

Asset Location Search



Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0845 850 2777
Email: developer.services@thameswater.co.uk

Clean Water queries

Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0845 850 2777
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS Standard/2016 3373517



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 516279,173177

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.

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
4315	n/a	n/a
4314	n/a	n/a
4303	6.55	3.65
4312	6.86	n/a
4304	6.94	3.38
4308	5.55	3.65
4202	n/a	5.7
4301	7.56	5.12
4307	7.61	4.43
4305	4.88	2.59
5201	n/a	n/a
01NF	n/a	n/a
2107	n/a	n/a
2102	n/a	n/a
22MK	n/a	n/a
22MJ	n/a	n/a
2001	n/a	n/a
2210	n/a	5.21
2002	n/a	n/a
2204	n/a	3.38
22NC	n/a	n/a
2203	n/a	4.83
21ML	n/a	n/a
22MN	n/a	n/a
2103	n/a	n/a
2205	n/a	4.79
22NE	n/a	n/a
2106	n/a	n/a
22MM	n/a	n/a
2207	7.71	1.99
22ML	n/a	n/a
2212	7.64	4.36
3201B	n/a	7.81
3202	n/a	7.72
32NC	n/a	n/a
32MN	n/a	n/a
3105	n/a	n/a
32KD	n/a	n/a
3205	7.74	5.51
1109	7.31	4
1104	7.3	3.5
1206	8.13	5.06
1201	8.13	1.52
1001A	7.38	2.03
1111	7.28	5.28
1110	7.15	5.09
1107	n/a	3.97
1103	n/a	1.98
12LC	n/a	n/a
1205	8.17	4.52
10NM	n/a	n/a
1101B	7.21	1.86
1102B	7.05	1.78
1106	n/a	4.3
11NL	n/a	n/a
1105	n/a	3.63
22LH	n/a	n/a
21NM	n/a	n/a
2109	7.49	3.15
2209	7.33	1.59
2213	n/a	4.78
2105	7.19	1.67
21NK	n/a	n/a
2104	n/a	1.8
2101	7.02	2.01
2108	7.01	3
01LD	n/a	n/a
01MH	n/a	n/a
01ME	n/a	n/a
01MF	n/a	n/a
01LF	n/a	n/a
01KN	n/a	n/a
021B	n/a	n/a
01LC	n/a	n/a
0112	7.54	5.65
00NM	n/a	n/a
00NF	n/a	n/a
01MG	n/a	n/a
0108	n/a	n/a
0006	8.01	5.57
0113	7.46	4.22
0104	7.43	5.34
0001	8.02	6.13
1112	7.35	4.93
1204	8.11	3.81
12LF	n/a	n/a
10ND	n/a	n/a
10NC	n/a	n/a
1203	8.2	3.44
1202	8.28	3.34
1108	n/a	5.39

Manhole Reference	Manhole Cover Level	Manhole Invert Level
1004	7.46	5.3
1002	7.52	5.02
3003	n/a	n/a
3002	n/a	n/a
3001	n/a	n/a
4101	n/a	n/a
3104	n/a	n/a
3103	n/a	n/a
4102	n/a	n/a
3102	n/a	n/a
3101	n/a	n/a
3204	n/a	n/a
321D	n/a	n/a
32KL	n/a	n/a
321C	n/a	n/a
32KK	n/a	n/a
32KN	n/a	n/a
32MK	n/a	n/a
4208	n/a	n/a
32MJ	n/a	n/a
32ML	n/a	n/a
4204	4.55	2.59
4209	4.53	3.29
321A	n/a	n/a
4210	4.07	2.59
321B	n/a	n/a
421A	n/a	n/a
4203	n/a	n/a
4207	n/a	n/a
01LE	n/a	n/a
0111	7.63	5.05
001B	n/a	n/a
09NE	n/a	n/a
00NC	n/a	n/a
1904	8.75	6.24
1903	8.71	2.23
1901	8.79	6.05
1005	8.59	6.5
1003	8.55	5.9
04LD	n/a	n/a
1407	8.43	6.4
2401	8.39	4.68
24NE	n/a	n/a
2406	8.24	6.46
2410	8.14	6.82
03JL	n/a	n/a
03JF	n/a	n/a
1402	8.42	6.39
1302	8.68	5.04
241A	n/a	n/a
231A	n/a	n/a
231B	n/a	n/a
2201A	8.28	4.77
231C	n/a	n/a
23ND	n/a	n/a
231D	n/a	n/a
231E	n/a	n/a
23LM	n/a	n/a
2309	8.88	6.16
23LN	n/a	n/a
23NE	n/a	n/a
2301A	8.76	5.11
231F	n/a	n/a
23MM	n/a	n/a
23NJ	n/a	n/a
231G	n/a	n/a
23NL	n/a	n/a
23LF	n/a	n/a
23LK	n/a	n/a
23HF	n/a	n/a
23LL	n/a	n/a
2308	8.16	5.11
2302B	8.15	4.77
23NC	n/a	n/a
23MK	n/a	n/a
23LJ	n/a	n/a
2303A	8.14	4.8
2305	7.76	5.06
24ND	n/a	n/a
23HN	n/a	n/a
2307	7.86	5.16
2306	n/a	5.25
2211	n/a	4.36
2202A	n/a	5.35
23KJ	n/a	n/a
23JL	n/a	n/a
23KD	n/a	n/a
23KH	n/a	n/a
23KE	n/a	n/a
2304	n/a	n/a
23JM	n/a	n/a
33NH	n/a	n/a
33KH	n/a	n/a



















Manhole Reference	Manhole Cover Level	Manhole Invert Level
33LJ	n/a	n/a
33LH	n/a	n/a
3304	7.84	5.77
33LK	n/a	n/a
32LH	n/a	n/a
3301	7.86	5.19
34LK	n/a	n/a
34MD	n/a	n/a
32LK	n/a	n/a
32MC	n/a	n/a
33JM	n/a	n/a
32LM	n/a	n/a
32ME	n/a	n/a
33JC	n/a	n/a
32LL	n/a	n/a
32MD	n/a	n/a
32JL	n/a	n/a
3302	7.75	4.37
32JM	n/a	n/a
33LF	n/a	n/a
33LD	n/a	n/a
3409	7.74	4.75
3408	7.76	6.01
33HL	n/a	n/a
33HK	n/a	n/a
3307	n/a	n/a
3406	7.8	5.89
33ML	n/a	n/a
3303	7.54	5.98
43MH	n/a	n/a
43MK	n/a	n/a
4302	7.1	3.72
03ME	n/a	n/a
021A	n/a	n/a
0203	n/a	n/a
03KJ	n/a	n/a
0201	n/a	n/a
03LC	n/a	n/a
03JK	n/a	n/a
03JE	n/a	n/a
03JD	n/a	n/a
03JJ	n/a	n/a
02NL	n/a	n/a
03KF	n/a	n/a
03KM	n/a	n/a
03HN	n/a	n/a
041C	n/a	n/a
03MJ	n/a	n/a
031E	n/a	n/a
03KL	n/a	n/a
031A	n/a	n/a
03KE	n/a	n/a
0303	8.79	1.25
031B	n/a	n/a
0304	n/a	n/a
13MM	n/a	n/a
1301	8.48	n/a
12LJ	n/a	n/a
12LE	n/a	n/a
03FD	n/a	n/a
03EK	n/a	n/a

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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

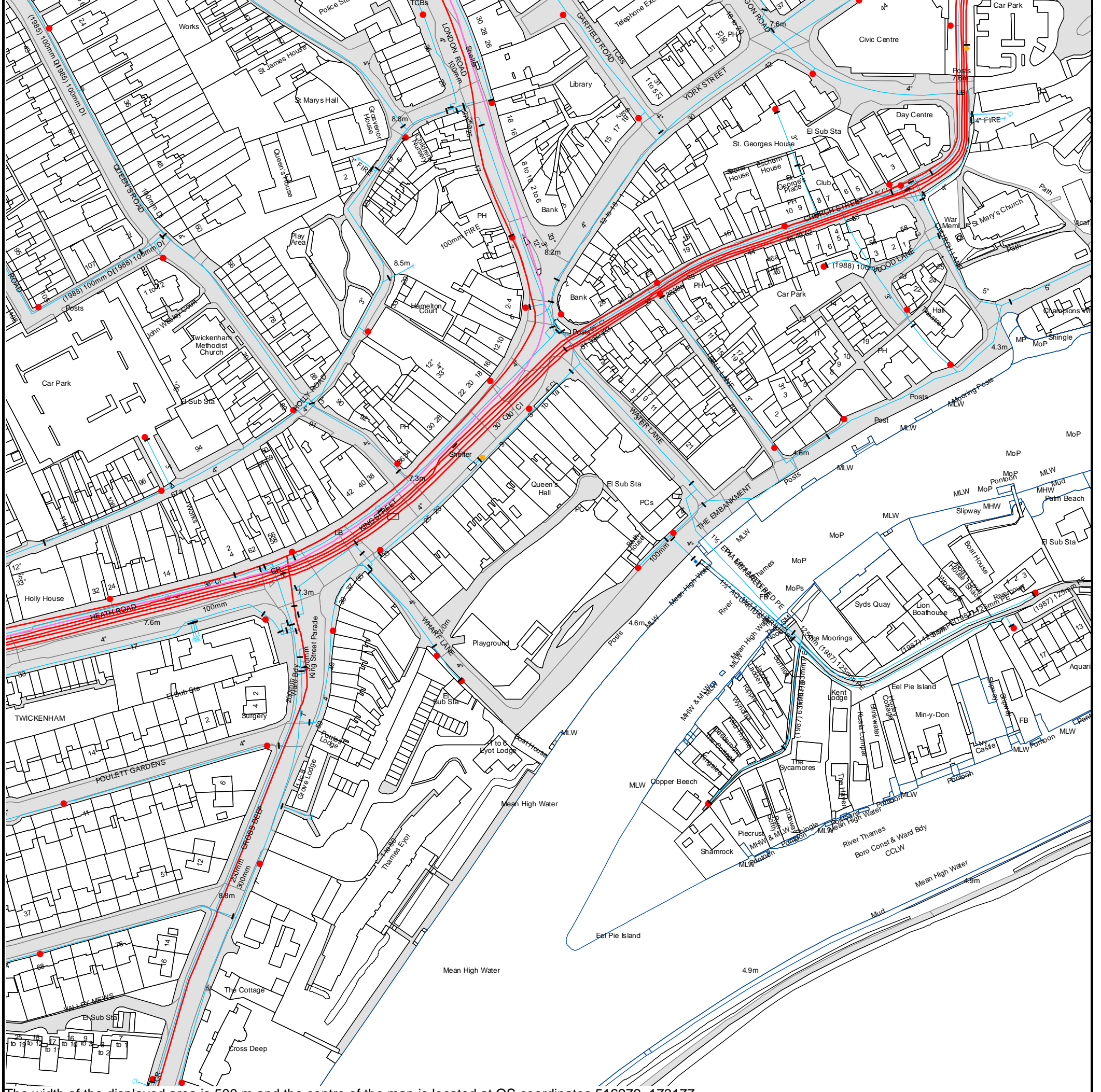
Other Sewer Types (Not Operated or Maintained by Thames Water)

-  Foul Sewer
-  Surface Water Sewer
-  Combined Sewer
-  Gully
-  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 millimetres. 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/2016 3373517



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 516279, 173177.
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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.

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')

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

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:** Indicates 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.

Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL`s terms and conditions shall apply.
6. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to him at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

Ways to pay your bill

Credit Card	BACS Payment	Telephone Banking	Cheque
Call 0845 070 9148 quoting your invoice number starting CBA or ADS.	Account number 90478703 Sort code 60-00-01 A remittance advice must be sent to: Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW. or email ps.billing@thameswater.co.uk	By calling your bank and quoting: Account number 90478703 Sort code 60-00-01 and your invoice number	Made payable to ' Thames Water Utilities Ltd ' Write your Thames Water account number on the back. Send to: Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW or by DX to 151280 Slough 13

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.



Search Code

IMPORTANT CONSUMER PROTECTION INFORMATION

This search has been produced by Thames Water Property Searches, Clearwater Court, Vastern Road, Reading RG1 8DB, which is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom
- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practise and quality standards within the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.

By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

The Code's core principles

Firms which subscribe to the Search Code will:

- display the Search Code logo prominently on their search reports
- act with integrity and carry out work with due skill, care and diligence
- at all times maintain adequate and appropriate insurance to protect consumers
- conduct business in an honest, fair and professional manner
- handle complaints speedily and fairly
- ensure that products and services comply with industry registration rules and standards and relevant laws
- monitor their compliance with the Code

Complaints

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award compensation of up to £5,000 to you if he finds that you have suffered actual loss as a result of your search provider failing to keep to the Code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs Contact Details

The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
Tel: 01722 333306
Fax: 01722 332296
Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk

PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE

Appendix I – BREEAM Summary

The table below summaries the BREEAM 2014 credits that can be achieved.

BREEAM 2104 NC Criteria	Credits available	Targeted credits	Comments on the BREEAM criteria
Pol 03.1 Low Flood Risk	2	1	<ol style="list-style-type: none"> 1. The site is in Flood Zone 3 and therefore criterion 1 is not achievable. 2. This site-specific FRA confirms that the development is not situated within the functional floodplain. This FRA takes into account all sources of current and future sources of flooding. 3. The final design of the building and wider wide reflects the recommendations made by an appropriate consultant, in accordance with the hierarchy approach outlined in Section 5 of BS 8533:2011. This FRA demonstrates that that flood risk at the site has been assessed. Flood Risk cannot be avoided, as the site was approved for development by the Local Planning Authorities. Substitution has been achieved by having no residential accommodation below the design flood level. SUDS will be installed in the development for flood control and surface water management. Resistant floor finishes and building techniques will be designed in all areas below the design water level. This includes hardwearing floors and wall finishes, raising electrical sockets and raising plant above the design flood water level.
Pol 03.2 Surface Water run-off	2	2	<ol style="list-style-type: none"> 4. Pre-requisite: The FRA has been prepared by a consultant with qualifications and experience relevant to designing SuDS and flood prevention measures and completing peak rate of run-off calculations. 5. Surface water attenuation will reduce surface water runoff rates, as close as possible to the Greenfield Runoff rate, without causing a risk of blockages. Existing 1 in 1 year run off rate = 32.96 l/s Proposed 1 in 1 year run off rate = 105.11 l/s Existing 1 in 100 year run off rate = 2.7l/s Proposed 1 in 100 year runoff rate = 2.7 l/s 6. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS will be place. Please refer to

			<p>the SUDs maintenance strategy that follows this section.</p> <ol style="list-style-type: none"> 7. Surface water calculations incorporate 40% allowance for climate change, in accordance with the EAs latest advice. A 70% allowance for climate change was added to the EA fluvial levels to attain the design flood level. 8. Flooding of the property will not occur in the event of local drainage system failure (caused either by extreme rainfall or a lack of maintenance) 9. N/A 10. N/A 11. Infiltration techniques are not suitable as the site is underlain with impermeable clay strata. 12. Drainage measures/SUDS have been designed to reduce surface water runoff rates to 2.7 l/s. This is less than the 1 in 1 year peak flow rate.
Pol 03.3 Minimising Watercourse Pollution	1	0	<ol style="list-style-type: none"> 15. Infiltration systems are not suitable at the site due to the ground conditions. There is runoff from the developed site for rainfall up to 5mm. Therefore, this credit is not achievable.

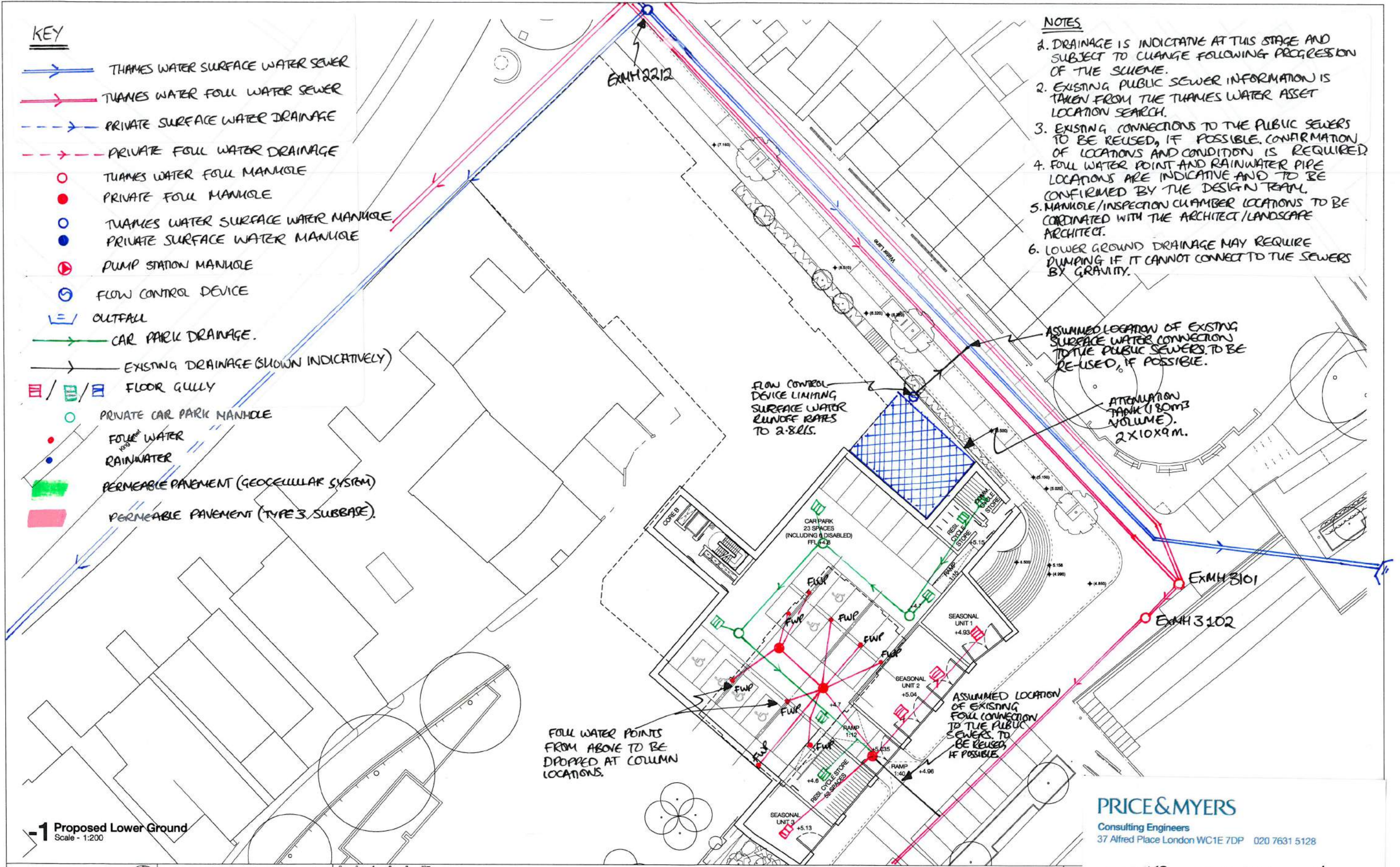
Appendix J – Initial Below Ground Drainage Sketch

KEY

-  THAMES WATER SURFACE WATER SEWER
-  THAMES WATER FOUL WATER SEWER
-  PRIVATE SURFACE WATER DRAINAGE
-  PRIVATE FOUL WATER DRAINAGE
-  THAMES WATER FOUL MANHOLE
-  PRIVATE FOUL MANHOLE
-  THAMES WATER SURFACE WATER MANHOLE
-  PRIVATE SURFACE WATER MANHOLE
-  PUMP STATION MANHOLE
-  FLOW CONTROL DEVICE
-  OUTFALL
-  CAR PARK DRAINAGE.
-  EXISTING DRAINAGE (SHOWN INDICATIVELY)
-  FLOOR GULLY
-  PRIVATE CAR PARK MANHOLE
-  FLOOR WATER
-  RAINWATER
-  PERMEABLE PAVEMENT (GEOCELLULAR SYSTEM)
-  PERMEABLE PAVEMENT (TYPE 3 SUBBASE)

NOTES

1. DRAINAGE IS INDICATIVE AT THIS STAGE AND SUBJECT TO CHANGE FOLLOWING PROGRESSION OF THE SCHEME.
2. EXISTING PUBLIC SEWER INFORMATION IS TAKEN FROM THE THAMES WATER ASSET LOCATION SEARCH.
3. EXISTING CONNECTIONS TO THE PUBLIC SEWERS TO BE REUSED, IF POSSIBLE. CONFIRMATION OF LOCATIONS AND CONDITION IS REQUIRED.
4. FOUL WATER POINT AND RAINWATER PIPE LOCATIONS ARE INDICATIVE AND TO BE CONFIRMED BY THE DESIGN TEAM.
5. MANHOLE/INSPECTION CHAMBER LOCATIONS TO BE COORDINATED WITH THE ARCHITECT/LANDSCAPE ARCHITECT.
6. LOWER GROUND DRAINAGE MAY REQUIRE PUMPING IF IT CANNOT CONNECT TO THE SEWERS BY GRAVITY.



FOUL WATER POINTS FROM ABOVE TO BE DROPPED AT COLUMN LOCATIONS.

FLOW CONTROL DEVICE LIMITING SURFACE WATER RUNOFF RATES TO 2.8L/S.

ASSUMED LOCATION OF EXISTING SURFACE WATER CONNECTION TO THE PUBLIC SEWERS TO BE RE-USED, IF POSSIBLE.

ATTENUATION TANK (180M³ VOLUME). 2X10X9M.

ASSUMED LOCATION OF EXISTING FOUL CONNECTION TO THE PUBLIC SEWERS TO BE RE-USED, IF POSSIBLE.

-1 Proposed Lower Ground
Scale - 1:200



PRICE & MYERS

Consulting Engineers
37 Alfred Place London WC1E 7DP 020 7631 5128

Project: Twickenham	Job No 25159	Page SK605	Ver 1.
Title: Propo	Date 03.11.17	Eng SR.	Chd -
Scale: Date	Job TWICKENHAM REDISCOVERED -		
Octob	INITIAL SURFACE WATER DRAINAGE		
Drawing (20)_0	SKETCH - LOWER GROUND		

DO3 LAYOUT UPDATED	RPP 25.10.17	RGF
DO2 UPDATED FOR PRE-APP	RPP 09.10.17	RGF
DO1 FIRST ISSUE	RPP 04.10.17	RGF
Rev. Des.	By	Date Ch.

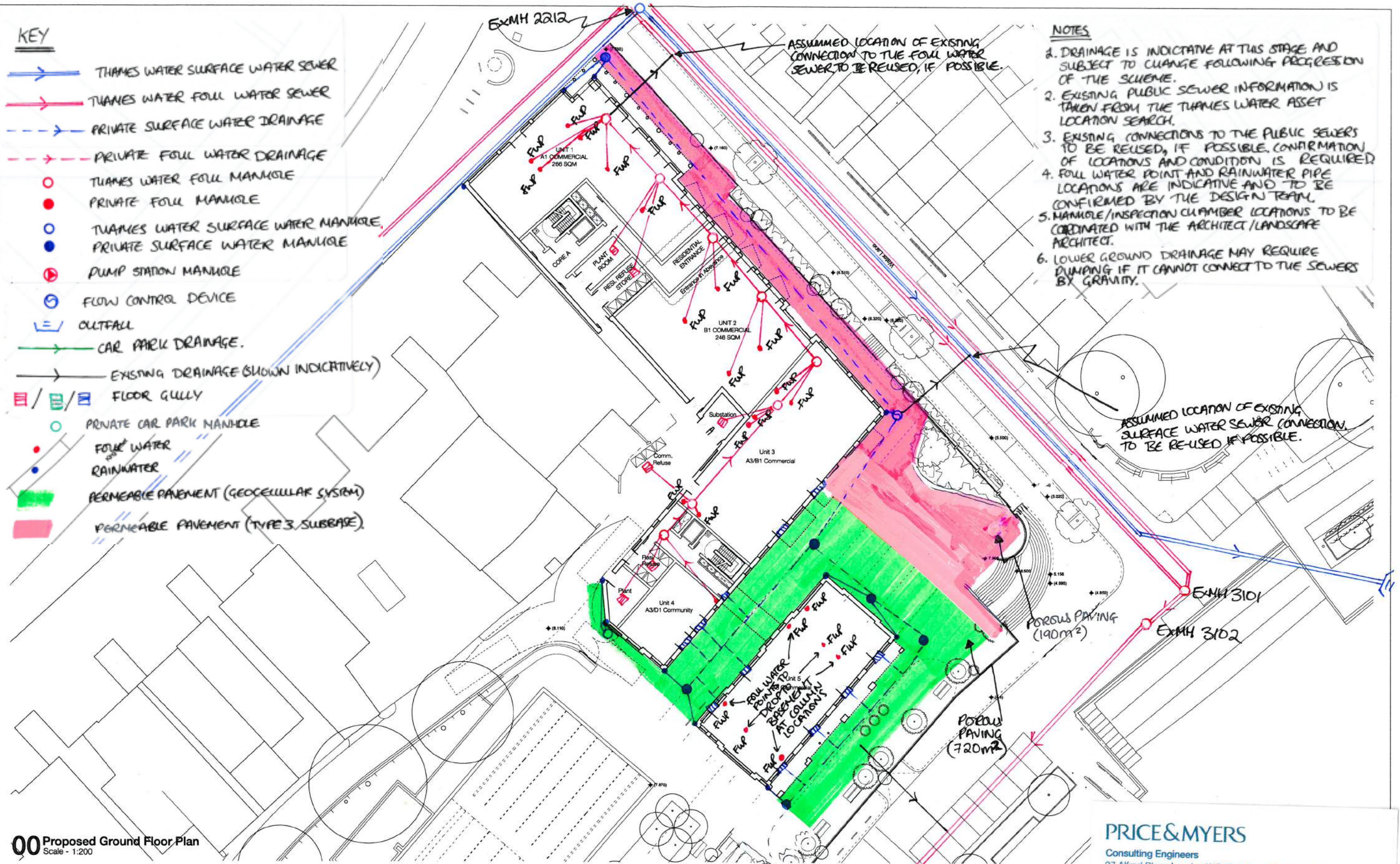
Contractor must verify all dimensions on site before commencing any work or shop drawings. If this drawing exceeds the quantities taken in any way the Architects are to be informed before the work is initiated. Only figured dimensions to be taken from this drawing. Do not scale off this drawing. Drawings based on Ordnance Survey and / or existing record drawings - design and drawing content subject to Site Survey, Structural Survey, Site Investigations, Planning and Statutory Requirements and Approvals. Authorised reproduction from Ordnance Survey Map with permission of the Controller of Her Majesty's Stationary Office. Crown Copyright reserved. © terreynones chapmanhalcher (Studio South) Ltd. All Rights Reserved

KEY

-  THAMES WATER SURFACE WATER SEWER
-  THAMES WATER FOUL WATER SEWER
-  PRIVATE SURFACE WATER DRAINAGE
-  PRIVATE FOUL WATER DRAINAGE
-  THAMES WATER FOUL MANHOLE
-  PRIVATE FOUL MANHOLE
-  THAMES WATER SURFACE WATER MANHOLE
-  PRIVATE SURFACE WATER MANHOLE
-  PUMP STATION MANHOLE
-  FLOW CONTROL DEVICE
-  OUTFALL
-  CAR PARK DRAINAGE
-  EXISTING DRAINAGE (SHOWN INDICATIVELY)
-  FLOOR GULLY
-  PRIVATE CAR PARK MANHOLE
-  Foul WATER
-  RAINWATER
-  PERMEABLE PAVEMENT (GEOCELLULAR SYSTEM)
-  PERMEABLE PAVEMENT (TYPE 3, SUBBASE)

NOTES

1. DRAINAGE IS INDICATIVE AT THIS STAGE AND SUBJECT TO CHANGE FOLLOWING PROGRESSION OF THE SCHEME.
2. EXISTING PUBLIC SEWER INFORMATION IS TAKEN FROM THE THAMES WATER ASSET LOCATION SEARCH.
3. EXISTING CONNECTIONS TO THE PUBLIC SEWERS TO BE REUSED, IF POSSIBLE. CONFIRMATION OF LOCATIONS AND CONDITION IS REQUIRED.
4. FOUL WATER POINT AND RAINWATER PIPE LOCATIONS ARE INDICATIVE AND TO BE CONFIRMED BY THE DESIGN TEAM.
5. MANHOLE/INSPECTION CHAMBER LOCATIONS TO BE COORDINATED WITH THE ARCHITECT/LANDSCAPE ARCHITECT.
6. LOWER GROUND DRAINAGE MAY REQUIRE PUMPING IF IT CANNOT CONNECT TO THE SEWERS BY GRAVITY.

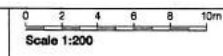


00 Proposed Ground Floor Plan
Scale - 1:200

PRICE & MYERS

Consulting Engineers
37 Alfred Place London WC1E 7DP 020 7631 5128

Project	Twicken		
Title	Job No 25159	Page SK606	Ver 2
Propose	Date 03.11.17	Eng SR	Chd -
Scale	1:200@/		
Date	October		
October	Job TWICKENHAM REDISCOVERED - INITIAL SURFACE WATER DRAINAGE SKETCH - GROUND FLOOR.		
Drawing N (20)_10			



D03 LAYOUT UPDATED	RPB	27.10.17	RGF
D02 UPDATED FOR PRE-APP	RPB	08.10.17	RGF
D01 FIRST ISSUE	RPB	04.10.17	RGF
Rev. Des.	By	Date	Ch.

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Appendix K - SUDS Maintenance Strategy

SUDS Maintenance Strategy – Permeable Pavement

Operation and maintenance requirements for pervious pavements		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

SUDS Maintenance Strategy – Attenuation Tank

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/ or internal forebays	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

Appendix L – Proposals for the Flood Defence Wall on the Embankment, Twickenham

Twickenham Rediscovered

Proposals for the Flood Defence Wall on The Embankment, Twickenham

Prepared by: Laura Norris MEng CEng MIStructE
Sabrina Ram MEng

Reviewed by: Peter Dash BEng CEng MIStructE
Dimitris Linardatos BEng MSc CEng MICE FIHE

Job Number: 25159

Date	Version	Notes/Amendments/Issue Purpose
Nov 2017	1	For planning submission

Contents		Page
1	The Site	3
2	Proposed Defence Wall	4
	Location & Layout	
	Seasonal Units (1 in 20 year flood defence level)	
	Drainage Considerations	
	Construction	
	Inspection	
	Maintenance	
	Future Measures	
3	Design Criteria for Wall	7
	Codes and Standards	
	Design Life	
	Loadings	
	Design Fire Periods	
	Agreements and Consents	

Appendices:

- Appendix A** Proposed Architectural, Structural, Civil and Landscape Drawings for Lower Ground Carpark and Podium Level
- Appendix B** Design details

1 The Site

It is proposed to demolish and remove all existing building & structures to redevelop a site which boundary includes 1A, 1B King Street and 2/4 Water Lane, the remaining former swimming pool buildings at the corner of Water Lane & The Embankment and the river-facing parcel of land on the Embankment in front of Diamond Jubilee Gardens with a mixed use development.

The development proposals comprise of seasonal units and a car park at lower ground floor level, flexible commercial and office space at ground floor level and residential apartments at first, second and third floors.

A new public square and the areas of the public realm will also be developed. This will involve the construction of a lower ground floor car park with vehicular access from The Embankment & cycle storage, reconfiguration of street parking in the roads immediately adjacent to the Site, amended pedestrian access with associated landscaping to the South of Diamond Jubilee Gardens and amendment of service vehicle access to the service road at the rear of Diamond Jubilee Gardens. Figure 1 shows the site location.

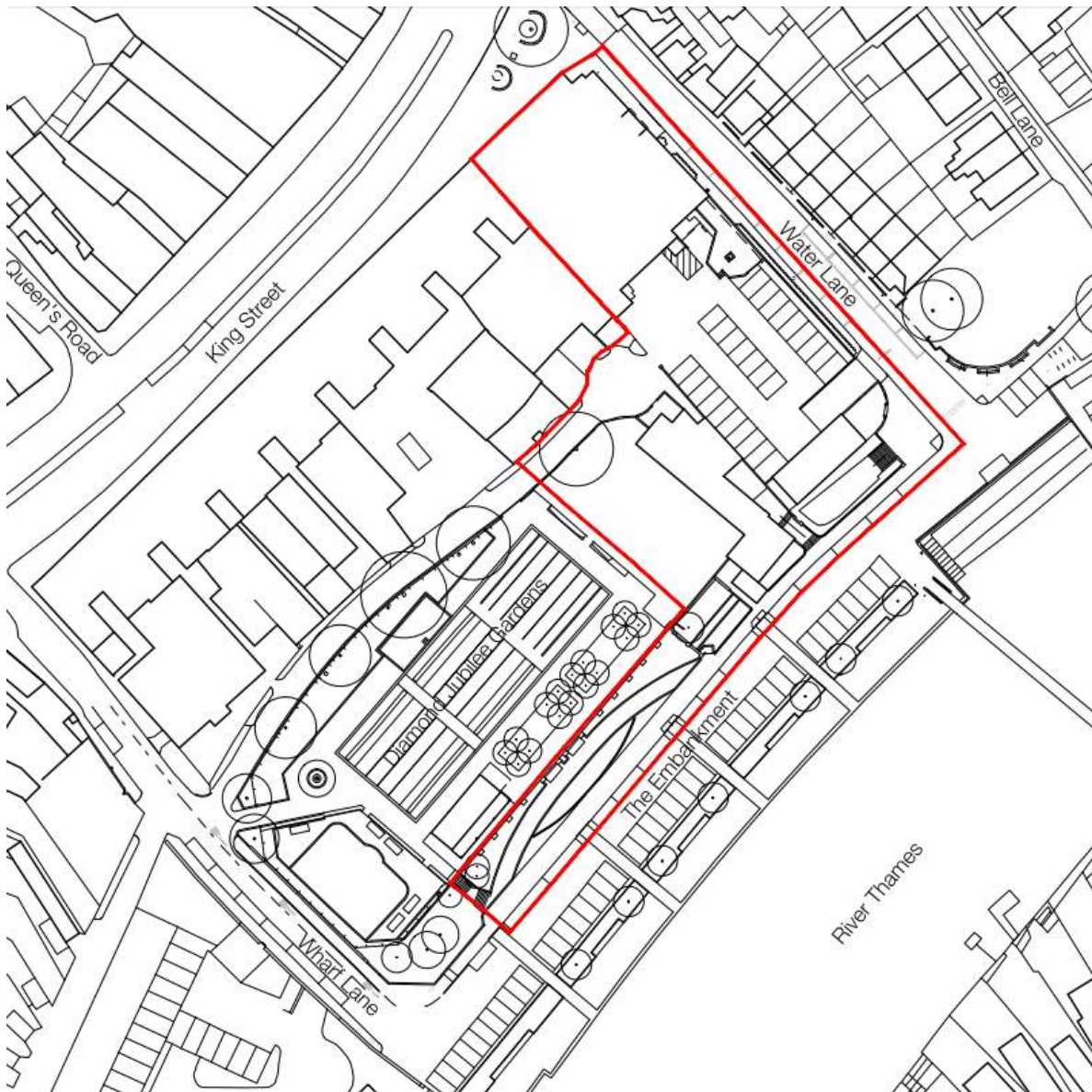


Figure 1 - CJCT Site Location drawing

2 Proposed Defence Wall

In order to achieve the proposed new public realm area and the improvements to the Embankment, the current flood defence wall along the south of the site is to be demolished. The existing flood defence line is classified as Condition Grade (2) by the Environment Agency on a scale of 1 (very good) to 5 (very poor). It should be noted that there are several openings along the flood defence line at present, including garage doors and steps. The existing flood defence line varies in height from 8.14m AOD at Jubilee Gardens to approximately 6m AOD at the junction of the Embankment and Water Lane. The existing flood wall is a brick built construction.

A new flood defence wall will be constructed as part of the new development. This report will deal purely with the proposed location, construction and maintenance of this new flood defence wall. For technical information regarding fluvial and tidal flood levels and the TE2100 future defence level that have been considered in the defence of this area please refer to the main P&M FRA report, job reference 25159.

Location & Layout

Figures 2 and 3 below shows the existing flood defence line, in m AOD. The TE2100 defence level at present is 6.1m AOD and developers should ensure that defences are raised to this level. The TE2100 level for the year 2100 is 6.9m AOD and developers should allow for future raising up to this level.

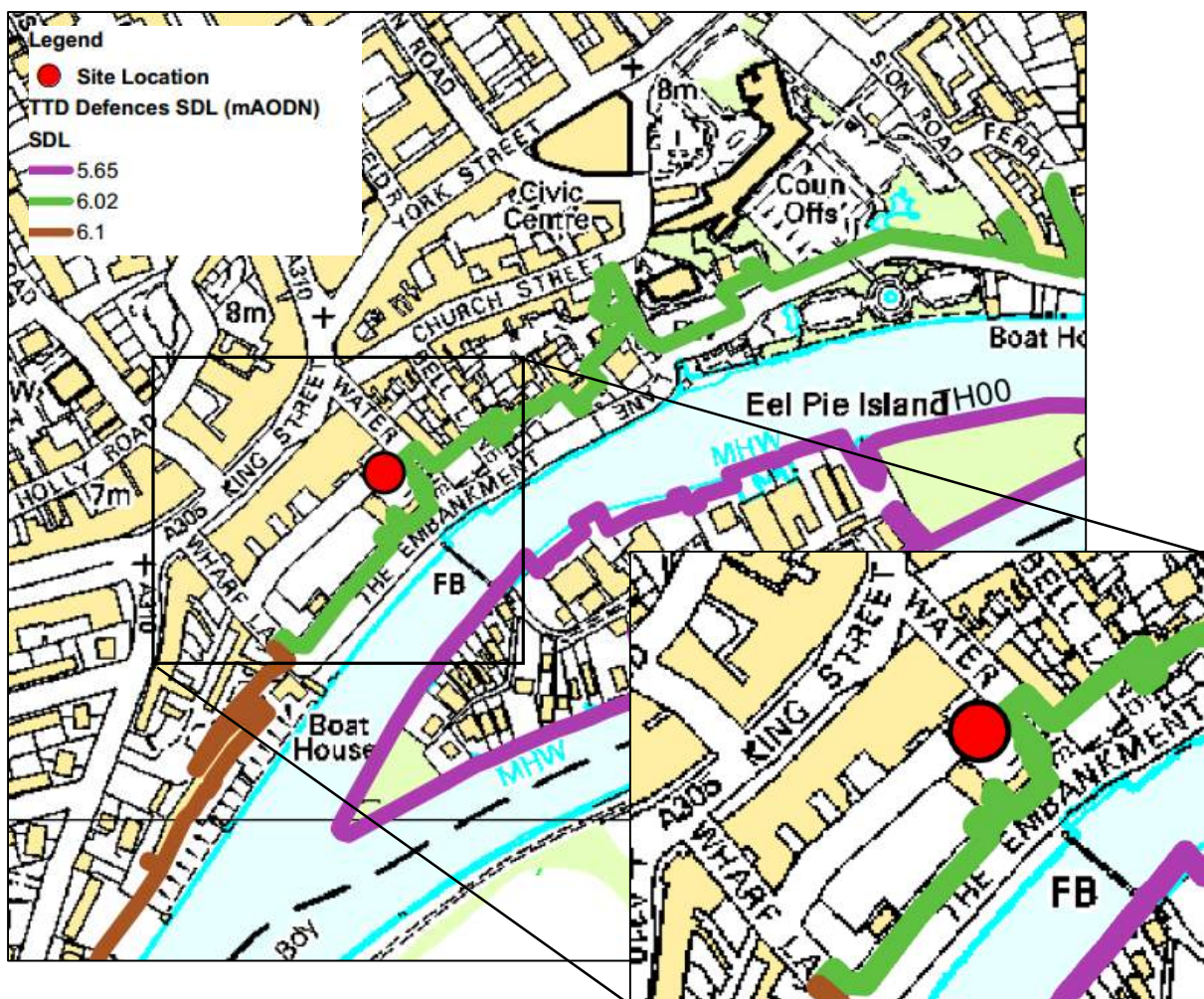


Figure 2 & 3 - Current Flood Defence Line - 6.02 mAODN. (Reference EA drawings HNL41959_P4)

Figure 4 shows the proposed new defence line. The red line indicates the formal flood defence to a level of 7.7m AOD. The 1 in 50 year return period flood defence is achieved on the green boundary, and the 20 year return period defence encompasses the entire site.

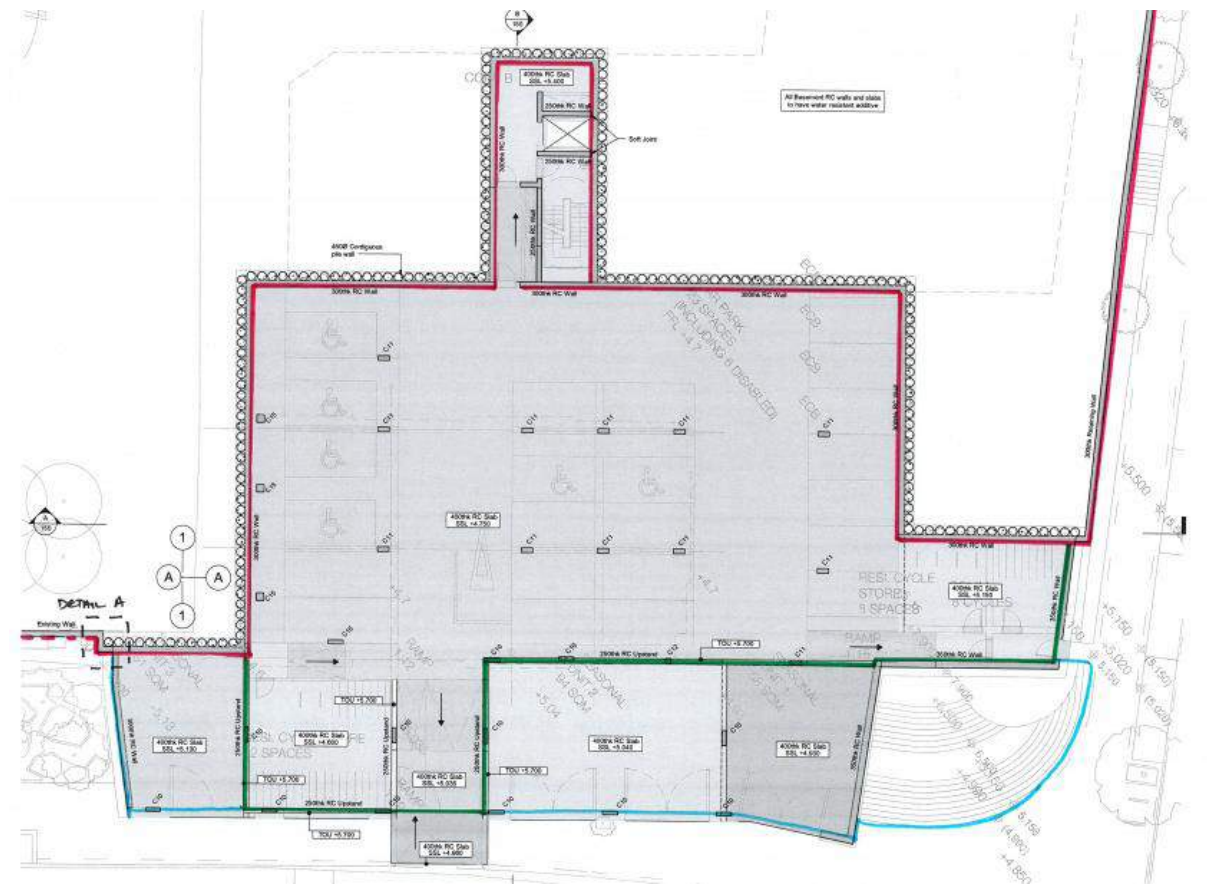


Figure 4 - Proposed New Line of Defence

Seasonal Units (1 in 20 year flood defence level)

The seasonal units fronting onto the Embankment (FFL 4.93 - 5.13m AOD) will be used for water compatible uses only, including boathouses for storage. It is anticipated that the Seasonal Units will flood over the lifetime of the development. However, the potential that these units may flood at lower return periods is considered acceptable as they will be occupied by temporary, lower vulnerability uses and water based activities.

All structures along the red and green line, indicated in Figure 4, will be constructed in accordance with the EA formal flood defence specification requirements.

Drainage Considerations

Although the perimeter of the lower ground carpark area is protected in the 50 year return period flood, the internal slab level is below this. The FFL for the slab is 4.75m AOD and so if the perimeter 50 year return period level is breached the car park will flood. This event has been allowed for in the Flood Management Plan, and the subsequent drainage of any floodwaters has been accounted for in the design of the site infrastructure.

A separate foul, surface and car park drainage network will be provided for the proposed development. A sump pump system will serve the car park which will be able to remove flood water after an extreme flood event.

