StayCity Aparthotel and 3 storey Basement Carpark
Park Street, Cambridge.

Green Roofs

Condition 15 of
19/1159/FUL AND 20/03373/S73

Revision	Date	Revision Description
0	22/03/24	Draft issue for review by project team
1	11/04/24	Tap locations added for manual irrigation
2	16/04/24	Final Amendments

Contents

1.0 Document Record

Document Record	
Project Reference	GA_498_Park_Street
Document Title	Green Roofs
Site	Previous Council Multi-Storey Carpark Corner of Park St and Round Church St, Cambridge, CB5 8AS
Client	Marick Management Limited 33 Cavendish Square, London, W1G 0PW
Document Date	22/03/2024
Document Version	Issue 0. Initial issue for project team comment 22/03/24
Document Authorization	Created by Stephen Mulligan, Senior Design Manager, Gilbert Ash BSC (Hons) Architecture, BREEAM Accredited Professional Design Input and references by Derek Crous, Project Engineer, Bryne Looby Mike Martin, Landscape Architect, Turkington Martin Andrew Kelly, Design Manager, Sharpe Mechanical Haydn Williams, The Green Roof Company Peter Schofield, Principle Designer, BWS Group Checked by Warren Copeland, Project Manager, Gilbert Ash Approved by TBC

2.0 Introduction

The propose of this design note is to convey the Green Roof Strategy for the site in relation to Planning Condition 15: '*No development above ground level, other than demolition, shall commence until full details of green roofs have been submitted to and approved in writing by the local planning authority and these works shall be carried out as approved. The details shall include details of build-ups, make up of substrates, planting plans for biodiverse roofs, methodologies for translocation strategy and drainage details where applicable'.*

2.1 Project Background

The site is located at the corner of Park Street and Round Church Street in Cambridge, site postcode, CB5 8AS as highlighted in Figure 1 below.

Figure 1: Site Location (Extracted from Google Earth)

The site is approximately 0.3ha in size and contains a building currently used as a ground level and above ground car park. There is a small area of existing hardstanding within the site boundary, with a proposed development includes demolition of an existing multi-storey car park and erection of 227 bed aparthotel alongside 225 space underground public car park, public cycle store and associated works.

The surrounding land uses for the development are a mixture of residential and commercial uses. The site is bordered by the Cambridge School of Visual performing Arts to the West, The Round Church medieval church to the south and west, residential properties and The Maypole pub to the north, and residential properties and a park to the east.

3.0 Site Drainage Strategy

3.1 Existing Drainage

The site has separate surface and foul sewer connections to the public sewers in the area. Surface water from the existing car park is drained by gullies and downpipes that discharge into the Anglian Water 525mm diameter surface water sewer in Park Street and an assumed connection into a private 150mm diameter sewer which discharges to the Anglian Water 300mm diameter surface water sewer in Round Church Street. Foul water from the existing building discharges to the Anglian Water 300mm diameter foul sewer in Park Street. Anglian Water sewer asset records indicate the location of the public surface and foul water sewers surrounding the site. The Anglian Water sewer record map is show in Figure2.

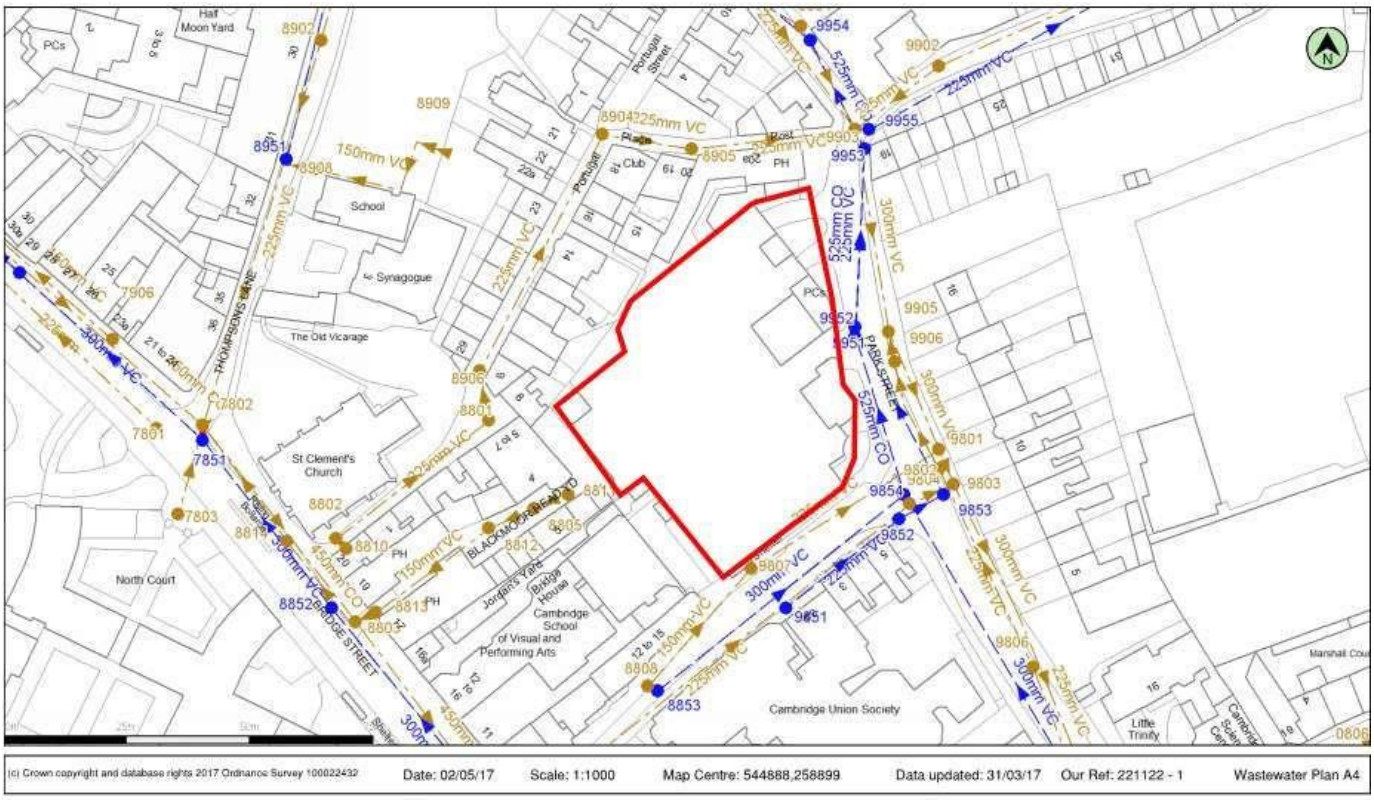


Figure 2: Anglian Water Sewer Records for the site location

3.2 Surface Water Strategy

Surface water will be collected from traditional roofs, green/blue roofs and external hardstanding areas, as shown on Turkington Martin Landscape Architects' drawings, as contained in Appendix B. A pipe system will convey the surface water from green roofs to the public sewer. All other runoff will be routed to the rainwater harvesting system located on level B3 (basement). In the event that the rainwater harvesting system reaches full capacity, an overflow is provided which diverts flow to a below ground pumping station and storage tank. The tank has been sized considering no storage from the rainwater harvesting system and a 100 year storm event plus an allowance of 40% for climate change.

Storage requirements on the site have been assessed to determine the required volume of attenuation required to prevent flooding on the site if discharge is set at the consented rate of 34l/s, as set out in accordance with approved Condition 35 as discharged under planning reference 20/03373/COND35 in December 2023 and Condition 34 discharged under planning reference 20/03373/CONDH in August 2023.

The green roofs are one of the SuDS items that offers features such as ecology and restricting water runoff from the site through its make up of successive layers: a drainage layer, a filter layer, a growing medium layer (substrate), and a vegetation layer. Successfully managing this composite structure is the key to creating a green roof system that performs well over the long-term. This creates storage of rainwater (attenuated flows) at roof and terrace levels through the use of green roofs and captures and reuses the surface water from roof/courtyard levels discharging to the rainwater harvesting system design in accordance with BS EN 16941-1:2018 Rainwater Harvesting Systems Code of Practice with overflow attenuation tank.

Drainage layout drawings and schematics are contained in Appendix A outlining the overall drainage strategy, and pipework arrangements are shown on latest Sharpe Group rainwater drainage drawings.

An analysis of the proposed development catchment areas for the site has been undertaken with the breakdown of areas shown below:

Table 1: Catchment Analysis Summary

Type	Proposed Area (m^2)
Traditional Roof discharging to rainwater harvesting	1649
Traditional Roof discharging directly to external drainage network	17.5
Green roofs discharging directly to local drainage network	584.2*
Courtyard (Hardstanding area) – discharges to rainwater harvesting	375
Total	2,625.7m^2

*Green roof discharge directly to local drain. Other areas gravitate to rainwater harvesting system

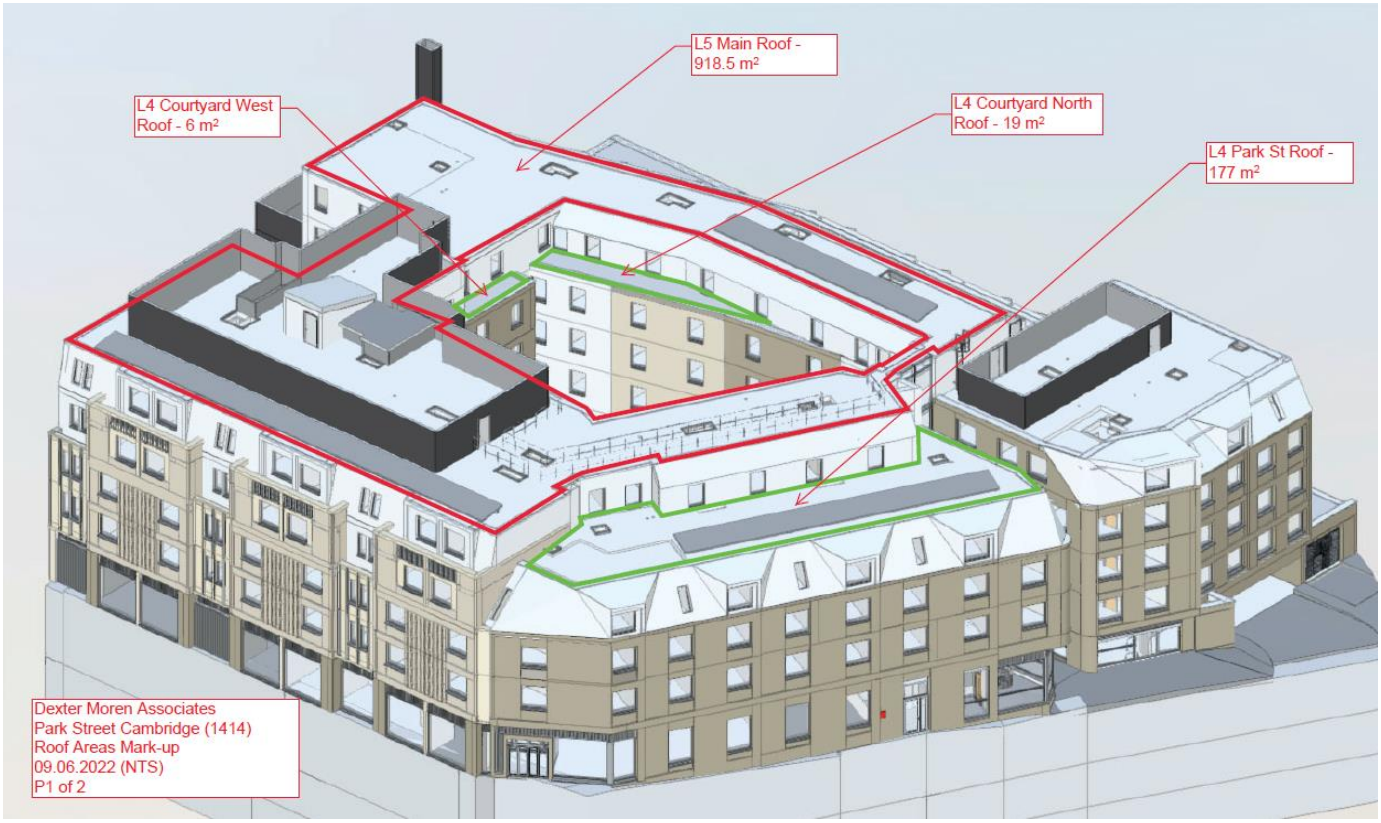
The total discharge to the drainage network from green roofs and 17.5 m2 of traditional roof is 18.88 l/s. (Refer to drainage schematics in Appendix A) Therefore, to comply with the consented discharge rate of 34 l/s the below ground storm pumping station will be set to discharge a maximum of 15.1 l/s.

The attenuation strategy has been designed to provide attenuation in the form of a below ground attenuation tank and permeable paving within the Jordans Yard Courtyard. The permeable paving additionally enables storage of exceedance flows within the courtyard hard standing and enables continued site operation in the event of blocked channels or gullies. There is also a central soft landscaping feature in the courtyard along with green and living walls to create a small amount of additional restriction of water runoff from the site.

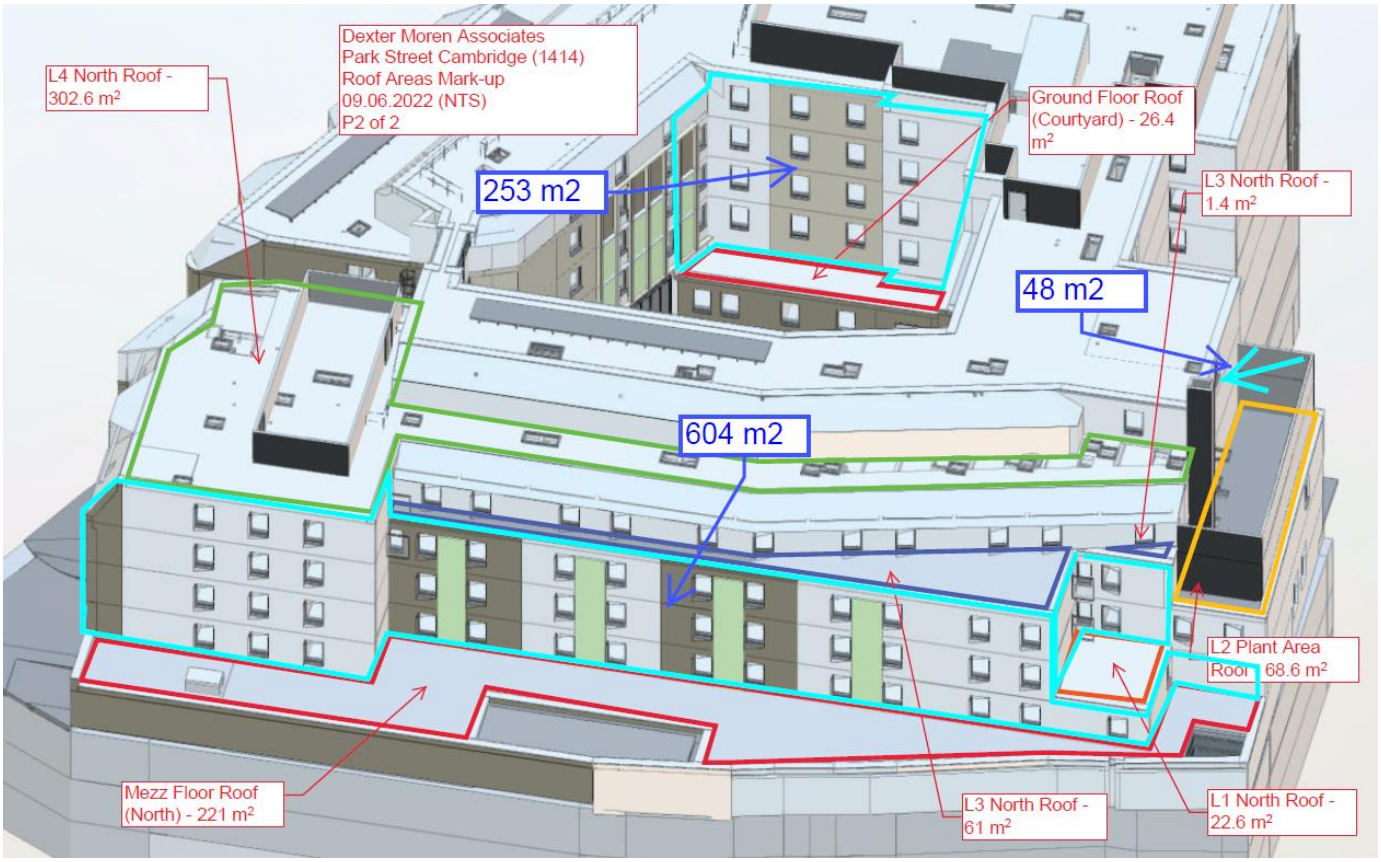
4.0 Green Roofs

4.1 Green Roof Location

The green roofs will be provided on the Mezzanine, 1st, 3rd level roofs and also the main roof level, providing mainly biodiversity and ecological benefits. However, the Green roofs will also provide rainwater storage during shorter rainfall periods and offer a lag in drain time as water is conveyed through the roof make up. In longer duration storm events, Green roofs are assumed to be saturated and the attenuation is provided within the drainage network at ground level. Below shows 3D images of the location of each roof type, and further Turkington Martin Green Roof locations plans can be seen in Appendix B.



