

TECHNICAL NOTE

Job Name: Waterfront Square, Norman Road, Reading
Job No: 332610561
Note No: TN002
Date: December 2024
Prepared By: Richard Fisher
Subject: **CLARIFICATION TO ADDRESS ENVIRONMENT AGENCY (EA) COMMENTS**
EA LETTER DATED 12TH NOVEMBER 2024, EA REF: WA/2024/131767/01-L01
READING BOROUGH COUNCIL (RBC) PLANNING REFERENCE PL/24/0958

This Technical Note has been prepared by Stantec to provide clarification on the points raised in the Environment Agency (EA) consultation response dated 12th November 2024, following submission of the Flood Risk Assessment (Stantec, July 2024) in support of the above planning application. The EA response raises concerns over two particular aspects as follows:

- (1) Impacts to floodplain capacity and flood flows;
- (2) Flood hazard on the surrounding access at the climate change scenario.

These points are addressed in turn below. Where relevant, the EA response is quoted in ***bold italic*** text.

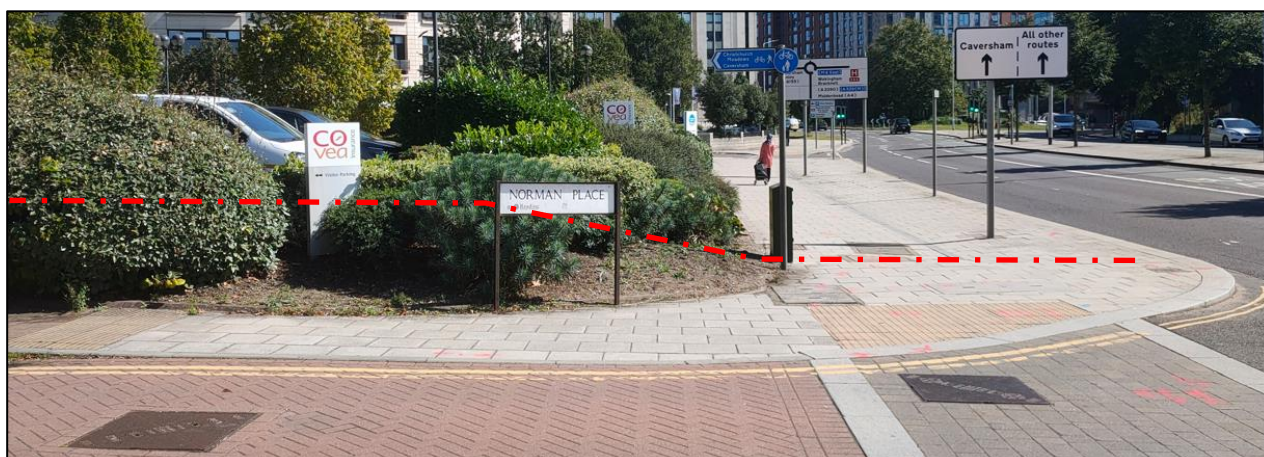
1. Floodplain Storage and Flow Routes

“The proposed 60 m wall to the south of the site bordering Vastern Road is within the 1% annual exceedance probability (AEP) plus 35% climate change allowance design flood extent. The flood plain level is 38.18 mAOD (above ordnance datum) and 1% AEP + 35% depth of flooding would be approximately 300 mm. The wall has the potential to impede flood flow and increase the hazard to the road and increase flood risk offsite.”

The detailed 1 in 100 annual probability +35% climate change extent has been updated in Stantec Drawing 332610561-STN-GEN-SW-DR-W rev P6, attached.

As detailed in the submitted FRA, the present day River Thames 1 in 100 annual probability floodplain is contained to the north of the site, but in the ‘design’ 1 in 100 annual probability +35% climate change flood, a second flow route occurs along Vastern Road to the south.

Figure 1: View east along southern site boundary



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The reference climate change flood level on this side of the site is 38.2m AOD. As shown indicatively on **Figure 1**, this boundary of the site rises from the Vastern Road footpath level (37.9m AOD) up a vegetated bank to the existing car park level at 38.4m AOD. As such, the floodplain extends partly up this vegetated bank but does not spill into the raised car park area, from a maximum depth of 300mm on the footpath up to zero.

