

# Victoria North, Manchester

## Flood Management Plan

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## Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS EN ISO 45001:2018)

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**Comments** Additional information for flood barrier responsibilities.

## Disclaimer

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# 1. Introduction

1.1. Waterman Infrastructure and Environment (WIE) has been commissioned by FEC Development Management Ltd to prepare a Flood Management Plan (FMP) for Victoria Riverside, Dantzic Street, Manchester; hereafter referred to as 'the Site'.

**A copy of this FMP should be provided to Facility Management and made available to commercial unit employees and residents to inform them of the actions they may need to take in the event of a flood. This FMP should be reviewed periodically (minimum every 5 years or if new data becomes available) by an appropriate flood risk professional to ensure that it remains fit for purpose and takes into account the latest flood risk data.**

1.2. It is strongly recommended that all residents read this document fully, with particular attention paid to the recommended actions in Section 3 (before and during a flood) and the relevant information provided in Sections 4 and 5 for potential hazards during and after a flood.

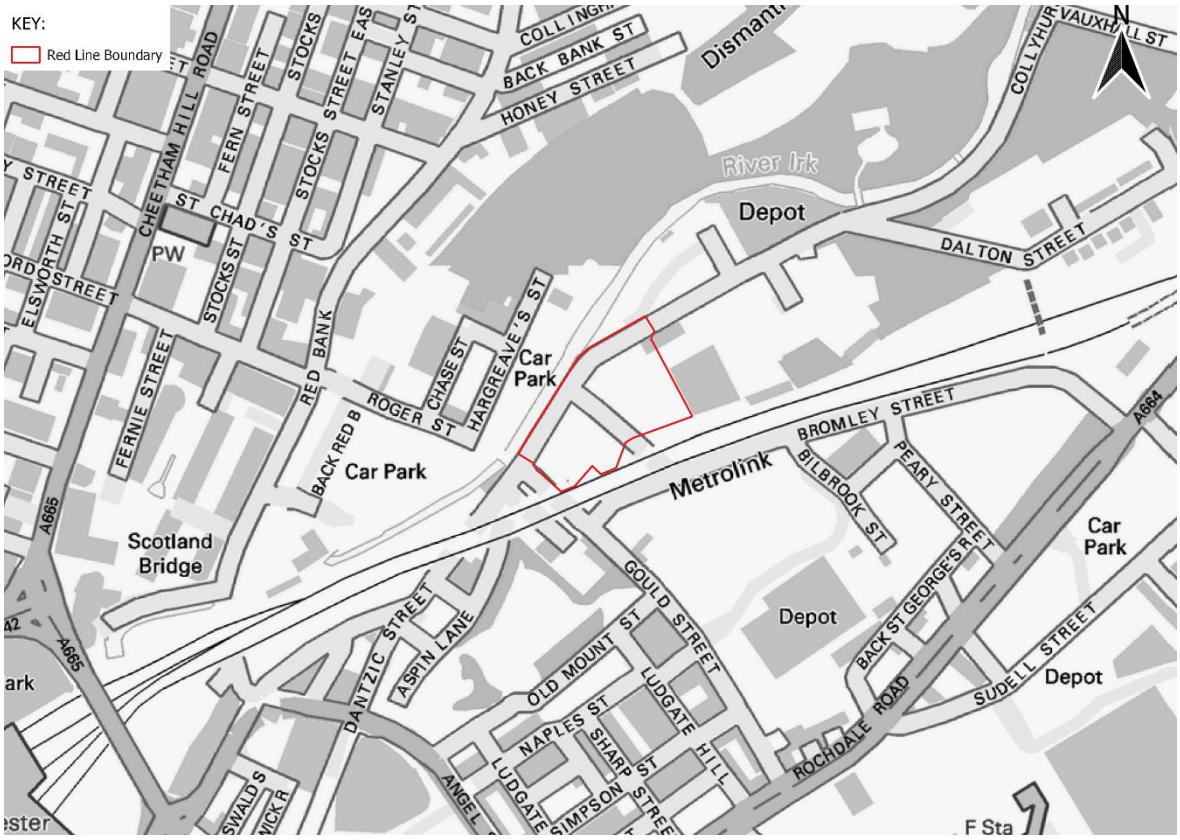
1.3. Since the primary risk identified is fluvial flooding, the focus of this FMP is on this aspect. Other flood risks in the FRA were evaluated to be low in the assessment.

## Site Description

1.4. The Site (Figure 1) is located within Victoria Riverside, Manchester and has an area approximately 0.8ha. It is bordered by Dantzic Street and Gould Street to the north and west respectively. The River Irk runs parallel to the site, approximately 17m beyond Dantzic Street. The sites southern border lies adjacent to a major elevated railway viaduct serving Manchester Victoria train station. The site also straddles Bromley Street, which runs north west through the site and arches of the viaduct. The Site (Figure 1) is centred on National Grid Reference (NGR) SJ 84534 99376.

1.5. The consented development scheme comprises a mixed used residential and commercial development. The development is split into two parcels, North and South., dissected by Bromley Street. The Southern Parcel will consist of a landmark 37 storey tower with a single storey podium for commercial space and ground floor townhouses. The Northern Parcel will consist of two smaller 26 and 18 storey towers, townhouses, and ground floor car parking and commercial use.

Figure 1: Site Location




## Purpose of this Report

1.6. The purpose of this FMP is to seek to provide recommendations for residents, facilities management and commercial unit employees on the required actions before, during, and after a flood event. Consideration of the safety of the development and its residents during a flood event has been secured as part of the planning process through the requirement of application 126944/FO/2020:

***"We would strongly advise that you consider developing a detailed emergency plan, such as a manual for use by the site operators detailing what to do in the event of a predicted or active flood. There are several examples on Google and government advice is available. This was not part of your Condition, but we strongly recommend that the applicant produces one given the risk highlighted to your development."***

*Reason*

*To minimise risks the risk of flooding to users of the building and comply with the National Planning Policy Framework (December 2023), Greater Manchester Strategic Flood Risk Assessment (SFRA) and Core Planning Strategy.*

1.7. The policies referenced in the condition are summarised below:

### National Planning Policy Framework (NPPF)

1.8. If it is not possible for development to be located in areas with a lower risk of flooding (taking into account wider sustainable development objectives), the exception test may have to be applied. The need for the exception test will depend on the potential vulnerability of the site and of the development proposed, in line with the Flood Risk Vulnerability Classification set out in Annex 3.

1.9. The NPPF states that when determining planning applications, Local Planning Authorities (LPA) should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific Flood Risk Assessment. Development should only be allowed in areas at risk of flooding where it can be demonstrated that:

- Within the Site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
- The development is appropriately flood resistant and resilient;
- It incorporates Sustainable Drainage Systems (SuDS), unless there is clear evidence that this would be inappropriate;
- Any residual risk can be safely managed; and
- Safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

### The Manchester, Salford, and Trafford Level 2 SFRA

1.10. The SFRA states that:

"The developer must ensure that safe access and egress is provided to an appropriate level for the type of development. This may involve raising access routes to a suitable level. Environment Agency guidance suggests that all development should have a dry access and egress in the 1 in 100-year event.

As part of the FRA, the developer should review the acceptability of the proposed access in consultation with the Environment Agency. For the purpose of the SFRA it is considered appropriate to provide a low hazard environment in access and egress routes associated with new housing developments."

### Policy EN 14 (Flood Risk) of the Manchester Core Strategy

1.11. The Core Strategy requires that:

"Where flood risk needs to be addressed, including that likely to arise from climate change, development should seek firstly to minimise the risk to the site, then to make the development resistant to any residual risk, and lastly to make the development flood-resilient; provision for emergency access and escape must also be included."

## Roles and Responsibilities

1.12. **Local Planning Authorities (LPA)** – LPA determine planning applications, including those in flood risk areas, ensuring proposed developments can safely comply with emergency plans The wider Local Authority is a category 1 responder under the Civil Contingencies Act.

1.13. **Environment Agencies (EA)** – As a statutory consultee, the EA verifies Flood Risk Assessments (FRAs), focusing on flood characteristics and residuals risks. However, they don't assess overall Emergency Plans. Emergency Planning teams, central in access and evacuation during floods, provide crucial input.

1.14. The EA issues flood warnings for various types of flooding and is a Category 1 responder.

1.15. **Local Resilience Forums (LRFs)** – Established by the Civil Contingencies Act, LRFs facilitate multi-statutory consultees, LPAs can engage LRFs for comprehensive input on proposals affecting emergency services or partners due to planned developments. The Greater Manchester Resilience Group is the LRF for the Victoria Riverside site.

