ACO Blue Roof Guide

THE ULTIMATE SUDS SYSTEM - ON A ROOF

Foreword

There is little question that water is one of the most important and life-supporting staples we have, yet industrialised society has spent over two and half centuries treating it as though there is an unlimited supply. We are now seeing urbanisation and population growth dramatically increase the need for clean water, though not enough is being done to ensure a reliable and safe supply of this finite resource.

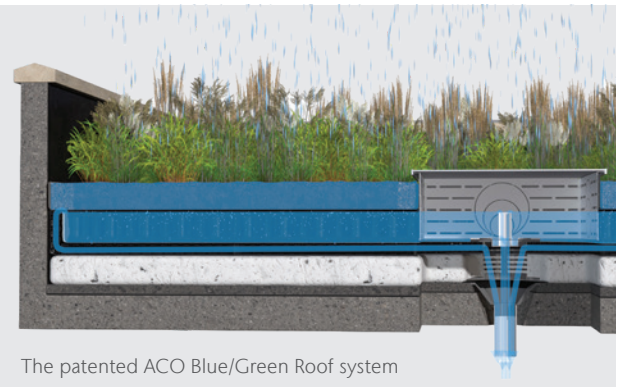
At the same time, British sewerage infrastructure has been revealed to be unfit for purpose and climate change is ushering in a rapid rise in the frequency of extreme weather. A sharp focus is needed on managing flood risk.

Rainfall in the UK in 2020 was around 25% greater than it was fifty years ago. Government rainfall data shows that since 1970, there has been a consistent upward trend in the amount of rain experienced each year. The current state of UK drainage infrastructure means that flooding is only going to get worse as the amount of annual rainfall continues to increase.

What is clear is that something will need to change soon. Either we learn to adapt our buildings to slow rainwater discharge or enable its on-site dispersion mitigating flood risk, or we experience a drastic decline in our quality of life as sewerage systems continue to overflow into streams and oceans, farmland floods, and roads become dilapidated far sooner than anticipated. Every effort across the construction industry is being made to meet the first scenario, and blue roofs are being increasingly hailed as a potential solution, allowing for the capture and slow release of rainwater, preventing sewerage from being overwhelmed and creating opportunities for reuse of rainwater at a later date.

The cost and time needed to upgrade the UK sewerage system is substantial and not likely to be completed any time soon. Blue roofs mitigate many of the problems exacerbated by outdated sewerage systems and should be given serious consideration for many developments and retrofit projects. In heavily urbanised areas, blue roofs forgo the need for underground tanks or basement level drainage which can be costly and even impossible In some for many cases.

Beyond the goodwill and coming together of industry professionals, there are also higher powers in play from the UK Government. The proposed commencement of Schedule 3 of the Flood and Water Management Act 2010 means that sustainable drainage solutions (SuDS) will become mandatory for many developments.



The patented ACO Blue/Green Roof system

As such, those involved in building design, whether they be architects, roofing contractors, or construction professionals, will benefit from an increased understanding of the issues around blue roofs and what options and assistance is available.

Under Schedule 3, developments of multiple dwelling or properties over 100m^2 must manage water on site rather than sending it directly to the sewer. This will not only protect the sewerage systems the country relies upon, but save the carbon used to process rainwater that runs into storm drains. For blue roof applications specifically, the water captured can be reused to water plants, further increasing the sustainability of the entire system.

As development projects continue to evolve to better manage rainwater, the UK will become more resilient to storms, more ecologically responsible, and able to slow the impacts of climate change. Those involved in blue roof projects can find assistance and expertise at ACO. Our team has an extensive range of solutions to suit any project, and the knowledge and experience to help ensure any blue roof project is a success story that contributes to the UK's greener future.

Kevin Bohea, Managing Director
ACO Building Drainage

ACO's Experience and Expertise on Blue Roofs

Climate change is one of the most significant challenges facing the planet and we at ACO are well-versed in drainage and well-placed to help tackle them. Urban environments are facing increased challenges from the growing frequency and severity of storms. It is this very real danger to people and the planet that drives ACO to continually be at the forefront of drainage innovation.

With an established history in several aspects of sustainable drainage systems (SuDS), ACO has evolved to meet the growing need for resilient water management strategies. Our experience spans a variety of projects where blue roofs have been critical in addressing urban water challenges while contributing to broader sustainability goals.

Our ethos is 'we care for water', and it has led us to become experts in regulations around sustainable drainage and best practice when it comes to compliance for blue roof construction.

