



TOPPING ENGINEERS

CONSULTING CIVIL &
STRUCTURAL ENGINEERS

FLOOD RISK ASSESSMENT

LOCATION:

25 Haley's Terrace, York

CLIENT:

Bob Marks

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Revision B

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Revision	Description	Date	Author	Checked
A	First Issue	August 2022	A Dyson	R Thacker
B	Updated Site Layout	Sept 2023	O Gill	J Sellers

1.0 INTRODUCTION

This Flood Risk Assessment (FRA) is compliant with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance. The FRA has been produced in respect of a planning application for the proposed residential development at 25 Haley's Terrace, York

Site Name	25 Haley's Terrace
Location	25 Haley's Terrace, Bell Farm, York, England, YO31 8RU
NGR (approx.)	460841, 453548
Application Site Area (ha)	0.026 ha
Development Type	Residential
NPPF Vulnerability	Low
EA Flood Zone	Flood Zone 3 with defences
EA Office	Yorkshire
Local Planning Authority	City of York Council

Table 1.1 - Site Summary

1.1 SOURCES OF DATA

The report is based on the following information:

- i. Existing Site Layout (Appendix A)
- ii. Proposed Site Layout (Appendix B)
- iii. Environment Agency information
- iv. City of York Strategic Flood Risk Assessment

1.2 EXISTING SITE

The site in question is located to the north of the city of York, approximately 1.6km away from the city centre. The site is approximately 0.026ha in size and is bounded by Haley's Terrace to the south, existing residential properties to the east and west and the River Foss to the north



Figure 1.1 - Site Location

1.3 PROPOSED DEVELOPMENT

The proposed development is set to consist of demolition of the existing stock and showroom and construction of new apartments with associated cycle and bin storage areas. A site layout is contained in Appendix B.

1.4 FLOOD RISK PLANNING POLICY

National Planning Policy Framework

The NPPF sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk. Planning Practice Guidance is also available online.

The Planning Practice Guidance sets out the vulnerability to flooding of different land uses. It encourages development to be located in areas of lower flood risk where possible and stresses the importance of preventing increases in flood risk off site to the wider catchment area.

The Planning Practice Guidance also states that alternative sources of flooding, other than fluvial (river flooding), should also be considered when preparing a Flood Risk Assessment.

This Flood Risk Assessment is written in accordance with the NPPF and the Planning Practice Guidance.

Flood Zones

The Flood Zone Map for Planning has been prepared by the Environment Agency. This identifies areas potentially at risk of flooding from fluvial or tidal sources. An extract from the mapping is included as Figure 1.2.

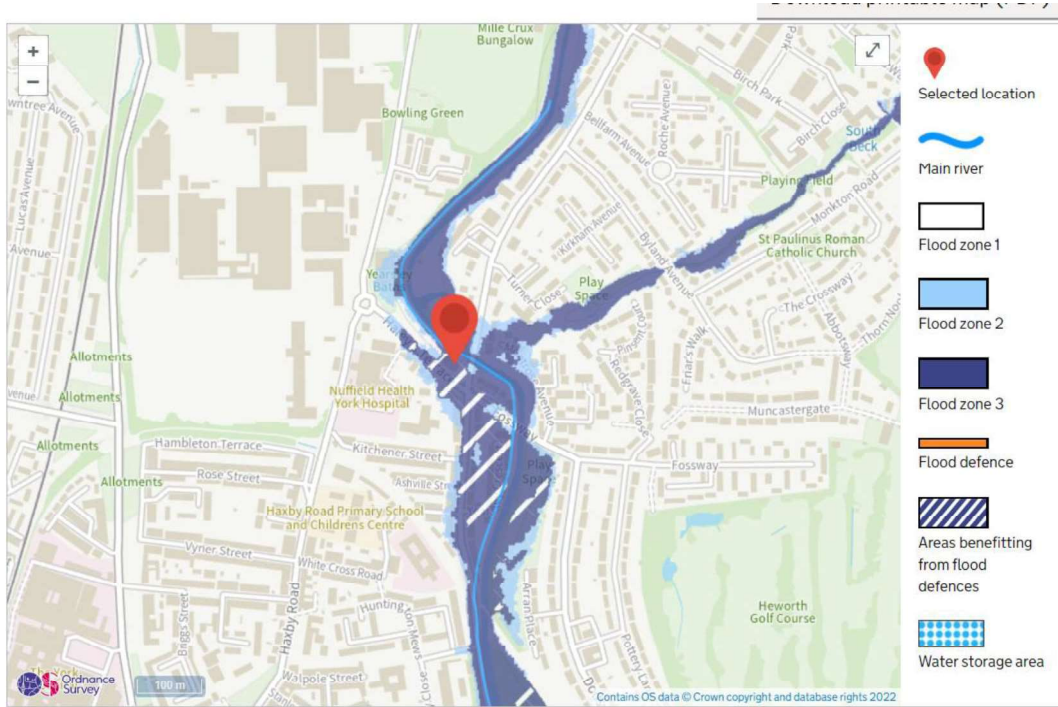


Figure 1.1 - Environment Agency Flood Zone Mapping

The site is shown to be located entirely within Flood Zone 3 (High Probability) therefore the site is considered to be high risk of flooding. The site is in an area of flood defences. Flood Zone 3 is defined as land assessed as having more than 1% annual probability of flooding from fluvial and tidal sources.

Table 2 of the Planning Practice Guidance classifies land use. Under these classifications the proposed health care unit is considered to be 'More Vulnerable' to the potential impacts of flooding.

Table 3 of the Planning Practice Guidance identifies that any development is considered appropriate within Flood Zone 1.

Flood Risk Vulnerability Classification	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable
Flood Zone 1	✓	✓	✓	✓
Flood Zone 2	✓	✓	Exception test required	✓
Flood Zone 3a	Exception test required	✓	x	Exception test required
Flood Zone 3b	Exception test required	✓	x	x

1.5 OTHER RELEVANT POLICY AND GUIDANCE

Strategic Flood Risk Assessment

The City of York Strategic Flood Risk Assessment (SFRA) was prepared to review flood risks on a much wider scale to assess the potential for new development within the study area. The SFRA was used as an evidence base for Local Development Frameworks for each Local Planning Authority.

The SFRA therefore aims to bring together all available flood risk information for a variety of sources to provide a robust assessment. The SFRA therefore is useful for this site-specific FRA by highlighting available data and instances of known flooding in the area. Although written under the guidance of Planning Policy Statement 25, the SFRA is still considered to include relevant information.

2.0 POTENTIAL SOURCES OF FLOOD RISK

The table below identifies the potential sources of flood risk to the site, and the impacts which the development could have in the wider catchment prior to mitigation. These are discussed in greater detail in the forthcoming section. The mitigation measures proposed to address flood risk issues and ensure the development is appropriate for its location are discussed within Section 3.0.

Flood Source	Potential Risk				Description
	High	Medium	Low	None	
Fluvial	X				The site is located in flood zone 3.
Tidal				X	There are no tidal influences effecting the site.
Canals				X	None present.
Groundwater			X		Ground conditions are not conducive to fluctuating groundwater levels.
Reservoirs and waterbodies		X			The site is shown to fall in reservoir and waterbodies flooding.
Sewers			X		The site in question is higher than the surrounding sewers therefore there is a very low risk.
Pluvial runoff				X	An area of the site is within a medium-risk area of surface water flooding.
Effect of Development on Wider Catchment				X	The impermeable area of the site is not being altered.

Table 2.1 - Pre-Mitigation Sources of Flood Risk

2.1 FLUVIAL FLOOD RISK

As previously mentioned, the site is shown to be within Flood Zone 1 and therefore poses a low risk to the proposed development.

The risk of flooding posed to the proposed development is low. This is because there is only one watercourse near the site that can pose a threat. However, the watercourse is 75m away from the site and is at a lower level.

Mitigation measures to address the residual risk posed by the watercourses surrounding the site are discussed within Section 3.0 of this report.

2.2 GROUNDWATER FLOOD RISK

Subject to completion of site investigation to confirm we would assume that natural ground water level is located well below the site surface and the nature of the strata means it is unlikely that there will be perched water above this level.

We therefore do not consider there is a risk of groundwater flooding affecting the development subject to final confirmation upon completion of suitable site investigation.

2.3 FLOOD RISK FROM RESERVOIRS & LARGE WATERBODIES

Reservoir failure flood risk mapping has been prepared by the Environment Agency, this shows the largest area that might be flooded if a reservoir were to fail and release the water it holds. The map displays a worst-case scenario and is only intended as a guide. An extract from the mapping is included as Figure 2.1.

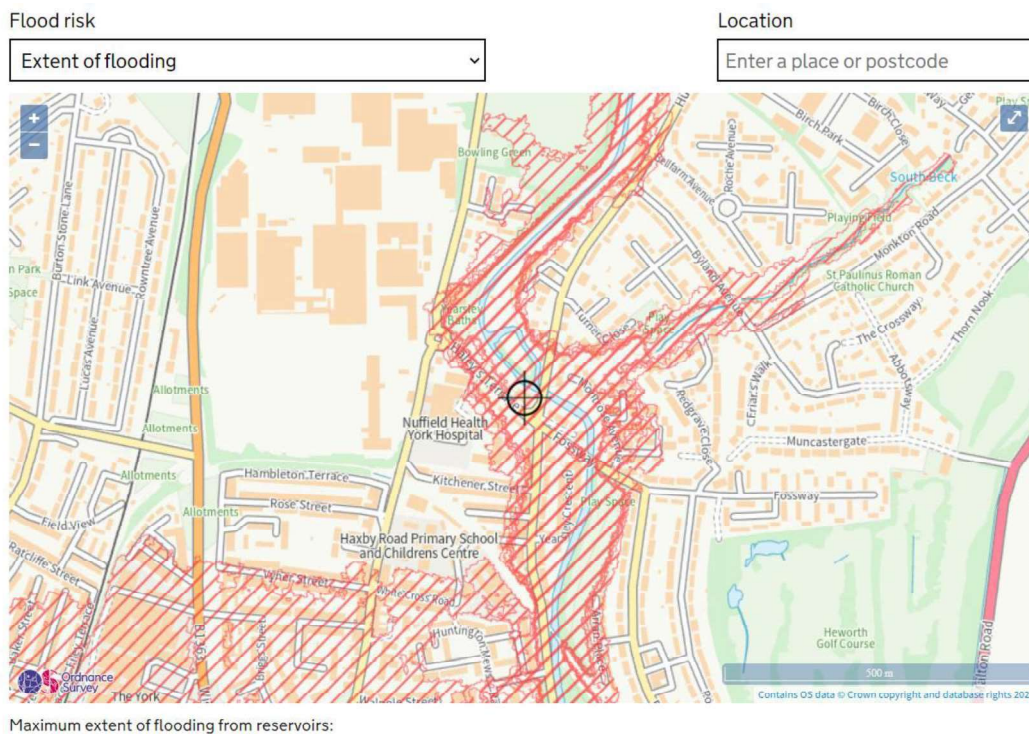


Figure 2.1 - Environment Agency Reservoir Failure Flood Risk Map

Mapping demonstrates the site is in an area where reservoir flooding is present when river flooding occurs.

As such, there is considered to be medium risk from reservoir flooding.

2.4 FLOOD RISK FROM SEWERS

The site in question lies above any main roads which is potentially where any Yorkshire Water sewers will lie.

As such, it is considered that there is no risk of flooding from sewers.

2.5 PLUVIAL FLOOD RISK

Risk of flooding from surface water mapping has been prepared by the Environment Agency, this shows the potential flooding which could occur when rainwater does not drain away through the normal drainage systems or soak into the ground but lies on or flows over the ground instead. An extract from the mapping is included as Figure 2.2

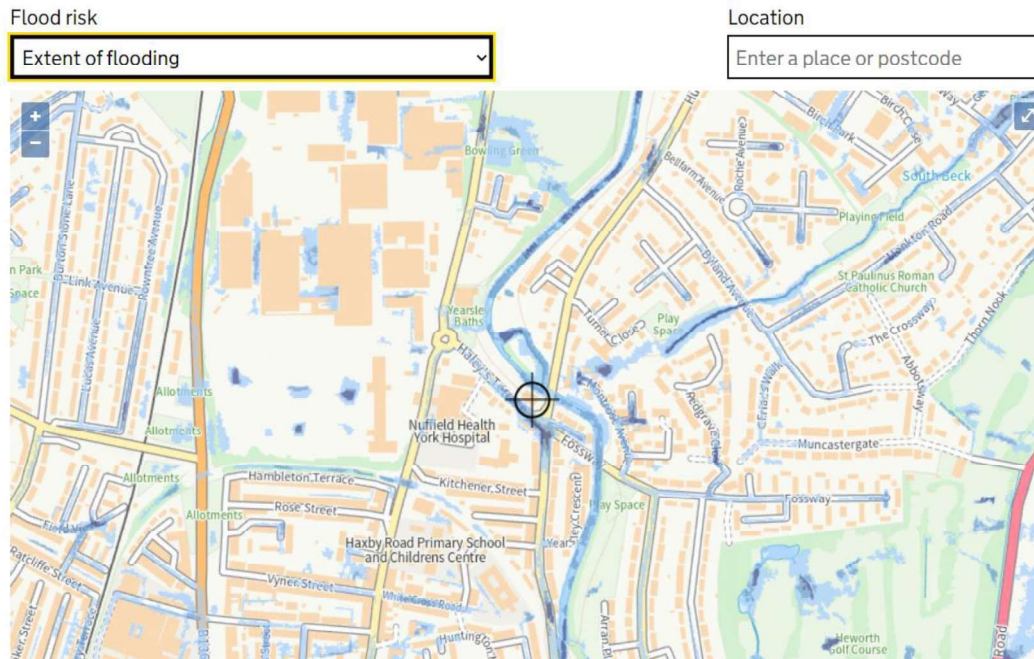


Figure 2.2 - Risk of Flooding from Surface Water Mapping

The mapping produced by the Environment Agency shows that there are several small areas just outside the site that are at risk of surface water flooding. These areas do not encroach the site and therefore will not affect the proposed development.

