

Flood Consequences Assessment (FCA) For:

Development at:

16 Cwrt-Ucha Terrace,

Port Talbot, Neath Port Talbot Council

SA13 1LE

Prepared for:

Mr Marcus Francis

19751 – FCA

May 2024



Vale Consultancy
CONSULTING CIVIL & STRUCTURAL ENGINEERS

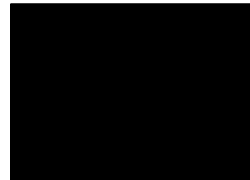
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Client	Marcus Francis
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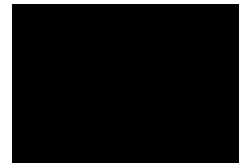
Prepared By: R Peskett

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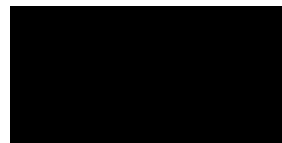
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Issue	Date	Status
01	23/05/2024	First issue
02		
03		

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LIMITATIONS

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Except as otherwise requested by the client, Vale Consultancy is not obliged to and disclaims any obligation to update the report for events taking place after: -

The date on which this assessment was undertaken, and the date on which the final report is delivered.

Vale Consultancy makes no representation whatsoever concerning the legal significance of its findings or the legal matters referred to in the following report.

All the Natural Resources Wales (NRW) mapping data used is under special license. Data is current as of **May 2024** and is subject to change.

The information presented and conclusions drawn are based on statistical data and are for guidance purposes only. The study provides no guarantee against flooding of the study site or elsewhere, nor of the absolute accuracy of water levels, flow rates and associated probabilities.

Purpose of the report

The purpose of this report is to outline the potential flood risk to the site, the impact of the proposed development on flood risk elsewhere, and the proposed measures which could be incorporated to mitigate the identified flood risk. The report has been prepared in accordance with the guidance contained in Planning Policy Wales (PPW) and Technical Advice Note 15 (TAN15): Development and Flood Risk. This report has been prepared in consultation with Natural Resources Wales (NRW).

Consultation

The report has been prepared in accordance with the guidance contained in Planning Policy Wales (PPW) and Technical Advice Note 15 (TAN15): Development and Flood Risk. This report has been prepared in consultation with Natural Resources Wales (NRW) including the Development Advice Map (DAM) and Flood Map for Planning (FMfP) Wales. Flood modelled data (Product 5 and 6) had been requested; however, the site falls *outside* the flood modelled extents.

The Neath Port Talbot County Borough Council Local Development Plan (LDP) was adopted in January 2016 and now forms the development plan that will form the basis of decisions on land use for planning in Cardiff. The relevant specific policies relating to flood risk, drainage and climate change have been reviewed and considered as part of this FCA.

1 INTRODUCTION

Vale Consultancy has been instructed by *The Client* to undertake a Flood Consequences Assessment (FCA) for the proposed development at 16 Cwrt-Ucha Terrace, Port Talbot, Neath Port Talbot, SA13 1LE (277075E, 189190N).

1.1 Existing Site & Location

The application site is considered to be *Brownfield* or *Previously Developed* Land as it is currently occupied by an existing two-storey, terraced residential house.

The A48 highway is located immediately north of the site with neighbouring residential buildings to the east and west. Commercial / industrial units are located immediately south from the site with national railway infrastructure located further afield.

Provision of site access / egress is from the A48 (Talbot Road) and Abbey Road , leading to the M4 Refer to Figure 1 below and the Existing Site Plans, Appendix A.



Figure 1 : Site Location Satellite Plan

1.2 Proposed Development

The proposals are for; *'Change of use from C3 dwelling house to C4 small house of multiple occupation'*.

Works to be limited to internal reconfiguration and refurbishment. No external works, alterations, increase in building footprint or increase in vulnerability classification to be experienced as a result of the proposed works.

Refer to the Proposed Development Plans, Appendix B.

1.3 Existing Topography

In the absence of topographical survey data, existing site and localised levels to metres Above Ordnance Datum have been derived and determined from NRW 1m resolution LiDAR Data in the form of a Digital Terrain Model (DTM).

A review of LiDAR Data indicates a level of 10.07 at the site. Based upon this, and the fact that buildings are required to have a Finished Floor Level (FFL) of 0.15m (150mm) above surrounding ground levels – an existing FFL in the order **10.22m AOD** is assumed.

Refer to the LiDAR Extract, Appendix B

1.4 Existing Ground Conditions

Reference to the British Geological Survey (BGS) online mapping (1:50,000 scale) indicates Superficial deposits underlying the site as Tidal Flat Deposits comprising Clay, Silt and Sand and Alluvial Fan Deposits comprising Sand and Gravel. Bedrock geology is recorded as South Wales Middle Coal Measures Formation comprising Mudstone, Siltstone and Sandstone.

A review of the Cranfield University Soilscape online mapping tools indicates the site is characterised by *Soilscape 13* which is identified as *'Freely draining and loamy soils over rock'*.

According to the British Geological Survey and Natural Resources Wales aquifer designation dataset bedrock and superficial deposits are described as a Secondary Aquifer. The site is / not shown to be located in a designated groundwater source protection zone

1.5 Existing Site Drainage

The existing site and surrounding area are served by long standing, formal drainage infrastructure.

Under naturally prevailing conditions; surface water generally discharges to the local groundwater and fluvial network.

2 FLOOD ZONE CATEGORY AND POLICY CONTEXT

2.1 Flood Zone Category

The Welsh Government Development Advice Map (DAM) has been developed for land use planning purposes. It is based on Natural Resource Wales' extreme flood outlines and the British Geological Survey drift data. The DAM should be used alongside Planning Policy Wales and Technical Advice Note (TAN) 15 to direct new development with respect to flood risk. Together, they form a precautionary framework to guide planning applications.

The DAM is used as a screening tool by Las to understand where future assessment of flooding may be needed. The DAM has not been updated since 2020 and no further updates are anticipated. This is due to implementation of the forthcoming and revised TAN15 which is yet to be officially published / adopted.

A Review of the DAM (**Appendix C**) indicates the site falls within **Zone A** which is defined as;

Zone A – 'Considered to be at little or no risk of fluvial or tidal / coastal flooding' And;

Zone A – 'Used to indicate that justification test is not applicable and no need to consider flood risk further'.

Policy 6.2 of TAN15 states;

6.2 New development should be directed away from Zone C and towards suitable land in Zone A.

Because the site is located within Zone A; the justification test is not applicable and the requirement to demonstrate meeting the requirements to 'pass' is not necessary. Flood Maps for Planning (FMFP) Wales (New Tan 15)

A review of the forthcoming FMfP Wales indicates the site falls very marginally (southern extent) within Flood Zone 2 (Rivers) which defines '*Areas with 0.1% to 1% (1 in 1000 to 1 in 100) chance of flooding from rivers in a given year, including the effects of climate change*'. The large majority of, and most of the site is in Flood Zone 1 (Rivers) which defines '*Areas with less than 0.1% (1 in 1000) chance of flooding from rivers in a given year, including the effects of climate change*'

The FMfP shows the site is located outside of the extreme flood extents for Sea and Pluvial. NRW definitions are provided below.

Flood Zone 1 (Sea) – Areas with less than 0.1% (1 in 1000) chance of flooding from the sea in a given year, including the effects of climate change

Flood Zone 1 (Surface Water and Small Watercourses or Pluvial) – Areas with less than 0.1% (1 in 1000) chance of flooding from surface water and / or small watercourses in a given year, including the effects of climate change.

Refer to Appendix C.

3 SOURCES OF FLOODING AND PROBABILITY

3.1 Fluvial

The nearest surface water feature to the site is the *Ffrwd Wylt* which is located approximately 330m east from the site. From here, the watercourse flows south before discharging into Port Talbot Docks. The *River Afan* is located approximately 1km north west from the site and also flows south before discharging into Swansea Bay. Both watercourses are listed as Main Rivers on the FMfP.

Main Rivers are usually larger streams and rivers but also include some smaller watercourses. In Wales, main rivers are legally designated by NRW. If you want to carry out works in, over, under or near a main river, or in a flood plain or flood defence (including sea defence), you will need to apply for a Flood Risk Activity Permit (FRAP). It can be concluded that the site and proposals are exempt from a FRAP.

NRW carry out maintenance, improvement or construction work on main rivers in Wales to manage flood risk. Every other open watercourse in Wales is known as an ordinary watercourse. Your local authority (as the lead local flood authority) or NRW (as the internal drainage board) carries out maintenance, improvement or construction work on ordinary watercourses in Wales to manage land drainage.

The NRW FMfP confirms that the site is located marginally within **(Flood Zone 2 Rivers)** but mostly in **Flood Zone 1 (Rivers)**. All developable aspects remain outside the extreme flood extent.

The FMfP indicates no records or incidents of historical flooding at the site or within the surrounding area.

Product 5 & Product 6 data have been used to inform the report. Specifically, the *PortTalbot_5_V3.2_2022* model.

The large majority of the site including the dwelling is shown to be flood-free during the critical Q100 Defended Fluvial Event + Climate Change Allowance (CCA). A small portion of the southern extent of the site (i.e. rear garden area) is shown to flood marginally. However, the recorded design flood levels (DFLs) are between 9.52 – 9.59m AOD which are at least 480mm (0.48) below the existing site levels and (more importantly) 0.61m below the existing assumed FFL. Based on this – it is deemed that the site and proposals are compliant with A1.14 of TAN15. Modelled data records an average inundation velocity associated with this extent and scenario of *perceived* flooding of approximately 0.5 m/s with a maximum of 0.8 m/s and a minimum of 0.2 m/s. The word *perceived* is used in lieu of the above comments which indicate that the existing site levels are in fact above the DFLs recorded from the modelled data.