Solutions to support SuDS

ACO's blue roof systems provide viable, effective solutions for urban drainage challenges, particularly in dense cities where traditional SuDS installations would face limitations. A standout product, ACO's RoofBloxx system, offers a highly adaptable approach to blue roof design. Working independently from the building's main roofing system, ACO's RoofBloxx reduce risks such as water ingress and drainage failure, while optimising stormwater retention. ACO works with selected roofing partners who can offer single point warranties on the full roof build-up.

The modular nature of RoofBloxx gives architects the flexibility to integrate blue roofs into both new builds and retrofit projects, allowing for efficient water management even in space-constrained urban environments. The system captures rainwater and gradually releases it at a controlled rate, helping prevent run-off during peak rainfall. It is also possible to incorporate green roof components, boosting biodiversity and enhancing air quality.

ACO's blue roof solutions have been successfully implemented in numerous urban projects. One notable example is Dublin's first blue green roof at Chelmsford Road, where ACO's RoofBloxx provided critical stormwater management while supporting vegetation that reduced the urban heat island effect. At The Acre in London, ACO's RoofBloxx system navigated complex logistical challenges to ensure effective water management, even amidst competing rooftop building services like solar panels.

Meet the Expert

Neill Robinson Welsh
Blue Roof Consultant
BA(Hons) DipM FRSA

Time with ACO:
13 years with ACO (7 directly, 6 as consultant)

Number of blue roof projects:
750 blue roof projects

Neill has over 35 years industry experience representing construction product manufacturers in building and civils drainage. He has contributed to several industry guidance documents including C753 The SuDS Manual and C768 Guidance on the Construction of SuDS as well as sitting on several BSI and CEN technical committees relating to flood risk, water re-use and geocellular storage systems.

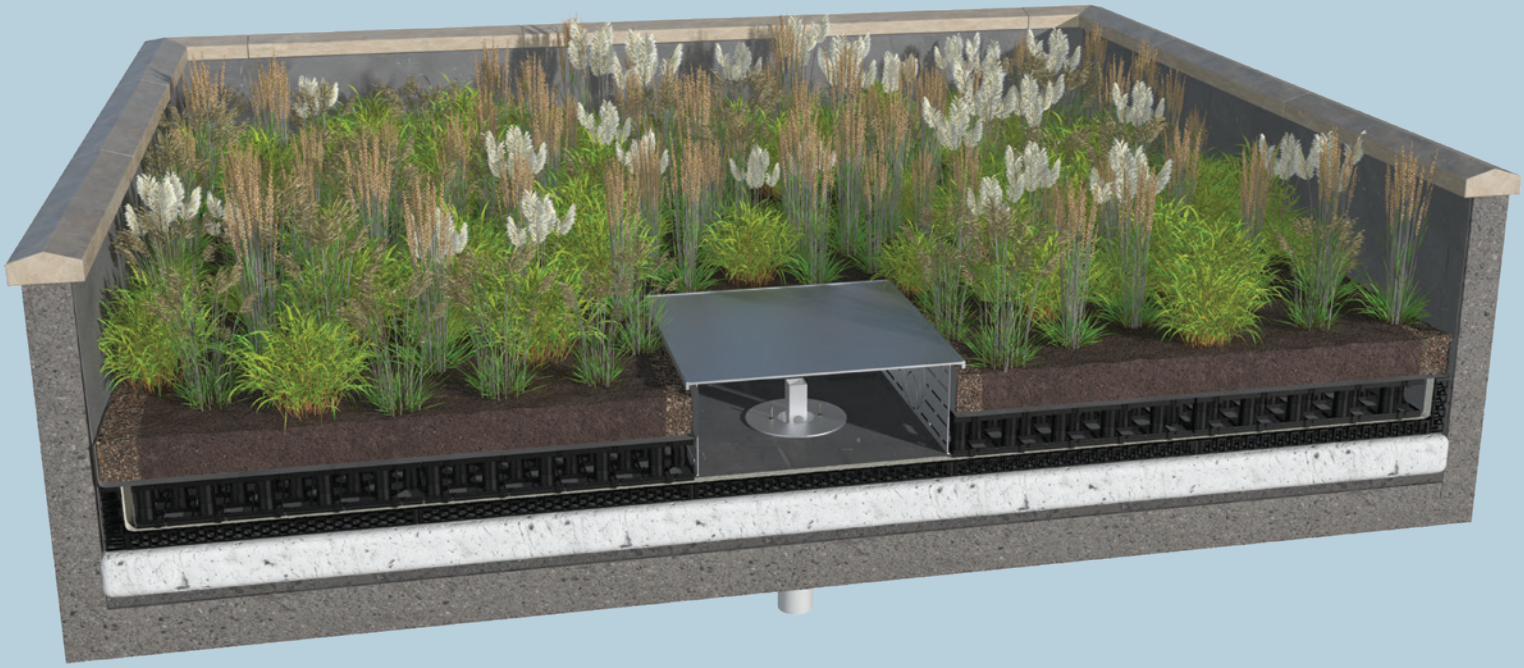
"Blue roofs hold the keys to unlock sustainable drainage in urban environments. Long term sustainability, especially in cities, must include the wide-spread adoption of blue and blue green roofs."

As new regulations come into play, such as Schedule 3 of the Flood and Water Management Act, ACO's systems ensure compliance with British Standards while managing water, building climate resilience, supporting urban ecosystems, and ensuring the sustainability of cities as they grow and face future climate challenges.

Schedule 3 of the Flood and Water Management Act 2010 provides a framework for the approval, adoption and maintenance of drainage systems and makes the right to connect surface water run-off to public sewers conditional upon the drainage system being approved before any construction work can start.

We will likely never know the exact amount of water and carbon saved by the implementation of blue roofs, nor will we know how many birds, bats and insects are better able to thrive thanks to blue green roofs. What we do know is that water is precious and needs to be better cared for. With sustainable drainage solutions in place, water sustainability and a healthier ecosystem are no longer pipe dreams but achievable goals within the near future.

What is a Blue Roof?



The rise of urbanisation, combined with the frequency of stormwater incidents, has resulted in blue roofs emerging as a popular forward-thinking solution. Major cities, including London, New York City and Amsterdam have already realised the potential of blue roofs. Dublin is one of the latest cities to join that list, following the completion of its first installation on a residential apartment building in 2022, shortly after Dublin City Council introduced a Blue Green Roof policy.

So, what exactly are blue roofs?

Put simply, blue roofs are designed to temporarily store rainwater and slow its release. However, while their name may suggest otherwise, they are technically not roofs – an all-too common assumption which needs to be highlighted.

Blue roofs are distinct attenuation systems that sit on top of a roof and and should function separately. This distinction is important because the standards for traditional roofs promote the fast removal of rainwater, whereas blue roofs are designed to retain water for specific periods to control flooding and potentially reuse the water. As such, they should be treated as separate systems.

Blue roofs are often required when other SuDS solutions are not practicable, largely due to a lack of space around the development in question. They enhance green urbanisation as they provide an opportunity for passive irrigation and water re-use, while they can help prevent pollution by stopping untreated surface water from overflowing into rivers and streams during periods of heavy rain.

Compliance Considerations

Designing blue roofs is complex due to the lack of definitive design guidance for compliance with existing standards and regulations. Their installation requires input from a range of disciplines, including architectural, mechanical, civils and structural, meaning greater collaboration and co-ordination is a necessity to deliver a fully functional system that complements all aspects of building design.

The aforementioned rise of urbanisation in major cities across the UK and Ireland means that any available land is a precious commodity. Given that every square foot of available land is extremely valuable, traditional free-standing attenuation systems which are often installed in basements are less desirable thanks to their larger footprint. By incorporating a blue roof, developers can maximise the building's footprint and reduce on going energy costs, enhancing return on investment.

The Two Approaches to Blue Roof Design

When designing a roof, the principle of 'form follows function' is key. This is especially true for blue roofs.

In the UK, we tend to see two approaches to designing a blue roof:

1. Treating the blue roof as a roofing system.
2. Viewing the blue roof as an attenuation system placed on top of a flat roof, making it a separate entity from the roof itself.

APPROACH 1:

Treating the blue roof as a roof

As previously discussed, blue roofs can be mistakenly viewed as the roof itself. By considering a blue roof as a roofing system, it fundamentally changes the design approach. This scenario is similar to that of designing a vehicle that excels both off-road and on a racetrack – it is almost an impossible task. The result is often a compromise that doesn't fully meet either requirement.

Applying this to a roof scenario, a hybrid design means that the blue roof must balance water retention with the structural integrity and waterproofing needs of a traditional roof. Any scenario where there is a balancing act will involve several critical design choices, each with its own set of compromises. These compromises can in turn increase risk and make it challenging to comply with existing building standards and regulations.

This is not an approach ACO recommends.

APPROACH 2:

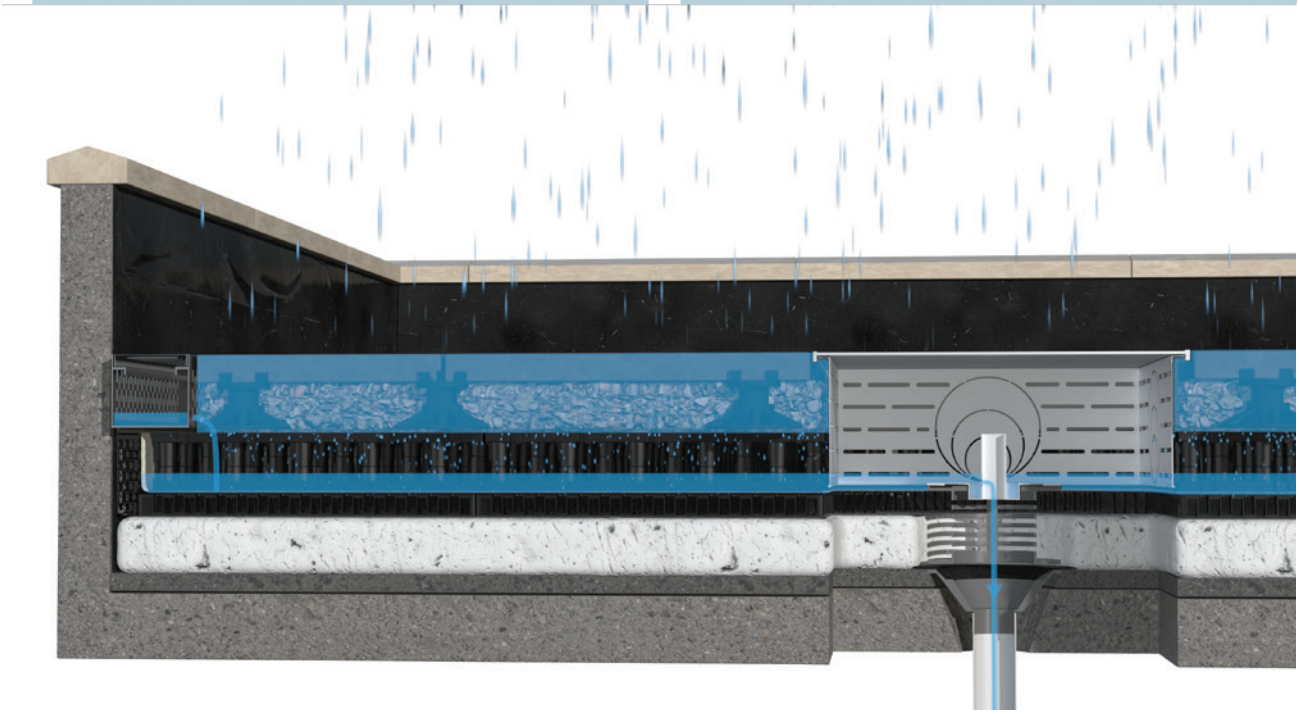
Blue roofs as an attenuation system

The second approach seen in the UK treats blue roofs as an attenuation system that sits on top of a flat roof. As previously explained, this method separates the water management function from the primary waterproofing function, allowing each system to be designed optimally. Crucially, no compromise is required.

As there is no compromise, risks are minimised. From an engineering perspective, this method ensures both the roof and attenuation system comply with building standards, regulations and best practices, while designers can focus on maximising efficiency and the effectiveness of each component.

Treating the blue roof as an attenuation system therefore offers a more logical and risk-averse solution.

This is the approach ACO recommends.



Five Key Considerations for Blue Roof Design

When it comes to designing blue roofs, careful consideration is required to ensure both functionality and compliance with regulations. Here are some of the most important factors to bear in mind.

1 Roof slope

One of the biggest challenges in blue roof design is determining the appropriate slope. Conventional flat roofs are typically designed with a slight fall — usually between 1:80 and 1:40 — to direct water toward drainage outlets. This helps prevent water pooling and reduces the risk of leaks.

This poses a significant design challenge because even a small slope can dramatically reduce the volume of water a blue roof can store. To address this, blue roof designs should incorporate a separate attenuation system to manage water, rather than relying on the roof's natural slope. By doing this, you avoid the risk of reduced water storage while maintaining the roof's structural integrity.

2 Quick vs. slow

Another crucial design consideration for blue roofs is balancing the need for efficient drainage with stormwater retention requirements. Roof drainage systems for conventional roofs quickly remove water to reduce the likelihood of leaks or any structural damage. These systems are typically built to handle short, intense rainstorms and drain the roof rapidly whereas blue roofs are designed to retain water for periods up to 48 hours and drain slowly. This slower drainage can present a challenge as the longer water sits on a roof, the more likely it is to cause damage or leaks.

3 Exceedance events

When designing a blue roof, it is essential to consider how the system will perform during events where the roof is overwhelmed by storms that exceed its design capacity or when blockages occur. In these situations, the roof must be able to drain quickly to prevent structural overload or water ingress into the building.

