

Land North of Elba Crescent, Swansea

Flood Consequence Assessment and Drainage Feasibility



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Elba Crescent, SA1 8QE
2
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REPORT

Quality Management

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1 INTRODUCTION

- 1.1 RPS was commissioned to update a Flood Consequence Assessment (FCA) conducted in 2008 (Reference: JER7348) in relation to the proposed residential development at *land north of Elba Crescent, Swansea, SA1 8QE*.
- 1.2 The aim of the FCA is to outline the potential for the site to be impacted by flooding, the impacts of the proposed development on flooding in the vicinity of the site, and the proposed measures which could be incorporated into the development to mitigate the identified risk. The report has been produced in accordance with the guidance detailed in TAN15, the TAN15 Maps for Planning (2021), and the Planning Policy Wales, Edition 11, from February 2021. Reference has also been made to the CIRIA SuDS manual (C753), the Neath Port Talbot Council Strategic Flood Consequence Assessment (SFCA) and Preliminary Flood Risk Assessment (PFRA).
- 1.3 This report has been produced in consultation with the Natural Resource Wales (NRW) and the Lead Local Flood Authority (LLFA). The site is not located within an Internal Drainage Board (IDB) District.
- 1.4 This report is not intended to provide formal details of the final drainage design for the development. However, it provides information regarding the capabilities of the conceptual surface water drainage strategy to meet the requirements of TAN15.
- 1.5 The desk study was undertaken by reference to information provided / published by the following bodies:
- Natural Resource Wales (NRW);
 - Neath Port Talbot Council;
 - British Geological Survey (BGS);
 - Ordnance Survey (OS); and
 - Welsh Water.

2 PLANNING POLICY CONTEXT

National Planning Policy

Technical Advice Note (TAN) 15: Development and Flood Risk

- 2.1 TAN 15 provides technical guidance to supplement the policy set out within Planning Policy Wales in relation to development and flooding. The guidance relates to sustainability principles and provides a framework to allow risks arising from river flooding, coastal flooding and additional run off from developments to be assessed.
- 2.2 In relation to flood risk, TAN 15 indicates that the Assembly has a duty to ensure that development is sustainable and does not create problems for future generations. Managing flooding has an important role to ensure sustainable development by: guiding developments to locations with little or no risk from river, tidal or coastal flooding, managing consequences of flooding where developments can be justified and making provision for climate change.
- 2.3 TAN 15 confirms that each planning authority in Wales must prepare a Development Plan for its area. The development plans provide locational guidance for development, detailed site-specific policies, and identification of proposals for development. Catchment Flood Management Plans aim to take a holistic approach to flood management at a catchment scale and can provide guidance on managing risk to future developments. The information provided in local development plans and catchment flood management plans will aid with the application of the Justification Test.

Requirements of TAN 15

- 2.4 A Flood Consequence Assessment, to support a development application, should be proportionate to the risk and appropriate to the scale, nature and location of the development. The following will need to be considered:
- The consequences of flooding on the development, the consequences of the development on flood risk elsewhere and if appropriate mitigation measures can be incorporated into the design.
 - Mechanisms of flooding, including sources of floodwater, how floodwater enters and flows across a site, height, and speed of floodwaters.
 - Uncertainties in estimating flood events including use of historical records and forecasting.
 - Security of proposed developments over their lifetime and ensuring those using the development have an awareness of the potential risks from flooding.
 - Description of consequences under a range of extreme events including: mechanisms, sources, depths, speed, rate of rise, overland flood routes, velocity, access and egress, impacts on natural heritage, impact on flood risk in surrounding areas.
 - Structural adequacy of defences to contain flows and withstand overtopping and if required the suitability of implementing a buffer zone adjacent to defences.
 - Measures required to ensure flooding is managed to acceptable levels and ensure that the impact upon flood risk elsewhere in the flood plain is managed.

Planning Policy Wales

- 2.5 Planning Policy Wales sets out the land use planning policies of the Welsh Government. Chapter 13 'Minimising and Managing Environmental Risk and Pollution' outlines the Welsh Government's objectives in terms of addressing flood risk.
- 2.6 Section 13.4 of Planning Policy Wales states:

“Development proposals in areas designed as being of high flood hazard should only be considered where:

New development can be justified in that location, even though it is likely to be at risk from flooding; and

The development proposal would not result in the intensification of existing development which may itself be at risk; and

New development would not increase the potential adverse impacts of a flood event.”

- 2.7 Planning Policy Wales is supplemented by a series of Technical Advice Notes (TAN). TAN15 provides technical guidance on development and flood risk.

Sustainable Drainage System Approval Body

- 2.8 From January 2019, all new developments of more than 1 house or where the construction area is of 100m² or more will require sustainable drainage to manage on-site surface water. Surface water drainage systems must be designed and built-in accordance with mandatory standards for sustainable drainage published by Welsh Ministers.
- 2.9 These systems must be approved by the local authority acting in its SuDS Approving Body (SAB) role before construction work begins. The SAB will have a duty to adopt compliant systems so long as it is built and functions in accordance with the approved proposals, including any SAB conditions of approval.

Local Planning Policy

Local Development Plan

- 2.10 The Neath Port Talbot Council Local Plan (2011 – 2026) contains the following Policies relating to flood risk and drainage:

Policy SP 1

“Climate Change

- 2.11 ...In relation to the consequences of climate change:

1. *Likely increased flood risk will be taken into account and addressed by ensuring that there is greater resilience by avoiding development on land that is at risk from flooding in the first instance in accordance with the sequential approach set out in national guidance or in locations that could increase the risk of flooding elsewhere;*
2. *The fragmentation of habitats will be minimised, and opportunities made for habitat and species change and migration where possible.”*

Policy SP 16

“Environmental Protection

- 2.12 *Air, water and ground quality and the environment generally will be protected and where feasible improved through the following measures:*
1. *Ensuring that proposals have no significant adverse effects on water, ground or air quality and do not significantly increase pollution levels;*
 2. *Giving preference to the development of brownfield sites over greenfield sites where appropriate and deliverable;*
 3. *Ensuring that developments do not increase the number of people exposed to significant levels of pollution.”*

Policy BE 1

“Design

- 2.13 *All development proposals will be expected to demonstrate high quality design which fully takes into account the natural, historic and built environmental context and contributes to the creation of attractive, sustainable places.*
- 2.14 *Proposals will only be permitted where all of the following criteria, where relevant, are satisfied:*
[...] (c) Developing brownfield land in preference to greenfield land where possible;
[...] 9. Its drainage systems are designed to limit surface water run-off and flood risk and prevent pollution”

Policy BE 3

“The Canal Network

1. *In order to protect and conserve the canal network, the following lengths of canal will be safeguarded:*
 - c. *The Tennant Canal; ...*
- 2.15 *Proposals which would prejudice the conservation, restoration and operation of these safeguarded lengths of canal will be resisted. Proposals will need to demonstrate that they would not adversely affect the setting of the canals or prevent or discourage the use of the canals for recreation and water supply;*
2. *Developments affecting locations where lengths of canal have been drained, infilled, culverted, obstructed or cut off from the remainder of the network, but where there is the possibility of future reinstatement, will be expected to take into account the historic line of the canal and to avoid the introduction of buildings or structures that would prevent reinstatement.”*
- 2.16 The Neath Port Talbot Council are in the process replacing the Local Development Plan to cover the years 2021 to 2036. At the time of writing this report, no strategy document is publicly available.