The extract of the detailed floodplain extent over the southern part of the site is shown below, overlaid with the proposals (fully updated flood extents plan appended for reference).

Figure 2: 1 in 100 Annual Probability +35% Climate Change Floodplain – Southern Site Boundary

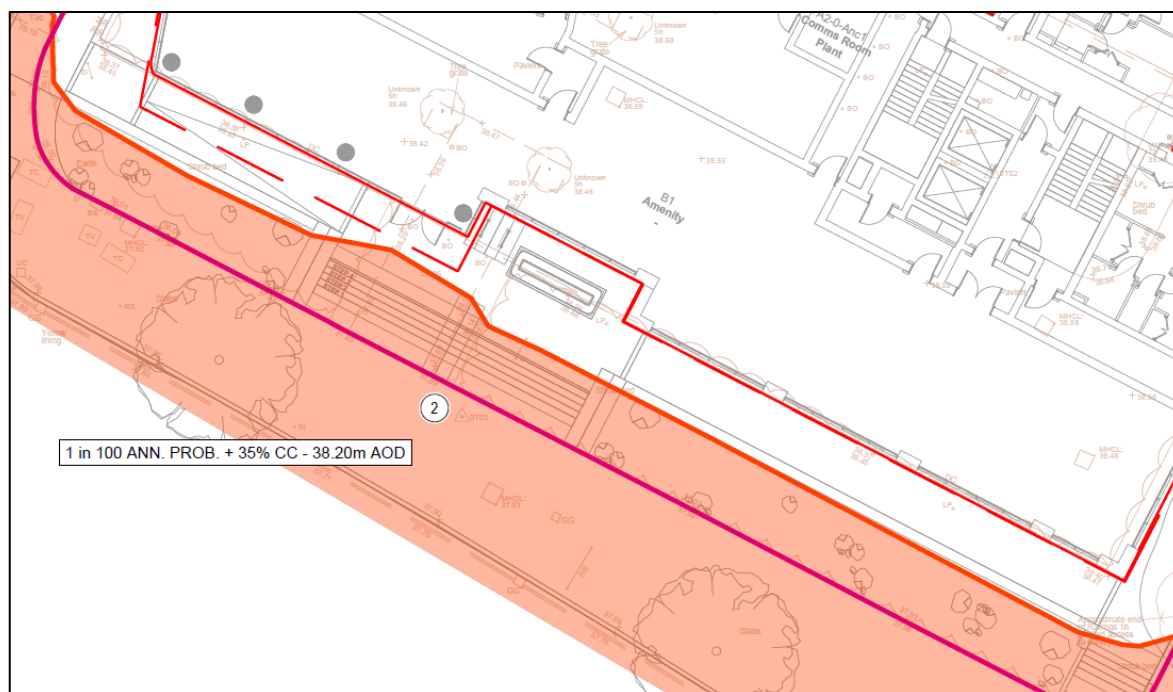


Figure 2 confirms that the proposed wall running along the southern part of the site is just outside the floodplain. The only elements just within the floodplain are (i) the main site entrance steps, (ii) the associated sidewalls, and (iii) the smaller set of steps in the south-east corner of the site.

The proposed steps along this boundary will have a negligible impact on floodplain storage; they step up from the existing Vastern Road ground level, up to the same approximate level as the existing car park, along the same approximate gradient/profile as the existing earth bank.

The sidewalls of the main steps would have the potential to cause a small obstruction to the periphery of the floodplain, and cause a small loss in floodplain storage; a plan area of 12m², over an average depth of 150mm, results in a loss of 1.8m³. This is clearly negligible, and ignores the overall significant enhancement to floodplain capacity provided by the site.