This is where proper drainage planning becomes critical. A well-designed blue roof should incorporate functions that allow for fast drainage under extreme conditions. Blue roofs designed as attenuation systems that are separate from the roofing structure and gravity drainage system offer greater flexibility, allowing the roof to handle these events without compromising on building integrity.

4 Retention for reuse

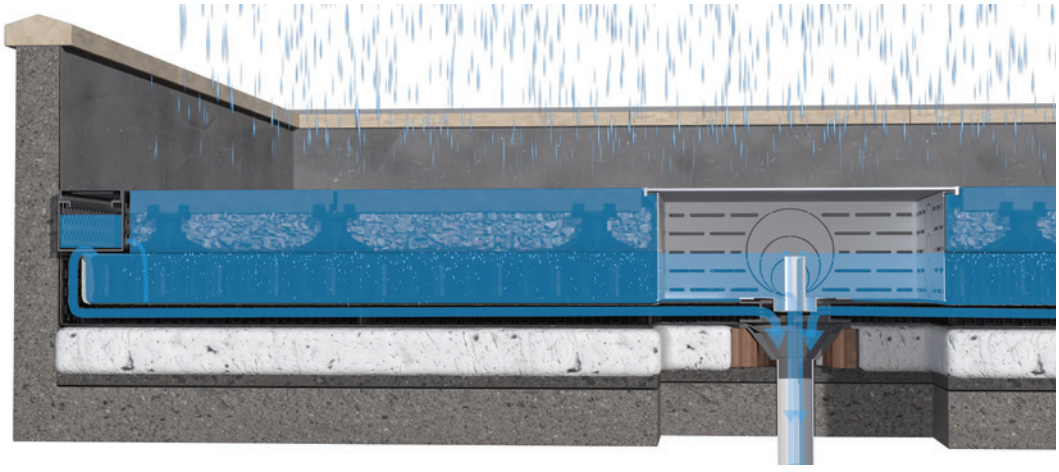
One of the key advantages of blue roofs is their potential to store water for reuse, such as irrigation for green roofs or other landscape features. However, this introduces another layer of complexity into the design. SuDS guidelines typically require that blue roofs drain half their volume within 24 hours, but for water reuse, a portion of that stored water must be retained for longer periods.

Designing the blue roof as a separate attenuation system addresses this challenge by allowing water to be retained for reuse without compromising the roof's waterproofing or its ability to handle subsequent storms.

5 Managing structural load

Finally, the structural load on the building is a critical consideration when designing a blue roof. Blue roofs add significant weight due to the volume of water they need to accommodate and drain. This extra load must be factored into the roof's design, particularly when dealing with inverted roofs, where insulation buoyancy and U-values may also be affected. These issues can be mitigated through the use of a separate attenuation system on the roof, like ACO RoofBloxx.

Addressing these considerations early in the design phase means blue roofs can be optimised to enhance urban resilience while ensuring compliance with building regulations and best practices.



Collaboration for Compliance

Sustainable water management has become increasingly important over the past decade and collaboration between disciplines needs to be high on the agenda as it is critical to the success of solutions such as blue roofs.

The complexity of blue roof systems means that collaboration is essential to compliance with building standards and regulations, and to create a system that meets both engineering and environmental objectives.

Early engagement

The foundation of any successful blue roof project lies in early engagement between key players. Civil engineers, architects, mechanical engineers, roofing contractors, and drainage manufacturers all have a role in implementing a blue roof that integrates with the building's design and manages water efficiently. From a project's earliest stages, these specialists must be aligned with one another and factor each discipline's requirements into the design.

This early collaboration is especially important because blue roofs are a relatively novel concept and design guidance is still evolving. As such, it is vital to get input from all relevant disciplines to avoid design flaws that may compromise the roof's performance or lead to non-compliance with regulations. Working together during the planning phase allows potential issues to be addressed before they become costly problems during construction.

Engineering expertise

One of the most significant areas requiring close collaboration is between civil and structural engineers. Civil engineers are typically responsible for designing the hydraulic performance of the blue roof, ensuring it can store and slowly release stormwater without overwhelming local drainage systems. This involves complex calculations around rainfall events, water retention, and discharge rates.

Structural engineers, on the other hand, must ensure the building can safely bear the additional load imposed by the blue roof's water storage. The weight of the added water can be significant so failure to account for this during the structural design phase could lead to safety concerns, especially in extreme rainfall events when the load will be at its heaviest. By working closely together, civil and structural engineers can design a blue roof that balances water retention with structural integrity.

Collaboration between roofing contractors and mechanical engineers is equally crucial. Roofing contractors need to ensure that the system is watertight, durable, and compliant with the latest building regulations. Meanwhile, mechanical engineers have a key role in integrating

drainage systems so that water flows from the roof in a controlled manner without interfering with other building services.