1.16. **Emergency Services** – As Category 1 responders and LRF members, emergency services aren't statutory consultees but provide advice on planning proposals affecting emergency planning or service burdens. LPAs can consult them to ensure adequate resources for new developments reliant on emergency services.

1.17. **Building Control** – Building Regulations (Approved Document B) require reasonable firefighting facilities and access provisions. While planning determines reasonableness, regulations focus on on-site access, not access routes beyond boundaries affected by flooding. EP considerations should not be deferred to building control during the planning stage.

1.18. **Lead Local Flood Authority (LLFA)** – LLFAs are statutory consultees for major development's surface water drainage. NPPF and Planning Practice Guidance (PPG) emphasise considering all flood risk sources. As experts in managing flood risk from watercourses, LLFA offer valuable advice on assessing these risks in EPs.

1.19. **Highway Authority** – Statutory consultees for highway design and drainage implications, especially regarding access and escape on adopted highways. As Category 2 responders and LRF members, they play a vital role in EP.

# 2. Assessment of Flood Risk

## Tidal & Fluvial Flood Risk

2.1. The nearest watercourse to the Site is the River Irk. According to the Environment Agency's (EA) Flood Map for Planning, the site lies within areas classified as Flood Zone 1, 2, &3 (see figure 2). As such the site is considered to be at high risk from fluvial flooding, defined as land having greater than 0.5% annual probability of tidal flooding, or 1% annual probability of fluvial flooding.

2.2. Product 4 data from the Environment Agency (EA) obtained in 2017 by Arup did not account for 35% climate change which the EA advised should be the case, therefore the data was extrapolated to account for 35% increase instead of the 20% within the data set. As such the 1% AEP plus 35% climate change (CC) flood level has been calculated to be 30.435mAOD.

2.3. A similar method to that as described above has been adopted to calculate the 1%AEP plus 70% climate change flood level at 30.661mAOD.

2.4. To get an accurate representation of the extents of the various flood zones across the site, Civic Engineers have plotted the flood levels against the current topographical survey. Figure 3 shows the site sits within areas of Flood Zone 2 (Light blue hatch), and 3 (Dark blue hatch). The dashed magenta line represents the flood zone 3b levels in the area.

Figure 2: Environment Agency Flood Map for Planning



Figure 3 Mapping of Flood Zone using current topographic data and flood zone levels from EA product 4 data.



## Impacts of Flooding on the Site

2.5. To accommodate the risk of flooding, floor levels to habitable rooms within the residential units will be set to a minimum level of 31.035mAOD which is the equivalent to 1% AEP plus 35% climate change plus 600mm freeboard. This minimum ground floor level for residential units is higher than the advised 0.1% AEP flood level.

2.6. The minimum ground floor level of the commercial units is summarised in Table 1 below. The floor levels to the Commercial units are lower than the 1% AEP + CC flood level; it is necessary to provide units at this level to tie into and access the existing streets as such further mitigation measures are to be provided including flood resistant construction to a level of 600mm above the floor level and, where necessary, flood resilient construction to a minimum level equivalent to the 1% AEP + CC + 300mm freeboard. The proposed levels of flood resistant and resilient structures are also shown in Table 1 below.

Table 1 Minimum ground floor level of the commercial units

| Block | Minimum ground floor level to Commercial units (mAOD) | Level to top of flood resistant construction (mAOD) | Minimum level to top of flood resilient construction (mAOD) |
|---|---|---|---|
| A | 29.68 | 30.28 | 30.74 |
| B | 29.85 | 30.45 | 30.74 |
| C | 30.3 | 30.9 | 30.74 |

2.7. Commercial units have an upstand within the building façade and in combination with flood doors or retractable flood barriers, this creates a flood resistant barrier up to 600mm above the ground floor level.

2.8. In response to the Local Planning Authority's (LPA) query, the responsibility for installing flood barriers has been clarified. Found, the building operator, will be responsible for all initial installations of the flood barriers, including for both the commercial units and the dwellings on Bromley Street. For commercial units, Found will manage installation until individual tenants are confirmed, after which responsibility will transfer to those tenants. Similarly, once each townhouse on Bromley Street is sold, the respective new residents will assume responsibility for their units' flood barriers.

2.9. Found will also install barriers for the commercial units (with responsibility transitioning to tenants upon leasing) and the townhouse garages on Dantzic Street (with responsibility transferring to residents upon sale). This ensures continuity in flood protection across the property while sales and tenancies are finalised. Found will handle flood barrier installations at the other two entrances.