Construction

The lower ground floor carpark structure is to be constructed by placing an embedded piled wall to the rear of the car park, this allows for the support of the retained soil in the temporary case. In the permanent case the piled wall will support the both vertical dead & live loads and horizontal lateral loads from the RC structures above.

A reinforced concrete wall constructed in front of the piled wall will act as the flood defence wall. The design of this wall allows for retaining loads and the predicted water pressures, and has been designed for 120 year design life in accordance with the relevant Eurocodes. The wall has therefore been sized as 300mm thick.

This new section of flood defence wall will be dowelled into the existing flood defence wall to the front of Diamond Jubilee Gardens and the new retaining wall that is to be built along the site boundary on Water Lane to achieve continuity for the wall for the full extent of the site boundary.

Inspection

The wall is completely exposed within the basement and access is available to its full length to carry out inspections of the wall. This will be arranged directly with the service management team of the development.

Maintenance

The car park wall has been designed so that the superstructure loads are supported by the piled wall. This means that the flood defence wall which sits in front of the piles can be repaired or replaced without any adverse effect on the structures above.

Given the design life and robustness of construction, typical repairs are unlikely to require any more intervention than locally breaking out small sections of the wall using small power tools. We do not envisage that heavy plant access will be required. Local insitu concrete repairs can be done using an extremely common pumped system from concrete wagons that are located on The Embankment.

Future Measures

The top of the proposed flood defence wall for the site has a level of 7.7m AOD. This is already 800mm higher than the TE2100 future defence level of 6.9m AOD. The likelihood of having to further raise the flood defence in the future is therefore considered small.

However, in the unlikely (far future) event that this is actually required, the development has been designed to allow for it. The external perimeter of the podium landscaping can be raised locally along the Embankment and Water Lane as shown in the sketches in Appendix B. There is also an extreme option, which would be exercised only in the most unlikely event of TE2100 and beyond levels being raised far beyond current predictions, to close the current openings to the lower ground floor carpark and provide a continuous defence line at the development boundary.

It should be noted that the design fluvial flood level for the site is 6.908m AOD (for the 1 in 100 plus 35% climate change level). The proposed development at ground floor level is classified as "less vulnerable" under Planning Practice Guidance. Therefore, the central and upper climate change allowances should be considered in the design which are 25% and 25% respectively. The ground floor is at 7.910m AOD which is above this level, including a 300mm freeboard.

3 Design Criteria for Wall

Codes and Standards

- BS EN 1990:2002+A1:2005 + NA Basis of structural design
- BS EN 1991- Actions on Structures
- BS EN 1992 – Design of concrete structures
- BS EN 1997 - Geotechnical design
- BS 8002:1994 - Code of practice for earth retaining structures
- BS 8004:1986 - Code of practice for foundations

Design Life

- 120 years

Loadings

Flood defence wall will be detailed to act independently of the piled wall. All superstructure load from the development RC frames and the podium will be supported by a combination of ground bearing rafts, embedded piled walls and localised shallow pad foundations.

- Ground Water - Design for Full height of Flood defence wall, one side only

Design Fire Periods

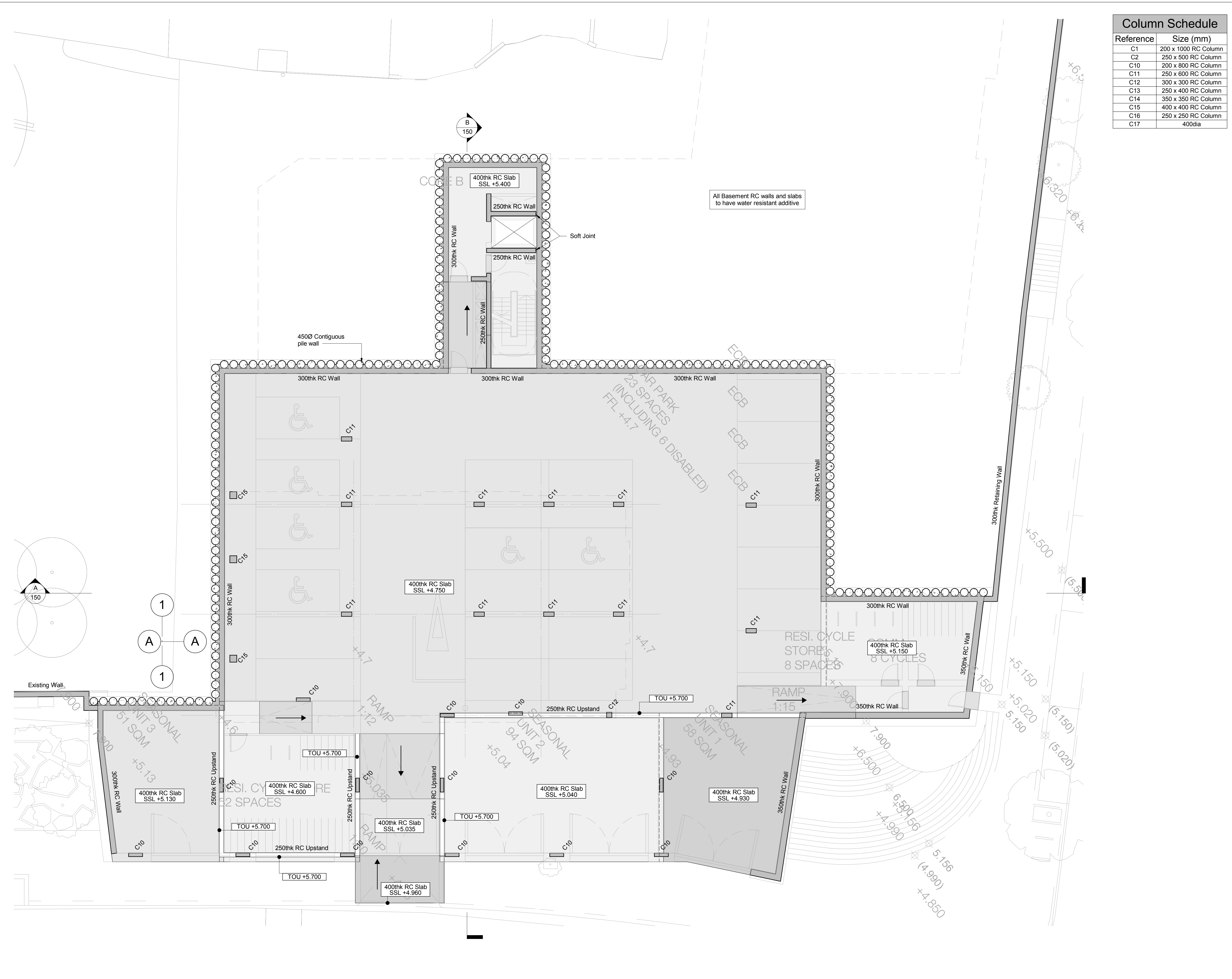
1 hour as required for carpark structure

Agreements and Consents

A Flood Risk Activity Permit will be attained from the Environment Agency, as works are taking place on a formal flood defence structure. Both the temporary and permanent case will be agreed with the Environment Agency, prior to construction works taking place.

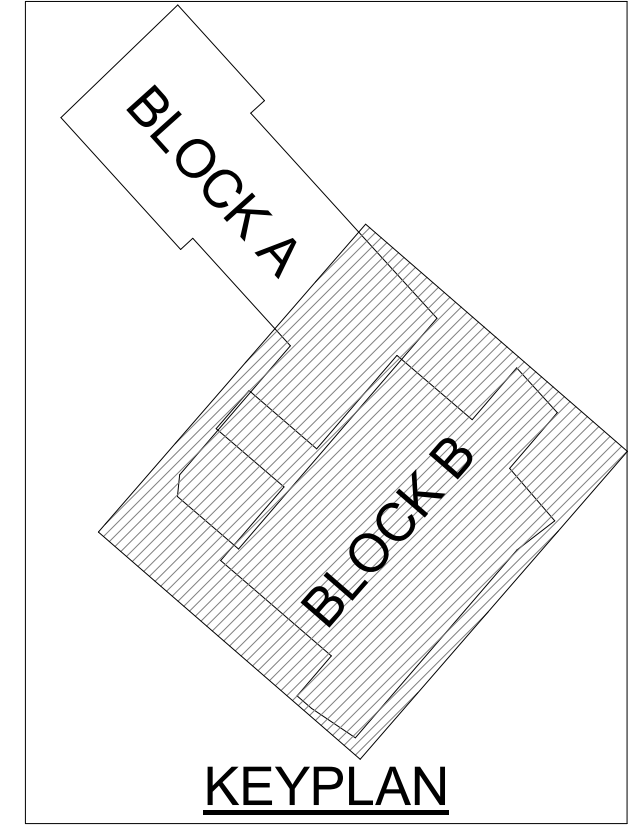
Appendix A

Proposed Architectural, Structural, Civil and Landscape Drawings for Lower Ground Carpark and Podium Level



Column Schedule	
Reference	Size (mm)
C1	200 x 1000 RC Column
C2	250 x 500 RC Column
C10	200 x 800 RC Column
C11	250 x 600 RC Column
C12	300 x 300 RC Column
C13	250 x 400 RC Column
C14	350 x 350 RC Column
C15	400 x 400 RC Column
C16	250 x 250 RC Column
C17	400dia

- Notes :-**
- This drawing is to be read in conjunction with all relevant Architect's, Engineer's and specialists' drawings and specifications.
 - Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check that this drawing has been printed to the intended scale this bar should be 50mm long @A1 or 25mm long @ A3
 - Health & Safety : All specific drawing notes are to be read in conjunction with the project "Information Pack" and "Site Rules".
 - For general notes refer to Drawing No. 25159/001



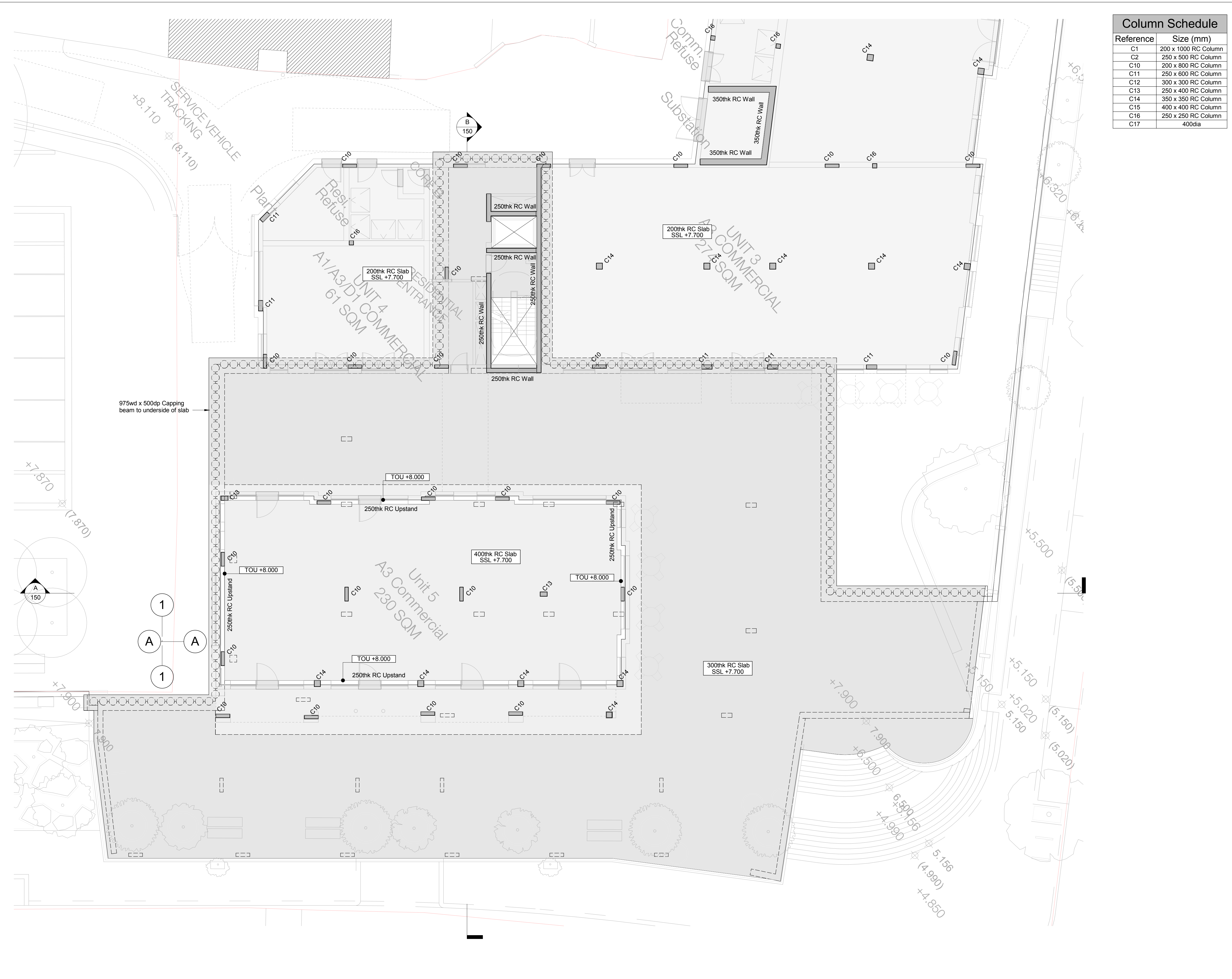
P1	17.11.17	ASM	DF	Issued for Information
Ver	Date	Drawn	Eng	Amendment

**TWICKENHAM RIVERSIDE
LONDON, TW1 3SD**

**BLOCK B
LOWER GROUND FLOOR
PLAN**

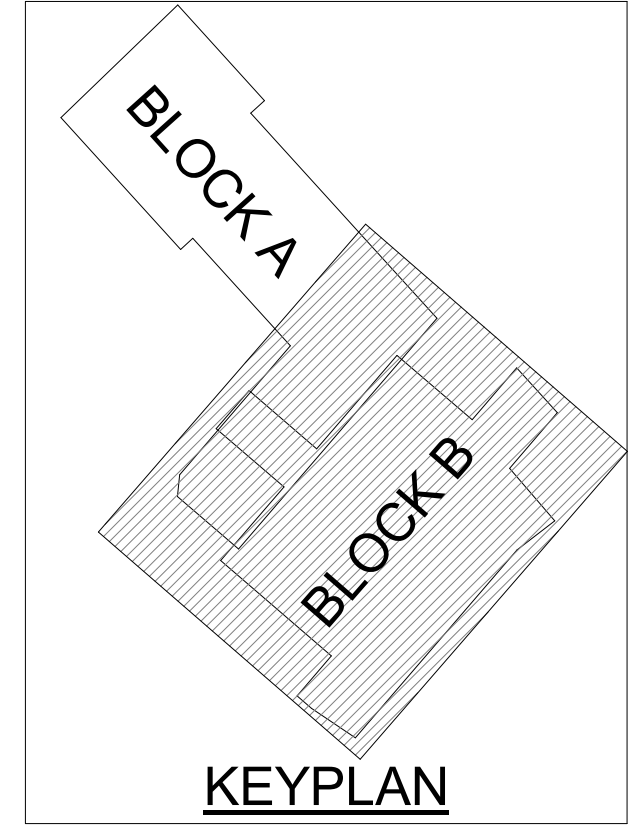
Status **FOR INFORMATION**
NOT FOR CONSTRUCTION

Drawn	Amardeep Mudhan	Eng	Daniel Firth
Scales	1:100 @ A1	1:200 @ A3	
Drawing No	25159 / 206	Ver	P1



Reference	Size (mm)
C1	200 x 1000 RC Column
C2	250 x 500 RC Column
C10	200 x 800 RC Column
C11	250 x 600 RC Column
C12	300 x 300 RC Column
C13	250 x 400 RC Column
C14	350 x 350 RC Column
C15	400 x 400 RC Column
C16	250 x 250 RC Column
C17	400dia

- Notes :-
- This drawing is to be read in conjunction with all relevant Architect's, Engineer's and specialists' drawings and specifications.
 - Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check that this drawing has been printed to the intended scale this bar should be 50mm long @A1 or 25mm long @ A3
 - Health & Safety : All specific drawing notes are to be read in conjunction with the project "Information Pack" and "Site Rules".
 - For general notes refer to Drawing No. 25159/001



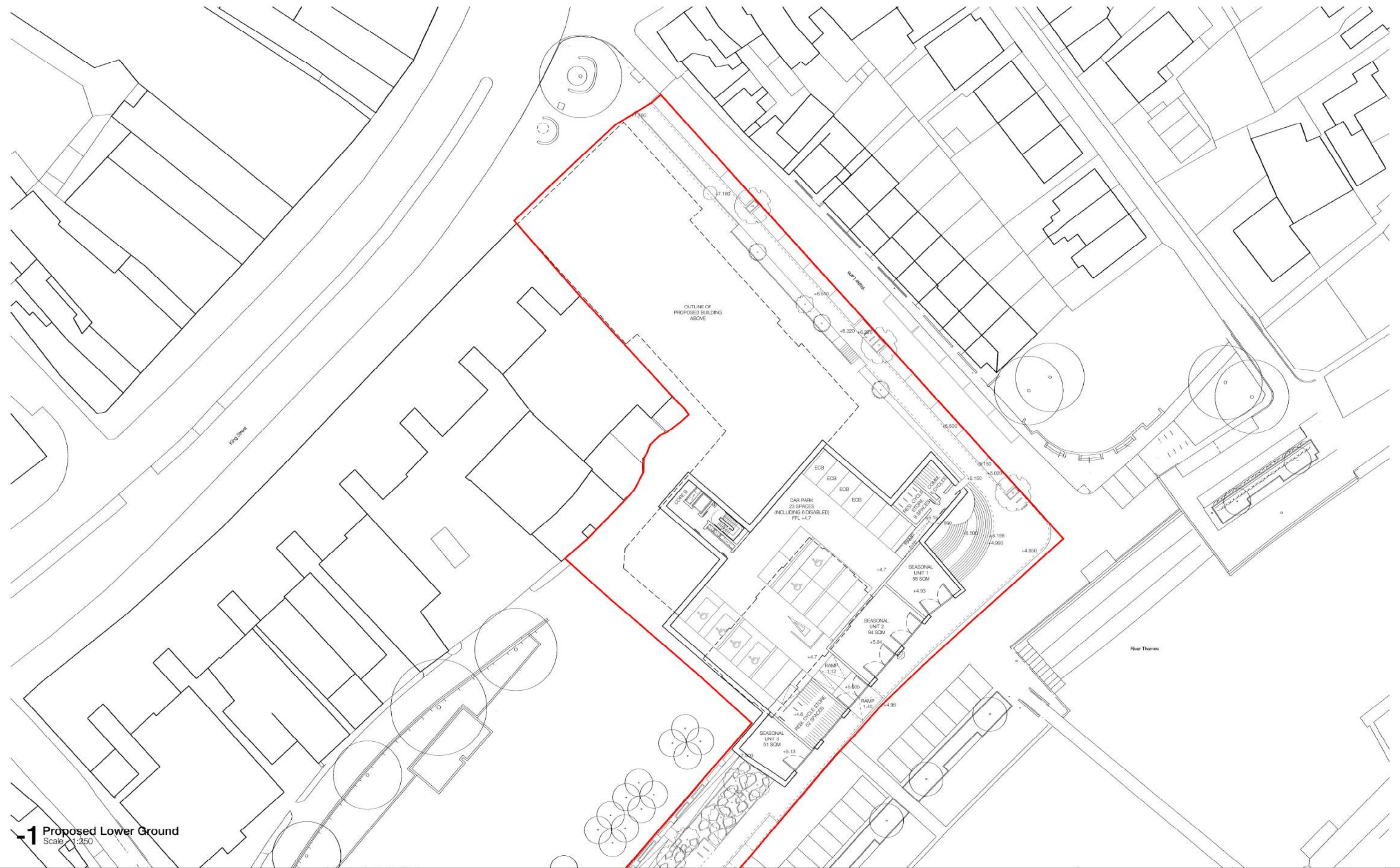
P1	17.11.17	ASM	DF	Issued for Information
Ver	Date	Drawn	Eng	Amendment

**TWICKENHAM RIVERSIDE
LONDON, TW1 3SD**

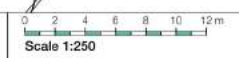
**BLOCK B
GROUND FLOOR PLAN**

Status
FOR INFORMATION
NOT FOR CONSTRUCTION

Drawn	Amardeep Mudhan	Eng	Daniel Firth
Scales	1:100 @ A1	1:200 @ A3	
Drawing No	25159/211	Ver	P1



1 Proposed Lower Ground
Scale 1:250



ECB=Electrical Charging Bay

Rev.	Des.	By	Date	Ch.
D06	SCHEME UPDATE	RGF	10.11.17	TNT
D05	SCHEME UPDATE	RGF	3.11.17	TNT
		AM		
D04	LAYOUT UPDATED	RPP	01.11.17	RGF
D03	LAYOUT UPDATED	RPP	25.10.17	RGF
D02	UPDATED FOR PRE-APP	RPP	08.10.17	RGF
D01	FIRST ISSUE	RPP	04.10.17	RGF

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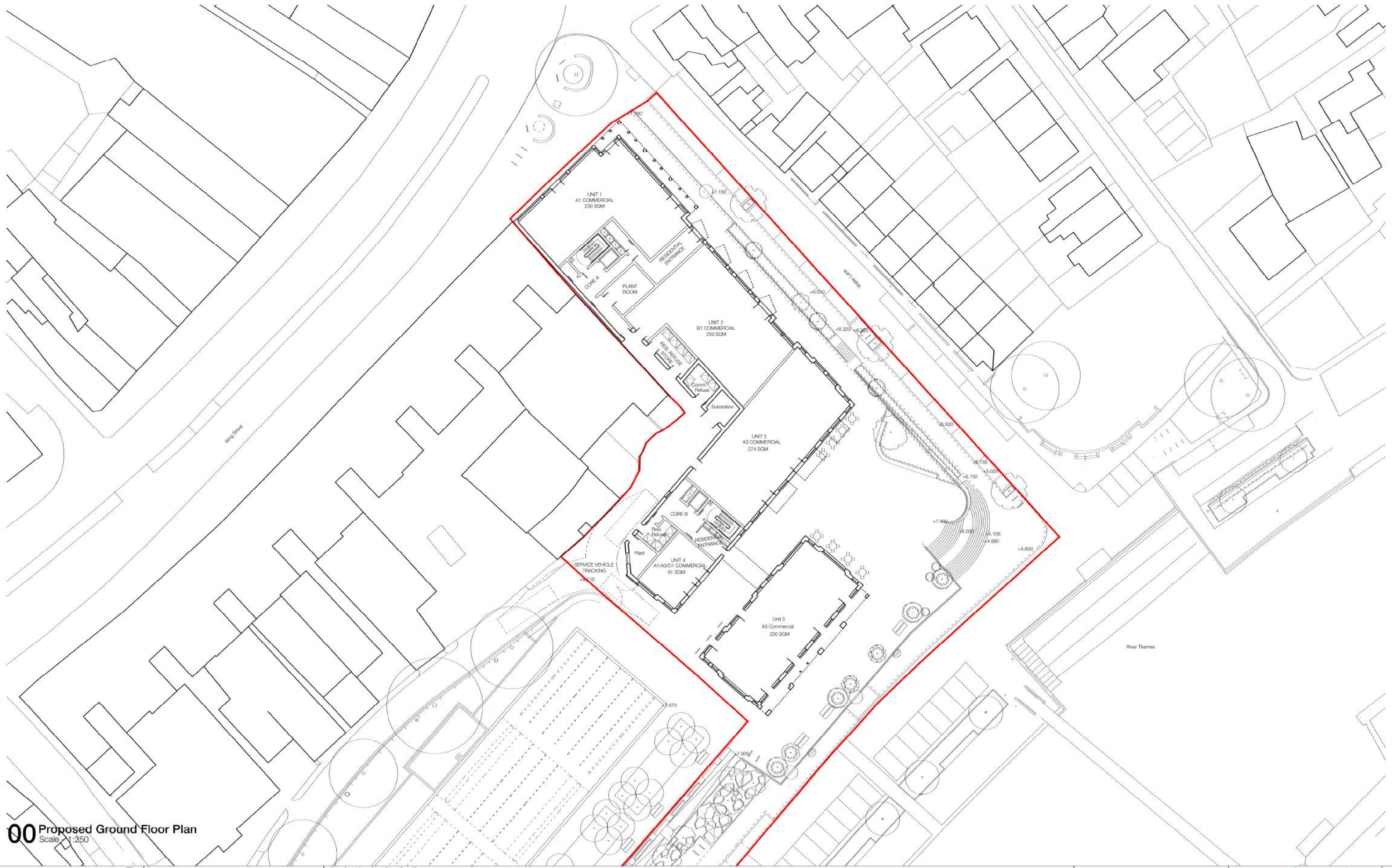
Project:	Twickenham	Job No:	31033
Title:	Proposed Lower Ground		
Scale:	1:250 @ A1, 1:500 @ A3	Drawn By:	RPP
Date:	October 2017	Checked By:	RGF
Drawing No:	(20)_099	Revision:	D06

cjct
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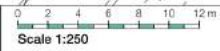
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PRELIMINARY



00 Proposed Ground Floor Plan
Scale 1:250



D05	SCHEME UPDATE	RGF	10.11.17	TNT
D05	SCHEME UPDATE	RGF	3.11.17	TNT
		AM		
D04	LAYOUT UPDATED	RPP	01.11.17	RGF
D03	LAYOUT UPDATED	RPP	27.10.17	RGF
D02	UPDATED FOR PRE-APP	RPP	06.10.17	RGF
D01	FIRST ISSUE	RPP	04.10.17	RGF
Rev.	Des.	By	Date	Ch.

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Project:	Twickenham	Job No:	31033
Title:	Proposed Ground Floor Plan		
Scale:	1:250 @ A1, 1:500 @ A3	Drawn By:	RPP
Date:	October 2017	Checked By:	RGF
Drawing No:	(20)_100	Revision:	D06

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info@cjctstudios.com

PRELIMINARY



Landscape Masterplan

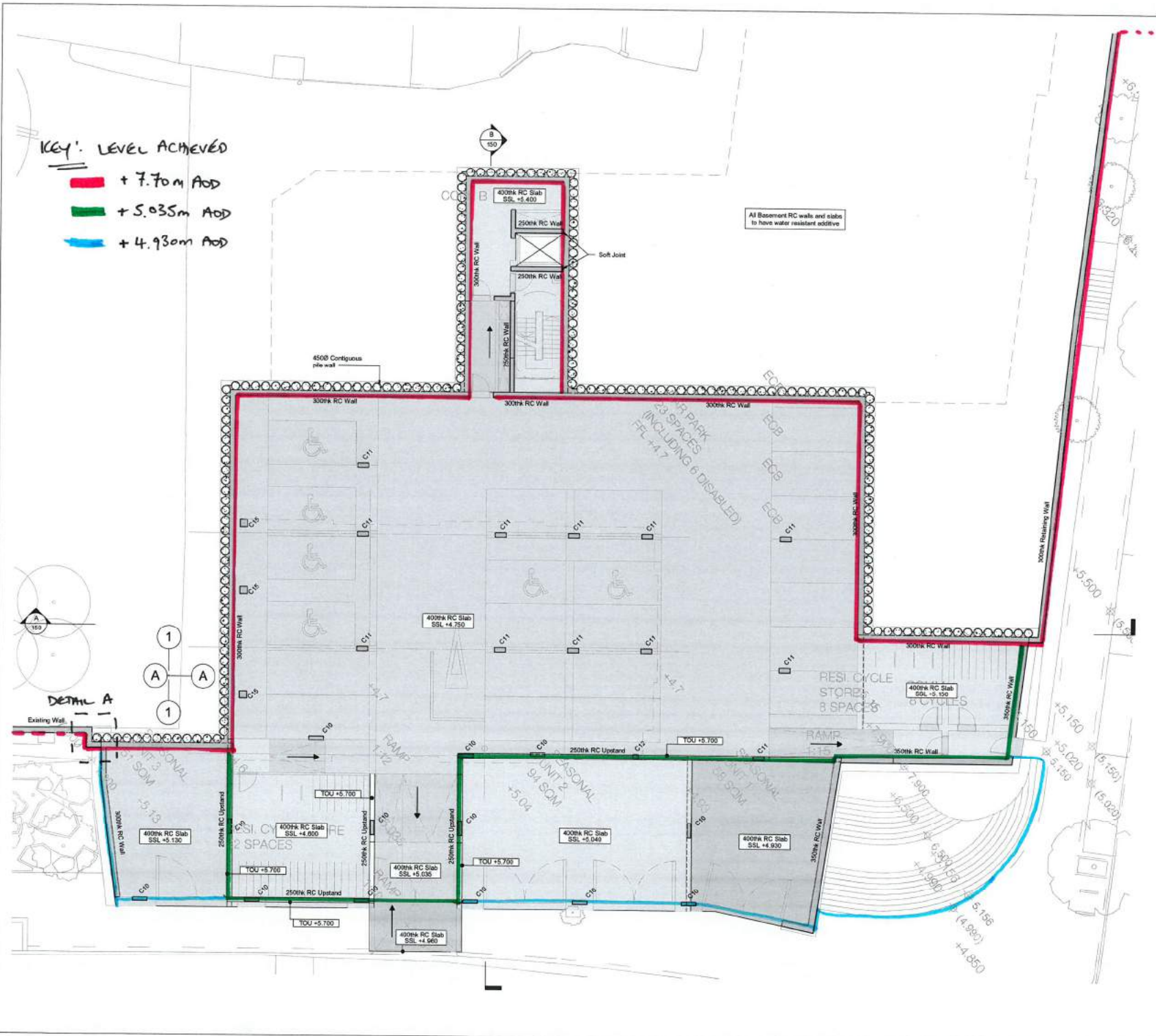
- 1 Town Square - public space for performances, markets and sitting out. Potential for water features, event lighting, and tree planting
- 2 New trees and planting to Water Street. Potential for water rill
- 3 Feature seating steps and bastion 'lookout' space
- 4 Terrace - 10m deep public space with outdoor seating, space for sitting and watching the river.
- 5 Level access created between Embankment and Diamond Jubilee Gardens
- 6 Car park entrance, some parking removed, pavements widened

Appendix B

Design details

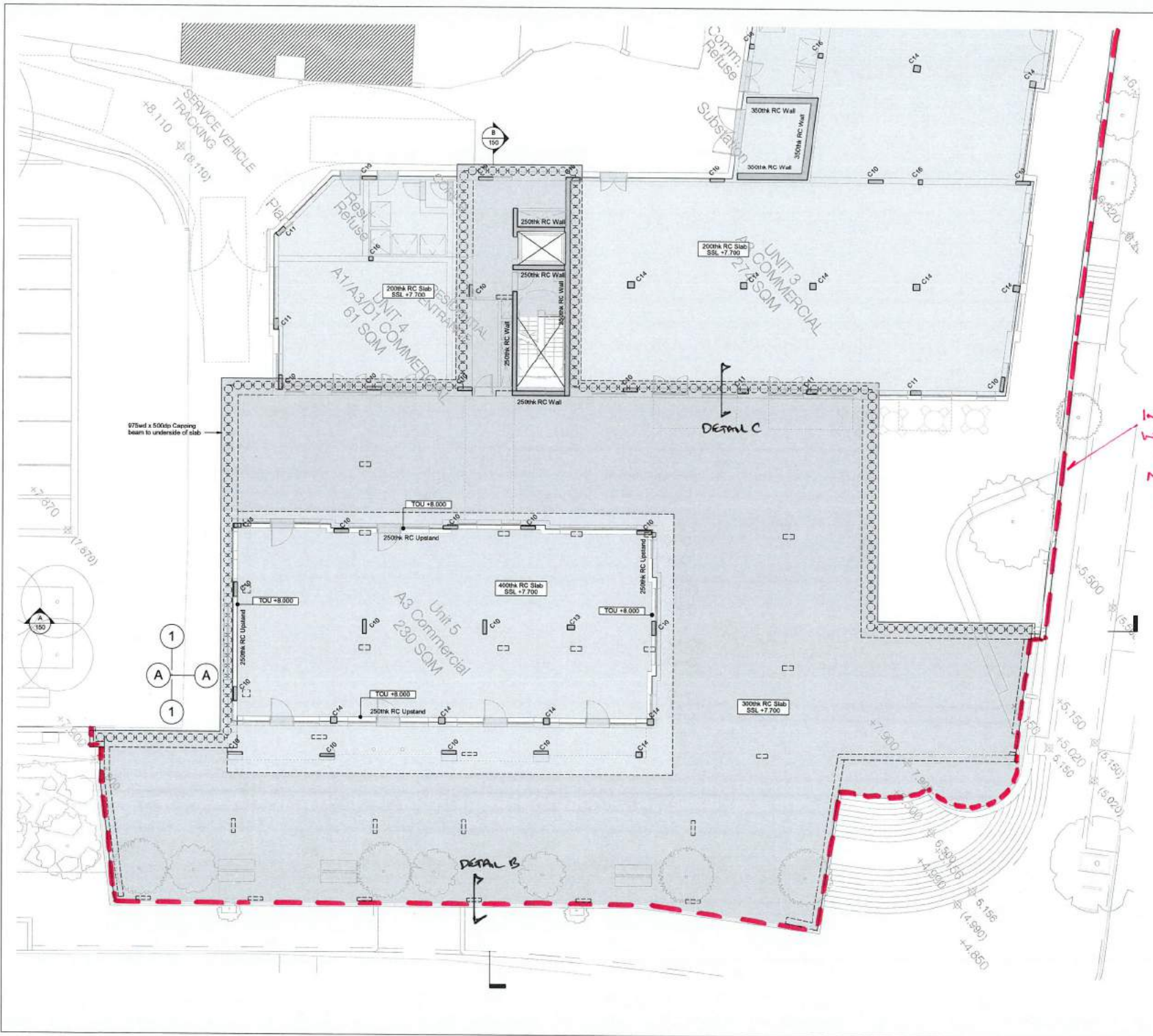
KEY: LEVEL ACHIEVED

- █ + 7.70m AOD
- █ + 5.035m AOD
- █ + 4.930m AOD



PRICE & MYERS
 Consulting Engineers
 37 Alfred Place London WC1E 7DP T 020 7831 5128

Job No	25159	Page	App.B/1	Ver
Date	Nov.'17	Eng	LMN	Chd
Job Twickenham Rediscovered				



INDICATIVE LINE
WHERE FLOOD
DEFENCE WALL
MAY BE RAISED
IN THE FUTURE

PRICE & MYERS

Consulting Engineers
37 Alfred Place London WC1E 7DP T 020 7831 5128

Job No 25159 Page App.B/2 Ver

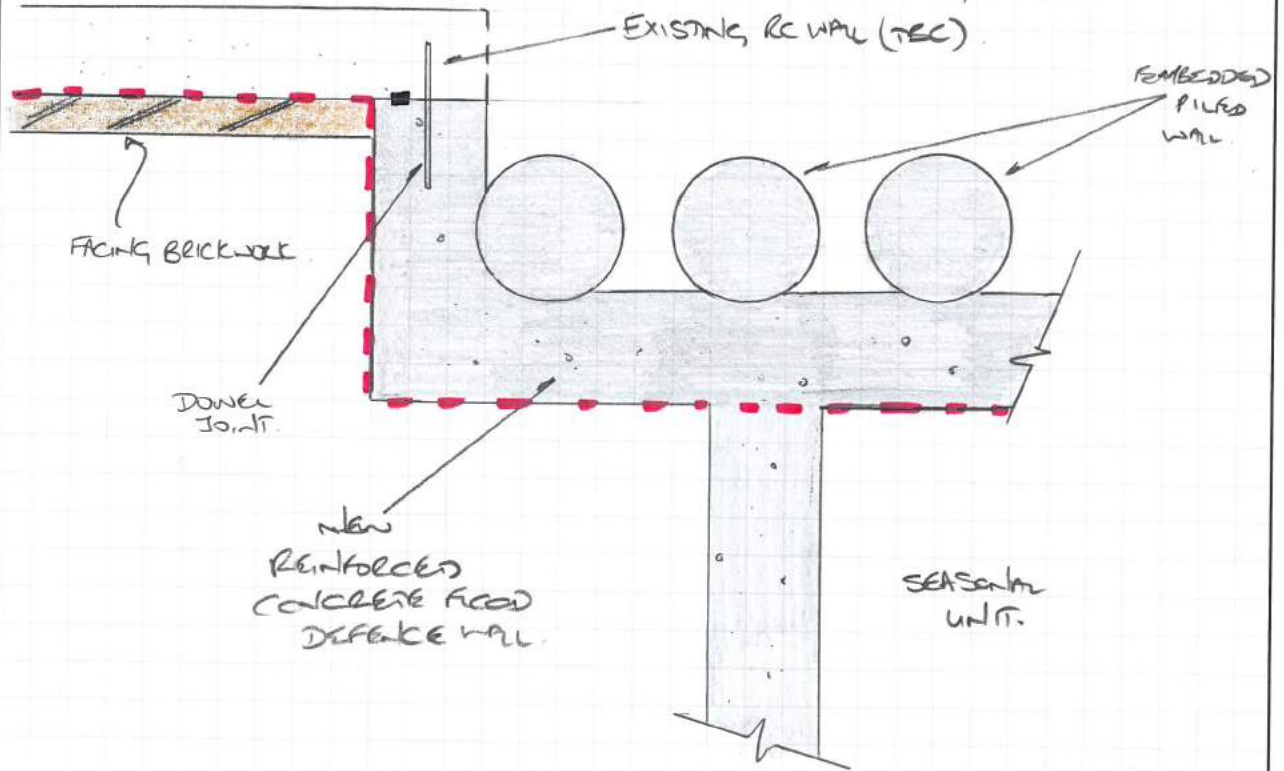
Date Nov.'17 Eng LMN Chd

Job Twickenham Rediscovered

CONNECTING NEW FLOOD DEFENCE WALL TO EXISTING:

NB: CONNECTION TO WATER LAKE "FLOOD LINE" IS NOT REQUIRED.

1. CONNECTION INTO WALL TO FRONT OF DIAMOND JUBILEE GARDENS:

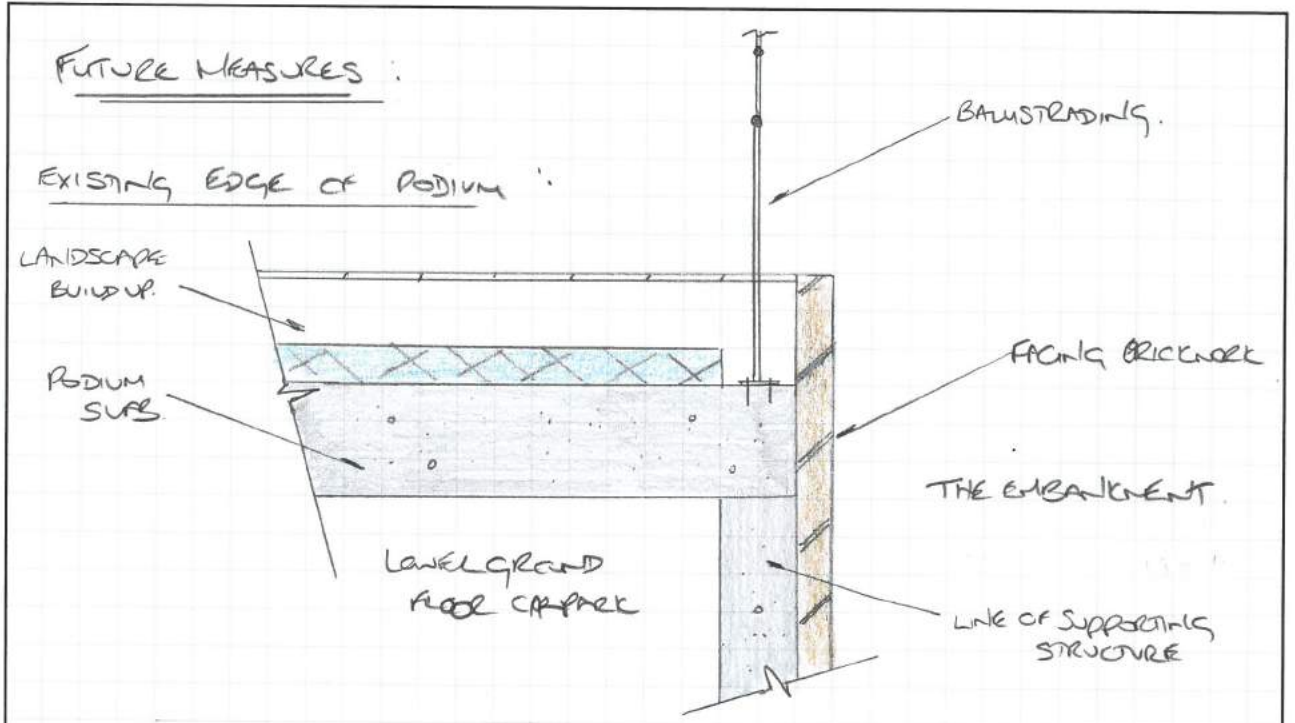


NOTES:

- EXISTING WALL TO BE INVESTIGATED FURTHER TO ESTABLISH CONSTRUCTION.
- ASSUMED RC REMAINING WALL.
- METHODOLOGY
 - EXISTING FACING BRICKWORK TO BE REMOVED LOCALLY.
 - WALL TO BE CLEANED + INSPECTED.
 - RESIN ANCHOR DOWEL CONNECTION FROM EXISTING TO TIE TO NEW.
 - HYDROPHILIC STRIP PROVIDED AT JOINT.
 - WATERPROOF SPECIALIST TO BE CONSULTED ON JOINT DETAIL.

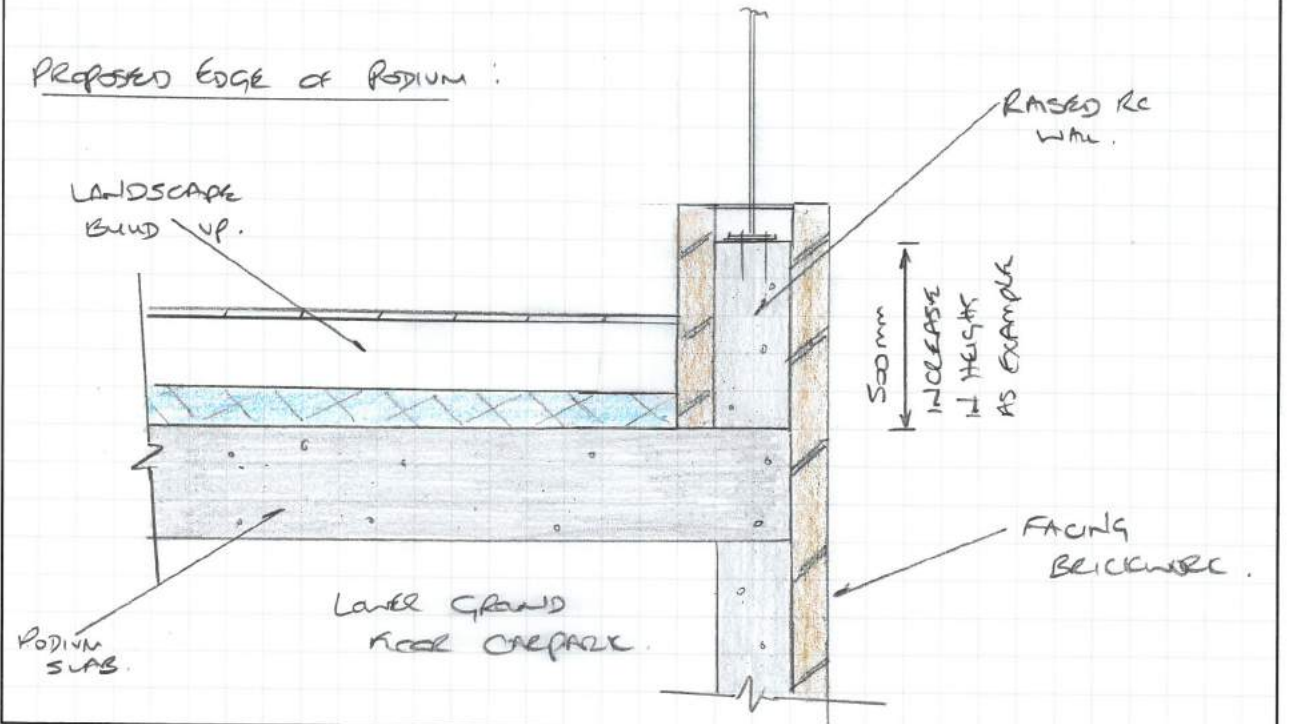
KEY:

— — — — — LINE OF FLOOD DEFENCE



METHODOLOGY :

- REMOVE BAUSTRADING + LOCALLY BREAKOUT EXISTING LANDSCAPING FINISHES + FACING BRICKWORK.
- REINFORCED CONCRETE BUILT UP AT PERIMETER OF PODIUM SLAB.
- NEW LANDSCAPING FINISHES PROVIDED TO DISGUISE FLOOD DEFENCE WALL.



STRUCTURE : FLOOD DEFENCE WALL INTERACTION