View of Round Church St and Park Street, highlighting some of New Jordans yard.



View of Portugal Place and New Jordan Yard.

4.2 Roof Build ups and substrates

For the main waterproofing layer is proposed to install a MOY Paro-Melt® waterproofing system, comprising a 2nd generation reinforced, modified bitumen-based, hot-applied, monolithic waterproof coating. It includes, where required, the necessary primers, inverted (closed cell) thermal insulation, a reinforced bitumen protection membrane, a water flow reducing layer (WFRL) to minimise the 'cooling effect' on the insulation from rainwater draining through the roof construction and the additional surface finishes of concrete paving slabs, stone ballast or green roofing build-ups as required. The full roof build-up details and specification of this waterproof layer is set out in Appendix C.

It is proposed to install SkyGarden green roof system from Moy Materials or similar approved it will be designed, constructed, and maintained in line with the CIRIA SuDS Manual (C753), the Green Roof Code (GRO) and Condition 34 for SuDS maintenance prepared by Gilbert Ash 9th October 2023.

The substrate depth will ultimately define the type of vegetation that will establish. The Substrate depth of 50mm depth is sufficient for the selected plant species to prosper and that the roof meets the required construction parameters. They will be varied substrate depths, surface contour and habitat provisions to increase invertebrate colonisation and areas of non-vegetated areas to encourage foraging by key bird species if invertebrate species have been considered. Substrates can include site materials, soils and aggregate and this material will be tested and screened for contaminates before being blended with locally imported material. Site material for habitat construction is also considered. Substrates are

designed to be compliant with roof water management processes and these must be considered at the design and planning stage to ensure sustainability, as stated in the SuD Maintenance document.

Substrates should comprise 80-90% crushed screened aggregate. A maximum of 20% organic content of which a max 5% should be compost to minimise combustion issues. Substrate grades should be a percentage of 20-40mm to maximise system performance and surface sustainability. Substrate mix should contact a percentage of aggregate fines, green waste, composted bark, pine and sand. Base layers should comprise larger grade aggregate that can aid drainage and water management. Refer to Appendix D for the full specification of Green Roof Layer build-ups.

4.3 Planting plan and Habitat Construction for Bio-diverse Roof

The bio-diverse roof will have pre-grown blankets that will produce increased aesthetic delivery whilst maintaining the biodiversity of the system. The bio-diverse system will contain a range of seeded, plug planted and more mature (possibly site preserved specimens) The range will include herbs, grasses, alpines, wildflower, cornflower and herbaceous species.

Wildflower (C) Seed Mix Species List

*This wildflower mixture is suitable for sowing onto engineered green roof substrates.

	Common Name	Latin Name	Quantity	Flowers	Height	Type
1	Agrimony, Common	Agrimonia eupatoria	0.2%	Jun - Sep	50 - 150cm	Perennial
2	Borage	Borago officinalis	1.4%	Aug-Sep	60 - 80cm	Annual
3	Clary, Wild	Salvia verbenaca	0.8%	May - Aug	30 - 40cm	Perennial
4	Clover, Red	Trifolium pratense	0.6%	May - Sep	20 - 60cm	Perennial
5	Clover, White	Trifolium repens	0.2%	Jun - Sep	15 - 20cm	Perennial
6	Corn Cockle	Agrostemma githago	1.6%	May - Aug	50 - 70cm	Annual
7	Cornflower	Centaurea cyanus	1.2%	Jun - Oct	20 - 80cm	Annual
8	Daisy, Ox-eye	Leucanthemum vulgare	1%	May - Sep	20 - 100cm	Perennial
9	Foxglove, Wild	Digitalis purpurea	0.6%	Jun - Aug	50 - 100cm	Biennial
10	Knapweed, Common	Centaurea nigra	1.2%	Jun - Sep	30 - 80cm	Perennial
11	Knapweed, Greater	Centaurea scabiosa	1%	Jun - Sep	50 - 90cm	Perennial
12	Loosestrife, Purple	Lythrum salicaria	0.2%	Jun - Sep	100 - 200cm	Perennial
13	Marjoram, Wild	Origanum vulgare	0.2%	Jul - Oct	20 - 50cm	Perennial
14	Meadow Cranesbil	Geranium pratense	0.2%	May-Aug	40 - 60cm	Perennial
15	Musk Mallow	Malva moschata	1%	May - Sep	20 - 150cm	Perennial
16	Poppy, Common	Papaver rhoeas	1%	May - Jul	50 - 70cm	Annual
17	Ragged Robin	Lychnis flos-cuculi	0.4%	May - Aug	30 - 90cm	Perennial
18	Sainfoin	Onobrychis vicilfolia	1.4%	Jul - Sep	30 - 40cm	Perennial
19	Scabious, Field	Knautia arvensis	1.4%	Jul - Sep	30 - 200cm	Perennial
20	Scabious, Small	Scabiosa columbaria	0.6%	Jul - Aug	20 - 60cm	Perennial
21	Teasel	Dipsacus fullonum	0.2%	Jul - Aug	100 - 200cm	Biennial
22	Trefoil, Birds-foot	Lotus corniculatus	0.4%	Jun - Aug	10 - 40cm	Perennial
23	Vetch, Kidney	Anthyllis vulneraria	0.4%	May - Oct	15 - 50cm	Perennial
24	Viper's Bugloss	Echium vulgare	0.4%	May - Oct	50 - 100cm	Biennial
25	Yarrow	Achillea millefolium	1%	Jun - Oct	20 - 100cm	Perennial
26	Yellow Rattle	Rhinanthus minor	1.4%	Jun - Sep	20 - 50cm	Annual
	Bent, Common	Agrostis castellana	4%		50 - 100cm	Grass
	Crested Dogstail	Cynosurus cristatus	20%		30 - 60cm	Grass
	Fescue, Sheeps	Festuca ovina	16%		15 - 50cm	Grass
	Fescue, Slender Creeping Red	Festuca rubra, litoralis	24%		10 - 20cm	Grass
	Meadow Grass, Smooth Stalked	Poa pratensis	6.4%		30 - 90cm	Grass
	Timothy, Small Leaved	Phleum pratense ssp Bertolinii	9.6%		50 - 100cm	Grass

- Bright and beautiful British native wildflowers, formulated to provide maximum food source for bees and butterflies, whilst creating a visually attractive meadow
- Carefully formulated to include twenty species from the Royal Horticultural Society "Plants For Pollinators" list, inc. yellow rattle.
- Contains suitable grasses for meadow creation plus 20% native wildflower species plus Borage and Sainfoin to encourage a wide range of pollinating insects and other wildlife.
- Sow at 5 grams per sqm - 1kg sows 200 sq/m

A key aspect of every bio-diverse system is the provision of habitat areas, these can be incorporated in a variety of ways:

• Habitat construction is driven by local and national bio-diversity action plans, site bio-diversity assessments and ecology plans. Based on the Landscape Statement provided by Turkington Martin it is anticipated that there will be a total Creation of 0.0469ha of extensive green roof (mix of sedum and biodiverse seedmix).

• Use of substrates incorporating sand beds that allow for varied plant establishment and offer habitat potential to ground burrowing insects and small mammals.

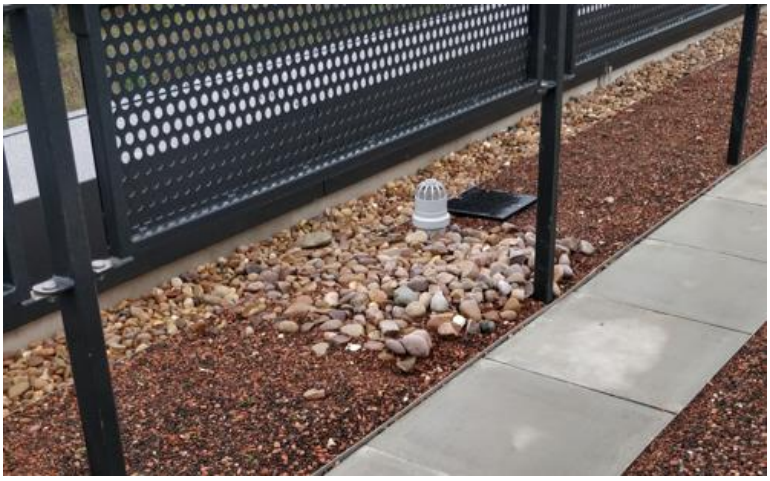
• Stone piles on sand beds to encourage ground dwelling bees and insects and some small birds.

• Boulder piles providing larger off ground habitat potential for insects, bats and birds.

• Seasoned soft and hardwood piles that provide shelter and habitats for birds, small mammals, bees, bats and insects.

• Bare areas to maximise foraging capacity of bird species assuming allowance for invertebrate development has been made.

Habitat provision is a functional requirement for bio-diverse and brown roofs, where applicable material is available from site; it can be incorporated into habitat design.



5.0 General aftercare and Maintenance

5.1 Sedum and Wild flower Blankets

Sedum and Wild Flower blanket systems are designed to be low maintenance. Species selection ensures that the roof will evolve successfully but intervention is sometimes required to minimise invasive urban species. Some wild- flower systems benefit from - flower removal once a year to maintain species diversity.

Sedum and Wild flower blanket systems with a minimum of 50mm substrate may require manual irrigation for the first six months post installation. Once established consideration is required only during elongated periods of drought (6-8 weeks). Manual irrigation will be via external taps adjacent to each roof area, tap location as shown.

5.2 Bio-diverse roof

Bio-diverse systems are seeded and left to self develop, a roof assessment to remove invasive or damaging specimens is recommended once a year.

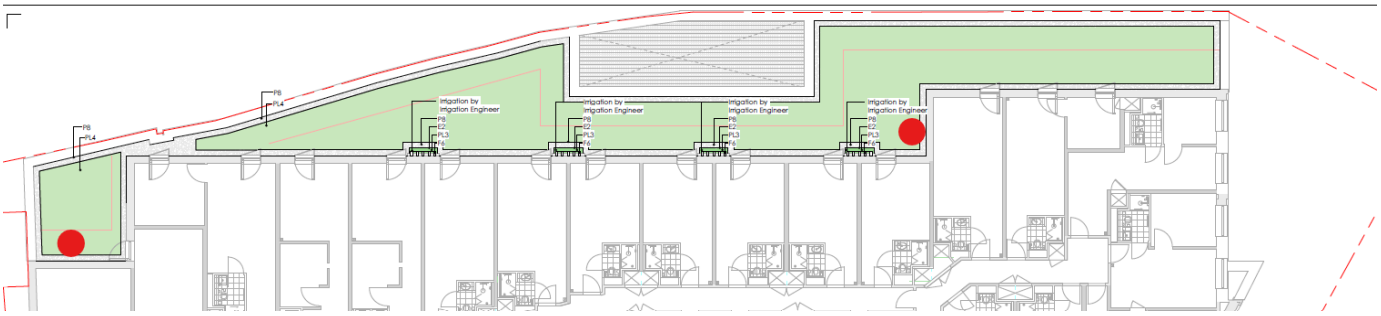
Bio-diverse systems tend not to have irrigation systems unless plug or young plants are used but leaving the vegetation for extended dry periods without water, this kind of neglect will be detrimental to the health and longevity. This will also be done via manual irrigation with external taps in adjacent to each roof area, tap locations as shown.

LANDSCAPE MAINTENANCE AND MANAGEMENT SCHEDULE

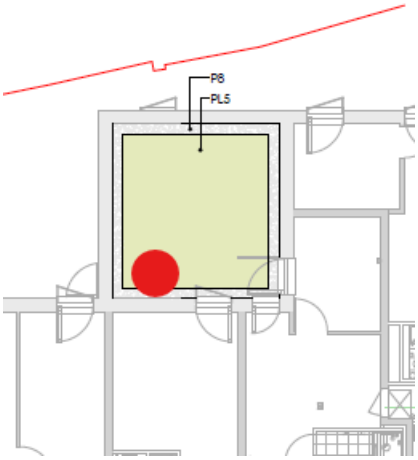
Operation	Frequency	Year 1												Year 2	Year 3	Year 4	Year 5
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec				
General																	
Management Plan Review	Every 5 years																x
Biodiverse Green Roof Areas																	
Fertiliser	1 x year				x									x	x	x	x
Control Plant Encroachment	Every 2-4 months				x			x			x			x	x	x	x
Litter Collection	Every 2-4 months				x			x			x			x	x	x	x
Cutting	1 x year										x			x	x	x	x
Weeding	2 x year				x						x			x	x	x	x
Watering	During establishment and dry periods					x	x	x	x	x				x	x	x	x
Ecological Elements																	
Check integrity	2 x year				x						x			x	x	x	x

Tap Location on each level shown as ●

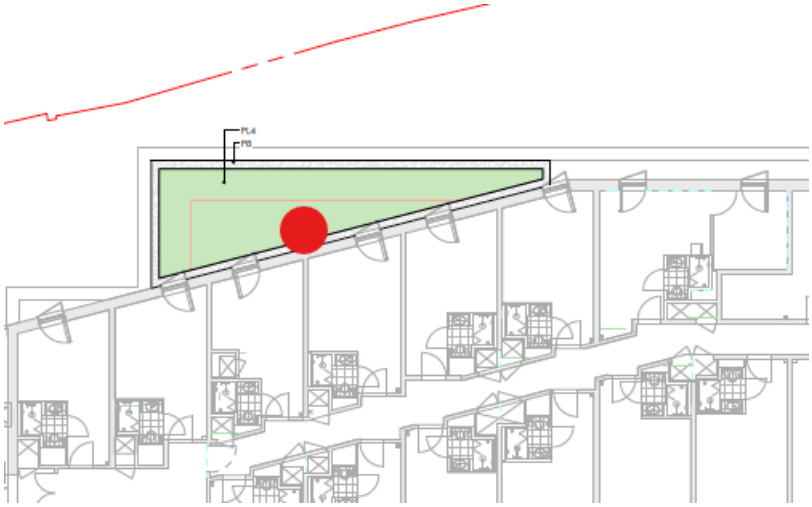
Mezz level



First Floor Level

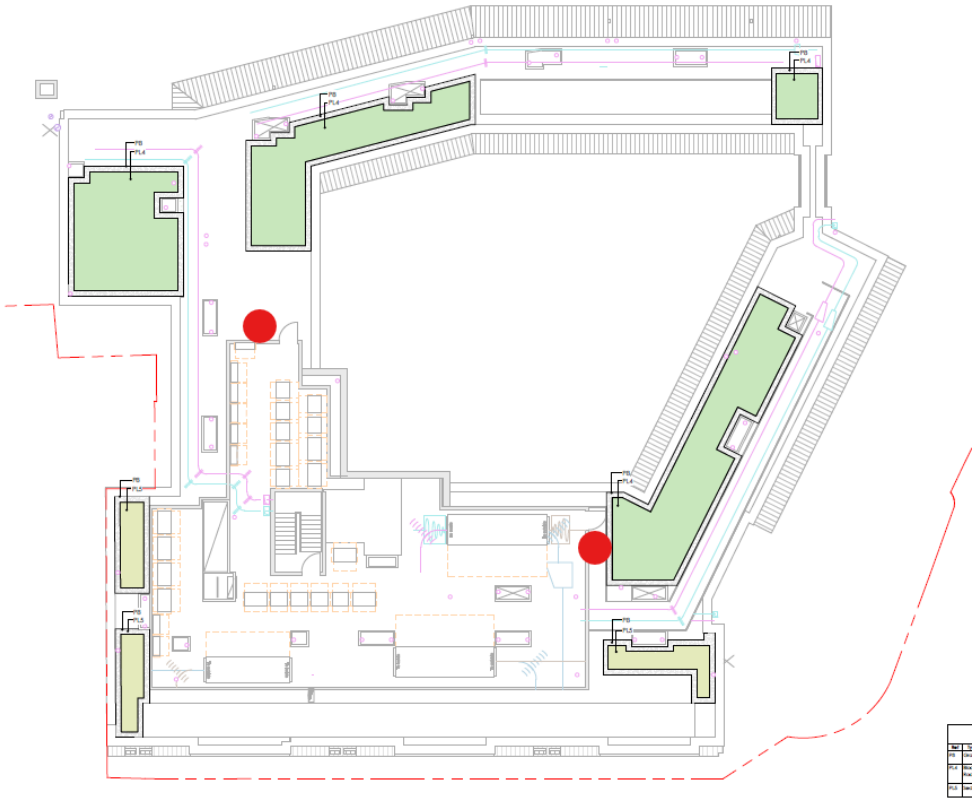


Third Floor Level

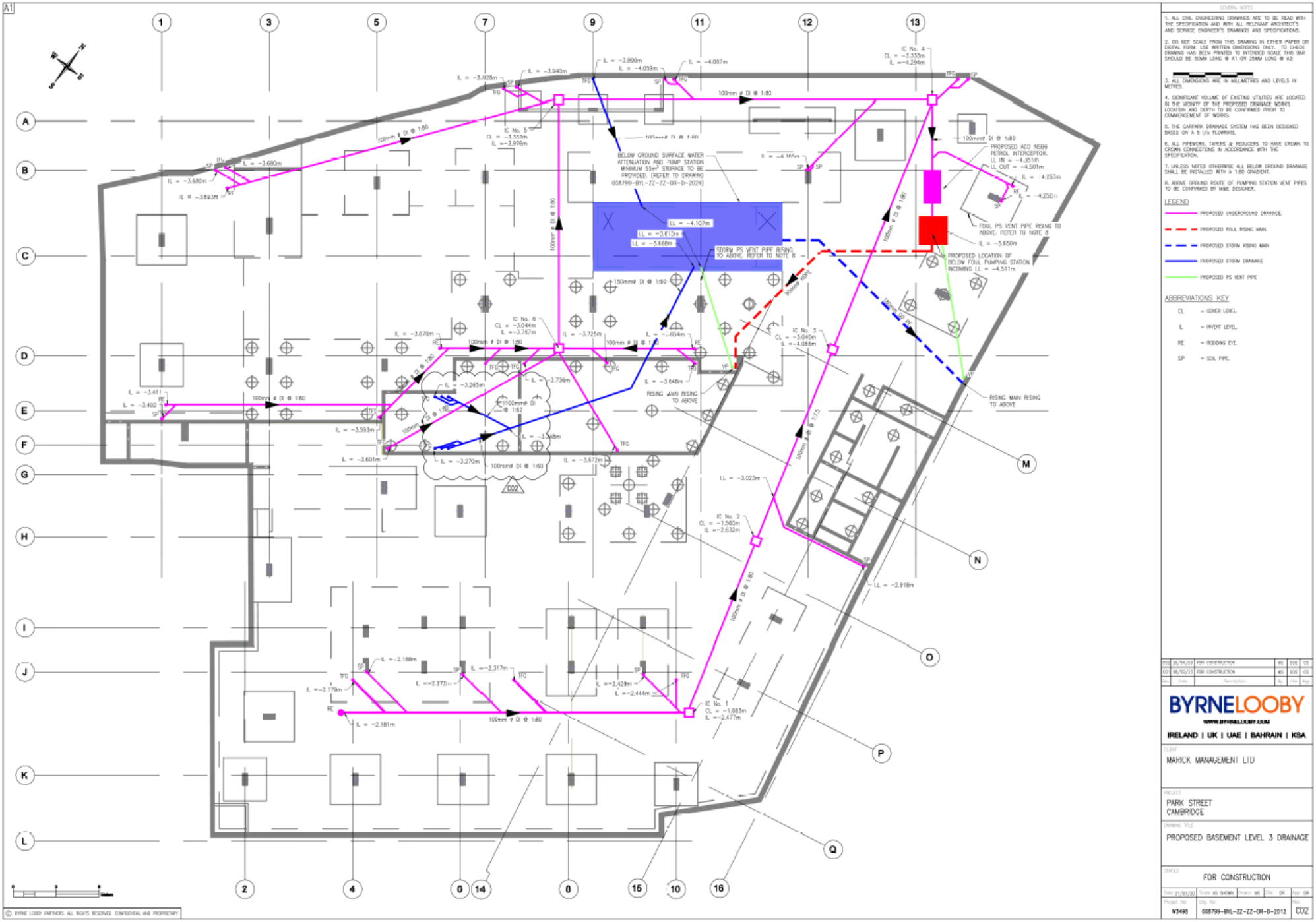


Fourth Floor Level

Roof Level



Appendix A – Drainage Layouts and Schematics


A1
GENERAL NOTES
1. ALL CIVIL ENGINEERING DRAWINGS ARE TO BE READ WITH THE SPECIFICATION AND WITH ALL RELEVANT ARCHITECT'S AND SERVICE ENGINEER'S DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE FROM THIS DRAWING IN EITHER PAPER OR DIGITAL FORM. USE WRITTEN DIMENSIONS ONLY. TO CHECK DRAWING HAS BEEN PRINTED TO INTENDED SCALE THIS BAR SHOULD BE 50MM LONG @ A1 OR 25MM LONG @ A3.
3. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES.
4. SIGNIFICANT VOLUME OF EXISTING UTILITIES ARE LOCATED IN THE VICINITY OF THE PROPOSED DRAINAGE WORKS. LOCATION AND DEPTH TO BE CONFIRMED PRIOR TO COMMENCEMENT OF WORKS.
5. THE CARPARK DRAINAGE SYSTEM HAS BEEN DESIGNED BASED ON A 5 l/s FLOWRATE.
6. ALL PIPEWORK, TAPERS & REDUCERS TO HAVE CROWN TO CROWN CONNECTIONS IN ACCORDANCE WITH THE SPECIFICATION.
7. UNLESS NOTED OTHERWISE ALL BELOW GROUND DRAINAGE SHALL BE INSTALLED WITH A 1:60 GRADIENT.
8. ABOVE GROUND ROUTE OF PUMPING STATION VENT PIPES TO BE CONFIRMED BY M&E DESIGNER.
LEGEND
PROPOSED UNDERGROUND DRAINAGE.
PROPOSED FOUL RISING MAIN.
PROPOSED STORM RISING MAIN
PROPOSED STORM DRAINAGE
PROPOSED PS VENT PIPE
ABBREVIATIONS KEY
CL = COVER LEVEL.
IL = INVERT LEVEL.
RE = RODDING EYE.
SP = SOIL PIPE.
BELOW GROUND SURFACE WATER ATTENUATION AND PUMP STATION MINIMUM 55m³ STORAGE TO BE PROVIDED. (REFER TO DRAWING 008799-BYL-ZZ-ZZ-DR-D-2024)
PROPOSED ACO NSB6 PETROL INTERCEPTOR. LL IN = -4.351m LL OUT = -4.501m
FOUL PS VENT PIPE RISING TO ABOVE. REFER TO NOTE 8
STORM PS VENT PIPE RISING TO ABOVE. REFER TO NOTE 8
PROPOSED LOCATION OF BELOW FOUL PUMPING STATION INCOMING LL = -4.511m
RISING MAIN RISING TO ABOVE
RISING MAIN RISING TO ABOVE
D02
P03 25/04/23 FOR CONSTRUCTION MS DOS CS
P02 08/02/23 FOR CONSTRUCTION MS DOS CS
BYRNELOOBY
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IRELAND | UK | UAE | BAHRAIN | KSA
CLIENT
MARICK MANAGEMENT LTD
PROJECT
PARK STREET CAMBRIDGE
DRAWING TITLE
PROPOSED BASEMENT LEVEL 3 DRAINAGE
STATUS
FOR CONSTRUCTION
Date: 31/01/20 Scale: AS SHOWN Drawn: MS Chk: DR App: DR
Project No: N3498 Dg. No: 008799-BYL-ZZ-ZZ-DR-D-2012 Rev: D02
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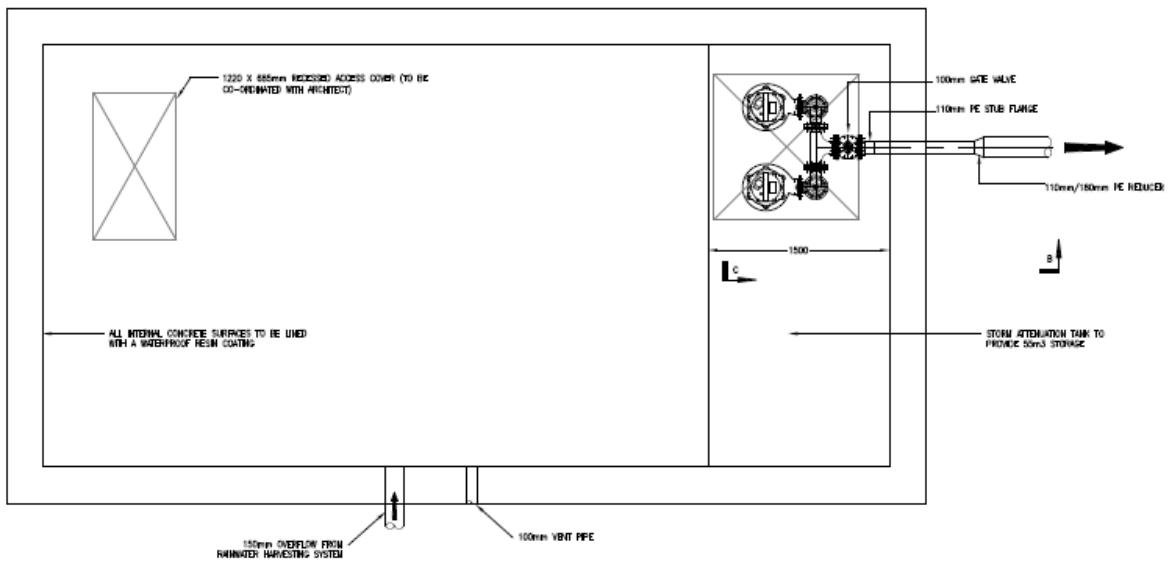
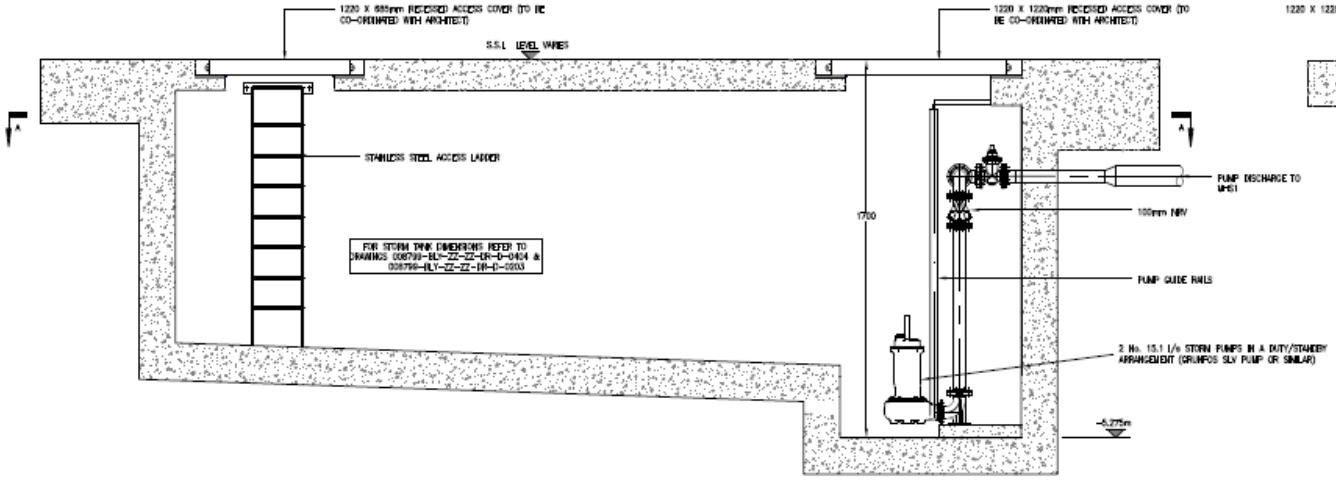
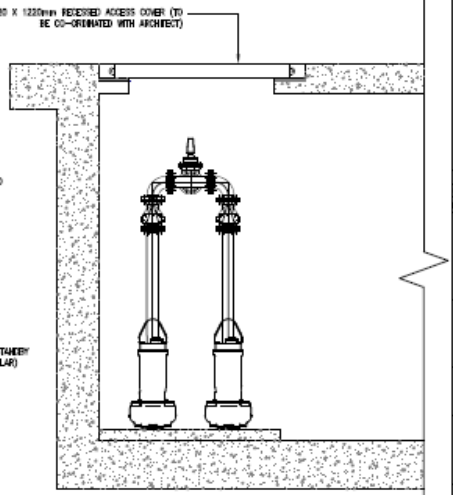


SECTIONIONAL PLAN A-A
SCALE 1:20



SECTION B-B



SECTION C-C

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS (MM) UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METERS.
3. REFER TO STRUCTURAL DESIGN PACKAGE FOR CONCRETE AND REINFORCEMENT DETAILS.
4. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS AND SPECIFICATIONS.
5. TANK SHALL BE COVERED WITH APPROVED HEAVY DUTY METAL COVERS TO I.S. EN 124 RATING D400. COVER AND FRAME SHALL BE SUITABLE FOR ROAD AND TRAFFIC CONDITIONS AND IS SUBJECT TO THE APPROVAL OF THE EMPLOYER'S REPRESENTATIVE
6. DUCTILE IRON PIPES AND FITTINGS TO BE IN ACCORDANCE WITH EN 12201-2011
7. STORM PUMP HEAD TO BE DETERMINED BY M&E DESIGNER BASED ON ABOVE GROUND RISING MAIN ROUTE.

Rev	Date	Description	By	Chk	App
C01	04/03/25	PLANNING ISSUE	MT	SCS	CS

BYRNELOOBY
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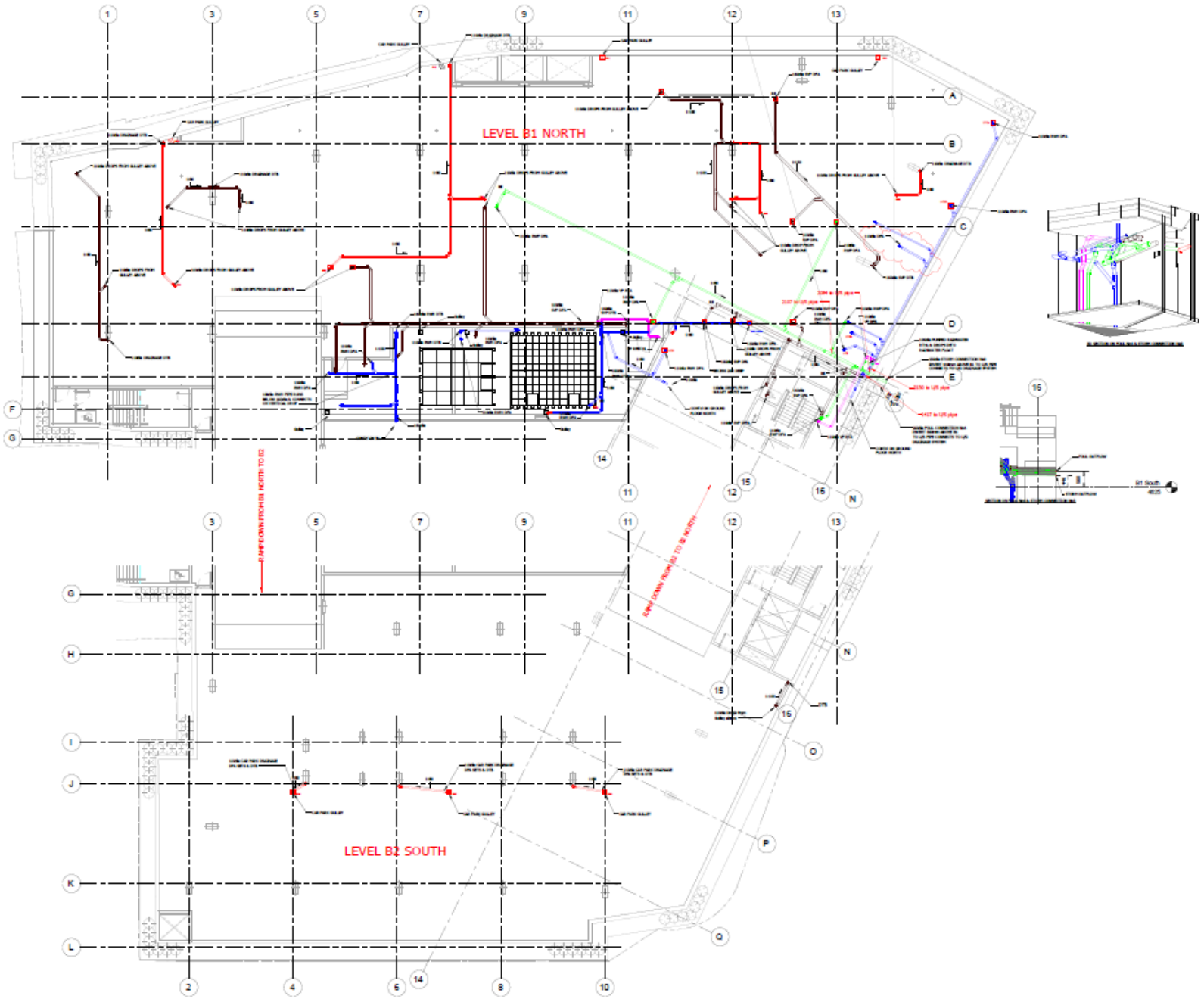
CLIENT
MARRICK MANAGEMENT LTD

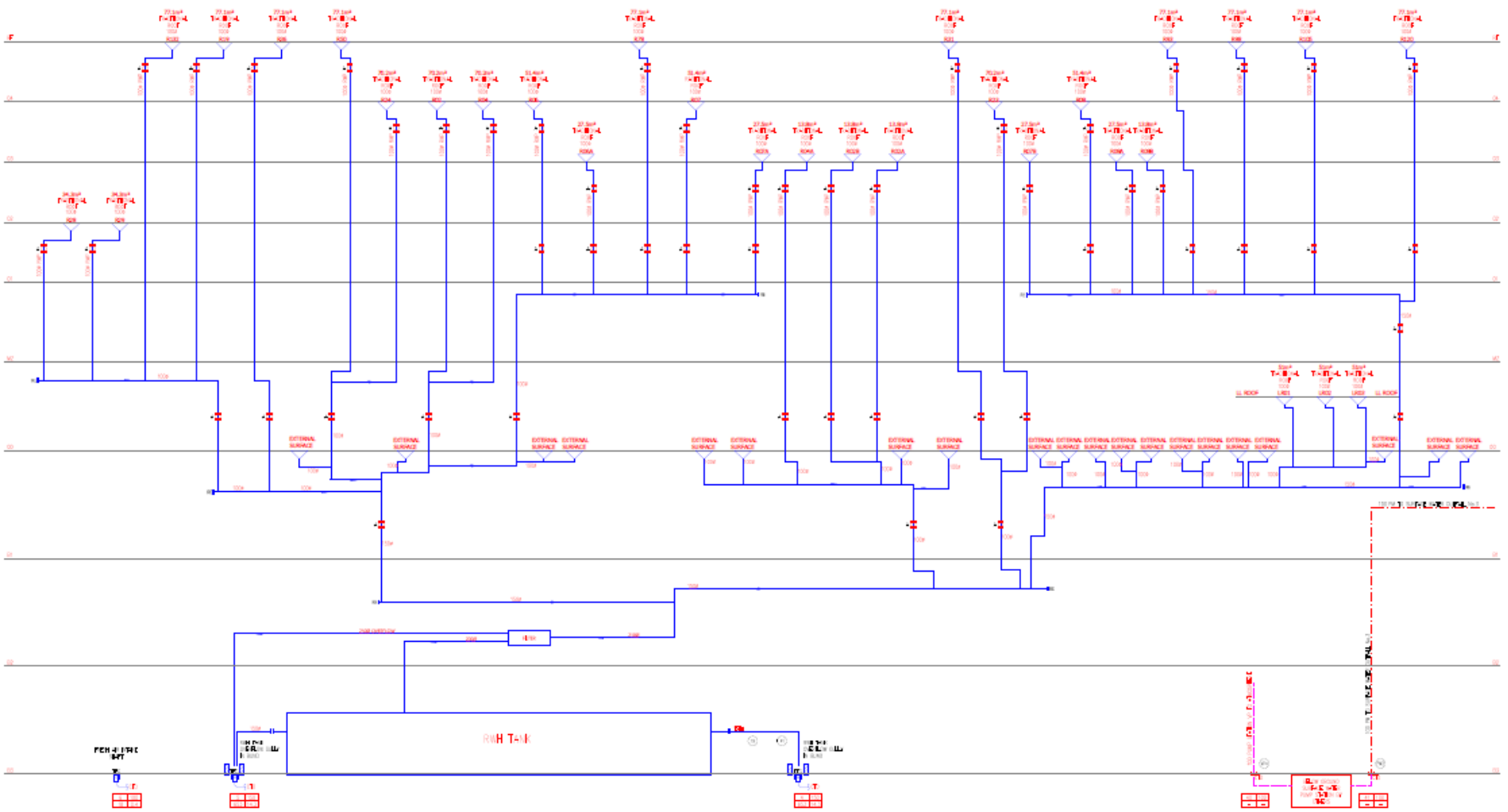
PROJECT
PARK STREET
CAMBRIDGE

DRAWING TITLE
BELOW GROUND DRAINAGE
STORM ATTENUATION TANK
AND PUMPING STATION

STATUS
FOR CONSTRUCTION

Date: 27/04/25	Scale: 1:20@A1	Drawn: SCS	Chk: MT	App: CS
Project No: 63498	Dwg No: 028799-BYL-ZZ-ZZ-DR-D-2024	Rev: C01		


LEVEL B1 NORTH
LEVEL B2 SOUTH



1. ALL ABOVE GROUND FOUL AND RAINWATER DRAINAGE PIPEWORK SHOWN ON THIS DRAWING WILL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE BUILDING REGULATIONS AND BS EN 12056.

2. ACCESS DOORS WILL BE PROVIDED ON ALL VERTICAL FOUL STUB STACKS (ABOVE THE SPILLOVER LEVEL OF THE HIGHEST APPLIANCE) AND HORIZONTALLY AT EACH CHANGE OF DIRECTION OR AS INDICATED ON THE DRAWINGS.

3. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE SPECIFICATION AND DRAINAGE LAYOUT PLANS.

4. ALL BENDS USED IN THE ABOVE GROUND FOUL DRAINAGE SYSTEM MUST BE LONG RADIUS OR 2x 45DEG.

LEGEND

CP - CAR PARK
CTD - CONNECTION TO DRAIN
RWP - RAIN WATER PIPE
RWO - RAIN WATER OUTLET
RWH - RAIN WATER HARVESTING
TFG - TRAPPED FLOOR GULLY
VP - VENT PIPE
PM - PUMPED MAIN
A.A. - DISCHARGE UNIT
A - ACCESS
RE - RODDING EYE
- ACCESS 1200MM AFFL
- HARVESTED RAIN WATER
- RAIN WATER
- PUMPED MAIN
- VENT PIPE
- RAIN WATER OUTLET

Rv Continuation Sec 006799-SHG-XX-XX-DR-WH0707 Rain Water Drainage Schematic Sheet 2-3

REV	DESCRIPTION OF WORKS	DRN	CKD	DATE
P3	REVISED AS PER AK COMMENTS	JMcA	AK	14/03/23
P2	ROOF AREAS REVIEWED	AS	AMcI	19/01/23
P1	STAGE 4 ISSUE	JMcA	AMcI	29/04/22

PRELIMINARY

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EMAIL: INFO@SHARPEGROUP.COM
WEB:WWW.SHARPEGROUP.COM

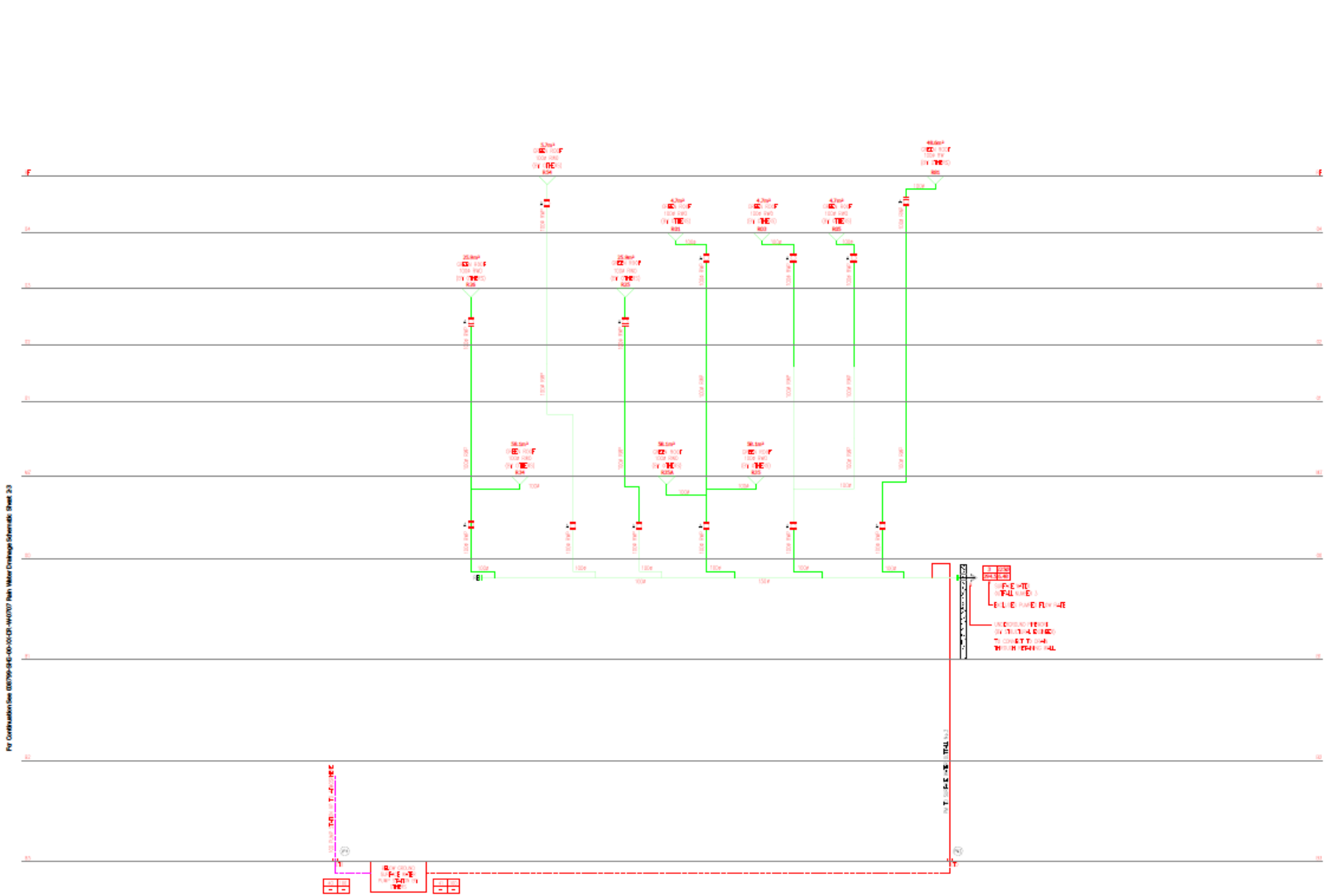
CLIENTS: GA

PROJECT: STAY CITY
PARK STREET
CAMBRIDGE

TITLE: MECHANICAL SERVICES INSTALLATION
RAINWATER DRAINAGE SCHEMATIC
SHEET 1/3

DRAWING NUMBER	REVISION
006799-SHG-00-XX-DR-WH0706	P3

DATE	DRAWN BY	CHECKED BY	PAGE / SCALE
MARCH 23	JMcA	AMcI	NTS



1. ALL ABOVE GROUND FOUL AND RAINWATER DRAINAGE PIPEWORK SHOWN ON THIS DRAWING WILL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE BUILDING REGULATIONS AND BS EN 12056.

2. ACCESS DOORS WILL BE PROVIDED ON ALL VERTICAL FOUL STUB STACKS (ABOVE THE SPILLOVER LEVEL OF THE HIGHEST APPLIANCE) AND HORIZONTALLY AT EACH CHANGE OF DIRECTION OR AS INDICATED ON THE DRAWINGS.

3. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE SPECIFICATION AND DRAINAGE LAYOUT PLANS.

