UNDA

Flood Risk Assessment

Flood Risk Assessment for Planning

Prepared for: Caldecote Ltd

Location: 91 Sea Avenue, Rustington, West Sussex BN16 2DR

Our reference: 95081/Caldecote SeaAv

July 2015

UNDA

Document Issue Record

Project:	Flood Risk Assessment for Planning
Client:	Caldotec Ltd
Location:	81 Sea Avenue, Rustington, West Sussex, BN16 2DR
Application:	Construction of ground floor extension to form a "granny annex"
Our reference:	86081-Caldotec-SeaAv
Version:	Final v1.0 170715

Lead Consultant:	Ms Jackie Stone, Mr Edward Bouët
Document Check:	Miss Florence Harris
Authorisation:	Mr Edward Bouët

This report (including any enclosures and attachments) has been prepared for the exclusive use and benefit of the commissioning party and solely for the purpose for which it is provided. Unless we provide express prior written consent, no part of this report should be reproduced, distributed or communicated to any third party. We do not accept any liability if this report is used for an alternative purpose from which it is intended, nor to any third party in respect of this report. Any data and information provided by third parties and referred to herein has not been checked or verified by us unless otherwise expressly stated within this report. This report was checked and approved on the date it was issued and is therefore valid on this date. Understanding, circumstances, regulations and professional standards do change, which could subsequently affect the validity of this report.

The Studio, Lime Tree Cottage, Oldlands Avenue, Balcombe, West Sussex, RH17 6LS

[redacted]

ARUN DISTRICT COUNCIL R/114/15/HH

Key Facts

Flood Risk Posed:

- EA Flood Zone 3 (High Risk).
- Tidal risk originating from the English Channel.
- High Risk of groundwater flooding (Arun SFRA).
- Medium / High Risk of pluvial flooding (EA).
- Historical evidence of sewer surcharge flooding in the vicinity (Arun SFRA).

Flood Risk Management:

- The site is situated partially in Flood Zone 3 when using the Environment Agency Flood Map for Planning (Rivers and Sea).
- There will be no loss of fluvial flood storage.
- Safe refuge is provided on the upper floors of the property.
- Flood proofing of the building will be incorporated as appropriate.
- A flood warning and evacuation plan will be implemented post development.

Assuming accordance with these flood risk management measures, Unda Consulting Limited consider the proposed application to be suitable in flood risk terms.

Introduction

Unda Consulting Limited have been appointed by Caldotec Ltd (hereinafter referred to as "the applicant") to undertake a Site Specific Flood Risk Assessment (FRA) for Planning at 81 Sea Avenue, Rustington, West Sussex, BN16 2DR (hereinafter referred to as "the site"). The FRA has been undertaken in accordance with the National Planning Policy Framework (NPPF) March 2012 and the associated technical guidance.

The site appears to be located within Flood Zone 3 as defined by the Environment Agency (EA) on their Flood Map for Planning. Under the National Planning Policy Framework (NPPF), a FRA is required if a proposed development:

- includes building or engineering works in Flood Zone 2 or 3;
- includes building or engineering works on land classified by the Environment Agency as having critical drainage problem;
- changes the use of land or buildings in a location at risk of flooding from rivers or the sea, or with critical drainage problems;
- changes the use of land or buildings in a way that increases the flood vulnerability of the development where it may be subject to other sources of flooding;
- is larger than 1 hectare.

Given that the proposed application site is located in Flood Zone 3 (High Risk of flooding from rivers or the sea), and includes building works, the applicant is required to submit a FRA under the NPPF. The assessment should demonstrate to the Local Planning Authority (LPA) and EA how flood risk will be managed now and over the development's lifetime, taking climate change into account, and with regard to the vulnerability of its potential users.

The objectives of a FRA to support a planning application are to establish:

- whether the proposed development is likely to be affected by current or future flooding from any source;
- whether it will increase flood risk elsewhere;
- whether the measures proposed to deal with these effects and risks are appropriate.

ARUN DISTRICT COUNCIL R/114/15/HH

Existing Situation

Site Usage:

The site is currently a corner plot with a detached double storey residential property. The site fronts Sea Avenue to the west with Bontany Close running along the northern boundary.

Detailed existing site plans are provided in the report Appendix.

Figure 1: Aerial view of the site and immediate surrounding area (Source: Google Earth)

Geography:

The site is situated 100m north of the English Channel. LiDAR remotely sensed digital elevation data suggests that the ground topography ranges from 4.60mAOD to 4.75mAOD across the site.

ARUN DISTRICT COUNCIL R/114/15/HH

Proposed Development

The proposed planning application is for the construction of a ground floor extension to form a "granny annex".

Detailed proposed site plans are provided in the report Appendix.

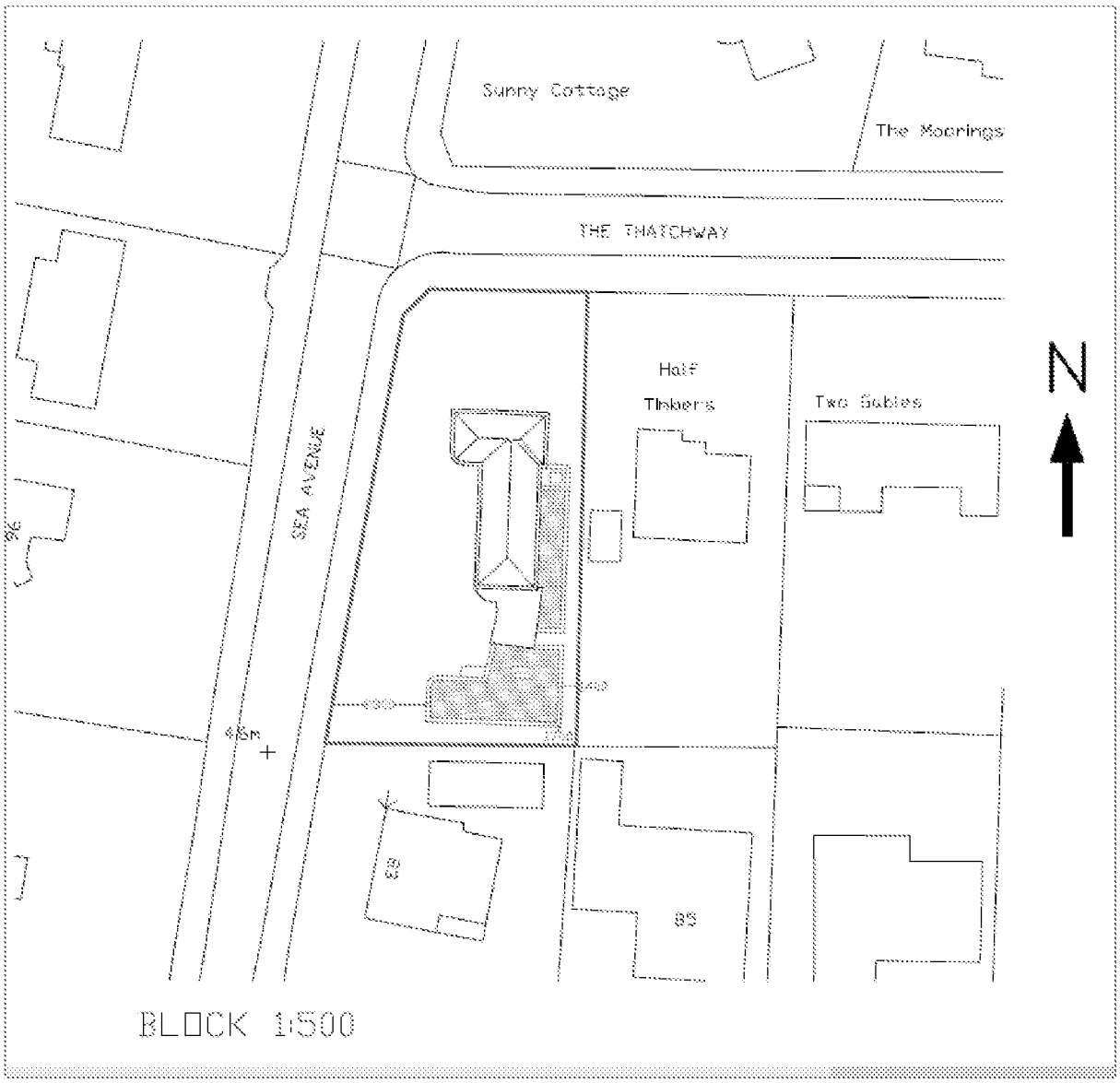


Figure 2: Proposed ground floor extension (Source: Caldotec Ltd)

ARUN DISTRICT COUNCIL R/114/15/HH

Assessment of Flood Risk

Flood Zones:

Within planning, Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's Flood Map for Planning (Rivers and Sea), available on the Environment Agency's web site.