Preliminary Flood Risk Assessment

- 2.17 A Preliminary Flood Risk Assessment (PFRA) was produced by Streetcare in March 2011 for Neath Port Talbot Council. The PFRA is aimed at providing high level overview of flood risk from all sources of flooding within the local area, including consideration of surface water, groundwater and ordinary watercourses. Relevant information has been referenced throughout this report.

Strategic Flood Consequence Assessment

- 2.18 The Neath Port Talbot SFCA identifies and maps flood risk from all sources at a borough-wide scale as well as providing guidance on producing site specific FRAs. Relevant information from the SFCA has been referenced throughout this report.

3 CONSULTATION

Natural Resource Wales

- 3.1 The NRW were contacted regarding detailed flood risk data, however no modelling data is available for the site location. Therefore, this FCA is based on data from Flood Risk Assessment Wales (FRAW) and published as part of Cycle 2 of the Flood Risk Regulations (2009).

Welsh Water

- 3.2 The public sewer network within the vicinity of the site is operated by Welsh Water. Preliminary consultation with Welsh Water has identified that they hold no records of sewer flooding around the site area.

Lead Local Flood Authority / Local Planning Authority

- 3.3 The site is within the administrative boundary of Neath Port Talbot Council. Consultation has been undertaken with the planning department regarding site specific flood risk and drainage requirements. A response is currently awaited.

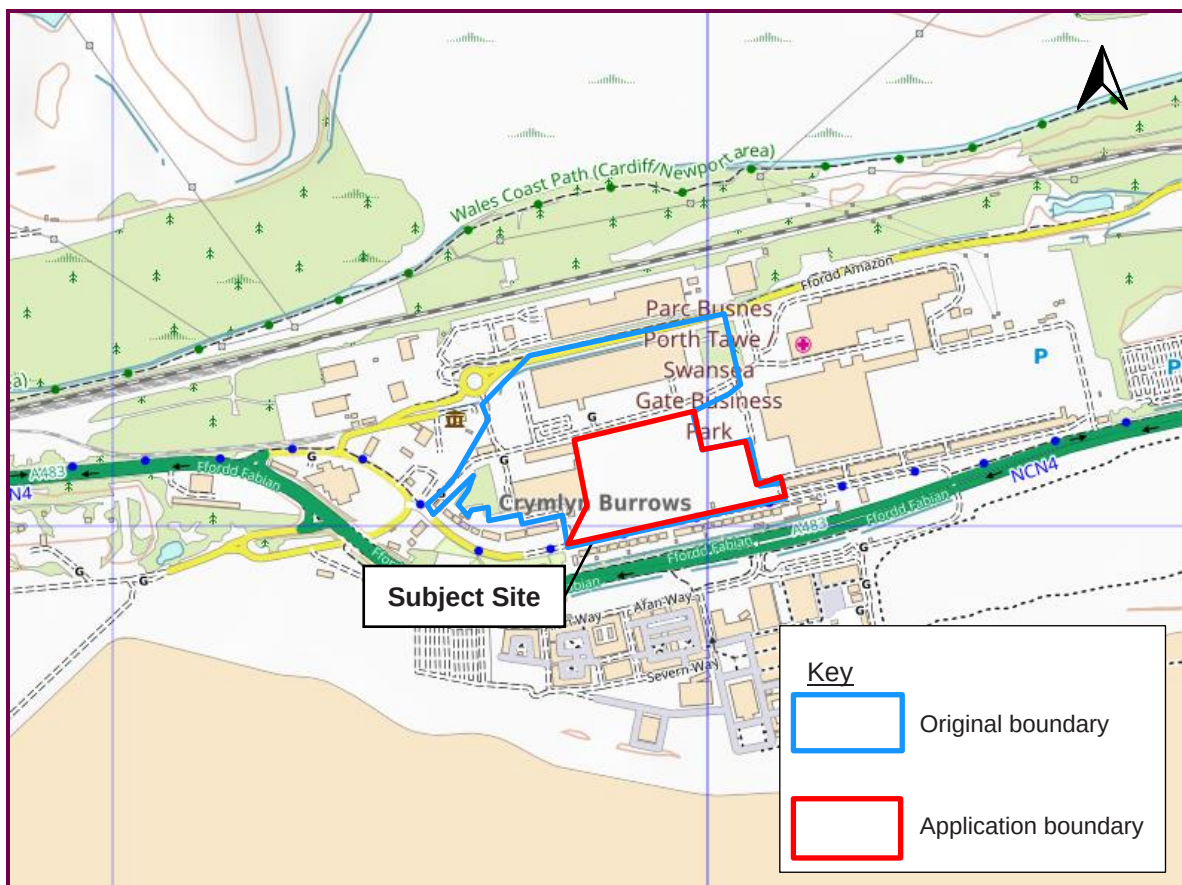
Internal Drainage Board

- 3.4 The site is not located within an IDB District.

4 SITE DESCRIPTION

Site Description

- 4.1 The site is located east of Swansea at National Grid Reference SS 69668 93056. Outline planning permission for a mixed-use development of the site comprising business (B1, B2 and B8) and residential (C3) was granted in September 2011 (Ref: P2008/0514). The permission was renewed over the years with the most recent consent expiring in May 2019. The original application was made for an approximate 1-hectare (ha) site, but the new application boundary occupies a reduced extent which is approximately 0.4 ha of the original site. The location is presented in Figure 1 with the blue line referring to the extent of the original application and the red line referencing the updated boundary.



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Figure 1. Site Location

- 4.2 The site is currently occupied by redundant car parking associated with a wider estate or previous development. As identified via satellite imagery, some hardstanding car park areas have been reclaimed by native shrubland and therefore the current proportion of hardstanding / soft landscaping are approximately as follows:
- Hardstanding: 30%
 - Soft landscaping: 70%
- 4.3 Vehicular access to the site can be obtained from the south via Elba Crescent.

Surrounding Land Uses

- 4.4 Surrounding land use is mixed industrial and residential. A Trojan Electronics Ltd retail unit exists approximately 60 m north with the Crymlyn Bog & Pant Y Sais National Nature Reserve approximately 430 m north of the site. Bay Field Hospital is approximately 80 m to the east and there are low rise residential units approximately 70 m south of the site along Elba Crescent and Baldwins Crescent. Swansea University Bay Campus exists approximately 180 m south of the site.
- 4.5 The Cors Crymlyn / Crymlyn Bog Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC) exists approximately 430 m north of the site. Additionally, the Crymlyn Burrows SSSI exists approximately 500 m south east of the site.