4. ALL BENDS USED IN THE ABOVE GROUND FOUL DRAINAGE SYSTEM MUST BE LONG RADIUS OR 2x 45DEG.

LEGEND

CP - CAR PARK
CTD - CONNECTION TO DRAIN
RWP - RAIN WATER PIPE
RWO - RAIN WATER OUTLET
RWH - RAIN WATER HARVESTING
TPG - TRAPPED FLOOR GULLY
VP - VENT PIPE
PM - PUMPED MAIN
A.A. - DISCHARGE UNIT
A - ACCESS
RE - RODDING EYE
- ACCESS 1200MM AFFL
- HARVESTED RAIN WATER
- RAIN WATER
- PUMPED MAIN
- VENT PIPE
- RAIN WATER OUTLET

CTD No. | DISCHARGE PIPE DIA. (mm)
AREA (m²) | FLOW RATE (l/s)

For Continuation See 008799-SHG-00-XX-DR-W-0707 Rain Water Drainage Schematic Sheet 2/3

REV	DESCRIPTION OF WORKS	DRN	CKD	DATE
P3	REVISED AS PER AK COMMENTS	JMcA	AK	14/03/23
P2	ROOF AREAS REVIEWED	AS	AMcI	13/01/23
P1	STAGE 4 ISSUE	JMcA	AMcI	09/04/22

PRELIMINARY

SHARPE GROUP
MECHANICAL, ELECTRICAL, VENTILATION, AIR CONDITIONING
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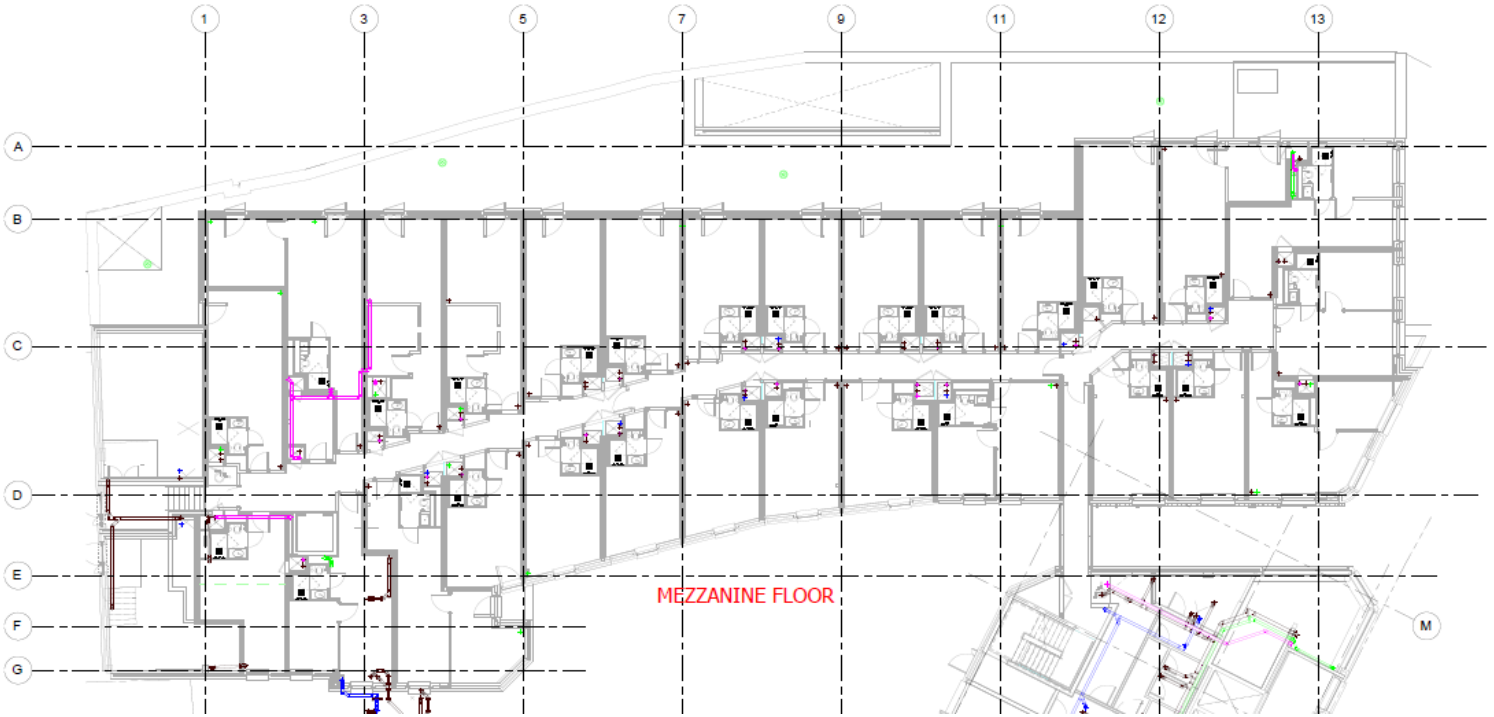
PROJECT: STAY CITY
PARK STREET
CAMBRIDGE

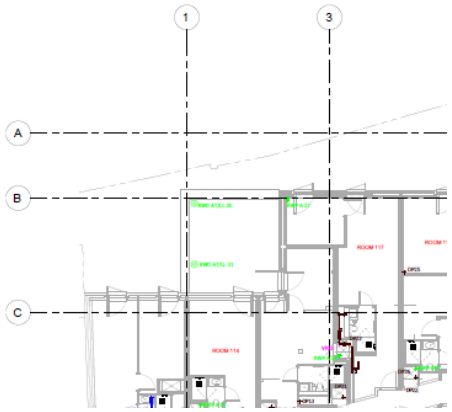
TITLE: MECHANICAL SERVICES INSTALLATION
RAINWATER DRAINAGE SCHEMATIC
SHEET 3/3

DRAWING NUMBER	REVISION
008799-SHG-00-XX-DR-W-0708	P3

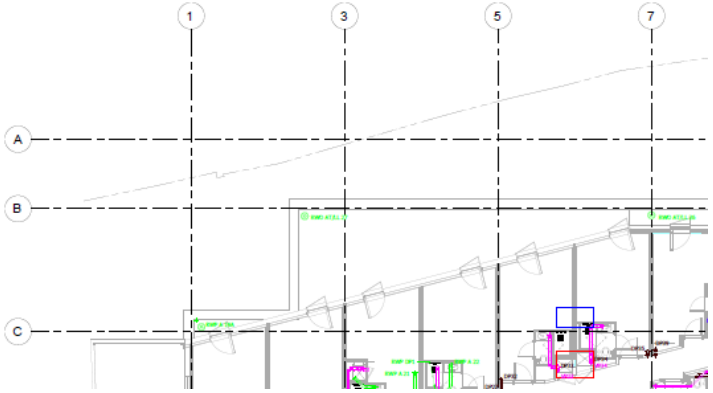
DATE	DRAWN BY	CHECKED BY	PAGE / SCALE
MARCH 23	JMcA	AK	NTS