2.10. The Finished Floor Level (FFL) for the residential units will be a minimum of 31.035 m AOD which is the equivalent to the 1% AEP + 35% CC flood level + 600mm freeboard. This level is 374mm higher than the calculated 1% AEP + 70% CC flood level and as such residential units would not be impacted in this flood event.

# 3. Flood Management

## Flood Warnings

### Met Office Weather Warnings

3.1. The Met Office publishes warnings and advice on their website for rain, snow, wind, fog and ice across the UK. They provide a free email alert service for weather warnings, allowing users to receive warnings for a chosen region.

3.2. It is strongly recommended that the facility management sign up to the email alerts, which would allow for commercial unit employees, residents and visitors to be made aware when a severe rainfall or storm surge event is forecasted. In these scenarios, management and residents should be prepared to take action if necessary and remind themselves on evacuation routes (see details below) to ensure the residents safety. The service is available here:

**UK weather warnings – Met Office**

### Environment Agency Flood Warning Service

3.3. The EA provide three main methods for receiving flood warnings, as outlined in the section below.

#### EA Five Day Flood Risk Forecast

3.4. This is an online service which classifies the risk of tidal and fluvial flooding for all areas within England and Wales as very low, low, medium and high, for five days in advance. The service is available here:

**https://flood-warning-information.service.gov.uk/5-day-flood-risk.**




3.5. The risk classifies as follows:

- **Very Low Risk**: Flooding is very unlikely – be aware of your local weather conditions
- **Low Risk**: Flooding is possible, be aware, check for flood warning in your area, be alert and monitor your local weather conditions, monitor traffic information and drive according to conditions.
- **Medium Risk**: Flooding is possible, be prepared, check for flood warning information, monitor local weather conditions, conder postponing travel plans, avoid driving or walking through flood water.
- **High Risk**: Significant risk to life, take action, stay alert and be prepared to act upon advice from emergency services. Check the latest flood warning information and monitor traffic information and avoid all non-essential travel.

### EA Flood Warning in Force by Region

3.6. This is an online service which shows severe flood warnings, flood warnings, and flood alerts by region by inputting a postcode or area. The service is available here:

**https://flood-warning-information.service.gov.uk/warnings**.

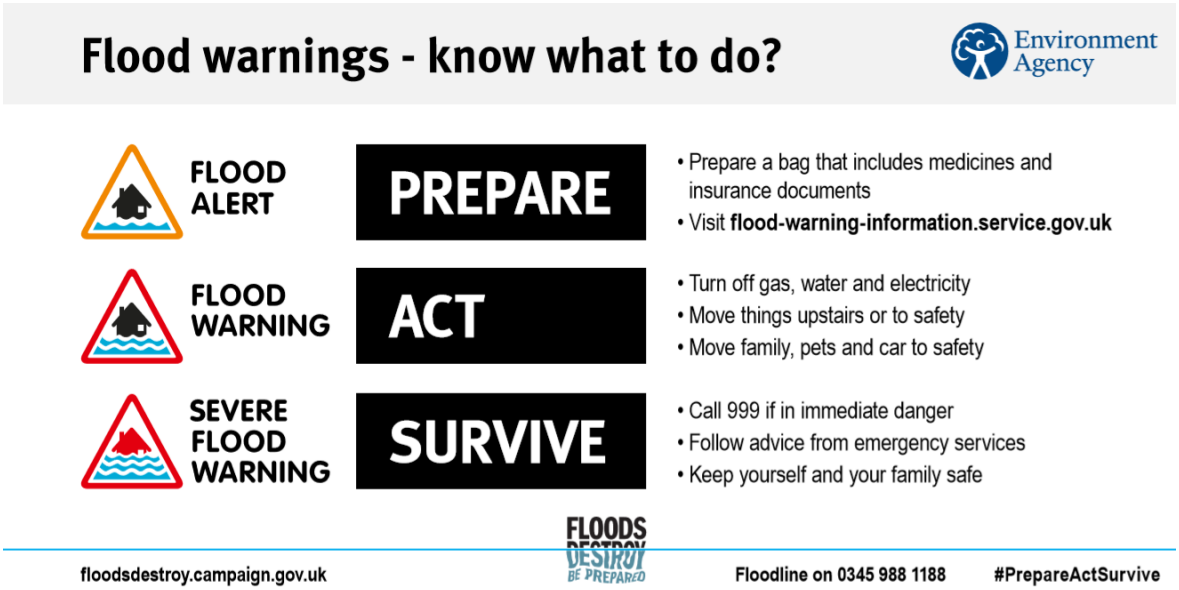
### EA Floodline Warnings

3.7. This is a warning scheme to inform people in vulnerable areas when there is a significant risk of flooding. Registration can be undertaken via the Floodline (contact: 0345 988 1188).

