Flood Risk Assessment

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Client:	Mr M Baker
Project:	Erection of 4 new dwellings following demolition of existing outbuilding and removal of caravan.
Site Address:	Site adj, The Firs, Coronation Avenue, Throckenholt, PE12 0QT
Date:	February 2025
Reference:	482 – Flood Risk Assessment

1.0 Description of Project

1.1 The proposal involves developing a portion of the existing garden area adjacent to The Firs, Coronation Avenue, Throckenholt, to construct 4 no. 2-bedroom dwellings.

2.0 Flood Zone Classification & Environment Agency Flood Risk Map

2.1 Upon consulting the Environment Agency's Flood Maps, it has been determined that the site encompasses areas within Flood Zones 1, 2 and 3.

2.2 Plot 3: Predominantly situated in Flood Zone 1 (very low probability of flooding), with a portion extending into Flood Zone 2 (medium probability of flooding).

2.3 Plot 2: Mainly located in Flood Zone 2, with a segment falling into Flood Zone 3 (high probability of flooding).

2.4 Although classified in Flood Zones 2 & 3, the SFRA confirms the site is not within a functional floodplain and is protected against extreme flood events.

2.5 The site is within the South Holland Updated SFRA (2116 Residual Depth Map) and benefits from existing flood defences.

North Level Internal Drainage Board (IDB) Protection Measures

2.6 Located in the North Level Internal Drainage Board (IDB) district, which provides a 1 in 50-year flood protection standard.

2.7 IDB actively maintains pumping stations, culverts, and drainage channels, reducing surface water flood risk.

2.8 A 900mm freeboard is maintained to manage storm events exceeding the 1 in 50-year threshold.

2.9 The risk of flooding is low due to existing flood defences and IDB drainage management.

3.0 Flood Mitigation Strategy

3.1 In alignment with national standards and the requirements for developments within Flood Zones 2 and 3, this Flood Risk Assessment (FRA) outlines a comprehensive set of mitigation measures to ensure the proposed dwellings' resilience against flood risks.

4.0 Primary Flood Mitigation Measures for the Proposed Dwellings

Elevation of Finished Floor Levels

4.1.1 The finished floor levels (FFL) of the new dwellings will be raised to ensure compliance with minimum flood risk standards, with a minimum of 600mm above the predicted flood level in accordance with Environment Agency guidance.

4.1.2 The road level will be set a minimum of 150mm below the FFL, ensuring proper drainage and safe vehicular access.

4.1.3 The exact elevation will be determined following site-level surveys and will be secured through a planning condition to ensure compliance with flood mitigation requirements.

5.0 Use of Flood-Resilient Materials and Construction Techniques

5.1 Flood-resilient materials will be used throughout, including:

- 5.1.1 Closed-cell PIR insulation, which prevents water ingress.
- 5.1.2 Flood-resistant concrete slab bases for the ground floor.
- 5.1.3 Water-resistant materials for external walls below the predicted flood level.
- 5.1.4 Wall cavities with weep holes and drainage channels to manage any unexpected water ingress.

6.0 Internal Design Considerations

6.1 Non-porous flooring materials, such as concrete tiles, will be used to ensure durability in the event of water exposure.

6.2 Electrical sockets and wiring will be installed at least 1 meter above the finished floor level to reduce the risk of flood-related damage, with water-resistant conduit housing.

6.3 Horizontally installed plasterboard will be used along the lower sections of walls. This ensures that, in the unlikely event of flooding, only the bottom section of plasterboard would need to be replaced, rather than the entire wall, significantly reducing repair costs.

6.4 No flush thresholds will be used, except for designated wheelchair access points, which will incorporate a ramped design to maintain flood resilience.

7.0 Drainage and Surface Water Management

7.1 The development will incorporate a sustainable drainage strategy designed to effectively manage surface water and minimize flood risk.

7.2 Permeable surfacing will be used for the access road and driveways, reducing surface runoff and improving infiltration.

7.3 ACO drains will be installed around the front and rear elevations of each property to help efficiently manage water runoff.

7.4 A perforated drainage pipe will be installed along the bottom of the northern boundary ditch to collect and direct water safely towards the eastern drainage ditch, ensuring that runoff is effectively managed.

7.5 A secondary drainage channel along the southern boundary will incorporate an underground pipe leading to an attenuation tank before connecting to the existing drainage ditch along the eastern boundary.

7.6 The final drainage design and capacity of the attenuation system will be subject to confirmation as a planning condition, ensuring that it aligns with site-specific requirements and best practices.

8.0 Justification for Development in Flood Zones 2 & 3

8.1 The Sequential Test has been considered, and the development is justified because:

8.1.1 The site is an extension of an existing developed residential area.

8.1.2 The Sequential Test is satisfied, as no alternative lower-risk sites are available that meet planning objectives.

8.1.3 The proposal exceeds minimum flood mitigation standards, ensuring long-term safety and sustainability.

8.2 The Exception Test is satisfied because:

8.2.1The Exception Test is met through elevated floor levels, flood-resilient construction, and sustainable drainage solutions.

8.2.2 The development provides sustainability benefits, including housing provision and improved infrastructure.

8.2.3 Mitigation measures exceed national flood safety standards, ensuring that the dwellings are resilient to flooding and will not increase flood risk to others.

9.0 Summary

9.1 The proposed dwellings will be built with sufficient flood mitigation to ensure their safety.

9.2 The sustainable drainage strategy will prevent surface water flooding.

9.3 Construction techniques will minimize flood damage risks, making the properties highly resilient.

9.4 The development has been designed to align with national flood safety policies while ensuring minimal long-term maintenance requirements.

9.5 The drainage system will require no maintenance, as:

- 9.5.1 Although classified in Flood Zones 2 & 3, the SFRA confirms the site is not within a functional floodplain and is protected against extreme flood events.
- 9.5.2 A perforated drainage pipe will be installed along the bottom of the northern boundary ditch to collect and direct water safely towards the eastern drainage ditch, ensuring that runoff is effectively managed.
- 9.5.3 A secondary drainage channel along the southern boundary will incorporate an underground pipe leading to an attenuation tank before connecting to the existing drainage ditch along the eastern boundary.

9.6 As part of the planning approval, a drainage maintenance strategy will be established to ensure long-term effectiveness of flood mitigation measures.

9.7 We remain open to working with the Local Planning Authority to finalize any necessary details and welcome any further discussions prior to the final planning decision.

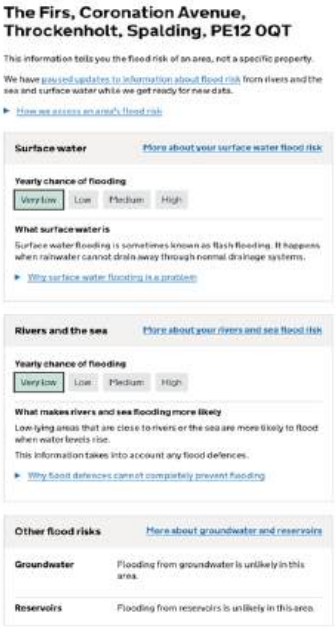


Fig 1: Environment Agency Flood Map - Surface Water

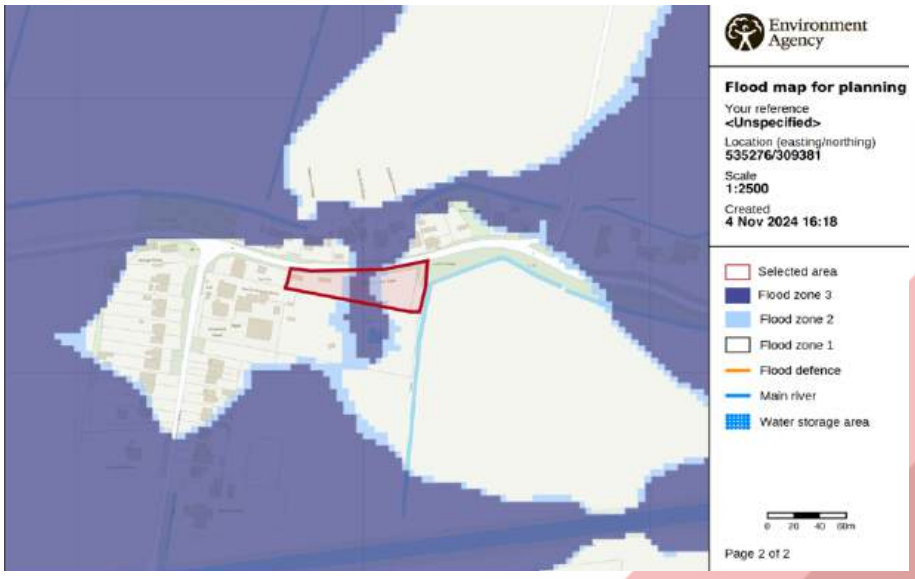


Figure 2: Environment Agency Flood Map - Rivers and Sea

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=Outline of location of site

NOTES

1. The potential flooding consequences shown on this map primarily relate to flooding from the sea and main rivers taking into account the presence of current flood risk management measures such as flood defences.

2. This update only included new flood risk information from River Welland (Fluvial), River Glen (Fluvial) and Tidal hazard mapping (River Welland, River Nene and the Wash sea defences). No new information from the Internal Drainage Boards and associated systems was used for this update.

3. In addition to the potential flood extents shown on this map, there may be shallow flooding in low-lying rural areas

4. The consequences designated as being a Residual Risk arise from direct overtopping of defences, where this would occur, together with breach failure which is assumed could occur at any point along the defences.

5. Functional Floodplain encompasses areas where water is intended to flow or be stored in times of flood.

6. Land outside South Holland District is not considered.

7. This map shows the extents only of the flooding probability bands relevant to the map Title

Map Legend

Peak Velocity (metres per second)

- 0 - 0.3
- 0.3 - 1
- 1 - 1.5
- 1.5 - 2.5
- 2.5 +
- Functional Floodplain
- South Holland District Boundary

REV	DATE	REMARKS
2	Feb 17	Modelling and Mapping Update
1	Dec 16	Modelling and Mapping Update

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UPDATE OF STRATEGIC FLOOD RISK ASSESSMENT

Residual Peak Velocity District - Present Day 1% Fluvial / 0.5% Tidal Event Probability

DATE OF ISSUE: Feb 2017 **REV NO:** 2

SCALE: 1 : 60,000 @ A1

MAP NO: