Monktonmead Section 19 – 2024 Addendum

Final Report

September 2024

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This report describes work commissioned by Isle of Wight Council, by an instruction dated 6th February 2024. Isle of Wight Council's representative for the contract was James Brewer. Elise Coughlin and Imogen Barnsley of JBA Consulting carried out this work.

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Abbreviations

AEP	Annual Exceedance Probability
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
EA	Environment Agency
FCERM	Flood and Coastal Erosion Risk Management (R&D programme)
FEH	Flood Estimation Handbook
IW	Isle of Wight Council
LLFA	Lead Local Flood Authority
MFAS	Monktonmead Flood Alleviation Scheme
PFR	Property Flood Resilience
RoFSW	Risk of Flooding from Surface Water mapping
S19	Section 19 post flood investigation

Executive Summary

Background

Following the flooding in Ryde in October 2023 as a result of Storm Babet, Isle of Wight Council (IWC) as Lead Local Flood Authority (LLFA) has prepared this addendum to the previous Monktonmead Section 19 Investigation which was published in 2022, as the causes of flooding in Ryde are relatively well understood.

This study is located in Ryde, a town in the north of the Isle of Wight. The Monktonmead Brook is a watercourse which runs through Ryde towards The Solent and is classed as a main river.

The flooding that occurred in Ryde caused internal flooding to at least 107 properties. IWC has appointed JBA Consulting to prepare this addendum on its behalf.

For more information see Section 1.1.

Stakeholder engagement

In preparing this addendum, we engaged with local stakeholders in Ryde, including residents, community representatives and other Risk Management Authorities.

The objectives of engagement are to:

- Gather facts, opinions and data to aid the understanding of the investigation
- Enable the involvement and buy-in of the community in the investigation
- Disseminate the findings of the investigation to the community

For more information, see Section 1.4.

Hydrological analysis of the flooding on the 25th October 2023

The flood event that affected Ryde on the 25th October 2023 was estimated to have been between a 1 in 144 and 1 in 189 year event. Therefore, the storm was an extreme rainfall event, with a large volume of rainfall occurring in a relatively short amount of time.

For more information see Section 2.

Incident response

Several agencies responded to the flooding event in Ryde, including the Isle of Wight Council, Environment Agency, Hampshire Police, Hampshire and Isle of Wight Fire and Rescue Service and Island Roads. A timeline of the incident responses for the event covering the 24th and 25th October are given in Tables 3-1 and 3-2, respectively.

Source-pathway-receptor analysis

The sources, pathways and receptors of flooding were as follows:

- Sources – extreme rainfall, combined sewer, Monktonmead Brook
- Pathways – overland flow, surface water drainage exceedance

- Receptors – confirmed internal flooding of approximately 107 properties across Ryde, resident displacement, loss of possessions, negative mental and physical health impacts, road closures, damage to the railway line.

For more information see Section 4.

Subsequent actions

Actions taken following the 2021 flooding include:

- The Environment Agency and Isle of Wight Council are contributing to a five-year PFR scheme that provides grants for flood resistance and resilience measures to individual qualifying homes. Ryde is one of the affected areas that will benefit from this.
- The Environment Agency has started to review the 2022 Section 19 recommendations relating to the recent flood mitigation works at Simeon Recreation Ground, which involved the construction of a flood wall around the perimeter.

Actions taken following the 2023 flooding include:

- The Environment Agency released a report detailing the events that occurred before the flooding on the 25th October 2023.

Recommendations

The Environment Agency published an initial review of the flooding in Ryde on 10 November 2023. One of the conclusions of this report was the need for a more detailed review into the causes of the flooding on 25 October 2023 and the operation of the Monktonmead Flood Alleviation Scheme. It is understood that the EA is currently undertaking this review.

Property Flood Resilience measures include implementing barriers for doorways, portable puddle sucker pumps and sump pumps with drainage outlets. It is understood that Isle of Wight Council is currently administering a scheme on behalf of DEFRA and that properties affected by the October 2023 flooding may be eligible.

The 2022 Monktonmead Section 19 investigation made a number of recommendations related to the capacity of surface water drainage systems including considering the feasibility of upgrading sewer capacity, disconnecting downpipes and drainage maintenance improvements. It is recommended that these are explored further.

Communities are encouraged to work together to improve their resilience and plan for future flood events. With the support of Risk Management Authorities, it is recommended that the Ryde Flood Action Group improve resilience of the community, through creating and coordinating a community flood plan.

1 Introduction

1.1 Background to Addendum

Following the flooding in Ryde in October 2023 as a result of Storm Babet, Isle of Wight Council (IWC) as Lead Local Flood Authority (LLFA) has prepared this addendum to the previous Monktonmead Section 19 Investigation which was published in 2022, as the causes of flooding in Ryde are relatively well understood. The scope of this report will include:

- Estimations of rainfall return period for the 25 October 2023 event
- Preparation of Source-Pathway-Receptor mapping
- Outline of the flood response during the event
- Review of actions undertaken since the publication of the Monktonmead Section 19 investigation in 2022.
- Provide high-level recommendations with consideration to those outlined in the 2022 Section 19 investigation.

For detailed review of roles and responsibilities, catchment characteristics and a background to flooding mechanisms on Ryde please refer to the Monktonmead Section 19 Investigation.

It is understood that the Environment Agency is preparing a more detailed investigation into the causes of flooding in Ryde on 25th October 2023, which will look at incident response and the operation of the Monktonmead Flood Alleviation Scheme (MFAS). It should be noted that this addendum is unable to provide comment on the potential impact of actions taken during the event, as it is not possible to quantify these without undertaking detailed flood modelling and analysis which is outside the scope of this addendum.

1.2 Investigation extent

The Monktonmead study area covers a large proportion of Ryde, a town in the north of the Isle of Wight. Whilst flooding was widespread across Ryde in 2022, this addendum looks in more detail at the Simeon Street area as this was disproportionately impacted during the 25 October 2023 event. The Monktonmead Brook is a watercourse which runs through Ryde towards The Solent and is classed as a ‘main river’. The study area is shown in Figure 1-1.

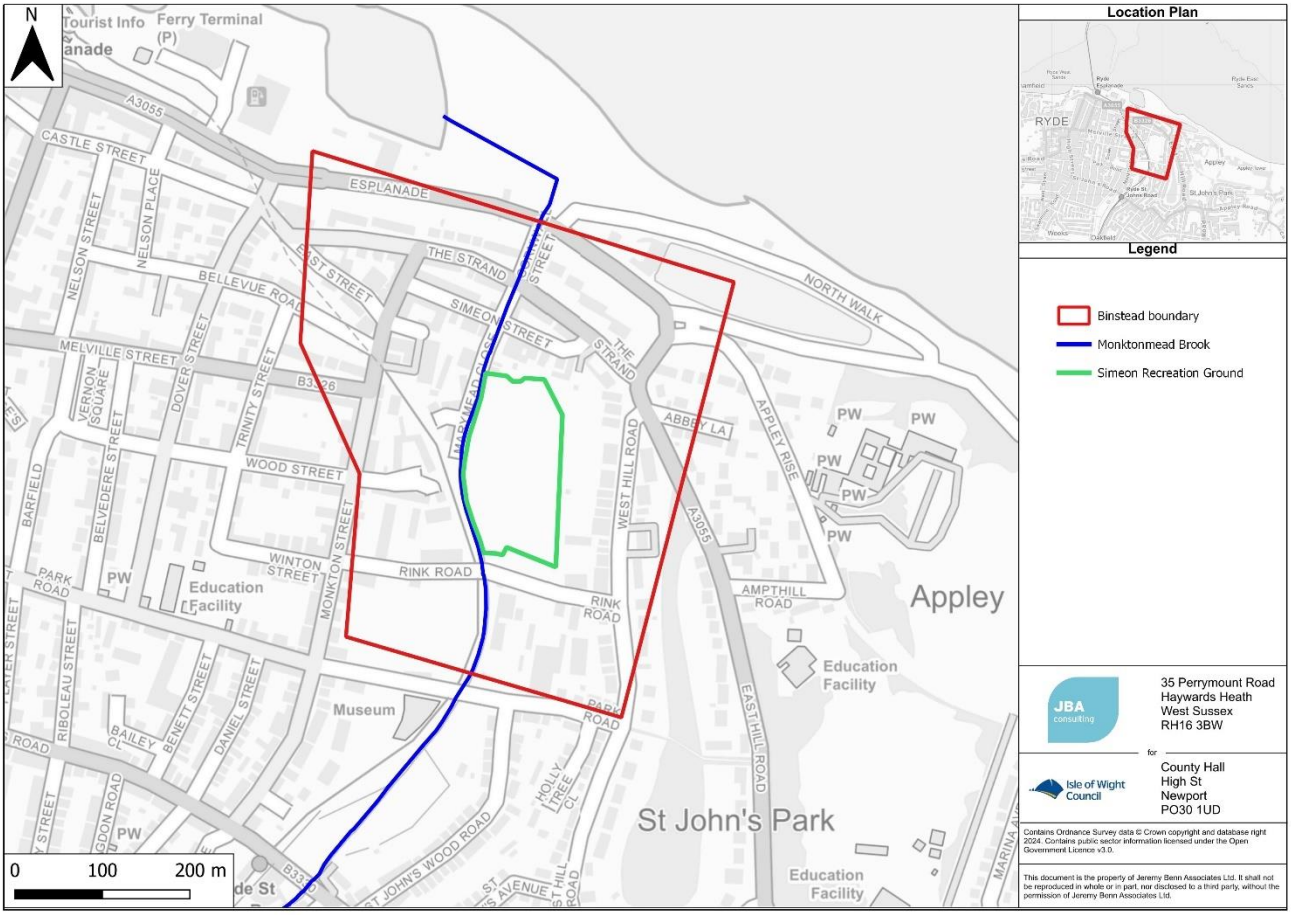


Figure 1-1: Study area

1.3 Data collection

A wide range of data has been collected and assessed to inform the addendum, this includes risk of flooding from surface water (RoFSW) and flood zone extents, which are shown in Figures 1-2 and 1-3, respectively. This has been used to understand the impacts of flooding in Monktonmead and to establish the context of the area. This includes the following:

- Open-source data from GOV.UK
- Photographs from the site visit, showing flood sources, pathways and receptors
- Rainfall data
- Residents' questionnaires
- Information from authorities on drainage infrastructure, such as highways and water companies
- Other data such as photographs, newspaper articles and notes from the event

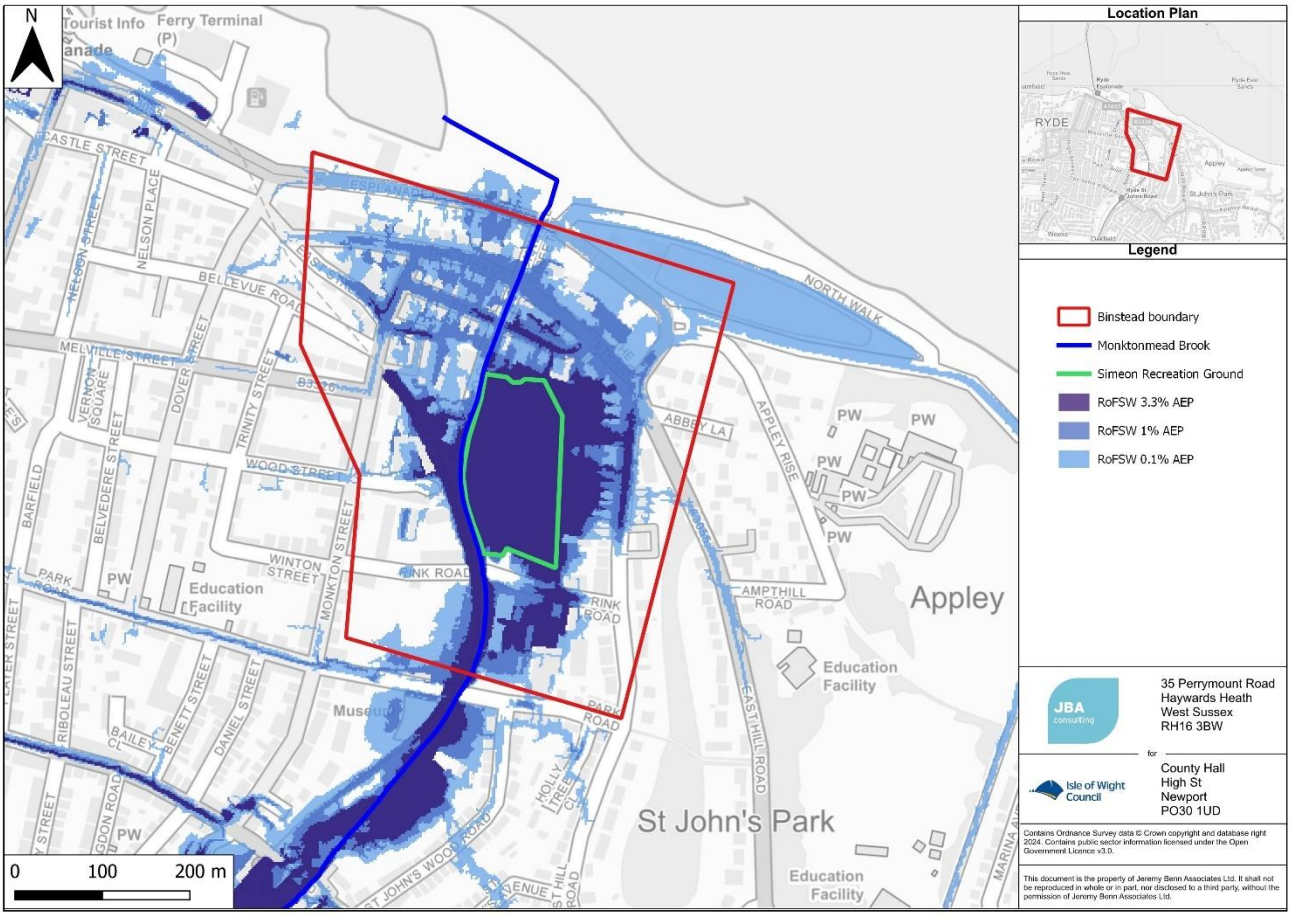


Figure 1-2: RoFSW in Ryde

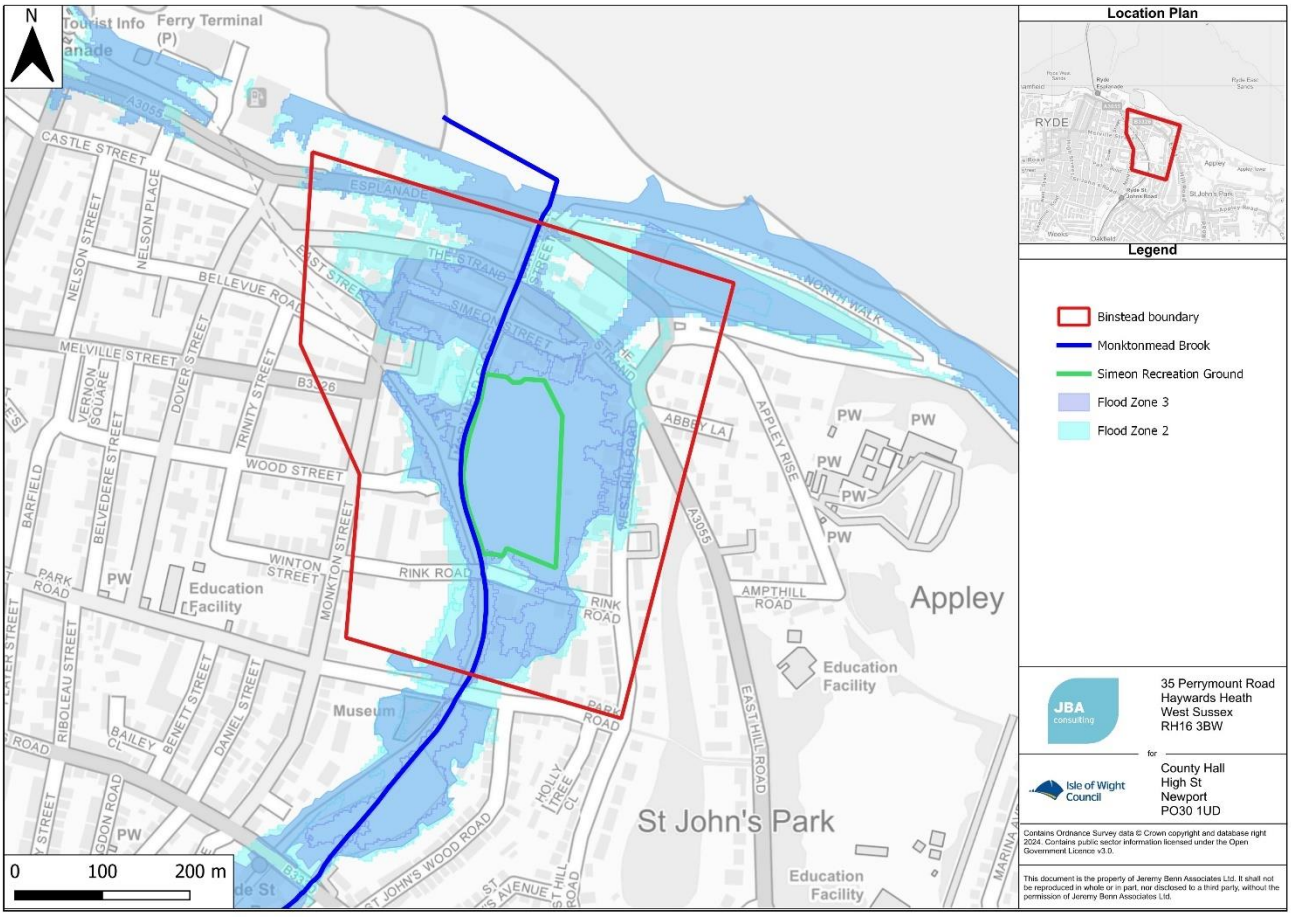


Figure 1-3: Flood Map for Planning Flood Zones

1.4 Stakeholder engagement

We engaged with multiple local stakeholders in the Monktonmead area including residents, community representatives, landowners, other Council departments, Council Members and Risk Management Authority (RMA) partners.

The objectives of engagement are to:

- Gather facts, opinions and data to aid the understanding of the investigation
- Enable the involvement and buy-in of the community in the investigation
- Provide more technical debrief with RMA and operational partners
- Disseminate the findings of the investigation to the community

A list of key stakeholders and how we engaged with them is shown in Table 1-1. The engagement terminology is taken from the Environment Agency's 'Working with Others' (2013) methodology:

- Inform – provide information
- Consult – receive, listen, understand and feedback
- Involve – decide together

- Collaborate – act together
- Empower – support independent action

Table 1-1: Key stakeholders

Role	Organisation	How to engage	Type of engagement
Residents	N/A	Consult	Site visit, online questionnaire, correspondence
Flood Action Group	Ryde Flood Action Group	Consult	Public engagement meeting, correspondence
Parish/Town Council	Ryde Town Council	Consult	Invitation to contribute, correspondence, public engagement meeting
Water and Sewerage Company (WASC)	Southern Water	Involve	Invitation to contribute, correspondence, data provision
Highways Authority	Isle of Wight Council / Island Roads	Involve	Invitation to contribute, correspondence, data provision
Environment Agency	Environment Agency	Involve	Correspondence, data provision
LLFA	Isle of Wight Council	Involve	Invitation to contribute, correspondence, online survey distribution, site visit, data provision
Council Members	Isle of Wight Council	Consult	Invitation to contribute through Flood Action Group
Emergency Planning	Emergency Management IWC	Consult	Data provision

1.5 Flood history

Table 1-2 details the known flood history in Ryde sourced from the previous Strategic Flood Risk Assessment (2018). Ryde has a long history of flooding, but the records prior to 2000 are limited.

Table 1-2: Flood history

Date	Source of flooding	Description of impacts
1999	High water levels in the Brook due to sand blocking the outfall	Unknown
2000	Groundwater, sewer, fluvial	70 houses flooded, basement flooding identified as the key issue. Coincidence of high tide, pump failure and high river flow.
2010	Unknown	60 properties flooded, the rainfall event had a low return period.
2013	Surface water drainage and foul sewer	22 properties affected, 16 of which were flooded internally.
2021	Surface water and fluvial	Internal flooding to at least 32 properties across Ryde, predominantly due to surface water flooding.

1.6 Existing FCERM measures

The Monktonmead Flood Alleviation Scheme was initiated to enhance flood protection for over 300 properties in Ryde and was completed in 2019. The Scheme is managed by the Environment Agency and aims to reduce flood risk in Ryde. In addition to works to the outfall of the culverted Monktonmead Brook, the scheme also involved constructing the flood wall around Simeon Street Recreation Ground to store flood water, with demountable drop boards that could be installed along access points in the wall when required.

2 Hydrological Analysis

2.1 Antecedent conditions

2.1.1 Rainfall

Rainfall records at Ryde Vineyard show that in the six months before the event on the 25th October 2023, rainfall was at or below the daily average for Ryde, approximately 24mm. For most months, there were two to three rainfall events that were around the daily average, whilst the rest were much lower.

2.1.2 Soils

The rainfall recorded at Ryde Vineyard in the months before the rainfall event in October 2023 were moderate to low, with little to no events exceeding the daily average of approximately 24mm. By contrast, October was a fairly wet month, with six rainfall events prior to the 25th October. This suggests that the soil was already saturated as there was limited time between rainfall events for the ground to recover. This therefore may have contributed to the flooding on the 25th October.

2.1.3 Groundwater levels

Based on the rainfall events at the beginning of October 2023, it can be assumed that the groundwater levels were slightly higher than normal. However, rainfall estimates across the Isle of Wight for the six months before the rainfall event show that rainfall levels were relatively low, suggesting that these events would not have caused a significant change in groundwater level.

2.2 Rainfall return period estimation

The rainfall return period for Ryde was estimated using the rainfall data from the Ryde Vineyard rainfall gauge using JBA's Hydrometric Database. The recorded rainfall for the event was measured multiple times, each time including other peaks either side of the main rainfall event. These durations and depths for each measurement were used to estimate the return period using the Flood Estimation Handbook (FEH) Web Service. The return period estimations from the different rainfall durations are shown below in Table 2-1.

Table 2-1: Return period estimations

Duration (hrs)	Depth (mm)	Return period (years)
13.00	78.99	189.27
17.00	81.19	161.15
22.00	84.09	144.36

The range of return periods is between 1 in 144 and 1 in 190 years which corresponds to a rainfall event with annual probability of occurrence of less than 1% but greater than 0.5% each year. As a result, this is considered to be an extreme rainfall event although it is likely that events of this type will become more frequent due to the impacts of climate change.

2.3 Impact of river levels

River level measurements recorded at St John's river level gauge, Monktonmead at the time of the event on the 25th October 2023 have been compared to peak river level measurements recorded in the October of previous years. These river levels, including the record from the 25th October 2023, are listed below in Table 2-2.

Table 2-2: October river levels recorded at St John's gauge, Monkton Mead

Date	Time (hrs)	River level (m)
25th October 2023	05:00	3.78
24th October 2022	01:45	2.75
21st October 2021	01:15	3.44
31st October 2020	16.15	2.81

2.4 Impact of groundwater levels

The groundwater levels for October 2023 recorded at Alverstone are similar to that of previous years, with a value of approximately 19.5m AOD, which is a standard measurement for this time of year.

2.5 Impact of tide levels

To determine whether tide levels had an impact on the flooding, data was collected from the wave height buoy for Hayling Island. The maximum wave height on the 25th October 2023 was 1.85m. This is lower than the storm threshold, which is 2.77m, therefore this wave hight was not great enough to be classified as a storm surge. Tidal data from Sandown Pier shows that the time of peak rainfall, approximately 04.45hrs on the 25th October 2023, did not occur at high tide. Further, the residual was approximately 0.432m compared to previous significant storm surges, which were measured at approximately 0.76m. However, tide data for Ryde indicates that high tide peaked at approximately 08:45, with a slower drop in tide level compared other days. Therefore, it is likely that high tide level did have an impact on flooding in Ryde.

3 Incident Response

Information has been obtained from the Environment Agency's flooding report that has been published online along with local news stories covering the event.

Several agencies responded to the flooding events in the Monktonmead area, including the Isle of Wight Council, Hampshire Police, Hampshire and Isle of Wight Fire and Rescue Service, the Environment Agency and Island Roads.

Responses from Isle of Wight Council include:

- Co-ordinating the delivery of sandbags to locations other than the strategic store at Simeon Rec, including deliveries to vulnerable residents
- Disseminated EA flood alert and warning information through social media, local media, Town, Parish & Community Councils and Elected Members, ensuring that residents who do not subscribe to the EAs Flood Warning Service receive the information
- Established an Information Hub in Ryde (initially at the Ryde Castle Hotel, then Aspire), staffed by Council Officers who provided advice guidance and support for affected residents
- Worked with Ryde Town Council to commence recovery activity

The Met Office issued no weather warnings for the Isle of Wight in the days leading up to Storm Babet, however local forecaster the Isle of Wight Met Service issued a yellow weather warning. This came into force from 12pm on Wednesday 18th October and warned of winds between 40 to 50mph. Rainfall of 20 to 25mm in some areas was also expected prior to the storm.

The Met Office issued a Yellow Warning for rain on Tuesday 24th October at 11:07. An Amber Warning for rain was issued at 06:16 on 25th October (valid until 08:00, then extended to 10:00).

Tuesday 24th October 2023

Table 3-1: Timeline of events on the 24th October 2023

Time	Event
2100-0000hrs	Rainfall gauge at Ryde recorded 8.3mm of rain.
2100hrs (on 24/10/23) - 1500hrs (on 25/10/23)	The rainfall recorded during this period was 83.3mm in 18 hours, which is over a month's worth of rainfall.

Wednesday 25th October 2023

Hampshire and Isle of Wight Fire and Rescue Service (HIWFRS) Control Room received a large number of calls on the morning of Wednesday 25th October as a result of the heavy rain and flooding. Approximately 130 calls were made to HIWFRS, with 3 of these incidents

attended to. Where resources were not deployed, Control Room operators offered advice on dealing with flooding and provided contact numbers for further help, including floodline and the local council. The fire service responded to few calls as a result of the flooding on 25th October, as there was deemed to be no threat to life.

Table 3-2: Timeline of events on the 25th October 2023

Time	Event
0000-1000hrs	An additional 72.1mm of rain was recorded by the Ryde rainfall gauge, with an intense 3 hour period between 0000-0300 recording 50.9mm of rain. This is equivalent to approximately two-thirds of the month's rain in 3 hours.
0100hrs	Low tide.
0107hrs	Ryde rainfall reached 15.6mm in 4 hours.
0319hrs	Monktonmead Brook reached a threshold of 1.9m AOD, meaning that surface water drainage becomes impeded. Flows started coming out of manholes and gullies, travelling along Rink Road and the lower section of West Hill Road towards the lower-lying Simeon Recreation Ground.
0329hrs	EA issued a Flood Alert for St Johns, Ryde. It should be noted that any Flood Alerts and Warnings issued out of hours were light on detail, due to the service being automated as the EA were in a period of Industrial Action.
0441hrs	Trigger alarmed notifying the EA duty officer that the Monktonmead Brook had reached its threshold level of 2.5m AOD. Contractors were instructed by the EA duty officer to install two drop boards in each of the three openings of the Simeon Recreation Ground. These two drop boards provided an additional 400mm of height.
0514hrs	EA issued a Flood Warning for Monktonmead Brook at St Johns.
0545hrs	The two flood drop boards were successfully installed in each of the three openings in the Simeon Recreation Ground. The installation of two drop boards as opposed to the five that can fit into the opening was deemed appropriate by the EA to provide an initial level of flood storage without fully compromising the surface water flows into the Recreation Ground. Surface water was already present outside of the storage area as the drop boards were installed.
0558hrs	EA contractors headed to Hunnyhill after being instructed to clear the screen due to reports of flooding in Newport, and once finished to return to Ryde to install the remaining drop boards in case they were required.

Time	Event
0600hrs (approx.)	Amber weather warning issued by the Met Office comes into effect and is in place until 1000hrs. This warning covered Ryde, near Monktonmead Brook at St John's Road, St John's Station and Park Road.
0830hrs	Contractors returned to Ryde after a delayed journey due to floodwater resulting in the road between Newport and Ryde becoming impassible. The locked storage boxes containing the drop boards were completely submerged, meaning the additional boards were unable to be installed.
0855hrs	High tide.

