

Davies Maguire

Appendix E. Greenfield Runoff Estimation



Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Chantelle Goncalves
Site name:	19 Charterhouse Street
Site location:	19 Charterhouse Street

Site Details

Latitude: 51.51870° N

Longitude: 0.1056° W

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management **Reference:** for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from **Date:**

1158641741 Oct 23 2024 11:42

Runoff estimation approach IH124

Site characteristics

Edited

Total site area (ha): 0.

(1) Is Q_{BAR} < 2.0 l/s/ha?

Notes

Methodology

 Q_{BAR} estimation method: SPR estimation method:

Calculate from SOIL type

Calculate from SPR and SAAR

When Q_{BAR} is <2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

Soil characteristics Default

 SOIL type:
 2
 5

 HOST class:
 N/A
 N/A

 SPR/SPRHOST:
 0.3
 0.53

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

Hydrological characteristics

Characteristics	Default	Edited
SAAR (mm):	608	608
Hydrological region:	6	6
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

(3) Is $SPR/SPRHOST \le 0.3$?

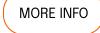
Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates	Default	Edited
Q _{BAR} (I/s):	0.22	0.74
1 in 1 year (l/s):	0.18	0.63
1 in 30 years (I/s):	0.5	1.71
1 in 100 year (l/s):	0.69	2.37
1 in 200 years (I/s):	0.81	2.78

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

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Davies Maguire		Page 1
20 Flaxman Terrace		
London		
WC1H 9AT		Micro
Date 23/10/2024 14:31	Designed by Chant	Drainage
File	Checked by	niailiade
Innovyze	Source Control 2020.1.3	'

ICP SUDS Mean Annual Flood

Input

Return Period (years) 1 Soil 0.300
Area (ha) 0.140 Urban 0.000
SAAR (mm) 600 Region Number Region 6

Results 1/s

QBAR Rural 0.2 QBAR Urban 0.2

Q1 year 0.2

Q1 year 0.2 Q30 years 0.5 Q100 years 0.7

Davies Maguire

Appendix F. ABG Blue Roof Calculations and Maintenance Report

ABG blueroof - General Maintenance abg | creative geosynthetic engineering

All roofing systems and areas (regardless of whether a blue roof SuDS attenuation system is present or not) require a minimum of two inspections per year to ensure their ongoing performance. Also as part of a new development's planning requirements, an ongoing maintenance programme for any SuDS methods implemented must be submitted. In addition, an ongoing maintenance programme by one of ABG's approved contractors must be in place to maintain the ABG blueroof Warranty. Please note: 1-3 years maintenance is recommended to be taken out as part of the installation package.

The specific roof surface finish should also require an appropriate maintenance regime to be carried out at the same time. For example, an intensive green roof will require regular maintenance in accordance with the chosen planting scheme and landscape design. An extensive green roof will generally require less maintenance, but includes removal of a season's growth and any unwanted/invasive species.

If ABG (via their installation team Geogreen) has also installed the surface finishes, we can also provide this additional maintenance service. For details of general maintenance on the different types of surface finishes, please download our specific maintenance technical notes/information.

ABG's blueroof Maintenance Service

Our service includes a full inspection and evaluation of the blue roof area and restrictor chambers.

A typical ABG/Geogreen maintenance programme includes:

Roof Evaluation:

 An expert from our Geogreen team will perform a review of your blue roof area to determine what remedial work, if any, needs to be done

Inspection:

- Of the blueroof restrictor chambers, orifices & roof outlets; with removal of any debris or vegetation to enable water to flow freely through the rainwater outlet
- Of the blueroof restrictor chamber particle filter boards, replacing as necessary
- Identification and reporting back of any general roof issues to the building owner, to include obvious maintenance requirements or defects that may require additional remedial work

Note:

• Any additional roof or plant installations, roofing remedial work, or change of use must be discussed and approved by ABG's technical team before the installation/commencement of works.

With over 5 years' experience in the design, manufacture and supply of blue roofs throughout the UK, ABG can offer unparalleled experience and expertise in blue roof maintenance.

To discuss your specific maintenance requirements, please call our Buildings Team on 01484 354813, or alternatively send the team an email at: building@abgltd.com.