This collaboration should include decisions on the choice of materials and design features like penetrations for skylights, vents, or photovoltaic panels. Each one is a potential weak point in the roof's waterproofing, and poor integration could lead to leaks or failures. Early engagement between those involved allows for the selection of materials that complement one another and ensure the roof's long-term performance and compliance.

Navigating compliance

The complexity of blue roofs means that compliance with building standards and planning requirements can be challenging. In the UK, for example, blue roofs must meet both SuDS guidelines for stormwater management and building regulations that cover roof construction and drainage. Collaboration between design and engineering teams is critical to navigating this regulatory landscape.

Successful collaboration does not end once the design is complete. During construction and post-installation, ongoing communication between disciplines ensures that the blue roof performs as expected and remains compliant. This ongoing dialogue is particularly important in cases where unexpected issues arise, such as drainage blockages or structural concerns. Having a collaborative framework in place makes it easier to address these issues quickly and efficiently.

CASE STUDY

Dublin's First Ever Blue Green Roof

Client:	Clonvara Developments
Application:	Retrofit Blue Green Roof
Location:	Ranelagh, County Dublin
Main Contractor/Engineer:	SCD Consulting
Subcontractor:	Beton Construction Services
No. of RoofBloxx Units:	240 units, 85mm deep
Attenuation Tank Capacity:	3.77m³
Flow Rate:	0.28 l/s

Newly in place regulations in Dublin meant developers of a three-storey residential apartment building needed to implement a blue green roof to secure planning permission. Collaborating with Beton Construction Services, ACO designed and specified a blue green system to manage stormwater runoff, combat climate change, and enhance urban biodiversity and amenity, setting a precedent as the first of its kind in the city.

In 2021, Clonvara Developments focused on transforming 47-48 Chelmsford Road in Ranelagh, County Dublin, into a residential complex. Under Dublin City Council's (DCC) recently implemented Green Blue Roof Policy, developments with roof areas exceeding 100m² must incorporate a blue green roof. As Dublin is densely built up, sustainable urban drainage systems (SuDS) are vital.

This saw Beton Construction Services, a subcontractor in surface protection services, engaged by SCD Consulting as a specialist contractor to design and install the blue green roof. ACO Building Drainage consulted on the attenuation system, hydraulic calculations and rainfall event modelling, and supplied patented RoofBloxx solutions, which form the attenuation tank on the building's roof.

Separating systems

ACO assessed the hydraulic requirements based on a 1 in 100-year rainfall event while considering a 40% uplift for climate change. With the catchment area totalling 131.8m², ACO specified its RoofBloxx attenuation system to be installed on an inverted blue roof.

The ACO system created an elevated shallow structural attenuation system independent of the flat roof drainage system. This approach ensured the roof met known standards and best practices, allowing for efficient drainage during extreme weather events.

Because the ACO system does not have the roof's waterproofing layer serve as an attenuation liner, it significantly reduces risk, prevents insulation buoyancy, and maintains the building's U-values. Rainfall is captured in the open-top tank, discharged through a flow restrictor at 0.28 l/s, and channelled into the perimeter gravity drainage system. In extreme conditions, rainfall bypasses the attenuation system through internal overflows and roof outlets.

In total, 240 RoofBloxx units, each 85mm thick, were used to create the blue roof, in two layers, providing 3.77m³ of stormwater storage capacity.

Dan O'Connor, Business Development Manager at Beton, said: *"We turned to ACO because we know they not only have innovative products like the RoofBloxx system, but they have the knowledge, experience, and assisting tools to make sure that the job runs smoothly. With ACO's support, the project was swiftly granted planning approval, and we and the developers have peace of mind that the roof is protected for years to come."*

Sean Drudy from SCD Consulting added: *"We were very happy with the end result and found the technical design and documentation offered along with the installation and performance on site to be to a first-class standard."*

Green gains

Beyond stormwater management, the blue roof aids cooling in summer, by mitigating the urban 'heat island' effect. Stored water irrigates a green roof, providing greenery that attracts wildlife and promotes biodiversity. The plants also reduce CO_2, making the building more environmentally friendly.

Neill Robinson-Welsh, Consultant for ACO, said: *"Caring for water will only become more important as the issue of water resilience grows. Thanks to our collaboration with the team at Beton, we have constructed a roof that performs multiple functions, ensuring sure that rainwater is not only slowed down but put to good use."*

CASE STUDY

Higher Education: Blue Roof Playground at London School

Client:	Madani Girls' School
Application:	Blue Green Playground Roof
Location:	Tower Hamlets, London
Main Contractor/Engineer:	ACO Building Drainage and Aquality
Subcontractor:	Plumbsa Plumbing Ltd
No. of RoofBloxx Units:	1020
Attenuation Tank Capacity:	96.3m³
Flow Rate:	0.3 l/s

Madani Girls' School in Tower Hamlets, London, partnered with ACO Building Drainage and Aquality to construct a blue green roof that doubles as a rooftop playground. This innovative solution addresses the school's need to manage surface water runoff from its new extension while maximising outdoor space for students.

