Drainage Strategy Report St Pancras Substation, Camden, London, NW1 0DP

24/04/24

Rev 06

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Prepared for Fisher German, on Behalf of UK Power Networks

Revision	Date	Revision Description		Name	Signature
00 Draft	23/05/23	Initial Draft Issue	Prepared	Chris Micklethwaite	CAM
			Checked	Michael Crown	MLC
			Approved	Michael Crown	MLC
01	24/05/23	Appendices Added	Prepared	Chris Micklethwaite	CAM
			Checked	Paul Laverty	PL
			Approved	Michael Crown	MLC
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			Checked	Chris Micklethwaite	CAM
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			Approved	Michael Crown	MLC
05	12/04/24	Masterplan Updated, Foul Strategy Removed	Prepared	Jack Prest	JP
			Checked	Chris Micklethwaite	CAM
			Approved	Michael Crown	MLC
06	24/04/24	Comments from Camden LLFA incorporated	Prepared	Jack Prest	JP
			Checked	Chris Micklethwaite	CAM
			Approved	Michael Crown	MLC

Executive Summary

Client	Fisher German, on behalf of UK Power Networks
Location	St Pancras Substation, Camden, London, NW1 0DP
Description	Erection of a new car parking and van parking spaces for use of the UK Power Networks operatives and staff, and storage areas. The proposals also seek the creation of a new open metal fence to replace the existing wall.
Report Objectives	The aim of this report is to undertake the following: • Undertake an assessment of the existing and anticipated surface water discharging from the proposed development. • Produce preliminary sustainable drainage proposals and provide guidance as to the viability of infiltration or attenuation to facilitate the drainage feasibility for the proposed development. • Should source control be identified as unviable, to assess the proximity of existing drainage points to which the proposed development may connect. • Produce preliminary drainage proposals for the collection and discharge of foul water and trade effluent into local public sewer networks.
Existing Runoff Rate	The existing runoff rate has been calculated using the modified rational method to be 55.6l/s, The existing greenfield runoff rate has been calculated using the FEH method to be 1.0l/s.
Concept Surface Water Sustainability Strategy	The site is a redevelopment of an existing substation with near total hardstanding. The surface water strategy identifies the collection, attenuation and conveyance of surface water, utilising available and appropriate sustainable drainage techniques, before restricting the flow via a flow control and discharging into the local Thames Water public sewer. These strategies are subject to London Borough of Camden Authority and Lead Local Flood Authority acceptance and approval, agreement from UK Power Networks and detailed design.
Concept Foul Water Strategy	There are no proposals to amend the foul water drainage within this application.

Contents

Introduction

1.1 Terms of Reference

1.1.1 Clancy Consulting Limited (CCL) have been commissioned by Fisher German, on behalf of UK Power Networks, to produce a Sustainable Drainage Strategy in support of the redevelopment at St Pancras substation, Camden, London.

1.1.2 The proposed redevelopment will replace an area which was previously part of the old substation before demolition.

1.2 General

1.2.1 The Local Planning Authority (LPA), Local Highway Authority (LHA) & Lead Local Flood Authority (LLFA) is The London Borough of Camden Council.

1.2.2 The local incumbent potable water mains provider is Thames Water (TW).

1.2.3 The local sewerage undertaker is Thames Water (TW).

1.2.4 This report is prepared solely for the benefit of the Client. This report may not be assigned without prior written permission from Clancy Consulting Ltd.

1.3 Scope of this Report

1.3.1 The aim of this report is to identify the following to assist a sustained and viable drainage strategy for the proposed development:

- Undertake an assessment of the existing and anticipated surface water discharging from the proposed development.
- Produce preliminary sustainable drainage layout proposals and provide guidance as to the viability of any infiltration, attenuation, pumping, or existing drainage network improvements that may be required to facilitate the detailed drainage design for the proposed development.
- Should source control be identified as unviable, assess the proximity of existing drainage points to which the proposed development may connect.
- Produce preliminary drainage proposals for the collection and discharge of foul water and trade effluent into local public sewer networks.

1.3.2 This report has been compiled using the following sources of information:

- Water Framework Directive
- Water Act 2014
- National Planning Policy Framework 2021 (NPPF)
- Ciria SuDS Manual C753
- Statutory Sewerage Guidance (SSG) – Design Construction Guidance (DCG).
- Department for Environment, Food and Rural Affairs. (DEFRA) non-statutory technical standards for sustainable drainage
- Building Research Establishment (BRE) Digest 365, 2016 edition
- Environmental Agency (EA), Report – SC030219, Rainfall Runoff Management for

developments

- The London Plan 2021
- The London Borough of Camden Local Plan 2017
- The London Borough of Camden Flood Risk Management Strategy
- The London Borough of Camden Planning Guidance – Water and Flooding 2019
- The London Borough of Camden Planning Guidance – Design 2021

2.0 Site Description

2.1 Location

2.1.1 Figure 1 below identifies an illustrative site boundary (red line) for the proposed UK Power Networks development, the blue line represents areas that are owned by the client but not included in the application. This can be found in **Appendix A**.

2.1.2 The site extents cover circa 0.400 Ha and is located on brownfield land in Camden, as detailed below:

OS X (Eastings)	529309
OS Y (Northings)	183930
Nearest Post Code	NW1 0DP
Lat (WGS84)	N51:32:20:26 (51.538961)
Long (WGS84)	W0:8:6:91 (-0.135252)
National Grid Ref	TQ 2983 3093

Table 1: Site Location Approximate Land Parcel Centre

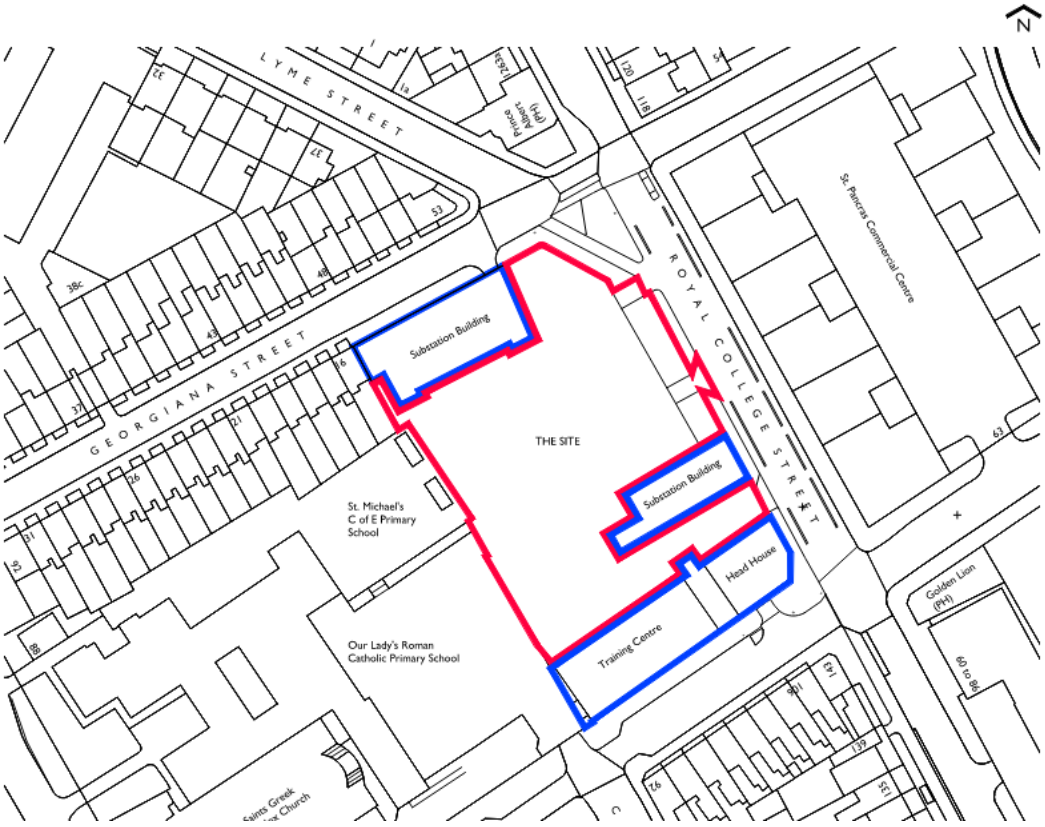


Figure 1 – Site Location Plan

2.2 Site Observations

2.2.1 The existing substation site is located within the London Borough of Camden.

2.2.2 The eastern boundary is defined by Royal College Street

2.2.3 The west north-western boundary is defined by Georgiana Street, until it eventually intersects with Royal College Street on the north north-eastern corner of the site.

2.2.4 The south-eastern boundary is defined by Pratt Street, until it eventually intersects with Royal College Street on the east south-eastern corner of the site.

2.2.5 The south-western boundary of the site is adjacent to St Michael's CE Primary School & All Saints Greek Orthodox Church.

2.2.6 Opposite the existing substation compound is another redevelopment by W.RE, labelled St Pancras Campus, which is under construction at the time of writing this report.

2.2.7 The site is entirely impermeable, with hardstanding and paving around the building footprint.

2.2.8 A Topographical Survey was undertaken by EDF Energy in September 2008 and can be found in **Appendix B.**

2.3 Existing Public Sewerage Networks

2.3.1 Existing sewerage asset location plans have been obtained from Thames Water.

2.3.2 These existing sewer plans identify public sewerage networks within Georgiana Street, Pratt Street and Royal College Street.

2.3.3 All sewer networks are identified as a combined foul and surface water sewerage networks collecting and conveying surface and foul water in underground pipe networks.

2.3.4 The asset maps identify that no combined sewers are within the site boundary.

2.3.5 There are no separate foul water public sewerage networks within the vicinity of the site.

2.3.6 There is one separate surface water public sewerage network within the vicinity of the site, which eventually connects to a combined sewer near the north-eastern boundary of the site.

2.3.7 Existing sewer asset maps obtained from Thames Water can be found in **Appendix C**.

2.4 Existing Geotechnical & Geo-environmental Report Information

2.4.1 A previous geotechnical investigation, undertaken by Southern Testing reference J10175 shows the below ground strata to consist of made ground up to depths of circa 1.4m, underlain by stiff or veery stiff clay to a maximum depth of circa 20m.

2.4.2 Infiltration testing was undertaken, and the permeability of the clay was recorded as Low.

2.4.3 Hydrocarbon contamination has been recorded in the site, discovered within the made ground.

3.0 Development Proposals

3.1 Development Masterplan

3.1.1 The description for the re-development is as follows; Erection of a new car parking and van parking spaces for use of the UK Power Networks operatives and staff, and storage areas. The proposals also seek the creation of a new open metal fence to replace the existing wall.

3.1.2 The proposed site plan is shown below in figure 2 and attached within **Appendix D.**

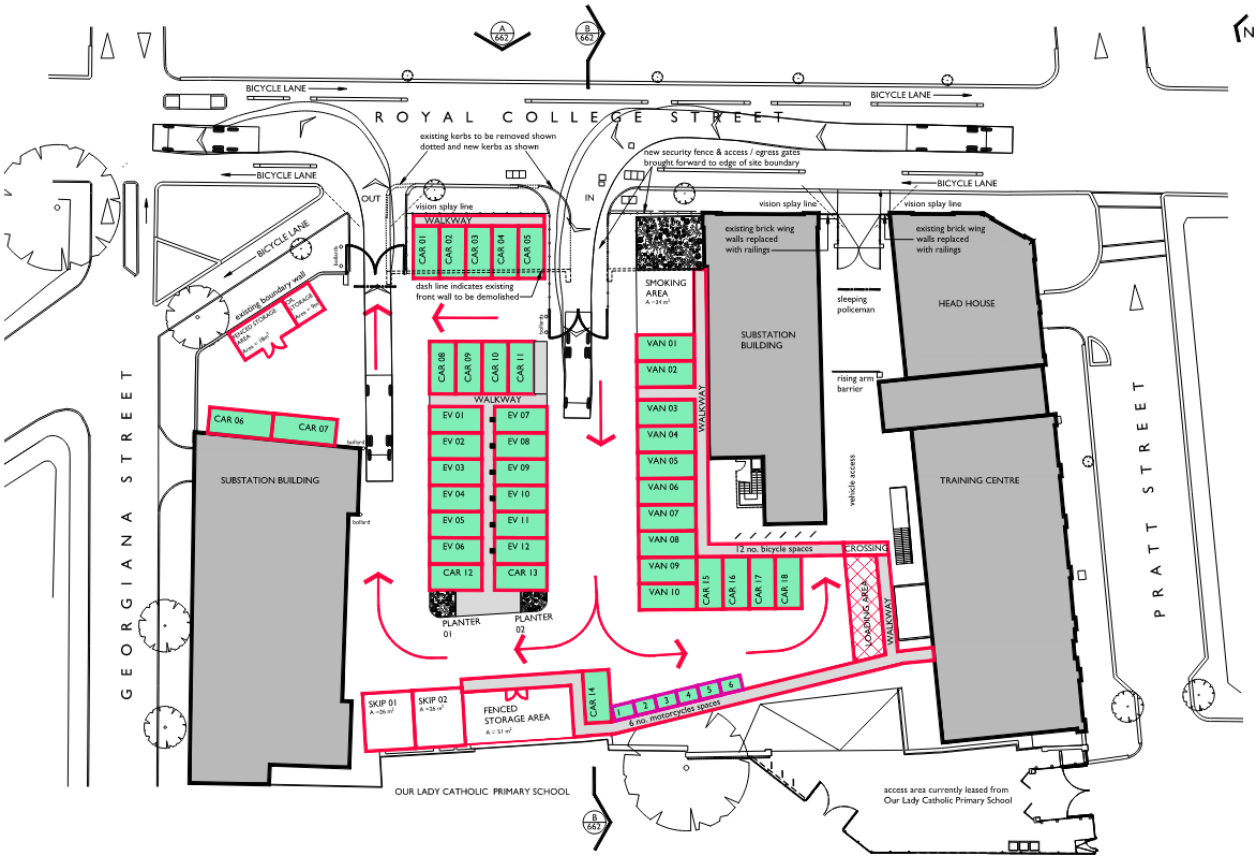


Figure 2 - Proposed Site Plan

4.0 Surface Water Drainage

4.1 Existing Surface Sewerage and Drainage Desktop Review

4.1.1 Existing surface water runoff is collected and conveyed via rainwater pipes, gullies and underground pipe networks, which is assumed to discharge into the existing public sewer network.

4.1.2 Existing public sewer asset maps obtained from Thames Water can be found in **Appendix C**.

4.2 Lead Local Flood Authority Pre-Application Consultation.

4.2.1 A pre-application consultation has not been undertaken at the time of writing this report.

4.2.2 Reference has been made to the following guidance published and highlighted by London Borough of Camden Council:

- The London Borough of Camden Local Plan 2017
- The London Borough of Camden Flood Risk Management Strategy
- The London Borough of Camden Planning Guidance – Water and Flooding 2019
- The London Borough of Camden Planning Guidance – Design 2021

4.2.3 The requirements of the Lead Local Flood Authority are discussed within the following sections.

4.3 Thames Water Pre-Development Enquiry

4.3.1 A pre-development sewerage enquiry with Thames Water has been submitted however, the response has not been received at the time of writing this report. It is anticipated that based on previous site investigations infiltration will not be a viable solution and the potential for a connection to the Thames Water's public sewer is necessary and is not likely to be withheld.

4.3.2 This is in accordance with the NPPF, Building Regulations Part H and Defra sustainable drainage best practice.

4.3.3 The pre-development enquiry for connection to the public sewerage network will be made seeking 5 l/s maximum rate of discharge from the proposed hardstanding area. This is a significant reduction of the existing arrangement.

4.4 Existing Surface Water Assessment

Modified Rationale Method

4.4.1 The existing site land parcel is approximate 0.400Ha in plan.

4.4.2 Based on the Modified Rational Method, the existing site runoff rate can be calculated as follows:
$Q = 2.78 \times A \times i \times Cv \times Cr$

Where:

Q = Flow Rate (l/s)

A = Impermeable Area (Ha) = 0.400 Ha estimated

i = Design Rainfall Intensity (mm/hr) = 50mm/hr

Cv & Cr = Run-off and Routing coefficient ~ 1.0

Therefore Q = circa 55.6 l/s

Greenfield Runoff

Storm Return Period	Existing Runoff Rate	Greenfield Runoff Rate
1 year	67.7l/s	0.8l/s
2 year		0.9l/s
5 year	100.6l/s	1.2l/s
30 year	140l/s	2.3l/s
100 year	145.1l/s	3.1l/s
100 year + 40% CC	148.4l/s	-

4.4.3 The greenfield runoff of the site has been calculated using the FEH method to be 1.0l/s.

4.4.4 Based on London Plan and Ciria guidance, it is proposed to restrict the proposed runoff value to 2l/s per hectare, therefore 2l/s for the site.

4.4.5 Greenfield runoff calculations can be found in **Appendix F**

4.4.6 It is considered that 2l/s is the minimum restricted runoff value to facilitate reliable drainage networks, help minimise maintenance and reduce the risk of blockages.

4.4.7 Restricting the flow down to 2 l/s will see the maximum runoff decreased by approximately 95%.

4.5 Climate Change Allowance

4.5.1 With respect to future development, it is recommended that the surface water drainage design parameters should be assessed for sensitivity to climate change and to cater for an allowance of 40% increase in peak rainfall intensity within the surface water runoff.

4.5.2 An appropriate allowance for additional volume of surface water runoff should be included for climate change for the 100-year return period, and this volume should be catered for as part of the detailed drainage design as required.

4.5.3 The proposed development is considered as ‘Essential Infrastructure’ as defined within the NPPF.

4.5.4 Figure 3 below shows anticipated changes in peak rainfall intensity for the London Management Catchment, defining the required climate change allowances to be made for the project taking into consideration both the central and upper end allowances to understand the range of impact.

London Management Catchment peak rainfall allowances

3.3% annual exceedance rainfall event

Epoch	Central allowance	Upper end allowance
2050s	20%	35%
2070s	20%	35%

1% annual exceedance rainfall event

Epoch	Central allowance	Upper end allowance
2050s	20%	40%
2070s	25%	40%

*Use '2050s' for development with a lifetime up 2060 and use the 2070s epoch for development with a lifetime between 2061 and 2125.

Figure 3 - Catchment Peak Rainfall Allowance

4.5.5 It is considered that it will be necessary to design the proposed below ground surface water drainage infrastructure and above ground drainage system to cater for the 100-year return period event + Climate Change allowance, and to contain this within the perimeter of the car park in the above and below ground infrastructure. This is to ensure that there is no increase in the rate of runoff discharged from the site due to topography and local site constraints.

4.5.6 Where onsite flooding for the upper end allowance presents a significant flood hazard (for example, where depths and velocities of surface water runoff cause a significant danger to people), it will be necessary to take measures to protect people and property. This could include, for example, raising floor levels. As a minimum, there should be no significant flood hazard to people from onsite flooding for the central allowance.

4.5.7 In this instance the buildings in the vicinity of the car park are constructed so the proposed car park should not increase flood risk to these buildings.

4.6 Overland Flow Routes

4.6.1 A topographic survey has been undertaken in September 2008 by EDF Energy and has identified levels to the west north-western of the development as circa 24.00m, with levels to the east north-eastern as circa 24.40m, creating a fall of circa 1 in 133.

4.6.2 North of the development has levels of circa 24.80m with levels to the south-eastern of circa 24.50m, equating to a gradient of circa 1 in 303.

4.6.3 The survey shows that the lowest point of the site is towards the north-eastern boundary, located at the hardstanding between the existing buildings, with the rest of the hardstanding falling towards the west south-western boundary behind the other existing buildings. Any

design for surface water drainage will attempt to replicate the existing flow route arrangement.

4.6.4 The topographic survey drawing ref Site Survey 2008 can be found in **Appendix B**.

4.7 Return Period Design

4.7.1 It is required that no part of the site should flood in a 30-year rainfall event, as such the proposed drainage systems should be designed to accommodate this event within any drainage or below ground storage system as a minimum.

4.7.2 In addition to the above, it is a requirement that no part of a building, utility plant or neighbouring site should flood in a 100-year event plus a suitable allowance for climate change impacts on rainfall intensities.

4.7.3 The proposed surface water drainage system should be designed to cater for the 100-year return period storm with a 20-40% sensitivity allowance for climate change impact.

4.7.4 Surface water associated with the proposed development is to be managed within the site perimeter and is not permitted to be passed through the drainage systems in an uncontrolled manner. As such, a restriction on discharge rate will need to be incorporated.

4.8 Allowances for 'Urban Creep'

4.8.1 In addition to the allowances to be made for climate change and a 100-year return period rainfall event, it is required to make allowance for 'Urban Creep', the process where impermeable areas can be added to residential development due to extension of properties, construction of conservatories or Sun Lounges and patio areas.

4.8.2 As this will be a car park which will not be extended in the future, it is deemed appropriate to apply 0% urban creep to the design.

4.9 SuDs Hierarchy

4.9.1 The Water Framework Act and NPPF requires that for major developments, the management of runoff is required to be put in place, unless demonstrated to be inappropriate. Major developments described as; 10 or more plots; or equivalent non-residential or mixed developments (as set out in Article 2(1) of the Town and Country Planning (Development Management Procedure) (England) Order 2010) sustainable drainage systems.

4.9.2 If it is not possible to discharge via source control, then surface water should be controlled with the use of Sustainable Drainage Systems (SuDS) and considered using the following SuDS Hierarchy (Figure 4).

	SUDS technique	Flood Reduction	Pollution Reduction	Landscape & Wildlife Benefit
Most Sustainable	Living roofs	✔	✔	✔
	Basins and ponds - Constructed wetlands - Balancing ponds - Detention basins - Retention ponds	✔	✔	✔
	Filter strips and swales	✔	✔	✔
	Infiltration devices - soakaways - infiltration trenches and basins	✔	✔	✔
	Permeable surfaces and filter drains - gravelled areas - solid paving blocks - porous paviors	✔	✔	
Least Sustainable	Tanked systems - over-sized pipes/tanks - storms cells	✔		

Figure 4 - Table of SuDS Hierarchy

4.10 Surface Water Disposal Hierarchy

4.10.1 The disposal of surface water should be considered in the following order of priority;

1. Source control, infiltration into source, evapotranspiration,
2. Discharge to a water course or the sea
3. Discharge to a surface water sewer
4. Discharge to a combined sewer.

4.10.2 Due to the ground investigation report identifying hydrocarbon contamination within the ground, the use of source control infiltration would be unsuitable as it may cause mobilisation of the contamination, potentially impacting groundwater dependant ecosystems. Additionally, the low permeability recording would impact the speed of infiltration and increase the risk of flooding onsite and to adjacent land.

4.10.3 There is no watercourse within the vicinity of the site, meaning that direct discharge of the surface water drainage is unavailable.

4.10.4 There is a short run of Thames Water surface water sewer in the vicinity of site, which then transitions into a combined sewer. There is no opportunity on this redevelopment to discharge the surface water drainage into a surface water sewer.

4.10.5 Based on the above, priority 4 is deemed the most suitable approach for this substation redevelopment. Surface water will be collected, conveyed and attenuated onsite before discharge to the Thames Water Public Combined Sewer.

4.11 Sustainable Drainage Provisions (SuDs)

4.11.1 In accordance with London Borough of Camden requirements and in line with the Camden Planning Guidance (2019), developers should utilise SuDS on developments where suitable in accordance with CIRIA guidance, unless there are practical reasons for not doing so.

4.11.2 The use of SuDS has been considered early in the design stage, to ensure that a suitable drainage system is developed. SuDS options may be updated or amended once detailed design is underway and further ground conditions and design information is available.

4.11.3 Below is a summary of the typical SuDS measures, which may be suitable for installation within the car park development;

- Permeable / Porous Paving
- Filter Strip or Drain

4.11.4 These techniques are subject to the topography of the site as the storage provided by these techniques is practical when used in steep gradients. The depth of the existing drainage will also dictate the availability to utilise these techniques.

4.11.5 The techniques listed above will be subject to confirmation on site prior to design / construction.

4.12 Proposed Sustainable Drainage Option – Proposed Attenuation and Discharge to Sewers.

4.12.1 The proposed redevelopment will create an area of near 100% impermeable area. The hardstanding is to be installed with a crossfall to the proposed parking bays, where the water can be collected by heavy duty permeable paving with type B stone subbase, to allow cleansing of the runoff and limited attenuation storage. The storage is proposed to be increased by heavy duty cellular crates beneath the permeable paving, which can store the runoff, before it is restricted by a flow control and discharged into the Thames Water public sewer.

4.12.2 As the intrusive investigations have been completed and have shown that infiltration drainage is found to be non-viable, the proposed strategy is to collect, convey and attenuate the surface water runoff before discharging into the Thames Water Public Sewer.

4.12.3 The rates of discharge and point(s) of connection are subject to acceptance and confirmation by London Borough of Camden and Thames Water.

4.12.4 It is noted that to provide a sustainable drainage network and to accommodate the existing ground level constraints, the collector networks will need to convey water to an attenuation storage system with an outfall located to the north-eastern boundary of the site. The levels will fall to linear drainage channels located around the proposed hardstanding, travelling in a northern direction.

4.12.5 It is proposed that permeable paving is incorporated into the design to collect the rainfall with a perforated pipe to convey the water to the attenuation. The use of partial infiltration paving is deemed to be unsuitable in this case based on the ground investigation report, due to a risk of mobilisation of the hydrocarbon contamination into groundwater dependant ecosystems.

4.12.6 Storage within permeable paving extents may be enhanced by using cellular crates underneath to increase the attenuation volume, helping deliver the required attenuation storage within the land parcel as required.

4.12.7 Runoff rates and volumes will be further restricted by flow controls that are incorporated to control runoff prior to discharge to the existing Thames Water Public Sewer to prevent flooding occurring.

4.12.8 A concept surface water drainage arrangement has been developed. This is subject to London Borough of Camden and Lead Local Flood Authority acceptance and approval at planning submission, agreement from UK Power Networks and detailed design stages. This strategy drawing can be found in **Appendix E.**

4.13 Proposed Surface Water Discharge Rates

4.13.1 It is proposed that surface water from the site will be limited to 2l/s, before discharge into the existing Thames Water Public Sewer, subject to agreement from Thames Water and London Borough of Camden.

4.13.2 Given that the existing surface water runoff rate based on the Modified Rationale method is significantly higher (see section 4.4) it is proposed that 2 l/s is approved for the redevelopment of the site as this will provide significant betterment and reduced risk of flooding on and offsite.

5.0 Foul Water Drainage

5.1 Existing Combined Sewerage and Drainage

5.1.1 There is a foul water drainage run located to the east south-east of the site, which discharges to the Thames Water Public Combined Sewer situated within Pratt Street adjacent.

5.1.2 Asset location plans from Thames Water identify existing combined sewers located within Georgiana Street, Royal College Street & Pratt Street.

5.1.3 There are no Thames Water assets located within the extents of the site.

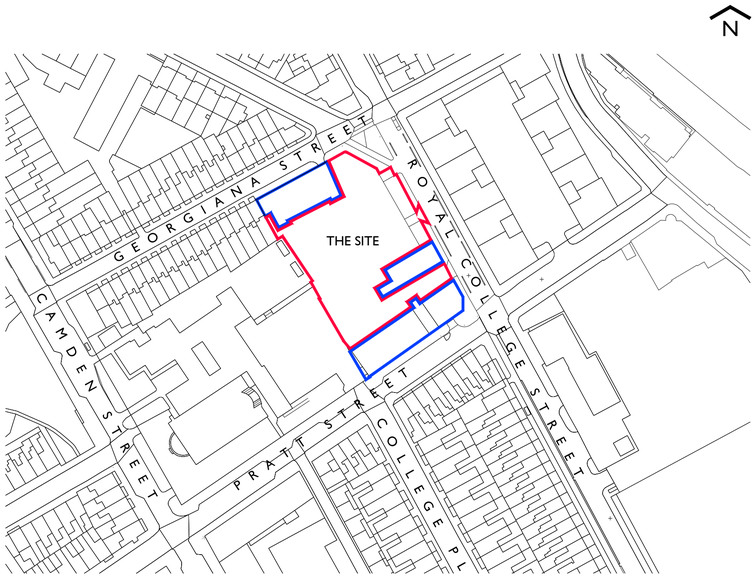
5.1.4 Existing sewer asset maps obtained from Thames Water can be found in **Appendix C**.

5.2 Proposed Foul Water Strategy

5.2.1 There are no proposals for foul water drainage in this redevelopment.

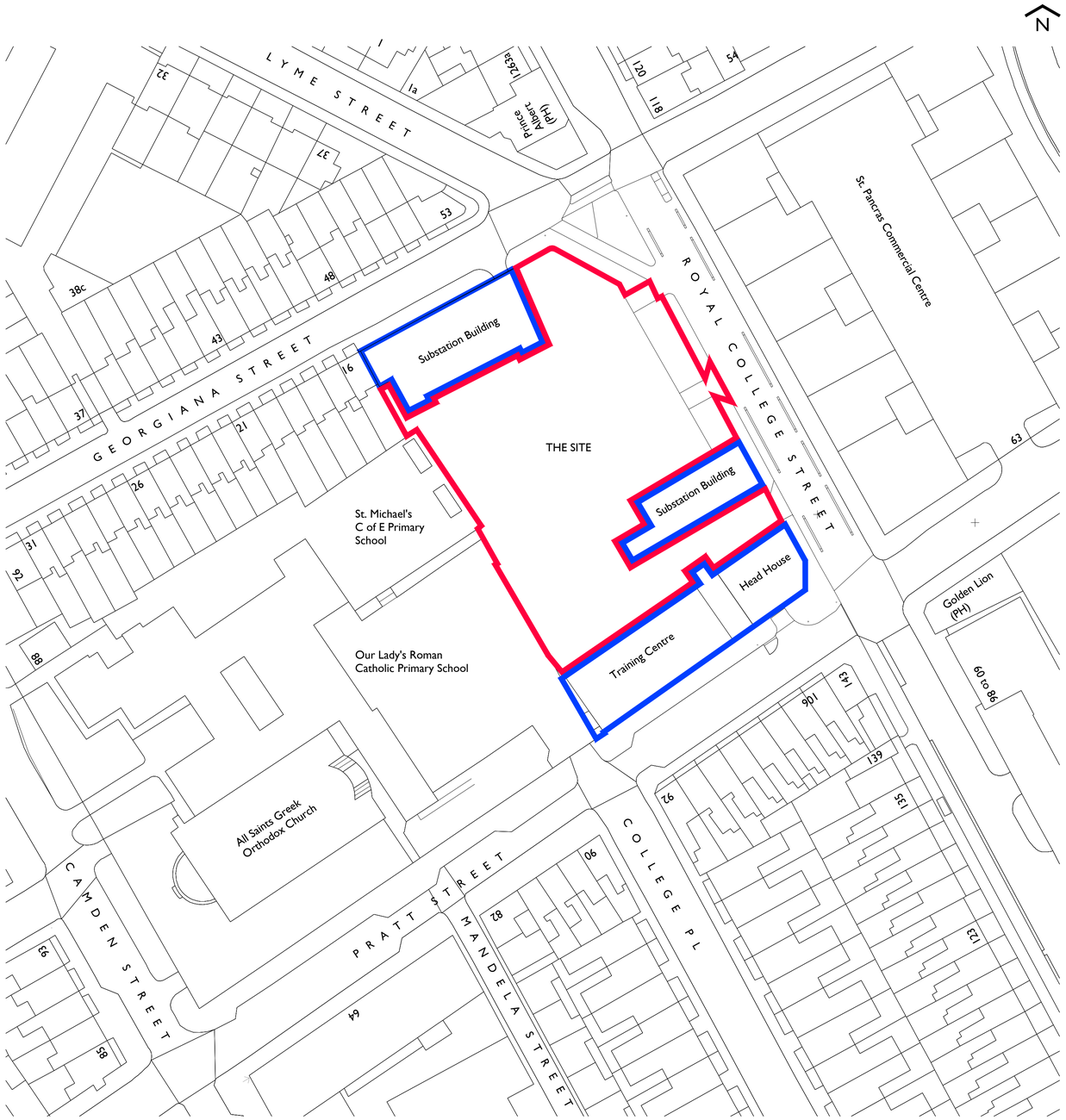
5.2.2 The site will continue to be served by the existing foul water drainage network.

Appendix A – Site Location Plan



SITE LOCATION

scale 1:1250



BLOCK PLAN

scale 1:500

THESE NOTES ARE IMPORTANT

If you are in any doubt about something - ASK

This drawing must be read in conjunction with all necessary architectural, structural, services drawings and scope of works

LEGEND

- Application boundary. Total internal area = 2720m²
- Area owned by client but not in application

Scale Bar 1:500

0 5 10 15 20 25 40

Scale Bar 1:1250

0m 10 20 30 40 50 100

REV.	DESCRIPTION	DATE	DRN.	CHKD.
A	ISSUED FOR PLANNING red line amended & internal area added	21.07.23	RM	TM
*	ISSUED FOR PLANNING	15.06.23	TC	TM

MARKWICK ARCHITECTS
THE OLD DAIRY
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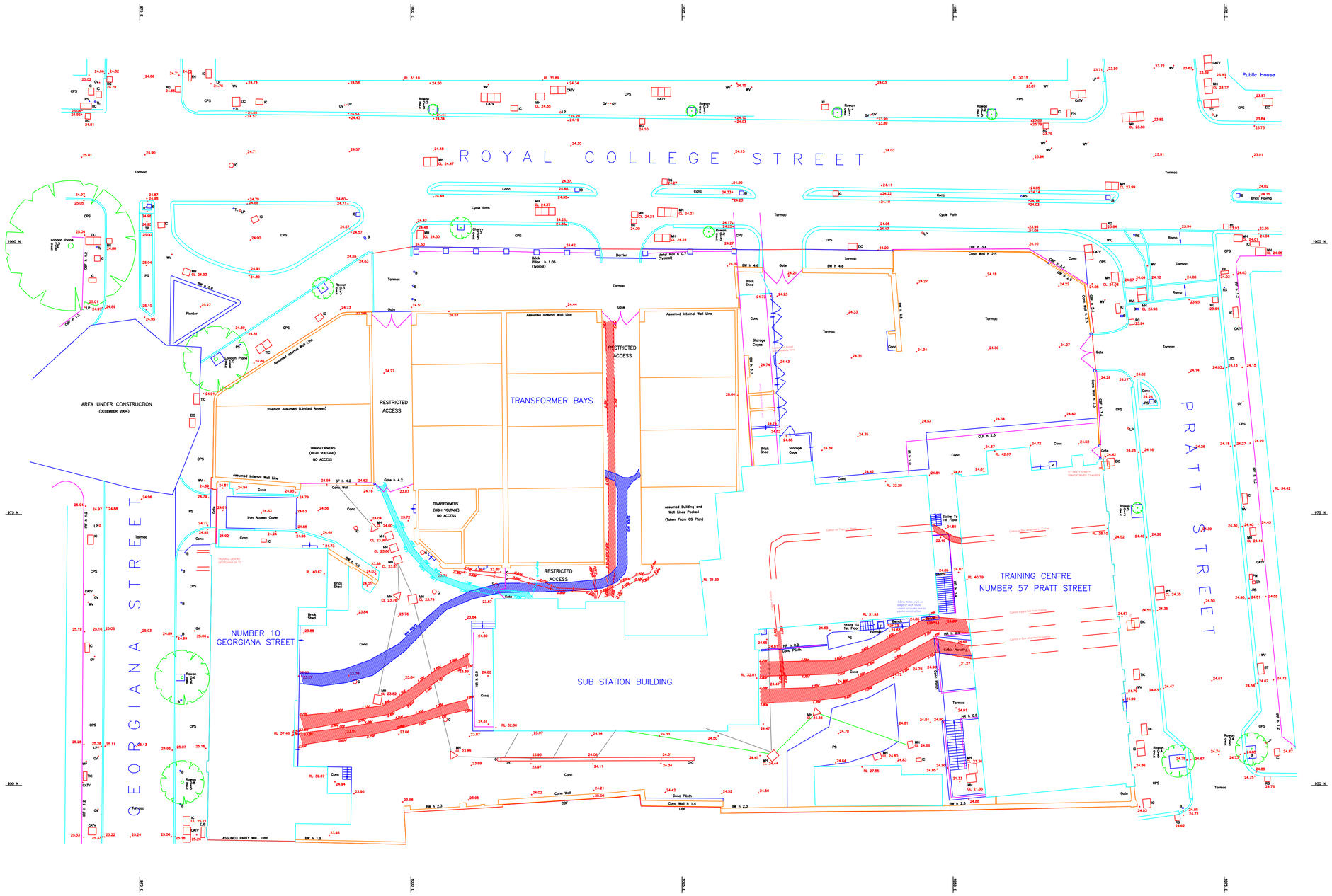
CLIENT
UK POWER NETWORKS

PROJECT
St. Pancras
Existing Transformer Removal

DRAWING TITLE
Site Location & Block Plan

DATE	SCALE
February 2023	as shown @ A1
DRAWING NUMBER	DRAWING REVISION
2209 / P / 650	A
DRAWN BY	CHECKED BY
RM	TM

Appendix B – Topographical Survey



	Fence
d.50m	Depth below surface in metres
500mm	Diameter of Pipe
dist	Depth unobtainable
E	Electricity Cable
E(R)	Assumed route of Electricity Cable
E(R)	Assumed route of Elec Cable (records)
	Band of Electricity Cables
T/F/O/M	BT / Fibre Optic / Mercury Cable
T/F/O/M	Assumed route of BT/FOM
T/F/O/M(R)	Assumed route of BT/FOM (records)
	Band of Communications Cables
CTV	Cable Television Cable
CTV	Assumed route of CTV Cable
CTV(R)	Assumed route of CTV Cable (records)
	Band of Cable Television Cables
W	Water pipe
W	Assumed route of Water pipe
W(R)	Assumed route of Water pipe (records)
G/A	Gas/Air Pipe
G/A	Assumed route of Gas/Air pipe
G(R)	Assumed route of Gas pipe (records)
W&G	Service directly over another
O	Oil Pipe
O	Assumed route of Oil pipe
O(R)	Assumed route of Oil pipe (records)
	Route of Drainage (flow) SWD Surface Water Drainage FWD Foul Water Drainage CD Combined Sewer System
	Assumed route of Drainage (flow)
	Unknown service
	Assumed route of unknown service
	Proposed Drill Route
	Proposed Mole Route
GPR	Service found by Ground Probing Radar

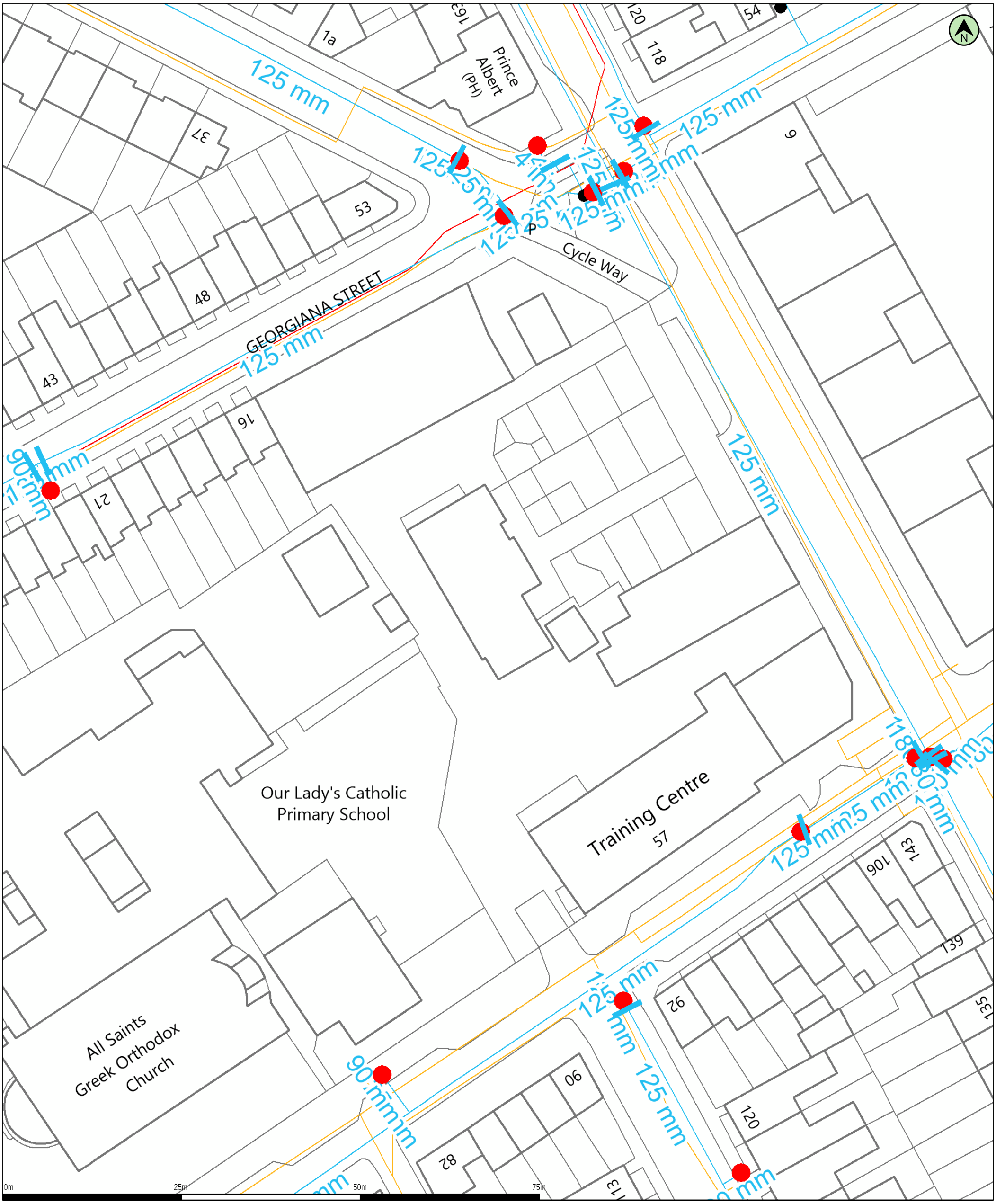
EDF ENERGY	client: CORPORATE BRANCH	notes: -	site: LONDON . OFFICE PREMISES AT CAMDEN TOWN, NW1	project: -	drawing title: SITE SURVEY

revisions

date:	scale:	drawn:
SEPT 2008	1:200@A1	PCA / EPS

rev. -

Appendix C – Thames Water – Asset Sewer Maps



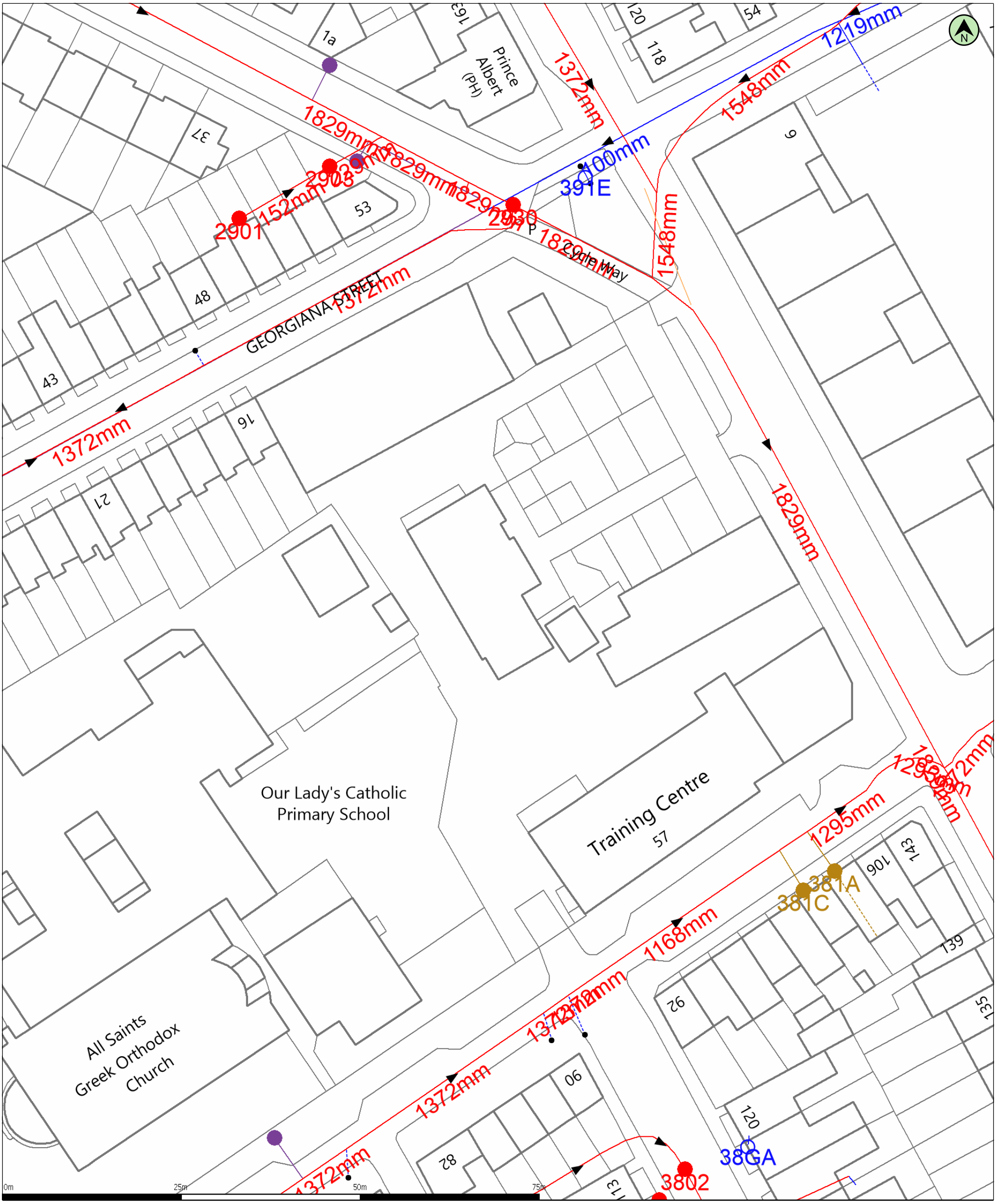
Scale: 1:500 | Date: 03/10/22 | Clean Water Plan A3

Data updated: 05/09/22 | Map Centre: 529297,183912 | Our Ref: 966514 - 1 | Powered by digdat

Water Main	Meter
Private Water	Valve
Proposed Water	Hydrant
Trunk Main	End Item
Proposed Trunk Main	
Abandoned Asset	

scott.watkins@ukpowernetworks.co.uk

1



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Data updated: 05/09/22 | Map Centre: 529297,183912 | Our Ref: 966514 - 2 | Powered by digdat

Foul Sewer	Foul Manhole
Surface Sewer	Surface Manhole
Combined Sewer	Combined Manhole
Abandoned Sewer	Abandoned Manhole
Pressure Main	Other Manhole
Private Asset (Colour dependant on effluent type)	End Item
Proposed Asset (Colour dependant on effluent type)	S104 Boundary

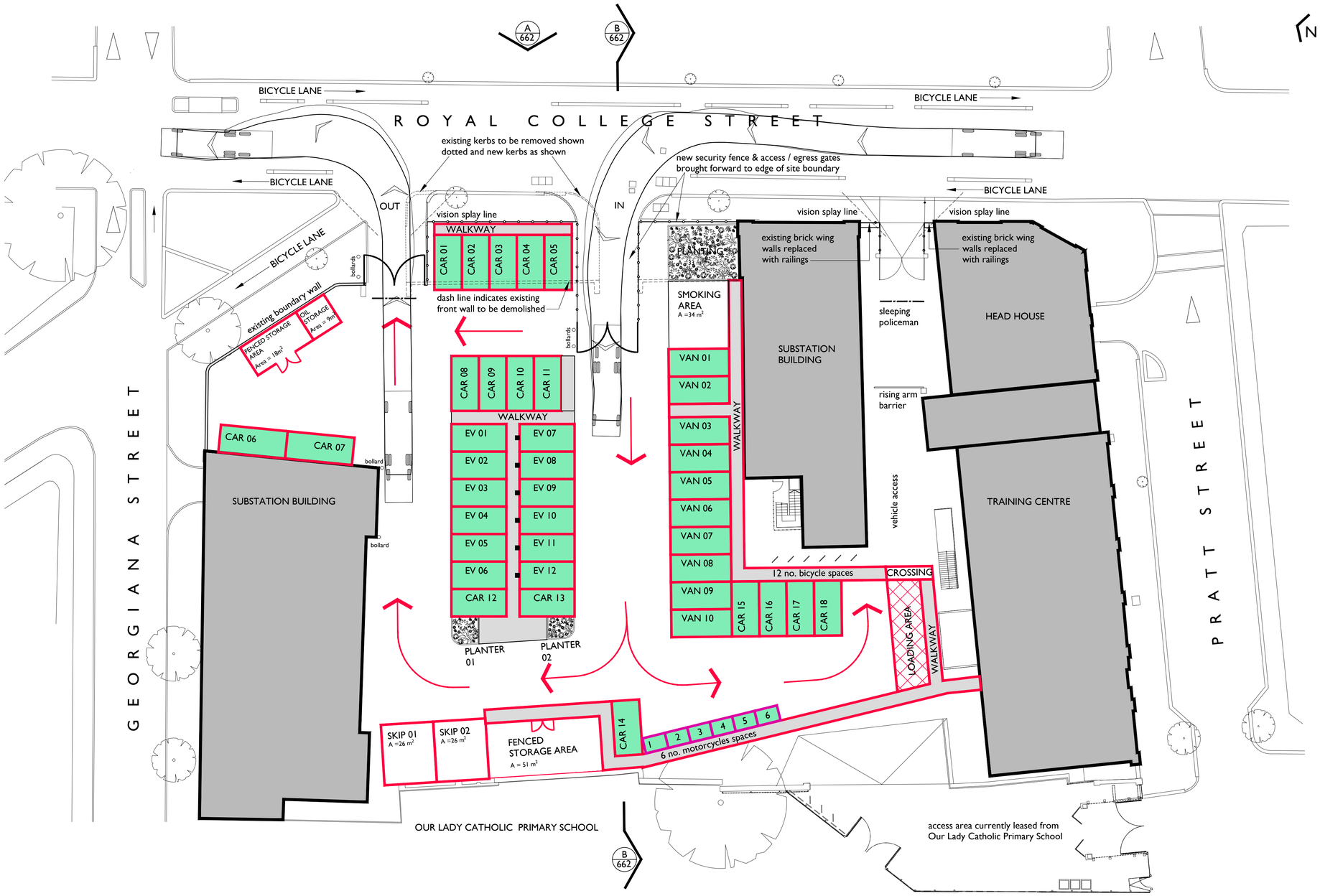
scott.watkins@ukpowernetworks.co.uk

1

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
2803	A	-	-	-
2901	C	-	-	-
2903	C	-	-	-
2928	A	25.09	20.58	4.51
2929	Z	25.02	22.03	2.99
2930	C	24.89	18.08	6.81
3802	C	-	-	-
381A	F	-	-	-
381C	F	-	-	-
38DI	C	-	-	-
38GA	S	-	-	-
391E	S	-	-	3

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Appendix D – Development Masterplan



THESE NOTES ARE IMPORTANT

If you are in any doubt about something - ASK

This drawing must be read in conjunction with all necessary architectural, structural, services drawings and scope of works

Scale Bar 1:200

0 1 2 3 4 5 10 15

PARKING PROVISION

18 Cars Spaces - 5000mm x 2500mm

12 EV Spaces - 5000mm x 2500mm

10 Vans Spaces - 5500mm x 2500mm

2 Skip Spaces - 5500mm x 4762mm

6 Motorcycle Spaces - 2100mm x 1400mm

12 Bicycle spaces - 6000mm x 2000mm

car parking spaces with permeable paving shown thus

motorcycle parking spaces with permeable paving shown thus

PENDING 05.12.23 - TC

REV.	DESCRIPTION	DATE	DRN.	CHKD.
C	ISSUED FOR PLANNING 'in' gate repositioned and associated fence amended. 'out' gate - existing kerb repositioned and associated fence amended. 2no. car parking bays relocated.	xxxx.23	TC	TM
B	ISSUED FOR PLANNING bicycle and motorcycle bays amended	21.07.23	RM	TM
A	ISSUED FOR PLANNING bicycle and motorcycle bays added	30.06.23	TC	TM
*	ISSUED FOR PLANNING	15.06.23	TC	TM

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CLIENT
UK POWER NETWORKS

PROJECT
St. Pancras
Existing Transformer Removal

DRAWING TITLE
Proposed Site Plan

DATE	SCALE
February 2023	1:200 @ A1
DRAWING NUMBER	DRAWING REVISION
2209 / P / 661	C
DRAWN BY	CHECKED BY
RM	TM

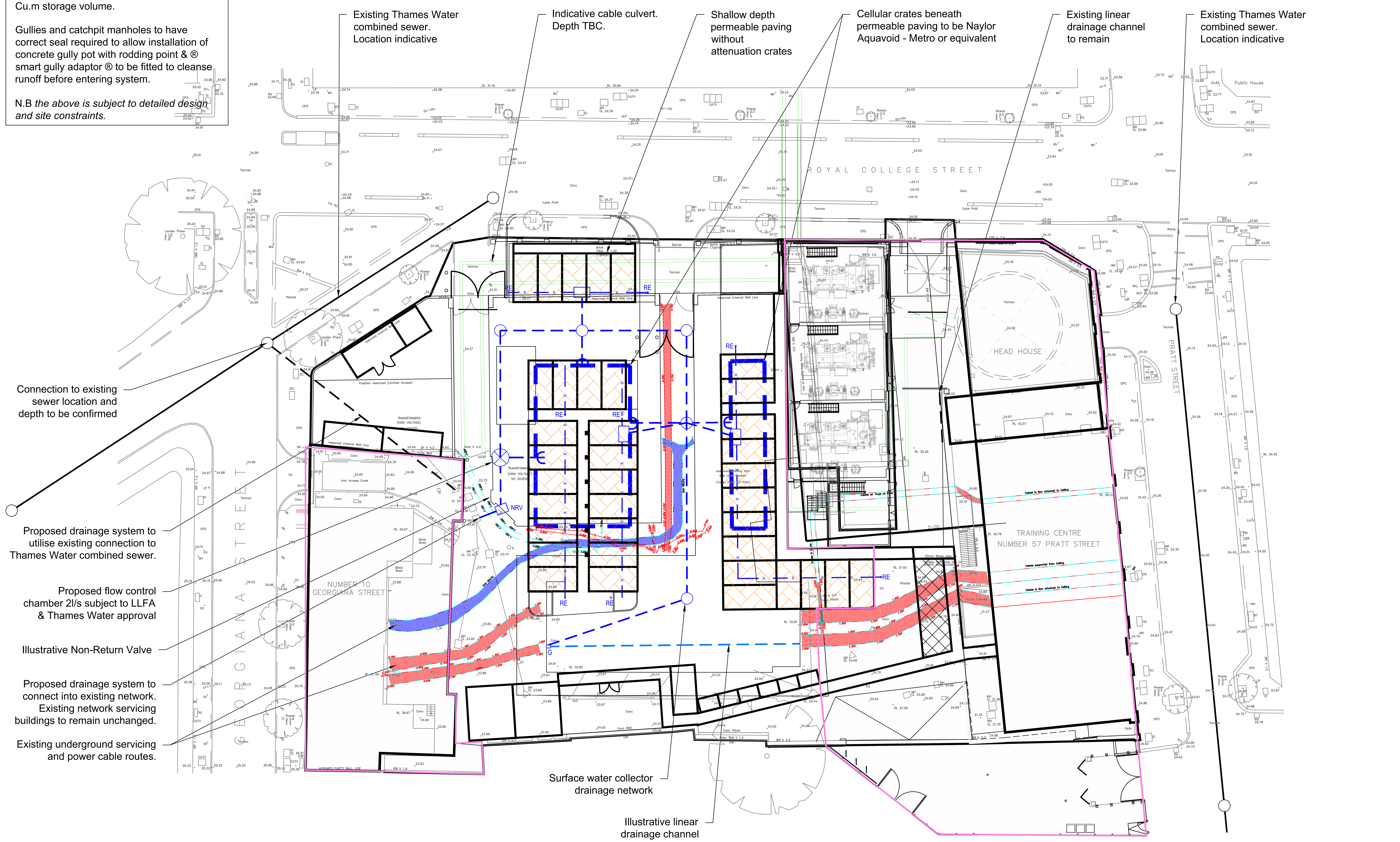
Appendix E – Concept SW Drainage Strategy

Design has considered storage for 100yr +40% climate change . Flow restricted to 2L/s

Indicative cellular crates to provide Circa 170 Cu.m storage volume.
Indicative porous paving to provide circa 67 Cu.m storage volume.

Gullies and catchpit manholes to have correct seal required to allow installation of concrete gully pot with rodding point & ® smart gully adaptor ® to be fitted to cleanse runoff before entering system.

N.B *the above is subject to detailed design and site constraints.*



GENERAL NOTES

1. All Clancy Consulting drawings are to be read in conjunction with all other relevant drawings and specifications. Should there be any conflict between the details indicated on this drawing and those indicated on other drawings, Clancy Consulting should be informed prior to construction.
2. Do not scale from any Clancy drawing, in either paper or digital form. use written dimensions only. all dimensions and levels are in metres unless otherwise stated.
3. Until technical approval has been obtained from the relevant authorities, it shall be understood that all drawings issued are preliminary and not for construction.
4. All levels to be confirmed on site prior to construction, following full topographical survey, drainage level survey information and current existing services plans and maps.
5. Any discrepancies must be reported to Clancy Consulting prior to the commencement or continuance of any further works.

CONSTRUCTION DESIGN & MANAGEMENT NOTES

1. CCL are project 'designers' as defined in the CDM regulations.
2. The contractor shall plan and implement his temporary support and building methodology so as to ensure the permanent works are built as designed and detailed.
3. CCL have assumed a competent and experienced contractor will be employed.
4. Party wall awards to be submitted by the contract administrator to the relevant adjoining properties. The contractor is to comply with the party wall award requirements.
5. The contractor is responsible for verifying all site levels and setting out dimensions, including 'as built' positions of temporary works, before commencing the works. The contractor must carry out an exact site survey to confirm all final levels and setting out. Any discrepancies that may exist between drawings and any other related document should be notified to the contract administrator immediately.
6. All work to be carried out to the satisfaction of the contract administrator.
7. The contractor is advised to visit the site to satisfy himself regarding the practicability of the works.

KEY

- Indicative Surface Water Pipe
- Indicative Surface Water Manhole
- Indicative Permeable Paving
- Indicative Attenuation Crates
- Indicative Manifold Arrangement
- Indicative Flow Control Chamber
- Indicative Existing Thames Water Combined Sewer
- Indicative Existing Thames Water Combined Manhole
- Indicative Cable Culvert
- Indicative Rodding Eye
- Indicative Gully
- Indicative Non-Return Valve
- Indicative Linear Drainage Channel
- Indicative Perforated Pipe
- Existing underground servicing and power cable routes.
- Existing underground servicing and power cable routes.
- Area of site to remain as existing

Rev	Date	Description	By	Check	App.
P3	24/04/24	Updated with Hydraulic Simulations	JP	CAM	MLC
P2	18/04/24	Drainage Strategy Amended	JP	CAM	MLC
P1	25/05/23	Initial Issue	JP	CAM	MLC

Client: UK Power Networks

Project: St Pancras Substation
Camden
London NW1 0DP

Office: Leeds

Discipline: Civil Engineering

Title: Concept Surface Water Drainage Strategy

Scale @ A1: 1:200

Status: Preliminary

clancy consulting

www.clancy.co.uk

Originator	Job Number	Discipline	Building/Zone
CCL	21/0644	CE	ALL
Type	**Level**	**Drawing No.**	**Revision**
DET	EXT	SK1000	P3

Birmingham 0121 200 7800 . Glasgow 0141 222 1720 . Liverpool 0151 227 5300 . London 020 3077 0970 . Manchester 0161 613 6000 . Newcastle 0191 221 0702 . Norwich 01603 305190 . Prestwick 01292 475375 . Reading 0118 941 7888

Appendix G – Concept SW Calculations

Greenfield Runoff Rates