3.8. Using the latest information available, EA staff monitor rainfall, river levels and sea conditions 24 hours a day and use this information to forecast the possibility of flooding. If flooding is forecast, warnings are issued using a set of three easily recognisable codes. A summary of the codes is provided below and an indication of the level of danger associated with the warning. The recommended actions are outlined in Figure 4.

- Flood alert – flooding is possible, be prepared;
- Flood warning – flooding is expected, immediate action required; and
- Severe flood warning – severe flooding is expected, danger to life.

Figure 4: Environment Agency Flood Warning Service




3.9. Facility management and security will sign up to the Floodline Warnings service in order to advise residents and visiting traders of any potential risks. Commercial unit employees and frequent residents should also sign up to the Floodline Warnings service as it is possible that they may be affected on their way to and from work.

## Before a Flood Event

3.10. It is recommended that reverse parking is practised as standard which will aid in the evacuation of vehicles. HGVs and vehicles with high wheel bases should be retained on site to reduce obstructions during evacuations.

3.11. Given that flood risk posed by parking along the public highway in Dantzic Street, which is adjacent to the river, it is strongly recommended that residents refrain from parking their vehicles on along this street, especially when flood alert warnings are issued. While Dantzic Street primarily serves as a public highway and does not typically accommodate resident parking, there are exceptions, including 1 loading bay and 2 disabled bays outside Tower A, as well as 1 loading bay outside Tower C. However, residents should still exercise caution and relocate their vehicles to a safer location beyond the anticipated flood area when flood alerts are issued. This proactive measure will help mitigate potential damage and reduce potential obstruction to emergency services.

3.12. Facility management should know who to contact and how and also:

- Agree where you will go and how to contact each other.
- Keep a list with all your important contacts to hand.

3.13. All Facility management and commercial unit employees, and residents should receive a site induction which includes being made aware of the risk of flooding and the actions to take during a flood event (see below).

3.14. Facility management should consider the siting of critical IT, servers and operational infrastructure onto first floor level (or above).

3.15. It is important for Facility management to check their insurance cover and to also:

- Check their buildings and contents insurance policy.
- Confirm they are covered for flooding.
- Find out if the policy replaces new for old, and if it has a limit on repairs.
- Don’t underestimate the value of their contents (including commercial equipment and stock).

3.16. Facility management and key commercial unit employees should know how to turn off their gas, electricity and water mains supplies and if in doubt ask their suppliers how to do this.

3.17. Facility management should prepare a flood kit of essential items and keep them handy at first floor level (or above). The kit should include:

- Copies of their insurance documents.
- Torches with spare batteries.
- A wind-up or battery radio.
- Warm, waterproof clothing and blankets.
- A first aid kit.
- Bottled water and non-perishable foods.

3.18. Site visitors should sign in / out and leave mobile contact details.

## On-Site Flood Warning System and Flood Alert Notice

3.19. Upon the onset of adverse weather conditions, it is expected that there will be a 24-48 hour advance warning of potential flood event.

3.20. Upon receipt of a flood warning, it is recommended that an on-site warning system is activated which will alert residents of the Site to the potential risk of flooding if the defences were to fail. This could be an automated on-site phone or email alert system. Once a flood warning is received from and official source i.e. the EA flood warning service, a member of the on-Facility management team or similar who are aware of the risks and how to implement the Flood Management Plan, should immediately activate the on-site system (phone or email alert system). Table 2 provides a set of general interpretations to be carried out upon issue of an EA flood warning.

3.21. Due to the nature of a flood event, it is important that all Facility management and commercial unit employees are made aware that they are in an area at risk of flooding and of the necessary actions to take during a flood event. A Flood Alert Notice has been included as Appendix A. Notices similar to that shown should be posted around the building to ensure that all residents are aware that the building is located within an area at risk of flooding, and what the current flood alert status is as issued by the EA.

