HIGHWAYS AGENCY

Safe roads, reliable journeys, informed travellers

A63 Castle Street Improvements, Hull

Environmental Statement Scoping Report

112630/AE/01 Rev 1

MARCH 2013

An executive agency of the Department for Transport

A63 CASTLE STREET IMPROVEMENTS, HULL

ENVIRONMENTAL STATEMENT SCOPING REPORT

MARCH 2013

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1. INTRODUCTION

1.1. INTRODUCTION TO THE PROPOSED PROJECT

1.1.1. The A63 Castle Street is located within Hull City Centre close to the Rivers Humber and Hull. It is a vital link between the M62 motorway, as well as the Humber Bridge and A15, to the west of the city and the Port of Hull to the east of the city (See Figure 1.1).

1.1.2. The A63 is a key route of both local and strategic importance and is part of the E20 Trans European Route.

Figure 1.1: Location of the A63 Castle Street Improvement Scheme

1.1.3. The Castle Street section of the A63 is reputed to be the busiest section of road in the whole of the East Riding of Yorkshire carrying daily flows in excess of those recorded on the M62 within the region. The current daily traffic flow on the Castle Street section of the A63 is in excess of 54,000 AADT two way flows. This level of flow is forecast to increase over the next twenty years.

1.1.4. The location of the ports to the east of the city centre, results in significant levels of Heavy Good Vehicle (HGV) traffic (10%-15%) using Castle Street in order to access these areas. This predominantly long distance traffic therefore interacts with local city centre movements on the Castle Street section of the A63.

1.1.5. Such large volumes of traffic, including both local and strategic traffic, combined with a significant proportion of HGVs, results in a bottleneck forming at the Castle Street section of the A63 and the Mytongate and Market Place/Queen Street junctions at either end.

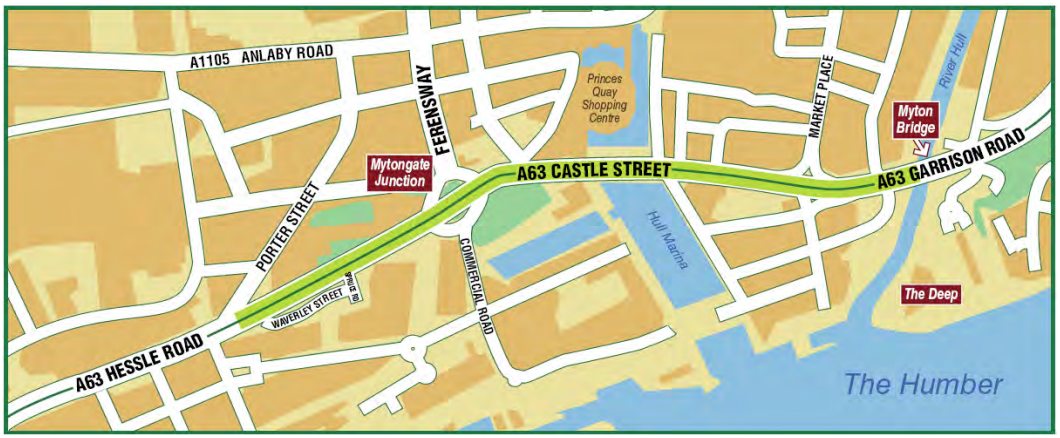
1.1.6. In addition, the A63 creates severance between the main shopping area and transport links to the north of the A63 and the waterfront area to the south with its tourist, commercial and recreational facilities and retail parks.

1.2. THE LOCATION OF THE PROJECT

1.2.1. The existing A63 Castle Street comprises a dual carriageway which runs through a 'built up' urban area, largely at-grade with the surrounding streets, on an east-west alignment. Castle Street lies to the south of Hull city centre and the scheme extends from Porter Street to Myton Bridge for a distance of approximately 1.5km. The entire study area lies within the administrative boundary of Hull City Council (HCC).

1.2.2. Figure 1.2 shows the existing street names, extent of works and buildings/structures of interest. Figure 1E (Appendix A) shows the extent of the proposed DCO Site Boundary.

Figure 1.2: Location Plan Showing Extent of Works



1.3. THE DEVELOPER

1.3.1. The Highways Agency (HA), an Executive Agency of the Department for Transport (DfT), is the Developer of the A63 Castle Street Improvement project.

1.4. THE DESIGNER

1.4.1. The Mott Macdonald Grontmij Joint Venture (MMGJV) has been appointed by the HA under their Project Support Framework (PSF) to undertake the preliminary design of the Preferred Option for the improvement of the A63 Castle Street. This work forms Stage 3 of the HA's Project Control Framework (PCF).

1.4.2. All engineering design and environmental assessment is being undertaken by the Mott Macdonald Grontmij Joint Venture (MMGJV).

1.4.3. The Hyder/Halcrow Joint Venture (HHJV) has been appointed by the HA under the PSF to undertake the traffic modelling requirements of the project.

1.5. THE PURPOSE OF THE SCOPING REPORT

1.5.1. The scheme will require an Environmental Impact Assessment (EIA) in accordance with the Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2012 (The EIA Regulations).

1.5.2. The EIA will be carried out in line with the guidance set out in the Design Manual for Roads and Bridges (DMRB) (Volume 11, Environmental Assessment), and will be reported in two stages, as follows:

1. A 'Preliminary Environmental Information' (PEI) report will be prepared, to inform consultation with the community about the scheme;

2. Following consultation with the community, an Environmental Statement (ES) will be prepared to accompany the application for a Development Consent Order (DCO).

1.5.3. This report sets out the proposed scope of work and methods to be applied in carrying out the EIA, and the proposed structure of the ES. It has been prepared in accordance with Advice note seven: Environmental Impact Assessment: screening and scoping (Planning Inspectorate, April 2012)

1.5.4. The EIA will build on the previous environmental assessment carried out by Pell Frischmann (2010) to compare alignment options and inform selection of a Preferred Route. This previous assessment will also form the basis of the PEI report. Figures 1A-E (Appendix A) show the environmental features of the area surrounding the site.

1.5.5. The EIA will be carried out by a team of specialists working in close iterative collaboration with the engineers responsible for the preliminary design of the scheme. This will maximise the opportunity to avoid or reduce environmental effects at source, and to enable the most effective mitigation of those effects that cannot be avoided.

1.6. METHODOLOGY

1.6.1. The assessment will be undertaken in accordance with the guidance set out in the Design Manual for Roads and Bridges (DMRB) Volume 11 and associated Interim Advice Notes (IANs) and reported in the Environmental Statement in accordance with the requirements of HD 48/08 (HA 2008a). The environmental topics have been chosen in accordance with the guidance given in IAN 125/09 (HA, 2009a) and are listed below:

- Air Quality
- Cultural Heritage
- Landscape
- Nature Conservation
- Geology and Soils
- Materials
- Noise and Vibration
- Effects on all Travellers
- Community and Private Assets
- Road Drainage and the Water Environment
- Consideration of Combined and Cumulative Effects

1.6.2. The carbon aspect of climate change will be dealt with in the Air Quality chapter. The climate change aspect within the Sustainability Appraisal which will accompany the ES.