The conclusions of the Environment Agency's Ryde Flooding Review Report, dated 10th November 2023 (Appendix A), include the following:

- Forecasts significantly underpredicted the expected rainfall quantities, hence why only one EA standby group was available, rather than two or three.
- The risk of surface water flooding in Ryde during heavy rainfall is a genuine cause for concern. The EA procedures repeatedly reference the importance of maintaining a flood route through the flood wall access points for surface water to prevent property flooding. This was a consideration in the EA duty officers decision not to fully install all the flood boards at 0545hrs on the 25th October 2023.
- The EA duty officers did not anticipate the significant disruption to transport links, the speed at which the rivers were rising or the subsequent volumes of water that were flowing down the catchment as an event of this size had never been forecast or experienced before.
- The Monktonmead Flood Alleviation Scheme has been designed to protect property flooding from a 1 in 100 (1% AEP) fluvial event. The findings of the EAs further investigations, together with further modelling, are required before comment can be made on any impacts of the installation of only some of the flood boards during the event.

4 Source-pathway-receptor analysis

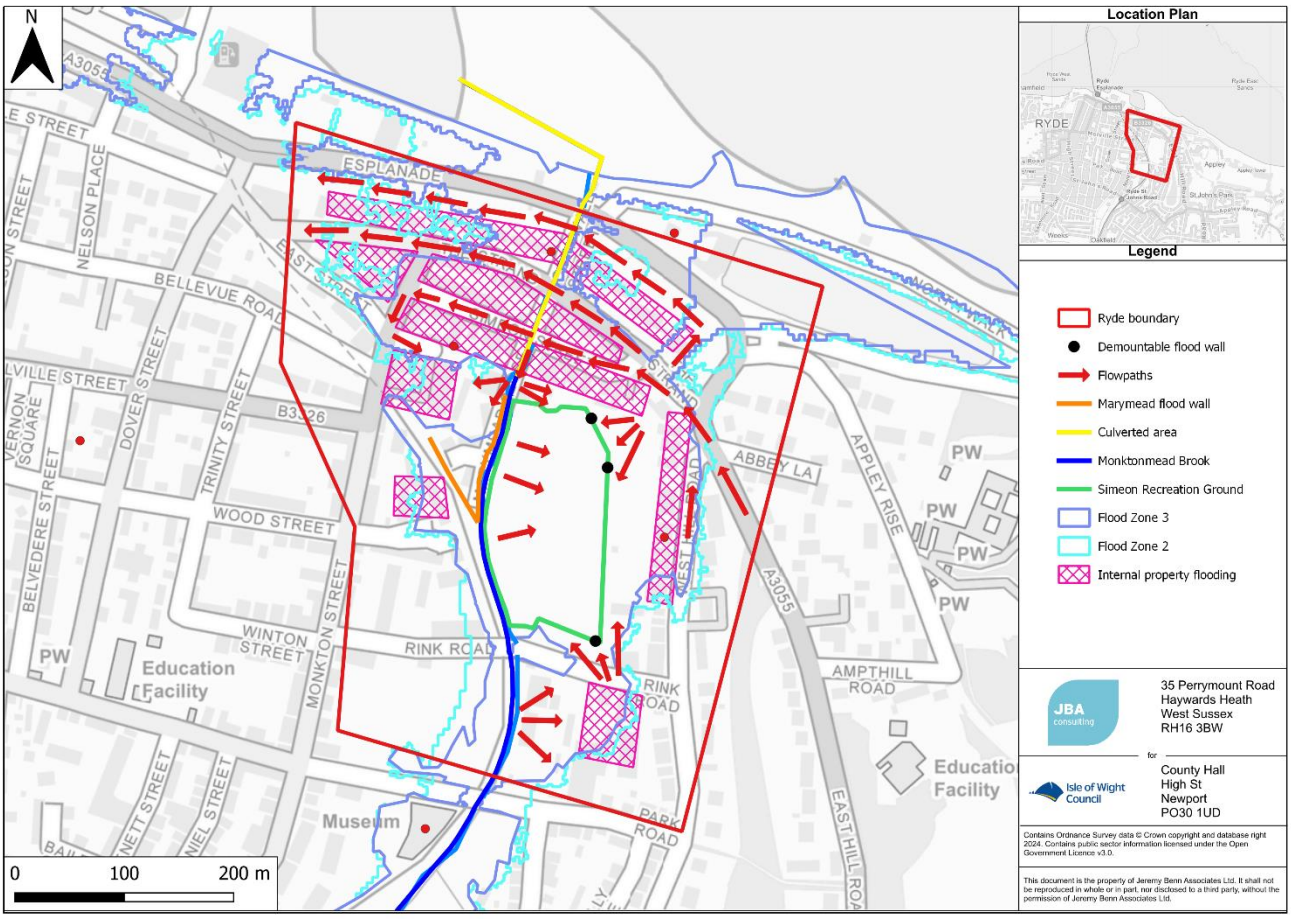
The Source-Pathway-Receptor model is a concept that can provide an understanding of all aspects of flood hazard. It breaks a flood incident down into three elements:

- Source – the origin of flood water
- Pathway – a route or means by which a receptor can be affected by flooding
- Receptor – something that can be adversely affected by flooding (e.g. people, property, infrastructure)

This is based on available evidence for example photographs that have been submitted to the Isle of Wight Council as well as probable routes taken by floodwater based on topography. It is not based on detailed flood modelling and it is understood that the EA is undertaking a more detailed review of the event that would include detailed modelling.

4.1 Location – Simeon Street area

Figure 4-1 Source-pathway-receptor mapping for Ryde



4.1.1 Source

Heavy rainfall began in the evening of the 24th October 2023 and continued through the night into the 25th October 2023. This unprecedented rainfall resulted in high river levels and the drainage network becoming overloaded with flows coming out of manholes and gullies. Responses to the stakeholder engagement survey identified several problems with drainage as a course of flooding, with issues such as blockages and insufficient capacity generating surface water runoff and pooling

4.1.2 Pathway

Fluvial floodwater exceeded the channel capacity of the Monktonmead Brook, with flooding on the left bank, which was likely to have resulted from exceedance. The floodwater filled the Monktonmead Flood Alleviation Scheme at Simeon Recreation Ground. The floodwater then overtopped the floodwater boards installed at Simeon Recreation Ground and flowed north, east and west of the recreation ground along Simeon Street, The Strand and West Hill Road.

It is understood that surface water flows from West Hill Road were also flowing towards the recreation ground during this time. Without undertaking detailed hydraulic modelling it is not possible to understand the relative significance of either the fluvial or surface water components to the flooding.

4.1.3 Receptor

Overall, at least 159 residential and commercial properties in Ryde experienced flooding on 25th October, at least 80 of which flooded internally. These properties include those located along the roads neighbouring Simeon Recreation Ground, such as Simeon Street, The Strand and West Hill Road (see Figure 4-1). The majority of property flooding was internal, with properties all around the recreation ground affected. Eight of the flooding incidents were external and 33 property flood extents are unknown. Evidence gathered from residents via the Community Survey and Flood grant application indicate that some properties only experienced basement flooding. Whilst the majority of flooding occurred along the roads mentioned above, there are a number of isolated internal flooding incidents across Ryde, for example on Rink Road and East Hill Road, with some incidents as far south as Southfield Gardens. These isolated incidents are shown in Figure 4-1.

Local businesses across Ryde were also heavily impacted by the flooding, with many having to shut their doors for days after to deal with the aftermath, causing a loss of revenue. There were reports of knee-high water and basements being swamped with floodwater, causing significant internal damage to businesses across the town. This uncertainty resulted in socio-economic issues for many business owners, with the worry of damage costs, loss of revenue and staff hours.

Picture: Flooding in and around Simeon Recreation Ground, Island Echo (accessed 13th February 2024).

4.2 Other areas

Whilst the majority of the flooding took place in the vicinity of Simeon Street, at least fourteen other properties are understood to have flooded across Ryde (not including Binstead). These locations included:

- Queens Road
- Argyll Street
- Partlands Avenue
- Southfield Gardens
- Lower Highland Road
- St John's Road

Many of these locations such as Argyll Street and Southfield Gardens correlate with the flooding experienced in 2021. The 2021 flood event was predominantly the result of surface water flooding and localised drainage issues with a smaller amount of fluvial flooding.

5 Subsequent actions

5.1 Actions taken since 2021 flooding

The recommendations from the previous Monktonmead S19 Investigation following the 2021 flood events are as follows:

- Property Flood Resilience (PFR) Scheme
- Community Flood Resilience
- Understand the impacts of the Simeon Street recreation ground flood wall on surface water flood risk
    - It is recommended that Isle of Wight Council works in partnership with the Environment Agency to understand whether the flood wall could be disrupting existing surface water flow paths.
    - If this has not been sufficiently assessed, it is recommended that surface water modelling of this area is undertaken to further understand this and consider potential solutions.

Isle of Wight Council responded to these recommendations in the following ways:

- The Environment Agency and Isle of Wight Council are contributing to a five-year PFR scheme that provides grants for flood resistance and resilience measures to individual qualifying homes. Ryde is one of the affected areas that will benefit from this.
- The Environment Agency has started to review the Section 19 recommendations relating to the recent flood mitigation works at Simeon Recreation Ground. This involved the construction of a flood wall around the perimeter of the recreation ground.

5.2 Actions undertaken following October 2023 flooding

5.2.1 Environment Agency review

The Environment Agency published a report detailing the events that occurred before the flooding on the 25 October 2023 (Appendix A). IWC in its role as LLFA coordinated this addendum to the previous 2022 Section 19 report which the Environment Agency have contributed to. This in turn will lead to local improvements in how events like this are managed in the future to better improve resilience to flooding.