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

Table 1: Flood Zones

The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding.

Figure 3: Environment Agency Flood Map for Planning (Rivers and Sea) (Source: EA)

The site is located partially within Flood Zone 3 (High Probability), which means it is defined as land having at least a 1 in 200 annual probability of tidal flooding.

The risk would appear to be predominantly tidal, and originate from the English Channel 100m to the south of the site.

Tidal (English Channel):

The English Channel (The Channel) is the body of water that separates southern England from northern France, and joins the southern part of the North Sea to the Atlantic Ocean. It is about 560km long and varies in width from 240km at its widest to 33.1km in the Strait of Dover. It is the smallest of the shallow seas around the continental shelf of Europe, covering an area of some 75,000km^2.

Uniquely, The Channel acts as a funnel that amplifies the tidal range from less than a metre as observed at sea to more than 6 metres as observed in the Channel Islands, the west coast of the Cotentin Peninsula and the north cost of Britany. The time difference of about 6 hours between high water at the eastern and western limits of the Channel are indicative of the tidal range being amplified further by resonance. Some areas along the south coast are particularly vulnerable to severe storms moving from the Atlantic eastwards along the English Channel.

The English Channel is situated 100m to the south of the site.

Modelled flood levels and extents:

Modelled flood levels and flood extents have been received from the EA as part of a Product 4 data request (reference SSD/6722).

The following modelled flood levels for in-channel nodes within the 2012 TUFLOW study model have been provided for use within this report. This table should be used in conjunction with the addition mapping provided in Figure 6:

Node Point	Easting	Northing	Tidal levels taken from 2012 TUFLOW model [mAOD]			
			DEFENDED			
			1.33% AEP [1in75yr]	0.5% AEP [1in200yr]	0.1% AEP [1in1000yr]	0.5% AEP [1in200yr] +CC 2115
1	505761	101565	5.03	5.13	5.29	5.68
2	505772	101550	5.03	5.13	5.29	5.68
3	502413	102017	5.03	5.13	5.29	5.68

Table 2: Modelled flood levels from the EA (Source: EA, SSD/6722)

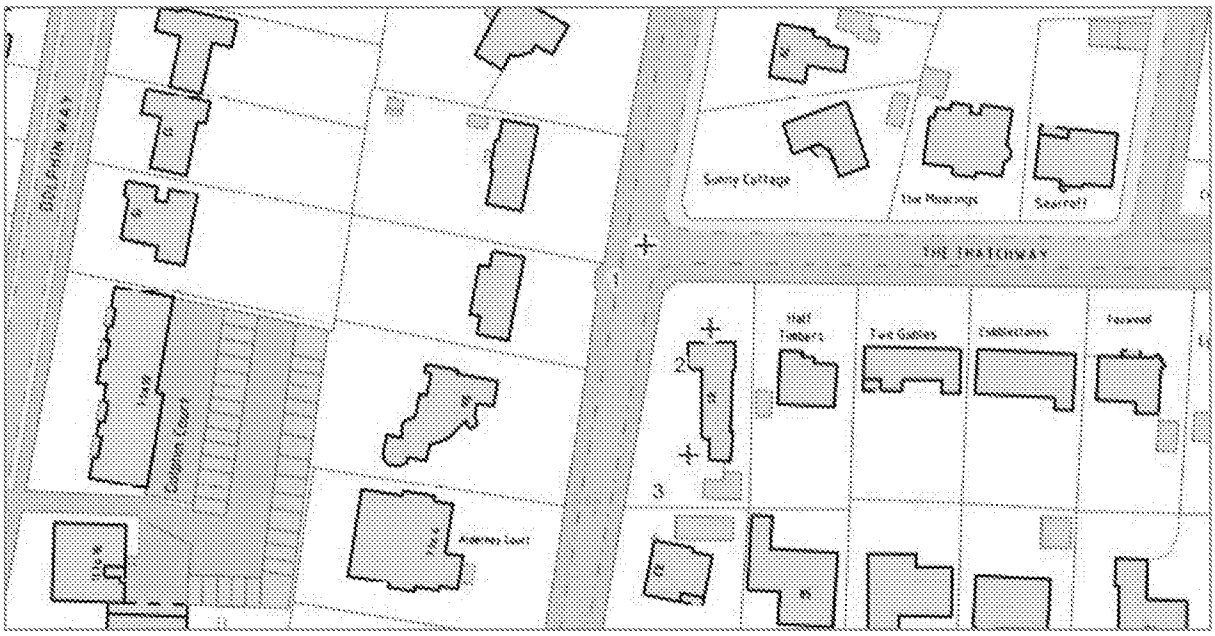


Figure 6: Modelled node locations (Source: EA, SSD/6722)

Of importance are the 1:200 year fluvial modelled floodplain level of 5.13mAOD, and the 1:200 year plus allowance for climate change fluvial modelled floodplain level of 5.68mAOD.

Comparison of these modelled floodplain levels with measured topographic site levels, shows the site is situated below the modelled 1:200 year flood level, and the modelled 1:200 year plus allowance for climate change flood levels. The minimum topographic level on site is 4.60mAOD, meaning the site could be inundated with up to 1.08m of floodwater during a 1:200 year plus allowance for climate change flood event.

Flood defences:

According to the information contained within The Strategic Flood Risk Assessment for Arun District Council, VOLUME II, TECHNICAL REPORT, February 2008 (Map D2 – Type of Flood Defence) (Arun SFRA) the flood defences consists of a sandy lower beach and a natural narrower shingle upper beach with groynes, constructed from timber and rock. Generally, the shingle beach provides the principal coastal defence. The defence system is supported by annual beach replenishment works.

The defences in this location are maintained by Arun District Council. It is the EA's understanding is that the shingle beach in this area is maintained to a height of 5.8mAOD.

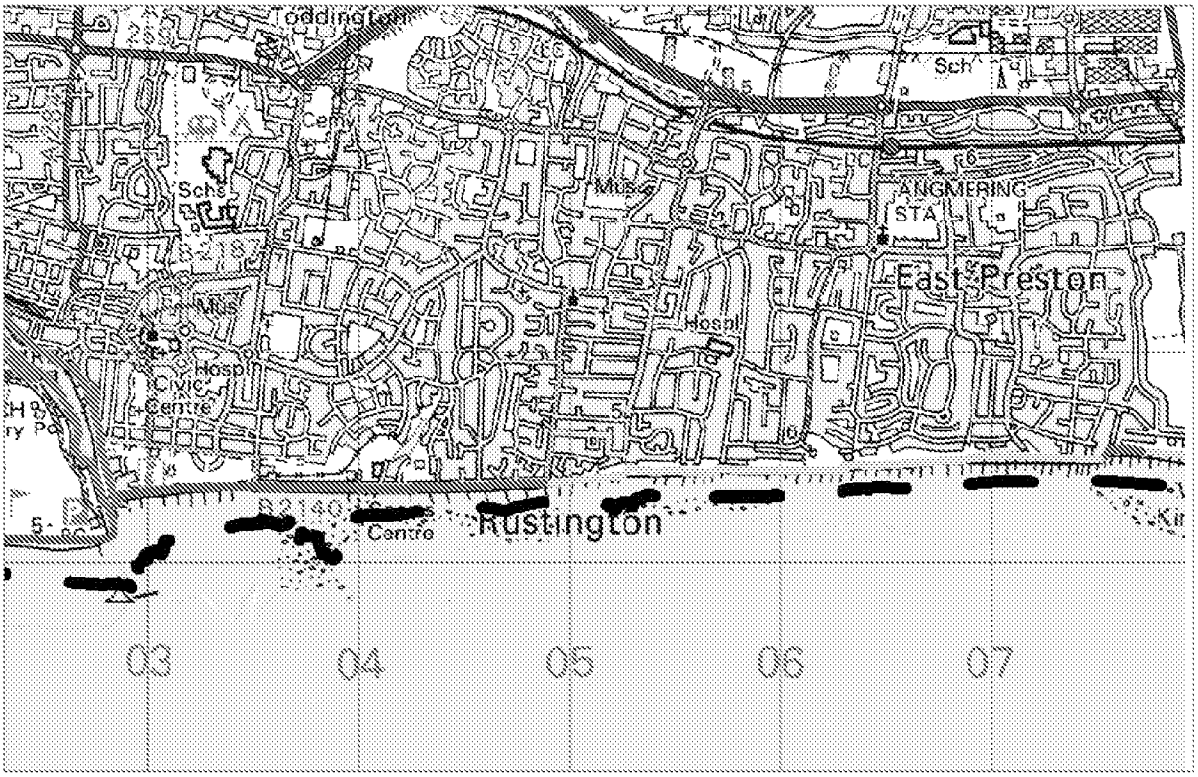


Figure 3: Extract from Arun SFRA (Map D2 – Type of Flood Defence). The green line denotes Coastal Protection (natural) and the red line denotes Coastal Protection (man-made).