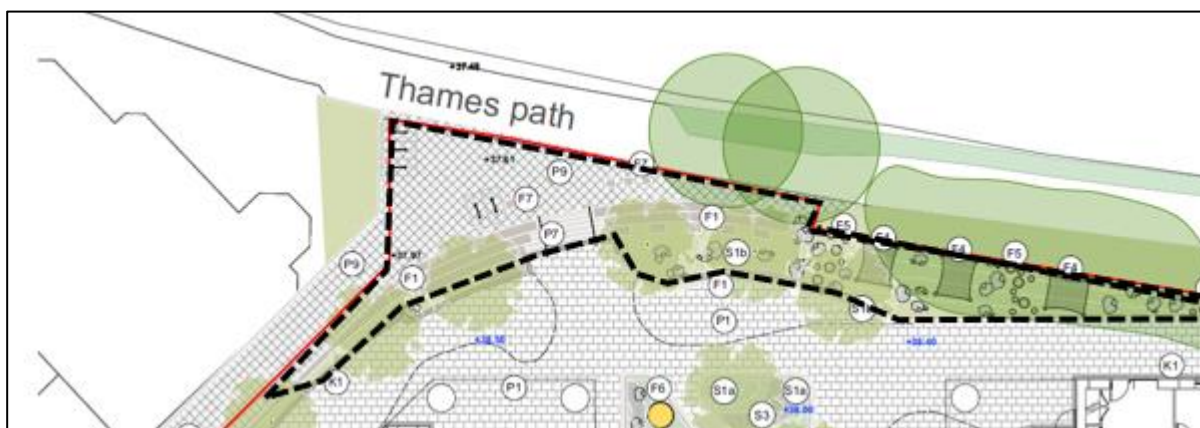
On the north side of the development, the existing site features a retaining wall along the back of the Thames towpath, with ground rising approximately 800mm from the 37.5m AOD towpath to a 38.3m AOD raised patio (see FRA Figure 3-2). The scheme proposal is for this raised wall to be removed, and replaced with a new landscaped bank and amenity space that gently grades down to the adjacent public rights of way within the site – see black outlined area in **Figure 3**. The associated impacts on floodplain storage volume have been assessed through a cut and fill exercise by Hexa Consulting (see attached 'Flood Volume Comparison'), and can be summarised as follows

- The northern boundary proposals result in a gain in floodplain volume of gain in floodplain capacity of 75.0m³ up to the reference climate change level,

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- Of this 75.0m³ gain, 54.4m³ of additional capacity is between the present day 1 in 100 annual probability flood level and the 1 in 100 annual probability +35% climate change flood level (37.89m AOD to 38.26m AOD);
- **As such, the gains in floodplain capacity – a total of 75.0m³ gain - far outweigh any minor losses of less than 2.0m³ associated with the features on the southern boundary** (and are provided in a location adjacent to the river that is more efficient in providing compensatory storage where needed).

Figure 3: Proposed northern site boundary treatment and extent of ground lowering



“The applicant should consider either demonstrating that the wall will not increase risk offsite or look at alternative options which would not impede the flow of flood water. The applicant could consider breaks in the wall, for example, every 5 m of length with 1 m openings.”

As noted above, it is evident the only impact would be from the limited area of steps (and steps sidewall) encroaching into the edge of the climate change floodplain, this impact is negligible and is significantly compensated for by the proposed enhancements on the north side of the site.

The base of the steps side walls within the floodplain could be designed to be open if this remained a concern to the EA despite the above evidence (and secured through a suitably worded planning condition).

2. Safe Access and Flood Hazard

“We have considered the findings of the flood risk assessment in relation to the likely duration, depths, velocities and flood hazard rating against the design flood for the proposal. The applicant has discussed the hazard rating, mentioning very low hazard for the 1% AEP flood, but has not provided a plan showing safe access and escape routes.

The FRA does not say what the hazard is for the 1% AEP with an allowance for climate change. However, the applicant has suggested a 'Flood Management and Evacuation Plan' is produced.

The flood hazard rating from the Thames (Pangbourne to Sonning) 2019 model indicates during the design flood there will be a danger to most people (e.g. there will be danger of loss of life for the general public).”