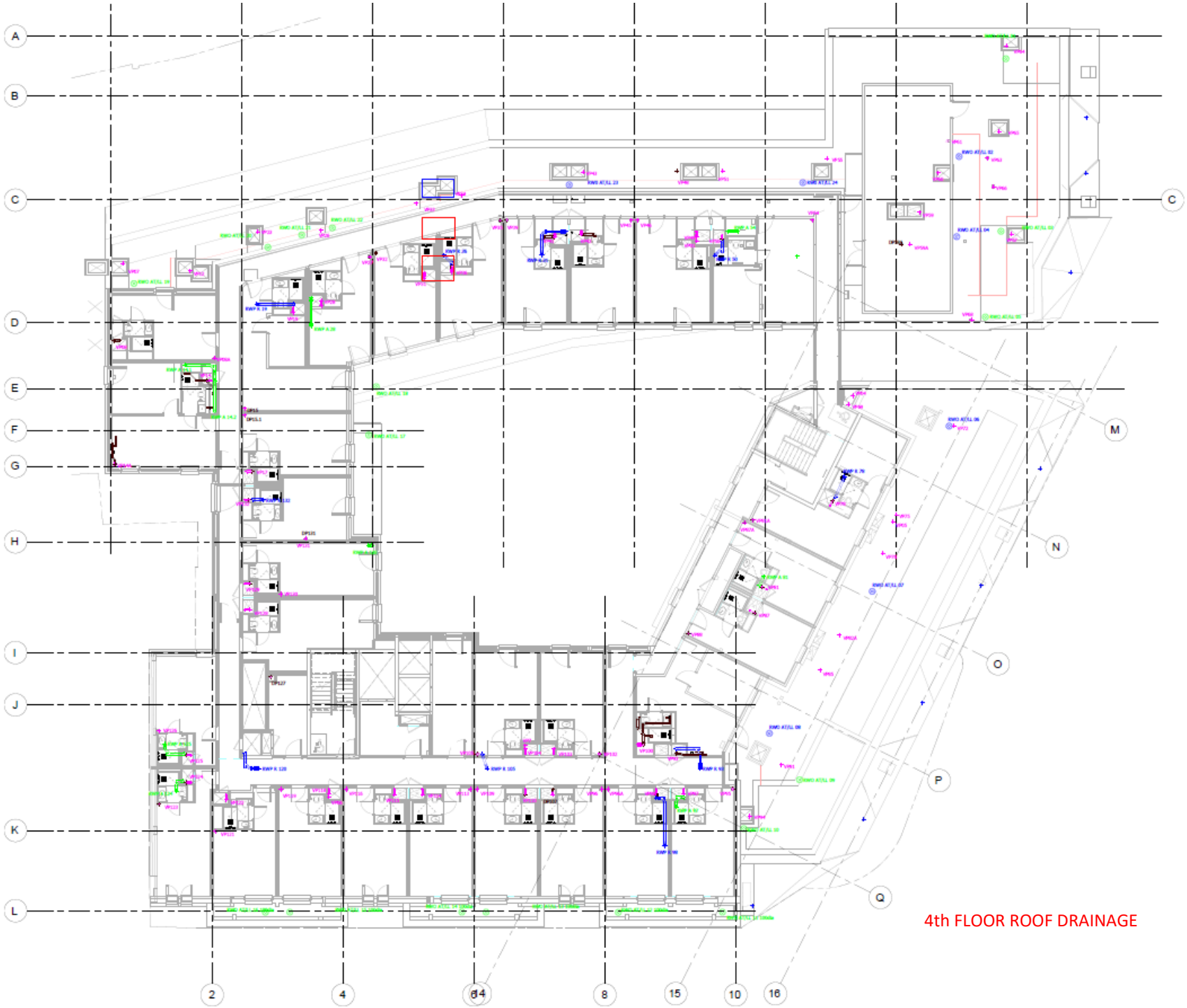
MEZZANINE FLOOR



1St FLOOR ROOF DRAINAGE



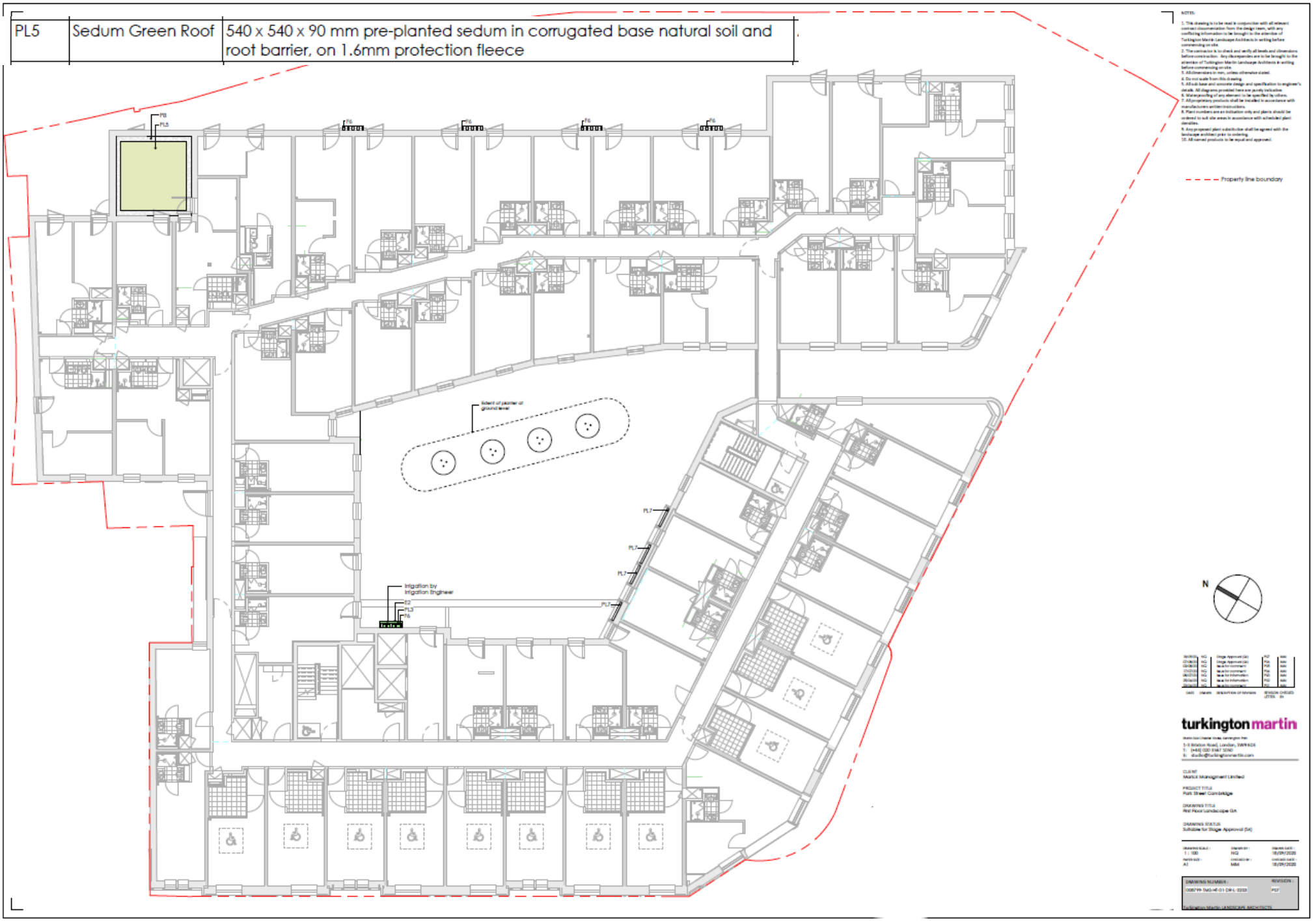
3rd FLOOR ROOF DRAINAGE



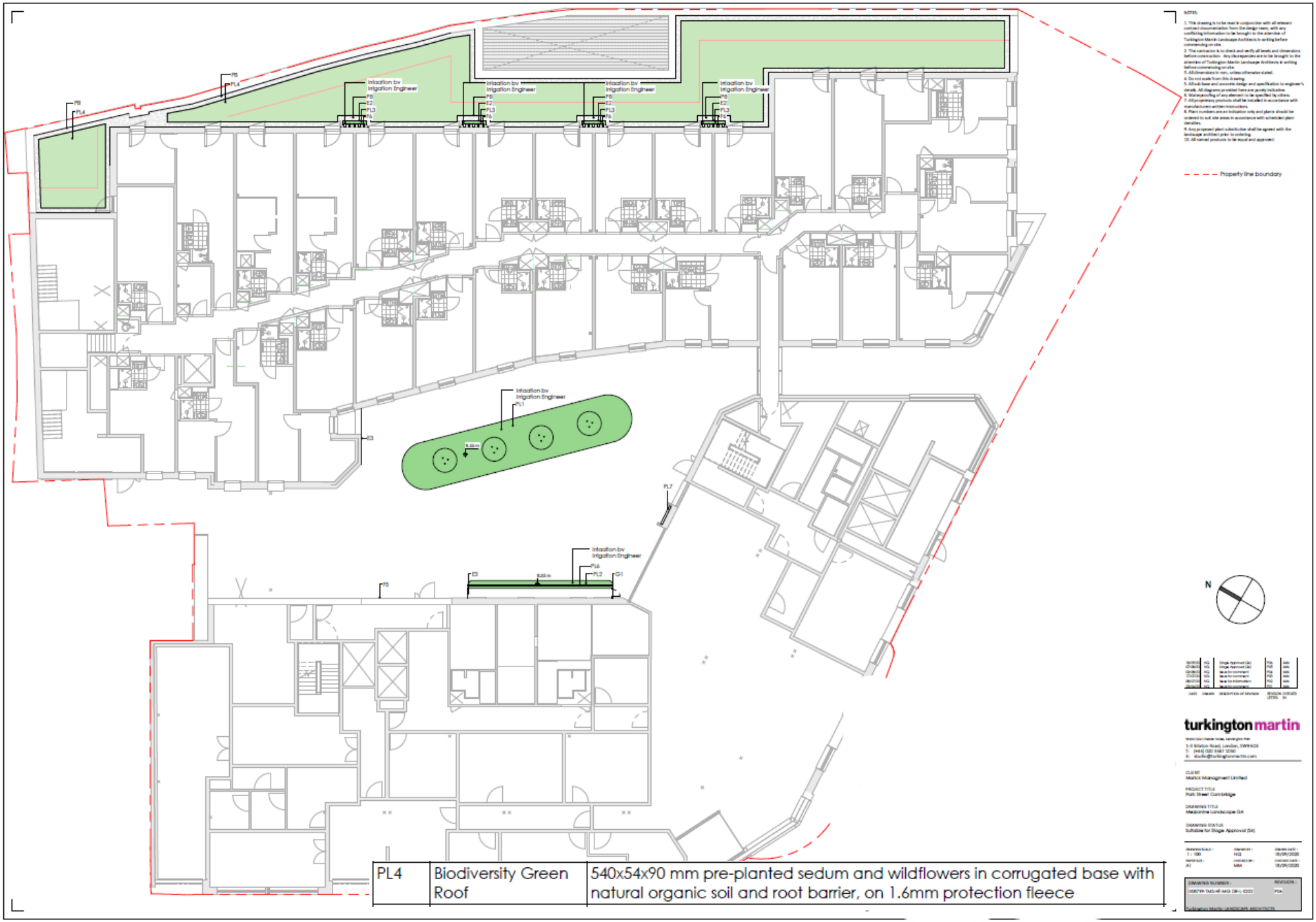
4th FLOOR ROOF DRAINAGE

Appendix B – Green Roof Plans

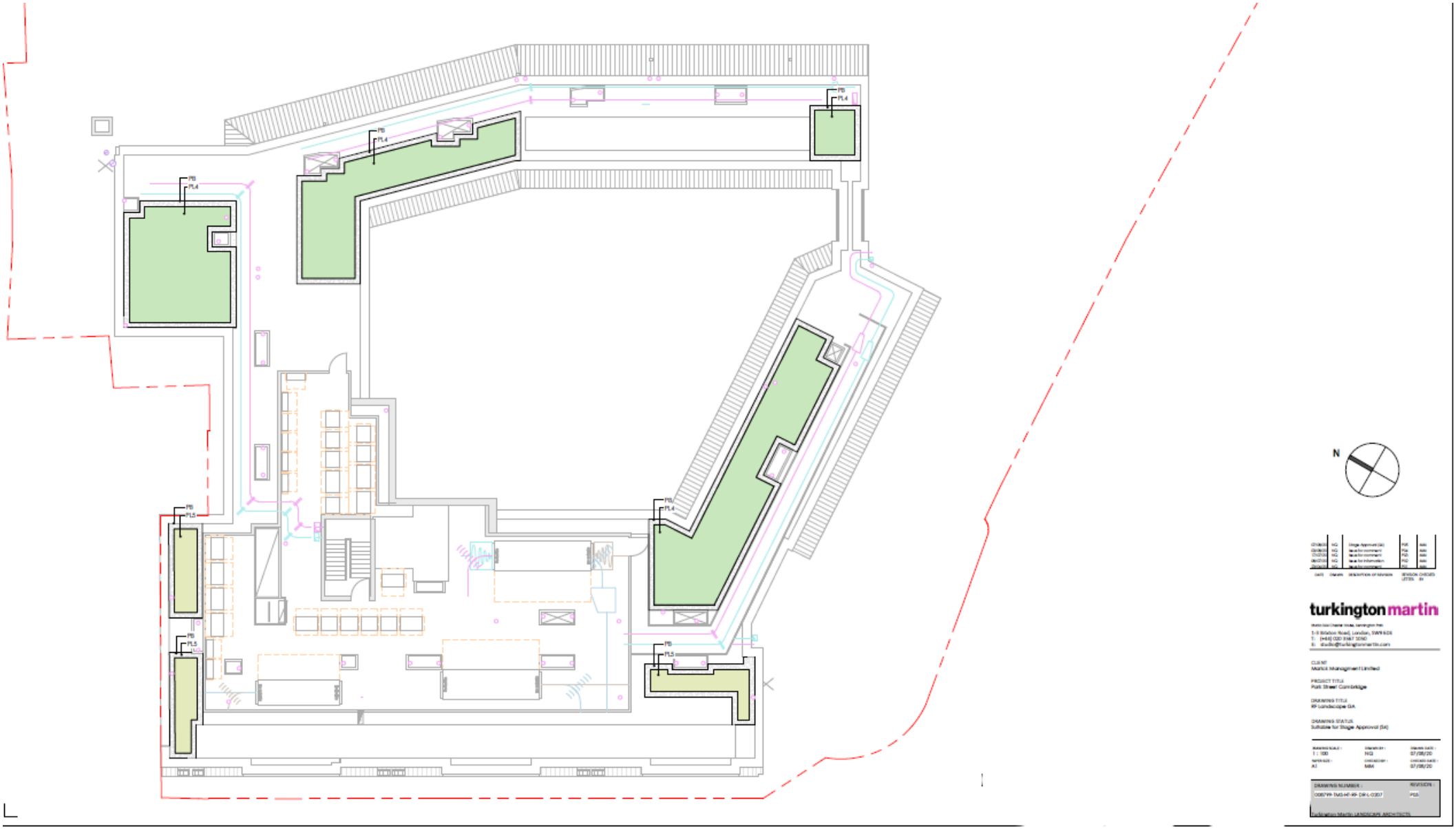
PL5	Sedum Green Roof	540 x 540 x 90 mm pre-planted sedum in corrugated base natural soil and root barrier, on 1.6mm protection fleece



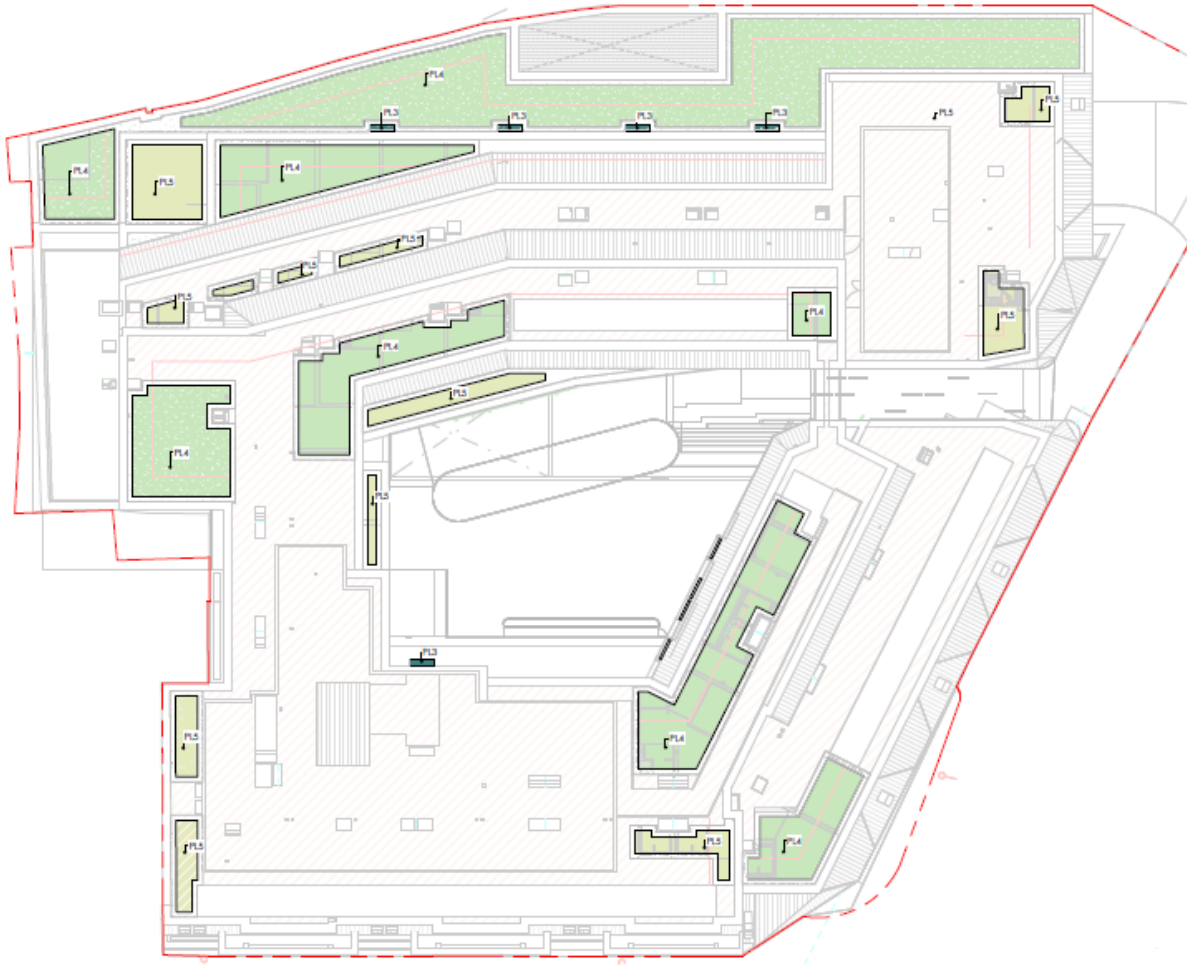

PL4 | Biodiversity Green Roof | 540x54x90 mm pre-planted sedum and wildflowers in corrugated base with natural organic soil and root barrier, on 1.6mm protection fleece
Property line boundary
N
turkington martin



PL4	Biodiversity Green Roof	540x54x90 mm pre-planted sedum and wildflowers in corrugated base with natural organic soil and root barrier, on 1.6mm protection fleece



PL4	Biodiversity Green Roof	540x54x90 mm pre-planted sedum and wildflowers in corrugated base with natural organic soil and root barrier, on 1.6mm protection fleece
PL5	Sedum Green Roof	540 x 540 x 90 mm pre-planted sedum in corrugated base natural soil and root barrier, on 1.6mm protection fleece



PL4	Biodiversity Green Roof	540x54x90 mm pre-planted sedum and wildflowers in corrugated base with natural organic soil and root barrier, on 1.6mm protection fleece
PL5	Sedum Green Roof	540 x 540 x 90 mm pre-planted sedum in corrugated base natural soil and root barrier, on 1.6mm protection fleece

Planting Schedule

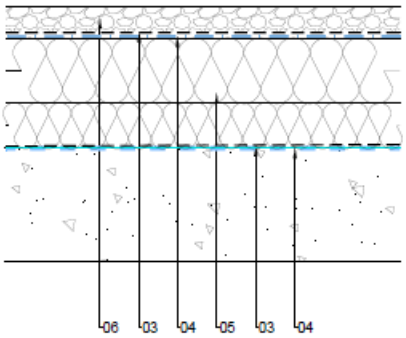
Ref.	Species	Pot (L)	Density	% of Mix
PL3	*Holboellia latifolia* *Trachelospermum jasminoides*	5L 5L	4/m² 4/m²	50% 50%
PL4	*Achillea millefolium* *Achillea millefolium* *Anthyllis vulneraria* *Anthyllis vulneraria* *Briza maxima* *Briza media* *Centaurea nigra* *Centaurea nigra* *Centaurea scabiosa* *Centaurea scabiosa* *Cynosurus cristatus* *Cynosurus cristatus* *Daucus carota* *Daucus carota* *Festuca ovina* *Festuca ovina* *Festuca rubra* *Festuca rubra* *Filipendula vulgaris* *Filipendula vulgaris* *Galium verum* *Galium verum* *Hoary plantain* *Kidney vetch* *Knautia arvensis* *Knautia arvensis* *Koeleria macrantha* *Koeleria macrantha* *Leontodon hispidus* *Leontodon hispidus* *Leucanthemum vulgare* *Leucanthemum vulgare* *Lotus corniculatus* *Lotus corniculatus* *Origanum vulgare* *Origanum vulgare* *Phleum bertolonii* *Phleum bertolonii* *Pimpinella saxifraga* *Pimpinella saxifrage* *Plantago media* *Poterium sanguissorba* *Primula veris* *Primula veris* *Prunella vulgaris* *Prunella vulgaris* *Ranunculus acris* *Reseda lutea* *Reseda lutea* *Sanguisorba minor* *Scabiosa columbaria* *Scabiosa columbaria* *Trifolium pratense* *Trisetum flavescens* *Trisetum flavescens*	Pre-planted sedum and wildflowers modules by supplier		
PL5	Sedum mix	Pre-planted sedum modules by supplier		

Appendix C – Roof Build-Ups and Water proof layer specifications

This drawing is to be read in conjunction with:

- Fire consultant's report
- Acoustic consultant's report
- 100 Series drawings - GAs Layouts
- 110 Series drawings - Elevations
- 130 Series drawings - Floor Finishes
- 150 Series drawings - Reflecting Ceiling Plans
- 160 Series drawings - GA Fire Strategy Layouts
- 700 Series schedules - Room Data Sheets
- NBS specifications

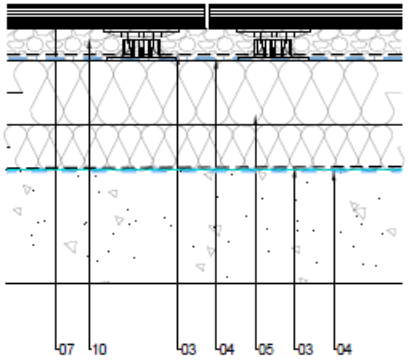
Roof Type 1: Gravel



Key

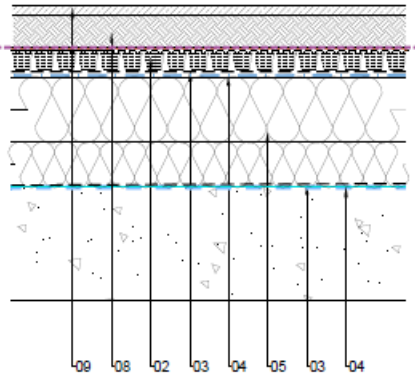
1. Pre-planted modules in accordance with Turkington Martin details.
2. Iko Plasfeed drainage / Moisture retention layer (Or equal)
3. Permaguard - F protection layer (Or equal, to contractors proposal)
4. 2 coats of permatec antiroot incorporating permaflash-r reinforcement (Or equal, to contractors proposal)
5. 130mm & 90mm Foamglas Ready Block Insulation Slab T3 + (Non-combustible) to achieve 0.15 'U' value - Or equal, to contractors proposal
6. Minimum 50mm layer of 20-40mm rounded washed aggregate
7. 50mm thick paving slabs on proprietary supports to Sub-contractor's specification
8. Pre-planted modules in accordance with Turkington Martin details.
9. Sedum blanket in accordance with Turkington Martin details.
10. Minimum 50mm layer of gravel / aggregate

Roof Type 2: Pavers on Pedastals



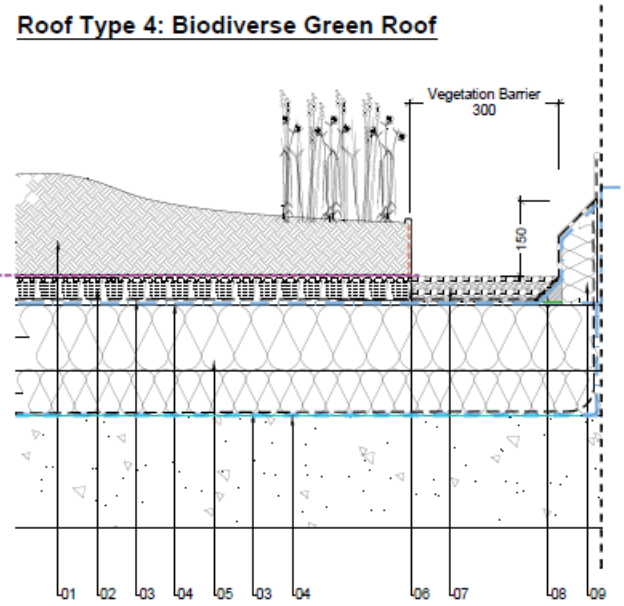
Roof Type 3: Sedum Green Roof

IN ACCORDANCE WITH LANDSCAPE ARCHITECTS DETAILS AND SPECIFICATIONS



IN ACCORDANCE WITH LANDSCAPE ARCHITECTS DETAILS AND SPECIFICATIONS

Roof Type 4: Biodiverse Green Roof



Key

1. Pre-planted modules in accordance with Turkington Martin details.
2. Iko Plasfeed drainage / Moisture retention layer (Or equal)
3. Permaguard - F protection layer (Or equal)
4. 2 coats of permatec antiroot incorporating permaflash-r reinforcement (Or Equal)
5. 130mm & 90mm Foamglas Ready Block Insulation Slab T3 + (Non-combustible) to achieve 0.15 'U' value
6. Perforated retention strip
7. Minimum 50mm layer of 20-40mm rounded washed aggregate
8. Non-combustible angle fillet
9. Foamglas T3+ ready board insulation on up-stand
10. Metal cover flashing
11. Sealant

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C1 ISSUED FOR CONSTRUCTION — 20.10.23 JC JC
rev amendments — date by chk

project	drawing title	scale	date	drawn by
Park Street Cambridge	Floor Build-ups All levels	1:10 @ A3 NTS @ A4	10.08.20	LE

client	drawing status	job no.	drawing no.	revision
MML	CONSTRUCTION	1414	A 500 008	C1

project number	originator	zone	level	type	role	number
008799	DMA	ZZ	ZZ	DR	A	500 008

J31
Liquid applied waterproof roof coatings

Types of roof covering

130 Inverted roof coating

1. Description: **Paro-Melt® reinforced, modified bitumen-based, hot-applied, monolithic waterproof coating in accordance with BBA Certificate Number 20/5745 British Board of Agrément.**
2. Substrate: Precast Concrete designed and constructed strictly in accordance with the specifiers and/or manufacturer's instructions (by others).

