
Job Title
St. Marks Methodist Church Public
Realm Improvements

Report Type
SuDS Strategy

Prepared for
London Borough of Haringey

Date
20 December 2022



Contents

1. Introduction	4
2. Existing Site Details.....	5
2.1 Site Description	5
3. Proposal Description	6
3.1 Wider Proposal Description	6
3.2 Car Park SuDS Proposals.....	6
4. SuDS Strategy	7
4.1 Point of Discharge	7
4.2 Greenfield Run-off.....	8
4.3 Attenuation.....	8
5. Maintenance strategy	11
5.1 Maintenance.....	11
5.2 Components	11
6. Haringey SuDS Proforma	13
7. Conclusion and Recommendation.....	14
Appendices	15

SuDS Strategy

Prepared by	Rhys Williams CEng MICE
--------------------	--------------------------------

Reviewed by	Emilie Leclerc CEng MICE
-------------	--------------------------

Approved by	Alasdair Gray CEng CIWEM
-------------	--------------------------

Civic Job No.	2443/01
---------------	---------

Issued	20/12/2022
--------	------------

Revised	23/02/2022
---------	------------

This report is the copyright of Civic Engineers and is for the sole use of the person/organisation to whom it is addressed. It may not be used or referred to in whole or in part by anyone else without the express agreement of Civic Engineers. Civic Engineers do not accept liability for any loss or damage arising from any unauthorised use of this report. Civic Engineers is a trading name of Civic Engineers Ltd (registered number 06824088), which is a limited company registered in England, registered address Carver's Warehouse, 77 Dale Street, Manchester M1 2HG

© Civic Engineers 2023

1. Introduction

Civic Engineers has been commissioned by London Borough of Haringey to produce a Drainage Strategy for a proposed improvement to the façade, shopfronts, boundary and carpark of St. Mark's Methodist Church on Tottenham High Road. Refer to Figure 1 for the general layout outlined by Roger Mears Architects. The site will be accessed through the existing entrance from Forster Road to the South.



Figure 1: Site layout by Roger Mears Architects

This report has been prepared in support of the planning applications submission and aims to assess it against the risk of flooding and to establish the principles of the drainage scheme in line with the National Planning Policy Framework (NPPF) and Planning Practice Guidance (PPG).

Note that the proposed drainage strategy is also in line with the London Plan 2021 Policy SI 12 Flood Risk Management and Policy SI 13 Sustainable Drainage.

2. Existing Site Details

2.1 Site Description

Situated within the Bruce Grove Conservation Area, St. Marks Methodist is a locally listed building and identified as a key landmark in the area. Its unique Art Deco frontage stands out on the high Road which comprises of predominantly late Victorian and Edwardian commercial properties. The frontage also unifies the earlier Wesleyan church and ancillary buildings behind the main façade.



Figure 2: Site location plan (© Google July 2022)

The site car park is bounded by St Loys Road to the north, A10 High Road to the east, Forster Road to the south and Network Rail train tracks to the West. The site's national grid coordinates 533758, 189887 and the postcode is N17 6QB. The extent of the site car park is shown in Figure 2. The topographical survey can be found in Appendix A.

3. Proposal Description

3.1 Wider Proposal Description

The aim of the project is to improve the appearance and heritage quality of public realm and provide design solutions to start to address antisocial behaviour in the area. Many of the commercial premises within the HSHAZ area have suffered from the incursion of inappropriately scaled and poorly designed shopfronts, signage and poor-quality materials or have fallen into disrepair due to a lack of maintenance. The enhancement of the area for this project will be primarily through the refurbishment of St. Mark's Methodist Church Art Deco Facades, replacement of first floor fenestration and ground floor shopfronts, improvements to boundary treatments and carparks in Zone three of the HSHAZ area.

3.2 Car Park SuDS Proposals

The pre-application advice states that the opportunity to improve the amenity value of the site should be explored with regards to the car park proposals, '...softening the very utilitarian character of the carpark through some form of landscaping or green paving'. The opportunity for 'greening' the site is also something that the Church are keen to achieve.

As a result the proposal for bound gravel presented in the stage 1 report has been reconsidered and replaced with an option for permeable bound resin gravel. This will enhance the amenity value of the space whilst providing a suitable surface for vehicular traffic. Main pathways between the entrance gates and the building entrances are to be provided in bound gravel for pedestrian access and pushchairs, etc for the nursery. The proposed layout is shown in Figure 3 and located in Appendix B.

As well as improving amenity, the In addition, the permeable nature of the material will provide a SUDS strategy for the space, allowing surface water to drain over the entire area rather than directing it to the existing surface water drainage system only. This will be in conjunction with the planting beds to the boundary which will also act as rain gardens to assist in water attenuation.



Figure 3: Proposed Car Park Layout

4. SuDS Strategy

4.1 Point of Discharge

The NPPF PPG – Flood risk and coastal change, states that:

"Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:

- 1. into the ground (infiltration);*
- 2. to a surface water body;*
- 3. to a surface water sewer, highway drain, or another drainage system;*
- 4. to a combined sewer."*

An appraisal of the discharge hierarchy has been conducted in the following paragraphs.

Infiltration Based Systems

The car park is bound on three sides by existing historic buildings; the nursery, the nave and the parade all of which were constructed between the mid 1800's and the mid 1900's. In accordance with Building Regulations infiltration features need to maintain a 5m offset from buildings and public highways and 2.5m from a property boundary.

Due to the ages of the surrounding structures it is deemed unfeasible to utilise an infiltration based system due to risk of causing settlement.

Waterbody

The closest waterbody to the site is the Pymmes Brook, located approximately 0.5km away. Discharge to a water body is deemed unfeasible.

Surface Water Sewer

A connection to the public sewer is required to dispose of surface water emanating from the site. It is proposed to utilise the existing surface water connection from the church car park.

Summary

Table 1: Summary of point of discharge suitability

Point of discharge	Suitability
Ground	x
Waterbody	x
Surface water sewer	√
Combined sewer	x
√ suitable x unsuitable	

4.2 Greenfield Run-off

Greenfield run-off rates for the site have been estimated with the HR Wallingford online tool using the IH124 method with a Standard Percentage Run-off (SPR) value of 0.30 and a Standard Average Annual Rainfall (SAAR) value of 620mm. The Greenfield run-off rates varies from 0.16L/s for a 1 in 1-year event to 0.50L/s for a 1 in 100-year event. The online tool outputs are available in Appendix C.

