

OLD CUSTOMS HOUSE, WHITEHAVEN**FLOOD RISK ASSESSMENT – FEBRUARY 2022****1. DEVELOPMENT DESCRIPTION AND LOCATION****a. What type of development is proposed and where will it be located?**

This flood risk assessment supports a planning application for the redevelopment of the Old Customs House in Whitehaven, Cumbria.

The site is located approximately 35m south of Whitehaven Marina that is protected by the sea lock at the entrance to the harbour.

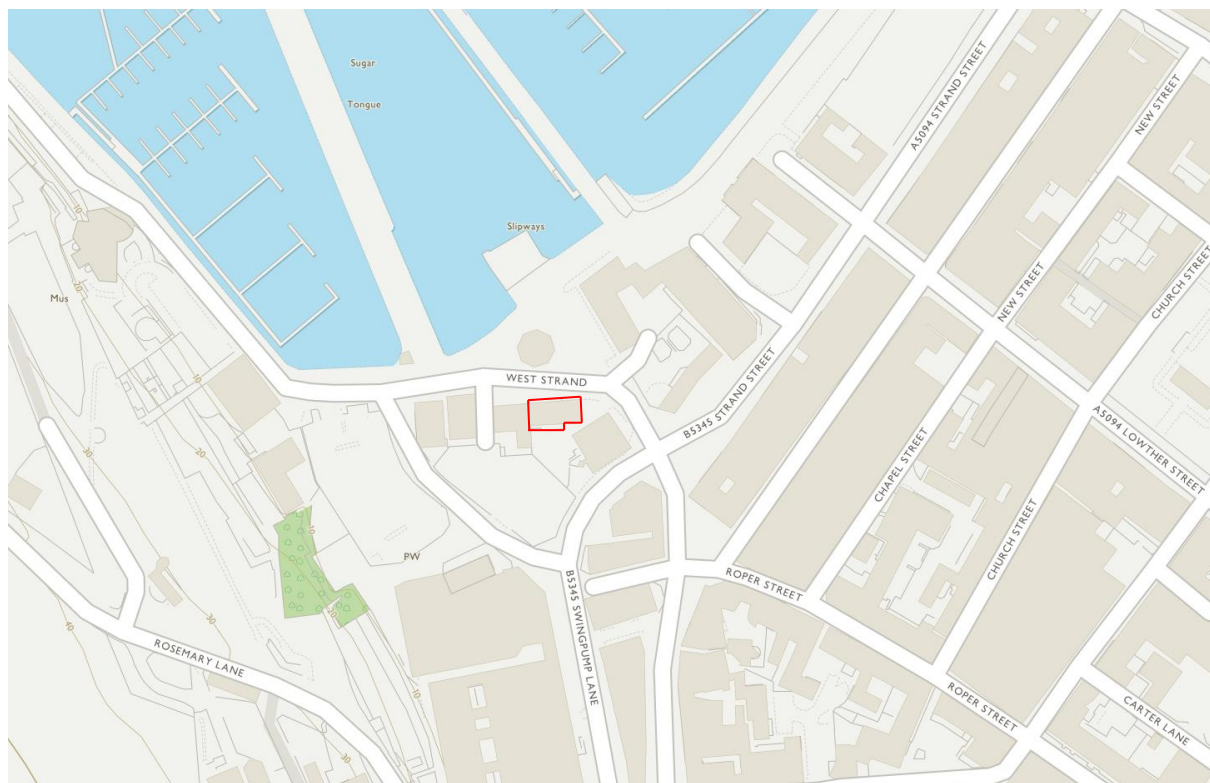


Figure 1 - Location of Proposed Development – Site of Old Customs House Shown by Red Boundary.

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The site location indicators are as follows:

OS X (Easting) 297132
OS Y (Northing) 518144
Nearest Post Code CA28 7LR
Lat (WGS84) 54.54805849672985
Long (WGS84) -3.591810930449668
Nat Grid NX971181 / NX9713218144

b. What is its flood risk vulnerability classification?

In the flood risk vulnerability classification, the ‘use of land as a residential establishment’ would be classed as “more vulnerable”.

c. Is the proposed development consistent with the Local Plan for the area?

We believe that this proposal is consistent with the local plan for the area by providing high quality housing in the form of serviced apartments within the area.

d. What evidence can be provided that the Sequential Test and where necessary the Exception Test has/have been applied in the selection of this site for this development type?

The site lies within Flood Zone 3 but is classed as an area benefiting from flood defences. Therefore, the sequential and exception test process will not need to be carried out by the planning authority.

e. Will your proposal increase overall the number of occupants and/or users of the building/land, or the nature or times of occupation or use, such that it may affect the degree of flood risk to these people?

The proposed serviced apartments will increase the number of permanent users that could be affected by flooding.

2. DEFINITION OF THE FLOOD HAZARD

a. What sources of flooding could affect the site?

The likelihood of flooding from all sources is assessed as follows: -

From Main Rivers and Other Watercourses

The existing property is over 800m from any open river/watercourse. Therefore, there is no risk associated with flooding from rivers or other watercourses.

From Tidal Sources

In accordance with the EA Flood Plans available online, the site lies within Flood Zone 3 but is classed as an area benefiting from flood defences. See Figure 2.

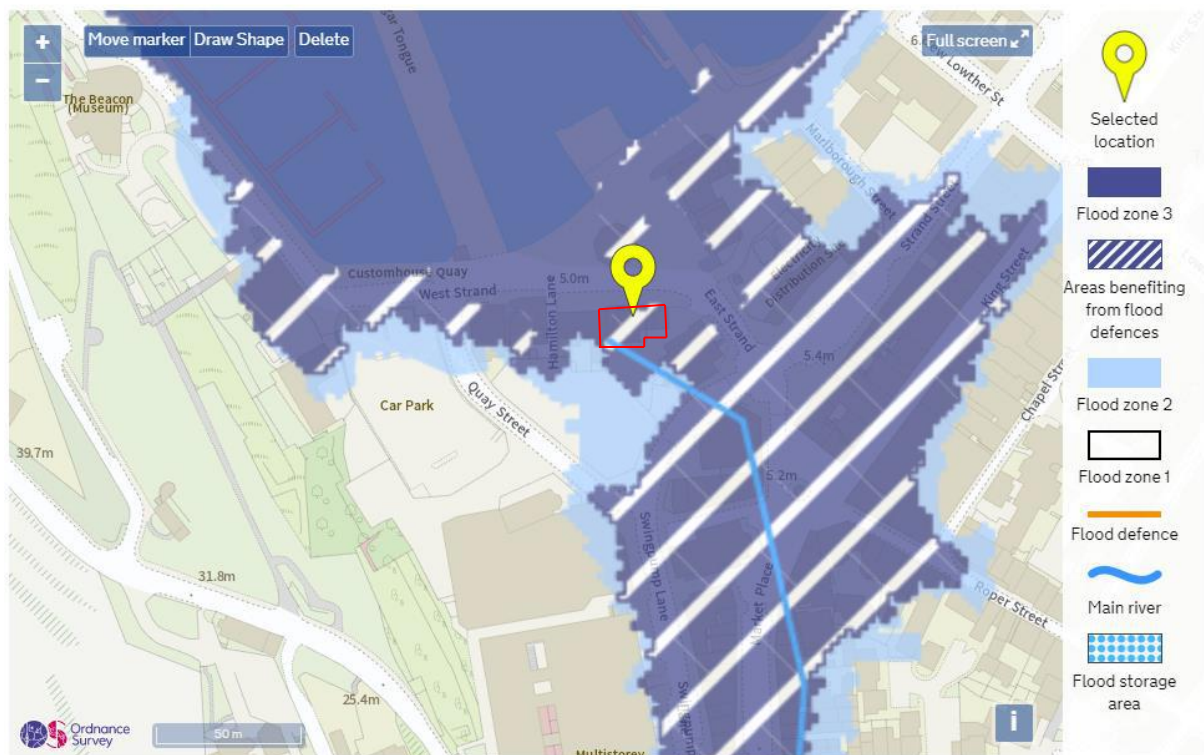


Figure 2 - EA Flood Map for Planning

Land and property within Flood Zone 3 that benefits from flood defences would have a high probability of flooding without the local flood defences. These protect the area against a river flooding event with a 1% chance of happening each year, or a flood from the sea with a 0.5% chance of happening each year.

From Reservoirs

Not possible.

From Ground Water Return Flow

According to the Copeland Borough SFRA, “a limited potential for groundwater flooding exists within the borough”.

From Surcharged Sewers

The site is within proximity to public sewers beneath the nearby public highway that may become surcharged.

From Blocked/Surcharged Culverts

Pow Beck is culverted directly beneath the site and outfalls to Whitehaven Marina a short distance to the north of site and may become surcharged.

Surface Water Runoff

According to the Government long term flood risk website the risk of surface water flooding within the development boundary is very low. This risk is uniform across the site. A very low risk means that the area has a yearly chance of flooding less than 0.1%.



Extent of flooding from surface water

● High ● Medium ● Low ○ Very Low ⊕ Location you selected

Figure 3 - Surface Water Risk for the Proposed Development Location.

A summary of the potential sources of flooding is given below:

| Potential Source of Flooding | Assessed Risk | Remedial Measures Required |
|-----------------------------------|---------------|----------------------------|
| Main River and Other Watercourses | Low | No |
| Tidal | High | No |
| Reservoirs | N/A | No |
| Ground Water Return Flow | Low | No |
| Surcharged Sewers | Low | No |
| Blocked/ Surcharged Culverts | Low | No |
| Surface Water Runoff | Very Low | No |

b. For each identified source in box 2a above, can you describe how flooding would occur, with reference to any historic records where these are available?

