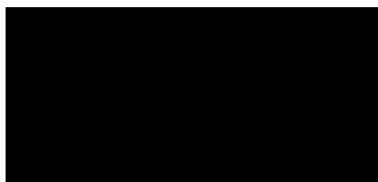


56-57 Pier Road,
Littlehampton.

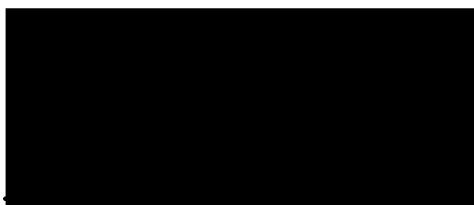
Flood Risk Assessment

July 2019



Prepared by:

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Version 3
Issued November 2019



Structural
Engineering



Civil
Engineering



CDM
Consultants



Sustainability
and BREEAM



Traffic and
Transport



Flood Risk
Assessments



Highway
Engineering



Event
Engineering

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Appendix 1

Aerial View of Site Boundary

Appendix 2

Environment Agency Flood Map

Appendix 3

Proposed Site Plans

Appendix 4

Environment Agency Data

1.0 Introduction

- 1.1 Scott White and Hookins have been instructed by Mr Michael Kavalieros to undertake a Flood Risk Assessment as part of the planning submission for a proposed development at No. 56-57 Pier Road in Littlehampton.
- 1.2 This report considers the flood risk to the proposed development and the impact that the development will have in relation to flooding of adjacent areas and watercourses. It considers any limits relating to flooding that are likely to be imposed to allow the development to be undertaken.
- 1.3 This report is based on information received from the Environment Agency, and the Arun District Strategic Flood Risk Assessment, in addition to a desk top study to assess the existing conditions on site. Scott White and Hookins cannot accept liability for the accuracy or otherwise of any information derived from third party sources.
- 1.4 This report is for the private and confidential use of Mr Michael Kavalieros and their agents and may not be copied in whole or in part without the written permission of Scott White and Hookins.

2.0 Government Policy on Flood Risk and Drainage of Development

- 2.1 The frequency and severity of river flooding is perceived to have increased in recent years and in an attempt to mitigate the flood risk the Government published Planning Policy Statement Note 25: Development and Flood Risk (PPS25) in December 2006. PPS25 details the importance of the effective management and reduction of flood risk in the land use planning process and attempts to address the issue of climate change. This has since been updated and is set out in The National Planning Policy Framework and the supporting technical guidance.
- 2.2 Traditionally surface water run off from developments has been conveyed by pipe systems to the nearest watercourse or sewer. This tends to increase the rate and volume of the run off often leading to flooding downstream of the new development. Latest policy promotes the use of sustainable urban drainage systems (SUDS) whereby the control of run off is to be as close to source as possible. This can be achieved by utilising techniques which mimic the natural drainage processes, the use of direct infiltration for example. The Environment Agency will, in general, seek to restrict the allowable discharge from a new development to that previously expected from the undeveloped land.
- 2.3 The requirements of the revised Building Regulations which came into force on 1st April 2002 are that adequate provision should be made for dealing with rainwater from the roofs of buildings and certain paved areas providing access to the buildings. Run off from such drainage systems are to be discharged to one of the following systems listed in order of priority:-
- A soakaway or other infiltration system
 - A watercourse
 - A sewer or drain

- 2.4 The revised Building Regulations were drafted to reinforce the requirements for SUDS wherever possible.

2.5 The Requirements of a Flood Risk Assessment

- 2.5.1 A Flood Risk Assessment is required in order to ascertain whether a development will exacerbate the risk of flooding elsewhere in the catchment or is at risk of flooding itself.

- 2.5.2 A site specific FRA is required for:-

- Proposals of 1 Hectare or greater situated in Flood Zone 1
- New development (including minor development and change of use) located in areas of Flood Zone 1 that have critical drainage problems
- New development (including minor development and change of use) located in areas of Flood Zones 2 & 3.

3.0 Existing Site Conditions

- 3.1 The proposed new development is an extension of an existing mixed use commercial and residential property at 56-57 Pier Road, Littlehampton, BN17 5LP. The site is centred on grid reference TQ 02777 01625.
- 3.2 The site is accessed directly from Pier Road and is bounded by Pier Road to the west of the site, and existing commercial and residential buildings to the north, east and south of the site. See Appendix 1 for site aerial photographs.
- 3.3 The nearest watercourse to the site is the River Arun which is located approximately 20m to the west of the site, on the other side of Pier Road on which the existing buildings are located.
- 3.4 The development area is an existing mixed use commercial and residential property with surrounding hardstanding area and existing garage building to be demolished as part of the works.
- 3.5 The arrangement of the existing building comprises of restaurant and associated kitchen facilities at ground floor level. From the restaurant there are stairs down to the basement with storerooms and toilet facilities. There are steps and a ramp at the rear of the property which provide access to the rear of the site. From the ground floor there is an internal staircase up to a single residential flat at first and second floor levels.

3.6 Ground Conditions

- 3.6.1 The geology of the area is shown on British Geological Survey map which indicates the site is underlain by Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, and Culver Chalk Forma, with overlying Raised Beach Deposits - Sand and Gravel.

4.0 Development Proposals

- 4.1 The proposed development involves the refurbishment of the existing restaurant facilities at ground floor, and the extension of the first and second floor to provide a larger residential provision. This will create two individual residential flats, both split over first and second floor. The residential units will still be accessed from the restaurant area, with an additional access staircase provided at the rear of the property, from first floor down to ground. See Appendix 3 for the proposed site plans.
- 4.2 The proposed development comprises the re-development of the existing building. The level of Pier Road in front of the property is 3.8mAOD, whilst at the rear of the property the level is 2.44mAOD. The lower ground floor is to be retained at a level of 1.78mAOD and the ground floor is to be maintained at the existing level of approximately 3.8mAOD. The first and second floor will remain at existing levels.
- 4.3 The restaurant will continue to be accessed from Pier Road at ground floor level with new kitchen facilities provided at the rear of the building. A new internal staircase at the rear will provide access to lower ground floor level of the commercial unit. The extended and refurbished residential accommodation is to be provided at first and second floor.
- 4.4 The area of the development will be the same as the existing building and garage footprint and therefore does not result in any increase to the overall impermeable area of the site. As the proposed development comprises the refurbishment of existing with a small extension at first and second floor, the development is categorised as a 'minor development'.