To enhance the school's facilities, plans were made to add a library, IT suite and sports hall, however, the only viable location was within the existing playground. To preserve outdoor play areas, the project team decided to convert the roof space of the new building into a playground for pupils.

One of the primary challenges was the council's requirement that surface water discharges at an appropriate rate to prevent downstream flooding, an essential factor in densely populated urban settings.

Another challenge was that, due to the school already being located in a built-up area, infiltration and other sustainable urban drainage systems (SuDS) methods were not feasible. Installing an attenuation tank underground would have meant excavating the playground and transporting the dug-up earth off-site, which would have been too disruptive and costly, leaving rooftop attenuation as the only practical solution.

A sustainable solution

The project team identified a blue roof as an ideal solution for managing surface water while providing multifunctional use of the rooftop. However, only preliminary calculations and feasibility outlines had been presented at the planning stage.

To refine the design, Plumbsa Plumbing Ltd, the subcontractor responsible for the roofing and plumbing, sought expertise from Aquality for hydraulic design and calculations and ACO for the RoofBloxx geocellular tank, roof outlets, and flow control. Following best practice, the complete blue roof attenuation system was designed to discharge at a maximum rate of 0.3 l/s and accommodate a one-in-100-year rainfall event, factoring in a 40% increase for climate change.

Highlighting the system's versatility, a porous asphalt playground was constructed over the tank, allowing rainwater to filter through. Surrounding the playground, an extensive green roof was added, providing a biodiverse environment for students.

Project impact

Neill Robinson-Welsh, Consultant at ACO, remarked, *"The extension at Madani Girls' School has been a challenging yet rewarding project. It's essential to preserve outdoor play areas in urban schools, and this project showcases how blue roof systems can deliver numerous benefits while meeting planning conditions."*

Ali Adan from Plumbsa Plumbing Ltd added, *"After discussions with Neill and the teams at ACO and Aquality, we were very pleased with the end result of the ACO RoofBloxx blue roof. It goes to show that even in some of the most difficult projects, rainwater can be managed with sustainability and amenity in mind, and SuDS principles can be followed."*

The blue roof at Madani Girls' School now prevents flooding while retaining valuable outdoor areas for learning and play. This initiative exemplifies the innovative integration of blue green roofs into urban educational settings, promoting sustainability and enhanced learning environments.

CASE STUDY

(Retro)fit for Purpose: A Blue Roof for Queen's Gate Place Mews

Client:	The Lodge at Queen's Gate Place Mews
Application:	Retrofit Blue Roof
Location:	Kensington, London
Main Contractor/Engineer:	Keystone Construction and Aquality
Subcontractor:	As above
No. of RoofBloxx Units:	55 (60mm depth 2 x 30mm)
Attenuation Tank Capacity:	0.80m³
Flow Rate:	0.07 l/s

A successful blue roof retrofit project was carried out on an extended building in central London, using ACO Building Drainage's innovative RoofBloxx attenuation system. This project presented significant challenges, particularly in managing water runoff while adhering to sustainable urban drainage system (SuDS) requirements set by The Royal Borough of Kensington and Chelsea (RBKC).

Nestled in Kensington's Queen's Gate conservation area, Queen's Gate Place Mews is a prestigious location with cobbled walkways and charming London façades. The Lodge at Queen's Gate Place Mews was revamped and extended with a mansard roof to add a second storey. A critical aspect of this renovation involved controlling rainwater runoff from the new roof.

Collaborative efforts for compliance

To meet planning criteria, principal contractors Keystone Construction partnered with Aquality, a rainwater harvesting specialist, and ACO Building Drainage. The objective was to retrofit a blue roof attenuation system without compromising the mansard roof' integrity. This system needed to retain water on the roof while managing the runoff rate effectively.

Consultations with various blue roof manufacturers revealed that most were unwilling to take on the project due to the roof's limited area and the complexity of maintaining water on the surface. However, Aquality and ACO stepped in with a solution.

Innovative design solutions

The need for compliance with planning conditions made controlling runoff necessary for mitigating flood risks and reducing pressure on the sewerage system. By retrofitting a standalone blue roof, Aquality was able to install the ACO system independently on top of the existing roof structure.

