

# Temporary Orchard Theatre, Dartford

## Flood Risk Assessment

**Curtins Ref:** 085074-CUR-00-XX-T-C-92000

Revision: P03


Issue Date: 04 December 2023

Client Name: Dartford Borough Council

Site Address: Orchard Street,  
Temple Hill,  
Dartford,  
Kent,  
DA1 1BX,

Rev	Description	Issued by	Checked	Date
P01	Preliminary Issue	MM	MCS	15 November 2023
P02	Revised to Latest Flood Data	MM	MCS	24 November 2023
P03	Revised Planning Description	MM	MCS	04 December 2023
P04	Revised following EA meeting	MM	MCS	12 December 2023

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Curtins Consulting Ltd has prepared this report based on the provided and available information. Investigations are required to confirm scope, assumptions and conclusions. The opinions, conclusions and any recommendations in this report are based on assumptions made by Curtins Consulting Ltd described in this report.

# Contents

<b>1.0</b>	<b>Project Background</b>	<b>1</b>
1.1	Scope of Flood Risk Assessment	1
<b>2.0</b>	<b>National and Local Policy Considerations</b>	<b>2</b>
2.1	National Planning Policy Framework	2
2.2	Planning Practice Guidance	2
2.3	Local Planning and Guidance Documents	3
2.3.1	Dartford Town Centre Strategic Flood Risk Assessment (SFRA)	3
2.3.2	Dartford Surface Water Management Plan (SWMP)	3
2.3.3	Thames Water Asset Plans	3
2.3.4	Environment Agency (EA) Flood Maps	3
2.3.5	British Geological Survey (BGS) Maps	3
<b>3.0</b>	<b>Existing Site Details</b>	<b>4</b>
3.1	Site Location	4
3.2	Site Description	4
3.3	Historic Uses	4
3.4	Existing Site Drainage	5
3.5	Existing Land Drainage	5
3.6	Existing Watercourses	5
3.7	Site Geology	5
3.8	Project Proposals	5
<b>4.0</b>	<b>Sources and Extents of Flooding</b>	<b>7</b>
4.1	Natural Drainage	7
4.1.1	Fluvial Flooding	7
4.1.2	Pluvial Flooding	8
4.1.3	Ground Water Flooding	9
4.2	Artificial Systems	9
4.2.1	Adopted Drainage	9
4.2.2	Private Drainage	9
4.2.3	Highway Drainage	9
4.2.4	Reservoir Flooding	10
4.2.5	Development Drainage	10
4.1	Summary	10
<b>5.0</b>	<b>Flood Mitigation Measures</b>	<b>11</b>
5.1	Safe Access and Egress	11
<b>6.0</b>	<b>Sequential Test</b>	<b>12</b>
6.1	Application	12
6.2	Sequential Test	12

<b>7.0</b>	<b>Conclusions and Recommendations</b>	<b>13</b>
<b>8.0</b>	<b>Appendices</b>	<b>14</b>

## Figures

Figure 1: Site location plan.	4
Figure 2: Extract from BGS surface geology map.	5
Figure 3: Fluvial Flood Zone Map	7
Figure 4: Climate Change Allowances for Dartford	8
Figure 5: Pluvial Flood Risk Map	9
Figure 6: Guest Access and Egress	11

## Tables

Table 2-1 - PPG Tables 1 & 2 Summary	2
Table 4-1 - Flood Risk Summary	10



## 1.0 Project Background

Curtins have been appointed by Dartford Borough Council to provide a Flood Risk Assessment report for a new temporary theatre located on Orchard Street in the centre of Dartford. The development is proposed to be in use for a period until approximately 2025 and its use beyond this is proposed to be prohibited by use of a planning condition. The purpose of the development is to allow for remediation works in relation to RAAC to take place at Orchard Theatre. The proposed site plan is contained in **Appendix A**.

In recent years, the Government and local Councils have placed increased priority on the need for developers to take full account for the risks of their development at all stages of the planning process. The National Planning Policy Framework (NPPF) identifies how the issue of flooding is dealt with through the planning process and with the creation of a site-specific Flood Risk Assessment (FRA) for sites over 1 hectare in area or in Flood Zones 2 & 3.

The purpose of this report is to assist our client and the Local Planning Authority to make an informed decision on the flood risks associated with the site development. Local Planning Authorities have the powers to control developments, in line with recent legislation, and are expected to apply a risk-based approach to development.

Proposals contained or forming part of this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material derivation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

Where the proposed works, to which this report refers, are undertaken more than twelve months following the issue of this report, Curtins Consulting Ltd shall reserve the right to re-validate the findings and conclusions by undertaking appropriate further investigations at no cost to Curtins Consulting Ltd.

Allowance for the effects of climate change will be made (where required) in accordance with government recommendations in place and statistical data available at the time of writing this report. These recommendations may become more onerous and the statistical data may be revised in the future; we will not make any estimate of what changes may result from this. Please be aware that this, and other issues over which the Curtins has no control, may affect future flood risk at the development and require further work to be undertaken for which we accept no liability.

### 1.1 Scope of Flood Risk Assessment

The assessment is to be undertaken in accordance with the standing advice and requirements of the Environment Agency for Flood Risk Assessments as outlined in the Communities and Local Governments Technical Guidance to the National Planning Policy Framework (NPPF).

The assessment will:

- Investigate all potential risks of current or future flooding to the site;
- Consider the impact the development may have elsewhere with regards to flooding; and
- Consider design proposals to mitigate any potential risk of flooding determined to be present.

## 2.0 National and Local Policy Considerations

### 2.1 National Planning Policy Framework

The Ministry of Housing, Communities and Local Governments initially published the National Planning Policy Framework (NPPF) in 2012 and updated in 2023 to identify how the issue of flooding is dealt with through the planning process and to introduce the requirement for a site-specific Flood Risk Assessment (FRA) for sites over 1 hectare in area or in Flood Zones 2 & 3. The document consolidates the previously used Planning Policy Statements.

### 2.2 Planning Practice Guidance

The NPPF and associated Technical Guidance documents set out the definitions for the flood zones and defines the permitted uses of development that can be proposed in them.

Table 2-1 - PPG Tables 1 & 2 Summary

Flood Zone	Appropriate Users
<b>Flood Zone 1 - Low Probability</b> This zone comprises land having less than 1 in 1000 annual probability of river or sea flooding (<0.1%)	All uses of land are appropriate in this zone
<b>Flood Zone 2 - Medium Probability</b> This zone comprises land assessed as having between 1 in 100 and 1 in 1000 annual probability of river flooding (1%-0.1%) or between 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5%-0.1%) in any year	The water-compatible, less vulnerable and more vulnerable uses of land and essential infrastructure in Table D.2 of the PPG are appropriate in this Zone Subject to the Sequential Test being applied, the highly vulnerable uses in Table D.2 are only appropriate in this zone if the Exception Test is passed
<b>Flood Zone 3a - High Probability</b> This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year	The water-compatible and less vulnerable uses of land in Table D.2 of the PPG area appropriate in this zone. The highly vulnerable uses in Table D.2 of the PPG should not be permitted in this zone. The more vulnerable and essential infrastructure uses in Table D.2 should only be permitted in this zone if the Exception Test is passed. Essential infrastructure permitted in this should be designed and constructed to remain operational and safe for users in time of flood.
<b>Flood Zone 3b - Functional Floodplain</b> This zone comprises land where water has to flow or be stored in times of flood. SFRAs should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the Environment Agency, including water conveyance routes)	Only the water-compatible uses and the essential infrastructure listed in Table D.2 of the PPG that has to be there should be permitted in this zone. It should be designed and constructed to remain operational and safe for users in times of flood, result in no net loss of floodplain storage, not impede water flows and not increase flood risk elsewhere. Essential infrastructure in this zone should pass the Exception Test.

## 2.3 Local Planning and Guidance Documents

### 2.3.1 Dartford Town Centre Strategic Flood Risk Assessment (SFRA)

The Dartford Strategic Flood Risk Assessment (SFRA) is a detailed examination of flood risks in Dartford, evaluating potential flooding events and their impact on the town. It assesses vulnerability, identifies flood risk areas, and recommends strategies to manage and mitigate these risks, helping guide urban planning and development decisions for a safer and more resilient Dartford.

### 2.3.2 Dartford Surface Water Management Plan (SWMP)

The Dartford Surface Water Management Plan (SWMP) is a strategic framework that addresses the management of rainwater runoff in the Dartford area. It identifies flood-prone areas and offers solutions to mitigate surface water flooding, including sustainable drainage systems (SuDS). The SWMP aims to improve drainage infrastructure, reduce flood risk, and enhance the overall resilience of Dartford against surface water-related issues.

### 2.3.3 Thames Water Asset Plans

Thames Water Asset plans have been provided from a previous FRA, this was dated 26<sup>th</sup> March 2020 and will require updated plans. The plans provide an indicative layout of existing assets in the area for guidance on connections and diversions if required.

### 2.3.4 Environment Agency (EA) Flood Maps

Product 4 (detail flood maps) have been requested from the EA. However, at the time of writing these have not yet been received. To review the flood risk on the site, Product 4 information dated 20<sup>th</sup> January 2020 has been used for the scheme and is contained in the appendix of this report. Once a revised Product 4 has been provided by the EA this will be revised where required.

### 2.3.5 British Geological Survey (BGS) Maps

BGS maps have been referenced to identify the indicative ground conditions for the site, no site investigations have been undertaken due to the nature of the development and the temporary nature of the construction.

## 3.0 Existing Site Details

### 3.1 Site Location

The location of the proposed development is in Dartford Town centre on an existing brownfield site to the east of Orchard Street approximately 100-150m south west from the existing Orchard Theatre. The site is located within a dense town centre with residential and commercial units surrounding the immediate vicinity. The grid reference for the site is X (Easting): 554091, Y (Northing): 174192, Figure 1 shows the site location with the site boundary in red.



Figure 1: Site location plan.

### 3.2 Site Description

The existing site is a 0.57ha brownfield site with all previous buildings and utilities demolished. There is an existing façade to be unchanged by the development from the original Cooperative Society Buildings. The west of Orchard Street is an asphalt car park.

The site levels range from 6.20m AOD in the south, 5.15m AOD to the west, 4.80m AOD to the north and 4.74m AOD to the east. The main development area of the site is generally flat with a slight fall from south west to north east.

The site is currently being used as a contractors compound for town centre works. The site has areas of asphalt hardstanding that are undrained and appears to run-off overland uncontrolled with the rest of the site.

A topographical survey is contained in **Appendix B**.

### 3.3 Historic Uses

Historic maps indicate the area as greenfield till around 1868, from then a brewery was located on the area of land to the east of Orchard Street. The site was cleared in 2014 and has remained unchanged since.

### 3.4 Existing Site Drainage

A GPR survey of the site is contained in **Appendix C**. This survey shows a 225mm surface water sewer that bisects the site flowing east. This sewer has been confirmed to connect to the 600mm Thames Water sewer in Hythe Street. The survey also shows 2 existing 150mm foul connections to Orchard street.

Thames Water asset plans show surface water sewers on all surrounding roads of Hythe Street, Spital Street and Kent Road ranging from 225mm to 600mm diameter sewers. This would allow connection at various points for the surface water discharge if required. The public foul sewers are also on all the previously mentioned roads ranging from 225mm to 375mm sewers plus a 225mm diameter pipe bisecting the site within Orchard Street.

The site is currently undrained, with rainwater leaving the site unmanaged. Furthermore, there are areas of hardstanding, installed for the contractors compound.

### 3.5 Existing Land Drainage

The site is a built-up urban area and no land drainage has been identified or expected to be located on site.

### 3.6 Existing Watercourses

There are no watercourses located on site, but the River Thames is located roughly 3km to the north east and the River Darent to the east is approximately 200m to the east.

### 3.7 Site Geology

British Geological Survey maps indicate the local bedrock geology as Lewes Nodular Chalk, Seaford Chalk and Newhaven Chalk Formation. The superficial geology Alluvium – Clay, Silt, Sand and Gravel.

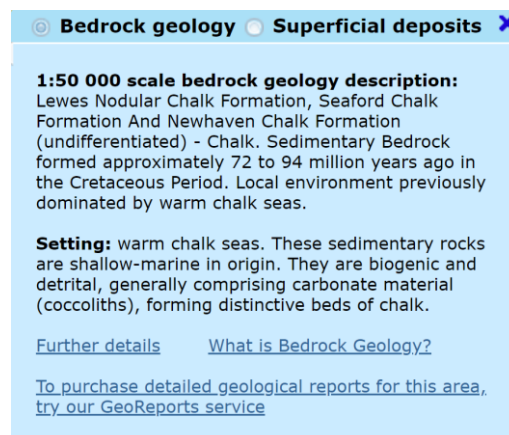


Figure 2: Extract from BGS surface geology map.

### 3.8 Project Proposals

This planning application related to:

***Retrospective planning application for temporary theatre (including auditorium, foyer, bar area, box office, toilets, stage, backstage and storage) (Sui Generis); together with associated servicing area; external waste storage, above ground fuel tanks, external heaters and power generators; pedestrian ramps (for external Stage Door and Fire Exits); alterations to and additional asphalt hardstanding; alterations to vehicle access gates on Hythe Street; alterations to means of enclosure to introduce fire escape gates; on-site security (V Mesh) fencing and external lighting.***

The proposed development is for a new 1091 person temporary theatre located on Orchard Street in the centre of Dartford. The development is proposed to be in use for a period until January 2025 and its use beyond this is proposed to be prohibited by use of a planning condition. The purpose of the development is to allow for remediation works in relation to RAAC to take place at Orchard Theatre. The proposed site plan is contained in **Appendix A**. The structure consists of a series of steel A-frames that support a vinyl roof. The walls are formed out of either pre-formed panels or windows.

The structure is anchored to concrete blocks and the ground using 900mm ground anchors. There is no major excavations proposed for the development other than that required by service runs.

The proposed site is reusing the existing areas of hardstanding for entrance with some areas of new hardstanding also proposed. See Appendix A.



## 4.0 Sources and Extents of Flooding

A number of sources of flood risk need to be assessed to be in line with the requirements for planning under NPPF and EA regulations. This report takes into consideration fluvial flooding (rivers and streams), pluvial flood risk (surface water), tidal flooding (coastal or estuarine), reservoir flooding, canal flooding, groundwater flooding, infrastructure failure flooding and any historical flooding reports.

### 4.1 Natural Drainage

#### 4.1.1 Fluvial Flooding

With reference to the EA's indicative flood maps, it can be seen that the site lies predominantly in Flood Zone 3a, with the southern tip of the site siting in Flood Zone 1 and 2. Flood Zone 3a comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1% AEP) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5% AEP) in any year.

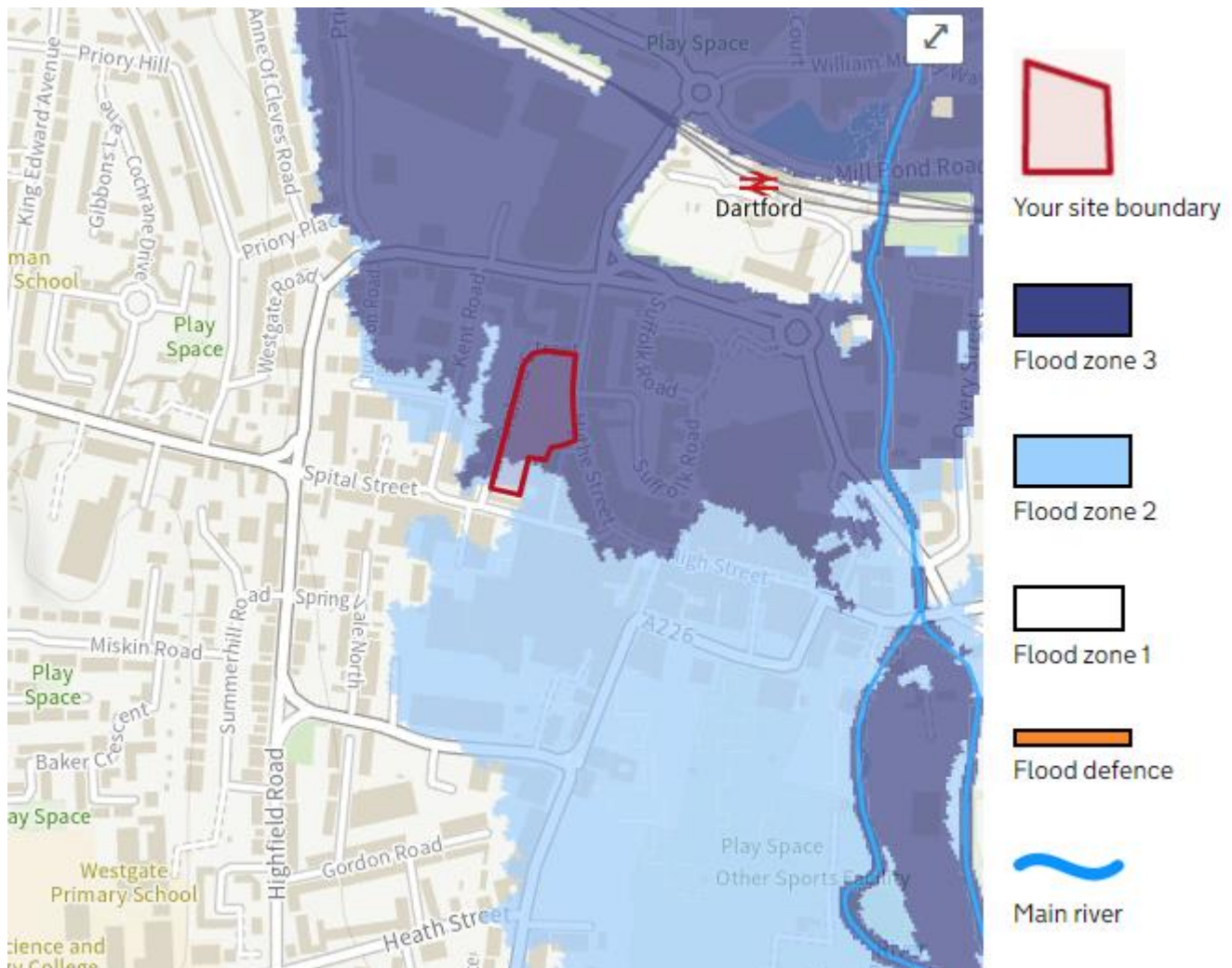


Figure 3: Fluvial Flood Zone Map

However, information contained in the Product 4 data provides a detailed view of how the above flood map is developed. The sites flood risk is affected by both the River Thames tidal flood risk and fluvial flood risk from the River Darent. These are summarised below. The Product 4 is contained in **Appendix D**.

4.1.1.1 Product 4 summary

**River Thames**

The Product 4 data used for the basis of this report uses the *Downriver Breach Inundation Modelling Study 2018* completed by Atkins Ltd. in May 2018. Based on the 2008 TE2100 in-channel levels, the 0.5% (1 in 200 year) and 0.1% (1 in 1000 year) annual probability of exceedance tidal events were modelled for all breach locations downriver of the Thames Barrier. These were modelled for the 2014 year epoch (current year), as well as 2115 epoch which include allowances for climate change.

The modelling shows that there is no flooding to the site for the 0.5%AEP in the 2014 year epoch and a flood level of 4.84mAOD for the 0.1%AEP in the 2014 year epoch. The site floods for both events in the 2115 year epoch, however as this development life is only to January 2025, this does not pose a risk to the development.

**River Darent**

Modelling for the River Darent & Cray was undertaken in 2019 by JBA Consulting. Flood levels across the site is provided using a 2D TuFLOW model.

Table 1 in the Product 4 information provided the modelled defended levels. This shows that no area of the site floods during the 1%AEP or 0.5%AEP events, with flooding only occurring in the 0.1%AEP event. Whilst it is noted that nodes 12, 14, 15, 16 & 17 show flooding during the 0.5%AEP events, these nodes lie outside the proposed red line boundary. With regards to the inclusion of climate change and the 1%AEP event, flooding only occurs within the site (nodes 1-11 & 12) during the 1%AEP+70%CC event. As this development will be in use until 2025, with reference to the Government’s climate change allowances, an allowance of 6% should be used. Therefore, the site is not at risk of flooding from the River Darent or Cray.

	Central	Higher	Upper
2020s	6%	11%	21%
2050s	3%	8%	23%
2080s	10%	18%	41%

Figure 4: Climate Change Allowances for Dartford

Based on the above, the site appears to be at low risk of tidal and fluvial flooding for the lifetime of the development for events up to and including the 0.5%AEP tidal event and 1%AEP fluvial event.

**4.1.2 Pluvial Flooding**

With reference to the EA’s online mapping, data related to the risk of potential surface water inundation or flooding is also provided. In Figure 5, it shows that there is a very low risk to the majority of the site, with low to medium risk surface water flooding located within the highway of Orchard Street. Towards the North on Hythe Street there are elevated areas of flood risk, ranging from medium to high.

Currently, levels on the site fall towards areas of medium and high risk and therefore the areas of elevated flood risk do not pose a risk to the site. The existing site, it is understood, does not have any formal drainage; additionally, its current utilisation as a contractor compound means that surface water flows off the site uncontrolled.

The flood risk from pluvial sources is therefore seen to be low. Furthermore, it is seen that as the proposed development will include a below ground drainage system, the risk to surrounding areas will be reduced for the duration of the development.





Extent of flooding from surface water

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

Figure 5: Pluvial Flood Risk Map

### 4.1.3 Ground Water Flooding

Kent County Council PFRA mentions that ground water flooding in Kent has significant potential due to the abundance of chalk and sandstone in the county which present potential sources of groundwater flooding. Figure 6 from the PFRA, shown in **Appendix E**, shows ground water risk areas for the county and indicatively shows that the site could be in a high-risk area.

The SFRA for Dartford town centre references groundwater flooding and notes that there are no records of groundwater flooding in Dartford. Previous consultation with the EA stated that potential groundwater head in Dartford is between 1.6m and 5m below ground level. Based on this consultation contained within the SFRA and due to there being no instances of groundwater flooding, the risk to the site is seen as low.

## 4.2 Artificial Systems

### 4.2.1 Adopted Drainage

Existing public sewers are indicated on the Thames Water asset plans in **Appendix F**, and also GPR surveys have been carried out on all necessary public sewers within the area, see **Appendix C**. There are no known risks of flooding from this source in this location. It is assessed that any failure of the sewer around the site will flow overground and follow the existing highway network rather than flow towards the site.

### 4.2.2 Private Drainage

The existing private sewers have been removed from the site, any existing drainage is mentioned in the previous section 3.4. There is no risk of flooding from private drainage.

### 4.2.3 Highway Drainage

With Orchard Street remaining the responsibility of Dartford Council Highways, any work to the highway drainage will require acceptance and adoption by the council. All drainage for the site should remain outside of the highway boundary.

#### 4.2.4 Reservoir Flooding

There is no risk from reservoir flooding from this site.

#### 4.2.5 Development Drainage

The proposed development will need to include a drainage network that is suitable for the nature and length of the development. Furthermore, this proposed network will need to ensure that the development doesn't increase flood risk to adjacent sites.

The existing site comprises unmanaged formal and informal surfacing. There does not appear to be any below ground drainage or collection systems serving the formal hardstanding areas. With regards to the informal area, these appear to consist of compacted rubble and made ground and it is unlikely that this offers a high permeability. Therefore, it is seen that the provision of a drainage network will improve the flood risk of the adjacent sites.

Further details of the proposed drainage network are provided in 085074-CUR-00-XX-T-C-92001.

### 4.1 Summary

Natural flooding risks are considered low, fluvial flooding is protected from flood defences and pluvial is located in the highways for this site which will be upgraded on Orchard Street. Artificial system flooding is very low risk for this site. Groundwater flooding is considered a low risk to the site as there has been no recorded incidents in Dartford but further investigation would be required on site.

The Product 4 information from the EA requires an FFL of 5.41m, but due to restrictions on site the FFL has been proposed at 5.13m AOD. To mitigate the risks of this, all vulnerable uses have been removed from the ground floor and flood mitigation measures to be considered for areas below 5.43m AOD.

Table 4-1 - Flood Risk Summary

Potential Source of Flooding	Is there a flood risk to the development?	Does the proposed development increase the flood risk upstream?	Does the proposed development increase the flood risk downstream?
Fluvial Flooding	NO	NO	NO
Pluvial Flooding	NO	NO	NO
Ground Water Flooding	NO	NO	NO
Adopted Drainage	NO	NO	NO
Private Drainage	NO	NO	NO
Highway Drainage	NO	NO	NO
Reservoir Flooding	NO	NO	NO
Development Drainage	NO	NO	NO

## 5.0 Flood Mitigation Measures

This section responds to the major risks outlined to the site in Section 4 and offers mitigation measures that will aim to reduce the risk of flooding to the site.

From the review of the EA's Product 4 data provided by the EA in relation to a scheme on the site from 2020, the site will not fall within the extents of the 0.5%AEP tidal or 1%AEP fluvial flood risk area. As the development life only extends to January 2024, no allowance is required to be made for climate change. However, due to the sites proximity to the current day flood zone it is proposed that the operators will sign up to the EA's flood alerts system.

Finished floor levels are also proposed to be 4.95mAOD. This is above the anticipated flood level for all events in the 2014 year of the TE2100 model (0.1%AEP being the highest at 4.84mAOD) & equal to the flood level of the 1% AEP +70%CC. Therefore, this is seen as more than sufficient for a temporary 1 year building.

### 5.1 Safe Access and Egress

Although the flood risk to the site has been deemed as low from all sources, the below commentary is provided on safe access and egress during a flood event.

In the event of a 0.5%AEP event on the River Darent & Cray, the flood level across site would raise to 4.56mAOD. Access and egress routes for guests would remain unchanged, with use of the emergency exits and guest entrances to the west onto Orchard Street. From here guests could leave the area by heading south to Spital Street. All routes below would be above the current 1 in 200 year flood event.

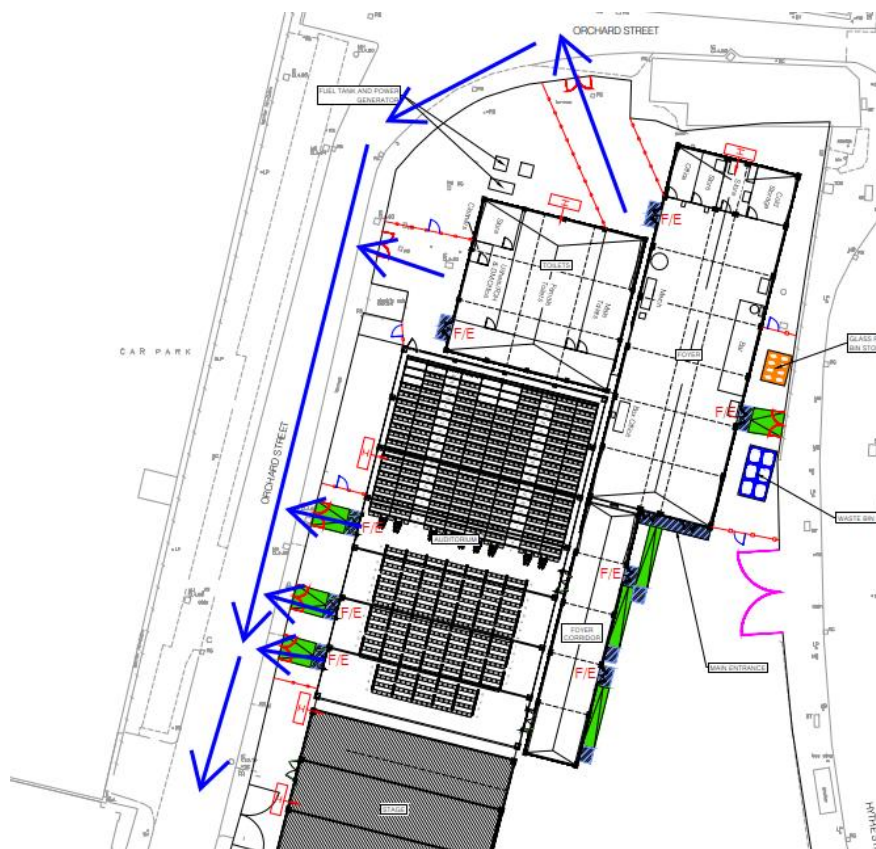


Figure 6: Guest Access and Egress

For performance staff, the exist route would be also onto Orchard Street and to Spital Street via an exit to the west of the performance area.

## 6.0 Sequential Test

### 6.1 Application

The majority of the site is currently classed as being in Flood Zone 3a, and having a greater than a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year annual probability of flooding from fluvial sources. There is a slight encroachment of the site into Flood Zone 2 to the south. The proposed development does however benefit from the River Thames Flood defences which are rated for a 1 in 1000 year event.

The Sequential Test is designed to direct development towards areas of lower flood risk, however, where suitable sites do not exist in Flood Zone 1 sites in Flood Zone 2 and then 3 may be considered.

It is therefore necessary to establish a hierarchy of sites ranking the most suitable. From this hierarchy sites may be selected that will be required for housing needs in this location.

### 6.2 Sequential Test

The area is a developed urban area and therefore possible locations for a development of this size are unavailable.

According to the NPPF Table 2, less vulnerable uses are appropriate in Flood Zone 3a and the exception test is not required. Furthermore, the Product 4 information supplied by the EA, demonstrates that the site is not at a significant risk of flooding for the 0.5%AEP tidal event or 1%AEP fluvial event, therefore the site can be viewed as Flood Zone 2 for the purpose of this assessment.

With regards to options for Flood Zone 1, there are no available sites in the vicinity of the existing Orchard Theatre that would be suitable for rapid development to accommodate shows from the theatre and are vacant. Furthermore, the existing theatre is at a higher risk of flooding than the proposed temporary site.

This would class this site as acceptable and the sequential test passed

## 7.0 Conclusions and Recommendations

A summary of the main findings of this report are summarised below. This report does not identify any significant sources of flooding posed to the site and the proposed development is appropriate for this location.

- The site is located in Flood Zone 3a, however information contained in the EA's Product 4 data shows that in the current day scenario the site is not at risk of flooding in the 0.5%AEP tidal or 1%AEP fluvial events.
- The site benefits from the river defences of both the Thames and Darent
- The site has little to no risk of the following sources of flooding:
  - Fluvial
  - Pluvial
  - Reservoirs
  - Canals
  - Groundwater
  - Public Sewers
  - Surface Water
- Finished floor levels are also proposed to be 4.95mAOD. This is above the anticipated flood level for all events in the 2014 year of the TE2100 model (0.1%AEP being the highest at 4.84mAOD) & equal to the flood level of the 1% AEP +70%CC. Therefore, this is seen as more than sufficient for a temporary 1 year building.
- The surface water drainage network will be designed to collect and manage surface water from the site and safely dispose of it; as the existing site is undrained and unmanaged, this will provide a betterment and reduction in flood risk.
- A drainage strategy report and layout have been provided, please refer to report 085074-CUR-00-XX-T-C-92000
- In the event of a 1 in 200 year event for the River Darent and Cray, safe access and egress routes would be provided via existing accesses.

## 8.0 Appendices

## Appendix A Proposed Site Drawings





**LEGEND**

- Application Site
- Other Adjoining Land in Applicant's Ownership
- Proposed Temporary Theatre Buildings
- Proposed Asphalt Paving Area
- Existing Asphalt Paving Area
- F/E Proposed Fire Exit Door
- Proposed Ramp (Max 1:12 Gradient)
- Proposed Ramp Landing Area
- Proposed V Mesh Fencing
- Proposed Staff Only Gate
- 1100 Litre Waste Bin
- Wheelie Style Waste Bin
- H Heater (QTY:6)

- NOTES**
1. All dimensions are in metres unless otherwise specified.
  2. The proposed temporary theatre buildings are designed by GL Events UK Ltd.
  3. The Topographical survey information for Orchard Street and Hythe Street is based on the as-built drawing of Co-operative store demolition by John F Hunt Demolition Ltd.

PROJECT CENTRE IS A DESIGNER APPOINTED BY DARTFORD BOROUGH COUNCIL TO PROVIDE ENGINEERING CONSULTANCY SERVICES.

**SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION**  
 In addition to the hazards/risks normally associated with the type of work detailed on this drawing, note the following significant risks and information identified by the designer

**▲ CONSTRUCTION**  
 C001 Existing utilities  
 C002 Working at height above tents  
 C003 Erection of temporary structure under strong wind

**▲ DEMOLITION**  
 --- No significant hazards

**▲ MAINTENANCE & OPERATION**  
 M001 Impact of adverse weather conditions (strong wind, snow, ice) on tent structure  
 M002 Flammable substance in fuel tank

It is assumed that all works be carried out by a competent contractor working to an approved method statement.

0	01/12/2023	ISSUED FOR PLANNING APPLICATION	IC	RT	NP
Rev	Date	Description	Drn	Chk	App

**PROJECT CENTRE**  
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Client  
**DARTFORD BOROUGH COUNCIL**

Project  
DARTFORD ORCHARD WEST TEMPORARY THEATRE

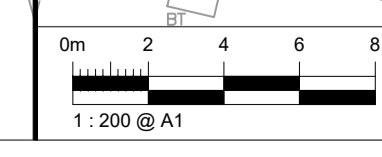
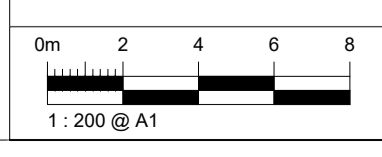
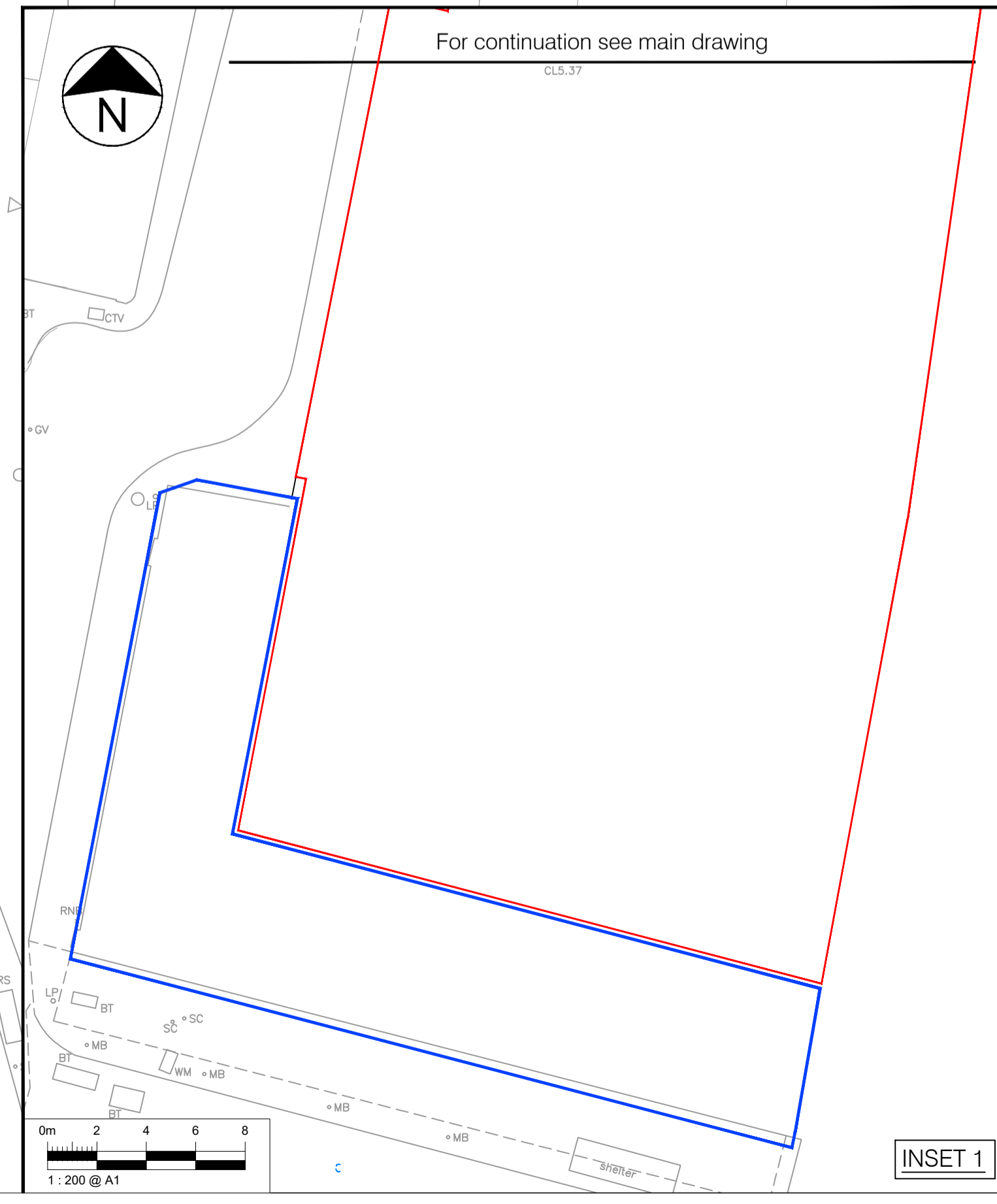
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PROPOSED SITE BLOCK PLAN

Drawing Status  
**FOR APPROVAL**

Drawn	Designed	Date	Scale	Size
IC	RT	Dec 2023	1:200	A1

Drawing No.  
1000009506-4-0100-01

Rev  
0







- NOTES**
- All dimensions are in metres unless otherwise specified.
  - The proposed temporary theatre buildings are designed by GL Events UK Ltd.
  - The Topographical survey information for Orchard Street and Hythe Street is based on the as-built drawing of Co-operative store demolition by John F Hunt Demolition Ltd.

PROJECT CENTRE IS A DESIGNER APPOINTED BY DARTFORD BOROUGH COUNCIL TO PROVIDE ENGINEERING CONSULTANCY SERVICES.

**SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION**  
 In addition to the hazards/risks normally associated with the type of work detailed on this drawing, note the following significant risks and information identified by the designer

**▲ CONSTRUCTION**  
 C001 Existing utilities  
 C002 Working at height above tents  
 C003 Erection of temporary structure under strong wind

**▲ DEMOLITION**  
 --- No significant hazards

**▲ MAINTENANCE & OPERATION**  
 M001 Impact of adverse weather conditions (strong wind, snow, ice) on tent structure  
 M002 Flammable substance in fuel tank

It is assumed that all works be carried out by a competent contractor working to an approved method statement.

Rev	Date	Description	Drn	Chk	App
0	01/12/2023	ISSUED FOR PLANNING APPLICATION	SL	RT	NP



Client  
**DARTFORD BOROUGH COUNCIL**

Project  
 DARTFORD ORCHARD WEST TEMPORARY THEATRE

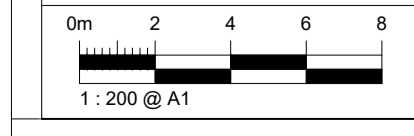
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Drawing Status  
**FOR APPROVAL**

Drawn	Designed	Date	Scale	Size
SL	RT	Dec 2023	1:200	A1

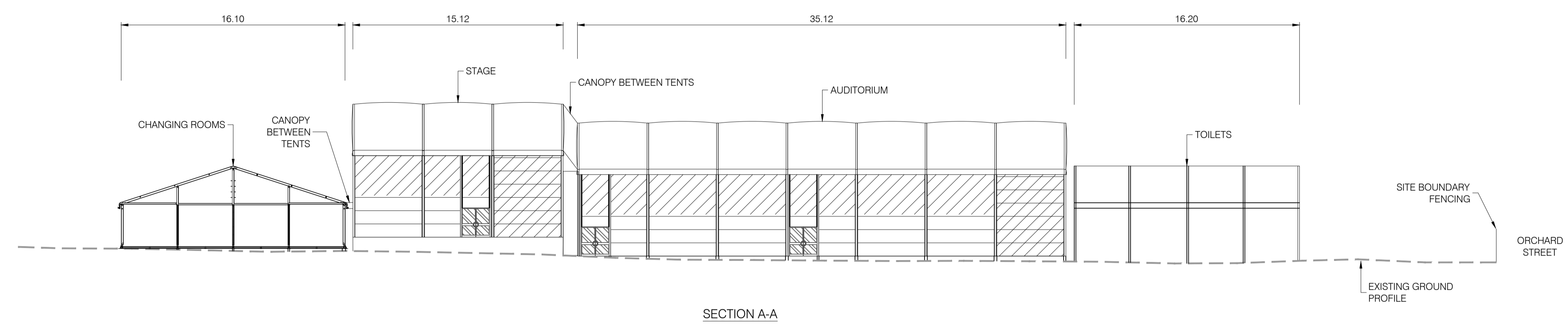
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Rev  
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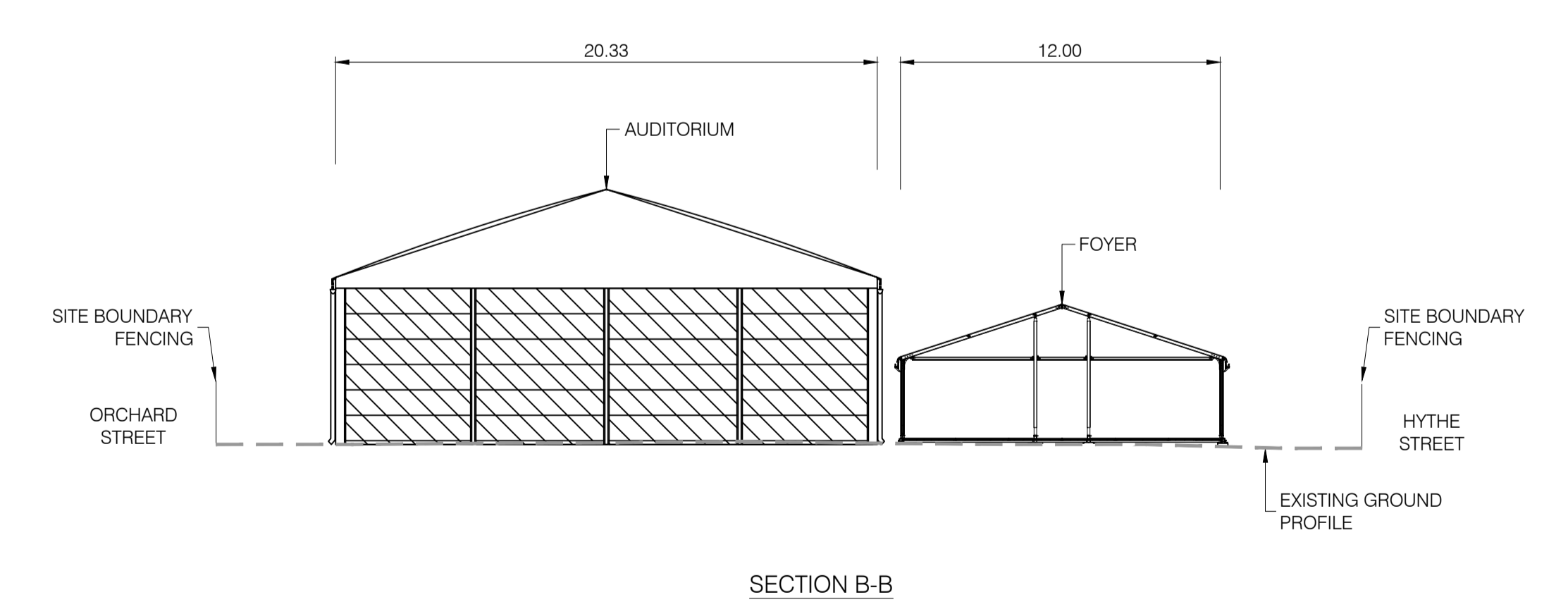




A  
B  
C  
D  
E  
F  
G  
H  
J  
K  
L



SECTION A-A



SECTION B-B



- NOTES**
1. All dimensions are in metres unless otherwise specified.
  2. The proposed temporary theatre buildings are designed by GL Events UK Ltd.
  3. The Topographical survey information for Orchard Street and Hythe Street is based on the as-built drawing of Co-operative store demolition by John F Hunt Demolition Ltd.

PROJECT CENTRE IS A DESIGNER APPOINTED BY DARTFORD BOROUGH COUNCIL TO PROVIDE ENGINEERING CONSULTANCY SERVICES.

Rev	Date	Description	IC	RT	NP
0	01/12/2023	ISSUED FOR PLANNING APPLICATION	IC	RT	NP

**PROJECT CENTRE**  
www.marstonholdings.co.uk/projectcentre

Client  
**DARTFORD BOROUGH COUNCIL**

Project  
DARTFORD ORCHARD WEST TEMPORARY THEATRE

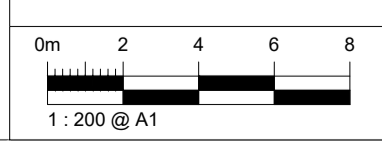
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TYPICAL SECTIONS

Drawing Status  
**FOR APPROVAL**

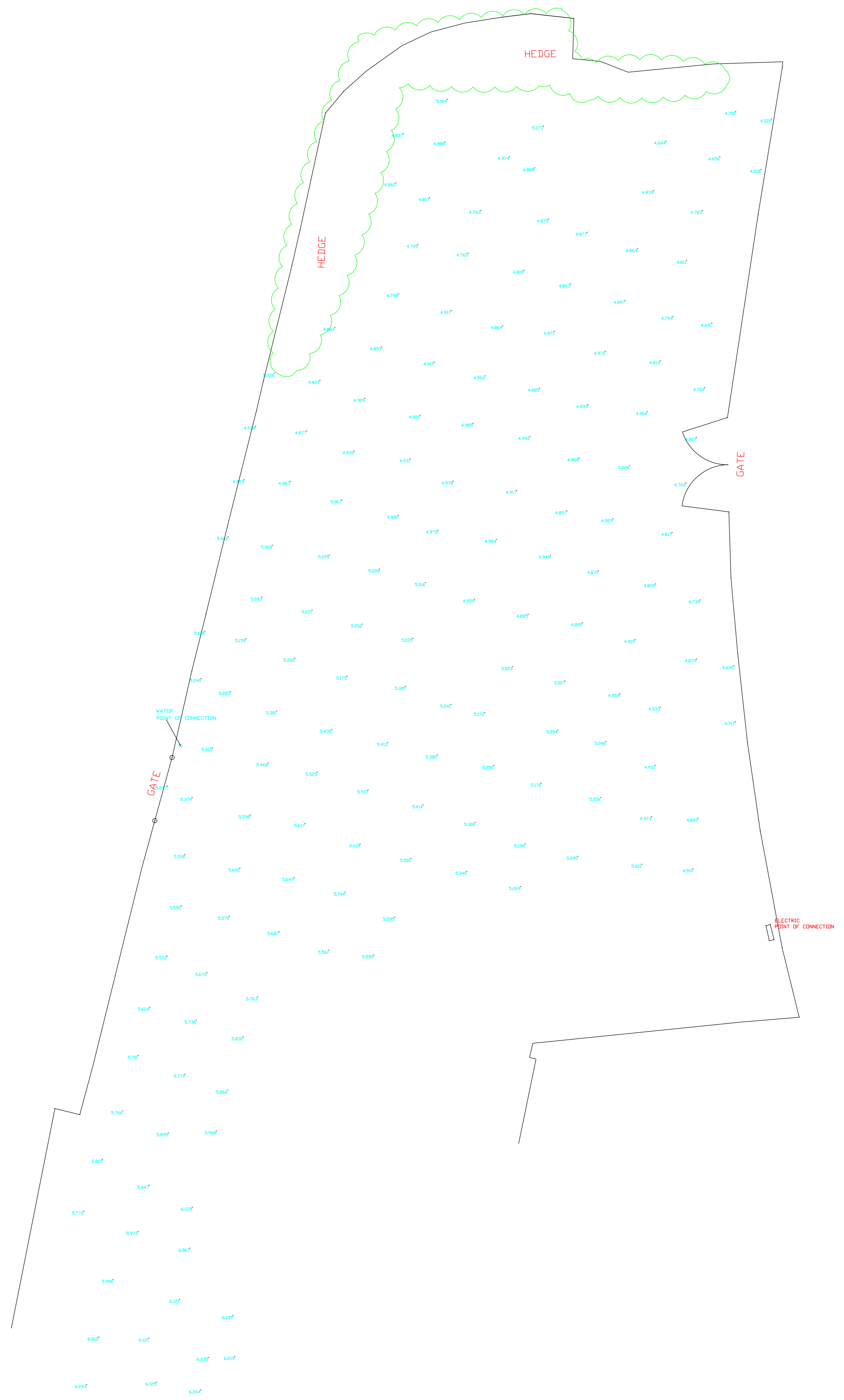
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IC	RT	Dec 2023	1:200	A1

Drawing No.  
1000009506-4-0150-01

Rev  
0



## Appendix B Topographic Survey



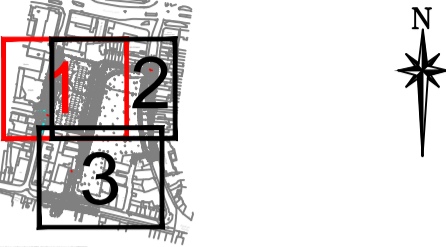
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DARTFORD TOWN CENTRE REGENERATION PHASE 2	
TITLE	
GPS TOPOGRAPHICAL SURVEY	
SCALE	DATE 18.10.2023
DRAWING No.	01

Appendix C GPR Survey



NOTES:

NAVIGATION KEY



UTILITY KEY

- ELECTRIC CABLE
- ELECTRIC & COMMS CABLE
- EARTHING ROD / CABLE
- TRAFFIC SIGNAL CABLE
- TELECOMS CABLE
- CABLE TELEVISION
- COMMUNICATION CABLE
- WATER PIPE
- GAS PIPE
- FOUL DRAINAGE
- CONTAMINATED SURFACE
- SURFACE DRAINAGE
- COMBINED DRAINAGE
- PUMPING MAIN
- FUEL PIPE
- VENT PIPE
- OFFSET FILL PIPE
- GAUGE LINE
- VAPOUR RECOVERY
- HEATING PIPES
- SERVICE DUCTS
- UNIDENTIFIED
- TRENCH SCAR
- GROUND DEPRESSION
- SURVEY BOUNDARY

ABBREVIATIONS

- |      |                                  |       |                    |
|------|----------------------------------|-------|--------------------|
| AC   | ASBESTOS CEMENT                  | LP    | LAMP POST          |
| AR   | ASSUMED ROUTE                    | MH    | MANHOLE            |
| BB   | BASE BEND                        | MW    | MONITORING WELL    |
| BD   | BACKDROP                         | OH    | OVERHEAD           |
| BH   | BORING HOLE                      | OSA   | OFF SURVEY AREA    |
| BR   | BRICK                            | PE    | POLYETHYLENE       |
| BT   | BT INSPECTION CHAMBER            | PL    | PLASTIC            |
| CATV | CATV INSPECTION CHAMBER          | PR    | PIPE RISER         |
| CBX  | CONTROL BOX                      | PVC   | POLYVINYL CHLORIDE |
| CI   | CAST IRON                        | RE    | RODDING EYE        |
| CL   | COVER LEVEL                      | RWP   | RAIN WATER PIPE    |
| CR   | CABLE RISER                      | S/A   | SOAKAWAY           |
| CP   | CATCHPIT                         | SI    | SPUN IRON          |
| D    | DEPTH                            | ST    | STOP TAP           |
| DI   | DUCTILE IRON                     | ST    | STEEL              |
| DP   | DOWN PIPE                        | SV    | SLUICE VALVE       |
| ED   | EMPTY DUCT                       | SVP   | SOIL VENT PIPE     |
| EOSC | END OF TRENCH SCAR               | TE    | TRAPPED EXIT       |
| EOT  | END OF TRACE                     | TRF   | TAKEN FROM RECORD  |
| ER   | EARTHING ROD                     | TL    | TRAFFIC LIGHT      |
| EP   | ELECTRICITY POLE                 | TP    | TELEGRAPH POLE     |
| FH   | FIRE HYDRANT                     | UTCTV | UNABLE TO CCTV     |
| FL   | FLOOD LIGHT                      | UTF   | UNABLE TO FIND     |
| G    | GULLY                            | UTL   | UNABLE TO LIFT     |
| GPR  | GROUND PENETRATING RADAR         | UTS   | UNABLE TO SURVEY   |
| GRP  | GLASS REINFORCED PLASTIC         | VC    | VITRIFIED CLAY     |
| GV   | GAS VALVE                        | VP    | VENT PIPE          |
| HL   | HIGH LEVEL                       | VR    | VAPOUR RECOVERY    |
| HOR  | HEAD OF RUN                      | WM    | WATER METER        |
| IC   | INSPECTION CHAMBER               | WO    | WASH OUT VALVE     |
| IL   | INVERT LEVEL                     |       |                    |
| SWS  | SURFACE WATER SEWER              |       |                    |
| CSWS | CONTAMINATED SURFACE WATER SEWER |       |                    |
| FWS  | FOUL WATER SEWER                 |       |                    |
| CWS  | COMBINED WATER SEWER             |       |                    |