During the Q1000 Defended event the site is largely shown to be flood-free including the dwelling; although the southern extents of the site (rear garden area) are shown to flood marginally. However, the recorded DFL at the site during the event is 9.7m AOD which is at least 0.35m below the existing site levels and 0.5m below the assumed existing FFL of the building. During this scenario; the average maximum estimated inundation velocity is recorded as 0.48 m/s. **Refer to the flood modelled data outputs (maps) in Appendix D.**

Because the works are limited to internal reconfiguration and refurbishment; any notion or suggestion that the proposals could or would exacerbate flood risk elsewhere can be disregarded. Although the sites southern most extents (rear garden) are shown to potentially flood during the extreme fluvial events; in reality this would not happen due to the presence of significant raised walls to the rear of the terraced houses within an unnamed access road. Although not measured; these walls appear to provide an informal flood defence barrier in the order of at least 1m. This would also explain the elevated inundation velocities within the access road which could or would (especially from analysis of the modelled data) become or act as a flow conveyance route. **Refer to Figure 2 below / overleaf.**



Figure 2 : Google Streetview showing rear (south) of the site

There are no records or incidents of historical flooding at the site nor in the near vicinity.

Upon the advice of NRW the FMfP should be used as the best source of information. Developments of this scale and nature are deemed acceptable in Flood Zone 1 (Rivers, Sea and Pluvial). **Refer to Figure 3, below.**

Figure 1 – Summary of national policy requirements for new developments

Flood Map for Planning Zone	Development Type	Development Advice	Planning Requirements	Acceptability Criteria
1	All	No constraints relating to flooding from rivers or the sea, other than to avoid increasing risk elsewhere.	Justification test not applicable. Flood resistant and resilient design in locally-defined areas of current or future flood risk. Refer to surface water requirements set out in section 8 and in the Development Plan.	No increase in flooding elsewhere.

Figure 3 : Figure 1 from the (DRAFT) forthcoming TAN15

It can be concluded that the risk of Fluvial flooding to the site are **Low**. Any potential inherent associated consequences are deemed to be minimal and are wholly accepted by the developer.

3.2 Tidal

The FMfP indicates the site to be located outside of the extreme tidal flood extent (**Flood Zone 1**) and therefore at **Low** risk of flooding from the sea / tidal sources, meaning it has less than 0.1% AEP of flooding, including the effects of climate change.

A review of modelled data indicates the site to be flood – free during all modelled tidal events up to and including the T200 and T1000 events plus CCA. The site is situated well outside of the maximum estimated flood extents. **Refer to Appendix D.**

The NRW ‘Historic Flood Map’ shows that there are no records of historical tidal flooding events at the site.

It can be concluded that the application site and proposed development are currently at **Low** risk of tidal flooding.

3.3 Surface Water and Small Watercourses (Pluvial)

Surface water (or pluvial) flooding occurs when rainwater does not drain away through the normal drainage system or soak into the ground. It is usually associated with high intensity rainfall events but can also occur with lower intensity rainfall or melting snow where the ground is saturated, frozen or developed, resulting in overland flow and ponding in depressions in topography. Surface water flooding can occur anywhere without warning. However, flow paths can be determined by consideration of contours and relative levels. The FMfP indicates the site is located *outside* of the extreme flood extent (**Flood Zone 1**) and therefore at **Low** risk of flooding from pluvial sources, meaning it has less than 0.1% AEP of flooding, including the effects of climate change. The site and surrounding area are served by formal longstanding and effective surface water drainage system and infrastructure. There are no distinct flow routes in the area which would direct any excess surface water towards the property. There are no records or incidents of historical pluvial flooding at the site or within the surrounding area.

It can be concluded that the risk of surface water flooding to the proposed development is **Low**.

3.4 Sewer Flooding

Flooding from sewers can occur when a sewer is overwhelmed by heavy rainfall, becomes blocked, is damaged, or is of inadequate capacity. There are no known records of notable flooding from sewers at the site or in the near vicinity. There are no distinct flow routes in the area which would direct any potential flooding arising from the local sewer network which serves the area. It can be concluded that the risk of sewer flooding is **Low**.

3.5 Groundwater Flooding

Groundwater flooding occurs when water levels underneath the ground rise above normal levels. Prolonged heavy rainfall soaks into the ground and can cause the ground to become saturated. This results in rising groundwater levels which leads to flooding above ground.

There are no known records of groundwater flooding incidents at or near to the site. Both the existing and proposed sites are predominantly overlain by hardstanding which would prevent the ingress / egress of groundwater to the surface.

Therefore, it can be concluded that the risk of groundwater flooding is **Low**.

3.6 Artificial Sources of Flooding

There are no canals or other artificial / man-made surface water bodies within immediate vicinity of the site or surrounding area which would pose a flood risk to the site.

The NRW 'Risk of Flooding from Reservoirs' map (**Appendix D**) shows that the site is potentially at risk of flooding from reservoirs should critical infrastructure fail. However, the risk of flooding from reservoirs is extremely unlikely to happen. Furthermore; all large reservoirs must be inspected and supervised by a reservoir panel engineer, as the enforcement agency the NRW ensure that reservoirs are inspected regularly, and essential safety / maintenance work is carried out.

It can be concluded that the probability of flooding from artificial sources is **Low**.

3.7 Summary of Potential Flooding

It can be concluded that *Fluvial* flooding poses the greatest flood risk to the site albeit **Low**.

All other sources of flooding have been considered and are deemed to pose a **Low / Residual** flood risk to the site.

4 TAN15 ASSESSMENT

4.1 Justifying the Location

The application site is considered to be *Previously Developed / Brownfield*. Residential was the original purpose of the property and as far as we know has always been a building of this nature.

The proposals for the application site are considered '*Highly Vulnerable Development*'. The existing property is deemed *Highly Vulnerable*.

As previously mentioned, the site falls within **Zone A** of the NRW DAM map which is defined as:

Zone A – 'Considered to be at little or no risk of fluvial or tidal / coastal flooding' And;

'Used to indicate that justification test is not applicable and no need to consider flood risk further'.

Therefore, no further justification (test) is required for the development proposals and there is no need to consider fluvial / tidal flood risk further.

It is envisaged that the proposal makes the best use of the available (Brownfield) land for which otherwise alternative proposals are limited, and which maximises the candidate site potential while remaining in keeping with the surrounding area.

The proposals are unobtrusive and in keeping with the local land use occupancy. The proposals will also help contribute to affordable living spaces in alignment with the aims and objectives of the LDP.

In it's current state; the building is in need of internal renovation works due to an ever increasing state of deterioration and dilapidation. It would be more cost-effective and economically reasonable to undertake these works as soon as possible instead of letting further deterioration occur.

In fact, in this sense – the proposals present a great opportunity to make the existing site and building more resilient and resistant to the perceived and potential risks and associated consequences of flooding and climate change.

5 MITIGATION MEASURES AND RECOMMENDATIONS

It can be concluded that the site is at Low risk of flooding from *Fluvial* sources. All other potential sources of flooding have been investigated and it has been concluded that these pose a **Low/Residual** risk.

Additional *internal* alterations that should be introduced where practically possible to the development include:

- Raised electronic control units and sockets
- Install smart air bricks or air brick covers
- Provide low level flood guards on all access points
- Use plastic and stainless-steel fixtures and fittings and avoid wooden alternatives
- Use solid flooring (tiled, resin, concrete) at lower ground level, where possible
- Ensure that with the time afforded by advance warning, evacuation of property via safe egress and removal of valuables from the building can be implemented
- Clearance of the existing surface water drainage system to improve drainage of the site and follow necessary maintenance procedures (to new and existing surface water drainage) to ensure that the system functions to optimum capacity
- The predicted depths, rise, speed of inundation and velocities are likely to satisfy the TAN 15 suggested tolerable conditions for more extreme events
- Use robust flood resistant construction techniques.

All construction methods to be inherently flood resilient where possible i.e., polished concrete floors, no plasterboard. Refer to the ***B5 85500: 2015, Flood resistant and resilient construction. Guide to improving the flood performance of buildings*** (November 2015).

5.1 Flood Alerts & Flood Warnings

Flood Alerts cover the site, however Flood Warnings do not. Refer to Figure 4, below.

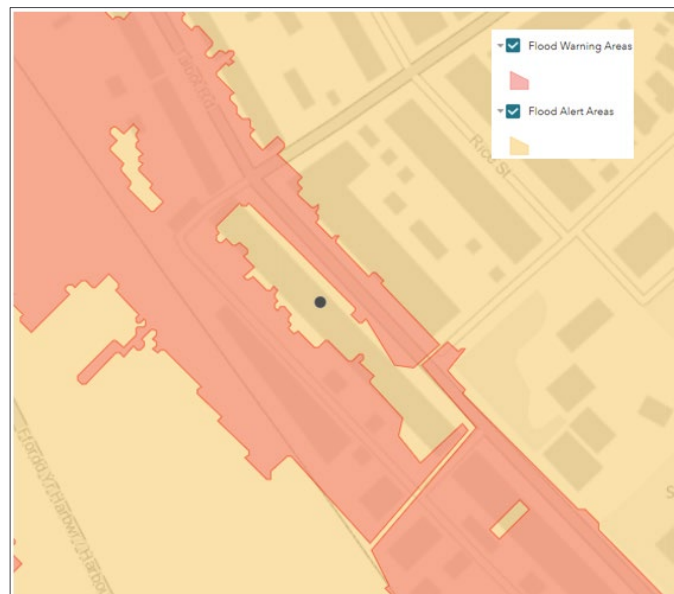


Figure 3 : NRW Flood Alert and Warning Coverage

Site owners / occupants should register to receive Flood Alerts and where possible, Flood Warnings if they become available to the site in the future.

5.2 Access and Egress

Safe access / egress routes are provided by the A48 highway. **Refer to the Flood Evacuation Route Plan, Appendix D.**

5.3 Safe Refuge Area and Flood Procedure

In the highly unlikely event that the site floods the competent warning authority is the NRW and a lead time of several hours in advance of flooding is typically provided, excluding potential breaches of defences. When a flood is expected Cardiff City Council, and the local emergency services will be responsible for public care and safety. In the highly unlikely event of the site flooding before site users have an opportunity to evacuate - the occupants should seek refuge on the upper floors as and where possible until flood waters have dispersed and / or assistance from the emergency services arrives.

5.4 Finished Floor Level (FFL)

Alteration of existing FFLs is not proposed, neither seen as an appropriate or necessary measure to alleviate flood risk. It would be unrealistic and out of proportion considering the relatively small nature and scale of the works; and also, the relatively **Low** flood risk as concluded by this report.

5.5 Impact on Flood Risk Elsewhere

No displacement of inundation waters or loss of flood storage / floodplain will result from the proposal. It can be concluded that the proposed development will not increase flood risk elsewhere and will not affect any third-party land.

6 CONCLUSIONS

The proposals are for; *'Change of use from C3 dwelling house to C4 small house of multiple occupation'*. Works to be limited to internal reconfiguration and refurbishment. No external works, alterations, increase in building footprint or increase in vulnerability classification to be experienced as a result of the proposed works.

Reference to the DAM indicates the site is located within **Zone A**. Therefore, there is no need to consider fluvial / tidal flood risk further and the Justification Test need not apply.

Reference to the FMfP indicates the site to be marginally within **Flood Zone 2 (Rivers)**. From all other sources of flooding; the site is located outside the extreme flood extents.

Sites in **Flood Zone 1 and 2 (Rivers)** can generally be considered compliant with A.14 of TAN15. From a technical view point the site is shown to be located outside of **Flood Zone 3** and therefore is deemed to comply with A1.14 of TAN15. All developable aspects of the site are located in FZ1 from all sources of flooding and all works to be internal.

Appropriate climate change allowances have been incorporated and considered.

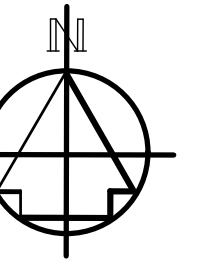
The level of detail covered within this FCA is at least commensurate with the scale and nature of the proposals.

The risk of flooding to the development proposal has been addressed and a balanced judgement has been applied in recognising the potential consequences of flooding. The site concurs with the necessary definition of *Previously Developed (Brownfield) Land*. The proposals concur with the aims and objectives laid out in the policies of the LDP and the definition of sustainable development.

The proposals will not increase flood risk elsewhere. Surface water drainage to be approved and designed in line with national, regional and sub-regional policy.

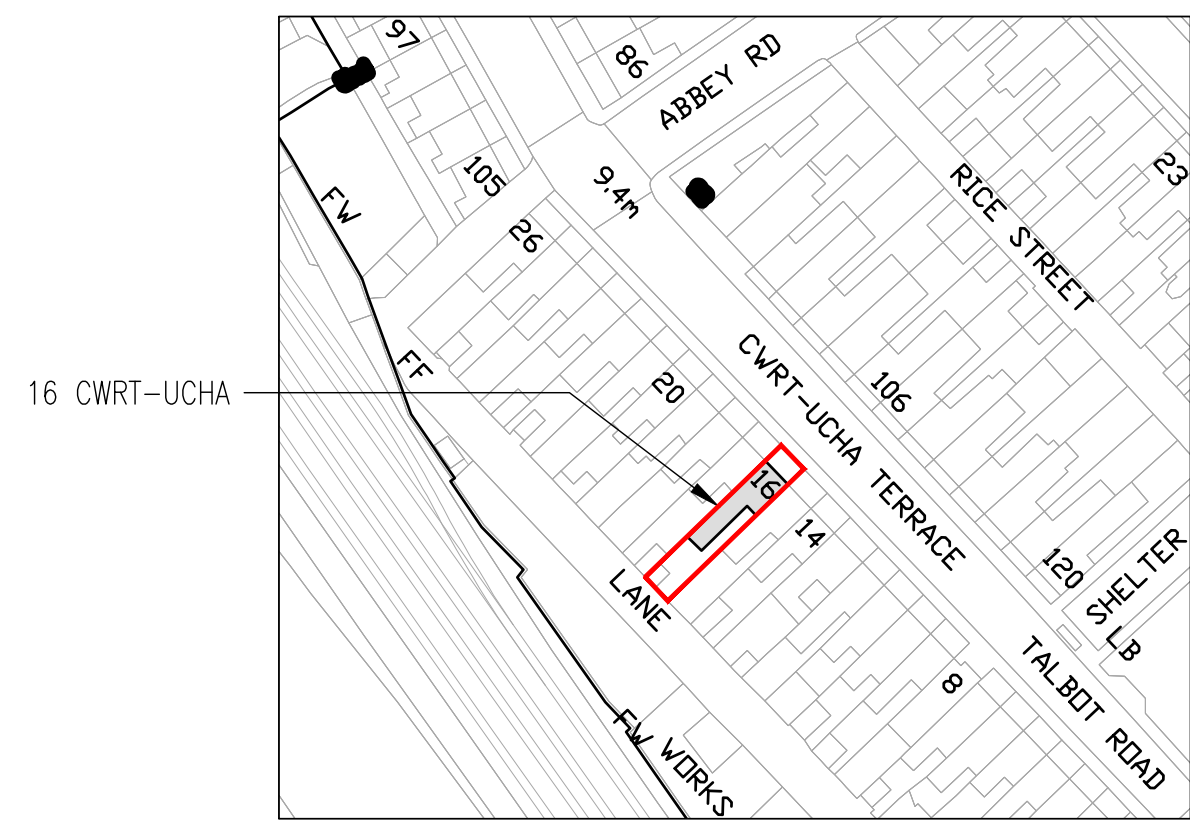
The developer wholly accepts any perceived risks / consequences associated with the flood risk to the site.

APPENDIX A: Existing and Proposed Development Plans

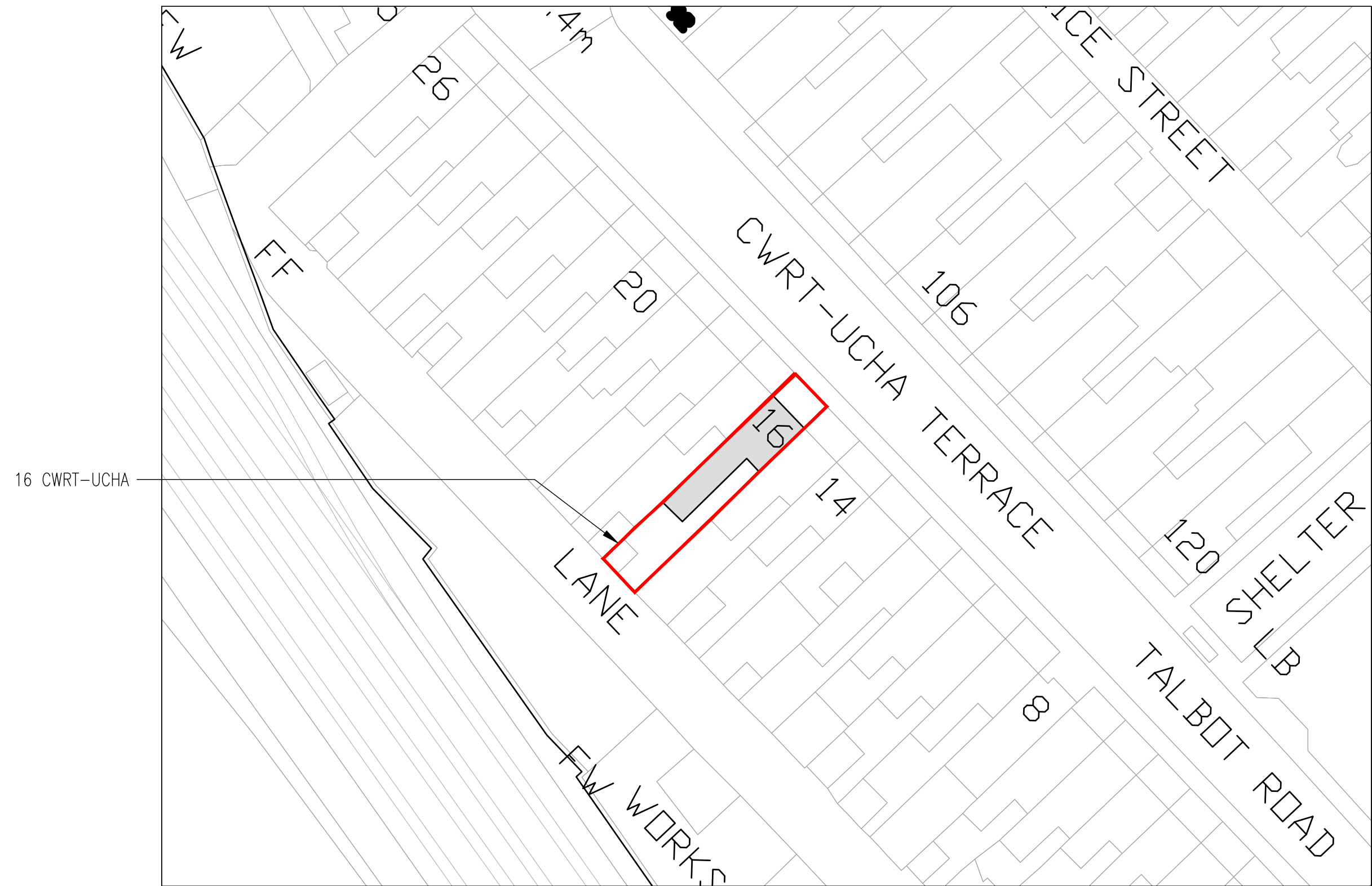


KEY

BOUNDARY LINE



LOCATION PLAN
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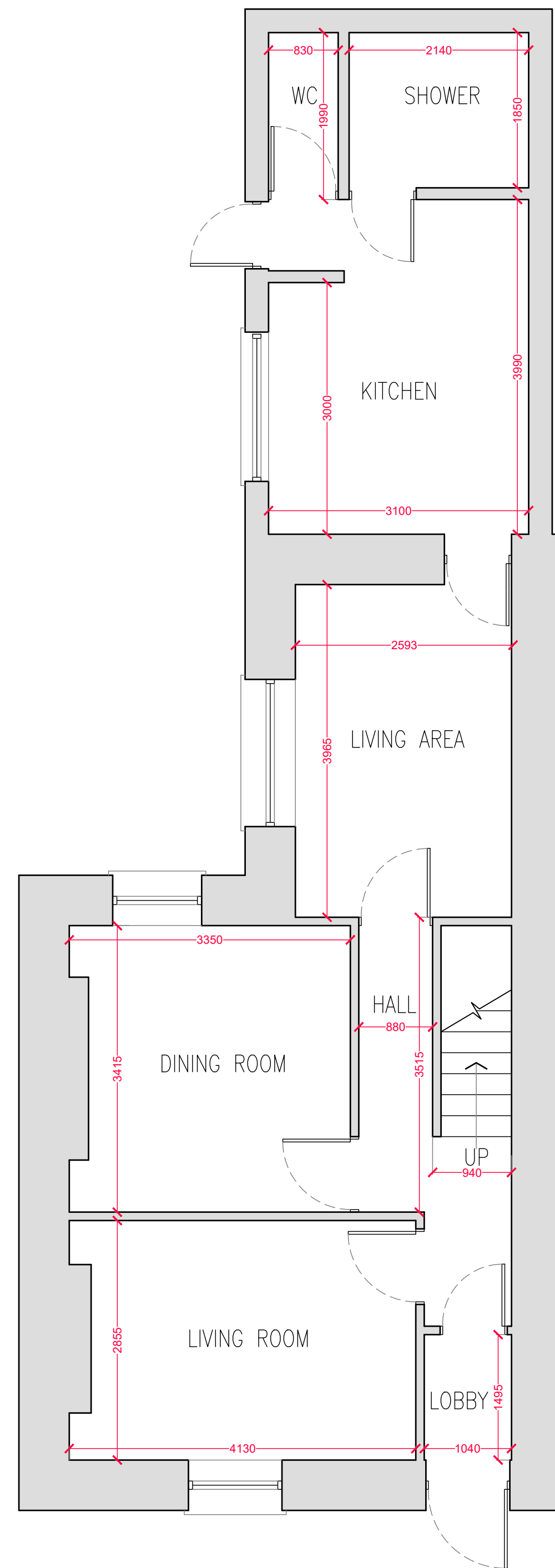
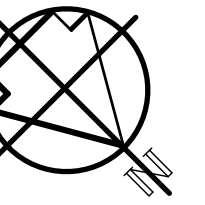


SITE PLAN
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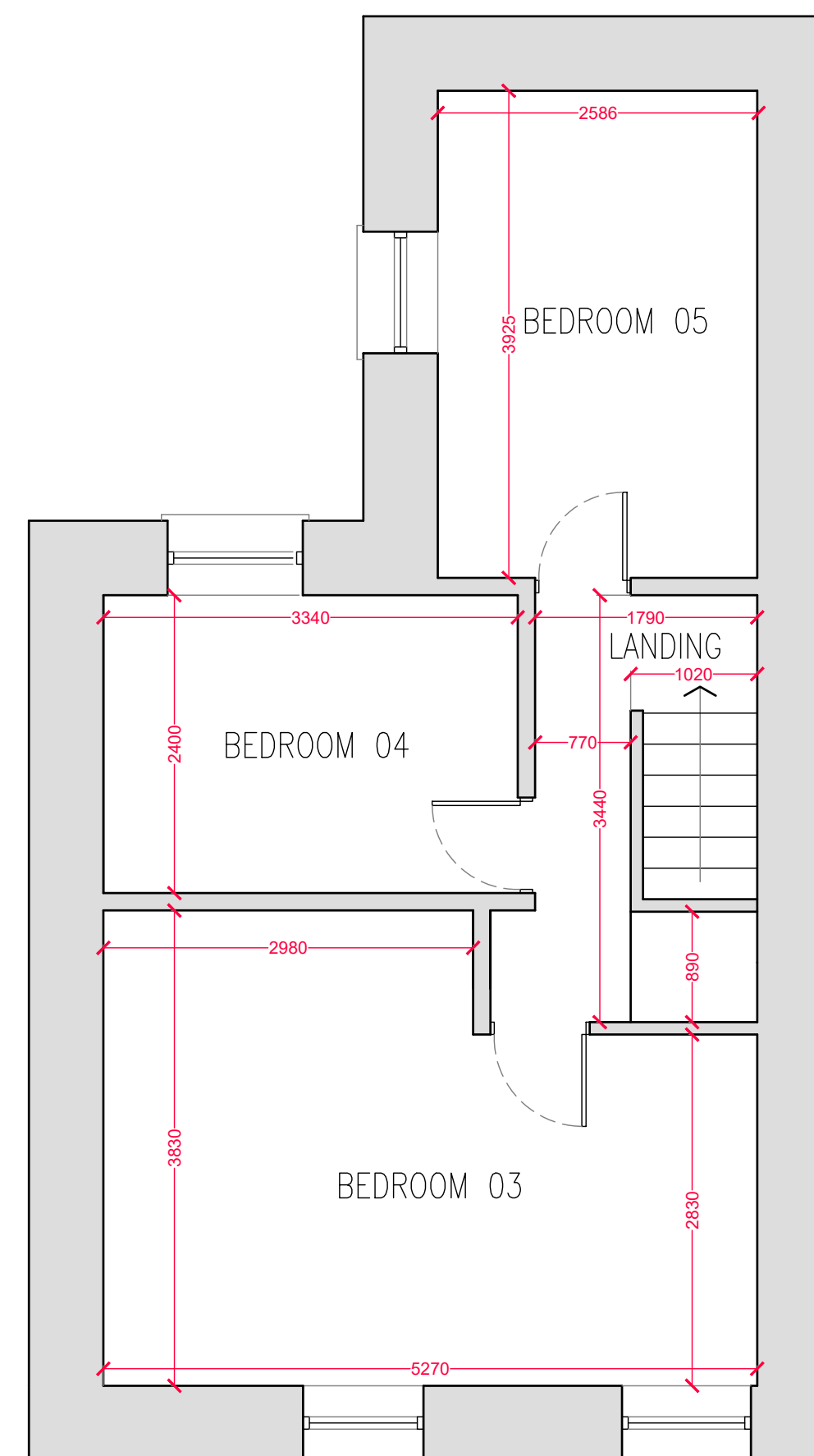
16 CWRT - UCHA TERRACE,
PORT TALBOT
SA13 1LD

