Figure 1: The Haven - key navigation features and locations

Source: Base image extracted from UKHO Admiralty Chart 1200
Figure 2: Aerial image of the Port of Boston (existing layout)

Source: Base image Google Earth dated 31 December 2007 © 2016 Getmapping plc
Figure 3: Map of the main waterways of England and Wales

Source: Waterways World

Figure 4: Example of Black Sluice CCTV footage image snapshot showing inbound fishing boat passing barrier site on 08/01/2016 at 14.06pm

Source: PoB and Mott MacDonald
Figure 5: Frontier grain ship moored on Silo Berth with bow overhanging the quay

Source: Mott MacDonald

Figure 6: Frontier grain ship moored on Silo Berth with bow overhanging the quay
Figure 7: Aerial view of the Swing Bridge and rafted fishing boats moored at London Road Quay

Source: Bing Maps
Figure 8: Fishing boat moorings above the Swing Bridge

Source: image downloaded from Google Earth © Richard James

Figure 9: Fishing boat moorings above the Swing Bridge

Source image downloaded from Google Earth © Richard James
Figure 10: Riverine small craft moorings just below the Swing Bridge

Source: image downloaded from Google Earth

Figure 11: Waiting pontoon and small craft moorings just above Black Sluice at low tide level

Source: Mott MacDonald
Figure 12: Black Sluice waiting pontoon and the Swing Bridge at high tide level

*Source: HR Wallingford*

Figure 13: Grand Sluice and Grand Sluice navigation lock at low tide level

*Source: NIA*
Figure 14: Black Sluice navigation lock

Source: HR Wallingford

Figure 15: Extent of intertidal areas in the central portion of the Haven at present

Source: Base image extracted from UKHO Admiralty Chart 1200
Figure 16: Cross section through the river at the barrier site comparing elevations of existing river bed levels and post-construction structures

Source: Mott MacDonald Drawing IMAN001472-CIV-DR-007 Rev P4
Figure 17: Aerial image showing river bends and bridges between PoB Wet Dock and Grand Sluice

Source: Google Earth image © 2016 Getmapping.plc
Figure 18: Time lapse image showing an inland waterway cargo vessel turning through a river bend

Source: PIANC

Figure 19: Restricted sight lines at present with grain ship on the Silo Berth– inbound narrowboat approaching the proposed site of the barrier in May 2016

Source: David Pullen, Chairman IWA East Midlands Region (OBJ/24)
Figure 20: Swing Bridge at low tide looking towards Black Sluice

Source: NIA Plate 5.10

Figure 21 View looking up-river from Black Sluice with Swing Bridge swung across the river

Source: NIA Plate 5.14, Photo1, Appendix 8.2, part of Appendix B of the Landscape, Townscape and Visual Assessment, dated January 2013
Figure 22: Town Bridge during high tide event

Source: NIA Plate 5.8

Figure 23: Bend in river at Haven Bridge looking up-river at low tide (Bend 1)

Source: Google Earth © DmitrijM
Figure 24: Wreck and vessel moorings below Haven Bridge at low tide

Source: Google Earth © folken83

Figure 25: Baseline layout

Source: HR Wallingford Ship Simulator
Figure 26: Cofferdam layout

Source: HR Wallingford Ship Simulator

Figure 27: Post-construction layout

Source: HR Wallingford Ship Simulator
Figure 28: Navigation simulation visual scene - View looking over Witham Wharf towards indicative cofferdam structure

Note: Boston Belle approaching cofferdam and fishing boats on temporarily relocated moorings on Lairage Quay

Source: HR Wallingford Ship Simulator

Figure 29: Navigation simulation visual scene - Boston Barrier structure viewed from Black Sluice

Source: HR Wallingford Ship Simulator
Figure 30: Navigation simulation visual scene - Boston Barrier structure, viewed from below the barrier looking towards Black Sluice

Source: HR Wallingford Ship Simulator

Figure 31: 14m fishing boat
Figure 32: “Boston Belle” passenger tour vessel

Source: Boston Belle

Figure 33: Port of Boston dredger “Mary Angus”

Source: Port of Boston
Figure 34: 6.5m yacht

Source: HR Wallingford Ship Simulator

Figure 35: Narrowboat

Source: HR Wallingford Ship Simulator
Figure 36: “Widebeam” canal boat

Source: HR Wallingford Ship Simulator

Figure 37: Extreme position of moored grain ship – baseline layout

Source: HR Wallingford Ship Simulator
Figure 38: Fishing boats raft moored on temporary berths – cofferdam layout

Source: HR Wallingford Ship Simulator

Figure 39: Position of moored grain ship – post-construction layout

Source: HR Wallingford Ship Simulator
Figure 40: Post-construction layout – inbound Boston Belle passing ship (in revised moored position) – Run 26

Source: HR Wallingford Ship Simulator

Figure 41: View from ship simulator bridge - PoB Dredger approaching the barrier piloted by Mark Murrison (right)

Source: HR Wallingford Ship Simulator
Figure 42: View from tug simulator bridge - Boston Belle transiting the barrier piloted by Mark Murrison

Source: HR Wallingford Ship Simulator

Figure 43: Baseline layout – outbound fishing boat approaching the grain ship – Run 12

Source: HR Wallingford Ship Simulator
Figure 44: Cofferdam layout – inbound fishing boat approaching cofferdam navigation channel – Run 17

Source: HR Wallingford Ship Simulator

Figure 45: Cofferdam layout – inbound “Boston Belle” approaching cofferdam navigation channel – Run 87

Source: HR Wallingford Ship Simulator
Figure 46: Outbound yacht transiting the cofferdam – Run 82

Source: HR Wallingford Ship Simulator

Figure 47: Outbound “widebeam” canal boat transiting the cofferdam – Run 94

Source: HR Wallingford Ship Simulator
Figure 48: Outbound “widebeam” canal boat transiting the cofferdam – Run 94

Source: HR Wallingford Ship Simulator

Figure 49: Post-construction layout – outbound fishing boat transiting barrier – Run 11

Source: HR Wallingford Ship Simulator
Figure 50: Post-construction layout – outbound and inbound fishing boat transiting barrier – Run 61

Source: HR Wallingford Ship Simulator

Figure 51: Outbound dredger in the barrier – Run 46

Source: HR Wallingford Ship Simulator
Figure 52: Post-construction layout – outbound Boston Belle transiting barrier – Run 25

Source: HR Wallingford Ship Simulator

Figure 53: Post-construction layout – outbound yacht approaching the barrier – Run 37

Source: HR Wallingford Ship Simulator
Figure 54: Post-construction layout – inbound yacht transiting barrier – Run 27

Source: HR Wallingford Ship Simulator

Figure 55: Post-construction layout – inbound and outbound yachts transiting the barrier – Run 34

Source: HR Wallingford Ship Simulator
Figure 56: Post-construction layout – inbound narrowboat – Run 91

Source: HR Wallingford Ship Simulator

Figure 57: Post-construction layout – inbound and “widebeam” canal boat transiting the barrier – Run 92

Source: HR Wallingford Ship Simulator
Figure 58: Post-construction layout - showing outbound “widebeam” canal boat passing yacht on Black Sluice waiting pontoon up-river of barrier (Run 93)

Source: HR Wallingford Ship Simulator

Figure 59: Post-construction layout - showing outbound “widebeam” canal boat passing ship on relocated Silo Berth and yacht on “Safe Haven” berth down-river of barrier (Run 93)

Source: HR Wallingford Ship Simulator
Figure 60: Locations (a) to (k) for alternative barrier or barrage schemes considered

Source: Base image extracted from UKHO Admiralty Chart 1200
Figure 61: Approaches to the Haven

Source: Image extracted from UKHO Admiralty Chart 1200