Residual risk (breach or overtopping of flood defences):

The Rustington seafront is protected by a natural defences. There remains a residual risk in the incidence of failure. Wave overtopping is one of the principal mechanisms of flooding for the coastal frontage. Allowing for wave-overtopping increases the extent of flooding.

Historical flood records:

The EA have no records of historical flooding having affected the site. The Strategic Flood Risk Assessment for Arun District Council, VOLUME II, TECHNICAL REPORT, February 2008 have no records of historical flooding having affected the site.

Pluvial (Surface Water):

Pluvial (surface water) flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead. The EA Surface Water Flood Map suggests that the site lies in close proximity to areas of "High" and "Medium" risk of flooding from surface water.

ARUN DISTRICT COUNCIL R/114/15/HH

Figure 4: Extract from Environment Agency Surface Water Flood Map (Source: EA)

Groundwater:

Groundwater flooding occurs as a result of water rising up from the underlying rocks or from water flowing from abnormal springs. This tends to occur after much longer periods of sustained high rainfall. Higher rainfall means more water will infiltrate into the ground and cause the water table to rise above normal levels. Groundwater tends to flow from areas where the ground level is high, to areas where the ground level is low. In low-lying areas the water table is usually at shallower depths anyway, but during very wet periods, with all the additional groundwater flowing towards these areas, the water table can rise up to the surface causing groundwater flooding.

Groundwater flooding is most likely to occur in low-lying areas underlain by permeable rocks (aquifers). These may be extensive, regional aquifers, such as chalk or sandstone, or may be localised sands or river gravels in valley bottoms underlain by less permeable rocks. Groundwater flooding takes longer to dissipate because groundwater moves much more slowly than surface water and will take time to flow away underground.

According to the information contained within The Strategic Flood Risk Assessment for Arun District Council, VOLUME II, TECHNICAL REPORT, February 2008 (Map G1 – Indicative Risk of Groundwater Flooding) (Arun SFRA) the site is located in a high groundwater flood risk area. No incidents have been recorded on site.

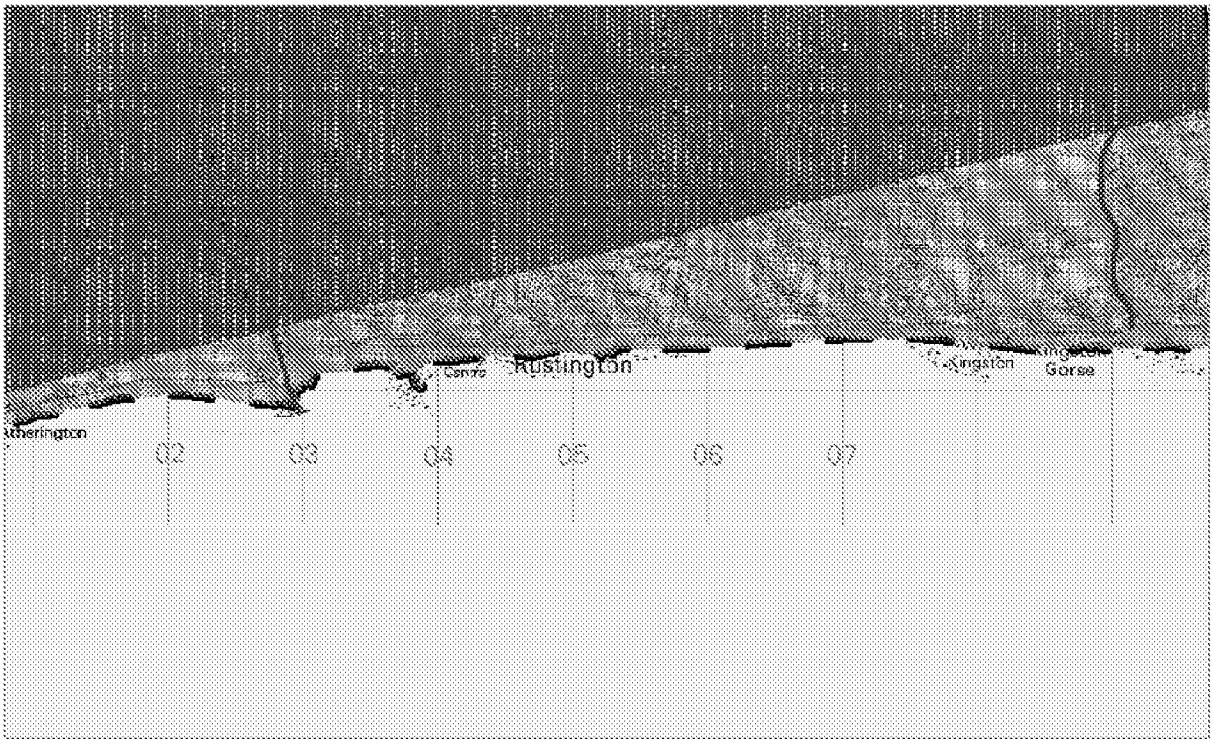


Figure 5: Extract from Arun SFRA Map G1 – Indicative Risk of Groundwater Flooding. The red hatching denotes High Risk to Groundwater Flooding.

Sewer Surcharge:

Sewer flooding events are usually the result of overloaded sewers following heavy rainfall or blockages caused by misuse of the sewerage system.

According to the information contained within Strategic Flood Risk Assessment for Arun District Council, VOLUME II, TECHNICAL REPORT, February 2008 (Figure 4: Map S Historic Incidents of Flooding From Sewers) historically an incident has occurred in close proximity to the site. The applicant any No further information has been provided to suggest that the site is susceptible to sewer surcharge flooding

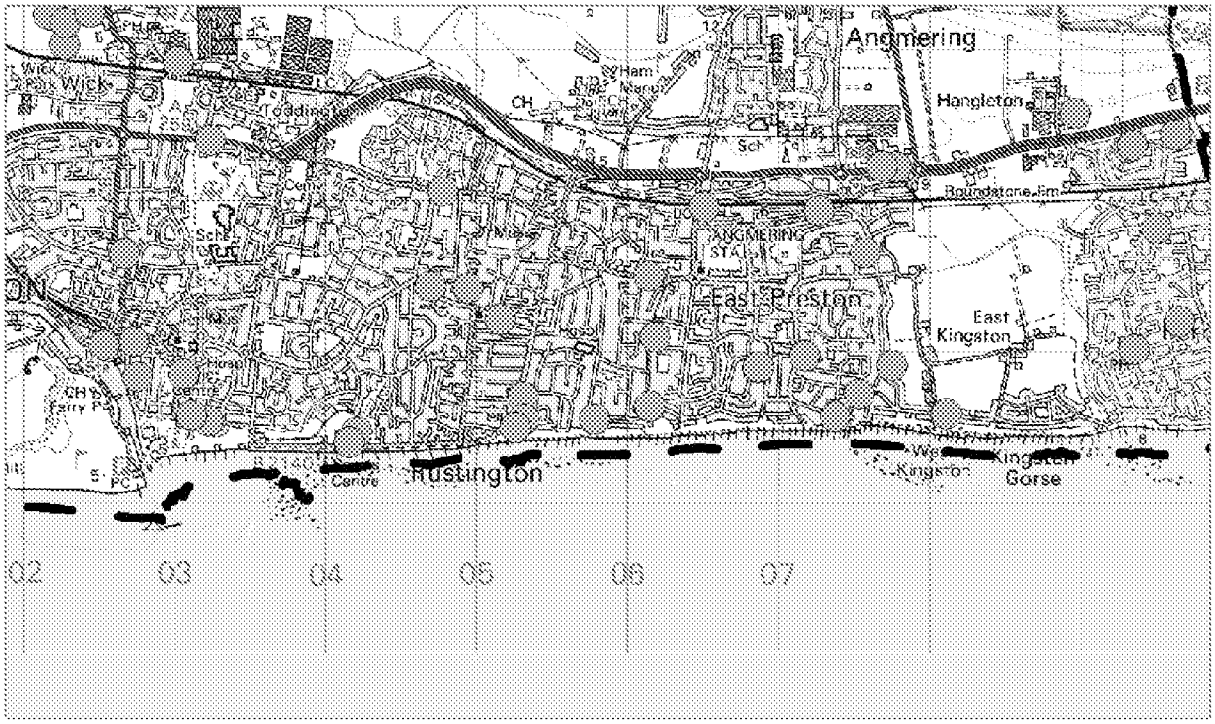


Figure 6: Extract from Arun SFRA Map S – Historic Incidents of Flooding from Sewers (Source: Arun SFRA). The blue dot denotes historic incidents of Sewer Flooding

Other Sources:

The EA have no records of any artificial (man-made) sources of flood risk (such as reservoirs or raised canals) in the vicinity of the site. In addition, according to Strategic Flood Risk Assessment for Arun District Council, VOLUME II, TECHNICAL REPORT, February 2008, no artificial sources of flooding (which include canals, reservoirs, lakes and pumping stations were identified during the strategic assessment.

Flood Risk Management Measures

Vulnerability to flooding:

The NPPF classifies property usage by vulnerability to flooding.

The existing site usage is classified as "more vulnerable" throughout, as it is a residential property.

Post development, the site will remain "more vulnerable", as the application is for the extension of the existing single residential property. Accordingly, is considered that the vulnerability of the site as a whole is increased marginally post development.

EA Standing Advice:

The EA Standing Advice guidance is for domestic extensions and non-domestic extensions where the additional footprint created by the development does not exceed 250m^2. It should not be applied if an additional dwelling is being created, e.g. a self-contained annex or additional commercial unit.

Physical Design Measures:

The NPPF requires new residential floor levels to be set at least 300mm above suitable modelled on-site 1:200 year plus allowance for climate change flood levels. This level is 1.38 m above ground levels and existing floor levels. The application is for the construction of an extension to the existing home, and not for a new standalone residential property. It is not feasible to raise floor levels of the extension 1.38m above the existing property.

Instead, it is proposed that the floor level of the extension be set at an equal level to the existing property. It is proposed that a point of safe refuge is provided within the upper floors of the property. During an extreme and imminent flood event, residents should seek refuge within the property.

To help protect against flooding during extreme events, the application has agreed to implement flood resistant design measures into the new extension, in consultation with the Local Authority building control department. These measures can include the following:

- Solid concrete ground floor slab, with waterproof membrane;
- Waterproof screed used on floors;
- Closed-cell foam used in wall cavities;
- Waterproof ground floor internal render;
- External walls rendered resistant to flooding to first floor level;
- Exterior ventilation outlets, utility points and air bricks fitted with removable waterproof covers;
- Ground floor electrical main ring run from first floor level; and on separately switched circuit from first floor;
- Electrical incomer and meter situated at first floor level or above;
- Boilers, control and water storage / immersion installed at first floor level or above;
- Gas meter installed at first floor level or above;
- Plumbing insulation of closed-cell design;
- Non-return valves fitted to all drain and sewer outlets;
- Manhole covers secured;
- Anti-syphon fitted to all toilets;
- Kitchen units of solid, water resistant material;
- Use of MDF carpentry (i.e. skirting, architrave, built-in storage) avoided at ground floor level;
- Stairs of solid hardwood construction with wood faces treated to resist water penetration.

ARUN DISTRICT COUNCIL R/114/15/HH

The applicant should also consider the use of demountable flood defence barriers to defend ground level doorways and low windows.

Safe Escape:

In the absence of modelled flood data, it is unknown if safe escape, as per the specification in the NPPF, can be provided from the site to an area wholly outside of the Flood Zone. However, it should be noted that the proposed application is for the extension of the existing single residential property. No new units will be created as part of the development. Safe escape is not a requirement under the EA Standing Advice guidance is for domestic extensions.

In the absence of safe escape, residents should follow the warning and evacuation procedure detailed in the following section.

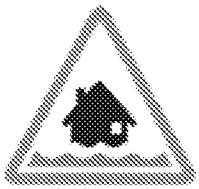
A point of safe refuge is provided within the upper floors of the property. During an extreme and imminent flood event, residents should seek refuge within the property.

Flood Warnings:

To further conform to the EA Standing Advice, the applicant has agreed to implement a flood warning and evacuation plan post development, and subscribe to the EA's flood warning service.

The flood warning service has three types of warnings that will help you prepare for flooding and take action:

Flood Alert



What it means? Flooding is possible. Be prepared.

When it's used? Two hours to two days in advance of flooding.

What to do? Be prepared to act on your flood plan.

Prepare a flood kit of essential items.

Monitor local water levels and the flood forecast on our website.

Flood Warning

What it means? Flooding is expected. Immediate action required.

When it's used? Half an hour to one day in advance of flooding.

What to do? Move family, pets and valuables to a safe place.

Turn off gas, electricity and water supplies if safe to do so.

Put flood protection equipment in place.

Severe Flood Warning

What it means? Severe flooding. Danger to life.

When it's used? When flooding poses a significant threat to life.

What to do? Stay in a safe place with a means of escape.

Be ready should you need to evacuate from your home.

Co-operate with the emergency services.

Call 999 if you are in immediate danger.

ARUN DISTRICT COUNCIL R/114/15/HH

Flood Plan:

It is recommended that the applicant and future owners, occupiers and Landlords of the proposed flats prepare a flood plan to protect life and property during a flood event:

Before a flood:

- Find out if you are at risk of flooding.
- Find out if you can receive flood warnings.
- Prepare and keep a list of all your important contacts to hand or save them on your mobile phone.
- Think about what items you can move now and what you would want to move to safety during a flood such as pets, cars, furniture, and electrical equipment.
- Know how to turn off gas, electricity and water supplies.
- Prepare a flood kit of essential items and keep it handy. It can include copies of important documents, a torch, a battery-powered or wind-up radio, blankets and warm clothing, waterproofs, rubber gloves and a first aid kit including all essential medication.
- Consider buying flood protection products such as flood boards and airbrick covers to help reduce flood water getting into your property.

Before a flood:

- Tune into your local radio station on a battery or wind-up radio.
- Fill jugs and saucepans with water.
- Grab your flood kit - if you have prepared one.
- Collect blankets, torch, first aid kit, medication and food.
- Move important documents, personal items, valuables, and lightweight belongings upstairs or to high shelves.
- Raise large items of furniture, or put them in large bags if you have them.
- Move people, outdoor belongings, cars and pets to higher ground.
- Switch off water, gas and electricity at mains when water is about to enter your home. Do not touch sources of electricity when standing in water.
- Fit flood protection products, if you have them, for example flood boards, airbrick covers, sandbags.
- Put plugs in sinks and baths. Weigh them down with a pillowcase or plastic bag filled with soil.
- If you do not have non-return valves fitted, plug water inlet pipes with towels or cloths.
- Move your family and pets upstairs or to a high place with a means of escape.
- Listen to the advice of the emergency service and evacuate if told to do so.
- Avoid walking or driving through flood water. Six inches of fast-flowing water can knock over an adult and two feet of water can move a car.

After a flood:

- If you have flooded, contact your insurance company as soon as possible.
- Take photographs and videos of your damaged property as a record for your insurance company.
- If you don't have insurance, contact your local authority for information on grants and charities that may help you.
- Flood water can contain sewage, chemicals and animal waste. Always wear waterproof outerwear, including gloves, wellington boots and a face mask.
- Have your electrics, central heating and water checked by qualified engineers before switching them back on.

Off-Site Impacts

Floodplain storage:

The NPPF requires that where development is proposed in undefended areas of floodplain, which lie outside of the functional floodplain, the implications of ground raising operations for flood risk elsewhere needs to be considered. Raising existing ground levels may reduce the capacity of the floodplain to accommodate floodwater and increase the risk of flooding by either increasing the depth of flooding to existing properties at risk or by extending the floodplain to cover properties normally outside of the floodplain. Flood storage capacity can be maintained by lowering ground levels either within the curtilage of the development or elsewhere in the floodplain, in order to maintain at least the same volume of flood storage capacity within the floodplain.

In undefended tidal areas, raising ground levels is unlikely to impact on maximum tidal levels so the provision of compensatory storage should not be necessary.

For development in a defended flood risk area, the impact on residual flood risk to other properties needs to be considered. New development behind flood defences can increase the residual risk of flooding if the flood defences are breached or overtopped by changing the conveyance of the flow paths or by displacing flood water elsewhere. If the potential impact on residual risk is unacceptable then mitigation should be provided.

Surface Water Drainage Strategy:

The development will utilise Sustainable Urban Drainage (SuDs) design in accordance with the NPPF for Planning Applications and the London Plan drainage hierarchy as follows:

1. Store rainwater for later use;
2. Infiltration techniques;
3. Attenuate rainwater by storing in tanks for gradual release;
4. Discharge rainwater direct into watercourse;
5. Discharge rainwater into surface water sewer;
6. Discharge rainwater into a combined sewer;
7. Attenuation of rainwater in ponds or open water features with controlled discharge into the local watercourse.

Sequential and Exception Test

The Sequential Test aims to ensure that development does not take place in areas at high risk of flooding when appropriate areas of lower risk are reasonably available. The site is situated in Flood Zone 3 when using the Environment Agency Flood Map for Planning (Rivers and Sea). Post development, the site will become "more vulnerable", as the application is for the construction of a residential property.

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a	Exception Test required	✗	Exception Test required	✓	✓
Zone 3b	Exception Test required	✗	✗	✗	✓

Table 2: Flood risk vulnerability and flood zone 'compatibility'

The Sequential and Exception Tests do not need to be applied to minor developments and changes of use. The proposed application is for the minor extension of an existing residential property.

Using the table about, the proposed application is considered to be suitable within Flood Zone 3, subject to implementation of the Exception Test.

ARUN DISTRICT COUNCIL R/114/15/HH

Conclusion

Unda Consulting Limited have been appointed by Caldotec Ltd to undertake a Site Specific Flood Risk Assessment (FRA) for Planning for 81 Sea Avenue, Rustington, West Sussex, BN16 2DR. The FRA has been undertaken in accordance with the National Planning Policy Framework (NPPF) March 2012 and the associated technical guidance.

The proposed planning application is for the construction of a ground floor extension to form a "granny annex". Post development, the site will remain "more vulnerable", as the application is for the extension of the existing single residential property.

The site is located within Flood Zone 3 as defined by the Environment Agency (EA) on their Flood Map for Planning. The site is situated below the modelled 1:200 year flood level, and the modelled 1:200 year plus allowance for climate change flood levels. Accordingly, the applicant will ensure that a route and area of saf refuge is provided to the upper floors of the property.

Additionally, the risk of flooding posed to the site by pluvial, groundwater, and sewer surcharge flooding would appear to be low.

In summary:

- The site is situated partially in Flood Zone 3 when using the Environment Agency Flood Map for Planning (Rivers and Sea).
- There will be no loss of fluvial flood storage.
- Safe refuge is provided on the upper floors of the property.
- Flood proofing of the building will be incorporated as appropriate.
- A flood warning and evacuation plan will be implemented post development.

Assuming accordance with these flood risk management measures, Unda Consulting Limited consider the proposed application to be suitable in flood risk terms.

ARUN DISTRICT COUNCIL R/114/15/HH

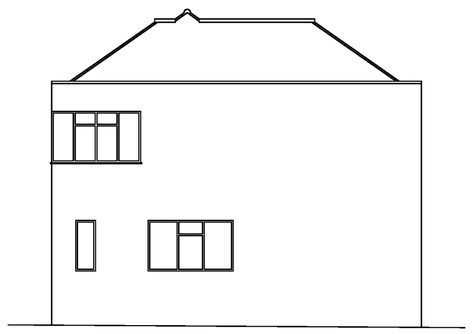
Appendix

Page 22 - 23: Existing and Proposed site plans.

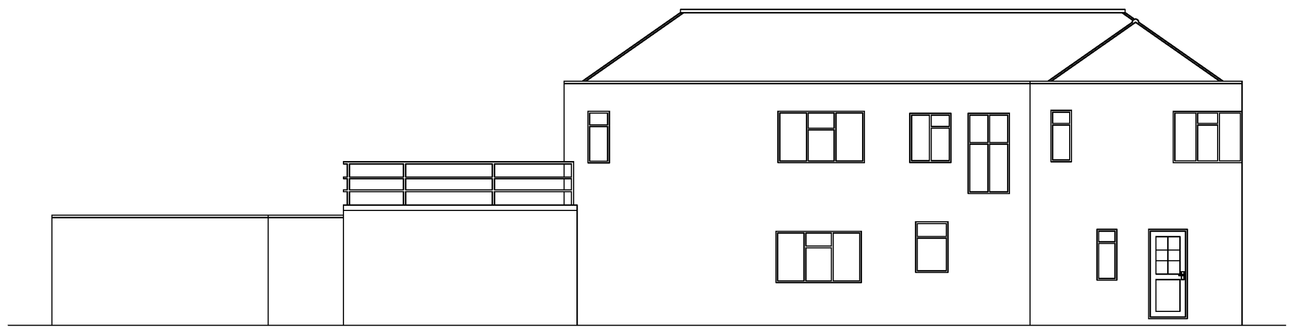
Page 24 – 26: EA Product 4 flood data.