LOCATION PLAN & SITE PLAN

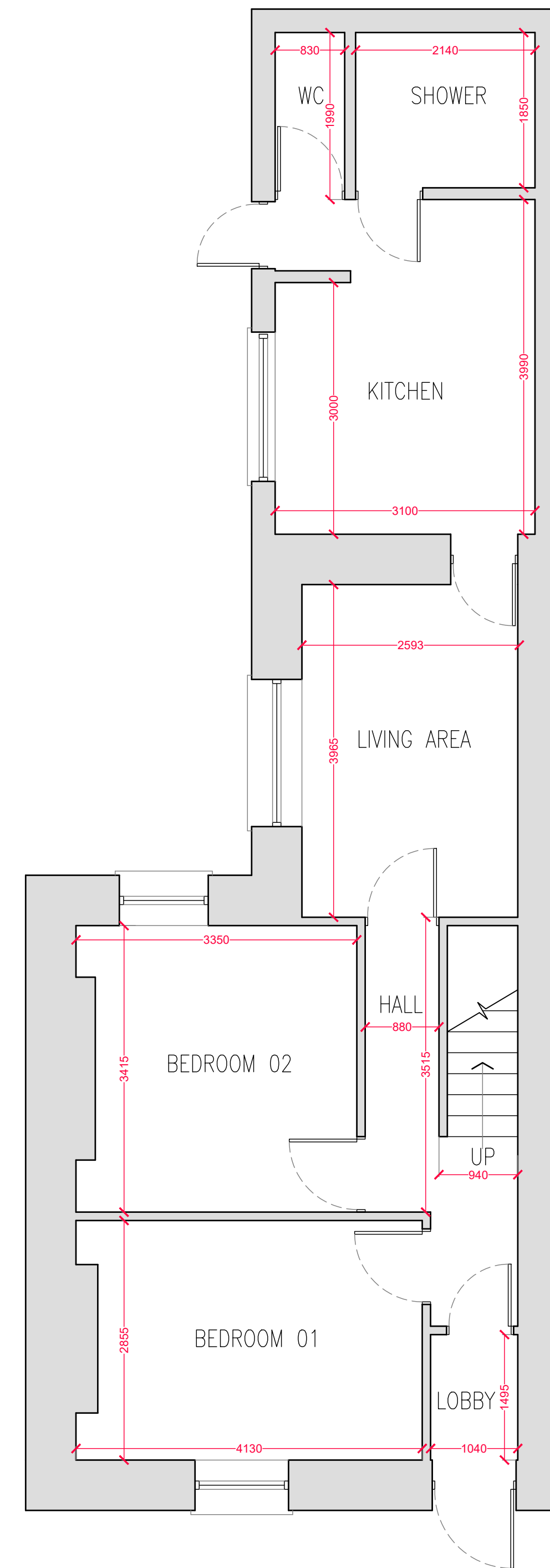
APPENDIX B: LiDAR Extract



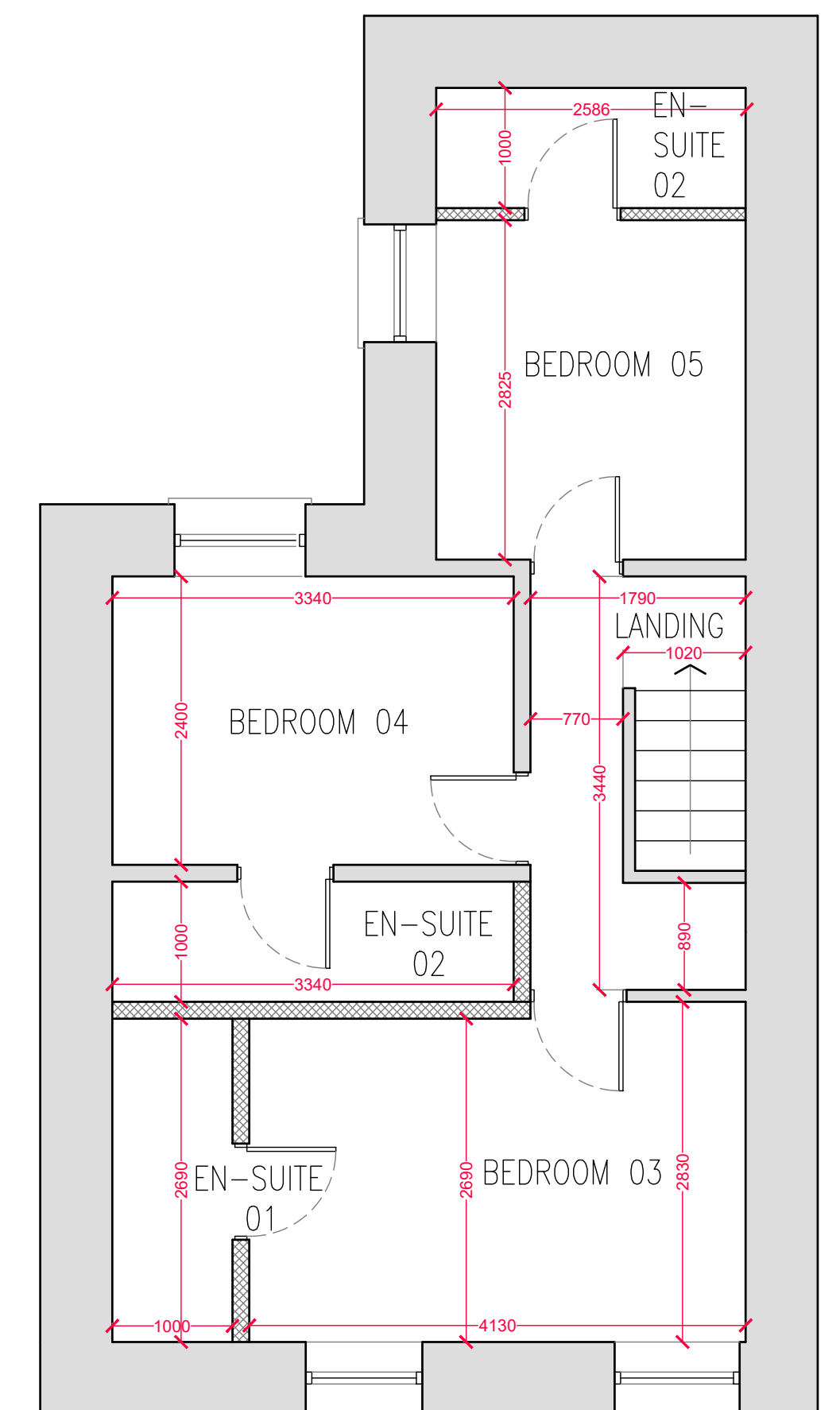
EXISTING PLAN
GROUND FLOOR
SCALE 1:50 ● A1



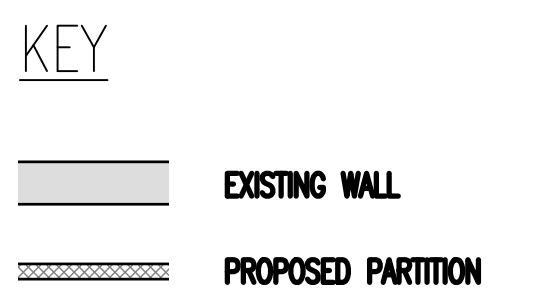
EXISTING PLAN
FIRST FLOOR
SCALE 1:50 ● A1



PROPOSED PLAN
GROUND FLOOR
SCALE 1:50 ● A1



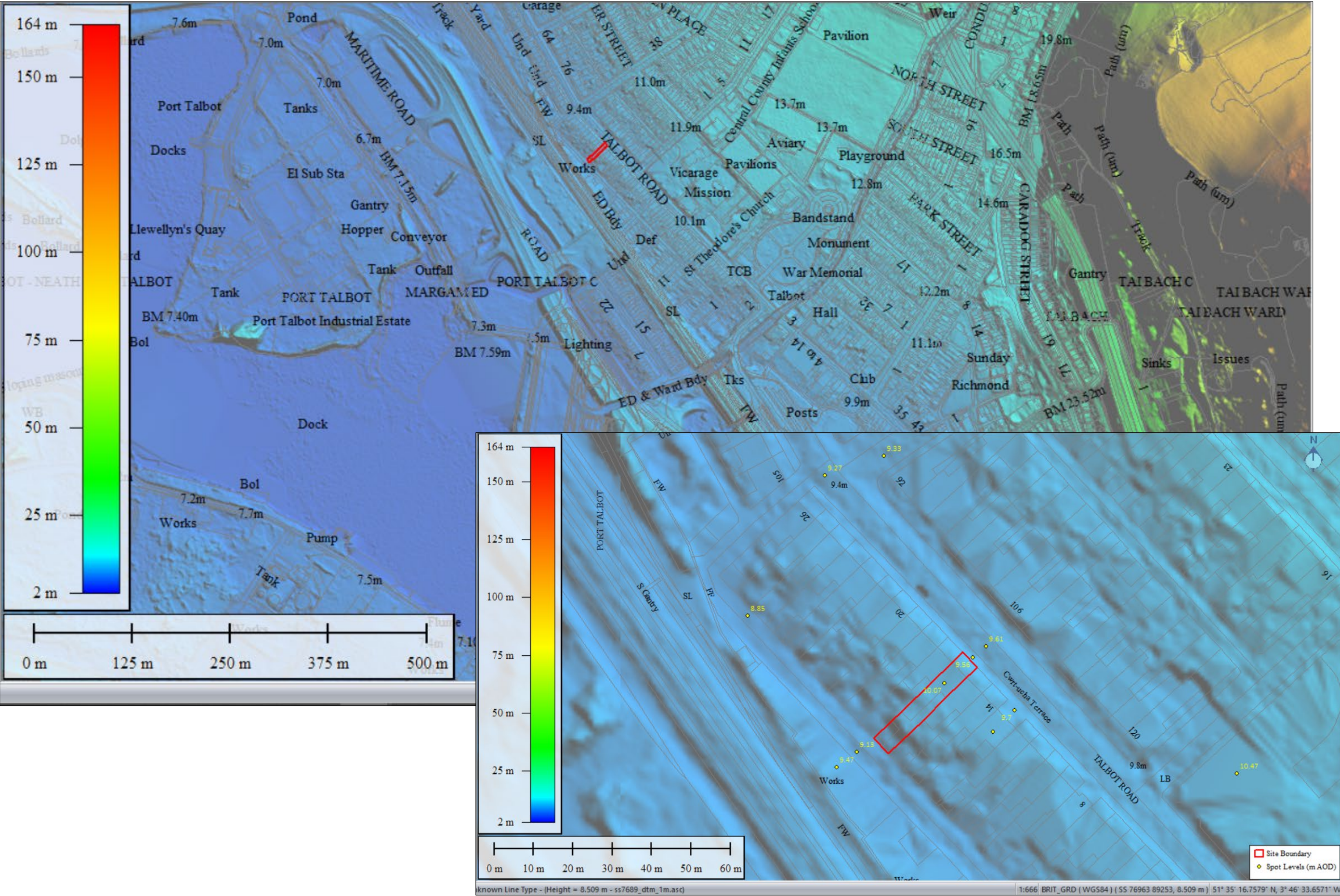
PROPOSED PLAN
FIRST FLOOR
SCALE 1:50 ● A1



16 CWRT - UCHA TERRACE,
PORT TALBOT
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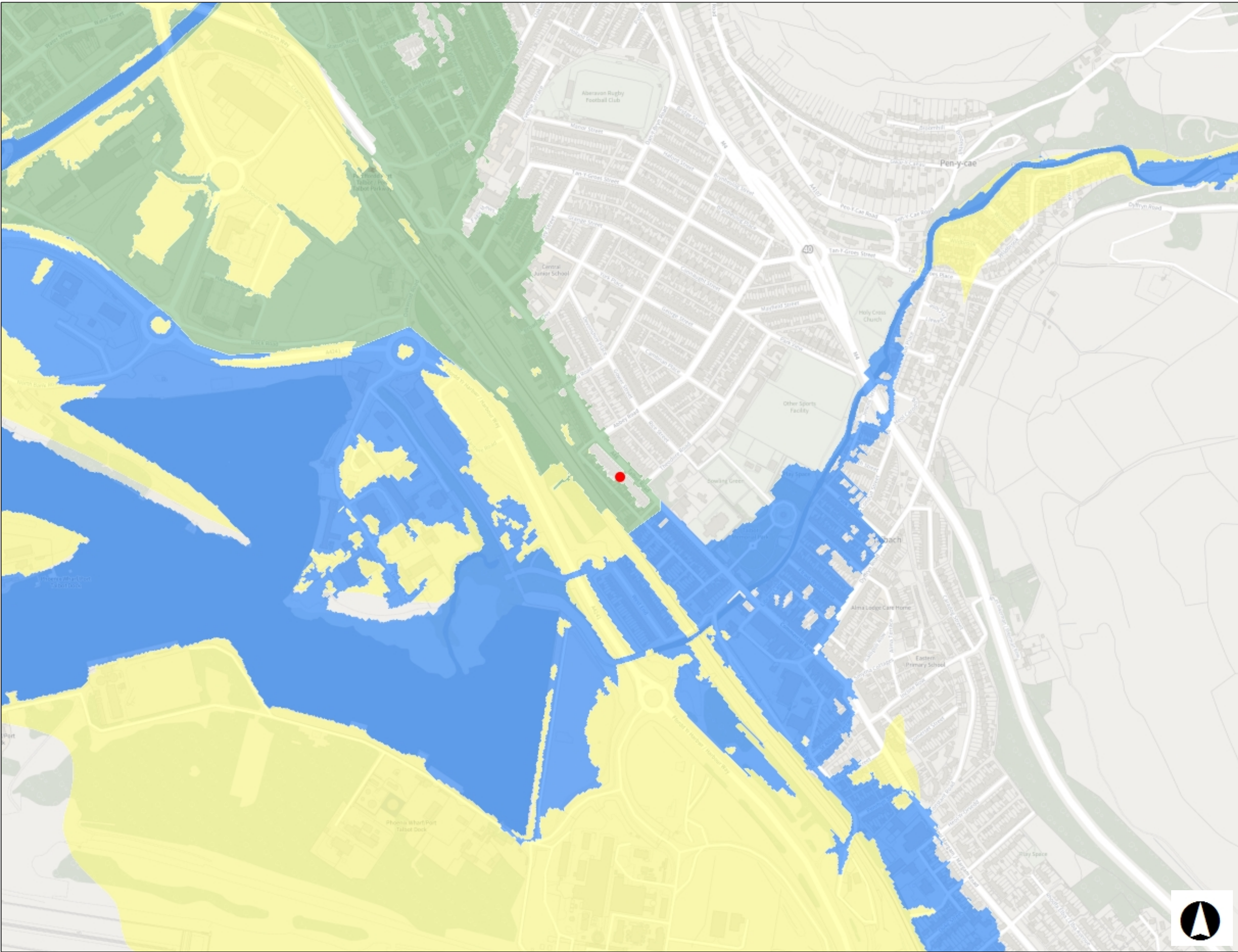
EXISTING & PROPOSED
GROUND FLOOR & FIRST FLOOR

APPENDIX C: NRW Flood Maps



NRW 1m DTM LiDAR Data including Spot Levels (to m AOD)

APPENDIX D: Modelled Data Outputs and Flood Evacuation Route Plan



19751 - 16 Cwrt Ucha Terrace

Allwedd / Map Key

Zone C1

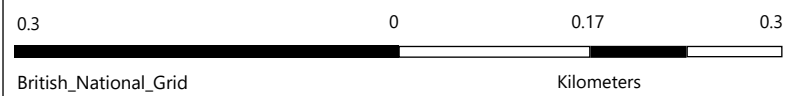
Zone C2

Zone B

Zone A

Graddfa / Scale at A3 1: 6,614

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17/05/2024



Flood Map for Planning - Detail
19751 - 16 Cwrt Ucha Terrace

Legend

--- Flood Defence Locations

TAN15 Defended Zones

Rivers

Sea

Rivers and Sea

Rivers

Flood Zone 3

Flood Zone 2

Sea

Flood Zone 3

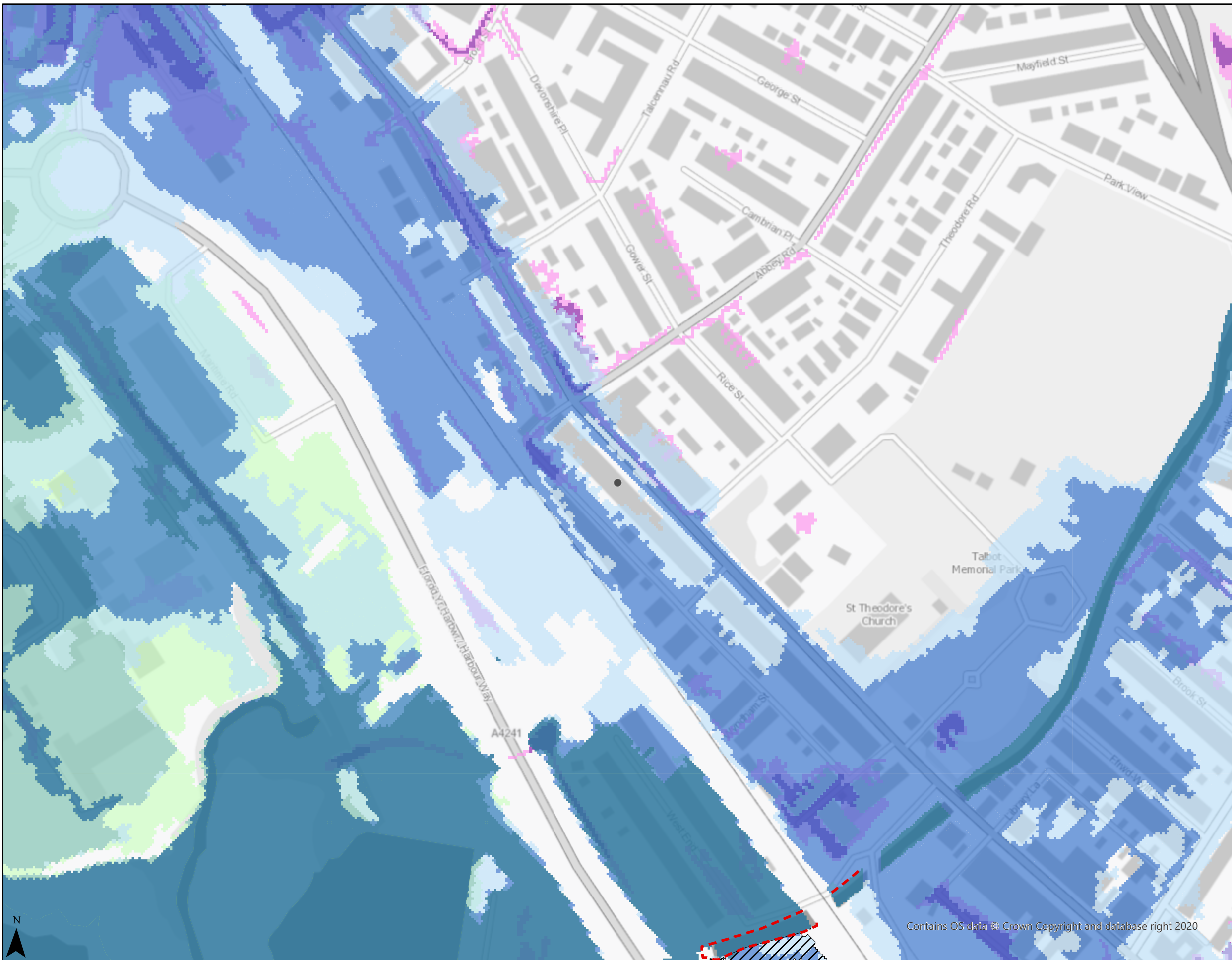
Flood Zone 2

Surface Water and Small Watercourses

Flood Zone 3

Flood Zone 2

Recorded Flood Extents



0.1 0.05 0 0.1
km

British National Grid

Disclaimer

<https://naturalresources.wales/flooding/disclaimer-for-our-flood-and-coastal-erosion-risk-maps/?lang=en>

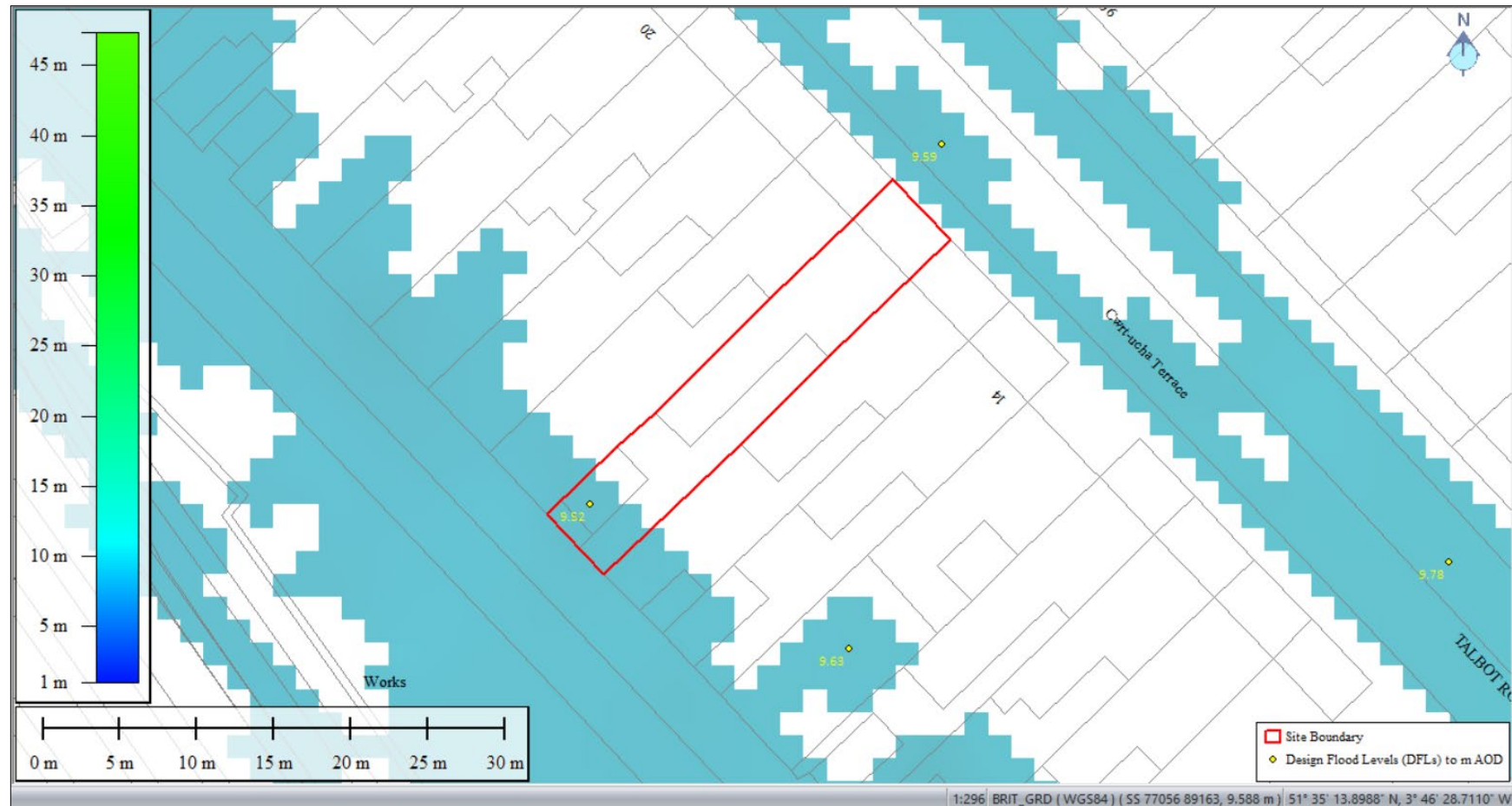
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Scale at A3: 1:2,500

Date: 17/05/2024

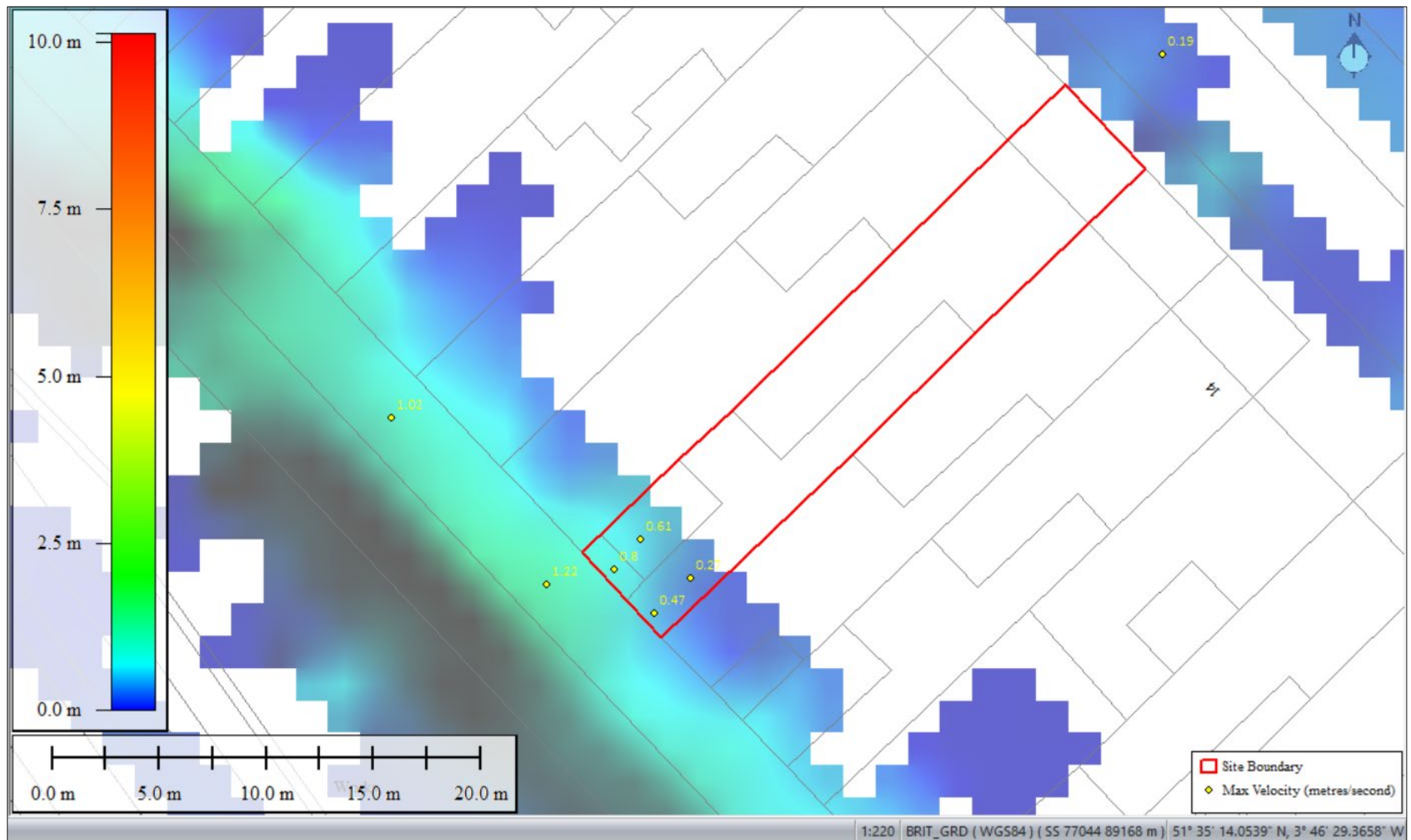
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19751 – 16-Cwrt Ucha, Port Talbot



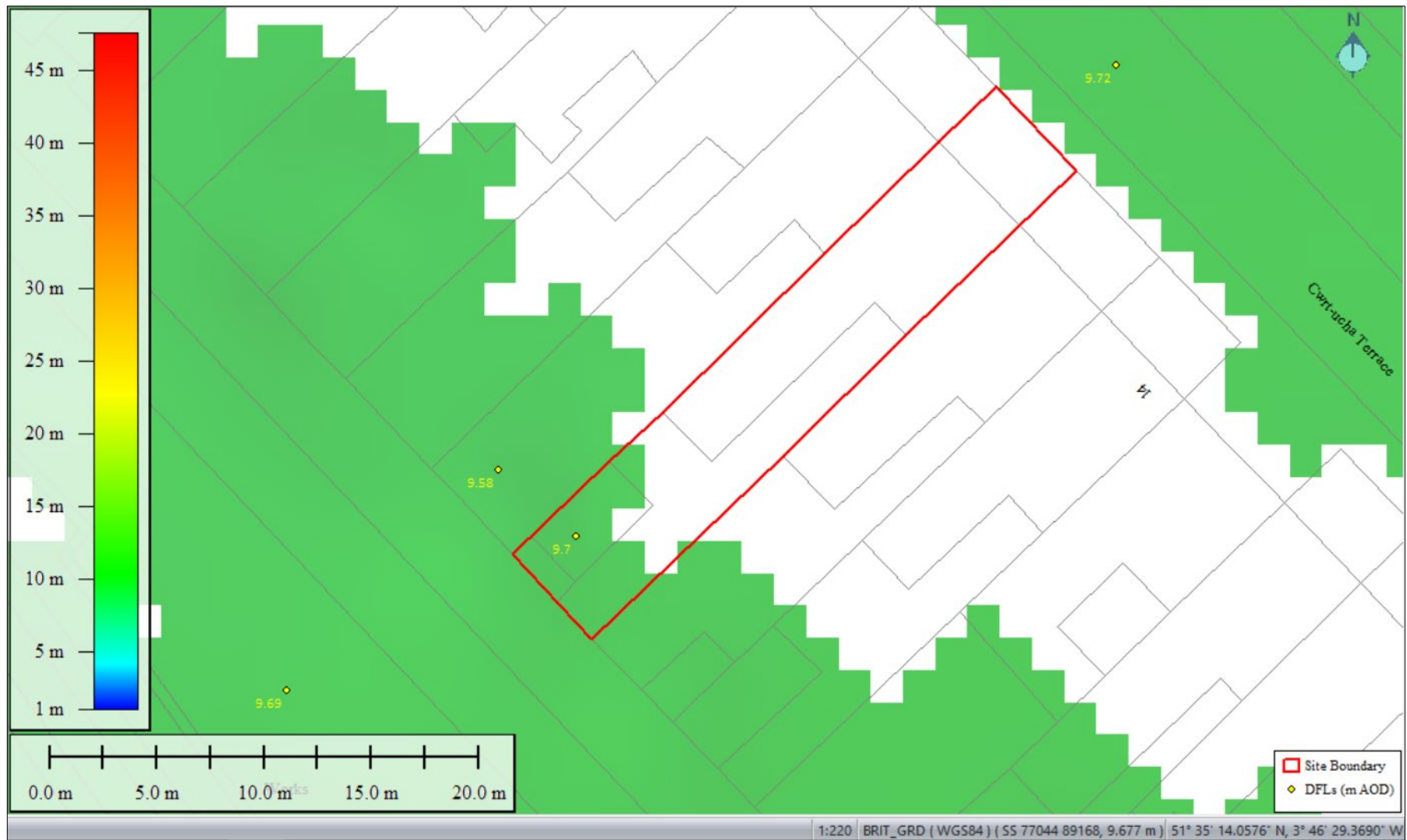
DFLs (m AOD) during the critical Q100 + CC Event

19751 – 16-Cwrt Ucha, Port Talbot



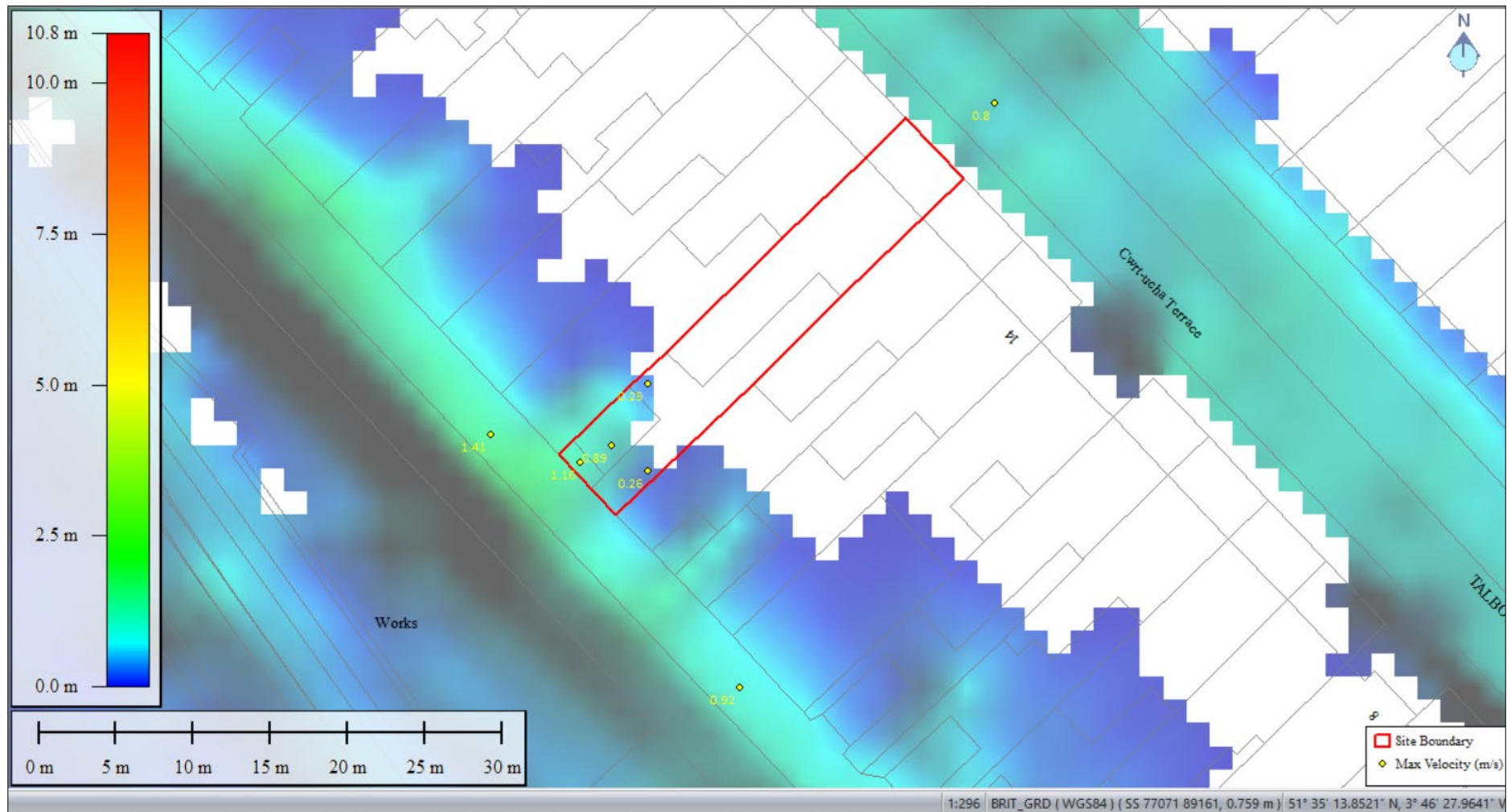
Maximum Inundation Velocity (m/s) during the Defended Q100 Event + CC

19751 – 16-Cwrt Ucha, Port Talbot

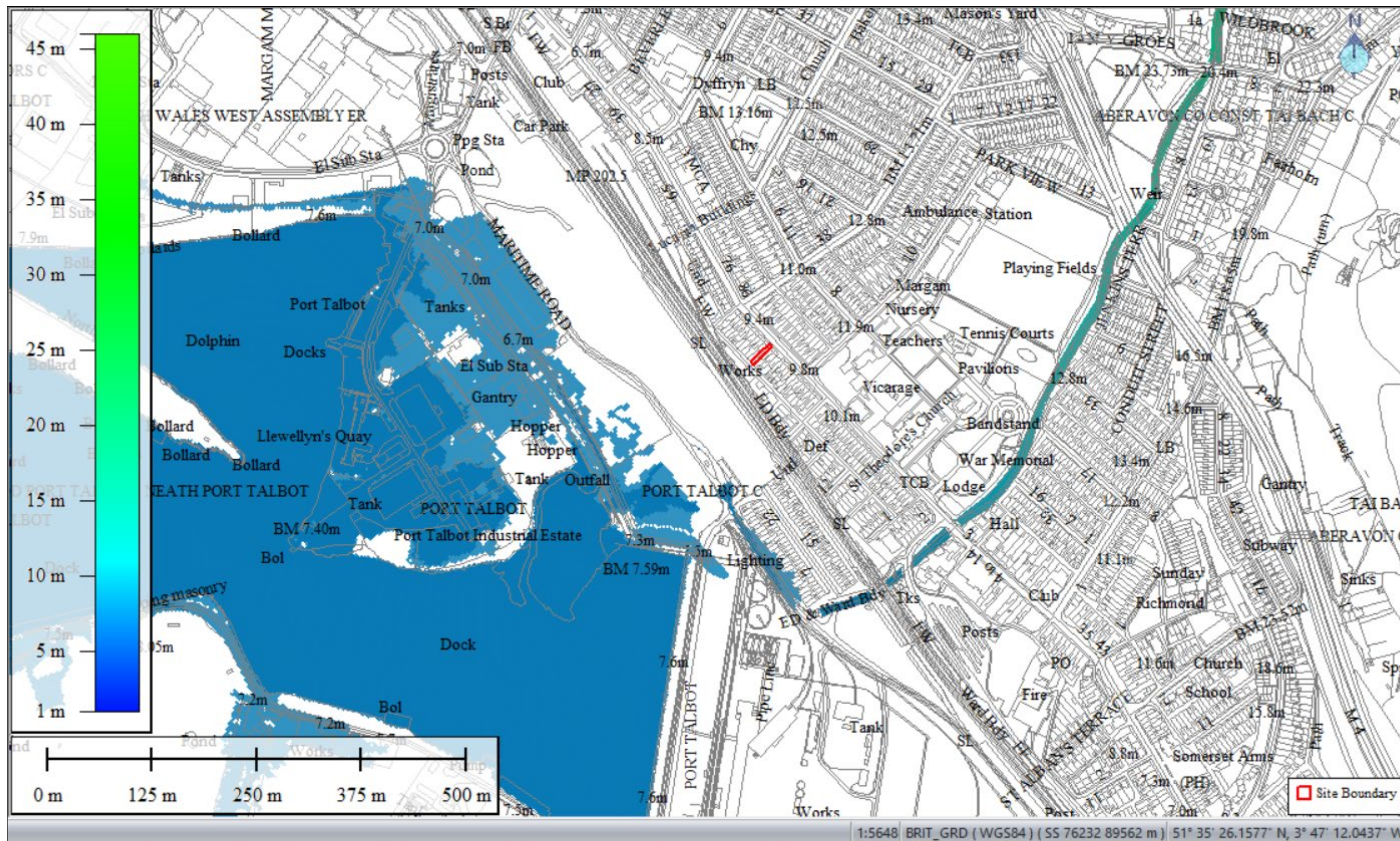


Design Flood Levels (m AOD) during the Defended Q1000 Event

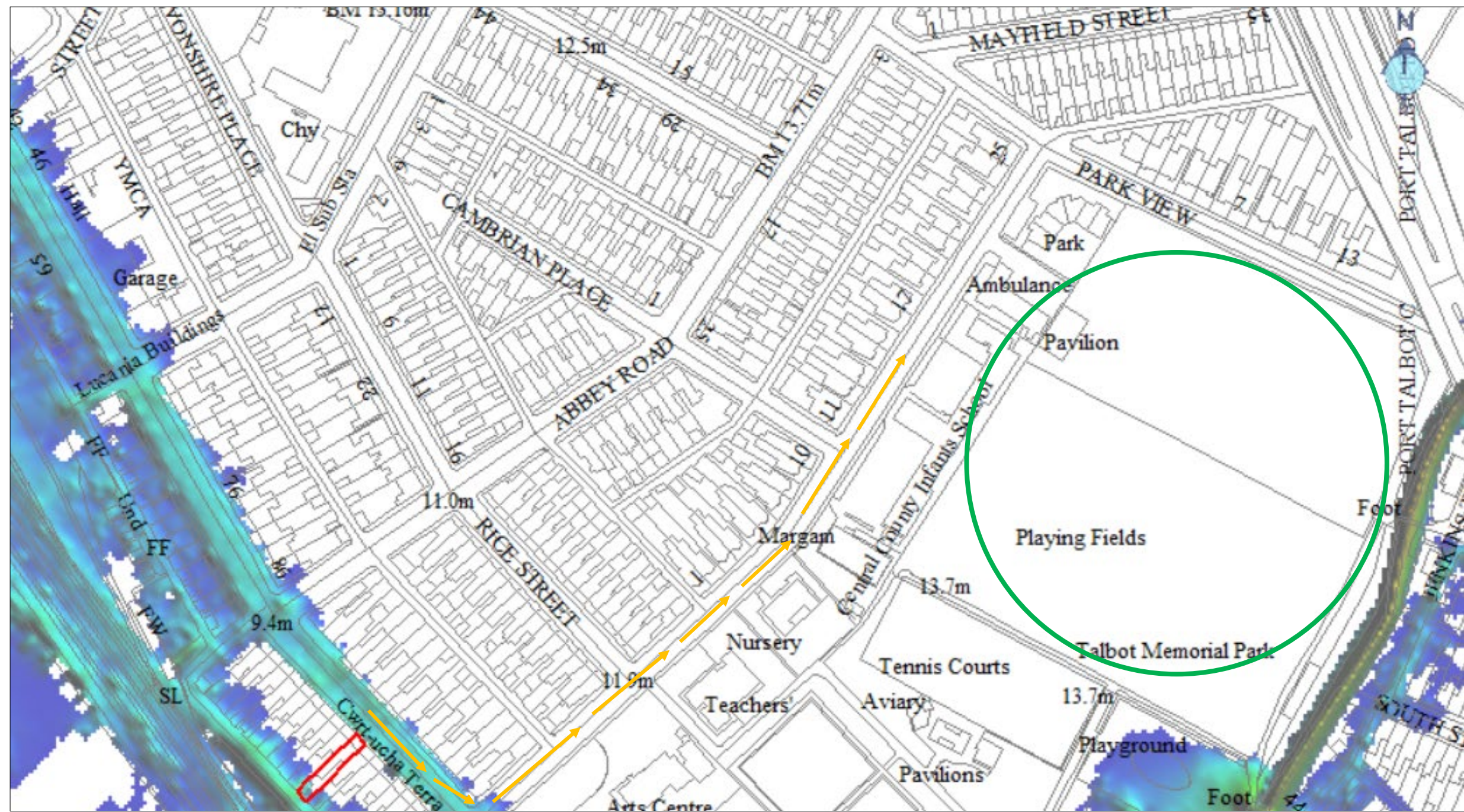
19751 – 16-Cwrt Ucha, Port Talbot



Maximum Inundation Velocity (m/s) during the Defended Q1000 Event



Maximum Flood Extent and Design Flood Levels (m AOD) during the Defended T200 and T1000 Events including CCA (2116)



Potential area of safe refuge for wider public



Proposed flood evacuation route