Table 2 Greenfield Runoff Rates

Total site area	Qbar	1-in-1-year event	1-in-30-year event	1-in-100-year event
0.1 ha	0.16 L/s	0.13 L/s	0.36 L/s	0.50 L/s

4.3 Attenuation

Water Quantity

This report will support a series of minor planning applications and in line with Haringey Borough Council's Policy DM25 stating that:

- A. *"The Council will require Sustainable Drainage Systems (SuDS) to be sensitively incorporated into new development by way of site layout and design, having regard to the following requirements:*
- a. *All major development proposals will be required to reduce surface water flows to a greenfield run-off rate for a 1 in 100 year critical storm event;*
 - b. *All minor development proposals should aim to achieve a greenfield run-off rate and, at a minimum, achieve a 50 per cent reduction on existing site run-off rates;*
 - c. *All other development should seek to achieve a greenfield run-off rate and include at least one 'at source' SuDS measure resulting in a net improvement in water quantity or quality discharging to a sewer; and*
 - d. *For all development where a greenfield runoff rate cannot be achieved justification must be provided to demonstrate that the run-off rate has been reduced as much as possible.*

In accordance with Haringey Borough Council's Policy DM25 it is proposed to restrict the discharge rate to a maximum of 0.50L/s which is the greenfield run-off rate for a 1 in 100-year storm event.

See Table 3 for the betterment it represents for different storm events against the existing surface water discharge rate from the site. See Appendix D for existing discharge rate and Appendix E for proposed discharge rate calculations.

Table 3: Surface Water Discharge Rate Betterment when Reducing to proposed discharge rate (in L/s)

Strom Event	1 in 1 year	1 in 30 year	1 in 100 year	1 in 100 year + 40%CC
Existing discharge rate (L/s)	6.0	14.6	19.0	N/A
Proposed discharge rate (L/s)	0.2	0.3	0.4	0.5
Betterment (%)	96.7	97.9	97.9	N/A

It is proposed to store rainwater on-site by the means of permeable pavement. The total proposed permeable paving area is listed in the below Table 4.

Table 4: Proposed SuDS features area

Total Car Park Area (m²)	Permeable Paving Area (m²)
400	280

Industry standard Causeway Flow software has been used to estimate the volume of storage required to attenuate the 1 in 100-year storm event + 40% allowance for climate change without any flooding.

Permeable paving has been modelled with 300mm depth of sub-base storage and 30% void ratio. It is proposed to restrict the discharge rate using an orifice plate in a new inspection chamber before connecting into the existing system.

There is currently 280m² of the total site dedicated to surface water management in the forms of different SuDS features which will provide 25.2m³ storage, Table 5 shows how this will be achieved.

Table 5: Attenuation details

SuDS feature	Length (m)	Width (m)	Depth (m)	Porosity	Total Volume (m³)
Permeable Paving	28	10	0.3	0.3	25.2

The above demonstrates that the new permeable surfacing and sub-base storage will be able to attenuate the surface water flows and discharge at greenfield run-off rate for up to a 1 in 100-year storm event +40% climate change with no flooding. This is in accordance with Haringey Borough Council's Policy DM25.

Sustainability

Haringey Council's Policy DM25 states that: "the council will require Sustainable Drainage Systems (SuDS) to be sensitively incorporated into new development by way of site layout and design."

The 'SuDS Manual' CIRIA report C753 states that "surface water run-off should be managed for maximum benefit." The types of benefits that can be achieved by SuDS can be put into four categories, the four pillars of SuDS: water quantity, water quality, amenity and biodiversity. Table 6 presents what benefits are likely to be achieved by different SuDS features.

Table 6: SuDS Likely Benefits

	SuDS Feature	Water quantity	Water quality	Amenity	Biodiversity
	Living roofs	✓	✓	✓	✓
	Infiltration systems	✓	✓	✓	✓
	Dry planted features – Swales, bio retentions areas, trees, detention basins	✓	✓	✓	✓
	Ponds and wetlands	✓	✓	✓	✓
	Pervious & reservoir pavements	✓	✓		
	Filter strips	✓	✓		
	Filter drains	✓	✓		
	Proprietary treatment systems		✓		
Least Benefits	Attenuation storage tanks	✓			

Table 7 shows what SuDS techniques are proposed to manage surface water on-site. These features are being designed in collaboration with the landscape architect to achieve a maximum of benefits to the project.

Table 7 Summary of SuDS Techniques Proposed

SuDS Technique	Proposed?	Comment
Living roofs	N	It is financially unfeasible to retrofit green roofs to the surrounding buildings
Infiltration systems	N	Spatial constraints deem this as unfeasible.
Dry planted features	N	The proposed surfacing is able to attenuate the surface water run-off allowing the planting palette of surrounding landscape to not be restricted to raingarden appropriate plants.
Open water features	N	Not considered appropriate for the site due to spatial constraints.
Pervious & reservoir pavements	Y	Pervious pavement is proposed within the forecourts where this has been deemed financially viable.
Attenuation storage tanks	N	The proposed surfacing is able to attenuate the surface water run-off.

5. Maintenance strategy

5.1 Maintenance

This maintenance section is intended to give an overview of the operation and maintenance of the drainage features included within the drainage strategy and in relation to typical details. Where propriety products are specified, the manufacturer's instructions and recommendations should be followed in priority to this document, unless specifically noted otherwise due to project constraints.

The recommended maintenance actions and frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the operation of the system. The frequency should then be adjusted to suit the site-specific requirements.

The surface water network has been designed to accommodate the 1 in 100-year rainfall event plus a 40% allowance for climate change. As the flows are attenuated on site there will be a period after storm events where the network is still partially or fully surcharged and is draining down. Where this surcharging is still present after 48 hours, appropriate action should be taken as noted in this section.

5.2 Components

The following components are included within the drainage design for the proposed development:

- Permeable paving.

Permeable Paving

Permeable paving is proposed in the parking bays and throughout the private road within the site.

Permeable paving is a proprietary product; the manufacturer's maintenance recommendation should therefore be followed. The information regarding operation and maintenance can be found within the manufacturer's specification and should be included in the hand-over documentation.

