

Vinegar Yard

Drainage Assessment Report
October 2021





4188 - Vinegar Yard
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Appendix 1 - Strategic Drainage Layouts - Options

Appendix 2 - Pre-planning application enquiry Thames Water's response



06	15.10.21	Planning Issue
05	25.08.21	Preliminary Issue
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1 Introduction

AKT II have been commissioned to undertake a Drainage Assessment Report in support of the proposed redevelopment of the land bounded by St Thomas Street, Fenning Street, Vinegar Yard and Snowfields including Nos. 1-7 Fenning Street and No. 9 Fenning Street, SE1 3QR. This report is intended to outline the surface and foul water drainage strategy for the development.

St Thomas Bermondsey Limited (the "Applicant") submitted an application for full planning permission for the redevelopment of Vinegar Yard (the "Site") to the London Borough of Southwark ("LBS" or the "Council") on 21 December 2018 under reference 18/AP/4171 (the "Application"). The Application was considered by the Council's Planning Committee on 29 June 2020. Officers recommended the Application for approval subject to conditions and S106, but LBS resolved to refuse.

On 24 August 2020 the Mayor notified LBS and the Applicant of his intention to recover the Application for his own determination (GLA ref. GLA/6208/S2). Since then, the Applicant has been working with officers at the GLA and Southwark to amend the development proposals, seeking amongst other changes to address LBS' heritage concerns that had led to the local refusal. This Drainage Assessment Report has therefore been prepared as part of a package of materials for submission to the GLA for the purposes of public consultation and consideration of the Revised Scheme by the Mayor.

The updated scheme seeks to provide flexible medical and research & development floorspace (Use Classes D1 and / or B1(b)) designed to allow for occupation by Guys and St Thomas' NHS Foundation Trust, but flexible to ensure long term resilience. Levels one to ten of the building will first be offered to Guys and St Thomas' for use as either D1 medical space or B1(b) research & development. The remainder of the upper floors, levels 11 to 18, comprise a B1(a) office use. This configuration reflects Guys and St Thomas's Adaptable Estates Strategy, where buildings are able to accommodate a range of possible functions both physically and by virtue of permitted uses in the long term. In the event that Guys and St Thomas' do not wish to occupy levels 1 to 10 of the proposed building, it will default to a B1(b) research and development use and will be made available to R&D occupiers whose work can support the SC1 Life Science & Innovation District. Minor changes to the plant configuration at levels 3 and 8 of the building and the retail floorspace at ground floor level would also change as a result of a research and development use. The remainder of the proposed floorspace within the scheme would not change in the event of a research and development occupier taking the building. The flexible medical and research & development use will be controlled by a suitably worded planning condition and obligation within the Section 106 agreement.

2 Surface water drainage

2.1 Existing site

The available Thames Water record plans indicate that the closest surface water or combined public sewers to the site are:

- A 305mm diameter combined sewer in Melior Street to south-west of the site.
- A 375mm diameter combined sewer in Snowsfields to the east of the site.
- A 1140 x 790mm combined sewer under St Thomas Street to the north of the site becoming 1190 x 930mm at the junction with Snowsfields.
- A 150mm diameter combined sewer to the south crossing the site in Vinegar Yard and connecting into the 1140 x 790mm combined sewer in St Thomas Street.

An extract from the record plans is shown in Figure 1.1 for reference.

The site comprises of an irregular shaped plot of land located in the Borough of Southwark City Council, in the London Bridge Area.

The majority of the site is currently being used as car park area with a small security cabin located on the eastern side.

The site comprises also of a low rise industrial building located at 1-7 Fenning Street and 9 Fenning Street. This is a two storey brick warehouse with a concrete ground floor which provides approximately 848 m² (GIA) of light industrial with ancillary office and storage floorspace (B1). The majority of the site was previously used as a work space for Network Rail in connection with the development works at London Bridge.

Details of existing private drainage including outfalls from the applicant site are not known and need to be confirmed by carrying out a CCTV drainage survey. Therefore, it is recommended that a CCTV survey of the existing drainage network is undertaken in order to confirm the location, size, levels and condition of all existing surface water connections from the site and to identify if there are any third party connections from the adjacent properties which will need to be considered in the proposed scheme.

The total site area is approximately 2,300m² which is 100% hardstanding.

In accordance with the Modified Rational Method, the peak existing run-off from the site is calculated from the formula:

$$Q = 3.61 \times C_v \times A \times i$$

where C_v is the volumetric runoff coefficient, A is the catchment area in hectares and i is the peak rainfall intensity in mm/hr.

For the peak 1-in-1-year return period storm event this gives an existing discharge rate from the site of:

$$Q_1 = 3.61 \times 0.75 \times 0.23 \times 32.4 = \mathbf{20.2 \text{ litres/sec}}$$

and for the peak 1-in-100-year return period storm event this gives an existing discharge rate from the site of:

$$Q_{100} = 3.61 \times 0.75 \times 0.23 \times 103.2 = \mathbf{64.2 \text{ litres/sec}}$$

2.2 Proposed scheme

The proposed redevelopment of the site comprises the demolition of existing buildings, retention and the refurbishment of the warehouse and the erection of a ground, mezzanine and 18 storey building (with plant at roof) and 3 basement levels, comprising of café and community space within the warehouse and within the new building office, flexible medical and research and development, and flexible retail and affordable workspace, alongside cycle and disabled car parking, servicing, refuse and plant areas, public garden (including soft and hard landscaping), highway improvements and all other associated works.

The plans indicate that the site area within red boundary is approximately 2,300m² and comprises of 93% hardstanding. It is proposed to have a soft landscaped area to the east of the site which will improve the sustainability of the development and help to reduce the peak surface water runoff from the site during smaller storm events. However, in large storm event the impact will be negligible and so it is assumed that site area is 100% impermeable.

The yellow shaded areas in Figure 1.1 are public realm areas and it is not intended to attenuate these areas within the development.

Using the Modified Rational Method, the proposed (unattenuated) peak run-off from the site for the 1-in-1-year return period storm would be:

$$Q_1 = 3.61 \times 0.75 \times 0.23 \times 32.4 = \mathbf{20.2 \text{ litres/sec}}$$

and for the peak 1-in-100-year return period storm event:

$$Q_{100} = 3.61 \times 0.75 \times 0.23 \times 103.2 = \mathbf{64.2 \text{ litres/sec}}$$

The Environment Agency updated their guidance on climate change allowance in February 2016 to include an upper and lower allowance to be considered depending on the specific site characteristics. Table 1.1 on page 5 shows the revised figures based on various building life spans. Therefore, making an allowance for climate change of 40% this would give an unattenuated design discharge of:

$$Q_{1(+40\%)} = \mathbf{28.3 \text{ litres/sec}} \text{ and } Q_{100(+40\%)} = \mathbf{89.9 \text{ litres/sec}}$$

In accordance with the Environment Agency's guidelines, the Building Regulations and the Water Authority's advice, the preferred means of surface water drainage for any new development is into a suitable soakaway or infiltration drainage system. Sustainable Urban Drainage Systems (SUDS) can reduce the impact of urbanisation on watercourse flows, ensure the protection and enhancement of water quality and encourage recharging of groundwater in a manner which mimics nature.

In addition to this, the National Planning Policy Framework requires that surface water arising from a developed site should, as far as is practicable, be managed in a sustainable manner to mimic surface water flows arising from the site prior to the proposed development, whilst reducing flood risk to the site itself and elsewhere, taking climate change into account.

Therefore, as an absolute minimum, the proposed site discharge under the 1-in-100-year storm plus climate change should be no greater than the existing 1-in-100-year storm discharge (i.e. mitigate the impact of climate change and any increase in the area of hardstanding). In this case, this would mean that the maximum permissible discharge from the site would be **64.2 litres/sec**.

Further to the above, the recently published new London Plan's Policy S1 13 on Sustainable drainage states that "Development proposals should aim to get as close to greenfield run-off rates as possible depending on site conditions". The Environment Agency (EA) also suggests that Developers should aim to achieve greenfield run off from their site. In accordance with the method outlined in the Institute of Hydrology Report 124, the Greenfield runoff for the site is calculated from the formula:

$$Q_{BAR} = 0.00108 \times \text{AREA}^{0.89} \times \text{SAAR}^{1.17} \times \text{SOIL}^{2.17}$$

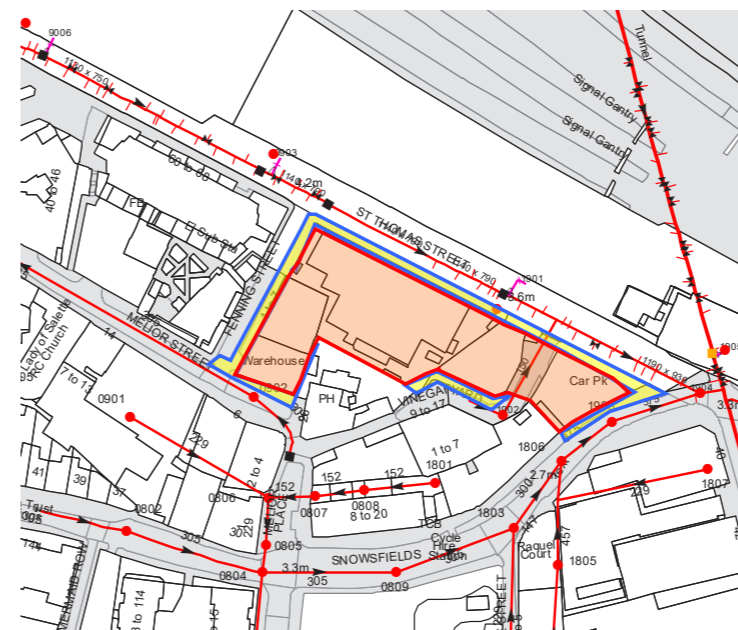


Figure 2.1 Thames Water Sewer Record

Manhole reference	Manhole cover level	Manhole invert level
0902	0.72 m	n/a
1902	n/a	n/a
1806	2.631 m	-1.581 m
1903	2.91 m	-0.92 m
1904	3.178 m	-1.581 m
1901	4.142 m	-1.028 m
1903	4.132 m	-1.038 m

where AREA is the site area in km² (pro rata of 50 ha if the site is less than 50 ha), SAAR is the Standard Average Annual Rainfall in mm and SOIL is the Soil Index both read from The Wallingford Procedure maps. This gives a greenfield runoff for the site of:

$$Q_{BAR} = 0.00108 \times 0.500^{0.89} \times 600^{1.17} \times 0.45^{2.17} = \mathbf{183.4 \text{ litres/sec (for 50 ha)}}$$

Scaling this for the actual site area gives:

$$Q_{BAR} = (183.4 \times 0.23) \div 50 = \mathbf{0.84 \text{ litres/sec}}$$

Using the Hydrological Growth Curve for south east England, the growth factor from Q_{BAR} to Q₁₀₀ is 3.146 which gives a value for Q₁₀₀ = **2.65 litres/sec**.

As the project is new build we would expect that based on our recent experience in the borough, the Local Authority, Thames Water, and the EA would require the storm water discharge to be limited to the greenfield run-off rate of **2.65 litres/sec**. A Pre-Planning Enquiry was sent to Thames Water Utilities on this basis on 11.10.20 and their response was received on 16.11.20 confirming the restricted surface water discharge of 2.65 litres/sec is acceptable (see Appendix 2).

As previously mentioned, details of existing private drainage including outfalls from the site to the public network are not known and need to be investigated. At this stage an allowance for three new sewer connections into the surrounding public sewers (one in St Thomas Street, one in Melior Street and one in Snowfields) should be made in case the existing connections are not in re-usable condition as indicated in the Strategic Drainage Layouts which can be found in Appendix 1. Sewer outfalls are to be positioned above the surcharge levels of the public sewers. At the next stage of the design AKTII will need to consult Thames Water with regard to any potential new sewer connections to the sewer in St Thomas Street, should the CCTV survey prove that existing connections are not viable for re-use. There is a risk that new connections would be subject to a Section 98 application which can take up to 12 months and is very expensive and also requires that Thames Water contractors carry out the sewer connection works on behalf of the Client.

Section 2.3 discusses the potential approaches that can be taken to meet these requirements.

2.3 Disposal methods

SUDS management train

A useful concept used in the development of sustainable drainage systems is the SUDS management train (sometimes referred to as the treatment train). Just as in a natural catchment, drainage techniques can be used in series to change flow and quality characteristics of the runoff in stages. There are a variety of measures that can be implemented to achieve these goals:

Site management / Prevention

Site management procedures are used to limit or prevent runoff and pollution and include:

- Minimising the hardened areas within the site
- Frequent maintenance of impermeable surfaces
- Minimising the use of de-icing products

Source control

Source control techniques will be used where possible as they control runoff at source in smaller catchments. They can also provide effective pollution control and treatment, thereby improving the quality of the effluent discharged to the receiving waters.

Site control

Where source control techniques do not provide adequate protection to the receiving watercourses in terms of flood protection and pollution control, site control may be required.

Regional control

Where large areas of public space are available regional control can be incorporated to provide additional 'communal' storage and treatment to runoff from a number of sites. However, in this case, all storage and treatment will be implemented on site.