Therefore, the risk posed by this threat is considered negligible.

2.6 EFFECT OF DEVELOPMENT ON WIDER CATCHMENT

2.6.1 Development Drainage

The current site is considered to be brownfield. The amount of impermeable area will not be altered. Therefore, the existing drainage systems will be suitable discharge the surface water from the site. This also means that there will be no additional run-off leaving the site.

3.0 FLOOD RISK MITIGATION

Section 2.0 has identified the sources of flooding which could potentially pose a risk to the site and the proposed development. This section of the FRA sets out the mitigation measures which are to be considered within the proposed development detail design to address and reduce the risk of flooding to within acceptable levels.

3.1 SITE ARRANGEMENTS

3.1.1 Sequential Arrangement

The Flood Zone mapping shows the site to be located within flood zone 3 with defences.

3.1.2 Finished Levels

The proposed levels will tie in with the existing buildings retained.

3.1.3 Mitigation

The floor levels of the development will match those of the existing building as the development retained. However the large stock and showroom will be demolished and the new development ground floor will have an open cycle store and bin area which equates to a volume of 78m³ which will be returned to 'floodable volume' so provides a betterment to the current flood zone extents.

The EA modelling contained in Appendix C shows in the worst case 1in100year plus 50% climate change flood event the site will flood to a level of between 1 and 2m depth. As noted on the plans in Appendix B the first floor will be 2600mm height therefore site a minimum of 600mm above 2m flood depth. All living and sleeping accommodation is located on first or second floors therefore above the maximum flood level.

Given the site's location within Flood Zone 3 measures are required to mitigate the risk of flooding. As the proposals for the site is to be a change of use from the existing office buildings to seven residential dwellings the following mitigations should be take.

It is proposed that flood resilient building techniques will be implemented for this building, flood proofing to the ground floor. The new building will incorporate some of the following, details of which will be finalised by the Architect at detailed design stage:

- Electricity supply cables to enter building from above flood level and wired downwards; electric sockets to be positioned at least 800mm above floor level.
- Anti-flood valves on internal building drainage.
- Water resilient ground floor coverings should be considered.

In addition to the flood resilient techniques above a safe place of refuge should be provided for the building, the site is site situated within an Environment Agency Flood Alert Area. It is recommended that the resident registers with this service. In the event of an extreme storm notification on the alert service the following Flood Management Plan should be put in place:

- Advise all occupiers on the site that a Flood Alert has been issued and they should prepare to vacate.
- Maintain contact with the Environment Agency and Local Authority.
- Monitor flood levels of the nearby river, if water levels rise up top of the bank level, retreat to a safe place of refuge which will be outside of the Flood Zone 3. Therefore the second floor would be a suitable location.

4.0 CONCLUSIONS AND RECOMMENDATIONS

This Flood Risk Assessment (FRA) is compliant with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance.

This report demonstrates that the proposed development is not at significant flood risk, and simple mitigation measures have been recommended to address any residual risks that may remain. The identified risks and mitigation measures are summarised within Table 4.1.

Flood Source	Proposed Mitigation Measure
Fluvial	Site is shown to be in Flood Zone 3.
Impact of the Development	Strategic surface water drainage strategy prepared for wider development will ensure a sustainable approach to surface water management.

Table 4.1 - Summary of Flood Risk Assessment

In compliance with the requirements of National Planning Policy Framework, and subject to the mitigation measures proposed, the development could proceed without being subject to significant flood risk. Moreover, the development will not increase flood risk to the wider catchment area as a result of suitable management of surface water runoff discharging from the site.

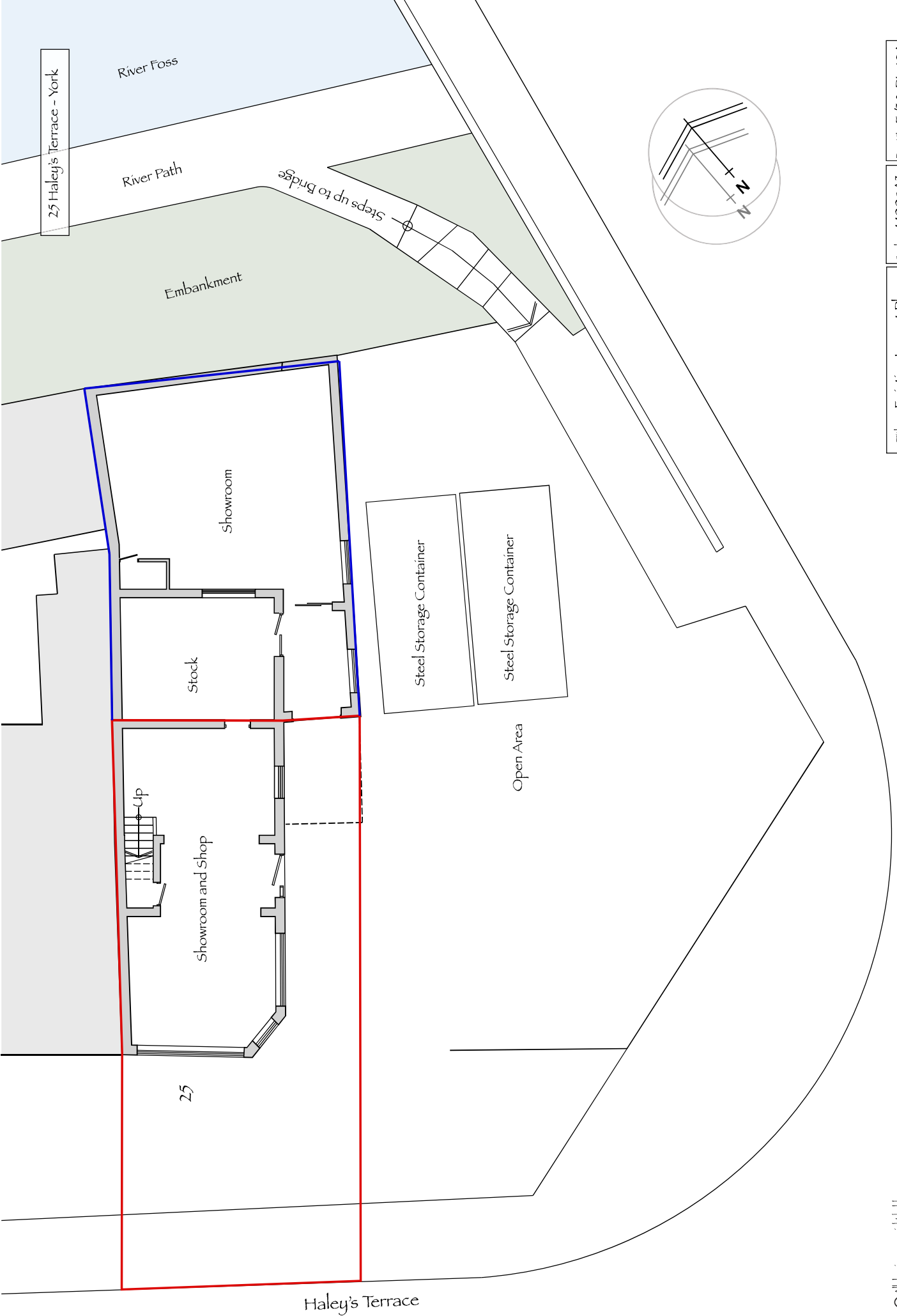
5.0 APPENDICES

Appendix A – Existing Site Layout Plan

Appendix B – Proposed Site Layout

Appendix C – EA Flood Data

Appendix A
Existing Site Layout



25 Haley's Terrace - York

River Foss

River Path

Embankment

Steps up to Bridge

Showroom

Stock

Showroom and Shop

Up

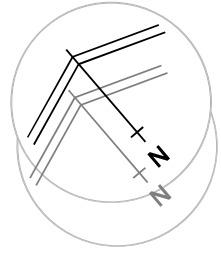
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Steel Storage Container

Steel Storage Container

Open Area

Haley's Terrace



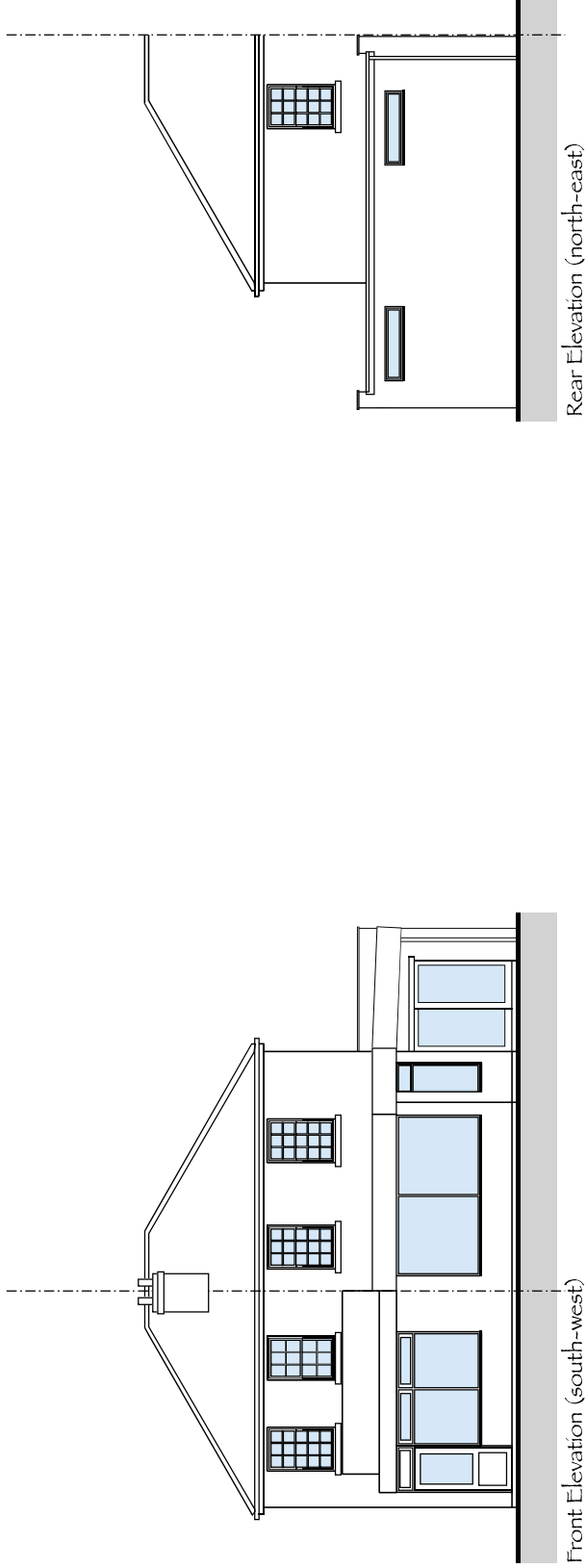
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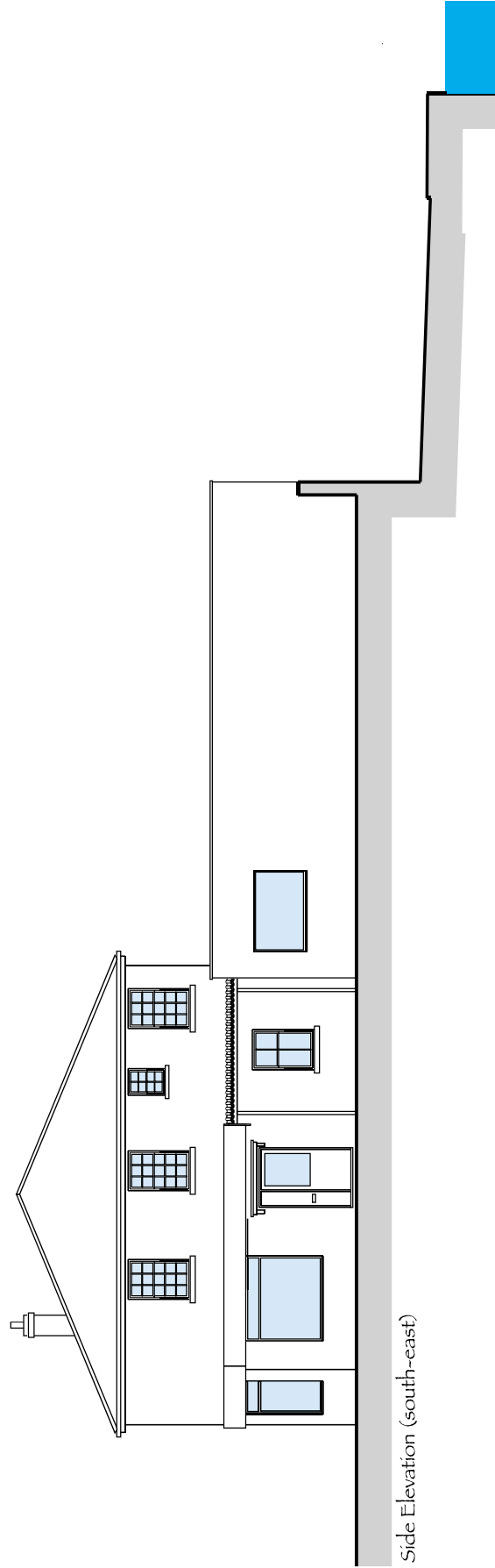
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25 Haley's Terrace - York