ARUN DISTRICT COUNCIL R/114/15/HH

FRONT ELEVATION
West



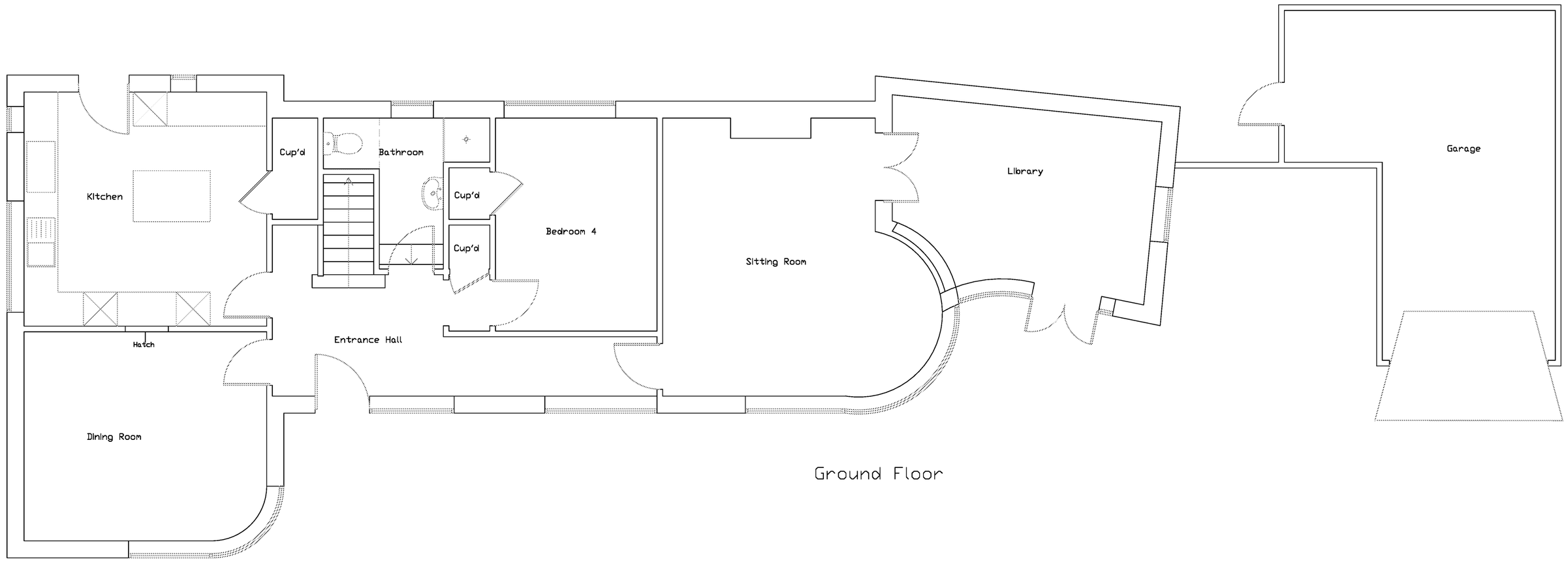
SIDE ELEVATION
North



REAR ELEVATION
East

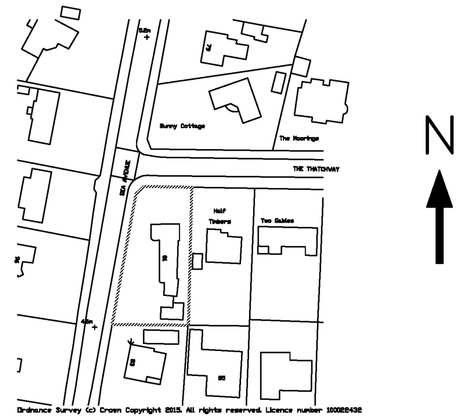
SIDE ELEVATION
South

EXISTING ELEVATIONS 1:100

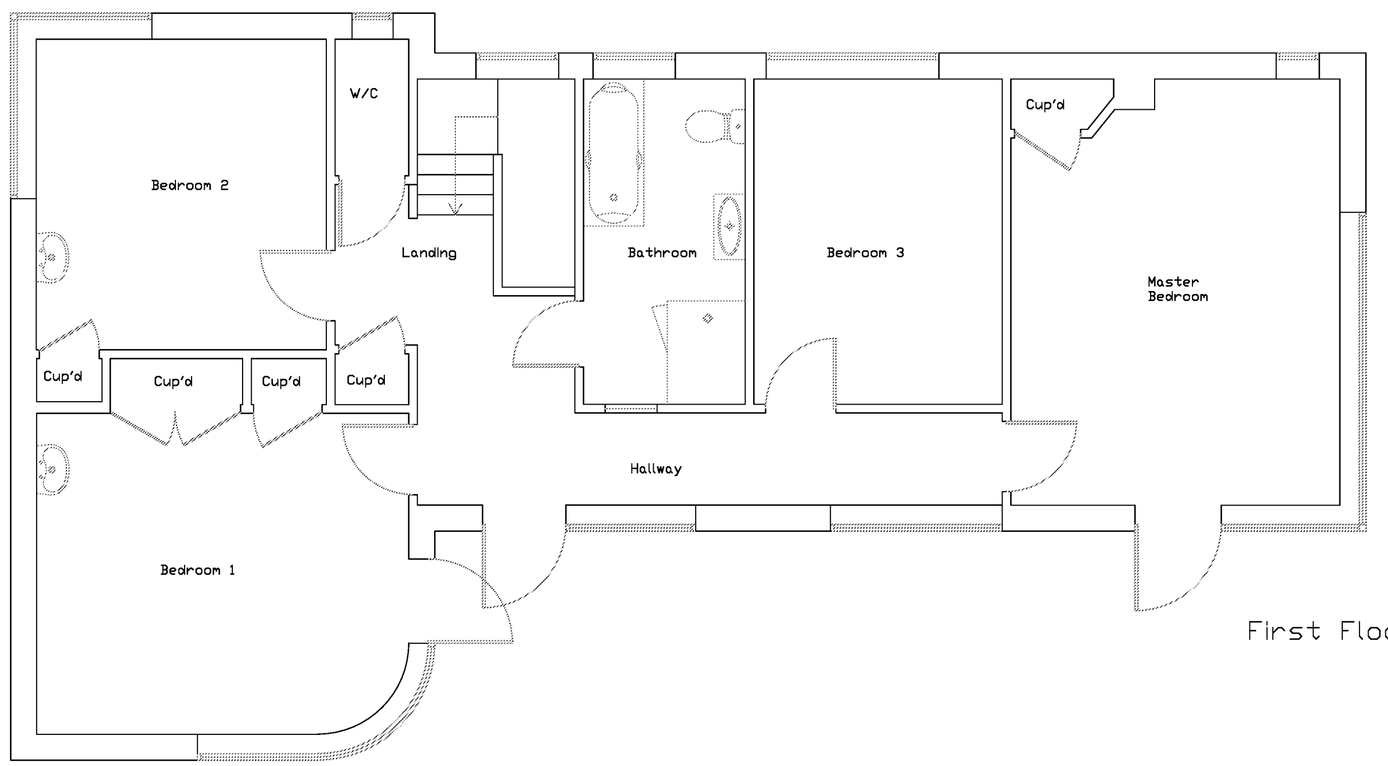


Ground Floor

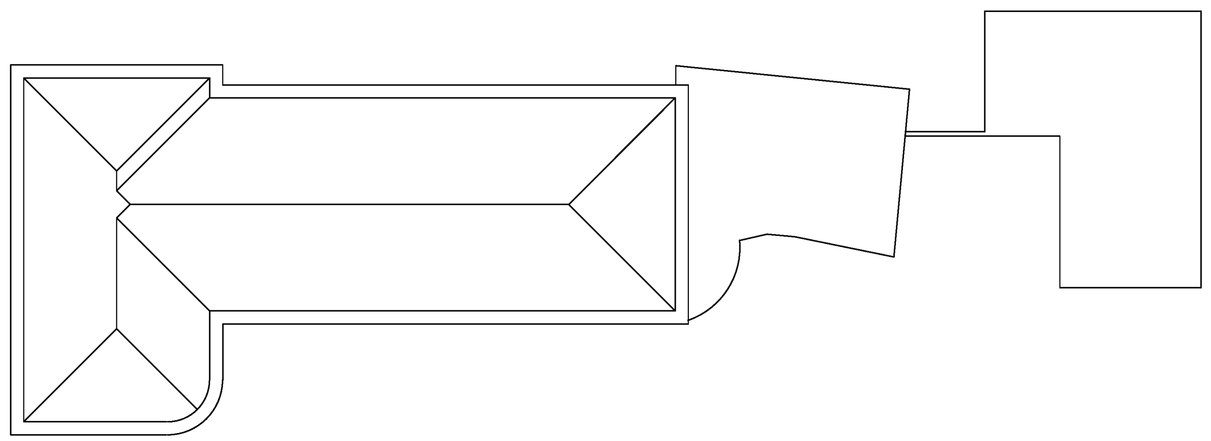
EXISTING FLOOR PLANS 1:50



LOCATION 1:1250



First Floor



EXISTING ROOF PLAN 1:100

All dimensions to be checked on site prior to commencement of work, except for planning purposes.

This drawing is the copyright of
CALDOTEC LTD
and may not be copied, altered or reproduced in any way without written authority.

CALDOTEC LTD
11 THE PARADE
WILLOWHAYNE CRESCENT
EAST PRESTON
WEST SUSSEX
BN16 1NS
Telephone
01903 859176

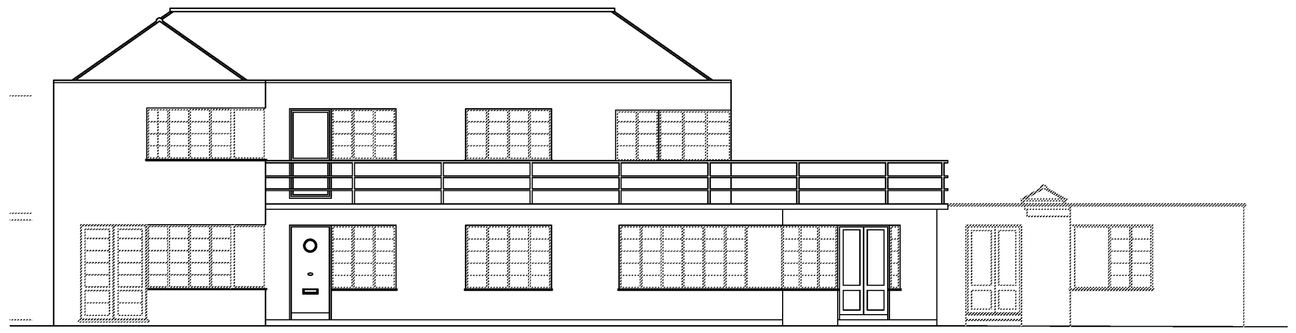
EXISTING FLOOR PLANS, ELEVATIONS, ROOF PLAN & LOCATION
81 Sea Avenue
Rustington
West Sussex
BN16 2DR

