TECHNICAL MEMORANDUM

Lowestoft FRA- Sequential Test

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CHECKED BY:	
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Introduction

The Lowestoft Flood Risk Management Project (LFRMP) aims to provide a sustainable flood risk management scheme for the town of Lowestoft. The scheme is envisaged to include provision of a tidal barrier and associated flood walls to provide a standard of protection of 1 in 200 years (including climate change). The approval and consenting of tidal barrier will follow the Transport and Works Act Order (TWAO) route while the tidal flood walls will be subject of local planning permission from the Waveney District Council.

A site-specific Flood Risk Assessment (FRA) will be prepared as part of the planning application for both the tidal flood walls and barrier forming the Lowestoft FRMP.

The project delivery plan includes construction of the flood walls ahead of the proposed tidal barrier. The wall alignment is shown in Figure 1. The FRA will consider both the temporary and permanent works. It is currently understood that the temporary works will involve limited amount of ground excavation and no material will be left on the floodplain, therefore permanent works will be the focus of the document.

The proposed permanent development is classified as a 'water compatible structure' and is located in Flood Zone 3 (Figure 2). Tidal flooding is considered the primary source of flood risk in the area. Tidal flooding could materialize either from direct ingress of water from the North Sea to Lake Lothing or from Great Yarmouth through the Broadlands system.

The site could also be subject to fluvial flooding from Kirkley Stream or the River Waveney (part of the Broadlands system), and to surface water flooding from the local Anglian Water sewage network. Groundwater flooding is assumed a secondary risk in the catchment (Broadlands Rivers Catchment Flood Management Plan, 2009).

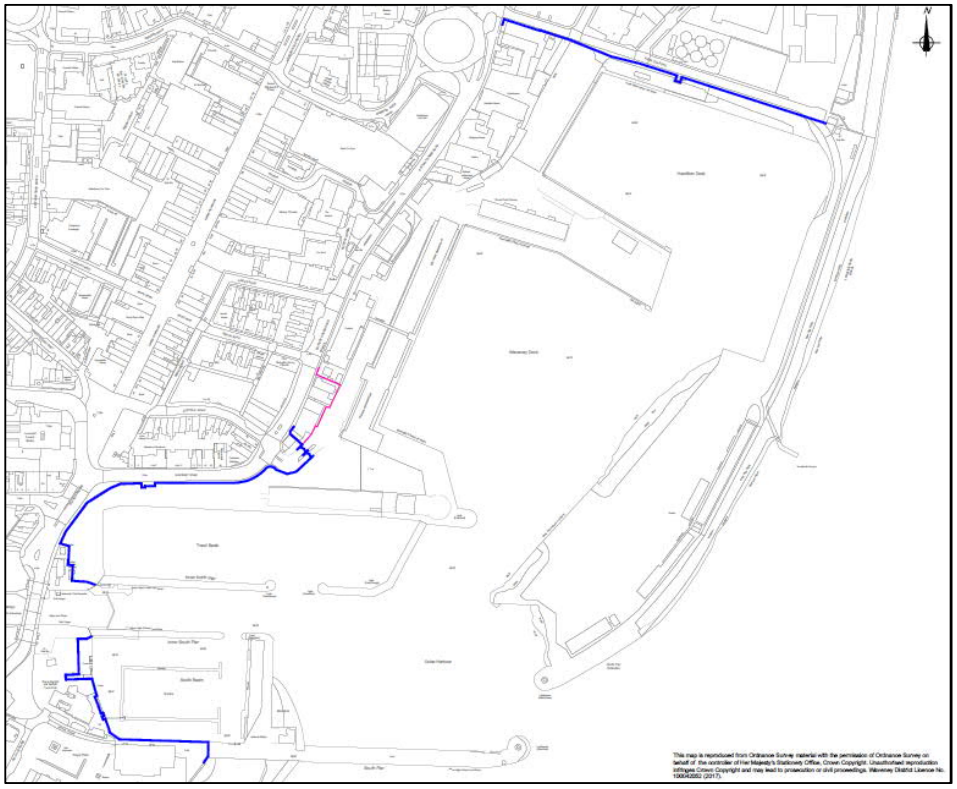

Figure 1: Location of the proposed flood walls and structures of options 3, 4, 5 and 6. Lengths are the approximate total lengths of the defence line taking into account lengths of walls, flood gates and demountable barriers.

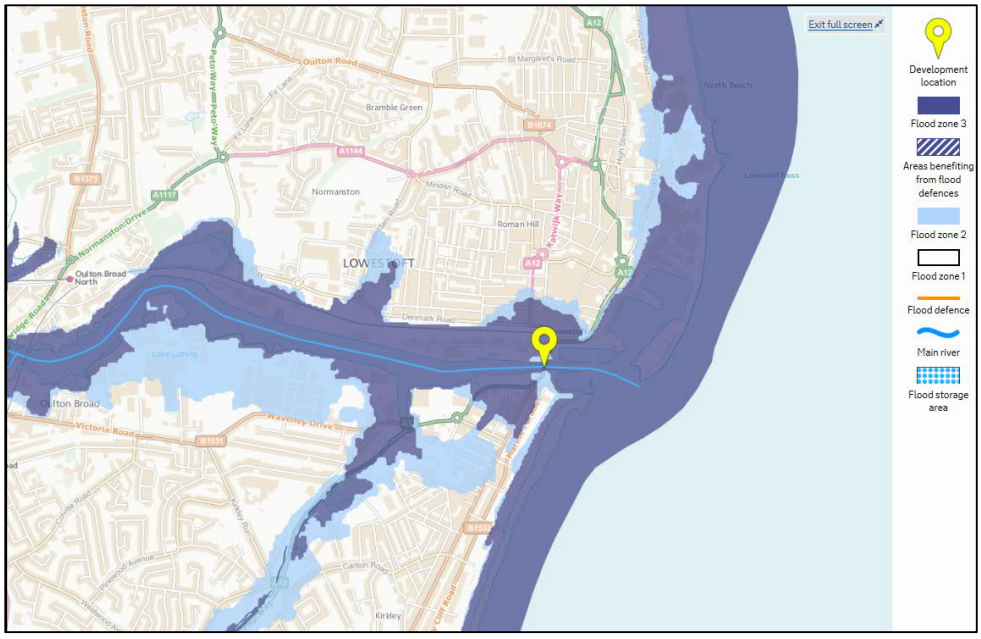

Figure 2: Flood zones in the study area (from https://flood-map-for-planning.service.gov.uk/, accessed 2nd of March 2018)

Purpose of this document

National Planning Policy Framework (NPPF) aims to ensure inappropriate development is avoided in areas at risk of flooding. The Sequential Test, required under NPPF, is a tool for determining land uses that are compatible with the level of flood risk at each development site within a Local Authority area.

This document shows the sequential approach applied to the Lowestoft Flood Risk Management Project when selecting the location of the development, in line with the Environment Agency recommendations as per 22/03/2018 email (ref. AE/2018/122619/01-L01, see Appendix E of the main FRA).

Sequential approach

The Environment Agency produces flood zones that are the starting point for the Sequential Test. Flood Zones 2 and 3 indicate the land at medium to high risk of flooding during extreme events, and Flood Zone 1 is the low-risk zone, which is all land outside Zones 2 and 3. These flood zones refer to the probability of sea and river flooding only, excluding any existing defences.

Table 1 summarises the annual probability of fluvial flooding in relation to the Flood Zones and the land uses considered appropriate for each Zone. It is based upon Table 1 of NPPF.

The proposed development of the barrier and flood defence walls in Lowestoft is within Flood Zones 3 of the Environment Agency flood maps. In accordance with Table 2 of NPPF, the proposed development will fall into the 'water compatible' vulnerability class, under the classification 'flood control infrastructure'. This development is an opportunity to reduce the overall level of flood risk in the area through its layout and form.

This development would, therefore, be deemed suitable under NPPF and assessment of other sites would not be required.

Table 1: Flood Zone summary table and appropriate land uses

Flood Zone	Annual Probability of Flooding	Appropriate Land Uses
Flood Zone 1 Low probability	< 1 in 1000 (<1%) annual probability of flooding in any given year.	All land uses
Flood Zone 2 Medium probability	1 in 100 – 1 in 1000 (1% - 0.1%) annual probability of flooding in any given year.	Less vulnerable More vulnerable Water compatible Highly vulnerable uses are only appropriate in this zone if the Exception Test is passed.
Flood Zone 3 High probability	1 in 100 (1%) annual probability of flooding in any given year.	Water compatible Essential infrastructure The more vulnerable uses and essential infrastructure should only be permitted in this zone if the Exception Test is passed.

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Appendix E

Provided as separate document as one of the FRA appendices.