It is understood that a more detailed review of the operation of the Monktonmead Flood Alleviation Scheme during the 25 October 2023 event, and significance of actions taken on the flooding that occurred is currently being undertaken by the Environment Agency. This is necessary as it is not possible to quantify the impacts of the incident response without undertaking a more detailed work involving flood modelling, which is beyond the scope of this addendum.

5.2.2 Community Recovery Grant

Flooded households in affected areas were able to apply for up to £500 to get cash quickly to help with immediate costs. The grant was available to anyone whose primary home suffered internal flood damage, or for people who were not able to live in their property, as a direct result of Storm Babet between 19 and 25 October 2023. Flooded households were also eligible for a 100 per cent council tax discount for a minimum of three months — this means affected residents did not have to pay council tax during this period. Overall, approximately 83 properties in Ryde town centre benefited from this scheme.

5.2.3 Business Recovery Grant

Small-to-medium sized businesses were eligible for up to £2,500 from the Business Recovery Grant to help them return quickly to business as usual. The business had to be a Small and Medium Sized Enterprise (SME) at the point of grant award.

The business must have been trading at and/or from the property at the point that the property was impacted by Storm Babet. For the purposes of this grant scheme, a business is trading if it is engaged in business activity. The business must have been either:

- Directly impacted by Storm Babet – for instance the business suffered flood damage to the property, or
- Indirectly impacted by Storm Babet – for instance access to the business premises is severely restricted as a result of flooding, including restricted access for customers, suppliers or staff.

Businesses that have not been able to operate due to flooding at their premises may be eligible for 100 per cent Business Rates Relief for a minimum of three months.

5.2.4 Property Flood Resilience grant

Isle of Wight Council is administering a Property Flood Resilience grant on behalf of DEFRA, for properties affected by flooding between 19 – 25 October 2023. Eligible property owners (both domestic and commercial) can apply for up to £5,000 (including VAT) towards the cost of flood resilience and recoverability measures. Up to £800 of the grant must be for survey costs.

5.2.5 Update to duty procedures

It is understood that updates have been made to the Environment Agency’s duty procedures following the event, these changes include duty contractors remaining in the area during a flood event so that the drop boards can be installed when required.

6 Conclusion and recommendations

6.1 Conclusions

Following the flooding in Ryde in October 2023 as a result of Storm Babet, Isle of Wight Council (IWC) as Lead Local Flood Authority (LLFA) has prepared this addendum to the Monktonmead Section 19 Investigation which was published in 2022, as the causes of flooding in Ryde are relatively well understood.

Analysis of the Ryde Vineyard rainfall gauge from the storm event indicates that this was likely to be between a 1 in 144 and 1 in 190 year event. Therefore, the storm event was an extreme rainfall event, with a large volume of rainfall occurring in a relatively short amount of time. As rainfall levels were high during the month of October compared to the same month in previous years, it is likely that the catchment was highly saturated prior to the event.

The reported cases of flooding were mostly in the vicinity of the Monktonmead Brook at Simeon Recreation Ground. The specific pathways are detailed in Section 4. A number of other properties were also impacted across Ryde and responses to the stakeholder engagement survey identified several issues with drainage as a potential factor of flooding, with issues such as blockages and insufficient capacity generating surface water runoff and pooling in other areas of Ryde which correlates with the 2022 investigation. The presence of foul sewage in the flood waters indicates the combined sewer system was also a secondary source of flooding.

The flooding has significantly impacted residents, many of whom have had to move out of their homes into alternative accommodation, either on a temporary or permanent basis. This includes vulnerable residents who cannot stay in their homes whilst repairs are being carried out. People have lost carpets, floorboards, furniture, and belongings from the ground floor and basements of their properties, which has led to financial pressures. A number of local businesses have also been impacted by the flooding leading to loss of business.

To support homes and businesses impacted by the flooding, owners could apply for flood relief support. This included a Community Recovery Grant of £500 for households affected and a Business Recovery Grant for small-to-medium sized businesses of whom were eligible for up to £2,500.

A Council Tax Discount was also available for flooded households, who could be eligible for a 100% council tax discount for a minimum of three months. If after three months home owners were not able to return to their properties, council tax would not have to be paid until they moved back.

Similarly for businesses affected, a Business Rate Relief Scheme meant that businesses that had not been able to operate due to the flood event may be eligible for a 100% Business Rate Relief for a minimum of three months.

Based on the scope of this addendum, it is not possible to conclude whether or to what extent different actions taken by Risk Management Authorities may have impacted the flooding experienced during this event. Detailed hydraulic modelling and a full investigation of the Environment Agency's incident response would be required to ascertain this.

6.2 Recommendations

Based on the review of the previous Section 19 and the events of the 25 October 2023, the following recommendations should be considered to mitigate flood risk and improve resilience to flooding.

6.2.1 Environment Agency review

The Environment Agency published an initial review of the flooding in Ryde on 10 November 2023 (Appendix A). One of the conclusions of this report was the need for a more detailed review into the causes of the flooding on 25 October 2023 and the operation of the Monktonmead Flood Alleviation Scheme. It is understood that the EA is currently undertaking this review. This report reiterates the need for such a review as there will be a need for more detailed flood modelling and hydrological analysis that is outside the scope of this addendum.

Continuing to build an understanding of the impacts of Simeon Recreation Ground flood wall on surface water flood risk was a recommendation in the 2022 Monktonmead Section 19. It is recommended that the impacts of surface water flood risk in the vicinity of Simeon Street are further explored

6.2.2 Property Flood Resilience

PFR measures include implementing barriers for doorways, portable puddle sucker pumps and sump pumps with drainage outlets. As the properties are within the same areas and have flooded from different sources, PFR may be an appropriate solution (where the property construction is suitable for such measures). It is understood that Isle of Wight Council is currently administering a scheme on behalf of DEFRA and that properties affected by the October 2023 flooding may be eligible. This may be an effective solution with regard of isolated clusters of properties that have been impacted by flooding, as these are unlikely to benefit from any other mitigation measures.

6.2.3 Surface water drainage

The 2022 Monktonmead Section 19 investigation made a number of recommendations related to the capacity of surface water drainage systems including:

- Consideration of whether existing surface water and combined sewer capacity can be upgraded;
- Disconnection of roof water drainage; and
- Improved asset maintenance regimes.

These recommendations would be most appropriate to consider across Ryde where a number of properties were affected by surface water flooding. Whilst there may be constraints for wide scale SuDS retrofit or sewer improvements, small incremental improvements can have a cumulative impact of mitigating flood risk. Therefore, the recommendations from the previous Section 19 report should be explored in more detail.

It is understood that Southern Water is looking to roll out water butts for residents in the Isle of Wight through its Storm overflows task force. Whilst water butts are unlikely to solve flooding issues, they can contribute to reducing flows into surface water and combined sewer systems that can alleviate sewer capacity issues.

6.2.4 Surface Water Management

It is evident that surface water runoff was one of the main sources of flooding in Ryde on 25 October. This caused significant pooling of water in Simeon Recreation Ground. Therefore, it is recommended that IWC investigate ways of diverting surface water from this area, through effective surface water management. This could include the use of SuDS features, such as swales and conveyance channels.

6.2.5 Community Flood Preparedness

Residents are encouraged to find out about possible flood risk in the area and to find out if their property is at risk. It is recommended that the individuals at risk of flooding make a personal flood plan, which sets out a list of actions which can quickly be put in place during a flood event to minimise the disruption caused. Guidance and a personal flood plan template is provided by the Environment Agency and can be found on the Government website

Communities are also encouraged to work together to improve their resilience and plan for future flood events. With the support of Risk Management Authorities, it is recommended that the Ryde Flood Action Group improve resilience of the community, through creating and coordinating a community flood plan and setting out formal procedures for coordinating the response of the community in response to flooding.

A EA Report

Ryde, IOW Flooding Review October 2023

Date: 10 November 2023

Version: Final

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Introduction

On the morning of Wednesday 25 October 2023, over 100[1] properties were flooded in Ryde, Isle of Wight following intense rainfall over the previous 12 hours. This area has suffered several flood events over the last 100 years that were a combination of fluvial and surface water flooding.

In 2019, the Environment Agency (EA) completed construction of a £5m upgrade to the existing flood alleviation scheme with the construction of a new outfall into the marina and a flood wall around the upstream recreation ground, Figure 1. This scheme had been designed to protect property flooding from a 1 in 100 (0.1% AEP - Annual Exceedance Probability) fluvial event.