From Main Rivers and Other Watercourses

Study of the EA flood maps shows that the site lies within Flood Zone 3 but is classed as an area benefiting from flood defences. The land and property in this flood zone would have a high probability of flooding without the local flood defences. These protect the area against a river flood with a 1% chance of happening each year, or a flood from the sea with a 0.5% chance of happening each year.

If the harbour flood defences were to fail, the proposed development would be at a significantly increased risk of flooding from tidal sources. In line with the Flood Zone information, the chance of flooding would be 0.5% or greater in a given year. Information regarding the condition of this flood defence asset (with reference 54531) has been obtained from the Environment Agency. The overall condition grade has been rated as a 3 (representing a fair condition). This information has been included within the appendix.

The EA has carried out a variety of modelling, including 1 in 100 year storm events for both a defended and undefended scenario in the Whitehaven area. For a defended scenario, the proposed development is located outside of the flood risk area. In an undefended scenario (where the harbour defences have been removed from the model) the predicted flood level on site is 5.74m AOD. This flood level is significantly lower than the floor level of the property which is approximately 8.0m AOD. Further modelling considering a 1 in 200 year undefended scenario with climate change places the flood level on site at 6.52m AOD which is also well below the current floor level.

There are no recorded instances of flooding at the property as confirmed by both the client and the EA. Flooding records obtained from the EA show that the largest flooding event on record occurred in November 199 and did not reach the property. The extent of flooding is shown on the recorded flood outline plan included within the appendix.

From Ground Water Return Flow

According to the Copeland Borough SFRA, “a limited potential for groundwater flooding exists within the Borough. In the whole of the Southwest Lakes Catchments, less than 10 properties are thought to be at risk.” The areas at risk are largely located further north than the proposed development.

Further information from Copeland Borough council has highlighted that ground water flooding has previously occurred in a number of properties in the Market Place area adjacent to site. The flooding on record for these properties occurred entirely within cellars. As the proposed development will not have a cellar, groundwater flooding is deemed to not pose a significant risk to the site.

From Surcharged Sewers

The site is within proximity to public sewers beneath the nearby public highway. These sewers are managed and maintained by United Utilities and as such it is not anticipated that flooding from surcharging is likely. There are no recorded instances of flooding from surcharged sewers affecting the site.

From Blocked/Surcharged Culverts

Pow Beck is culverted directly beneath the site and outfalls to Whitehaven Marina a short distance to the north of site. This culvert runs through the centre of Whitehaven with the culvert entrance located approximately 800m to the southeast. In the event of the culvert becoming blocked or surcharged, flooding would occur in the proximity of the culvert entrance. As this location is approximately 800m from the site of the development it is not anticipated that flooding would occur on site as a result of this culvert becoming blocked or surcharged.

From Reservoirs

It is anticipated that there are no reservoirs adjacent to the site that could cause a flood risk.

Surface Water Runoff

According to the Government long term flood risk website, the location of the proposed redevelopment is shown to be at very low risk from surface water flooding.

c. What are the existing surface water drainage arrangements for the site?

This site currently drains to the public sewer. There will be no increase in surface water from the site.

3. PROBABILITY

a. Which flood zone is the site within?

The EA Flood Map for Planning shows the site lies within Flood Zone 3 but is classed as an area benefiting from flood defences. The land and property in this flood zone would have a high probability of flooding without the local flood defences. These protect the area against a river flood with a 1% chance of happening each year, or a flood from the sea with a 0.5% chance of happening each year.

b. If there is a Strategic Flood Risk Assessment covering this site. Does this show the same or a different flood zone compared with the Environment Agency's flood map?

The Strategic Flood Risk Assessment for Copeland Borough shows the same flood zone as the EA, Zone 3a high probability but benefits from local flood defences. See Figure 4 below.

The SFRA states the risk of tidal flooding is reduced by recent flood defence improvements that provide protection for a 0.5% (1 in 200 year) rainfall event coinciding with a high tide.

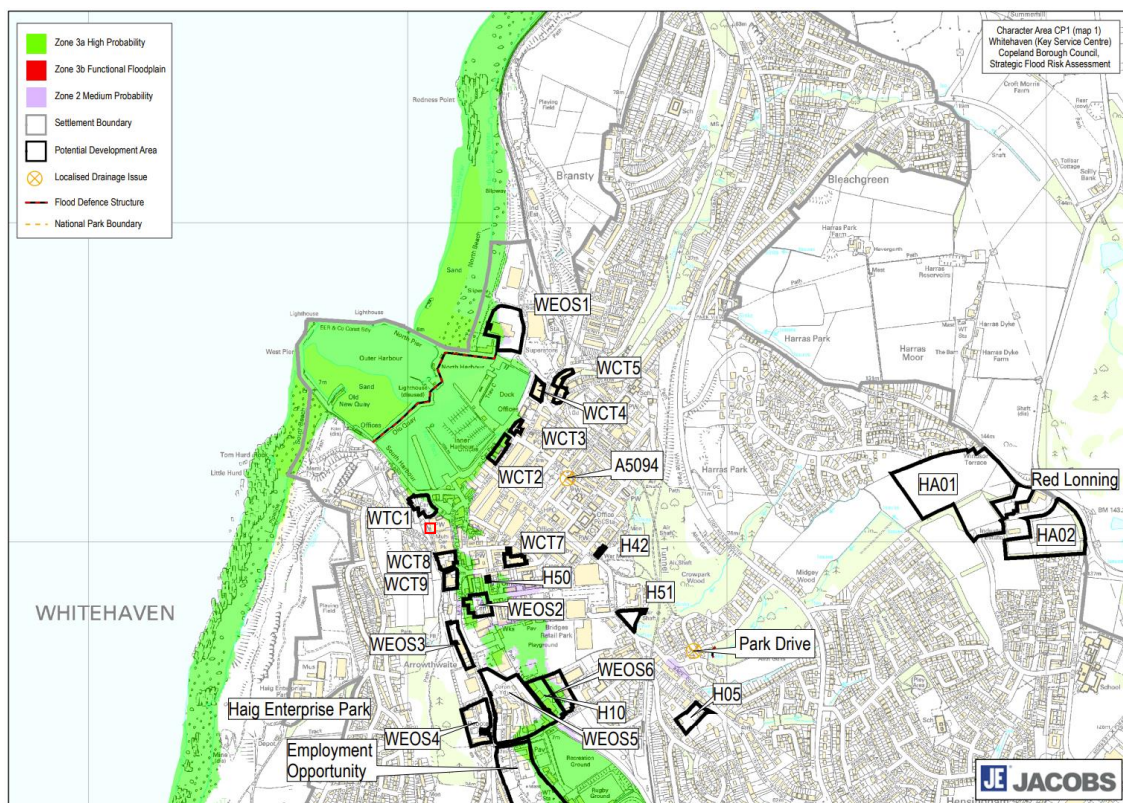


Figure 4 - SFRA flood risk map

c. What is the probability of the site flooding, taking account of the maps of flood risk from rivers and the sea and from surface water, on the Environment Agency’s web site, and the Strategic Flood Risk Assessment, and of any further flood risk information for the site?

The EA Flood Map for Planning indicates that the site lies within Flood Zone 3 but is classed as an area benefiting from flood defences. The land and property in this flood zone would have a high probability of flooding without the local flood defences. These protect the area against a river flood with a 1% chance of happening each year, or a flood from the sea with a 0.5% chance of happening each year.

The SFRA states that the risk of tidal flooding has been reduced due to recent flood defence improvements that provide protection for a 0.5% (1 in 200 year) rainfall event coinciding with a high tide.

According to the Government long term flood risk website, the location of the proposed redevelopment is shown to be at very low risk from surface water flooding.

4. CLIMATE CHANGE

How is flood risk at the site likely to be affected by climate change?

Climate change may increase the frequency of potential flood events and may increase flood levels.

If the average storm severity were to increase, there is the possibility that the marina flood defences may not be able to provide adequate protection for the property. These defences are under the control of Copeland Council and the EA, as such they are expected to be maintained and upgraded to be fit for purpose. In late 2020 a number of measures to improve the sea lock and carry out maintenance were proposed during a council meeting (Executive Item 185).

5. DETAILED DEVELOPMENT PROPOSALS

Where appropriate, are you able to demonstrate how land uses most sensitive to flood damage have been placed in areas within the site that are at least risk of flooding (including providing details of the development layout)?

Not applicable as it is the redevelopment of an existing building into serviced apartments.

6. FLOOD RISK MANAGEMENT MEASURES

How will the site/building be protected from flooding, including the potential impacts of climate change, over the development's lifetime?

The site is protected from flooding by the local flood defences. The risk of tidal flooding has been reduced due to recent flood defence improvements that provide protection for a 0.5% (1 in 200 year) rainfall event coinciding with a high tide.

Access and Escape:

Access requirements will not change following the completion of the proposed development.

The property would need to be registered on the Environment Agency flood warning system to provide advance warning to the residents of any potential flooding.

In the event of a flood, an escape route is available to the southwest and through the adjacent car park in the direction of Quay Street. As per the Flood Zone information, the flood risk decreases in this direction with Quay Street rated as a Flood Zone 1 area.