- 4.5 The proposed new dwelling will seek to retain and re-use the existing drainage conditions on site if possible. As the redevelopment of the existing building will not result in any change to the building footprint, there will be no overall increase of impermeable area; however the proposed development should seek to replicate the existing drainage characteristics of the site.
- 4.6 With reference to National Planning Policy Framework (NPPF): Table 2, as a building used as a restaurant the flood risk vulnerability would be classed as 'Less Vulnerable' at ground floor and with the inclusion of residential buildings used for dwellings, the flood risk vulnerability classification would remain as 'More Vulnerable' to the first and second floor.

5.0 Flood risks

5.1 River Catchment and Flooding

- 5.1.1 Based on the Environment Agency flood map the site is located in Flood Zone 3a which indicates this area has an annual probability of tidal flooding of 1 in 200 or greater (>0.5%) for the undefended scenario. See Appendix 2 for Environment Agency flood map.
- 5.1.2 With reference to Section 4 and NPPF: Table 3, where the classification of the site is more vulnerable, developments of this type are considered appropriate where the Exception Test is satisfied. As the proposed development is considered to be a 'minor development', the Environment Agency recommend following standing advice. It should be noted the ground floor and basement are to remain as existing restaurant use and thus considered to be 'less vulnerable'.
- 5.1.3 The EA standing advice is to ensure floor levels are either no lower than existing floor levels or 300mm above the estimated flood level. It also requires that the plans show how efforts have been made to ensure the development won't be flooded by surface water runoff.
- 5.1.4 With reference to the existing site plans the floor level of the existing upper ground floor level is set at 3.8mAOD at the front of the site and 2.44mAOD to the rear of the site. The basement level is 1.78mAOD. All floors will match existing levels therefore satisfying the Environment Agency standing advice.
- 5.1.5 The SFRA notes that the area located to the east of the River Arun, where the proposed development is located, is at risk of tidal flooding. The SFRA also states that there are defences present along the River Arun with a recent multi million-pound defence scheme being implemented by the Environmental Agency involving the construction of defences with a 1 in 300 year standard of protection. The Environment Agency detailed flood information provided in Appendix 4 confirms that they do not have any records of previous flood events affecting the proposed site. The existing

flood defences ensure that the annual exceedance probability of tidal flooding to the development site reduces from 0.5-5% down to 0.1%.

5.1.6 Flood level modelling data has been obtained from the Environment Agency and is included in Appendix 4. The level data indicates the modelled flood level assuming no defences are present, and the modelled flood level with the defences.

5.1.7 The water levels data provided from the Environment Agency is summarised as follows:

Modelled Flood Levels in Metres Undefended Annual Exceedance Probability			
Node Reference	0.5% (current 1 in 200 year event)	0.5% (2115 1 in 200 year event)	0.1% (current 1 in 1000 year event)
1	3.73	4.94	4.05
2	3.73	4.94	4.05
3	3.73	4.94	4.05

Modelled Flood Levels in Metres Defended Annual Exceedance Probability			
Node Reference	0.5% (current 1 in 200 year event)	0.5% (2115 1 in 200 year event)	0.1% (current 1 in 1000 year event)
1	-	4.89	-
2	-	4.89	2.94
3	-	4.89	2.94

5.1.8 From the data provided, the ground floor level of the building will be above the 1 in 1000 modelled flood event for both the defended scenario, with minor flooding for the undefended situation. The building is also set above the modelled flood level for the current 1 in 200 year present event for the undefended scenario, and there is no risk noted for the defended scenario thus confirming the presence of the current flood defences. With reference to the future 2115, 1 in 200 flood event, this would result in flooding to the restaurant facilities located at lower and ground floor level.

5.1.9 It should be noted that the peak tidal levels modelled for the defended and undefended scenarios do not place the proposed residential units or any inhabitants at first floor at risk.

5.1.10 Based on the data obtained above, whilst the proposed site is located within an area identified to be at risk tidal fluvial flooding, since there will be no change to the overall impermeable area of the site and the development represents a 'minor development' we would therefore conclude that the risk of flooding will not be increased as a result of the development. However consideration of safe access and egress are discussed in more detail below.

5.2 Overland flow

5.2.1 The existing site has been visually assessed for overland flows. Due to the nature and topography of the site, although not calculated, the depth of potential flow across the site is thought likely to be very small, and the general velocity over the ground will be minor.

5.2.2 The SFRA model and Environment Agency maps indicate the site is not located within an area of surface water flood risk and therefore it is considered the site is at low risk of this type of flooding. It is envisaged that as the proposed development will involve the construction of new extension to the rear, the development will incorporate new drainage which will be designed in accordance with current best practice and legislation.

5.2.3 The proposed development will not result in an increase to impermeable area since the development comprises the redevelopment of the existing building over existing hardstanding with refurbished restaurant and residential units. Therefore the proposed development does not increase the risk of flooding due to overland flow on site or to surrounding areas. Proposed development will provide mitigation to prevent potential risk of surface water ingress into the building.

5.3 Local flooding of surface water sewer

- 5.3.1 The information available in the SFRA states that there have been incidents of surface water sewer flooding recorded in the Littlehampton area, with records of incidents noted within the site proximity. There is also a flood incident recorded in close vicinity to the site location although the exact location and the cause of flooding is unknown.
- 5.3.2 The proposed development will replicate the existing drainage characteristics of the building, utilising the same discharge points. Therefore, the proposed development will not increase the risk of flooding to the existing surface water sewer.

6.0 Flood Mitigation Proposals

6.1 Proposed floor levels

- 6.1.1 With reference to the tidal levels provided by the EA, for the tidal 1 in 200 (0.5% AEP) year flood event the peak tidal level is 3.73m AOD and for the 1 in 1000 (0.1% AEP) year extreme flood event the peak tidal level for the site will be 4.05m AOD although the defences provided reduce this level to 2.94mAOD. The level of the ground floor will therefore achieve 70mm freeboard above the 0.5% AEP undefended event. In the event of a 1 in 1000 event, with the presence of the existing defences there will be no flooding to the front of the development site. It is recommended that removable flood guards are provided at the rear of the property such that in the event of flood risk these can be installed to prevent ingress of flood water and protect the all levels of the dwelling.
- 6.1.2 With reference to the future modelled flood levels for 2115, for the 1 in 200 (0.5% AEP) year flood event, the peak tidal level is 4.89m AOD for the defended scenario and it is recognised this represents a flood risk for a large extent of Littlehampton. As previously stated the proposed development is classified as a 'minor development' and whilst there remains a long term residual risk, the proposed development does not increase the risk of flooding on the site or to surrounding areas.
- 6.1.3 It should be noted that the peak tidal levels modelled for the defended and undefended scenarios do not place the proposed residential units or any inhabitants at first floor at risk. Only the 'less vulnerable' restaurant unit at ground floor will be at risk.
- 6.1.4 The proposed development does not require consideration of flood plain compensation as the projected flooding is due to an extreme tidal event which is unaffected by localised changes in level.

6.2 Safe access and egress

- 6.2.1 The proposed development comprises a minor development of an existing mixed use commercial and residential property. The development does not increase the flood risk or affect the ability of occupants to access and egress from the dwelling.
- 6.2.2 As the development is classified as a minor development, the Environment Agency recommend following standing advice whereby basement and lower ground floor rooms should have clear internal access to an upper level. The storerooms at lower ground floor will have clear access to a staircase which allows occupants to access to ground floor level which is just above the modelled flood level and thus a safe refuge..
- 6.2.3 Whilst the provision of access routes does provide adequate provision to the inhabitants, it is recommended this is supported by a Flood Evacuation Plan which is made available to all inhabitants and remains within each dwelling. The proposed development is located within a Flood Warning Area and therefore the Environment Agency provide a flood warning service which the occupants can register with to receive and check on flood updates.
- 6.2.4 The site was subject to a previous planning application reference LU/243/17/PL. A response from the Planning Inspectorate and confirms that the Environment Agency themselves issue tidal flood warnings in advance, which residents for the whole area will respond to.
- 6.2.5 In reality the nature of the extreme tidal event is such that the duration will only be a few hours. Occupants of the residential units at first floor can remain in their accommodation and not be at risk. The restaurant facilities will be at risk and the owners should take suitable precautions to provide flood guards as recommended in this report.

6.3 Flood resilient construction

6.3.1 The proposed development should incorporate flood resilient measures where feasible. This should be carried out in accordance with 'Improving the flood performance of new buildings' published by Communities and Local Government and covers specific flood resilient details, choice of materials, provision of services and water exclusion strategy for low flood levels (less than 0.3m).

6.3.2 Items to consider during construction will be

- Locating all incoming services (gas, electricity, water, telecoms etc.) within waterproof protected ducting or above the modelled defended 1 in 1000 level of 2.94mAOD.
- All sockets within the new residential units to be at minimum of modelled 2.94mAOD level
- Consideration of the construction materials and finishes used to lower ground floor level. Any materials used at this level should be such that the ingress of water will not impair their integrity or functionality and can be easily dried and ventilated in the event of flooding. E.g. blockwork and waterproof render instead of lightweight plasterboard stud walls.
- Tanking of upper ground floor to a level of 1.14m above the FFL.
- Consideration for incorporating removable flood guards such that in the event of flood risk these can be installed to protect the proposed units.

7.0 Exception Test

- 7.1 As the residential part of the proposed development is classed as 'More Vulnerable', Table 3 of NPPF states an Exception Test is required.
- 7.2 For the Exception Test to be passed, three criteria must be satisfied:
- a) it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a Strategic Flood Risk Assessment where one has been prepared.
 - b) the development should be on developable, previously developed land or, if it is not on previously developed land, that there are no reasonable alternative sites on developable previously developed land.
 - c) a FRA must demonstrate that the development will be safe, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.
- 7.3 The criterion (a) is for determination by the LPA and not this site-specific FRA although it should be noted this aspect is not relevant to a domestic minor development.
- 7.4 As per the earlier sections of this report, the proposed development is to be located on previously developed land thereby satisfying the requirement of criteria (b).
- 7.5 This FRA has demonstrated the proposed development satisfies criterion (c)
- The proposed development does not change the flood risk vulnerability of the site. Residential is to remain at first and second floor, above the flood risk.
 - The proposed extension comprises a minor development and the floor level is to be set at the same as existing.
 - The design of the properties should incorporate flood resilient measures to locate any incoming services above the modelled flood level.
 - The proposed development will not increase the overall impermeable area of the site and therefore not increase the risk to surrounding areas.

8.0 Summary

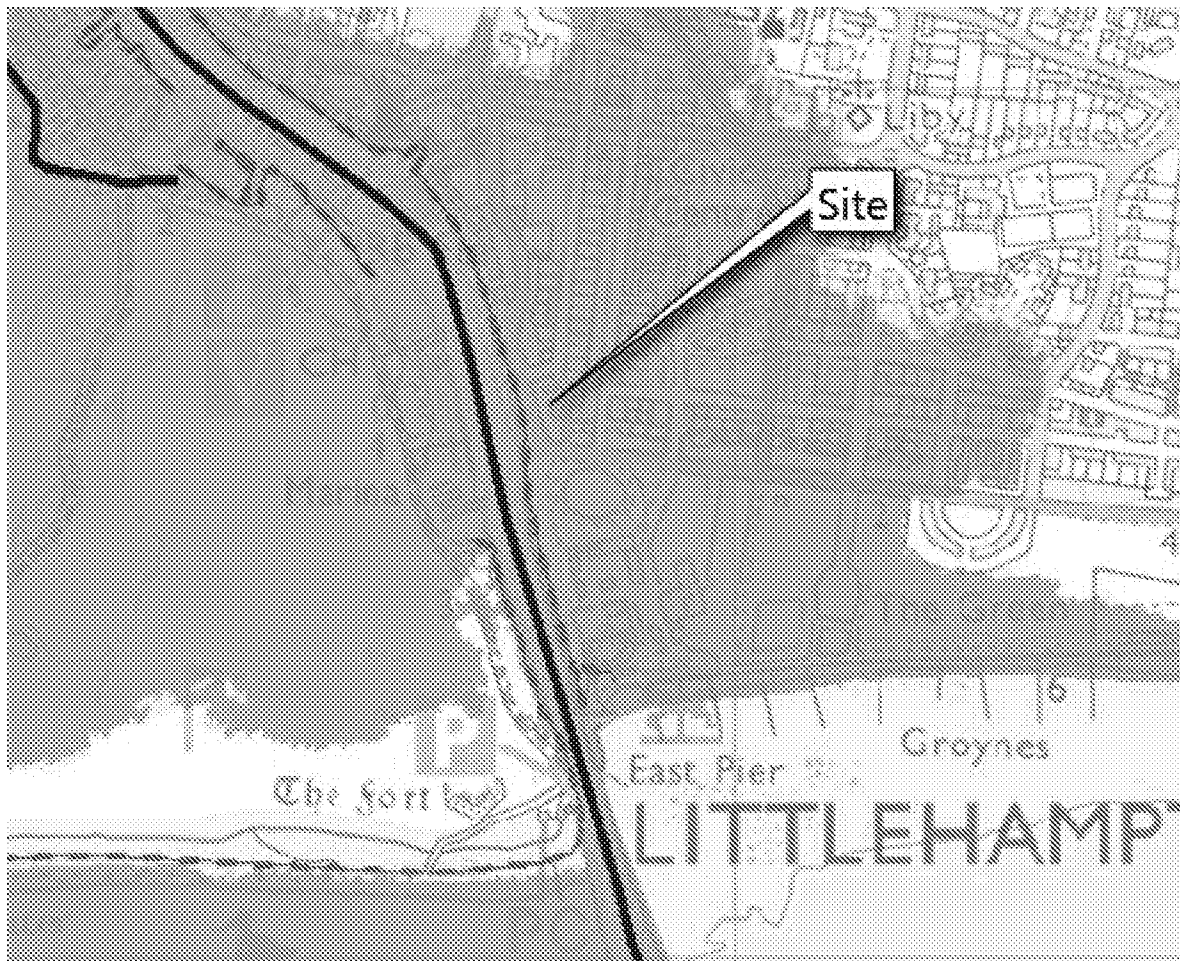
- 8.1 Based on the Environment Agency map the proposed development lies within Flood Zone 3a which indicates that the site is at high risk of flooding but benefits from River Arun flood defences
- 8.2 With reference to section 5.1.2, the proposed development is considered appropriate for Flood Zone 3a where the Exception Test is satisfied.
- 8.3 The proposed development comprises the redevelopment of an existing property with no increase over the existing building footprint. The proposed development is considered to be a minor development and therefore it is proposed to follow the Environment Agency standing advice, setting floor levels at no lower than existing.
- 8.4 Since there will be no increase to the overall impermeable area as a result of the proposed development it is therefore considered that there will be no increase in flood risk to the site or surrounding area as a result of the new building.
- 8.5 Final detail for the drainage proposals should be developed during the detailed design period, and agreed with the Environment Agency and statutory authorities.