   Where falls are achieved within structural deck. Drainage falls must achieve a finish of 1:80 in accordance with BS 6229: 2018, be free from deflection, without back-falls and in full compliance with the manufacturer's guidance, third party certification and British Standard documentation.

   Where the deck is laid to **zero falls**, it must conform to BS 6229: 2018 and provide a minimum finished roof falls of between 0 and 1:80. The deck must be laid with no negative fall, deck deflections or back falls and a site level survey is required in line with current British Standards.

   2.1. Preparation: Substrate as 420 & 625.
3. Waterproof coating:
   - 3.1. System manufacturer: **Moy Materials (UK) Ltd,** Victoria House (4th Floor), Victoria Road, Chelmsford, CM1 1JR. T: +44 (0)1245 707 449 / E: info@moymaterials.co.uk.
     - 3.1.1. Primer reference: Paro-Melt® Primer as 326 & 720.
     - 3.1.2. Coating reference: Paro-Melt® Compound as 353.
   - 3.2. Application: Single coat as 760.
   - 3.3. Reinforcement: Paro-Melt® Reinforcement Mesh as 760.
   - 3.4. Minimum compound thickness: 3mm.
   - 3.5. Colour: Black.
4. Surface protection: Paro-Melt® 4mm Hot Melt Protection Membrane as 760.
5. Insulation: MOY Ravatherm XPS X 300 SL as 332/333 & 830.
6. Water control / filter layer: MOY Ravatherm X MK as 390.
7. Insulation protection / Securement: Precast concrete paving slabs as 370, 377 & 850.
8. Accessories: Appropriate MOY Accessories, all as required (MOY RWO's, GRP Trims, Termination Bars, Mechanical Fixings, MOY Flex Joint EP20/EP40, MOY Expansion Joint Strips, MOY PP3 Roof Nek & Penetration Devices, MOY Roof Box Penetration Units, MOY SBS Universal Fixing Points).
9. Guarantee: 40 **Year MOY ROOF WARRANTY.** See clause 950 for further details.

Performance

210 Roof performance

1. General: Firmly adhered, free draining and weathertight.
2. Performance: BBA certified for the 'design life of the roof in which it is incorporated'. See BBA for details.

225 Avoidance of interstitial condensation: Inverted roofs

1. Interstitial condensation within roof construction: Determine risk as recommended in BS 5250 and BS EN ISO 13788.

2. Air and vapour control layer: If necessary, provide a suitable membrane so that damage and nuisance from interstitial condensation do not occur.

230 Insulation

1. Requirement: Determine type and thickness of insulation and integral or separate overlay to satisfy the following criteria:
   1.1. Thermal transmittance of roof (maximum): **0.15** W/m²K.
   1.2. Compressive strength of insulation (minimum) at 10% compression: Refer to manufacturer.
   1.3. Finished surface: Suitably even, stable and robust to receive roof covering.
   1.4. Insulation compliance: To relevant European Standard, or Agrément certified for use in Inverted roofs.
   1.5. Fire: As section B05.

   Whilst MOY Materials (UK) Ltd can provide supporting evidence on the performance of our products in accordance with FM (Factory Mutual Global), BBA and many of the European testing standards (BS EN 13501/CEN TS1187 BROOF t1, t2, t3 & t4) as well as "Low Vulnerability" (Scotland), the suitability of this proposed specification is based on information made available at the time of writing and ultimately the specifier or designer should also carry out their own due diligence and submit the required information for Building Control approval, in order to ensure the whole building complies fully with all relevant regulations and local standards. It is also recommended to seek confirmation of the suitability of the thermal insulation with the insurer of the building.

   MOY roofing systems can meet current Building Regulations for fire performance and the latest fire test information is available on request.

   NB: Careful consideration should be given where flat roofing materials are proposed in steep sloping roof applications, verticals and/or buildings where internal party walls are present, as alternatives may be necessary.

   Roof waterproofing membranes are not designed or certified for use as a cladding product in vertical wall applications and their use should be avoided.

   Guidance can be found in the National Building Regulations, which are freely available online:
   - Fire Safety: Approved Document B
   - Building Standards - Scotland

Products

315 Timber trims

1. Quality: Planed. Free from wane, pitch pockets, decay and insect attack (except ambrosia beetle damage).
2. Moisture content at time of covering (maximum): 22%.
3. Preservative treatment: Please note organic solvent-based timber preservatives are not permitted, as these can attack bitumen-based materials.

326 Primer

1. Type: Solvent-based rapid drying (toluene free) bituminous primer.
2. Manufacturer: MOY Materials (UK) Ltd.
   2.1. Product reference: Paro-Melt® Primer.

3. Characteristics when tested to BS EN 12846-2
   3.1. Viscosity (maximum) (STV at 25°C, 4 mm orifice): 16-30 (Refer to data sheet).

332 Extruded polystyrene (XPS) inverted deck roof insulation (flat areas)

1. Manufacturer: MOY Materials (UK) Ltd.
2. Product reference: MOY Ravatherm XPS X 300 SL (HFC free, Zero OPD, GWP <5) extruded polystyrene (XPS).
3. Standard: To BS EN 13164.
   3.1. Reaction to fire: Class E (BS EN 13501-1).
   3.2. Thermal conductivity (minimum): Refer to data sheets.
   3.3. Thickness: **195mm** to achieve required U-value stated in 230.
   3.4. Compressive strength (minimum): 300kPa at 10% compression.
   3.5. Other BS EN 13164 characteristics: Refer to data sheets.
4. Edges: Shiplap.
5. Facing: Unfaced.
6. Suitability: The specifier should establish that the thermal insulation proposed complies with all relevant regulatory requirements, including fire. The specifier and/or the client should also confirm the suitability of the thermal insulation suggested, with the insurer(s) of the building prior to adopting this proposal. MOY can only assume that the proposed specification is suitable if it is then adopted as the basis for tendering purposes to procure the works.

333 Extruded polystyrene (XPS) inverted deck roof insulation (upstands)

1. Manufacturer: MOY Materials (UK) Ltd.
2. Product reference: MOY Ravatherm XPS X UB300 (HFC free, Zero OPD, GWP <5) extruded polystyrene (XPS) inverted upstand board with a 6mm fibre cement flat sheet facing.
3. Standard: To BS EN 13164.
   3.1. Reaction to fire: Class E (BS EN 13501-1).
   3.2. Thermal conductivity (minimum): Refer to data sheets.
   3.3. Thickness: 56mm (50mm XPS with 6mm fibre cement facer).
   3.4. Compressive strength (minimum): 300kPa at 10% compression.
   3.5. Other BS EN 13164 characteristics: Refer to data sheets.
4. Edges: Butt edges.
5. Facing: 6mm fibre cement.
6. Suitability: The specifier should establish that the thermal insulation proposed complies with all relevant regulatory requirements, including fire. The specifier and/or the client should also confirm the suitability of the thermal insulation suggested, with the insurer(s) of the building prior to adopting this proposal. MOY can only assume that the proposed specification is suitable if it is then adopted as the basis for tendering purposes to procure the works.

353 Waterproof coating

1. Type: A 2nd generation reinforced, modified bitumen-based, hot-applied, monolithic waterproof coating.
2. Manufacturer: MOY Materials (UK) Ltd.
   2.1. Product reference: Paro-Melt® Compound.
3. Primer: Paro-Melt® Primer.
4. Application: Single coat as 760.
5. Reinforcement: Paro-Melt® Reinforcement Mesh as 760.

6. Colour: Black.
7. Minimum compound thickness: 3mm.
8. Surface protection: Paro-Melt® 4mm Hot Melt Protection Membrane.

355 Perimeter trims

1. Type: GRP Trims.
2. Manufacturer: MOY Materials (UK) Ltd.
   2.1. Product reference: MOY GRP Trims.
3. Colour: Black.
4. Size: Various profile sizes.
   4.1. Lengths (maximum): 3m.

357 Pipe collars

1. Manufacturer: MOY Materials (UK) Ltd.
   1.1. Product reference: MOY Art. 54 (Grey) / Art. 55 (Brown) Anti-Condense Extractor Flexible Collar.
2. Size: Refer to data sheet.

360 Roof ventilators

1. Manufacturer:
   1.1. Product reference:
2. Size:

365 Stone ballast

1. Type: Well rounded, ovoid shaped river washed pebbles.
2. Supplier:
3. Size: Graded 20-40mm dia. Free from sharps and fines.
4. Colour:
5. Recycled content:

370 Precast concrete paving slabs

1. Manufacturer:
   1.1. Product reference:
2. Standard: To BS EN 1339, hydraulically pressed.
   2.1. Size (minimum): 50mm thick.
   2.2. Water absorption:
   2.3. Resistance to freeze thaw:
   2.4. Breaking load (minimum):
   2.5. Colour:
   2.6. Finish:
   2.7. Other BS EN 1339 characteristics:
3. Recycled content:

377 Support system for precast concrete paving slabs

1. Manufacturer: MOY Materials (UK) Ltd.
   1.1. Product reference: MOY Adjustable Paving Supports.

2. Size: Various sizes available.
3. Accessories: MOY Paving Slab Levellers.

390 Water flow reducing layer

1. Type: A polyethylene geotextile WFRL, with excellent water vapour permeability. A critical component in inverted roofs it is resistant to the passage of liquid water, mold and bacterial growth.
2. Manufacturer: MOY Materials (UK) Ltd.
   2.1. Product reference: MOY Ravatherm X MK.
3. Application: Strictly in accordance with the latest data sheet and application guidelines.

Execution generally

410 Adverse weather

1. Do not apply coatings
   1.1. In wet conditions or at temperatures below 5°C, unless otherwise permitted by coating manufacturer.
   1.2. In high winds (speeds > 7 m/s), unless adequate temporary windbreaks are erected adjacent to working area.
2. Unfinished areas of roof: Keep dry.

420 Suitability of substrates

1. Substrates generally
   1.1. Secure, clean, dry, smooth, free from frost, contaminants, loose material, voids, protrusions and organic growths.
   1.2. Compatible with coating system.
2. Preliminary work: Complete, including:
   2.1. Formation of upstands, kerbs, box gutters, sumps, grooves, chases and expansion joints.
   2.2. Fixing of battens, fillets and anchoring plugs/ strips.
3. Moisture content and stability: Must not impair integrity of roof.

422 Protection and storage of materials

1. Storage:
   1.1. Store block of bitumen and associated products in clean, dry, well ventilated and cool conditions. Rolls of bitumen membrane should be stored upright, raised off the ground and suitably covered.
   1.2. Store materials designated by the manufacturers as temperature sensitive in facilities where temperature can be maintained at the recommended level.
2. Insulation protection: Insulation products must be kept dry and protected from wet weather during storage and installation.

423 Protection of works

1. Ensure that from completion of the roof until practical completion:
   1.1. The roof is not used as a working platform, unless fully protected to the satisfaction of the CA.
   1.2. No paints, solvents or other volatile substances harmful to the membrane are allowed to come into contact with the roof surface.
   1.3. No building materials stored on the roof.

950 Guarantee

1. Guarantee: A 40 Year MOY ROOF WARRANTY is to be provided upon completion, following a final inspection by MOY.

    1.1. Installers must be approved MOY installers.
    1.2. In order to issue this warranty a MOY Materials (UK) Ltd representative must inspect each element of the system build-up before the next is installed.

2. Details regarding the cover of this guarantee are outlined below, however, full terms and conditions are available separately from MOY Materials (UK) Ltd upon request.

    WHAT IS COVERED?
    - Cover for roof leaks through the roof materials arising only from failure or manufacturing defects of the Products supplied by MOY Materials (UK) Ltd.

Project: MO-23-008 - Park Street, Cambridge Date: 01/03/2023

- MOY Materials (UK) Ltd will, during the warranty period, supply material at no charge and reimburse the cost of labour involved for repairing or replacing the materials. The maximum amount of reimbursement offered will be as per the terms of the warranty.
- Consequential damage will be covered subject to the limiting value, as per the terms of the warranty.
- Guarantee supported by Product Liability Insurance.

WORKMANSHIP

For this warranty to be issued, the system must be installed by an approved and suitably trained MOY Contractor. The workmanship is covered as part of a back-to-back agreement, with the roofing contractor for the term of the warranty, however, MOY are fully committed to providing best service to our client base, throughout the key stages of the project and will remain on hand post completion should any issues arise, to ensure they are resolved effectively

Appendix D – Green Roof Specifications

Q37 Specification for

Park street, Cambridge

Sky Garden Wildflower Seeded System

For: Moy Materials

Ref: SG92387

09/11/2023

Q37 GREEN ROOFS

To be read with Preliminaries / General Conditions

GENERAL

130 **EXTENSIVE BIODIVERSE BROWN LIVING ROOF**

Roof type: J31 (liquid)
Substrate: As J31
Slope: As J31
Waterproofing: As J31
Thermal Insulation: As J31
Protection: Protection fleece as clause 330
Moisture Control: Drainage layer as clause 350
Growing medium: Soil-less substrate as clause 390
Vegetation: Sedum blanket as clause 400

Accessories:
Filter fleece as clause 360
Surface habitat creation as clause 392
Wall mounted habitats as clause 393
Irrigation as clause 401
Aftercare as clause 402
Edge retaining profile as clause 420
Separation edge as clause 420/b
Border as clause 460
Intermediate restraints as clause 820A

PERFORMANCE

210 GENERAL DESIGN

Green roof and associated features: Complete the detailed design.

Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

Performance criteria: As per design requirements.

250 CHARACTERISTIC ROOF LOADS

Roof structure: The structural engineers must satisfy themselves that the roof structure and deck are suitable to receive the dead load of the proposed green roof system and landscape both during construction and on completion of the works.

Living Roof: 93kg/m2 (Dry) & 133kg/m2 (Saturated)

Allowance for additional loads during construction: To be advised

Requirement: Restrict site activities to ensure that design loads are not exceeded, or submit proposals for temporary supports.