7. OFF SITE IMPACTS

a. How will you ensure that your proposed development and the measures to protect your site from flooding will not increase flood risk elsewhere?

There will be no increase in run off from the site due to redeveloping an existing building.

b. How will you prevent run-off from the completed development causing an impact elsewhere?

As above – there will be no increase in natural runoff from the site.

c. Are there any opportunities offered by the development to reduce flood risk elsewhere?

There will be no increase in run off from the site.

8. RESIDUAL RISKS

a. What flood-related risks will remain after you have implemented the measures to protect the site from flooding?

Not applicable.

b. How, and by whom, will these risks be managed over the lifetime of the development? (e.g., flood warning and evacuation procedures).

It is recommended that the site be registered with the Environment Agency Warning System if not already so that site users receive warning of flooding risks.

Andy Poole BEng (Hons) CEng MICE
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CA11 9FB

February 2022

APPENDIX A – PROPOSALS



Existing Gable Elevation - (Fire Escape stair omitted for clarity)

existing flat roof removed and walls extended up in new blockwork with rendered walls - sandstone coping 400 x 50mm to wall head and toughened glass screen to wall top



Proposed Gable Elevation - (Fire Escape stair omitted for clarity)

existing chimneys to be inspected from high level scaffold and consideration of taking down and re-building with new lead trays to prevent water ingress

existing slate roof to be stripped off and re-laid with new breathable roof membrane

Velux Conservation rooflights size 550 x 1180mm with recessed flashing trims

Velux Conservation rooflight size 550 x 1180mm with recessed flashing trims

second floor windows lowered to provide outlook to harbour - render bands with timber sw sliding sash casements



Front Elevation to Harbour new timber double glazed door screen - existing railing to side of ramp removed

AS PROPOSED ELEVATIONS

metal grilles to basement louvres replaced with new galvanised metal grille with vertical bars and glazing to rear face to prevent water / vermin ingress

existing modern ramp removed and steps re-instated to frontage - paving repaired in new stone flags

extent of basement - full depth

existing flat roof removed and walls extended up in new blockwork with rendered walls - sandstone coping 400 x 50mm to wall head and toughened glass screen to wall top

new sw timber sliding sash window to match window below

existing mono pitch slate roof removed and existing wall built up in new cavity wall blockwork



Rear Elevation to car park

basement access - existing door and frame refurbished - repair works only of basement

existing door replaced with new hardwood painted 6 panel solid core door and new hardwood frame - timber fencing to perimeter of existing staircase to be removed off site

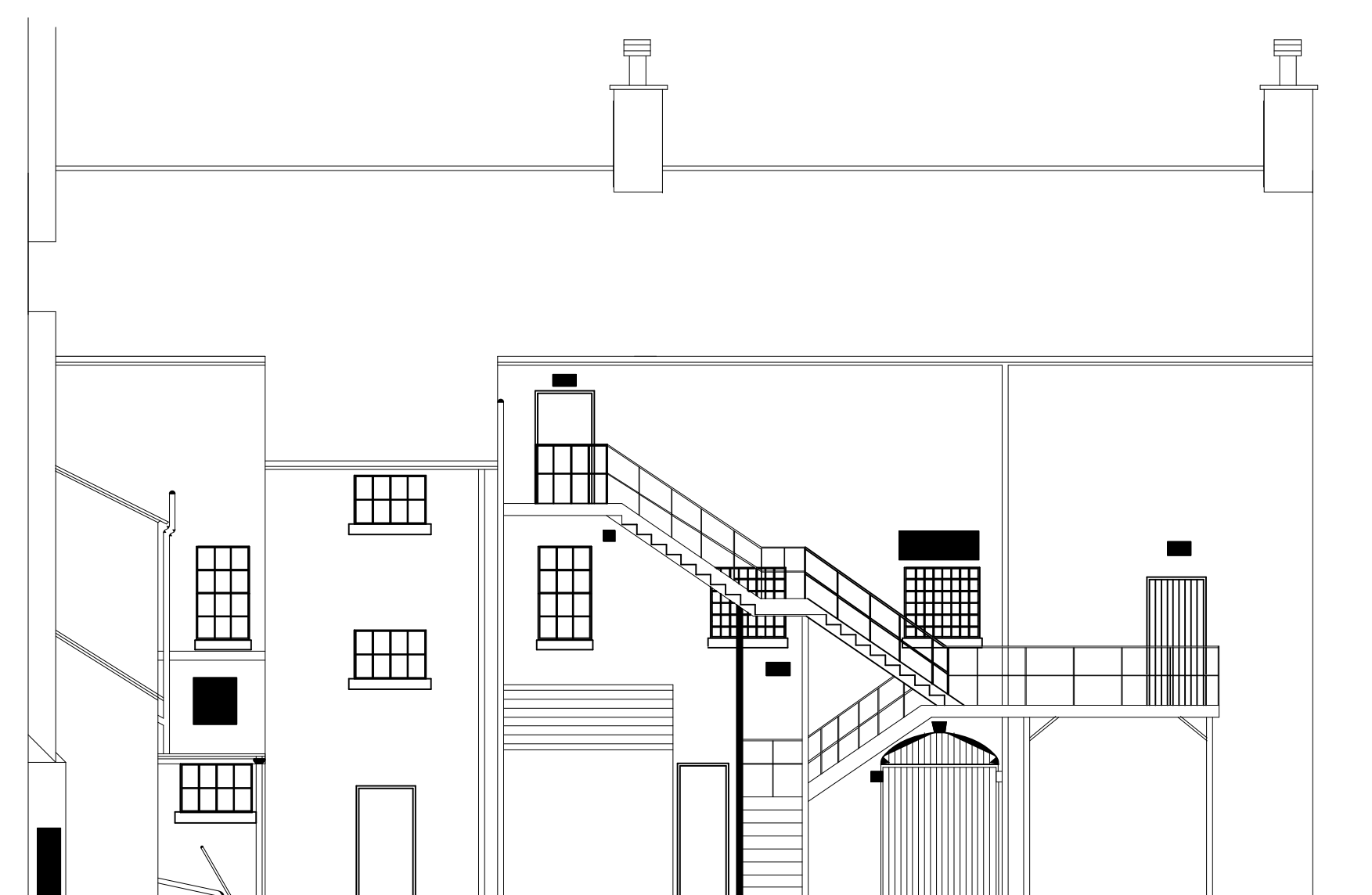
existing steel staircase removed due to decay and replaced with single flight galvanised steel staircase to first floor only. Stair spindles in 20mm square bar with flat top - 50mm wide semi-round hand rail Existing fixings into the building to be removed and wall patch repaired.

meter room cedar timber screening to form storage 19 x 100mm wide boarding onto galvanised steel framework

