WEBB YATES ENGINEERS

Structural Impact Assessment

J3841 75-81 George Street

Ref: J3841-S-PL-0001

Revision: 01

Status: S9

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DOCUMENT CONTROL

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Reviewer:	R.A.M	**Signature:**	Rosie Mounsey Digitally signed by Rosie Mounsey DN: DC=LOCAL, DC=WEBBYATES, OU=Employees, OU=LON, CN=Rosie Mounsey, E=rosie.mounsey@webbyates.com Reason: I have reviewed this document Date: 2019-06-18 16:41:46
Approver:	M.D	**Signature**	Mark Day Digitally signed by Mark Day DN: DC=LOCAL, DC=WEBBYATES, OU=Employees, OU=LON, CN=Mark Day, E=Mark.Day@webbyates.com Reason: I am approving this document Date: 2019-06-18 16:45:52

REVISION HISTORY

Date	Status	Revision
10.06.2019	S0	00
18.06.2019	S9	01

1. INTRODUCTION

Webb Yates Engineers have been appointed by Canadian & Arcadia Limited to undertake the Structural and Civil design of refurbishment works to 75-81 George Street, Richmond TW9 1HA. As part of the planning requirements of the London Borough of Richmond upon Thames a Structural Impact Assessment has been prepared and presented in this report.

This report should be read in conjunction with all relevant drawings and documents.

2. DESK STUDY

2.1. Site Description

The site is located on the south side of the River Thames at the corner of King Street and George Street in Richmond, South West London. George street, which forms part of Richmond's high street, hosts a mixture of retail and commercial buildings that are typically three to four stories in height.

The first recorded building on the site was a Drapery store at 80 George Street, built in 1795. As the trade grew, numbers 75, 76, 77, 78 and 79 George Street were also incorporated in to the store. In 1957 a subsidiary of House of Fraser ltd. bought the store and expanded into neighbouring buildings including the Queens' Head Hotel which resided at number 81. The store was badly damaged in 1962 and eventually demolished in 1968. The building which currently occupies the site was constructed in 1969 by House of Fraser and operated as a department store. The two basements on the site were redeveloped in 1975 to convert the lower ground floor to a sales area, whilst at the same time the ground floor was completely refurbished. The building has remained as a department store until the present day. The proposed scheme is to repurpose the 1st, 2nd and 3rd floor as office space and create an additional 4th storey which will also be used as offices.

Figure 2.1: Site Location.

2.2. Geology

Geological maps of the area show that superficial deposits in the area are likely to be either the Kempton Park Gravel member or the Taplow Gravel member, both of which are sedimentary deposits.

The entire site is underlain by the London Clay Formation. Borehole records local to the site indicate that the top of the clay layer is approximately 5m below ground level. Due to the proximity of the river the water table is expected to be relatively close to the surface and is recorded as shallow as 3m b.g.l in some boreholes.

2.3. Rivers and Watercourses

The site is approximately 200m North West of the River Thames. A review of lost and hidden water sources reveal that the site is remote from any lost or underground rivers.

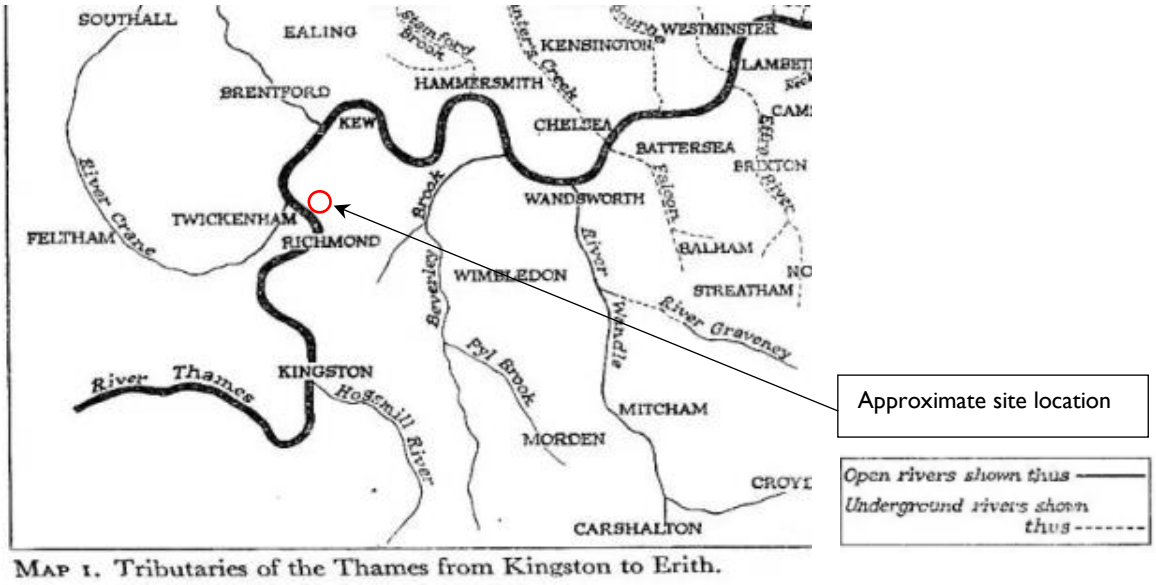


Figure 2.2: Nearby Water Sources to the site.

2.4. Underground infrastructure

2.4.1. Services and Utilities

Utility searches have been undertaken by DSA Engineering and show that below the roads surrounding the site there are mains gas and water supply. No mains supply passes below the building, however connections are made into the site. Refer to appendix A for a full utility asset report. In addition, asset searches reveal the building is surrounded on all four sides by a trunk foul sewer and a trunk surface water sewer. At this point in time the size and depth of these sewers is unknown, existing connections to these sewers are to be confirmed by future investigation.

2.4.2. LUL property

Maps reveal that the nearest section of LUL tunnels are approximately 500m to the North West of the site.

2.5. Adjacent Basements

The Princes Head public house, which neighbours the property, is known to have a single-story basement although the exact depth is unknown. The believed extent of the adjacent basement is shown below, no evidence has been found of other basements adjacent to the property.

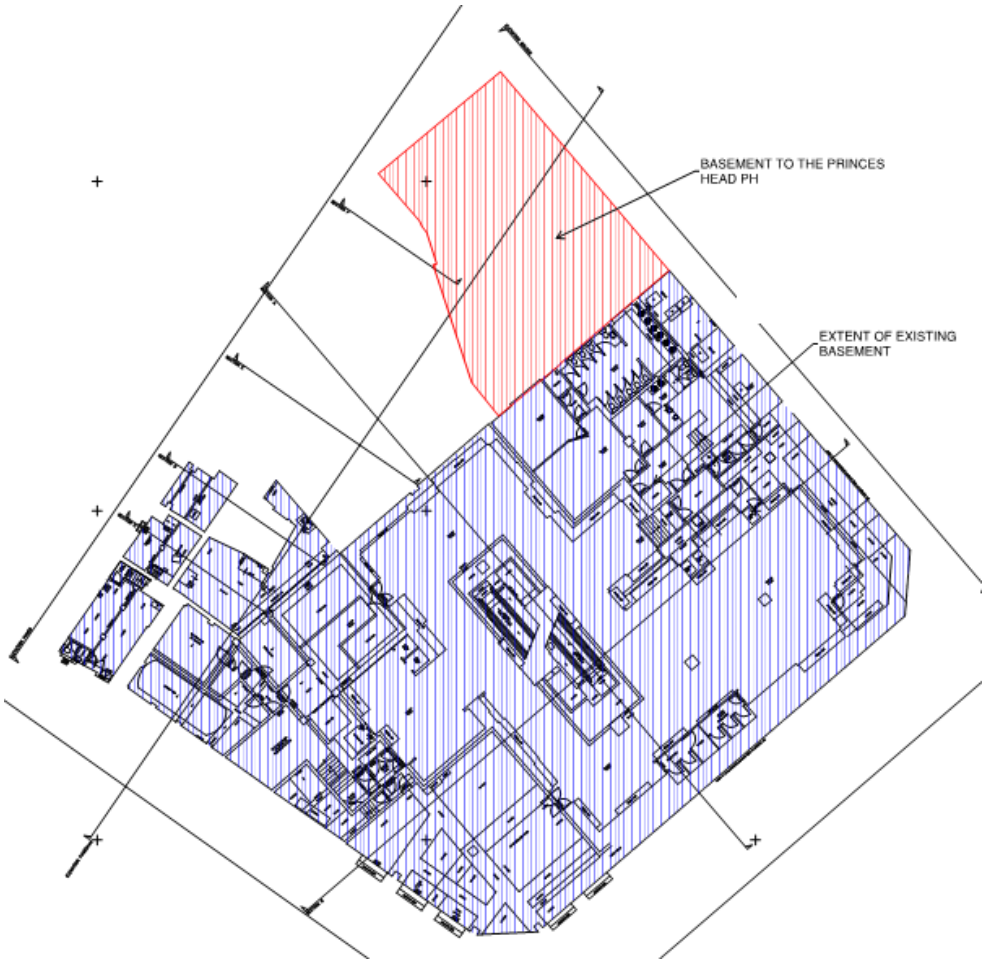


Figure 2.3: Extent of the existing basement and the adjacent basement to the Princes Head PH.

3. EXISTING STRUCTURE

The existing in-situ concrete frame structure is four storeys in height with a single storey basement and is set out on a 7.5m x 7.5m grid. A measured survey and initial opening up works show that typically floors are two-way spanning 200mm thick slabs spanning on to wide drop beams. An escalator void in the centre of the building runs from basement through to third floor. Columns are typically 600mm sq. or 450mm sq depending on the floor, except for the columns between the escalators which are 500x350 in size.

At present, the existing foundation scheme is unknown but based on a review of the existing loads and ground information it is assumed that the building is supported by either piles or a raft slab. At basement level, towards the rear of the property, there is raised floor consisting of deep mass filled concrete. It is not clear if this is a structural slab or an infill. Stability of the building is assumed to be provided by walls around the existing stair and lift cores. There is a plant room located in the basement to the north west of the property.

The façade appears to be formed by a combination of concrete walls and columns around the perimeter. It is assumed beams at first floor level span between concrete columns at ground floor level which align with the primary structural gridlines, providing support for the façade above. A canopy cantilevers out from the façade at first floor level, but it is unclear how this is supported.

A single storey roof structure at the rear of the building is formed by a lightweight metal deck supported on structural steelwork which is in turn supported on loadbearing masonry around the perimeter.

The surveys carried out to date haven't indicated any signs of distress or damage to the existing structure.

Survey drawings of the existing building and an opening up report can be found in appendices B and C respectively.

4. PROPOSED STRUCTURAL CHANGES

The structural alterations of the proposed development are as follows:

- Construction of an additional storey formed of a steel frame structure with a lightweight metal deck and concrete roof.
- Structural infill of escalator voids.
- New atrium formed at the new entrance to Golden Court.
- Relocation of exiting stair core.
- New lift cores from basement to fourth floor level.
- New cycle lift from basement to ground floor level.
- New atrium area to replace single storey roof structure at the rear of the building.

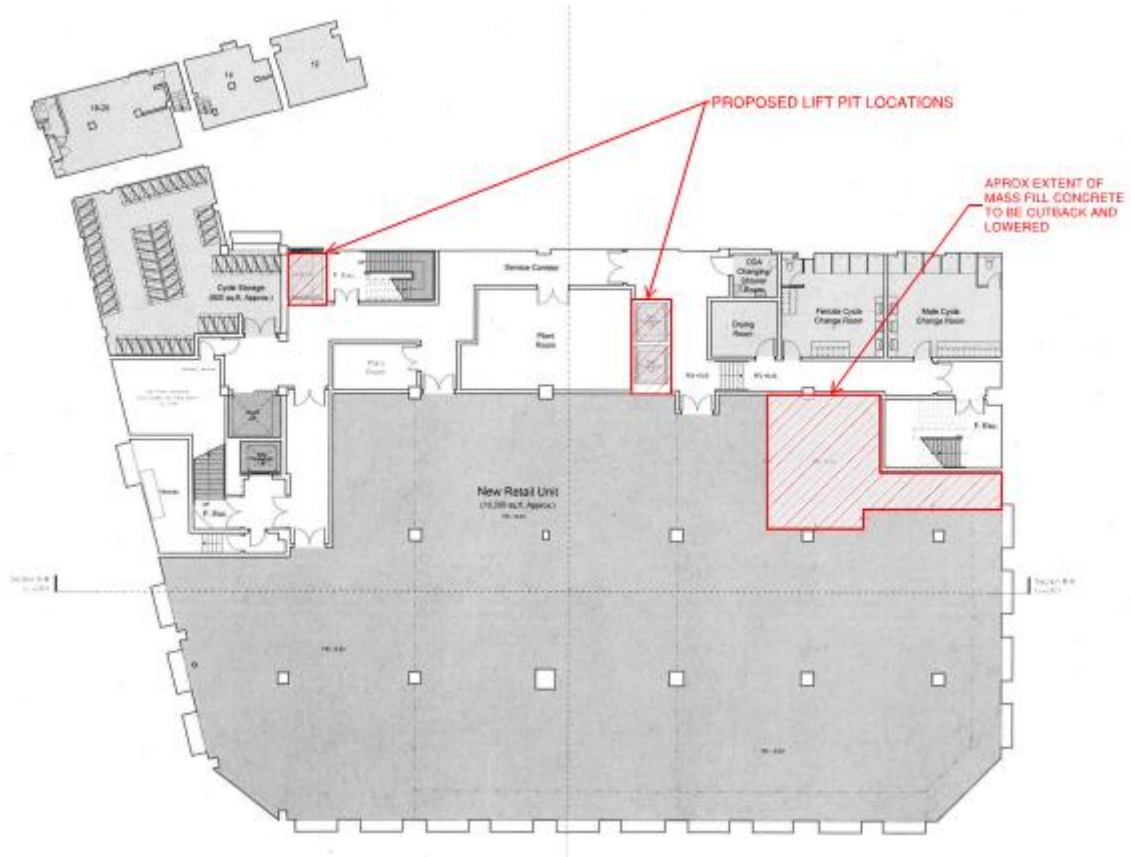


Figure 4.1: Proposed basement plan - Location of new lift pits and area of infill to be cutback and lowered.

A comparison of assumed existing and new design loads has demonstrated that the increase in foundation loads is minimal, approximately 5%. As such, no change to the existing foundation scheme is currently proposed.

There are no proposals to extend or lower the existing basement. However, to accommodate the new lift cores two new lift pits are proposed, the locations of the proposed lift pits are shown below. As part of the design development the cycle lift which is shown in the North West corner of the building has been brought away from the wall, eliminating the need for changes to the retaining wall.

All new lift pits will be cast in reinforced concrete locally within the basement. Exact dimensions are to be confirmed but they are expected to be approximately 1750mm deep. Structural options for the lift pits, depending on whether the existing foundation is a raft or piled, are shown in Appendix D. Due to the proximity of the new lift pits to existing columns, modifications to the existing foundations may be required locally at these locations.

To create more useable floor space at basement level a small section of the raised mass concrete infill at the rear of the building is to be cut back and lowered level with the typical slab level.

No changes are proposed to the buildings on Paved Court and are to remain as retail units.

5. IMPACT ASSESSMENT

5.1. Structural Impact

Generally, the existing load path of the building is retained with only localised alterations to the structure. Due to the change of use of some floors of the building (retail to office) there is little increase in overall foundation loads and no changes to the current foundation scheme are proposed.

The work to the basement is limited to the new lift pits, which are localised to the lift cores and remote from the adjacent basement so it is expected that the proposed scheme will have a negligible impact on both the existing structure or adjacent basement.

The mass concrete infill that is to be cut back and lowered is suspected to be a non-structural element, used to raise internal floor levels. As removing this infill does not lower or increase the extent of the basement it is considered that this will also have no impact on the existing structure or adjacent buildings.

5.2. Underpinning

No underpinning of foundations of any party walls is proposed as part of the current scheme. As no walls are impacted by the proposals a site investigation is not considered necessary.

5.3. Existing Trees and Infrastructure

The overall footprint of the basement has not increased and therefore the building won't encroach on to root protection areas. The desk study has shown that the planned works do not clash with any underground assets.

5.4. Flooding

The site is within Flood Zone 1 and as such, the only source of flooding is from residual surface water. Since there is no increase in the footprint of the building there will be no increase in impermeable areas meaning there is no impact on the flood risk.

5.5. Impact on Ground Water Flow

Whilst the water table is likely to be high as the site is adjacent to the river, the changes to the basement are localised and minor so it is therefore assumed that there will be no impact on groundwater flow.

5.6. Ground Movements and Damage Assessment

The changes to the basement are minor and are expected to not cause any significant additional ground movement, as such damage to adjacent structures is not predicted.

5.7. Construction Sequence

The proposed structural alterations are in discrete locations and generally the existing load path is retained. It is therefore demonstrated that, with good practices in place, that the proposed scheme poses no significant risk to the existing structure or neighbouring properties.

6. CONCLUSION

This report provides a summary of the history of the site, description of the existing structure, the proposed structural modifications and their impact.

It has been demonstrated that the proposed scheme poses no significant risk to the integrity of the current structure or neighbouring properties. It also found that the proposed scheme will have no adverse effects on the surface water or ground water regimes.

APPENDIX A – STRUCTURAL SKETCHES

150mm THK RC SLAB ON STEEL DECK, COMFLOR 60.

100mm STRUCTURAL ZZ/ZR ROOFDEK D100

B1 WESTOK 550x152x67 COMPOSITE CB. 350mm CELLS @ 525mm C/C

B2 UB 406x178x67

B3 WESTOK 524x178x54 CB

B4 FABRICATED TAPERED BEAM 550-400x127.

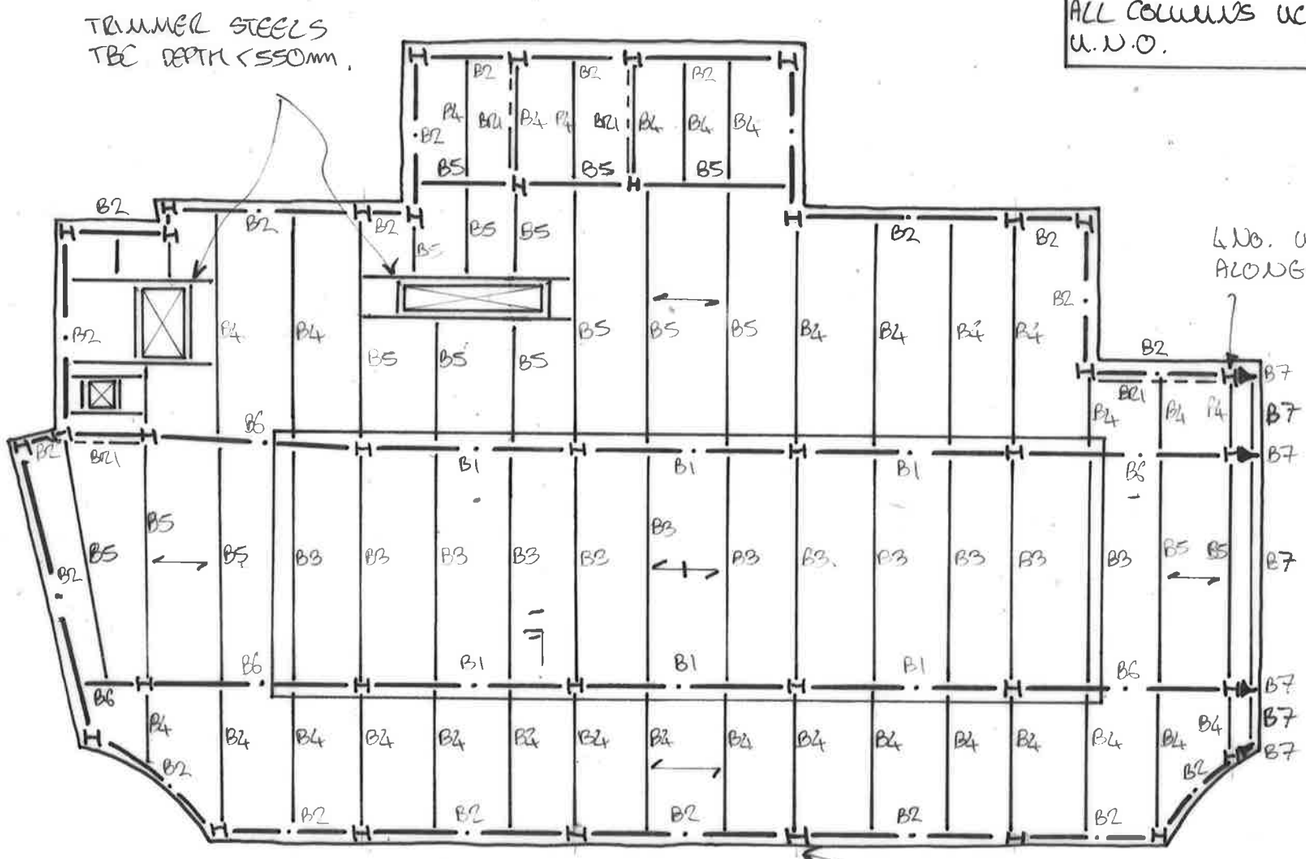
B5 WESTOK 540x140x39 CB 350mm CELLS @ 525mm C/C.