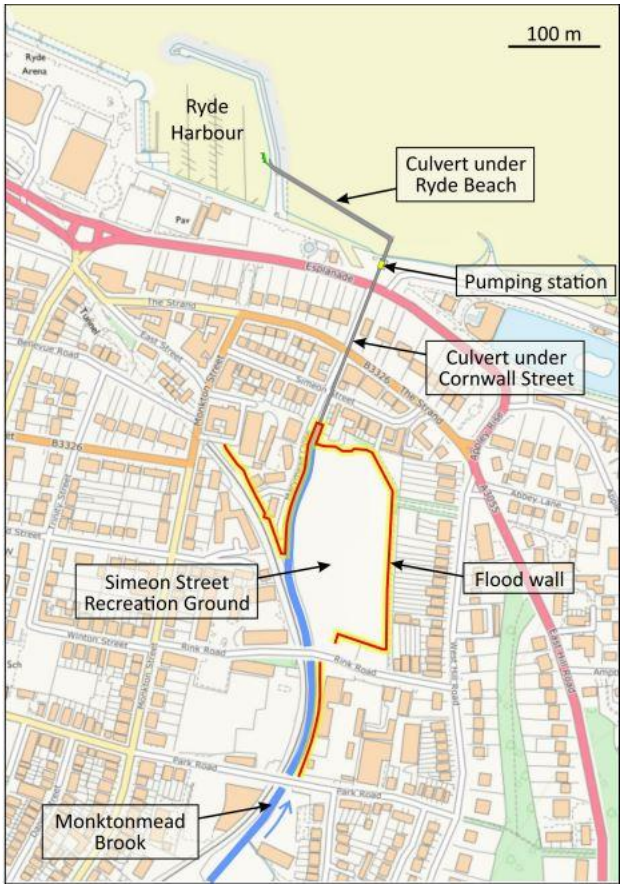


Figure 1: Plan of Monktonmead Flood Alleviation Scheme

On 25 October 2023, fluvial floodwater overtopped the Monktonmead Brook and filled the Simeon Recreation Ground. This area is a designated flood storage area surrounded by a 1.3m high wall with three access points that can be blocked off with 5 or 6 flood drop boards. On the morning of 25.10.2023 the EA duty officer instructed contractors to install 2 drop board in each opening. This decision was taken to provide an initial level of flood storage without compromising the ability to allow surface water flows into the Recreation Ground, if that became the overriding source of flood risk as the event developed. Surface

water was already present around the outside of the storage area as the drop boards were installed.

The fluvial/surface flooding eventually extended outside of Simeon Recreation Ground south of Rink Road, along West Hill Road and to the north along The Strand, Simeon Street and Cornwall Street, Figure 2.

Picture: Island Echo

Figure 2: Extent of Ryde flooding on 25.10.2023

Flood Event Information

Rainfall data

The EA has data for the Ryde rain gauge since it was installed in 1949. The recorded rainfall between 2100 24.10.2023 and 1500 25.10.2023 was 83.3mm in 18 hours; this is over a month's rain.

This daily total is the highest ever October daily rainfall on record at Ryde, with the previous highest total being 39mm (less than half of the October 2023 record) on 27.10.2013.

Between 2100-0000 on Tuesday 24.10.2023 the rainfall gauge at Ryde recorded 8.3mm of rain and between 0000-1000 on Wednesday 25.10.2023 another 72.1mm of rain, with an intense 3hr period between 0000-0300 recording 50.9mm of rain. This is equivalent to approximately 2/3rd of the month's rain in 3 hours, Figure 3.

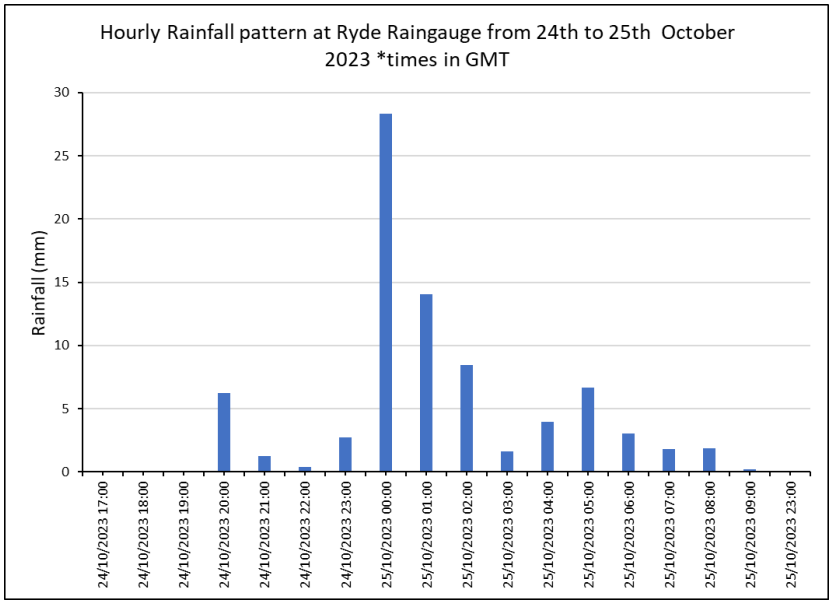


Figure 3: Ryde hourly rainfall totals

The 10km^2 Monktonmead Brook catchment extends from Ryde, south to Upton and Asley Down, east to Nunwell Down and back north to Beaper Copse, Elmfield and Appley, Figure 4.

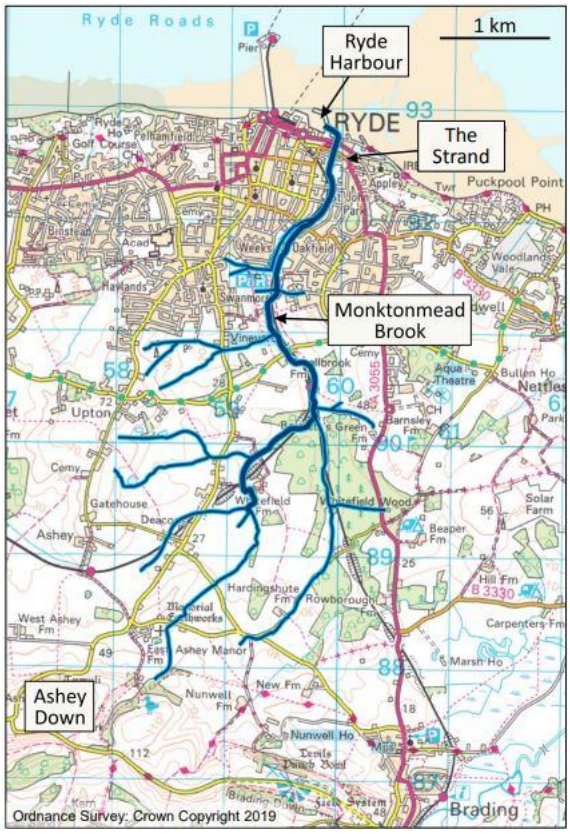


Figure 4: Monktonmead Brook catchment

This catchment area (and much of the Isle of Wight) received up to 91mm during the 18-hour flood event, Figure 5 (bottom left).

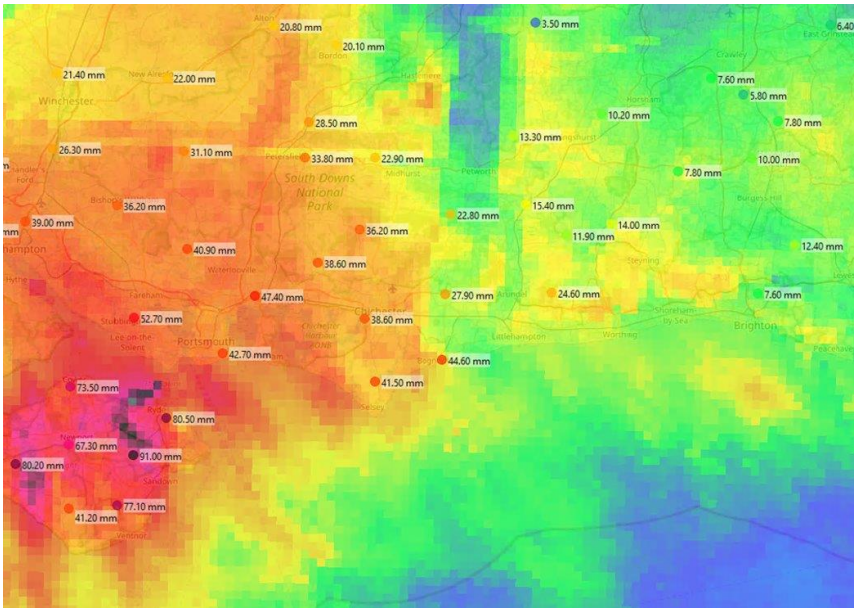


Figure 5: Rainfall totals during October 2023 flood event

The long term average monthly October rainfall for Ryde is 81.5mm (1960-1991). October 2023 recorded the highest ever October monthly rainfall at Ryde on its 74-year record, exceeding the previous record by 21.8mm, Figure 6.

Year	October Monthly Rainfall (mm)
2023	258.3
1987	236.5
2000	231.8
1949	228.6
1976	191.9
1960	191.0
2020	175.8
2021	169.6
2001	164.4
2013	158.6

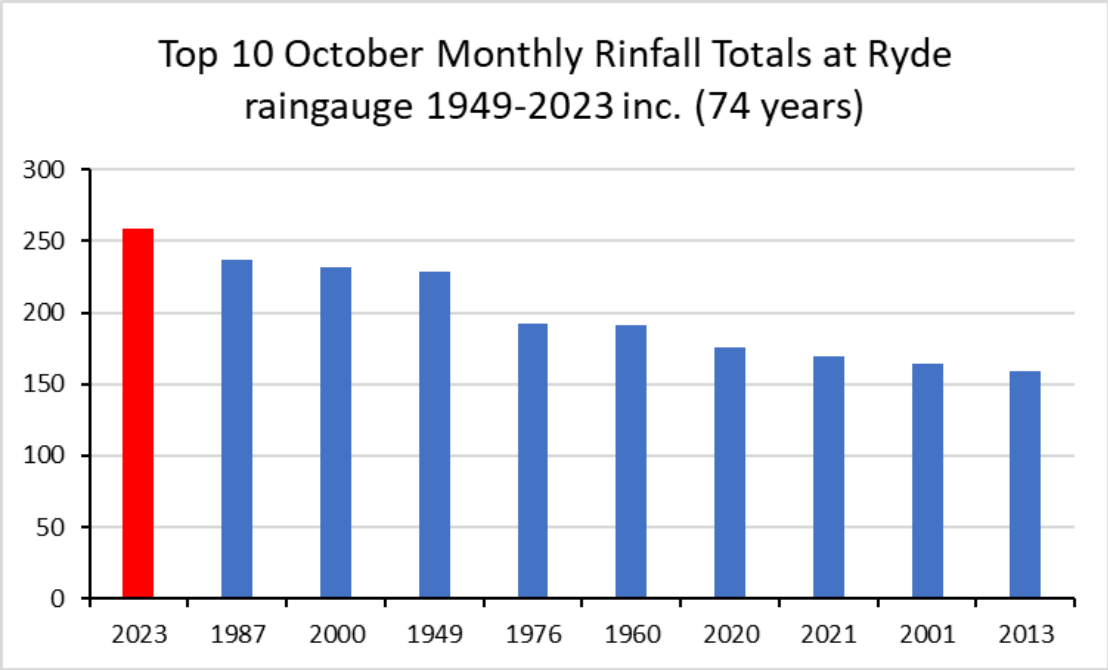


Figure 6: Historic monthly rainfall totals, Ryde

River Flows

We have limited long term flow data for the Monkton Mead Brook as the gauging station was installed in 2014. After reviewing flow data for patterns, the nearest comparable event was in January 2015.

In figure 7 below, the flow for the event of the 24-25th October 2023 can be seen. The figure shows that the rainfall caused a steep rise in flows where flow increased to 7.62m^3/sec from about 0.5m^3/sec in about 3 hours and then stays high between 4m^3/sec and 7m^3/sec for the next 12 hours. Note that high tide was at 0855 25.10.2023 when the majority of the outfall flow was achieved through the two pumps, combined capacity 3.0 m^3/sec. Both pumps were running from 0300 25.10.2023 until 0045 26.10.2023.

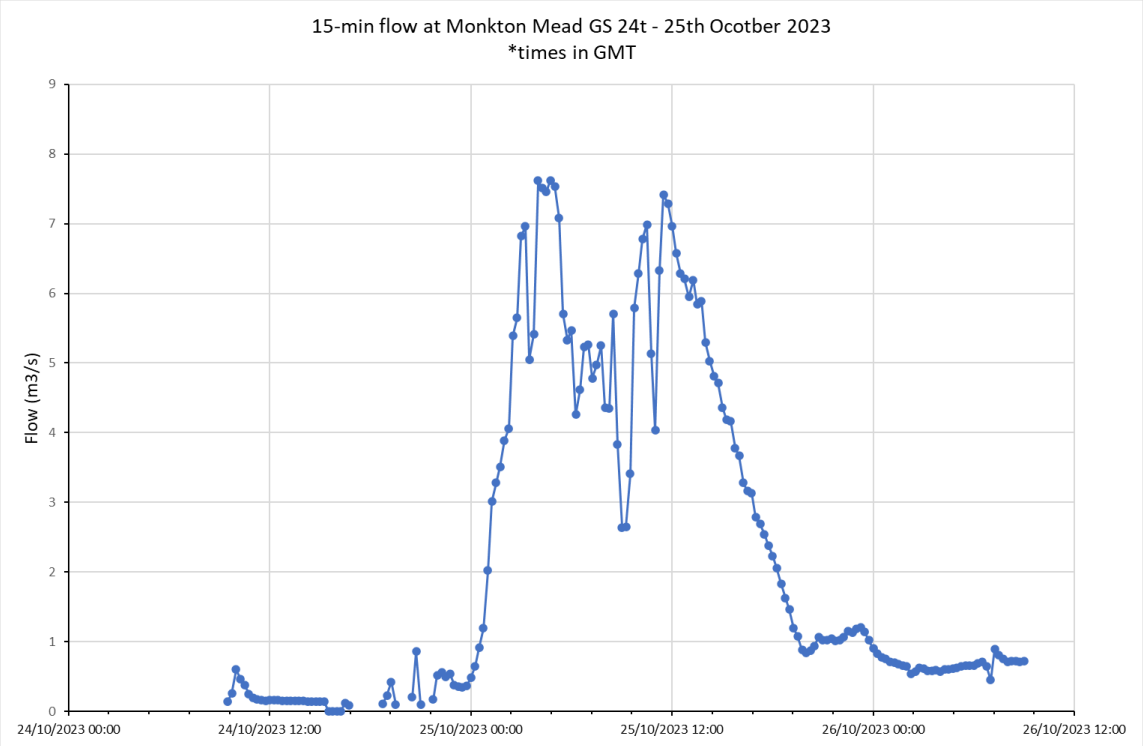


Figure 7: Monktonmead Brook flow data

This flow has only been seen once before on the record. The next significant event at the site that is similar to 2023 was between 7-9 January 2015. This event, while getting to around 6.8 m^3/s within a 3 hour period did not last as long. This is the significant difference between the two events. The flow once at its peak in January 2015 stayed there for only a few hours and the event was over within 12 hours (back to base flow) rather than the 24 hours during the October 2023 event, Figure 8.

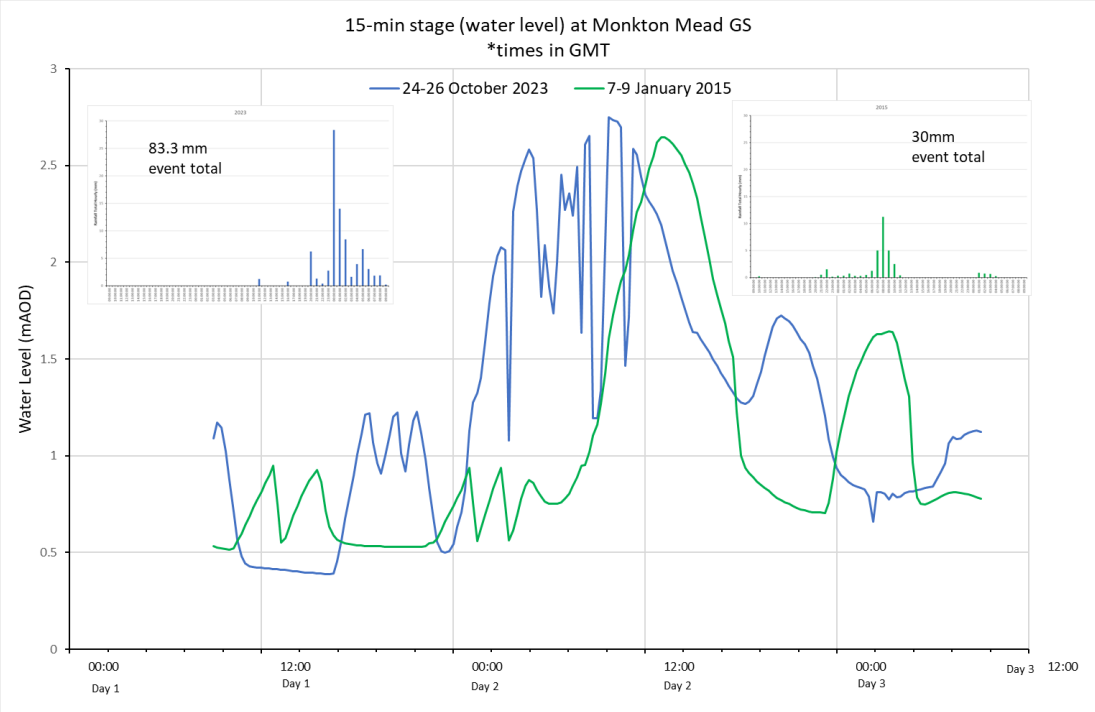


Figure 8: Monktonmead Brook flow comparison

Environment Agency Operation

Forecast

The forecast that EA duty officers were working to indicated 9-27mm rainfall between 1800-0000 on Tuesday 24.10.2023 (which was broadly correct) and 7-26mm of rainfall between 0000-0600 on Wednesday 25.10.2023 (actual figure was 61.8mm), Figure 9.

		Tue 24/10/2023				Wed 25/10/2023			
Region		06-12	12-18	18-24	Day 1 total	00-06	06-12	12-24	Day 2 total
Hampshire & IOW	Average (mm)	0	0	9	13	7	0	0	7
	Max (mm)	10	6	27	34	26	2	1	27

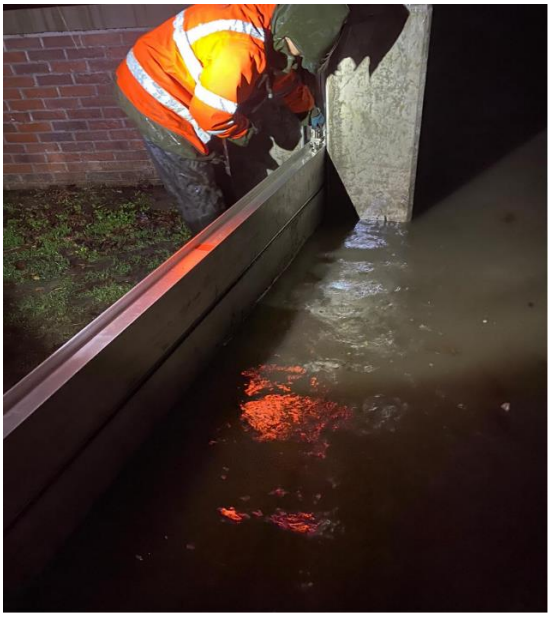
Figure 9: Hampshire and IOW forecast

Environment Agency Incident Response

The EA has a river level gauge on the debris screen at the entrance to the culvert at the north side of Simeon Recreation Ground alongside Marymead Close.

At a level of 2.5mAOD the EA procedures require duty officers to mobilise operational staff to install drop boards in the Simeon Recreation Ground access points. This trigger was alarmed at 0441hrs on 25.10.2023. The duty officer had already requested this action as a precautionary measure and EA contractors had been contacted. They arrived on site, cleared the debris screen and installed two of the five or six flood drop boards in each of the three access points by approximately 0545hrs.

Surface water flooding is an important consideration in this area and as can be seen in Figure 10 & 11 was already building up outside the Recreation Ground as these drop boards were installed. Once all the drop boards are locked in place it is much harder to quickly remove them to allow surface water to drain into the Recreation Ground. This action has been required in previous flood events. Indeed, at a subsequently much smaller rainfall event on Saturday 4 November 2023, the Isle of Wight County Press posted a video at 12:21 PM saying *"The flood gates are in position at Simeon Rec, however water is welling up outside the park"* Note that surface water drainage into the Monktonmead Brook is impeded when the river reaches 1.9mAOD which was reached by 0319 on 25.10.2023. This is the point when the drainage network can become overloaded and flows start coming out of manholes and gullies. Along Rink Road and the lower part of West Hill Road these flows travel along the surface towards the lower lying Simeon Recreation Ground.

Figures 10 & 11: Simeon Recreation Ground drop boards in place with surface water building up outside

The EA procedures indicate that it takes approximately 45 mins for the river to fill the Recreation Ground up to the 2.3mAOD threshold of these access points. The two drop boards provided an additional 400mm of height.

After receiving reports of flooding in Newport the EA duty officer instructed the EA contractor to see if they could clear the screen at Hunnyhill to reduce the flood risk to those residents and return to Ryde to install the remaining drop boards should they be required. This operation (inc. travel time) should have taken a little over 1 hour at that time in the morning. A second standby gang had been requested but was not yet available.

After the EA contractor attempted to clear the screen at Hunnyhill, the road between Newport and Ryde had become impassible and they were unable to reach Ryde until 0830 by which time the locked storage boxes containing the drop boards were completely submerged and they were unable to install the additional boards, Figure 12.

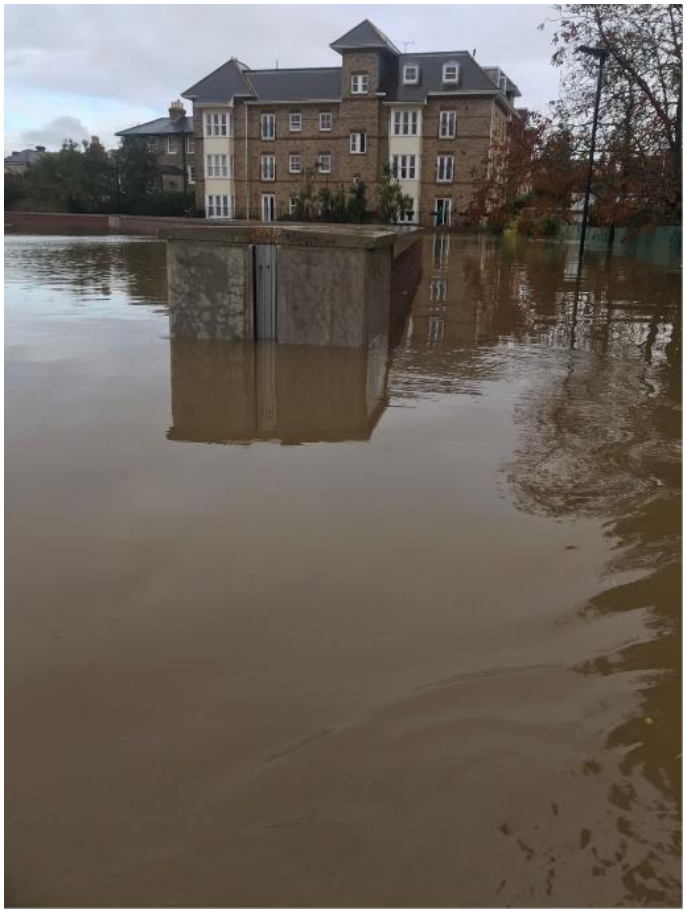


Figure 12: Simeon Recreation Ground flood levels 0900 25.10.2023

Conclusions

1. This was the largest rainfall event ever recorded in the Ryde area (since 1949).

2. Forecasts significantly underpredicted the expected rainfall quantities. This was why only one standby gang was available rather than two or three which is the case during predicted events that may require an operational response in multiple areas.

3. The risk of surface water flooding in Ryde during heavy rainfall was (and continues to be) a genuine cause for concern. The EA procedures repeatedly reference the importance of maintaining a flood route through the flood wall access points for surface water to prevent property flooding. This was a material consideration in the EA duty officers decision not to fully install all the flood boards at 0545 on 25.10.2023.

4. Due to the size and timing of this unprecedented rainfall event, EA duty officers did not anticipate the significant disruption to transport links, the speed in which the rivers were rising or the subsequent quantities of water that were flowing down this catchment (and most other catchments across the Island) as this size of event had not been forecast or experienced before. This was the reason why the EA contractor was unable to get back in time to install the additional boards.

5. The Monktonmead Flood Alleviation Scheme has been designed to protect property flooding from a 1 in 100 (0.1% AEP - Annual Exceedance Probability) fluvial event. Although the flood levels in Simeon Recreation Ground exceeded the top level of the two boards that were installed; given that properties have flooded from surface water during much smaller rainfall events historically, it is unclear whether the overall numbers of property flooding was made worse by not installing all of the flood drop boards, and if so by how much. A more detailed review to determine the event return period (initial analysis suggests that it was greater than 1 in 100) and whether the fully activated Ryde Flood Alleviation Scheme would have been overwhelmed needs to be completed.

6. The IOW Council will coordinate a Section 19 review of this flooding and the EA will contribute fully to this review. This should lead to local improvements in how future events are managed to provide better resilience for the local community to fluvial and surface water events.

[1] Estimated number of properties to be confirmed.

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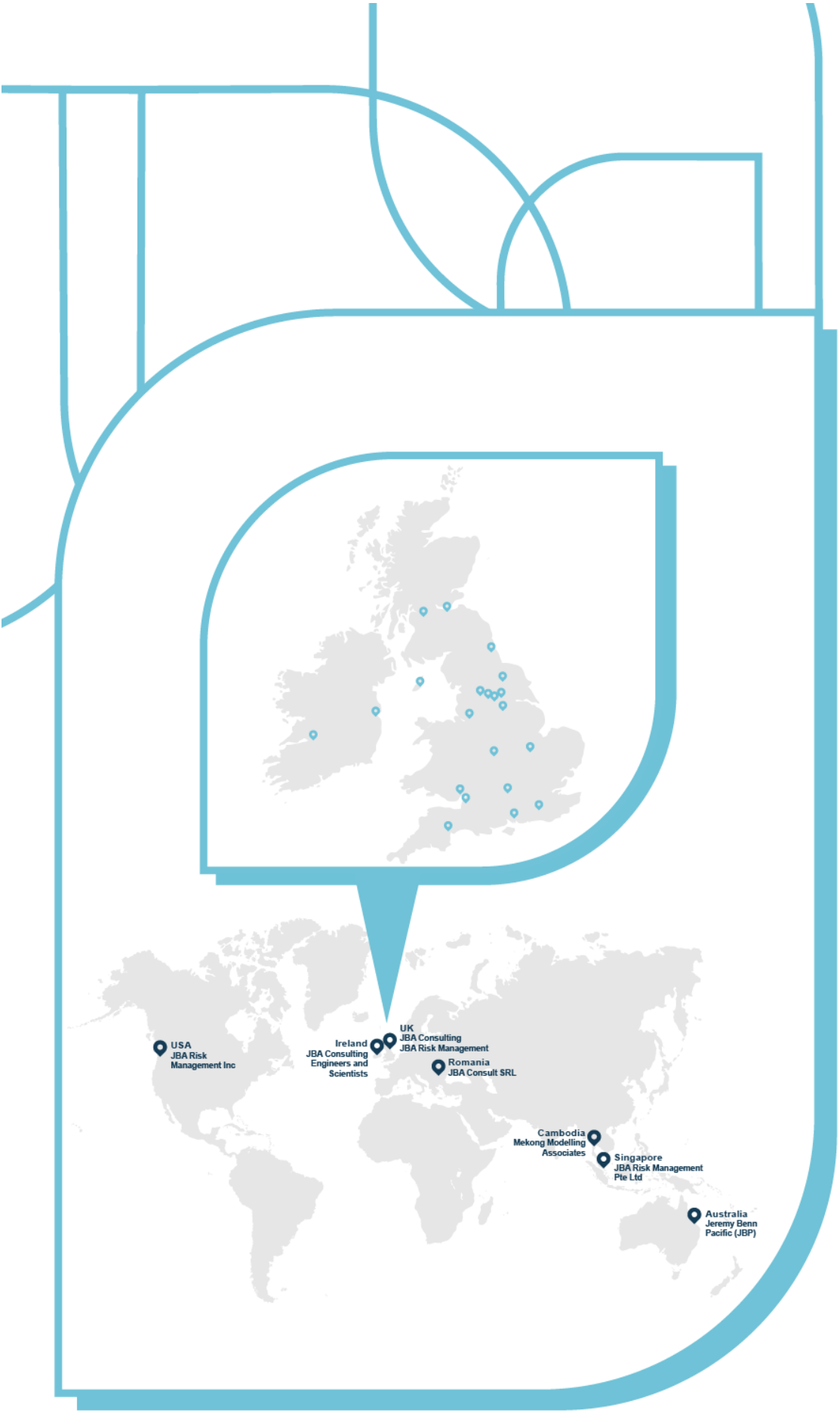

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