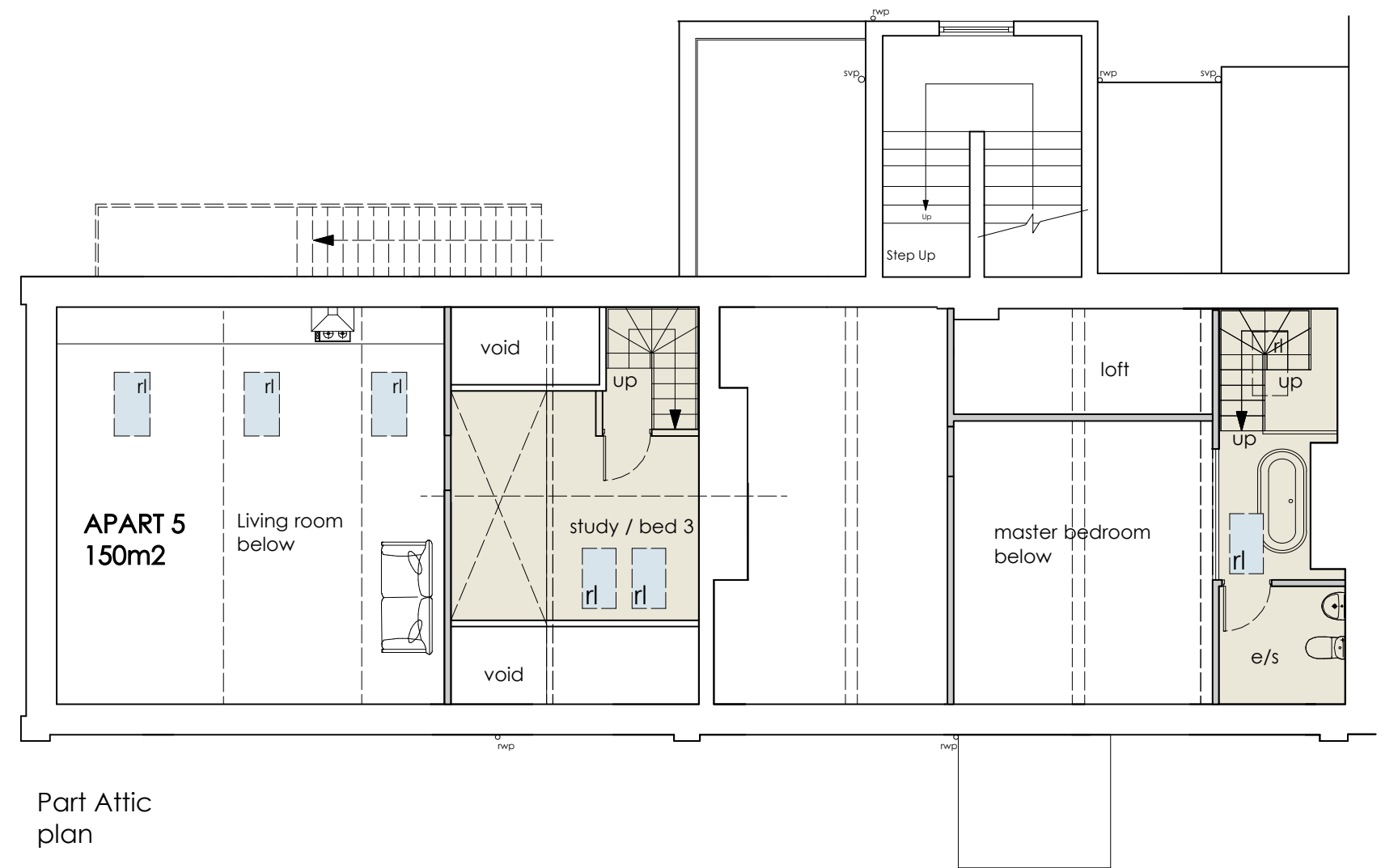


Front Elevation to Harbour

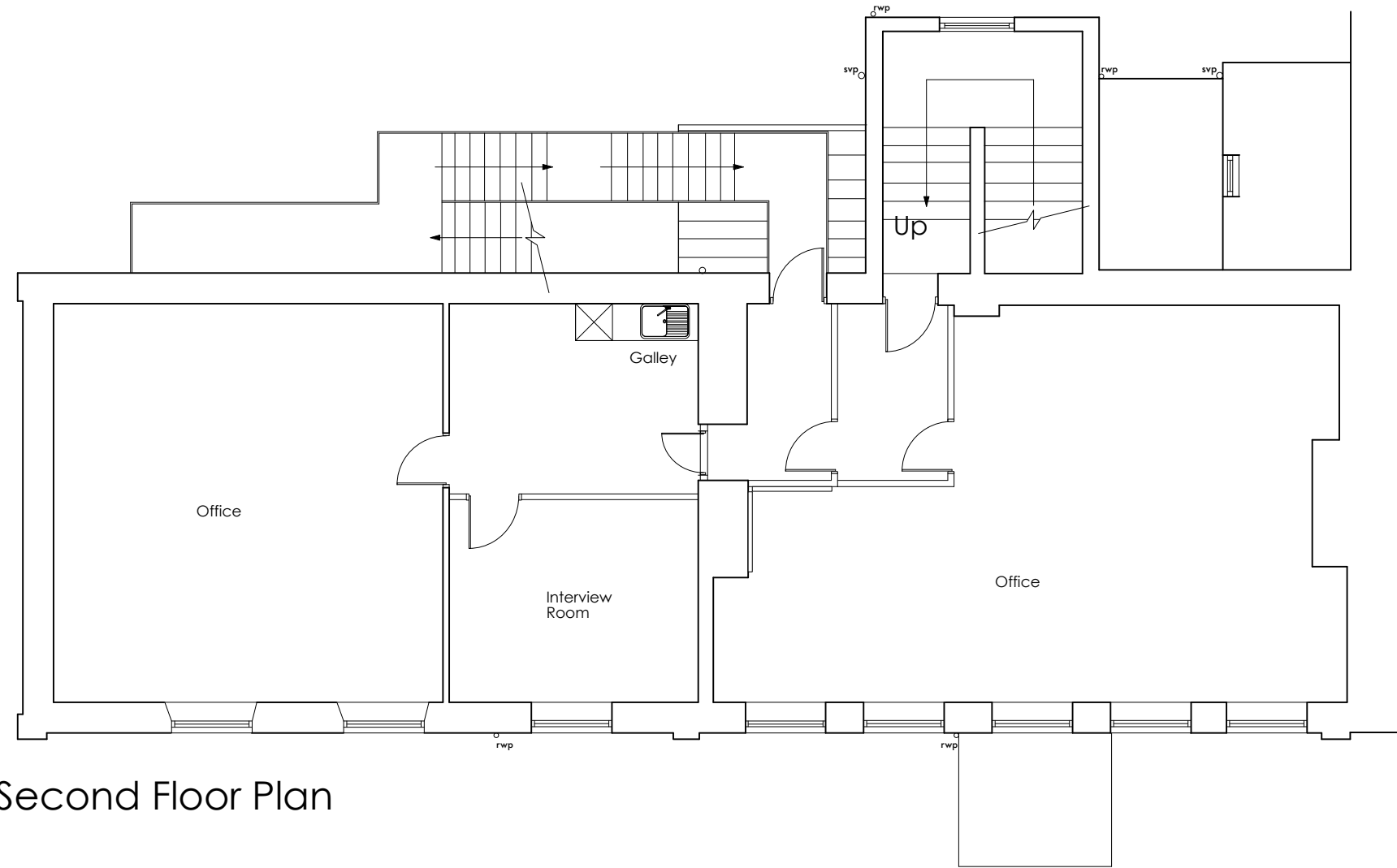
AS EXISTING ELEVATIONS



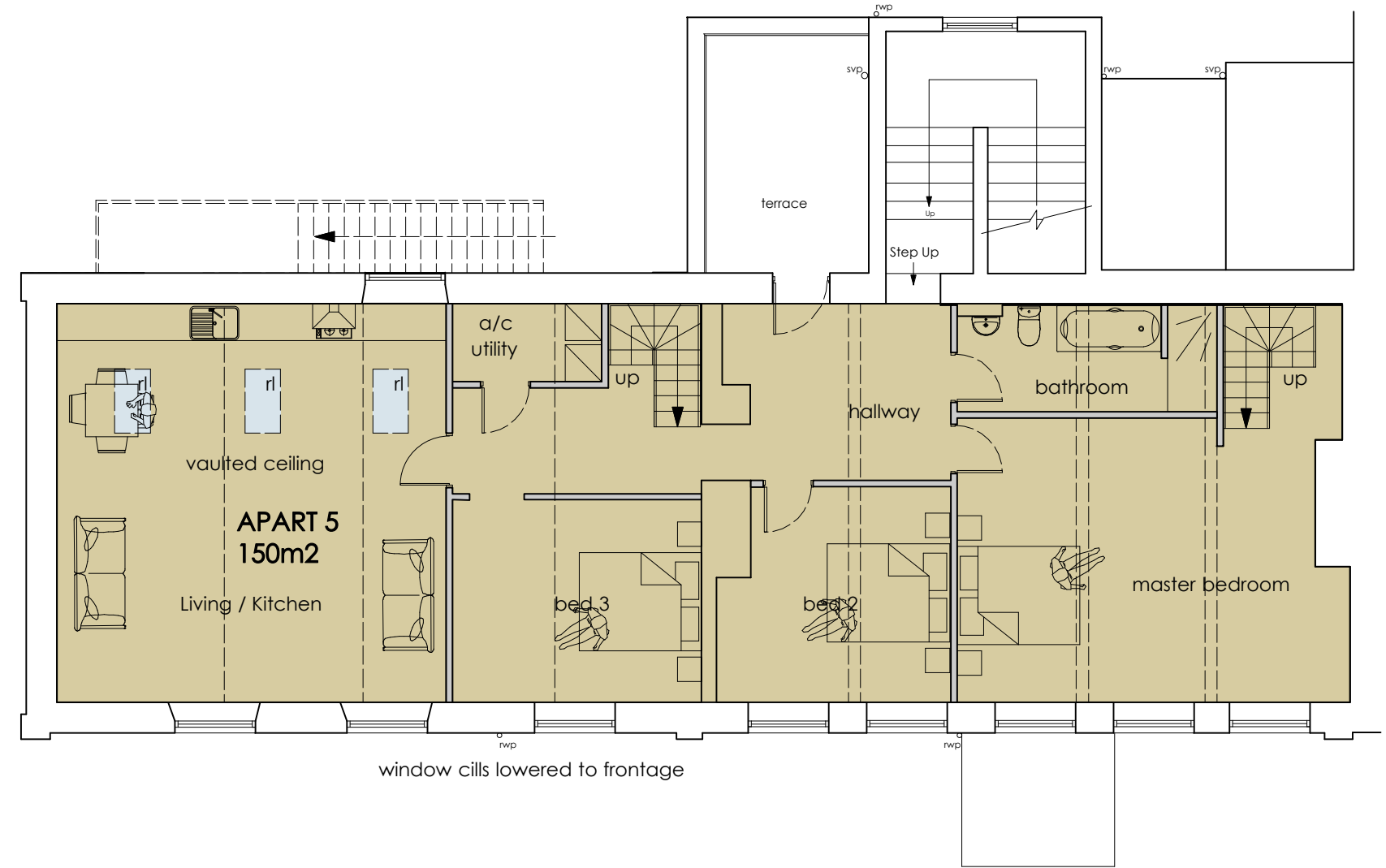