B6 WESTOK 550x140x39 CB 350mm CELLS @ 525mm C/C

B7 UB 254x146x31

BC1 10x100 FLAT CROSS BRACING

ALL COLUMNS UC 203x203 U.N.O.



ROOF LEVEL

▶ DENOTES MOMENT CONNECTION.

NOTES:

- GREEN ROOF ALLOWANCE = 1kN/m²

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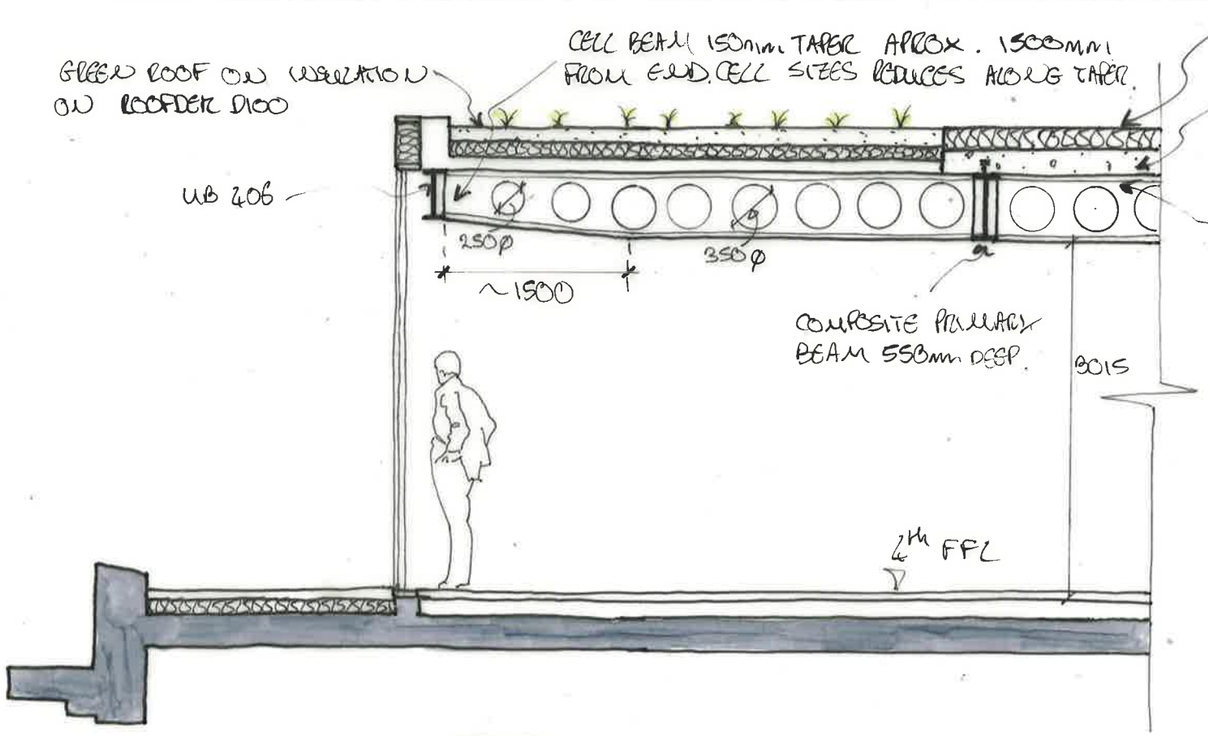
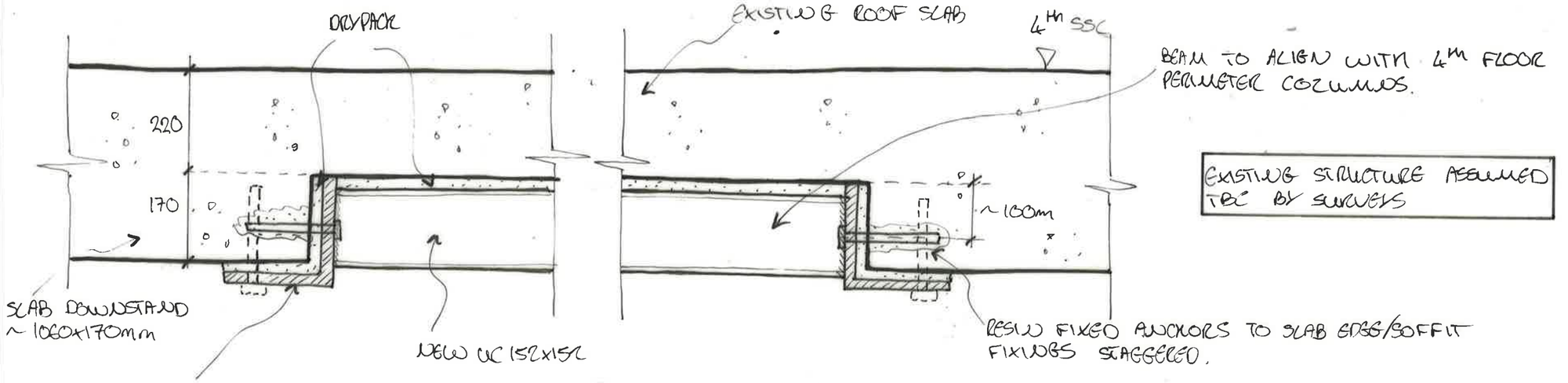
Drawing No			
33841-S-SK-0009			
Project		Status	
GEORGE STREET		S2	
Drawing Title			
ROOF LEVEL SCHEME DESIGN			
Date	Drawn by	Scale	Revision
MAY '19	D.COLE	NTS	00.



SECTION 1-1



ROOF SLAB STRENGTHENING

Drawing No. 33841-S-SK-0010			Status S2
Project GEORGE STREET			Job number 33841
Drawing Title ROOF SCHEME - DETAILS			
Date MAY '19	Drawn by O. COLE	Scale NTS	Revision 00

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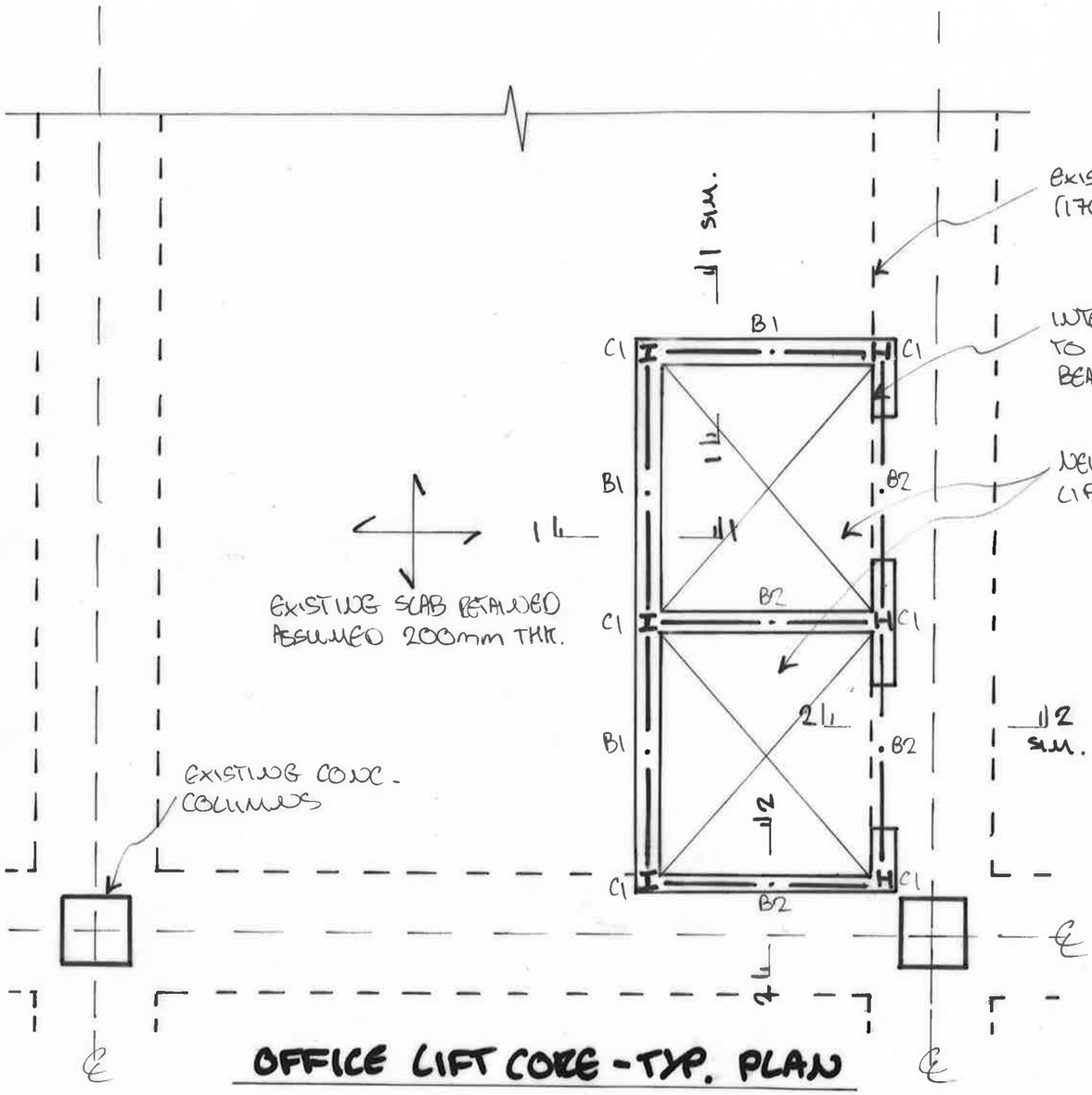
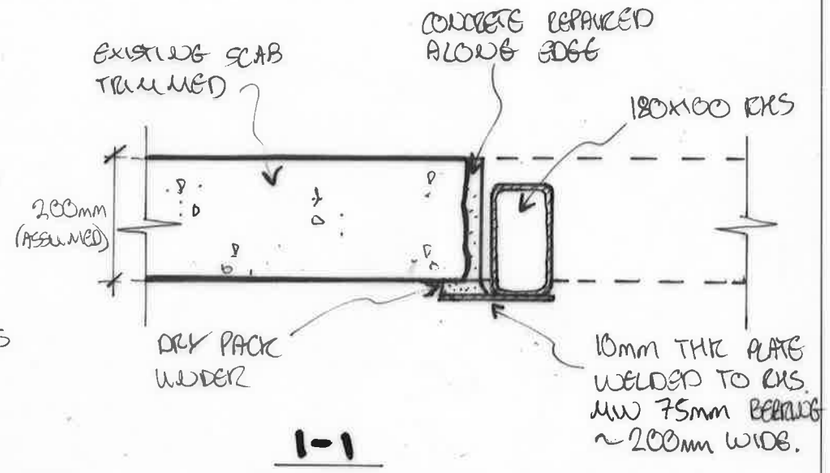


OFFICE LIFT CORE - TYP. PLAN



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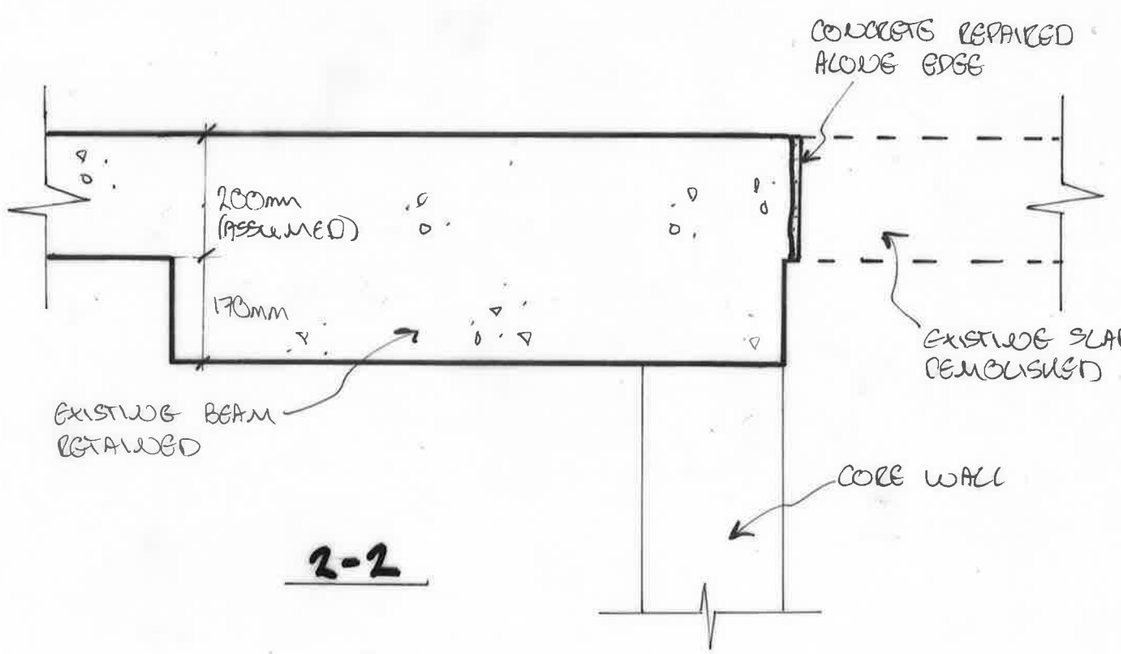

2-2

C1: UC 203×203×46 BASEMENT → GF
UC 152×152×37 GF → 3rd FLOOR.

B2: UB 203×133×30

B1: 100×100×6.3 RHS

Drawing No. J3841-S-SK-0012			Status S2
Project GEORGE STREET			Job number J3841
Drawing Title OFFICE LIFT CORE			
Date MAY '19	Drawn by D.COLE	Scale NTS	Revision 00

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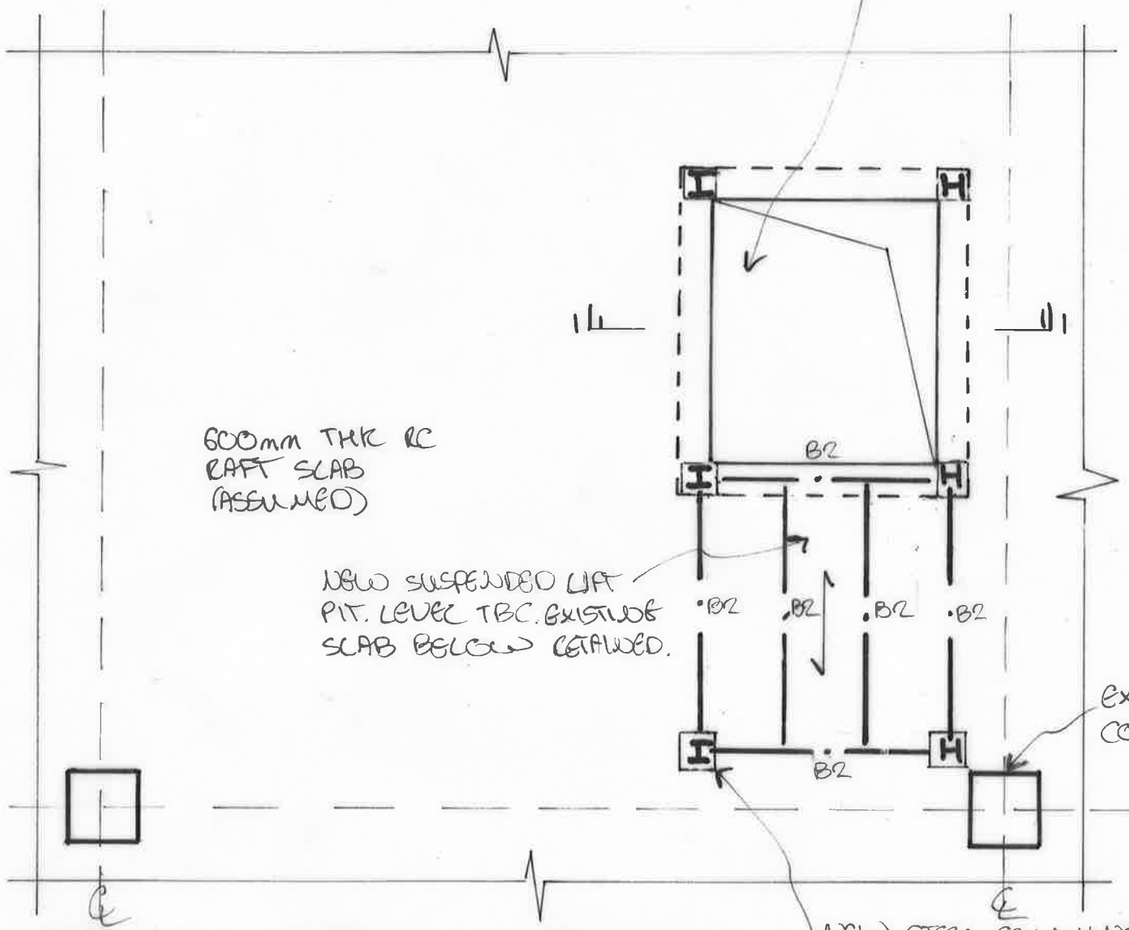
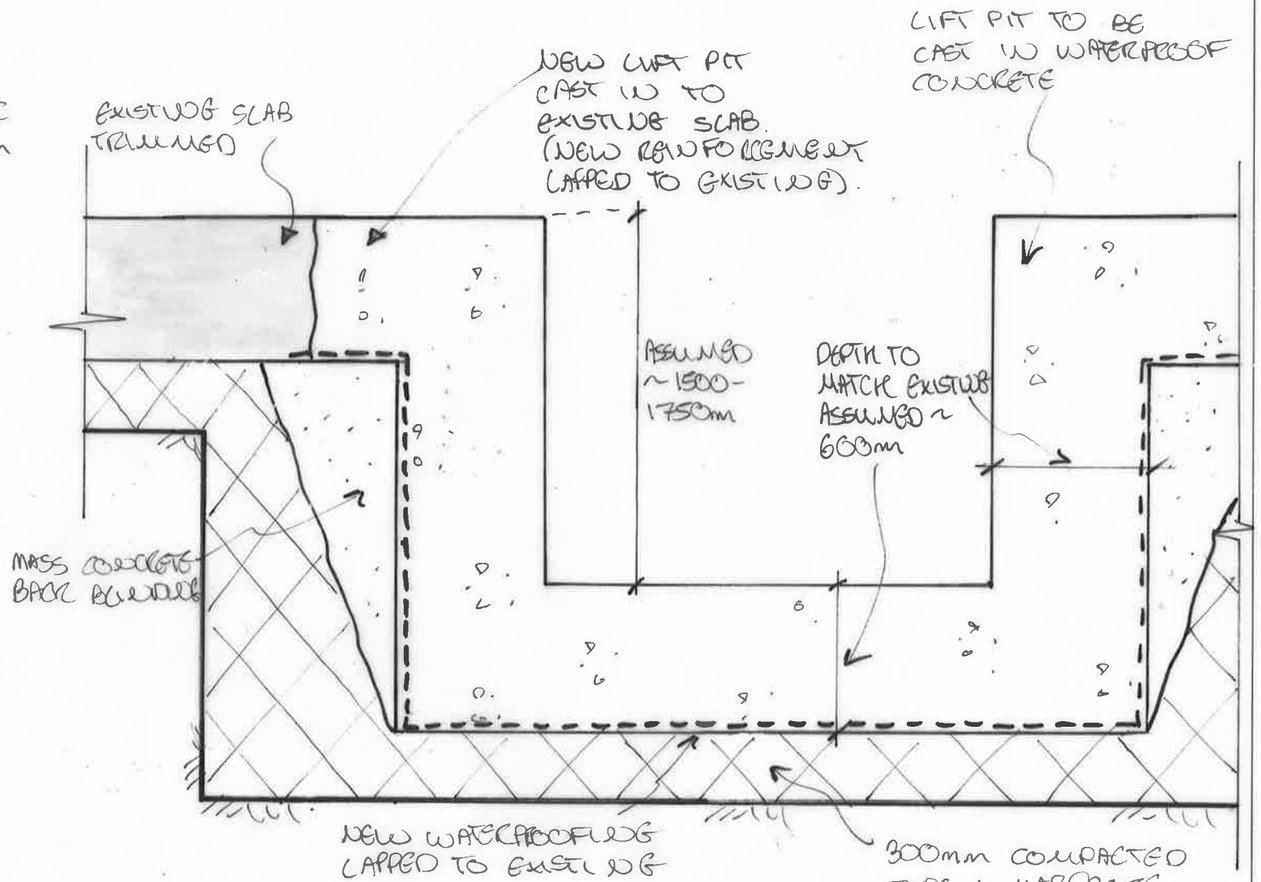
B2 UB 203x133x30

NEW 150mm THK RC SUSPENDED SLAB.