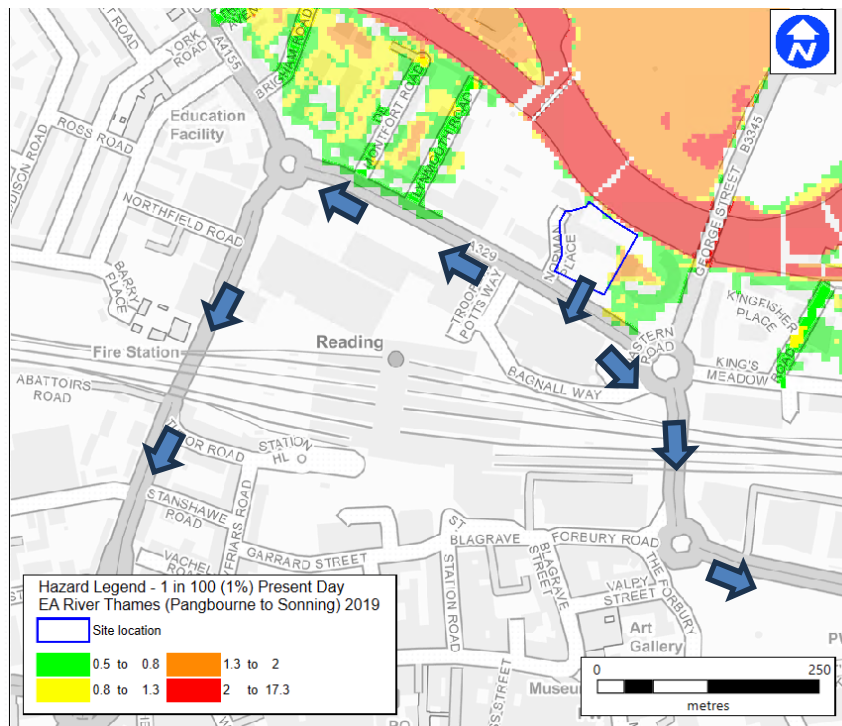
Safe access is addressed in Section 7.5 of the FRA.

This confirms that a continuous dry access route was available to occupants of the development in events up to and including the present day 1 in 100 annual probability flood. The optimal routes are south towards the town centre, either west along Vastern Road and south on Caversham Road, or east on Vastern Road, under the railway line and south-east via Forbury Road/Forbury Gardens.

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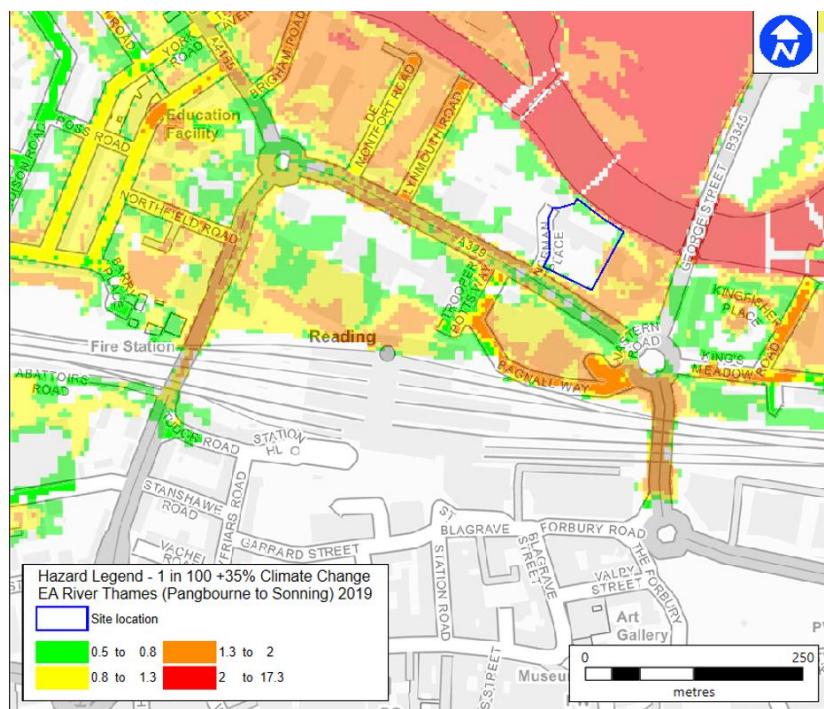
Figure 7.1 provided the Flood Hazard mapping for this event but this is replicated in **Figure 4** below with arrows to denote access routes as requested.

