Kingsway House

Civil Engineer
SuDS Report

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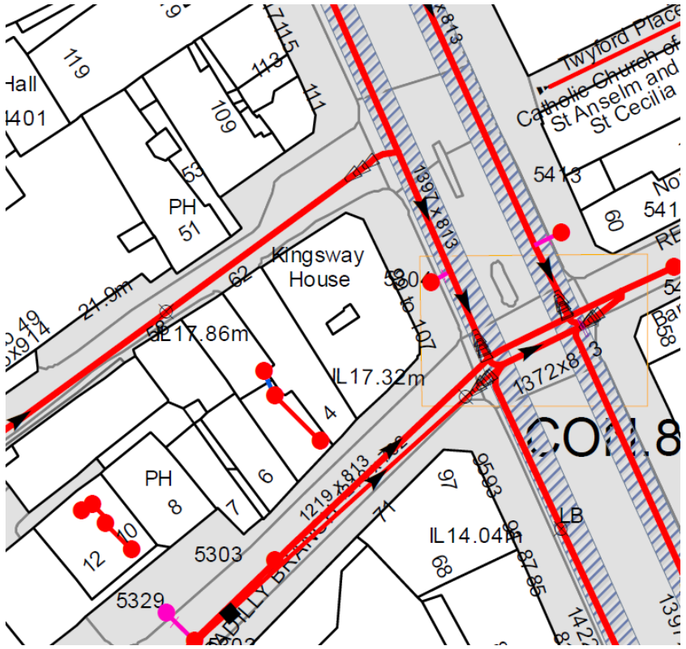
Surface Water Drainage

Existing scheme

The Thames Water sewer records indicate that there are existing combined sewers on three sides of the site as shown in Figure 1 below. A CCTV survey has been carried out to confirm the condition and configuration of the below ground drainage network. The survey has shown the existing below ground drainage to be combined use (foul and surface water together) with three outlets to the Thames Water public sewers in Kingsway, Great Queen Street and Parker Street. The existing drainage outlets are all 150mm diameter and the outlet pipe invert levels vary between 0.6 – 1.0m below finish floor level.

The existing site is entirely hard-standing and surface water drains unrestricted to the combined sewer network.



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.

Figure 1 – Thames Water sewer records

Proposed below ground drainage

The below ground drainage proposals are shown in the attached drawing D5000. The three existing gravity outlets to the public combined sewer network will be retained whereas the internal drainage will all be replaced with a separated drainage network. New drainage pipes will be constructed from ductile cast iron, cast within the lower ground floor slab; new manholes will consist of sealed cast iron hatch box chambers with double sealed covers.

There will be no increase in surface water run-off as the existing site is completely hard-standing. The below table below details the SuDS review that we have conducted for this project:

SuDS technique	Y/N	Comment
Green Roofs	Y	A lightweight green roof will be installed and coordinated with the proposed plant at roof level. The proposed green roof will help to reduce both the peak and total surface water discharge from the site, whilst also bringing ecological benefits to the area.
Basins, ponds, swales, filter strips	N	The building footprint occupies the entire site and there are no areas of soft landscaping
Rainwater Re-use	N	It is proposed to maintain the existing rainwater pipe connections to the sewer network. Rainwater reuse is therefore deemed unsuitable. There is also limited available space within the lower ground level for rainwater harvesting.
Infiltration devices	N	Infiltration would not be possible as the building footprint occupies the entire site.
Permeable surfaces	N	There are no external areas that could benefit from lined permeable surfacing.
Tanked systems	N	Traditional below ground tanked systems have currently been discounted due to the restrictions on excavation, existing shallow outfalls and lack of available space at lower ground level.

Surface Water Attenuation

As mentioned in the previous section, the proposed green roof will help to reduce both the peak and the total surface water discharge. Further to this, the site has been assessed in line with the London Plan Essential Standards, which states that developers should aim to achieve a 50% reduction on the existing discharge rate.

The total site area is approximately 420m^2 and is entirely covered by hardstanding. Due to the size of the site, a rainfall intensity of 0.014 l/s/m^2 can be used in order to calculate the existing discharge:

Q_{exg} = 420 x 0.014

= 5.88 l/s

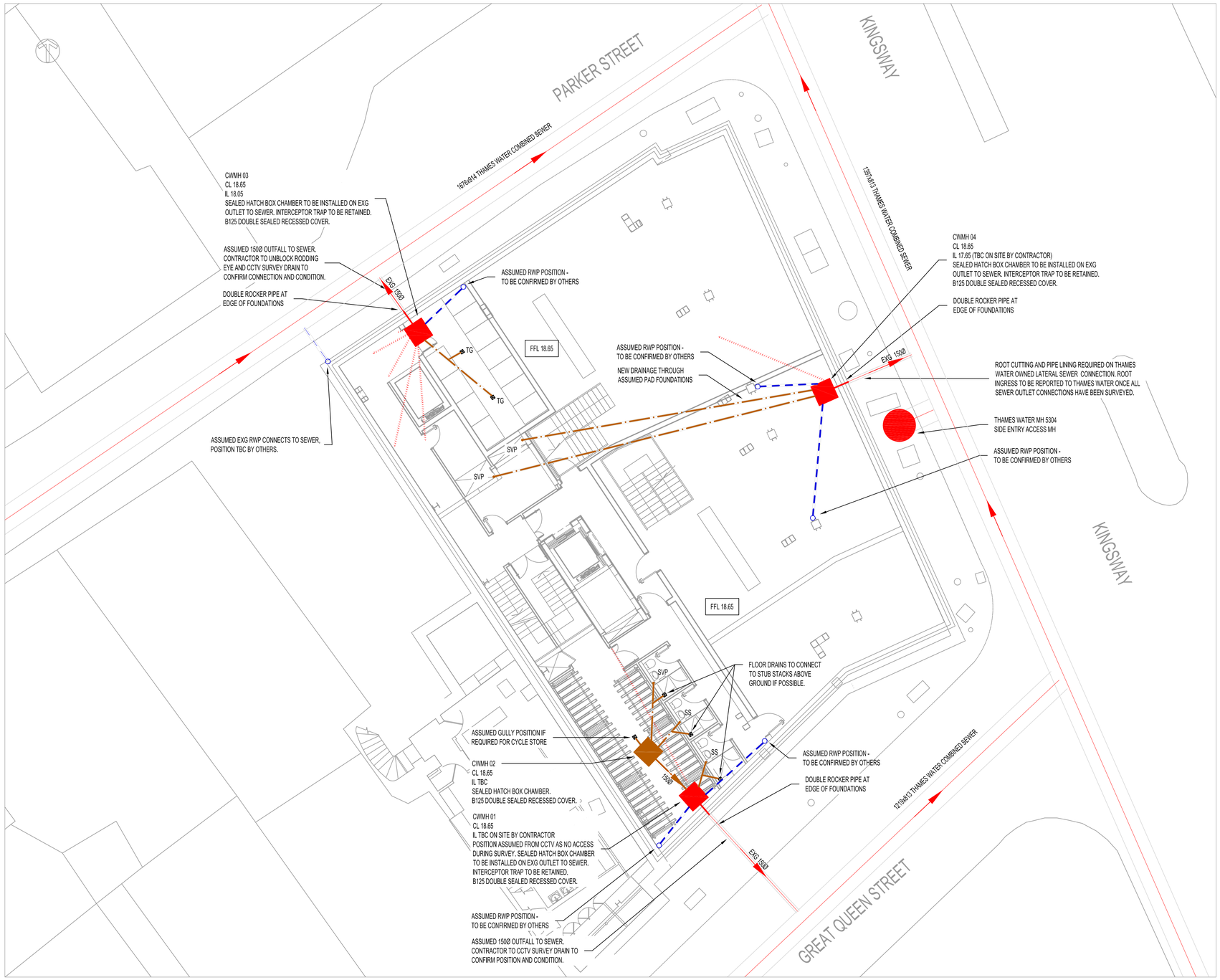
The volume of required attenuation has been estimated using the MicroDrainage Quick Storage Estimation software with a proposed flow of 2.94 l/s (50% reduction on existing). The results are summarised below:

1 in 100 year storm event plus 30% climate change: Volume=10 – 17m^3

Due to this required storage volume, it is not considered practical to include tanked attenuation systems within the site. In addition, the size of orifice plate would need to be less than 35mm diameter in order to restrict the flow to 2.94 l/s, and therefore be at high risk from flooding due to blockages.

It is for these reasons that the SuDS proposals are limited to a green roof solution.

Appendix – Proposed Below Ground Drainage Layout



DRAINAGE STRATEGY

THERE WILL BE NO INCREASE IN THE SURFACE WATER DISCHARGE FROM THE SITE AS THE EXISTING SITE IS CURRENTLY 100% HARD-STANDING. A PROPOSED GREEEN ROOF WILL HELP REDUCE THE PEAK AND TOTAL SURFACE WATER RUN-OFF FROM THE SITE, WHILST ALSO BRINGING ECOLOGICAL BENEFITS TO THE AREA. IT IS NOT POSSIBLE TO INFILTRATE SURFACE WATER, AS THE BUILDING FOOTPRINT OCCUPIES THE WHOLE SITE, AND THE THERE ARE NO NEARBY SURFACE WATER SEWERS. THEREFORE, DISCHARGE INTO THE OFFSITE THAMES WATER PUBLIC COMBINED SEWERS WILL BE REQUIRED VIA EXISTING LATERAL CONNECTIONS.

MAINTENANCE STRATEGY

THE PROPOSED DRAINAGE SYSTEM WILL BE ENTIRELY WITHIN THE EXTENTS OF THE DEVELOPMENT OWNERSHIP BOUNDARY AND WILL THEREFORE BE PRIVATELY MAINTAINED FOR THE LIFETIME OF THE DEVELOPMENT. THE BELOW GROUND DRAINAGE NETWORK SHOULD BE MAINTAINED APPROPRIATELY WITH ANNUAL INSPECTIONS AT A MINIMUM. IN ADDITION, A GREEN ROOF MAINTENANCE REGIME WILL BE REQUIRED TO ENSURE EFFICIENT OPERATION. IT IS VITAL THAT A RECORD IS KEPT OF THE INSPECTIONS AND MAINTENANCE WORK. THIS ALLOWS THE RESPONSE OF THE SYSTEM TO DIFFERENT MAINTENANCE REGIMES TO BE ASSESSED IN FUTURE, AND ALSO PROVIDES PROTECTION AGAINST LEGAL CLAIMS SHOULD THE CAPACITY OF THE SYSTEM BE EXCEEDED DURING A RAINFALL EVENT AND FLOODING OCCURS ELSEWHERE AS A RESULT.

THE GREEN ROOF MAINTENANCE REQUIREMENTS ARE SUMMARISED BELOW:

GREEN ROOFS:

MAINTENANCE SCHEDULE	REQUIRED ACTION	RECOMMENDED FREQUENCY
REGULAR INSPECTIONS	INSPECT ALL COMPONENTS INCLUDING SOIL SUBSTRATE, VEGETATION, DRAINS, IRRIGATION SYSTEMS (IF APPLICABLE), MEMBRANES AND ROOF STRUCTURE FOR PROPER OPERATION, INTEGRITY OF WATERPROOFING AND STRUCTURAL STABILITY	ANNUALLY AND AFTER SEVERE STORMS
	INSPECT SOIL SUBSTRATE FOR EVIDENCE OF EROSION CHANNELS AND IDENTIFY ANT SEDIMENT SOURCES	ANNUALLY AND AFTER SEVERE STORMS
	INSPECT DRAIN INLETS TO ENSURE UNRESTRICTED RUNOFF FROM THE DRAINAGE LAYER TO THE CONVEYANCE OR ROOF DRAIN SYSTEM	ANNUALLY AND AFTER SEVERE STORMS
	INSPECT UNDERSIDE OF ROOF FOR EVIDENCE OF LEAKAGE	ANNUALLY AND AFTER SEVERE STORMS
REGULAR MAINTENANCE	REMOVE DEBRIS AND LITTER TO PREVENT CLOGGING OF INLET DRAINS AND INTERFERENCE WITH PLANT GROWTH	SIX MONTHLY AND ANNUALLY OR AS REQUIRED
	DURING ESTABLISHMENT (I.E. YEAR ONE), REPLACE DEAD PLANTS AS REQUIRED	MONTHLY (BUT USUALLY RESPONSIBILITY OF MANUFACTURER)
	POST ESTABLISHMENT, REPLACE DEAD PLANTS AS REQUIRED (WHERE >5% OF COVERAGE)	ANNUALLY (IN AUTUMN)
	REMOVE FALLEN LEAVES AND DEBRIS FROM DECIDUOUS PLANT FOLIAGE	SIX MONTHLY OR AS REQUIRED
	REMOVE NUISANCE AND INVASIVE VEGETATION, INCLUDING WEEDS	SIX MONTHLY OR AS REQUIRED
	MOW GRASSES, PRUNE SHRUBS AND MANAGE OTHER PLANTING (IF APPROPRIATE) AS REQUIRED – CLIPPINGS SHOULD BE REMOVED AND NOT ALLOWED TO ACCUMULATE	SIX MONTHLY OR AS REQUIRED
REMEDIAL ACTIONS	IF EROSION CHANNELS ARE EVIDENT, THESE SHOULD BE STABILISED WITH EXTRA SOIL SUBSTRATE SIMILAR TO THE ORIGINAL MATERIAL, AND SOURCES OF EROSION DAMAGE SHOULD BE IDENTIFIED AND CONTROLLED	AS REQUIRED
	IF DRAIN INLET HAS SETTLED, CRACKED OR MOVED, INVESTIGATE AND REPAIR AS APPROPRIATE	AS REQUIRED

DRAINAGE NOTES

1. THE DESIGN IS BASED ON THE INFORMATION AVAILABLE ON THE DATE OF ISSUE FROM OTHER PARTIES (EG. ARCHITECT AND M & E ENGINEER). IT IS SUBJECT TO CHANGE RESULTING FROM UPDATES TO THE AVAILABLE INFORMATION FROM OTHERS.
2. THE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE NBS SPECIFICATIONS AND STANDARD DRAINAGE DETAIL DRAWINGS WHERE APPLICABLE.
3. THE POSITIONS OF FOUL AND SURFACE WATER DRAINAGE POINTS ARE INDICATIVE ONLY, REFER TO THE ARCHITECTS DRAWINGS FOR SETTING OUT DETAILS.
4. UNADOPTED FW AND SW DRAINAGE IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT BUILDING REGULATIONS, BS EN752 AND BS EN12056.
5. DRAINS ARE TO BE CONSTRUCTED USING CAST IRON PIPES TO BS EN 437 AND BS EN 877 (EG SAINT GOBAIN TIMESAVER/ENSIGN OR SIMILAR APPROVED). ALL DRAINAGE TO BE CAST WITHIN LOWER GROUND FLOOR SLAB.
6. ALL SOIL CONNECTIONS UNDER BUILDINGS TO BE 100mm DIA LAID AT A MINIMUM GRADIENT OF 1/40 UNLESS NOTED OTHERWISE AND SHOULD BE RODDABLE FROM GROUND LEVEL.
7. ALL RWP CONNECTIONS TO BE 100mm DIAMETER AND TO BE LAID AT A MINIMUM GRADIENT OF 1/80 UNLESS NOTED OTHERWISE AND SHOULD BE RODDABLE FROM ABOVE GROUND LEVEL.
8. RAINWATER DOWN PIPES TO CONNECT TO A DRAIN VIA A REST BEND OR BE CONNECTED DIRECT TO A TRAPPED GULLY OR P TRAP ON A COMBINED SYSTEM. WHERE INTERNAL RWP'S OCCUR THESE MUST BE CONNECTED TO A 'P' TRAP WITH RODDABLE ACCESS ABOVE FLOOR LEVEL.
9. WHERE DRAINS PASS THROUGH FOUNDATIONS OR OTHER RIGID STRUCTURES A LINTEL OR SLEEVE IS TO BE USED AND PROVISION FOR FLEXIBILITY IS TO BE MADE USING ROCKER PIPES.
10. BACKFILLING OF DRAIN TRENCHES ADJACENT TO BUILDING OR OTHER STRUCTURES IS TO BE IN ACCORDANCE WITH DIAGRAM 8 OF THE BUILDING REGULATIONS.
11. ALL INTERNAL FLOOR DRAINS TO BE SPECIFIED BY THE ARCHITECT.
12. ANY PIPE OR GULLEY OR OTHER FITTING OR DUCT PENETRATING THE BASEMENT SLAB OR WALL IS TO BE WATERPROOFED USING HYDROPHILIC STRIPS OR PUDDLE FLANGES TO ENSURE A WATER TIGHT JOINT. CONCRETE SURROUND TO DRAINAGE PIPES AND FITTINGS MAY BE REQUIRED IN CERTAIN CASES - REFER TO DETAILED DRAINAGE DRAWINGS AND RELEVANT STRUCTURAL DETAILS.
13. EXISTING FOUNDATIONS AND RETAINING WALLS MUST NOT BE UNDERMINED BY NEW DRAINAGE RUNS UNLESS AGREED IN WRITING WITH THE STRUCTURAL ENGINEER. CONTRACTOR TO SUBMIT METHOD STATEMENTS AND TEMPORARY WORKS PROPOSALS TO THE STRUCTURAL ENGINEER FOR COMMENT PRIOR TO COMMENCEMENT OF WORKS.

This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

Do not scale from this drawing.

LEGEND

- PROPOSED COMBINED MANHOLE
- PROPOSED FOUL MANHOLE
- EXISTING COMBINED WATER SEWER/DRAIN
- EXISTING FOUL WATER SEWER/DRAIN
- EXISTING SURFACE WATER SEWER/DRAIN
- PROPOSED COMBINED WATER SEWER/DRAIN
- PROPOSED FOUL WATER SEWER/DRAIN
- PROPOSED SURFACE WATER SEWER/DRAIN
- COMBINED DRAIN TO BE REMOVED
- CAVITY DRAIN RISING MAIN
- FOUL WATER RISING MAIN
- TRAPPED GULLY
- SS STUB STACK
- SVP SOIL VENT PIPE
- RWP RAIN WATER PIPE

NOT FOR CONSTRUCTION

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project

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Lower Ground Floor

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