DISCLAIMER

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REV	DATE	COMMENT	CAD

CLIENT: **BWB Consulting**

PROJECT: **Westgate  
Dartford  
DA1 2DJ**

TITLE: **Underground  
Utility Survey**

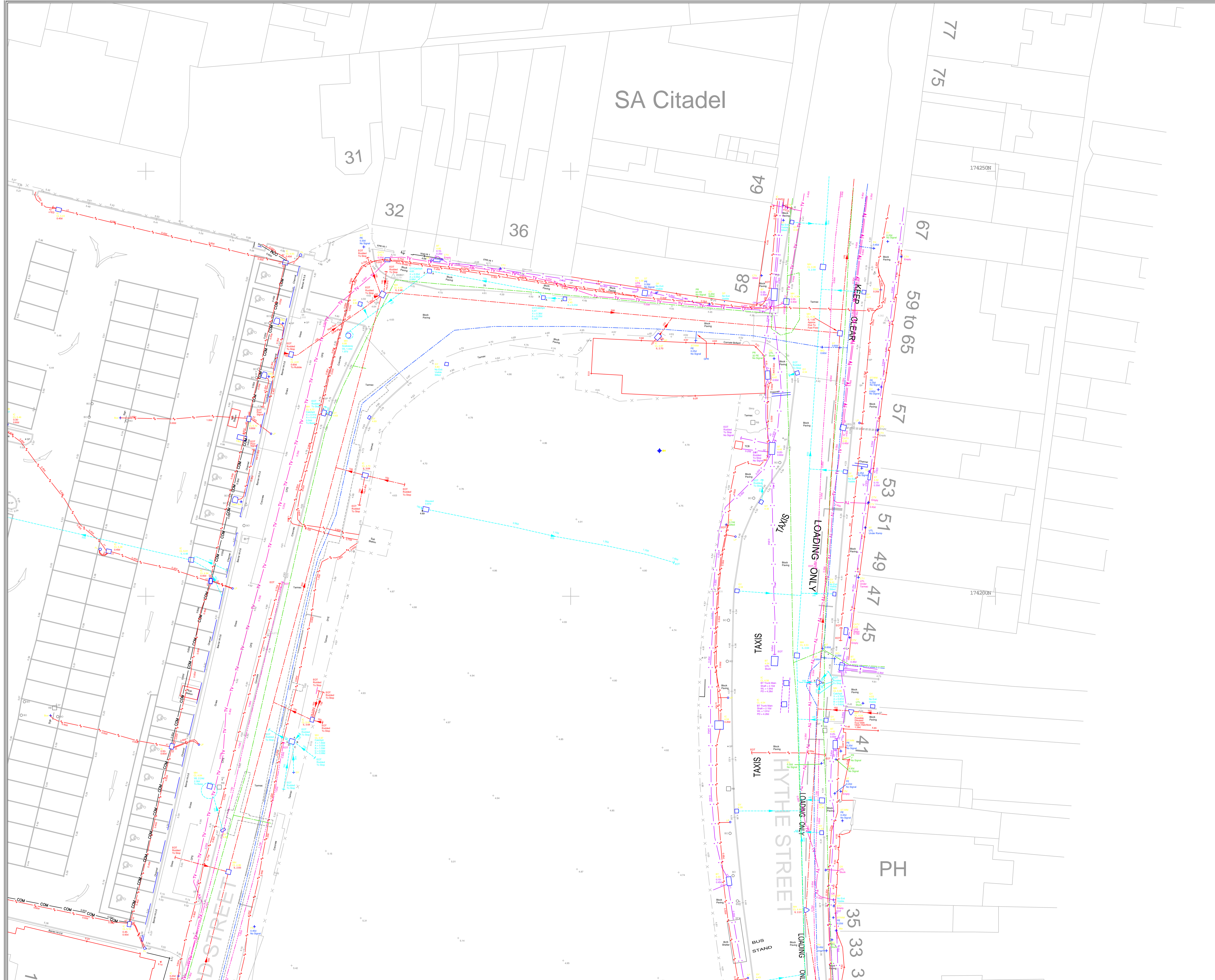
**AMETHYST SURVEYS LIMITED**

Unit 2 Davy Court, Central Park  
Rugby, Warwickshire, CV23 0UZ  
Tel: 01788 566740  
Fax: 01788 571158  
Email: enquiries@amethystsurveys.com  
www.amethystsurveys.com

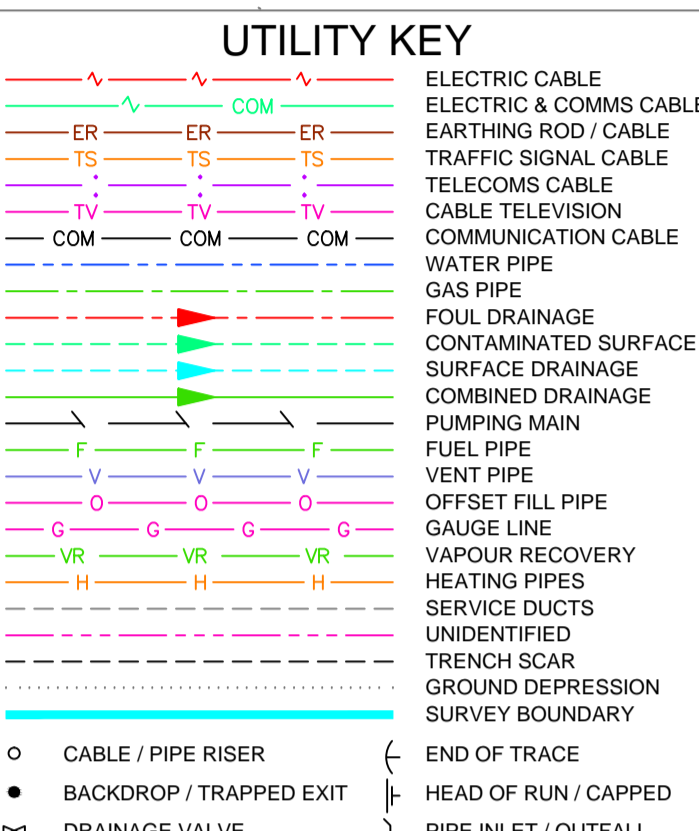
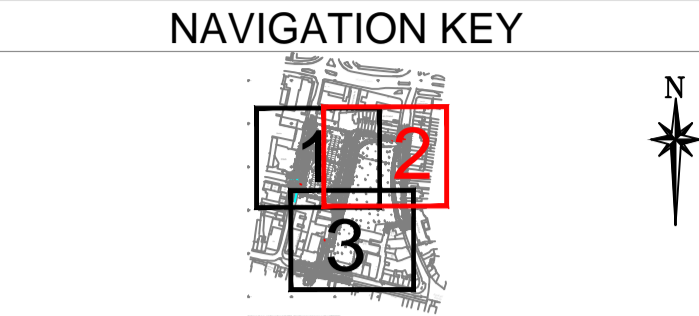
DATE: 11.06.18	JOB No: 13113
DRAWING No: 13113_UG_1	REV: 0
DRAWN: D.OT	SURVEYED: JP
APPROVED: MD	SCALE: 1:200 @ A1







NOTES;



**ABBREVIATIONS**

AC	ASBESTOS CEMENT	LP	LAMP POST
AR	ASSUMED ROUTE	MH	MANHOLE
BB	BASE BEND	MW	MONITORING WELL
BD	BACKDROP	OH	OVERHEAD
BH	BORINGHOLE	OSA	OFF SURVEY AREA
BR	BRICK	PE	POLYETHYLENE
BT	BT INSPECTION CHAMBER	PL	PLASTIC
CATV	CATV INSPECTION CHAMBER	PR	PIPE RISER
CBX	CONTROL BOX	PVC	POLYVINYL CHLORIDE
CI	CAST IRON	RE	RODDING EYE
CL	COVER LEVEL	RWP	RAIN WATER PIPE
CR	CABLE RISER	S/A	SOAKAWAY
CP	CATCHPIT	SI	SPUN IRON
D	DEPTH	ST	STOP TAP
DI	DUCTILE IRON	S.T	STEEL
DP	DOWN PIPE	SV	SLUICE VALVE
ED	EMPTY DUCT	SVP	SOIL VENT PIPE
EOSC	END OF TRENCH SCAR	TE	TRAPPED EXIT
EOT	END OF TRACE	TFR	TAKEN FROM RECORD
ER	EARTHING ROD	TL	TRAFFIC LIGHT
EP	ELECTRICITY POLE	TP	TELEGRAPH POLE
FH	FIRE HYDRANT	UTCCTV	UNABLE TO CCTV
FL	FLOOD LIGHT	UTL	UNABLE TO FIND
G	GULLY	UTL	UNABLE TO LIFT
GPR	GROUND PENETRATING RADAR	UTS	UNABLE TO SURVEY
GRP	GLASS REINFORCED PLASTIC	VC	VITRIFIED CLAY
GV	GAS VALVE	VP	VENT PIPE
HL	HIGH LEVEL	VR	VAPOUR RECOVERY
HOR	HEAD OF RUN	WL	WATER LEVEL
IC	INSPECTION CHAMBER	WM	WATER METER
IL	INVERT LEVEL	WO	WASH OUT VALVE

SWS SURFACE WATER SEWER  
 CSWS CONTAMINATED SURFACE WATER SEWER  
 PWS FOUL WATER SEWER  
 CWS COMBINED WATER SEWER

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REV	DATE	COMMENT	CAD

CLIENT: **BWB Consulting**

PROJECT: **Westgate  
Dartford  
DA1 2DJ**

TITLE: **Underground  
Utility Survey**

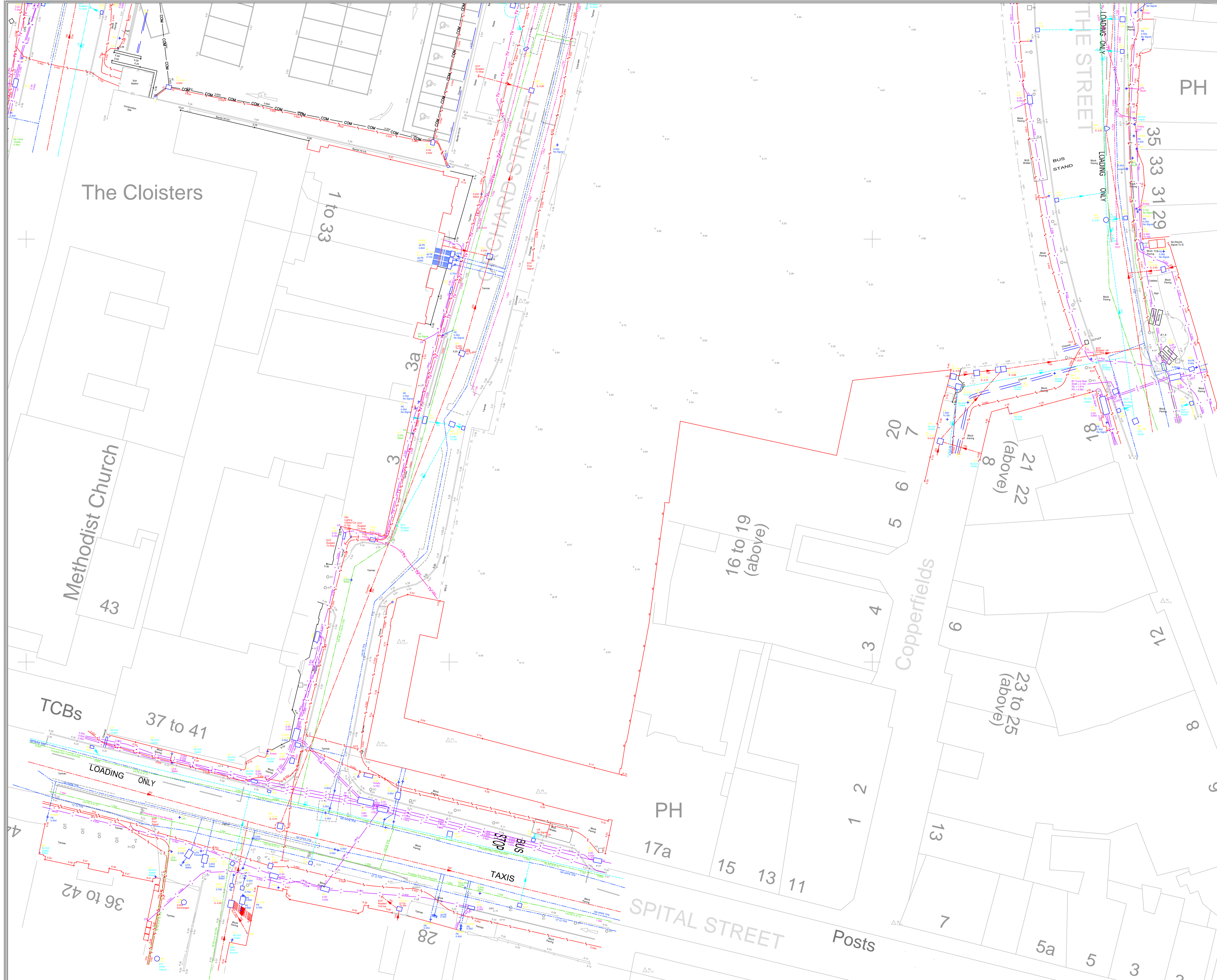
**AMETHYST SURVEYS LIMITED**

Unit 2 Davy Court, Central Park  
Rugby, Warwickshire, CV23 0UZ  
Tel: 01788 566740  
Fax: 01788 571158  
Email: enquiries@amethystsurveys.com  
www.amethystsurveys.com

DATE: 11.06.18	JOB No: 13113
DRAWING No: 13113_UG_2	REV: 0
DRAWN: D.OT	SURVEYED: JP
APPROVED: MD	SCALE: 1:200 @ A1







NOTES:

NAVIGATION KEY



UTILITY KEY

- ELECTRIC CABLE
- ELECTRIC & COMMS CABLE
- EARTHING ROD / CABLE
- TRAFFIC SIGNAL CABLE
- TELECOMS CABLE
- CABLE TELEVISION
- COMMUNICATION CABLE
- WATER PIPE
- GAS PIPE
- FOUL DRAINAGE
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- COMBINED DRAINAGE
- PUMPING MAIN
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- VENT PIPE
- OFFSET FILL PIPE
- GAUGE LINE
- VAPOUR RECOVERY
- HEATING PIPES
- SERVICE DUCTS
- UNIDENTIFIED
- TRENCH SCAR
- GROUND DEPRESSION
- SURVEY BOUNDARY

ABBREVIATIONS

- |      |                                  |        |                    |
|------|----------------------------------|--------|--------------------|
| AC   | ASBESTOS CEMENT                  | LP     | LAMP POST          |
| AR   | ASSUMED ROUTE                    | MH     | MANHOLE            |
| BB   | BASE BEND                        | MW     | MONITORING WELL    |
| BD   | BACKDROP                         | OH     | OVERHEAD           |
| BH   | BOREHOLE                         | OSA    | OFF SURVEY AREA    |
| BR   | BRICK                            | PE     | POLYETHYLENE       |
| BT   | BT INSPECTION CHAMBER            | PL     | PLASTIC            |
| CATV | CATV INSPECTION CHAMBER          | PR     | PIPE RISER         |
| CBX  | CONTROL BOX                      | PVC    | POLYVINYL CHLORIDE |
| CI   | CAST IRON                        | RE     | RODDING EYE        |
| CL   | COVER LEVEL                      | RWP    | RAIN WATER PIPE    |
| CR   | CABLE RISER                      | S/A    | SOAKAWAY           |
| CP   | CATCHPIT                         | SI     | SPUN IRON          |
| D    | DEPTH                            | ST     | STOP TAP           |
| DI   | DUCTILE IRON                     | S.T    | STEEL              |
| DP   | DOWN PIPE                        | SV     | SLUICE VALVE       |
| ED   | EMPTY DUCT                       | SVP    | SOIL VENT PIPE     |
| EOSC | END OF TRENCH SCAR               | TE     | TRAPPED EXIT       |
| EOT  | END OF TRACE                     | TFR    | TAKEN FROM RECORD  |
| ER   | EARTHING ROD                     | TL     | TRAFFIC LIGHT      |
| EP   | ELECTRICITY POLE                 | TP     | TELEGRAPH POLE     |
| FH   | FIRE HYDRANT                     | UTCCTV | UNABLE TO CCTV     |
| FL   | FLOOD LIGHT                      | UNF    | UNABLE TO FIND     |
| G    | GULLY                            | UNL    | UNABLE TO LIFT     |
| GPR  | GROUND PENETRATING RADAR         | UTS    | UNABLE TO SURVEY   |
| GRP  | GLASS REINFORCED PLASTIC         | VC     | VITRIFIED CLAY     |
| GV   | GAS VALVE                        | VP     | VENT PIPE          |
| HL   | HIGH LEVEL                       | VR     | VAPOUR RECOVERY    |
| HOR  | HEAD OF RUN                      | WL     | WATER LEVEL        |
| IC   | INSPECTION CHAMBER               | WM     | WATER METER        |
| IL   | INVERT LEVEL                     | WO     | WASH OUT VALVE     |
| SWS  | SURFACE WATER SEWER              |        |                    |
| CSWS | CONTAMINATED SURFACE WATER SEWER |        |                    |
| PWS  | FULL WATER SEWER                 |        |                    |
| CWS  | COMBINED WATER SEWER             |        |                    |

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CLIENT: **BWB Consulting**

PROJECT: **Westgate  
Dartford  
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TITLE: **Underground  
Utility Survey**

**AMETHYST SURVEYS LIMITED**

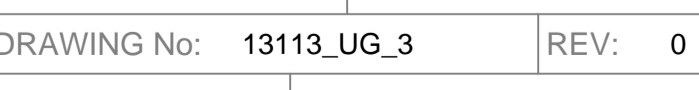
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Tel: 01788 566740  
Fax: 01788 571158  
Email: enquiries@amethystsurveys.com  
www.amethystsurveys.com

DATE: 11.06.18 JOB No: 13113

DRAWING No: 13113\_UG\_3 REV: 0

DRAWN: D.OT SURVEYED: JP

APPROVED: MD SCALE: 1:200 @ A1



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## Appendix D EA Product 4

Product 4 (Detailed Flood Risk) for: Orchard Street, Dartford, Kent DA1 2DH

Requested by: Michael Smith, Curtins

Reference: KSL 332826 LMB

Date: 20 November 2023

## Contents

- Flood Map for Planning (Rivers and Sea)
- Flood Map Extract
- Thames Estuary 2100 (TE2100)
- Thames Tidal Downriver Breach Inundation Modelling 2018
- Thames Tidal Downriver Breach Inundation Modelling Map
- Model Output Data – Darent & Cray 2019
- Modelled Flood Outlines Map – Darent & Cray 2019
- Site Node Locations Map
- Defence Details
- Recorded Flood Events Data
- Recorded Flood Events Outlines Map
- Additional Information

The information provided is based on the best data available as of the date of this letter.

You may feel it is appropriate to contact our office at regular intervals, to check whether any amendments/ improvements to the data for this location have been made. Should you re-contact us after a period of time, please quote the above reference in order to help us deal with your query.

Please refer to the [Open Government Licence](#) which explains the permitted use of this information.

## Flood Map for Planning (Rivers and Sea)

### **The Flood Map:**

Our Flood Map shows the natural floodplain for areas at risk from river and tidal flooding. The floodplain is specifically mapped ignoring the presence and effect of defences (including any tidal barriers). Although flood defences reduce the risk of flooding they cannot completely remove that risk as they may be over topped or breached during a flood event.

The Flood Map indicates areas with a 1% (0.5% in tidal areas), Annual Exceedance Probability (AEP) - the probability of a flood of a particular magnitude, or greater, occurring in any given year, and a 0.1% AEP of flooding from rivers and/or the sea in any given year. In addition, the map also shows the location of some flood defences.

The Flood Map is intended to act as a guide to indicate the potential risk of flooding. When producing it we use the best data available to us at the time and also take into account historic flooding and local knowledge. The Flood Map is updated on a quarterly basis to account for any amendments required. These amendments are then displayed on the internet at <https://www.gov.uk/check-flood-risk>

### **At this Site:**

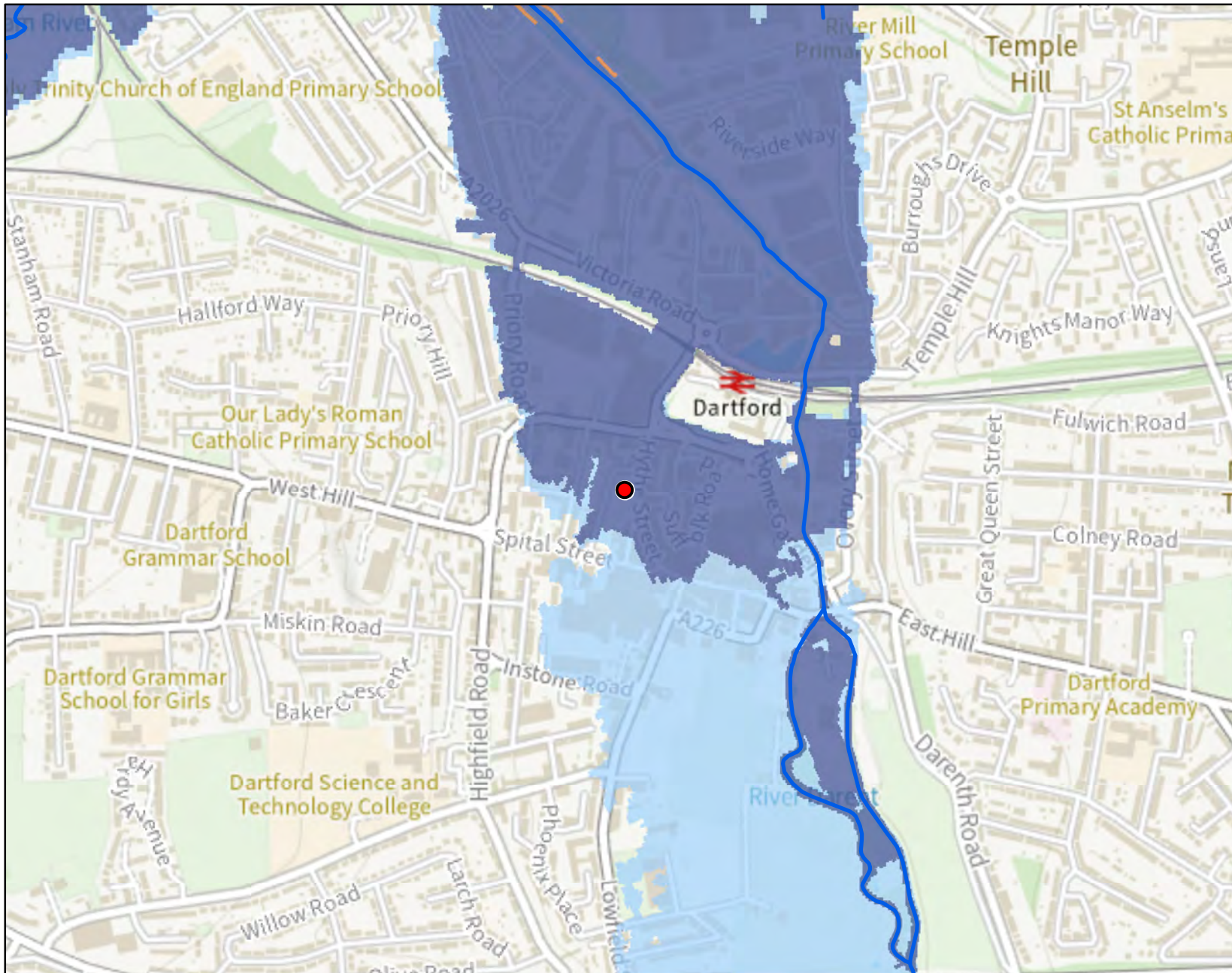
The Flood Map shows that this site lies within the outline of Flood Zone 3. This zone comprises land assessed as having a 0.5% (1 in 200) or greater annual probability of tidal flooding.

Enclosed is an extract of our Flood Map which shows this information for your area.

### **Method of production**

The Flood Map at this location has been derived using detailed modelling of the tidal River Thames through the North Kent Coastal Modelling study completed in 2018 by JBA Consulting.

# Flood Map for Planning centred on DA1 2DH created 20 November 2023 [Ref: KSL 332826 LMB]



Scale 1: 10,000



## Legend

- Site Location
- Main Rivers
- Flood Zone 3
- Flood Zone 2
- Flood Defences

## Flood Map for Planning (assuming no defences)

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

- from the sea with a 0.5% or greater chance of occurring each year
- from a river with a 1% or greater chance of occurring each year.

**Flood Zone 2** shows the extent of an extreme flood from rivers or the sea with up to a 0.1% chance of occurring each year.

## Thames Estuary 2100 (TE2100)

You have requested in-channel flood levels for the tidal river Thames. These have been taken from the Thames Estuary 2100 study completed by HR Wallingford in 2008. The modelled node closest to your site is **3.17**; the locations of nearby nodes are also shown on the enclosed map.

### Details about the TE2100 plan

The Plan sets out how the Environment Agency and our partners can work together to manage tidal flood risk, from now until the end of the century. The Plan covers the Thames Estuary from Teddington in the west to the mouth of the estuary at Shoeburyness (north bank) and Sheerness (south bank) in the east. It is an adaptive plan for managing the estuary, including the tidal defence system, until 2100 so that current standards of flood protection are maintained or improved taking into account climate change effects e.g. sea level rise. The Plan has 3 phases of activity:

- Until 2035 – maintain and improve current defences, safeguard areas required for future improvements, and monitor climate change indicators.
- 2035-2050 – raise existing walls, defences & smaller barriers whilst reshaping the riverside environment.
- 2050-2100 – determine and implement an option for the future of the Thames Barrier, and adapt other defences as required to work alongside this to protect the estuary.

The Thames Estuary 2100 Plan can be found at: <https://www.gov.uk/government/publications/thamesestuary-2100-te2100>

### Details about the TE2100 in-channel levels

The TE2100 in-channel levels take into account operation of the Thames Barrier when considering future levels. The Thames Barrier requires regular maintenance and with additional closures the opportunity for maintenance will be reduced. When this happens, river levels – for which the Barrier would normally shut for the 2008 epoch – will have to be allowed through to ensure that the barrier is not shut too often. For this reason, levels upriver of the barrier will increase and the tidal walls will need to be raised to match.

For further information about the Thames Barrier please visit our website at:

<https://www.gov.uk/the-thames-barrier>

### Where to find the in-channel levels and defence crest level data from the 2008 TE2100 study

The TE2100 in-channel levels and defence crest levels documents can be downloaded from ShareFile at the following link:

<https://ea.sharefile.com/d-s5e564014724448219331e780c91c4ac2>

- Upriver of the Thames Barrier – is detailed within Table 6.1 (page 44) of the document titled '*Thames Estuary 2100, Improvements to Flood Risk Management System, Design Water Levels and Future Defence Crest Levels, May 2015*'.
- Downriver of the Thames Barrier is detailed within Table 7.1 (page 56) of the document titled '*Thames Estuary 2100, Improvements to Flood Risk Management System, Design Water Levels and Future Defence Crest Levels, May 2015*'. Defence raising for other barrier options can also be found in the document titled '*Thames Estuary 2100, Phase 3 Studies, Topic 1.5, Phase 3 Set 2 Estuary Wide Options Hydraulic modelling, December 2008*'



## Thames Tidal Downriver Breach Inundation Modelling - 2018

The table below displays site-specific modelled flood levels at your site. These have been taken from the Downriver Breach Inundation Modelling Study 2018 completed by Atkins Ltd. in May 2018.

We have developed a modelling approach where all downriver breach locations along the Thames are equitably modelled, to ensure a consistent approach across London. This modelling simulates continuous tidal breaches along the entire extent of the Thames between the Thames Barrier and east of Gravesend on the south bank and east of Tilbury on the north bank. For hard and composite defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, the defence breach scour distance was assumed to extend into the floodplain by the same distance as the breach width.

Based on the 2008 TE2100 in-channel levels, the 0.5% (1 in 200 year) and 0.1% (1 in 1000 year) annual probability of exceedance tidal events were modelled for all breach locations downriver of the Thames Barrier. These were modelled for the 2014 year epoch (current year), as well as 2115 epoch which include allowances for climate change.

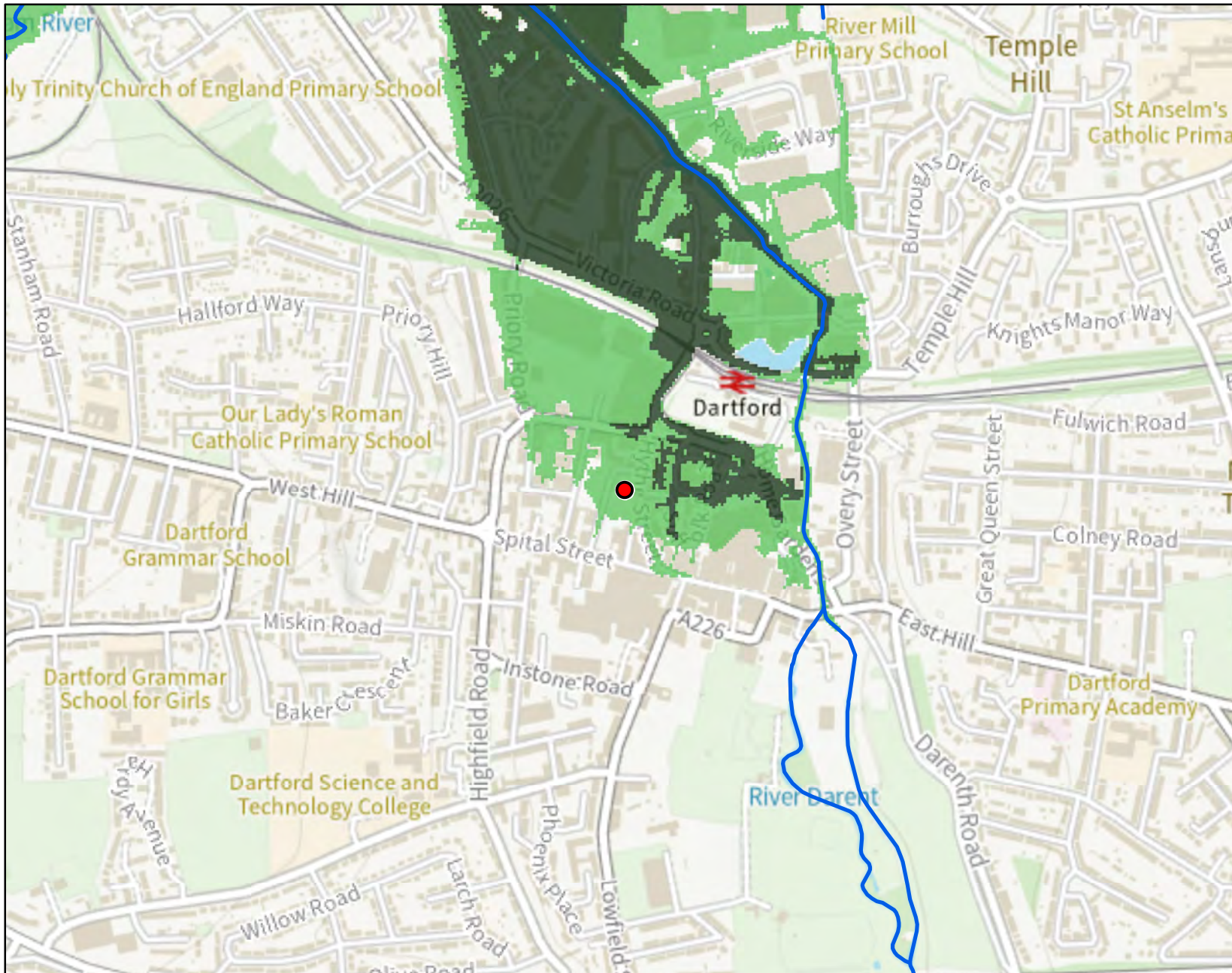
This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within London.

Node	National Grid Reference		Modelled levels in mAODN for 0.5% AEP		Modelled levels in mAODN for 0.1% AEP	
	Easting	Northing	2014	2115	2014	2115
1	554048	174167	Nil return	5.32	Nil return	5.41
2	554060	174139	Nil return	Nil return	Nil return	5.41
3	554072	174117	Nil return	Nil return	Nil return	Nil return
4	554055	174202	Nil return	5.32	Nil return	5.41
5	554074	174176	Nil return	5.32	Nil return	5.41
6	554083	174156	Nil return	5.32	Nil return	5.41
7	554093	174130	Nil return	Nil return	Nil return	5.41
8	554077	174232	Nil return	5.32	4.84	5.41
9	554087	174208	Nil return	5.32	4.84	5.41
10	554099	174179	Nil return	5.32	4.84	5.41

<b>11</b>	554113	174144	Nil return	5.32	Nil return	5.41
<b>12</b>	554128	174234	Nil return	5.32	4.84	5.41
<b>13</b>	554113	174218	Nil return	5.32	4.84	5.41
<b>14</b>	554115	174199	Nil return	5.32	4.84	5.41
<b>15</b>	554131	174189	Nil return	5.32	4.84	5.41
<b>16</b>	554124	174165	Nil return	5.32	4.84	5.41
<b>17</b>	554131	174133	Nil return	5.32	4.84	5.41



# Downriver Breach Modelling Map centred on DA1 2DH created 20 November 2023 [Ref: KSL 332826 LMB]



Scale 1: 10,000



## Legend

● Site Location

— Main Rivers

### Downriver 0.5% AEP Outlines

#### Epoch

2014 (Current year)

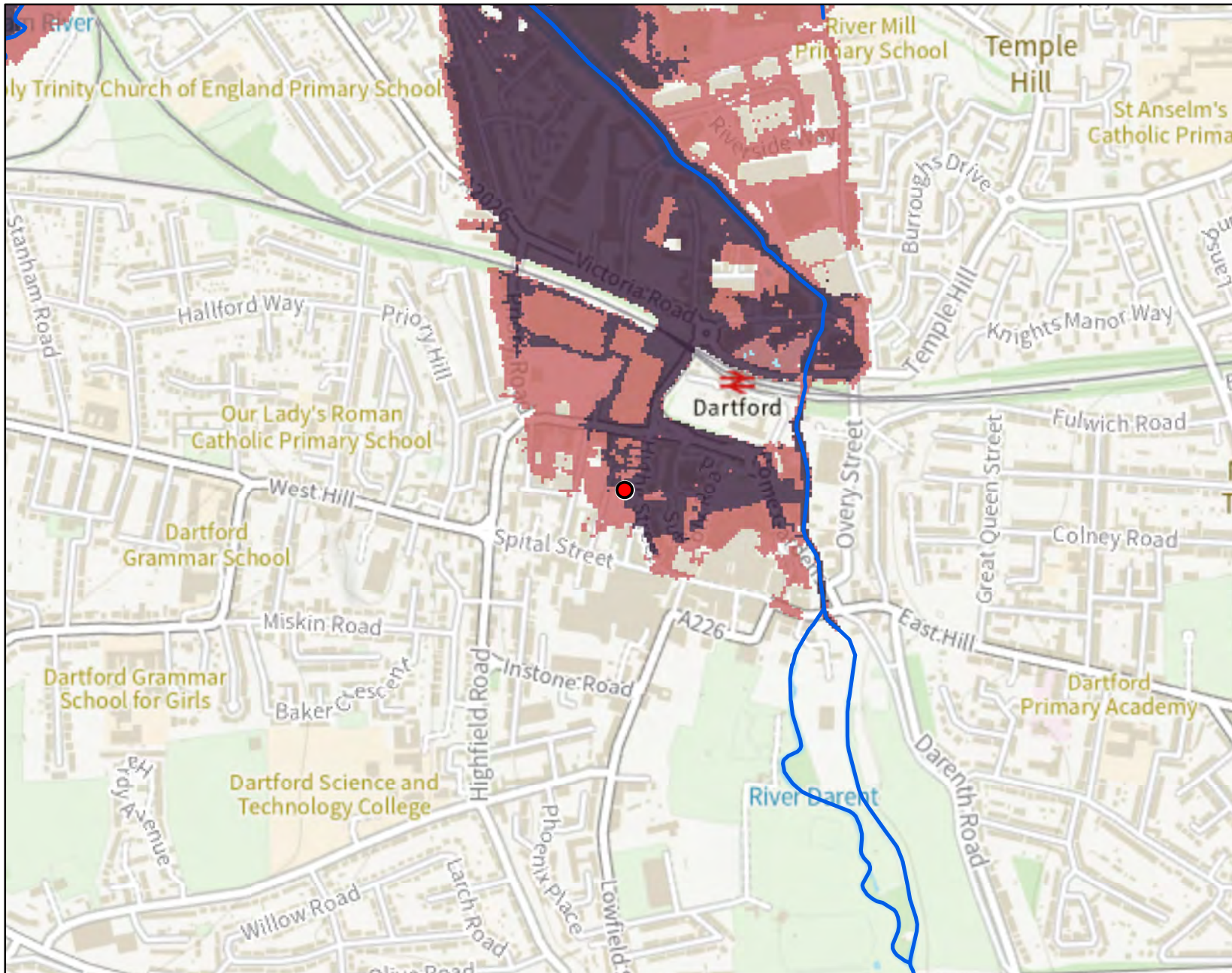
2115

### Thames Tidal Downriver Breach Inundation Modelling 2018

A modelled representation of all tidal breach locations along the Thames from the Thames Barrier to Gravesend, based on low floodplain topography. For hard and composite defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, the defence breach scour distance was assumed to extend into the floodplain by the same distance as the breach width. The modelling is based on the 2008 TE2100 in-channel levels, with an allowance for climate change for epoch 2115.



# Downriver Breach Modelling Map centred on DA1 2DH created 20 November 2023 [Ref: KSL 332826 LMB]



Scale 1: 10,000



## Legend

● Site Location

— Main Rivers

## Downriver 0.1% AEP Outlines

### Epoch

■ 2014 (Current year)

■ 2115

## Thames Tidal Downriver Breach Inundation Modelling 2018

A modelled representation of all tidal breach locations along the Thames from the Thames Barrier to Gravesend, based on low floodplain topography. For hard and composite defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, the defence breach scour distance was assumed to extend into the floodplain by the same distance as the breach width. The modelling is based on the 2008 TE2100 in-channel levels, with an allowance for climate change for epoch 2115.

## Model Output Data

You have requested flood levels for various return periods at this location.

Using a 2D TuFLOW model the floodplain has been represented as a grid. The flood water levels have been calculated for each grid cell.

The modelled flood levels for the closest most appropriate model grid cells, any additional information you may need to know about the modelling from which they are derived and/or any specific use or health warning for their use are set out below.

A map showing the location of the points from which the data is taken is enclosed. Please note you should read the notice enclosed for your specific use rights.

This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites.

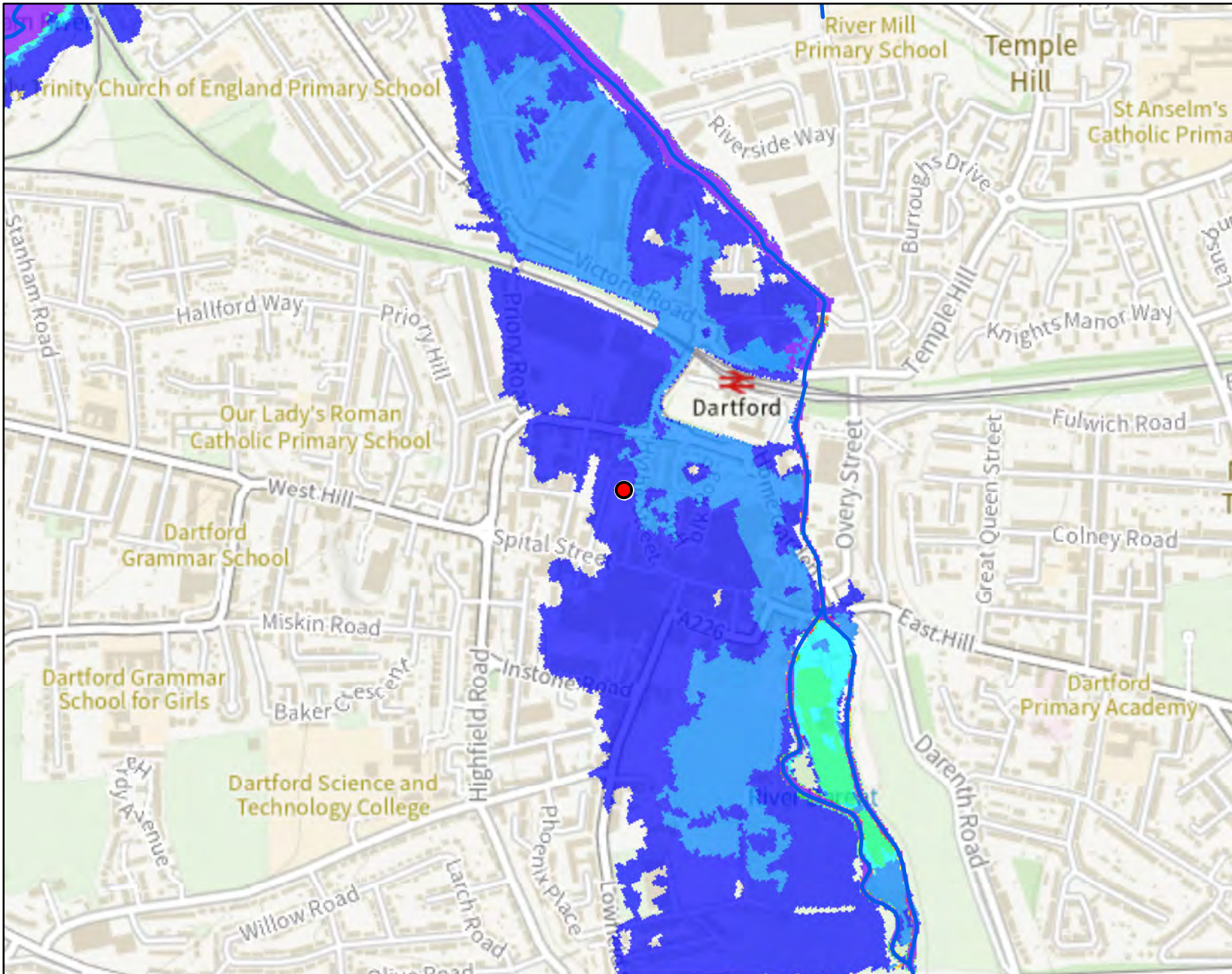
**Table 1:** Modelled **defended** levels in metres above Ordnance Datum Newlyn (m AODN), for various Annual Exceedance Probabilities (AEP).

Node	Easting	Northing	20% AEP	10% AEP	5% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
1	554048	174167	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	5.39
2	554060	174139	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	5.42
3	554072	174117	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	5.53
4	554055	174202	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	5.39
5	554074	174176	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	5.39
6	554083	174156	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	5.40
7	554093	174130	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	5.40
8	554077	174232	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	5.39
9	554087	174208	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	5.39
10	554099	174179	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	5.40
11	554113	174144	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	5.40
12	554128	174234	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	4.56	5.39
13	554113	174218	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	5.39
14	554115	174199	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	4.56	5.40
15	554131	174189	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	4.56	5.40
16	554124	174165	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	4.56	5.40
17	554131	174133	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	4.56	5.41

Data taken from the River Darent and Cray modelling in March 2019 by JBA Consulting.



**Modelled Defended Extents centred on DA1 2DH created 20 November 2023**  
**[Ref: KSL 332826 LMB]**



Scale 1: 10,000



**Legend**

- Site Location
- Main Rivers

**Maximum Defended Flood Extents**

**AEP (%)**

- 20% AEP Extent
- 10% AEP Extent
- 5% AEP Extent
- 3.33% AEP Extent
- 2% AEP Extent
- 1.33% AEP Extent
- 1% AEP Extent
- 0.5% AEP Extent
- 0.1% AEP Extent

AEP = Annual Exceedance Probability  
 The probability of a flood of a particular magnitude, or greater, occurring in any given year.

**Table 2:** Modelled **defended climate change** levels in metres above Ordnance Datum Newlyn (m AODN), for various Annual Exceedance Probabilities (AEP).

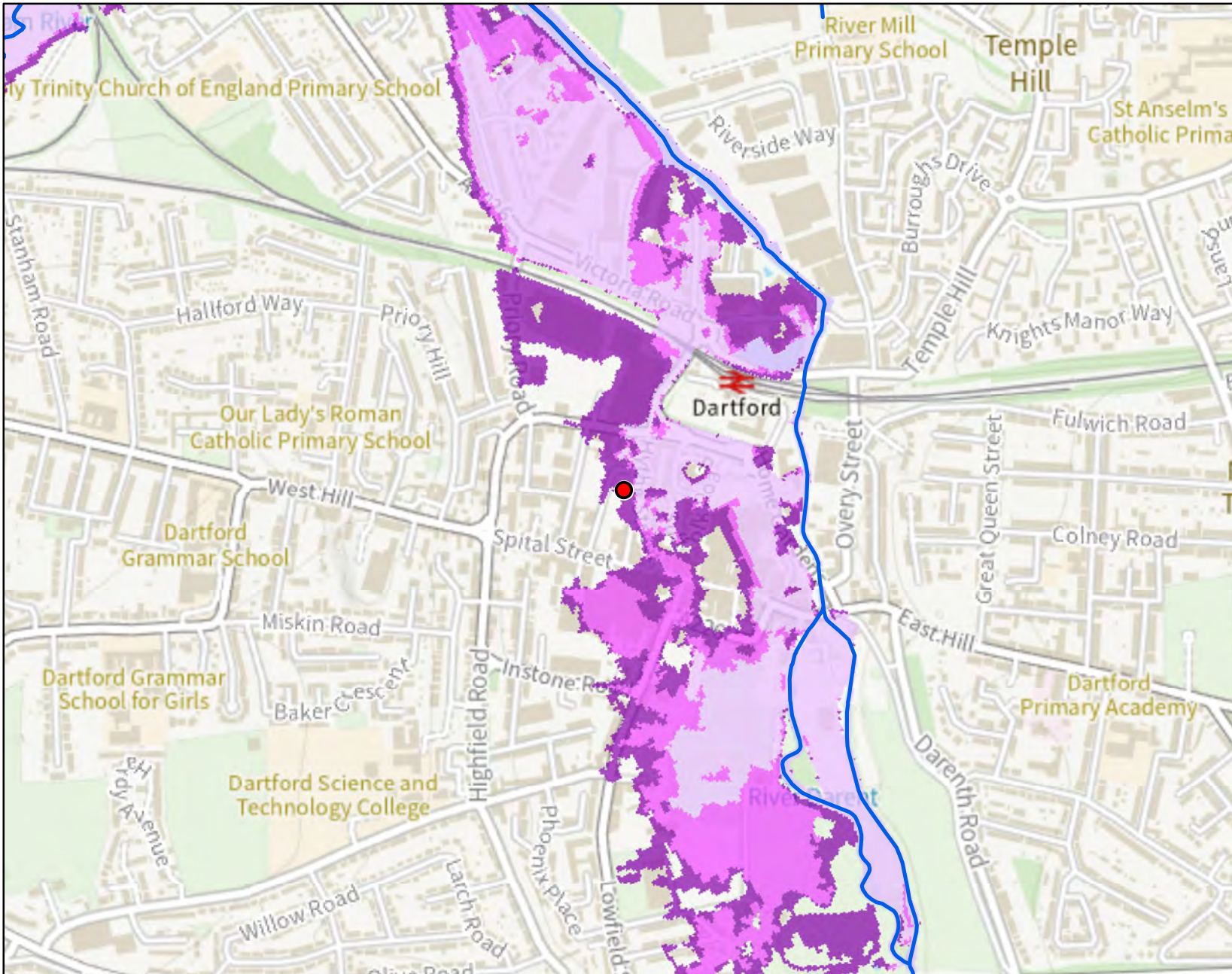
Node	Easting	Northing	1% AEP + CC (25%)	1% AEP + CC (35%)	1% AEP + CC (70%)
1	554048	174167	Nil return	Nil return	Nil return
2	554060	174139	Nil return	Nil return	Nil return
3	554072	174117	Nil return	Nil return	Nil return
4	554055	174202	Nil return	Nil return	Nil return
5	554074	174176	Nil return	Nil return	Nil return
6	554083	174156	Nil return	Nil return	4.96
7	554093	174130	Nil return	Nil return	Nil return
8	554077	174232	Nil return	Nil return	4.95
9	554087	174208	Nil return	Nil return	4.95
10	554099	174179	Nil return	Nil return	4.95
11	554113	174144	Nil return	Nil return	4.96
12	554128	174234	4.56	4.61	4.95
13	554113	174218	Nil return	Nil return	4.95
14	554115	174199	4.56	4.61	4.95
15	554131	174189	4.56	4.61	4.95
16	554124	174165	4.56	4.61	4.96
17	554131	174133	4.56	4.61	4.96

Climate change (CC) data represents modelled levels with a 25%, 35% and 70% increase in river flows.

Data taken from the River Darent and Cray modelling in March 2019 by JBA Consulting.



**Modelled Defended Climate Change Extents centred on DA1 2DH created 20 November 2023**  
**[Ref: KSL 332826 LMB]**



Scale 1: 10,000



**Legend**

- Site Location
- Main Rivers

**Maximum Defended CC Flood Extents**

**AEP (%)**

- 1% AEP + 25% Extent
- 1% AEP + 35% Extent
- 1% AEP + 70% Extent

AEP = Annual Exceedance Probability  
 The probability of a flood of a particular magnitude, or greater, occurring in any given year.

**Table 3:** Modelled **undefended** levels in metres above Ordnance Datum Newlyn (m AODN), for various Annual Exceedance Probabilities (AEP).

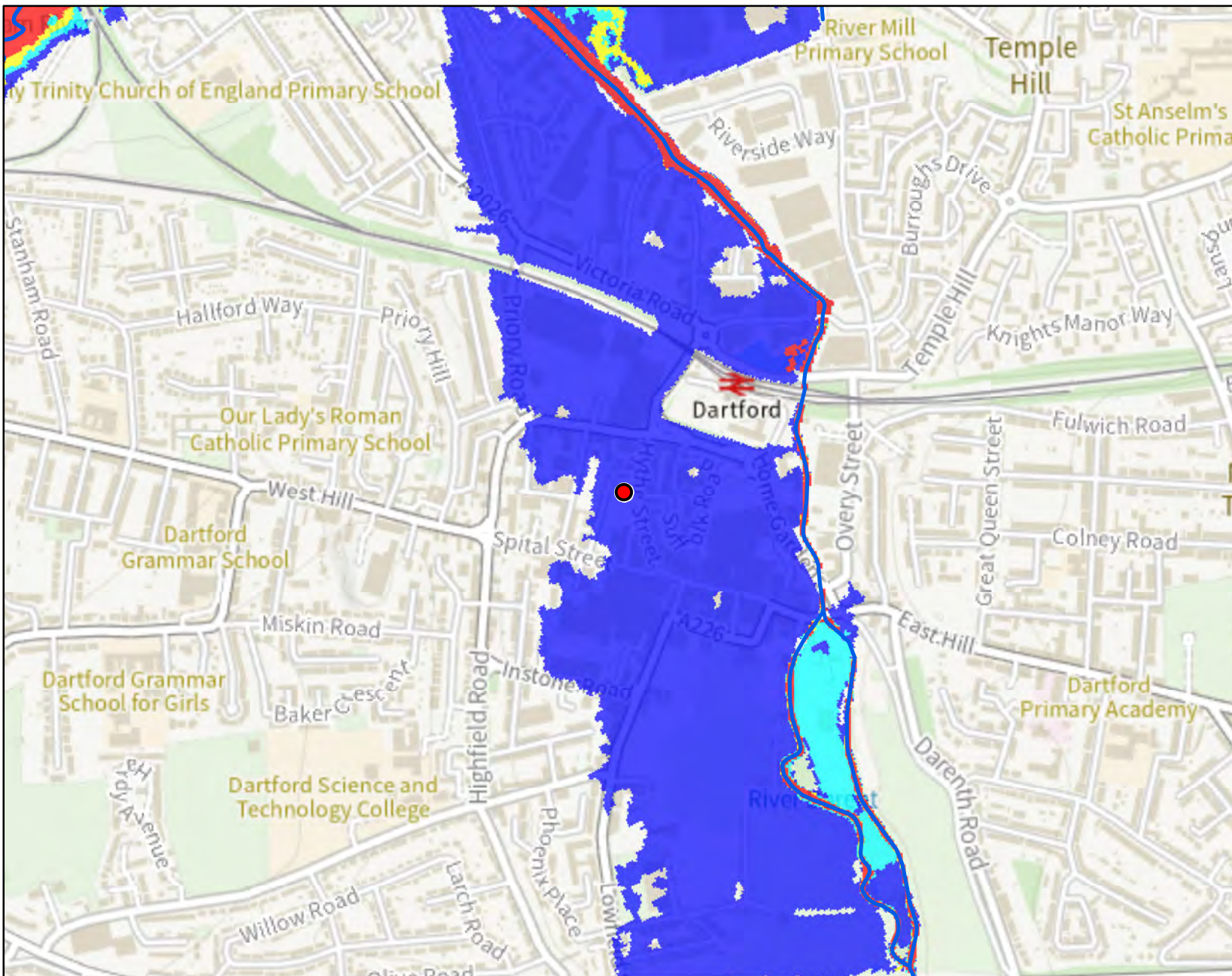
Node	Easting	Northing	10% AEP	3.33% AEP	1% AEP	0.1% AEP
1	554048	174167	Nil return	Nil return	Nil return	5.40
2	554060	174139	Nil return	Nil return	Nil return	5.42
3	554072	174117	Nil return	Nil return	Nil return	5.53
4	554055	174202	Nil return	Nil return	Nil return	5.40
5	554074	174176	Nil return	Nil return	Nil return	5.40
6	554083	174156	Nil return	Nil return	Nil return	5.40
7	554093	174130	Nil return	Nil return	Nil return	5.41
8	554077	174232	Nil return	Nil return	Nil return	5.39
9	554087	174208	Nil return	Nil return	Nil return	5.40
10	554099	174179	Nil return	Nil return	Nil return	5.40
11	554113	174144	Nil return	Nil return	Nil return	5.41
12	554128	174234	Nil return	Nil return	Nil return	5.39
13	554113	174218	Nil return	Nil return	Nil return	5.40
14	554115	174199	Nil return	Nil return	Nil return	5.40
15	554131	174189	Nil return	Nil return	Nil return	5.40
16	554124	174165	Nil return	Nil return	Nil return	5.41
17	554131	174133	Nil return	Nil return	Nil return	5.42

Data taken from the River Darent and Cray modelling in March 2019 by JBA Consulting.



# Modelled Undefended Extents centred on DA1 2DH created 20 November 2023

[Ref: KSL 332826 LMB]



Scale 1: 10,000



## Legend

- Site Location
- Main Rivers

## Maximum Undefended Flood Extents

### AEP (%)

- 10% AEP extent
- 3.33% AEP extent
- 1% AEP extent
- 0.1% AEP extent

AEP = Annual Exceedance Probability  
The probability of a flood of a particular magnitude, or greater, occurring in any given year.

**Table 4:** Modelled **undefended climate change** levels in metres above Ordnance Datum Newlyn (m AODN), for various Annual Exceedance Probabilities (AEP).

Node	Easting	Northing	1% AEP + CC (25%)	1% AEP + CC (35%)	1% AEP + CC (70%)
1	554048	174167	Nil return	Nil return	Nil return
2	554060	174139	Nil return	Nil return	Nil return
3	554072	174117	Nil return	Nil return	Nil return
4	554055	174202	Nil return	Nil return	Nil return
5	554074	174176	Nil return	Nil return	Nil return
6	554083	174156	Nil return	Nil return	4.96
7	554093	174130	Nil return	Nil return	Nil return
8	554077	174232	Nil return	Nil return	4.95
9	554087	174208	Nil return	Nil return	4.95
10	554099	174179	Nil return	Nil return	4.95
11	554113	174144	Nil return	Nil return	4.96
12	554128	174234	4.56	4.62	4.95
13	554113	174218	Nil return	Nil return	4.95
14	554115	174199	4.56	4.62	4.95
15	554131	174189	4.56	4.63	4.95
16	554124	174165	4.56	4.63	4.95
17	554131	174133	4.56	4.63	4.96

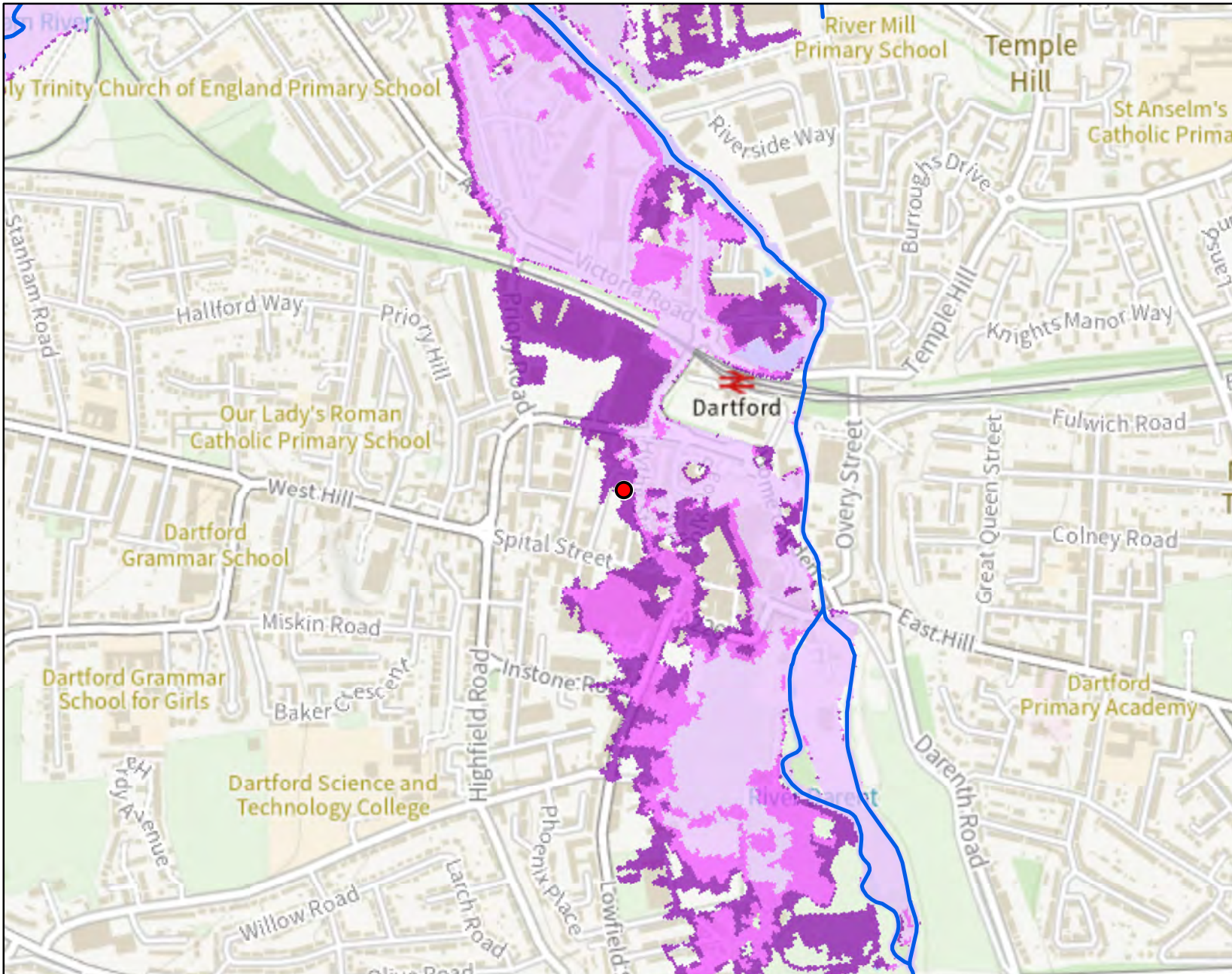
Climate change (CC) data represents modelled levels with a 25%, 35% and 70% increase in river flows.

Data taken from the River Darent and Cray modelling in March 2019 by JBA Consulting.



# Modelled Undefended Climate Change Extents centred on DA1 2DH created 20 November 2023

[Ref: KSL 332826 LMB]



Scale 1: 10,000



## Legend

Site Location

Main Rivers

### Maximum Undefended CC Flood Extents

#### AEP (%)

1% AEP + 25% Extent

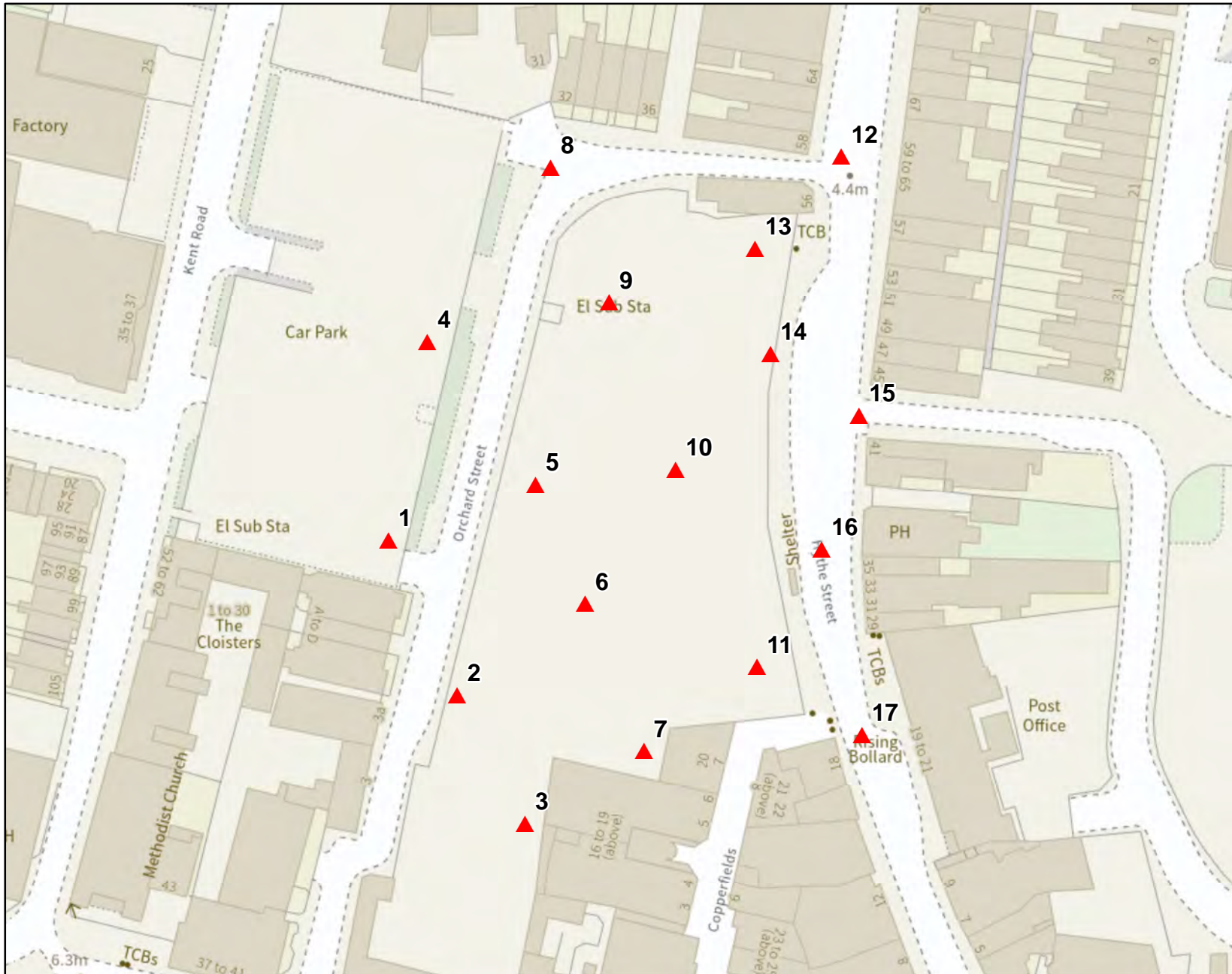
1% AEP + 35% Extent

1% AEP + 70% Extent

AEP = Annual Exceedance Probability  
The probability of a flood of a particular magnitude, or greater, occurring in any given year.





# Node Location Map centred on DA1 2DH created 20 November 2023 [Ref: KSL 332826 LMB]



Scale 1: 1,000



## Legend

-  Node Point Locations
-  Main Rivers

## Defence Details

### Areas Benefiting from Flood Defences

The Environment Agency has taken the decision to retire this dataset and remove it from the Flood Map for Planning portal. This is because we have determined that it no longer meets the customer needs and creates a false sense of security for users.

To understand the long-term risk of flooding to an area, you can use the [Check Your Long Term Flood Risk portal](#): this will provide an understanding of flood risk from rivers and sea, taking into account the presence and condition of defences, and other sources of flood risk such as from surface water and reservoirs.

## Recorded Flood Events Data

We hold records of historic flood events from rivers and the sea. Information on the floods that may have affected the area local to your site is provided below and in the enclosed map (if relevant).

### Flood Event Data

Dates of historic flood events in this area – September 1968

Due to the fact that our records are not comprehensive, we would advise that you make further enquiries locally with specific reference to flooding at this location. You should consider contacting the relevant Local Planning Authority and/or water/sewerage undertaker for the area.

We map flooding to land, not individual properties. Our historic flood event record outlines are an indication of the geographical extent of an observed flood event. Our historic flood event outlines do not give any indication of flood levels for individual properties. They also do not imply that any property within the outline has flooded internally.

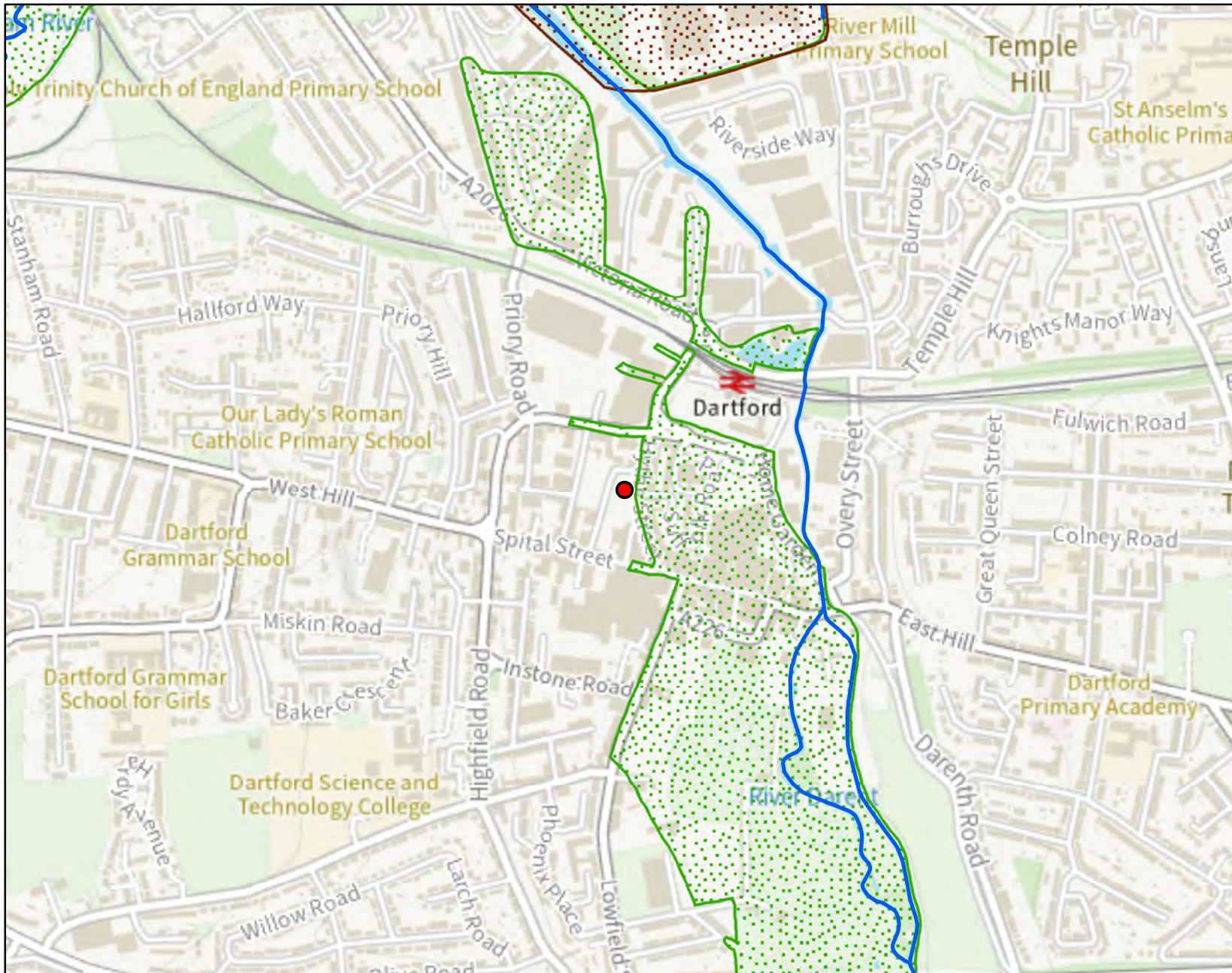
Please be aware that flooding can come from different sources. Examples of these are:

- from rivers or the sea;
- surface water (i.e. rainwater flowing over or accumulating on the ground before it is able to enter rivers or the drainage system);
- overflowing or backing up of sewer or drainage systems which have been overwhelmed,
- groundwater rising up from underground aquifers

Currently the Environment Agency can only supply flood risk data relating to the chance of flooding from rivers or the sea. However you should be aware that in recent years, there has been an increase in flood damage caused by surface water flooding and drainage systems that have been overwhelmed.



# Historic Flood Map centred on DA1 2DH created 20 November 2023 [Ref: KSL 332826 LMB]



Scale 1: 10,000



## Legend

- Site Location
- Main Rivers
- Jan 1953 Flood Outline
- Sep 1968 Flood Outline



## Additional Information

### Information Warning - OS background mapping

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 to this background mapping. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which the Environment Agency makes it available. You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form. Third party rights to enforce the terms of this licence shall be reserved to OS.

### Environment Agency planning guidance and pre application service

- Planning Practice Guidance\_- provides information about planning considerations in areas at risk of flooding. <https://www.gov.uk/guidance/flood-risk-and-coastal-change>
- Planning applications: assessing flood risk - information about completing Flood Risk Assessments. <https://www.gov.uk/planning-applications-assessing-flood-risk>
- Site specific flood risk assessment: Checklist\_- a checklist to help ensure you have considered all the relevant factors in your flood risk assessment. <http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/site-specific-flood-risk-assessment-checklist/>
- Climate change allowance guidance <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

We recommend that you discuss your proposals with the Local Planning Authority at the earliest opportunity. They will be able to advise you on a wide range of planning matters in addition to flood risk.

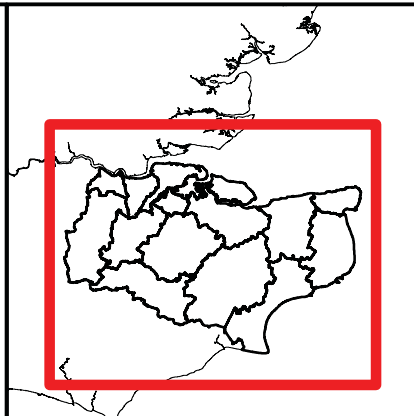
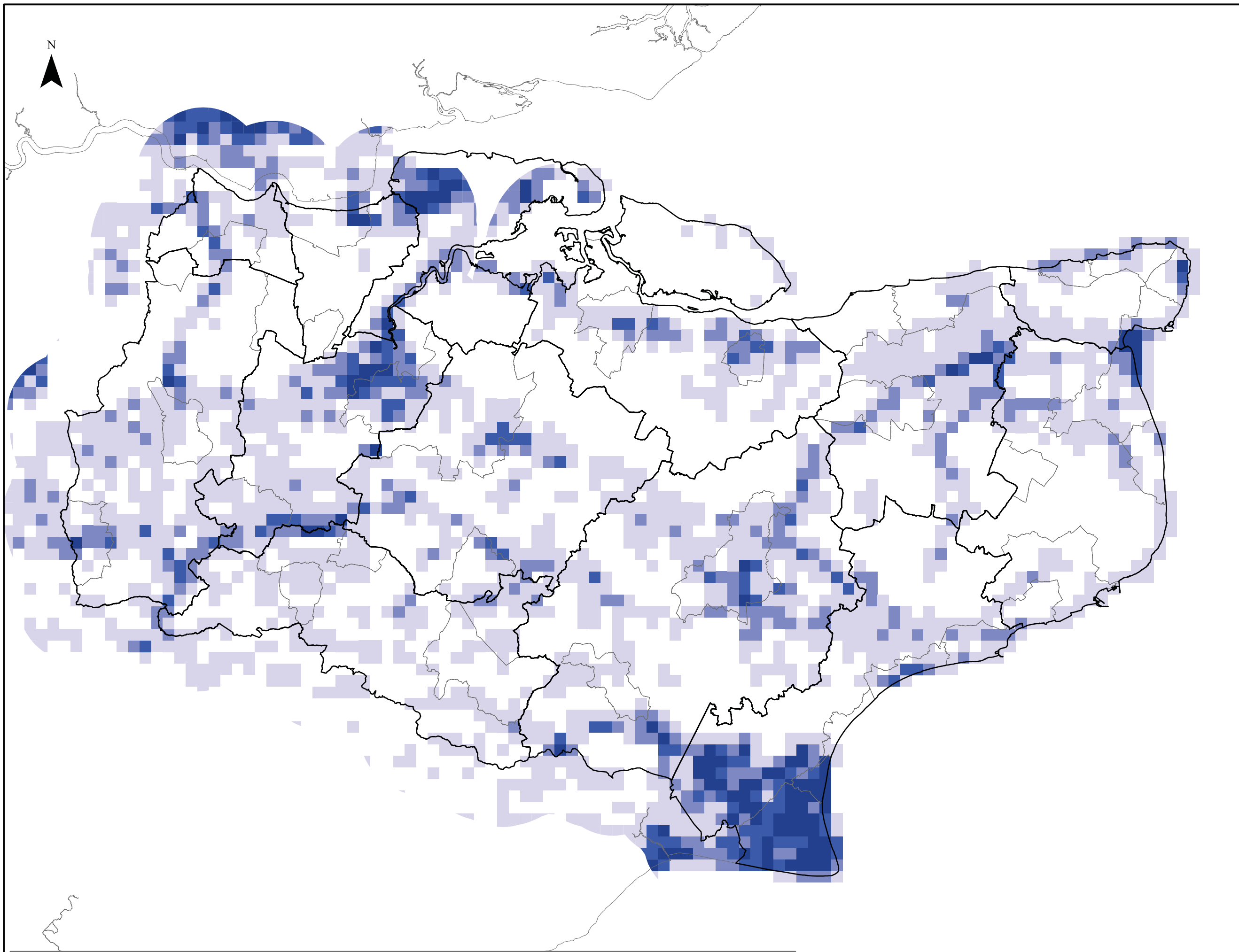
Please see our website for details on how to get planning advice, including charged-for discretionary advice, from the Environment Agency <https://www.gov.uk/guidance/developers-get-environmental-advice-on-your-planning-proposals#when-to-consult>. Our planning team can be contacted at [kslplanning@environment-agency.gov.uk](mailto:kslplanning@environment-agency.gov.uk)

You should also consult the Strategic Flood Risk Assessment and flood risk local plan policies produced by your local planning authority.

You should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk Assessment where one is required, but does not constitute such an assessment on its own.
2. 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 overland runoff. You should discuss surface water management with your Lead Local Flood Authority.
3. Where a planning application requires a FRA and this is not submitted or deficient, the Environment Agency may well raise an objection due to insufficient information

# Appendix E Ground Water Flood Risk Plans



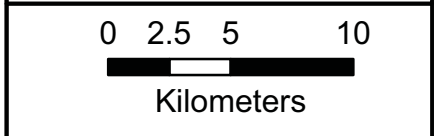
**Legend**

**Groundwater Risk Areas**

- Negligible
- Low
- Medium
- High

Drawing Title:  
Groundwater Risk Areas

Drawing Number:  
Figure 6



This map is based upon Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office (C) Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. 100019238. 2010



# Appendix F Thames Water Sewer Records

**Asset Location Search Sewer Map - ALS/ALS Standard/2018 3779971**



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 554068,174158

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
2204	3.97	-.58
2203	3.9	2.4
2104	4.65	3.19
2108	4.52	2.59
2105	4.5	2.97
2106	4.59	2.74
2107	4.41	2.5
3101	4.54	2.58
2208	4.47	2.27
2207	4.27	2.02
2206	4.28	1.68
3202	3.83	1.46
3214	3.88	2.45
2205	4.18	2.33
3209	4.22	2.32
1012	4.76	n/a
1011	4.86	4.18
2024	5.17	4.51
1010	4.98	4.03
2018	5.28	3.38
1009	4.98	n/a
2014	n/a	4.09
1019	5.16	3.31
2019	5.03	3.24
1116	n/a	n/a
2110	4.58	3.06
2101	4.69	3.68
1117	3.59	2.57
2102	4.44	3.43
1118	3.16	2.31
111A	n/a	n/a
2103	n/a	3.31
111C	n/a	n/a
2109	4.48	2.7
1119	4.32	1.39
1103	n/a	n/a
1102	4.68	2.87
1215	4.37	3.46
1214	4.04	3.68
1212	4.3	n/a
1213	4.12	3.73
1225	4.31	1.37
121A	n/a	n/a
0302	4.71	3.31
0202	n/a	n/a
0203	4.68	2.48
021B	n/a	n/a
021C	n/a	n/a
0201	n/a	n/a
1217	4.74	3.04
1219	n/a	n/a
1218	4.29	2.46
1229	n/a	n/a
1206	4.42	1.78
1221	4.41	3.13
1222	n/a	n/a
1210	4.26	3.42
1209	4.06	3.17
1208	4.22	3.19
1207	4.27	3.17
1223	4.31	3.2
1205	4.06	3.44
1204	4.02	3.34
1203	4.48	3.2
1202	4.48	3.16
1201	4.2	2.99
1224	4.31	-.41
1226	4.38	.83
1308	4.29	3.1
2202	4.85	2.15
2209	4.41	3.16
2201	4.12	1.44
0001	6.18	5.01
0206	5.37	2.72
0002	6.257	3.637
0003	6.02	4.47
0104	5.2	3.03
0103	4.91	2.78
1216	n/a	n/a
1108	5.02	4.29
1107	n/a	n/a
1001	6.12	5.32
1106	4.86	3.76
1109	5.2	4.22
1114	n/a	n/a
1112	4.38	2.66
1104	4.38	2.11
1123	4.4	3.71
1006	5.17	4.57
1220	4.37	2.56
1007	5.18	4.91

Manhole Reference	Manhole Cover Level	Manhole Invert Level
1115	4.43	2.89
1211	4.33	1.93
1105	n/a	n/a
111B	n/a	n/a
1113	4.39	3.21
1110	4.91	3.76
1005	5.23	4.44
1111	4.48	2.16
1305	4.294	-4.486
0301	4.79	2.76
2301	4.3	1.11
1309	4.54	3.23
9306	4.87	3.57
9301	4.88	2.92
1307	4.17	2.5
1304	4.09	2.77
1302	4.19	2.35
1303	4.04	n/a
1301	n/a	n/a
1306	3.76	n/a
241A	n/a	n/a
1404	3.81	n/a
841H	n/a	n/a
841G	n/a	n/a
831D	n/a	n/a
8306	7.61	5.26
8308	n/a	n/a
9303	5	2.05
9305	4.96	3.53
9304	5.18	n/a
9201	5.34	n/a
8207	8.91	n/a
8205	8.92	6.27
921A	n/a	n/a
8304	7.5	4.82
8307	n/a	n/a
8303	6.99	4.04
9307	5.11	3.73
9302	5.14	3.07
9308	n/a	n/a
8301	7.648	4.108
8208	13.75	n/a
8110	n/a	n/a
8209	12.85	10.73
8204	9.99	4.64
821A	n/a	n/a
821B	n/a	n/a
8106	8.51	7.17
8105	7.99	6.78
9102	7.31	5.66
911C	n/a	n/a
911A	n/a	n/a
911H	n/a	n/a
911B	n/a	n/a
911E	n/a	n/a
9103	5.82	4.27
911F	n/a	n/a
9104	5.56	4.55
0102	5.61	3.83
0101	5.42	2.57
0105	5.39	4.15
0204	5.27	4.16
0205	5.21	3.98
8109	9.15	8.13
8101	9.124	4.834
8107	8.95	7.8
8108	9.05	7.66
8104	7.91	6.8
8103	7.59	6.54
8102	7.52	5.46
9001	7.48	6.1
9002	7.37	5.9
901D	n/a	n/a
9101	7.37	n/a
901E	n/a	n/a
9003	7.14	5.44
901F	n/a	n/a
9005	7.04	5.77
901C	n/a	n/a
9107	6.78	5.4
9106	6.99	4.65
9105	6.81	4.36
911G	n/a	n/a
9007	6.14	n/a
911D	n/a	n/a
9004	6.36	5.08
9108	6.14	4.72
021A	n/a	n/a
391A	n/a	n/a
2012	5.91	2.63
291A	n/a	n/a
2017	5.76	4.56
2011	5.85	3.05





















Manhole Reference	Manhole Cover Level	Manhole Invert Level
2010	5.6	3.34
2009	5.6	3.46
2008	5.6	3.52
291C	n/a	n/a
291B	n/a	n/a
2007	5.6	3.7
2006	n/a	n/a
2902	5.85	3.62
2901	5.76	3.48
2903	5.81	3.9
2001	5.8	3.32
3006	5.79	2.74
391C	n/a	n/a
391B	n/a	n/a
3005	5.62	2.92
1903	n/a	n/a
1906	5.32	4.19
1904	5.27	2.95
191C	n/a	n/a
191B	n/a	n/a
191A	n/a	n/a
2910	5.49	4.69
2911	5.59	5.04
2908	5.71	4.18
2905	5.99	n/a
291D	n/a	n/a
2909	5.67	4.51
2904	5.49	4.2
2906	5.57	4.12
1911	5.25	3.19
2913	n/a	n/a
2907	5.47	4.77
2912	n/a	n/a
1916	n/a	n/a
1902	5.39	n/a
1901	5.16	3.68
101A	n/a	n/a
1018	n/a	n/a
2016	5.4	3.9
2015	5.41	3.26
1016	5.39	3.13
2002	5.319	2.494
1017	5.1	3.13
1008	5.01	2.43
2022	5.49	3.69
2005	5.49	4.09
1015	5.12	3.42
1003	5.42	4.83
2004	5.2	4.35
1014	4.85	3.01
2003	5.1	n/a
2023	5.1	4.14
1004	5.42	4.14
1013	4.79	2.92
1002	5.77	4.02
8902	n/a	n/a
991D	n/a	n/a
991C	n/a	n/a
991B	n/a	n/a
991A	n/a	n/a
9903	6.88	6.23
9901	6.81	4.93
9907	6.92	n/a
8002	11.81	10.41
9006	n/a	n/a

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.








# ALS Sewer Map Key

## Public Sewer Types (Operated & Maintained by Thames Water)

-  **Foul:** A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
-  **Surface Water:** A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
-  **Combined:** A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
-  **Trunk Surface Water**
-  **Trunk Foul**
-  **Storm Relief**
-  **Trunk Combined**
-  **Vent Pipe**
-  **Bio-solids (Sludge)**
-  **Proposed Thames Surface Water Sewer**
-  **Proposed Thames Water Foul Sewer**
-  **Gallery**
-  **Foul Rising Main**
-  **Surface Water Rising Main**
-  **Combined Rising Main**
-  **Sludge Rising Main**
-  **Proposed Thames Water Rising Main**
-  **Vacuum**





## Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

-  Air Valve
-  Dam Chase
-  Fitting
-  Meter
-  Vent Column




## Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

-  Control Valve
-  Drop Pipe
-  Ancillary
-  Weir






## End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol, Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

-  Outfall
-  Undefined End
-  Inlet






## Other Symbols

Symbols used on maps which do not fall under other general categories








-  /  Public/Private Pumping Station
-  Change of characteristic indicator (C.O.C.I.)
-  Invert Level
-  Summit

### Areas

Lines denoting areas of underground surveys, etc.

-  Agreement
-  Operational Site
-  Chamber
-  Tunnel
-  Conduit Bridge

## Other Sewer Types (Not Operated or Maintained by Thames Water)

-  Foul Sewer
-  Surface Water Sewer
-  Combined Sewer
-  Gully
-  Culverted Watercourse
-  Proposed
-  Abandoned Sewer

### Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plans are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
- 5) 'na' or '0' on a manhole level indicates that data is unavailable.
- 6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.