

**TRANSPORT AND WORKS ACT 1992  
TRANSPORT AND WORKS (INQUIRIES PROCEDURE) RULES 2004  
TOWN AND COUNTRY PLANNING ACT 1990  
BOSTON BARRIER ORDER**

**DOCUMENT EA/1/1  
PROOF OF EVIDENCE  
OF  
JAMES ANDERSON  
SCHEME NEED**

**FOR  
ENVIRONMENT AGENCY**

**MARCH 2017**



# SUMMARY PROOF OF EVIDENCE

## 1 Qualifications and Experience

- 1.1 My name is James George Anderson. I have a Bachelor of Science (Honours) in Civil Engineering and I am a PRINCE2 Practitioner. I am a Member of the Institution of Civil Engineers and registered as a Chartered Engineer with the Engineering Council.
- 1.2 The last 21 years have been spent working for the Environment Agency delivering flood risk management plans and schemes.

## 2 Scope of Evidence

- 2.1 My evidence explains the need for the improved flood risk management in Boston and the work undertaken to develop the Scheme. Of the matters about which the Secretary of State wishes to be informed, my evidence addresses matters 1, 2, 3, 4, 5(b), 5(c), 5(d), 7, 10, 11, 12(ii) and 14(d).

## 3 Need for the Scheme

- 3.1 Boston lies on the edge of The Wash in the low lying fens. The tidal river presents a flood risk to Boston. Significant tidal flood events have occurred in 1953, 1961, 1978 and 2013. Boston is at risk from overtopping of existing defences and breaching of the defences under an event with a 1 in 50 (2%) annual chance each year.
- 3.2 Because of the high number of properties and people whom are at risk of significant flooding the proposed Scheme is a 'National Priority Project'.
- 3.3 The fundamental purpose of the Scheme is to reduce the risk of tidal flooding to 582 commercial properties and 17,269 residential properties through the construction of a barrier within the Haven.
- 3.4 Following construction of the barrier, tidal flood risk in Boston would be reduced to a 1 in 300 chance (or a 0.33% probability) of flooding in any given year for a period of 100 years.

## 4 Aims of the Scheme

- 4.1 The Scheme would reduce the risk of flooding in Boston from a 'Significant Risk of Flooding' to a 'Low Risk of Flooding'. The Scheme objectives are as follows:
- 4.1.1 **Flood Risk Management:** to reduce the risk to people and the developed and natural environment from flooding;
- 4.1.2 **Economics:** to further amenity, social and economic opportunities; and
- 4.1.3 **Environment:** to minimise the adverse impacts on the natural and built environment of the area and to maximise opportunities for environmental enhancement.

## **5 Scheme Benefits**

- 5.1 The Scheme will improve the standard of protection in Boston from tidal flooding. Without the Scheme the existing flood defences have a high probability of breach in the next ten years. Any breach can cause considerable risk to life.
- 5.2 The appraisal of the Scheme has been managed using HM Treasury Green Book's Five Case Model and has also followed FCERM Appraisal Guidance. The appraisal work undertaken found that the Scheme had a robust benefit cost ratio (**BCR**) of 12.9:1.
- 5.3 In non-monetised terms, the Scheme will deliver the following benefits:
  - 5.3.1 protection of homes;
  - 5.3.2 protection of public services;
  - 5.3.3 protection of businesses, and hence local jobs
  - 5.3.4 reduce stress and anxiety for those living at risk of flooding; and
  - 5.3.5 reduce the risk to life during a flood event.

## **6 Support for the Scheme**

- 6.1 It is clear that the Scheme enjoys support at the national, local and regional level.
- 6.2 When George Osborne gave his 2014 Autumn Statement he prioritised the delivery of flood defence schemes including the Boston Barrier Scheme. The outline business case for the Scheme was approved by HM Treasury in October 2016.
- 6.3 Lincolnshire County Council and Boston Borough Council are fully supportive of the Scheme. All interested parties who have commented on the proposals accept that improved flood risk management is needed.

## **7 Flood Risk, Environmental, Economic and Planning Policies**

- 7.1 I consider that the Scheme conforms with national, regional and local flood risk and economic policies. Planning policy is considered in Emma Lunt's evidence (**EA/8/1**).

## **8 Scheme Development**

- 8.1 In the early 1990s condition surveys highlighted problems with existing flood defences in Boston. However, legal ownership issues called into question the viability of raising the height of the existing flood defences.
- 8.2 In 1994 Balfour Maunsell undertook the Boston Sea Lock Pre-Feasibility Study (**the 1994 Study**). This found that there were dis-benefits with the concept of a sea lock and barrage solution. This was later confirmed by the Lower Witham Strategy Study (1997). A sea lock and barrage were considered uneconomic and unaffordable in 1994, and this remains the case today.

- 8.3 Between 2003 and 2005 the Environment Agency began to develop the Boston Haven Flood Management Strategy Study. It recommended a strategic policy encompassing a barrier that would improve the standard of protection to 1 in 300 chance of flooding in any year.
- 8.4 A decision was then made by the Environment Agency, with support from partners, to develop a combined FRM and Navigation Strategy for Boston and the Boston Combined Strategy (BCS) study (C/3/4) was undertaken.
- 8.5 The most favourable option was found to be Option VI, a multifunctional barrier to improve the standard of protection and control water levels within the Haven, accompanied with a new navigation link. The preferred option for a standalone FRM strategy was assessed in parallel.
- 8.6 The multifunctional strategy recommended that the barrier should be within a zone defined upstream by the Swing Bridge and downstream by the Port's Wet Dock Entrance.
- 8.7 Work started on the detailed appraisal of options for the barrier and five short listed options were subject to further public consultation and detailed assessment.
- 8.8 The preferred option was Option B, a barrier located approximately 200m downstream of the confluence of the Boston Haven and the South Forty Foot Drain and adjacent to the Port. Option B was also the option which minimised impacts on key stakeholders and facilitated the accommodation of mitigation. The same conclusions were reached for a flood risk management barrier or a multi-functional barrier.

## **9 Water Level Management**

- 9.1 In February 2015 Lincolnshire County Council decided to withdraw funding for the waterway elements of the Scheme and WLM was removed from its scope.
- 9.2 It remains the aspiration of project partners, including the Environment Agency, to deliver the waterway elements of the multifunctional strategy in the medium and long term as funding becomes available.
- 9.3 When WLM was removed, the Environment Agency considered whether it was necessary to revisit the option and location preferences for the tidal barrier and concluded that it did not. They had been assessed separately at each stage of Scheme's development and the recommendations for FRM were still valid as nothing had materially changed.

## **10 Inclusion of a lock alongside the barrier**

- 10.1 A lock is not required to mitigate the impacts of the Scheme on river users. The possibility of a lock being introduced at a later date has not been precluded.

## **11 Climate Change**

- 11.1 Throughout development of the Scheme the latest available guidance on climate change has been followed and decisions made have been reviewed to ensure they take account of updated guidance.

## **12 Haven Flood Banks**

- 12.1 As part of the staged approach of raising embankment levels downstream of the Barrier, the Haven Banks Scheme is being implemented to fill in existing 'low spots'.
- 12.2 The embankments downstream of Boston will need to be raised in the future in response to current predicted climate change. This work is currently envisaged to be required in 51 years' time.

## **13 Costs and Funding**

- 13.1 Due to the substantial economic benefits and the number of homes better protected from tidal flooding, the Scheme is 100% eligible for Grant in Aid to pay the costs of the Scheme.

## **14 Alternatives**

- 14.1 I do not consider that there was a viable option when a sea lock and barrage was first considered in 1994 and nothing has substantially changed since that time.
- 14.2 The evidence clearly demonstrates that the only sustainable means of reducing tidal flood risk in Boston is through the construction of a tidal barrier. The Environment Agency has sought to balance the interests of all parties and mitigate all impacts.
- 14.3 It can be seen from the evidence that the best location for a tidal barrier is clearly downstream of Black Sluice Outfall in the location proposed.

## **15 Commitment to Mitigation**

- 15.1 The Environment Agency is fully committed to delivering the construction management plans and method statements proposed to ensure the impacts of the Scheme will be mitigated in so far as reasonably possible.

## **16 Issues raised by Objectors and in Representations**

- 16.1 My evidence sets out the Environment Agency's response to the main issues raised within the objections and representations made in so far these issues fall within the scope of my evidence.

## **17 Conclusions**

- 17.1 Boston is at a high risk of tidal flooding. This risk will be addressed by the Scheme which will directly benefit 17,269 homes and 582 commercial properties. The Scheme has been developed in accordance with policy, appraisal guidance and following extensive consultation. I am confident a barrier is the right solution and that the right location has been selected. Appropriate mitigation, or compensation, is in place for residual effects.