PRODUCTS

ROOT BARRIER to Extensive Roof

320 Supplier: Sky Garden Ltd, 7&8 Keil Close, Broadway, Worcestershire, WR12 7DP
Contact: Abi Mustow T: 01242 620905 E: abi.mustow@sky-garden.co.uk

Product reference: N/A

Material: N/A

Thickness: N/A

330 **PROTECTION LAYER To Extensive Roof**

Supplier: Sky Garden Ltd, 7&8 Keil Close, Broadway, Worcestershire, WR12 7DP
Contact: Abi Mustow T: 01242 620905 E: abi.mustow@sky-garden.co.uk

Product reference: SGPL0102

Material: Tensile geo-synthetic protection layer

Thickness: 3.5 mm

350 DRAINAGE LAYER To Extensive Roof

Supplier: Sky Garden Ltd, 7&8 Keil Close, Broadway, Worcestershire, WR12 7DP
Contact: Abi Mustow T: 01242 620905 E: abi.mustow@sky-garden.co.uk

Product reference: SGDRRD20

Material: HDPE rigid drainage and retention board with high compressive strength.

Depth: 20 mm

360 FILTER MEMBRANE To Extensive Roof

Supplier: Sky Garden Ltd, 7&8 Keil Close, Broadway, Worcestershire, WR12 7DP
Contact: Abi Mustow T: 01242 620905 E: abi.mustow@sky-garden.co.uk

Product reference: SGFF01

Material: 150gsm non-woven polypropylene fibre filter membrane bonded to drainage layer

Thickness: 2 mm

390 EXTENSIVE

Supplier: Sky Garden Ltd, 7&8 Keil Close, Broadway, Worcestershire, WR12 7DP
Contact: Abi Mustow T: 01242 620905 E: abi.mustow@sky-garden.co.uk

Product reference:SGSBS50

Material: Screened blend of recycled crushed brick and lightweight mineral materials with 20% organic matter (PAS100 recycled green waste)

Depth: 115 mm

Ameliorant/ conditioner: N/A

Coverage: Total.

Declaration of analysis: Submit.

Parameters: Consistent installation of product to filter layers provided.

391 ROOF FINISH CONTOUR To Extensive Roof

Supplier: Sky Garden Ltd, 7&8 Keil Close, Broadway, Worcestershire, WR12 7DP
Contact: Abi Mustow T: 01242 620905 E: abi.mustow@sky-garden.co.uk

Product Reference: Contour 50mm

Material: Surface contour of substrate +/- 50mm

392 SURFACE HABITAT CREATION To Extensive Roof

Manufacturer: Sky Garden Ltd, 7&8 Keil Close, Broadway, Worcestershire, WR12 7DP

Product Reference: surface habitats R&W

Material: Habitats to be seasoned native hardwood log piles, sand lenses and rock/stone mounds. Minimum 1 habitat feature per 50m² to the Living Roof total area.

393 WALL MOUNTED HABITAT To Extensive Roof Boundaries

Manufacturer: Sky Garden Ltd, 7&8 Keil Close, Broadway, Worcestershire, WR12 7DP

Product Reference: N/A

Material: N/A

400 VEGETATION To Extensive Roof

Supplier: Sky Garden Ltd, 7&8 Keil Close, Broadway, Worcestershire, WR12 7DP
Contact: Abi Mustow T: 01242 620905 E: abi.mustow@sky-garden.co.uk

Product reference: **SGWS01**

Density: Cast at 2 – 4 g/m2 on to 75 – 150mm sky-garden biodiverse growing medium. Seeds are best sown in the autumn or spring months, allowing for sufficient warmth and moisture. Mix proportioned as 80% wildflower: 20% grass seed.

Planting mix: Achillea millefolium (Yarrow), Agrimonia eupatoria (Agrimony), Anthyllis vulneraria (Kidney Vetch), Betonica officinalis (Betony), Campanula glomerata (Clustered Bellflower), Campanula rotundifolia (Harebell), Centaurea nigra (Lesser Knapweed), Echium vulgare (Viper's Bugloss), Galium verum (Lady's Bedstraw), Glebionis segetum (Cornflower Corn Marigold), Hypericum perforatum (Perforate St John's Wort), Hypochaeris radicata (Catsear), Knautia arvensis (Field Scabious), Leontodon hispidus (Rough Hawkbit), Leucanthemum vulgare (Oxeye Daisy), Linaria vulgaris (Common Toadflax), Lotus corniculatus (Birdsfoot Trefoil), Medicago lupulina (Black Medic), Papaver rhoeas (Common Poppy), Plantago media (Hoary Plantain), Primula veris (Cowslip), Prunella vulgaris (Selfheal), Ranunculus acris (Meadow Buttercup), Rhinanthus minor (Yellow Rattle), Rumex acetosa (Common Sorrel), Sanguisorba minor ssp. Minor (Salad Burnet), Scabiosa columbaria (Small Scabious), Silene dioica (Red Campion), Silene vulgaris (Bladder Campion), Thymus (Thyme), Trifolium pratense (Red Clover), Agrostis capillaris

Additional: A greater range of species and additions of wildflower, cornflower, herb and alpine mixes can be added as a regional pre-grown blanket or as a post installation over seed and should be discussed at planning stage.

EXECUTION

710 INSTALLATION GENERALLY
Preparation: Clear all surfaces of debris.
Timing: After certification of waterproof membrane integrity.
Surface condition: Visually inspect waterproof membrane, report any damage.
Faults in waterproof membrane: Report.
Contamination: Do not use materials detrimental to healthy plant growth.
Storage: Do not overload.
Point loads: Avoid.
Outlets: Do not block.
Outlet grilles: Installed (by roofing contractor)

720 ADVERSE WEATHER
Unfinished work: Secure from damage and wind uplift.
Conditions: Do not install or work with frozen materials.

740 ROOT BARRIER INSTALLATION
Joints: Minimize
Overlaps (minimum): 100mm

750 PROTECTION LAYER INSTALLATION
Joints: Minimize
Overlaps (minimum): 100mm
Upstands: Extend to top of growing medium.

770 DRAINAGE LAYER INSTALLATION
Extent: Continuous beneath living roof area
Fitting: Loose laid
Up stands: Fit closely around penetrations and outlets.

780 FILTER MEMBRANE INSTALLATION
Joints: Minimize
Overlaps (minimum): 100mm
Fitting: Loose Laid
Upstands: Extend to top of growing medium.

790 GROWING MEDIUM INSTALLATION
Handling: Minimize.
Conditions: Handle in the driest condition possible. Do not handle or install wet or frozen.
Layers: N/A
Depth (maximum): as per Q37 clause 390
Sequence: Gently firm each layer before spreading the next

800 VEGETATION INSTALLATION

Handling: Minimize.

Vegetation: Foliage upright. Avoid tearing blanket. Lift from beneath root zone/carrier, not foliage. Minimise foot traffic or laying of materials on to blanket during or after installation.

Conditions: Blankets should be moist but not saturated nor dry. Do not handle or install when frozen.

Surface preparation: Ensure substrate surface is flat and even before laying blanket

Layers: Lay blanket root zone on to substrate ensuring direct contact with substrate across entire surface. Ensure no air pockets between substrate and root zone.

Sequence: Remove from pallets on same day of delivery. Open rolls with foliage upwards and lay direct onto substrate. Gently firm blanket onto substrate surface. Water in on day of installation.

820 EDGE RETAINING PROFILE INSTALLATION

Cutting: Neat, accurate and without spalling.

Junctions: Vertical, secured using proprietary connectors.

Position: True to line and level. Smooth continuous lines.

Fixing: Spot bonded with manufacturers approval or system ballasted

Retention detail used where there are system retention requirements and should be sport bonded in accordance with manufacturers approval or system ballasted.

Separation detail if for physical divide between system and slab or stone detailing and is system ballasted.

840A INTERMEDIATE RESTRAINTS INSTALLATION

Intermediate restraints should be fitted across the roof on pitches exceeding 10º. Refer to specification and design detail or waterproof system manufacturer detail for type and fixing method.

As a guide, retention battens on pitches from 10º-20º should be installed at 2000mm increments up the roof slope with a mechanical fixing at eaves. From 21º-45º the spacing should be reduced to 1000mm. The height of the restraints should not exceed the combined height of the drainage and substrate layers

840 LAYING BORDER

Condition of substrate: Clean.

Gravel guards: Fit to outlets.

Laying: 500 mm borders around perimeters and outlets - spread evenly, do not pile to excessive heights

Depth (minimum): 75 mm

Previously laid materials: Protect during the spreading of Riverstone Pebbles

Q37 Specification for

Park street, Cambridge

Sky Garden Sedum Blanket System

For: Moy Materials

Ref: SG92387

09/11/2023

Q37 GREEN ROOFS

To be read with Preliminaries / General Conditions

GENERAL

130 **EXTENSIVE GREEN ROOF**

Roof type: J31 (liquid)
Substrate: As J31
Slope: As J31
Waterproofing: As J31
Thermal Insulation: As J31
Protection: Protection fleece as clause 330
Moisture Control: Drainage layer as clause 350
Growing medium: Soil-less substrate as clause 390
Vegetation: Sedum blanket as clause 400

Accessories:
Filter fleece as clause 360
Surface habitat creation as clause 392
Wall mounted habitats as clause 393
Irrigation as clause 401
Aftercare as clause 402
Edge retaining profile as clause 420
Separation edge as clause 420/b
Border as clause 460
Intermediate restraints as clause 820A

PERFORMANCE

210 GENERAL DESIGN

Green roof and associated features: Complete the detailed design.

Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

Performance criteria: As per design requirements.

250 CHARACTERISTIC ROOF LOADS

Roof structure: The structural engineers must satisfy themselves that the roof structure and deck are suitable to receive the dead load of the proposed green roof system and landscape both during construction and on completion of the works.

Living Roof: 60kg/m2 (Dry) & 102kg/m2 (Saturated)

Allowance for additional loads during construction: To be advised

Requirement: Restrict site activities to ensure that design loads are not exceeded, or submit proposals for temporary supports.

PRODUCTS

ROOT BARRIER to Extensive Roof

320 Supplier: Sky Garden Ltd, Unit 3 Miller Court, Severn Drive, Tewkesbury, GL20 8DN
Contact: Abi Mustow T: 01242 620905 E: abi.mustow@sky-garden.co.uk

Product reference: N/A

Material: N/A

Thickness: N/A

330 PROTECTION LAYER To Extensive Roof

Supplier: Sky Garden Ltd, Unit 3 Miller Court, Severn Drive, Tewkesbury, GL20 8DN
Contact: Abi Mustow T: 01242 620905 E: abi.mustow@sky-garden.co.uk

Product reference: SGPL0102

Material: Tensile geo-synthetic protection layer

Thickness: 3.5 mm

350 DRAINAGE LAYER To Extensive Roof

Supplier: Sky Garden Ltd, Unit 3 Miller Court, Severn Drive, Tewkesbury, GL20 8DN
Contact: Abi Mustow T: 01242 620905 E: abi.mustow@sky-garden.co.uk

Product reference: SGDRRD20

Material: HDPE rigid drainage and retention board with high compressive strength.

Depth: 20 mm

360 FILTER MEMBRANE To Extensive Roof

Supplier: Sky Garden Ltd, Unit 3 Miller Court, Severn Drive, Tewkesbury, GL20 8DN
Contact: Abi Mustow T: 01242 620905 E: abi.mustow@sky-garden.co.uk

Product reference: SGFF01

Material: 150gsm non-woven polypropylene fibre filter membrane bonded to drainage layer

Thickness: 2 mm

390 EXTENSIVE

Supplier: Sky Garden Ltd, Unit 3 Miller Court, Severn Drive, Tewkesbury, GL20 8DN
Contact: Abi Mustow T: 01242 620905 E: abi.mustow@sky-garden.co.uk

Product reference:SGSBS50

Material: Screened blend of recycled crushed brick and lightweight mineral materials with 20% organic matter (PAS100 recycled green waste)

Depth: 60 mm

Ameliorant/ conditioner: N/A

Coverage: Total.

Declaration of analysis: Submit.

Parameters: Consistent installation of product to filter layers provided.

391 ROOF FINISH CONTOUR To Extensive Roof

Supplier: Sky Garden Ltd, Unit 3 Miller Court, Severn Drive, Tewkesbury, GL20 8DN
Contact: Abi Mustow T: 01242 620905 E: abi.mustow@sky-garden.co.uk

Product Reference:N/A

Material:N/A

392 SURFACE HABITAT CREATION To Extensive Roof

Supplier: Sky Garden Ltd, Unit 3 Miller Court, Severn Drive, Tewkesbury, GL20 8DN
Contact: Abi Mustow T: 01242 620905 E: abi.mustow@sky-garden.co.uk

Product Reference:surface habitats to increase biodiversity.

Material:N/A

393 WALL MOUNTED HABITAT To Extensive Roof Boundaries

Supplier: Sky Garden Ltd, Unit 3 Miller Court, Severn Drive, Tewkesbury, GL20 8DN
Contact: Abi Mustow T: 01242 620905 E: abi.mustow@sky-garden.co.uk

Product Reference: N/A

Material: N/A

400 VEGETATION To Extensive Roof

Supplier: Sky Garden Ltd, Unit 3 Miller Court, Severn Drive, Tewkesbury, GL20 8DN
Contact: Abi Mustow T: 01242 620905 E: abi.mustow@sky-garden.co.uk

Product reference: **SGSB01**

Density: pre-grown blanket (12 month minimum established) at point of installation. Vegitation coverage at installation miniumum (90% coverage) installed.

Planting mix: 8-12 species from the following: Sedum acre, Sedum album, Sedum ellacombianum, Sedum floriferum, Sedum hybridum, Sedum middendorffianum, Sedum montanum, Sedum Pulchellum, Sedum reflexum, Sedum selskianum, Sedum sexangulare, Sedum spurium. Species according to seasonal availability

Additional: A greater range of species and additions of wildflower, cornflower, herb and alpine mixes can be added as a regional pre-grown blanket or as a post installation over seed and should be discussed at planning stage.

401 IRRIGATION

The green roof will need thorough saturation following installation. Immature systems will require a supplementary irrigation system to be available for the first 12 months of the establishment period. Blanket systems may need supplementary watering during periods of extended drought, especially for the first 2 years' post installation.

It is strongly recommended that a connection at roof height is left for systems to connect with providing a roof pressure of 2.5-3bar and a flow rate of 60L/min.

800 VEGETATION INSTALLATION

Handling: Minimize.

Vegetation: Foliage upright. Avoid tearing blanket. Lift from beneath root zone/carrier, not foliage. Minimise foot traffic or laying of materials on to blanket during or after installation.

Conditions: Blankets should be moist but not saturated nor dry. Do not handle or install when frozen.

Surface preparation: Ensure substrate surface is flat and even before laying blanket

Layers: Lay blanket root zone on to substrate ensuring direct contact with substrate across entire surface. Ensure no air pockets between substrate and root zone.

Sequence: Remove from pallets on same day of delivery. Open rolls with foliage upwards and lay direct onto substrate. Gently firm blanket onto substrate surface. Water in on day of installation.

820 EDGE RETAINING PROFILE INSTALLATION

Cutting: Neat, accurate and without spalling.

Junctions: Vertical, secured using proprietary connectors.

Position: True to line and level. Smooth continuous lines.

Fixing: Spot bonded with manufacturers approval or system ballasted

Retention detail used where there are system retention requirements and should be sport bonded in accordance with manufacturers approval or system ballasted.

Separation detail if for physical divide between system and slab or stone detailing and is system ballasted.

840A INTERMEDIATE RESTRAINTS INSTALLATION

Intermediate restraints should be fitted across the roof on pitches exceeding 10º. Refer to specification and design detail or waterproof system manufacturer detail for type and fixing method.

As a guide, retention battens on pitches from 10º-20º should be installed at 2000mm increments up the roof slope with a mechanical fixing at eaves. From 21º-45º the spacing should be reduced to 1000mm. The height of the restraints should not exceed the combined height of the drainage and substrate layers

840 LAYING BORDER

Condition of substrate: Clean.

Gravel guards: Fit to outlets.

Laying: 500 mm borders around perimeters and outlets - spread evenly, do not pile to excessive heights

Depth (minimum): 75 mm

Previously laid materials: Protect during the spreading of Riverstone Pebbles