Table 2: General Interpretation of Environment Agency Flood Warning Service

| Flood Warning Level | What it means | When it is used | What to do |
|---|---|---|---|
|  | • Flooding is possible.<br>• Be prepared. | • Two hours to two days in advance of flooding. | • Be prepared to act on your flood plan;<br>• Prepare a flood kit of essential items; and<br>• Monitor local water levels and the flood forecast on the Environment Agency website. |
|  | • Flooding is expected; and<br>• Immediate action is required. | • Half an hour to one day in advance of flooding. | • Move critical IT, equipment and valuable stock to a safe place;<br>• Turn off gas, electricity and water supplies if safe to do so; and<br>• Put flood protection equipment in place. |
|  | • Severe flooding; and<br>• Danger to life. | • When flooding poses a significant threat to life. | • Stay in a safe place with a means of escape;<br>• Be ready should you need to evacuate from your property;<br>• Co-operate with the emergency services; and<br>• Call 999 if you are in immediate danger. |
| n/a | • No further flooding is currently expected in your area. | • When weather, river or sea conditions begin to return to normal. | • Be careful as flood water may still be around for several days; and<br>• If you've been flooded, ring your insurance company as soon as possible |

## During a Flood Event

3.22. During a flood event residents should take action in line with the current flood warning status. As such, there should be a designated member of staff monitoring the Flood Warning level to ensure appropriate action is being taken. Table 3 provides a list of site-specific actions that should be undertaken, based upon the current flood warning status.

3.23. During a flood event, residents should focus on the safety of themselves and other critical workers still on-site. They should:

- Cooperate with the emergency services if they tell you to evacuate during flooding.
- Be prepared to act quickly and get yourself to safety.

Table 3: Site specific actions based on Environment Agency Flood Warning Service

| Flood Warning Level | What it means | When it is used | What to do |
|---|---|---|---|
|  | • Flooding is possible.<br>• Be prepared. | • Two hours to two days in advance of flooding. | • Remain calm.<br>• Designated person to monitor EA Website, local news and weather forecasts on an hourly basis and appraise facility management. |
|  | • Flooding is expected; and<br>• Immediate action is required. | • Half an hour to one day in advance of flooding. | • As above.<br>• Designated person to alert on-site staff/visitors of elevated flood warning and make verbal contact with facility management.<br>• Business critical equipment to be moved to upper floors.<br>• Non-critical site operatives to leave site.<br>• On an hourly basis or less designated person to ensure egress is clear without obstruction.<br>• Sign in/out all residents.<br>• Pin up Flood Alert Notices in areas around the site where they can be clearly viewed.<br>• Ensure windows on first floor above are openable to allow for evacuation by emergency services, should this become necessary.<br>• Notify any potential visitors to the site and postpone any non-essential deliveries. |
|  | • Severe flooding; and<br>• Danger to life. | • When flooding poses a significant threat to life. | • Designated person to monitor EA Website, local news and weather forecasts on a 30-minute basis and appraise facility management.<br>• Minimum staff levels to remain at site as required for security/operational reasons – all other staff instructed to leave.<br>• On a 30-minute basis or less designated person to ensure egress is clear without obstruction.<br>• Upon notification, (or egress routes begin to inundate) turn off main electricity supply to premises and isolate on-site substation supply prior to flood water entering the property if safe to do so. DO NOT touch sources of electricity when standing in flood water.<br>• Upon notification of a flood (or egress routes begin to inundate) turn off gas and water supply prior to flood water entering the property if safe to do so.<br>• Remaining staff to evacuate site if site begins to inundate or access / egress route begins to flood. Evacuate the site via the possible routes indicated on the map in Appendix A. |

| Flood Warning Level | What it means | When it is used | What to do |
|---|---|---|---|
| | | | overleaf, subject to local conditions at the time and advice from the Emergency Services.<br>• If safe egress from site is not possible, staff or site residents to congregate on a designated area at first floor level, contact emergency services and heed their instructions.<br>• Avoid walking or driving through flood water.<br>• Keep vulnerable people away from flood water.<br>• Wash their hands thoroughly if touched by flood water. |
| n/a | • No further flooding is currently expected in your area. | • When river or sea conditions begin to return to normal. | • Keep aware of weather and EA flood warning status every two hours for the following 24 hours.<br>• Only return to site if you are told it is safe to do so.<br>• Beware sharp objects, open manhole covers and pollution in flood water. |

# 4. Evacuation Routes and Safe Egress

4.1. Building managers, store stewards, and all residents will need to sign up to the 'EA floodline warning direct service' where they will receive notification of impending flooding. This will trigger the evacuation protocol.

4.2. Once a flood warning notification is received by the Facility Management, they will alert the commercial unit employees to start procedures to fit the flood defence barriers and seal the units until the flood risk has passed.

4.3. Commercial unit employees are advised to follow emergency signage, which will direct them to evacuate through the main entrance of the unit. From there, they will be directed to the top of Bromley Street, which sits outside of the 0.1% AEP flood extents.

4.4. It's important to note that lifts should not be used for transporting people following receipt of a Severe Flood Warning, nor during a flood event.

4.5. All dwellings will be set a minimum 600mm above 1% AEP + 35% CC flood level. This will also satisfy the 0.1% AEP flood level. If there is not a sufficient time to escape safely then residents would remain indoors and move up to higher levels of their homes when/if required. As units will be above flood level the residents will either need to wait for the flood waters to recede or await rescue.

4.6. It is expected that 24-48 hours warning will be available between the onset of adverse conditions and the occurrence of a flood event.

4.7. Therefore, upon receipt of a severe flood warning, it is recommended that an on-site phone or email alert system (through the Facility management's portal/app) is activated which will alert staff and residents of the Site to the potential risk of flooding if the defences were to fail.

4.8. Should any residents still be present during the onset of flooding at the Site, residents should seek refuge via internal stair cores to designated areas on first floor level (or above) where areas of safe refuge would be available.

4.9. Due to the 12-hour tidal cycle, a tidal flood event would not be expected to be a long duration event, therefore, residents may only need to seek refuge for around 6 hours until flood waters subside.

4.10. Security or other designated personnel should be stationed at key locations within the premises to direct residents to areas of safe refuge.

4.11. Key points to note during evacuation and egress are noted below:

**Remember**

Don’t walk through flowing water – currents can be deceptive, and shallow, fast moving water can knock you off your feet!

Don’t swim through fast flowing water – you may get swept away or struck by an object in the water!

If you have to walk in standing water, use a pole or stick to ensure that you do not step into deep water, open manholes or ditches!

Don’t drive through a flooded area – you may not be able to see abrupt drop-offs and only half a metre of flood water can carry a car away!

Avoid contact with flood water – it may be contaminated with sewage, oil, chemicals or other substances!

# 5. After a Flood

## Dangers of Flood Water

5.1. Flood waters pose various risks, including infectious diseases, chemical hazards and injuries. Due to the presence of foul and combined sewers within the area, there is a risk that flood waters may contain sewage. In addition, flood water may contain sharp objects such as glass or metal fragments that can cause injury and lead to infection. These risks should be taken into consideration when preparing for or cleaning up after a flood event.

5.2. The Environment Agency recommends that the following should be undertaken after a flood event, as per Public Health England guidance document Floods – How to Clean up Your Home Safely:

- Contact insurance company;
- Wash clothes, surfaces and any other items that would have been in contact with flood water, with hot water and detergent;
- Ensure good ventilation to dry out indoor spaces;
- Only turn on gas or electrics that may have become wet after they have been checked by a qualified technician; and
- Areas in the basement that have experienced flooding may need pumping out.

5.3. The full Public Health England guidance document can be found at **https://www.gov.uk/after-flood**.

5.4. The National Flood Forum and their Floodline advisers can also provide advice on recovering from a flood event. They can be reached at 01299 403 055 and **https://nationalfloodforum.org.uk/** can also offer guidance.

# 6. Useful Contacts

6.1. Table 4 below provides contact numbers for relevant bodies and Emergency Services.

6.2. London Fire and Rescue Services and the Police should be contacted during an emergency. It is recommended that this table is completed by the Facility management team and updated regularly (annual basis) to ensure that details are as accurate as possible.

Table 4: Useful Contacts

| | Company Name | Telephone Number |
|---|---|---|
| Greater Manchester Fire and Rescue Service | - | 0800 555 815 |
| Greater Manchester Police | - | 101 |
| National Flood Forum | - | 01299 403055 |
| Greater Manchester Resilience Forum | - | 0161 608 4375 |
| United Utilities | | 0345 672 3723 |
| Electricity Supplier and Meter Number | | |
| Electricity Substation Reference and Emergency Contact | | |
| Gas Supplier and Meter Number | | |
| Insurance Company 24 hour number and Policy Number | | |
| Insurance Agent | | |
| Local Radio Station for News Alerts and Weather Updates | | |
| Electrician | | |
| Plumber | | |
| Builder | | |
| Equipment Repair/Supplier | | |
| Security Services | | |
| Water Pumping Services | | |
| Emergency Power Suppliers | | |

# 7. Conclusion

7.1. The consented development scheme comprises a mixed used residential and commercial development. The development is split into two parcels, North and South buildings, dissected by Bromley Street. The Southern Parcel will consist of a landmark 37 storey tower with a single storey podium for commercial space and ground floor townhouses. The Northern Parcel will consist of two smaller 26 and 18 storey towers, townhouses, and ground floor car parking and commercial use.