Figure 4: 1 in 100 Annual Probability Event – Flood Hazard



FRA Figure 7-2 denoted the flood hazard at the peak of the 1 in 100 annual probability +35% climate change event. As detailed in the FRA, this confirms that there is not a safe ('very low hazard') pedestrian route out of the site at the peak of this event due to the new flood flow routes across the area and along Vastern Road, resulting in a 'danger for some' on the adjacent footpath – see **Figure 5**.

Figure 5: 1 in 100 Annual Probability +35% Climate Change Event – Flood Hazard



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As noted in the FRA, in accordance with the Reading SFRA guidance a Flood Management and Evacuation Plan will be produced for the development to ensure that residents are provided with sufficient advance warning to evacuate the site prior to the access routes becoming blocked.

This can be secured through planning condition, and is on the basis that the River Thames is a slow-responding catchment and there has been widespread public awareness of prior flood events in the area several days before the area was affected, and there would be visual signs of wider flooding and the slowing rising floodwater from the site for a period of multiple days before any access routes are compromised.

Encls.

Hexa Consulting 'Flood Volume Comparison' Figure 700135-HEX-00-XX-SK-C-0300

Stantec Drawing 332610561-STN-GEN-SW-DR-W P06 – Flood Extents – Climate Change



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Notes

UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also be present but not shown. The Contractor is therefore advised to undertake their own investigation where the presence of any existing sewers, services, plant or apparatus may affect their operations.

- KEY:

 SITE BOUNDARY

② FLOOD NODES

 1 IN 100 ANNUAL PROBABILITY FLOOD +
35% CLIMATE CHANGE ALLOWANCE

 EXISTING BUILDING

RIVER CHANNEL

 PROPOSED BUILDING GROUND LEVEL FOOTPRINT PROPOSED BUILDING FIRST FLOOR OUTLINE

	RAB	ML	RF	2023.10.04
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

sue Status

S2 - FOR INFORMATION

This document is suitable only for the purpose noted above.
Use of this document for any other purpose is not permitted.

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PACKAGED LIVING

COVEA BUILDING, NORMAN PLACE,
READING

FLOOD EXTENTS - CLIMATE CHANGE

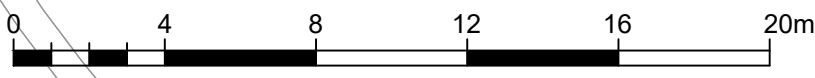
Project No.
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A1 Scale