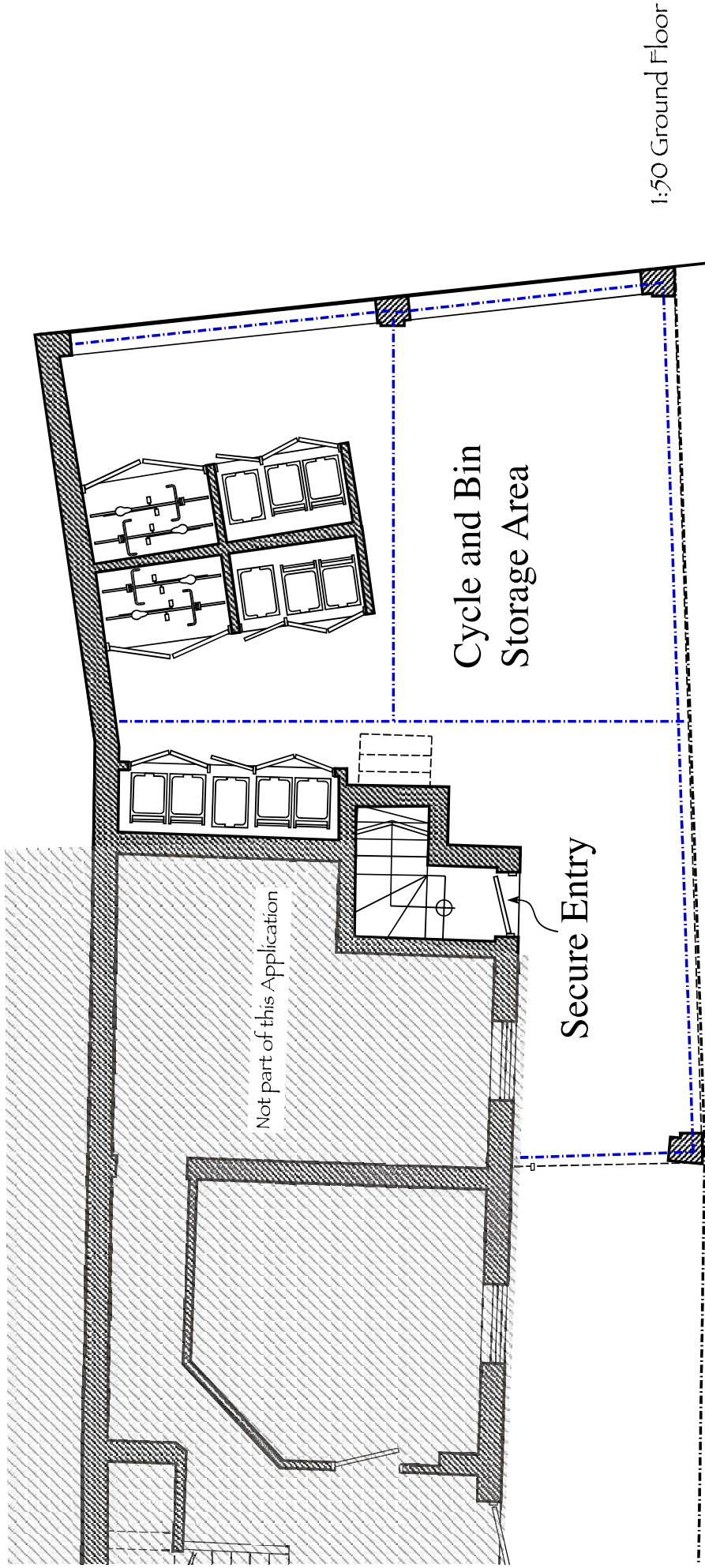
Rear Elevation (north-east)

Front Elevation (south-west)

