



# Flood Risk Assessment and Drainage Strategy

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21T2064 – New Access Road, South Bank Teesworks,  
Redcar

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# Flood Risk Assessment

Project: New Access Road, Southbank Teesworks

Client: STDC

BGP Job No: 21T2064

## Document Checking:

Prepared By: T Cutter

Checked By: J Conway

Issue	Date	Status	Checked for Issue
001	17/08/2021	Planning	JC

This document has been prepared solely as a Flood Risk Assessment Report STDC regarding the proposed development of New Access Road, Southbank Teesworks. Billingham George & Partners accepts no responsibility or liability for any use that is made of this document other than by the Client for which it was originally commissioned and prepared.

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## 1. Introduction

- 1.1. This Flood Risk Assessment has been prepared in accordance with the requirements of The National Planning Policy Framework (Ministry of Housing, Communities and Local Government – Feb 2019) [The Framework] and the Planning Practice Guidance to the National Planning Policy Framework Website (Launched 6<sup>th</sup> March 2014) [The Technical Guidance].
- 1.2. This Flood Risk Assessment has been prepared to supplement the planning application for the development of New Access Road, South Bank Teesworks.
- 1.3. The development will create the new access into the South Bank Teesworks development. See Appendix A for the site location.

## 2. Development Description and Location

### 2.1. Site Location:

- 2.1.1 Site Name: New Access Road
- 2.1.2 Site Address: South Bank Teesworks, Redcar
- 2.1.3 OS Grid Reference: 453869, 521612
- 2.1.4 National Grid Reference: NZ538216

### 2.2. Site Description:

- 2.2.1 Site Area: 2.99 Ha
- 2.2.2 Existing Land Use: Brownfield
- 2.2.3 Proposed Land Use: Industrial
- 2.2.4 Local Planning Authority: Redcar and Cleveland Council (RCC)
- 2.2.5 Sewer Undertaker: Northumbrian Water (NWL)
- 2.2.6 The site is located within the wider South Bank Teesworks Development.
- 2.2.7 The boundaries to the site consist of A Network Rail rail-line to the south, Smith's Dock Road to the west. The River Tees is located approximately 600m to the northwest.
- 2.2.8 The proposed development is provide the primary access into the Wider South Bank Teesworks development.

### 2.3. Flood Zone (Table 1 NPPF):

The development lies within Flood Zone 1. (see Appendix C for EA Maps).

### 2.4. NPPF Site Classification (Table 2 NPPF):

The vulnerability classification for 'Docks, marinas and wharves' is "Water-compatible development".

2.5. Flood Zone “Compatibility” (Table 3 NPPF):

	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone 1	Yes	Yes	Yes	Yes	<u>Yes</u>
Flood Zone 2	Yes	Exception test required	Yes	Yes	Yes
Flood Zone 3a	Exception test required	No	Exception test required	Yes	Yes
Flood Zone 3b	Exception test required	No	No	No	Yes

The proposal for the New Access Road to South Bank Teesworks is acceptable in terms of flood risk in accordance with Table 3 of the NPPF.

2.6. Sequential Test:

As the site is located within Flood Zone 1, the sequential test does not need to be applied.

### 3. Definition of the Flood Hazard

#### 3.1. Tidal Flood Risk:

3.1.1. The site is approximately 7km from the sea and located at an elevation of between 8-10m AOD. The T1000 tidal level is given as 5.28m, and the Environment Agency flood map shows the site is located entirely within Flood zone 1. The 1:200 year coastal and tidal flood level with an allowance for sea sea level rise equates to 5.03m AOD. It is therefore considered that the site will not be affected by flooding from the sea.

3.1.2. The risk of flooding from the sea is categorised as LOW.

#### 3.2. Fluvial Flood Risk:

3.2.1. The River Tees is located approximately 600m to the northwest of the proposed New Access Road location. The line of the former Holme Beck is located approximately 300m for the proposed road.



Figure 1 – Environment Agency Flood Map for Planning

3.2.2. The Environment Agency 'Flood Map for Planning' (Figure 1 and Appendix C) also shows that the proposed site is unaffected by the adjacent watercourses and is wholly within Flood Zone 1. Flood Zone 1 is land that is assessed as having less than a 1 in 1000 (0.1 percent) chance of flooding each year.

3.2.3. It is considered that the risk of flooding to the site from fluvial sources is categorised as LOW.

3.3. Overland Flood Risk:

- 3.3.1. Intensive rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems can run quickly off land and result in localised flooding.
- 3.3.2. The existing site area consists of Brownfield land where surface water will have previously discharged via a surface water drainage network into either the River Tees or the NWL sewer.



Extent of flooding from surface water

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

Figure 2 – Environment Agency Surface Water Flooding Map for Planning

- 3.3.3. The above extract shows small pockets of surface water flooding across the site. These are assumed to be associated with the existing topography.
- 3.3.4. The New Access Road will include a new surface water drainage network, and will be graded to avoid surface water ponding.
- 3.3.5. The above assessment is confirmed by the Environment Agency ‘Surface Water Flooding Map for Planning’ (Figure 2 above), which shows that the site is at ‘Very Low’ risk to surface water flooding.
- 3.3.6. Based on the above, the risk of flooding from overland sources is categorised as LOW.



### 3.4. Groundwater Flood Risk:

- 3.4.1. Groundwater flooding occurs when water levels in the ground rise above surface elevations. It is most likely to occur in low lying areas underlain by permeable rocks.
- 3.4.2. The bedrock mudstone is classified as a Secondary B Aquifer, defined by the EA as predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures.
- 3.4.3. The top of groundwater table lies within the made ground layer between 1.3-2.2mAOD (between 1-9mbgl) (Wood, 2020)
- 3.4.4. The risk of flooding from groundwater is therefore categorised as LOW.

### 3.5. Flooding from Sewers:

- 3.5.1. See Appendix D for locations of existing Northumbrian Water public drains. An 1800mm diameter Northumbrian Water adopted foul water sewer runs along the western boundary of the development. There are no records of sewer flooding within the site.
- 3.5.2. All proposed drainage would be designed in accordance with current best practices and follow the requirements of the Lead Local Flood Authority in order to obtain planning permission. As such, the proposed drainage system would need to be designed in order to prevent flooding to buildings for rainfall events up to and including the 1 in 100-year event with an additional 40% increase allowance for climate change. Therefore, the expected risk of flooding from proposed drainage would be low.
- 3.5.3. Based on the above analysis, it is considered that the risk of flooding from sewers is categorised as LOW.

### 3.6. Flooding from Artificial Sources:

- 3.6.1. Based on the Environment Agency map 'Flood Risk from Reservoirs' the site is not at risk from any artificial sources such as reservoirs.
- 3.6.2. The risk of flooding from artificial sources is categorised as LOW.

## 4. Probability of Flooding

- 4.1. The Environment Agency maps have been reviewed (see Appendix C). The entirety of the site is identified as being in Flood Zone 1 as categorised by the National Planning Policy Framework (NPPF) and Technical Guidance.
- 4.2. Flood Zone 1 describes the land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any one year.
- 4.3. The previous section describes other flood hazards and the risk they pose to this project. A summary table of the existing flood risk and the mitigation required is provided below.
- 4.4. Based on the previous section the overall assessment of the probability of flooding to the site is LOW.

Flood Risk Source	Current Risk Level	Mitigation Requirement during detailed design	Risk Level following Mitigation
Tidal and Fluvial Flooding	LOW	Development is located in Flood Zone 1. No mitigation required.	LOW
Overland Flow	LOW	The site is unaffected by overland. No mitigation required.	LOW
Groundwater	LOW	The proposed site is not at risk from groundwater. No mitigation required.	LOW
Sewer Flooding	LOW	The proposed site is not at risk from sewer flooding. No mitigation required.	LOW
Artificial Sources	LOW	The site is not at risk from any artificial sources according to the EA map 'Flood Risk from Reservoirs'.	LOW

## 5. Climate Change

- 5.1. The Government website provides information on the impacts of climate change, which include sea level changes, river flash flooding and more frequent high intensity, short-duration rainfall. These are based on the Environment Agency current recommendations.
- 5.2. As concluded previously the risk of flooding from the sea and rivers is low. The risk of flooding from land again is low; both are, therefore unlikely to be affected by climate change.

## 6. Detailed Development Proposals

- 6.1. The development is to construct a new access road to serve the South Bank Teesworks development.
- 6.2. It is proposed that all surface water run-off from the road will discharge via below ground drainage network into the new site drainage channel, that is being constructed as part of the wider South Bank development.
- 6.3. The new drainage channel has been sized to accept unrestricted surface water flows from the South Bank development, prior to discharge into the River Tees.
- 6.4. The system should be designed in order to prevent flooding to the proposed buildings or adjacent sites for rainfall events up to and including the 1 in 100-year rainfall event with an allowance of 40% for climate change.

## 7. Off Site Impacts

The proposals for this site should not increase the flood risk elsewhere off site for the following reasons: -

- The proposed surface water discharge rate will be equal to or less than existing.
- The impermeable areas within the site will be positively drained via a proposed drainage network.

## 8. Conclusions

- 9.1 From the above analysis it can be seen that the risk to the proposed New Access Road, South Bank Teesworks is LOW from all forms of flooding as categorised in the Framework and the Technical Guidance. This confirms the Flood Zone designation for the site.
- 9.2 The proposed uses of land are appropriate in this Flood Zone. (Tables 1, 2 & 3 of the Technical Guidance).
- 9.3 This report has been prepared with reference to the information available at the time of writing.



Appendix A  
Site Location Plan



First Issue	TC	P01	JC	17.08.2021
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AMENDMENT	BY	REV	CHK	DATE
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Rev P = Preliminary T = Tender C = Construction LCI = Last Construction Issue

In instances where this drawing completes or partly completes a contract, Billingham George & Partners will consider that it's product has been validated, unless in a period not exceeding 90 working days, the client advises to the contrary.

Client **STDC**

Title **Site Location Plan**

Drawn: **TC**

Date: **Aug 2021**

Original Size **A3**

Checked: **JC**

Date: **Aug 2021**

Scale: **1:10000**



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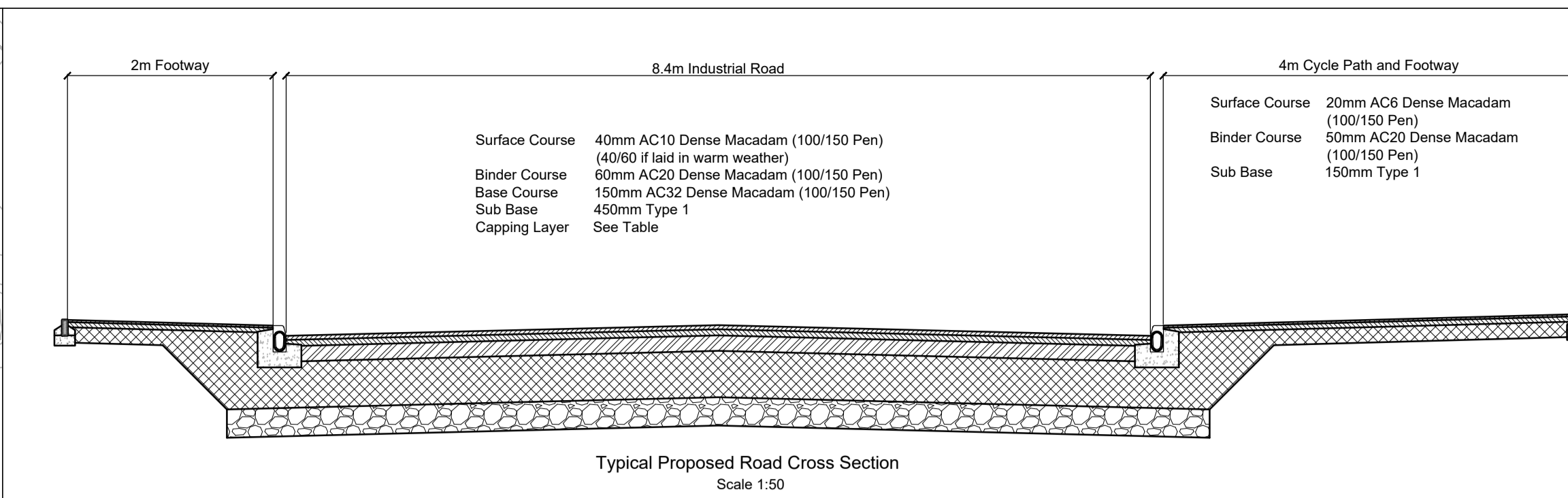
**DO NOT SCALE**

Drg. No. **LMWIN-BGP-XX-XX-DR-C-003** Rev. **P01**



## Appendix B

### Proposed Site Layout



**Notes:**

Road and footpath surfaces are to meet architects specification.

- All works and materials to be in accordance with;
  - Tees Valley current design standards
  - New Road and Streetworks Act. 1991
  - BGP Specifications
  - All applicable Building regulations
- All levels are in metres to Ordnance Datum (m AOD).
- The contractor is to check all dimensions and levels and report any discrepancies or omissions to the Engineer.
- This drawing is to be read only in conjunction with BGP specification and drawings.
- All concrete for foundation to kerb channels and edgings shall be Class Gen3 (BS 5328) unless shown otherwise.
- All kerbs and channels shall be hydraulically pressed and comply in all respects with BS 7263 Part 1.
- Kerbs and channels shall be laid true to line and level and shall not be backed until inspected and approved by the Engineer.
- For softscape areas refer to Architects specification & details.



Issued for Planning	TC	P04	JC	17.08.2021
Updated following comment	TC	P03	JC	29.07.2021
Updated following comment	TC	P02	JC	06.07.2021
Issued for Information	TC	P01	JC	24.06.2021
AMENDMENT	BY	REV	CHK	DATE

Rev P = Preliminary T = Tender C = Construction LCI = Last Construction Issue

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<b>Client</b>								
<b>Project</b>	Blade Factory						<b>Project No.</b>	21T2082
<b>Drawing Title</b>								
Highway proposals								
<b>Drawn</b>	<b>Date</b>	<b>Checked</b>	<b>Date</b>	<b>Size</b>	<b>Scale</b>	<b>Class.</b>	<b>Rev.</b>	
TC	June 21	JC	June 21	A1	1:2000		P04	
<b>Location</b>	<b>Originator</b>	<b>Volume</b>	<b>Level</b>	<b>Type</b>	<b>Role</b>	<b>Unique No.</b>		
LMWIN	BGP	XX	XX	DR	C	001		
<b>File Reference</b>								
LMWIN-BGP-XX-XX-DR-C-001								



## Appendix C

### EA Flood Map



# Flood map for planning

Your reference  
**Teesworks SB**

Location (easting/northing)  
**453682/521554**

Created  
**12 Aug 2021 14:55**

**Your selected location is in flood zone 1, an area with a low probability of flooding.**

## **This means:**

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

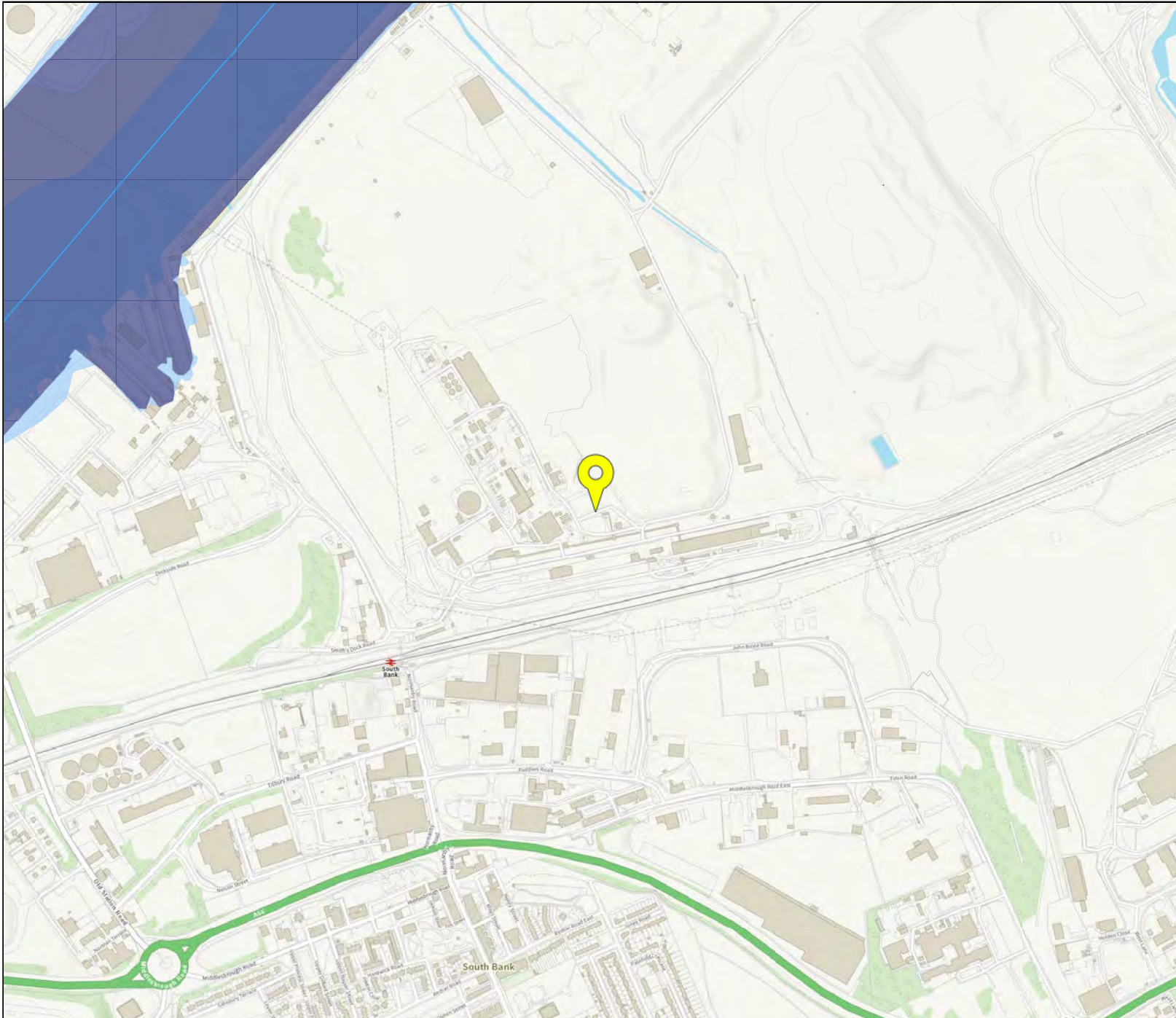
## **Notes**

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2021 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>





### Flood map for planning

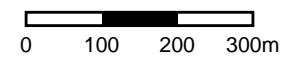
Your reference  
**Teesworks SB**

Location (easting/northing)  
**453682/521554**

Scale  
**1:10000**

Created  
**12 Aug 2021 14:55**

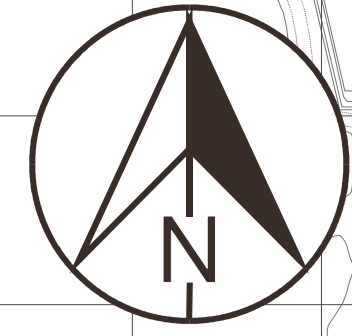
-  Selected point
-  Flood zone 3
-  Flood zone 3: areas benefiting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Flood storage area





## Appendix D

### Northumbrian Water Sewer Records



Waste Water -		NWL Responsibility		Private/Non NWL		Proposed		Water Network -		Network Types		AB Asbestos	
Combined	—	Combined	—	Combined	—	Combined	—	Distribution	—	AB Asbestos	XXXXXX	AB Asbestos	XXXXXX
Foul	- - - - -	Foul	- - - - -	Foul	- - - - -	Foul	- - - - -	Treated	—	Abandoned	XXXXXX	Abandoned	XXXXXX
Surface	- - - - -	Surface	- - - - -	Surface	- - - - -	Surface	- - - - -	Raw	—	Out of Comm	- - - - -	Out of Comm	- - - - -
Treated Eff	—	Treated Eff	—	Treated Eff	—	Treated Eff	—	Fire	—	Proposed	- - - - -	Proposed	- - - - -
Untreated Eff	—	Trade Eff	—	Trade Eff	—	Trade Eff	—	Supply	—				
Overflow	- - - - -	Watercourse	- - - - -	Watercourse	- - - - -	Watercourse	- - - - -	Private	- - - - -				

User : BOWMS  
Title :

Date : 12/04/2021 09:45:29  
Centre Point : 454212,522169

Map Sheet : NZ5422  
Paper / Scale : A0@1:4000



The material contained on this plot has been reproduced from an Ordnance Survey map with permission of the controller of H.M.S.O. Crown Copyright Reserved. Licence No.100022480. The information shown on this plan should be regarded as approximate and is intended for guidance only. No Liability of any kind whatsoever is accepted by Northumbrian Water, its servants or agents for any omission. The actual position of any water mains or sewers shown on the plan must be established by taking trial holes in all cases. In the case of water mains Northumbrian Water must be given two working days notice of their intention to excavate trial holes. With effect from 1 October 2011, private lateral drains and sewers automatically transferred to Northumbrian Water under a scheme made by the Secretary of State pursuant to section 105A Water Industry Act 1991. These former private drains and sewers together with existing private connections may not be shown but their presence should be anticipated. **WARNING**...Where indicated on the plan there could be abandoned asbestos cement materials or shards of pipe. If excavating in the vicinity of these abandoned asbestos cement materials, the appropriate Health & Safety precautions should be taken. Northumbrian Water accepts no liability in respect of claims, costs, losses or other liabilities which arise as the result of the presence of the pipes or any failure to take adequate precautions. Emergency Telephone Number: 0345 717 1100



## Appendix E

### Reference Documents List

The National Planning Policy Framework (Feb 2019)	Ministry of Housing, Communities and Local Government
The Technical Guidance to the NPPF (Website)	Communities and Local Government
Flood Risk Assessment Guidance Note 1	Environment Agency