Drainage hierarchy

Based on the above, the following drainage hierarchy, in accordance with the new London Plan 2021 Policy SI 13 on Sustainable drainage, will therefore need to be considered when preparing the surface water disposal strategy:

1. Rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation)
2. Rainwater infiltration to ground at or close to source
3. Rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens)
4. Rainwater discharge direct to a watercourse (unless not appropriate)
5. Controlled rainwater discharge to a surface water sewer or drain
6. Controlled rainwater discharge to a combined sewer

The new London Plan also states that "rainwater should be managed as close to the top of the hierarchy as possible" and that "there should be a preference for green over grey features, and drainage by gravity over pumped systems."

Rainwater harvesting

This involves the capture of rainwater into a tank for re-use (usually non-potable) such as irrigation, toilet flushing or vehicle cleaning. Systems are now available which combine rain water harvesting with tanked attenuation. This means that water is stored during dry periods for re-use but released ahead of predicted storms in order to ensure that the full attenuation capacity remains available when it is needed.

As the project is a new build, it should be possible to install a rainwater harvesting system where roof water could be collected for re-use to flush toilets or irrigate planted areas. Its use should therefore be investigated further at the next design stages to determine its suitability in terms of the plant space requirements, the need for a secondary water distribution network, the available yield and demand.

Green / brown / blue roofs

These are used on flat or shallow pitched roofs to provide a durable roof covering which also provides thermal insulation, amenity space and biodiversity habitat as well as attenuation of rainwater. Depending on the design, these roofs can attenuate differing volumes of rainwater. The term 'blue roof' is reserved for those roofs designed to maximise water retention. This is a relatively recent area of increased focus and can involve an attenuation tank at roof level which reduces (or avoids) the need for pumping of basement tanks.

It is not proposed to include green roofs at terrace level, but it is intended to incorporate some trees and plants to improve biodiversity of the development and to limit the run-off volume of rainwater through short-term attenuation and evaporation.

It is proposed that blue roofs are incorporated into the scheme. The volume of attenuation required is provided in the 'storage tanks' section of this report.

Raingardens

Raingardens are planted areas (usually close to buildings but not immediately adjacent) that allow the diversion of a portion of rainwater from either downpipes or the surrounding paved surfaces. These techniques can be incorporated into the landscaping plans for a site and are most effective where the landscaping regime is designed with the aim of capturing as much rainfall as possible. They can either allow infiltration into the ground or have tanked systems for water retention, depending on the site and soil conditions. There are also a number of vertical raingardens attached to building walls with rainwater downpipes diverted through a stacked series of planters.

As the proposed structure takes up the majority of the site area it is not possible to incorporate raingardens into the scheme.

Bio-retention

This refers to a chain of landscaped features, potentially including reed beds, filter drains, etc. designed to hold and treat surface water. They are often used where there is a high risk of low-level pollution, for example from road run-off. However, it does require areas of open space. The design of a bio-retention system can vary widely depending on site conditions and available space. At a small scale this could include flow through planters or tree pits.

As the proposed structure takes up the majority of the site area it is not possible to incorporate bio-retention into the scheme.

Permeable surfacing

Permeable hard surfaces which work in much the same way as traditional impermeable surfaces apart from the ability to allow rainwater to pass through. Permeable blocks are traditionally used but there are now a range of permeable asphalt and resin bound gravel pavings being used increasingly commonly.

Permeable surfaces can either allow infiltration into the ground or have tanked systems for water retention, depending on the site and soil conditions. They are suitable in even the most densely built-up development. However, they're not well suited to roads carrying heavy or fast motor traffic.

The Landscape Architects proposals do not include permeable paving systems in the scheme.

Range	Total potential change anticipated for 2010-2039	Total potential change anticipated for 2040-2059	Total potential change anticipated for 2060-2115
Upper end	10 %	20 %	40 %
Central	5 %	10 %	20 %

Table 1.1 Peak rainfall intensity allowance

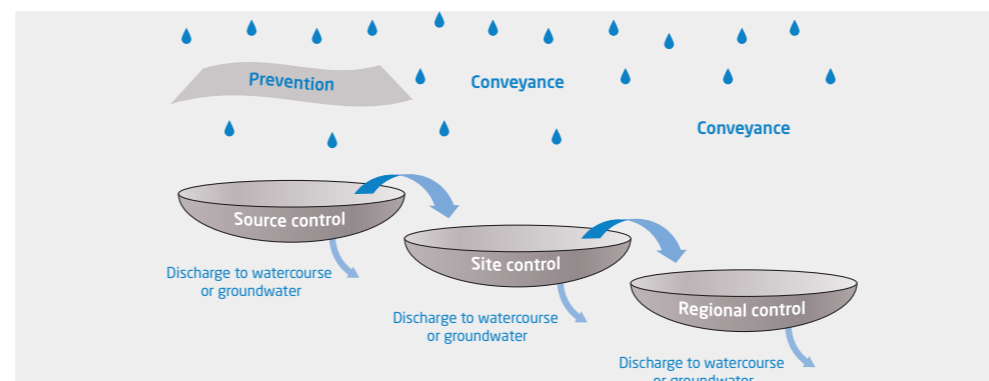


Figure 2.2 SUDS management train

Swales

These are dry ditches used as landscape features to allow the storage, carriage and infiltration of rainwater and are often used as linear features alongside roads, footpaths or rail lines. They can also be integrated into the design of many open spaces.

As the proposed structure takes up the majority of the site area it is not possible to incorporate swales into the scheme.

Detention basin / ponds

These are landscape features designed to store and in some cases infiltrate rainwater. Detentions basins are usually dry, whereas a pond should retain water. These features need areas of open space but can often be combined with other sustainable drainage techniques.

As the proposed structure takes up the majority of the site area it is not possible to incorporate ponds into the scheme.

Discharge to tidal river / dock / canals

Discharging clean rainwater directly to tidal rivers, canals or docks isn't normally a sustainable drainage technique. Other more productive techniques should be used first. However, it is generally more sustainable than discharging to the combined or surface drainage systems. Residual surface water can be discharged to tidal / large waterbodies, in some cases with no limitation on volumes. Some storage may be required to allow for outfalls becoming tide locked. Care is needed to prevent scour (sediment removal) in the receiving waterbody and potentially to prevent pollution. Consent from the EA, the asset owner and (where applicable) the Canal and River Trust is required.

There are no adjacent rivers or ponds and so discharge to a watercourse will not be a viable disposal method.

Storage tanks

Storage tanks are single GRP (glass reinforced plastic) units usually but not necessarily located below ground level which attenuate rainwater for later slow release back into the drainage system but do not provide the wider benefits of green infrastructure sustainable drainage. They can also have the disadvantage that pumping may be required to empty the tank into the drainage system - especially if the tank is located at or below basement level. Where tanks are designed for large storm events, care is needed to ensure that they still perform a useful sustainable drainage function for low order storms.

Geocellular storage tanks are similar to storage tanks except that the volume is made up from multiple units rather than a single tank meaning they can be more flexible in terms of shape to suit constrained sites.

It is proposed that geo-cellular tanks are introduced as a form of attenuation below the ground level to the east of the site and below the Warehouse ground floor finished floor level to the south of the site.

It is believed that the most feasible disposal option for the site is to discharge to the existing public sewers utilising the existing or new outfalls. The approximate storage volume required for greenfield rate of **2.65 litres/sec** under the 1-in-100-year (plus 40 % climate change) storm event from the building is **150 m³**.

It is recommended that at this stage a cost and space allowance is made for the storage volume of **150 m³** in order to limit the discharge rates to the Greenfield run-of rate of **2.65 l/sec** with Policy SI 13 of the new London Plan. An additional 10% freeboard within the blue roofs is to be provided to meet the LBS requirements.

The proposed attenuation features for the main building will comprise blue roof systems covering part of the roof terraces and a geo-cellular tank located below the landscaped area to the east of the site. The proposed attenuation strategy for the existing Warehouse to the south-west of the site will consist of a small geo-cellular tank with a storage volume of 15m³ located below the ground finished floor level. The intention is to accommodate the majority of the required attenuation volume at roof utilising blue roof systems. Any volume that cannot be accommodated at roof will be provided in a geo-cellular storage tank located below the ground level in order to allow gravity discharge into the public sewer. The proposed discharge rates and volumes will be determined at the next design stage. Provision of non-return valves at outfall points is to be confirmed during the next design stage.

Oversized piping

Using larger than necessary pipework creates more room to store rainwater. This would be potentially more sustainable than storage tanks / geocellular storage (modular attenuation tank) if the pipes drain by gravity and do not require pumping. However, this option lacks the wider benefits of the green infrastructure based techniques.

Due to the restricted nature of the site the pipework would become impractically large to provide the volume of storage required to achieve the required run-of rate.

Design for exceedance

This involves designing areas within a site such that they will flood and hold water during rare storm events (typically a frequency of once in ten years or longer).

As the attenuation volume has been sized to accommodate the 1-in-100-year plus climate change event there is no need to design for exceedance.

Summary of the proposed SuDS strategy

The intention is to accommodate the majority of the required attenuation volume for the main building at roof utilising blue roof systems. Any volume that cannot be accommodated at roof will be provided in a geo-cellular storage tank located below the ground level in the landscaped area to the east of the site in order to allow a gravity discharge into the public sewer. The proposed discharge rates and associated storage volumes will be determined at the next design stage. The intention is also to accommodate a small geo-cellular tank with a volume of 15m³ below the ground finished floor level of the existing Warehouse building to allow gravity discharge into the public sewer running in Melior Street. The discharge rate will be agreed with Thames Water by a way of submitting a pre-planning enquiry. A pre-planning enquiry was sent on 11.11.20, Thames Water responded on 16.11.20 confirming that a restricted discharge rate of 2.65 litres/sec into the public sewer from the development is acceptable (see Appendix 2).

Three options have been considered in terms of surface water attenuation strategy and they will need to be further investigated at the next stage of the design (see Appendix 1). Options A and B are based on a combination of blue roof systems covering a portion of roof terraces and geo-cellular tanks below ground level in order to limit the discharge rate to the Greenfield run-of rate of **2.65 l/sec** in line with Policy SI 13 of the new London Plan. Option C is considered as a secondary option and it is based on blue roof systems covering all the roof terraces (except for new level 13th terrace) in order to attenuate the majority of the main building catchment area. The remaining landscaped area and the existing Warehouse building will be attenuated via two small tanks located below the ground level. It is worth mentioning the fact that this option will be in line with LBS requirements to maximise the use of blue roof systems, but on the other hand the greenfield runoff will be exceeded (from 2.65 litres/sec to 4 litres/sec).

Option A

This will comprise of blue roof systems covering a portion of level 17th, 15th, 10th and 8th roof terrace, resulting in a total volume of 43m³ and in a gravity discharge into the public sewers. The remaining volume will be provided via a storage tank located below ground level in the landscaped area to the east of the site with a total volume of 100m³ and a small geo-cellular tank located below the ground finished floor level of the existing Warehouse building with a volume of 15m³ to allow a gravity discharge into the public sewers.

Option B

This will comprise of blue roof systems covering a portion of level 15th, 10th and 8th roof terrace, resulting in a total volume of 17m³ and in a gravity discharge into the public sewers. The remaining volume will be provided via a storage tank located below ground level with a total volume of 118m³ in the landscaped area to the east of the site and a small geo-cellular tank located below the ground finished floor level of the existing Warehouse building with a total volume of 15m³ to allow gravity discharge into the public sewers.

Option C

This will comprise of blue roof systems covering a portion of all the roof terraces (level 19th, 17th, 15th, 10th and 8th) except for new level 13th where it is intended not to have blue roof resulting in a total volume of 94m³ and in a gravity discharge into the public sewers. The remaining catchment area will be attenuated via a storage tank located below ground level in the landscaped area to the east of the site with a total volume of 42m³ and a small geo-cellular tank located below the ground finished floor level of the existing Warehouse building with a total volume of 15m³ to allow gravity discharge into the public sewers. This option is based on the majority of the main building being attenuated via blue roof systems covering all roof terraces (except for new level 13th terrace) and on the assumption that the maximum allowable discharge in the sewer of 4 litres/sec can exceed the greenfield run-off rate of 2.65 litres/sec.

The surface water attenuation strategy is based upon three new outfall gravity connections into the public sewer: one in Melior Street for the existing Warehouse building, one in St Thomas Street for the blue-roof outfall discharge and one in Snowfields for the geo-cellular tank outfall discharge. If the CCTV drainage survey at the next stage of the design will prove that the existing 150mm dia. public sewer running through the site can be divested and the outfall into the public sewer running in St Thomas Street is suitable for re-use then an alternative option could be to connect the discharge from the below ground geo-cellular tank to the east of the site into the existing outfall in the public sewer running in St Thomas Street (see Appendix 1). This will need to be confirmed via a CCTV drainage survey of the existing drainage to be undertaken at the next stage of the design.

Element	Management stage	Water quantity	Water quality	Amenity & biodiversity	Possible in scheme
Rainwater harvesting	Prevention	✓	✗	✗	✓
Green/brown/ blue roof	Source control	✓	✓	✓	✓
Raingardens	Source control	✓	✓	✓	✗
Bio-retention	Source control	✓	✓	✓	✗
Permeable surfacing	Source control	✓	✓	✗	✗
Swales	Source control	✓	✓	✓	✗
Detention basin/ponds	Source control	✓	✓	✓	✗
Discharge to tidal river / dock / canals	Site control	✓	✗	✗	✗
Storage tanks/ Geocellular storage	Site control	✓	✗	✗	✓
Oversized pumping	Site control	✓	✗	✗	✗
Design for exceedance	Site control	✓	✗	✗	✗

Figure 2.3 Summary of potential SuDS devices

3 Foul water drainage

3.1 Existing scheme

The available Thames Water record plans indicate that the closest foul water or combined public sewers to the site are:

- A 305mm diameter combined sewer in Melior Street to south-west of the site.
- A 375mm diameter combined sewer in Snowsfields to the east of the site.
- A 1140 x 790mm combined sewer under St Thomas Street to the north of the site becoming 1190 x 930mm at the junction with Snowsfields.
- A 150mm diameter combined sewer to the south crossing the site in Vinegar Yard and connecting into the 1140 x 790mm combined sewer in St Thomas Street.