7.2. To get an accurate representation of the extents of the various flood zones across the site, Civic Engineers have plotted the flood levels against the current topographical survey. Figure 3 shows the site sits within areas of Flood Zone 2 (Light blue hatch), and 3 (Dark blue hatch). The dashed magenta line represents the flood zone 3b levels in the area.

7.3. The minimum ground floor level of the commercial units is summarised in Table 1 below. The floor levels to the Commercial units are lower than the 1% AEP + CC flood level; it is necessary to provide units at this level to tie into and activate the existing streets as such further mitigation measures are to be provided including flood resistant construction to a level of 600mm above the floor level and, where necessary, flood resilient construction to a minimum level equivalent to the 1% AEP + CC + 300mm freeboard.

7.4. The Finished Floor Level (FFL) for the residential units will be a minimum of 31.035 mAOD which is the equivalent to the 1% AEP + 35% CC flood level + 600mm freeboard. This level is 374mm higher than the calculated 1% AEP + 70% CC flood level and as such residential units would not be impacted in this flood event.

7.5. In addition to this the units are multi-storey; if there is insufficient time to escape then the residents will be advised to implement a stay put strategy and move up to the upper floors of their homes.

7.6. Facility management will sign up to the Floodline Warnings service in order to advise Residents and visitors of any potential risks. Commercial unit employees and frequent residents should also sign up to the Floodline Warnings service as it is possible that they may be affected on their way to and from work.

7.7. It is expected that 24-48 hours warning will be available between the onset of adverse conditions and the occurrence of a flood event.

7.8. Once a flood warning notification is received by the Facility Management, they will alert the commercial unit employees to start procedures to fit the flood defence barriers and seal the units until the flood risk has passed. Commercial unit employees are advised to follow emergency signage, which will direct them to evacuate through the main entrance of the unit. From there, they will be directed to the top of Bromley Street, which sits outside of the 0.1% AEP flood extents.

7.9. Facility management should receive flood warnings and implement appropriate site-specific actions set out within this FMP to minimise risk to Residents and to minimise disruption to the commercial business and property.

7.10. Facility management and Residents should be prepared to take action, if necessary, by seeking refuge within upper floors of the property to ensure the Residents are safe.

7.11. All residents should be made aware of the risk of flooding to the Site and the procedures to take before and during a flood event. This should include the undertaking of a site induction which includes being made aware of flood risk posed to the building, and what to do during a flood event. Any visitors should be accompanied at all times unless they have undertaken a site induction.

7.12. Facility management must understand how to operate the first-floor windows during the occurrence of a breach event. Should safe refuge towards the upper floors be required, it may be necessary to

use the windows as a means of evacuation once emergency services have reached the Site. Facility management must also understand how to store, test, and operate flood defence barriers.

7.13. Residents should also be made aware of the information for accessing safe refuge areas.

7.14. This plan is a living document and should be reviewed periodically and updated as necessary, in light of the latest guidance and available flood data. Where possible, the plan should be exercised through on-site testing with involvement of the building users.

7.15. A copy of this Flood Management Plan should be made available for all Facility management, commercial unit employees and residents of the Site.

7.16. Provision is made within this FMP for notification of flood warnings, actions to be taken, safe evacuation routes and safe areas of refuge, ensuring that Residents remain safe in a flood event.

# APPENDICES

# A. Flood Alert Notice

# Flood Alert Notice

**This building is located in an area at risk of fluvial (river) flooding which could occur very quickly during times of high river level.**

**The current weather warning status issued by the Met Office is:**

**(INSERT THE APPROPRIATE CODE HERE)**

**The period this Flood Alert is active for is:**

**(INSERT DATE/TIME HERE)**

**Emergency services will access the building through the main entrance from York Road if required.**

**Designated Flood Warden**

**(INSERT NAME HERE)**

**Flood Warden Contact Number**

**(INSERT NUMBER HERE)**

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