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17 CHARTERHOUSE STREET, LONDON
BELOW GROUND DRAINAGE STRATEGY

RAMBOLL

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BELOW GROUND DRAINAGE STRATEGY

Revision	**03**
Date	**04/08/17**
Made by	**Robert Rigge**
Checked by	**Lisa Sawyer**
Approved by	**Lisa Sawyer**
Description	**Below Ground Drainage Strategy**

Ref 162003673-RAM-XX-XX-RP-D-00001

Revision	Date	Made by	Checked by	Approved by	Description
01	27/07/17	Robert Rigge	Lisa Sawyer	Lisa Sawyer	Draft
02	01/08/17	Robert Rigge	Lisa Sawyer	Lisa Sawyer	Planning
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APPENDICES

1. INTRODUCTION

Ramboll UK Ltd have been appointed by Anglo American and De Beers to produce a Drainage Strategy to support a planning application for the expansion of 17 Charterhouse Street and Saffron Hill in London.

The site, hereafter referred to as the "Application Site", is located at approximate central ordnance survey National Grid Reference 531507mE, 181659mN. The total planning boundary of the site will be confirmed following receipt of a site plan .

Refer to Appendix 1 for a site location and redline boundary plan.

2. SCOPE AND OBJECTIVES

This Drainage Strategy report has been prepared to support the planning application for the development of the Application Site and should be read in conjunction with all other planning documents for the site.

The specific objectives of this assessment are to establish the following:

- Existing drainage systems on the Application Site
- Proposals for collection and discharge of surface water from the proposed development
- Proposals for collection and discharge of foul water from the proposed development

3. LIMITATIONS

This report has been prepared for the planning application and shall not be relied upon by any third party unless that party has been granted a contractual right to rely on this report for the purpose for which it was prepared.

The findings and opinions in the report are based upon information derived from a variety of information sources. Ramboll believe these information sources to be reliable and where possible have tried to verify the information.

This report has been prepared on the basis of the proposed end land use defined by the Client. If this proposed end land use is altered or changed then it will be necessary to review the findings of this report.

It should be noted that some of the aspects considered in this study are subject to change with time. Therefore, if the development is delayed or postponed for a significant period then it should be reviewed to confirm that no changes have taken place, either at the Application Site or within relevant legislation.

4. LEGISLATION

The following legislation has been reviewed and taken into account in preparation of the proposed drainage strategy.

4.1 Planning Policy

Government has strengthened planning policy on the provision of sustainable drainage systems (SuDS) for 'major' planning applications introduced from 6 April 2015 (Paragraph 103 of National Planning Policy Framework and Ministerial Statement on SuDS). As per the guidance issued by the Department of Communities and Local Government (DCLG), all 'major' planning applications being determined from 6 April 2015, must consider sustainable drainage systems.

Assessment of the suitability of sustainable drainage systems must be undertaken in accordance with paragraphs 051, 079 and 080 of the revised NPPF Planning Practice Guidance (PPG) for Flood Risk and Coastal Change.

The department for Environment, Food and Rural Affairs has produced a non statutory technical standard for sustainable drainage systems which states that:

For developments which were previously developed, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event must be close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event.

4.2 Strategic Flood Risk Assessment

The London Borough of Camden Strategic Flood Risk Assessment has been reviewed along with the flood maps which indicate that the Application site is within the Group3_003 Critical Drainage Area and is also close to the Local Flood Risk Zone of Farringdon, although this is outside of the Borough of Camden.

The drainage discharge hierarchy for Camden Council is as follows;

1. Store rainwater for later use
2. Use infiltration techniques, such as porous surfaces in non-clay areas
3. Attenuate rainwater in ponds or open water features for gradual release
4. Attenuate rainwater by storing in tanks or sealed water features for gradual release
5. Discharge rainwater direct to a watercourse
6. Discharge rainwater to a surface water sewer/drain
7. Discharge rainwater to the combined sewer.

Camden Planning Guidance 3 imposes the following restrictions for proposed developments with regards to surface water discharge:

- Developments are to achieve a greenfield run off rate once SuDS have been installed;
- Where it can be demonstrated that this is not feasible, a minimum of 50% reduction in run off rate across the development is required.

4.3 Building Regulations

The requirements of Building Regulations Part H5 will need to be adhered to unless agreement can be made with the Building Control Officer for the development. This requires any new development to be drained by means of a separate foul and surface water system.

4.4 BREEAM

Due to the nature of the site the requirements under BREEAM are still being defined. However the current strategy is to follow the New Construction guidance, which is more onerous than those for Redevelopment. The above is in line with the requirements outlined in the pre-assessment carried out by Twin & Earth while a specific criteria is developed.

A BREEAM score of Excellent is being targeted. There are two surface water credits available within the New Construction BREEAM guidance; their requirements have been outlined below;

4.4.1 POL3

Pre-requisite

4. An Appropriate Consultant is appointed to carry out, demonstrate and/or confirm the development's compliance with the following criteria:

One credit

5. Where drainage measures are specified to ensure that the peak rate of run-off from the site to the watercourses (natural or municipal) is no greater for the developed site than it was for the pre-development site. This should comply at the 1-year and 100-year return period events.

6. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS are in place.

7. Calculations include an allowance for climate change; this should be made in accordance with current best practice planning guidance (see definitions).

One credit

8. Where 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

9. Drainage design measures are specified to ensure 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 for the 100-year 6-hour event, including an allowance for climate change (see criterion 14).

10. Any additional predicted volume of run-off for this event is prevented from leaving the site by using infiltration or other Sustainable Drainage System (SuDS) techniques.

OR (only where criteria 9 and 10 for this credit cannot be achieved):

11. 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.

12. Drainage design measures are specified to ensure 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 1-year peak flow rate; OR
    b. The mean annual flow rate Qbar; OR
    c. 2L/s/ha.

    Note that for the 1-year peak flow rate the 1-year return period event criterion applies (as described in the peak run-off criteria above).

13. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS are in place.

14. For either option, above calculations must include an allowance for climate change; this should be made in accordance with current best practice planning guidance

5. CONSULTATIONS

Consultations have been undertaken with Thames Water and Camden Council acting as the Lead Local Flood Authority for the Borough, with regards to discharge of proposed foul and surface water flows from the Application Site.

A copy of all consultations are included in Appendix 2.

5.1 Local Flood Authority – Camden Borough Council

Initial consultation was made with the Lead Local Flood Authority via a meeting held between Planning Potential and Camden Borough Council on 12th July 2017 in regards to the proposed foul and surface water discharge strategy and the management of surface water within the Application Site.

The Lead Local Flood Authority confirmed on the 20th of July that the approach outlined below was in line with their requirements, however noted that SUDS should be implemented higher up the hierarchy. A copy of the full drainage memo issued to Camden is included in Appendix 2.

A summary of the memo is below;

- Existing surface water flows will be assessed for various return periods
- Surface water will be attenuated in accordance with Camden Borough Councils requirements
- SUDS techniques will be reviewed for the formal planning report

5.2 Thames Water

A predevelopment enquiry has been submitted to Thames water in regards to discharge of foul and surface from the Application Site.

A response from Thames Water is still outstanding.

6. SITE DESCRIPTION

6.1 General

The 17 Charterhouse Street and Saffron Hill site is an existing complex of interconnected office spaces in central London. The site is currently largely unoccupied, with the majority of staff having been recently relocated. The structures compromise of a two storey concrete basement/lower ground level and five to eight storeys of concrete frame above ground level. The various office spaces are arranged around a courtyard.

6.2 Existing Drainage

The existing record drawings show that there 3no. outfalls into the combined public sewer within Saffron Hill;

- One from the access ramp up to the patio area behind Saffron House at the end of the Extension Block,
- One from Saffron House itself, and;
- One outfall from Saffron House and Charterhouse beneath the shared stairway.

Each of the above are combined foul and surface water outfalls which discharge separately into the public sewer. The rain water pipes collect within the building footprint and combine with the foul water in a drainage network of manholes and pipes below the various basements slabs. There also appears to be 2No. basement/sub-basement level sumps with pumps one in Saffron House and the other in Charterhouse, it is unclear from the record drawing where these discharge although it is assumed that they discharge into the below ground networks within the respective buildings.

6.3 Existing Surface Water Flows

The site red line boundary plan includes areas that are not being developed as part of the works as such a reduced boundary is proposed for the surface water flows from the site. The area shown outside of this reduced boundary will continue to drain as existing.

The existing brownfield runoff rates have been calculated based on the reduced area described above;

- M1-5 Storm Q = 50.2 l/s
- M2-5 Storm Q = 64.1 l/s
- M30-5 Storm Q = 120.2 l/s
- M100-5 Storm Q = 153.1 l/s

Calculations and plan are included within Appendix 3.

7. PROPOSED DEVELOPMENT

7.1 Description

The proposed development is the refurbishment of the Saffron Hill Building with a new build structure on the Charterhouse site in order to provide a revitalised central London office space.

8. SURFACE WATER DRAINAGE PROPOSALS

8.1 Strategy

The following hierarchy has been reviewed in regards to discharge of surface water from the proposed development site:

- Infiltration
- Watercourse
- Sewer

In accordance with Building Regulations Part H, it is proposed that foul and surface water drainage systems will be kept separate where practical. Despite the existing outfall being combined it is proposed to separate out the foul and surface within the site. .

Building regulations indicate that soakaways should be kept 5m away from and structure or road and therefore due to the site space constraints the use of soakaways will not be a viable option on this site.

There are no watercourses or surface water sewers within the vicinity of the site. Therefore it is proposed to discharge surface water into the combined public sewer network via one or more existing outfalls.

The discharge for the site will be restricted to a flow rate equal to a 50% betterment on the existing brownfield rates in accordance with the Lead Local Flood Authority requirements. It is proposed that the discharge from the proportion of the site where works are being under taken (plan within appendix 3) will be at a variable rate to suit differing storm return periods. However this is subject to Thames Water confirmation and is dependent upon the BREEAM requirements where reasonably practicable. If it is found that this rate is less than 5l/s as per BREEAM requirements it will be proposed to discharge at 5l/s.

Proposed Surface water discharge rates;

- M1-5 Storm Q = 25.1 l/s
- M2-5 Storm Q = 32.1 l/s
- M30-5 Storm Q = 60.1 l/s
- M100-5 Storm Q = 76.6 l/s

Surface water run-off will therefore be required and be attenuated up to and including a 1 in 100 year 6 hour event + 20% Climate Change allowance. An impact assessment will also be undertaken for the 1 in 100 year + 40% Climate Change event in accordance with Camden Council's pre planning guidance.

Due to the proposed replacement of the whole roof structure and changes to downpipe locations the surface water restrictions will be placed on the whole site and not just the new building.

It is proposed that a non-return valve will be included for within the scheme to prevent any surcharging of the existing public sewer system into the on-site private network.

The proposed surface water drainage strategy layout is included within Appendix 4.

8.2 Design Codes

The detailed surface water drainage system will be designed in accordance with the following codes of practice:

- Building Regulations 2015 Drainage and Waste Disposal Approved Document H
- BS EN 752:2008 Drain and sewer systems outside buildings
- BS EN 10256-2:2000 Gravity drainage systems inside buildings
- CIRIA C753 The SuDS manual

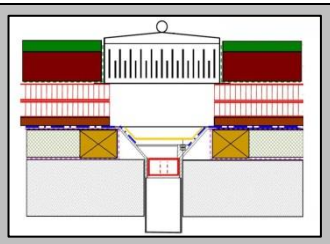
8.3 Review of Sustainable Drainage Techniques

Planning policy promotes sustainable management of surface water run-off from a new development or redevelopment, and the use of SuDS is recommended. Due to the restrictions imposed on the surface water discharge attenuation will need to be incorporated within the design.

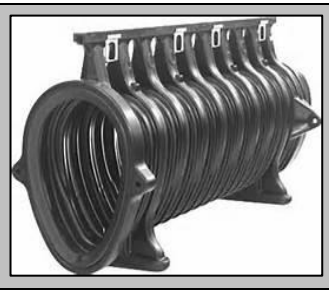
A review of potential sustainable drainage systems have been undertaken to determine the form of attenuation which is most suited to the development and which will be included for within the scheme.

Technique	Image	Description	Advantages	Disadvantages	Suitability at Project 2020
Sustainable drainage options possibly suitable for this site					
Sub-surface storage Circular tank systems		Underground circular corrugated tank system.	Range of diameters available High void ratios Can be installed beneath trafficked and soft landscaped areas and under building footprint System can be incorporated with additional storage within the surround (not under buildings)	Circular therefore requires greater plan area to fit in required storage No water quality treatment	Circular tanks could be used so long as there are sited within the existing basement due to the confined nature of the site. Can be used to collect water from the external paved areas and roof drainage. Roof drainage outlets would need to be located as close to the proposed location to allow above ground routing preventing the need to excavate the basement floor.
Sub-surface storage Concrete tank systems		Underground tank system which does not allow infiltration into the ground	Range of standard sizes available. Can be installed beneath trafficked and soft landscaped areas and under building footprint.	Believed to be more expensive than other forms of underground storage units Is good where space is limited as requires no additional concrete surround and is rectangular so full space utilised No infiltration option	Concrete tanks could be used on Project 2020, However it would be unpractical to install a concrete tank on the basement slab as it may prove difficult to waterproof.

Technique	Image	Description	Advantages	Disadvantages	Suitability at Project 2020
Green/brown roof		Multi-layered system that covers the roof of a building with vegetation cover/landscaping over a drainage layer. Designed to intercept and retain precipitation, reducing the volume of run-off and attenuating peak flows.	Mimics greenfield state of building footprint for high density developments Good removal of pollutants Ecological benefits Contributes towards insulation of the building Contributes towards sound absorption A greenroof system can be incorporated with a blueroof storage system.	Possible additional weight on the structure Not appropriate for steep roof falls Maintenance of roof vegetation required A greenroof on its own does not remove the need of other forms of attenuation due to the calculations need to assume green roof is saturated in high storm events	The roof has large flat areas and terraced areas and therefore for this site green/brown roofs could be used. The use of green roofs would reduce the time it takes for water to enter the drainage system and therefore reduce storage requirements in short term storm events. A green roof could be incorporated with a blue roof or underground tank system. The requirement for maintenance of these would need to be reviewed.

Technique	Image	Description	Advantages	Disadvantages	Suitability at Project 2020
Blue Roof		Roof designed to allow the build-up of water above the roof waterproofing membrane (within various elements), not exceeding the designed hydraulic head, for a defined period of time, to enable attenuation of stormwater at roof level, and also controls the discharge of rainwater run-off at designed flow rate to meet design requirements	Removes excavation required for other forms of surface water attenuation Build up on roof could contribute towards insulation/sound absorption of the building Can be incorporated with a green roof Live load (snow loading) already taken into account within structural design	Increased weight on structure, live load allowance already allowed for in structural design could be offset Increased waterproofing specification required Increased maintenance required to ensure outlets do not get blocked up	Large flat roof area is proposed for this site with parapet therefore a blue roof is possible for this site. This could be incorporated with a green/brown roof. On this site the use of a blue roof is likely to need to be incorporating with other forms of underground attenuation for the small areas of hardstanding outside the building footprint.

Technique	Image	Description	Advantages	Disadvantages	Suitability at Project 2020
Permeable Paving / subbase attenuation		Block or porous paving allows run-off to infiltrate through to sub base layer. Water can then either be infiltrated into ground or conveyed into storage or drainage systems.	Provides source attenuation Provides low level water treatment If designed for infiltration contributes towards groundwater recharge Easy to install and retrofit Simple to maintain if lined and can be used where groundwater is sensitive	Not suitable normally for heavily trafficked areas or adoptable roads Requires regular maintenance to prevent clogging with dirt Requires increased build up in some situations Coordination with services essential to ensure routes provided through the sub base attenuation	Permeable paving/subbase attenuation could be used for the proposed external areas to collect water from the external paved areas. Water would pass through the surface and be collected within a lined subbase (as infiltration is unlikely to be possible) prior to discharge.
Rainwater Harvesting		Rainwater collection from roofs to supply toilets. Harvested rainwater is stored substituted for potable water mains supply, reducing both site discharge and water consumption.	Reduces demand on mains water	Use is dependent on demand requirements, contributing surface area, and seasonal rainfall characteristics. Cannot be used as full attenuation as assumed to be full during high storm events.	Volume could be incorporated within the blue roof area or underground storage tank. Not possible as a form of SuDs on its own for this site.

Technique	Image	Description	Advantages	Disadvantages	Suitability at Project 2020
Water feature/Rills		Formal linear drainage features in which surface water can be stored or conveyed. They can be incorporated with water features such as ponds or waterfalls where appropriate.	Negate the need for underground pipework Can provide small volumes of attenuation	Potential trip/wheel hazard, disabled access issues. Only small volumes of attenuation can be provided if space is limited.	This could be used for collection of external drainage in the court yard behind Saffron House. This would not provide enough attenuation without incorporating other systems for the whole site.
Drainage Channels		Formal linear drainage systems in which surface water can be stored or conveyed.	Negate the need for underground pipework Can provide small volumes of attenuation	Only small volumes of attenuation can be provided if space is limited	This could be used in the landscape/pedestrian areas as a self-attenuating system. This would not give us enough attenuation without incorporating other systems for the whole site.

Technique	Image	Description	Advantages	Disadvantages	Suitability at Project 2020
Options not suitable for this site					
Detention basin		Provides both storm water attenuation and treatment in large grassed depressions either formed into community facilities or subtly through depressions in the land	The retention time promotes good removal of pollutants through sedimentation Can be used where groundwater is vulnerable Good community acceptability High ecological, and amenity benefits Run-off from each rain event is detained and treated in the pool	No reduction in run-off volume High land take required limiting its use Depths can be constrained by external levels	This is not a feasible option on this site due to the size of the land take required.

Technique	Image	Description	Advantages	Disadvantages	Suitability at Project 2020
Sub-surface storage Modular geocellular systems		Underground plastic crate systems which are either wrapped or allowed to infiltrate dependent on ground conditions	Modular and flexible Dual usage (infiltration if possible/storage) High void ratios Can be installed beneath trafficked and soft landscaped areas	Cannot be installed under the building footprint due to access for maintenance If infiltration available then needs to be more than 5m away from the building Size restricted to unit size No water quality treatment	Due to spatial requirements the use of below ground geocellular crates is not practical on the Project 2020 site.
Wetlands Shallow, extended detention, pond wetland, pocket wetland, submerged gravel wetland		Wetlands provide stormwater attenuation and treatment and comprise of shallow ponds/marshy areas areas covered in aquatic vegetation.	Good pollutant removal If lined can be used where groundwater is vulnerable Good community acceptability Good ecological and amenity benefits. Wetlands can detain flows for an extended period to allow sediments to settle and to remove contaminants	High land take Requires baseflow to keep areas wet Little reduction in run-off volume. Not suitable for steep sites	This is not a feasible option on this site due to the size of the land take required

Technique	Image	Description	Advantages	Disadvantages	Suitability at Project 2020
Filter drains		Shallow excavations filled with rubble or stone that create temporary subsurface storage for filtration of storm water run-off. Receive lateral inflow from an adjacent impermeable surface.	Hydraulic benefits achieved with filter trenches. Trenches can be incorporated into landscaping scheme	Limited to small catchments. Dependent on proposed external levels. High cost of replacing filter material if clogged.	Filter drains will not be possible in the external area due to space requirements.
Infiltration Trench, basin, soakaway		Surface water run-off can be discharged directly to ground for infiltration by soakaways, basins, or trenches. A prerequisite is that both groundwater and ground conditions are appropriate to receive the quality and quantity of water generated.	Reduces the volume of run-off Effective at pollutant removal Contributes to groundwater recharge Simple and cost-effective Easy performance observation	Requires appropriate pre-treatment such as oil separation Basins require a large flat area Soakaways need to be located away from substructure to prevent adverse effect on foundations	This is not a feasible option on this site due to the constraints of the proposed development and proximity of the new and existing building substructures

Technique	Image	Description	Advantages	Disadvantages	Suitability at Project 2020
Swales		Swales are linear vegetated drainage features in which surface water can be stored or conveyed. They can be designed to allow infiltration, where ground conditions allow.	Can be incorporated into landscaping Good removal of pollutants Reduces run-off rates and volumes Low cost	Not suitable for steep sites Significant land take required to fit feature in	This is not a feasible option on this site due to the external space requirements on this site.

9. FOUL SEWERAGE PROPOSALS

9.1 Strategy

In accordance with Building Regulations Part H, foul and surface water drainage systems will be kept separate where possible on the Application Site prior to discharge.

A Thames Water response to the predevelopment enquiry is still outstanding however it is expected that they will confirm that unrestricted foul flows from the Application Site would be acceptable into the 1321mm x 762mm combined culvert within Saffron Hill

The foul drainage discharge strategy is indicated on the drawing in Appendix 4.

9.2 Proposed Peak Foul Water Flows

The proposed peak foul water flow from the Application Site into the public sewer system has been calculated as 9.6 l/s. This is based on the Population Method as described in BS EN 752:2008 and also references British Water Flows and Loads 4.

9.3 Design Codes

The detailed foul drainage system will be designed in accordance with the following codes of practice:

- Building Regulations 2010 Drainage and Waste Disposal Approved Document H
- BS EN 752:2008 Drain and sewer systems outside buildings
- BS EN 10256-2:2000 Gravity drainage systems inside buildings

10. MAINTENANCE OF DRAINAGE SYSTEMS

10.1 Performance Objectives

The operational maintenance need of the installed below ground drainage system is to provide a system that will continue to perform in accordance with the design and that the operation of the system is safe, environmentally acceptable, economically efficient and provide the client with a functional and easily operated asset.

10.2 Maintenance Requirements

Effective maintenance includes a combination of planned and reactive tasks, and looks to ensure that the system is kept in a condition that it can function as required.
The tasks may include:

- Localised repair or replacement of damaged pipework or other structures
- Removal of natural occurring sediments, abnormal obstructions etc. to restore hydraulic capacity
- Maintenance of mechanical plant
- Rodent and insect control

10.3 Maintenance Schedule

A strategy for the maintenance of the underground drainage elements will be developed incorporating normal regular maintenance requirements, any potential long term maintenance work and any monitoring required.

Any parties involved with the disposal of any waste materials from the underground drainage system should hold appropriate management licenses to undertake any such activities. Disposal of any site materials is required to be made in accordance with current legislation and guidance.

This initial maintenance schedule has been prepared using guidance provided in 'CIRIA C625 – Model agreements for sustainable water management systems', CIRIA 626 – Rainwater and Greywater systems and manufacturers recommendation for specialist drainage elements. The detailed design drawings will incorporate the maintenance requirements for the proposed specified products if a more detailed maintenance strategy this is to be provided by the contractor.

The following table notes the likely maintenance requirements for this project and this is to be developed further at the next stage of the design.

Conventional Drainage Systems		
Foul and surface water gravity drainage pipework and manholes		
Silt accumulation, blockage, structural integrity		
Maintenance Schedule	Requirement	Recommended minimum frequency
Regular	Litter/Debris removal	Monthly (or as required)
	Excess silts to silt traps and gully pots to be removed	Monthly (or as required)
Occasional	Pipe cleaning and inspection	As required
Monitoring	Inspection of manholes/chambers to identify evidence of sedimentation accumulation	Quarterly per annum

Conventional Drainage Systems		
Storm Water Attenuation Tank and Flow Controls		
Silt accumulation, blockage, structural integrity		
Maintenance Schedule	Requirement	Recommended minimum frequency
Regular	Removal of excess silts	Monthly (or as required)
Occasional	Removal and disposal of oil or petrol residues using safe standard practices	As required
Monitoring	Inspect upstream and downstream manholes and flow control devices for evidence of silt accumulation and integrity of system	Quarterly per annum

APPENDIX 1
SITE LOCATION PLAN

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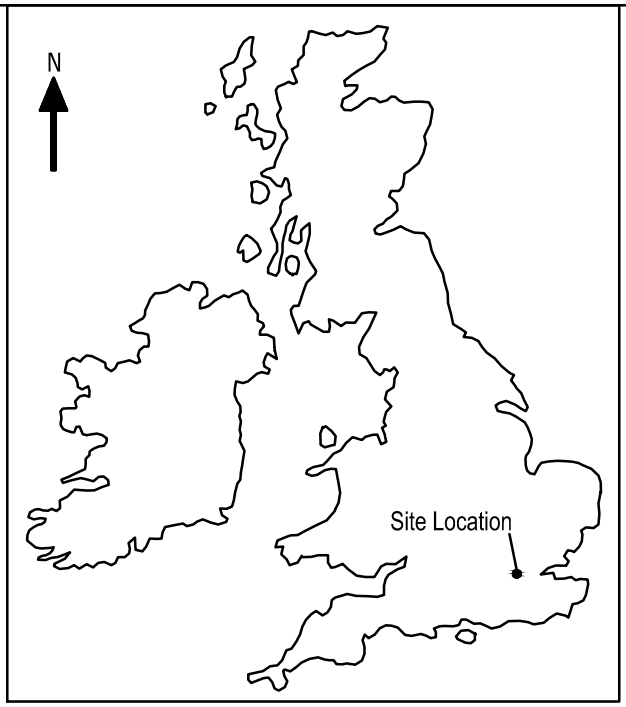
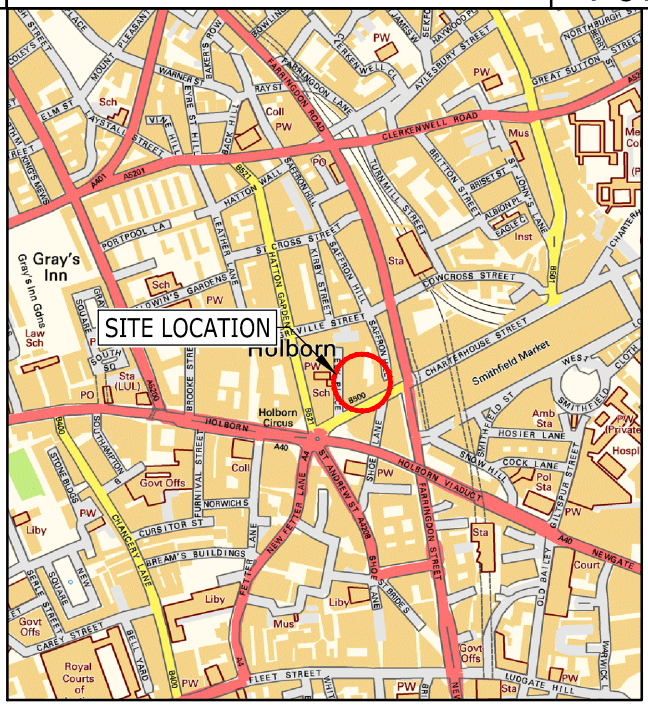
PROJECT 2020

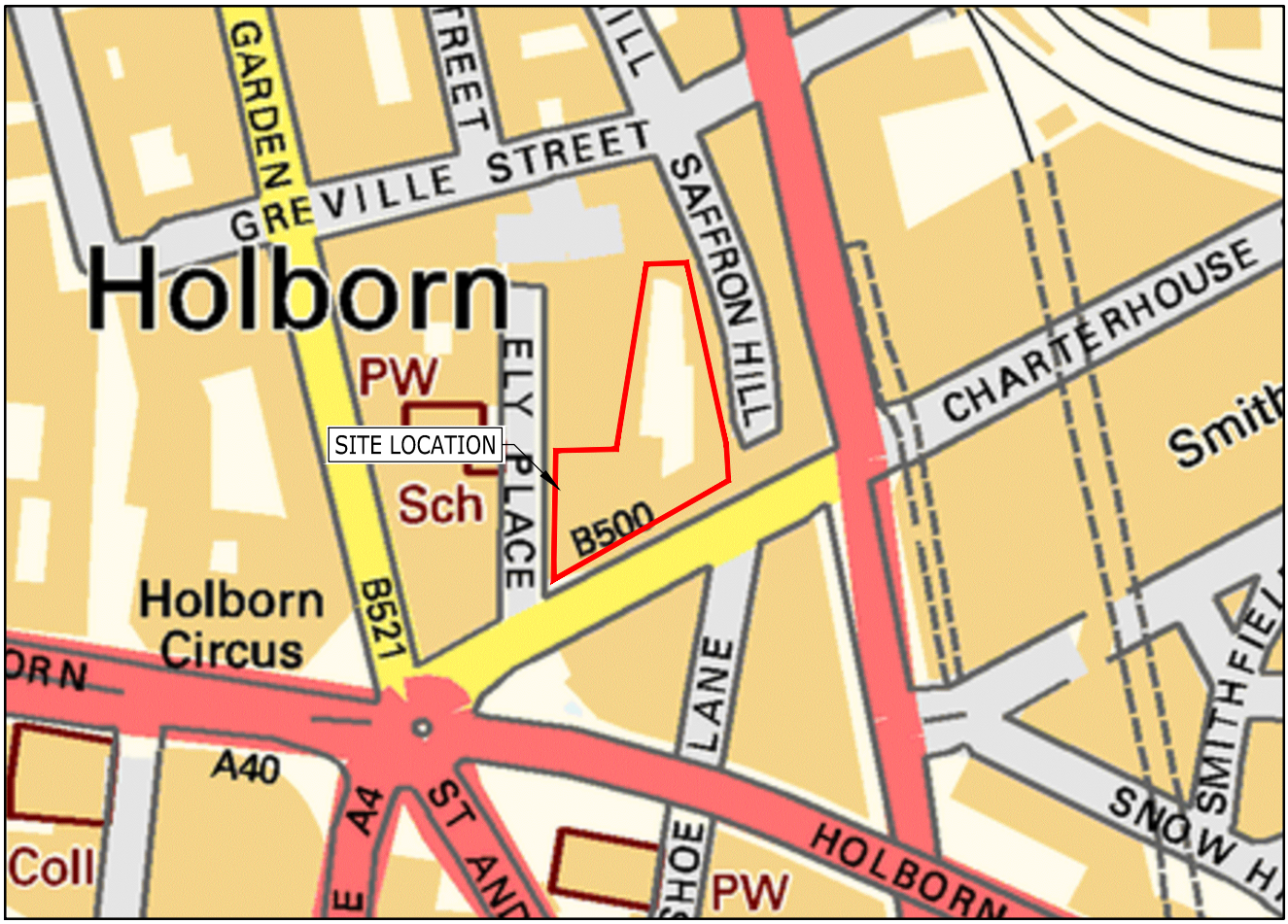
SITE LOCATION PLAN

Project No:	Scale (@A4):	Drawn:	Date:
1620003673	NTS	FD	JUL 17

Drawing No:	Rev:
RAM-XX-XX-DR-D-00000	P01







APPENDIX 2
CONSULTATIONS

RAMBOLL

TRANSPORT

DESIGN NOTE – SURFACE WATER STRATEGY

Job	**162003673**
Client	**AA De Beers Project 2020**
Memo no.	**00001**
Date	**11/07/2017**
To	**Planning Potential / Camden Council Meeting Wednesday 12/07/2017**
From	**Robert Rigge**
Copy to	**Tim Roe – Ramboll**
	Helen Cuthbert – Planning Potential
	Derek Adams – Burke Hunter Adams

1. Introduction

The following document is produced to outline the below ground drainage strategy of the development of 17 Charterhouse in London for Anglo American De Beers (AADB) for a meeting with Camden Council.

2. Strategic Flood Risk Assessment

The London Borough of Camden Strategic Flood Risk Assessment has been reviewed along with the flood maps which indicate that the Application site is within the Group3_003 Critical Drainage Area and is also close to the Local Flood Risk Zone of Farringdon, although this is outside of the Bough of Camden.

The drainage discharge hierarchy for Camden Council is as follows;

1. Store rainwater for later use
2. Use infiltration techniques, such as porous surfaces in non-clay areas
3. Attenuate rainwater in ponds or open water features for gradual release
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5. Discharge rainwater direct to a watercourse
6. Discharge rainwater to a surface water sewer/drain
7. Discharge rainwater to the combined sewer.

Date 11/07/2017

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Ref Design Note - Proposed Drainage Strategy AADB

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- Developments are to achieve a greenfield run off rate once SuDS have been installed;
- Where it can be demonstrated that this is not feasible, a minimum of 50% reduction in run off rate across the development is required.

3. Existing Drainage

The existing record drawings show that there 3no. outfalls into the combined public sewer within Saffron Hill;

- One from the access ramp at the end of the Extension Block onto the patio area behind Saffron House,
- One from Saffron House itself, and;
- One outfall from Saffron House and Charterhouse beneath the shared stairway.

Each of the above are combined foul and surface water outfalls which discharge separately in to the public sewer.

3.1 Existing Surface Water Flows

An assessment as to the existing surface water flows from the AADB site has not yet been under taken however it is proposed that that following return periods will be assessed prior to submission of the planning report;

- 1 in 1 year storm,
- 1 in 2 year storm,
- 1 in 30 year storm, and
- 1 in 100 year storm

4. Proposed Drainage

As the proposed development is an extension of the internal office space by the construction of an extension to the existing buildings, over an existing basement. It is proposed that only the extension is subject to the restrictions imposed on surface water flow.

The site constraints do not allow for the use of soakaways or open water/pond storage for attenuation. Also there are no watercourses or surface water sewers within the area. Therefore it is proposed to discharge surface water into the combined public sewer network via an existing outfall. If it is found following the receipt the public sewer records that there is surface water sewer within the area of the building this strategy will be reviewed.

The discharge for the extension section of building will be restricted to a flow rate equal to a 50% betterment on existing brownfield rates. The other existing surface water outfalls from the site will remain unchanged.

It is proposed that the discharge from the extension will be at a variable rate to suit differing storm return periods, however if this is not possible the discharge will be

attenuated to 50% of the existing 1 in 1 year rate where reasonably practicable. However if it is found that this rate is less than 5l/s it is proposed to discharge at 5l/s.

Surface water run-off will be attenuated up to and including a 1 in 100 year 6 hour event + 20% Climate Change allowance. An impact assessment will be undertaken for the 1 in 100 year + 40% Climate Change event.

A full review of the above strategies will be undertaken upon further consultation with the relevant stakeholders.

5. Sustainable Drainage Techniques

Planning Policy promotes the use of sustainable drainage techniques therefore a review of the potential options available will be undertaken for the full planning report.

From: Litherland, Jenna [mailto:Jenna.Litherland@camden.gov.uk]
Sent: 20 July 2017 15:23
To: Helen Cuthbert <helen@planningpotential.co.uk>
Subject: RE: AADB Project 2020

Hi Helen,

I've has comments from the sustainability officer.

Limiting to 50% of existing run-off rates is the correct calculation, however you should be seeking to implement SUDS higher up the hierarchy such as rain water harvesting and green roofs.

I hope this is of assistance.

Thanks, Jenna

Jenna Litherland
Principal Planning Officer

Telephone: 020 7974 3070

From: Helen Cuthbert [mailto:helen@planningpotential.co.uk]
Sent: 17 July 2017 15:07
To: Litherland, Jenna <Jenna.Litherland@camden.gov.uk>
Cc: Paul Galgey <Paul@planningpotential.co.uk>
Subject: FW: AADB Project 2020

Jenna

I realised we did not raise the SUDs strategy with you last week. See below and attached – can you get some feedback for us on the approach please?

Thanks

APPENDIX 3
CALCULATIONS

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Job number	1620003673
Sheet number	1of2
Date	31/07/17
Eng	RR
Checked	

Project Project 2020 - Existing Surface Water Flows

The Existing surface water flows have be calculated based on the Wallingford Procedure.

from fegure A1 = M5-60 = 20mm.

figure A2 = r = 0.44

from fegure A3b = Z1 = 0.39

therefore = M5-5 = 20 x 0.39 = 7.8mm

from tabe A1 are bicenship between the M5-5 storm and other return periods can be found.

M1 = 0.61
M2 = 0.79
M30 = 1.46
M100 = 1.86

Therefore the following storms can be calculated as follows.

M1-5 = 7.8 x 0.61 = 4.76 mm
M2-5 = 7.8 x 0.78 = 6.08 mm
M30-5 = 7.8 x 1.46 = 11.39 mm
M100-5 = 7.8 x 1.86 = 14.51 mm

The point intensities for the above storms as follows.

M1-5 = 4.76 ÷ (5÷60) = 57.12 mm/hr
M2-5 = 6.08 ÷ (5÷60) = 72.96 mm/hr
M30-5 = 11.39 ÷ (5÷60) = 136.68 mm/hr
M100-5 = 14.51 ÷ (5÷60) = 174.12 mm/hr

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Job number	1620003673
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Project Project 2020 - Existing Surface Water Flows

- Surface water runoff can be calculated based on the following equation;

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

Where; Cu = a coefficient of discharge

i = is the point intensity

A = is the site area.

$A = 2927 m^2 = 0.29 ha$

$M_1 = 3.61 \times 0.84 \times 57.12 \times 0.29$

$M_2 = 3.61 \times 0.84 \times 72.96 \times 0.29$

$M_{30} = 3.61 \times 0.84 \times 136.69 \times 0.29$

$M_{100} = 3.61 \times 0.84 \times 174.12 \times 0.29$

$M_1 = 50.2 L/s$

$M_2 = 64.1 L/s$

$M_{30} = 120.2 L/s$

$M_{100} = 153.1 L/s$

} Existing flow Rates

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Job number	1620003673
Sheet number	1
Date	18/07/17
Eng	RR
Checked	

Project Anglo American De Beers. - Foul Flows.

Foul flows for the proposed & existing building has been assessed using Flows and Loads 4 and building occupancy levels provided by the architects.

Existing Occupancy = 800 people

Proposed Occupancy = 1390 people.

Existing Flows.

From Flows and Loads 4 an Office with a canteen has flows equal to:

100 L/per person/day.

∴

Q = 650 × 100
= 65000 L/day
= 65000 ÷ (24 × 3600)
Q L/s = 0.75 L/s = Average daily flow.
× 6 ← DWF.
= 4.5 L/s = Peak existing flow

Proposed Flows.

Q = 1390 × 100
= 139000 L/day
= 139000 ÷ (24 × 3600)
= 1.6 L/s = Proposed Average daily Flow.
× 6 ← DWF
= 9.6 L/s = Peak Proposed Flow.

	Average flows	Peak flows
Existing	0.75 L/s	4.5 L/s
Proposed	1.6 L/s	9.6 L/s

APPENDIX 4
PROPOSED DRAINAGE STRATEGY DRAWING

Notes

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE MILLIMETRES U.N.O.
3. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM U.N.O.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.

KEY

- RED LINE
- BOUNDARY OF AFFECTED WORKS
- EXISTING DRAINAGE
- EXISTING BASEMENT DRAINAGE
- EXISTING LOWER GROUND FLOOR DRAINAGE
- PROPOSED FOUL WATER DRAINAGE
- PROPOSED SURFACE WATER DRAINAGE
- EXISTING PUBLIC SEWER
- AREA TO REMAIN AS EXISTING
- POTENTIAL AREA FOR BLUE ROOF

NEW SURFACE WATER NETWORK TO COLLECT EXTERNAL WORKS AREAS. CONNECTED INTO EXISTING NETWORK AT RAMP NEXT TO THE EXTENSION BLOCK.

RAINWATER PIPES TO THE EXTENSION BLOCK TO BE CONNECTED AS EXISTING. NO PROPOSED BELOW GROUND DRAINAGE CHANGES IN THIS AREA.

EXISTING PUBLIC SEWER. 1321 X 762mm

FURTHER SURVEY INFORMATION REQUIRED TO DETERMINE THE LEVEL AND EXTENTS OF THE OF THE EXISTING BELOW GROUND NETWORK.

NEW FOUL WATER DRAINAGE TO BE PROVIDED FOR CONNECTION OF THE NEW OFFICE LAYOUT.

PROPOSED FOUL CONNECTION IN TO EXISTING SYSTEM

BASEMENT SUMP PUMP DEISGN TO BE REVIEWED.

COORDINATION REQUIRED WITH EXISTING BELOW GROUND STRUCTURES.

POTENTIAL BLUEROOF/GREENROOF. ATTENUATION AT ROOF LEVEL, RESTRICTED OUT. ROOF OUTLETS TO BE POSITIONED TO ALLOW FOR MINIMAL BELOW GROUND PIPE WORK AND CONNECTION INTO THE EXISTING BELOW GROUND NETWORK. ROOF OUTLETS FROM ROOF OF SAFFRON HOUSE AND CHARTERHOUSE TO BE ROUTED ABOVE GROUND AND DISCHARGE INTO BLUEROOF/GREENROOF. ATTENUATION VOLUME DEPENDANT UPON DISCHARGE RATE TO BE AGREED WITH THAMES WATER.

EXISTING MANHOLE

HH5605

NEW FOUL DRAIN TO CONNECT WITHIN PASSAGEWAY BETWEEN SAFFRON HOUSE AND CHARTERHOUSE.

PROPOSED FOUL CONNECTION IN TO EXISTING SYSTEM

PROPOSED FOUL CONNECTION IN TO EXISTING SYSTEM

EXISTING LOWER GROUND FLOOR DRAINAGE TO BE RETAINED.

EXISTING BASEMENT DRAINAGE TO BE RETAINED.

Rev	Description	Date	By Chk	App
	SKETCH - 01/08/2017			

PRELIMINARY

PROJECT 2020

RAMBOLL

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PROPOSED BELOW GROUND DRAINAGE

Project No:	Scale (@A1):	Drawn:	Date:
1620003673	1:250	CO	07/2017

Drawing No: RAM-XX-00-SK-D-00001 Rev: P01

01/08/2017 15:36:19