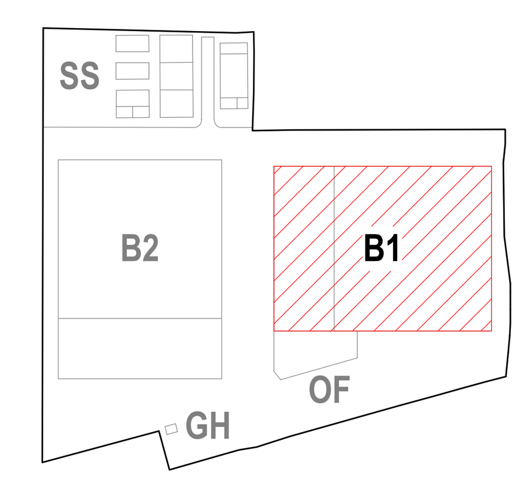
Key Plan



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ROOFING & CONTRACTING LIMITED

Rev	Details	By / Chkd / App	Date
P02	S4 - FOR APPROVAL	SR/HA/XX	29/03/2024
P01	S3-FOR REVIEW AND COMMENT	NP/HA/XX	09/02/2024

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Project Title

Colt London 4

Drawing Title

ROOF LEVEL 02 (STAIR 2) GREEN ROOF - GA PLAN

Project Status

WIP

Discipline	Status Code
ROOFING	**S4**

Project Number	Scale @ A1	Revision
DCS20109	**As indicated**	**P02**

Drawing Number

DCS20109-MRC-DC-B1-06-DR-X-27213

Project — Originator — Functional Breakdown — Spatial Breakdown — Level — Form — Discipline — Number

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