BLUE ROOF ATTENUATION AND OUTFLOW SUMMARY

PRIVATE & CONFIDENTIAL - NOT FOR DISTRIBUTION

Project Name: 19 Charterhouse Street, Farringdon, EC1N 6RA - Level 06 Roof 1

Prepared for: Davies Maguire
Date: 25/03/2025

ABG Project ID: ABG/P/24/001011 Calculator version: 1.37

Prepared by: Matt Gledhill, matthew.gledhill@abgltd.com

Notes/description: Mix of green roof, soft and hard landscaping - TBC. Potential for free-standing/ballasted,

PV panels, lighter-weight plant units or planters to be installed on top of the 'blue roof' system (recommended). Appropriate support for larger plant units TBC with ABG, and structural and M&E engineers. Maintenance or pedestrian/amenity access only - TBC.

Warm/inverted roof construction, with zero falls - TBC.

Document/Drawing references: 2352-DMAG-SK066A P01

Input Parameters - Rainfall Information (FEH22)

Return period: 2 years As supplied by Client
Allowance for Climate Change: 0 % As supplied by Client

OS grid reference selected for FEH data: TQ 31672 81731

Input Parameters - Roof Information

Total catchment area: 30 m² As supplied by Client
Attenuation area: 28 m² As supplied by Client
Maximum allowable runoff: 0.30 l/s As supplied by Client

Output - Rainfall Calculation Duration Time to Empty Restricted Outflow (I/s) 15 mins 0 hours and 10 minutes 0.06 30 mins 0 hours and 10 minutes 0.07 1 hour 0 hours and 20 minutes 0.08 2 hours 0 hours and 10 minutes 0.06 4 hours 0 hours and 0 minutes 0.01 0.01 6 hours 0 hours and 0 minutes 0.01 10 hours 0 hours and 0 minutes 0.00 24 hours 0 hours and 0 minutes 0.00 48 hours 0 hours and 0 minutes

Total attenuation required: 0.3 m³

Half empty time: The critical storm does not result in the storage reaching half full

Output - Recommended Blue Roof System

System Name: ABG blueroof VF HD 108mm

Description: Blue roof depth of 108mm. No. of control positions TBC by design team, and also cross-

referenced with the structural engineer's long-term deflection analysis. Additional 'tell-

tale' parapet overflow outlets, may also be added by the architect.

Total attenuation capacity: 2.7 m³ Number of Blue Roof outlets: 2

Notes:

- 1. This document contains an estimate which has been prepared by ABG Ltd and is illustrative only and not a detailed design.
- 2. Further details on the theories used in this estimate are available upon request from ABG. The values given for the performance of the system relate to testing, modelling and analysis of our systems obtained from laboratories and testing institutes. In line with our policy of continuous improvement the right is reserved to make changes to our systems without notice at any time.
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- 5. Final determination of the suitability of any information is the sole responsibility of the user. ABG will be pleased to discuss the use of this or any other product but responsibility for selection of a material and its application in any specific project remains with the user.

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www.abgltd.com

'Consultant' means ABG Geosynthetics Ltd and its legal successors. 'Client' means the person, firm, company or organisation for whom the Consultant is performing the Services. 'Agreement' means the contract referred to in Clause 2. 'Services' means the services to be performed by the Consultant in accordance with the proposal from the Consultant. 'Project' means the project or works for which the Client has commissioned the Services.

2. GENERAL

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contract between the Client and the Consultant which contract will be subject to any terms and conditions contained or referred to in the aforementioned proposal and these terms and conditions. In the event of any conflict, the terms and conditions in the proposal shall prevail over these terms and conditions. The Agreement so formed shall supersede all previous understandings, commitments or agreements whether written or oral between the Client and the Consultant relating to the subject matter hereof. No person or entity shall have any rights in relation to this Agreement, whether as third parties or otherwise, save the parties to this Agreement. Should any term or condition of this Agreement be held to be unenforceable or invalid by the courts of any jurisdiction to which it is subject then such term or condition shall be disregarded and the remaining terms and conditions shall remain in full force and effect.

3. PERFORMANCE OF SERVICES AND SCOPE

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aforesaid programme shall show the key dates for final information and the delivery of such to the Consultant so as to enable the Consultant to carry out the services in an efficient once through manner to achieve the programme delivery dates for the Services.

The Consultant provides various services including Design and Product use advice which is distinct from a Design Service. The Design Service may or may not attract a fee.

Where the Consultant's services are of an advisory nature and dependent upon the degree of information and release thereof by the Client then the Client agrees that any reliance placed on the services by the Client shall take due account of such constraints.

4. CONFIDENTIALITY AND INTELLECTUAL PROPERTY RIGHTS

i. The Consultant and the Client shall keep confidential all information pertaining to the Services.

ii. Copyright for all reports, documents and the like produced by the Consultant in the performance of the Services

shall remain vested with the Consultant but the Consultant shall grant an irrevocable royalty free license to the Client to use such reports, documents and the like for any purpose in connection with the Project.

5. LIABILITY

i. The Consultant shall be liable to pay compensation to the Client arising out of or in connection with this

Agreement only if a breach of the duty of care in Clause 3 is established against the Consultant.

ii. Notwithstanding any other term to the contrary in this Agreement or any related document and whether the cause of action for any claim arises under or in connection with the Agreement in contract or in tort, in negligence or for breach of statutory duty or otherwise the Consultant shall have no liability to the Client in respect of any claim for loss or damage arising from acts of war or terrorism or arising from flooding, burst water mains or failed drainage or arising from any incidence of toxic mould or asbestos but otherwise in relation to any cause of action as aforesaid the total liability of the Consultant in the aggregate for all claims shall be limited to a sum equivalent to ten (10) times the fee payable under this Agreement or £50,000, whichever is the lesser, or such other sum as may be expressly stated in the Consultant's proposal, and further but without prejudice to the aforesaid limit of liability any such liability of the Consultant shall be limited to such sum or sums as it would be just and equitable for the Consultant to pay having regard to the Consultant's responsibility for the same and on the basis that all other parties appointed or to be appointed by the Client to perform related services in connection with the Project shall be deemed to have provided undertakings on terms no less onerous than this Agreement and shall be deemed to have paid to the Client such contribution as it would be just and equitable for them to pay having regard to their responsibility for any loss or damage and providing that it shall be deemed that such other parties have not limited or excluded their liability to the Client for such loss or damage in any way which may be prejudicial to the Consultant's liability under this clause. Nothing in this clause shall operate to exclude or limit the Consultant's liability for death or personal injury.

iii. The Client shall indemnify and keep indemnified the Consultant from and against all claims, demands,

proceedings, damages, costs and expenses arising out of or in connection with this Agreement or the Project

arising from acts of terrorism or arising otherwise in excess of the liability of the Consultant under this

Agreement or which may be made in respect of events occurring after the expiry of the period of liability stated in this Agreement.

iv. No action or proceedings under or in connection with this Agreement shall be commenced against the Consultant after the expiry of one year from completion of the Services.

v. ABG Geosynthetics Ltd is not responsible for consequential, indirect or incidental losses.

The Consultant shall arrange Professional Indemnity Insurance cover for the amount stated in Clause 5(ii). The Consultant will use all reasonable endeavours to maintain Professional Indemnity Insurance cover for the period stated in 5(iv) above, providing such insurance remains available to the Consultant at commercially reasonable rates.

7. CLIENT'S OBLIGATIONS

The Client shall supply, without charge and in such time so as not to delay or disrupt the performance of the Consultant in carrying out the Services, all necessary and relevant information, in his possession or available to him from his other agents or consultants and all necessary approvals or consents. Any deviation on any information from the proposal shall be confirmed in writing and any attendant consequential fees will be forwarded for approval by the Client before any changes are made. The Consultant shall not be liable for any consequential delays on site. Every reasonable effort will be made to mitigate against delays, however no liability for losses and costs will be accepted. The approval or consent by the Client to the Services shall not relieve the Consultant from any liability under this Agreement. All work undertaken by the Consultant must be ratified and signed off by the Client.

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performed. The agreed invoice, or in the event of a dispute the undisputed element, shall be paid within 28 days of receipt of the invoice by the Client. Any invoice paid after this period will attract interest at 3% above the base

rate of the central bank of the country of the currency of payment along with any collection costs which may occur.

ii. The Client shall not withhold any payment of any sum or part of a sum due to the Consultant under this

Agreement by reason of claims or alleged claims against the Consultant unless the amount to be withheld has

been agreed between the Client and the Consultant as due to the Client or such sum arises from an award in adjudication, arbitration or litigation in favour of the Client and arises under or in connection with the Agreement.

Save as aforesaid all rights of set off at common law, in equity or otherwise which the Client may otherwise be entitled to exercise are hereby expressly excluded.

9. TERMINATION

If a party is in breach of a material term of this Agreement and despite written notice from the other party fails to

remedy such breach within 30 days or such other period as may be agreed between the parties, then the other party shall be entitled to terminate this Agreement forthwith. The Consultant may seek to recoup costs incurred for works completed prior to termination.

10. DISPUTE RESOLUTION

Any dispute between the parties that cannot be settled by mutual agreement shall be referred for final settlement to the arbitration of a person agreed between the parties or failing such agreement appointed upon the application of either party by the President of the Chartered Institute of Arbitrators and the said arbitration shall be carried out in accordance with the Construction Industry Model Arbitration Rules 1998 or such other version current at the time of the referral under this clause. Where the Agreement is subject to a governing law other than that of England and Wales then any dispute between the parties that cannot be settled by mutual agreement shall be finally settled by arbitration in accordance with the UNCITRAL Arbitration Rules by one arbitrator appointed in compliance with the said Rules. In either case such rules as appropriate are deemed to be incorporated into this Agreement by reference.

11. COMPLIANCE WITH LAWS

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BLUE ROOF ATTENUATION AND OUTFLOW SUMMARY

PRIVATE & CONFIDENTIAL - NOT FOR DISTRIBUTION

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Prepared by: Matt Gledhill, matthew.gledhill@abgltd.com

Notes/description: Mix of green roof, soft and hard landscaping - TBC. Potential for free-standing/ballasted,

PV panels, lighter-weight plant units or planters to be installed on top of the 'blue roof' system (recommended). Appropriate support for larger plant units TBC with ABG, and structural and M&E engineers. Maintenance or pedestrian/amenity access only - TBC.

As supplied by Client

As supplied by Client

Warm/inverted roof construction, with zero falls - TBC.

0 %

Document/Drawing references: 2352-DMAG-SK066A P01

Input Parameters - Rainfall Information (FEH22)

Return period: 30 years

OS grid reference selected for FEH data: TQ 31672 81731

Input Parameters - Roof Information

Allowance for Climate Change:

Total catchment area: 30 m² As supplied by Client
Attenuation area: 28 m² As supplied by Client
Maximum allowable runoff: 0.30 l/s As supplied by Client

Output - Rainfall Calculation Duration Time to Empty Restricted Outflow (I/s) 15 mins 1 hour and 0 minutes 0.19 30 mins 1 hour and 10 minutes 0.20 1 hour 1 hour and 10 minutes 0.20 2 hours 0 hours and 50 minutes 0.17 4 hours 0 hours and 20 minutes 0.09 6 hours 0 hours and 0 minutes 0.03 0.01 10 hours 0 hours and 0 minutes 0.01 24 hours 0 hours and 0 minutes 0.00 48 hours 0 hours and 0 minutes

Total attenuation required: 0.8 m³

Half empty time: The critical storm does not result in the storage reaching half full

Output - Recommended Blue Roof System

System Name: ABG blueroof VF HD 108mm

Description: Blue roof depth of 108mm. No. of control positions TBC by design team, and also cross-

referenced with the structural engineer's long-term deflection analysis. Additional 'tell-

tale' parapet overflow outlets, may also be added by the architect.

Total attenuation capacity: 2.7 m³

Number of Blue Roof outlets: 2

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Attenuation area: 28 m² As supplied by Client
Maximum allowable runoff: 0.30 l/s As supplied by Client

Output - Rainfall Calculation Duration Time to Empty Restricted Outflow (I/s) 15 mins 1 hour and 20 minutes 0.22 30 mins 1 hour and 30 minutes 0.24 1 hour 1 hour and 20 minutes 0.23 2 hours 1 hour and 10 minutes 0.21 4 hours 0 hours and 40 minutes 0.13 0.06 6 hours 0 hours and 10 minutes 0.02 10 hours 0 hours and 0 minutes 0.01 24 hours 0 hours and 0 minutes 0.00 48 hours 0 hours and 0 minutes

Total attenuation required: 1 m³

Half empty time: The critical storm does not result in the storage reaching half full

Output - Recommended Blue Roof System

System Name: ABG blueroof VF HD 108mm

Description: Blue roof depth of 108mm. No. of control positions TBC by design team, and also cross-

referenced with the structural engineer's long-term deflection analysis. Additional 'tell-

tale' parapet overflow outlets, may also be added by the architect.

Total attenuation capacity: 2.7 m³

Number of Blue Roof outlets: 2

Notes:

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- 5. Final determination of the suitability of any information is the sole responsibility of the user. ABG will be pleased to discuss the use of this or any other product but responsibility for selection of a material and its application in any specific project remains with the user.

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contract between the Client and the Consultant which contract will be subject to any terms and conditions contained or referred to in the aforementioned proposal and these terms and conditions. In the event of any conflict, the terms and conditions in the proposal shall prevail over these terms and conditions. The Agreement so formed shall supersede all previous understandings, commitments or agreements whether written or oral between the Client and the Consultant relating to the subject matter hereof. No person or entity shall have any rights in relation to this Agreement, whether as third parties or otherwise, save the parties to this Agreement. Should any term or condition of this Agreement be held to be unenforceable or invalid by the courts of any jurisdiction to which it is subject then such term or condition shall be disregarded and the remaining terms and conditions shall remain in full force and effect.

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Where the Consultant's services are of an advisory nature and dependent upon the degree of information and release thereof by the Client then the Client agrees that any reliance placed on the services by the Client shall take due account of such constraints.

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ii. Copyright for all reports, documents and the like produced by the Consultant in the performance of the Services

shall remain vested with the Consultant but the Consultant shall grant an irrevocable royalty free license to the Client to use such reports, documents and the like for any purpose in connection with the Project.

5. LIABILITY

i. The Consultant shall be liable to pay compensation to the Client arising out of or in connection with this

Agreement only if a breach of the duty of care in Clause 3 is established against the Consultant.

ii. Notwithstanding any other term to the contrary in this Agreement or any related document and whether the cause of action for any claim arises under or in connection with the Agreement in contract or in tort, in negligence or for breach of statutory duty or otherwise the Consultant shall have no liability to the Client in respect of any claim for loss or damage arising from acts of war or terrorism or arising from flooding, burst water mains or failed drainage or arising from any incidence of toxic mould or asbestos but otherwise in relation to any cause of action as aforesaid the total liability of the Consultant in the aggregate for all claims shall be limited to a sum equivalent to ten (10) times the fee payable under this Agreement or £50,000, whichever is the lesser, or such other sum as may be expressly stated in the Consultant's proposal, and further but without prejudice to the aforesaid limit of liability any such liability of the Consultant shall be limited to such sum or sums as it would be just and equitable for the Consultant to pay having regard to the Consultant's responsibility for the same and on the basis that all other parties appointed or to be appointed by the Client to perform related services in connection with the Project shall be deemed to have provided undertakings on terms no less onerous than this Agreement and shall be deemed to have paid to the Client such contribution as it would be just and equitable for them to pay having regard to their responsibility for any loss or damage and providing that it shall be deemed that such other parties have not limited or excluded their liability to the Client for such loss or damage in any way which may be prejudicial to the Consultant's liability under this clause. Nothing in this clause shall operate to exclude or limit the Consultant's liability for death or personal injury.

iii. The Client shall indemnify and keep indemnified the Consultant from and against all claims, demands,

proceedings, damages, costs and expenses arising out of or in connection with this Agreement or the Project

arising from acts of terrorism or arising otherwise in excess of the liability of the Consultant under this

Agreement or which may be made in respect of events occurring after the expiry of the period of liability stated in this Agreement.

iv. No action or proceedings under or in connection with this Agreement shall be commenced against the Consultant after the expiry of one year from completion of the Services.

v. ABG Geosynthetics Ltd is not responsible for consequential, indirect or incidental losses.

The Consultant shall arrange Professional Indemnity Insurance cover for the amount stated in Clause 5(ii). The Consultant will use all reasonable endeavours to maintain Professional Indemnity Insurance cover for the period stated in 5(iv) above, providing such insurance remains available to the Consultant at commercially reasonable rates.

7. CLIENT'S OBLIGATIONS

The Client shall supply, without charge and in such time so as not to delay or disrupt the performance of the Consultant in carrying out the Services, all necessary and relevant information, in his possession or available to him from his other agents or consultants and all necessary approvals or consents. Any deviation on any information from the proposal shall be confirmed in writing and any attendant consequential fees will be forwarded for approval by the Client before any changes are made. The Consultant shall not be liable for any consequential delays on site. Every reasonable effort will be made to mitigate against delays, however no liability for losses and costs will be accepted. The approval or consent by the Client to the Services shall not relieve the Consultant from any liability under this Agreement. All work undertaken by the Consultant must be ratified and signed off by the Client.

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rate of the central bank of the country of the currency of payment along with any collection costs which may occur.

ii. The Client shall not withhold any payment of any sum or part of a sum due to the Consultant under this

Agreement by reason of claims or alleged claims against the Consultant unless the amount to be withheld has

been agreed between the Client and the Consultant as due to the Client or such sum arises from an award in adjudication, arbitration or litigation in favour of the Client and arises under or in connection with the Agreement.

Save as aforesaid all rights of set off at common law, in equity or otherwise which the Client may otherwise be entitled to exercise are hereby expressly excluded.

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If a party is in breach of a material term of this Agreement and despite written notice from the other party fails to

remedy such breach within 30 days or such other period as may be agreed between the parties, then the other party shall be entitled to terminate this Agreement forthwith. The Consultant may seek to recoup costs incurred for works completed prior to termination.

10. DISPUTE RESOLUTION

Any dispute between the parties that cannot be settled by mutual agreement shall be referred for final settlement to the arbitration of a person agreed between the parties or failing such agreement appointed upon the application of either party by the President of the Chartered Institute of Arbitrators and the said arbitration shall be carried out in accordance with the Construction Industry Model Arbitration Rules 1998 or such other version current at the time of the referral under this clause. Where the Agreement is subject to a governing law other than that of England and Wales then any dispute between the parties that cannot be settled by mutual agreement shall be finally settled by arbitration in accordance with the UNCITRAL Arbitration Rules by one arbitrator appointed in compliance with the said Rules. In either case such rules as appropriate are deemed to be incorporated into this Agreement by reference.

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This Agreement shall be governed by and construed in accordance with the law of England and Wales unless stated otherwise in the proposal for services from the Consultant.

BLUE ROOF ATTENUATION AND OUTFLOW SUMMARY

PRIVATE & CONFIDENTIAL - NOT FOR DISTRIBUTION

Project Name: 19 Charterhouse Street, Farringdon, EC1N 6RA - Level 06 Roof 1

Prepared for: Davies Maguire
Date: 25/03/2025

ABG Project ID: ABG/P/24/001011 Calculator version: 1.37

Prepared by: Matt Gledhill, matthew.gledhill@abgltd.com

Notes/description: Mix of green roof, soft and hard landscaping - TBC. Potential for free-standing/ballasted,

PV panels, lighter-weight plant units or planters to be installed on top of the 'blue roof' system (recommended). Appropriate support for larger plant units TBC with ABG, and structural and M&E engineers. Maintenance or pedestrian/amenity access only - TBC.

Warm/inverted roof construction, with zero falls - TBC.

Document/Drawing references: 2352-DMAG-SK066A P01

 Input Parameters - Rainfall Information (FEH22)

 Return period:
 100 years
 As supplied by Client

 Allowance for Climate Change:
 40 %
 As supplied by Client

OS grid reference selected for FEH data: TQ 31672 81731

Input Parameters - Roof InformationTotal catchment area:30 m²As supplied by ClientAttenuation area:28 m²As supplied by ClientMaximum allowable runoff:0.30 l/sAs supplied by Client

Output - Rainfall Calculation Duration Time to Empty Restricted Outflow (I/s) 15 mins 1 hour and 40 minutes 0.27 30 mins 1 hour and 50 minutes 0.29 1 hour 1 hour and 50 minutes 0.29 2 hours 1 hour and 40 minutes 0.27 4 hours 1 hour and 0 minutes 0.19 6 hours 0 hours and 30 minutes 0.11 0.03 10 hours 0 hours and 0 minutes 0.01 24 hours 0 hours and 0 minutes 0 hours and 0 minutes 0.01 48 hours

Total attenuation required: 1.5 m³ Half empty time: 0 hours and 10 minutes.

Output - Recommended Blue Roof System

System Name: ABG blueroof VF HD 108mm

Description: Blue roof depth of 108mm. No. of control positions TBC by design team, and also cross-

referenced with the structural engineer's long-term deflection analysis. Additional 'tell-

tale' parapet overflow outlets, may also be added by the architect.

Total attenuation capacity: 2.7 m³
Number of Blue Roof outlets: 2

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