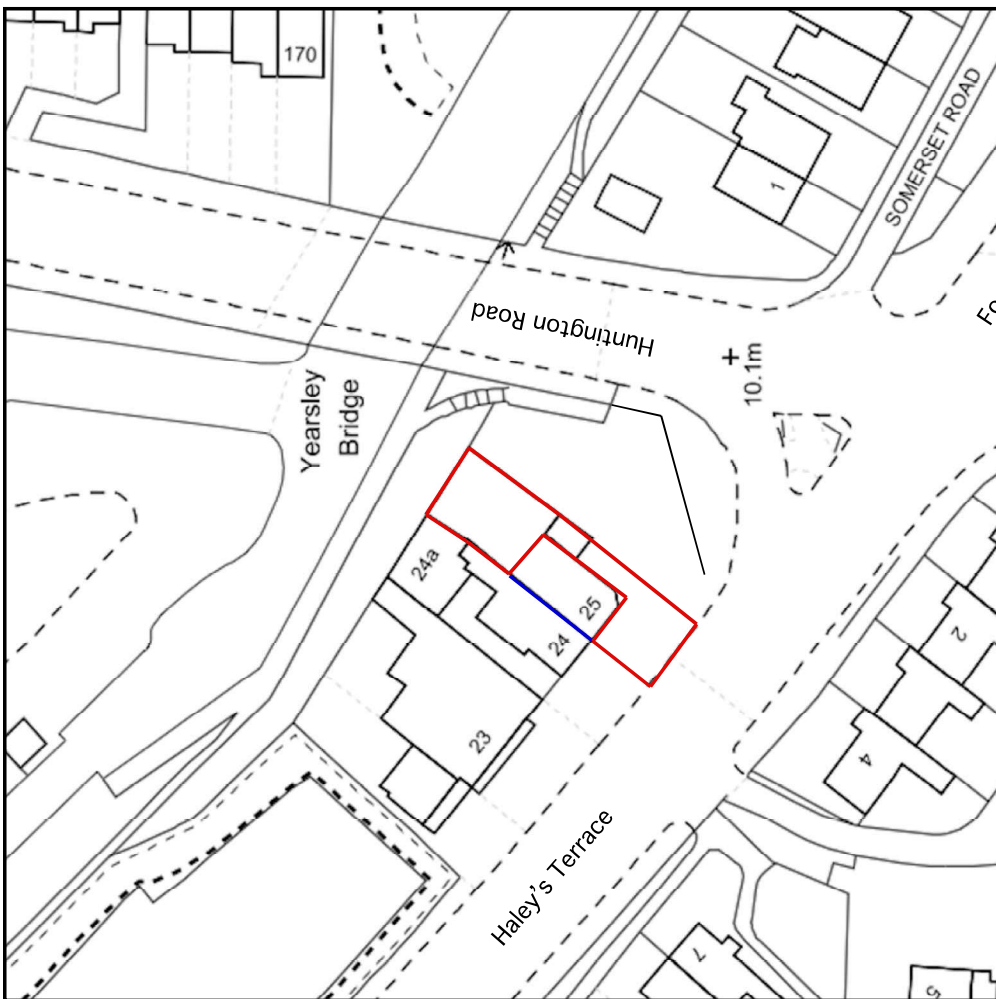


Side Elevation (south-east)

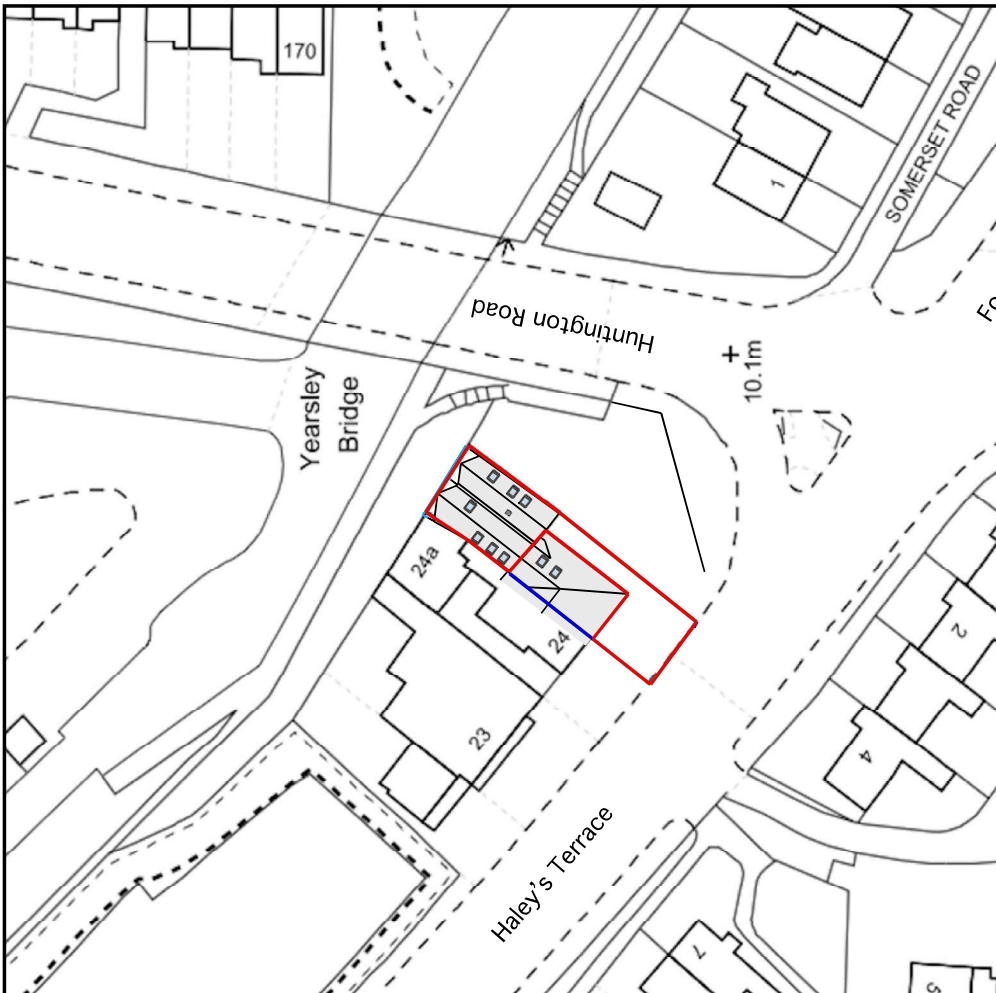
Appendix B
Proposed Site Layout



1:50 Ground Floor



Existing Layout



Proposed Layout