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& Geotechnical



EARTH ENVIRONMENTAL
& GEOTECHNICAL

Flood Risk Assessment

Mill House and Clarks Mill

Trowbridge

for

The Planning and Land
Partnership

October 2023



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Report Reference:	B2947/FRA
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Issue Date:	31 st October 2023
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1. Introduction

NSugg Ltd, on behalf of Earth Environmental and Geotechnical Ltd, has prepared a Flood Risk Assessment (FRA) Addendum to support the proposed conversion of Clarks Mill & Mill House, Stallard Street, Trowbridge to residential use.

The proposed development benefits from planning permission 17/00200/FUL granted April 2019 and 20/00186/var, granted June 2021 and the redevelopment of Clarks Mill is substantially completed. However, it is understood that the redevelopment is subject to a revised planning application (PL/2021/11045) which is currently being determined.

This FRA Addendum has been prepared to address Planning Condition 13:

No ground floor flat in Clarks Mill and none of the dwellings in Mill House shall be first occupied until full details (including elevation plans) of flood resilience measures and a flood emergency plan for both buildings have been submitted to and approved in writing by the Local Planning Authority.

The development shall be carried out in strict adherence to the approved details in perpetuity; including the prior installation of the agreed flood resilience measures prior to any occupation of the aforementioned residential units.

REASON: In the interests of flood prevention and the safety of future residents.

NOTE: The Council expects that the ground floor doors of each building will require flood barriers and this condition will require full details (and elevations) of said barriers. It is also fully expected that the discharge of condition application will detail that the frames of each flood barrier will be installed prior to the occupation of the ground floor doors of flats in Clarks Mill and the dwellings in Mill House. The barriers themselves will only be installed/put in place in flood events which is to be set out in the flood emergency plans.

An FRA was prepared by M. Frank Tyhurst, Flood Risk Consultant, in December 2016 to support the original planning application and an update to the 2016 FRA was submitted in September 2022. However, Wiltshire Council Drainage has confirmed that the updated FRA remains insufficient to discharge Planning Condition 13

This FRA Addendum should be read in conjunction with the 2016 FRA and 2022 FRA Update previously submitted; however, this report presents a detailed assessment of fluvial flood risk to the development from the River Biss and any mitigation measures deemed necessary or feasible to manage the risk of flooding to the development are identified.

The report has been prepared in accordance with the national guidance and requirements set out in the National Planning Policy Framework 2023 (NPPF), the National Planning Practice Guidance (NPPG) for flood risk and the Environment Agency's flood risk standing advice for vulnerable development.

2. Site Setting and Description

2.1. Site Location and Land Use

The development site comprises Clarks Mill and Mill House, Stallard Street, Trowbridge, Wiltshire, BA14 8GD, as shown on the site location plan included as Appendix A.

The development site is located within a mixed-use residential, retail and commercial area, within Trowbridge town centre. The site is bound to the east by the River Biss, to the north and west by Stallard Street and residential/retail properties and to the south by a car park, as indicated on the site location plan.

2.2. Permitted Development

Clarks Mill and Mill House were previously in commercial use, including offices and education, and the permitted development comprises their conversion to provide 18 residential apartments within Clarks Mill and redevelopment of Mill House to provide 5 houses. The conversion of Clarks Mill is largely completed, as indicated in the background of Figure 1.



Figure 1 – Development Site (view from Stallard Street, extracted from Google Streetview, image captured May 2023).

It is understood that Mill House will be redeveloped to provide 5 dwellings; work is yet to commence on this development.

NPPF Annex 3 confirms that residential dwellings are classified as ‘more vulnerable’ in flood risk terms. This is discussed further within Section 5.3 of the report.

2.3. Topography

Review of Ordnance Survey mapping indicates that the local topography falls gently to the north-east, towards the River Biss, with external ground levels falling from 36mAOD to 31mAOD across the development site.

A topographic site survey was undertaken in September 2023; a copy of the survey is included as Appendix B. The survey confirms that external site levels fall from 37.1mAOD on the south-west boundary to approximately 34.0mAOD in the centre of the site, between the buildings. Ground levels are shown to rise slightly away from this central low point in all directions, to approximately 34.6mAOD at the site entrance off Stallard Street and to an elevation of 34.5mAOD – 35.3mAOD adjacent to the River Biss.

The survey confirms the presence of a stone wall (height 0.9m) surrounding the site along the northern and north-western boundaries, in the vicinity of the River Biss, although it is noted that the wall is incomplete and would not therefore represent a potential flood defence structure.

The ground floor finished floor level (FFL) of Clarks Mill has been confirmed by the client as 34.90mAOD. The re-development of Mill House has not yet commenced, and this FRA Addendum will inform the finished floor level for Mill House.

2.4. Local Hydrology

The development site is located within the surface water catchment of the River Biss, a main river, which flows in a north-westerly direction through Trowbridge, passing immediately east of the site. The River Biss discharges into the River Avon near Hilperton, approximately 1.8km north-north-west of the site. Lambrok Stream discharges into the River Biss approximately 700m west of the site and a potential bypass channel is indicated on the opposite bank 400m downstream of the site. The Environment Agency Product 4 data (Appendix C) confirms this feature represents an overflow channel. There are no other surface water features in the vicinity of the site.

Figure 2 presents the local hydrological setting.

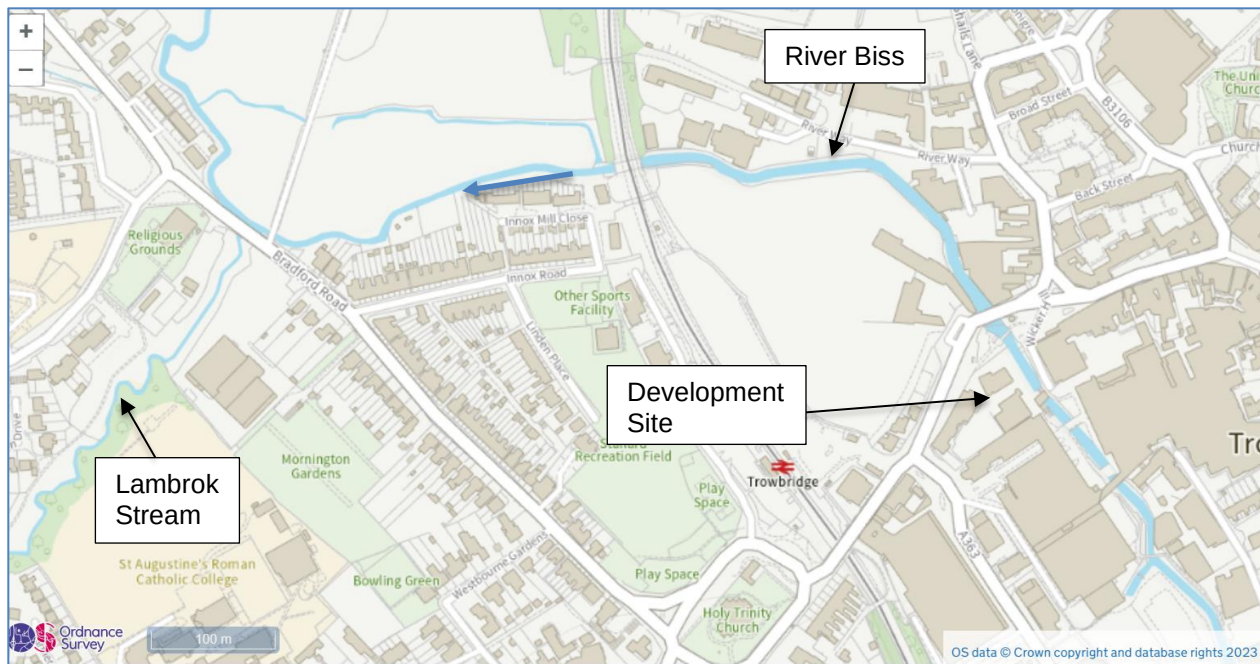


Figure 2 – Hydrological Site Setting

3. National Flood Risk Policy and Guidance

3.1. National Planning Policy Framework (NPPF) and National Planning Practice Guidance (NPPG)

NPPF (last updated: September 2023) sets out the Government's national policy on development and flood risk and seeks to provide clarity on what is required at regional and local levels, to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest risk.

NPPF Paragraphs 153 to 154 provide guidance for developments for the plans to take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk.

NPPF Paragraphs 159 to 169 provides guidance for planning and flood risk, where are plans should apply a sequential, risk-based approach to the location of development taking into account current and future impacts of climate change; to ensure that flood risk is not increased elsewhere due to the development; and to incorporate sustainable drainage systems.

NPPG, Paragraph 020, outlines that the objectives of this FRA Addendum are to establish whether a proposed development is likely to be affected by current or future flooding from any source, whether it will increase flood risk elsewhere, whether the measures proposed to deal with these effects and risks are appropriate, to establish the evidence for the local planning authority to apply (if necessary) the Sequential Test; and whether the development will be safe and pass the Exception Test, if applicable.

3.2. Environment Agency Flood Risk Standing Advice

The Environment Agency has prepared standing advice to be followed when completing flood risk assessments for vulnerable development (published April 2012; last updated February 2022).

The standing advice presents guidance on appropriate flood risk mitigation measures for vulnerable development and has been followed in the preparation of this report.

4. Fluvial Flood Risk

4.1. Introduction

This section of the report reviews published mapping and site-specific data obtained from the Environment Agency (Product 4 data) to assess the risk of fluvial flooding from the River Biss to the development site.

4.2. Published Flood Maps

The Environment Agency flood zone map is presented as Figure 3 and indicates that the majority of the development site, including the footprint of the buildings, lies within Flood Zone 2 associated with the River Biss. Flood Zone 2 is defined as land with a medium probability of flooding from rivers (0.1% to 1.0% annual probability). The south-western part of the site lies within Flood Zone 1, which comprises land with a low probability of flooding from rivers (<0.1% annual probability).

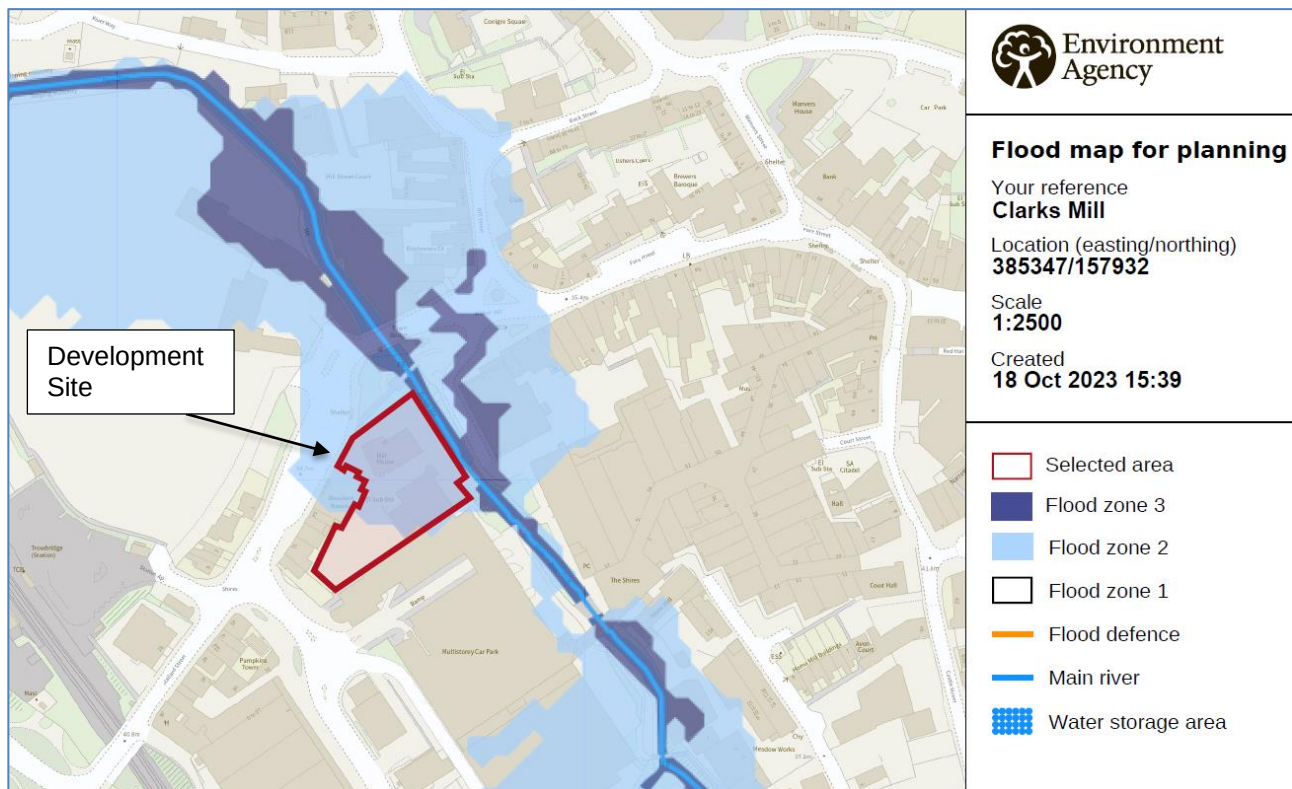


Figure 3 – Environment Agency Flood Zone Map

The Environment Agency's flood zone map does not take into account the presence of any local flood defences, but confirms there are no formal flood defences in the vicinity of the site.

Figure 4 presents the Environment Agency's flood map from rivers which takes into account any local flood defences. This indicates that the north-eastern part of the site, which includes the building footprints, is predominantly within an area with medium risk of flooding from the River Biss; this is defined as between 1.0% and 3.3% annual probability of flooding. The central area of the site is shown to have a low risk of flooding from the river (between 0.1% and 1.0% annual probability) and the south-western part of the site has a very low risk of flooding (<0.1% annual probability).



Figure 4 – Environment Agency River Flood Map

4.3. Environment Agency Product 4 Data and Design Flood Water Level

The Environment Agency has been consulted for site-specific flood water level data (Product 4 data) and their consultation response is included as Appendix C.

The Product 4 data includes predicted peak 2D floodplain water levels within the development site from the Bristol Avon – Trowbridge SOP 2013 model. The following peak flood water levels and flood water velocities are predicted within the development site, for a range of flood scenarios:

Flood Event	Predicted Peak Flood Water Level (mAOD)	Predicted Peak Flood Water Velocity (m/s)
1.0% Annual Probability	No flooding predicted	
1.0% Annual Probability + 20% climate change	34.81	0.37
0.1% Annual Probability	35.18	0.90

The data confirm that the site is not predicted to flood during the 1.0% annual probability flood event which defines high probability Flood Zone 3; therefore, the site does not extend into Flood Zone 3. However, flooding is predicted during the 1.0% annual probability + 20% climate change allowance flood event and during the extreme 0.1% annual probability event.

The design flood water level for the development is represented by the 1.0% annual probability flood event + climate change and Section 4.5 confirms that a 26% climate change allowance is appropriate for the development. This design flood event is not included within the modelled scenarios of the Bristol Avon – Trowbridge SOP 2013 model. The predicted peak flood water level for the 1.0% annual probability + 20% climate change event is 34.81mAOD.

Based on the available information, the design flood water level, equivalent to the peak water level during the 1.0% annual probability + 26% climate change event, is estimated as **35.0mAOD**.

The predicted peak flood water level during the extreme 0.1% annual probability flood event of 35.18mAOD will also

be considered within this report.

Review of the site topographic survey (Appendix B) confirms that the design flood water level of 35.0mAOD is equivalent to peak external flood water depths of approximately 0.4m at the site entrance off Stallard Street and up to 1.0m in the centre of the site. Ground levels in the south-west of the site are elevated above 35.18mAOD and therefore this area of the site is confirmed as Flood Zone 1 and would remain dry during the extreme 0.1% annual probability flood event.

The design flood water level is reviewed against the building finished floor levels in Section 6, where any requirement for further mitigation is identified.

A peak flood water velocity of between 0.37m/s and 0.90m/s would be anticipated during the design flood event, based on the available data.

The Environment Agency's R&D Technical Report FD2320/TR2 (Flood Risk Assessment Guidance for New Development) presents the following equation to relate the flood hazard to flood depth and velocity:

$$\text{Flood Hazard Rating (HR)} = ((v + 0.5) \times D) + DF$$

where: v = Flood velocity (m/s)

D = Flood depth (m)

DF = Debris factor (assumed 0.5 for flood water depths $\leq 0.25\text{m}$ and assumed 1.0 for flood water depths $> 0.25\text{m}$)

The above hazard rating equation has been applied to various combinations of flood depth and velocity to produce a matrix of hazard ratings to define the danger to people. Table 13.1 of FD2320/TR2 presents the flood hazard matrix, which is reproduced below as Figure 5.

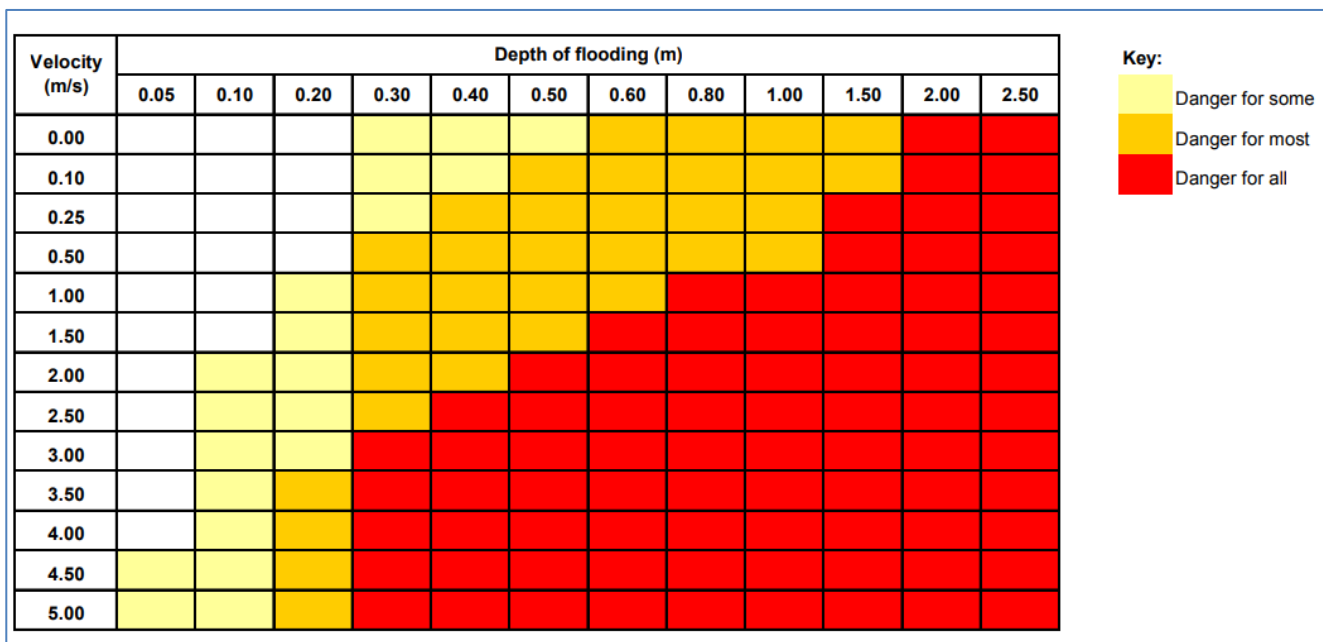


Figure 5 – Flood Danger to People Matrix

Assuming a peak flood water depth of 0.4m and flood water velocity of between 0.37m/s and 0.90m/s at the site entrance, Figure 5 indicates this would represent 'danger for most', with the site remaining accessible to emergency services, but no safe access/egress for the general public.

Appropriate flood risk mitigation measures are presented in Section 6.

4.4. Historic Flooding

Review of the Environment Agency's online historic flood map confirms that the development site has recorded flooding from the River Biss in the past as indicated on Figure 6, no further details are provided.



Figure 6 – EA Historic Flood Map

4.5. Environment Agency Climate Change Allowances

Environment Agency guidance on climate change allowances (February 2016, last updated May 2022) confirms that river levels are predicted to increase as a result of climate change, and this must be considered within development proposals. The development site lies within the Avon Bristol and North Somerset Streams Management Catchment, where peak river flows are predicted to increase between 26% (central allowance) and 71% (upper end allowance) by the '2080s'.

The EA climate change allowances guidance confirms that the central allowance (26%) is appropriate for 'more vulnerable' development within Flood Zone 2. Appropriate allowance for climate change has been considered in determining the design flood water level for the site (Section 4.3).

5. Flood Risk and Vulnerability

The NPPG Paragraphs 077 to 079 sets out the flood risk for a site by assessing the flood zones, flood risk vulnerability classification, and flood risk vulnerability and flood zone 'incompatibility'.

5.1. Flood Zones

There are four classifications for flood zones, as defined in Table 1 of the NPPG document.

Flood Zones	
Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water should flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

The development site lies within Flood Zone 2, defined as land with a medium probability of fluvial flooding.

5.2. Flood Risk Vulnerability Classification

Annex 3 of the NPPF states the flood risk vulnerability classifications as:

Flood Risk Vulnerability Classification
Essential Infrastructure Essential transport infrastructure (including mass evacuation routes) which should cross the area at risk; Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood; Wind turbines.
Highly Vulnerable Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding; Emergency dispersal points; Basement dwellings; Caravans, mobile homes and park homes intended for permanent residential use; Installations requiring hazardous substances consent.
More Vulnerable Hospitals; Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels; Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels; Non-residential uses for health services, nurseries and educational establishments; Landfill* and sites used for waste management facilities for hazardous waste; Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable Police, ambulance and fire stations which are not required to be operational during flooding; Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'More Vulnerable' class; and assembly and leisure; Land and buildings used for agriculture and forestry; Waste treatment (except landfill* and hazardous waste facilities); Minerals working and processing (except for sand and gravel working); Water treatment works which do not need to remain operational during times of flood.
Water-Compatible Development Flood control infrastructure; Water transmission infrastructure and pumping stations; Sewage transmission infrastructure and pumping stations; Sand and gravel working; Docks, marinas and wharves; Navigation facilities.

Residential dwellings are classified as 'More Vulnerable' development in flood risk terms.

5.3. Flood Risk Vulnerability and Flood Zone ‘incompatibility’

NPPG Paragraph 079 Table 2, gives guidance on flood risk vulnerability compared with flood zone, to determine the compatibility of the proposed development.

Flood Risk Vulnerability and Flood Zone ‘incompatibility’					
Flood Zones	Flood Risk Vulnerability Classification				
	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	† Exception Test required	✗	Exception Test required	✓	✓
Zone 3b*	* Exception Test required	✗	✗	✗	✓*

In accordance with Table 2 of the NPPG, more vulnerable development is acceptable within Flood Zone 2. However, the risk of fluvial flooding from the River Biss is acknowledged, and appropriate flood risk mitigation measures are detailed in Section 6.

6. Flood Risk Mitigation

6.1. Flood Risk Mitigation

The following fluvial flood risk mitigation measures are based on the Environment Agency's Flood Risk Standing Advice for vulnerable developments (last updated: February 2022). The standing advice has been followed with regards:

- Analysis of the finished floor level and any requirement for extra flood resistance and resilience measures; and
- Safe and access and egress from the development,

6.2.1 Finished Floor Level and Flood Resistant Design

This FRA Addendum infers a design flood water level for the development site of 35.0mAOD and an extreme flood water level for the 0.1% annual probability flood event of 35.18mAOD. The Environment Agency's standing advice states that finished floor levels should be a minimum of whichever is higher of 300mm above the:

- average ground level of the site
- adjacent road level to the building
- design flood water level

Mill House

A minimum FFL for the proposed Mill House development of **35.3mAOD** is recommended; this is 300mm above the design flood water level and also elevated above the extreme, 0.1% annual probability peak flood water level for the site.

Low permeability construction materials should be used up to the finished floor level. No further flood resistant design measures are considered necessary.

Clarks Mill

The as-built, ground floor finished floor level (FFL) of Clarks Mill has been confirmed by the client as 34.90mAOD. This is 100mm below the design flood water level of 35.0mAOD and 280mm below the extreme, 0.1% annual probability flood water level of 35.18mAOD. Therefore, it is recommended that flood resistant design measures be introduced to exclude flood water from the development to at least 300mm above the design flood water level (i.e. to an elevation of 35.3mAOD). The following measures are recommended:

- Removable Floodgates should be provided for all external doorways (<https://floodgate.ltd.uk>), as indicated on Figure 7. Each Floodgate is 680mm high, thus providing protection to approximately 35.58mAOD, significantly above the required design elevation of 35.3mAOD. The Floodgate comprises a boxed steel frame covered by a rubberised cover. A jacking mechanism attached to the rear of the frame allows the frame and cover to expand telescopically widthways into the walled area (reveal) immediately in front of the door. Due to this expandable design, Floodgates do not normally need any permanent fittings to the property or pre-drilling of the door frame, making them suitable for listed buildings. If required, for wider openings, stanchions should be used to connect multiple Floodgates together to form a continuous flood protection barrier.

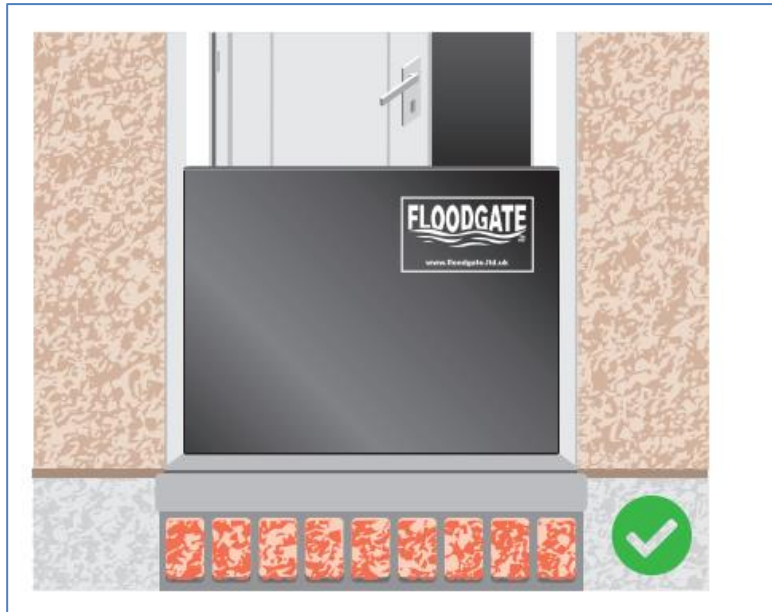


Figure 7 – Floodgate Design

- Any airbricks at an elevation below 35.3mAOD should be identified and fitted with a Ventguard (<https://floodgate.ltd.uk>). The Ventguard provides a cover that is screwed onto the wall surrounding the airbrick; when there is a risk of flooding, quick release bungs are manually inserted into the sides of the Ventguard to make it watertight.

Floodgates and Ventguards are designed and tested in accordance with BSI PAS1188:2014, Flood Protection Products. Further details regarding these products are included within Appendix D. Floodgates and Ventguards (if required) should be stored securely on site and installed in the event of a risk of flooding, as detailed within the site's Flood Warning & Evacuation Plan (discussed below and reported separately).

6.2.2 Safe Access & Egress

The application site lies within the Environment Agency's Flood Warning Area for the River Biss at Trowbridge.

Therefore, it is recommended that a Flood Warning & Evacuation Plan be provided to the owner/occupier of each dwelling and form part of the property deeds or rental contract/agreement, thus ensuring the continued awareness of future owner/occupiers. The Property Manager and each owner/occupier would sign up to the Environment Agency's free flood warning service and the Flood Warning & Evacuation Plan outlines the actions to be taken in the event of a flood alert or flood warning being issued. The Flood Warning & Evacuation Plan is reported separately.

7. Residual Risk

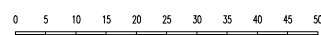
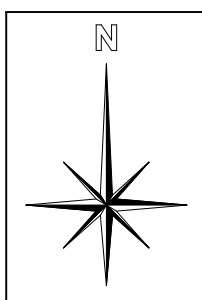
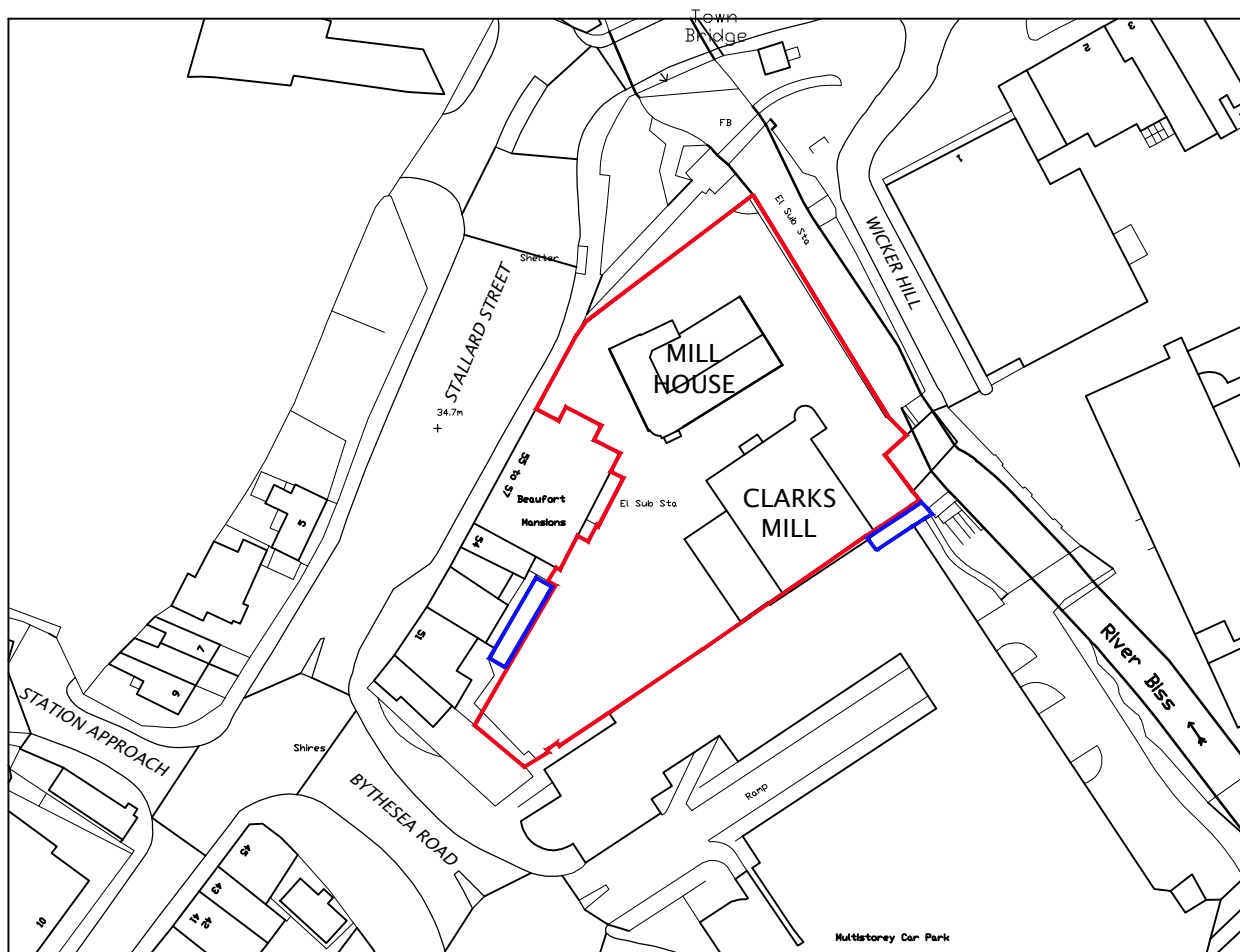
It is difficult to completely guard against flooding since extreme events greater than the design standard event are always possible, however, there are practicable ways to minimise the risk such as by allowing a freeboard (safety margin) and by using suitable construction and management techniques.

This flood risk assessment has been prepared in accordance with the NPPF, NPPG and Environment Agency Flood Risk Standing Advice.

Earth Environmental and Geotechnical Ltd do not warrant that the advice in this report will guarantee the availability of flood insurance either now or in the future.

It will be the owner's /occupier's responsibility to ensure the recommended flood risk mitigation measures outlined within this FRA Addendum are implemented and the surface water drainage infrastructure is appropriately maintained, to ensure that flood risk on and off site is managed effectively.

Appendix A - Site Location Plan



NOTES

- DO NOT scale from this drawing
- Use figured dimensions ONLY
- ALL dimensions in millimetres unless stated otherwise.
- The Contractor is to check drawings and to verify ALL dimensions on site.
ANY discrepancies to be notified to Greenward Associates immediately.
- This drawing and the depicted design are the copyright of Greenward Associates and may not be reproduced without written consent.



Drawing prepared with AutoCAD

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GREENWARD ASSOCIATES
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CLIENT Barook Developments Ltd.

PROPERTY Clarks Mill & Mill House,
Stallard Street, Trowbridge

Drawing Title
SITE LOCATION PLAN
CONVERSION

Scale 1:1250 @ A4

Drawn By
RJT

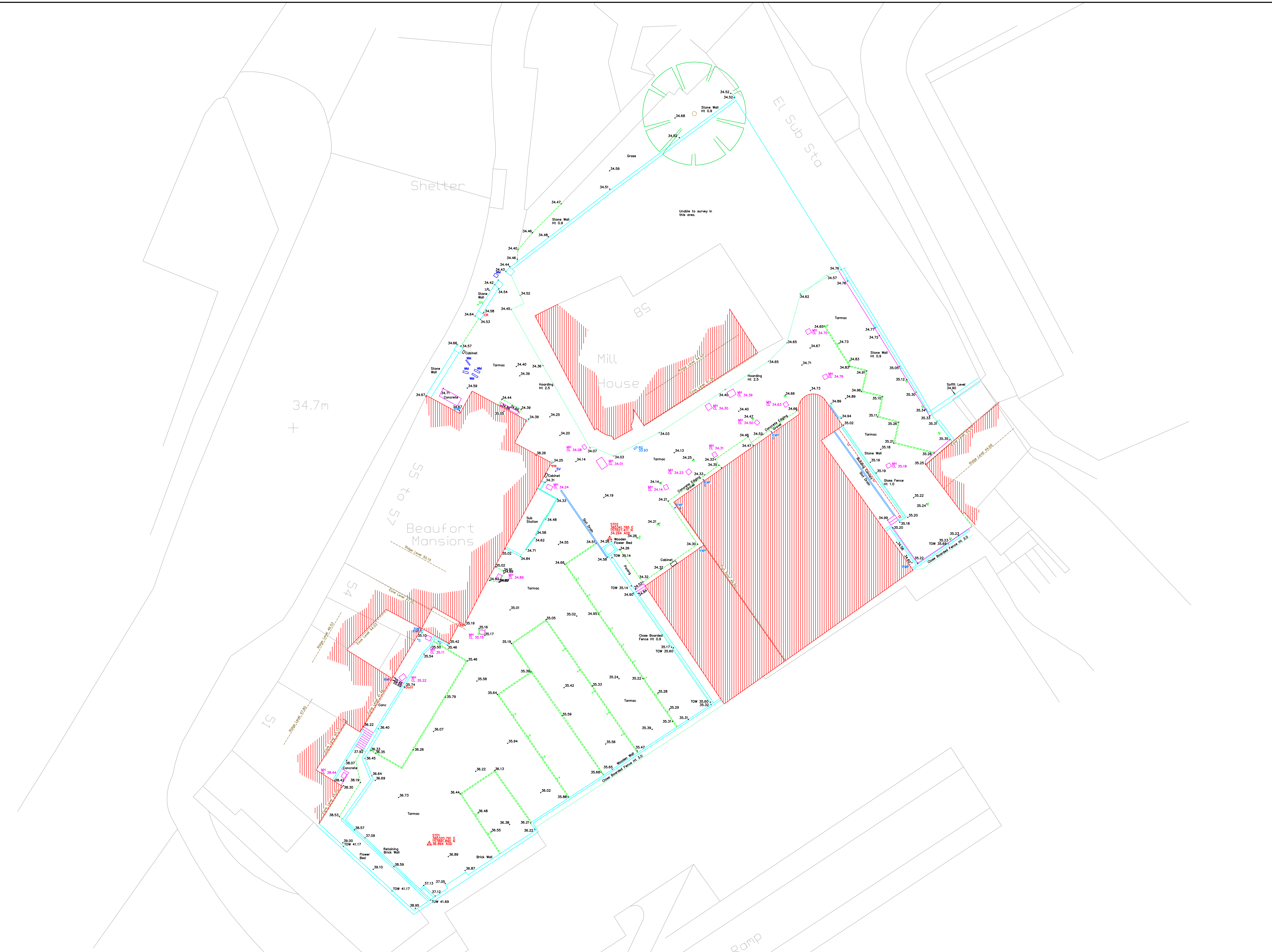
Date
Nov. 2021

Drawing Number

Revision

21-T5436/107

Appendix B - Topographic Site Survey



NOTES;

LAND SURVEY INFORMATION

GRID: LOCAL PLANE METRIC RELATED TO 0.5 NATIONAL GRID

STATION 3000200X

VERTICAL DATUM: 3000200M-AGD

HEIGHT ESTABLISHED VIA "VRS" & "LEICA SMARTNET"

COMMERCIAL RTK GPS CORRECTION SERVICE

LOCAL SCALE FACTOR: NOT APPLIED or LSF

Maptec Surveys Ltd is not liable for any topographical survey data that has not been undertaken by us. Any inaccuracies relating to topographical plans/development plans/Ordnance Survey data that we have no control over is the liability of the customer.

Any contours shown on drawing have been interpolated using survey levels and features.

These have been created using ground modelling software and are indicative only.

ABBREVIATIONS (Land & Utilities)

AR ASSUMED ROUTE

AV AIR VALVE

BD BACK DROP

BN BORNHOLE

BN LITTER/GRIT BIN

Bd BOLLARD

BTC BRITISH TELECOM COVER

CATV CABLE TV COVER

CB CONTROL BOX

CI CAST IRON

CL COVER LEVEL

Conc CONCRETE

CP CABLE PIT

CR CABLE RISER

CL CROWN LEVEL

d DEPTH

Dis DIAMETER

CON END OR RECORDS

EOT END OF TRACE

EP ELECTRICITY POLE

ER EARTH ROD

FR FIRE HYDRANT

FL FLOOR LEVEL

G GULLY

GPR TRACED BY RADAR

GV GAS VALVE

HV HIGH VOLTAGE

IC INSPECTION CHAMBER

I INVERT LEVEL

KO KERB OUTLET

LP LAMP POST

LV LOW VOLTAGE

MH MANHOLE

MkP MARKER POST

OSA OUTSIDE SURVEY AREA

OSBM O.S BENCH MARK

OH OVERHEAD

P POST

PE POLYETHYLENE

PF PITCH FIBER

PI PILE

PR PIPE RISER

PVC POLYVINYL CHLORIDE

RE RODDING EYE

RS ROAD SIGN

RWP RAIN WATER PIPE

SA SURVEY ABANDONED

SI SPUN IRON

SL SOFFIT LEVEL

SV STOP VALVE

SVP SOIL VENT PIPE

Tar TARMAC

TBM TEMPORARY BENCH MARK

TFR TAKEN FROM RECORDS

TH THRESHOLD LEVEL

TL TRAFFIC LIGHT

TP TELEGRAPH POLE

TFS TACTILE PAVING SLABS

TOW TOP OF WALL

UTGA UNABLE TO GAIN ACCESS

UTL UNABLE TO LIFT

UTR UNABLE TO ROD

UTS UNABLE TO SURVEY

UTTI UNABLE TO TRACE

VC VITREOUS CLAY

VP VENT PIPE

VR VAPOUR RECOVERY

WL WATER LEVEL

WM WATER METER

WO WASHOUT VALVE

WWP WASTE WATER PIPE

FENCE TYPES:

AMF ARMCO

BWF BARBED WIRE FENCE

CBF CLOSE BOARDED FENCE

OF CORRUGATED IRON FENCE

CLF CHAIN LINK FENCE

RRF IRON RAILING FENCE

WPR WOOD POST & RAIL

WFW WOOD POST & WIRE

WWF WIRE MESH FENCE

CLIENT

Earth Environmental

DWG No

23247_F

REV.

TITLE

Clarks Mill & Mill House Stallard Street Trowbridge BA14 8HH

SCALE

1:200

SHEET

1 of 1

DATE

13.09.23

SURVEY TYPE

TOPOGRAPHICAL ☒

DRAINAGE ☐

UTILITY ☐

MAPTEC SURVEYS

Specialists in Topographical and Underground Surveying.

Office:
Unit 5 Vantage Park
Goodwood Drive
Sparkford Somerset
BA22 7FQ
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Appendix C - Environment Agency Product 4 Data

Nicola Sugg
N Sugg
nicola@nsugg.co.uk

Our ref: 314617-WX
Your ref: Clarks Mill Site, Trowbridge
Date: 13th July 2023

Dear Nicola Sugg,

Thank you for your enquiry which was received on 19th June 2023. We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

Abstract

Name	Product 4
Description	Detailed Flood Risk Assessment Map for Clarks Mill Site, Stallard Street, Trowbridge, BA14 8HH NGR: ST8534857951
Licence	Open Government Licence
Information Warnings	<i>The mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply.</i>
Attribution	Contains Environment Agency information © Environment Agency and/or database rights. Contains Ordnance Survey data © Crown copyright 2023 Ordnance Survey 100024198.

Open Data

The following Environment Agency published datasets are now available on the weblink below as part of the Government's 'Open Data' project and are available for you to download free of charge.

Environment Agency published datasets: <https://data.gov.uk/data/search?publisher=environment-agency&unpublished=false>

You will need to search and select the name of the following datasets to take you directly to the weblink to enable you to download the data:

- Flood Map for Planning (Rivers and the Sea) – Flood Zones 2 and 3
- Flood Map for Planning (Rivers and Sea) – Areas Benefiting from Defences
- Flood Map for Planning (Rivers and Sea) Flood Storage Areas
- Flood Map for Planning – Spatial Flood Defences (without Standard attributes)
- Recorded Flood Outlines
- Historic Flood Map
- Risk of Flooding from Surface Water Extent for:
 - 3 percent annual chance
 - 1 percent annual chance
 - 0.5 percent annual chance

You can also access the Flood Map for Planning here: <https://flood-map-for-planning.service.gov.uk/>

You can also access the Risk of Flooding from Surface Water maps and Risk of Flooding from Reservoirs information here: <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>

If you have requested this information to help inform a development proposal, then you should also note the detail in the attached advisory text on the use of Environment Agency Information and Further Guidance for FRAs.

Recorded Historic Flood Events

We no longer produce pdf copies of the Historic Flood Map. This information is available to search select, and download free of charge as part of the Government's 'open data' as

- Recorded Flood Outlines
- the Historic Flood Map

These are GIS layers and can be downloaded from: <https://data.gov.uk/publisher/environment-agency>

Please note: we cannot guarantee that this is an exhaustive list of all past flood events in this location. All reasonable care has been taken to ensure that the historical flood event data is as accurate as possible. The Environment Agency will update it's records if new evidence emerges.

Flood Defences

Please find enclosed details of Flood Defences within the vicinity of the site boundary. This information has been taken from our Asset Information Management System database (AIMS).

Please note that flood defences can increase water levels elsewhere eg through channels being restricted by defences, or because defences prevent flood water flowing back into the river channel.

Flood Levels

1D 'In Channel' Model Node Data

The attached map contains a set of modelled fluvial flood level node locations/unique identifiers, for the main river, taken from our Bristol Avon - Trowbridge SOP 2013 model. A sheet is also attached providing the associated flood levels, NGRs and further information for the river channel relating to each of these nodes. Please note that the labels annotated to the Node Location Map are unique node identifiers and not the associated flood levels.

Please note: Modelled water levels and flows are in channel values only. There may be a variation in water levels and flows across the flood plain in the 2D domain.

2D Flood Plain Model Data

Please see the table below for maximum 2D depth, velocity and level information for your site for a range of return periods. Please note that the maximum flood depths include all low points within your site of interest, which include watercourses, ditches, rhynes and low ground spots.

Baseline

5% (1 in 20) AEP Fluvial Depth	0.00m
1% (1 in 100) AEP Fluvial Depth	0.00m
1% (1 in 100) AEP +20%CC Fluvial Depth	0.58m
1% (1 in 100) AEP +30%CC Fluvial Depth	Not Available
1% (1 in 100) AEP +40%CC Fluvial Depth	Not Available

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Rivers House, East Quay, Bridgwater, Somerset, TA6 4YS
Phone: 03708 506 506
Email: wessexenquiries@environment-agency.gov.uk
www.environment-agency.gov.uk

VAT No: 662 4901 34

0.1% (1 in 1000) AEP Fluvial Depth	0.93m
------------------------------------	-------

5% (1 in 20) AEP Fluvial velocity	0.00 mAOD
1% (1 in 100) AEP Fluvial velocity	0.00 mAOD
1% (1 in 100) AEP +20%CC Fluvial velocity	0.37 m/s
1% (1 in 100) AEP +30%CC Fluvial velocity	Not Available
1% (1 in 100) AEP +40%CC Fluvial velocity	Not Available
0.1% (1 in 1000) AEP Fluvial velocity	0.9 m/s

5% (1 in 20) AEP Fluvial Level	0.00 mAOD
1% (1 in 100) AEP Fluvial Level	0.00 mAOD
1% (1 in 100) AEP +20%CC Fluvial Level	34.81mAOD
1% (1 in 100) AEP +30%CC Fluvial Level	Not Available
1% (1 in 100) AEP +40%CC Fluvial Level	Not Available
0.1% (1 in 1000) AEP Fluvial Level	35.18mAOD

N.B. 0.00 (m, m/s or mAOD) indicates the data does not reach the site

N.B. Levels, velocity and depths have been extracted based upon the site boundary plan provided

N.B. Please note not all models contain climate change runs.

Planning

If you have questions regarding the planning nature of your enquiry, or require advice on floor levels, please contact our Sustainable Places team on SWX.SP@environment-agency.gov.uk. Please be aware that we now charge for planning advice when consulted on pre-application enquiries. This new approach provides advice to developers in two ways. Firstly, there is the provision of 'free' advice available to everyone where we give a preliminary opinion on a proposed development. This sets out the environmental constraints together with any issues this raises for us. Should you wish us to review in detail any of these issues then we can do this through a chargeable scheme aimed at recovering our costs.

[Pre-planning application enquiry form \(preliminary opinion\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/pre-planning-application-enquiry-form-preliminary-opinion)

If you have requested this information to help inform a development proposal, then you should note the information on GOV.UK on the use of Environment Agency Information for FRAs:

[Flood risk assessments if you're applying for planning permission - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/flood-risk-assessments-if-youre-applying-for-planning-permission)

If you intend undertaking a FRA for a planning application using climate change flood level information supplied in this letter, you should consider whether it is appropriate in light of a range of potential allowances for fluvial flood flow now advised in current planning guidance on 'Flood risk assessments: climate change allowances'. The relevant guidance is available at the following website address:

<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

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VAT No: 662 4901 34

Environmental Permit for Flood Risk Activities

In addition to any other permission(s) that you may have already obtained e.g. planning permission, you may need an environmental permit for flood risk activities (formerly known as Flood Defence Consent prior to 06 April 2016) if you want to do work:

- in, under, over or near a main river (including where the river is in a culvert)
- on or near a flood defence on a main river
- in the flood plain of a main river
- on or near a sea defence

For further information and to check whether a permit is required please visit: [Flood risk activities: environmental permits - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/flood-risk-activities-environmental-permits)

For any further advice, please contact your local Environment Agency Office, at Blandford.frap@environment-agency.gov.uk.

Strategic Flood Risk Assessment (SFRA)

Please contact Wiltshire Council for an update on their Strategic Flood Risk Assessment in your area.

Further Information

We advise that you also contact Wiltshire Council, to see if they have any further advice with respect to localised flooding and drainage issues.

Further details about the Environment Agency information supplied can be found on our website: [Flooding and extreme weather - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/flooding-and-extreme-weather)

We hope you find this information helpful and it is provided subject to the guidance below, which we strongly recommend you read.

Yours sincerely

Katy Barnes

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Email: wessexenquiries@environment-agency.gov.uk

Enc: Use of Environment Agency Information for Flood Risk Assessments (below)
314617-WX Node Location Map
314617-WX Node Data
314617-WX Defence map and data
314617-WX Flood Map for Planning (Rivers and the Sea)

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VAT No: 662 4901 34

Use of Environment Agency Information for Flood Risk Assessments (FRAs)

Important

Use of Environment Agency data: you should note that

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk Assessment (FRA) where one is required, but the use of Environment Agency information does not constitute such an assessment on its own.
2. As part of your data request, we have provided all of the modelled data we hold for your location. Please note that some of our modelled information may have been produced for purposes other than for flood zone generation. This may mean that some of the modelled data you have been provided with has a lower confidence level, and has not been used in producing our flood map, nor definitively reflects the predicted flood water level at the property/development site scale. To check the suitability of the use of this information in your FRA please contact your local Partnership & Strategic Overview (PSO) team.
3. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or surface water runoff. The information produced by the Local Planning Authority and the Lead Local Flood Authority (LLFA) may assist in assessing other sources of flood risk.
4. Where a planning application requires a FRA and this is not submitted or deficient, the Environment Agency may well raise an objection.
5. For more significant proposals in higher flood risk areas, we would be pleased to discuss details with you ahead of making any planning application, and you should also discuss the matter with your Local Planning Authority.

Pre-Planning Advice from the Environment Agency

If you have requested this information to help inform a development proposal, then we recommend that you undertake a formal pre-application enquiry using the form available from our website:

Pre-application Preliminary Opinion:

[Pre-planning application enquiry form \(preliminary opinion\) - GOV.UK \(www.gov.uk\)](#)

Pre-application Charged Service:

[Planning and marine licence advice: standard terms for our charges - GOV.UK \(www.gov.uk\)](#)

Depending on the enquiry we may also provide advice on other issues related to our responsibilities, including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

Flood Risk Assessment (FRA) Guidance

You should refer to the Planning Practice Guidance of the National Planning Policy Framework (NPPF) and the Environment Agency's Flood Risk Standing Advice for information about Flood Risk Assessment (FRA) for new development in the different Flood Zones. These documents can be accessed via:

National Planning Policy Framework Planning Practice Guidance:

[Planning practice guidance - GOV.UK \(www.gov.uk\)](#)

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Environment Agency advice on FRAs:

[Flood risk assessments if you're applying for planning permission - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/flood-risk-assessments-if-youre-applying-for-planning-permission)

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VAT No: **662 4901 34**



Scale: 1:5,000



Legend

Defences

- Barrier Beach
- Beach
- Bridge Abutment
- Cliff
- Demountable Defence
- Dunes
- Embankment
- Engineered High Ground
- Flood Gate
- Natural High Ground
- Promenade
- Quay
- Spillway
- Wall

Culverts

- Simple Culvert
- Complex Culvert

This data has been extracted from the Asset Information Management System (AIMS OM) which was created to draw various data sources into one database and has been populated with information of varying quality.

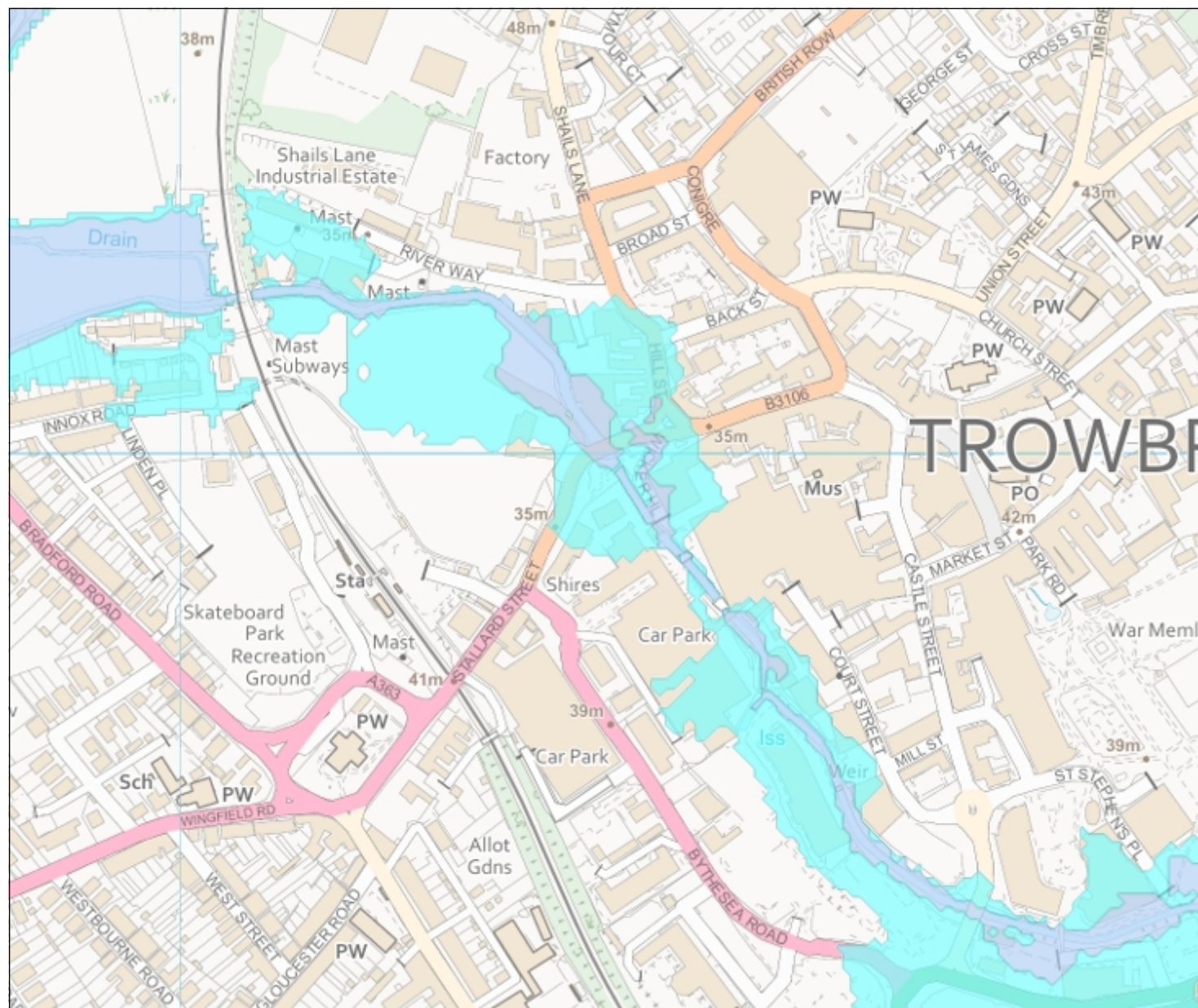
Product 4 - AIMS Information314617-WXDate:26/06/2023

Map Ref	Asset ID	Asset Type	Right or left bank	Asset Description	Approx length (m)	Actual fluvial downstream crest level (mAOD)	Actual fluvial downstream crest level accuracy	Actual fluvial upstream crest level (mAOD)	Actual fluvial upstream crest level accuracy	Actual fluvial coastal crest level (mAOD)	Actual fluvial coastal crest level accuracy	NGR	Most recent inspection	Overall condition
3	1790	Natural High Ground	Right	(Trowbridge FAS) Sheet Piling	170.51	DNR	DNR	DNR	DNR	DNR	DNR	ST85315805	02/08/2022	3 - Fair
4	1791	Natural High Ground	Right	(Trowbridge FAS)Walled Bank	73.34	35.77	1 - +/- 0.01m to 0.05m vertical accuracy (Typically on site survey)	35.74	1 - +/- 0.01m to 0.05m vertical accuracy (Typically on site survey)	DNR	DNR	ST85475784	02/08/2022	3 - Fair
5	1792	Natural High Ground	Left	(Trowbridge FAS)Natural Bank	64.26	DNR	DNR	DNR	DNR	DNR	DNR	ST85475780	02/08/2022	3 - Fair
6	1793	Natural High Ground	Right	Natural Bank	139.52	DNR	DNR	DNR	DNR	DNR	DNR	ST85905765	02/08/2022	3 - Fair
10	1924	Natural High Ground	Left	(Trowbridge FAS)Concrete Wall	36.72	DNR	DNR	DNR	DNR	DNR	DNR	ST85135811	02/08/2022	3 - Fair
12	39938	Natural High Ground	Right	Masonry Wall	84.17	35.79	1 - +/- 0.01m to 0.05m vertical accuracy (Typically on site survey)	35.85	1 - +/- 0.01m to 0.05m vertical accuracy (Typically on site survey)	DNR	DNR	ST85895768	22/12/2022	2 - Good
13	40052	Natural High Ground	Left	(Trowbridge FAS) Stone Lined Bank	77.43	DNR	DNR	DNR	DNR	DNR	DNR	ST85095812	02/08/2022	3 - Fair
14	40053	Natural High Ground	Left	(Trowbridge FAS)Sheet Piling	162.48	DNR	DNR	DNR	DNR	DNR	DNR	ST85315804	02/08/2022	3 - Fair
16	40055	Natural High Ground	Right	(Trowbridge FAS) Natural Bank	326.79	DNR	DNR	DNR	DNR	DNR	DNR	ST84845806	02/08/2022	3 - Fair
17	40056	Natural High Ground	Right	(Trowbridge FAS)Masonry Wall	166.71	DNR	DNR	DNR	DNR	DNR	DNR	ST85375795	02/08/2022	2 - Good
18	40057	Natural High Ground	Left	(Trowbridge FAS)Walled Bank	76.32	34.51	1 - +/- 0.01m to 0.05m vertical accuracy (Typically on site survey)	34.91	1 - +/- 0.01m to 0.05m vertical accuracy (Typically on site survey)	DNR	DNR	ST85545770	02/08/2022	3 - Fair
19	40058	Natural High Ground	Left	Natural Bank	134.09	DNR	DNR	DNR	DNR	DNR	DNR	ST85915764	02/08/2022	3 - Fair
20	40059	Natural High Ground	Right	Walled Bank	219.69	DNR	DNR	DNR	DNR	DNR	DNR	ST85745760	02/08/2022	3 - Fair
21	40059	Natural High Ground	Right	Walled Bank	219.69	DNR	DNR	DNR	DNR	DNR	DNR	ST85745760	02/08/2022	3 - Fair
27	4598	Natural High Ground	Left	(Trowbridge FAS)Stone Lined Bank	98.38	DNR	DNR	DNR	DNR	DNR	DNR	ST85215812	02/08/2022	3 - Fair
28	4599	Natural High Ground	Left	(Trowbridge FAS)Masonry Wall	166.03	DNR	DNR	DNR	DNR	DNR	DNR	ST85355798	02/08/2022	2 - Good
29	4600	Natural High Ground	Left	(Trowbridge FAS)Natural Bank	79.67	DNR	DNR	DNR	DNR	DNR	DNR	ST85475783	02/08/2022	3 - Fair
32	519811	Engineered High Ground	DNR	Overflow channel	370.19	DNR	DNR	DNR	DNR	DNR	DNR	ST84815815	02/08/2022	3 - Fair
33	519830	Engineered High Ground	DNR	Overflow channel	371.73	DNR	DNR	DNR	DNR	DNR	DNR	ST84835816	02/08/2022	3 - Fair
64	56795	Natural High Ground	Left	(Trowbridge FAS) Natural Bank	277.65	DNR	DNR	DNR	DNR	DNR	DNR	ST84855808	02/08/2022	3 - Fair
65	56796	Natural High Ground	Right	(Trowbridge FAS) Masonry Lined Bank	215.26	DNR	DNR	DNR	DNR	DNR	DNR	ST85135812	02/08/2022	3 - Fair
66	57215	Natural High Ground	Left	(Trowbridge FAS)Walled Bank	154.50	34.91	1 - +/- 0.01m to 0.05m vertical accuracy (Typically on site survey)	35.59	1 - +/- 0.01m to 0.05m vertical accuracy (Typically on site survey)	DNR	DNR	ST85615763	02/08/2022	3 - Fair
67	57397	Natural High Ground	Left	Paxcroft Brook Masonry Wall	81.60	DNR	DNR	DNR	DNR	DNR	DNR	ST85895768	22/12/2022	2 - Good
68	57522	Natural High Ground	Right	(Trowbridge FAS)Regraded Bank	257.47	DNR	DNR	DNR	DNR	DNR	DNR	ST85555769	02/08/2022	2 - Good
69	57540	Natural High Ground	Left	Stone Lined Bank	185.23	DNR	DNR	DNR	DNR	DNR	DNR	ST85795762	02/08/2022	3 - Fair

Map Ref	Asset ID	Asset Type	Right or left bank	Asset Description	Approx length (m)	Actual fluvial downstream crest level (mAOD)	Actual fluvial downstream crest level accuracy	Actual fluvial upstream crest level (mAOD)	Actual fluvial upstream crest level accuracy	Actual fluvial coastal crest level (mAOD)	Actual fluvial coastal crest level accuracy	NGR	Most recent inspection	Overall condition
Map Ref	Asset ID	Asset Type	Right or left bank	Asset Description	Approx length (m)	Actual fluvial downstream crest level (mAOD)	Actual fluvial downstream crest level accuracy	Actual fluvial upstream crest level (mAOD)	Actual fluvial upstream crest level accuracy	Actual fluvial coastal crest level (mAOD)	Actual fluvial coastal crest level accuracy	NGR	Most recent inspection	Overall condition
1	5345	Simple Culvert	DNR	Paxcroft Brook Culverts Culvert	26.77	DNR	DNR	DNR	DNR	DNR	DNR	ST85845764	22/12/2022	1 - Very Good

Notes
* Overall Condition has been taken from the most recent inspection
* Inspections are of a purely visual nature and do not necessarily reflect the true condition of the asset
* Condition: 1 = very good, Condtion 2 = good, Condition 3 = fair, Condition 4 = poor, Condition 5 = very poor
* Crest level accuracy: 1 = ± 0.01 to 0.05m, 2 = ± 0.05 to 0.15m, 3 = ± 0.15 to 0.75m, 4 = ± 0.75 or greater

314617-WX Flood Map for Planning (Rivers and Sea) centred on land at Trowbridge - created 13/07/2023



1: 5,000

0 Metres 125



Flood Map for Planning (Rivers & Sea)

- Defences
- Flood Storage Areas
- Flood Zone 3
- Flood Zone 2

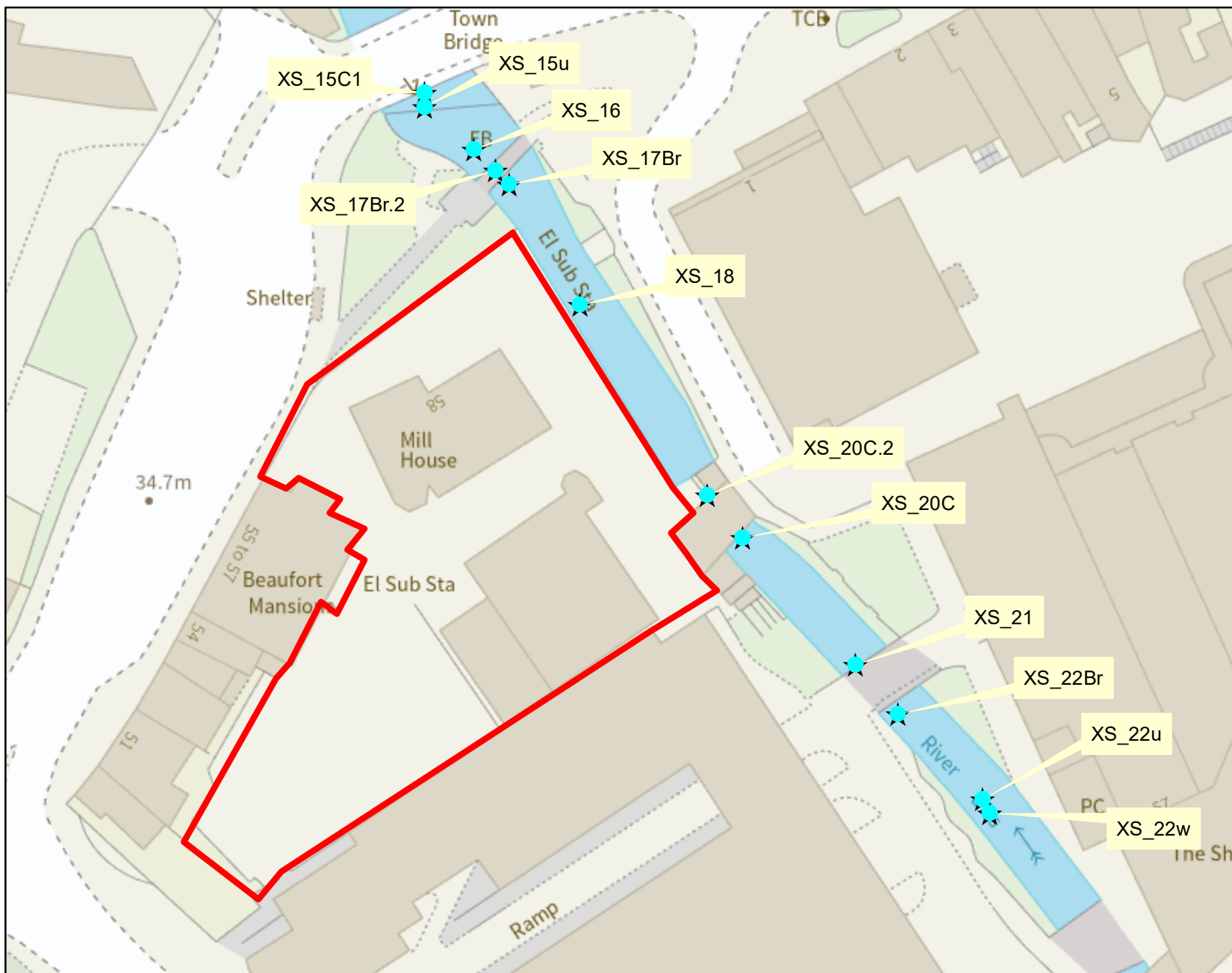
Flood Map Areas (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

314617-WX Map Showing Modelled Node Locations centred on land at Stallard Street, Trowbridge
- Created 12 July 2023



Scale 1:800



Legend

NODE_TYPE

- ★ 1D_RiverSection
- ★ 2D_RiverSection
- ★ Interpolate
- ★ Replicate
- Reservoir

□ 314617-WX_Site_Location

Please see Model Results sheet for available modelled measurements from Trowbridge SoP Study 2013

TITLE **Trowbridge SoP Study 2013**
 MODEL DATE **19/07/2013**
 SOFTWARE **Estry-TUFLOW**

SCENARIO **Undefended**

NODE	XS_15C1	XS_15u	XS_16	XS_17Br	XS_17Br.2	XS_18	XS_20C	XS_20C.2	XS_21	XS_22Br	XS_22u	XS_22w
WATERCOURSE	Biss	Biss	Biss	Biss	Biss	Biss	Biss	Biss	Biss	Biss	Biss	Biss
2YR Level	33.02	33.02	33.16	33.18	33.16	33.20	33.25	33.24	33.29	33.31	33.33	33.52
2YR Flow	5.67	13.75	13.73	13.76	NMD	13.71	13.75	NMD	13.73	13.73	13.73	13.73
5YR Level	33.23	33.23	33.41	33.42	33.41	33.44	33.51	33.50	33.55	33.57	33.60	33.84
5YR Flow	7.63	18.44	18.44	18.44	NMD	18.44	18.44	NMD	18.44	18.44	18.44	18.44
10YR Level	33.39	33.40	33.59	33.60	33.60	33.63	33.71	33.69	33.76	33.78	33.81	34.08
10YR Flow	9.17	22.10	22.10	22.10	NMD	22.10	22.10	NMD	22.10	22.10	22.10	22.10
20YR Level	33.59	33.59	33.81	33.82	33.82	33.85	33.95	33.92	33.99	34.02	34.05	34.35
20YR Flow	11.01	26.45	26.45	26.45	NMD	26.45	26.45	NMD	26.45	26.45	26.45	26.45
20YR 20%CC Level	33.86	33.86	34.11	34.12	34.11	34.15	34.25	34.21	34.29	34.32	34.35	34.70
20YR 20%CC Flow	13.73	32.12	31.97	31.84	NMD	31.86	31.85	NMD	31.85	31.84	31.84	31.84
25YR Level	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD
25YR Flow	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD
30YR Level	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD
30YR Flow	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD
50YR Level	33.88	33.89	34.14	34.15	34.14	34.17	34.27	34.24	34.32	34.35	34.38	34.72
50YR Flow	14.08	32.85	32.26	32.61	NMD	32.27	32.23	NMD	32.27	32.27	32.25	32.24
75YR Level	34.01	34.02	34.28	34.30	34.29	34.32	34.42	34.38	34.46	34.49	34.52	34.88
75YR Flow	15.51	35.91	35.00	35.09	NMD	34.70	34.58	NMD	34.40	34.56	34.48	34.45
100YR Level	34.13	34.13	34.42	34.43	34.42	34.46	34.56	34.52	34.60	34.63	34.66	35.03
100YR Flow	16.33	39.50	36.36	36.36	NMD	36.35	36.32	NMD	35.92	36.08	36.38	36.38
100YR 20%CC Level	34.38	34.38	34.73	34.74	34.73	34.76	34.86	34.81	34.90	34.94	34.97	35.39
100YR 20%CC Flow	18.56	50.71	39.48	39.42	NMD	39.90	40.72	NMD	42.29	43.21	43.57	43.57
100YR 30%CC Level	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD
100YR 30%CC Flow	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD
100YR 40%CC Level	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD
100YR 40%CC Flow	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD
100YR 85%CC Level	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD
100YR 85%CC Flow	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD
200YR Level	34.30	34.30	34.63	34.65	34.64	34.67	34.78	34.73	34.82	34.85	34.88	35.29
200YR Flow	18.10	47.92	39.40	39.33	NMD	39.76	40.14	NMD	40.57	40.02	41.44	41.44
200YR 20%CC Level	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD

314617-WX selected nodes data extract

200YR 20%CC Flow	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD
500YR Level	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD
500YR Flow	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD
1000YR Level	34.84	34.85	35.22	35.23	35.22	35.25	35.16	35.04	35.22	35.26	35.30	35.84
1000YR Flow	19.72	60.20	39.86	39.80	NMD	40.30	51.83	NMD	55.59	55.89	58.80	58.85
1000YR 20%CC Level	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD
1000YR 20%CC Flow	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD
TIDE 200YR	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD
TIDE 1000YR	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD	NMD
Eastings	385344	385344	385351	385356	385354	385366	385389	385384	385405	385411	385423	385424
Northings	157998	157996	157990	157985	157987	157968	157935	157941	157917	157910	157898	157896

Level of confidence	Moderate	The model was produced to assess our flood risk management assets and the results are fit for this purpose. We have MODERATE confidence in its input data, and subsequently its results. The reason that we have MODERATE confidence in the model and its results is because the model requires verification against a known flood event. You will need to contact our Partnership and Strategic Overview Team to discuss whether the flood levels from this model are suitable for your FRA or whether they require you to carry out further work to update the modelling.
NMD	No Modelled Data	
UNITS	LEVELS:	mAOD
	FLOW:	cumecs

Appendix D - Flood Resistant Product Details



Deployment Guide & User Manual



Note: It is the responsibility
of the installer to confirm
currency of documents

Manual No. 11-20



Deployment Guide & User Manual

1 What's Included

2 Deployment Steps

3 After Use Maintenance

4 Storage

5 Troubleshooting / FAQ

6 General Information

7 Product Warranty

This Deployment Guide & User Manual contains all the necessary information to correctly install, remove, maintain and store your Floodgate® flood barrier.

It is available to download via the **Download Section** on our website. www.floodgate.ltd.uk/downloads

Your Floodgate flood barrier is a manually operated, reusable, demountable flood protection product designed for the temporary mitigation of flood risk and should be seen as part of a suite of measures to reduce the risk of flood water entering a property. It is not intended for installations providing permanent flood protection.

For demonstration videos
www.floodgate.ltd.uk



DEFINITION OF SYMBOLS



**CORRECT/
DO**



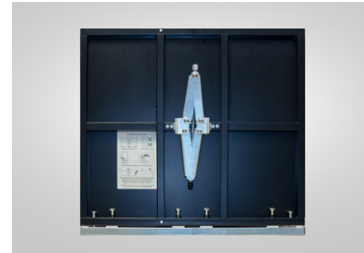
**INCORRECT/
DON'T**



**CAUTION/
IMPORTANT**

What's Included

1



x1 Floodgate
Flood Barrier



x1 Black Cover



x1 Ratchet Spanner



x1 Fitting Instructions



Important Information

- A flood protection risk assessment should be carried out by a suitably qualified professional prior to installation of the product to ensure the relevant routes for water entry have been identified and that the structural integrity of the building is not compromised by the product.
- The safety advice given by the emergency services should always be adhered to during flood conditions.



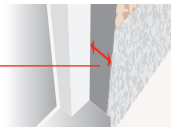
To help achieve an effective seal, walls need to be plumb, parallel with one another and at right angles to a level step/ground. Walls need to be sufficiently strong to cope with the lateral pressure exerted by the barrier.



Contact surfaces should be smooth, even and in good condition.

Floodgate's rubber cover is designed to work with surfaces such as brick, as long as the pointing is flush.

A minimum clear depth of reveal of 40mm is recommended.



Rough, uneven surfaces can damage the cover.



If you are not sure the contact surfaces can withstand the pressures being exerted you MUST seek advice from a qualified professional.

Prior to deploying, remove any packaging from the cover and ensure the steel frame is fully closed. Carefully place the cover over all four edges of the frame (see diagram).



Avoid lifting the barrier by its cover and/or dragging along the ground.



Metal finishing on this product can be sharp. Suitable gloved protection should be worn whenever handling and operating the product.



When operating the unit ensure all limbs, loose garments and other personal accessories are kept clear of the moving parts.



This product should only be installed by a responsible adult.



Floodgate units can be heavy - please take care when lifting.

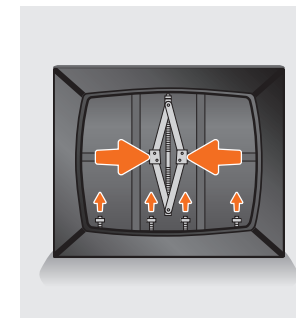


STEP 1

Ensure the entrance is clear of dirt and debris.



Debris can perforate the cover and undermine the integrity of an effective seal.



STEP 2

In preparation for positioning your Floodgate, ensure the central scissor jack on the rear of the Floodgate has been retracted to its closed position and the 4 downward pressure bolts have been fully loosened.



STEP 3

Standing behind the Floodgate, position it with its front facing towards the flood threat, and its rear vertical edges in contact with the door frame.

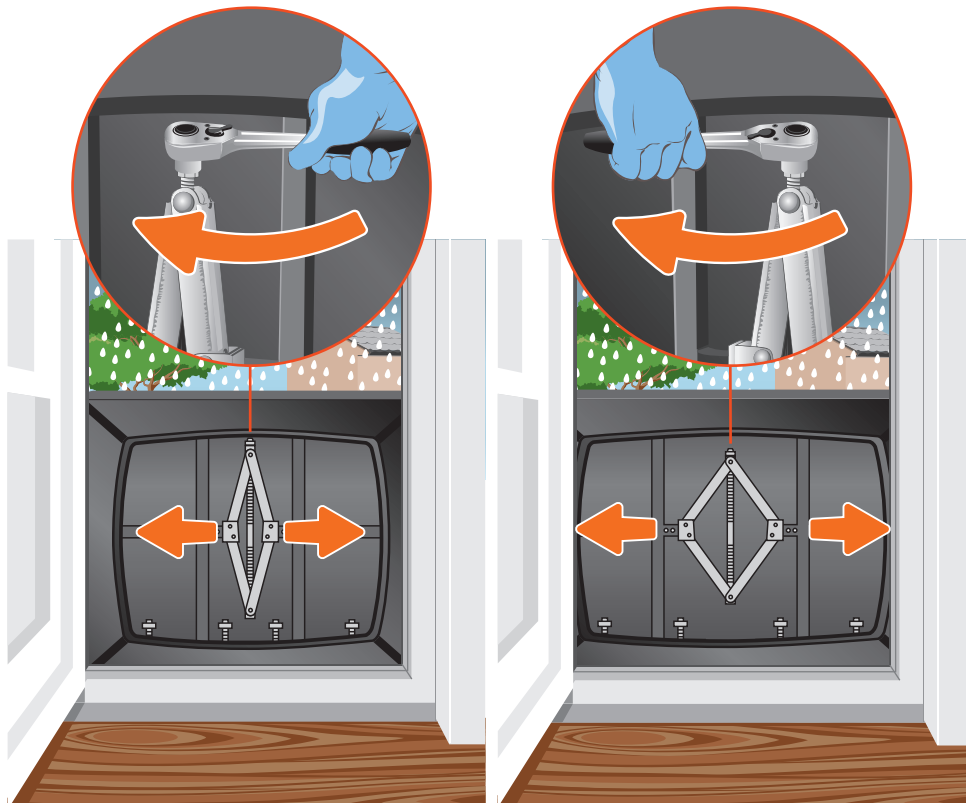
STEP 4

Keeping the barrier in a vertical position, use the supplied 17mm spanner to turn the bolt situated at the top of the scissor jack with a clockwise action, expanding the barrier horizontally into the walls of the reveal.

Once sufficient pressure is applied, the Floodgate will resist any attempt to manually move from its position.



Ensure the corners of the cover are positioned into the corners of the frame when expanding to achieve a uniform expansion.

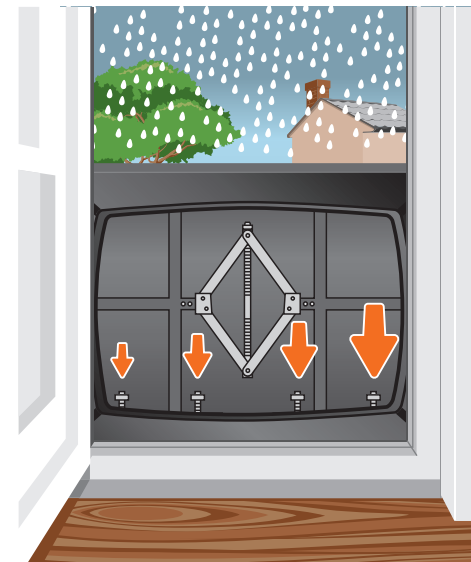


Using excessive force may result in damage to the product or doorway.

STEP 5

Starting with one of the downward pressure bolts located closest to the sides of the barrier, adjust downwards, with a clockwise action, firstly with your fingers and then with the 17mm spanner.

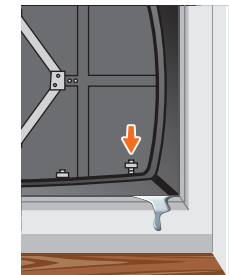
The bolt should be adjusted until it offers resistance and the cover has been compressed sufficiently to create a seal along the floor.

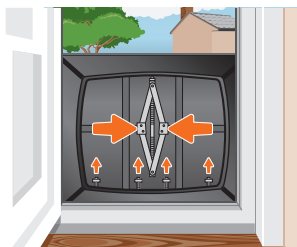
**STEP 6**

Repeat **STEP 5** for the remaining bolts until they have all been adjusted accordingly.

**STEP 7**

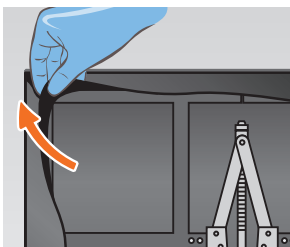
Further adjustment may be required to the operating mechanisms for example, if slight seepage occurs adjust the bolt closest to stem the flow.





Once the flood threat has passed, counter turn the 4 downward pressure bolts and scissor jack, returning the barrier to its unexpanded state.

Remove the barrier from the doorway.



Carefully remove the cover and wipe clean with a damp cloth.

A hosepipe set at a low pressure, can be used to wash contamination from the cover or wash in a lukewarm water with a small amount of non biological detergent.

✗ Do not machine wash or tumble dry.

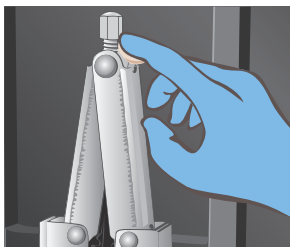


Dry in a shaded area, out of direct sunlight. Prior to storing, examine for potential damage. Repair or replace as necessary.

NOTE - some deformation of the cover may be seen after use. This is natural and the material will usually return to a normal state within a few days.

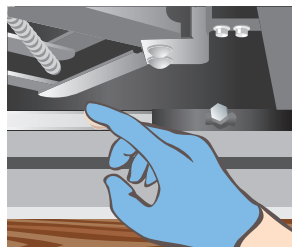


Remove excess moisture from the metal frame using a clean cloth. Examine for damage caused by stress, use or wear and tear, paying particular attention to the operating mechanisms.

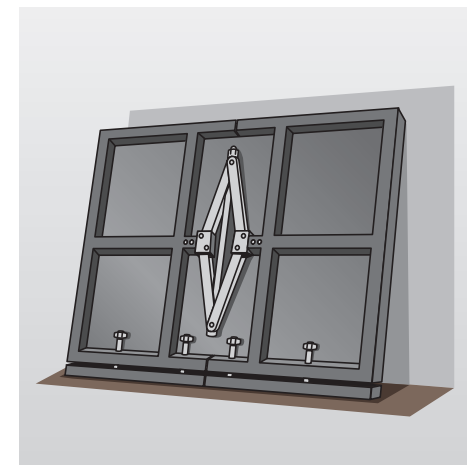
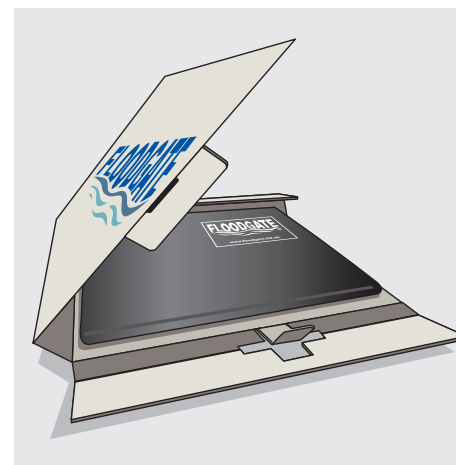


Apply marine grease (or similar) to all moving parts. Remove excess.

NOTE - you may need to open the barrier to grease the scissor jack and internal sliding parts. Fully retract after greasing so the cover can be easily placed over the frame when next needed.



All component parts of the Floodgate system should be stored in a cool, dry, well ventilated and secure environment, away from direct sunlight and temperature extremes.



Once the cover is completely dry, lay flat in the original box. Cardboard inserts may be used to help the cover hold its shape. Store the box flat and off the ground to avoid accidental damage.



Store the steel frame in an upright position.



Periodically (and at least every 6 months of non use), examine the frame and cover to ensure they remain fit for purpose and operate correctly.

Troubleshooting

Problem	Possible Cause(s)	Solution
Spanner turns one way but not the other	Switch engaged in one direction	Toggle switch so that spanner operates in reverse direction
Barrier is stiff to open/close	Insufficient lubrication to operating mechanisms and/or internal sliding bars	Apply grease to operating mechanisms and internal sliding bars
Difficult to remove or place cover on the frame	Frame is in an expanded state	Ensure frame is fully closed and downward pressure bolts loosened prior to removing and reattaching cover

FAQ

What types of floodwater can a Floodgate be used in?	Floodgates can be used in fluvial (river), pluvial (rainfall) or saline (salt water) flood conditions. Floodgates should not be used to protect against hydrocarbon and solvent spills.
What type of wall and floor finishes can a Floodgate be used with?	Floodgates can be used with brick/blockwork, render, wood, uPVC and metal – as long as the surfaces are sufficiently strong to cope with the pressures exerted by the barrier.
How long does it take to deploy a Floodgate?	A Floodgate should take no more than 5 minutes to deploy meaning little or no warning is required.
Can I purchase replacement covers for my Floodgate?	Yes, new covers can be purchased from our online store - www.floodgate.ltd.uk/store
Can Floodgates be recycled?	All components of a life expired Floodgate frame can be recycled at a registered recycling centre. The covers require specialist recycling.

Floodgate has been independently tested against the standard set of tests as defined in BSI PAS 1188-1:2014 which represent typical conditions that might be experienced during a flood in the UK. This includes testing the product for leakage under static water levels 0.6m above aperture threshold level, waves up to 0.1m high and parallel currents up to 1.0m/s. The testing undertaken under this PAS excludes all other components of the flood protection system.

The maximum permitted leakage rate defined in BSI PAS 1188-1:2014 is 500mL/h/m. The maximum leakage rate during testing of Floodgate was recorded as 50mL/h/m at the designated maximum water depth (DMWD) of 0.6m.

Conformance of the product to BSI PAS 1188-1:2014 does not mean it is suitable for all buildings or locations. If the user has any uncertainty about the suitability of a product they should seek professional guidance.

Floodgate is intended for use on building apertures such as doorways or windows.

Floodgate can be used to protect domestic property, commercial premises, schools, hospitals, other public buildings and other categories of building.

Floodgate warrants that its Flood Barrier Kit will be free from defects in materials or workmanship on the date of shipment by Floodgate. Floodgate's exclusive obligations under this Warranty are as follows: if within 12 months from the date of purchase, Floodgate determines, upon inspection, that a Flood Barrier Kit was defective in materials and/or workmanship on the date of shipment, Floodgate will repair or replace any Kit that Floodgate determined was so defective. Whether repair or replacement is appropriate is a decision Floodgate shall make in its sole discretion.

Except for this Warranty, Floodgate makes no express warranties regarding its Flood Barrier Kit, does not guarantee the performance of this product, and specifically disclaims all implied warranties, including but not limited to the implied warranty of merchantability and the implied warranty of fitness for a particular purpose. No representative of Floodgate may change or alter this Warranty.

Exclusions From Warranty Coverage

Because Floodgate's Warranty is only against defects in materials or workmanship existing on the date of shipment by Floodgate, this Warranty does not apply in the following circumstances:

1. Floodgate's Flood Barrier Kit has been modified in any manner, installed in an improper manner, or improperly maintained; and/or
2. Floodgate's Flood Barrier Kit was damaged or mishandled after shipment by Floodgate, including but not limited to damage sustained as a result of repair not authorized by Floodgate.

It is important to follow Floodgate's fitting and maintenance instructions.

Warranty Service

Applications for repair or replacement of the purchase price for any Floodgate Flood Barrier Kit must be made to Floodgate in writing within 30 days of knowledge of any problem or alleged problem with the Floodgate product, and no later than 12 months from the date of purchase, at the following e-mail address: sales@floodgate.ltd.uk or the following street address: Floodgate Ltd, 49-51 Lammas Street, Carmarthen, Wales UK, SA31 3AL. Floodgate can also be reached by phone at 01267 234205, although all applications for warranty service must be in writing. If it is necessary for a Flood Barrier Kit to be returned to Floodgate for evaluation, the cost of shipping for such return is the responsibility of the user or owner of the Kit(s) in question.

Limitation of Liability

In no event shall Floodgate have any liability beyond repair or replacement as selected by Floodgate, whether in contract or tort or for breach of warranty, for damages or losses of any kind or nature directly or indirectly caused in whole or in part by Floodgate's Flood Barrier Kit, including but not limited to damages to property, damages for inconvenience or delay, damages for lost profits or business interruption, or direct, indirect, incidental, consequential, special, exemplary, or punitive damages. The limited remedies herein, which Floodgate has discretion to choose, are exclusive.

Choice of Law

Floodgate's Warranty shall be governed and construed under English law without giving effect to any principles of conflicts of law. Any claim by the purchaser or user of the product covered by Floodgate's Warranty, whether in contract or tort or for breach of warranty, shall be governed by English law, without giving effect to any principles of conflicts of law.

GENERAL INFORMATION

- ⚠ Prior to the installation of any flood protection equipment, it is strongly advised that a flood protection risk assessment is carried out by a suitably qualified building surveyor, architect, structural engineer, civil engineer or those deemed competent, to ensure the relevant routes for water entry have been properly identified and the structural integrity of the building is not compromised by the installation of such products.
- ⚠ Ventguard has been designed to protect air-bricks or air vents. It should **NOT** be used to protect gas flues, chimney or other heating outlets or vents which serve white goods appliances. If in doubt, seek professional advice prior to installation of the product.

Ventguard is designed for the temporary mitigation of flood risk and should be seen as part of a suite of measures to reduce the risk of flood water entering a property.

Ventguard can be used on domestic properties, commercial premises, schools and other public buildings. It can be used in fresh or salt water flood conditions.

Ventguard can be used on brick or rendered finishes.

Ventguard is reusable and once installed can be manually sealed in seconds.

PRODUCT INFORMATION

Ventguard is manufactured from glass reinforced nylon. All component parts of a life expired unit can be recycled.

Ventguard has been tested against the standard set of tests as defined in BSI PAS 1188-1:2014 which represent typical conditions which may be experienced during a flood in the United Kingdom.

This includes testing for leakage under static water levels 900mm above the aperture threshold level, waves up to 0.1m high and parallel currents up to 1.0m/s.

Maximum recorded leakage rates during testing were 0.015 ltr/m/hr.

Conformance of the product to BSI PAS 1188-1:2014 does not mean it is suitable for all buildings or locations. If the user has any uncertainty about the suitability of a product they should seek professional guidance.



Floodgate Ltd
49/51 Lammas Street
Carmarthen
Carmarthenshire
Wales SA31 3AL

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E-mail: sales@floodgate.ltd.uk

VENTGUARD



Fitting & Maintenance Manual



Important Information

Advice and Safety - Please read before installation.

The safety advice given by the emergency services should always be adhered to during flood conditions.

What's Included



Ventguard



Plugs



Screws



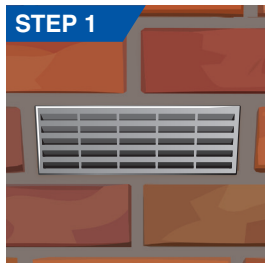
Rawlplugs



Instructions

Ventguard Fitting Instructions

Installation Steps



Position the Ventguard with the black tubes along the bottom edge, onto the wall surrounding the air brick. Making sure the Ventguard is level, mark the wall through each of the screw holes.



Using a 5.5mm masonry drill bit, drill into each of the marks on the wall.



Insert the supplied rawplugs into each hole, ensuring the top of the plug is flush with the wall.



Cover the underside of the flange with a suitable all weather, exterior silicone sealant.

NOTE: The sealant should be capable of bonding to both plastic and masonry.



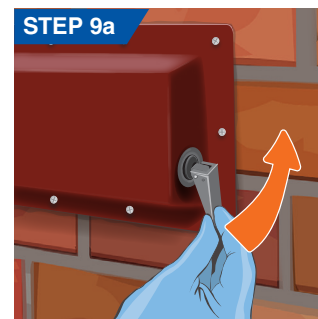
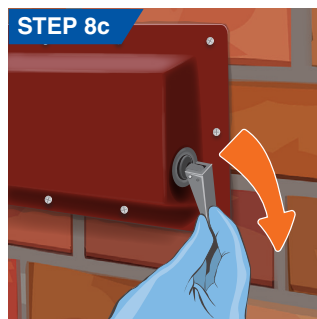
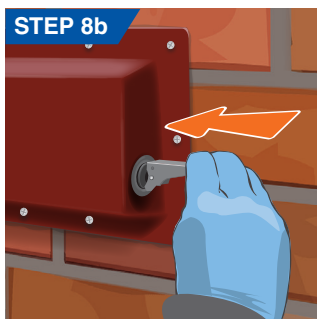
Screw the Ventguard to the wall using the supplied screws.

! Do not apply excessive force to the screws as this may split the plastic and/or strip the screw head.



Run a beading of silicone sealant around all edges of the Ventguard.

Using Ventguard



On flood warning or when flooding is imminent, insert the supplied plugs into the 2 tubes, ensuring they are fully locked in place.

Once flooding subsides and/or the flood warning is cancelled, remove both plugs and store in a safe place ready for next use.

MAINTENANCE AND STORAGE INSTRUCTIONS

Ensure that the plastic tubes on either side of the Ventguard are kept clear of debris and vegetation which would otherwise hinder placement of the plugs.

Periodically, and after every flood event, inspect the Ventguard for damage. A unit showing signs of damage should be replaced immediately.

Preparatory steps

- !** Suitable hand and eye protection should be worn when fitting Ventguard.
- To help achieve an effective seal, ensure the wall surrounding the air brick is flat and level and can be drilled.
- !** Installing against uneven surfaces can result in damage to the Ventguard.
- The air brick should be at least 3" (7.5cm) from ground level to allow correct fitting of Ventguard.
- This Ventguard can be used to protect an air brick with maximum dimensions of 10" x 5" (25cm x 13cm)

Periodically, and after every flood event, inspect the silicon sealant around the edge of the unit. If the sealant shows signs of deterioration, remove and apply a fresh layer (see Step 7).

Screws showing signs of weathering should be replaced.

To allow air to flow through the unit, the plastic plugs should only be inserted when flooding is imminent. When not in use, the plastic plugs should be stored in a dry, safe area ready for the next deployment.

Replacement plugs are available to purchase from Floodgate Ltd.