Table 8 presents the recommended maintenance schedule for the permeable paving.

Table 8 Maintenance schedule for permeable paving

Permeable Paving			
Activity/Maintenance Schedule	Required Action	Frequency	Maintenance Responsibility
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs	Property Owner

		<i>onto previous surface from adjacent impermeable areas as this area is most likely to collect the most sediment</i>	
Occasional maintenance	<i>Stabilise and mow contributing and adjacent areas</i>	<i>As required</i>	Property Owner
	<i>Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying</i>	<i>As required – once per year on less frequently used pavements</i>	Property Owner
Remedial actions	<i>Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving</i>	<i>As required</i>	Property Owner
	<i>Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material</i>	<i>As required</i>	Property Owner
	<i>Rehabilitation of surface and upper substructure by remedial sweeping</i>	<i>Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)</i>	Property Owner
Monitoring	<i>Initial inspection</i>	<i>Monthly for three months after installation</i>	Property Owner
	<i>Inspect for evidence of poor operation and/or weed growth – if required, take remedial action</i>	<i>Three-monthly, 48 h after large storms in the first six months</i>	Property Owner
	<i>Inspect silt accumulation rates and establish</i>	<i>Annually</i>	Property Owner

	<i>appropriate brushing frequencies</i>		
	<i>Monitor inspection chambers</i>	<i>Annually</i>	Property Owner

6. Haringey SuDS Proforma

The Haringey SuDS Proforma can be found in Appendix F.

7. Conclusion and Recommendation

The proposed surface water drainage strategy proposes to reduce the risk of downstream flooding by reducing the existing discharge rates emanating from the proposed development site.

In line with Haringey Borough Council Policy DM25: On Site Water Management and Surface Water Attenuation, it is proposed to drain surface water to a series of SuDS features providing a total of 25.2m³ of effective storage and restrict to the proposed discharge rates. The required attenuation volume has been estimated using industry standard Causeway Flow software to ensure that there is no flooding for up to the 1 in 100-year storm event +40% allowance for climate change.

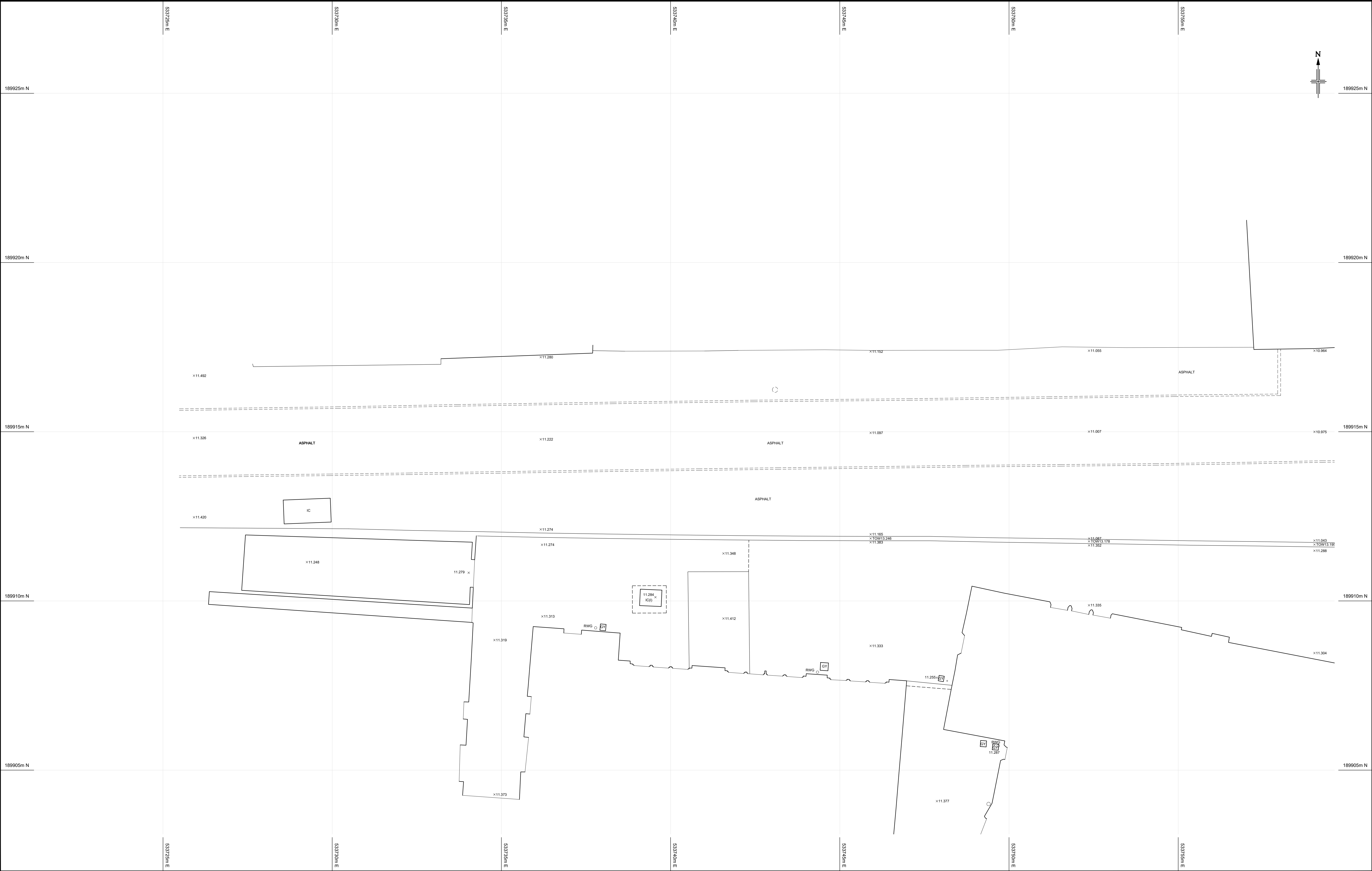
The proposed surface water drainage strategy demonstrates that development is able to achieve Greenfield Runoff Rate following the implementation of the proposed SuDS permeable paving as required by Policy DM 25 B (a) and offer a 97.8% betterment from the existing position.

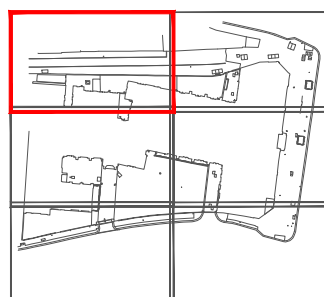
The SuDS feature being proposed to manage the surface water run-off is pervious paving. This will be designed in collaboration with the landscape architect on the project with the aim to achieve a wide range of benefits including water quality, amenity and biodiversity.

Appendices

- A. Topographical Survey
- B. Proposed Layout
- C. Greenfield Run-Off Rate Calculation
- D. Existing Discharge Rate Calculation
- E. Proposed Attenuation and Discharge Rate Calculation
- F. Haringey SuDS Proforma

A. Topographical Survey

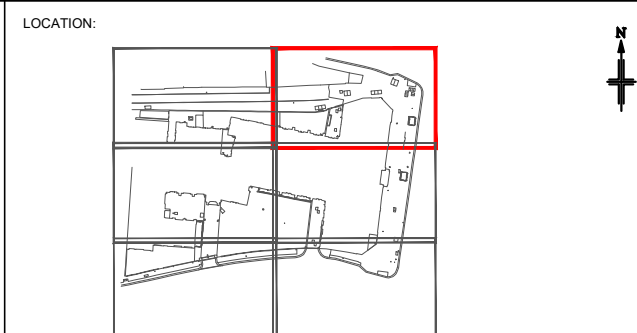


ST.MARKS CHURCH HIGH ROAD, LONDON	TOPOGRAPHICAL PLAN SHEET 1 OF 6	LOCATION:  	Annotations: BT/C - Telecom Cover DK - Drop Kerb EOP - Electricity Transmission Pole ER - Earth Road F+H - F+H Hydrant FP - Footpath GV - Gully GVV - Gull Stop Valve H - Hedge IC - Inspection Chamber K - Kerb L - Lamp LAP - Lateral Pole M+M - Manhole MCP - Manhole Cover Post NB - Notice Board P - Pole R - Road Sign RWG - Rain Water Goods T - Telegraph Pole V - Valve VW - Water Valve WSP - Water Stopcock/valve	Levels: CL - Corner Level EV - Eave Height RH - Ridge Height TF - Top of Fence TOW - Top of Wall US - Underdrain WL - Water Level	Notes: The survey grid is tied to reduced OS co-ordinates and levels to OS datum. The grid and levels were established via GPS GNSS observations. 	SURVEY PREPARED FOR: ROGER MEARS ARCHITECTS LLP Union Chapel Compton Avenue London N1 2XD SURVEY PREPARED BY: THE DOWNLAND PARTNERSHIP LTD UNIT 6, ROUNDWAY HILL BUSINESS CENTRE DRIVELERS - SN10 2LT Tel: 001380 738413 Email: info@exactsurvey.com	SCALE 1 : 50@A1	
							Date of survey	February 2022
							CAD file name	St.Marks Methodist Church Topo Plan.dwg
							Checked	EVM



ST.MARKS CHURCH
HIGH ROAD, LONDON

TOPOGRAPHICAL PLAN
SHEET 2 OF 6



Annotations:

BTIC - Telecom Cover	IC - Inspection Chamber
DK - Drop Kerb	K - Kerb
EP - Electricity Transmission Pole	LP - Lamp-post
ER - Earth Rod	MH - Manhole
FM - Fire Hydrant	MC - Concrete Post
FP - Footpath	NB - Notice Board
GV - Gully	P - Post
GSV - Gas Stop Valve	RE - Roadding Eye
H - Hedge	RS - Road Sign
	RWG - Rain Water Goods
	TP - Telegraph Pole
	WM - Water Meter
	WSV - Water Stopcock/valve

Levels:

- CL - Cover Level
- EV - Eave Height
- RH - Ridge Height
- TF - Top of Fence
- TOW - Top of Wall
- US - Underside
- WL - Water Level

Notes:	The survey grid is tied to reduced OS co-ordinates and levels to OS datum. The grid and levels were established via GPS GNSS observations.
--------	--



SURVEY PREPARED FOR:

ROGER MEARS ARCHITECTS LLP
Union Chapel
Compton Avenue
London N1 2XD

SURVEY PREPARED BY:

THE DOWNLAND PARTNERSHIP LTD
UNIT 6, ROUNDWAY HILL BUSINESS CENTRE
DEVIZES SN10 2LT
Tel: (01380) 738413
Email: info@exactsurvey.com

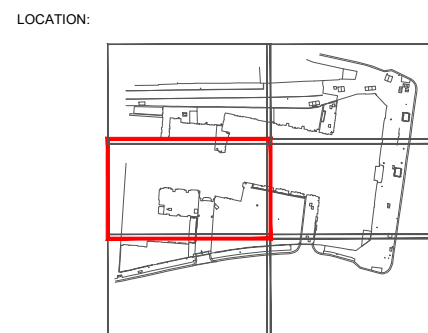
SCALE 1 : 50@A1

Date of survey	February 2022
CAD file name	St.Marks Methodist Church Topo Plan.dwg
Checked	EVM



ST.MARKS CHURCH
HIGH ROAD, LONDON

TOPOGRAPHICAL PLAN
SHEET 3 OF 6



Annotations:

BTIC - Telecom Cover
DK - Drop Kerb
EP - Electricity Transmission Pole
ER - Earth Rod
FH - Fire Hydrant
FP - Footpath
GY - Gully
GSV - Gas Stop Valve
H - Hedge

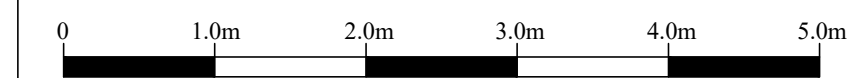
IC - Inspection Chamber
K - Kerb
LP - Lamp-post
MH - Manhole
Mkr - Concrete Post
NB - Notice Board
P - Post
RE - Rodding Eye
RS - Road Sign
RWG - Rain Water Goods
TP - Telegraph Pole
WM - Water Meter
WSV - Water Stopcock/valve

Levels

CL - Cover Level
EV - Eave Height
RH - Ridge Height
TF - Top of Fence
TOW - Top of Wall
US - Underside
WL - Water Level

Notes:

The survey grid is tied to reduced OS co-ordinates and levels to OS datum. The grid and levels were established via GPS GNSS observations.