Rear Elevation to car park



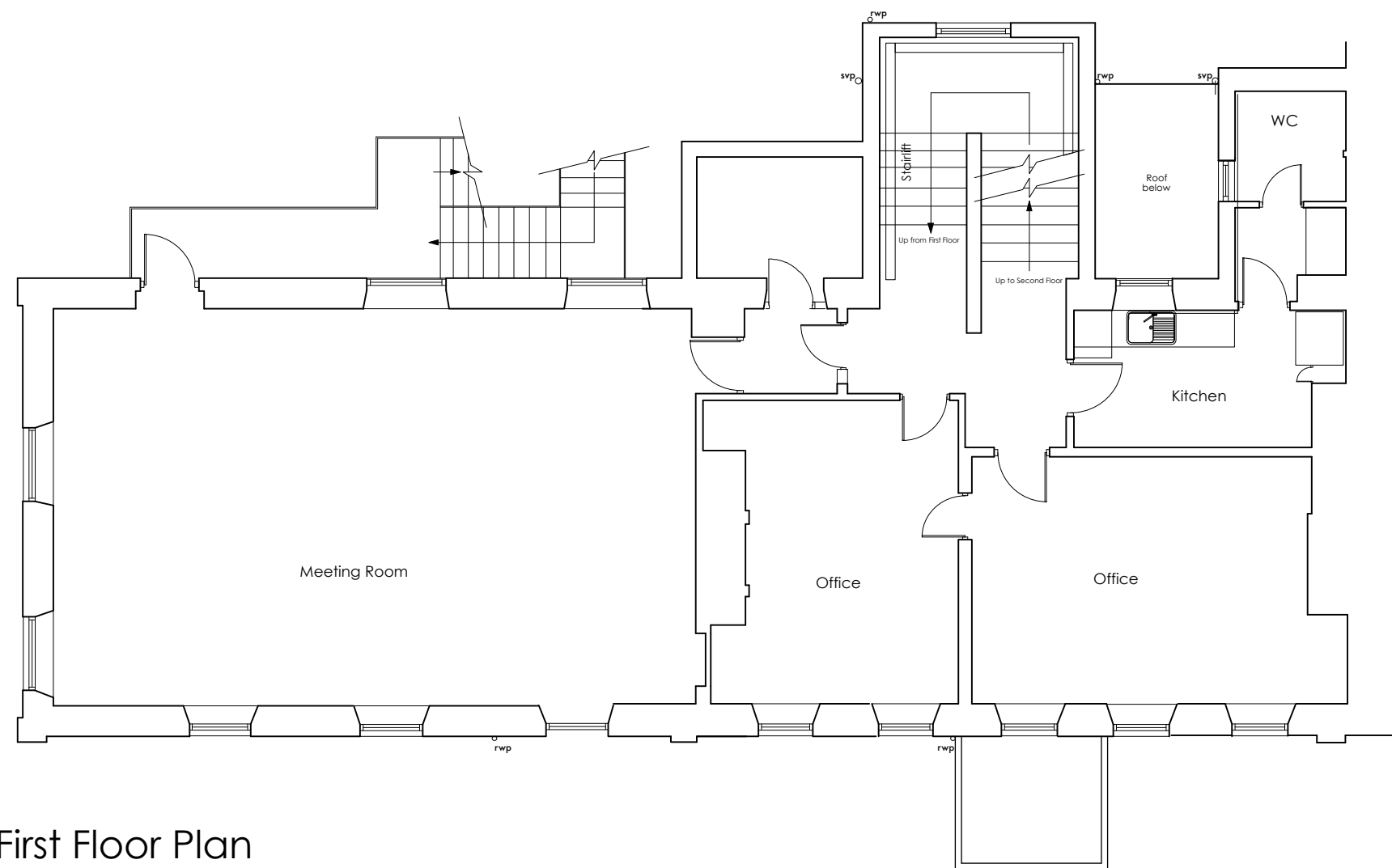
Part Attic plan



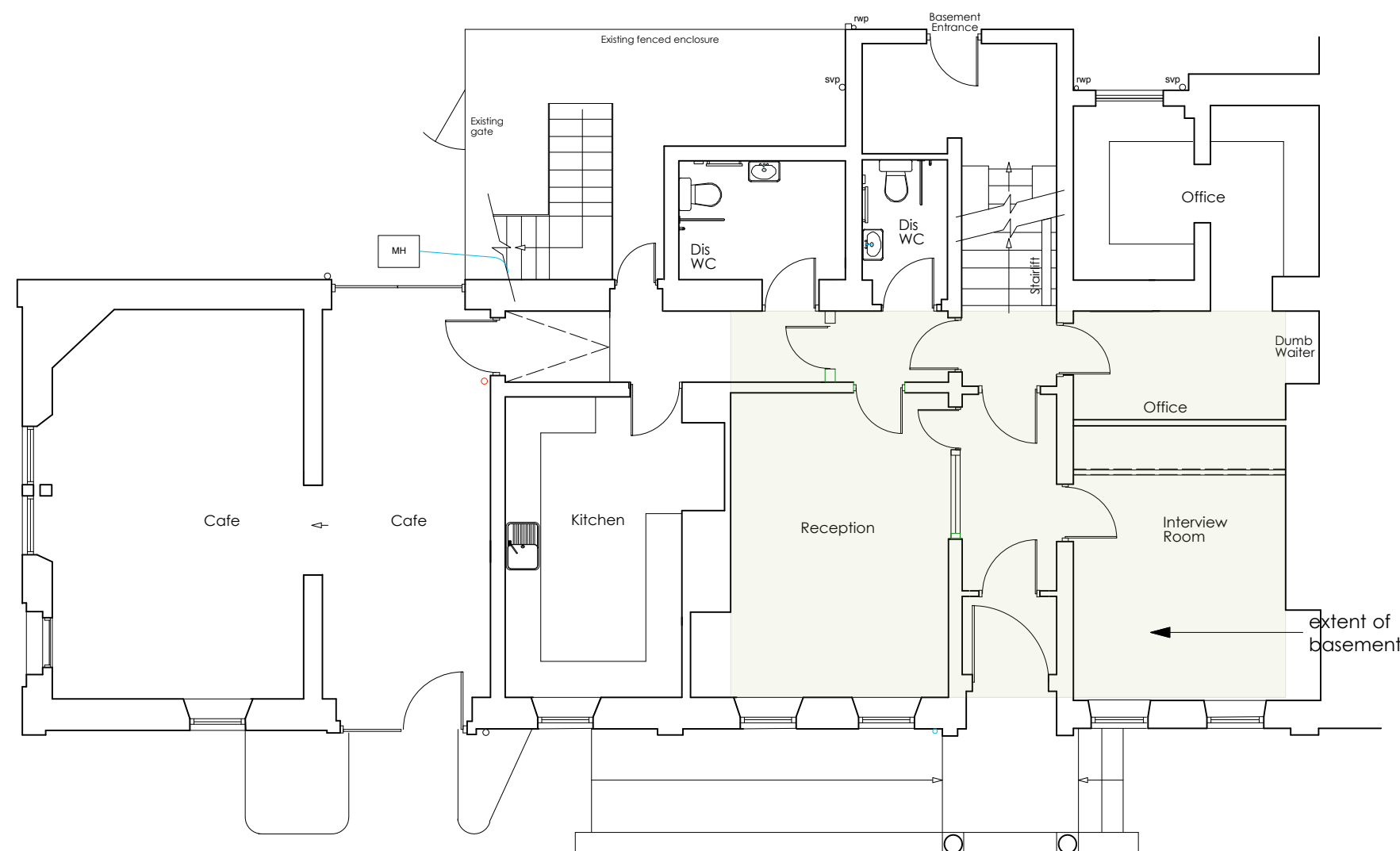
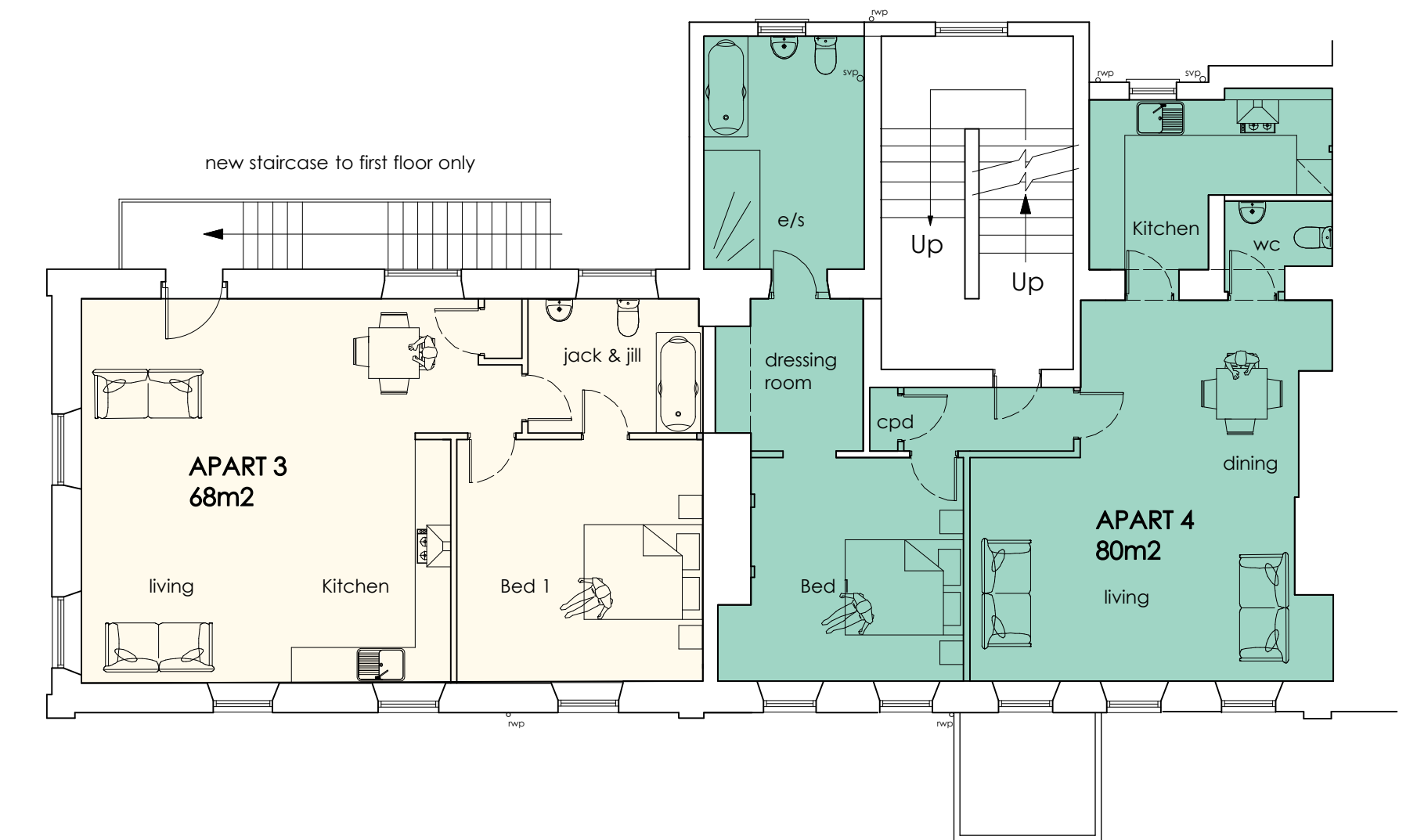
Second Floor Plan