1.7. PROPOSED STRUCTURE OF THE ENVIRONMENTAL STATEMENT

1.7.1. It is proposed that the Environmental Statement will be structured in the following way:

Volume 1 – Environmental Statement including Non-Technical Summary

Volume 2 - Figures

Volume 3 - Appendices

1.8. PLANNING POLICY CONTEXT

1.8.1. The Localism Act 2011 introduced a number of changes to the planning system, including transferring decisions on major infrastructure projects from the Infrastructure Planning Commission to ministers. The Scheme is considered to be a Nationally Significant Infrastructure Project (NSI) Project. NSI Projects are determined in accordance with the decision-making framework set out in the Planning Act 2008. National policy statements are a material consideration as well as any other matters that are considered both important and relevant (which may include the National Planning Policy Framework. At this stage, the National Policy Statement on Transport Networks (including rail and roads) has yet to be published.

1.8.2. The Coalition Agreement set out the government's commitment to publish and present to Parliament a simple and consolidated national planning framework covering all forms of development and setting out national economic, environmental and social priorities by April 2012. On 27 March 2012 the National Planning Policy Framework (the 'Framework') was published. This replaces all Planning Policy Statements. The following are considered relevant to the Scheme.

1.8.3. The NPPF seeks to promote a strong and competitive economy with Local Plans identifying:

- '*priority areas for economic regeneration, infrastructure provision and environmental enhancement;*

1.8.4. The NPPF seeks to ensure the vitality of town centres;

- '*recognise town centres as the heart of their communities and pursue policies to support their viability and vitality;*

1.8.5. The NPPF seeks to promote good design with Local plans aiming to ensure that developments:

- '*create safe and accessible environments where crime and disorder, and the fear of crime, do not undermine quality of life or community cohesion; and,*

- *are visually attractive as a result of good architecture and appropriate landscaping.*

1.8.6. The NPPF seeks to promote healthy communities through ;

- *'safe and accessible developments, containing clear and legible pedestrian routes, and high quality public space, which encourage the active continual use of public areas'.*

1.8.7. Local Planning Authorities are required, by the Planning and Compulsory Purchase Act, 2004, to produce an up to date Local Development Scheme (or LDS), comprising a programme and list of plans that will be produced covering their area. The Act is supplemented by new provisions under the Town and Country Planning (Local Planning) (England) Regulations 2012 and new National Planning Policy Framework (NPPF) that require the production of a Local Plan. This can comprise one or a number of documents and the policies they contain will, over time, replace the planning policies which were 'saved' when the new legislation was introduced.

1.8.8. The HCC Core Strategy was withdrawn in December 2012 in light of recommendations from the Planning Inspector received in November 2012. Instead a strategic policies document is now proposed to replace the withdrawn core strategy. This will form an important part of a local plan as required by NPPF. It will be a key document for Hull containing a vision of the city and policies that guide future development and protect important assets over the period to 2030. Once this is adopted more detailed site allocations and policies governing development management will follow, although work has already been (or is being) completed on a number of area action plans for different parts of the city. Documents which comprise the new Local Development Scheme are at the emerging stage and will each be subject to public consultation therefore the Adopted Local Plan carries the most weight.

2. THE PROJECT

2.1. BACKGROUND TO THE PROJECT

Introduction

2.1.1. The proposal to improve the A63 from the M62 to the Port of Hull supports a number of National, Regional and Sub-Regional policies.

2.1.2. The on-line improvement of the A63 Castle Street was recommended by the Hull East-West Corridor Multi Modal Study (Faber Maunsell, 2002). Commissioned by the Government Office for Yorkshire and the Humber, the study looked at congestion problems and possible solutions on routes to the Port of Hull. The study, undertaken between 2000 and 2002, considered a number of options for the improvement of transport and infrastructure around Hull, part of which included options for the improvement of the existing road network; including the A63 Castle Street.

2.1.3. The Eddington Study (Eddington, 2006) examined the links between transport and the UK's economic productivity, growth and stability and reported on the importance of International Gateways, of which the Port of Hull is one, and the inter-urban road network between them. The study outlined that access to the Port of Hull from the strategic road network was via local/urban roads leading to congestion, pollution and noise for local residents and that improvements should be made.

2.1.4. The Yorkshire & Humber Assembly prioritised the scheme in their Regional Funding Advice that was submitted to Ministers at the end of February 2009 and allocated £189 million within their advice for the scheme. Ministers subsequently endorsed this advice. In July 2009 and again in November 2009 the Yorkshire and Humber Regional Transport Advisory Board reaffirmed their prioritisation of the A63 Castle Street Scheme.

Reasons for the Project

2.1.5. The A63 forms part of the strategic E20 Trans-European Network Route linking the Port of Hull to the M62 and strategic road network. The European Transport Network Route E20 runs roughly west-east through Ireland, the United Kingdom, Denmark, Sweden, Estonia and finally Russia. The total length of the route is approximately 1880km.

Figure 2.1 Scheme's European, National, Regional, Relevance

2.1.6. The Port of Hull is one of the UK's leading and fastest growing foreign-trading ports, and is the only passenger port on the Humber. Regular short-sea services operate to Europe, Scandinavia and the Baltic states. In 2007 the Humber Ports (Hull and Immingham) dealt with 93 million tonnes of cargo with Hull's share being 12.7% of this (11.8m tonnes). Hull is the UK's leading softwood timber-handling port and regularly handles in excess of 1.5 million cubic metres of timber, in addition to large volumes of other forest products.

2.1.7. Associated British Ports, which operates the Port of Hull have confirmed that they will continue to lobby with others to see improvements to Castle Street to ensure good access to the Port area.

2.1.8. The A63 Castle Street is the busiest section of road in the whole of the East Riding of Yorkshire, carrying daily flows in excess of 54,000 AADT two way flows. Figure 1.2 provides a location plan showing the existing street names and proposed limit of works.

2.1.9. By virtue of its position in the local and regional road network Castle Street attracts large volumes of traffic, both cars and a significant number of HGV's. These comprise:-

- Regional traffic from the development and dock areas to the east of the city heading west to the M62 and Humber Bridge;
- Local through traffic, in particular, commuters travelling between the western residential areas and their places of work to the east of the city; and

- Local commuter, shopping, business and recreational traffic with destinations in and around the city centre.

2.1.10. The large signalised junction at Mytongate links the A63 to Ferensway and the city centre to the north and via Commercial Road to the waterfront, commercial and retail areas to the south. This signalised at-grade junction restricts the through flow of traffic along the A63 and Ferensway and the interconnecting roads.

2.1.11. Within the scheme limits other principal bottlenecks are the signalised junction at Market Place and the three signalised pedestrian crossing facilities which, as well as having safety problems associated with pedestrians crossing a very busy road at-grade, cause significant delays to traffic.