SURVEY PREPARED FOR:

ROGER MEARS ARCHITECTS LLP
Union Chapel
Compton Avenue
London N1 2XD

SURVEY PREPARED BY:

THE DOWNLAND PARTNERSHIP LTD
UNIT 6, ROUNDWAY HILL BUSINESS CENTRE
DEVIZES SN10 2LT
Tel: (01380) 738413
Email: info@exactsurvey.com

SCALE 1 : 50@A1

Date of survey

February 2022

CAD file name

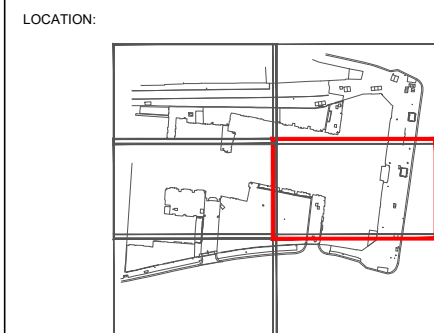
Marks Methodist Church Topic
Plan down

Checked

EVM

ST.MARKS CHURCH
HIGH ROAD, LONDON

TOPOGRAPHICAL PLAN
SHEET 4 OF 6



Annotations:

- BTIC - Telecom Cover
- DK - Drop Kerb
- EP - Electricity Transmission Pole
- ER - Earth Rod
- FH - Fire Hydrant
- FP - Footpath
- GY - Gully
- GSV - Gas Stop Valve
- H - Hedge

IC - Inspection Chamber
K - Kerb
LP - Lamp-post
MH - Manhole
Mkr - Concrete Post
NB - Notice Board
P - Post
RE - Rodding Eye
RS - Road Sign
RWG - Rain Water Goods
TP - Telegraph Pole
WM - Water Meter
WSV - Water Stopcock/valve

Levels:

- CL - Cover Level
- EV - Eave Height
- RH - Ridge Height
- TF - Top of Fence
- TOW - Top of Wall
- US - Underside
- WL - Water Level

	Notes
--	-------

The survey grid is tied to reduced OS co-ordinates and levels to OS datum. The grid and levels were established via GPS GNSS observations.



SURVEY PREPARED FOR:

ROGER MEARS ARCHITECTS LLP
Union Chapel
Compton Avenue
London N1 2XD

SURVEY PREPARED BY:

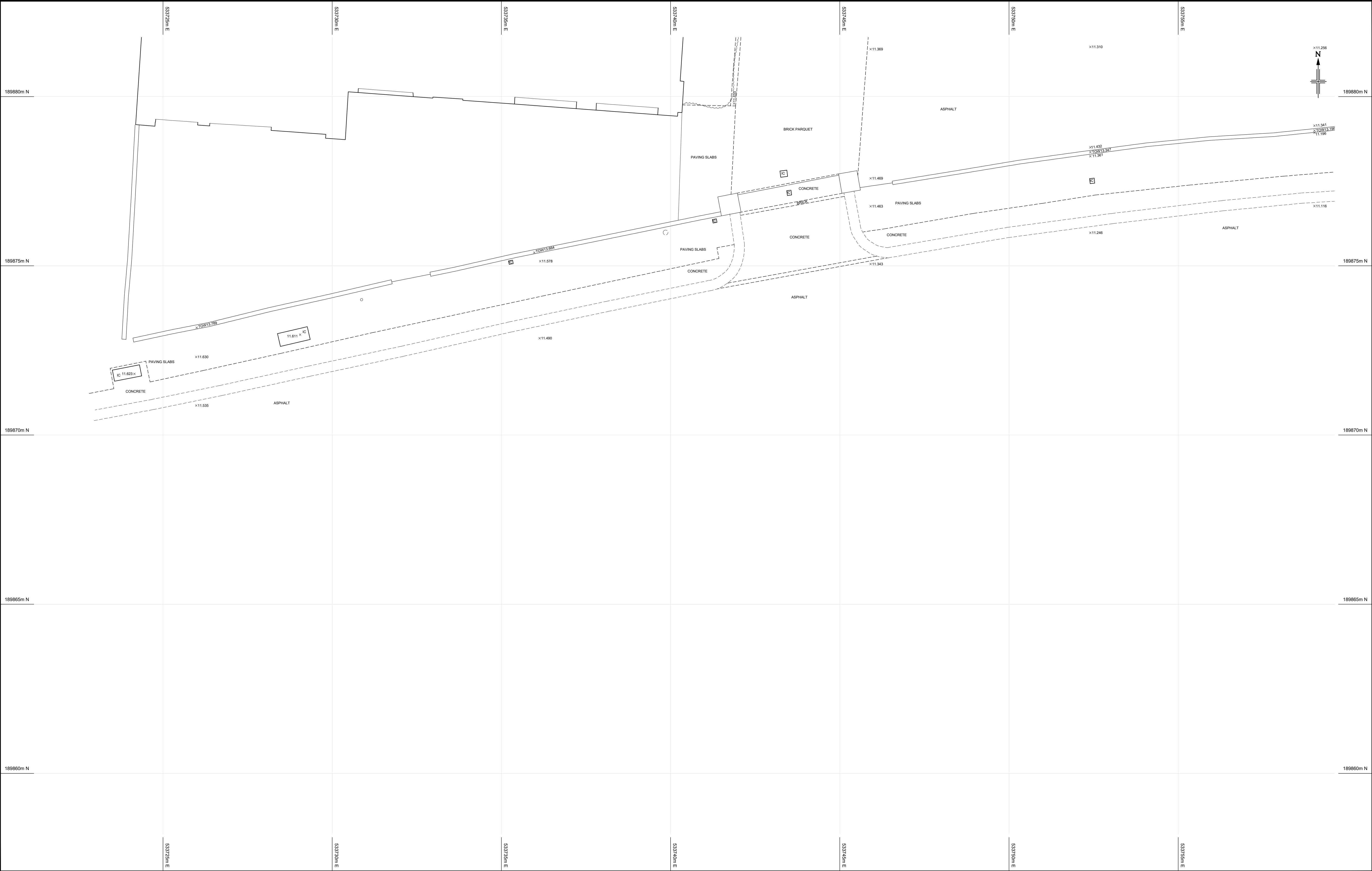
THE DOWNLAND PARTNERSHIP LTD
UNIT 6, ROUNDWAY HILL BUSINESS CENTRE
DEVIZES SN10 2LT
Tel: (01380) 738413
Email: info@exactsurvey.com