NEW FOUNDATION OPTION -RAFT SLAB

* SEE SK-0012 FOR COLUMN DIMENSIONS



1-1

NOTES:

- FOUNDATION SYSTEM AND SLAB DEPTH ASSUMED TBC FOLLOWING OPENING UP.
- RAFT SLAB ASSUMED TO HAVE SUFFICIENT CAPACITY FOR NEW COLUMN LOADS.

Drawing No. J3841-S-SK-0013			Status S2
Project GEORGE STREET			Job number J3841
Drawing Title NEW FOUNDATIONS-RAFT			
Date MAY'19	Drawn by D.COLE	Scale NTS	Revision 00

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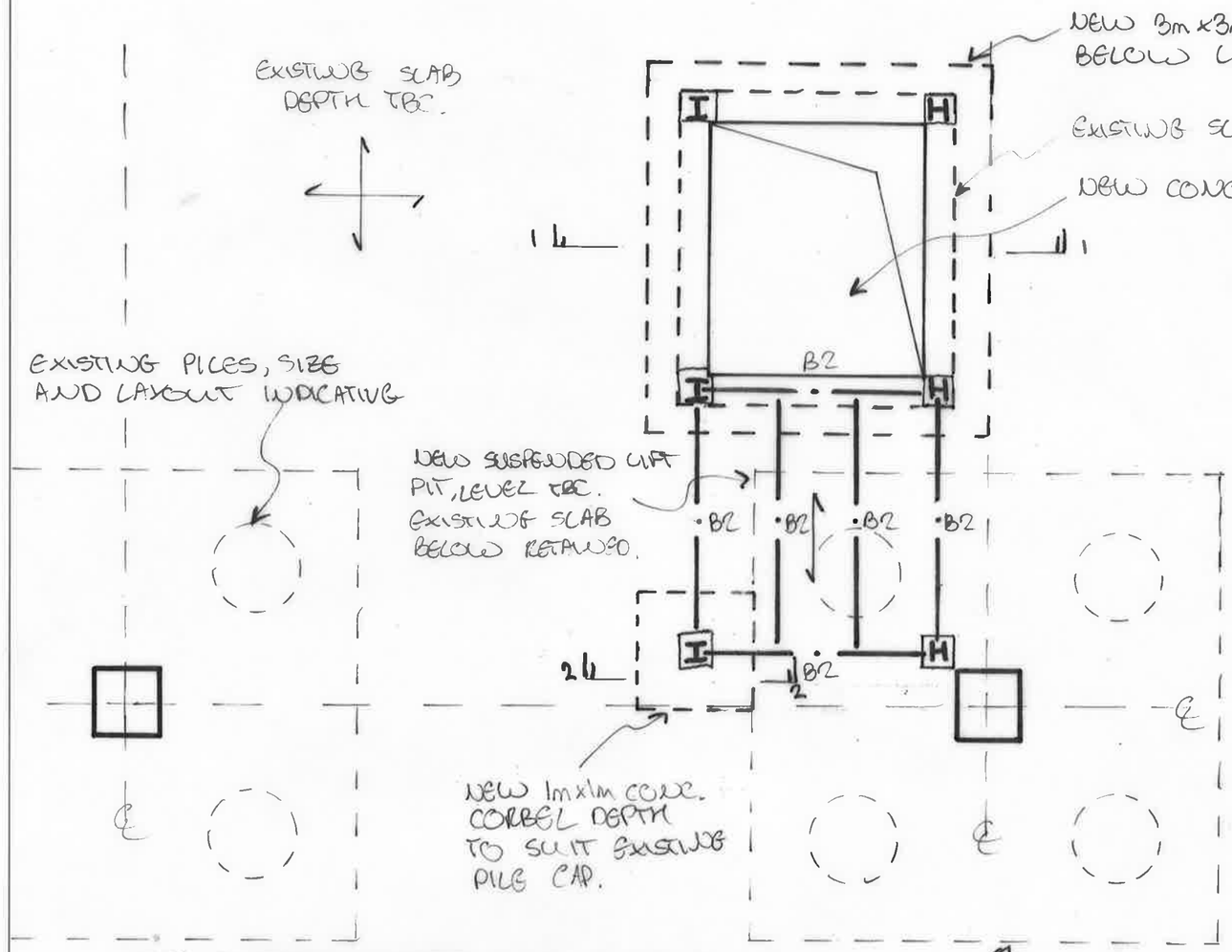
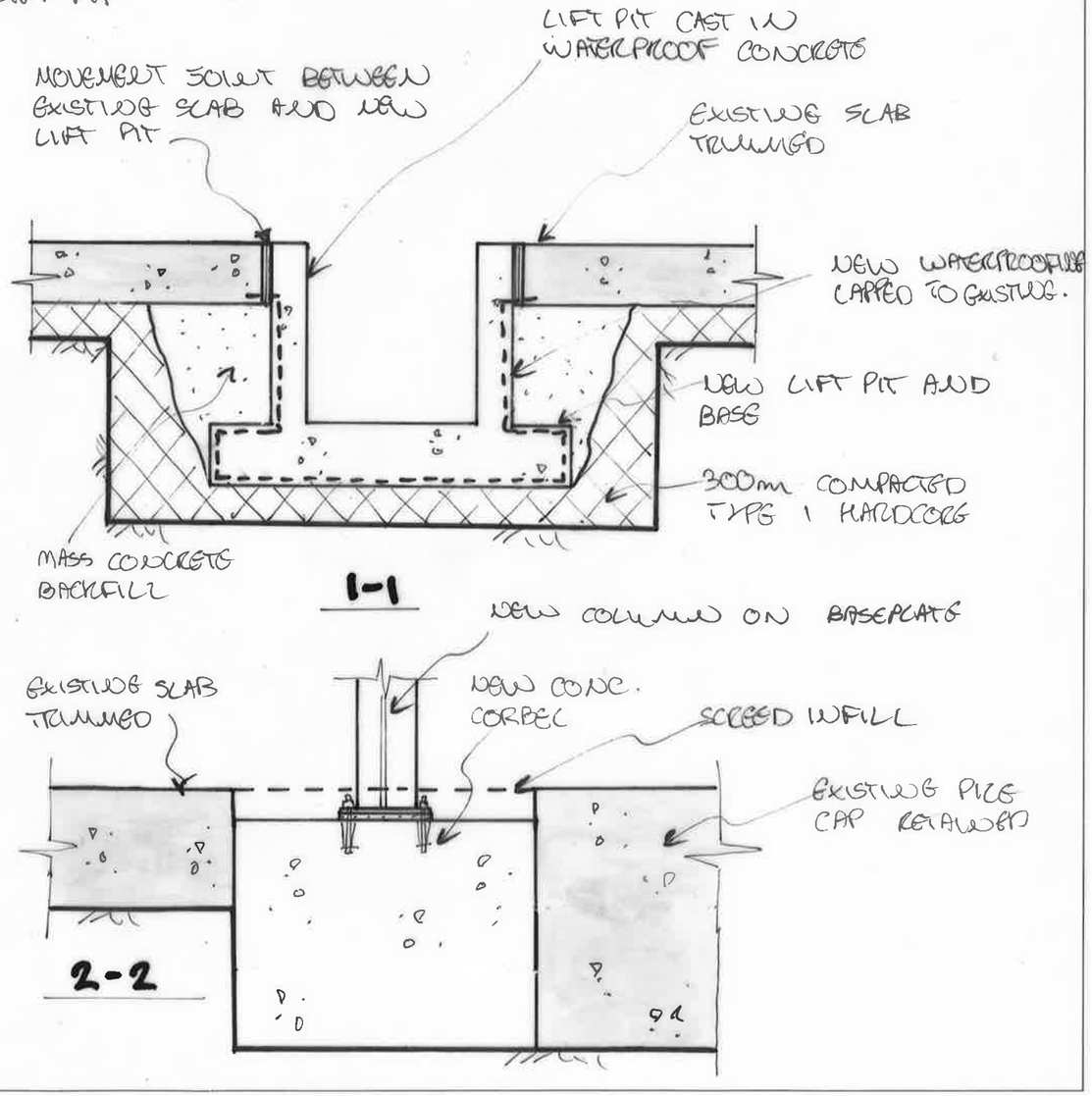


NEW FOUNDATION OPTION - PILED

B2 UB 203 x 133 x 30

⟷ NEW 150 THK RC SUSPENDED SLAB.

* SEE SKETCH SK-0012 FOR COLUMN DIMENSIONS



NOTES:

- EXISTING FOUNDATIONS ASSUMED. PILE DIMS & LAYOUT INDICATIVE ONLY. TBC AFTER OPENING UP.

Drawing No. 33841 - S - SK - 0012			Status S2
Project GEORGE STREET			Job number 33841
Drawing Title NEW FOUNDATIONS - PILES			
Date MAY 19	Drawn by ACGCE	Scale NTS	Revision 00

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APPENDIX B - MEASURED SURVEY DRAWINGS

INDICATIVE

Although every effort has been made to confirm type, run and size of drainage it is advisable to check these details against statutory authority records before proceeding with any design.

Although every effort has been made to confirm species of trees shown on this drawing if it is critical to design we do not accept responsibility for any errors and advise consultation with an aboriculturalist.

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Rev.	Notes:	Date

LEGEND

when viewing individual elements please ensure that all layers beginning "C" are turned on & thawed , as well as the relevant floor prefix. e.g. "1:" for first floor

Layer control Plan			Elevation / Section	Drawing Annotation: heights above FFL to:	
B : Basement	B	Brick	elev_*_b : Brick	b	: Sill Height
G : Ground	P	Partition	elev_*_f : Fixtures	h	: Head Height
1 : First	O	Overheads	elev_*_t : Text	c	: Ceiling Height
2 : Second	R	Ramps/Steps	elev_*_w : Window	b	: Beam Height
3 : Third	S	Services	sec_*_b : Brick	p	: Plinth Height
4 : Fourth	W	Windows	sec_*_f : Fixtures	sp	: Spring Point
5 : Fifth	L	Levels	sec_*_t : Text	sc	: Structural Ceiling
6 : Sixth	T	Text	sec_*_w : Window	fc	: False Ceiling

Symbols:-

- Beam (Exposed)
- Beam (Hidden)
- Section/Elevation line
- Step Up
- Slope Up
- Stair Cut
- Jamb
- Hinge
- Fit Mark

Example Level Annotation:-

- T 00.00 Elevation Detail Levels
- + 00.00 Plan Detail Levels
- +[00.00] Plan Soffit Levels

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Project
80 GEORGE STREET
RICHMOND UPON THAMES
TW9 1HA

Title
EXISTING
BASEMENT FLOOR PLAN

Client
CANADIAN & PORTLAND
ESTATES PLC

Project No	Revision	Dwg No.
2591BS	F0	1 of 6
Plot Scale	Sheet Size	Date
1:100	A0	OCTOBER 2018

Levels Related to OSGB36 unless otherwise stated.

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1 : First	O : Overheads	elev_*_t : Text	c : Ceiling Height	
2 : Second	R : Ramps/Steps	elev_*_w : Window	b : Beam Height	
3 : Third	S : Services	sec_*_b : Brick	p : Plinth Height	
4 : Fourth	W : Windows	sec_*_f : Fixtures	sp : Spring Point	
5 : Fifth	L : Levels	sec_*_t : Text	sc : Structural Ceiling	
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Project
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Title
EXISTING
FIRST FLOOR PLAN

Client
CANADIAN & PORTLAND
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Project No	Revision	Dwg No.
2591BS	F0	3 of 6
Plot Scale	Sheet Size	Date
1:100	A0	OCTOBER 2018

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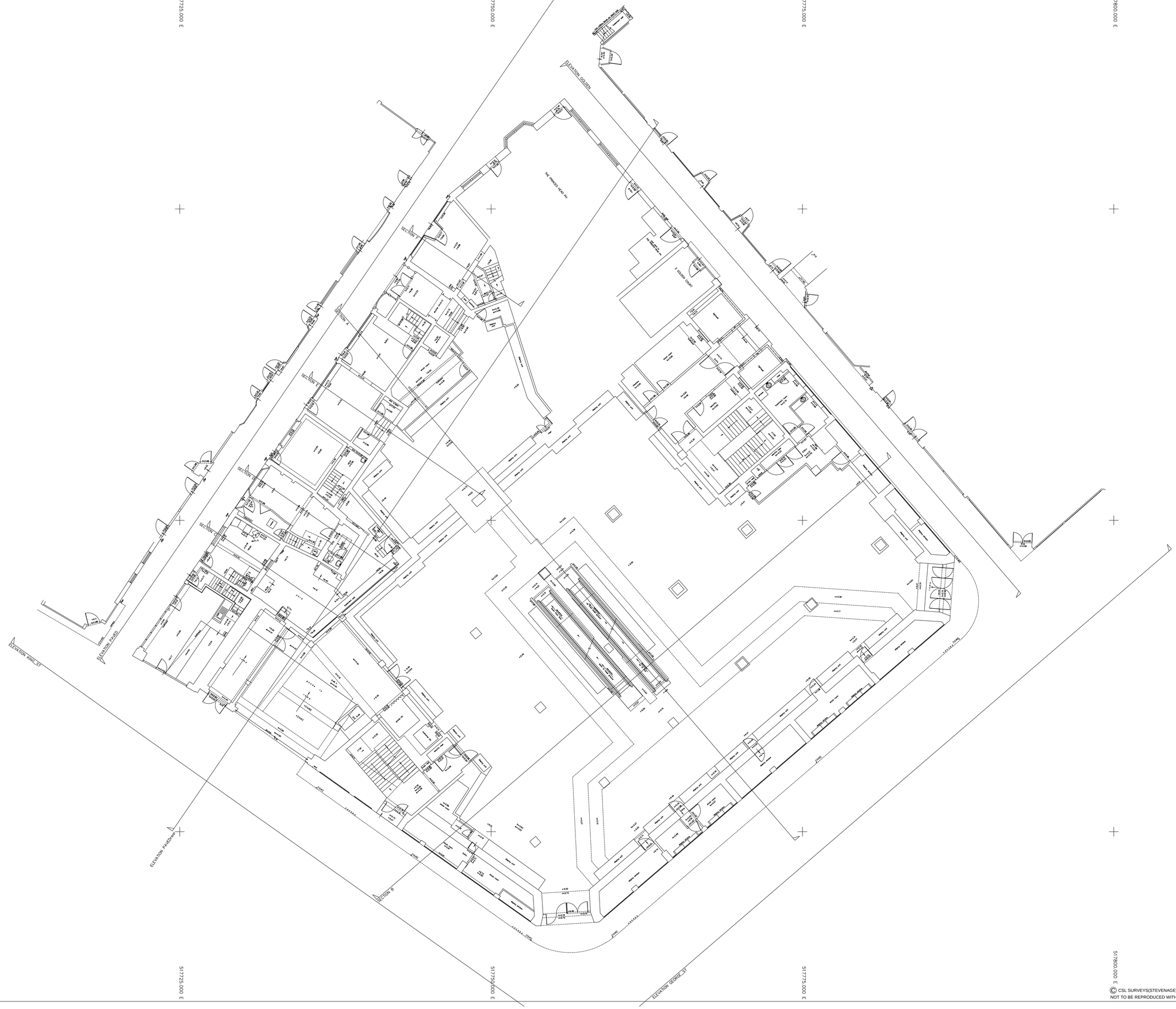

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Project
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Title
EXISTING
GROUND FLOOR PLAN

Client
CANADIAN & PORTLAND
ESTATES PLC

Project No	Revision	Dwg No.
25918S	F0	2 of 6
Plot Scale	Sheet Size	Date
1:100	A0	OCTOBER 2018

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Rev.	Notes:	Date

LEGEND

when viewing individual elements please ensure that all layers beginning "C" are turned on & thawed , as well as the relevant floor prefix. e.g. "1" for first floor

Layer control Plan		Elevation / Section	Drawing Annotation heights above FFL to:	
B : Basement	B : Brick	elev_*_b : Brick	s :	Sill Height
G : Ground	P : Partition	elev_*_f : Fixtures	h :	Head Height
1 : First	O : Overheads	elev_*_f : Text	c :	Ceiling Height
2 : Second	R : Ramps/Steps	elev_*_w : Window	b :	Beam Height
3 : Third	S : Services	sec_*_b : Brick	p :	Plinth Height
4 : Fourth	W : Windows	sec_*_f : Fixtures	sp :	Spring Point
5 : Fifth	L : Levels	sec_*_t : Text	st :	Structural Ceiling
6 : Sixth	T : Text	sec_*_w : Window	fc :	False Ceiling

Symbols:-

Beam (Exposed)
Beam (Hidden)
Section/Elevation line
Step Up
Slope Up
Stair Cut
Jamb
Hinge
Fit Mark

Example Level Annotation:-

T 00.00 Elevation Detail Levels
+ 00.00 Plan Detail Levels
+[00.00] Plan Soffit Levels

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http://www.cslsurveys.com

Project
80 GEORGE STREET
RICHMOND UPON THAMES
TW9 1HA

Title
EXISTING
ROOF PLAN

Client
CANADIAN & PORTLAND
ESTATES PLC

Project No	Revision	Dwg No.
25918S	F0	6 of 6
Plot Scale	Sheet Size	Date
1:100	A0	OCTOBER 2018

Levels Related to OSGB36 unless otherwise stated.

517725.000 E

517750.000 E

517775.000 E

517800.000 E

174850.000 N

174825.000 N

174800.000 N

INDICATIVE

Although every effort has been made to confirm type, run and size of drainage it is advisable to check these details against statutory authority records before proceeding with any design.

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LEGEND

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3 : Third	S : Services	sec_*_b : Brick	p : Pinch Height
4 : Fourth	W : Windows	sec_*_f : Fixtures	sp : Spring Point
5 : Fifth	L : Levels	sec_*_t : Text	sc : Structural Ceiling
6 : Sixth	T : Text	sec_*_w : Window	fc : False Ceiling

Symbols:-

Beam (Exposed)
Beam (Hidden)
Section/Elevation line
Step Up
Slope Up
Stair Cut
Jamb
Hinge
Fit Mark

Example Level Annotation:-

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+ [00.00] Plan Soffit Levels

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Project
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RICHMOND UPON THAMES
TW9 1HA

Title
EXISTING
SECOND FLOOR PLAN

Client
CANADIAN & PORTLAND
ESTATES PLC

Project No	Revision	Dwg No.
25918S	F0	4 of 6
Plot Scale	Sheet Size	Date
1:100	A0	OCTOBER 2018

Levels Related to OSGB36 unless otherwise stated.

517725.000 E

517750.000 E

517775.000 E

517800.000 E

174850.000 N

174825.000 N

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e.g. "1*" for first floor

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G : Ground	P : Partition	elev_*_f : Fixtures	h : Head Height
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Symbols:-

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TW9 1HA

Title
EXISTING
THIRD FLOOR PLAN

Client
CANADIAN & PORTLAND
ESTATES PLC

Project No	Revision	Dwg No.
25918S	F0	5 of 6
Plot Scale	Sheet Size	Date
1:100	A0	OCTOBER 2018

Levels Related to OSGB36 unless otherwise stated.

APPENDIX C - INITIAL OPENING UP REPORT

Initial Opening up Works Survey
75-81 George Street, Richmond

Ref: J3841-S-RP-0002
Revision: 00
Status: S9

Webb Yates Engineers Ltd
48-50 Scrutton Street
London. EC2A 4HH
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info@webbyates.co.uk
www.webbyates.co.uk

CONTENTS

GENERAL NOTES

REVISION HISTORY

Revision	Status	Date	Author	Reviewer	Approver
00	S9 - Information	17.05.2019	TW	RM	TW

EXECUTIVE SUMMARY

Based on the opening up works surveys carried out across the week of 29th April 2019 75-81 George Street, Richmond it has been concluded that the structure is an insitu concrete frame with two way spanning slabs spanning onto wide drop beams. Concrete walls are believed to provide stability to the building around the buildings stair and lift cores. At basement level the raised toilet area seems to be solid mass fill concrete. It was not clear if this area is reinforced structural concrete or purely an infill.

The single storey roof infill above the shoe sales area appears to be lightweight roof deck, support on structural steel beams bedding into load bearing masonry walls on the perimeter of the shoe sales area.

We have not identified through the limited survey works undertaken any fundamental reasons why the development cannot be delivered.

1 INTRODUCTION

This report relates to initial survey works at 75-81 George Street, Richmond. Webb Yates Engineers have been appointed as structural engineer for the redevelopment of the building. Webb Yates Engineers scoped the requirements for the opening up works and observed a number of the locations on site once the structure was revealed.

Figure 1.1 – Site location map

2 SCOPE

The scope of this report is to summarise the findings from the survey on night shifts during the week commencing 29th April. Please note that this report is thus restricted by the locations that finishes could be removed on site and restrictions placed by the tenant. Further intrusive structural investigations will be required once a soft strip of the building has been undertaken.

3 SURVEY WORKS

3.1 BASEMENT

Typically, columns in the basement area of the building were found to be reinforced insitu concrete and 600mm square. The column that sits between the escalator's was found to be 500x350 in size. The basement perimeter concrete retaining wall was viewed in plant rooms and found to be in good condition and dry.

Two previously formed cores were found in the raised toilet area adjacent to Golden Court. The cores appeared to show mass concrete to the depth of the core. It was unclear if the cores proved the full depth of the structure in this area. Core 1 terminated at approximately 750mm below finished floor level and core 2 terminated at approximately 1030mm below finished floor level. A bonded 50mm sand cement screed was observed at floor level.

A 440mm wide by 200mm deep service trench was observed in the toilets.

The soffit of the ground floor slab was observed from a point in the ceiling where a ceiling tile had previously been removed. Structural beams were seen spanning column to column, No intermediate beams were observed.

In the stock room adjacent to Golden Court a brick wall was observed sitting in front of the reinforced concrete wall and smoke vents. The wall was laterally restrained with timbers running vertically.

3.2 GROUND FLOOR

Typically, columns at ground floor were found to be reinforced insitu concrete and 600mm square. The column that sits between the escalator's was found to be 500mm x 350mm in size.

The beam between escalators was revealed o one side and measured to be 600mm wide 600mm deep.

Structure in windows displays was revealed. Concrete columns were overserved on primary structural grid lines

Aligning with the columns within the floor plate. Intermediate "columns" were found to be masonry infills and were considered non-structural.

Plaster was removed I the stair core adjacent to the Golden court. The back wall of the stair core was found to be masonry, the side wall was found to be reinforced concrete. Thickness were not proven.

To the rear of the shop in the shoe sales area the roof structure was found to be a lightweight metal deck support on structural steelwork. The steelwork was supported on concrete padstones and loadbearing masonry

3.3 FIRST FLOOR TO THIRD FLOOR

One column was measured at first floor and found to be 450 square which is a reduction in size from the columns below,

At first floor the front facade was opened up from the personal shopper room, lightweight plaster board and Metsec channels were found to have been placed over the original plater and windows. The structure between windows was

revealed and found to be a concrete wall/column which extended at last 700mm. It was therefore assumed the whole infill was a structural wall.

Along Golden court the plaster was removed in two locations between windows. A 250mm wide column was found adjacent to the window recess. The columns were infilled with lightweight block.

A ceiling light was removed, and the soffit of the slab was viewed. On first, second and third floors beams were observed spanning between columns except for the front structural bay parallel to George Street where intermediate beams were observed spanning to the façade. Beams are presumed to be at third points between columns. A downstand beam was observed on the perimeter of the building.

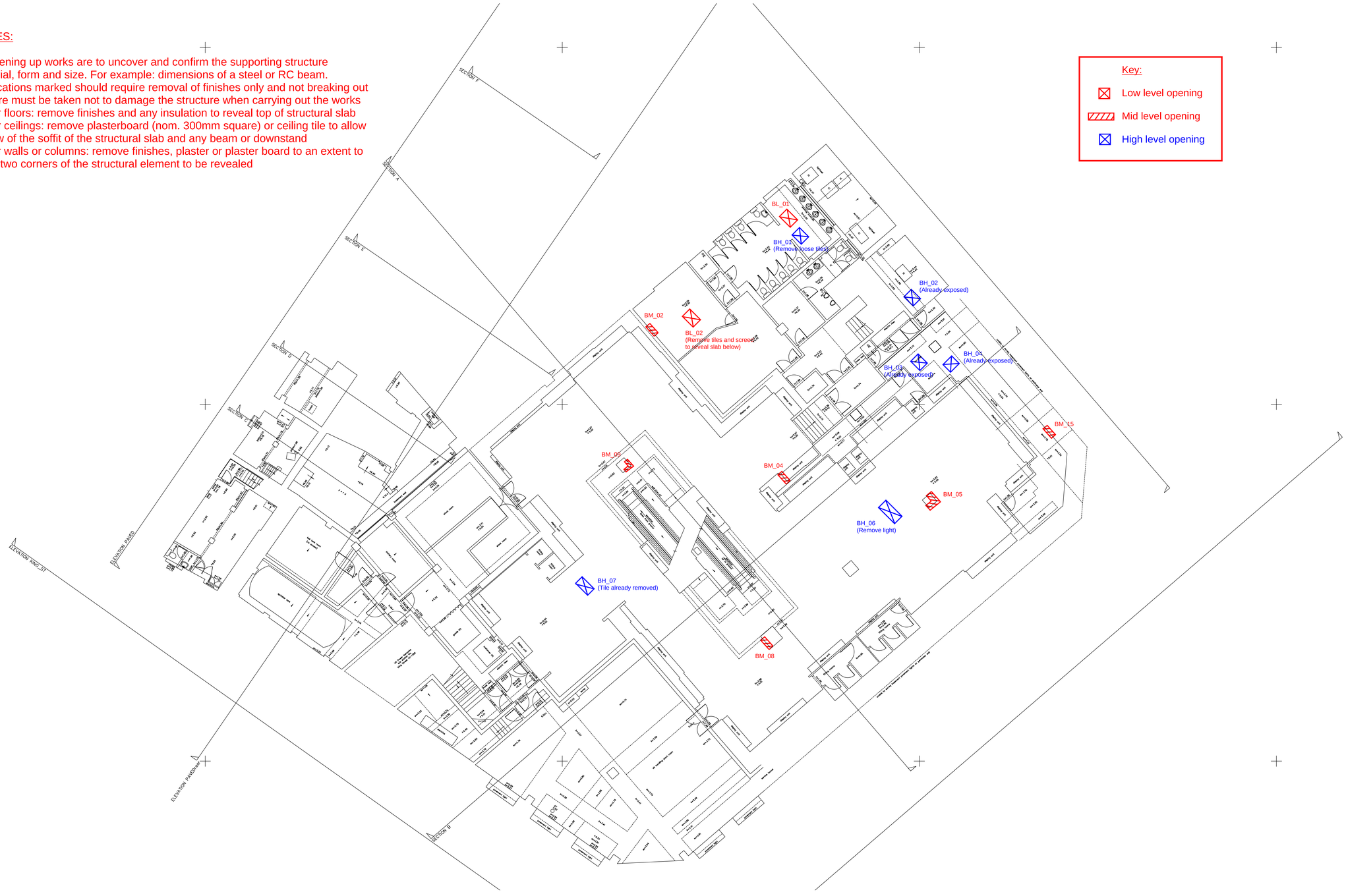
4 APPENDIX A – OPENING UP SCOPING DOCUMENTS

NOTES:

1. Opening up works are to uncover and confirm the supporting structure material, form and size. For example: dimensions of a steel or RC beam.
2. Locations marked should require removal of finishes only and not breaking out
3. Care must be taken not to damage the structure when carrying out the works
4. For floors: remove finishes and any insulation to reveal top of structural slab
5. For ceilings: remove plasterboard (nom. 300mm square) or ceiling tile to allow review of the soffit of the structural slab and any beam or downstand
6. For walls or columns: remove finishes, plaster or plaster board to an extent to allow two corners of the structural element to be revealed

Key:

- Low level opening
- Mid level opening
- High level opening



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Drawing No	J3841-S-SK-0003						
Project	75-81 George Street			Status	S1		
Drawing Title	Basement Opening Up Works						
Date	08.04.19	Drawn by	RJM	Scale	ASL	Revision	01

NOTES:

1. Opening up works are to uncover and confirm the supporting structure material, form and size. For example: dimensions of a steel or RC beam.
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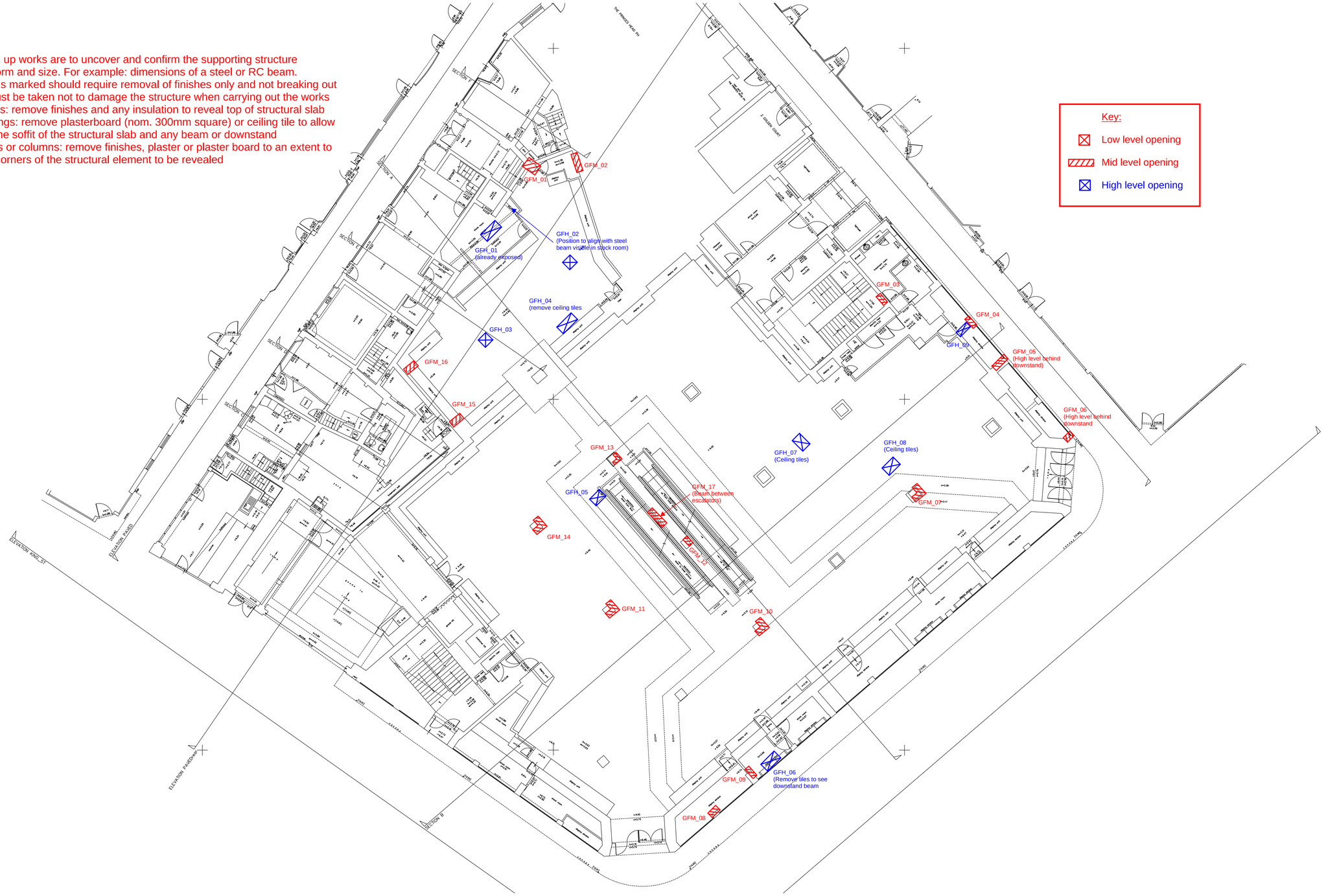

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Drawing No	J3841-S-SK-0004		
Project	75-81 George Street	Status	S1
Drawing Title	Ground Floor Opening Up Works		
Date 08.04.19	Drawn by RJM	Scale ASL	Revision 01

NOTES:

1. Opening up works are to uncover and confirm the supporting structure material, form and size. For example: dimensions of a steel or RC beam.
2. Locations marked should require removal of finishes only and not breaking out
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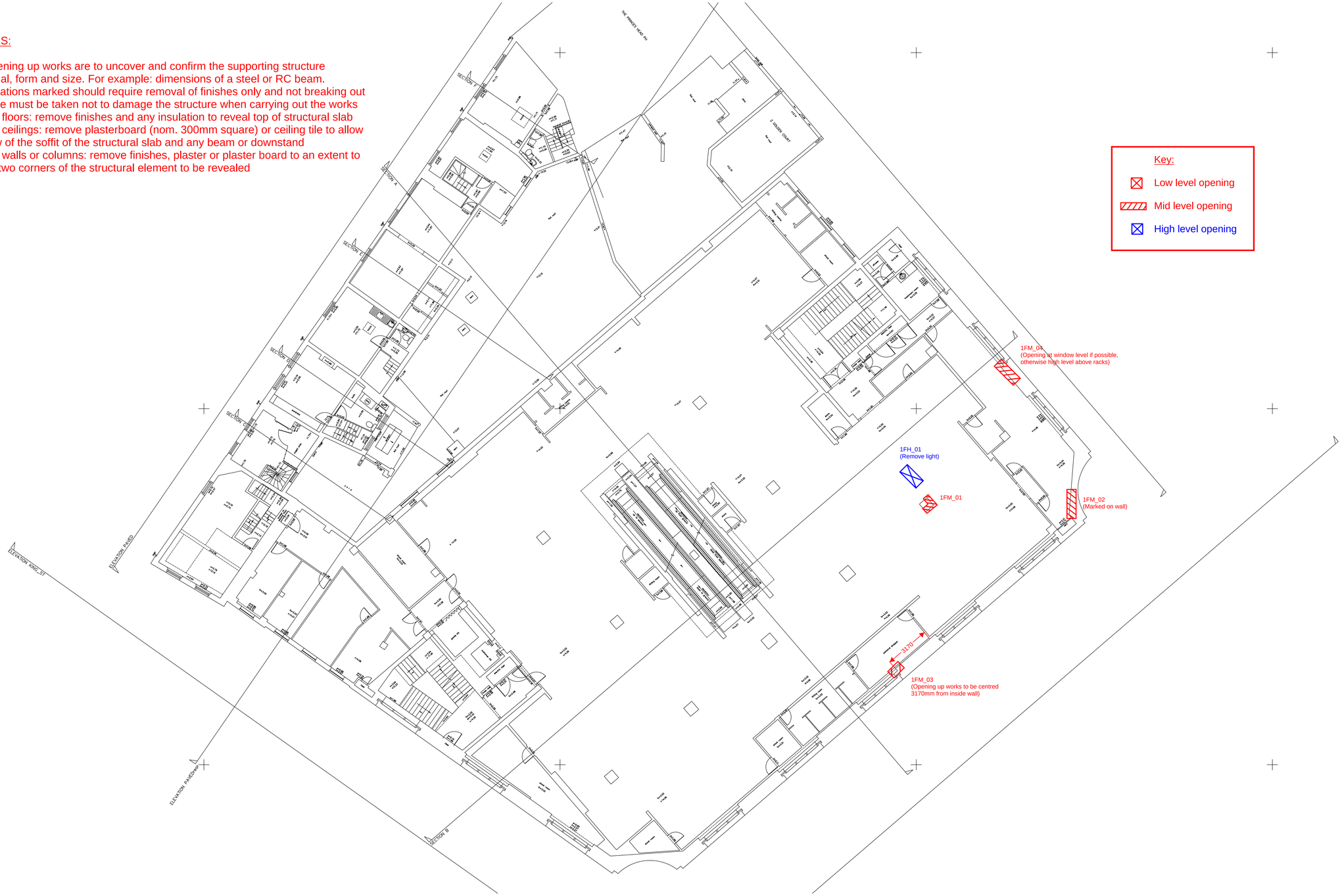

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Drawing No	J3841-S-SK-0005						
Project	75-81 George Street			Status	S1		
Drawing Title	First Floor Opening Up Works						
Date	08.04.19	Drawn by	RJM	Scale	ASL	Revision	01

NOTES:

1. Opening up works are to uncover and confirm the supporting structure material, form and size. For example: dimensions of a steel or RC beam.
2. Locations marked should require removal of finishes only and not breaking out
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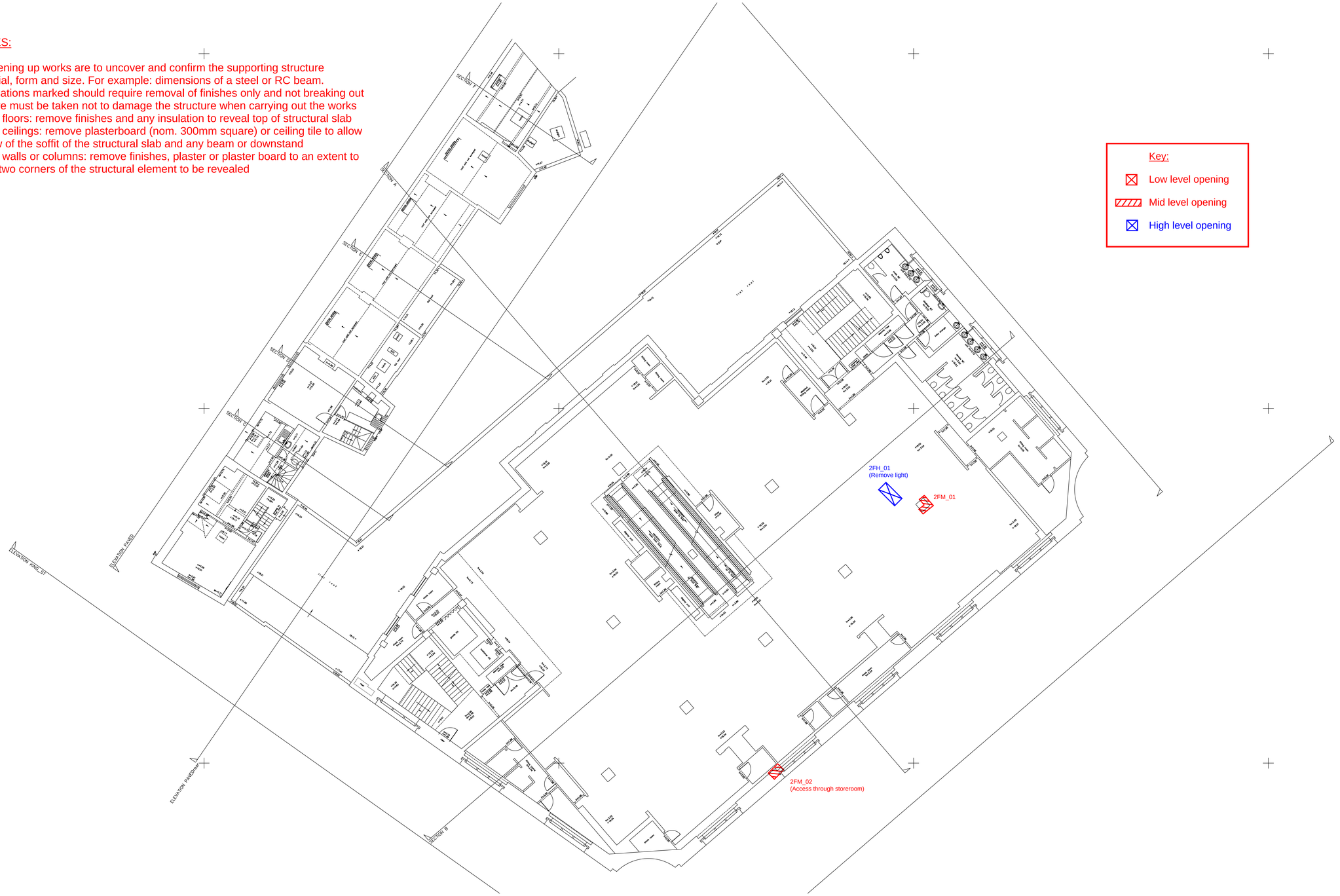

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Drawing No	J3841-S-SK-0006		
Project	75-81 George Street	Status	S1
Drawing Title	Second Floor Opening Up Works		
Date	08.04.19	Drawn by	RJM
Scale	ASL	Revision	01

NOTES:

1. Opening up works are to uncover and confirm the supporting structure material, form and size. For example: dimensions of a steel or RC beam.
2. Locations marked should require removal of finishes only and not breaking out
3. Care must be taken not to damage the structure when carrying out the works
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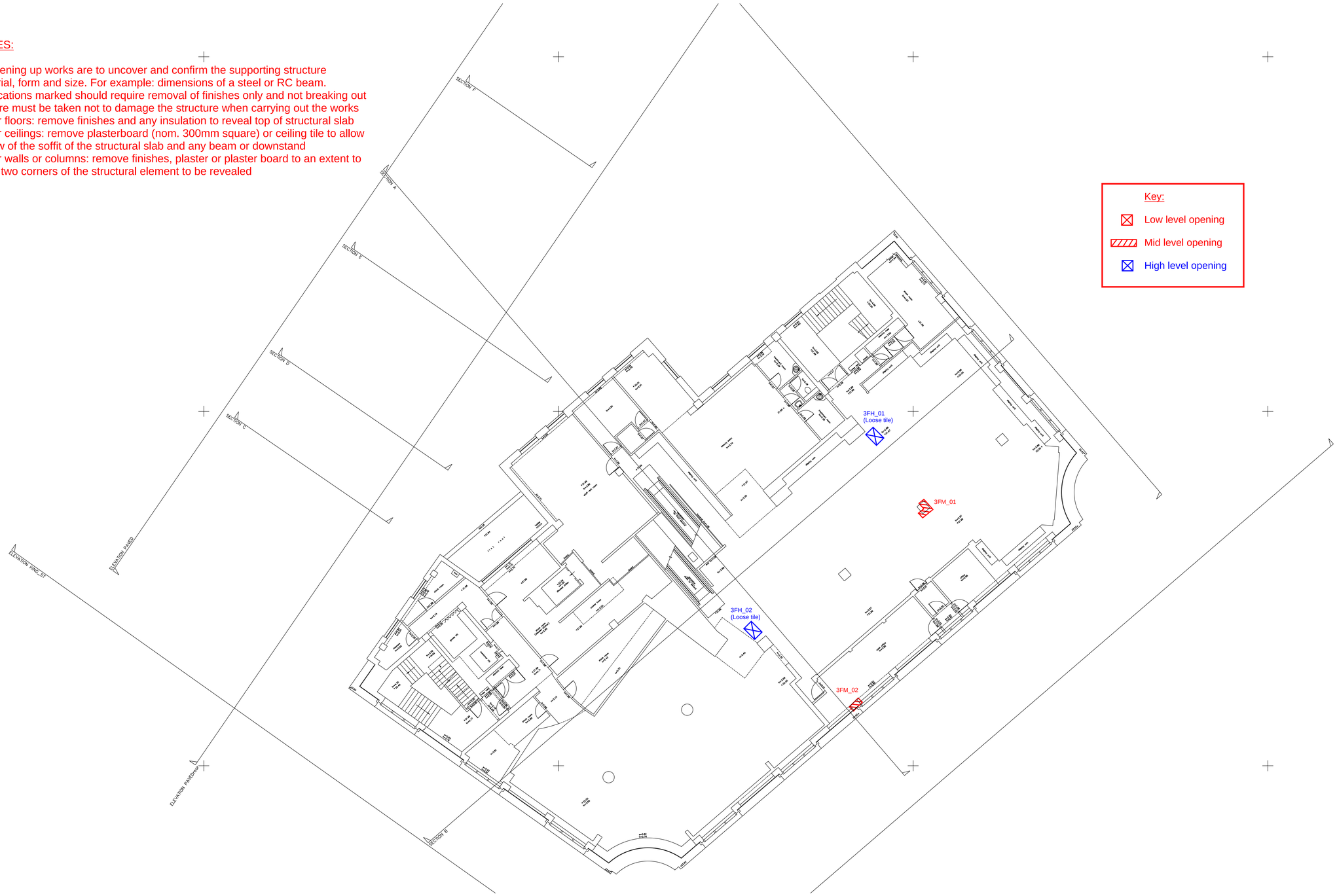

Key:

- Low level opening
- Mid level opening
- High level opening

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Drawing No	J3841-S-SK-0007		
Project	75-81 George Street	Status	S1
Drawing Title	Third Floor Opening Up Works		
Date 08.04.19	Drawn by RJM	Scale ASL	Revision 01

5 APPENDIX B – SURVEY INFORMATION

517725.000 E
517750.000 E
517775.000 E
517800.000 E
174850.000 N
174825.000 N
174800.000 N

ELEVATION GEORGE_ST
SECTION F
SECTION A
SECTION E
SECTION G
SECTION C
SECTION D
ELEVATION PARK
ELEVATION KING_ST
ELEVATION PARKPATH
SECTION B

200 deep 440 wide service trench

Assumed 200 deep 440 wide service trench

Assumed Line on raised concrete plinth

Core 2

Core 1

Partition Wall Exposed from Higher Level wall is brickwork

600 Sq Column

500 x 350 Column

600 Sq Column

600 Sq Column

600 Sq Column

Soffit of Ground floor 1070 wide beam 170 dp below slab

No intermediate Beams between Beams on Primary Grid

A

A

FFL
50mm Screed (bonded)
100mm well compacted concrete
600mm concrete of variable compaction
Bottom of Core did not prove depth of concrete

Existing Core 1

FFL
50mm Screed (bonded)
980mm well compacted concrete
Bottom of Core did not prove depth of concrete

Existing Core 2

Smoke Vent
Timber supports
150mm Brickwork Wall (non structural)

Section A-A

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Fit Mark

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Project
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Title
EXISTING
BASEMENT FLOOR PLAN

Client
CANADIAN & PORTLAND
ESTATES PLC

Project No	Revision	Dwg No.
2591BS	F0	1 of 6
Plot Scale	Sheet Size	Date
1:100	A0	OCTOBER 2018

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RICHMOND UPON THAMES
TW9 1HA

Title
EXISTING
FIRST FLOOR PLAN

Client
CANADIAN & PORTLAND
ESTATES PLC

Project No	Revision	Dwg No.
25918S	F0	3 of 6
Plot Scale	Sheet Size	Date
1:100	A0	OCTOBER 2018

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517725.000 E
517750.000 E
517775.000 E
517800.000 E
174850.000 N
174825.000 N
174800.000 N

ELEVATION GEORGE ST
ELEVATION KING ST
ELEVATION PARADISE
SECTION A
SECTION B
THE TERRACE HEAD PH
2 GILDEA COURT

Masonry
LW metal roof deck supported on a steel beam (size unknown) support from a concrete pad stone set in masonry
LW metal roof deck supported on a steel beam (size unknown) support from a concrete pad stone set in masonry
Masonry
Masonry Wall (Thickness not known)
Concrete Wall (Thickness not known)
Column (size unknown depth at least 500mm)
Brickwork Pier
Precast concrete lintel
Column (size unknown)
600 Sq Column
600 wide (assumed) x 600 deep Beam
500 x 350 Column
600 wide (assumed) x 600 deep Beam
600 Sq Column
600 Sq Column
600 Sq Column
600 Sq Column
Column (size unknown)
Brickwork Pier
Column (size unknown)

INDICATIVE

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Elevation / Section

Drawing Annotation heights above FFL fo

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h :	Head Height
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Example Level Annotation:-

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16 LEYDEN ROAD, STEVENAGE,
HERTFORDSHIRE, SG1 2BP
TEL: (01438) 728 441 FAX: (01438) 742 435
email: mail@cslsurveys.com
http://www.cslsurveys.com

Project
80 GEORGE STREET
RICHMOND UPON THAMES
TW9 1HA

Title
EXISTING
GROUND FLOOR PLAN

Client
CANADIAN & PORTLAND
ESTATES PLC

Project No	Revision	Dwg No.
25918S	F0	2 of 6
Plot Scale	Sheet Size	Date
1:100	A0	OCTOBER 2018

Levels Related to OSGB36 unless otherwise stated.

517725.000 E

517750.000 E

517775.000 E

517800.000 E

174850.000 N

174825.000 N

174800.000 N

INDICATIVE

Although every effort has been made to confirm type, run and size of drainage it is advisable to check these details against statutory authority records before proceeding with any design.

Although every effort has been made to confirm species of trees shown on this drawing if it is critical to design we do not accept responsibility for any errors and advise consultation with an aboriculturalist.

Every effort has been made to confirm the structure within the building, however this is a non-intrusive survey and we accept no responsibility for any errors beyond the visible fitout.
If this is critical to design we suggest further investigation.

As determined by RICS guidelines, this survey has a presentation scale of 1:100. Interrogated dimensions will be within tolerance for this and smaller scales only.

Do Not Scale From Paper Copies

Rev.	Notes:	Date

LEGEND

when viewing individual elements please ensure that all layers beginning "C" are turned on & thawed , as well as the relevant floor prefix.
e.g. "1-" for first floor

Layer control Plan		Elevation / Section:	Drawing Annotation: heights above FFL to:
B : Basement	B : Brick	elev_*_b : Brick	s : Sill Height
G : Ground	P : Partition	elev_*_f : Fixtures	h : Head Height
1 : First	O : Overheads	elev_*_t : Text	c : Ceiling Height
2 : Second	R : Ramps/Steps	elev_*_w : Window	b : Beam Height
3 : Third	S : Services	sec_*_b : Brick	p : Pinch Height
4 : Fourth	W : Windows	sec_*_f : Fixtures	sp : Spring Point
5 : Fifth	L : Levels	sec_*_t : Text	sc : Structural Ceiling
6 : Sixth	T : Text	sec_*_w : Window	fc : False Ceiling

Symbols:-

Beam (Exposed)
Beam (Hidden)
Section/Elevation line
Step Up
Slope Up
Stair Cut
Jamb
Hinge
Fit Mark

Example Level Annotation:-

T 00.00 Elevation Detail Levels
+ 00.00 Plan Detail Levels
+ [00.00] Plan Soffit Levels

CSL SURVEYS (STEVENAGE) LTD
16 LEYDEN ROAD, STEVENAGE,
HERTFORDSHIRE, SG1 2BP
TEL: (01438) 728 441 FAX: (01438) 742 435
email: mail@cslsurveys.com
http://www.cslsurveys.com

Project
80 GEORGE STREET
RICHMOND UPON THAMES
TW9 1HA

Title
EXISTING
SECOND FLOOR PLAN

Client
CANADIAN & PORTLAND
ESTATES PLC

Project No	Revision	Dwg No.
25918S	F0	4 of 6
Plot Scale	Sheet Size	Date
1:100	A0	OCTOBER 2018

Levels Related to OSGB36 unless otherwise stated.

517725.000 E
517750.000 E
517775.000 E
517800.000 E
174850.000 N
174825.000 N
174800.000 N

INDICATIVE

Although every effort has been made to confirm type, run and size of drainage it is advisable to check these details against statutory authority records before proceeding with any design.

Although every effort has been made to confirm species of trees shown on this drawing if it is critical to design we do not accept responsibility for any errors and advise consultation with an aboriculturalist.

Every effort has been made to confirm the structure within the building, however this is a non-intrusive survey and we accept no responsibility for any errors beyond the visible fitout.
If this is critical to design we suggest further investigation.

As determined by RICS guidelines, this survey has a presentation scale of 1:100. Interrogated dimensions will be within tolerance for this and smaller scales only.

Do Not Scale From Paper Copies

Rev.	Notes:	Date

LEGEND

when viewing individual elements please ensure that all layers beginning "G" are turned on & thawed , as well as the relevant floor prefix.
e.g. "1*" for first floor

Layer control Plan		Elevation / Section	Drawing Annotation heights above FFL is:
B : Basement	B : Brick	elev_*_b : Brick	s : Sill Height
G : Ground	P : Partition	elev_*_f : Fixtures	h : Head Height
1 : First	O : Overheads	elev_*_t : Text	c : Ceiling Height
2 : Second	R : Ramps/Steps	elev_*_w : Window	b : Beam Height
3 : Third	S : Services	sec_*_b : Brick	p : Plinth Height
4 : Fourth	W : Windows	sec_*_f : Fixtures	sp : Spring Point
5 : Fifth	L : Levels	sec_*_t : Text	sc : Structural Ceiling
6 : Sixth	T : Text	sec_*_w : Window	fc : False Ceiling

Symbols:-

Beam (Exposed)
Beam (Hidden)
Section/Elevation line
Step Up
Slope Up
Stair Cut
Jamb
Hinge
Fit Mark

Example Level Annotation:-

T 00.00 Elevation Detail Levels
+ 00.00 Plan Detail Levels
+[00.00] Plan Soffit Levels

CSL SURVEYS (STEVENAGE) LTD
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email: mail@cslsurveys.com
http://www.cslsurveys.com

Project
80 GEORGE STREET
RICHMOND UPON THAMES
TW9 1HA

Title
EXISTING
THIRD FLOOR PLAN

Client
CANADIAN & PORTLAND
ESTATES PLC

Project No	Revision	Dwg No.
25918S	F0	5 of 6
Plot Scale	Sheet Size	Date
1:100	A0	OCTOBER 2018

Levels Related to OSGB36 unless otherwise stated.

APPENDIX D – UTILITIES SURVEY

75 – 81 GEORGE STREET
RICHMOND, UK

UTILITIES STATEMENT

Presented to:

Canadian & Arcadia Ltd

8-10 South Street

Epsom, Surrey

KT18 7PF

Presented by:

DSA Engineering Ltd

Damaso House

31 Islington Green

London

N1 8DU

Tel: +44 (0)20 7242 7272

Email: mail@dsaengineers.com

Date	Remarks	Revision
23rd April 2019	First Issue	00

Contents

1.0 INTRODUCTION

This Utilities Statement has been prepared by DSA Engineering on behalf of Canadian & Arcadia Ltd. ("the Applicant") to accompany the planning application for the new build fourth floor extension and for the redevelopment of the existing floor levels at 75-81 George Street. The application that has been submitted to London Borough of Richmond upon Thames Council.

The Utilities Stat Searches contained herein describes the numerous below ground services in and around the vicinity of the site to inform the development plans for 75 – 81 George Street, Richmond, Surrey, TW9 1HE.

The attached document is a result of a number of desktop based searches of existing maps and record from diverse service providers. This report should be read as a first instance study of the services and needs to be verified through the use of suitable detecting devices on site prior to any digging works takes place.

The following services have been located within and around the vicinity of the site, and therefore included in this report:

- UK Power Networks
- Thames Water (Water & Drainage)
- Cadent Gas Network
- GTC
- Energetics
- Openreach
- Virgin Media
- Vodafone – [Nothing within our area]
- Celeste Imthurn – [Enquires into a number of companies has confirmed no impact on construction services to our building. Please replay emails in document]
- Interoute
- SKY Telecommunications – [Nothing within our area]
- euNetworks –[Nothing within our area]
- Instalcom – [Nothing within our area]
- Verizon – [Nothing within our area]
- City Fibre
- euNetworks Fiber UK
- SSE Telecoms
- Transport for London/LU
- Thames Tunnel
- Crossrail/Network Rail

2.0 ELECTRICITY

Currently a substation with a total capacity of 1000 kVA is located on site at basement level to feed the existing building and adjacent consumers in the neighbourhood. Refer to **Appendix B** for UKPN site map

Estimated electricity demand is expected to increase as a result of change of use and extension of the building. Discussions with UKPN have been made which confirmed that 750kVA capacity of the existing substation is available for the proposed development.

Detailed load calculations have been prepared to review whether the available capacity is sufficient. Please see **Appendix A** for information. After the assessment being carried out based on the latest area schedules it is anticipated that the provided capacity is sufficient to supply the building.

3.0 GAS SERVICES

The survey map indicates a 180mm diameter PE pipes running along King St and Paved Court, with 125mm PE along George St. Golden Court has a 63mm PE pipe running about 50% of the way from a branch connection emulating from the Paved Court main. No connections are shown into 75-81 George St, although we know from our site visit that a connection does exist off the King St main into our basement to supply the existing boilers and any cooking demand that the store required. Please see **Appendix B** for relevant information.

4.0 WATER SERVICES

The water services map indicated a large 16" trunk water main running along George St as well as a similar size main along Paved Court. It does not appear that any connections are made from these main to service our building. There is however two distribution main running along King St of which one is a 4"(100mm) water main and a 3"(80mm) dedicated fire main which is clearly shown entering our building. No dedicated water main connection is shown entering our building, but this will be confirmed by further survey. It could be that the water services supply is branched off the fire main once it enters our building. Please see **Appendix B** for relevant information.

5.0 DRAINAGE SERVICES

The building is surrounded on all four sides by a trunk foul sewer and a separate trunk surface water sewer. It is unclear as to what is the size and depth of these sewers and will therefore require investigation with Thames Water. No connections from either sewer is indicated on the drawings for 75-81 George St, but we know that this is incorrect as based on our initial site inspection there are connections to these sewers. The existing toilet connection to the building are located on Golden Court, so there is definitely a foul sewer connection in this location. There might also be another connection on the King St sewer, but will have to be confirmed by future site inspection. Please see **Appendix B** for relevant information.

6.0 TELECOMMUNICATION

All four streets around the development is served by BT Openreach with a number of live box locations around the building. Directly opposite the building on the corner of George St and King St, there are two cabinets from which new connections can be brought into the building if required.

The Virgin network is not as extensive as the BT Openreach network in that the trenches run in Paved Court and Golden Court with nothing down King St. There is however a main trench system on George St starting from the east corner of the building and another trench on the opposite side of George St. Please see **Appendix B** for relevant information.

7.0 APPENDIX A - LOAD ASSESSMENT

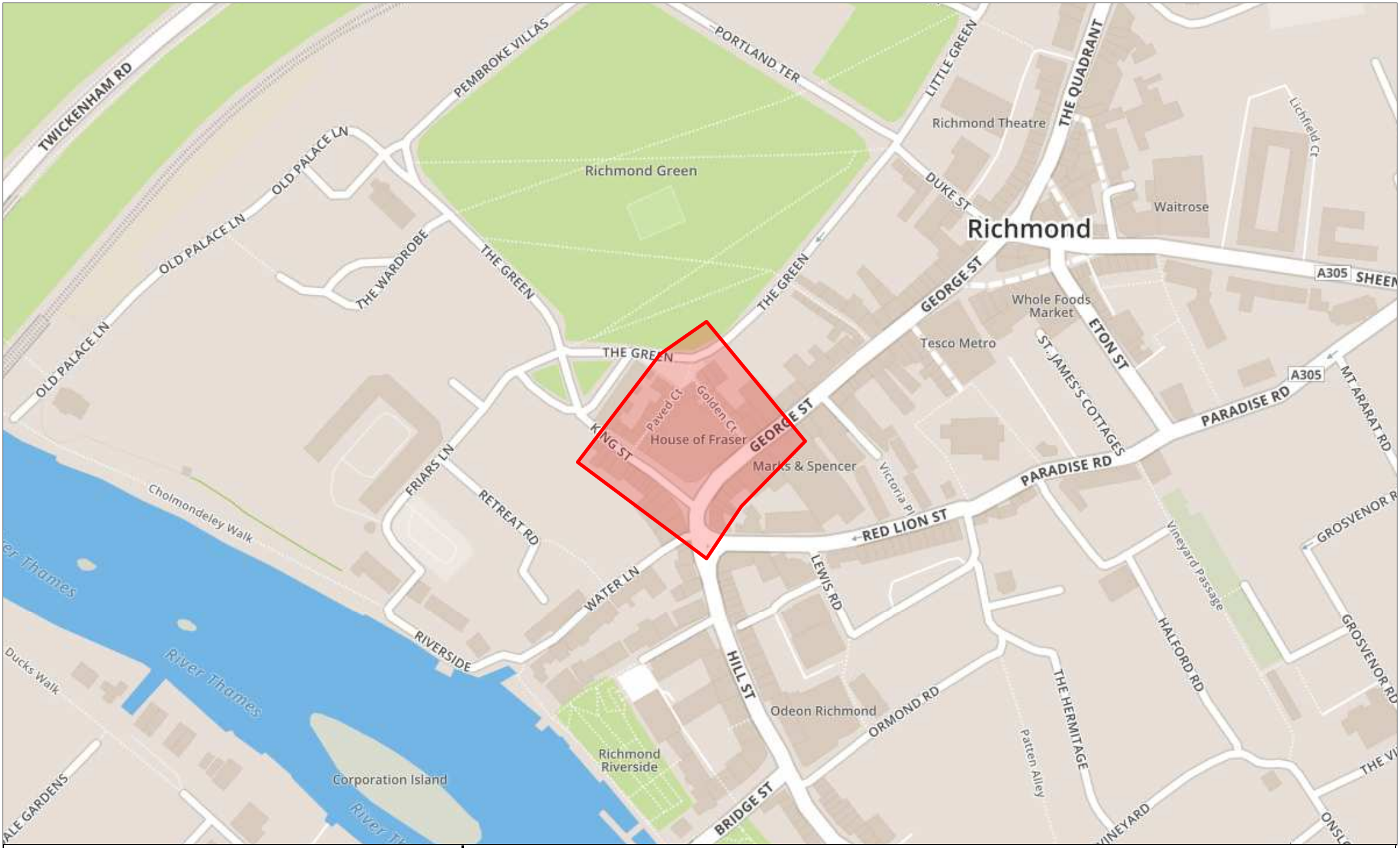
There are currently 4 office floors and 2 retail levels proposed in the scope. This will account for a total of 3768 m² of office areas and 2138 m² of retail areas within the development. The below calculations are based on these numbers.

	Area (m²)	Power (W/m²)	Lighting (W/m²)	HVAC (W/m²)	Power Upgrade (W/m²)	Lifts	TCL (kW)	EMD (kW)
Office	3768.0	25.0	10	60	15.0	10.0	452.2	389.0
Retail	2138.0	15.0	15	70	-	-	213.8	170.5
Terrace & Balconies	349.0	5	10	-	-	-	5.2	3.8
Amenities	187.0	5	5	-	-	-	1.9	1.3
Common Areas	474	5	10	-	-	-	7.1	5.2
Courtyard	186	5	5	-	-	-	1.9	1.3
Reception & Lobbies	541	10	15	70	-	-	51.4	38.5
Total (m²)	7643					**Total (kW)**	**733.4**	**609.7**
						Total (kVA)	**772**	**642**
*Average diversity factor @0.8								
**A power factor of 0.95 has been considered								

8.0 APPENDIX B – UTILITIES AREA STATISTICS

Acronyms Key

Apparatus			
Electric			
DNO	Distribution Network Operator	kVA	Kilo Volt Amperes
IDNO	Independent Distribution Network Operator	MVA	Mega Volt Amperes
ICP	Independent Connections Provider	AC	Alternating Current
LV	Low Voltage	S/S	Substation
HV	High Voltage	PMT	Pole Mounted Transformer
EHV	Extra High Voltage		
Water			
SLO	Self Lay Organisation	WRAS	Water Regulation Advisory Scheme
Incumbent	Local Water or Water & Sewerage Company		
Gas			
GDN	Gas Distribution Network	LP	Low Pressure
IGT	Independent Gas Transporter	MP	Medium Pressure
UIP	Utility Infrastructure Provider	IP	Intermediate Pressure
PRS	Pressure Reducing Station (Governor)	HP	High Pressure
Others			
PES	Premier Energy Services	CATV	Cable Television
PE	Polyethylene	FTTP	Fibre to the premise
DI	Ductile Iron	FTTC	Fibre to the cabinet
ST	Steel	l/min	Litres per minute
CI	Cast Iron	H&S	Health & Safety
SI	Spun Iron	HBF	House Builders Federation
HPPE	High Performance Polyethylene	TPO	Tree Preservation Order
MDPE	Medium Density Polyethylene	TBC	To be confirmed
GRP	Glass Reinforced Plastic	N/A	Not Applicable



Premier Energy
specialists in utility infrastructure

Request Ref: 505167

75-81 George Street, Petersham, London Borough of Richmond, TW9 1HE
Eastings 517762, **Northings** 174832

Imagery sourced from Open Street Maps

Title: JOB NO: STANDARD PLOT

20-22 THE GREEN 122219

KING STREET 121399

TO DICKENS & JONES

M&S RED LION STREET 122188

WATER LANE NO 2

Lv/HV Cables on this site have been installed by Power On Connections under arrangements for contestable projects. Up to two years from the date of adoption, costs from any faults or quality issues with their work should be recovered from them. Adoption date: 15/06/2012

IDNO – The Electricity Network Company Notification – 40082960

IDNO Point of Supply

IDNO Point of Supply

All ducts blocked

WATER METER

PELICAN CROSSING

B CORE DEAD IN DUCT

NOTE: STREET LIGH
IN BASEMENT OF "TH

The LV cable & the link box has been ins
by UK Power Solutions under arrangeme
for contestable projects; up to two years
the date of adoption, costs from any faul

LV Cable or Line
HV Cable or Line
EHV Cable or Line Approx. position
Ductline
Pole & Street Furniture
Substation & Link Box

1. The position of the apparatus shown on this drawing is believed to be correct but the original landmarks may have been altered since the apparatus was installed.
2. The exact position of the apparatus should be verified – use approved cable avoidance tools prior to excavation using suitable hand tools.
3. It is essential that trial holes are carefully made avoiding the use of mechanical tools or picks until the exact location of all cables have been determined.
4. It must be assumed that each property and item of street furniture has an electricity supply. Service cables shown only where known.
5. All cables must be treated as being live unless proved otherwise by UK Power Networks.
6. The information provided must be given to all people working near UK Power Networks plant & equipment. Do not use plans more than 3 months after the issue date for excavation purposes.
7. Please be aware that electric cables/lines belonging to other owners of licensed electricity distribution systems may be present and it is your responsibility to identify their location.

0m 10m 20m 30m 40m 50m 60m 70m 80m 90m 100m

1. UK Power Networks does not warrant that the information provided to you is correct. You rely upon it at your own risk.
2. UK Power Networks does not exclude or limit its liability if it causes the death of any person or causes personal injury to a person where such death or personal injury is caused by its negligence.
3. Subject to paragraph 2 UK Power Networks has no liability to you in contract, in tort (including negligence), for breach of statutory duty or otherwise for any loss, damage, cost, claims, demands, or expenses that you or any third party may suffer or incur as a result of or in connection with the information provided whether for physical damage to property or for any economic loss (including without limitation loss of profit, loss of opportunity, loss of savings, loss of goodwill, loss of business, loss of use) or any special or consequential loss or damage whatsoever.
4. This plan has been provided to you on the basis of the terms of use set out in the covering letter that accompanies this plan. If you do not accept and/or do not understand the terms of use set out in the covering letter you must not use the plan and you must return it to the sender of the letter.
5. You are responsible for the security of the information provided to you. It must not be given, sold or made available upon payment of a fee to a third party.

The quality and accuracy of any print will depend on your printer, your computer and its print settings. Measurements scaled from this plan may not match measurements between the same points on the ground.

VISITING AN OPEN POINT? Please mark on this plan all locations visited and open points as found, then return updated map to your Business Unit – Thank You.

Contact UK Power Networks on 0800 056 5866 for details of EHV Cable routes before commencing work.

Maps produced at 1:2500 scale are LV Geo-Schematics which show LV mains cables and overhead lines (in some cases all voltages). Prior to carrying out excavations you must refer to the 1:500 records to determine the location of all known underground plant and equipment.

Plan Provision

CHECK IT OUT BEFORE YOU DIG IT OUT
CALL: 0800 056 5866
EMERGENCY – if you damage a cable
Phone
0800 096 3766 (24hrs)
URGENTLY

ALWAYS LOOK UP BEFORE YOU START WORK
Refer to HSE Guidance note G56

Grid Ref: TQ 17731 74826
Map Centre: TQ1774NE
Scale: 1:250
(When Plotted at A0)
Plotted on: 28/02/2019
Plotted by: <anonymous>

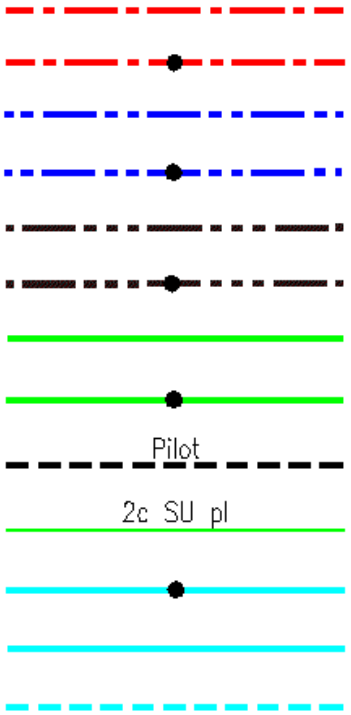
UK Power Networks

Primary distribution line route (1:500 view)

NetMAP system	Description
	275–400kV National Grid route 132kV cable route 33kV cable route

Approximate routes only – see seperate record

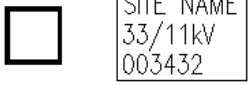
Secondary distribution cables (1:500 view)

NetMAP system	Description
	11kV underground cable 11kV overhead line 6.6kV underground cable 6.6kV overhead line <6.6kV underground cable <6.6kV overhead line LV underground cable LV overhead line Pilot cable LV street lighting (pl) Service overhead line Service underground Logical service connection

Poles (1:500 view)

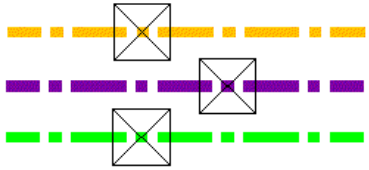
NetMAP system	Description
(S) 999999	Section pole Pole number (unique)
	Single leg
	H pole
	3 member
	4 member
	Strut
	Pole support (stay)
	Flying stay
	Tower 33kV to 400kV

EHV, HV and LV sites (1:500 view)

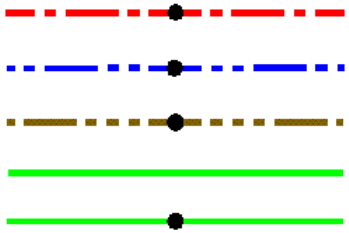
NetMAP system	Description
Note: EHV and HV sites are identified by a unique 6 digit number (SPENS)	
	Ground mounted primary substation showing name, transformer voltage and SPENS number
	Pole mounted substation showing name and SPENS number
	Ground mounted substation showing name and SPENS number
	2 way link box
	4 way link box
	Link box without busbar
	(options similar to 1:2500 view) LV distribution pillar
	Voltage regulator
	Voltage balancer
	Open point
	Open point – out of phase
	Overhead open point

Note: For LV linking, use the 1:2500 view

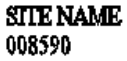
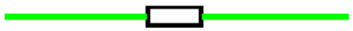
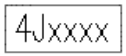
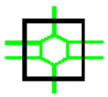
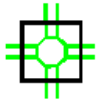
Primary distribution line route (1:2500 view)

NetMAP system	Description
	275–400kV National Grid route 132kV cable route 33kV cable route

Secondary distribution cables (1:2500 view)

NetMAP system	Description
	11kV overhead line 6.6kV overhead line <6.6kV overhead line LV underground cable LV overhead line

Primary and secondary sites (1:2500 view)

NetMAP system	Description
Note: EHV and HV sites are identified by a unique 6 digit number (SPENS)	
	Ground mounted substation showing capacity, phase, name and SPENS number
	Pole mounted substation showing capacity, phase, name and SPENS number
	Primary substation showing name and SPENS number (no site shown)
	2 way link box
	4 way link box
	Link box identifier
	4 way link box without busbar
	6 way link box without busbar
	8 way link box without busbar

section continued on next page

Primary and secondary sites continued (1:2500 view)

NetMAP system	Description
	LV distribution pillar
	Voltage regulator
	Voltage balancer
	Open point
	Open point – out of phase
	Earth pin

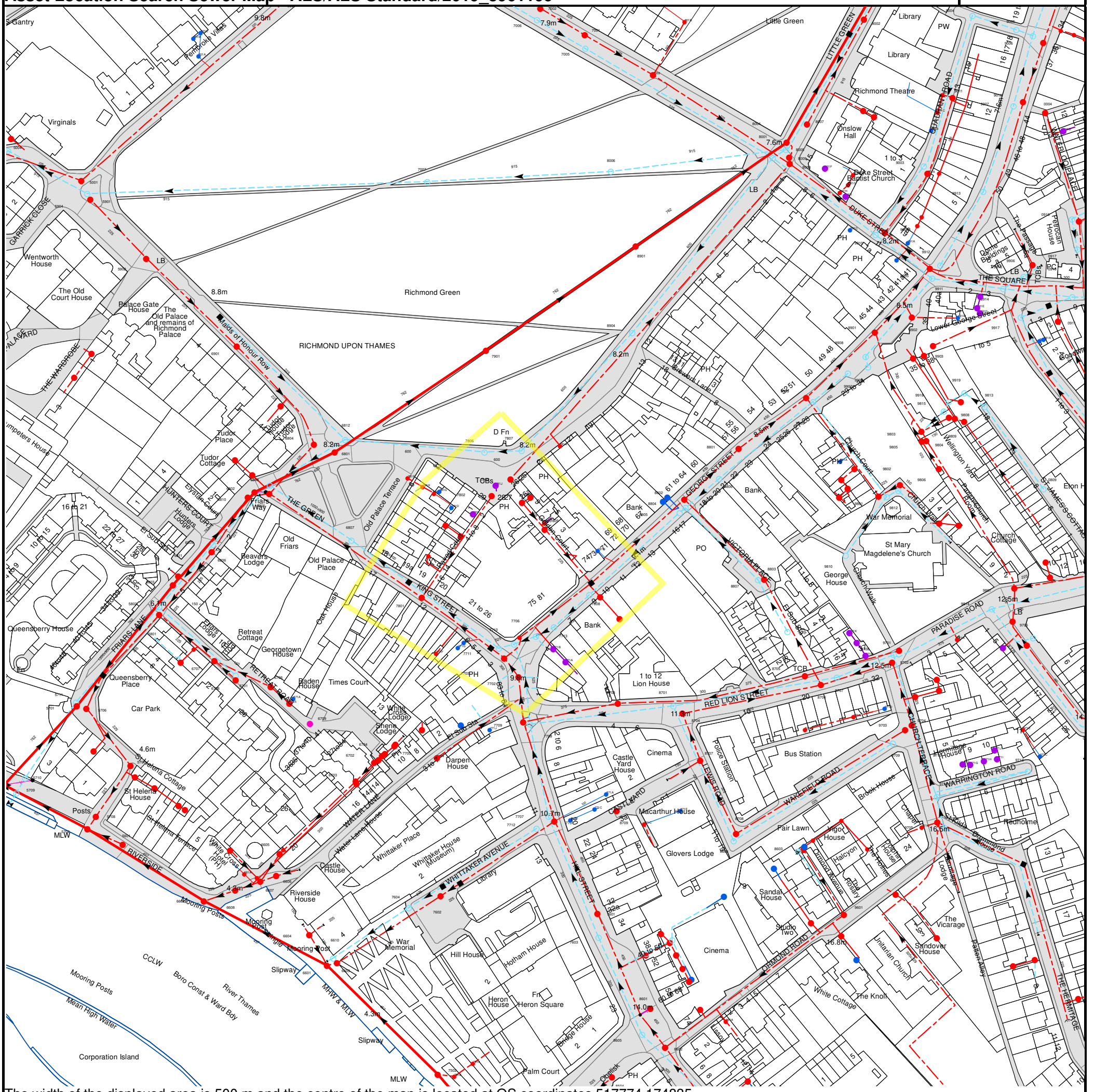
Secondary distribution cables (1:10000 view)

NetMAP system	Description
	11kV underground cable
	6.6kV underground cable
	<6.6kV underground cable
	11kV overhead line
	6.6kV overhead line
	<6.6kV overhead line

Primary and secondary sites (1:10000 view)

NetMAP system	Description
Note: EHV and HV sites are identified by a unique 6 digit number (SPENS)	
SITE NAME 008590	Primary substation showing name and SPENS number
SITE NAME 521234	11kV ground mounted substation showing name and SPENS number
SITE NAME 524514	6.6kV ground mounted substation showing name and SPENS number
SITE NAME 523634	<6.6kV ground mounted substation showing name and SPENS number
SITE NAME pmt 527522	11kV pole mounted substation showing name and SPENS number
SITE NAME pmt 525743	6.6kV pole mounted substation showing name and SPENS number
SITE NAME pmt 526543	<6.6kV pole mounted substation showing name and SPENS number
SITE NAME 527238	Pole mounted switching substation showing name and SPENS number

Asset Location Search Sewer Map - ALS/ALS Standard/2019_3961199



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 517774,174835

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

Air Valve

Dam Chase

Fitting

Meter

Vent Column

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

Control Valve

Drop Pipe

Ancillary

Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol, Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

Outfall

Undefined End

Inlet

Other Symbols

Symbols used on maps which do not fall under other general categories

Public/Private Pumping Station

Change of characteristic indicator (C.O.C.I.)

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Operational Site

Chamber

Tunnel

Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

Foul Sewer

Surface Water Sewer

Combined Sewer

Gulley

Culverted Watercourse

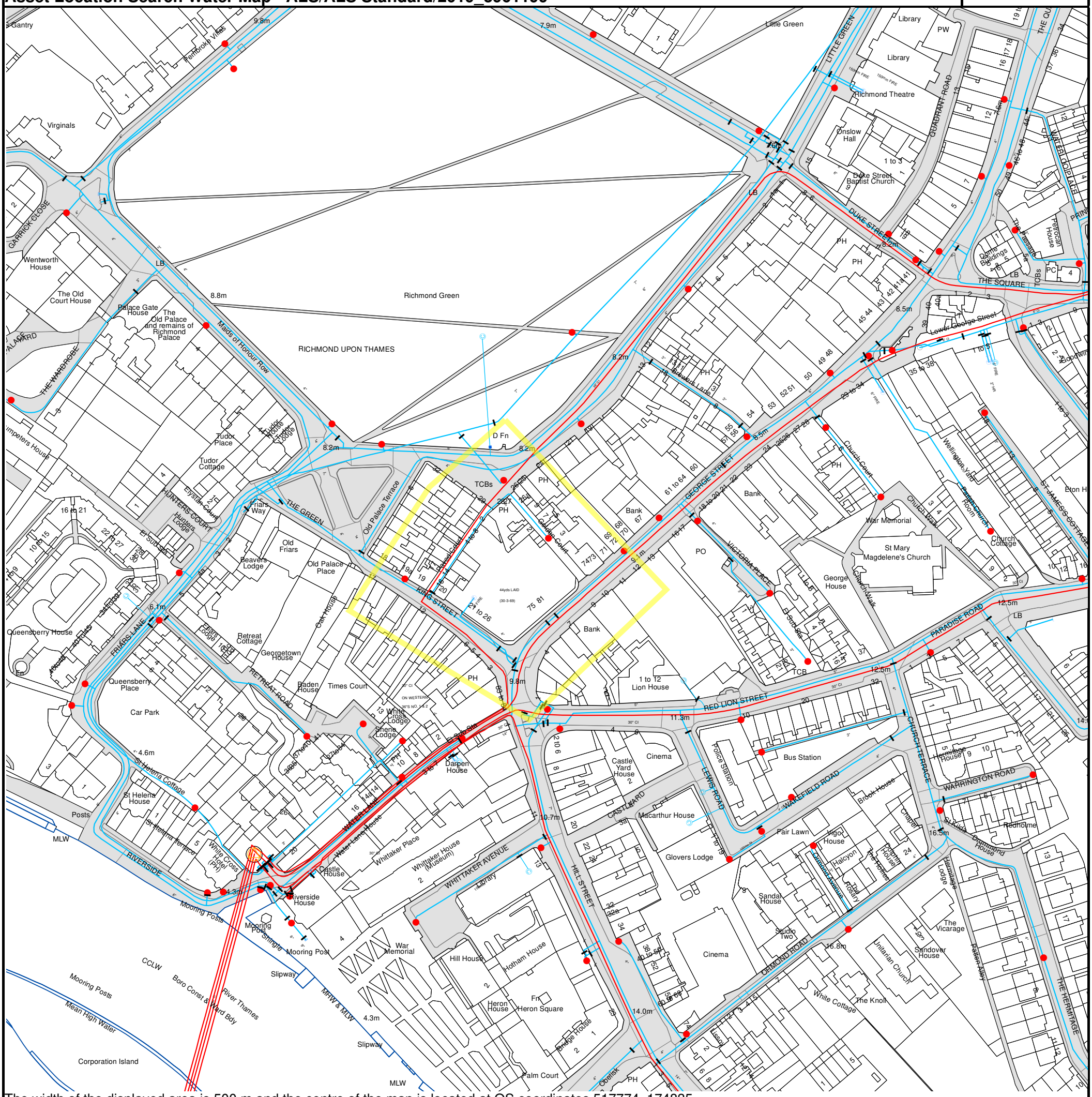
Proposed

Abandoned Sewer

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plans are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
5) 'na' or '0' on a manhole level indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.

Asset Location Search Water Map - ALS/ALS Standard/2019_3961199



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 517774, 174835.

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

ALS Water Map Key

Water Pipes (Operated & Maintained by Thames Water)

4"

Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

16"

Trunk Main: A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.

3" SUPPLY

Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.

3" FIRE

Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

3" METERED

Metered Pipe: A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.

Transmission Tunnel: A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.

Proposed Main: A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

Symbol indicating what happens at the end of a water main.

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

Other Symbols

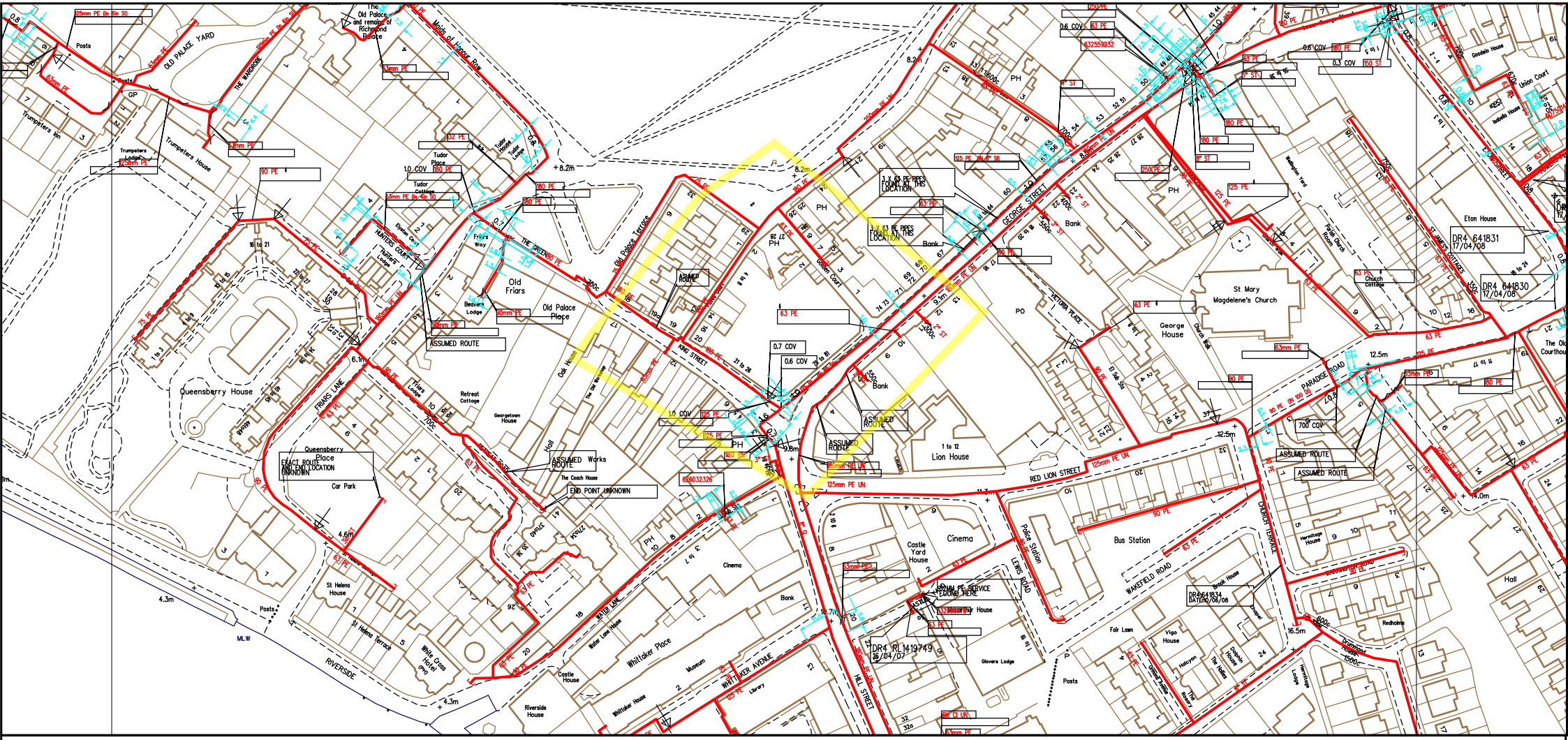
- Data Logger

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Other Water Pipes (Not Operated or Maintained by Thames Water)

Other Water Company Main: Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.

Private Main: Indiates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.



SCALE: Not to scale	LP MAINS
USER ID: Celeste.Imthurn	MP MAINS
DATE: 28/02/2019	IP MAINS
EXTRACT DATE: 10/12/2018	LHP MAINS
MAP REF: TQ1774	
CENTRE: 517758, 174803	

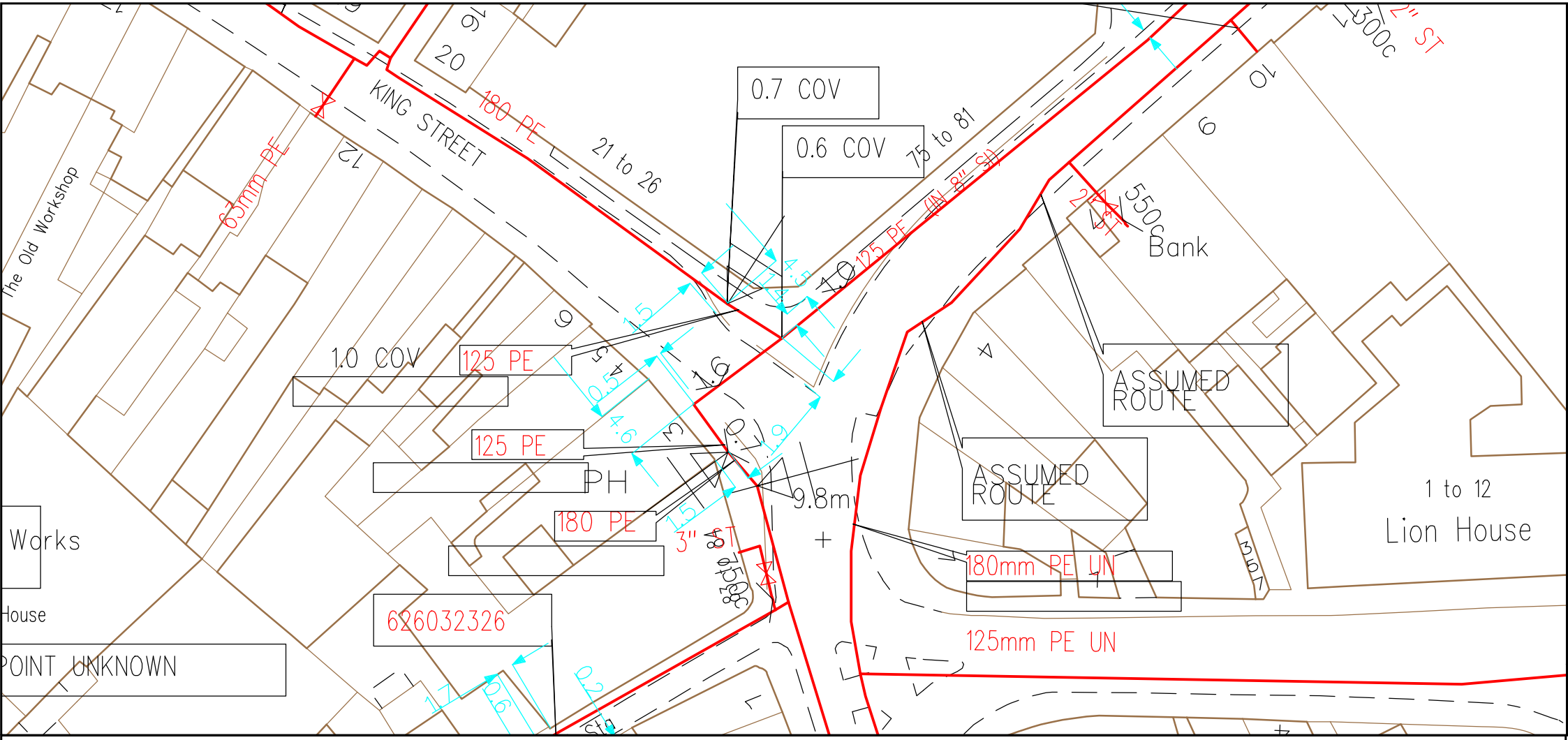
Some examples of Plant Items:

Valve | Depth of Cover | Syphon | Diameter Change | Material Change | Out of Standard Service

This plan shows those pipes owned by Cadent Gas Ltd in their role as a Licensed Gas Transporter (GT). Gas pipes owned by other GTs, or otherwise privately owned, may be present in this area. Information with regard to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections, etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Ltd or their agents, servants or contractors for any error or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue. Further information on all DR4s can be determined by calling the DR4 hotline on 01455 892426 (9am-5pm) A DR4 is where a potential error has been identified within the asset record and a process is currently underway to investigate and resolve the error as appropriate.

MAPS Viewer Version 5.8.0.1

Local Machine



SCALE: Not to scale

USER ID: Celeste.Imthurn

DATE: 28/02/2019

EXTRACT DATE: 10/12/2018

MAP REF: TQ1774

CENTRE: 517757, 174785

LP MAINS
MP MAINS
IP MAINS
LHP MAINS

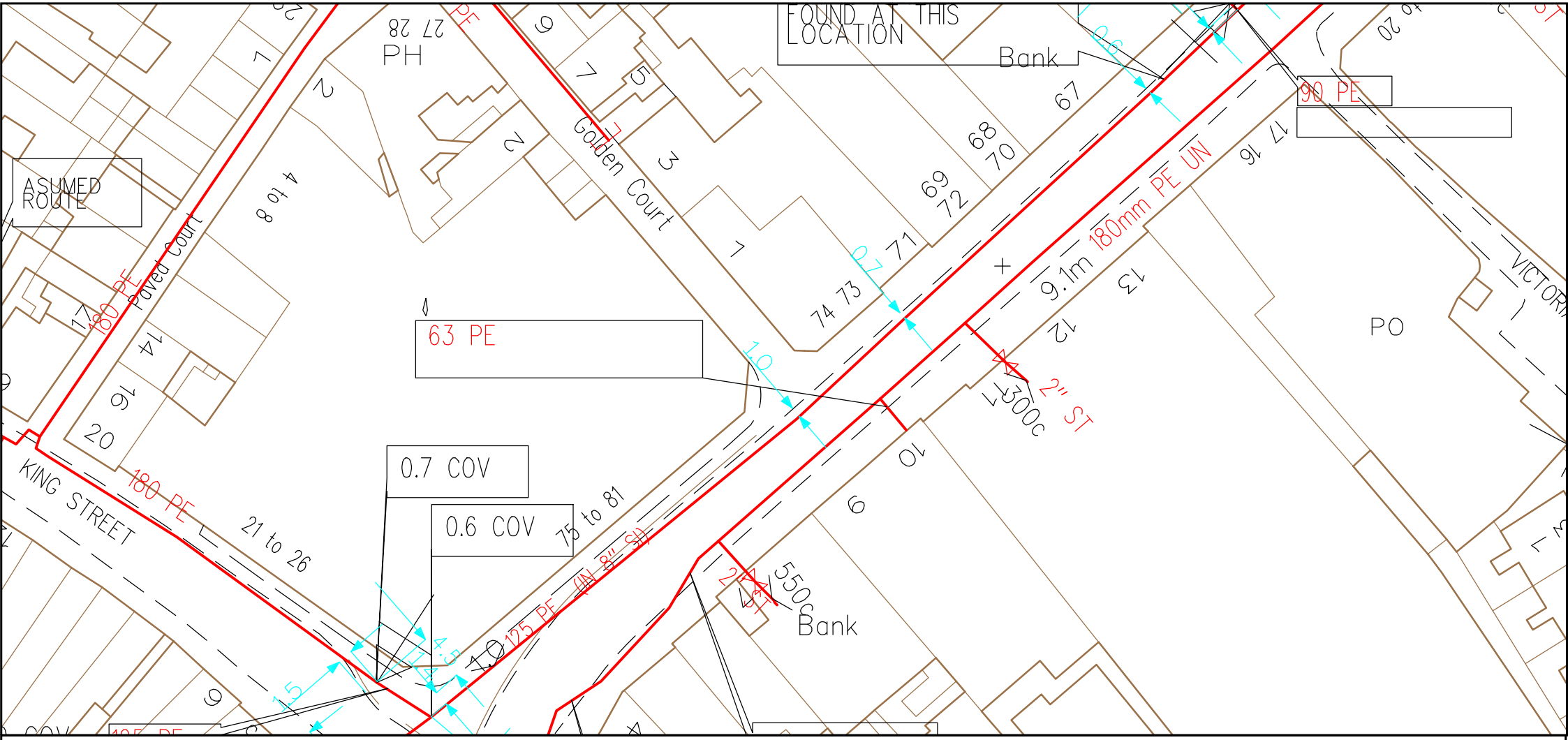
Some examples of Plant Items:

Valve | Depth of Cover | Syphon | Diameter Change | Material Change | Out of Standard Service

This plan shows those pipes owned by Cadent Gas Ltd in their role as a Licensed Gas Transporter (GT). Gas pipes owned by other GTs, or otherwise privately owned, may be present in this area. Information with regard to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections, etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Ltd or their agents, servants or contractors for any error or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue. Further information on all DR4s can be determined by calling the DR4 hotline on 01455 892426 (9am-5pm) A DR4 is where a potential error has been identified within the asset record and a process is currently underway to investigate and resolve the error as appropriate.