Appendix 1



Photograph 1: Aerial View of Site Boundary

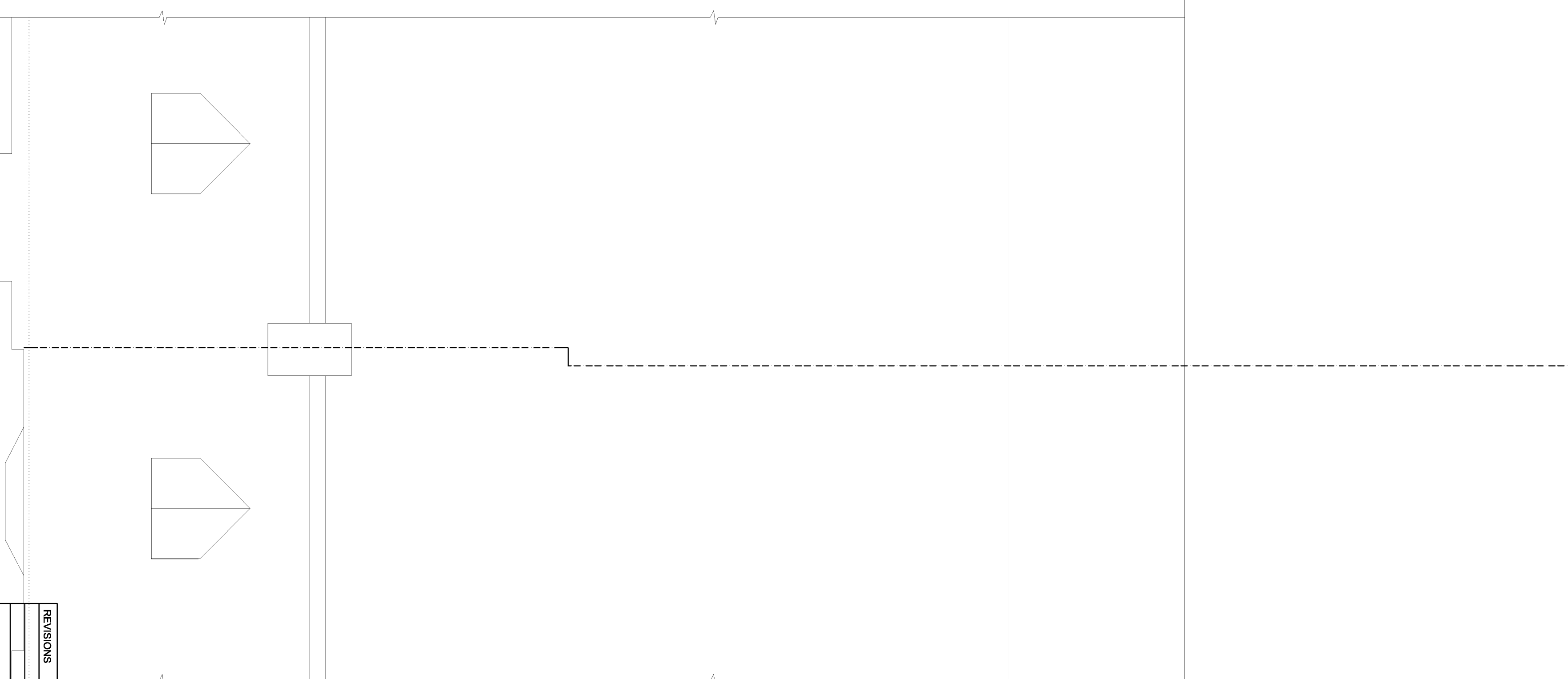
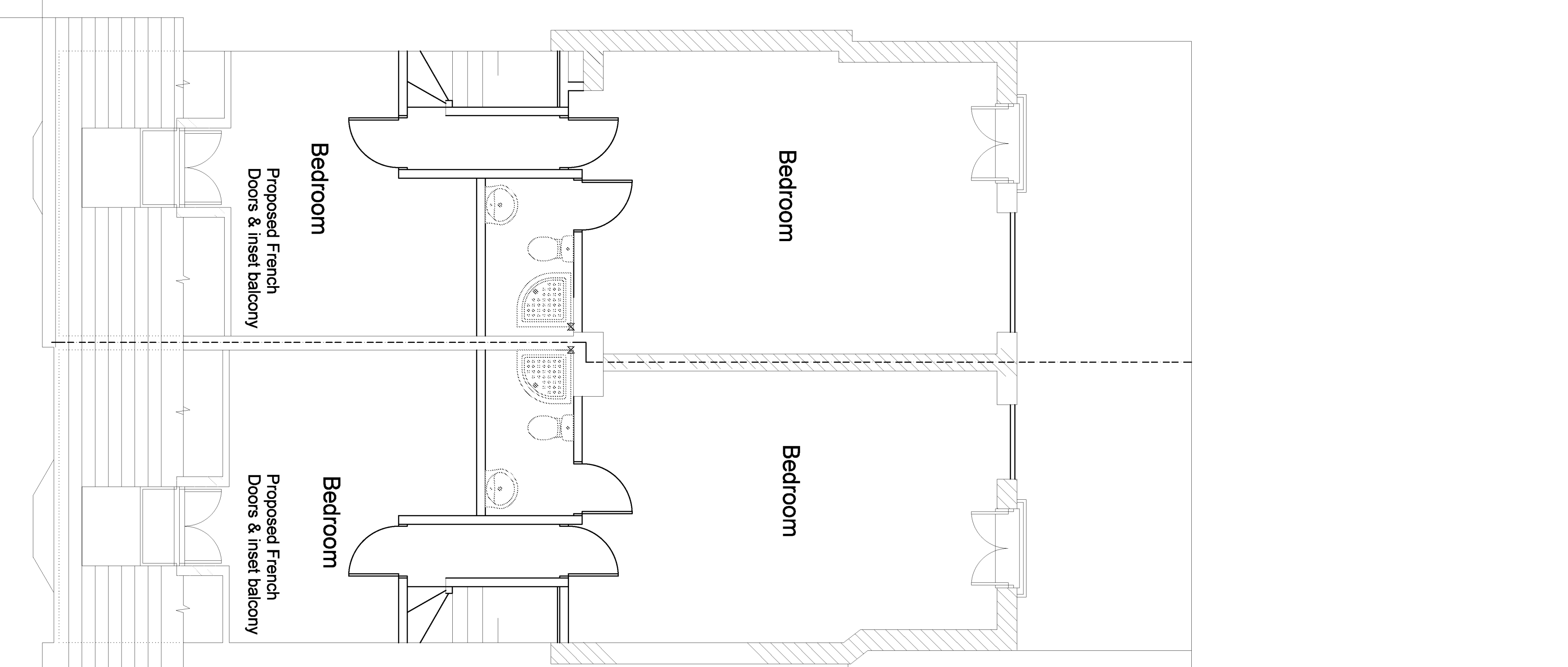
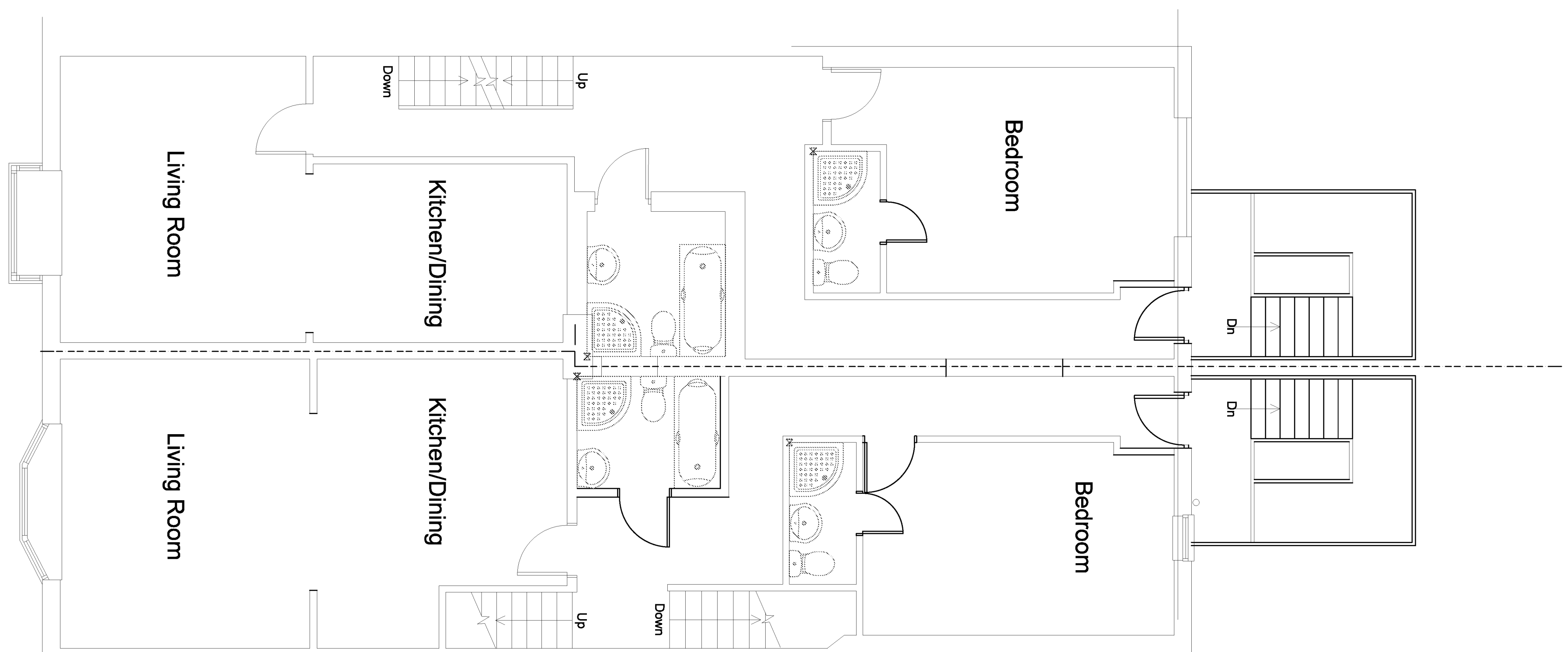
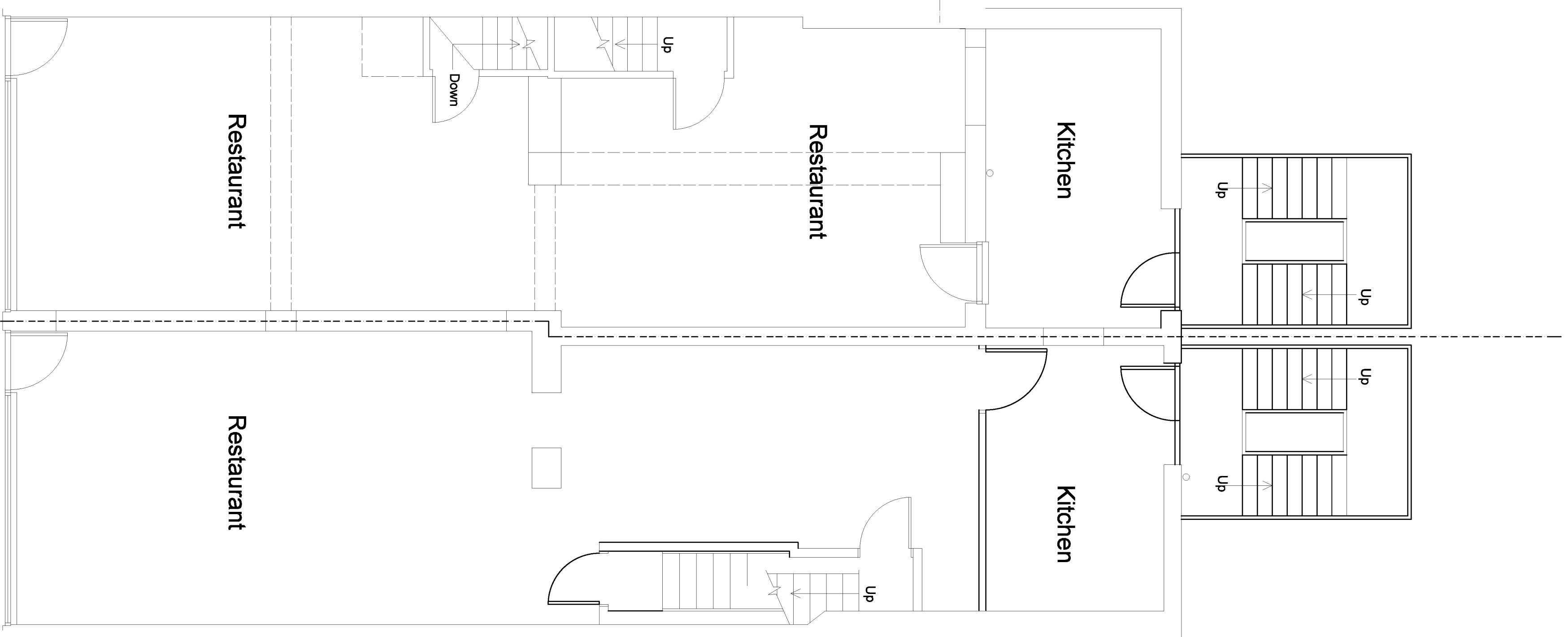
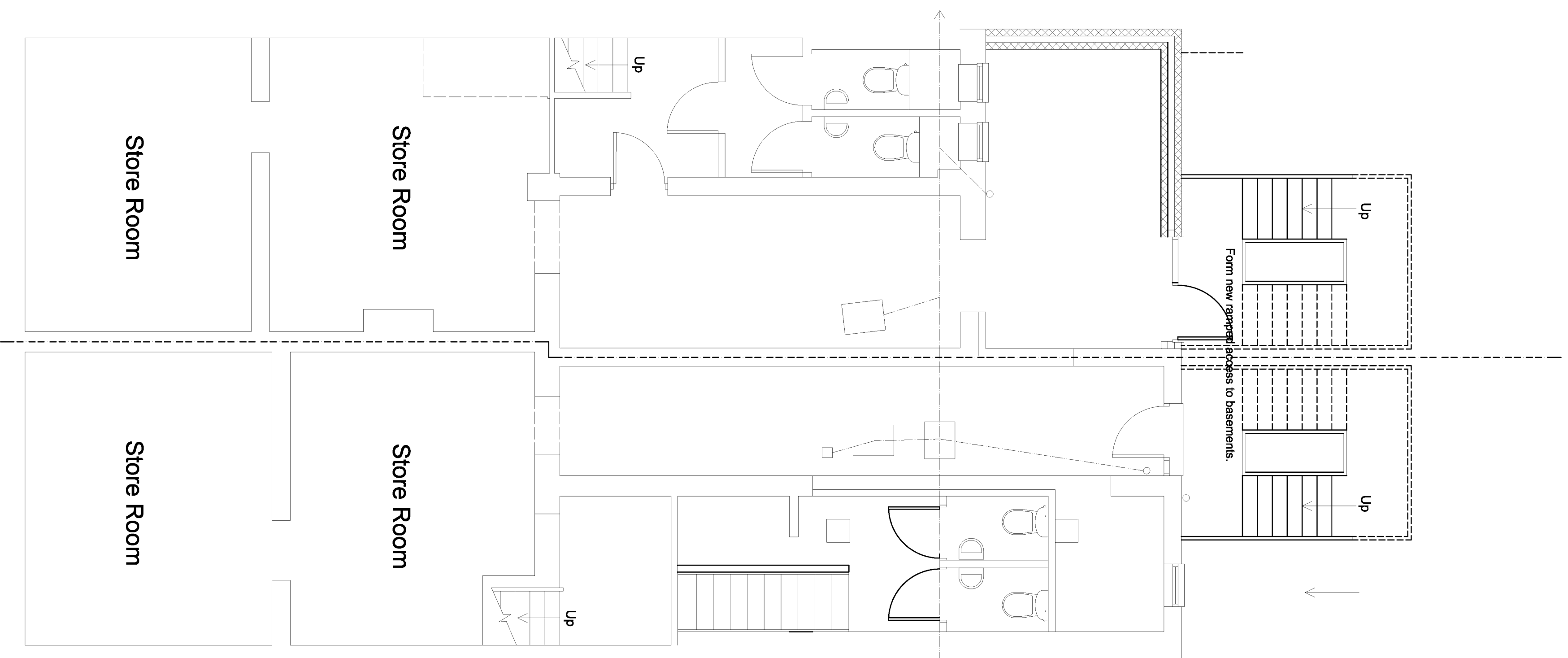
Appendix 2



Environment Agency Flood Map

Appendix 3

Proposed Site Plans

[illegible]

PROJECT DETAIL	
RIVER BRIDGE RESTAURANT	
56-57 RIVER ROAD, LITTLEHAMPTON	
WEST SUSSEX BN1 5LP	
CONVERSION TWO RESTAURANTS	
FOR: MICHAEL KANALIEROS	
DRAWING	SCALE
PROPOSED PLANS	1/50
DATE: MAY 2019	
DRAWN: T. Murrey	
DRAWING: 18641	REVISION:

Appendix 4

Environment Agency Data

Linda Hampton
lhampton@swh.co.uk

Our ref: SSD/42687

Date: 05/04/2017

Dear Linda

Provision of Product 4 for address: 56-57 Pier Road, Littlehampton, BN17 5LP

Thank you for your request of 28th March 2017 to use Environment Agency data, Product 4. The information is attached.

The information on Flood Zones in the area relating to this address is as follows:

The property is in an area located within Flood Zone 3 shown on our Flood Map for Planning (Rivers and Sea).

Note - This information relates to the area that the above named property is in and is not specific to the property itself.

Please find attached a copy of the Flood Map for Planning (Rivers and Sea) for the area relating to your address.

Further details about the Environment Agency information supplied can be found on the GOV.UK website:

<https://www.gov.uk/browse/environment-countryside/flooding-extreme-weather>

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 Flood Risk Assessments

<https://www.gov.uk/planning-applications-assessing-flood-risk>

<https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion>

Guildbourne House, Chatsworth Road, Worthing, West Sussex, BN11 1LD
Customer services line: 03708 506 506
Email: enquiries@environment-agency.gov.uk
www.environment-agency.gov.uk
98_07_SD01

Supporting Information

Flood Defences

Based on our records, Steel Pile Walls to the North-West of the site reduce the risk of flooding in this area to a standard of protection of a 1 in 75 year flood. There is also a flood wall to the West of the site with a concrete capping beam that offers a standard of protection of a 1 in 300 year flood.

Model Information

The flood outlines, depths and levels are taken from the Arun to Adur Flood Model, completed in 2012 by JBA Consulting.

Flood History

We do not have any records of previous flood events affecting this site. I would suggest contacting Arun District Council for a more comprehensive flood history check.

Please note our records are not comprehensive and may not include all events, you can contact your Local Authority to check if they hold any relevant information regarding your application.

You are encouraged to use and re-use this information freely and flexibly, with only a few conditions. Details of which can be found here:

<http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

We respond to requests for recorded information that we hold under the Freedom of Information Act 2000 (FOIA) and the associated Environmental Information Regulations 2004 (EIR).

If you are not satisfied with our response to your request for information you can contact us within 2 calendar months to ask for our decision to be reviewed.

If you have any queries or would like to discuss the content of this letter further please call us on 03708 506506.

Yours faithfully
Freddie Fielding
PSO West Sussex

Enc. Flood Map for Planning (Rivers and Sea) / Node point locations / Flood levels/depths / Modelled flood outlines / Flood Defence Locations

Flood Defence Locations. Centred BN17 5LP. Created 05/04/2017.

Legend

Defences

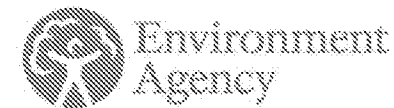
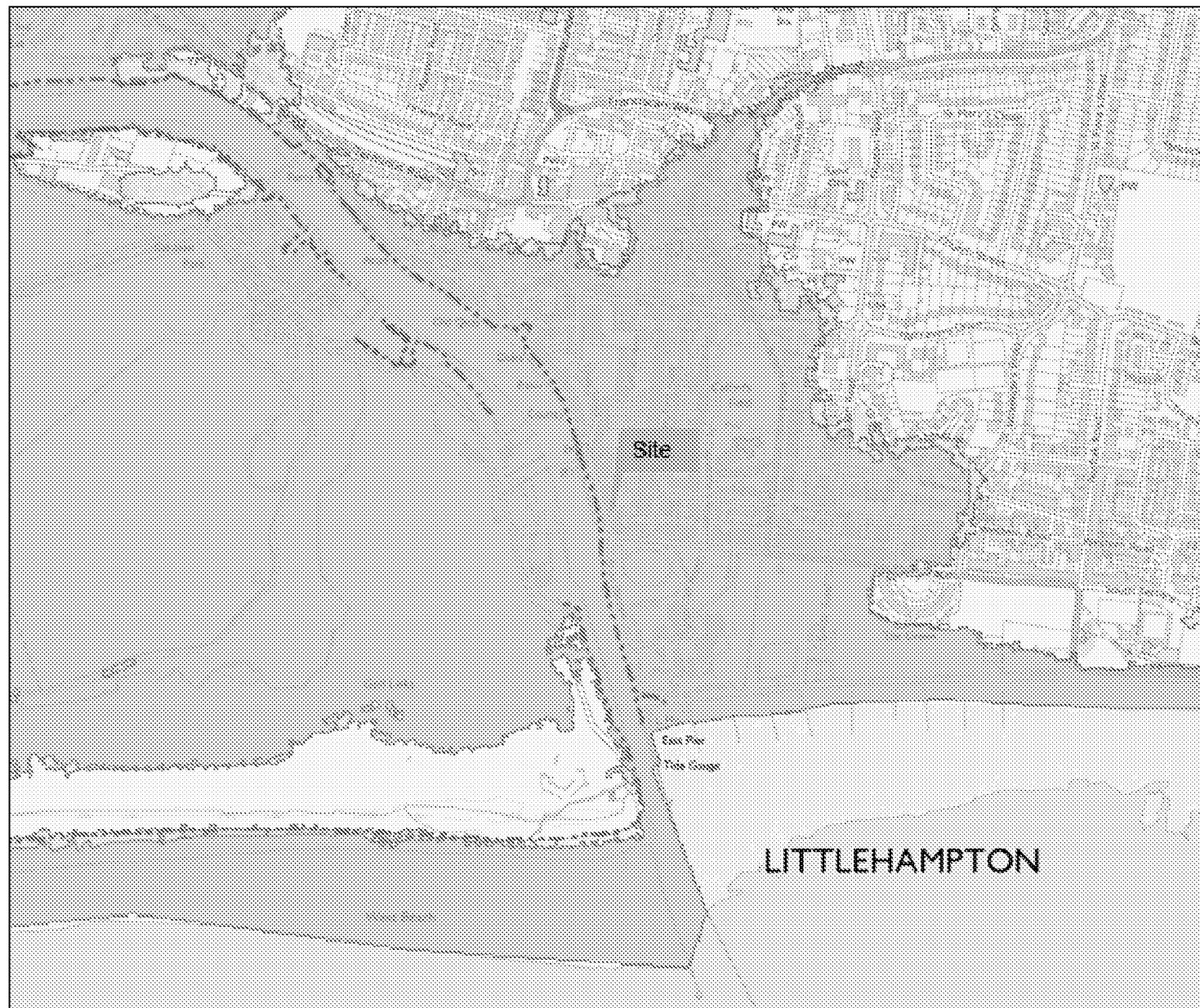
- Embankment
- Wall
- Flood Gate
- Demountable Defence
- Bridge Abutment
- High Ground
- Beach
- Barrier Beach
- Promenade
- Quay
- Cliff
- Dunes
- Culvert



0 100 200 300
Metres



Flood Map for Planning (Rivers and Sea). Centred BN17 5LP. Created 05/04/2017.



Scale 1: 10,000



Flood Map for Planning (Rivers & Sea)

- Defences
- Flood Storage Areas
- Areas benefiting from flood defences
- 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.

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Product 4 Flood Risk Data Requested by: Linda Hampton

Site: 56-57 Pier Road, Littlehampton, BN17 5LP

Table 1: Water Levels: Tidal Undefended

Node Reference	NGR		Modelled Flood Levels in Metres			
	Eastings	Northings	Undefended Annual Exceedance Probability			
			5%	0.5%	0.5% (2115)	0.1%
1	502780	101627	-	3.73	4.94	4.05
2	502789	101629	2.62	3.73	4.94	4.05
3	502798	101632	-	3.73	4.94	4.05

Table 2: Water Levels: Tidal Defended

Node Reference	NGR		Modelled Flood Levels in Metres			
	Eastings	Northings	Defended Annual Exceedance Probability			
			5%	0.5%	0.5% (2115)	0.1%
1	502780	101627	-	-	4.89	-
2	502789	101629	-	-	4.89	2.94
3	502798	101632	-	-	4.89	2.94

Table 3: Water Depth: Tidal Undefended

Node Reference	NGR		Modelled Flood Depth in Metres			
	Eastings	Northings	Undefended Annual Exceedance Probability			
			5%	0.5%	0.5% (2115)	0.1%
1	502780	101627	-	0.55	1.75	0.87
2	502789	101629	0.32	1.42	2.63	1.74
3	502798	101632	-	0.92	2.13	1.24

Table 4: Water Depth: Tidal Defended

Node Reference	NGR		Modelled Flood Depth in Metres			
	Eastings	Northings	Defended Annual Exceedance Probability			
			5%	0.5%	0.5% (2115)	0.1%
1	502780	101627	-	-	1.93	-
2	502789	101629	-	-	2.58	0.63
3	502798	101632	-	-	2.08	0.13

All levels taken from: Arun to Adur Flood Model, completed in 2012 by JBA Consulting.

There is no additional information or health warnings for these levels/depths or the model from which they have been produced.

Produced on 05/04/3017



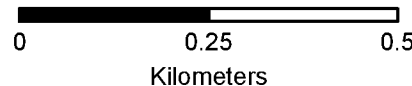
Environment
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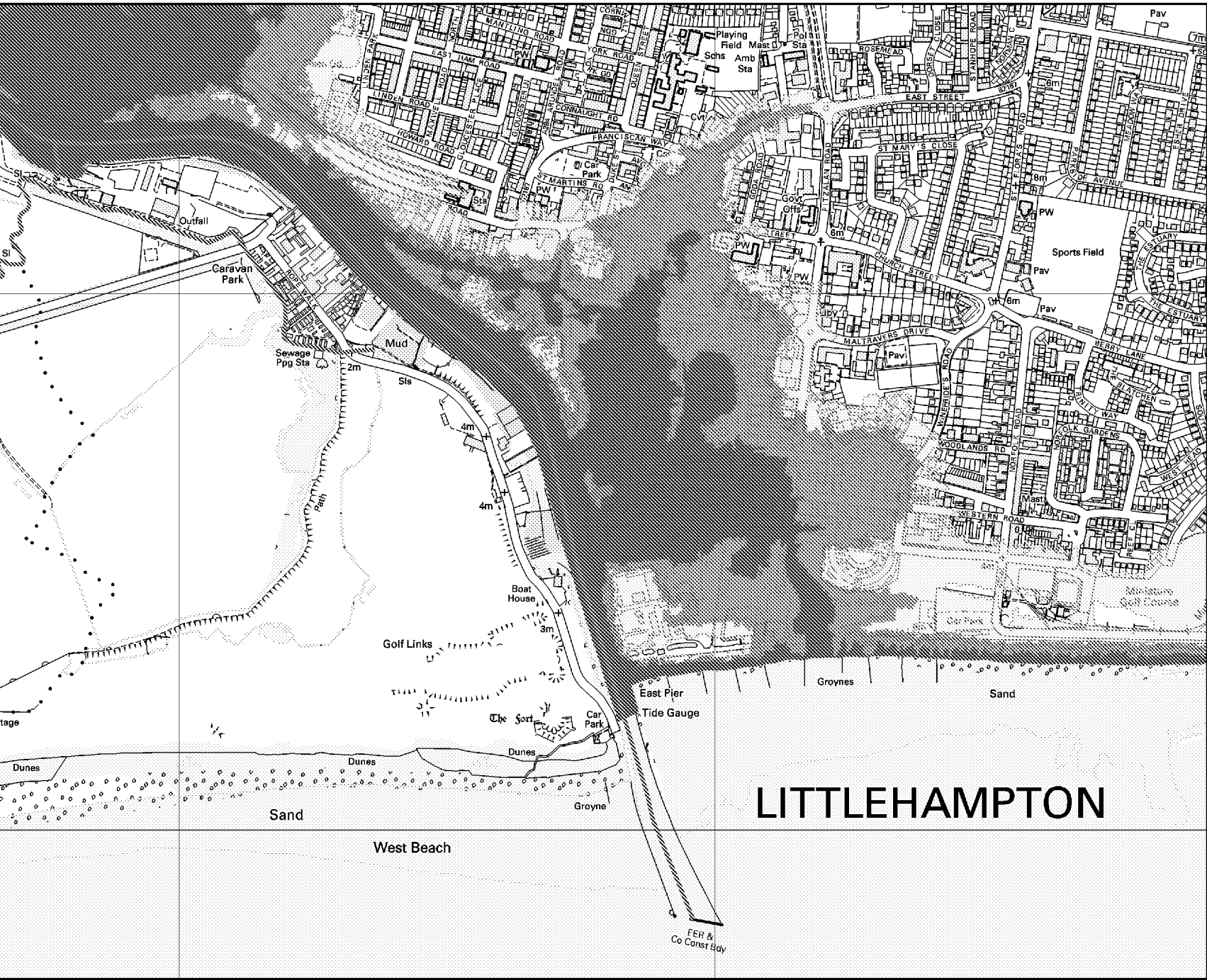


Legend

- Site Boundary
- Main River
- 5% AEP (2012) (Defended)
- 0.5% AEP (2012) (Defended)
- 0.1% AEP (2012) (Defended)
- 0.5% AEP (2115) (Defended)

Scale: 1:10,000







Environment
Agency



N

Legend

- Site Boundary
- Main River
- 5% AEP (2012) (Undefended)
- 0.5% AEP (2012) (Undefended)
- 0.1% AEP (2012) (Undefended)
- 0.5% AEP (2115) (Undefended)

Scale: 1:10,000

0

0.25

0.5

Kilometers





Environment Agency



Legend

-  Site Nodes
-  Site Boundary
-  Main River

Scale: 1:1,000



0 0.025 0.05
Kilometers