window cills lowered to frontage

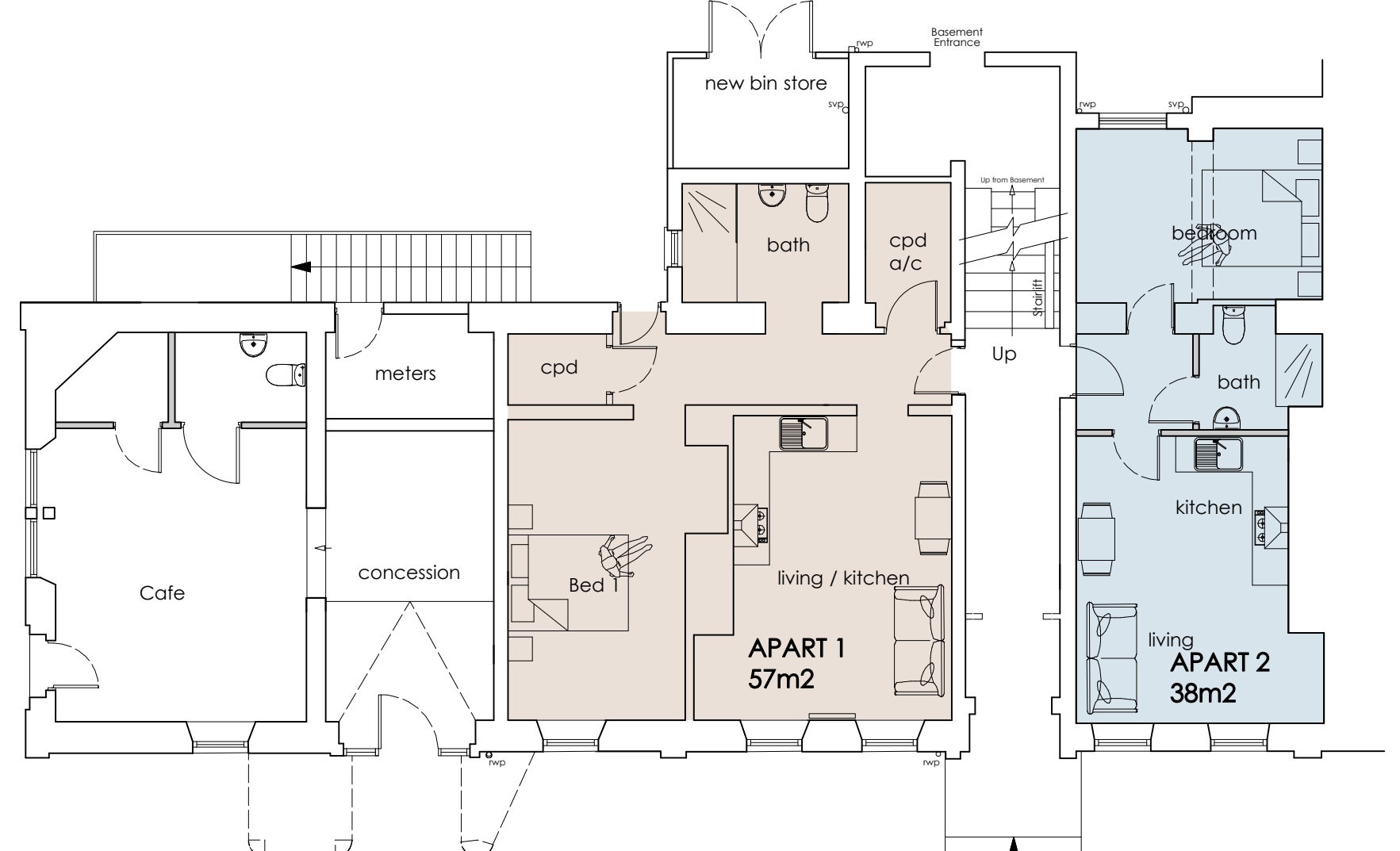


First Floor Plan



Ground Floor Plan

AS EXISTING PLANS



AS PROPOSED PLANS

Rev : D 1/06/21 - Planning Revision

FOR PLANNING & LISTED BUILDING CONSENT ONLY

ALL DIMENSIONS TO BE CHECKED ON SITE
FIGURED DIMENSIONS TO BE TAKEN IN
PREFERENCE
TO SCALED DIMENSIONS
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RIBA CHARTERED
ARCHITECTS



CLIENT : GHH Ltd

PROJECT : Old Customs House, Whitehaven

DWG TITLE : Ex & Proposed Floor Plans

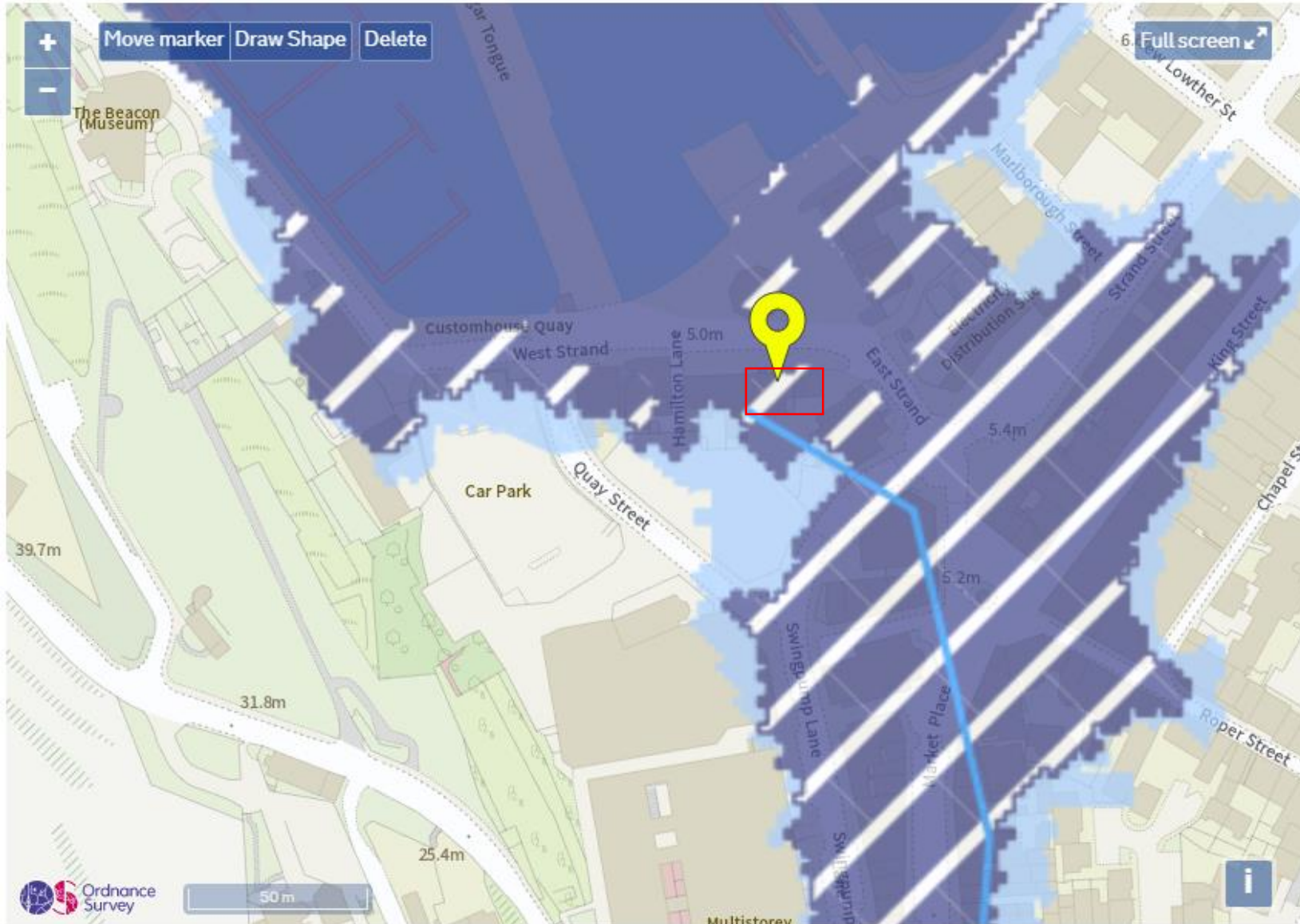
JOB NO : 1234 Dwg No : 04 Rev : D

DATE : 25 Mar 2020 SCALE : 1 : 100 @A1

GREEN SWALLOW

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Swallow Barn, Blindcrake, Cumbria, CA13 0QP