Topography

- 4.6 A topographic survey was completed by RPS Group in September 2021, reference JER73848-&H 004, and indicates that the site generally slopes from north to south. The land in the north of the site is undulating with elevations generally between 7.6 and 6.87 m AOD and land in the south falls to around 6.8 m AOD. The topographic survey is located in Appendix B.

5 PROPOSED DEVELOPMENT

- 5.1 A residential development is proposed at the site. An illustrative masterplan is included as Appendix C.
- 5.2 The proposed residential use of the site is classified as 'highly vulnerable' within the TAN15 guidance.
- 5.3 The potential to provide surface water attenuation, including the use of Sustainable Drainage Systems (SuDS), has been considered as part of the preliminary design process (see Section 10 – Surface Water Management).

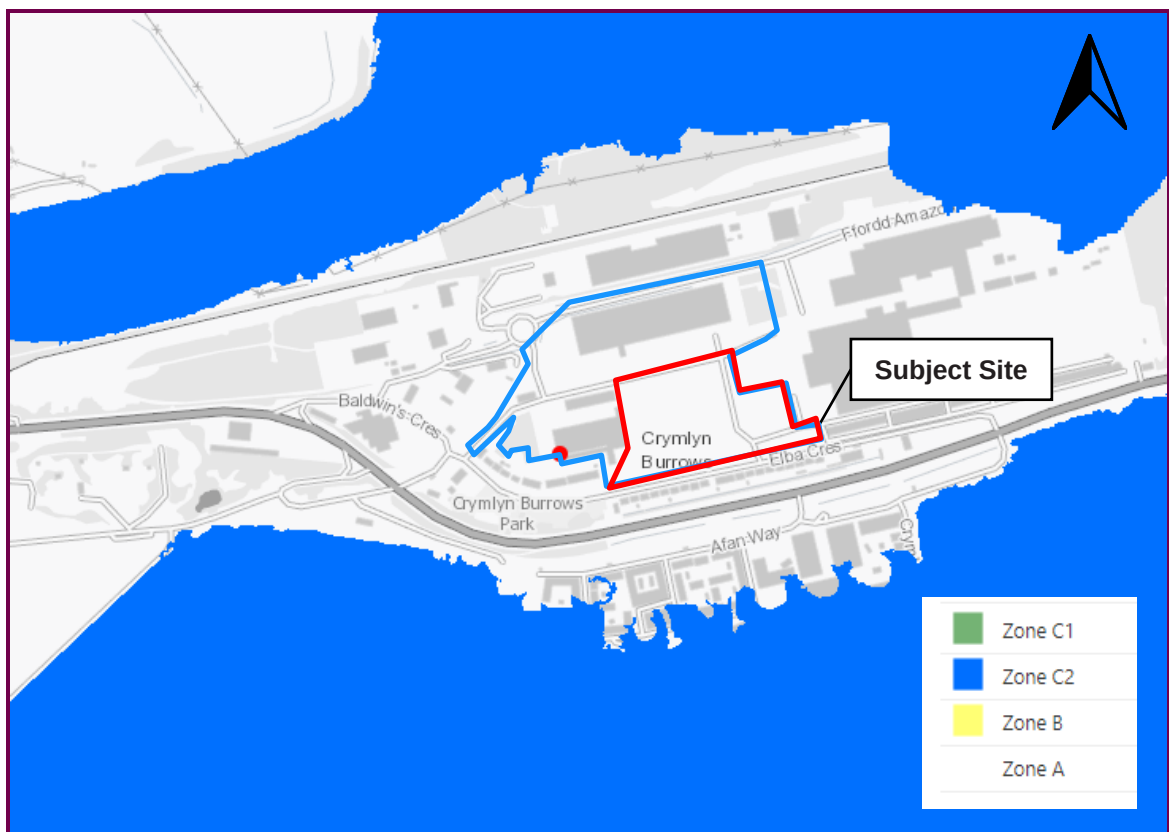
6 HYDROLOGICAL SETTING

Nearby Watercourses

- 6.1 OS Mapping indicates that the nearest surface water feature is a drain feature that is present approximately 150 m from the site's northern boundary, between the Kings Dock Building and Ffordd Amazon. The drain appears to connect to a wider network from the roundabout north west of the site towards a balancing pond approximately 750 m north east.
- 6.2 The closest main watercourse is the disused Tennant Canal, approximately 390 m north of the site, flowing in a westerly direction. The Tennant Canal is designated as a Site of Importance for Nature Conservation (SINC 226) approximately 465 m south of the site is Swansea Bay.

Published Flood Zone

- 6.3 The Welsh Assembly Government produces Development Advice Maps (DAM) to accompany TAN 15. These maps show the degree of flood risk which is to be applied to the site for the planning process and thus establish the suitability of the site for development. These maps are based upon the Natural Resource Wales flood maps and similarly they can be modified through the presentation of data (i.e. hydraulic modelling) to illustrate that a site is within a different flood zone.
- 6.4 The Development Advice Map indicates that the site is located within Zone A. Zone A is described in TAN15 as those areas "considered to be at little or no risk of fluvial or coastal/tidal flooding".



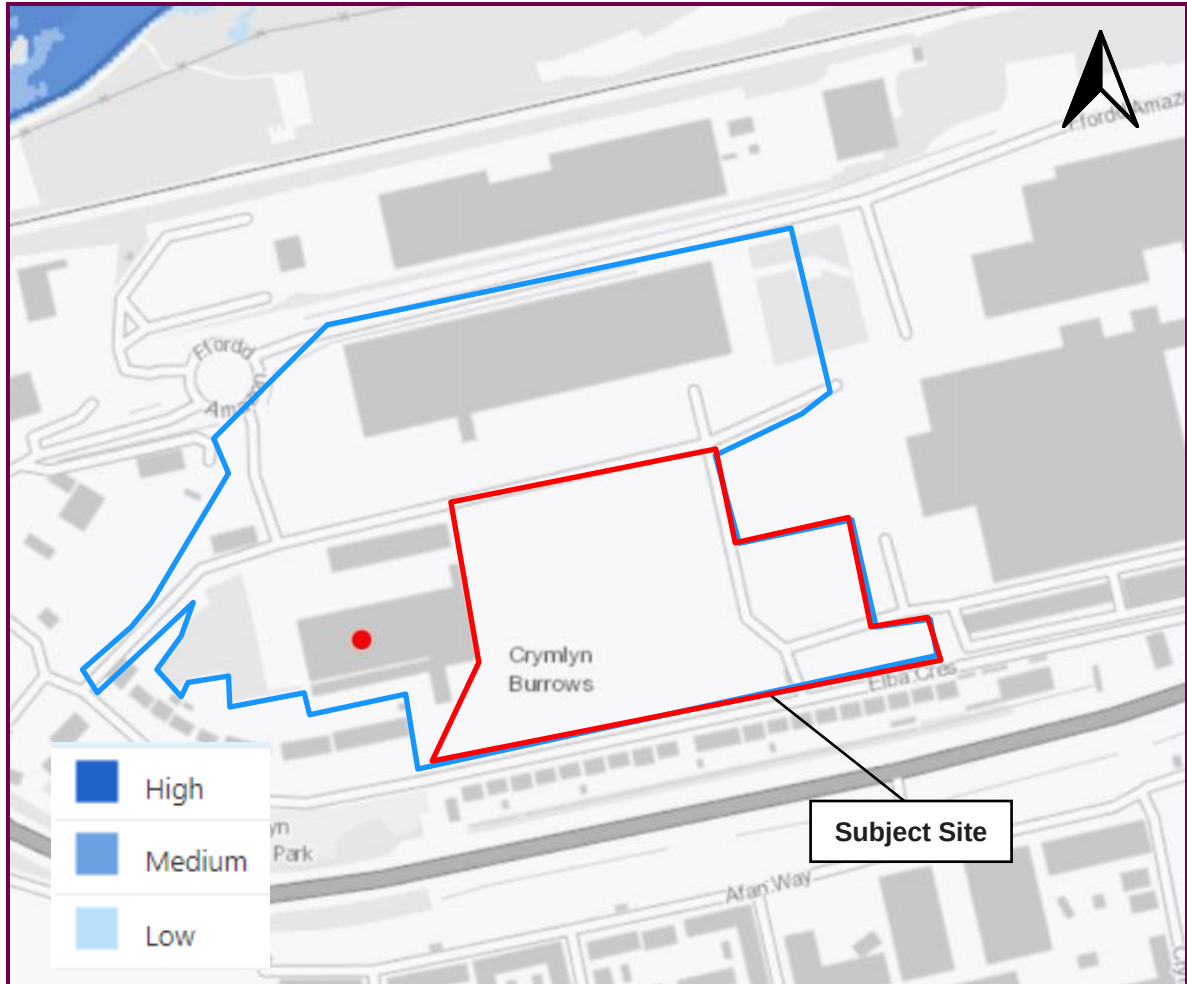
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Figure 2. NRW Development Advice Map

- 6.5 RPS notes that TAN 15 (published in 2004) and TAN 14 (published in 1998) are being replaced by a new TAN 15. The existing documents will both be cancelled, and the current TAN 15 Development Advice Map will be replaced by a new Flood Map for Planning, which is available in advance. These changes will not come into effect until 1st June 2023.

Fluvial and Tidal Flood Risk Classification

- 6.6 The NRW Flood Risk from River's map, in Figure 3, shows that the site is not at risk of fluvial flooding. These flood risk classifications are synonymous with EA Flood Zones and take into account the effect of any flood defences that may be in this area, indicating the site is classified as the equivalent as Flood Zone 1 whereby this area has an annual chance of flooding of less than 1 in 1000 (0.1%).



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Figure 3. NRW Flood Risk from Rivers Map

- 6.7 The current NRW Flood Risk from the Sea map, in Figure 4, shows that the site is not at risk of tidal/coastal flooding.

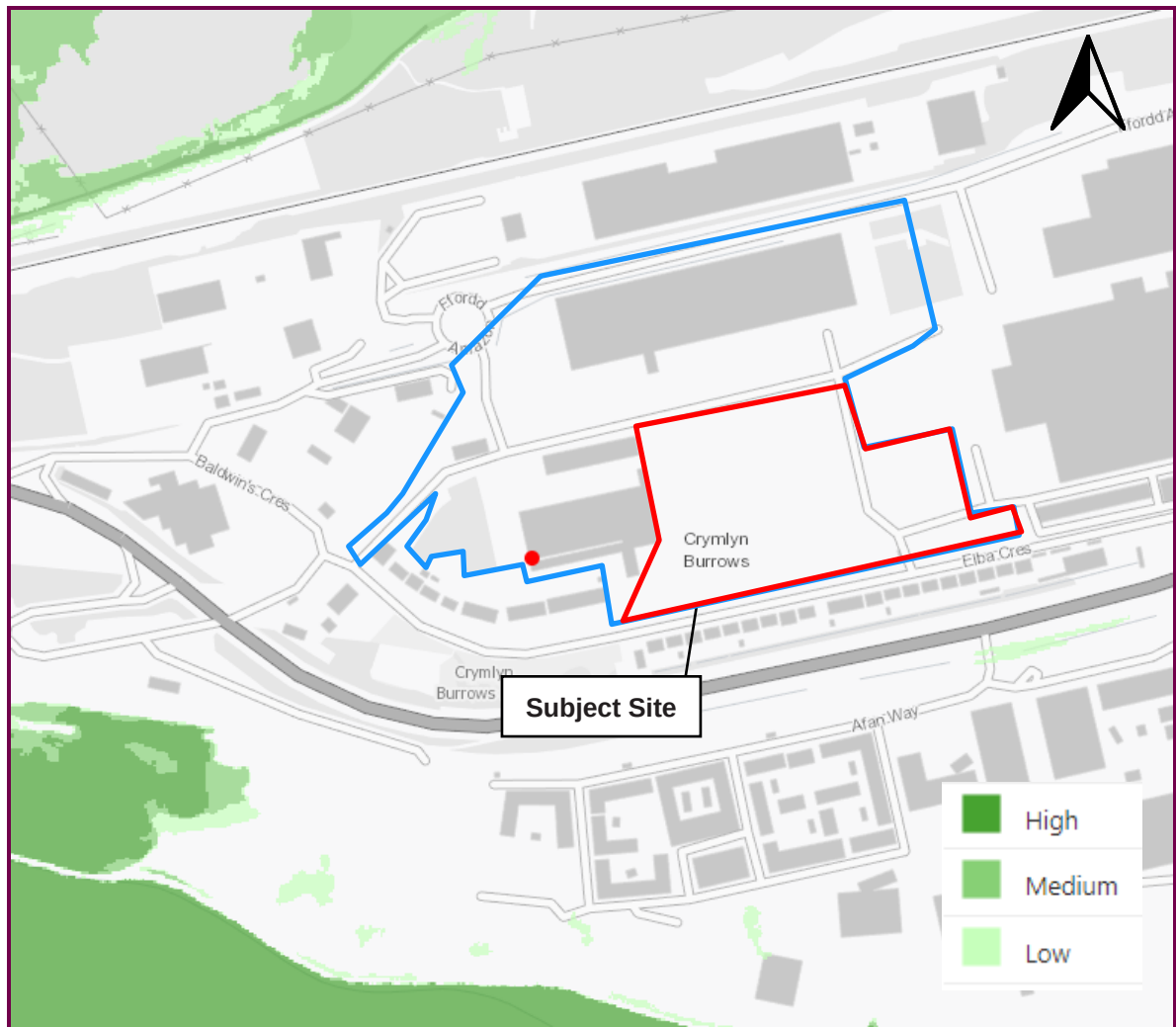


Figure 4. NRW Flood Risk from the Sea Map

6.8 The NRW were consulted for additional information relating to the fluvial/tidal flood risk to the site, however detailed flood modelling is unavailable for the site location. The full consultation response is provided in Appendix A. Key information of relevance to this assessment is summarised below:

- The site is located in the DAM's Zone A;
- The site is not located in an area benefitting from flood defences;
- There are no flood defences in the site vicinity;
- The site is outside the extent of recorded flood outlines.

6.9 NRW online surface water flood mapping provides surface water flood extents for the 1 in 30, 1 in 100 and 1 in 1,000-year return periods.

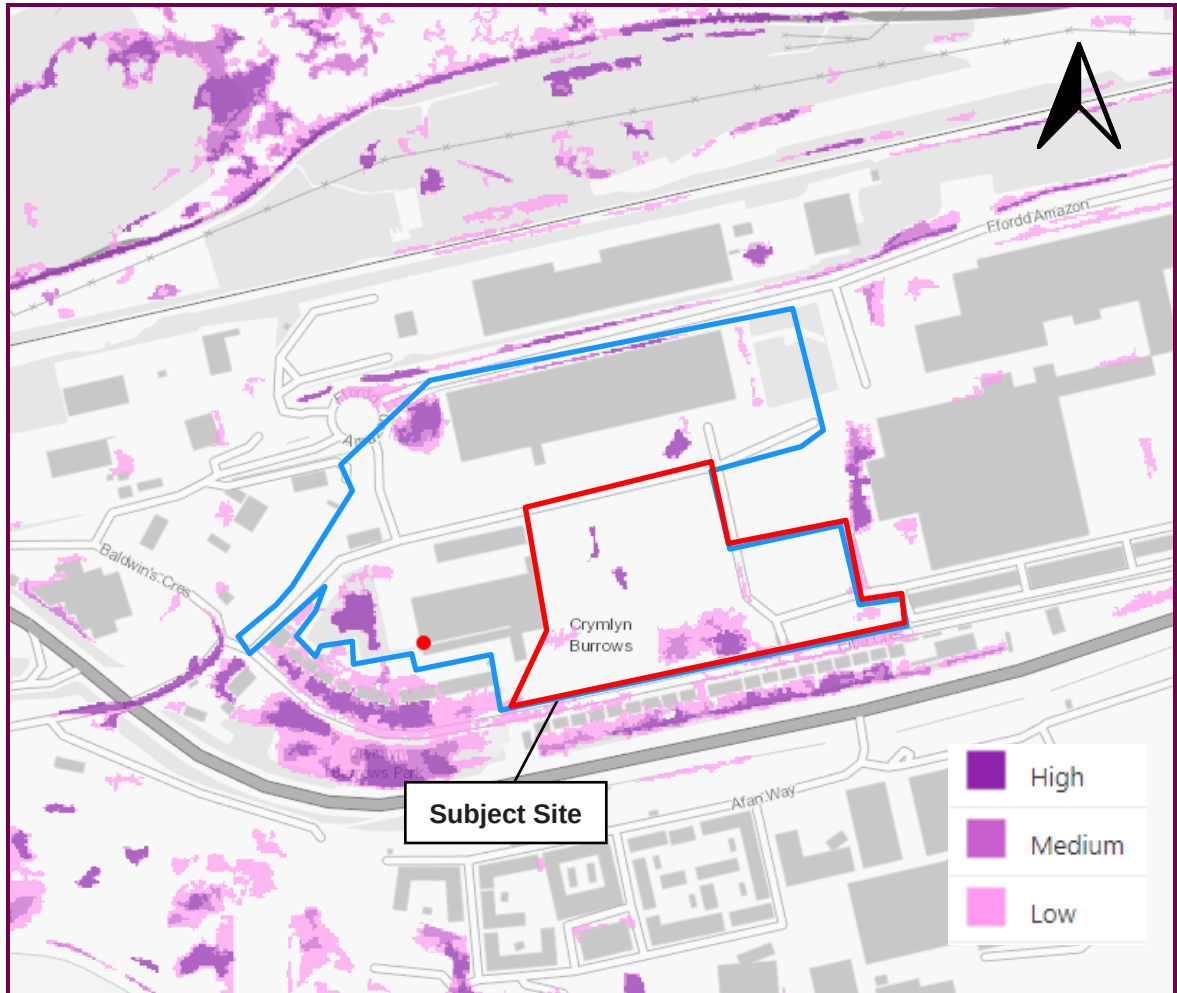
Flood Alert Areas

6.10 NRW define Flood Alert Areas as 'geographical areas where it is possible for flooding to occur from rivers or the sea'. The Flood Alert Area for Swansea Bay and the Gower coast exists approximately 450 m to the north and 400 m to the south of the site but does not encroach the site boundary.

Surface Water Flood Risk Classification

6.11 The surface water flood map indicates that the site is predominantly at negligible risk of surface water flooding corresponding with an annual probability of flooding that is less than 1 in 1,000 (0.1%).

There is a portion of land along the centre of the southern boundary that is identified as having 'high' risk, whereby the annual probability greater than 1 in 30 (3.3%), 'medium' risk, corresponding with an annual probability of between 1 in 100 (1%) and 1 in 30 (3.3%), and 'low' risk of surface water flooding, associated with an annual probability between 1 in 1,000 (0.1%) and 1 in 100 (1%). In addition, there are isolated areas of 'high' risk towards the north and an isolated area of 'low' risk in the west. The NRW Flood Risk from Surface Water Map is provided in Figure 5.



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Figure 5. NRW Surface Water Flood Risk Map

- 6.12 RPS notes that this modelling has several limitations, most significantly that it does not accurately represent the drainage capacity in urban areas.

Reservoir Flood Risk Classification

- 6.13 NRW mapping also indicates that the site is not located within an area potentially at risk from reservoir flooding.

Local Authority Flood Risk Assessment

- 6.14 The Neath Port Talbot SFCA was published in September 2014. It provides an overview of flood risk from various sources within the borough. Information relevant to this assessment is summarised below:

- The site is in Zone A;

- The site is outside the mapped historical flood extents;
- No flood defences appear to be present near the site vicinity;
- There are no recorded sewer flood history events in the vicinity of the site;
- The site appears to have mixed 'less' and 'intermediate' susceptibility to surface water flooding, correlating to max depths between 0.1 m – 0.3 m and 0.3 m – 1.0 m respectively.
- Neath and Swansea Canals divert water from the watercourses and are considered to reduce the risk of flooding by providing additional flood storage capacity;
- In the Lower Neath sub area, the main sources of flood risk identified are from tidal influences and overtopping of the Tennant Canal.

6.15 The Neath Port Talbot PFRA was published in March 2011. It provides an overview of flood risk from various sources within the borough. Information relevant to this assessment is summarised below:

- It states there are no specific areas of historical flooding related to groundwater flooding recorded in the borough;
- Overall, groundwater is not considered to be a major source of flooding.

7 HYDROGEOLOGICAL SETTING

- 7.1 British Geological Survey (BGS) online mapping (1:50,000 scale) indicates that the site is situated on Blown Sand deposits comprising sand. This is underlain by South Wales Middle Coal Measures Formation comprising mudstone, siltstone and sandstone.
- 7.2 No available BGS borehole data on site or in the site vicinity gave an indication of groundwater levels.
- 7.3 The soils are described as 'loamy and clayey floodplain soils with naturally high groundwater' by the National Soils Research Institute.
- 7.4 According to the BGS GeoIndex Aquifer Designation Mapping, both the bedrock and superficial deposits are classified as Secondary A Aquifers. These formations are formed of permeable layers capable of supporting water supplies at a local scale, in some cases forming an important source of base flow to rivers.
- 7.5 NRW online groundwater Source Protection Zone (SPZ) mapping indicates that the site is not located within a groundwater SPZ.

8 EXISTING DRAINAGE / WATER MAINS

- 8.1 Welsh Water plans of public sewers included as Appendix D indicate that the site is served by a 200 mm combined sewer (CS) which runs west to east along the southern boundary of the site. A foul sewer travels east to west approximately 70 south west of the site.
- 8.2 No information on cover or invert levels for chambers in the area are held by Welsh Water.
- 8.3 Water network plans provided by Welsh Water indicates that the site is served by 160 mm trunk water main which goes west to east immediately north of the site boundary. Additionally, there are 110 mm distribution mains to the south of the site.
- 8.4 Welsh Water have confirmed that there have been no incidences of hydraulic overload related to incapacity of the public sewers around the site.

9 FLOOD RISK AND MITIGATION

- 9.1 The key sources of flooding that could potentially impact the site are discussed below:

Fluvial / Tidal Flooding

- 9.2 As no NRW flood data is available at the site location, this assessment is based on the data from FRAW and published as part of Cycle 2 of the Flood Risk Regulations (2009).
- 9.3 Fluvial and tidal flooding refers to flooding from surface watercourses and their tributaries, estuaries and the sea. NRW mapping indicates the site is located in Zone A where land is considered to be at little or no risk of fluvial or coastal/tidal flooding. Additionally, the site is located in an area of 'very low' fluvial and tidal flood risk.
- 9.4 No flood defences are present in the site vicinity therefore risk of breach is reduced.
- 9.5 Additionally, the site is outside the historic flood extent.
- 9.6 PPW details the suitability of different land uses within each flood zone. The proposed residential land use is classified as 'highly vulnerable'. Such uses are generally considered appropriate within Zone A.
- 9.7 Overall, on the information stated above, the risk associated with fluvial and tidal sources can be considered to be low.

Flooding from Sewers

- 9.8 Sewer flooding can occur during periods of heavy rainfall when a sewer becomes blocked or is of inadequate capacity. The site is currently served by a combined sewer (detailed in Section 8).
- 9.9 The SFRA holds no records of sewer flooding at the site vicinity.
- 9.10 In the unlikely event of a sewer surcharging event, as the site exists on a southerly slope, runoff would likely flow south and away from the development.
- 9.11 Overall, risk associated with sewer flooding can be considered to be low.

Surface Water Flooding (Overland Flow)

- 9.12 This can occur during intense rainfall events, when water cannot soak into the ground or enter drainage systems.
- 9.13 SFRA mapping indicates the site appears to have mixed 'less' and 'intermediate' susceptibility to surface water flooding.
- 9.14 Satellite imagery mapping indicates there are surface water drains located along Elba Crescent to the south of the site. The drainage capacity of these features is not likely considered in the surface water flood mapping and they will likely drain water away in the south during rainfall events.
- 9.15 Overall, the risk associated with surface water flooding is considered to be low.
- 9.16 Surface water flooding from on-site sources is considered in Section 10 of this report.

Groundwater Flooding

- 9.17 This can occur in low-lying areas when groundwater levels rise above surface levels, or within underground structures. BGS mapping indicates that the site is situated on Blown Sand deposits and this is underlain by South Wales Middle Coal Measures Formation. Both are classified as Secondary A Aquifers.

- 9.18 The PFRA states that groundwater is not considered a major cause of flooding in Neath Port Talbot and no specific incidents have been recorded.
- 9.19 Overall, the risk from groundwater flooding is considered low.

Other Sources

- 9.20 There is a limited risk of flooding occurring as a result of a break in a water main. The locations of the water mains in the immediate vicinity of the site are described in Section 8. In the unlikely event of a mains burst, due to the topography of the site, runoff can be expected to flow south and away from the development.
- 9.21 The NRW map for the reservoir flood extent stated that the site is not located in an area susceptible to risk.
- 9.22 The risk of flooding associated with reservoirs, canals and other artificial structures is considered to be low given the absence of any such structures in the site vicinity.

Event Exceedance

- 9.23 The mitigation measures proposed as part of the development scheme are considered appropriate to help mitigate against event exceedance scenarios.

10 SURFACE WATER MANAGEMENT

Introduction

- 10.1 The proposed development comprises a residential development. Generally, this type of development is considered to have a design life of 100 years. Therefore, for the purposes of this assessment, taking into account the NRW's climate change allowances (published in February 2016), a 40 % increase in peak rainfall intensity has been included as climate change allowance, which caters up to the year 2115. No climate change guidance is available beyond 2115.

Existing Surface Water Runoff Rates

Equivalent Greenfield Runoff Rate

- 10.2 At this initial stage it has been estimated that the proposed development could result in approximately 60% to 70% of the site being covered with impermeable surfacing, comprising building footprint or external hardstanding. As such, initial drainage calculations have been undertaken on the basis of a proposed impermeable area.
- 10.3 The equivalent greenfield runoff rate for the proposed impermeable areas have been calculated using the Interim Code of Practice for Sustainable Drainage Systems (ICP SuDS) Method. The greenfield rates are presented in Table 1 below. A MicroDrainage Modelling Assessment calculating the attenuation required at the site and ICP SuDS calculations are included as Appendix E.

Table 1. Equivalent Greenfield Runoff Rates

	60% Impermeable Area	70% Impermeable Area
Return Period (years)	Runoff Rate (l/s)	Runoff Rate (l/s)
1 in 1	1.2	1.4
Q_{BAR}	1.4	1.6
1 in 30	2.4	2.8
1 in 100	3.0	3.4

Q_{BAR} = mean annual flood flow
l/s = litres per second

Brownfield Runoff Rate

- 10.4 The site is located on a former commercial site and is therefore can be considered brownfield land. The existing runoff rate (brownfield) has been estimated using the Wallingford Rational Method and is given in full as pre-development runoff rates included as Appendix F. The existing brownfield rates are summarised in Table 2 below.

Table 2. Brownfield Runoff Rates

Return Period (years)	Runoff Rate (l/s)
1 in 1	8.5
1 in 30	21.3
1 in 100	26.1

1 in 100 + CC*

36.5

*CC = Climate Change Allowance
l/s = litres per second

- 10.5 Pre and post development runoff rates for the site have been calculated using rainfall data from the Flood Estimation Handbook (FEH) and are included also in Appendix F.

Proposed Runoff Discharge Rates

- 10.6 Surface water runoff is proposed to be restricted to the Q_{BAR} greenfield runoff rate. In order to achieve this restriction, a Quick Storage Estimate (QSE) indicates that it could be necessary to provide between 173 m³ and 268 m³ attenuation for the 1 in 100 year plus 40% climate change event for a 60% impermeable development and 203 m³ and 315 m³ of attenuation for the 1 in 100 year plus 40% climate change for a 70% impermeable development.
- 10.7 Achieving a discharge rate of 1.4 l/s would provide a 96% betterment on the existing 1 in 100 year plus Climate Change event according to Tables 1 and 2.

Consideration of Drainage Hierarchy

- 10.8 The PPG advises of the following hierarchy for the disposal of surface water;
1. Infiltration;
 2. To a surface water body;
 3. To a surface water sewer, highway drain or another drainage system; or
 4. To a combined sewer.
- 10.9 The drainage hierarchy has been considered as follows:
- 10.10 The bedrock and superficial geology under the site are both classified as Secondary A Aquifers. Based on the underlying geology at the site infiltration could provide a viable means for the disposal of surface water. Soakaway testing in accordance with BRE 365 should be undertaken to investigate the feasibility of infiltration at the site and determine site-specific groundwater levels.
- 10.11 Should infiltration not prove viable, or should it not be suitable as the sole means of disposal of surface water, in line with the drainage hierarchy discharge should outfall the Tennant Canal which is present north of the site. However, due to the ecological conservation status, use of a pollution interceptor should be considered at design stage.
- 10.12 As there are no surface water sewers in the vicinity of the site, discharge into a surface water sewer has not been considered. However, a combined sewer is present south of the site along Fabian Way. The appropriate consents should be obtained from Welsh Water at the approval of conditions phase.

Consideration of Sustainable Drainage Systems

- 10.13 The potential for the use of Sustainable Drainage Systems (SuDS) to provide attenuation within the development has been considered as follows:

Infiltration SuDS Features

- 10.14 Given the reported geology conditions beneath the site, it is considered that soakaways or other infiltration-based SuDS techniques could provide a feasible method for the disposal of surface water runoff from the site. Consideration would need to be given to appropriate treatment of surface water in order not to adversely affect water quality in the underlying aquifer.

Rainwater Harvesting

- 10.15 The attenuation benefits provided through the use of rainwater harvesting are considered to be limited and would only be realised when the tanks were not full. The potential for the use of rainwater harvesting measures such as water butts will be considered at detailed design stage.

Green Roofs

- 10.16 Green roofs help to attenuate surface water flows at source receptors by absorbing water into the soil make up while also helping to evaporate water away through the planting. The amount of rainfall that can be stored within a green roof is dependent on antecedent soil moisture content, substrate depth, gradient of the roof and the specific storage provision determined during the design of the green roof.
- 10.17 Green roofs systems could be considered for the buildings but if a pitch roof is proposed then they are unlikely to be suitable. If appropriate, these techniques can provide wider sustainability benefits in addition to surface water attenuation.

Permeable / Porous Paving

- 10.18 Permeable paving can be an efficient means of managing surface water close to its source. The use of permeable paving is likely to be suitable on footpaths and in car parking areas. This will provide storage within the sub-base – which could be lined with an impermeable membrane - as well as water quality benefits through filtration.

Swales, Detention Basins and Ponds

- 10.19 The provision of open storage features would offer benefits in terms of water quality by slowing the flow and enabling filtration and settlement of particles. SuDS should not be located within the 1 in 100 year plus climate change flood extent as this area needs to remain functional during a fluvial flood event. The SuDS features should also be located in topographically low areas of the site (whilst remaining outside the flood risk areas).

Modular Underground Attenuation Tanks

- 10.20 Should no other methods prove viable, in line with the Drainage Hierarchy, geocellular attenuation crates should be pursued.

11 SUMMARY AND CONCLUSIONS

- 11.1 The aim of the FRA is to outline the potential for the site to be impacted by flooding, the potential impacts of the development on flooding both onsite and in the vicinity, and the proposed measures which can be incorporated into the development to mitigate the identified risks. The report has been produced in accordance with the guidance detailed in the NPPF. Reference has also been made to the CIRIA SuDS manual (C753), the SFRA and the SWMP and following consultation with the EA's Partnership and Strategic Overview Team.
- 11.2 The potential flood risks to the site, and the measures proposed to mitigate the identified risks, are summarised in Table 3.

Table 3. Proposed mitigation

Source of Flooding	Identified Risk			Comments
	L	M	H	
Fluvial	✓			The site is located in Zone A whereby there is 'little or no ' risk
Tidal	✓			NRW maps indicate site not at risk
Sewers	✓			No public sewers located on the site
Surface Water	✓			Areas of 'low' 'medium' and 'high' risk of surface water
Groundwater	✓			Not considered a huge risk in Neath Talbot
Other Sources (e.g. reservoirs, water mains)	✓			Site is outside the maximum reservoir flood extent

- 11.3 Overall, on the basis of information reviewed by RPS, the subject site is not considered to be at a significant risk of flooding from any of the sources assessed. Development at this location would be considered to be safe from a flood risk perspective and, following the incorporation of an appropriate drainage strategy, would not result in an increase in flood risk off-site.

APPENDICES

Appendix A

NRW Flood Data Consultation

From: [Data Distribution](#)
To: [Lauren Sims](#)
Subject: FW: ATI-22358a - Flood Risk Data Request: SA1 8QE
Date: 28 October 2021 10:37:49
Attachments: [image006.jpg](#)
[image007.png](#)
[image008.jpg](#)

CAUTION: This email originated from outside of RPS.

Hi Lauren

Unfortunately, we don't have any detailed modelling data available for this location. The Flood Map would be based on the FRAW national dataset.

Thanks,

Marc Campbell

Cymorth Technegol Cyswllt Cyfoeth / Customer Hub Technical Support
Cwsmer, Cyfathrebu a Masnach/ Customer, Communications and Commercial
Cyfoeth Naturiol Cymru/Natural Resources Wales

Ffôn/Tel: 0300 065 3000

E-bost/E-mail: marc.campbell@cyfoethnaturiolcymru.gov.uk / marc.campbell@naturalresourceswales.gov.uk

Gwefan/Website: <http://www.cyfoethnaturiolcymru.gov.uk/> / www.naturalresourceswales.gov.uk

Ein diben yw sicrhau bod adnoddau naturiol Cymru yn cael eu cynnal, eu gwella a'u defnyddio yn gynaliadwy, yn awr ac yn y dyfodol.

Our purpose is to ensure that the natural resources of Wales are sustainably maintained, enhanced and used, now and in the future.

Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi

Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay

From: Lauren Sims <Lauren.Sims@rpsgroup.com>

Sent: 15 October 2021 13:27

To: Access to Information Team <accesstoinformationteam@cyfoethnaturiolcymru.gov.uk>

Subject: Flood Risk Data Request: SA1 8QE

Good Afternoon,

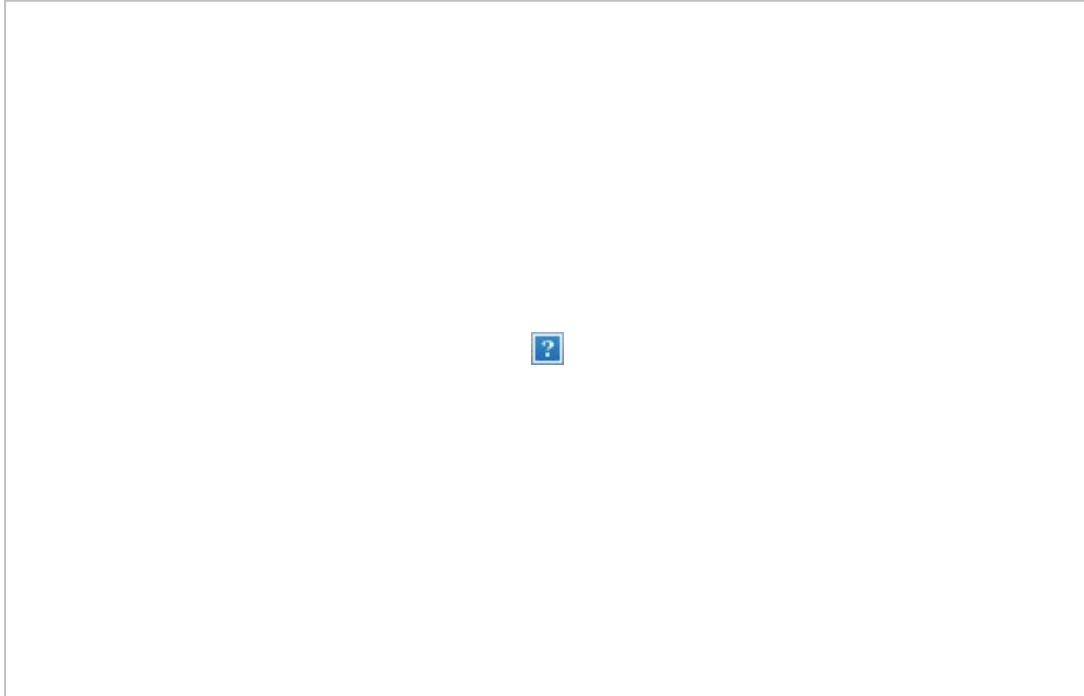
Could you please provide the following flood risk data (if available) for land at *Elba Business Park, Elba Crescent, Swansea, SA1 8QE*:

- Flood Map confirmation
- Modelled flow and flood levels
- Details of the existence of flood defences
- Details of the standard of protection afforded by flood defences

- Details of any historical flood events impacting the site
- Modelled breach flood extents and flood levels
- Breach hazard mapping (Product 8)

Site location plan is attached below for your reference.

Thank you and kind regards,
Lauren



Lauren Sims

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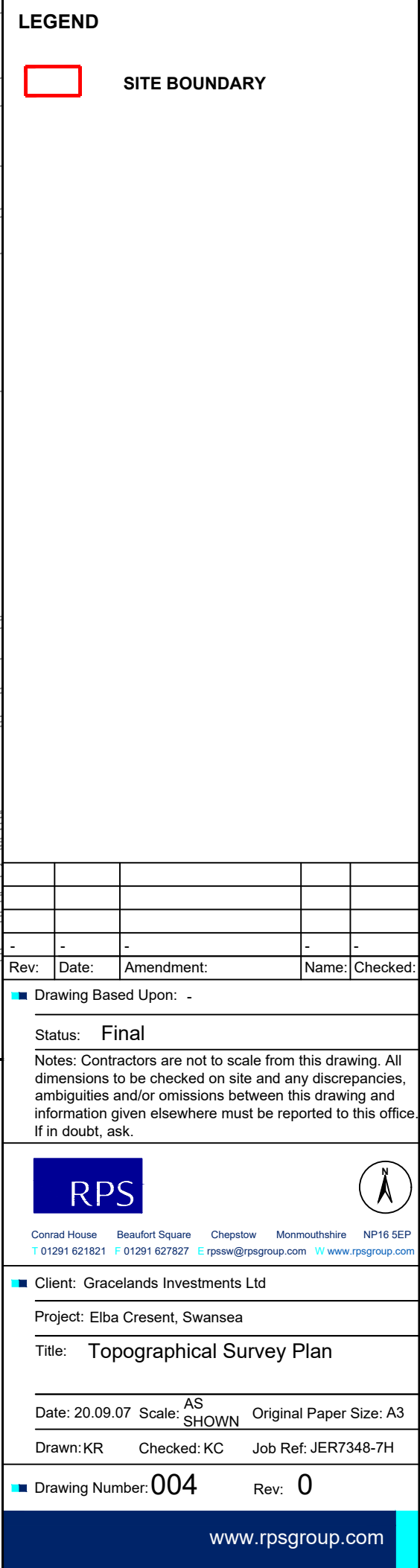
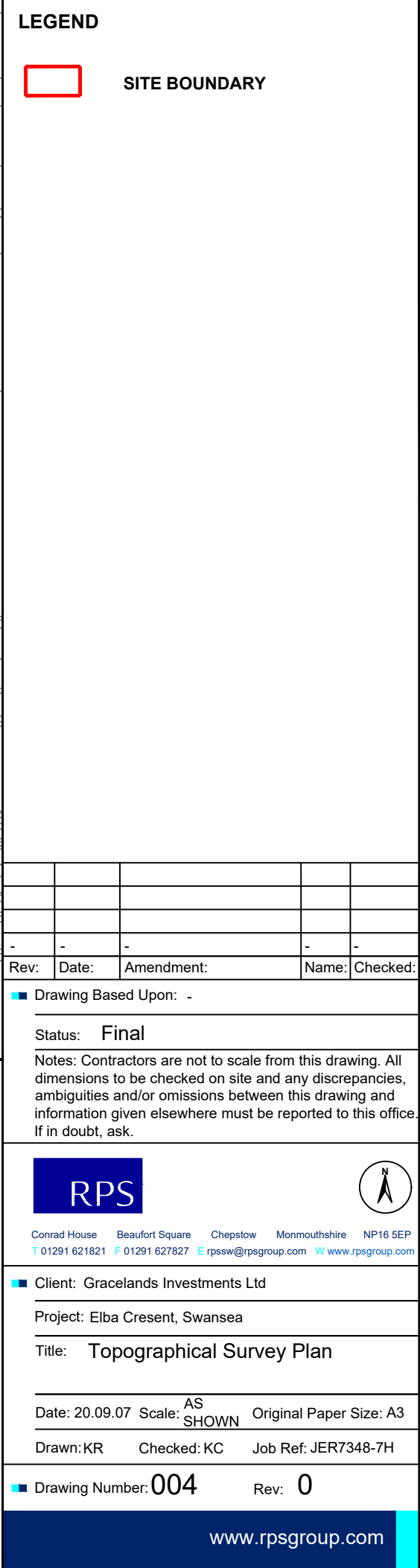
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Appendix B

Topographic Survey



Appendix C

Illustrative Masterplan