2.1.12. The mixture of local traffic accessing side roads around Market Place and Princes Dock Street, and strategic traffic accessing the Port of Hull and M62, causes problems with weaving and traffic turning onto and emerging from side roads.

2.1.13. Opportunities for regeneration and development in the surrounding area and immediately adjacent to the scheme, particularly in the waterfront area, are being severely restricted as planning approval for development projects is dependent on improvement works to Castle Street and the Junction at Mytongate being completed. As a result, development and regeneration opportunities have been severely restricted in the centre of Hull.

2.1.14. The A63 Castle Street Improvements are seen as a catalyst for future development in Hull city centre which is currently restricted due to the present levels of congestion on the A63. The improvements will also aid the future expansion of the Port of Hull. In traffic terms Castle Street has been operating at capacity for several years with the current configuration of the junction at Mytongate and the traffic signals on this section of the A63 unable to cope with any future traffic growth. The key stakeholders, including HCC, are keen that the scheme should be constructed at the earliest opportunity.

2.1.15. The A63 acts as a substantial barrier and creates severance between the city centre, main shopping areas and transport links to the north of the A63 and developments, tourist and recreational facilities and retail parks to the south. The volume of traffic on the A63 produces conflict between pedestrians and vehicles and leads to poor amenity on the footpaths in the vicinity of the road.

The presence of such a busy road can discourage some pedestrians from making their journey and / or induce them to change their habits. Severance is one of the key objectives of the scheme to reflect HCC's desire to reconnect the city centre with the waterfront area as part of the redevelopment and growth of the city centre.

2.1.16. Accident records for the five year period 2005 to 2009 show there has been 553 Personal Injury Accidents (PIAs) within the study area, which is above the UK average for this type of road. The proportion of accidents where someone was Killed or Seriously Injured (KSI) is 13.4%. Table 2.1 below shows the breakdown of accidents by severity and year.

Table 2.1: Accident Summary 2005 - 2009

Severity	Yearly Totals					Total
	2005	2006	2007	2008	2009	
Fatal	2	1	1	1	0	5
Serious	8	21	12	15	13	69
Slight	96	105	96	79	103	479
Total	106	127	109	95	116	553

2.2. THE PROJECT OBJECTIVES

2.2.1. The four key objectives of the proposed scheme are to:

- Reduce congestion on this section of the A63;
- Improve access / reduce journey times to the Port of Hull;
- Improve safety on this section of the A63; and
- Reduce severance between the city centre to the north and waterfront to the south.

2.2.1. The HA's published Environmental Strategy and the Business Plan 2012-13 set out key aims of the HA, and place a strong emphasis on protection, conservation and enhancement of the environment. The Sustainable Development Plan 2012 – 2015 sets out the HA's aim to minimise adverse impacts and where able to improve social and environmental outcomes.

2.3. A BRIEF HISTORY OF THE PROJECT TO DATE

Project History

2.3.1. Development of highway improvements in the area of Castle Street have been tabled from as far back as the early 1990's when Acer Consultants undertook initial design works to formulate options, which would increase the traffic capacity of Castle Street (Acer, 1991). A preferred option was subsequently taken to Public Consultation in 1992. Following a review of the HA Roads Programme in the mid 1990's, this design process was halted.

2.3.2. The scheme development is summarised in Table 2.2.

Table 2.2: Summary of Scheme Development to Date

Date	Study	Undertaken By	Client
Pre 1994	Scheme development pre 1994	Acer Consultants	Department of Transport
February 1992	Public Consultation	Acer Consultants	Department of Transport
1997	Scheme development halted due to a comprehensive review of the roads programme		
Spring 2000 to July 2002	Hull East-West Corridor Multi Modal Study (HUMMS)	Faber Maunsell	Highways Agency
Jan 2002 to April 2002	HUMMS Validation	Pell Frischmann	Highways Agency
May 2003	Feasibility and Pre TPI Entry Preparation	Pell Frischmann	Highways Agency
June 2003	Cut and Cover Tunnel Option Introduced	Pell Frischmann	Highways Agency
July 2003	TPI Submission (Excluding Cut and Cover Tunnel) and Ministers Decision – Instructed to look at further options	Pell Frischmann	Highways Agency
2004	Feasibility and Pre TPI Entry Preparation	Pell Frischmann	Highways Agency
January 2006	Government Announcement on Allocation of scheme to Regional Transport Board		
January 2008	Introduction of three overground options taking total number of options to six.	Pell Frischmann	Highways Agency
January 2009	Technical Appraisal Report (TAR) recommending the underground and overground grade separation of Mytongate Junction are put forward for Public Consultation	Pell Frischmann	Highways Agency

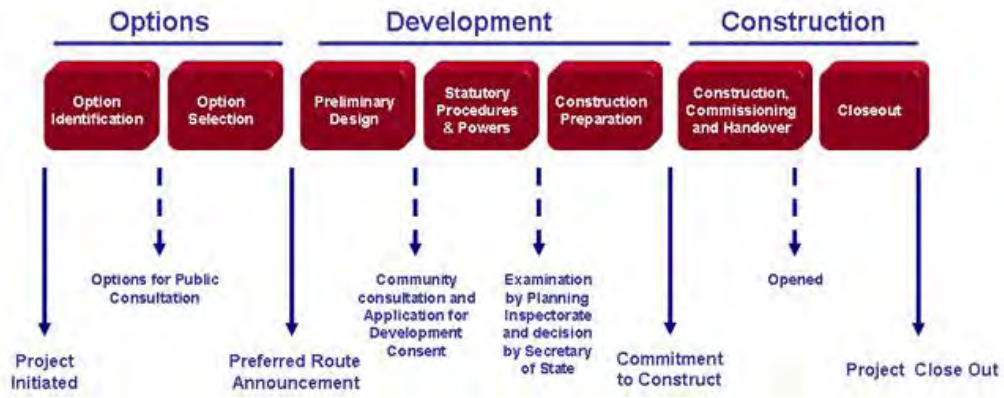
Date	Study	Undertaken By	Client
April – May 2009	Public Consultation Exhibitions	Pell Frischmann	Highways Agency
January 2010	Report on Public Consultation and Scheme Assessment Report	Pell Frischmann	Highways Agency
February 2010	Environment Assessment Report (Options Selections Stage)	Pell Frischmann	Highways Agency
March 2010	Secretary of State for Transport announced the Underground Option was the Preferred Route for improving the A63 Castle Street, Hull.		
September 2010	Pipeline Scheme Review	Jacobs	Highways Agency
May 2012	Roads Minister Mike Penning announced that the A63 Castle Street Improvement Scheme had been selected to receive funding for development work to maintain a future pipeline of major investment in the strategic road network.		

Project Control Framework

2.3.3. Since 2008 assessment of the scheme has been undertaken in accordance with the HA Project Control Framework (PCF). The PCF sets out how the Major Projects Directorate of the HA, together with the DfT, manage and deliver major improvement projects as part of the Roads Programme.

2.3.4. The framework includes a project lifecycle (see Figure 2.2) which breaks down the development and delivery of a major project into seven defined stages within three phases.

Figure 2.2: HA Project Control Framework Project Lifecycle



2.3.5. For every stage of the lifecycle key deliverables (or products) have been defined that are required in order to progress the project to its next stage or phase. The

Scheme has recently completed the Options Phase and moved into the Development Phase.

Options Phase

2.3.6. As part of the completed Options Selection Stage, a Public Consultation exercise was undertaken between 9th March and 5th June 2009. Public Exhibitions were held as part of the consultation exercise. Two options, Underground and Overground Options, were presented as preferred options. The remaining scheme options, Underground Landbridge, Overground Landbridge, Cut and Cover Tunnel and Extended Viaduct, were presented as non-preferred options. Details of the options are given in Chapter 3 of this report.

2.3.7. The consultation exercise gave statutory consultees, key stakeholders and the general public the opportunity to gain information about the scheme and to comment on the proposals.

2.3.8. The overall response to the proposals for improving Castle Street was very good, with many respondents stressing that something needed to be done immediately. The majority of the public accepted the reasons why only two options were being put forward as preferred options; however, a number did indicate that they felt some of the non-preferred options would help with the redevelopment of Hull and provide greater connectivity between the city and the waterfront.

2.3.9. Two main issues dominated the response from the public – the severance of the city centre from the waterfront and the risk of flooding (both during and after construction) as a result of the possible lowering of the A63.

2.3.10. Two contrasting preferences were obtained from the general public. Overall, the majority of the respondents to the consultation indicated a slight preference for the Overground Option. However, an analysis of the views of respondents living within 500m of the proposed scheme clearly revealed that the local residents preferred the Underground Option.

2.3.11. Mixed opinions were received from the key stakeholders, two of which, Visit Hull and East Yorkshire and Hull and Humber Chamber of Commerce, indicated that they felt the non-preferred Underground Landbridge scheme would benefit the city of Hull the most. However, Hull and Humber Chamber of Commerce

indicated that if the Landbridge scheme was not viable, then, of the two preferred options, they would support the Underground Option.

2.3.12. The key product at Options Selection stage was the Scheme Assessment Report (SAR) (PF, 2009b). The purpose of the SAR was to draw together the information from the Economic Appraisal and Environmental Assessments, together with the results of the Public Consultation, and recommend a Preferred Route.

2.3.13. The SAR recommended that the Underground Option should be nominated as the Preferred Route on the basis that it meets the objectives of the scheme, the range forecast is within the total Regional Transport Advisory Board budget of £189m, it has the highest BCR at 3.6, has the lowest environmental impact and was the preference of the majority of consultees following public consultation.

2.3.14. On 22nd March 2010, the Secretary of State for Transport announced the Underground Option was the Preferred Route for improving the A63 Castle Street, Hull.

Development Phase

2.3.15. The first stage in the Development Phase is the Preliminary Design Stage and the A63 Castle Street Improvements is currently in this Stage.

2.3.16. The aim of the Preliminary Design Stage is to develop the scheme in sufficient detail to enable the submission of a Development Consent Order under the Planning Act 2008. .

2.3.17. The key tasks of the Preliminary Design Stage for the A63 Castle Street are:

- Undertake surveys to obtain sufficient information to inform the preliminary design e.g. topographical, drainage, geotechnical, environmental;
- Preliminary design of the preferred route completed and frozen;
- Planning Inspectorate (PINS) Development Consent Order submitted;
- Environmental Impact Assessment undertaken and the Environmental Statement produced; and Traffic and Economic Appraisals updated.

2.3.18. In 2009, it was agreed with the HA's Traffic, Modelling and Economics (TAME) Team that a new traffic model was required to take the scheme forward. The agreed model specification included a SATURN highway model, CUBE

TRIPS/Voyager public transport model, and associated distribution and mode choice models. The SATURN Highway model was completed in January 2010. Development of the CUBE TRIPS/Voyager public transport model and associated distribution and mode choice models was completed in March 2011. Additional traffic surveys were carried out in November 2012 at Mytongate Junction and at Market Place.

2.3.19. The traffic forecasts will take account of the main growth effects for the study area including an assessment of growth associated with development proposals, and background growth, estimated using TEMPRO and NTM forecasts for cars and commercial vehicles respectively, to produce the most likely traffic, pessimistic and optimistic forecasts for the peak hours and AADT using the newly developed A63 SATURN model.

2.3.20. Traffic forecasting will be undertaken for the following key years:

- Base year – 2008
- Opening Year – 2019
- Design Year – 2034

2.3.21. The Environmental Products of the Preliminary Design Stage, identified on the PCF Product Matrix and prepared in accordance with DMRB Methodologies and guidance commensurate with this stage of the assessment process, are as follows:

- EIA Screening and Scoping (produced);
- Assessment of Implication on European Sites (refined);
- Environmental Statement (including Non-Technical Summary) (produced).

2.3.22. A preliminary Assessment of Implication on European Sites (AIES) was completed during the Options Selection Stage, as the Humber Estuary, an internationally designated site, is present approximately 500m to the south of the site. However, at the time of production there was insufficient design detail, particularly regarding drainage of the scheme, to provide sufficiently robust evidence that the scheme would not adversely impact the Humber Estuary.

2.3.23. Following completion of the preliminary design, and as part of the EIA, the AIES will be revisited and reassessed to ensure that sufficient information is available

to the Competent Authority to assess the impact of the scheme on the Humber Estuary.

2.3.24. The EIA will be undertaken in accordance with current Guidance. The HA has developed a set of criteria for establishing the environmental value of individual assets (HA205/08, HA, 2008b). Since this time the HA has published Interim Advice Note 125 (HA, 2009a). This IAN provides supplementary advice for users of DMRB Volume 11 and clarifies the assessment approach to be used where up to date topic specific guidance has not yet been published.

2.3.25. IAN 125 (HA, 2009a) states that, until updates of DMRB or IANs are published for the new Section 3 topics, designers should use the existing published guidance.

2.4. THE PREFERRED OPTION

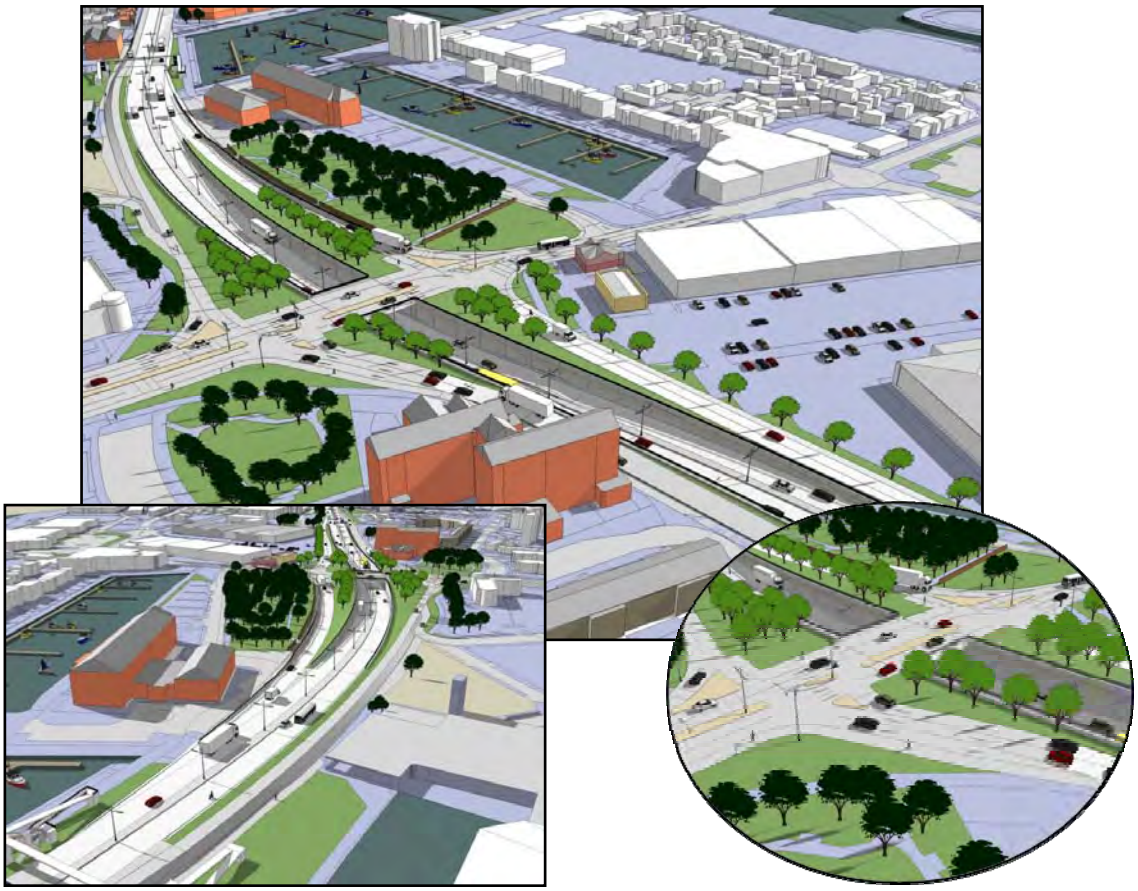
2.4.1. The Preferred Route lowers the level of the existing A63 in the vicinity of Mytongate Junction (Ferensway/Commercial Road) by approximately 7m with Ferensway and Commercial Road being raised by approximately 1m and passing over the A63 on a new bridge.

2.4.2. Between Mytongate Junction and Market Place, the eastbound carriageway would be widened to three lanes, with the nearside lane being marked for local traffic only and which, for safety reasons, would be physically segregated from the main eastbound carriageway from Mytongate Junction as far as Prince's Dock Street. Vehicles wishing to access Myton Street and Prince's Dock Street from the A63 would do so via the eastbound exit and entry slip-roads. The westbound carriageway would have two lanes, as at present.

2.4.3. The realigned A63 and the westbound exit slip road to Commercial Road would pass through the northern part of the Trinity Burial Ground, affecting around one third of the Burial Ground.

2.4.4. East of Mytongate Junction the A63 would tie back into existing ground level where a pedestrian footbridge would be provided in front of Princes Quay Shopping Centre and the Humber Dock Marina. This bridge would be approximately 7m above existing road level and would allow pedestrians to cross above Castle Street, eliminating the current pedestrian/vehicle conflict caused by the existing signalised crossing.

Figure 2.3: Preferred Route



2.4.5. Currently the junction at Market Place is signal controlled and, as part of previous improvement works; the gap in the central reserve is closed. As part of the Castle Street Improvement scheme it is proposed to remove the existing signalised pedestrian crossings at Market Place and replace them with a new pedestrian footbridge, thereby removing the pedestrian/vehicle conflict at this location. Vehicle movements would be restricted to left in/left out as at present.

2.4.6. In order to construct the eastbound entry slip road, nearside eastbound local traffic lane and improved A63, two Grade II listed properties would require demolition; the Castle Buildings and the former Earl de Grey Public House.

2.4.7. It would be necessary to close the accesses from the A63 to the Holiday Inn Hotel, Spruce Road and Waverley Street, on safety grounds. Alternative access would be provided for the hotel from Commercial Road and access to Spruce Road/Waverley Street is currently proposed via a new road off St James Square/St James Street.

2.4.8. In addition to the pedestrian footbridges opposite Princes Quay and at Market Place, to further improve pedestrian facilities, a footbridge would also be provided near Porter Street; to replace the current signalised pedestrian crossing facility at this location. Pedestrian footways would also be provided along the length of scheme with a replacement cycleway to the north of the A63.

2.4.9. A Scheme Plan and Long Section (Figure 3A) showing the Scheme can be found in Appendix A.

3. CONSIDERTION OF ALTERNATIVES

3.1. DESIGN OPTIONS THAT HAVE BEEN EXAMINED

Introduction

3.1.1. In total six alternatives were considered during the Options Phase, two of which were, in the Options Selection Stage, designated Preferred Options and four of which were designated as Non-Preferred.

Overground Option

Figure 3.1: Overground Option

3.1.2. This option would raise the level of the existing A63 in the vicinity of Mytongate Junction (Ferensway/Commercial Road) by approximately 8m with Ferensway and Commercial Road being lowered by around 1m and passing beneath the A63 bridge.

3.1.3. Between Mytongate Junction and Market Place, the eastbound carriageway would be widened to three lanes, with the nearside lane being marked for local traffic only and which, for safety reasons, would be physically segregated from the main eastbound carriageway from Mytongate Junction as far as Prince's Dock Street. Vehicles wishing to access Myton Street and Prince's Dock Street from the A63 would do so via the eastbound exit and entry slip-roads. The westbound carriageway would have two lanes, as at present.

3.1.4. The realigned A63 and the westbound exit slip road to Commercial Road would pass over/through the northern part of the Trinity Burial Ground.

3.1.5. East of Mytongate Junction the A63 would tie back into existing ground level where a pedestrian footbridge would be provided in front of Princes Quay Shopping Centre and the Humber Dock Marina. This bridge would be approximately 7m above existing road level and would allow pedestrians to cross above Castle Street, eliminating the current pedestrian/vehicle conflict caused by the existing signalised crossing.

3.1.6. As part of the Castle Street Improvement scheme it is proposed to remove the existing signalised pedestrian crossings at Market Place and replace them with a new pedestrian footbridge, thereby removing the pedestrian/vehicle conflict at this location. Vehicle movements would be restricted to left in/left out as at present.

3.1.7. In order to construct the eastbound entry slip road, nearside eastbound local traffic lane and improved A63, two Grade II listed properties would require demolition; the Castle Buildings and the former Earl de Grey Public House.

3.1.8. It would be necessary to close the accesses from the A63 to the Holiday Inn Hotel, Spruce Road and Waverley Street on safety grounds. Alternative means of access would be provided.

3.1.9. In addition to the pedestrian footbridges opposite Princes Quay and at Market Place, to further improve pedestrian facilities, a footbridge would also be provided near Porter Street, to replace the current signalised pedestrian crossing facility at this location. Pedestrian footways would also be provided along the length of scheme with a replacement cycleway to the north of the A63.

Underground Landbridge Option

Figure 3.2: Underground Landbridge Option

3.1.10. As with the preferred Underground Option this option would consist of lowering the A63 in the vicinity of Mytongate junction to pass below Ferensway and Commercial Road. East of Mytongate junction the A63 would remain in cutting passing beneath a 25m wide pedestrian landbridge in front of Princes Quay Shopping Centre. The landbridge would be approximately 2.5m above adjacent ground level.

3.1.11. Between Mytongate Junction and Market Place, the eastbound carriageway would be widened to three lanes with the nearside lane marked for local traffic only. The westbound carriageway would have two lanes, as at present.

3.1.12. Pedestrian footbridges over the A63 would replace the current signalised pedestrian crossing facilities at Porter Street and Market Place. There would be no direct access from the A63 to the Holiday Inn Hotel, Spruce Road or Waverley Street. Alternative means of access would be provided.

Cut and Cover Tunnel

Figure 3.3: Cut and Cover Tunnel

3.1.13. As with the preferred Underground Option this option would consist of lowering the A63 in the vicinity of Mytongate junction to pass below Ferensway and Commercial Road. East of Mytongate Junction the A63 would continue at a low level before entering a tunnel between Myton Street and Finkle Street, and then rising to tie into existing levels just west of Myton Swing Bridge.

3.1.14. Within the tunnel the A63 would be a dual carriageway. Above the tunnel a single carriageway Local Access Road would be constructed between Ferensway and Market Place, and would link with the local roads that presently connect to the A63. The Market Place Junction with the A63 would be closed with the exceptions of the eastbound entry onto the A63 and the westbound exit onto Queen Street.

3.1.15. A pedestrian footbridge would be provided over the A63 at Porter Street. There would be no direct access from the A63 to Spruce Road or Waverley Street. Alternative means of access would be provided.

Overground Landbridge Equivalent

Figure 3.4: Overground Landbridge Equivalent

3.1.16. As with the preferred Overground Option this option would consist of raising the level of the existing A63 in the vicinity of Mytongate Junction to pass over Ferensway and Commercial Road. East of Mytongate Junction the A63 would remain on flyover passing over a 25m wide pedestrian walkway in front of Princes Quay Shopping Centre. The walkway would be approximately 1.5m below adjacent ground level.

3.1.17. Between Mytongate Junction and Market Place, the eastbound carriageway would be widened to three lanes with the nearside lane marked for local traffic only. The westbound carriageway would have two lanes, as at present.

3.1.18. Pedestrian footbridges over the A63 would replace the current signalised pedestrian crossing facilities at Porter Street and Market Place. There would be no direct access from the A63 to the Holiday Inn Hotel, Spruce Road or Waverley Street. Alternative means of access would be provided.

Overground Extended Viaduct

Figure 3.5: Overground Extended Viaduct

3.1.19. As with the preferred Overground Option this option would consist of raising the level of the existing A63 in the vicinity of Mytongate Junction to pass over Ferensway and Commercial Road. East of Mytongate Junction the A63 would continue on a viaduct, tying into existing levels just west of Myton Swing Bridge.

3.1.20. On the viaduct the A63 would remain as a dual carriageway. Below the viaduct a single carriageway Local Access Road would be constructed between Ferensway and Market Place and would link with the local roads that presently connect to the A63. The Market Place Junction with the A63 would be closed with the exceptions of the eastbound entry onto the A63 and the westbound exit onto Queen Street.

3.1.21. A pedestrian footbridge over the A63 would be provided at Porter Street. There would be no direct access from the A63 to Spruce Road or Waverley Street. Alternative means of access would be provided.

3.2. DEVELOPMENT OF PREFERRED OPTION

3.2.1. The Secretary of State for Transport considered the views expressed during the Public Consultation and announced on 22nd March 2010 that the Underground Option should be the Preferred Route.

3.2.2. During the Preliminary Design Stage further work will include an assessment of the horizontal and vertical road alignment (to minimise required landtake and the depth of excavation), and alterations required to the side roads.

4. CONSULTATION

4.1. PROPOSED PUBLICATION STRATEGY AND TIMINGS

4.1.1. The key milestones of the current project programme and the anticipated dates associated with them are listed below.

Table 4.1: Current Programme – Key Milestones

PCF Stage	Milestone	Date
Stage 3 – Preliminary Design	Preferred Route Announcement	Mar 2010
	Start Planning Act 2008 Section 47 Consultation	July 2013
	Draft Environmental Statement	Feb 2014
	Start Planning Act 2008 Section 42 Consultation	May 2013
	Final Environmental Statement	April 2014
	Notify Minister to Publish DCO	April 2014
	Submit DCO Application	April 2014
Stage 4	NIPS Pre Examination Complete	Aug 2014
	Examination Complete	Feb 2015
	Recommendation	May 2015
	Secretary of State Decision	Aug 2015
Stage 5*	Commencement of Detailed Design	Aug 2014
Stage 6*	Start of Works	Oct 2015
Stage 7 *	Commencement of Operation	2019

*Subject to the outcome of the DCO Application

4.1.2. Roads Minister Mike Penning announced on 8th May 2012 that the A63 Castle Street Improvement Scheme had been selected to receive funding for development work to maintain a future pipeline of major investment in the strategic road network.

4.2. CONSULTATION UNDERTAKEN TO DATE

4.2.1. Throughout the assessment process the HA is committed to engaging with key Stakeholders and statutory consultees. In the Options Phase of the PCF lifecycle consultation occurred through three ways:

- the Public Consultation process;
- Value Management workshop; and

- Correspondence and meetings with key stakeholders and statutory consultees.

Public Consultation (Options Phase)

4.2.2. The public consultation period commenced on 9th March 2009, following a Central Office of Information (COI) press release on behalf of the HA, and formally ended on 5th June 2009.

4.2.3. Public Consultation leaflets, accompanied by a questionnaire, were produced describing the preferred options for the A63 Castle Street Improvement scheme and providing details of the forthcoming exhibitions. The questionnaire asked the respondents to indicate their preferred option and to grade how successful the two preferred options were at resolving Castle Street's key problems. It also asked for respondent's opinions on the type of pedestrian crossing facilities that should be provided. Space was provided on the questionnaire for respondents to make additional comments.

4.2.4. Letters, accompanied by the Public Consultation leaflet and the executive summary of the Technical Appraisal Report (PF, 2008), were sent to organisations and key stakeholders informing them of the exhibitions and inviting them to attend and comment on the proposals. The list of organisations and key stakeholders included emergency services, local councils, government agencies, members of parliament, members of the European parliament and environmental groups.

4.2.5. Approximately 132,000 consultation leaflets and questionnaires were distributed between 9th March 2009 and 1st April 2009. In addition, a scheme page was set up within the HA's website. Details of the website, which can be accessed at http://www.highways.gov.uk/A63castlestreet, were given on the Public Consultation leaflet.

4.2.6. A total of 544 members of the public attended the Public Exhibitions, which were held as follows:

The Deep	Thursday 2nd April 2009 (2 pm – 8 pm) Friday 3rd April 2009 (10 am – 8 pm) Saturday 4th April 2009 (10 am – 4 pm)
The Royal Hotel	Friday 8th May 2009 (10 am – 8 pm)

4.2.7. A special exhibition preview event for invited stakeholders and local dignitaries was held at The Deep on the evening of Wednesday 1st April 2009, prior to the first public attendance day. The local press were invited to attend the opening of the exhibition at The Deep on the afternoon of 2nd April 2009.

4.2.8. Feedback forms, comments sheets and a ballot box were provided at the exhibition for visitors requesting further information or to provide comments on the scheme. A total of 144 feedback forms and 30 comment sheets were received requesting further information and providing comments on the scheme. Overall, 26% of the exhibition visitors gave feedback on the exhibition and 13% of the visitors made comments on the scheme or requested further information.

4.2.9. By the end of the consultation period a total of 1503 completed questionnaires were received, with 1469 completed by hand and 34 submitted on-line via the HA's A63 website. The total number of questionnaires returned (1503) represents 1.1% of the leaflets distributed. In addition, 786 respondents (52%) provided additional comments on the scheme. The total number of comments received in proportion to the total number of questionnaires returned is considered to represent a good response for a consultation of this type.

4.2.10. Fifteen members of the public also submitted their views by letter or e-mail.

4.2.11. Full details of the public consultation exercise are reported in the Report on Public Consultation (PF, 2009a).

Value Management Workshop

4.2.12. A Stakeholder's Value Management (VM) Workshop was held on the 29th July 2009 to review the various scheme options associated with the A63 Castle Street Improvement Scheme. VM is used to continuously review objectives, identify options and to help control development of a major project; hence the value management process consists of workshops at key phases of major project development.

4.2.13. The broad aim of the VM workshop was to improve the value of the concept designs to align with the project objectives and develop value for money (VfM) improvements to the preferred scheme options.

4.2.14. The workshop was an opportunity for the HA to provide stakeholders with an overview of the development of the project and for stakeholders to review the various options so that they could contribute to the overall opinion assessment process by considering the relative strengths and weaknesses of the various options.

4.2.15. Full details on the discussions undertaken during the workshop are reported in the Value Management Workshop Report (CVRL, 2009).

Air Quality

4.2.16. A consultation meeting with HCC Public Protection Team was undertaken in March 2009. The aim of the meeting was to provide the Council with an update of the October 2008 assessment findings and to discuss the approach and assessment method proposed for the current assessment. It was stated that the air quality work was being undertaken to update the assessment of the air quality impacts, given that the new SATURN traffic model data was available. Further to this, consultation included determining the availability of updated baseline data for this assessment.

4.2.17. Consultation with the Environmental Protection Section of the HCC Public Protection Division was undertaken in January 2013. The purpose of this was to agree the locations of additional diffusion tube monitoring to supplement that previously undertaken and currently being carried out by HCC.

Noise and Vibration

4.2.18. Consultation with the Environmental Protection Section of the HCC Public Protection Division was undertaken in January 2013 to obtain information regarding any known sources of noise complaints and any specific details of the noise climate within the study area.

Cultural Heritage

4.2.19. A copy of the Options Identification Cultural Heritage Detailed Assessment was issued to English Heritage (EH) and Humber Archaeology Partnership (HAP) on the 7th August 2008, requesting comments. A reply was received from HAP on the 1st October 2008; and from EH on the 28th October 2008. A summary of those replies is given below.

4.2.20. A copy of the revised detailed Cultural Heritage Report (Option Selection Stage) was issued to EH and HAP on 17th July 2009. A response from EH was received on 12th August 2009.

Humber Archaeology Partnership (Reply to Options Identification)

4.2.21. Many of HAP's comments were factual stemming from their detailed knowledge of the study area; these comments were very useful and amendments were made to the Cultural Heritage chapter as necessary.

4.2.22. Significant comments and HAP's reservations over the scoring system used to assess the impacts of the scheme options, related to the fact that specific individual medieval properties within the Old Town were not identified or itemised in the site gazetteer. They also commented that the potential excavations within the Trinity Burial Ground were too large and might detract from the amount of excavation required in the Old Town.

4.2.23. HAP did not seem unduly concerned about the proposed demolition of the Listed Buildings, and questioned whether there was actually any viable future for the Earl de Grey public house. HAP was more concerned about the impacts on the underlying archaeology within the Old Town. Apart from the above comments relating to the burial ground, no significant comments were received concerning the scale and scope of the proposed mitigation strategy, and little comment was made regarding impacts upon the built environment, townscape and Conservation Area, or the visual impacts.

English Heritage

4.2.24. At Options Identification Stage, EH took a wider perspective, and indeed questioned the whole rationale behind the scheme. They confirmed that they concurred with the HAP's comments regarding the below-ground archaeology and that there needed to be an appropriate mitigation strategy; although no specific comments were made on the proposed strategy.

4.2.25. EH was much more concerned about the above ground impact. They indicated that greater mention should be made of the impacts on the Conservation Area/townscape; this is an accepted omission in the cultural heritage report and was subsequently addressed in the Options Selection Environmental Assessment Report (EAR) (PF, 2010a). In particular, they could not support the

demolition of the various Listed Buildings, and did not consider that these demolitions could be justified.

4.2.26. In response to the letter received from EH a meeting was arranged, in February 2009, between the HA, PF and EH. A brief background to the scheme and progress to date was discussed including descriptions of the scheme options and the key dates in the programme.

4.2.27. Discussions about the length of scheme construction and constraints due to construction works also took place at the meeting. EH outlined their current concerns regarding the proposed schemes. Their first concern was the time it was taking to move the improvements for Castle Street forward.

4.2.28. EH stated that they meet regularly with Hull Forward with regards to regeneration of the Fish Market area. Proposed improvements to the area are difficult to undertake until the problems on Castle Street are dealt with e.g. they are having problems getting people to invest in the existing buildings which has a knock on effect on the area.

4.2.29. EH's main concern was to ensure that minimal impact on the historic environment was considered a priority. It was stressed that although archaeology is an important factor, they did not want the archaeology of the area (i.e. underground issues) to override the overground historic environment/listed buildings.