An extract from the record plans is shown in Figure 1.1 for reference.

Details of existing private drainage including outfalls from the applicant site are not known and need to be confirmed by carrying out a CCTV drainage survey. Therefore it is recommended that a CCTV survey of the existing drainage network is undertaken in order to confirm the location, size, levels and condition of all existing foul water connections from the site and to identify if there are any third party connections from the adjacent properties which will need to be considered in the proposed scheme.

The peak foul water discharge from the pre-development site has been estimated based on the existing warehouse floor area (1000m²).

Based on a daily discharge of 990 litres per day per 100 m² of floor area of warehouse and assuming a 12 hour day for this facility, the approximate existing foul water discharge from the site is as follows:

Use	Area (sqm)	Daily Discharge (litres/day)	Peak Flow Rate (litres/sec)
Warehouse	1,000	9,900	0.23
Total			0.23

3.2 Proposed scheme

The foul water assessment of the proposed scheme has been carried out considering D1 use (medical use) only from the first to the tenth floor of the main building as this use is more onerous when compared to the alternative B1B use (research and development use).

The peak foul water flow has been estimated based on the loading units provided by the MEP engineer for the low usage (offices, retail units, seminar floorspace) and high usage (medical use/D1 use) based upon the hot and cold water peak demand.

Details of loading units per m² (related to the hot and cold water peak flow) are shown as follows:

	Low	Medium
Cold Water Peak Flow (LU/m ²)	0.076	0.11
Hot Water Peak Flow (LU/m ²)	0.036	0.08

The calculations of the proposed peak foul water flows from the development are summarized in the table below. According to the MEP consultant, an allowance of 20% design uplift future proofing has been made in accordance with the recommendation given by the MEP consultant.

Building Use	Type	Area (sqm)	Cold Water Peak Flow (LU)	Hot Water Peak Flow (LU)	Total LU
Offices		11,470	881.72	412.92	1,294
Retail	Low	588	44.69	21.17	65.86
Seminar		234	17.78	8.42	26.2
Medical (D1 use)	High	12,314	1,354.54	985.12	2,339
Total (LU)			2,288	1,427	3,716
20% Design Uplift					4,460

The conversion chart taken from Annex D in BS 6700 has been used in order to convert the loading units in litres/sec. The value of 4,460 (loading units) corresponds to a value of approximately **20 litres/sec** which represents the peak foul water flow from the proposed scheme.

There will be therefore an increase in the foul water flow rate of approximately 19.7 litres/sec which has been agreed with Thames Water by a pre-development enquiry that was submitted on 11.11.20. Thames Water's response dated 16.11.20 confirms that

the public combined sewers surrounding the site have sufficient sewerage capacity to serve the development (see Appendix 2).

It is assumed that any foul water drainage from ground floor level and above will be drained by gravity in order to minimise the amount of pumping required. Until the levels of the existing connections and public sewers are confirmed it is unclear whether all the basement levels will need to be pumped although this appears to be likely. It is therefore recommended that an allowance is made at this stage for pumping foul water from below the B3 basement level slab up to high level in the basement to allow it to discharge by gravity to the public sewer.

It is assumed that, if necessary, to provide future flexibility that any A3 uses will be fitted out with suitable above ground grease management/dosing systems and this is not part of the below ground drainage network.

As previously mentioned, details of existing private drainage including outfalls from the site to the public network are not known and need to be investigated. At this stage an allowance for two new sewer connections into the public sewer (one running in St Thomas Street for the main building and one in Melior Street for the Warehouse building) should be made as indicated in the Strategic Drainage Layouts which can be found in Appendix 1. At the next stage of the design AKTII will need to consult Thames Water with regard to any potential new sewer connections to the sewer in St Thomas Street, should the CCTV survey prove that existing connections are not viable for re-use. There is a risk that new connections would be subject to a Section 98 application which can take up to 12 months and is very expensive and also requires that Thames Water contractors carry out the sewer connection works on behalf of the Client.

The proposed strategic drainage layout below ground level is contained in Appendix 1 for information.

4 Cavity Drainage

The perimeter retaining walls are to be designed to limit any flow of groundwater inside the basement box. In the event that water does penetrate through the walls, a cavity drainage utilising gullies will be provided throughout the new basement and will be connected to the below ground cavity drainage pumps.

It is intended that all cavity drainage discharges into the public sewers via the proposed/existing outfalls.

A strategy for the cavity drainage is to be confirmed by the Architect. Local thickenings of the raft are likely to be required to suit falls within the drainage system. Internal manholes will need to be incorporated into the design, however, wherever possible rodding eyes will be used within the raft in place of manholes to reduce the impact on the existing and proposed structures. It is therefore recommended that a suitable cost contingency is allowed for this.

5 Diversion of Existing Sewer

As discussed in Section 1.1 there is an existing 150mm public combined sewer that currently runs through the development area in Vinegar Yard. At present no CCTV drainage survey of this sewer has been carried out, therefore it is not possible to identify which property this sewer serves and the level of the sewer. It is therefore recommended that a CCTV drainage survey of the existing combined sewer is undertaken to investigate all incoming lateral connections (to rule out the risk of affecting 3rd party drainage), to identify the invert levels of the run and to determine if the outfall into the public sewer running in St Thomas Street is suitable for re-use.

At this stage, three diversion options have been explored which will be further investigated at the next design stage:

- Section 185 Diversion Agreement with Thames Water. This will be required if the existing sewer can be diverted to one of the sewers around the site.
- Build Over Agreement with Thames Water. This will be required if the new buildings can be constructed over the existing sewer that will need to be kept running in the proposed scheme.
- Section 116 Divestment Agreement with Thames Water. This will be required if the CCTV drainage survey results confirm that the existing sewer can be divested.

5.1 Stopping up of existing public carriageway

There are areas of existing public footpath and existing public carriageway which fall within the planning boundary and require alteration in the proposed scheme.

These areas are highlighted in yellow on the drawing 4188-CV-HS-002 in Appendix 1.

It is assumed that these areas will continue to drain unrestricted to the highway drainage system and into the Thames Water sewers.

The area highlighted in orange on 4188-CV-HS-002 in Appendix 1 has been assumed to be existing public highway which would be stopped up.

It is intended to divert the existing foul sewer from this area subject to CCTV survey and consultation with Thames Water.

All other service diversions are covered by the MEP Consultant proposals.

6 Flood risk assessment requirements

A Flood Risk Assessment has been undertaken by AKT II. Please refer to AKT II FRA report submitted for planning.

The main findings of this report can be summarised as:

- In accordance with the National Planning Policy Framework, the site would be categorised as lying within Flood Zone 3a - an area assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%). However, the site benefits from the presence of well maintained flood defences along the River Thames. According to the Environment Agency Product 4 data (see Appendix D), The Thames Barrier and associated defence system has a 1 in 1000 year standard which means it ensures that flood risk is managed up to an event that has 0.1% annual probability. This is also confirmed by the Thames Estuary 2100 (2012) report.
- In accordance with the NPPF, the proposed office, retail, cafe are acceptable within Flood Zone 3a.
- The “more vulnerable” uses (medical uses) of the development are located above ground level and are therefore at minimal risk of flooding. However, additional measures including the presence and condition of flood defences, the intention to raise the finished floor levels to protect the building entrances up to breach level, the available warning systems and the safe evacuation route further satisfy the requirements of the Exception Test.

- The site has been assessed as being at very low risk of flooding from rivers or tidal sources.
- In the event of breach the occupants can evacuate to higher levels and safely remain inside or can leave the site early having been alerted by the Flood Warning Service.
- The Developer should register for the Environment Agency’s Flood Warning Service as a precaution.
- The site has been assessed as being at low risk from surcharging sewers.
- The site has been assessed as being at low risk from groundwater sources.
- The site has been assessed as being at low risk from artificial sources.
- The site has been assessed as being at flood risk from surface water flooding from St Thomas Street and Vinegar Yard. It is recommended that the mitigation measures specified in Sections 6.6 & 7.2 are implemented during the next design stage. It is considered that the implementation of any of the recommended measures would reduce the risk from the surface water flooding to low.
- Temporary or permanent barriers should be provided to the building entrances from flooding in a breach event. It is concluded that given the large number of access points to the building that a temporary level of protection would be difficult to achieve, and therefore it is recommended that the floor levels are set at or above the breach event level, as a permanent protection.
- The proposed redevelopment has an acceptable flood risk within the terms and requirements of the National Planning Policy Framework, subject to implementation of the mitigation measures outlined in this report.
- In order to comply with legislative requirements the existing surface water discharge should be reduced to the Greenfield rate of 2.65 litres/sec.

The comments stated above are based on information received from other consultees. The flood risk classification of this site has been based on the above observations, and the recommendations stated.

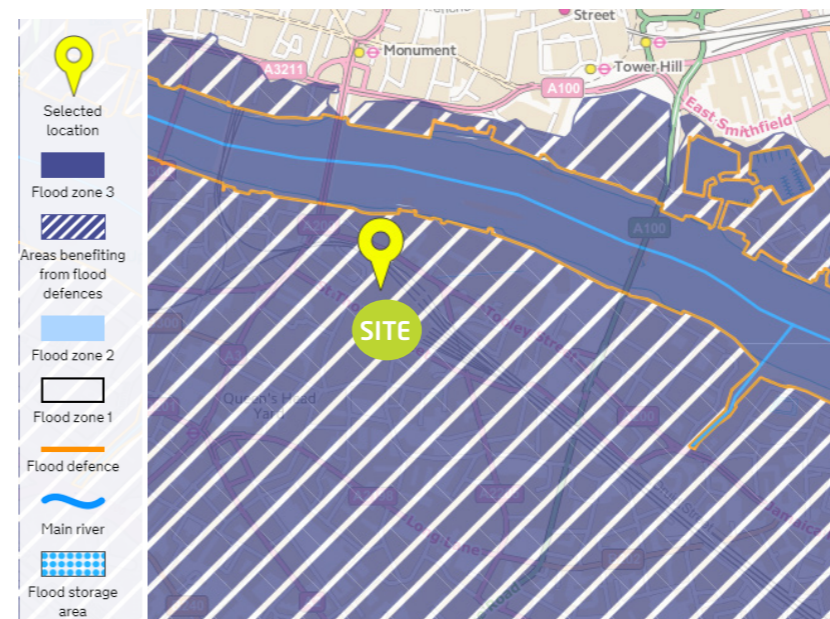


Figure 6.1 Environment Agency indicative flood map

7 BREEAM

Pol 03: Flood and surface water management

Prerequisite

1. An appropriate consultant is appointed to carry out and demonstrate the development's compliance with all criteria.

Up to two credits – Flood resilience

Two credits – Low flood risk

2. A site specific flood risk assessment (FRA) confirms the development is in a flood zone that is defined as having a low annual probability of flooding. The FRA takes all current and future sources of flooding into consideration.

One credit – Medium or high flood risk

3. A site specific FRA confirms the development is in a flood zone that is defined as having a medium or high annual probability of flooding and is not in a functional floodplain. The FRA must take all current and future sources of flooding into consideration.
4. To increase the resilience and resistance of the development to flooding, one of the following must be achieved:
 - a. The ground level of the building and access to both the building and the site, are designed (or zoned) so they are at least 600 mm above the design flood level of the site's flood zone; **OR**
 - b. The final design of the building and the wider site reflects the recommendations made by an appropriate consultant in accordance with the hierarchy approach outlined in Section 5 of BS 8533:2017.

Two credits – Surface water run-off

Prerequisite for surface water run-off credits

5. Surface water run-off design solutions must be bespoke, i.e. they must take account of the specific site requirements and natural or man-made environment of and surrounding the site. The priority levels detailed in the Methodology must be followed, with justification given by the appropriate consultant where water is allowed to leave the site.

One credit – Surface Water Run-Off – Rate

6. Drainage measures are specified so that the peak rate of run-off from the site to the watercourses (natural or municipal) shows a 30% improvement for the developed site compared with the pre-developed site. This should comply at the 1-year and 100-year return period events.
7. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified Sustainable Drainage Systems (SuDS) are in place.
8. Calculations include an allowance for climate change. This should be made in accordance with current best practice planning guidance.

One Credit – Surface Water Run-Off – Volume

9. Flooding of property will not occur in the event of local drainage system failure (caused either by extreme rainfall or a lack of maintenance); **AND EITHER**
10. Drainage design measures are specified so that the post-development run-off volume, over the development lifetime, is no greater than it would have been prior to the assessed site's development. This must be for the 100-year 6-hour event, including an allowance for climate change.
11. Any additional predicted volume of run-off for this event is prevented from leaving the site by using infiltration or other SuDS techniques.

OR (only where Criteria 10 & 11 cannot be achieved)

12. Justification from the appropriate consultant indicating why the above criteria cannot be achieved, i.e. where infiltration or other SuDS techniques are not technically viable options.
13. Drainage design measures are specified so that the post-development peak rate of run-off is reduced to the limiting discharge. The limiting discharge is defined as the highest flow rate from the following options:
 - a. The pre-development one-year peak flow rate **OR**
 - b. The mean annual flow rate Q_{BAR} **OR**
 - c. 2 litres/sec/ha

For the one-year peak flow rate, the one year return period event criterion applies.

