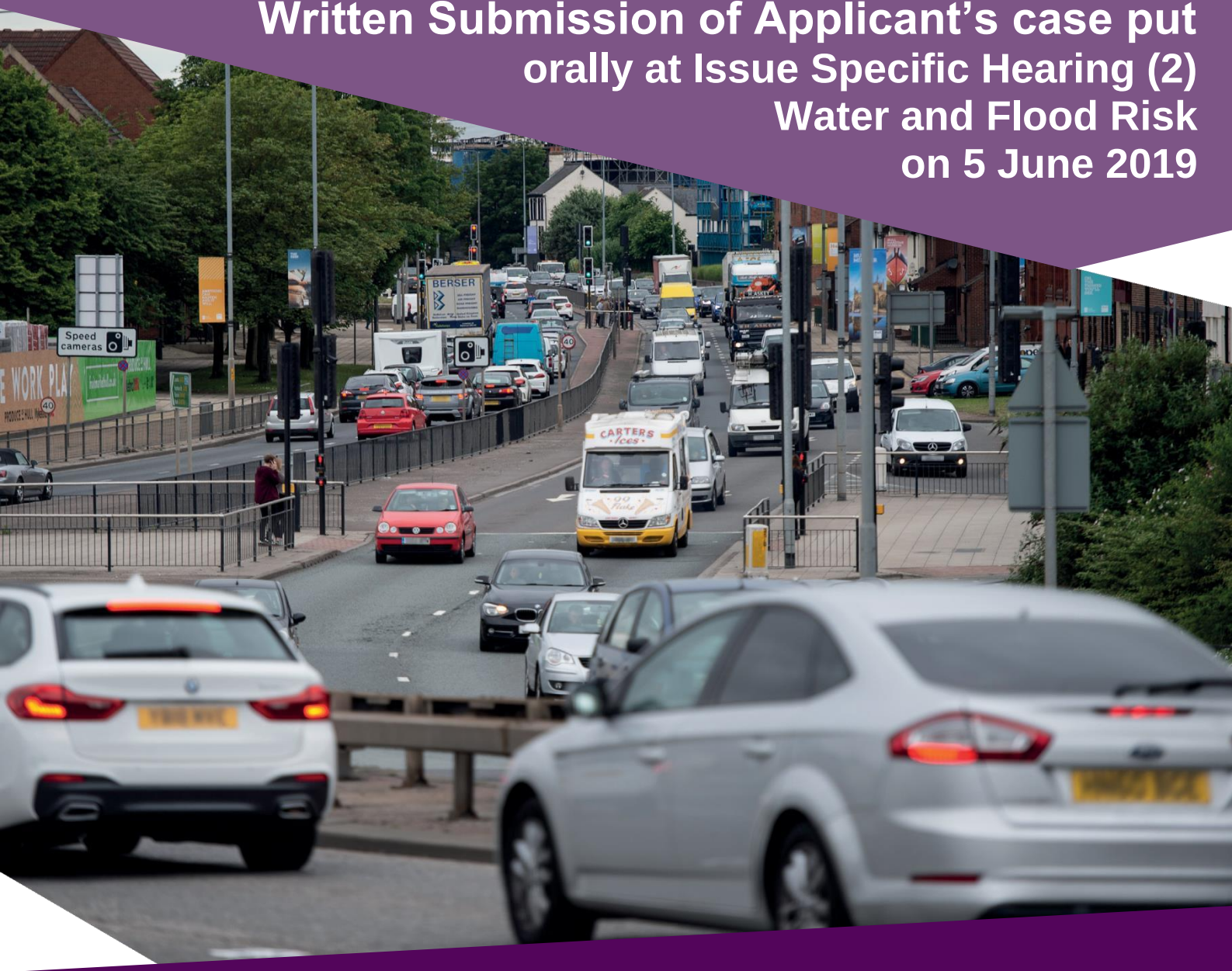
A63 Castle Street Improvement, Hull

TR010016

Written Submission of Applicant's case put orally at Issue Specific Hearing (2) Water and Flood Risk on 5 June 2019



A63 Castle Street Improvement, Hull

Development Consent Order 20[xx]

Written Submission of Applicant's case put orally at Issue Specific Hearing (2) – Water and Flood Risk on 5 June 2019

Planning Inspectorate Scheme Reference	TR010016
Application Document Reference	
Author:	A63 Castle Street Improvement Project Team, Highways England

Version	Date	Status of Version
Rev 0	17 June 2019	Final

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1 Introduction

1.1 Purpose of this document

1.1.1 This document summarises the case put by Highways England (the Applicant), at the Issue Specific Hearing (ISH 2) regarding Water and Flood Risk which took place at the KCOM Stadium, Hull on 5 June 2019.

1.1.2 In what follows, the Applicant's submissions on the points raised broadly follow the Agenda for ISH 2 set out in the Examining Authority's (ExA) letter which was published on the Planning Inspectorate's website on 28 May 2019.

1.1.3 The following members of the Applicant's team spoke during this ISH:

- Stephen Whale, Counsel to the Applicant (**SW**)
- Katie Persaud, Associate, BDB Pitmans (**KP**)
- James Leeming, Senior Project Manager, Highways England (**JDL**)
- Jason Ball, Principal Consultant, Mott MacDonald Sweco (**JB**)
- Matthew Twiss, Design Manager, Balfour Beatty (**MT**)
- Adriaan van den Berg, Senior Engineer, Arup (**AvdB**)

2 ExA Agenda Item 1 - Welcome, introductions and arrangements for the Hearing

2.1.1 The ExA welcomed all parties to the hearing and discussed the agenda and format for the day.

2.1.2 The ExA explained the process for recording of the hearings and noted that they would be available on the Planning Inspectorate website for a period of five years post hearing.

3 ExA Agenda Item 2 - Background to flooding issues in Hull and implications for the future

3.1 Potential sources of flooding

3.1.1 **JB** outlined the baseline flooding issues in the area, and the flood risk to the Scheme (see section 6 of the Flood Risk Assessment (APP-064). **JB** noted that the principal flood risk to affect the area was tidal flooding from the Humber as a result of high tide levels and storm surge. He noted there is also a risk of flooding from a breach in the Humber defences, and from the failure of the Hull Tidal Surge Barrier to close, which could result in flooding from the tidal River Hull and Humber. **JB** noted that surface water and sewer flood risk is an issue in the city but is less significant in the area of the Scheme. Fluvial and groundwater flood risk were not considered an issue in the Scheme area.

3.2 Historic Flooding in Hull

3.2.1 The Applicant was not required to answer any questions relating to this agenda item.

3.3 Assessment and data prepared in support of the scheme

3.3.1 **JB** noted that Albert Dock had been constructed during the development of the A63 Castle Street Improvement Scheme and had been included in the Flood Risk Assessment along with the other existing defences. **JB** clarified the Hull Humber Frontages (HHF) scheme has not been included in the Flood Risk Assessment.

3.4 Climate Change

UKCP18

3.4.1 **JB** explained the assessment of climate change within the Flood Risk Assessment for the A63 Castle Street Improvement Scheme. **JB** advised the assessment of climate change within the flood risk model is based on UKCP09 and the 2016 climate change allowance guidance issued by the Environment Agency. **JB** explained that for the drainage design an increase of 30% in peak rainfall intensity had been considered. This allowance was agreed between the EAand the Applicant [***Post Hearing note****: As a site-specific requirement and in consideration of the historic flooding in Hull – see paragraph 3.2.13 in the Flood Risk Assessment (APP-064)*] prior to publishing the 2016 climate change allowance guidance. **JB** noted that a 40% increase in peak rainfall intensity has been considered within the drainage assessment as a sensitivity assessment [***Post Hearing note:*** *Following the recommendations in the 2016 climate change allowance guidance].*

3.4.2 During the Hearing **JB** could not confirm how the UKCP18 climate change projections differed from the UKCP09 projections with regard to the peak rainfall intensity allowance. [***Post Hearing note****: The Applicant would like to confirm that no guidance has been issued by either the Environment Agency (EA) or Hull City Council (HCC) on the peak rainfall intensity allowance from the UKCP18 projections. This was also confirmed later in the Hearing by the EA and HCC.]*

3.4.3 With regards to the UKCP18 climate change impacts on tidal flooding, **JB** noted that a comparison had been undertaken between the sea level rise predicted under UKCP09 and that predicted under UKCP18. This is documented in the Applicant's comments on Relevant Representations (paragraph 18.12 in REP1-016). **JB** noted that the UKCP09 sea level rise to 2115 was 1.13m which is broadly comparable to the UKCP18 'RCP 8.5 50th percentile' scenario sea level rise to 2115 of 0.93m and the UKCP18 'RCP 8.5 95th percentile' scenario sea level rise to 2115 of 1.39m. **JB** noted that flood modelling for the 1 in 200 year plus climate change scenario [based on UKCP09 and presented in Figure 14.26 to Figure 14.28 in the Flood Risk Assessment (APP-064)] would show similar results. *[**Post Hearing note:** The Applicant would like to clarify that it was not possible to undertake tidal flood model predictions using the UKCP18 projections because the appropriate EA model data was only available for the UKCP09 projections.]*

H++

3.4.4 **JB** noted that the H++ climate change scenario was considered in consultation with the Environment Agency. **JB** added further that the H++ scenario predicts an additional 1m of sea level rise over and above the rise indicated in the Environment Agency's 2016 climate change allowances based on UKCP09 *[**Post Hearing note**: This is documented in the Applicant's comments on Relevant Representations (paragraph 18.13 in REP1-016].*

3.4.5 **JB** noted that the flood risk assessment modelling was reliant on output from other EA models including the Humber North Bank tidal model and that constrains the type of scenarios that could be considered. In order to consider the flood risk impacts of the scheme under the H++ scenario, the sea level rise element of the Environment Agency's model input data *[**Post Hearing note**: for the Humber undefended scenario for the 1 in 200 year event plus climate change allowance to 2115 the level was scaled upwards by 1m.]*

3.4.6 **JB** noted there was no information was available to adjust the storm surge element for the H++ scenario but noted that the principal component under the H++ scenario is considered to be the 1m sea level rise element. **JB** noted under this scenario there would be extensive flooding in the city and the predictions of flood risk impact would be similar in extent to those under the Humber 1 in 200 year plus climate change scenario. *[**Post Hearing note**: as presented in Figure 14.35 to Figure 14.37 in the Flood Risk Assessment (APP-064)].*

3.4.7 *[**Post Hearing note:** Following the Hearing, the Applicant wishes to clarify the position with regard to the impact of climate change on future storm surge. Firstly, the 1 in 200 year plus climate change (to 2115) Humber wave overtopping scenario used in the Flood Risk Assessment model is extracted from the Environment Agency's Humber North Bank tidal model and includes sea level rise to 2115, an additional wave height allowance of 10% (as per the current guidance**Error! Bookmark not defined.**) but no climate change allowance for storm surge.*

3.4.8 *The Environment Agency's 'Adapting to climate change: advice for Flood and Coastal Erosion Risk Management Authorities' document recognises the significant uncertainty with regard to projected change to storm track over the UK which is the primary driver for storm surge intensity and frequency. Advice in this document suggests a UK potential change to storm surge of 70cm up to 2080s (2070-2115); this is based on UKCP09 climate change output.*

3.4.9 *The UKCP18 factsheet on sea level rise and storm surge notes that there is no evidence for significant changes in future storm surge adding further that there is "…potential for changes in the severity of future storm surge events . . . . However, the UKCP18 model results suggest a relatively small contribution from storm surge changes and we [the Met Office] don't yet know whether storm surges will become more severe, less severe or remain the same. The response of the storm track under climate change is an important driver of storm surge changes and this is an active area of research."*

3.4.10 *Therefore, it is recognised there is significant uncertainty about how future storm surge will be affected by climate change. It is also noted that the predicted flood risk impacts for the 1 in 200 year plus climate change scenario [based on UKCP09 and presented in Figure 14.35 to Figure 14.37 in the Flood Risk Assessment (APP-064)] and those for the H++ scenarios documented in the Applicant's comments on Relevant Representations (paragraph 18.13 in REP1-016) show significant flooding to Hull and the Scheme whilst also showing diminished impacts of the Scheme at this scale of flooding.*

3.4.11 *Therefore, it is considered that the incorporation of a storm surge allowance into the H++ scenario would not produce significantly different flood prediction output than that already provided and given the significant technical input that would be required to do this it is not considered worthwhile. During the Hearing, the EA confirmed they accepted the Applicant's approach to the H++ assessment.]*

3.5 Flood Defences

3.5.1 The Applicant was not required to answer any questions relating to this agenda item.

4 ExA Agenda Item 3 - The flood resilience of the scheme

4.1 The FRA and how flood risk has been assessed

4.1.1 The Applicant was not required to answer any questions relating to this agenda item.

4.2 How the scheme has been designed to address flood risk

4.2.1 **AvdB** explained the design process, engagement and consultation that has been undertaken with relevant stakeholders.

4.2.2 **AvdB** noted that the EA and HCC were consulted on the drainage and storm water requirements that the scheme needed to adhere to.

4.2.3 **AvdB** stated that in addition to this we have worked closely with the Statutory Undertaker companies developing and understanding their requirements. In particular we have worked closely with Yorkshire Water (YW) whilst developing the scheme and undertaking the design.

4.2.4 **AvdB** confirmed that at the onset of the design the design criteria were agreed with the EA;

- The underpass should not flood for a 1-in-100-year return period with a 30% allowance for climate change. This is in line with guidance from the National Planning Policy Framework
- Traffic diversion routes around the underpass should be drivable, this is taken to mean no flooding deeper than kerb level during a 1-in-100-year return period rainfall event with a 30% allowance for climate change

- Consideration is given to the overland flows (external to the site) entering the underpass during extreme events
- Flows may be pumped into the River Humber at an unrestricted rate
- Alternative power supply sources (generator, uninterruptable power supply etc.) should be considered to manage the risk of power failure and
- Emergency procedures should be developed to minimise the risk to road users should power failure occur over an extended period of time

4.2.5 **AvdB** noted that based on the design criteria set out, extensive modelling was done, to understand the potential flood risks involved with the design. We are working closely with the EA to address these potential risks and agree on a reasonable level of flood protection. The team proceeded to make several changes to the illustrative design which includes the following;

- A section of the vertical alignment was altered to reduce the surface water run-off to the main carriageway into the underpass. The current vertical alignment has localised raised sections (humps) on the eastern side of the underpass to minimise the overland surface water flows entering the underpass from pluvial flooding events up to a 1-in-100-year return period with an allowance of 30% for climate change
- The westbound diverge slip road was amended to reduce both the potential risk of flooding, by changing the vertical alignment of the slip road and
- The underpass pumping station solution has been designed to be as robust as possible based on the constraints of the scheme, to address potential flood risks. These include;
    - Running a duty and assist pump system, with a third pump as standby. The level detection will control the operation of the pumps via Programmable Logic Controller (PLC).
    - Monitoring of the pumping station operating and communications back to the Area Maintenance Contractor will be provided. The pumps are available with condition monitoring systems, which can be used to further control the system should the need be identified during detailed design.
    - Provide a standby generator to ensure continuous power supply in the event of a power failure.

4.2.6 **AvdB** advised the approvals in principle have been signed off by the Applicant's specialists for the pumping station and the pumping station's electronics/equipment. **AvdB** noted that the Applicant does not wish to share information with the public at this stage due specific details of the equipment and in maintaining the security of the equipment used.

4.2.7 **AvdB** noted that the Applicant is happy to share with HCC and the EA the details of the design of the Pumping Station and associated buildings.

4.2.8 The resilience of the pumping station to flood is also being considered in the detailed design with a commitment to finding a solution mutually beneficial to the project, HCC and the EA.

4.2.9 **AvdB** explained how the proposed design is based on a drainage design strategy shared with Yorkshire Water (YW). YW then agreed that they were happy to accept the proposal based on the intention. The only condition outlined by YW was that discharge would be no greater than 200ltr/sec to the YW sewer system. This is consistent with the design of the scheme.

4.3 Outstanding areas of concern

4.3.1 The Applicant was not required to answer any questions relating to this agenda item.

5 ExA Agenda Item 4 - Impact of the scheme on flooding in the surrounding area

5.1 How risk to the surrounding area has been assessed

5.1.1 **JB** presented supporting figures to the Applicant's comments on the EA's Relevant Representation at the Hearing (Appendices A to E). Four copies of the plans were provided and a copy was displayed on screen. *[**Post Hearing note**: The plans discussed below have since been issued to the Planning Inspectorate].*

5.1.2 Following a request from the ExA, **JB** provided an overview of the content of the document shared at the meeting, noting that the document contains the flood map output of the additional modelling the Applicant has been undertaking as a result of the EA's requests made in their Relevant Representation.

5.1.3 Appendix A shows the output of the H++ climate change scenario assessment. **JB** noted that the flooding under the H++ scenario was extensive over the study area for both the existing and proposed cases. **JB** noted that in a similar way to the 1 in 200 year plus climate change Humber wave overtopping event presented in the Flood Risk Assessment (Figure 14.26 to Figure 14.28 in APP-064), the impact of the Scheme is diminished due to the scale of the flooding. The figures presented were:

- Figures A1 and A2 show the predicted maximum flood depth for the H++ scenario at 2085 for the existing and Scheme layout respectively
- Figures A3 and A4 show the Flood Hazard Rating for the 2085 scenarios presented in Figures A1 and A2.
- Figures A5 and A6 show the predicted flooding for the H++ scenario at 2115 for the existing and Scheme layout respectively
- Figures A7 and A8 show the Flood Hazard Rating for the 2115 scenarios presented in Figures A5 and A6.

5.1.4 Appendix B contains breach flooding maps extracted from HCC's Strategic Flood Risk Assessment (SFRA). These were referred to in The Applicant's

comments on Relevant Representations (paragraph 18.21 in REP1-016).

5.1.5 Appendix C shows the output of the flood model breach assessment. **JB** noted that this shows a composite of the maximum predicted flooding depth at four breach locations for the scheme layout under the 1 in 200 year plus climate change Humber wave overtopping event. **JB** described that the breach locations were the same as the ones used in HCC's SFRA but couldn't confirm the reasons why these locations were selected. [***Post hearing note****: The Applicant would like to confirm that the reasons for the selection of the breach locations is not documented in HCC's SFRA.]* The figures presented were:

- Figure C1 shows the predicted maximum flood depth for the Humber 1 in 200 year plus climate change (2115) composite defense breach scenario with the Scheme in place.
- Figure C2 shows the Flood Hazard Rating for the scenario presented in Figure C1.

5.1.6 Appendix D shows the flood risk impact of the Scheme on HCC's Local Plan development allocations for residential and employment use for a range of scenarios. **JB** noted that as with the general pattern of flood risk impacts noted in the Flood Risk Assessment (APP-064) there are increases in flood depths south and east of the Scheme as reported in The Applicant's comments on Relevant Representations (paragraph 18.16 in REP1-016) showing increase in depth of the order of 0.1m in general with some greater increases in isolated areas, say for example in Figure D2 near the Fruit Market *[**Post hearing note**: on the north edge of allocation number 23]*. **JB** noted there is a general decrease in flood depth for the scenarios to the north and west of the Scheme and **JB** cited the allocation site in the area around Mytongate, Castle Street and Ferensway *[**Post hearing note**: allocation number 0]* as an example. Finally, **JB** noted that there was no impact on the allocation sites as a result of pluvial flooding under a 1 in 100 year plus climate change event. The figures presented were:

- Figure D1 shows the location of the development allocations.
- Figure D2 shows the predicted change in maximum flood depths as a result of the scheme during a 1 in 1000 year tidal flood event from the River Hull with the Hull Tidal Surge Barrier open.
- Figure D3 shows the predicted change in maximum flood depths as a result of the scheme during a 1 in 200 year tidal flood event from the River Hull with the Hull Tidal Surge Barrier open.
- Figure D4 shows the predicted change in maximum flood depths as a result of the scheme during a 1 in 200 year tidal wave overtopping flood event from Humber.
- Figure D5 shows the predicted change in maximum flood depths as a result of the scheme during a 1 in 200 year plus climate change tidal wave overtopping flood event from Humber.

- Figure D6 shows the predicted change in maximum flood depths as a result of the scheme during a 1 in 1000 year tidal wave overtopping flood event from Humber.
- Figure D7 shows the predicted change in maximum flood depths as a result of the scheme during a 1 in 200 year (undefended) tidal wave overtopping flood event from Humber.
- Figure D8 shows the predicted change in maximum flood depths as a result of the scheme during a 1 in 200 year plus climate change (undefended) tidal wave overtopping flood event from Humber.
- Figure D9 shows the predicted change in maximum flood depths as a result of the scheme during a 1 in 100 year plus 30% allowance for climate change pluvial flooding event.

5.1.7 Appendix E presented the predicted change in Flood Hazard Rating, together with the location of strategic diversion routes for a range of flood scenarios. **JB** noted that the overarching conclusion from these flood maps is that there is no increase on Flood Hazard Rating along the strategic diversion routes and in some cases and areas there is a reduction in Flood Hazard Rating as a result of the Scheme as follows:

- Figure E1 shows the predicted change in Flood Hazard Rating as a result of the scheme during a 1 in 100 year plus 30% allowance for climate change pluvial flooding event.
- Figure E2 shows the predicted change in Flood Hazard Rating as a result of the scheme during a 1 in 200 year tidal wave overtopping flood event from Humber.
- Figure E3 shows the predicted change in Flood Hazard Rating as a result of the scheme during a 1 in 1000 year tidal wave overtopping flood event from Humber.
- Figure E4 shows the predicted change in Flood Hazard Rating as a result of the scheme during a 1 in 200 year plus climate change tidal wave overtopping flood event from Humber.
- Figure E5 shows the predicted change in Flood Hazard Rating as a result of the scheme during a 1 in 200 year undefended flood event from Humber.
- Figure E6 shows the predicted change in Flood Hazard Rating as a result of the scheme during a 1 in 200 year plus climate change undefended flood event from Humber.
- Figure E7 shows the predicted change in Flood Hazard Rating as a result of the scheme during a 1 in 200 year tidal flood event from the River Hull with the Hull Tidal Surge Barrier open.
- Figure E8 shows the predicted change in Flood Hazard Rating as a result of the scheme during a 1 in 1000 year tidal flood event from the River Hull with the Hull Tidal Surge Barrier open.

5.1.8 **AvdB** confirmed the updated FEEP will take the EA's comments on inundation times into consideration.

5.1.9 **AvdB** advised that the FEEP has been updated in line with comments received from the EA. This will be issued at Deadline 3.

5.2 Areas where flood risk would be increased

5.2.1 Discussed under agenda item 5.1.

5.3 Areas where flood risk would be decreased

5.3.1 Discussed under agenda item 5.1.

5.4 The significance of the changes in flood risk

5.4.1 Discussed under agenda item 5.1.

5.5 Implications for housing allocations

5.5.1 The Applicant was not required to answer any questions relating to this agenda item.

6 ExA Agenda Item 5 - Safety and Emergency Planning

6.1 The Flood and Emergency Evacuation Plan (FEEP)

6.1.1 **AvdB** responded to HCC regarding the existing emergency plan for the Humber. AvdB stated that through consultations the FEEP will tie into existing plans in use by HCC.

6.1.2 **AvdB** advised that the FEEP has been updated in line with comments received from the EA. This will be issued at Deadline 3.

6.1.3 **AvdB** advised the availability of emergency service vehicles to block off the underpass was raised through the consultation for the production of the FEEP. As a result, the agreement was reached that the responsibility for closing the underpass in the event of an emergency scenario would lie with the area maintenance contractor for Area 12.

- The FEEP describes the emergency and evacuation procedures to respond to a flood event (See APP-064). The document links into and builds on the existing plans for the network. These include:
- The Humber Local Residence Forum Multi Agency Flood Plan, outlines the responsibilities of all responsible parties
- The Area 12 Incident Response Plan
- The Area 12 Service Provider Contingency Plan
- The Area 12 Severe Weather Plan

6.1.4 **AvdB** also presented the different options explaining why having a physical barrier to close the underpass would be unsuitable. This included the implications of the ground conditions on electronic bollards and the risks associated with gates to allow safe use or prevent tampering in the urban

environment. **AvdB** also outlined the implications of undertaking the closure with a physical barrier and the additional complexity for the maintenance contractor from placing people in the road. **AvdB** noted that there are already systems and structures in place with a road closure protocol through Highways England as a better option.

6.1.5 In response to the query with respect to costs **AvdB** noted that whilst the physical barrier would not make the scheme unviable some technological solutions had the ability to do so.

6.2 Inundation times

6.2.1 *[**Post Hearing note**: The revised inundation time assessment is presented in The Applicant's comments on Relevant Representations (paragraph 18.18 in REP1-016)]*

6.2.2 *[**Post Hearing note**: The repairs to the Albert Dock defences are included in the flood model used in the Flood Risk Assessment]*.

6.2.3 *[**Post hearing note:** The Applicant wishes to clarify that the FEEP is the Flood Emergency and Evacuation Plan (FEEP) for the Scheme. This document aims to identify and assess the potential risk of flooding within the area of the Scheme and describes the emergency and evacuation procedures for travellers and the wider public to respond to such a flood event. The document ties in and builds on the existing Humber Local Resilience Forum Multi Agency Flood Plan owned by the Humber Local Resilience Forum. It is currently being updated in line with ongoing discussions with the EAand will incorporate a Recovery Plan including emergency pumping discharge locations and pumping station resilience details.*

6.2.4 *The Construction Flood Emergency Plan (FEP) will detail suitable emergency procedures during construction to ensure safety of personnel, nominated places of safety and includes measures for the protection or removal of other sensitive material likely to be mobilised during a flood.*

6.2.5 *Both documents are listed in the Outline Environmental Management Plan (OEMP (APP-072) and Register of Environmental Actions and Commitments (REAC) (APP-068) at W12, DCO Documents Errata (REP2-010) at W13 and in the DCO Requirement 4.]*

6.2.6 **AvdB** confirmed the updated FEEP will take the EA's comments on inundation times into consideration

6.3 Procedures for alerting the onset of a flood

6.3.1 The procedures for the onset of flood are outlined in APP-064.

6.3.2 The FEEP describes the procedures for alerting the onset of a flood.

6.4 Diversion routes

6.4.1 **MT** stated that during a flood emergency the proposed diversion route for traffic aligns with HCC's wider diversion routes and the tactical diversion routes from Highways England. This will encompass consideration of both parties in order to safe guard the wider network.

6.5 Barriers and signage

6.5.1 **AvdB** presented the different options explaining why having a physical barrier to close the underpass would be unsuitable. This included the implications of the ground conditions on electronic bollards and the risks associated with gates to allow safe use or prevent tampering in the urban environment.

6.5.2 **AvdB** also outlined the implications of undertaking the closure with a physical barrier and the additional complexity for the maintenance contractor from placing people in the road. **AvdB** noted that there are already systems and structures in place with a road closure protocol through Highways England as a better option.

6.5.3 In response to the query with respect to costs **AvdB** noted that whilst the physical barrier would not make the scheme unviable some technological solutions had the ability to do so.

6.5.4 The ExA noted concerns with the resilience of the signage. **AvdB** responded on how the proposed signage is anticipated to be resilient in a flood scenario stating protection for the signage included the processes in design with respect to feeds and positioning are being considered to reach agreement with the EA. There are options for reverting to flap signs in events of flood as well.

6.5.5 **AvdB** confirmed the prospect of a power outage has been considered and presented the plans for CCTV and communication in the event of flooding. This includes a flood emergency proposal which includes diversion routes which tie into the HCC's wider diversion routes. The Underpass Flood Detection Technology report outlines the proposed technology for the underpass, which include:

- Above lane mounted LED signals, to indicate lane status and show underpass is closed;
- Reduced MS4 message signs, one on each approach located upstream of the diverge nosing, with the capability to display text messages and pictograms to advise road users of flooding and redirect them across the Mytongate Junction;
- CCTV cameras on masts within the junction to monitor traffic flow conditions. This will be connected to the NERCC and HCC control room. This will allow signal timings to be adjusted remotely, to accommodate additional traffic diverted from the mainline A63 if necessary.

6.5.6 The proposed Variable Message Signs (VMS) will tie into HCC's wider VMS emergency diversion routes and Electronic Message Signs Locations Overview. This will be developed further as part of the detail design.

6.6 Pumps and water clearance

6.6.1 **AvdB** discussed the proposed use of the high-volume pump currently maintained within Area 14 in the event of an emergency.

6.6.2 The Regional Control Centre has control of the Pump. In the event of a flood warning or alert Area 14 will be notified and the pump mobilised through the RCC. The current understanding is that the high-volume pump will pump directly into the Humber Estuary which is only 600m away using a pump capable of working over much greater distances.

6.6.3 The location of a preferred outfall will be agreed with HCC and the EA and included in a further submission of the FEEP.

6.6.4 **MT** also outlined that during construction there is an outline plan to install the shaft as early as is practicable when accounting for all programme constraints. Construction of the Pumping Station chamber is currently scheduled for March 2022 – Sept 2022. This is constrained by enabling works for the exhumation works in the burial ground. Once the associated activities are complete this will provide the necessary milestone for commencing the Pumping Station.

6.6.5 In the interim period from Sept 2022 we are investigating the possibility of using the chamber to manage surface water runoff along with some form of pollution prevention measure to prevent turbid discharge between the PS and the YW outfall in Commercial Road.

6.6.6 Installation of pumps, mechanical and electrical fit out and commissioning for use will not be until around May 2024. This is constrained by the connection of the structure to the underpass. The underpass needs to be excavated to enable the connections to be installed and commissioning of the Pumping Station cannot be completed until after that activity so some form of temporary pumping measures will be necessary.

6.7 Risk levels

6.7.1 Health and Safety Executive Publication L153 Managing health and safety in construction; Construction (Design and Management) Regulations 2015; Guidance on Regulations which provides guidance on The Construction (Design and Management) Regulations 2015 (CDM 2015) identifies on page 26 Regulation 9 Duties of designers. This states under items (2) and (3) the following:

(2) When preparing or modifying a design the designer must take into account the general principles of prevention and any pre-construction information to eliminate, so far as is reasonably practicable, foreseeable risks to the health or safety of any person—

(a) carrying out or liable to be affected by construction work;

(b) maintaining or cleaning a structure; or

(c) using a structure designed as a workplace.

(3) If it is not possible to eliminate these risks, the designer must, so far as is reasonably practicable—

(a) take steps to reduce or, if that is not possible, control the risks through the subsequent design process;

(b) provide information about those risks to the principal designer; and

(c) ensure appropriate information is included in the health and safety file

6.7.2 This regulation will include the consideration of flood risk to the pumping station.

7 ExA Agenda Item 6 - The Exception Test

7.1 The policy basis for applying the Exception Test

7.1.1 **SW** stated that the A63 already exists and the Scheme is essentially an on-line scheme. In terms of paragraph 5.102 of the NN NPS, the Scheme is essentially an upgrade to existing linear infrastructure in an area at risk of flooding. As explained during the hearings, and as is common ground with the City Council, the whole of the city or the relevant part of it (including the Scheme land) is effectively in Flood Zone 3 and there is no reasonably available site in Flood Zones 1 or 2. It is not possible for the project to be located in zones of lower probability of flooding.

7.1.2 In terms of the Exception Test, the Scheme and its impacts need to be considered in the round. It reduces flood risk in some areas whilst slightly increasing it in other areas. The net effect is that the Scheme is essentially neutral in terms of impact on flood risk. It is inappropriate to adopt the EA's tentative suggestion that any increase in flood risk results in a scheme having a net adverse impact on flood risk: the flaw in this approach is that a scheme which reduced flood risk for every single property bar one would be deemed to have a net adverse impact on flood risk. In any event, any increase in flood risk is outweighed by the wider sustainability benefits to the community associated with the Scheme. These wider sustainability benefits include the need for the infrastructure (see the footnote to paragraph 5.108 of the NN NPS).

7.1.3 The application is supported by an appropriate FRA, demonstrating that the project will be safe for its lifetime. The Exception Test is passed. The Scheme is appropriately flood resilient and resistant, and any residual risk can be safely managed. The Applicant explained during the hearings the inherent difficulties in terms of sustainable drainage systems.

7.1.4 In response to a query from the ExA about the applicability of the Sequential Test to this scheme, **JB** noted that the purpose of the Sequential Test is to divert development away from areas of flood risk but as this is an improvement to an existing asset, the test is not considered relevant.

7.1.5 **JB** stated that there are two elements which ensure the Scheme is 'safe for its lifetime' (a component of the Exception Test). These are the drainage design which will keep the underpass free from flooding for the 1 in 100 year pluvial event including a 30% allowance for climate change and the FEEP which provides a mechanism to prevent users entering the underpass in the event of tidal flooding. **JB** considered that this part of the Exception Test would be met.

7.1.6 **JB** clarified that the FEEP is a live document and will be reviewed on a regular basis (every three years).

7.2 The requirements of the Exception Test

7.2.1 Discussed under agenda item 7.1.

8 ExA Agenda Item 7 - Requirements of the NN NPS

8.1 Consideration of the scheme with regard to the NPS

8.1.1 **AvdB** provided information on the constrained nature of the scheme and why SuDS have not been accommodated in the design in accordance with the requirements of the National Networks NPS – requirements in paragraph 5.99, paragraph 5.100 and SuDS. This is due to the urban environment and constrained nature of the contract. One aspect of issues with SuDS is that there is insufficient room and capacity on the scheme, another issue is that the scheme also utilises and accommodates the existing network in Hull to reduce costs for the proposed road. With both these issues and as discussed with HCC the provision is very difficult in this environment

8.1.2 **AvdB** noted that within the accommodation works for the pedestrianisation of Cogan Street there is the potential for SUDs. These proposals are preliminary at this stage but are being viewed as a potential place to incorporate this drainage method in the scheme. A draft design is being drafted for July 2019 and should be available for sharing a draft with the ExA at a future Deadline.

9 ExA Agenda Item 8 - The DCO and other documents

9.1 Potential changes to the DCO

9.1.1 The consideration for the discharge will be done in collaboration with HCC, the EA and The Applicant. This will collaboratively consider and agree where water needs to be discharged to in an emergency situation. This will allow us to update the FEEP accordingly. **AvdB** advised two PCF products (scheme management plan and combined operations plan) outline the responsibilities of various parties, their duties and who is responsible for the operational management. This information will inform part of the plan.

9.2 Any requirements for additional information or changes to existing documents.

9.2.1 This was discussed at further length at the Draft DCO Issue Specific Hearing on 6th June 2019 and is referenced in that written submission.