CLIENT Mr & Mrs Bevan

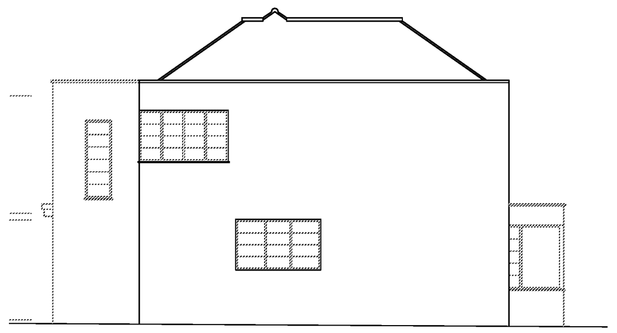
Issue	Details	By	Date

SCALE AS SHOWN on A1
DATE 11/02/15
DRAWING NUMBER 14060/01

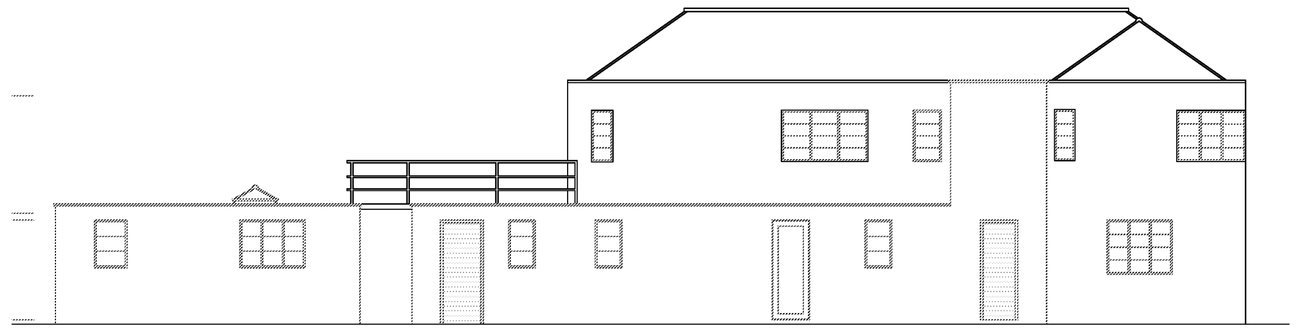
ARUN DISTRICT COUNCIL 01114/15/01



FRONT ELEVATION
West

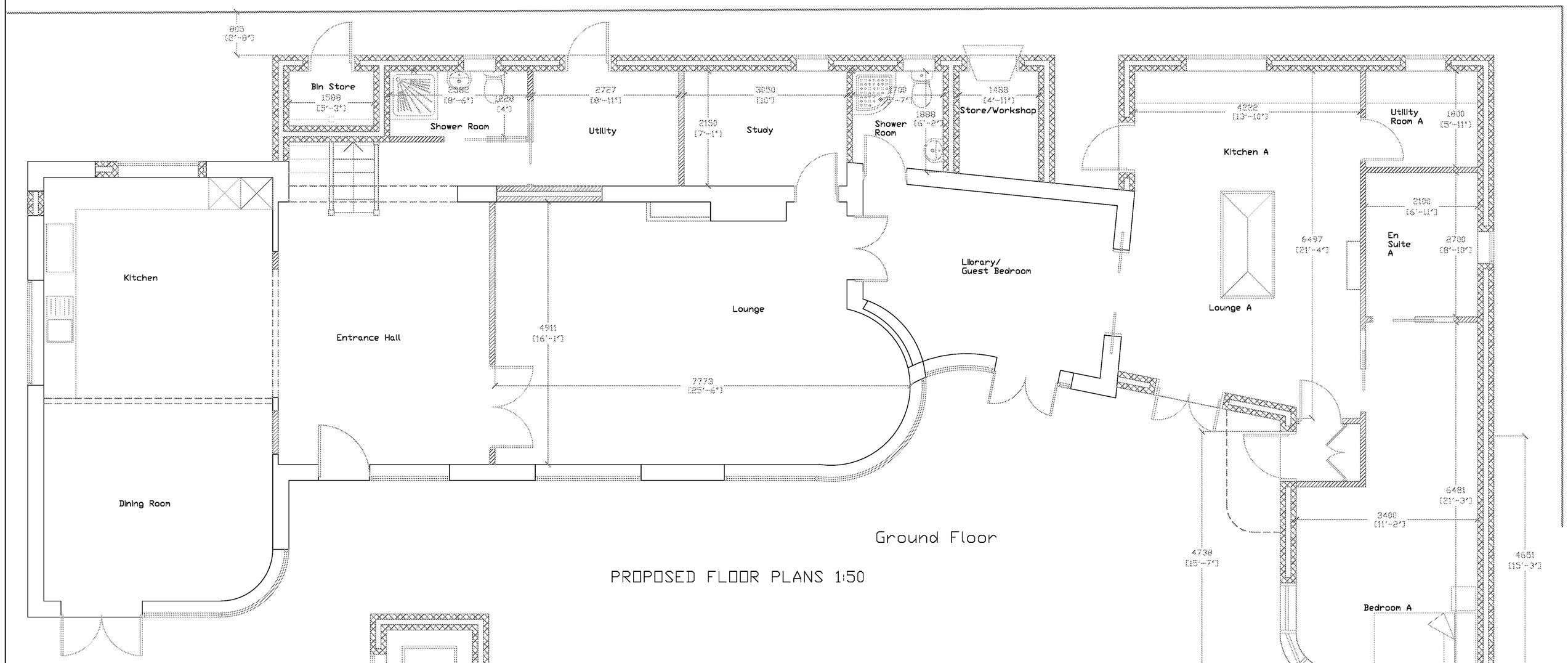


SIDE ELEVATION
North



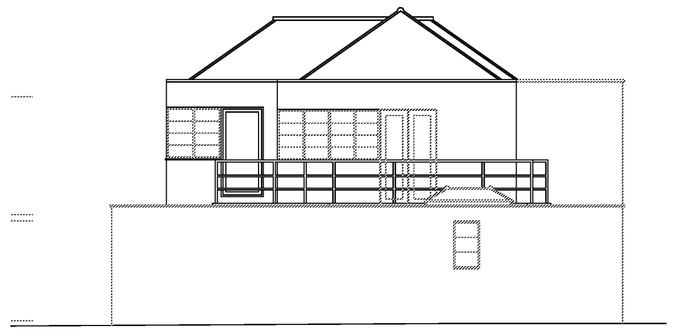
REAR ELEVATION
East

PROPOSED ELEVATIONS 1:100

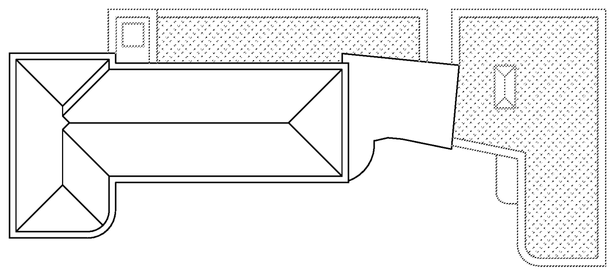


Ground Floor

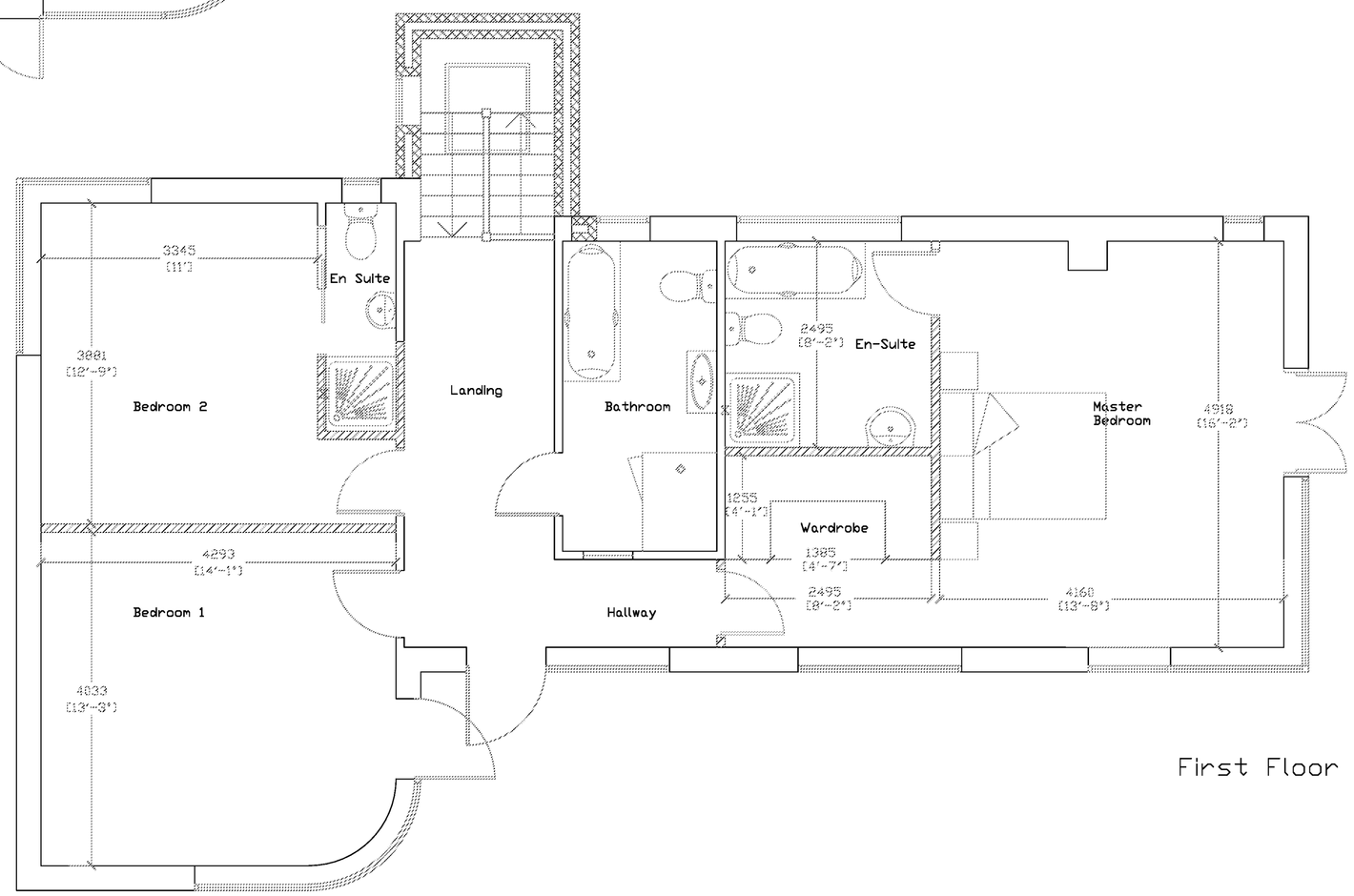
PROPOSED FLOOR PLANS 1:50



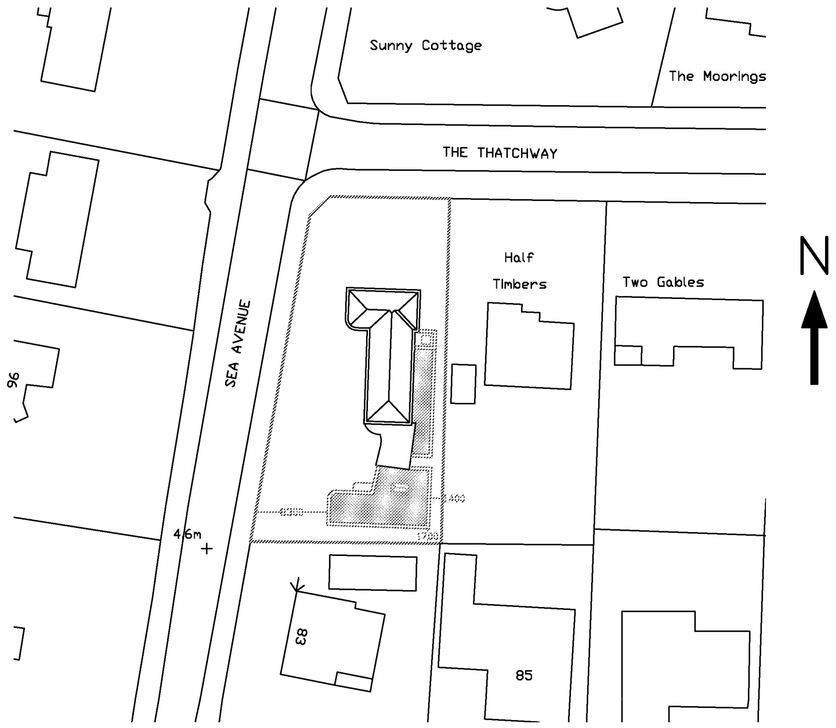
SIDE ELEVATION
South



PROPOSED ROOF PLAN 1:200



First Floor



BLOCK 1:500

All dimensions to be checked on site prior to commencement of work, except for planning purposes.

This drawing is the copyright of
CALDOTEC LTD
and may not be copied, altered or reproduced in any way without written authority.

CALDOTEC LTD
11 THE PARADE
WILLOWHAYNE CRESCENT
EAST PRESTON
WEST SUSSEX
BN16 1NS
Telephone
01903 859176

PROPOSED FLOOR PLANS, ELEVATIONS, ROOF PLAN & LOCATION
81 Sea Avenue
Rustington
West Sussex
BN16 2DR

CLIENT Mr & Mrs Bevan

Issue	Details	By	Date
R6	Planning suggestion	RM	28/04/15
R5	Planning suggestion	RM	21/04/15
R4	Client amendments	RM	21/04/15
R3	Window amendments	RM	25/03/15
R2	Art deco window style	RM	25/03/15
R1	Client amendments	RM	19/03/15

SCALE AS SHOWN on A1
DATE 28/04/15
DRAWING NUMBER 14060/02R6

ARUN DISTRICT COUNCIL R1141S4H1

Flood Map for Planning Centered on Sea Avenue, Rustington - Created 10/07/2015 [Ref: SSD/6722]

Environment Agency

Legend

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

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

1:10,000 *

*when printed at A4.

N

0 250 500

Meters

Environment Agency copyright and / or database rights 2012. All rights reserved. C Crown Copyright and database right. All rights reserved. Environment Agency, 100026380, 2012.

ARUN DISTRICT COUNCIL R/114/15 HFL

Contact Us: National Customer Contact Centre, PO BOX 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

2012 TUFLOW Modelled Flood Outlines Centered on Sea Avenue, Rustington - Created 10/07/2015 [Ref: SSD/6722]

Environment Agency

Legend

- 1in75 Outline
- 1in200 Outline
- 1in1000 Outline
- 1in200 Outline +CC [2115]

1:10,000 *

*when printed at A4.

N

0 250 500

Meters

Environment Agency copyright and / or database rights 2012. All rights reserved. C Crown Copyright and database right. All rights reserved. Environment Agency, 100026380, 2012.

ARUN DISTRICT COUNCIL 2014/1415/FTF

Contact Us: National Customer Contact Centre, PO BOX 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

2012 TUFLOW Modelled Flood Depths and Levels Centered on Sea Avenue, Rustington - Created 10/07/2015 [Ref: SSD/6722]

Node Point	Easting	Northing	Tidal depths taken from 2012 TUFLOW model [m] DEFENDED 1.33% AEP [1in75yr]	0.5% AEP [1in200yr]	0.1% AEP [1in1000yr]	0.5% AEP [1in200yr] +CC 2115
1	505761	101565	0.22	0.32	0.48	0.87
2	505772	101550	0.39	0.48	0.65	1.04
3	502413	102017	0.38	0.47	0.63	1.02

Node Point	Easting	Northing	Tidal levels taken from 2012 TUFLOW model [mAOD] DEFENDED 1.33% AEP [1in75yr]	0.5% AEP [1in200yr]	0.1% AEP [1in1000yr]	0.5% AEP [1in200yr] +CC 2115
1	505761	101565	5.03	5.13	5.29	5.68
2	505772	101550	5.03	5.13	5.29	5.68
3	502413	102017	5.03	5.13	5.29	5.68

Environment Agency

Legend

Node Point
1

1:1,000 *

*when printed at A4.

N

0 25 50
Meters

Environment Agency copyright and / or database rights 2012. All rights reserved. C Crown Copyright and database right. All rights reserved. Environment Agency, 100026380, 2012.

ARUN DISTRICT COUNCIL-R/114/15 HFL

Contact Us: National Customer Contact Centre, PO BOX 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk