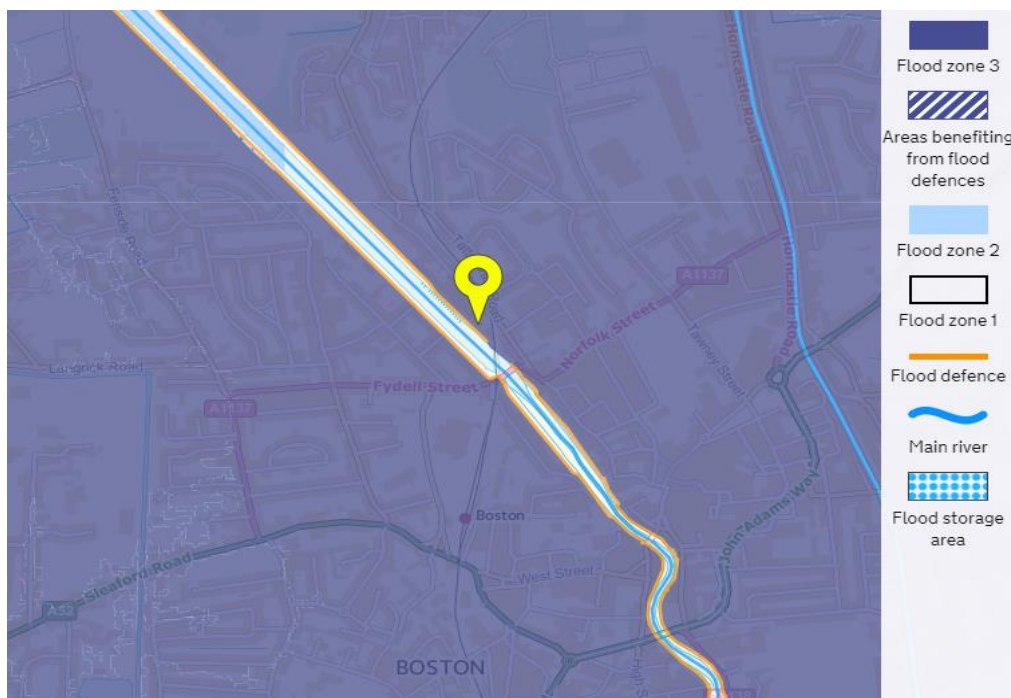


# FLOOD RISK ASSESSMENT

## Witham Tavern

The site is located in a land drainage district that is administered by the Witham Fourth District Internal Drainage Board (IDB).

The Environment Agency's flood plain map shows the site to be located within a Flood Zone 3, assessed as having a 1 in 100 or greater annual probability of river flooding or 1 in 200 or greater annual probability of flooding from the sea in any year. The chance of flooding at the site, marked yellow in the map below can best be categorised as bordering "Low to High". (Source flood-map-for-planning.service.gov.uk)



### Location

The site is in the northern sector of Boston and is located in proximity to and immediately eastward from the fluvial River Witham between Witham Bank East and the embanked Boston – Skegness railway line. 140m upstream from the Grand Sluice tidal limit of The Haven. "The Witham Tavern" property, is essentially located on the gentle landward decline of the river embankment where it is bordered northward and southward, respectively, by the former Boston Marina Chndlery property and a pedestrian thoroughfare linking Witham Bank East and Tattershall Road. Additional to the Tavern buildings, the site supports paved areas utilised for vehicular parking and a patio, thereby rendering it, for all intents and purposes totally impermeable.

## **Existing flood alleviation measures**

Boston is located along the banks of The Haven (tidal River Witham) whose reaches from “The Wash” extend through much of the town’s urban conurbation to interface with the fluvial River Witham at Grand Sluice. Local topography dictates that if Boston is not to be frequently flooded, it must be defended against high-level tidal events; this being substantially achieved by “hard floodwalls” of varied construction that are interspersed by waterfront buildings, predominantly located around the town’s central area at Town Bridge.

While a significant proportion of the overall length of floodwall through Boston comprises concrete capped steel sheet piles, of particular relevance to the site are defences along the river’s left-hand (east) bank, in particular those between Town Bridge and Grand Sluice. Along this section, the initial length of floodwall, for a distance of proximately 120m from the bridge, comprises a brick wall from which a substantial, cast in-situ concrete structure founded at the channel’s toe, continues upstream. However, this defence gives way to a line of low-level steel sheet piles that support a traditional “battered” profile along with the frontage of St. Botolph’s Churchyard where the high-level part of the defence is completed by a 0.45m approx. thick brick wall of around 1.20m height. This wall is positioned well behind the channel’s brink line.

Progressing upstream from the churchyard, the channel’s battered profile remains but with the absence of the low-level, steel sheet piling, the toe line is formed by natural river deposits that may well obscure stoning or other fascine work from the past. Nevertheless, the walled, high-level defence continues and whilst not readily accessible behind the riverside properties that extend to Grand Sluice comprise of two, reinforced concrete walls of differing age and crest elevation. The tidal defences are in good condition and inspected regularly to ensure that any potential defects are identified at an early stage.

## **River Witham**

The hard structure, which extends for some 200m along Witham Bank East from the embanked railway and associated river crossing, passes the site to interface with an earth embankment that continues northward towards Langrick Bridge, which is located around 7km upstream from grand Sluice.

Irrespective of different elevations and structural type, all of the defences appear to be maintained by the Environment Agency to a good standard and there is no reason to doubt their integrity when subject to peak flow condition along the river.

### **Maud Foster Drain**

Located some 0.83km from the site and following an approximate north – south course eastward of Boston town centre, the un-embanked Maud Foster Drain is the final reach of a high-land carrier system, which includes the East and West Fen Catchwater Drains, that convey flows emanating from the southern edge of the Lincolnshire Wolds to “The Haven”. The system evacuates via a gravity sluice situated in the southern sector of the town, some 3km downstream from Grand Sluice. The channel appears in good condition and once more there is no reason to doubt its performance when subjected to peak flow conditions.

### **Tidal – “the Haven”**

Tidal flooding would occur in Boston if a tidal surge elevated the astrological high tide level to a level exceeding that of “The Haven’s” defences. However, since the various structures between the Town Bridge and grand Sluice are of “hard” construction at a general elevation of around 6m, they would be unlikely to breach under such conditions. It is to be accepted that predicted climate change will progressively increase sea level.

#### Recommended Contingency Allowances for Sea level Rises

Region	Net sea level rise (mm per year) relative to 1990			
	1990 to 2025	2025 to 2055	2055 to 2085	2085 to 2115
East of England, east midlands, London, south-east England (south of Flamborough Head)	4.0	8.5	12.0	15.0

### **Known flooding and identified changes**

During the evening of 11 January, 1978 a tidal surge along the east coast elevated the tide level along The Haven with resultant 5.63m ODN peak level recorded at Grand Sluice. The consequent pressure of this event proved too much for the aged, unreinforced brick wall fronting St. Botolph’s Church, which collapsed with the ebbing tide causing flooding in the locality that affected the church, local businesses and some 180 houses.

During December 2013 an overtop condition from a surge tide, caused the tidal floodwalls to be overtopped again resulting in the flooding of the town's lower topography and as this incident is related to the site, it is understood that floodwater to a depth of approximately 75mm extended along the Witham Town road. It is noteworthy that the site was not affected by this occurrence and moreover no evidence has been discovered during the preparation of this FRA to indicate the site as having a history of flooding.

Due to the occurrence of these events, the authority had made improvements which currently still being developed to ensure that such an unacceptable condition does not arise. In this regard, the construction of a long-planned barrier to span 'The Haven' downstream from the Black Sluice Pumping station outfall is ongoing, and will be in place by December, 2019 and will start running from 2020, thereby addressing the poor standard of protection secured to the town by the existing tidal defences. The project will prevent the upper tidal ranges from entering the town section of river.

The year 2115, predicted tide level at Boston, under present-day defence conditions, would cause widespread, significant flooding in the town, but despite the permissive power under which the Environment Agency operates, it is reasonable to consider that the authority will make improvement during the intervening period to ensure that such an unacceptable condition does not arise. While the project is not intended to relocate the Grand Sluice tidal limit, it will prevent the upper tidal ranges from entering the town section of river. However, as the barrier is not in yet in place, it is appropriate to consider the likely effect at the site from a year 2115 tide with the current defences.

## **Summary**

The proposal will not add to the potential flood risk of other properties within the indicative flood plain area and it will not change residual flood risk at the site. The site is defended against tidal and fluvial flooding by the left-hand floodwall alongside "The Haven" and the left-hand floodwall/embankment alongside the River Witham, respectively.

While it is considered that this Flood Risk Assessment addresses the developer's responsibilities, it would, nevertheless be prudent to register the property with the Environment Agency's automated "Flood Warning Direct" service to obtain early warning of potential flood.