



VALLIS & HALL
CONSERVATION ARCHITECTS

FLOOD RISK ASSESSMENT

PLANNING CONSENT FOR SINGLE STOREY KITCHEN AND DINING ROOM EXTENSION
TO THE REAR OF COMMONMEAD BARN, PAGHAM ROAD, BOGNOR REGIS, WEST SUSSEX
PO21 3PY



Commonmead Barn
Pagham Road
Bognor Regis
West Sussex
PO21 3PY

for

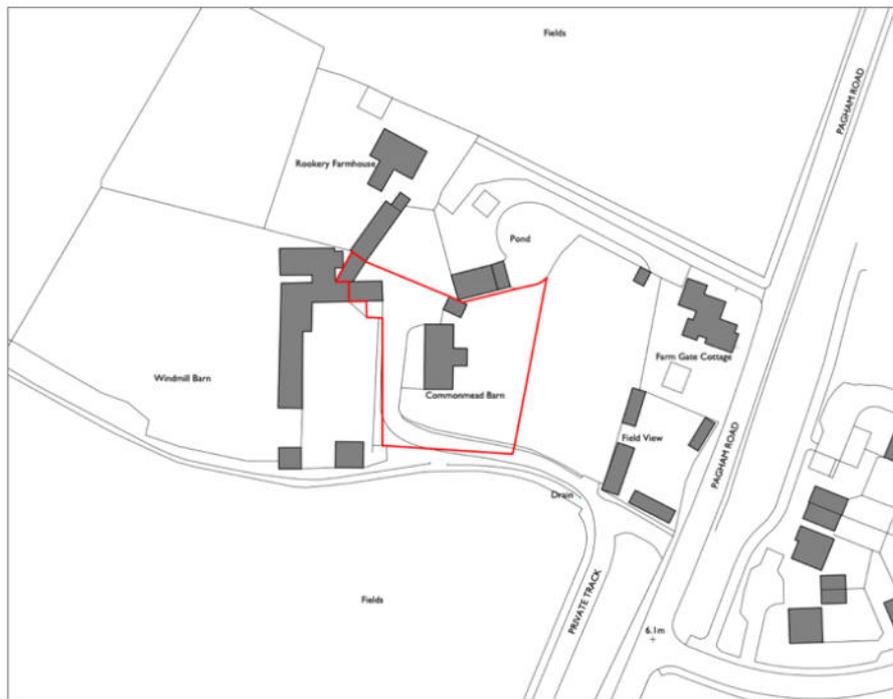
Mr A Geffryes

Project No: 846

January 2026

1. Introduction

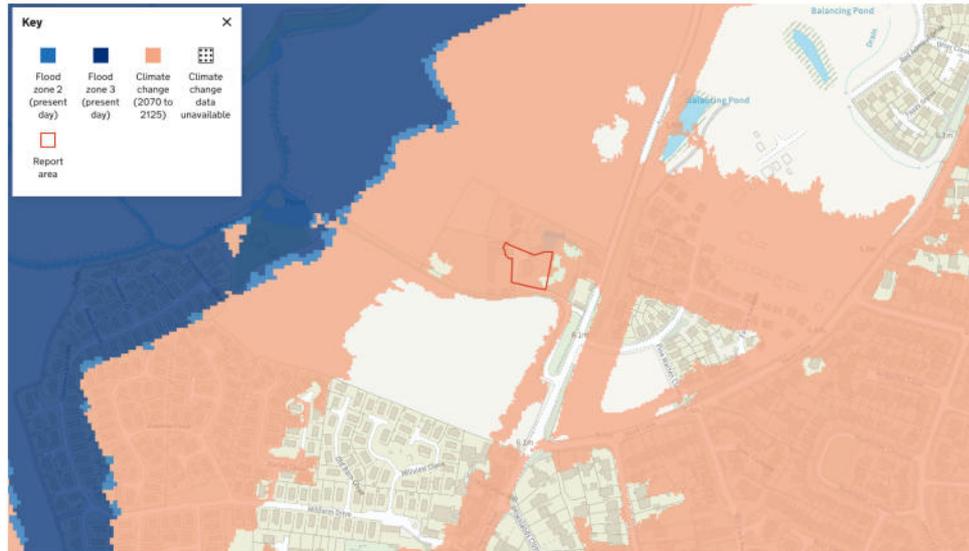
- 1.1. This Flood Risk Assessment has been prepared to inform an application for Planning Consent relating to Commonmead Barn, Pagham Road, Bognor Regis, West Sussex PO21 3PY and is submitted to Arun District Council on behalf of the applicant, Mr A Geffryes.
- 1.2. The application proposes a single storey extension to the north of the existing two storey converted barn alongside associated revision of the surrounding landscaping features. The extension comprises of an open plan kitchen and dining room alongside a gym and shower room, all of which are to be linked back to the main house via a glazed linking structure.
- 1.3. A detailed description of the site and the extent of the proposals is detailed within the Design Access and Heritage Statement alongside the as existing and as proposed drawings, therefore this document is to be read in conjunction with the submitted plans and documentation.



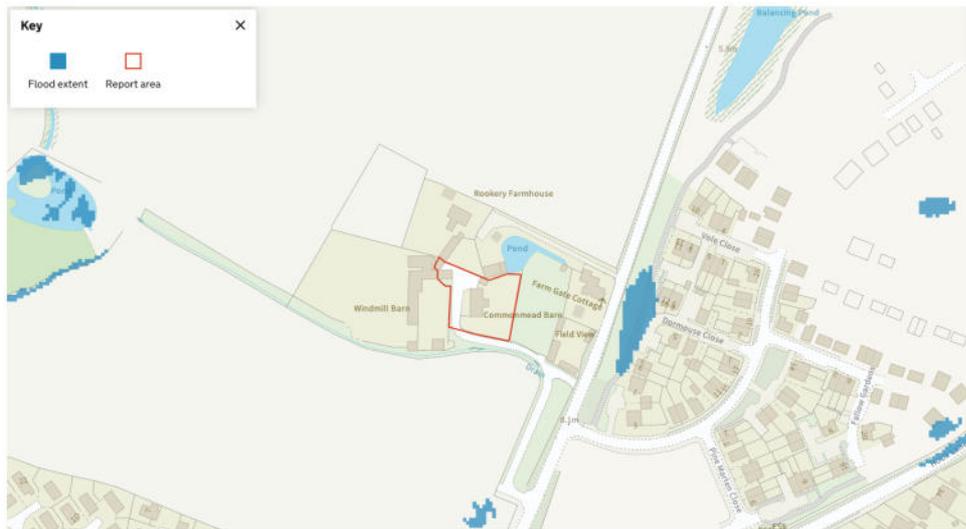
Extract of drawing no. 846/SU100 showing the existing site and surrounding context

2. Site Context

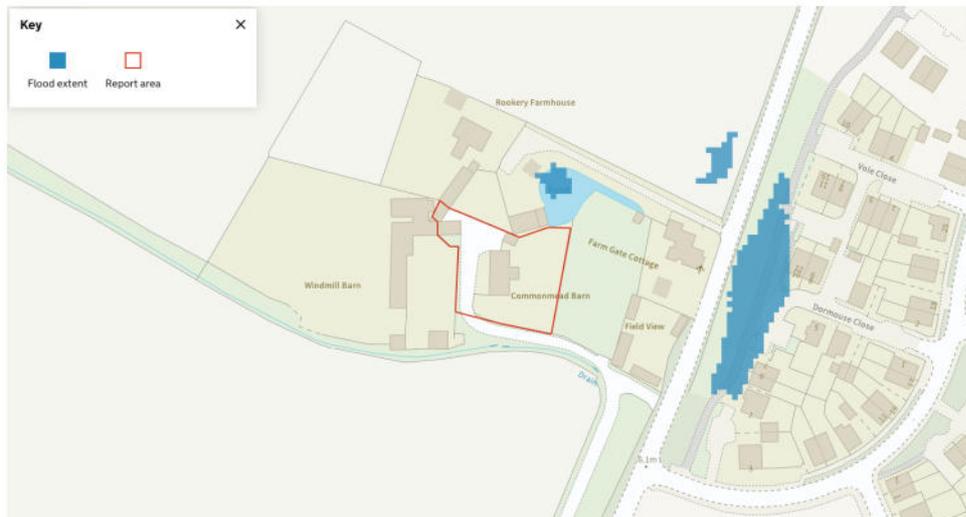
- 2.1. The application site is within Flood Zone 1, comprising of land having a less than 1 in 1000 annual probability of flooding from rivers or the sea in any year. It is identified that the site is at risk of flooding from rivers within the period 2070 to 2125 and from sea (tidal flooding) by the year 2125 when climate change is taken into account.
- 2.2. Flood mapping indicates that there is a low risk of surface water flooding directly within the site, albeit noting there are limited areas near to the site which have a 1 in 30 or 1 in 100 annual likelihood of surface water flooding.



Flood zone map for the application site showing the site is located within Flood Zone 1.



Map highlighting areas with 1 in 30 annual surface water flood risk near to the site location.



Map highlighting areas with 1 in 30 annual surface water flood risk near to the site location.

- 2.3. The Level 1 Strategic Flood Risk Assessment: Appendix F (2016) produced by Arun District Council suggests the site and the surrounding area may be susceptible to groundwater flooding. It should be noted that the dataset included within the appendix below is to a resolution of 1km and therefore only isolated locations within the overall area are likely to be at risk of groundwater flooding.
- 2.4. The Level 1 Strategic Flood Risk Assessment: Appendix F (2016) produced by Arun District Council shows there is no recorded history of flooding within the site or its immediate surroundings.
- 2.5. There is a pond located to the northeast of the application site at a notably lower level in relation to the topography of the site as existing. Known site topography and existing flood mapping indicate there is a low probability of surface water flooding from the pond. The pond features an overflow drainage route that runs through the neighbouring site to the east.
- 2.6. Recent Flood Risk Assessment and SuDS documentation submitted within planning application P/124/25/PL for the land to the east of Commonmead Barn indicate the highest groundwater level of the neighbouring site was 1.02mbgl. Given the competitively similar topography it is anticipated groundwater levels within the application site will be of an equivalent height, albeit subject to further investigation.
- 2.7. The proposed extension is to generally follow the existing internal and external ground floor levels. The topography immediately surrounding the proposed extension is to be revised to accommodate it, including the extension of the existing planting beds and retaining wall features navigating the transition between the paved terrace and the rest of the rear garden.

3. Impact Assessment

- 3.1. As existing, approximately 780.5m² of the application site comprises of existing buildings and hardstanding, including the gravel driveway. The proposed removal, extension and landscaping results in a net increase of 97.9m², or an increase of 11% on the existing situation.
- 3.2. The existing main building has a roof area of approximately 157.8m², or total of 184.2m² with the inclusion of the existing shed and home office. Accounting for the removal of the shed and home office, the proposed extension roof is anticipated to cover an additional 105.1m² for a total proposed roof area of 262.9m², representing a 30% increase of total roof area.
- 3.3. To accommodate the footprint of the proposed extension a select area of the existing rear garden will be lowered by approximately 350mm. This is to ensure the internal finished floor levels of the proposed will match the existing ground floor, and likewise, the external ground levels are to be continued around the perimeter of the proposed extension.
- 3.4. The resulting proposed extension shall feature stepped external thresholds up into the new rooms and therefore avoids a degree of risk from water ingress should a flooding event occur. Additionally, the single storey extension does not include bedroom accommodation, and the existing bedrooms are all located within the first floor of the main building.

- 3.5. Existing foul drainage is connected to the existing mains sewer, with the existing routes are to be subject to revision to serve the proposed kitchen relocation, and the proposed shower room. The property shall remain as a three-bedroom residential dwelling and therefore the existing occupancy rate will be unchanged.
- 3.6. To improve flood resilience within the site it is proposed that a stormwater attenuation soakaway system shall be introduced in accordance with manufacturers installation guidance and recommendations alongside the proposed extension. The proposed location for the new soakaway is indicated within the submitted as proposed drawings. The attenuation system will allow for the temporary storage of excess surface rainwater for gradual drainage at a controlled rate and thereby preventing peak surface water runoff overwhelming the existing drainage and infiltration situation.
- 3.7. Existing rainwater goods and stormwater drainage presently drain to soakaways present within the site, where feasible, it is proposed they are to be retained as existing or otherwise revised to drain into the proposed attenuation system where required.
- 3.8. New and re-laid paving shall be laid to fall towards drainage gulleys introduced alongside new rainwater downpipes to the proposed extension, all of which is proposed to drain into the proposed attenuation soakaway system.
- 3.9. The construction of the proposed extension is to include the installation of waterproof tanking membranes within the new floor, and wall, build-ups, thereby preventing water ingress through the structure in the event of groundwater flooding.

4. Summary and Conclusion

- 4.1. The proposal is for the introduction of a single storey extension, however, ground floor sleeping accommodation is not proposed and the existing occupancy rate shall be unchanged.
- 4.2. There are no historic records flooding within the immediate site context as indicated by the Arun District Councils Level 1 Strategic Flood Risk Assessment.
- 4.3. The site is not within a Flood Zone 2 or 3, and it is indicated that the site has a low risk of flooding from rivers, the sea or surface water. It is acknowledged, however, that climate change data suggests a potential increased risk of flooding within the period 2070 to 2125.
- 4.4. Additionally, the site is within an area considered susceptible to groundwater flooding and presently is anticipated to typically have a groundwater level of approximately 1mbgl (meters below ground level).
- 4.5. The proposed extension shall include the installation waterproof tanking membranes and featured stepped external thresholds to prevent water ingress into the structure.
- 4.6. The proposals will result in a limited increase in hardstanding and roof surface area and therefore an increased peak stormwater runoff is anticipated. It proposed that this is mitigated through the introduction of a stormwater attenuation tank serving new and revised drainage provisions and thus allowing infiltration at a controlled, manageable rate.

- 4.7. The proposal does seek to lower a section of raised ground levels to the northeast of the site, however, this simply brings the ground level down to match levels within proximity to the main existing building, and similar to that of the gravel driveway.
- 4.8. As detailed within the Design Access and Heritage Statement, the Commonmead Barn, and number of surrounding buildings including Rookery Farmhouse, were built during the 18th and 19th Centuries, suggesting a long-standing history of resilience to flooding within the site and its surrounding contexts.
- 4.9. It is therefore considered that the proposed measures mitigate the potential impacts to the site and towards the wider site context.

5. Appendix

- 5.1. Appendix below includes the following:
 - Flood map for planning. (Generated from the Environment Agency via the flood map for planning service, <https://flood-map-for-planning.service.gov.uk>)
 - Extract from Arun District Council Level 1 Strategic Flood Risk Assessment: Appendix C
 - Extract from Arun District Council Level 1 Strategic Flood Risk Assessment: Appendix F
 - Extract from Arun District Council Level 1 Strategic Flood Risk Assessment: Appendix H
 - Product Data Sheets for Stormwater Attenuation System provisionally proposed to be installed, or equivalent approved.



Flood map for planning

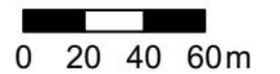
Your reference
846 Commonmead Barn

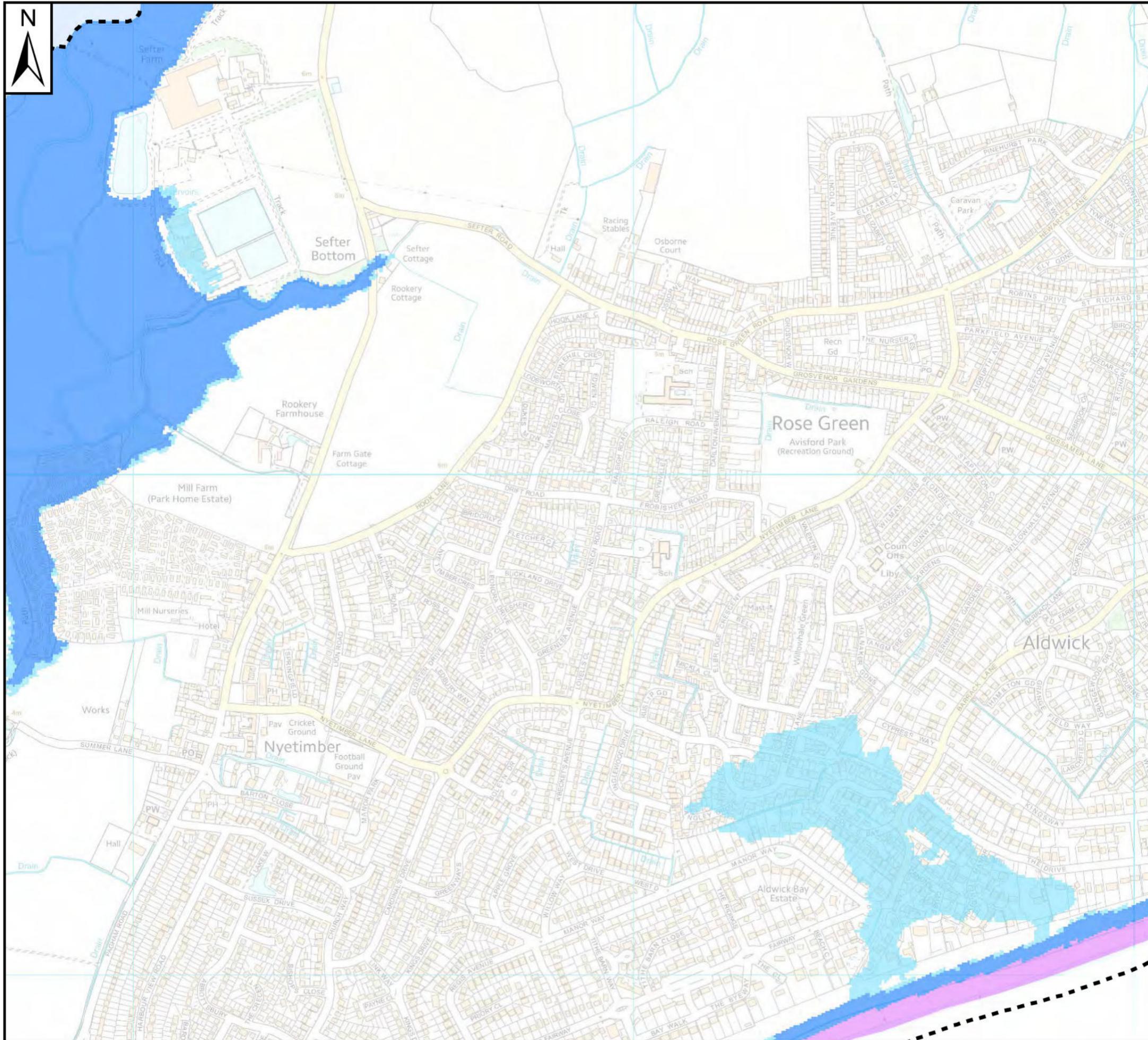
Location (easting/northing)
489294/99038

Scale
1:2,500

Created
6 Jan 2026 12:26

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area





Notes

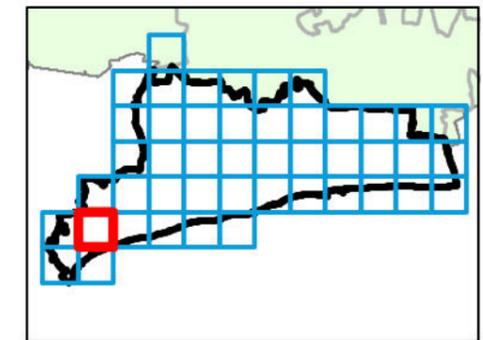
Zone 1: Comprised of land having a less than 1 in 1,000 annual probability of river or sea flooding in any year.

Zone 2: Comprised of land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding or 1 in 200 and 1 in 1,000 annual probability of sea flooding in any year.

Zone 3a: This zone comprises land assessed as having a greater than 1 in 100 annual probability of river flooding or a greater than 1 in 200 annual probability of flooding from sea in any year.

Zone 3b: This zone comprises land where water has to flow or be stored in times of flood (the functional floodplain). The SFRA identified this Flood Zone as land which would flood with an annual probability of 1 in 20 years, where detailed modelling exists. In the absence of detailed hydraulic model information, a precautionary approach has been adopted with the assumption that the extent of Flood Zone 3b would be equal to Flood Zone 3a. If development is shown to be in Flood Zone 3a, further work should be undertaken as part of a detailed site specific

Key Plan



Legend

- Arun District SFRA boundary
- Flood Zone 3b
- Flood Zone 3a
- Flood Zone 2



REF	Date	Comments
A	June 2016	-
B		
C		

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ARUN DISTRICT COUNCIL

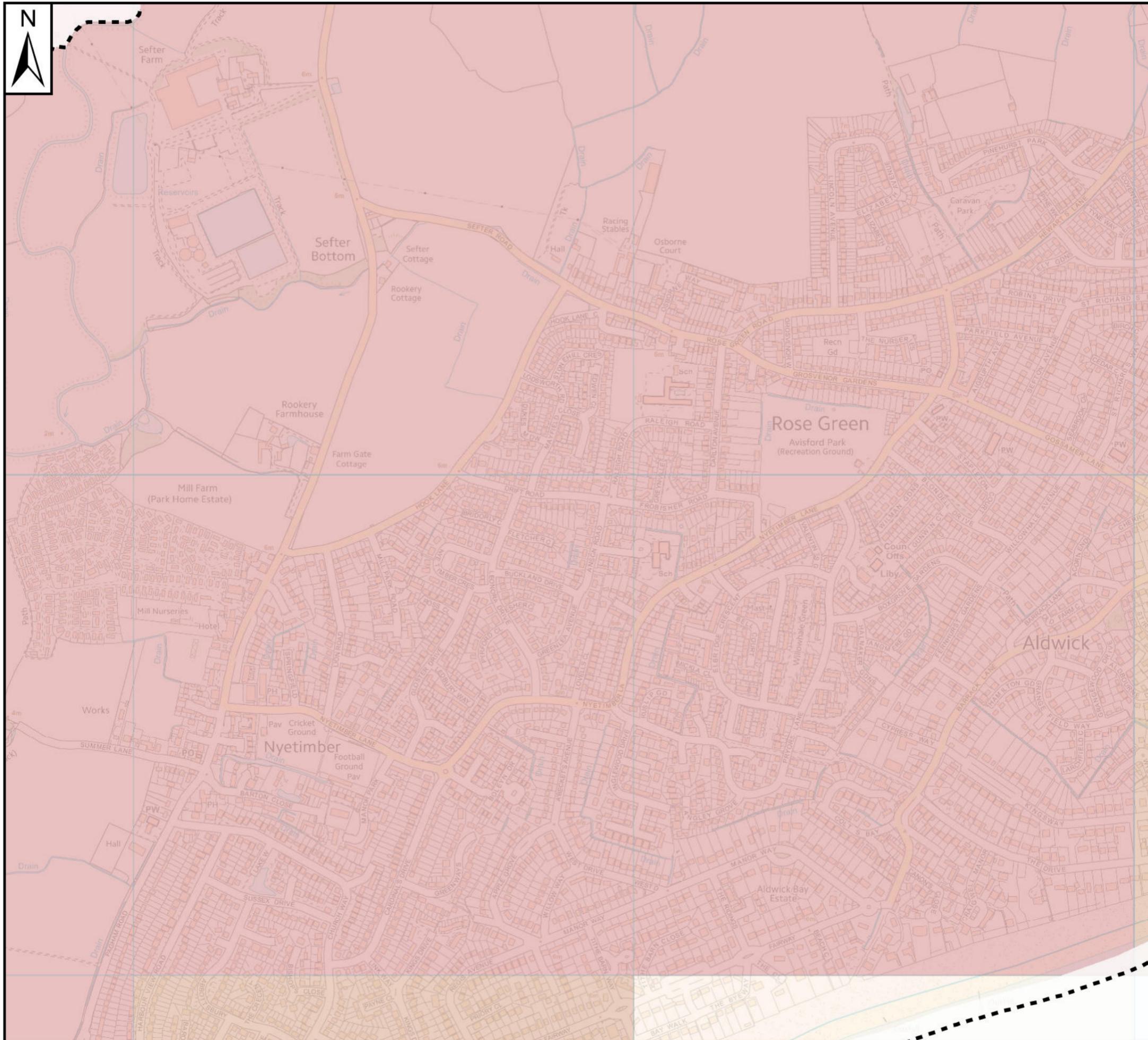
LEVEL 1 SFRA: APPENDIX C FLOOD ZONES

Sheet No: 4 of 46

Index Number: ADC_04

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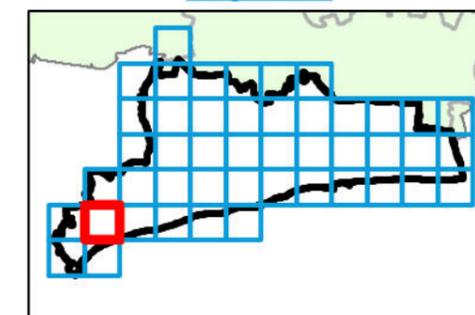
Notes

The Areas Susceptible to Groundwater Flooding (ASTGWF) is a strategic scale map showing groundwater flood areas on a 1km square grid. The data was produced to annotate indicative Flood Risk Areas for Preliminary Flood Risk Assessment (PFRA) studies and allow the Lead Local Flood Authorities (LLFAs) to determine whether there may be a risk of flooding from groundwater.

This data shows the proportion of each 1km grid square where geological and hydrogeological condition show that groundwater might emerge. It does not show the likelihood of groundwater flooding occurring. It does not take account of the chance of flooding from groundwater rebound. This dataset covers a large area of land, and only isolated locations within the overall susceptible area are actually likely to suffer the consequences of groundwater flooding.

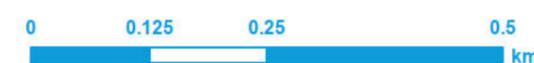
The ASTGWF data should be used only in combination with other information, for example local data or historic data. It should not be used as sole evidence for any specific flood risk management, land use planning or other decisions at any scale. However, the data can help to identify areas for assessment at a local scale where finer resolution datasets exist.

Key Plan



Legend

- Arun District SFRA boundary
- < 25%
- ≥ 25% < 50%
- ≥ 50% < 75%
- ≥ 75%



REF	Date	Comments
A	June 2016	-
B		
C		

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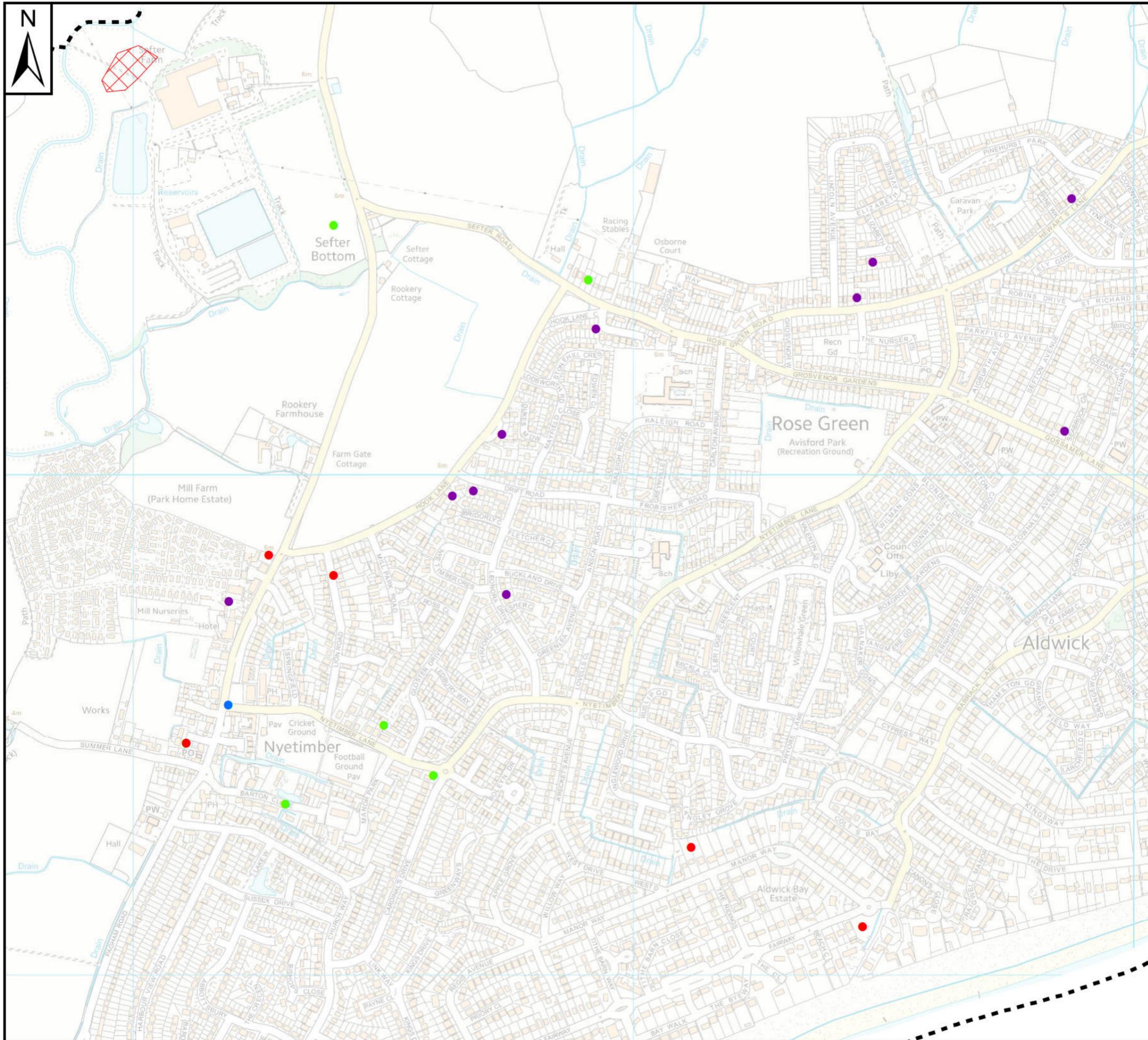
LEVEL 1 SFRA: APPENDIX F

AREAS SUSCEPTIBLE TO GROUNDWATER

Sheet No: 4 of 46 Index Number: ADC_04

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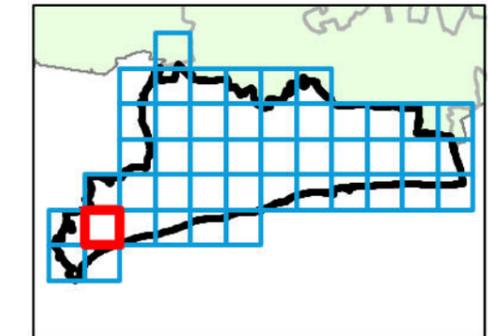
Notes

The Historic Flooding Map shows the recorded incidents and flood outlines provided by Arun District Council, West Sussex County Council, Southern Water and Environment Agency. Historical flood extent was obtained from the Environment Agency.

Flooding incidents provided have been categorised based upon the details provided in the records. Unknown flood points could not be determined from the information provided, and therefore could be from a number of sources.

Please note that not all historical records may be shown on this map, and that it is therefore advised you contact Arun District Council for updated information post 2015.

Key Plan



Legend

- Arun District SFRA boundary
- Historic flood outline
- Fluvial
- Coastal
- Surface Water
- Failure
- Unknown
- Tidal

Source of flooding

- Fluvial
- Coastal
- Surface Water
- Failure
- Unknown



REF	Date	Comments
A	June 2016	-
B		
C		

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ARUN DISTRICT COUNCIL LEVEL 1 SFRA: APPENDIX H HISTORIC FLOODING RECORDS

Sheet No: 4 of 46 Index Number: ADC_04

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Product Specification Sheet

RainBloc is manufactured from selected recycled material and is designed for deeper applications which may be subject to regular and heavy traffic loadings, e.g. cars and HGV's.

Technical Specification

	Crate
Product Code	360050
Colour	Black
Dimensions (mm)	1200 x 600 x 420
Weight	17kg
Gross Volume	300 litres
Net Volume	285 litres
Void Ratio	95%
Inspectable	No
Vertical Loading	45 tonnes/m ² (450kN/m ²)
Lateral Loading	15 tonnes/m ² (150kN/m ²)
BBA Approved	No



Maximum depth of installation

Maximum depth of installation - to base of units (m)¹

Typical soil type	Soil weight kN/m ²	Angle of internal friction (degrees) ²	Landscaped areas	Vehicle weight <9 tonnes ³	Vehicle weight <30 tonnes	Vehicle weight <60 tonnes
Over consolidated stiff clay	20	24	4.75	4.50	4.25	4.25
Silty sandy clay	19	26	5.50	5.25	5.00	5.00
Loose sand and gravel	18	30	6.00	5.75	5.50	5.50
Medium dense sand and gravel	19	34	6.50	6.25	6.00	6.00
Dense sand and gravel	20	38	6.75	6.50	6.25	6.25

It is advised that structural design calculations are carried out prior to work commencing. Installation depths and loadings outside of those covered in this table may be permissible depending on site conditions. Contact Graf UK Ltd for more information.

Minimum cover depths

	Landscaped area	Vehicle weight <3 tonnes ⁴	Vehicle weight <9 tonnes	Vehicle weight <12 tonnes	Vehicle weight <30 tonnes	Vehicle weight <60 tonnes
Minimum cover depth (m)	0.30	0.50	0.55	0.65	0.70	1.00 ⁵
Maximum cover depth (m)	3.0	3.0	3.00	3.00	2.75	2.50

Other vehicle loads are possible. Please contact Graf UK for technical advice

Notes:

- Without groundwater present. RainBloc may be used where groundwater is present, contact Graf UK for technical advice.
- The design is very sensitive to small changes in the assumed value of ϕ , therefore, it is recommended that these values are confirmed by a chartered geotechnical engineer.
- Applicable for car parks or other areas trafficked only by cars or LGVs. Infrequent accidental load from heavier vehicles may be possible.

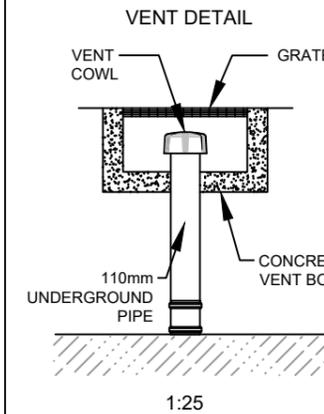
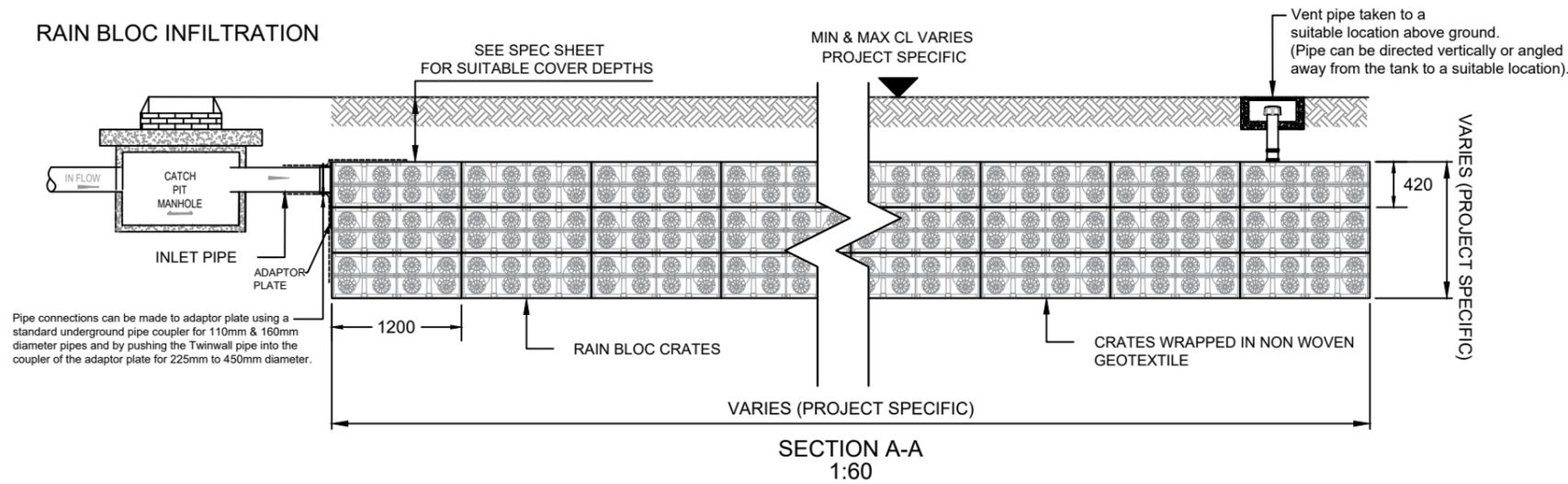
- This category should be used when considering landscaped areas that may be trafficked by ride on mowers.
- Including 200mm concrete slab.

Assumptions made:

- Ground above and to the sides of the tank is horizontal.
- Shear planes or other weaknesses are not present within the structure of the surrounding soil.



RAIN BLOC INFILTRATION



NB. The infiltration tank must be vented to a suitable location above ground and it is recommended to have one Ø110mm vent pipe for every 7,500m² of impermeable catchment area.

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DO NOT SCALE - IF IN DOUBT ASK

Notice: This drawing is issued only as a guideline and is an estimate of the materials required to construct the drainage system, it should not be used for construction purposes.

Graf UK Ltd makes no warranty or guarantee in relation to the suitability of any of the layout details shown on this drawing in relation to a particular scheme.

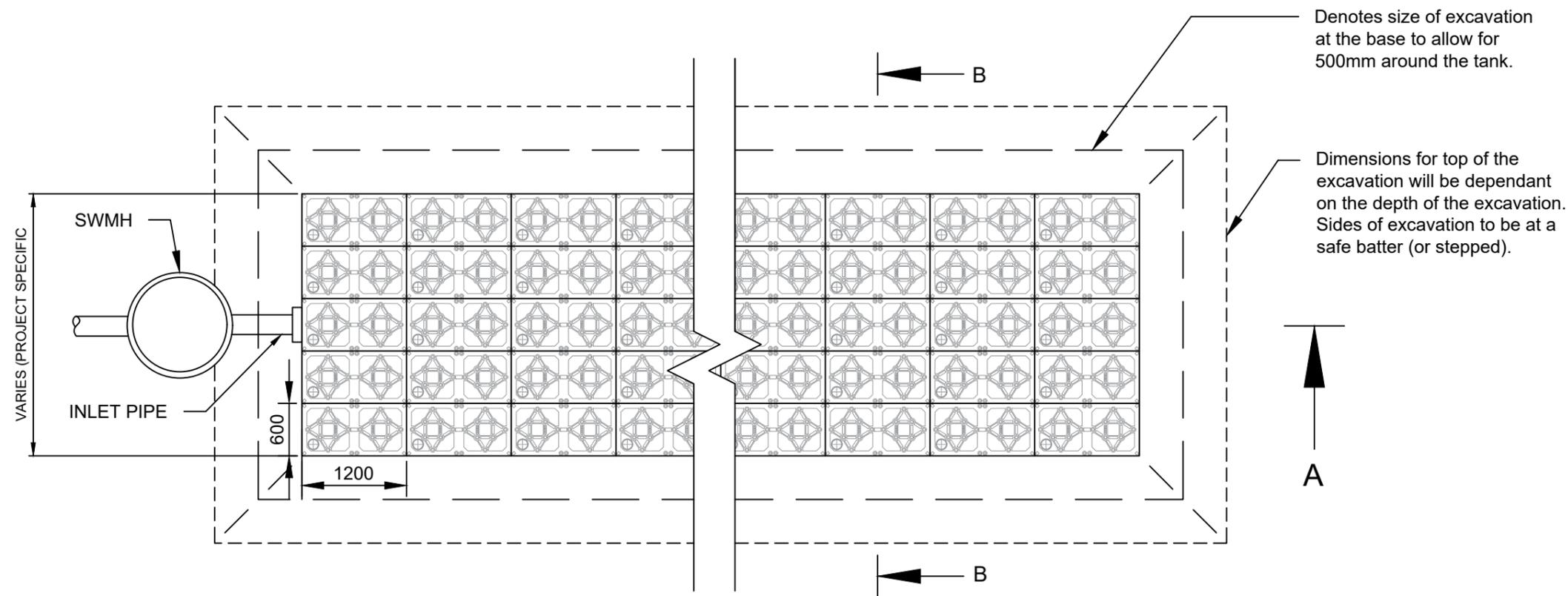
NOTES:-

- All dimensions in mm, unless otherwise stated.
- All dimensions are nominal and may vary within manufacturing tolerances.
- All site temporary enabling works by others.
- Graf products to be installed in strict accordance with Graf recommendations.
- This drawing is intended for guidance only. Confirmation of the suitability for a particular project should be sought from the consulting engineers prior to final design or commencement of any construction works.

RAIN BLOC



Crate	
Dimensions (mm)	1200 x 600 x 420
Gross Volume (m3)	0.300m ³
Net Volume (m3)	0.285m ³
Material	Polypropylene (Upcyclen TV30)
Weight	17kg
Void Ratio	95%
Inspectable	No
*UCS Vertical	450 kN/m ²
*UCS Lateral	150 kN/m ²
*Ultimate Compression Strength	



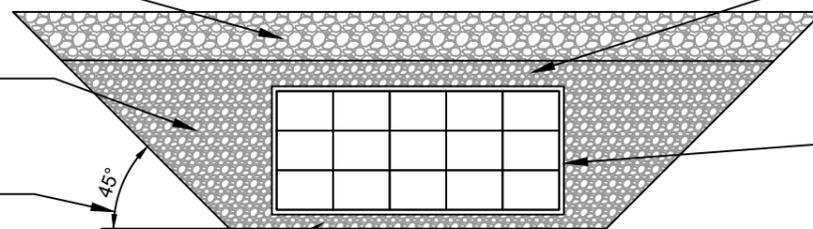
NOTE: EXCAVATION TO EXCEED TANK SIZE BY 500MM ON ALL SIDES TO ALLOW FOR ACCESS

BACKFILL UP TO FINISHED GROUND LEVEL USING SUITABLE MATERIAL AS REQUIRED FOR FINISHED COVER.

8 TO 16mm SINGLE SIZED NON-ANGULAR STONE AROUND SIDES OF TANK TO BE COMPLETED PRIOR TO ANY FILL MATERIAL BEING PLACED ON TOP OF TANK

ANGLE TO SUIT SAFE EXCAVATION OR SURROUNDING GROUND AND DEPTH

BASE LAYER TO BE 8 TO 16mm SINGLE SIZED NON-ANGULAR STONE MIN DEPTH 50mm



LAYER IMMEDIATELY ABOVE TANK TO BE 8 TO 16mm SINGLE SIZED NON-ANGULAR STONE MIN100mm BEFORE BACKFILLING AS PER FINISHED GROUND COVER

OUTER LAYER TO BE 110g/m² (NW9) NON-WOVEN GEOTEXTILE. INSTALLED WITH A MIN. OVERLAP OF 300mm

UNDISTURBED EARTH BASE OF EXCAVATION. EXCAVATED AREA TO BE SMOOTH, FIRM AND LEVEL, FREE FROM LUMPS AND DEBRIS AND SUITABLE TO CARRY ANTICIPATED LOADS WITH A MIN CBR VALUE OF 5%. SOFT SPOTS IN EXISTING MATERIAL BELOW BOTTOM OF EXCAVATION ARE TO BE DUG OUT AND THE RESULTANT VOIDS REPLACED WITH TYPE 1.

P3	UPDATED NOTES	AP	21.09.22
P2	DETAILS UPDATED FOR NEW RAINBLOC CRATE	MC	02.02.21
REV.	DESCRIPTION	BY	DATE



GRAF UK Limited, Regen House, Beaumont Road, Banbury, Oxfordshire, OX16 1RH

T: 01608 661500

F: 01295 211333

E: info@grafuk.co.uk

www.grafuk.co.uk

DRAWN :	DB	DATE :	01.01.2019
CHECKED :	MC	SCALE :	AS STATED

PROJECT	GRAF STANDARD DETAILS
---------	-----------------------

DESCRIPTION	INFILTRATION TANK using GRAF RAIN BLOC
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DRAWING No.	STANDARD DETAIL.RAIN BLOC. P3	REV.	(Pg.1)
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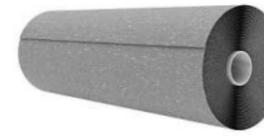
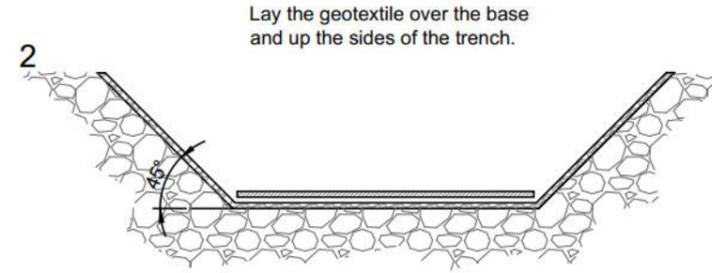
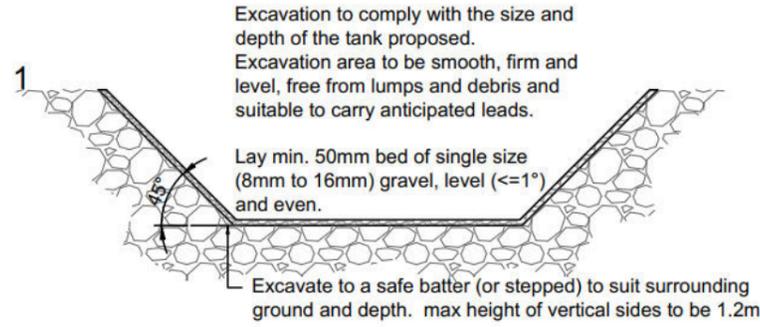
Notice: This drawing is issued only as a guideline and is an estimate of the materials required to construct the drainage system, it should not be used for construction purposes.

Graf UK Ltd makes no warranty or guarantee in relation to the suitability of any of the layout details shown on this drawing in relation to a particular scheme.

INSTALLATION METHOD:-

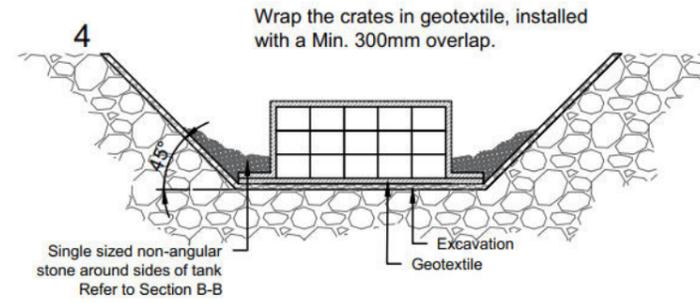
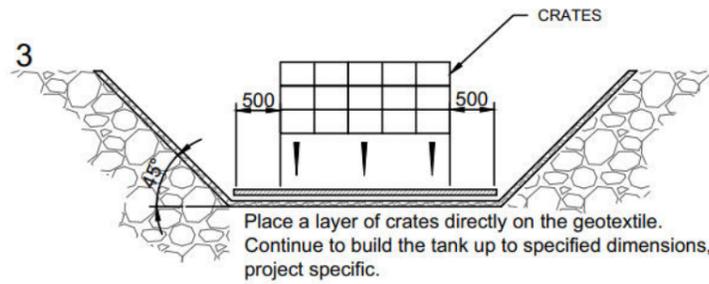
1. a) Excavate the trench with a safe batter (or stepped) ensuring the footprint allows for sufficient space between tank and the sides. (minimum 500mm around all sides of the tank).
 b) Mark out the position of the tank including inlets.
 c) Lay min. 50mm of single sized non angular stone (8 to 16mm) as a base for the tank. This can be laid to a maximum fall of 1°.
2. a) Lay the Non-Woven Geotextile on the base of the excavation, overlapping any joins by a minimum of 300mm
 b) The geotextile used must meet the specification stated on the drawing.
3. a) Place the first layer of crates until complete ensuring clips are used to secure each crate.
 b) Continue building the tank up until all crates have been installed to the specified dimensions, project specific.
4. a) Fix adaptor plates to the sides of the crates in the required position for the inlets.
 b) Cover the top and sides with non-woven geotextile covering the entire tank with a minimum overlap of 300mm.
 c) Install vent pipe connection into the top of the tank at a suitable location.
 d) Backfill around the tank and for 100mm above with non-angular stone. Backfill to finished ground level with suitable material in layers.
 e) Connect inlet pipes using appropriate bandseals.
 f) In order to prevent silt from entering the tank it is recommended that silt traps or catchpit manholes are installed upstream of any inlet. These should be regularly maintained to avoid the buildup of any silt.

N.B. Installation method may vary depending on depth of the tank and is project specific. For more information or technical questions please contact our Technical Department at Graf UK.

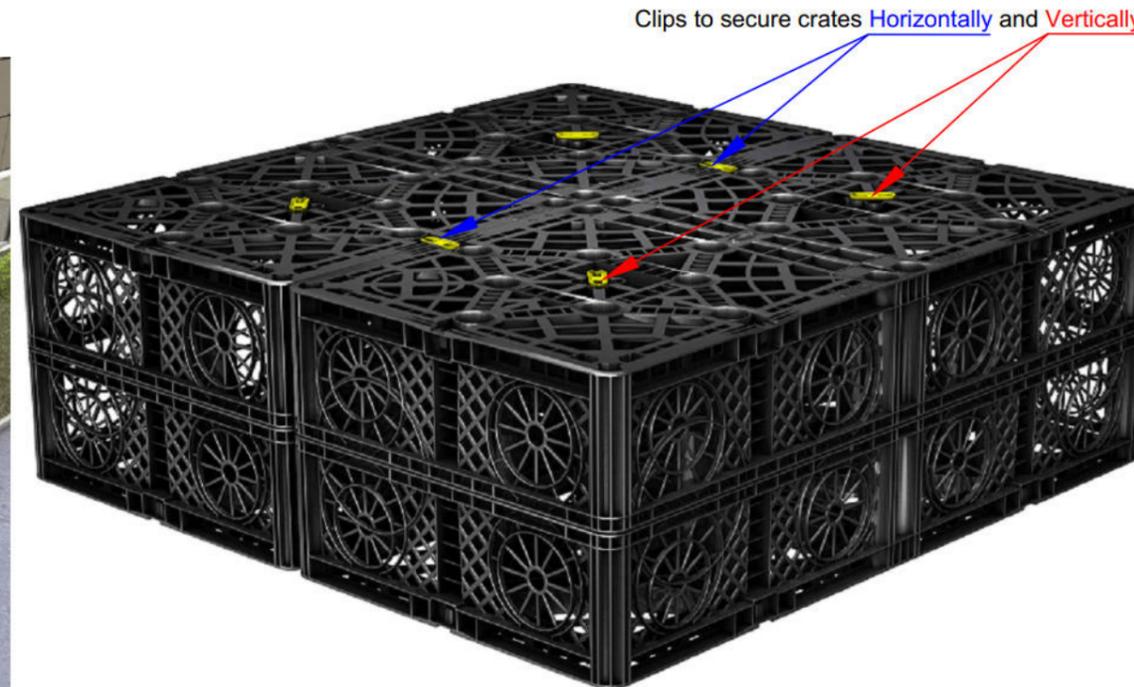


Geotextile:
110g/m² Non-woven,
needle punched
geotextile

Geotextiles with characteristics less than those specified are unlikely to be suitable and are therefore not recommended for use with Graf UK systems for this application



(Drawing for illustrative purposes only)



P3	UPDATED NOTES	AP	16.06.22
P2	DETAILS UPDATED FOR NEW RAINBLOC CRATE	MC	02.02.21
REV.	DESCRIPTION	BY	DATE

GRAF GRAF UK Limited

GRAF UK Limited, Regen House, Beaumont Road, Banbury, Oxfordshire, OX16 1RH
 T: 01608 661500 F: 01295 211333
 E: info@grafuk.co.uk www.grafuk.co.uk

DRAWN : DB DATE : 01.01.19
 CHECKED : MC SCALE : VARIOUS@A3

PROJECT
GRAF STANDARD DETAILS

DESCRIPTION
**INFILTRATION TANK
using GRAF RAIN BLOC**

DRAWING No. **STANDARD DETAIL.RAIN BLOC.** REV. **P3**
(Pg.2)