MAPS Viewer Version 5.8.0.1

Local Machine



SCALE: Not to scale	LP MAINS
USER ID: Celeste.Imthurn	MP MAINS
DATE: 28/02/2019	IP MAINS
EXTRACT DATE: 10/12/2018	LHP MAINS
MAP REF: TQ1774	
CENTRE: 517790, 174821	

Some examples of Plant Items:

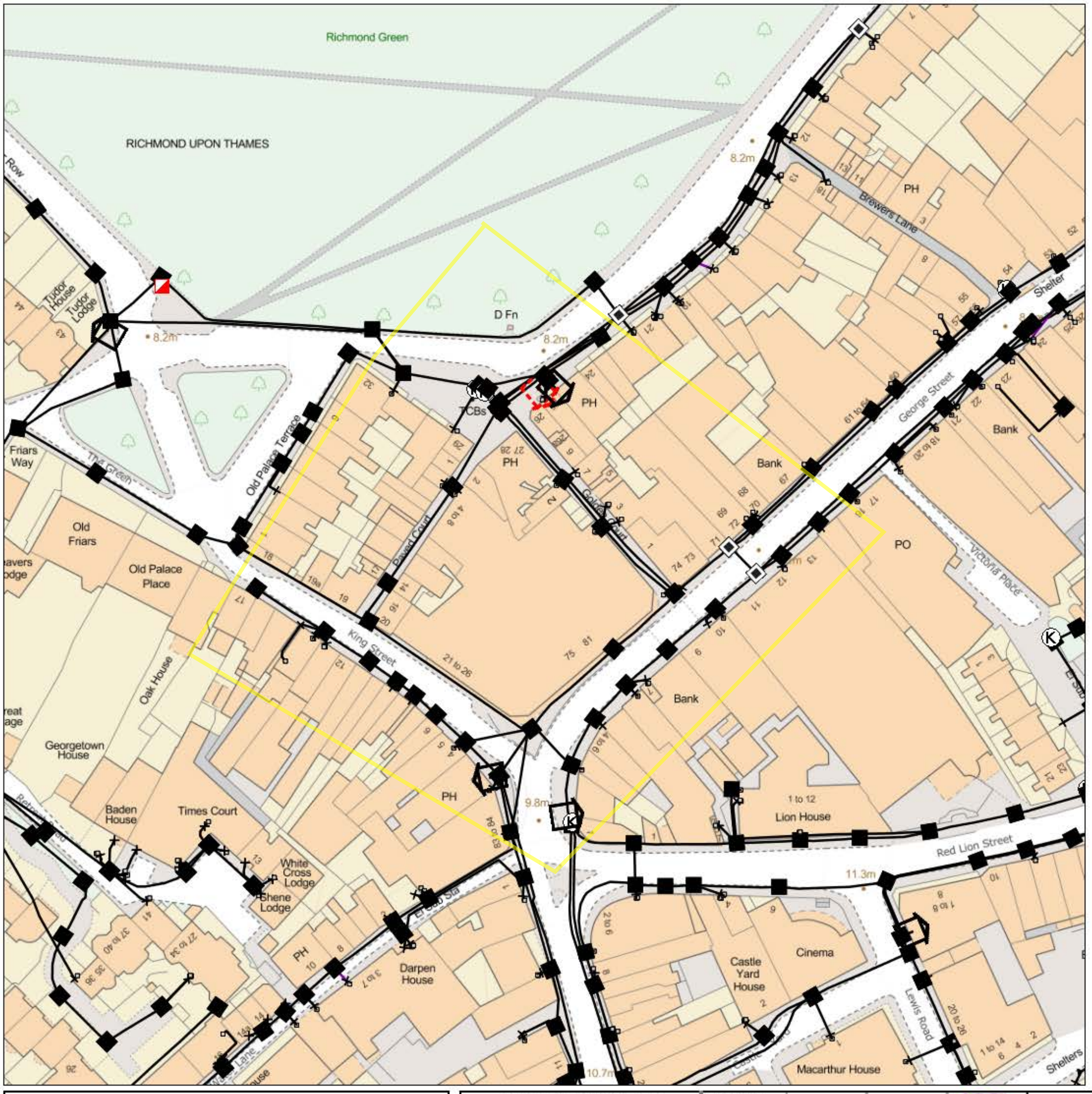
Valve | Depth of Cover | Syphon | Diameter Change | Material Change | Out of Standard Service

This plan shows those pipes owned by Cadent Gas Ltd in their role as a Licensed Gas Transporter (GT). Gas pipes owned by other GTs, or otherwise privately owned, may be present in this area. Information with regard to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections, etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Ltd or their agents, servants or contractors for any error or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue. Further information on all DR4s can be determined by calling the DR4 hotline on 01455 892426 (9am-5pm) A DR4 is where a potential error has been identified within the asset record and a process is currently underway to investigate and resolve the error as appropriate.

MAPS Viewer Version 5.8.0.1

Local Machine

Maps by email Plant Information Reply



IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy. It should not be relied upon in the event of excavations or other works being made near to BT apparatus which may exist at various depths and may deviate from the marked route.

openreach

CLICK BEFORE YOU DIG

FOR PROFESSIONAL FREE ON SITE ASSISTANCE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS INCLUDING LOCATE AND MARKING SERVICE

email cbyd@openreach.co.uk

ADVANCE NOTICE REQUIRED
(Office hours: Monday - Friday 08.00 to 17.00)
www.openreach.co.uk/cbyd

KEY TO BT SYMBOLS

	Planned	*Live*
PCP		
Pole		
Box		
Manhole		
Cabinet		

Change Of State	+	Hatchings	
Split Coupling	×	Built	
Duct Tee	▲	Planned	
Building		Inferred	
Kiosk	K	Duct	

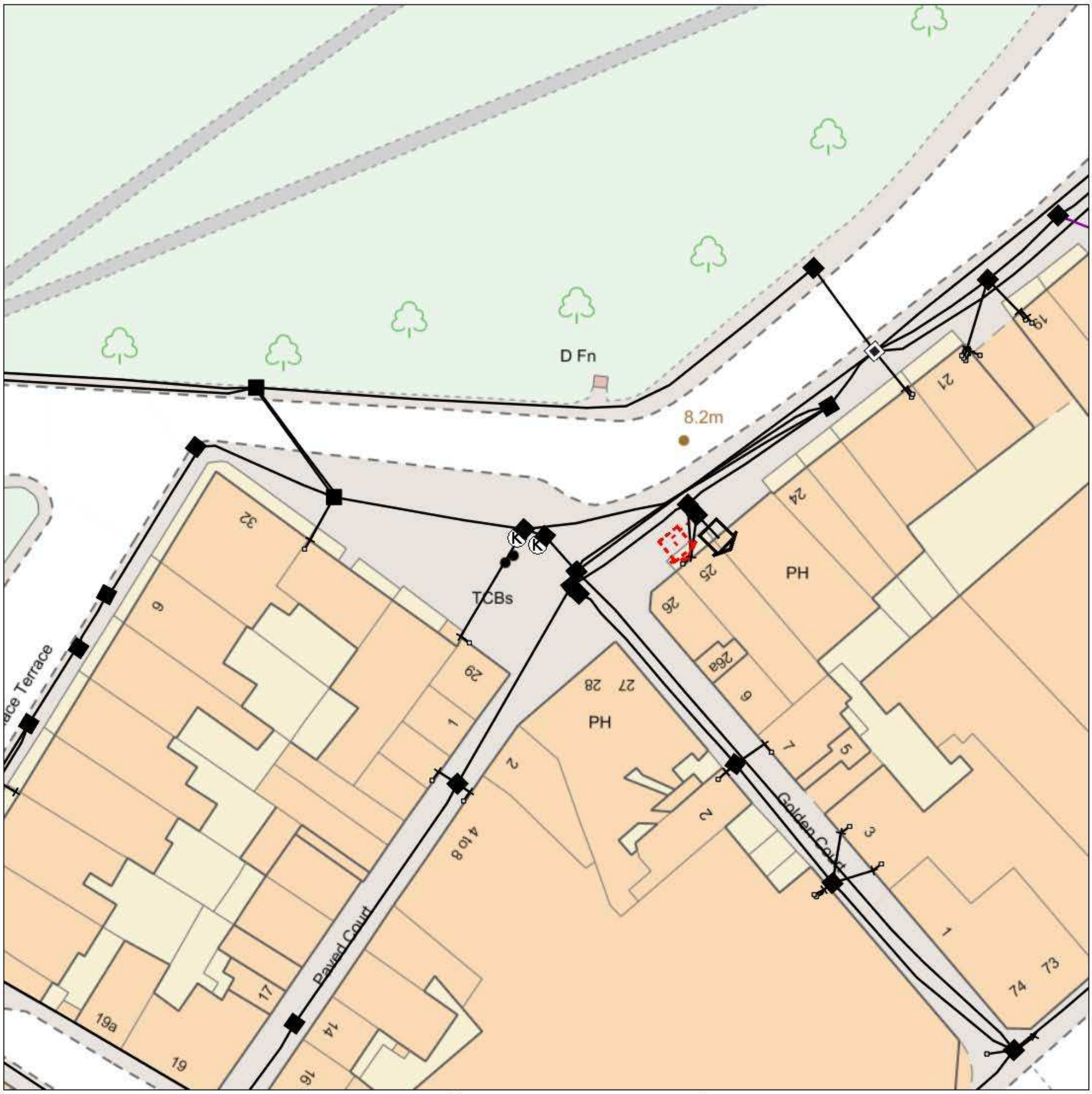
Other proposed plant is shown using dashed lines.
BT Symbols not listed above may be disregarded.
Existing BT Plant may not be recorded.
Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.

	Pending Add	*In Place*	*Pending Remove*	*Not In Use*
Power Cable				
Power Duct				N/A

BT Ref : FMM03362V
Map Reference : (centre) TQ1776274832
Easting/Northing : (centre) 517762,174832
Issued : 28/02/2019 15:36:41

WARNING: IF PLANNED WORKS FALL INSIDE HATCHED AREA IT IS ESSENTIAL BEFORE PROCEEDING THAT YOU CONTACT THE NATIONAL NOTICE HANDLING CENTRE. PLEASE SEND E-MAIL TO: nnhc@openreach.co.uk

Maps by email Plant Information Reply



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(Office hours: Monday - Friday 08.00 to 17.00)
www.openreach.co.uk/cbyd

KEY TO BT SYMBOLS

	Planned	*Live*
PCP		
Pole		
Box		
Manhole		
Cabinet		

Change Of State	+	Hatchings	
Split Coupling	×	Built	
Duct Tee	▲	Planned	
Building		Inferred	
Kiosk	K	Duct	

Other proposed plant is shown using dashed lines.
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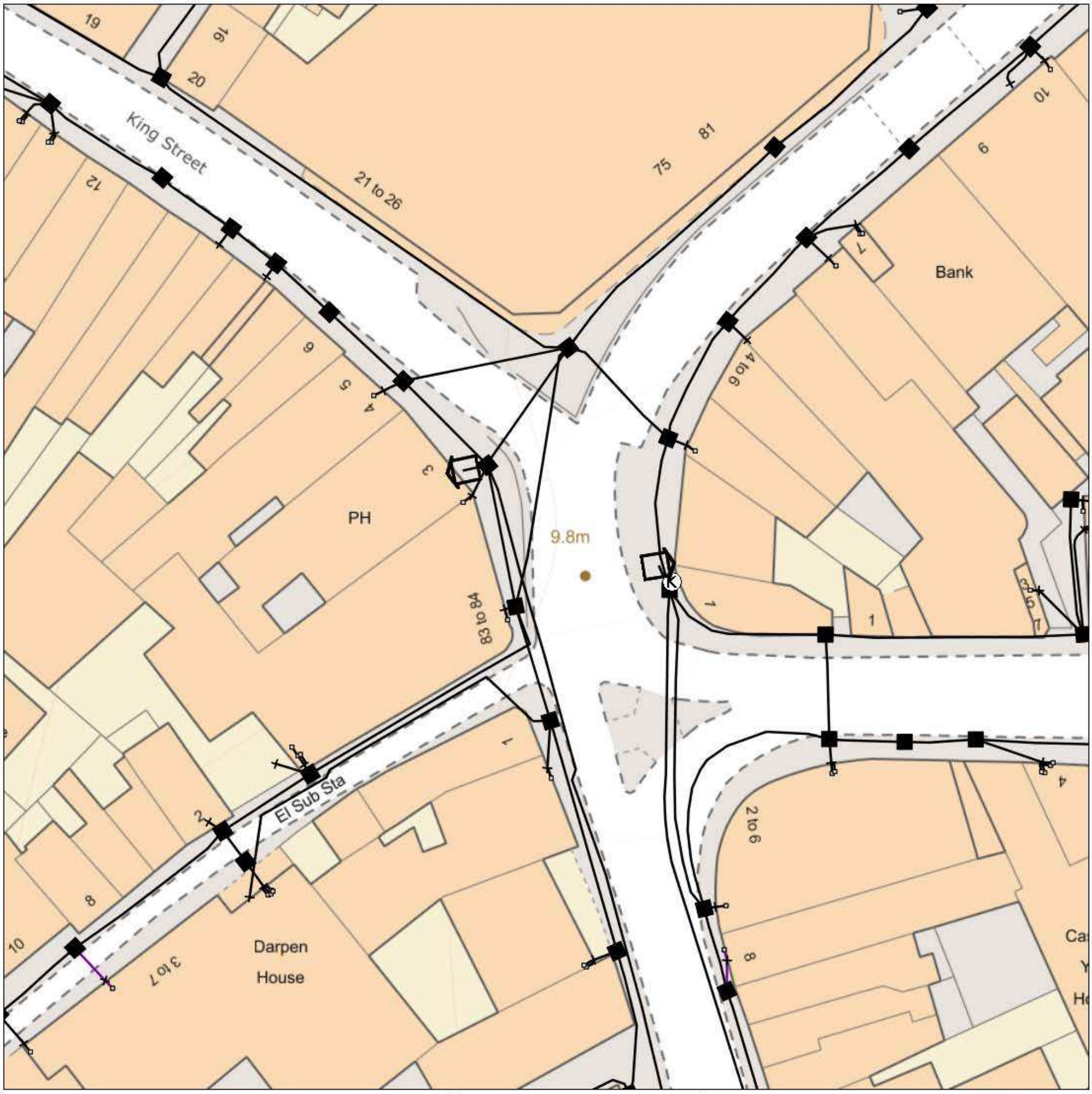
Existing BT Plant may not be recorded.
Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.

	Pending Add	*In Place*	*Pending Remove*	*Not In Use*
Power Cable				
Power Duct				N/A

BT Ref : USD03371K
Map Reference : (centre) TQ1774974867
Easting/Northing : (centre) 517749,174867
Issued : 28/02/2019 15:37:47

WARNING: IF PLANNED WORKS FALL INSIDE HATCHED AREA IT IS ESSENTIAL BEFORE PROCEEDING THAT YOU CONTACT THE NATIONAL NOTICE HANDLING CENTRE. PLEASE SEND E-MAIL TO: nnhc@openreach.co.uk

Maps by email Plant Information Reply



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(Office hours: Monday - Friday 08.00 to 17.00)
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KEY TO BT SYMBOLS

	Planned	*Live*
PCP		
Pole		
Box		
Manhole		
Cabinet		

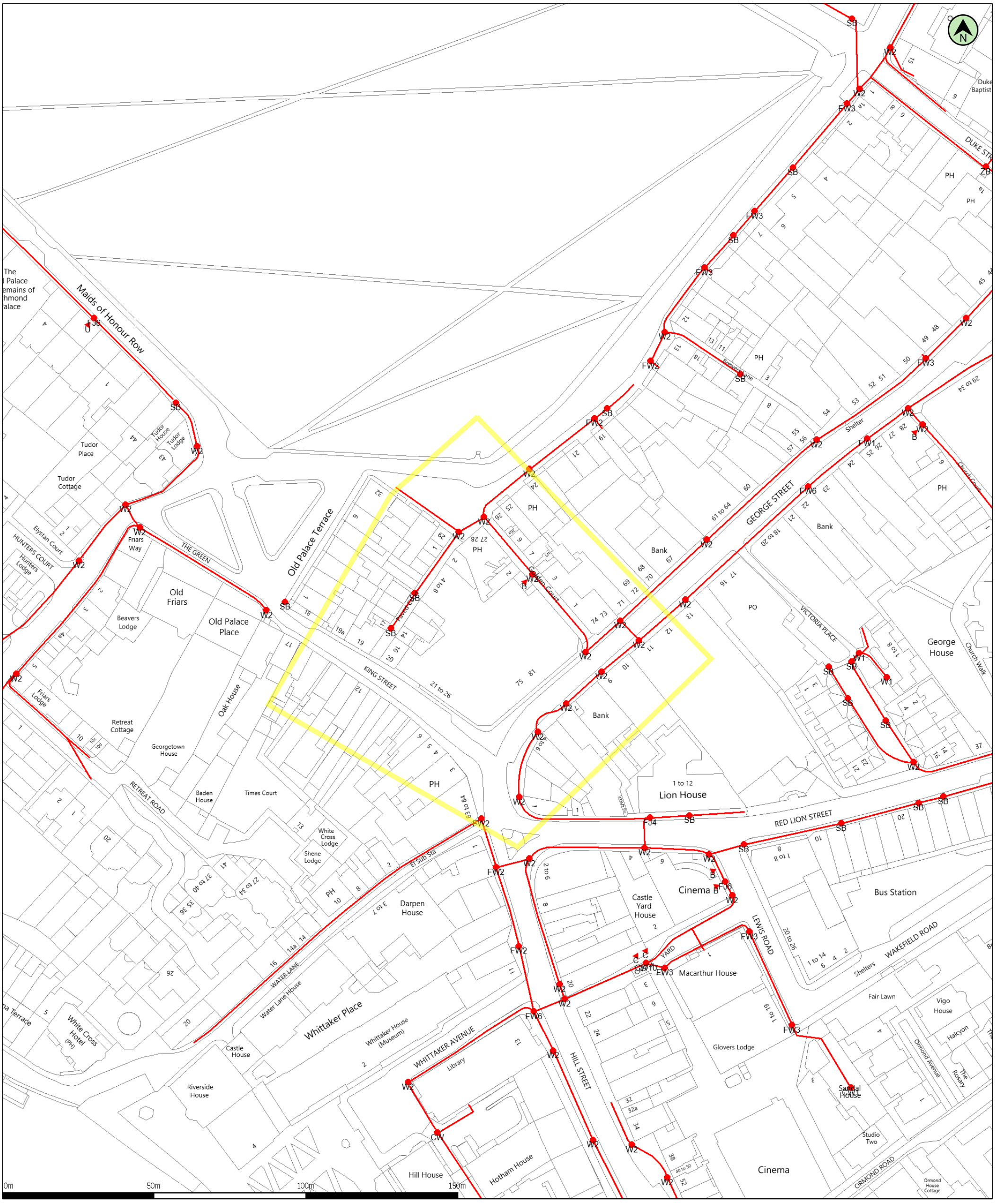
Change Of State	+	Hatchings	
Split Coupling	×	Built	
Duct Tee	▲	Planned	
Building		Inferred	
Kiosk	K	Duct	

Other proposed plant is shown using dashed lines.
BT Symbols not listed above may be disregarded.
Existing BT Plant may not be recorded.
Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.

	Pending Add	*In Place*	*Pending Remove*	*Not In Use*
Power Cable				
Power Duct				N/A

BT Ref : VYF03371K
Map Reference : (centre) TQ1775774771
Easting/Northing : (centre) 517757,174771
Issued : 28/02/2019 15:38:18

WARNING: IF PLANNED WORKS FALL INSIDE HATCHED AREA IT IS ESSENTIAL BEFORE PROCEEDING THAT YOU CONTACT THE NATIONAL NOTICE HANDLING CENTRE. PLEASE SEND E-MAIL TO: nnhc@openreach.co.uk



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Scale: 1:1178

Date: 01/03/19

Telecoms Plan A3

Data updated: 11/01/19

Map Centre: 517760,174834

Powered by digdat

Duct, Trench

Chamber

Cabinet

chilakala.apsar@virginmedia.co.uk

VM.1129239

Important Information - please read The purpose of this plan is to identify Virgin Media apparatus. We have tried to make it as accurate as possible but we cannot warrant its accuracy. In addition, we caution that within Virgin Media apparatus there may be instances where mains voltage power cables have been placed inside green, rather than black ducting. Further details can be found using the "Affected Postcodes.pdf", which can be downloaded from this website. Therefore, you must not rely solely on this plan if you are carrying out any excavation or other works in the vicinity of Virgin Media apparatus. The actual position of any underground service must be verified by cable detection equipment, etc. and established on site before any mechanical plant is used. Accordingly, unless it is due to the negligence of Virgin Media, its employees or agents, Virgin Media will not have any liability for any omissions or inaccuracies in the plan or for any loss or damage caused or arising from the use of and/or any reliance on this plan. This plan is produced by Virgin Media Limited (c) Crown copyright and database rights 2019 Ordnance Survey 100019209.

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