APPENDIX B – FLOOD MAP FOR PLANNING AND LONG-TERM FLOOD RISK



Selected location



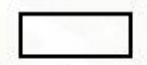
Flood zone 3



Areas benefiting from flood defences



Flood zone 2



Flood zone 1



Flood defence



Main river



Flood storage area

+
-
Move marker Draw Shape Delete

6 Full screen



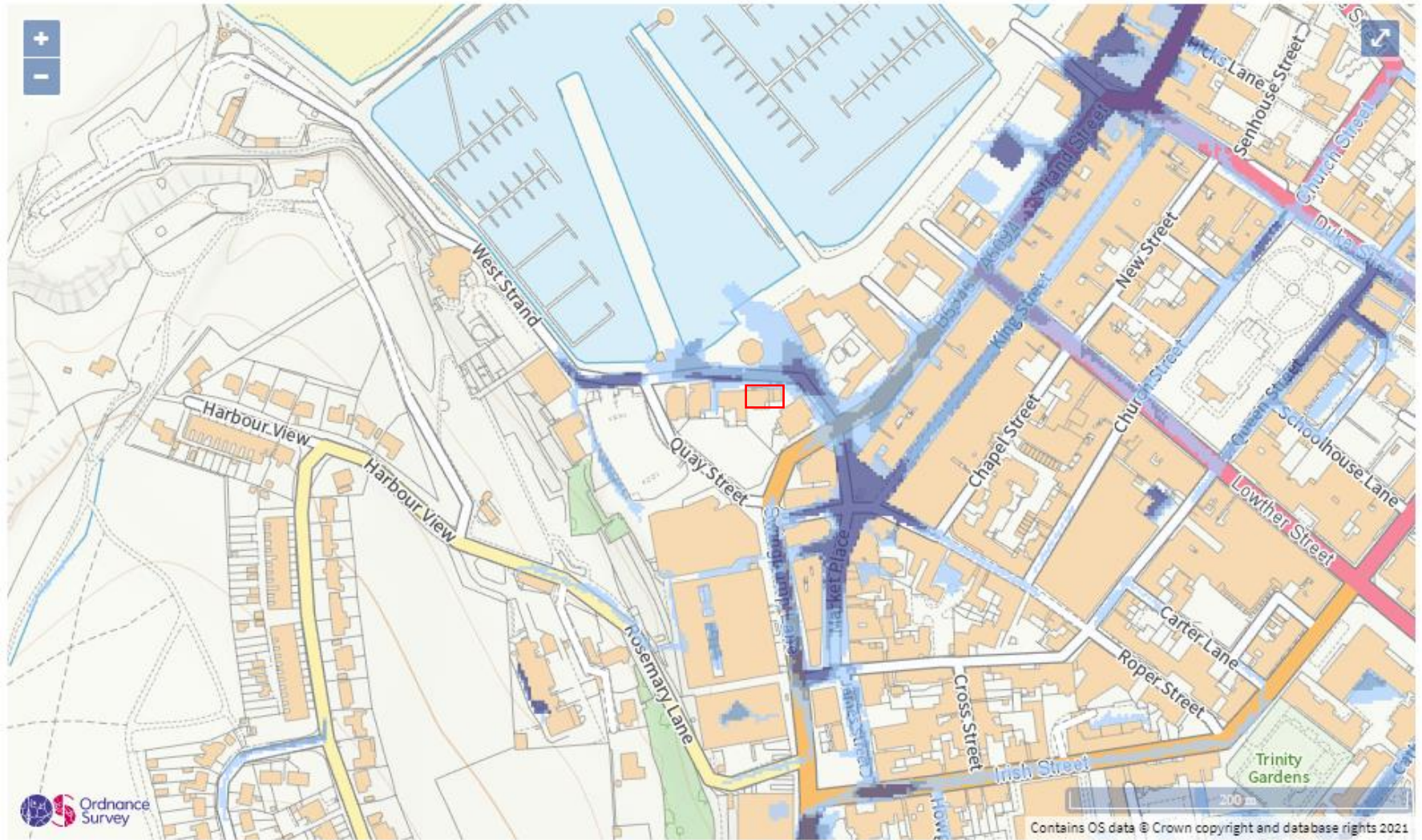
50 m





Extent of flooding from rivers or the sea

High
 Medium
 Low
 Very low
 Location you selected

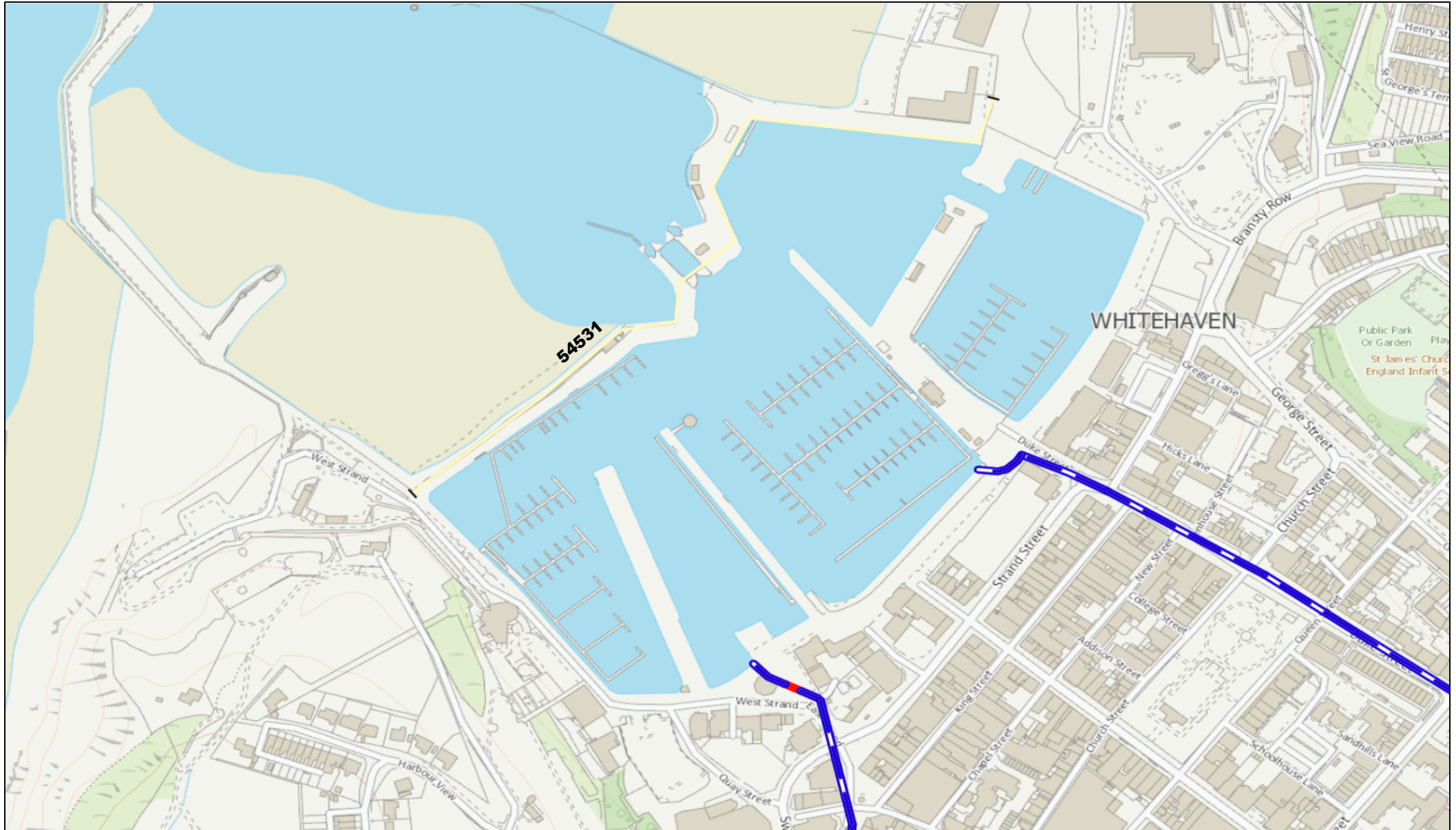


Extent of flooding from surface water

- High
- Medium
- Low
- Very low
- Location you selected

APPENDIX C – FLOOD DEFENCE ASSET INFORMATION

CL222681 Old Customs House, West Strand, Whitehaven



June 25, 2021

- | | | |
|---------------------|------------------------|-----------------|
| Beach | Embankment | Wall |
| Bridge Abutment | Engineered High Ground | Open Channel |
| Cliff | Flood Gate | Simple Culvert |
| Demountable Defence | Natural High Ground | Complex Culvert |
| Dunes | Spillway | Outfall |

| | | |
|----------------------|--|----------|
| Site Location | Old Customs House, West Strand, Whitehaven | CL222681 |
|----------------------|--|----------|

Coastal Defences

| Asset ID | National Grid Reference | Asset Type | Protection Type | Location | Maintained By | Design Standard (Return Period) | Overall Condition Grade | Effective Crest Level (m) | | E.C.L Data Quality (Reliable 1-4 Unreliable) | Length (m) | Height (m) |
|----------|-------------------------|------------|-----------------|---|---------------|---------------------------------|-------------------------|---------------------------|------------|--|------------|------------|
| | | | | | | | | UCL (mAOD) | DCL (mAOD) | | | |
| 54531 | NX9689018311 | Wall | Coastal | West Strand, South Harbour to North Harbour, Whitehaven | Private | 200 | 3 - Fair | 7.85 | | 2 | 595.55 | - |

The Environmental Permitting (England and Wales) Regulations 2016 require a permit to be obtained for any activities which will take place:

- on or within 8 metres of a flood defence structure or culvert (16 metres if tidal)
- on or within 16 metres of a sea defence

APPENDIX D – EA FLOOD LEVELS AND HISTORICAL FLOOD MAPPING

1 in 100yr defended scenario tidal risk area and modelled water levels (mAOD)

Outside risk area

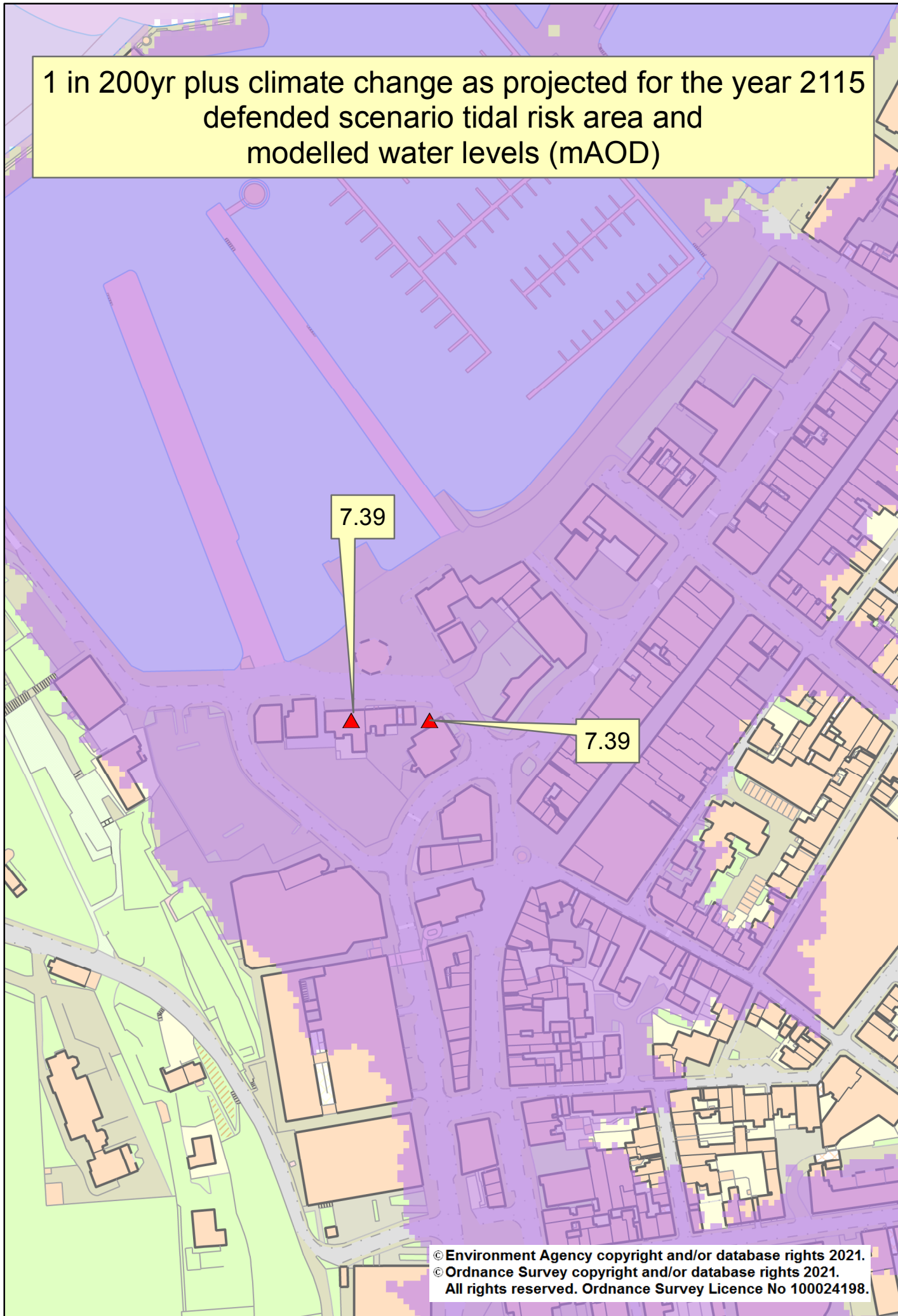
Outside risk area

1 in 100yr defended scenario tidal risk area and modelled water levels (mAOD)

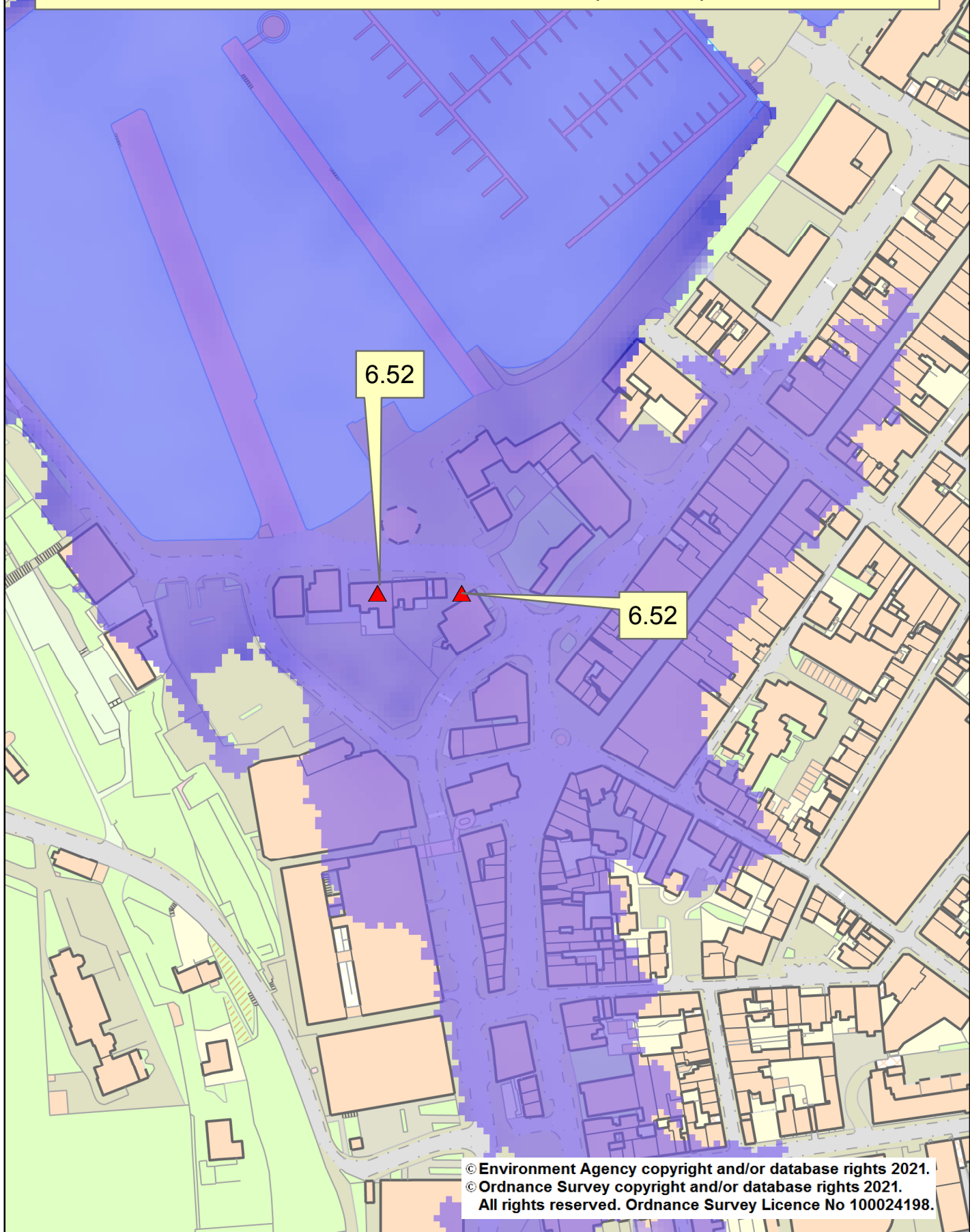
Outside risk area

Outside risk area

1 in 200yr plus climate change as projected for the year 2115
defended scenario tidal risk area and
modelled water levels (mAOD)



1 in 200yr plus climate change as projected for the year 2115
undefended scenario tidal risk area and
modelled water levels (mAOD)



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Recorded flood extent November 1999



Legend

 RECORDED_FLOOD_OUTLINE

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