SCALE 1 : 50@A1

Date of survey	February 2022
----------------	---------------

CAD file name	St.Marks Methodist Church Plan.dwg
---------------	---------------------------------------

Checked	EVM
---------	-----

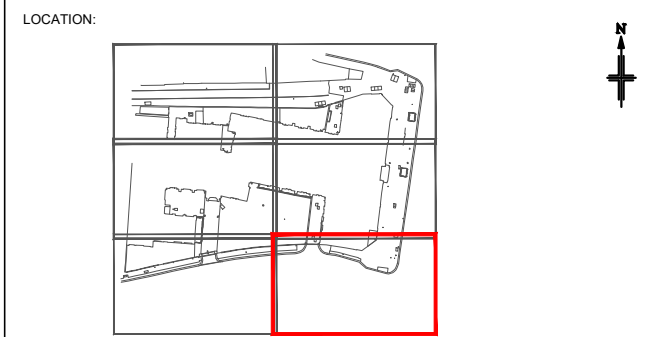


ST.MARKS CHURCH HIGH ROAD, LONDON	TOPOGRAPHICAL PLAN SHEET 5 OF 6	LOCATION:	Annotations: BTIC - Telecom Cover DK - Drop Kerb EIP - Electricity Transmission Pole ER - Earth Road FIP - Fire Hydrant FP - Footpath GV - Gully GVV - Gull Stop Valve H - Hedge IC - Inspection Chamber K - Kerb LP - Lintage M - Manhole MC - Concrete Post NB - Notice Board P - Pole RE - Road Sign RWS - Rain Water Goods TR - Tree V - Valve VW - Water Valve WSP - Water Stopcock/valve	Levels: CL - Cover Level EV - Eave Height RH - Ridge Height TF - Top of Fence TOM - Top of Mound US - Underdrain WL - Water Level	Notes: The survey grid is tied to reduced OS co-ordinates and levels to OS datum. The grid and levels were established via GPS GNSS observations. 01.0m 2.0m 3.0m 4.0m 5.0m	SURVEY PREPARED FOR: ROGER MEARS ARCHITECTS LLP Union Chapel Compton Avenue London N1 2XD	SCALE 1 : 50@A1
						SURVEY PREPARED BY: THE DOWNLAND PARTNERSHIP LTD UNIT 6, ROUNDWAY HILL BUSINESS CENTRE DRIVELLS - SN10 2LT Tel: 011880 738413 Email: info@exactsurvey.com	
						Date of survey February 2022	
						CAD file name St.Marks Methodist Church Topo Plan.dwg	
Checked	EVM						



ST.MARKS CHURCH
HIGH ROAD, LONDON

TOPOGRAPHICAL PLAN
SHEET 6 OF 6



Annotations:

BTIC - Telecom Cover	IC - Inspection Chamber
DK - Drop Kerb	K - Kerb
EP - Electricity Transmission Pole	LP - Lamp Post
ER - Earth Rod	MH - Manhole
FH - Fire Hydrant	Mkr - Concrete Post
FP - Footpath	NB - Notice Board
GV - Gully	P - Post
GSV - Gas Stop Valve	RE - Rooding Eye
H - Hedge	RS - Road Sign
	RWG - Rain Water Goods
	TP - Telegraph Pole
	WM - Water Meter
	WSV - Water Stopcock/valve

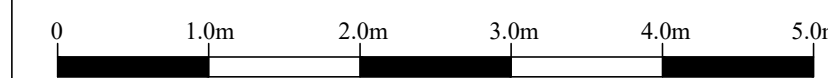
IC - Inspection Chamber
K - Kerb
LP - Lamppost
MH - Manhole
Mkr - Concrete Post
NB - Notice Board
P - Post
RE - Rodding Eye
RS - Road Sign
RWG - Rain Water Goods
TP - Telegraph Pole
WM - Water Meter
WSV - Water Stopcock/valve

Levels:

- CL - Cover Level
- EV - Eave Height
- RH - Ridge Height
- TF - Top of Fence
- TOW - Top of Wall
- US - Underside
- WL - Water Level

Notes:

The survey grid is tied to reduced OS co-ordinates and levels to OS datum. The grid and levels were established via GPS GNSS observations.



SURVEY PREPARED FOR:

ROGER MEARS ARCHITECTS LLP
Union Chapel
Compton Avenue
London N1 2XD

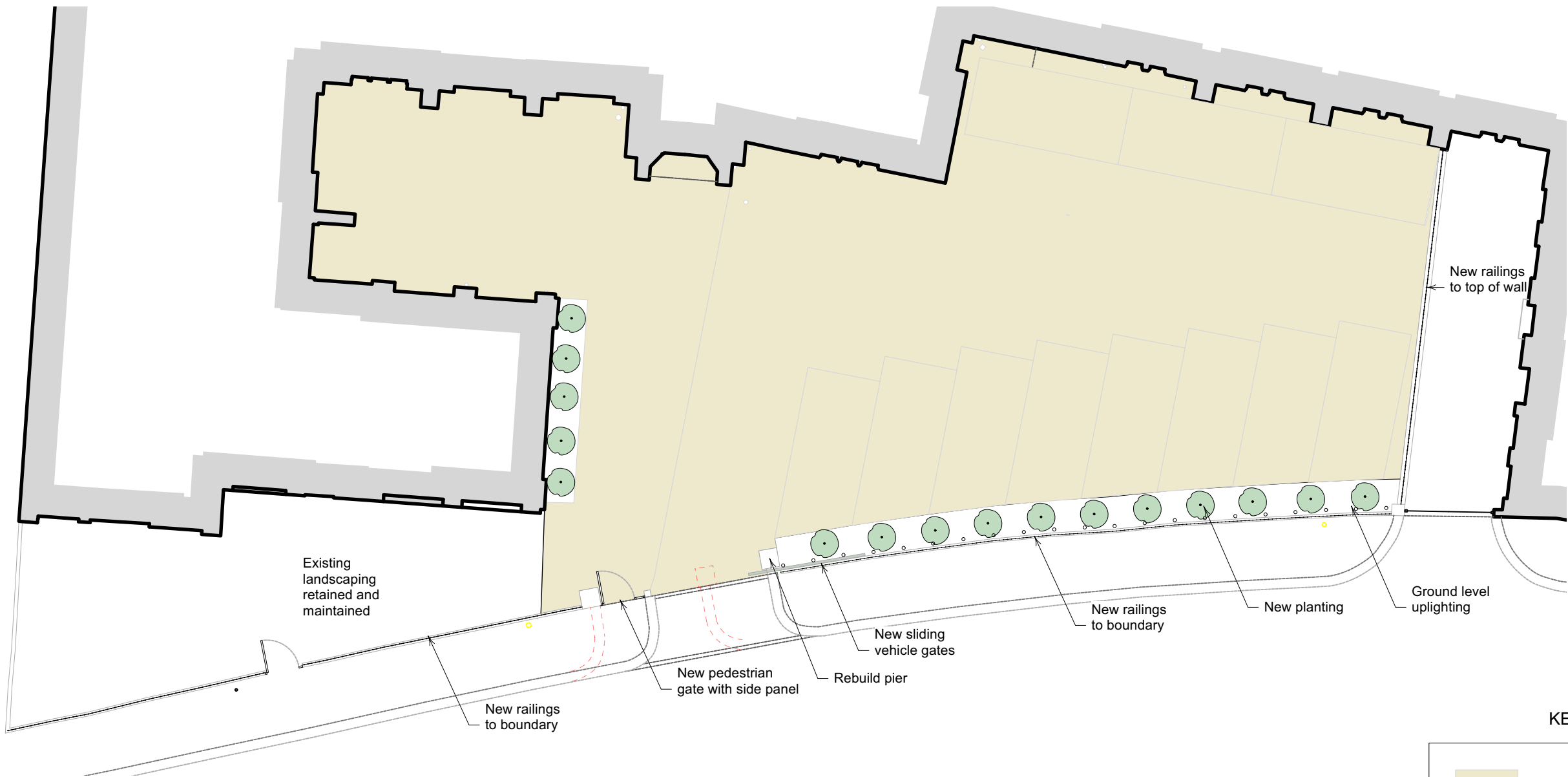
SURVEY PREPARED BY:

THE DOWNLAND PARTNERSHIP LTD
UNIT 6, ROUNDWAY HILL BUSINESS CENTRE
DEVIZES SN10 2LT
Tel: (01380) 738413
Email: info@exactsurvey.com

SCALE 1 : 50@A1

Date of survey	February 2022
CAD file name	St.Marks Methodist Church Topo Plan.dwg
Checked	EVM

B. Proposed Layout



1 Proposed Car Park
1:150@A3; 1:75@A1

KEY:

- BOUND GRAVEL
- NEW PLANTING
- DEMOLITION

0 5 10 15 M

Notes	DO NOT SCALE - Use Figure Dimensions Only IF IN DOUBT - ASK		Revisions A 19/12/2022 Drawing updated and notes revised		St. Mark's Methodist Church High Rd, London N17 6QB Proposed Car Park		ROGER MEARS ARCHITECTS LLP Union Chapel, Compton Avenue				
-------	--	--	---	--	---	--	--	--	--	--	--

C. Greenfield Run-Off Rate Calculation

[Print](#)[Close Report](#)

Greenfield runoff rate estimation for sites

www.ukuds.com | Greenfield runoff tool

Calculated by: Rhys Williams

Site name: St Marks Church

Site location: Bruce Grove

Site Details

Latitude: 51.59198° N

Longitude: 0.07038° W

Reference: 2433456327

Date: Dec 12 2022 14:39

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Runoff estimation approach IH124

Site characteristics

Total site area (ha): 0.1

Methodology

Q_{BAR} estimation method: Calculate from SPR and SAAR

SPR estimation method: Calculate from SOIL type

Soil characteristics

Default

Edited

SOIL type: 2 2

HOST class: N/A N/A

SPR/SPRHOST: 0.3 0.3

Hydrological characteristics

Default

Edited

SAAR (mm): 620 620

Hydrological region: 6 6

Growth curve factor 1 year: 0.85 0.85

Growth curve factor 30 years: 2.3 2.3

Growth curve factor 100 years: 3.19 3.19

Growth curve factor 200 years: 3.74 3.74

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

Default

Edited

Q_{BAR} (l/s): 0.16 0.16

1 in 1 year (l/s): 0.13 0.13

1 in 30 years (l/s): 0.36 0.36

1 in 100 year (l/s): 0.5 0.5

1 in 200 years (l/s): 0.55 0.55

We use cookies on this site to enhance your user experience

Ok, I agree

More

By clicking the Accept button, you agree to us doing so.

D. Existing Discharge rate Calculation

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	999.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Width (mm)	Easting (m)	Northing (m)	Depth (m)
St Marks Church Car Park Catchment	0.040	4.00	0.0	10.000	600	600	11.245	54.754	1.000
External Sewer	0.000	4.00	0.0	10.000	1200		88.908	53.608	1.250

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0



Civic Engineers Ltd
Reeds Wharf
33 Mill Street
London

File: St marks - Existing Discharge Ra
Network: Storm Network
Rhys Williams
12/12/22

Page 2
St Marks Church
Existing Discharge Rates

Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute summer	St Marks Church Car Park Catchment	10	9.049	0.049	6.0	0.0572	0.0000	OK
15 minute summer	External Sewer	10	8.797	0.047	6.0	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	St Marks Church Car Park Catchment	1.000	External Sewer	6.0	1.231	0.213	0.0487	2.3

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event		US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	St Marks Church Car Park Catchment		10	9.083	0.083	14.6	0.0965	0.0000	OK
15 minute summer	External Sewer		10	8.827	0.077	14.6	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)	
15 minute summer	St Marks Church Car Park Catchment	1.000	External Sewer	14.6	1.532	0.518	0.0953	5.7	

Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event		US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	St Marks Church Car Park Catchment		10	9.100	0.100	19.0	0.1157	0.0000	OK
15 minute summer	External Sewer		10	8.840	0.090	19.0	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)	
15 minute summer	St Marks Church Car Park Catchment	1.000	External Sewer	19.0	1.618	0.674	0.1174	7.4	

E. Proposed Attenuation & Discharge Rate Calculation

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	999.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
St Marks Church Car Park Catchment	0.040	4.00	0.0	10.000		11.245	54.754	0.400
External Sewer	0.000	4.00	0.0	10.000	1200	88.908	53.608	1.250

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	0.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0
100	40	0	0

Node St Marks Church Car Park Catchment Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	9.600	Slope (1:X)	400.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.300
Safety Factor	2.0	Width (m)	28.000	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	St Marks Church Car Park Catchment	272	9.668	0.068	0.9	4.6609	0.0000	OK
15 minute summer	External Sewer	1	8.750	0.000	0.2	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Discharge Vol (m³)
360 minute winter	St Marks Church Car Park Catchment	Orifice	External Sewer	0.2	5.7

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	St Marks Church Car Park Catchment	232	9.752	0.152	2.6	11.7020	0.0000	FLOOD RISK
15 minute summer	External Sewer	1	8.750	0.000	0.2	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Discharge Vol (m³)
240 minute winter	St Marks Church Car Park Catchment	Orifice	External Sewer	0.3	7.7

Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	St Marks Church Car Park Catchment	344	9.799	0.199	2.5	15.6317	0.0000	FLOOD RISK
15 minute summer	External Sewer	1	8.750	0.000	0.3	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Discharge Vol (m³)
360 minute winter	St Marks Church Car Park Catchment	Orifice	External Sewer	0.4	10.8

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	St Marks Church Car Park Catchment	344	9.882	0.282	3.4	22.6652	0.0000	FLOOD RISK
15 minute summer	External Sewer	1	8.750	0.000	0.3	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Discharge Vol (m³)
360 minute winter	St Marks Church Car Park Catchment	Orifice	External Sewer	0.5	13.1

F. Haringey SuDS Proforma

1. Project & Site Details	Project / Site Name (including sub-catchment / stage / phase where appropriate)	St Marks Methodist Church
	Address & post code	N17 6QB
	OS Grid ref. (Easting, Northing)	E 533758 N 189887
	LPA reference (if applicable)	
	Brief description of proposed work	improvement to the façade, shopfronts, boundary and carpark
	Total site Area	400 m ²
	Total existing impervious area	380 m ²
	Total proposed impervious area	200 m ²
	Is the site in a surface water flood risk catchment (ref. local Surface Water Management Plan)?	Yes
	Existing drainage connection type and location	Existing drainage connection is assumed lateral connection to public sewer
	Designer Name	Rhys Williams
	Designer Position	Associate
Designer Company	Civic Engineers	

2. Proposed Discharge Arrangements	2a. Infiltration Feasibility		
	Superficial geology classification	London Clay formation	
	Bedrock geology classification	London Clay formation	
	Site infiltration rate	N/A	m/s
	Depth to groundwater level	N/A	m below ground level
	Is infiltration feasible?	No	
	2b. Drainage Hierarchy		
		Feasible (Y/N)	Proposed (Y/N)
	1 store rainwater for later use	N	N
	2 use infiltration techniques, such as porous surfaces in non-clay areas	N	N
	3 attenuate rainwater in ponds or open water features for gradual release	N	N
	4 attenuate rainwater by storing in tanks or sealed water features for gradual release	Y	Y
	5 discharge rainwater direct to a watercourse	N	N
	6 discharge rainwater to a surface water sewer/drain	Y	Y
	7 discharge rainwater to the combined sewer.	N	N
	2c. Proposed Discharge Details		
	Proposed discharge location	ing into public sewers at a controlled discharge	
	Has the owner/regulator of the discharge location been consulted?	Yes	

3. Drainage Strategy	3a. Discharge Rates & Required Storage				
		Greenfield (GF) runoff rate (l/s)	Existing discharge rate (l/s)	Required storage for GF rate (m ³)	Proposed discharge rate (l/s)
	Qbar	0.16			
	1 in 1	0.13	6	25	0.2
	1 in 30	0.36	14.6	25	0.3
	1 in 100	0.5	19	25	0.4
	1 in 100 + CC			25	0.5
	Climate change allowance used		40%		
	3b. Principal Method of Flow Control		Orifice		
	3c. Proposed SuDS Measures				
	Catchment area (m ²)	Plan area (m ²)	Storage vol. (m ³)		
Rainwater harvesting	0		0		
Infiltration systems	0		0		
Green roofs	0	0	0		
Blue roofs	0	0	0		
Filter strips	0	0	0		
Filter drains	0	0	0		
Bioretention / tree pits	0	0	0		
Pervious pavements	400	280	25		
Swales	0	0	0		
Basins/ponds	0	0	0		
Attenuation tanks	0		0		
Total	400	280	25		

4. Supporting Information	4a. Discharge & Drainage Strategy	Page/section of drainage report
	Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	Section 4.1
	Drainage hierarchy (2b)	Section 4
	Proposed discharge details (2c) – utility plans, correspondence / approval from owner/regulator of discharge location	Section 4
	Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	Section 4.3 & Appendix D&E
	Proposed SuDS measures & specifications (3b)	Section 4.3
	4b. Other Supporting Details	Page/section of drainage report
	Detailed Development Layout	Appendix B
	Detailed drainage design drawings, including exceedance flow routes	Appendix B
	Detailed landscaping plans	Appendix B
	Maintenance strategy	Section 5
	Demonstration of how the proposed SuDS measures improve:	
	a) water quality of the runoff?	Section 4.3, Table 6
	b) biodiversity?	Section 4.3, Table 6
	c) amenity?	Section 4.3, Table 6

Manchester

Carver's Warehouse
77 Dale Street
Manchester M1 2HG
+44 (0)161 228 6757

London

Reeds Wharf
33 Mill Street
London SE1 2AX
+44 (0)20 7253 2977

Leeds

Unit 02/01 Tower Works
Globe Road
Leeds LS11 5QG
+44 (0)113 2025 130

Glasgow

Gresham Chambers
45 West Nile Street
Glasgow G1 2PT
+44 (0)141 370 1829