14. Relevant maintenance agreements for the ownership, long-term operation and maintenance of all specified SuDS are in place.
15. For either option, above calculations must include an allowance for climate change; this should be made in accordance with current best practice planning guidance.

One credit – Minimising watercourse pollution

One credit

16. There is no discharge from the developed site for rainfall up to 5 mm (confirmed by the appropriate consultant).
17. Areas with a low risk source of watercourse pollution, an appropriate level of pollution prevention treatment is provided, using appropriate SuDS techniques.
18. Areas with a high risk of contamination or spillage of substances, such as petrol and oil, have separators (or an equivalent system) installed in surface water drainage systems.
19. Chemical or liquid gas storage areas have a means of containment fitted to the site drainage system (i.e. shutoff valves). This is to prevent the escape of chemicals to natural watercourses in the event of a spillage or bunding failure.
20. All water pollution prevention systems have been designed and installed in accordance with the recommendations of documents such as the SuDS Manual and other relevant industry best practice. They must be bespoke solutions taking account of the specific site requirements and natural or man-made environment of and surrounding the site.
21. A comprehensive and up-to-date drainage plan of the site will be made available for the building or site occupiers.
22. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS must be in place.
23. All external storage and delivery areas designed and detailed in accordance with the current best practice planning guidance.

Assessment of available credits

Prerequisite

Criterion	AKT II assessment	
1.	AKT II are appropriate consultants with the relevant qualifications and experience to design SuDS and flood prevention measures and completing peak rate of run-off calculations.	✓

Flood resilience

Criterion	AKT II assessment	
2.	Not applicable as the development is in Flood Zone 3a.	N/A
3.	The site-specific FRA carried out by AKT II confirms that the site is situated in Flood Zone 3a.	✓
4a.	It is not possible to locate the building access 600mm above the food levels as entrances need to tie in with the existing ground levels.	✗
4b.	The design of the building and the wider site is in accordance with the flood risk assessment and the hierarchical approach outlined in the relevant standards.	✓

Based on this we believe that potentially one credit out of a possible two can be awarded under these criteria.

However, based upon the BREEAM Knowledge Base which states that 'In an area protected by existing flood defences, (designed to withstand a certain magnitude of flooding), the appropriate number of flood risk credits can be awarded where the defences reduce the risk to 'low' or 'medium' and the following conditions are met:

1. The development is not located in an area where new flood defences have to be, or have been, constructed to minimise the risk of flooding to the site and its locality purely for the purpose of the development or its wider master plan.
2. The development is located on previously occupied land (as defined by the criteria in BREEAM issue LE 01 Site selection).
3. The relevant agency confirm that, as a result of such defences, the risk of a flood event occurring is reduced to low or medium risk. If firm confirmation is not provided then the credit cannot be awarded.'

It is considered that the proposed development complies with the three conditions stated above. Condition 3 is confirmed by the EA Product 4 data (contained in Appendix D of the FRA) which states that 'The Thames Barrier and associated defence system has a 1 in 1000 year standard which means it ensures that flood risk is managed up to an event that has a 0.1% annual probability' and 'The design standard of protection of the flood defences in this area of the Thames is 0.1% AEP; they are designed to defend London up to a 1 in 1000 year tidal flood event', which is a low risk.

Based on the above evidence we believe that two credits out of a possible two may be awarded under these criteria.

Surface water run-off

Run-off criteria	AKT II assessment	
5.	The drainage strategy will be prepared in line with the London Plan drainage hierarchy and the priority levels detailed in the BREEAM Methodology.	✓
6.	The proposed peak run-off rate will be reduced to greenfield run-off rate from the proposed development.	✓
7.	The ownership, operation and maintenance requirements for each SuDS device will be written into the O&M Manual for the site.	✓
8.	An allowance of 40% has been made for climate change in all calculations in line with the Environment Agency's guidance.	✓
9.	The site-specific FRA has been carried out by AKT II which confirms that the site is at low risk of flooding from local drainage system failure.	✓
10.	As the pre and post development hard standing areas are the same then there will be more run-off volume over the lifetime of the building once climate change is considered.	✗
11.	As the existing building covers the entire site area it is not possible to utilise infiltration. Therefore, it is not possible to prevent the additional run-off from leaving the site.	✗
12.	As the existing building covers the entire site area it is not possible to utilise infiltration.	✓
13.	Pre-development 1-year peak flow rate = 20.2 litres/sec Mean annual flow rate $Q_{bar} = 0.84$ litres/sec z litres/sec/ha = 0.46 litres/sec It is proposed to reduce the proposed discharge rate to the Greenfield rate (2.65 litres/sec) from the proposed development.	✓
14.	The ownership, operation and maintenance requirements for each SuDS device will be written into the O&M Manual for the site.	✓
15.	An allowance of 40% has been made for climate change.	✓

Based on this we believe that potentially two credits out of a possible two can be awarded under these criteria.

Minimising watercourse pollution

Pollution criteria	AKT II assessment	
16.	As confirmed in Section 2.3, no infiltration is possible and there is no provision for green roof coverage therefore this criterion cannot be achieved.	✗
17.	SuDS devices will be specified where possible within the limitations of the development.	✓
18.	As there is a loading bay being provided as part of the scheme and petrol/oil separators will be provided as necessary.	✓
19.	There are no chemical/liquid gas storage areas proposed as part of the scheme.	N/A
20.	All water pollution prevention and SuDS devices will be designed in accordance with the SuDS Manual.	✓
21.	An up-to-date drainage plan will be made available to the site occupiers upon completion.	✓
22.	The ownership, operation and maintenance requirements for each SuDS device will be written into the O&M Manual for the site.	✓
23.	There are no external storage or delivery areas proposed as part of the scheme.	N/A

Based on this we believe that this credit cannot be awarded under these criteria.

Overall, we believe that potentially four credits out of a possible five can be awarded under the Polo3 criteria outlined above.

8 Maintenance and operation

Before cleaning, final testing and immediately before handover the Contractor will:

- Lift covers to manholes, inspection chambers and access points. Remove mortar droppings, debris and loose wrappings.
- Thoroughly flush pipelines with water to remove silt and check for blockages. Rod or jet pipelines between access points if there is any indication that they may be obstructed.
- Carry out a CCTV of the pipework to ensure that it is free of silt and blockages.

The End User shall then follow the "Waste Management, The Duty of Care - A Code of Practice (Revised 1996)" and shall ensure that their waste does not escape from their control and is transferred only to a registered waste carrier to be sent for recycling or disposal at a suitable licensed facility.

All waste arising from the maintenance of the drains and sewers shall be handled, stored and disposed of correctly to avoid pollution. Waste may be designated as hazardous / special waste and, as such, the End User shall ensure that they comply with the Hazardous Waste (England and Wales) Regulations 2005.

Reference shall be made to CIRIA publication C753 - The SuDS Manual by the Contractor and the End User. A suitable maintenance schedule must be developed, maintained, followed and updated as required to reflect observed performance. The following items are highlighted for guidance.

8.1 General drainage

The below ground drainage network will be designed in accordance with the requirements of the Building Regulations whilst acknowledging the need to limit the number of inspection chambers within "front of house" areas. To this end, all main runs have rodding eyes, manholes or inspection chambers at the head of the run and at all changes of direction to provide access to rod or jet the main pipework.

Where possible, connections from stacks or gullies will be made directly to these manholes or inspection chambers to allow the connection to be rodded or jetted from the downstream end. Where this is not possible, each stack will be detailed to have an access hatch provided just above floor level (see Figure 8.1) to allow the connection to be rodded or jetted from the upstream end. Similarly, the gullies will have a rodding access provided within their body allowing the pipework to be rodded or jetted from the gully downstream.

Gullies and channels will be specified with silt buckets and silt trap manholes have been provided upstream of all tanks and infiltration structures to prevent the ingress of silts into the drainage network and impairing the performance of the system.

Maintenance schedule	Required action	Recorded frequency
Regular maintenance	Inspect and identify areas that are not operating correctly. If required, take remedial action.	Monthly for the first three months then six-monthly
Occasional maintenance	Remove sediment from pre-treatment structures (e.g. gullies, channels, silt traps).	Six-monthly or as required
Occasional maintenance	Debris removal from catchment surface where this may cause risks to performance.	Monthly
Remedial actions	Repair / rehabilitation of inlets, outlets, overflows and vents.	As required
Monitoring	Inspect all manholes, inspection chambers, inlets, outlets, overflows and vents to ensure they are in good condition and operating as designed.	Annually and after large storms

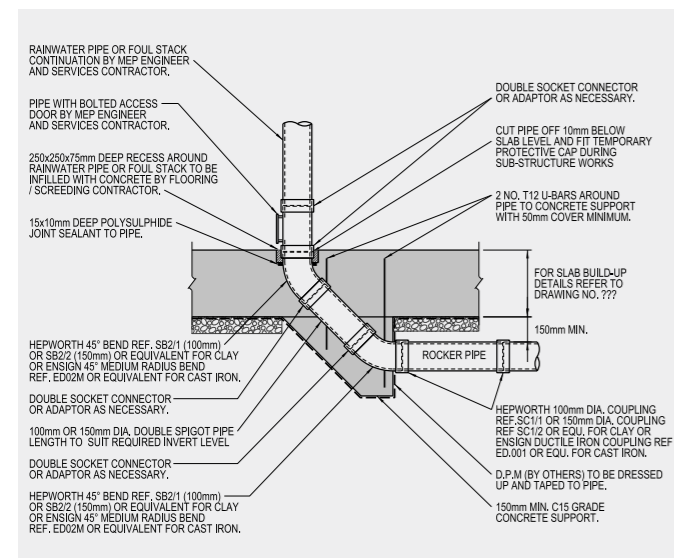


Figure 8.1 Rodding/jetting access detail

8.2 Pumped systems

Pumps will be designed as duplex units operating on a duty/ standby run based on hours, pump failure and high/high water level. A suitable BMS interface shall be provided monitoring each pump system for the following status points:

- Pump 1 running / Pump 2 running - These statuses shall be provided to the BMS in the form of a volt free contact that is closed when the pump is running.
- Pump 1 failed / Pump 2 failed - These statuses shall be provided to the BMS in the form of a volt free contact that is closed when the pump has deemed to have failed, i.e. failed to run when requested. This shall cause a latched general alarm on the BMS.
- High water level - This status shall be provided to the BM in the form of a volt free contact that is closed when a high water level is breached. The level shall be set at a level that is higher than the normal pump control level switch. This shall cause a latched general alarm on the BMS.
- High/High water level - This status shall be provided to the BMS in the form of a volt free contact that is closed when a high/high water level is breached. The level shall set at a level that is higher than the high water level switch. This shall cause a critical latched alarm on the BMS.
- System not in automatic/not available - This status shall be provided to the BMS in the form of a volt free contact that is open (failsafe) when the system is not available to operate.

This shall operate should any event occur that could prevent the system from operating, such as power loss to the control panel, hand/of/auto switches not in Auto, or isolators opened. This shall cause a critical latched alarm on the BMS.

The BMS shall be capable of raising the following alarms:

- Excessive Pump Running Alarm - The BMS shall monitor the running status of each pump. Should any pump run for longer than 20 minutes, a general alarm shall be raised on the BMS.
- Excessive Pump Starts Alarm - The BMS shall calculate from the running status the number of starts per hour. Should the number of starts per hour exceed 4, a general alarm shall be raised on the BMS.

A control panel local to each pump station shall be provided to monitor the same status points and alarms as defined for the BMS Interface above

9 Drainage design standards

The following guides and current British Standards will be used for the design of the drainage elements on this project:

- BS EN 752:2017 Drain and Sewer Systems Outside Buildings. Sewer System Management
- BS EN 12056 Gravity Drainage Systems Inside Buildings: Part 2
- Building Regulations 2010 Part H1 - Foul Water Drainage (2015 Edition)
- Building Regulations 2010 Part H2 - Wastewater Treatment Systems and Cesspools (2015 Edition)
- Building Regulations 2010 Part H3 - Rainwater Drainage (2015 Edition)
- Building Regulations 2010 Part H4 - Building Over Sewers (2015 Edition)
- Building Regulations 2010 Part H5 - Separate Systems of Drainage (2015 Edition)
- Building Regulations 2010 Part H6 - Solid Waste Storage (2015 Edition)
- Environment Agency "Control of Runoff from New Developments Interim Regional Guidance"
- National Planning Policy Framework with reference to: 'Planning and Flood Risk and sustainable drainage requirements'
- Planning Practice Guidance with reference to: ' Non statutory technical standards for sustainable drainage systems'
- New London Plan (2021 version) - Policy SI 13 Sustainable Drainage

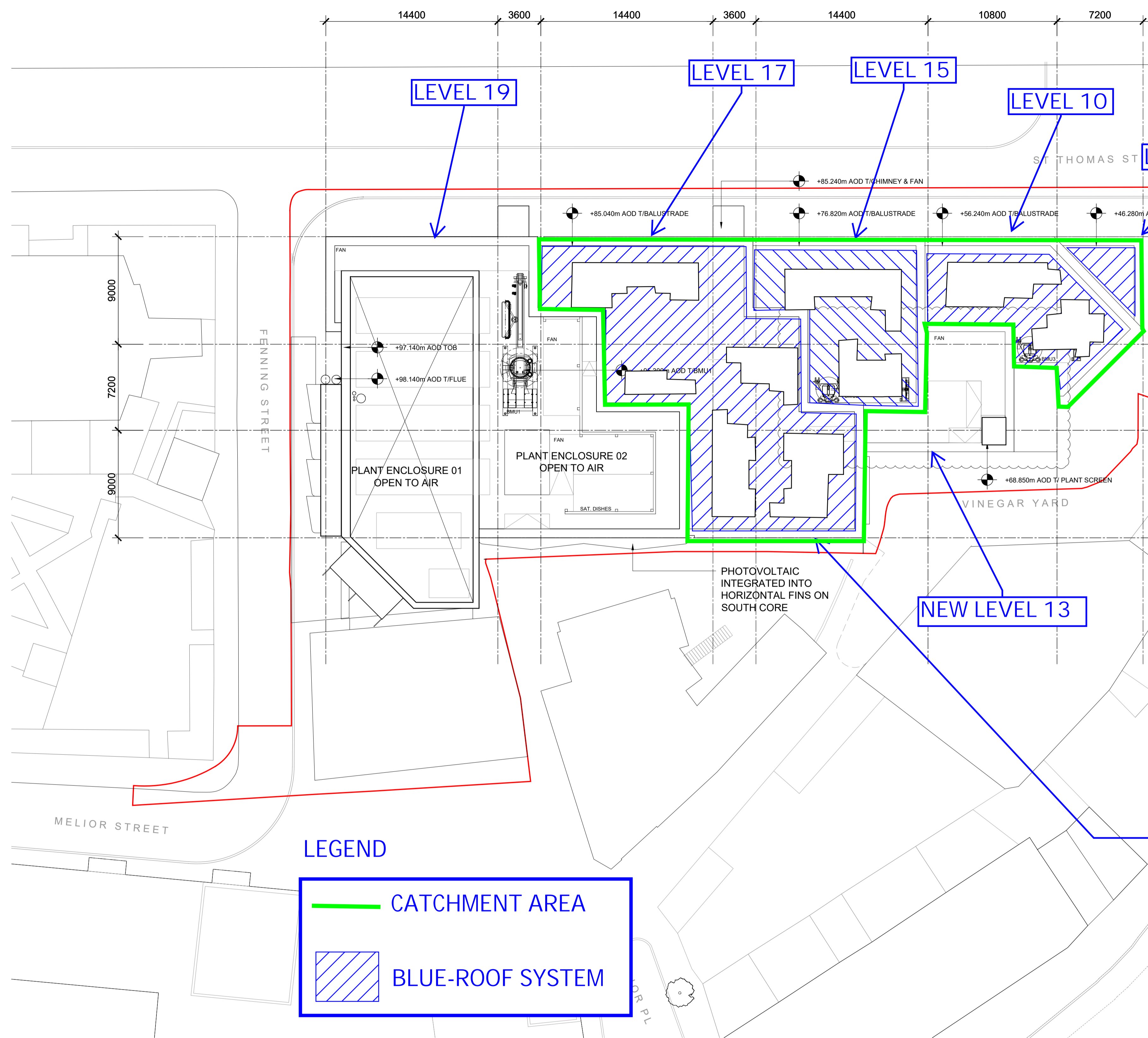
10 Materials

Item	Material	British standard
a) Drainage pipe work	Vitrified clayware	BS EN 295-1
	Cast iron	BS EN 877
	Concrete	BS 5911-1 and BS EN 1916
	uPVC	BS EN 1401-1
b) Precast inspection chambers	Precast concrete	BS 5911 Part 200
c) Drainage gullies and gratings	Vitrified clayware	BS EN 295-1
	Ductile iron	BS EN 124 D 400
d) Drainage channels and gratings	Polymer concrete	
	Ductile iron	BS EN 124 D 400
e) Access covers	Grey iron	BS EN 124
	Galvanised steel	Facta Class A, B & D
f) Cellular units	Polypropylene	
g) Geotextiles		

Appendix 1

Strategic Drainage Layouts - Options





LEGEND

CATCHMENT AREA
 BLUE-ROOF SYSTEM

STORAGE ASSESSMENT BASED UPON BLUE ROOF AT ROOF AND GEO-CELLULAR TANK AT GROUND LEVEL

TOTAL VOLUME TO BE PROVIDED ON SITE TO ATTENUATE CATCHMENT AREA OF 2,300m² UNDER 1 IN 100 YS STORM EVENT + 40% CLIMATE CHANGE = 150m³

MAXIMUM Q_{RESTRICTED} = 2.65 litres/sec (CONFIRMED BY PRE-DEVELOPMENT ENQUIRY)

ATTENUATION STRATEGY @ ROOF LEVEL OPT.A

TOTAL CATCHMENT AREA = 639m²
 ROOF AREA TO BE USED AS BLUE ROOF SYSTEM (STORAGE AREA) = 406m²
 MAXIMUM Q_{RESTRICTED} = 1.9 litres/sec
 TOTAL VOLUME = 43m³

- LEVEL 17--> 130mm BLUE ROOF SYSTEM --> 0.6 litres/sec
- LEVEL 15--> 130mm BLUE ROOF SYSTEM --> 0.5 litres/sec
- LEVEL 10--> 130mm BLUE ROOF SYSTEM --> 0.5 litres/sec
- LEVEL 8 --> 58mm BLUE ROOF SYSTEM --> 0.3 litres/sec

ASSUMPTIONS:

- 10% OF BLUE-ROOF STORAGE AREA AT TERRACE LEVEL Nos. 10 AND 15 TO BE EXCLUDED FROM CALCULATIONS TO ALLOW FOR BMU TRACKS (STRATEGY FOR BMU TO BE DEVELOPED AT THE NEXT STAGE OF THE DESIGN).
- ROOF AT LEVEL 19 (WITH NO ATTENUATION TO THE WEST OF THE SITE) AND AT LEVEL 13 (TO THE EAST OF THE SITE) WILL DRAIN TO BELOW GROUND ATTENUATION TANK IN THE LANDSCAPED AREA (TO THE EAST OF THE SITE) VIA PIPEWORK RUNNING HIGH LEVEL IN THE BASEMENT (TBC BY MEP ENGINEER).
- ROOF WITH NO ATTENUATION TO THE SOUTH OF THE SITE (WAREHOUSE) TO BE CONNECTED TO A GEO-CELLULAR TANK LOCATED BELOW WAREHOUSE GROUND FLOOR FFL TO ALLOW GRAVITY CONNECTION INTO PUBLIC SEWER IN MELIOR STREET.
- BLUE ROOF DESIGN BY MEP/ARCHITECT



PROJECT VINEGAR YARD		TITLE PROPOSED ATTENUATION STRATEGY AT ROOF LEVEL OPT. A	
DATE 15/10/21	SCALE NTS	CAD FILENAME	ISSUED FOR PLANNING
DRAWN SM	CHECKED DN	PROJECT No. 4188	DRAWING No. 4188-CV-HS-001A
			REV P6

TW MH REF. 0903
CL = 4.132
IL = -1.038

NEW COMBINED DRAINAGE OUTFALL INTO THE PUBLIC SEWER IN ST. THOMAS STREET (SUBJECT TO CCTV DRAINAGE SURVEY). AT THE NEXT STAGE OF THE DESIGN AKTII WILL NEED TO CONSULT TW WITH REGARD TO ANY POTENTIAL NEW SEWER CONNECTIONS TO THE SEWER IN ST THOMAS STREET, SHOULD THE CCTV SURVEY PROVE THAT EXISTING CONNECTIONS ARE NOT VIABLE FOR RE-USE. THERE IS A RISK THAT NEW CONNECTIONS WOULD BE SUBJECT TO A SECTION 98 APPLICATION WHICH CAN TAKE UP TO 12 MONTHS AND IS VERY EXPENSIVE AND ALSO REQUIRES THAT THAMES WATER CONTRACTORS CARRY OUT THE SEWER CONNECTION ON BEHALF OF THE CLIENT.

EXISTING 150mm DIA. PUBLIC SEWER CROSSING THE SITE TO BE DIVERTED/DIVESTED. IN CASE OF DIVESTMENT OF 150mm. DIA. TW SEWER (SUBJECT TO CCTV DRAINAGE SURVEY) THE EXISTING OUTFALL CONNECTION INTO THE PUBLIC SEWER IN ST. THOMAS STREET COULD BE POTENTIALLY RE-USED (SUBJECT TO CCTV DRAINAGE SURVEY) AS SURFACE WATER OUTFALL FROM THE BELOW GROUND TANK.

EXTERNAL AUTOMATED BICYCLE STORAGE

TW MH 1904
CL = 3.178
IL = -1.582

1140 x 790mm

ST THOMAS STREET

TW MH 1903
CL = 2.91
IL = -0.92

NEW SURFACE WATER CONNECTION INTO 375mm DIA. PUBLIC SEWER RUNNING IN SNOWFIELDS

EXTERNAL AUTOMATED BIKE STORAGE (204 BIKES)

ATTENUATION STRATEGY @ GROUND LEVEL - WAREHOUSE BUILDING
CATCHMENT AREA = 250m²
MINIMUM Q_{RESTRICTED} = 0.25 litres/sec
ATTENUATION VOLUME REQUIRED = 15m³
FULLY TANKED AND WATER TESTED GEO-CELLULAR SYSTEM (800mm DEEP) ACCOMMODATED BELOW GROUND FFL IN THE WAREHOUSE TO ALLOW GRAVITY CONNECTION INTO THE PUBLIC SEWER IN MELIOR STREET

ATTENUATION STRATEGY @ GROUND LEVEL - MAIN BUILDING OPT. A
CATCHMENT AREA = 1,411m²
MINIMUM Q_{RESTRICTED} = 0.5 litres/sec
ATTENUATION VOLUME = 100m³
VIA FULLY TANKED AND WATER TESTED (1200mm DEEP) WITH 95% VOID RATIO.
STORAGE AREA = 88m²
TANK SOFFIT LEVEL = 1.65m AOD
TANK INVERT LEVEL = 0.45m AOD

TW MH REF. 1902
CL = N/A
IL = N/A





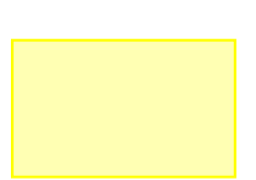
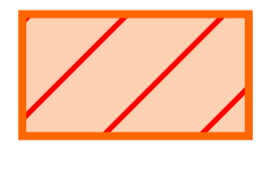
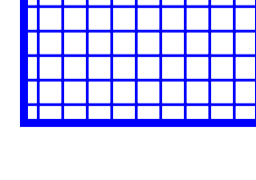
TW MH 1806
CL = 2.631
IL = -0.984

STORAGE ASSESSMENT BASED UPON BLUE ROOF AT ROOF AND GEO-CELLULAR TANK AT GROUND LEVEL

TOTAL VOLUME TO BE PROVIDED ON SITE TO ATTENUATE CATCHMENT AREA OF 2,300m² UNDER 1 IN 100 YS STORM EVENT + 40% CLIMATE CHANGE = 150m³

MAXIMUM Q_{RESTRICTED} = 2.65 litres/sec (CONFIRMED BY PRE-DEVELOPMENT ENQUIRY)

LEGEND

-  PUBLIC COMBINED SEWER
-  PUBLIC COMBINED MANHOLE
-  SITE BOUNDARY
-  BASEMENT OUTLINE
-  AREA OF EXISTING ADOPTED HIGHWAY TO BE ALTERED BUT WHICH WILL CONTINUE TO DRAIN TO HIGHWAYS GULLIES + DRAINAGE (IT IS ASSUMED THAT SECTION 278 WORKS ARE CARRIED BY OTHERS)
-  ADOPTED HIGHWAY TO BE STOPPED UP AND NEW HARD LANDSCAPING DRAINS TO NEW PRIVATE DRAINAGE SYSTEM.
-  GEO-CELLULAR TANK

9000
7200
FENNING STREET

FENNING STREET

VINEGAR YARD

MELIOR STREET

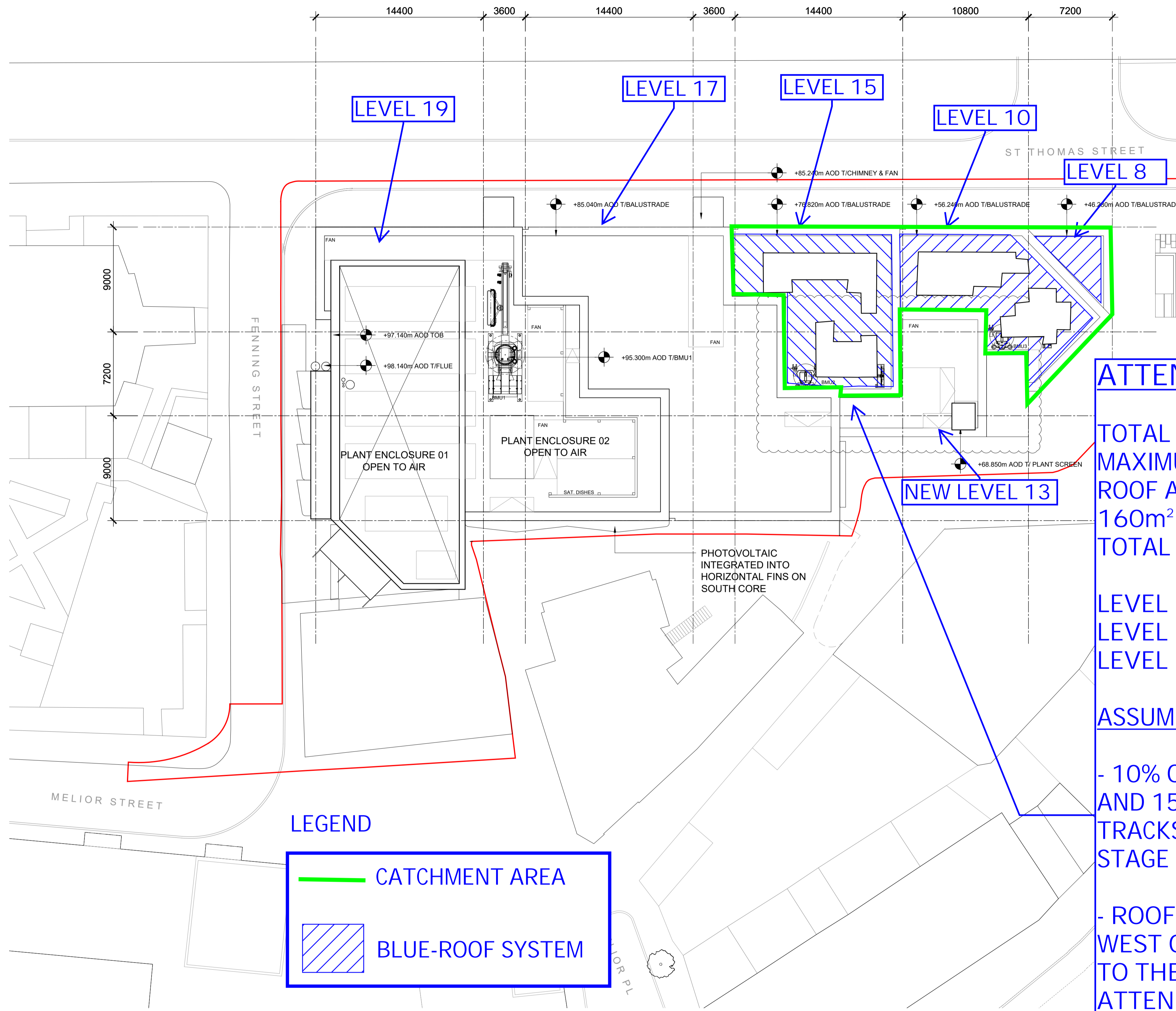
ø305mm

TW MH 0902
CL (4.080)
IL (1.860)

NEW COMBINED DRAINAGE OUTFALL INTO THE PUBLIC SEWER IN MELIOR STREET (SUBJECT TO CCTV DRAINAGE SURVEY)



PROJECT VINEGAR YARD		TITLE PROPOSED ATTENUATION STRATEGY AT GROUND LEVEL_OPT. A	
DATE 15/10/21	SCALE NTS	CAD FILENAME -	STATUS ISSUED FOR PLANNING
DRAWN SM	CHECKED DN	PROJECT No. 4188	DRAWING No. 4188-CV-HS-002A
			REV P7



STORAGE ASSESSMENT BASED UPON BLUE ROOF AT ROOF AND GEO-CELLULAR TANK AT GROUND LEVEL

MINIMUM TOTAL VOLUME TO BE PROVIDED ON SITE TO ATTENUATE CATCHMENT AREA OF 2,300m² UNDER 1 IN 100 YEARS STORM EVENT + 40% CLIMATE CHANGE = 150m³

MAXIMUM Q_{RESTRICTED} = 2.65 litres/sec (CONFIRMED BY PRE-DEVELOPMENT ENQUIRY)

ATTENUATION STRATEGY @ ROOF LEVEL OPT.B

TOTAL CATCHMENT AREA = 269m²
 MAXIMUM Q_{RESTRICTED} = 1.3 litres/sec
 ROOF AREA TO BE USED AS BLUE ROOF SYSTEM (STORAGE AREA) = 160m²
 TOTAL VOLUME = 17m³

- LEVEL 15--> 130mm BLUE ROOF SYSTEM --> 0.5 litres/sec
- LEVEL 10--> 130mm BLUE ROOF SYSTEM --> 0.5 litres/sec
- LEVEL 8 --> 58mm BLUE ROOF SYSTEM --> 0.3 litres/sec

ASSUMPTIONS:

- 10% OF BLUE-ROOF STORAGE AREA AT TERRACE LEVEL Nos. 10 AND 15 TO BE EXCLUDED FROM CALCULATIONS TO ALLOW FOR BMU TRACKS (STRATEGY FOR BMU TO BE DEVELOPED AT THE NEXT STAGE OF THE DESIGN).
- ROOFS AT LEVEL 17 & 19 (WITH NO ATTENUATION TO THE WEST OF THE SITE) AND NEW LEVEL 13 (WITH NO ATTENUATION TO THE EAST OF THE SITE) WILL DRAIN TO BELOW GROUND ATTENUATION TANK IN THE LANDSCAPED AREA (TO THE EAST OF THE SITE) VIA PIPEWORK RUNNING HIGH LEVEL IN THE BASEMENT (TBC BY MEP ENGINEER).
- ROOF WITH NO ATTENUATION TO THE SOUTH OF THE SITE (WAREHOUSE) TO BE CONNECTED TO A GEO-CELLULAR TANK LOCATED BELOW WAREHOUSE GROUND FLOOR FFL TO ALLOW GRAVITY CONNECTION INTO PUBLIC SEWER IN MELIOR STREET.
- BLUE ROOF DESIGN BY MEP/ARCHITECT



PROJECT	VINEGAR YARD	TITLE	PROPOSED ATTENUATION STRATEGY AT ROOF LEVEL OPT. B		
DATE	15/10/21	SCALE	NTS	CAD FILENAME	-
DRAWN	SM	CHECKED	DN	PROJECT No.	4188
				DRAWING No.	4188-CV-HS-001B
				REV	P6

TW MH REF. 0903
CL = 4.132
IL = -1.038

NEW COMBINED DRAINAGE OUTFALL INTO THE PUBLIC SEWER IN ST. THOMAS STREET (SUBJECT TO CCTV DRAINAGE SURVEY).
AT THE NEXT STAGE OF THE DESIGN AKTII WILL NEED TO CONSULT TW WITH REGARD TO ANY POTENTIAL NEW SEWER CONNECTIONS TO THE SEWER IN ST THOMAS STREET, SHOULD THE CCTV SURVEY PROVE THAT EXISTING CONNECTIONS ARE NOT VIABLE FOR RE-USE. THERE IS A RISK THAT NEW CONNECTIONS WOULD BE SUBJECT TO A SECTION 98 APPLICATION WHICH CAN TAKE UP TO 12 MONTHS AND IS VERY EXPENSIVE AND ALSO REQUIRES THAT THAMES WATER CONTRACTORS CARRY OUT THE SEWER CONNECTION ON BEHALF OF THE CLIENT.

EXISTING 150mm DIA. PUBLIC SEWER CROSSING THE SITE TO BE DIVERTED/DIVESTED.
IN CASE OF DIVESTMENT OF 150mm. DIA. TW SEWER (SUBJECT TO CCTV DRAINAGE SURVEY) THE EXISTING OUTFALL CONNECTION INTO THE PUBLIC SEWER IN ST. THOMAS STREET COULD BE POTENTIALLY RE-USED (SUBJECT TO CCTV DRAINAGE SURVEY) AS SURFACE WATER OUTFALL FROM THE BELOW GROUND TANK.

EXTERNAL AUTOMATED BIKE STORAGE

TW MH 1904
CL = 3.178
IL = -1.582

1140 x 790mm

TW MH 1903
CL = 2.91
IL = -0.92

NEW SURFACE WATER CONNECTION INTO 375mm DIA. PUBLIC SEWER RUNNING IN SNOWFIELDS

EXTERNAL AUTOMATED BIKE STORAGE (204 BIKES)

ATTENUATION STRATEGY @ GROUND LEVEL - WAREHOUSE BUILDING
CATCHMENT AREA = 250m²
MINIMUM Q_{RESTRICTED} = 0.25 litres/sec
ATTENUATION VOLUME REQUIRED = 15m³
FULLY TANKED AND WATER TESTED GEO-CELLULAR SYSTEM (800mm DEEP) ACCOMMODATED BELOW GROUND FFL IN THE WAREHOUSE TO ALLOW GRAVITY CONNECTION INTO THE PUBLIC SEWER IN MELIOR STREET

ATTENUATION STRATEGY @ GROUND LEVEL - MAIN BUILDING OPT. B
CATCHMENT AREA = 1,781m²
MINIMUM Q_{RESTRICTED} = 1.15 litres/sec
ATTENUATION VOLUME = 118m³
VIA FULLY TANKED AND WATER TESTED (1200mm DEEP) WITH 95% VOID RATIO.
STORAGE AREA = 104m²
TANK SOFFIT LEVEL = 1.65m AOD
TANK INVERT LEVEL = 0.45m AOD

TW MH REF. 1902
CL = N/A
IL = N/A

TW MH 1806
CL = 2.631
IL = -0.984

STORAGE ASSESSMENT BASED UPON BLUE ROOF AT ROOF AND GEO-CELLULAR TANK AT GROUND LEVEL

TOTAL VOLUME TO BE PROVIDED ON SITE TO ATTENUATE CATCHMENT AREA OF 2,300m² UNDER 1 IN 100 YS STORM EVENT + 40% CLIMATE CHANGE = 150m³

MAXIMUM Q_{RESTRICTED} = 2.65 litres/sec (CONFIRMED BY PRE-DEVELOPMENT ENQUIRY)

NEW COMBINED DRAINAGE OUTFALL INTO THE PUBLIC SEWER IN MELIOR STREET (SUBJECT TO CCTV DRAINAGE SURVEY)

TW MH 0902
CL (4.080)
IL (1.860)

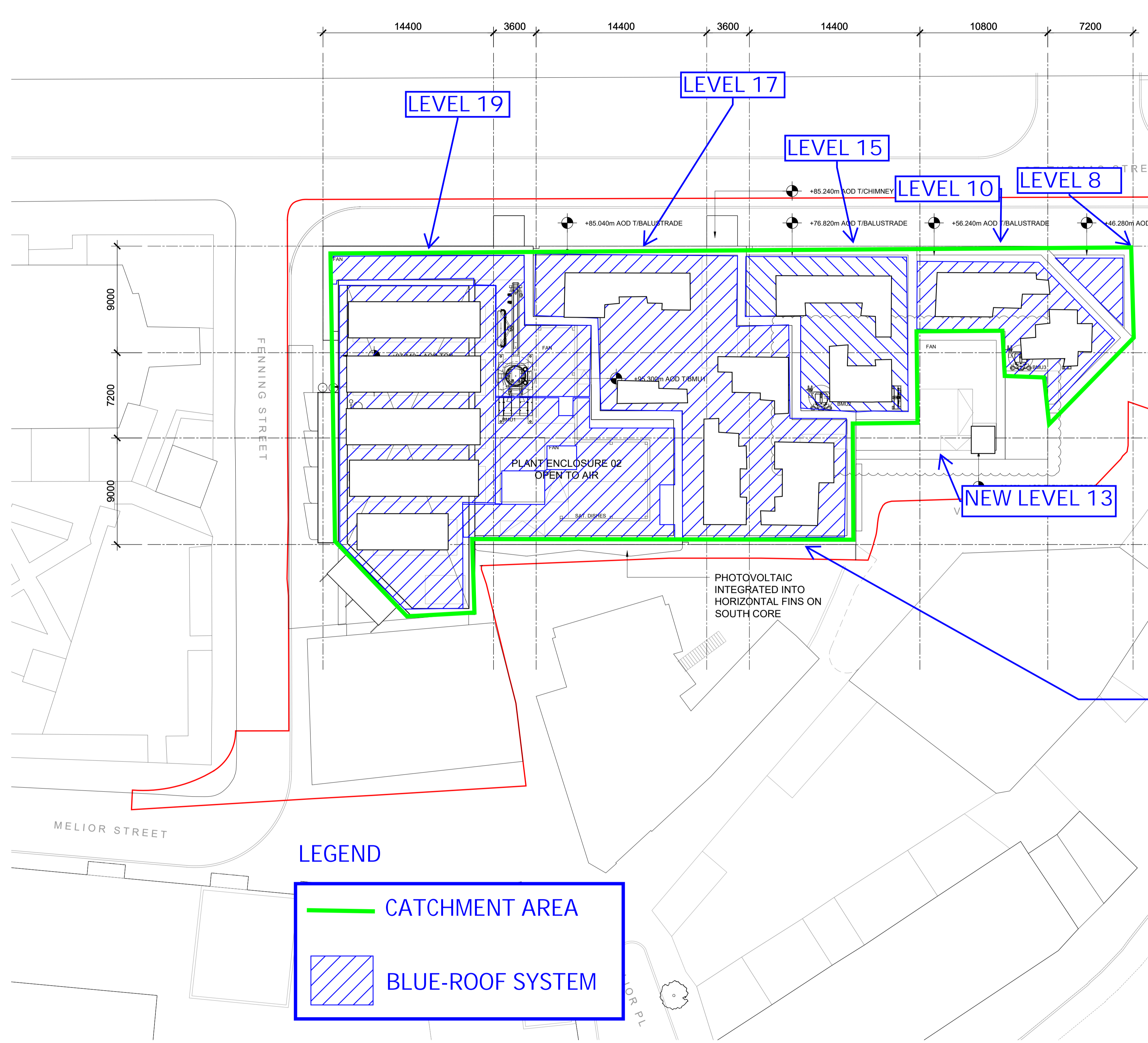
ø305mm

LEGEND

- PUBLIC COMBINED SEWER
- PUBLIC COMBINED MANHOLE
- SITE BOUNDARY
- BASEMENT OUTLINE
- AREA OF EXISTING ADOPTED HIGHWAY TO BE ALTERED BUT WHICH WILL CONTINUE TO DRAIN TO HIGHWAYS GULLIES + DRAINAGE (IT IS ASSUMED THAT SECTION 278 WORKS ARE CARRIED OUT BY OTHERS)
- ADOPTED HIGHWAY TO BE STOPPED UP AND NEW HARD LANDSCAPING DRAINS TO NEW PRIVATE DRAINAGE SYSTEM.
- GEO-CELLULAR TANK



PROJECT VINEGAR YARD		TITLE PROPOSED ATTENUATION STRATEGY AT GROUND LEVEL_OPT. B	
DATE 15/10/21	SCALE NTS	CAD FILENAME -	ISSUED FOR PLANNING
DRAWN SM	CHECKED DN	PROJECT No. 4188	DRAWING No. 4188-CV-HS-002B
			REV P7



ATTENUATION STRATEGY @ ROOF LEVEL OPT. C

TOTAL CATCHMENT AREA = 1,239m²
 ROOF AREA TO BE USED AS BLUE ROOF SYSTEM (STORAGE AREA) = 840m²
 MAXIMUM Q_{RESTRICTED} = 2.5 litres/sec
 TOTAL VOLUME = 94m³

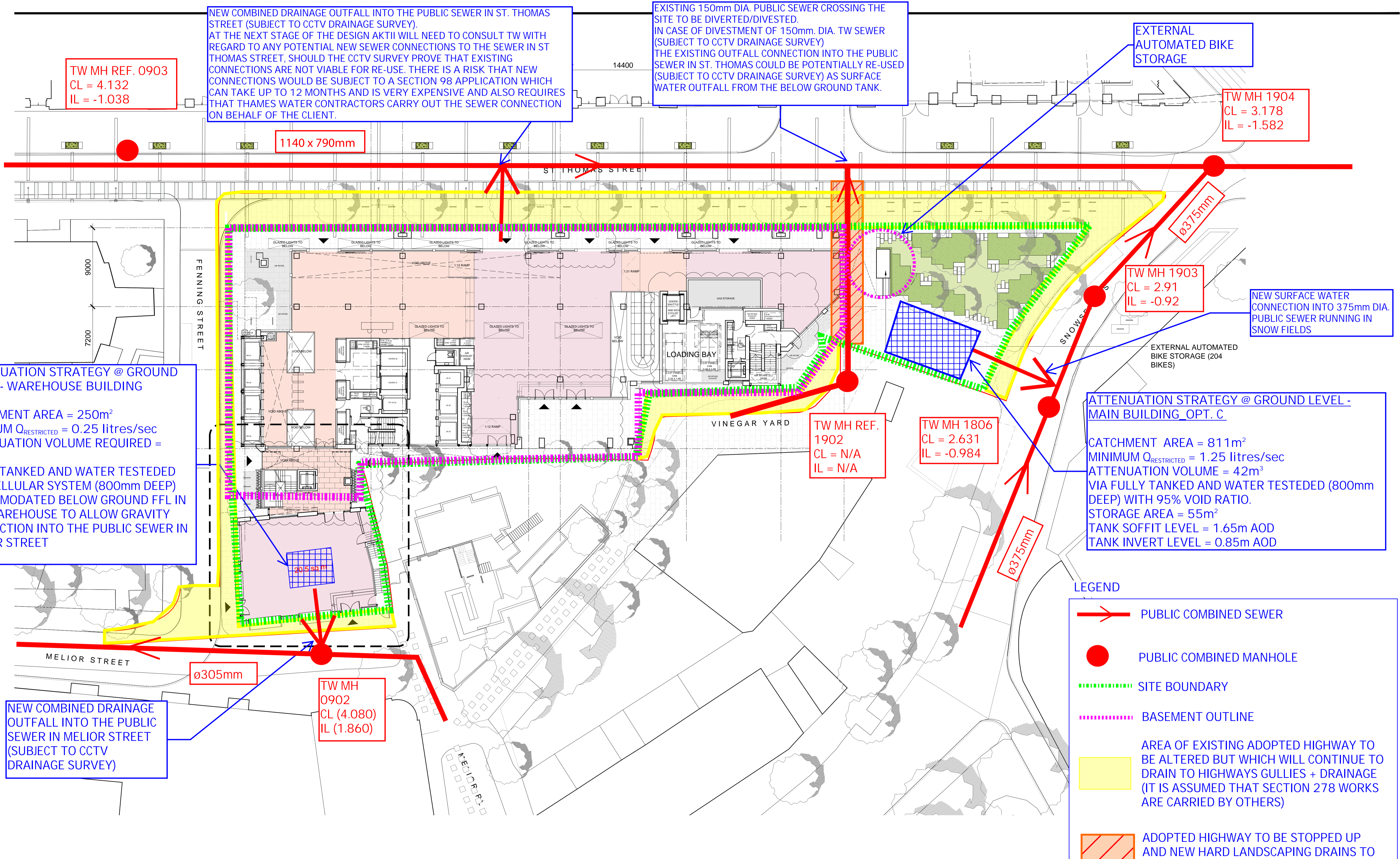
- LEVEL 19 --> 158mm BLUE ROOF SYSTEM --> 0.6 litres/sec
- LEVEL 17--> 130mm BLUE ROOF SYSTEM --> 0.6 litres/sec
- LEVEL 15--> 130mm BLUE ROOF SYSTEM --> 0.5 litres/sec
- LEVEL 10--> 130mm BLUE ROOF SYSTEM --> 0.5 litres/sec
- LEVEL 8 --> 58mm BLUE ROOF SYSTEM --> 0.3 litres/sec

ASSUMPTIONS:

- NO BLUE ROOF PROVISION FOR LEVEL 13 TERRACE. L13 TERRACE TO BE DRAINED TO BELOW GROUND ATTENUATION TANK IN THE LANDSCAPED AREA (TO THE EAST OF THE SITE) VIA PIPEWORK RUNNING HIGH LEVEL IN THE BASEMENT (TBC BY MEP ENGINEER).
- MAIN BUILDING ROOF TO BE ATTENUATED VIA BLUE-ROOF SYSTEM AT ROOF LEVEL, EXCEPT FOR NEW LEVEL 13 TERRACE
- 10% OF BLUE-ROOF STORAGE AREA AT TERRACE LEVEL Nos. 10 AND 15 TO BE EXCLUDED FROM CALCULATIONS TO ALLOW FOR BMU TRACKS (STRATEGY FOR BMU TO BE DEVELOPED AT THE NEXT STAGE OF THE DESIGN).
- ROOF WITH NO ATTENUATION TO THE SOUTH OF THE SITE (WAREHOUSE) TO BE CONNECTED TO A GEO-CELLULAR TANK LOCATED BELOW WAREHOUSE GROUND FLOOR FFL TO ALLOW GRAVITY CONNECTION INTO PUBLIC SEWER IN MELIOR STREET.
- BLUE ROOF DESIGN BY MEP/ARCHITECT
- IT IS ACCEPTABLE TO EXCEED THE MAXIMUM ALLOWABLE DISCHARGE IN THE PUBLIC SEWER SYSTEM (2.65 L/S) AS LONG AS THERE IS THE INTENTION TO MAXIMIZE THE USE OF BLUE ROOF AT ROOF LEVEL (PLANNER'S PREFERRED OPTION)



PROJECT	VINEGAR YARD	TITLE	PROPOSED ATTENUATION STRATEGY AT ROOF LEVEL OPT. C	
DATE	15/10/21	SCALE	NTS	ISSUED FOR PLANNING
DRAWN	SM	CHECKED	DN	STATUS
PROJECT No.	4188	DRAWING No.	4188-CV-HS-001C	REV P6



TW MH REF. 0903
CL = 4.132
IL = -1.038

NEW COMBINED DRAINAGE OUTFALL INTO THE PUBLIC SEWER IN ST. THOMAS STREET (SUBJECT TO CCTV DRAINAGE SURVEY).
AT THE NEXT STAGE OF THE DESIGN AKTII WILL NEED TO CONSULT TW WITH REGARD TO ANY POTENTIAL NEW SEWER CONNECTIONS TO THE SEWER IN ST THOMAS STREET, SHOULD THE CCTV SURVEY PROVE THAT EXISTING CONNECTIONS ARE NOT VIABLE FOR RE-USE. THERE IS A RISK THAT NEW CONNECTIONS WOULD BE SUBJECT TO A SECTION 98 APPLICATION WHICH CAN TAKE UP TO 12 MONTHS AND IS VERY EXPENSIVE AND ALSO REQUIRES THAT THAMES WATER CONTRACTORS CARRY OUT THE SEWER CONNECTION ON BEHALF OF THE CLIENT.

EXISTING 150mm DIA. PUBLIC SEWER CROSSING THE SITE TO BE DIVERTED/DIVESTED.
IN CASE OF DIVESTMENT OF 150mm. DIA. TW SEWER (SUBJECT TO CCTV DRAINAGE SURVEY) THE EXISTING OUTFALL CONNECTION INTO THE PUBLIC SEWER IN ST. THOMAS COULD BE POTENTIALLY RE-USED (SUBJECT TO CCTV DRAINAGE SURVEY) AS SURFACE WATER OUTFALL FROM THE BELOW GROUND TANK.

EXTERNAL
AUTOMATED BIKE
STORAGE

TW MH 1904
CL = 3.178
IL = -1.582

1140 x 790mm

TW MH 1903
CL = 2.91
IL = -0.92

NEW SURFACE WATER
CONNECTION INTO 375mm DIA.
PUBLIC SEWER RUNNING IN
SNOW FIELDS

EXTERNAL AUTOMATED
BIKE STORAGE (204
BIKES)

ATTENUATION STRATEGY @ GROUND LEVEL - WAREHOUSE BUILDING

CATCHMENT AREA = 250m²
MINIMUM Q_{RESTRICTED} = 0.25 litres/sec
ATTENUATION VOLUME REQUIRED = 15m³
FULLY TANKED AND WATER TESTED GEO-CELLULAR SYSTEM (800mm DEEP) ACCOMMODATED BELOW GROUND FFL IN THE WAREHOUSE TO ALLOW GRAVITY CONNECTION INTO THE PUBLIC SEWER IN MELIOR STREET

ATTENUATION STRATEGY @ GROUND LEVEL - MAIN BUILDING OPT. C

CATCHMENT AREA = 811m²
MINIMUM Q_{RESTRICTED} = 1.25 litres/sec
ATTENUATION VOLUME = 42m³
VIA FULLY TANKED AND WATER TESTED (800mm DEEP) WITH 95% VOID RATIO.
STORAGE AREA = 55m²
TANK SOFFIT LEVEL = 1.65m AOD
TANK INVERT LEVEL = 0.85m AOD





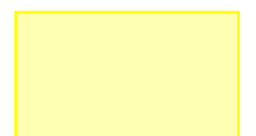
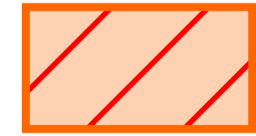
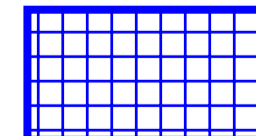
TW MH REF.
1902
CL = N/A
IL = N/A

TW MH 1806
CL = 2.631
IL = -0.984

TW MH
0902
CL (4.080)
IL (1.860)

NEW COMBINED DRAINAGE
OUTFALL INTO THE PUBLIC
SEWER IN MELIOR STREET
(SUBJECT TO CCTV
DRAINAGE SURVEY)

LEGEND

-  PUBLIC COMBINED SEWER
-  PUBLIC COMBINED MANHOLE
-  SITE BOUNDARY
-  BASEMENT OUTLINE
-  AREA OF EXISTING ADOPTED HIGHWAY TO BE ALTERED BUT WHICH WILL CONTINUE TO DRAIN TO HIGHWAYS GULLIES + DRAINAGE (IT IS ASSUMED THAT SECTION 278 WORKS ARE CARRIED BY OTHERS)
-  ADOPTED HIGHWAY TO BE STOPPED UP AND NEW HARD LANDSCAPING DRAINS TO NEW PRIVATE DRAINAGE SYSTEM.
-  GEO-CELLULAR TANK



PROJECT	VINEGAR YARD	TITLE	PROPOSED ATTENUATION STRATEGY AT GROUND LEVEL_OPT. C		
DATE	15/10/21	SCALE	NTS	CAD FILENAME	ISSUED FOR PLANNING
DRAWN	SM	CHECKED	DN	PROJECT No.	4188
				DRAWING No.	4188-CV-HS-002C
				REV	P7

Appendix 2

Pre-planning enquiry application form + Thames Water's response



Pre- planning enquiry

Application form

Please complete this form and return it to us at
developer.services@thameswater.co.uk or
Thames Water, Developer Services, Clearwater Court,
Vastern Road, Reading, RG1 8DB.



Application for a pre-planning enquiry

Please complete all sections of this form in BLOCK CAPITALS

If you're using this form to request a budget estimate, please note that you should be able to calculate the likely charges involved in your scheme by consulting our guide, 'Charging arrangements for new connection services', on our website.

Are you a: Developer Consultant Land promoter (Please tick one.)

Is your application for: Water Wastewater Both (Please tick one.)

Would you like a water budget estimate? Yes No

(We can only offer a wastewater budget estimate after modelling, if required).

A - About the person applying

Company name	AKT II					
Title	Mr <input type="checkbox"/>	Mrs <input type="checkbox"/>	Ms <input type="checkbox"/>	Miss <input checked="" type="checkbox"/>	Dr <input type="checkbox"/>	Other <input type="text"/>
First name(s)	SARA					
Last name	MERCURIALI					
Preferred contact number	02072507840					
Alternative number	07483 040 308					
Email address	sara.mercuriali@akt-uk.com <input type="text"/>					
Full postal address	Address line 1	White Collar Factory				
	Address line 2	1 Old Street Yard				
	Town	<input type="text"/>				
	County	LONDON	Postcode	EC1Y 8AF		

B - Nominated contact

Who should we contact to process your application? Applicant Someone else (Please tick one.)

If someone else:

Company name	<input type="text"/>					
Title	Mr <input type="checkbox"/>	Mrs <input type="checkbox"/>	Ms <input type="checkbox"/>	Miss <input type="checkbox"/>	Dr <input type="checkbox"/>	Other <input type="text"/>
First name(s)	<input type="text"/>					
Last name	<input type="text"/>					
Preferred contact number	<input type="text"/>					

Alternative number

Email address

Full postal address

Address line 1

Address line 2

Town

County Postcode

C - Where the work is taking place

What is the address of the property being connected? Same as applicant Same as nominated contact
 Somewhere else (Please tick one.)

If somewhere else:

Site name

Full postal address

Address line 1

Address line 2

Town

County Postcode

D - About the site

What is the local authority?

Ordnance Survey grid ref

Type of site Greenfield Brownfield Mixed

How big is the site? hectares

When do you intend to have first occupancy? TBC (Approximate date if necessary)

E - Planning status (if you've already started the planning process)

Is the development identified in the local plan? Yes No Don't know If Yes, reference number

Does it have outline planning permission? Yes No Don't know If Yes, reference number

Does it have full planning permission? Yes No Don't know If Yes, reference number

Does the development have building regulations permission? Yes No Don't know

When do you intend to start on site? TBC

F - About the water supply

If you're proposing a water storage tank, what is its capacity? m³

When will you want your first domestic connection laid on? MM YYYY

For water supplies, what is the estimated flow rate required for your site? litres/sec (Not required if applying only for wastewater.)

G - Existing sewerage connections (Not required if applying only for water.)

	Foul water	Surface water
Does the site have the following sewerage connections?	<input type="checkbox"/>	<input type="checkbox"/>
What is the type of discharge method?	<input checked="" type="checkbox"/> Gravity	<input checked="" type="checkbox"/> Gravity
	<input type="checkbox"/> Pumped	<input type="checkbox"/> Pumped
If sewage is pumped, what is the pump rate?	<input type="text"/> litres/sec	<input type="text"/> litres/sec
Amount of existing impermeable area per connection	N/A	TOTAL SITE IMPERMEABLE AEREA = 0.23 ha
What are the existing connection points? (For example, 'X' number of domestic and commercial properties drain into manhole 'Y' / sewer with diameter of 'Z'.)	EXISTING FW Q PEAK) Existing building --> two storey brick building <u>warehouse</u> $Q_{\text{peak}} = 0.11 \text{ l/s}$	EXISTING SW Q PEAK--> in 100 year storm) $Q_{\text{peak}} = 3.61 \times 0.75 \times 0.23 \times 103.8 = 64.6 \text{ l/s}$

H - Proposed sewerage connections (Not required if applying only for water.)

	Foul water	Surface water
Does the site have the following sewerage connections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
What is the type of discharge method?	<input checked="" type="checkbox"/> Gravity	<input checked="" type="checkbox"/> Gravity
	<input type="checkbox"/> Pumped	<input type="checkbox"/> Pumped
If sewage is pumped, what is the pump rate?	<input type="text"/> litres/sec	<input type="text"/> litres/sec
What is your proposed approach to surface water drainage?	N/A	<input type="checkbox"/> Traditional piped system
		<input checked="" type="checkbox"/> Sustainable drainage system (SuDS)
Do you propose using separate highway and surface water drainage systems?	N/A	n/a
If the surface water rate is attenuated, to what rate is it attenuated?	N/A	5 litres/sec
Amount of proposed impermeable area per connection	N/A	<p>2 catchment areas)</p> <p>catchment area no. 1) Tower + hardstanding podium area</p> <p>Impermeable area = 0.201 ha Peak Surface Water Q = 4 l/s</p> <p>catchment area no. 2) Pavilion/Music Venue impermeable area = 0.029 ha Peak Surface Water Q = 1 l/s</p> <p>TOTAL SW Q peak FROM THE SITE --> 5 L/S</p>
What are the proposed connection points? (For example, 'X' number of domestic and commercial properties drain into manhole 'Y' / sewer with diameter of 'Z'.)	<p>OUTFALL no. 1 IN COMBINED SEWER IN ST. THOMAS STREET)</p> <p>SW Q_{peak} = 4 L/S</p> <p>FW Q_{peak} = 15 L/S</p> <p>COMBINED Q_{peak} = 4 + 15 = 19 l/s</p>	<p>OUTFALL no. 2 IN COMBINED SEWER IN ST. THOMAS STREET)</p> <p>SW Q_{peak} = 1 L/S</p> <p>FW Q_{peak} = 5 L/S</p> <p>COMBINED Q_{peak} = 1 + 5 = 6 l/s</p>

Please note: The developer is expected to follow the local authority's drainage strategy and be able to demonstrate how the proposed (attenuated) discharge rate of any surface water flows has been calculated. For developments in Greater London, please refer to the London Plan Drainage Hierarchy (Policy 5.13). We will challenge the rates provided if they are not in line with those based on the local drainage strategies.

I - Additional information (where available)

When we're assessing your development needs, it's important that we know what buildings (if any) currently exist on the site. It may be, for example, that the infrastructure serving those properties is already sufficient to cater for your proposed development.

We realise it may be too early in your process to complete this table, but any information you can provide at this stage will help improve the accuracy of our assessment and could prevent us from requesting data in the future.

Property type	Existing site	Proposed site
General housing (units 3 person+)		
Flat (units up to 2 person)		
Primary school (max. pupil capacity)		
Senior school (max. pupil capacity)		
Boarding school (max. pupil capacity)		
Assembly hall (max. capacity)		200
Cinema (max. capacity)		
Theatre (max. capacity)		
Sports hall (max. capacity)		
Hotel (total bedrooms)		
Guest house (total bedrooms)		
Motel (total bedrooms)		
Holiday apartment (capacity)		
Leisure park (capacity)		
Caravan park standard (per space)		
Caravan site standard (per space)		
Camping site standard (per space)		
Camping site serviced (per space)		
Public house (max. capacity)		200
Restaurant / Day care centre (max. capacity)		60
Drive in restaurant (max. capacity)		
Hospital (per bed)		
Nursing / Care home (per bed)		
Offices (gross internal area in m ²)		23083
Shopping centre (gross internal area in m ²)		
Warehouse (gross internal area in m ²)	1000	
Commercial premises (gross internal area in m ²)		3705
Manufacturing unit (gross internal area in m ²)		
Other (please state units and description)		

J - Enclose your documents

Please make sure any attachments are in PDF format and don't exceed a total of 20MB in size per email.

All drawings must be of suitable detail and have a drawing reference number on them.

What we need from you to process your application:

Site location plan This should show the site with nearby buildings, roads and any sewers.

Scaled site layout This should show existing and proposed layouts.

Site drainage strategy plan (if available at this stage) This should show all proposed sewers, pipe sizes and gradients.
(Not required if applying only for water.)

Please also let us know if you have a **schedule of planned works** showing how you might phase your development.

Please note, without this information we may need to make assumptions about your requirements when calculating your budget estimate (if requested).

K - How we'll use this information

We'll use the information you give on this application form, and potentially share it with our delivery partners, to provide the service you've requested.


This could include contacting you to discuss your application and/or provide more details, visiting the site where work needs to be carried out, and invoicing you when appropriate. Your feedback is important to us, so we may also use the information to ask for your feedback on how we can improve our performance.

We won't use this information for marketing purposes without contacting you to seek your consent.

You can find Thames Water's privacy policy at thameswater.co.uk/Legal/Privacy.

L - Declaration

I confirm to the best of my knowledge that the information in this application is complete and correct.

Print name	sara mercuriali
Position within company	engineer
Company	AKT II
Date	29.10.18
Signature	 <p>Sara Mercuriali Digitally signed by Sara Mercuriali DN: C=US, E=sara.mercuriali@akt-uk.com, OU=AKT II, CN=Sara Mercuriali Date: 2018.10.29 10:24:39Z00'00'</p>

Submitting your application

Please email your completed form to developer.services@thameswater.co.uk or send it to Thames Water Developer Services, Clearwater Court, Vastern Road, Reading RG1 8DB.

Once we've assessed your application, we'll write to tell you the result within 21 calendar days.

Where we know there's sufficient capacity we'll tell you, but if we're concerned there may not be, we'll advise you of the next steps. We'll also let you know if we need further information from you.

Getting in touch

For enquiries regarding this application or any other questions relating to your building or development work please contact us on:



thameswater.co.uk/developerservices



developer.services@thameswater.co.uk



0800 009 3921

Monday – Friday, 8am – 5pm



Thames Water, Developer Services, Clearwater Court,
Vastern Road, Reading, Berkshire RG1 8DB



This leaflet can be supplied in braille or audio-tape upon request.





Sara Mercuriali
AKT II
White Collar Factory
1 Old Street Yard
London
EC1Y 8AF



Our ref: DS6054801



0800 009 3921
Monday to Friday, 8am to 5pm

16th November 2018

Pre-planning enquiry: Confirmation of sufficient capacity

Site Address: Vinegard Yard, St Thomas Street, London, SE1 3QX

Dear Miss Mercuriali,

Thank you for providing information on your development for 23,083m² of office space, 3705m² of commercial space, a 200 capacity music venue, a 200 seat public house and a 60 seat restaurant replacing the existing car park and 1000m² industrial use building.

We have completed the assessment of the foul water flows and surface water run-off based on the information submitted in your application with the purpose of assessing sewer capacity within the existing Thames Water sewer network.

Foul Water

If your proposals progress in line with the details you've provided, we're pleased to confirm that there will be sufficient sewerage capacity in the adjacent combined sewer network to serve your development.

This confirmation is valid for 12 months or for the life of any planning approval that this information is used to support, to a maximum of three years.

Please note that you must keep us informed of any changes to your design – for example, an increase in the number or density of homes. Such changes could mean there is no longer sufficient sewerage capacity.

Surface Water

Please note that discharging surface water to the public sewer network should only be considered after all other methods of disposal have been investigated and proven to not be viable. In accordance with the Building Act 2000 Clause H3.3, positive connection to a public sewer will only be consented when it can be demonstrated that the hierarchy of disposal methods have been examined and proven to be impracticable. The disposal hierarchy being: 1st Soakaways; 2nd Watercourses; 3rd Sewers.

Only when it can be proven that soakage into the ground or a connection into an adjacent watercourse is not possible would we consider a restricted discharge into the public combined sewer network.

If the peak surface water run-off discharge is then restricted to a maximum of 5l/s (split between the two proposed combined connections i.e. 4l/s and 1l/s) as your drainage strategy indicates, then we would have no objections to the proposals.

We would encourage techniques such as green roofs, permeable paving and rainwater harvesting that restricts surface water discharges from your site.

Please note that the Local Planning authority may comment on surface water discharge under the planning process.

Please Note

There are existing public sewers crossing the site. New buildings will need to be kept between 3 and 6.5m away from existing sewer depending on the size and depth of the sewer. Alternatively, it may be possible for sewers to be diverted around the new development. If you wish us to review a diversion proposal please submit this via a Section 185 Diversion application. On some occasions it may be possible to abandon existing public sewers. Please contact us for further information on this process.

All connection requests are subject to a full Section 106 (Water Industry Act 1991) application before the Company can confirm approval to the connection itself. Please also note that capacity in the public sewerage system cannot be reserved. Please make sure you submit your connection application giving us at least 21 days' notice of the date you wish to make your new connection/s.

Note on trunk sewers: Connecting directly to Trunk sewers can be complex and dangerous, which means we often refuse permission. In this case, you will need to find an alternative sewer or method of discharge. Please contact the Sewer Connections team through our Helpdesk on 0800 009 39 21 for further information.

If Thames Water permits a connection to the trunk sewer, we will insist on carrying out the connection ourselves under Section 107 of the Water Industry Act. We would advise for you to apply as soon as possible.

The discharge of non-domestic effluent is not permitted until a valid trade effluent consent has been issued by Thames Water. If anything other than domestic sewage is discharged into the public sewers without the above agreement an offence is committed and the applicant will be liable to the penalties contained in Section 109(1) (WIA 1991).

Applicants should contact Trade Effluent prior to seeking a connection approval, to discuss trade effluent consent and conditions of discharge. A Trade Effluent reference number should be obtained and included in the relevant box of the attached application form. The address for

Trade Effluent is - Thames Water Utilities Limited, Waste Water Quality, Crossness Sewage Treatment Works, Belvedere Road, Abbeywood, London. SE2 9AQ. Alternatively you can telephone them on 020 8507 4321.

The views expressed by Thames Water in this letter are in response to this pre development enquiry at this time and do not represent our final views on any future planning applications made in relation to this site.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'J Shildrick', written in a cursive style.

Jonathan Shildrick BSc
Development Engineer
Developer Services