In urban settings, underground tanks are often impractical due to space constraints. For Queen's Gate, this meant that a below-ground tank was not an option, so Neill Robinson-Welsh, consultant at ACO, collaborated with Aquality to design an above-roof attenuation system. The RoofBloxx cells, with a footprint of 13m² and two layers measuring 30mm each, can manage extreme rainfall and control runoff at a rate of 0.07 l/s.

The system features a free-draining edge upstand, with a drainage layer on the roof gradient. A geotextile membrane sits above this layer with the roof fall built out to create a level invert for the open tank, which is part of ACO's patented system. A geomembrane was installed inside and detailed around the soil pipe, followed by the placement of RoofBloxx Cell units to create the necessary attenuation void.

Efficient and Accessible Maintenance

The installation was completed in under a day due to ACO RoofBloxx' lightweight and robust design, which can be easily handled and interlocked. To ensure ease of maintenance, ACO incorporated an access point for the attenuation tank, addressing the concern of potential blockage at the 10mm outlet.

Neill Robinson-Welsh said: *"When approached by about this project, we knew that only our ACO RoofBloxx system could fulfil the retrofit brief. This project has demonstrated the versatility of the ACO RoofBloxx attenuation system, proving that innovative solutions can thrive even in challenging urban environments."*

ACO's Patented Blue Roof System

Sustainable water management is a critical concern for those in construction and property development. With the impact of climate change and stringent drainage regulations, ACO's blue roof system offers an ideal solution, balancing environmental responsibility with regulatory compliance.

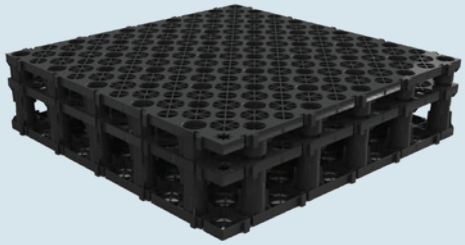
Blue roofs are designed to store and control rainwater, releasing it gradually to prevent overwhelming local drainage systems. ACO's patented system provides both efficiency and resilience in water attenuation. ACO works with selected roofing partners who can offer single point warranties on the full roof build-up.

Key components include:

RoofBloxx system

ACO RoofBloxx is a complete roof attenuation system for blue and blue green roofs, providing drainage layers that allow architects to design multi-functional green spaces. It features a shallow, high-strength geocellular storage void and a flow control system, compatible with ACO roof outlets.

When used with the ACO Blue Roof Flow Restrictor, it can effectively manage rainwater run-off and support passive irrigation for sedum roofs with the addition of reservoir trays or capillary wicks.



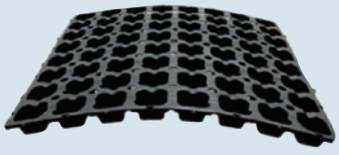
Flow restrictor

The ACO Blue Roof Flow Restrictor controls rainwater run-off from blue and blue green roofs, preventing overloading. It is custom-designed to fit specific project needs and works with ACO and other outlets. Made from corrosion-resistant stainless steel, it includes a built-in overflow for safe drainage and supports green roof irrigation. The design reduces blockages and ensures secure sealing with a cover to prevent debris ingress.

Reservoir tray

The ACO RoofBloxx Reservoir Tray is a lightweight, interlocking modular tray designed for optimal flexibility, allowing easy cutting to fit various shapes. Its interlocking design enhances stability by facilitating connections between adjacent trays. Made from recycled polypropylene, the trays are available in a range of heights between 30mm - 60mm with a capacity of up to 18 litres per square metre.

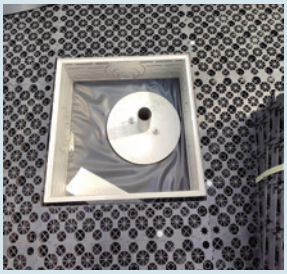
By combining these innovative components, ACO's blue roof system offers a fully compliant, modular, and sustainable solution to rooftop water management. Whether controlling run-off through the Flow Restrictor or enhancing attenuation with RoofBloxx and the Reservoir Tray, ACO's system maximises roof efficiency while contributing to a building's green credentials.



Accessories

The ACO Blue Roof Diffuser and Access Unit is a modular frame and riser system compatible with the ACO RoofBloxx range for blue-green roofs and podium decks. It functions as both an access unit and an inlet diffuser, featuring a shallow silt trap.

With an 85mm deep base frame and 165mm risers, it accommodates 68-150mm diameter pipes. Additionally, the ACOTex Plus fleece protects the roofing membrane beneath the RoofBloxx system, while the ACOTex geotextile acts as a separation layer above it. Capillary wicks enhance irrigation for blue green roofs by facilitating water distribution from the ACO RoofBloxx geocellular unit.



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