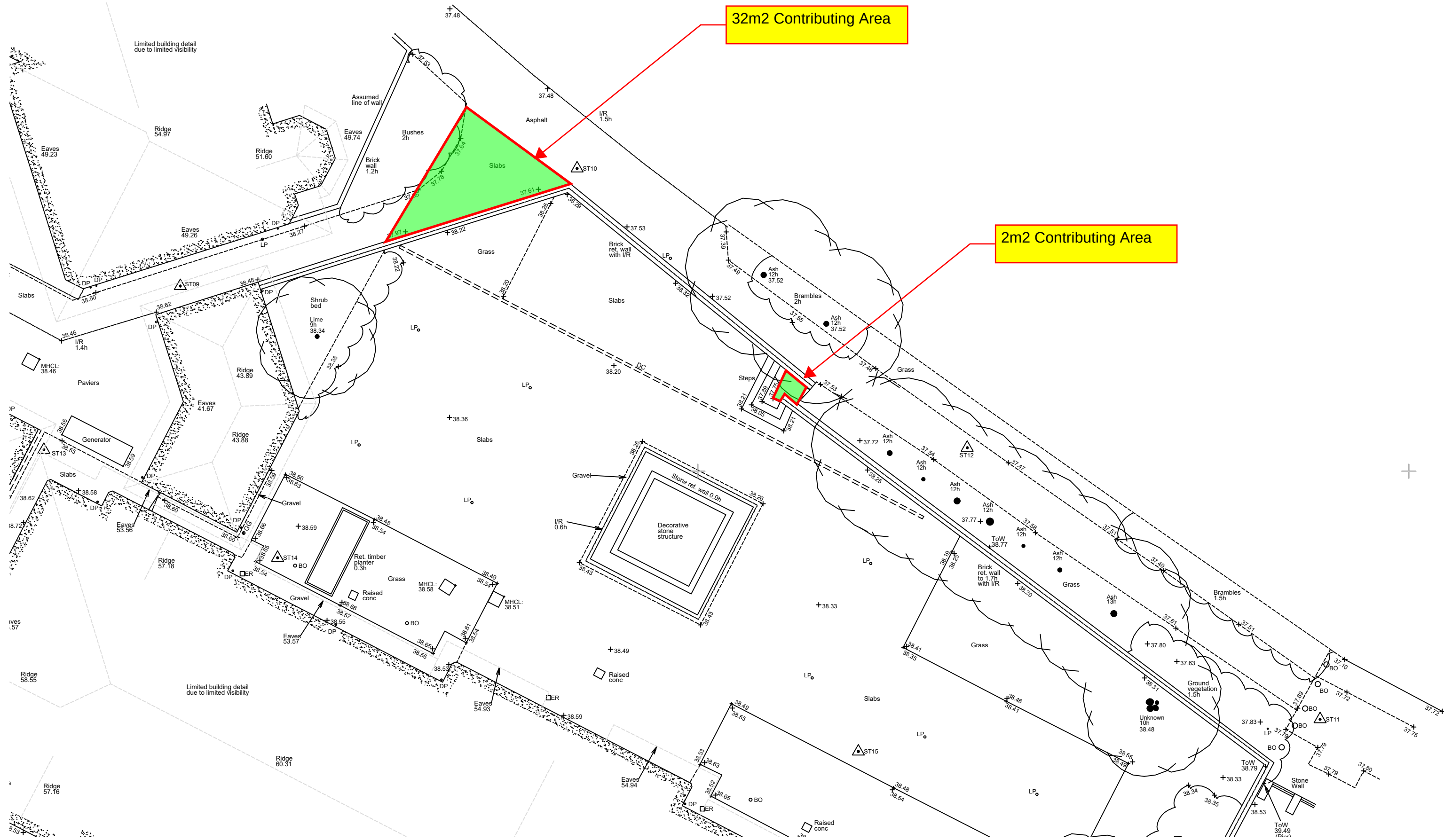
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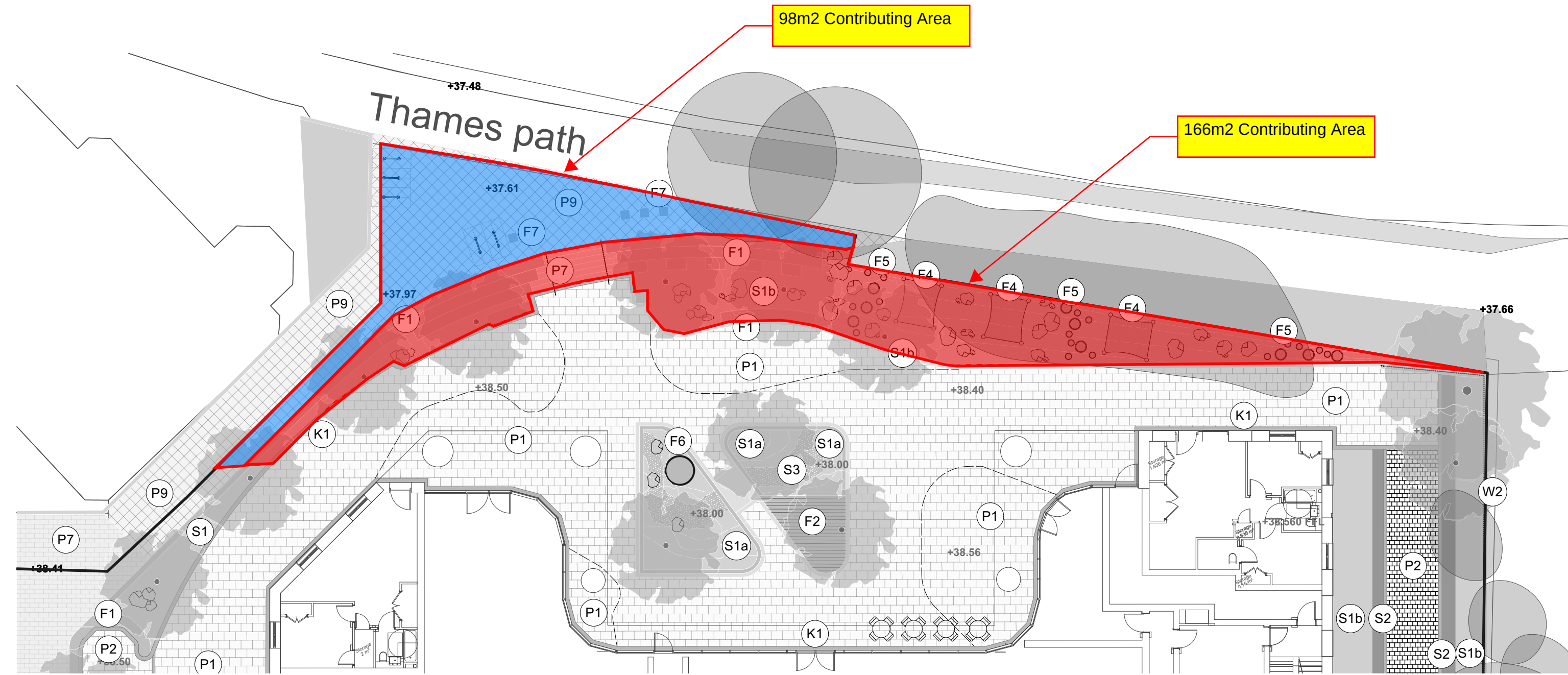
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SCALE 1:200



EXISTING FLOOD VOLUMES (Scale 1 : 200)



PROPOSED FLOOD VOLUMES (Scale 1 : 200)

EXISTING FLOOD VOLUME CALCULATIONS

Total contributing area = 34m2

Flood volume existing to 37.890 AOD = $(37.890 - 37.750) \times 34$

Flood volume existing to 37.890 AOD = **4.76m3**

Flood volume 37.890 to 38.260 AOD = $(38.260 - 37.890) \times 34$

Flood volume 37.890 to 38.260 AOD = **12.58m3**

TOTAL VOLUME (to 38.260 AOD) = 17.34m3

PROPOSED FLOOD VOLUME CALCULATIONS

Total contributing area **BLUE** = 98m2

Flood volume existing to 37.890 AOD = $(37.890 - 37.750) \times 98$

Flood volume existing to 37.890 AOD = **13.72m3**

Flood volume 37.890 to 38.260 AOD = $(38.260 - 37.890) \times 98$

Flood volume 37.890 to 38.260 AOD = **36.26m3**

TOTAL BLUE VOLUME (to 38.260 AOD) = 49.98m3

Total contributing area **RED** = 166m2

Note - RED area is triangular in shape, hence 50% contributing to volume.

Flood volume existing to 37.890 AOD = $(37.890 - 37.750) \times 166 \times 0.5$

Flood volume existing to 37.890 AOD = **11.62m3**

Flood volume 37.890 to 38.260 AOD = $(38.260 - 37.890) \times 166 \times 0.5$

Flood volume 37.890 to 38.260 AOD = **30.71m3**

TOTAL RED VOLUME (to 38.260 AOD) = 42.33m3

TOTAL COMBINED BLUE & RED VOLUME = 92.31m3

FLOOD VOLUME COMPARISON

Existing volume existing to 37.890 = 4.76m3

Existing volume 37.890 to 38.260 = 12.58m3

Existing volume TOTAL = 17.34m3

Proposed volume existing to 37.890 = 25.34m3

Proposed volume 37.890 to 38.260 = 66.97m3

Proposed volume TOTAL = 92.31m3

INCREASE OF 74.97m3 (432%)

HEXA

PROJECT:
NORMAN PLACE, READING

SKETCH TITLE:
FLOOD VOLUME COMPARISON

SKETCH REF:
700135-HEX-00-XX-SK-C-0300

DRAWN BY: RJO
DATE: 13.12.24
REV: P02