4.2.30. The proposed loss of the two listed buildings – Castle Buildings and Earl de Grey Public House - were of concern to EH, and the question was raised as to whether there was any chance of saving these buildings. PF confirmed that during detailed design it may be possible to refine the preferred scheme in order to avoid demolition, however at the present conceptual stage the worst case scenario would have to be the loss of these buildings. Both of the schemes require land take from the Trinity Burial Ground and this is unavoidable.

4.2.31. In their response to the Options Selection Stage report EH confirmed that they considered the report to be a very through document which clearly sets out the heritage interests of the route between Mytongate and Market Place. They confirmed that the impact assessment was balanced and concise. They indicated that the descriptive nature and magnitude of the scheme impact was helpful, confirming that there will be damaging impacts on the cultural assets influenced by the route.

4.2.32. In their response they did not offer any indication of their views on the preferred options, but indicated that they would respond as part of the ongoing Public Consultation

4.2.33. In their response to the Public Consultation EH reiterated that their views previously given at Options Identification Stage (letter dated 28 October 2008) were still valid. They confirmed that they considered the four Non-Preferred Options would be the most damaging, to the heritage of central Hull, of the six options considered at Options Identification Stage and that they supported the selection of the two Preferred Options.

4.2.34. They stated that while they still have concerns over the damage which the two preferred options would cause to the historic core, they wish to continue to engage with the HA to try to mitigate the damage and offered a number of comments specific to each of the Preferred Options. In particular they queried whether the Grade II listed Buildings (Earl de Grey and Castle Buildings) needed to be demolished or whether it would be possible to amend the slip road design in order to allow the buildings to be retained as this would help the historic environment in this area. Similarly they have questioned whether amendments to the proposed highway alignment could reduce/mitigate the impacts on Trinity Burial Ground and the Humber Dock wall.

4.2.35. Finally they indicated that they would like to ensure that the visual intrusion of signage, barriers and other highway paraphernalia is minimised and to explore how the footbridges could be designed innovatively so that the structures are sensitive to the area's heritage.

4.2.36. In conclusion, EH confirmed that they welcome continuing dialogue so as to investigate all options for making either scheme less damaging and visually intrusive.

4.2.37. In January 2013 a Cultural Heritage Liaison Group was established to discuss the many cultural heritage issues related to the scheme. The group comprises the HA, MMGJV, EH, HCC and HAP, and will meet on a regular basis (currently monthly).

Nature Conservation

4.2.38. During the Options Identification Stage of the project, Chris McGregor, of Natural England (North and East Yorkshire Team) was consulted by telephone. The

results of ecological surveys that had been carried out were discussed. Natural England did not consider the scheme likely to have significant effects on wildlife, however it was pointed out that appropriate surveys and mitigation must be put in place, in particular in relation to the confirmed bat roost. Natural England would be supportive of any ecological enhancements that could be incorporated into the scheme.

4.2.39. Further to the telephone consultation a map showing the approximate scheme location was issued. Chris McGregor forwarded this to Tim Page of the Natural England Humber to Pennines Team. The response was that potential disturbance to Humber Estuary SPA/SSSI/Ramsar birds should be considered and that this may require an assessment of Likely Significant Effect (LSE) and Appropriate Assessment. Natural England is satisfied that potential need for further assessment at a later stage has been incorporated into the scheme assessment report.

4.2.40. Consultation during the Options Selection stage was undertaken with Humber Industries Nature Conservation Association (Humber INCA) and Hull Biodiversity Partnership as HCC currently do not have their own ecologist or nature conservation officer. Humber INCA is a partnership between large firms who operate on either side of the estuary, statutory agencies and voluntary sector bodies while Hull Biodiversity Partnership is a group of voluntary and statutory organisations who have put together the Hull Biodiversity Action Plan, and monitor its effectiveness.

4.2.41. In addition, following informal discussion, a copy of the ecology assessment report and the preliminary screening for the appropriate assessment was issued to the Natural England Officer with responsibility for Hull and the Humber Estuary on completion. No formal comments were received.

4.2.42. In their response to the Public Consultation, Natural England indicated that they have a neutral opinion of the scheme proposals at this time.

4.2.43. Natural England was contacted in February 2013 to discuss the progress of the scheme but a response has not been received to date.

Landscape/Townscape

4.2.44. During the Option Identification stage, a meeting was undertaken with the head of urban design and conservation at HCC (Richard Wilson) in July 2008.

4.2.45. As part of the current Options Selection Stage, further consultation was undertaken with HCC Urban Design, Planning and Landscape Department (April 2009) to discuss the October 2008 assessment approach and findings. Baseline data gathering also included consultation with Hull Forward, whom provided information regarding the Humber Quays and Quay West proposals and the new River Hull footbridge.

Road Drainage and the Water Environment

4.2.46. During Options Identification Stage, the Environment Agency (EA) was contacted by e-mail to obtain water quality data on the River Hull, River Humber and Humber Dock Marina, as well as information on any fisheries which may be affected by the proposed scheme. However flow data for the Humber Estuary was not available.

4.2.47. As flow data was not available contact was made with HA's Network Services (NS) to seek advice on how to proceed with the assessment.

4.2.48. The EA formally replied to the Public Consultation. A summary of the their views is given below:

- They objected to the Underground Option on grounds that lowering the road level would lead to an increased flood risk;
- They require a full Flood Risk Assessment (FRA) to be carried out to ensure that there is no impact on the flood flow routes through the site and that construction of the scheme would not increase the flood risk;
- The Environmental Statement should assess the effects the proposed works would have upon controlled waters and how these effects would be mitigated;
- A detailed drainage assessment should be undertaken; and
- The likelihood of the scheme encountering contaminated land and the need for remediation should be assessed.

4.2.49. Following receipt of their response and attendance by representatives at the Stakeholder workshop a meeting between the EA, HA and PF was arranged for Friday 18th September 2009. A summary of the discussion undertaken in this meeting is given below.

4.2.50. A discussion of the stage of the project was undertaken. The EA indicated that the FRA previously undertaken in 2007 was out of date and needed to be updated. It was confirmed that the FRA was being updated in conjunction with the current environmental assessment.

4.2.51. A discussion over the discharge methods was undertaken. PF confirmed that discharge to a Yorkshire Water sewer is very unlikely to be acceptable, as the current system is near its design capacity, therefore this method of discharge will no longer be considered as an option. The scheme cost has been estimated assuming discharge direct to the Humber Estuary; however there may be the potential to discharge into Railway Dock. This would be addressed in more detail at preliminary design stage.

4.2.52. EA confirmed that the risk of failure of the tidal barrage on the River Hull was low but the consequences if it did fail were high. The consequences would be amplified with the underground option. They indicated that HA would need to have a proactive emergency plan in place for the scheme, to ensure the safety of road users.

4.2.53. It was confirmed by the HA Senior Project Manager following discussions with his Network Operations colleagues on 2nd December 2009 that the HA are content to develop an emergency procedure appropriate to the chosen route option following Preferred Route Announcement. It was also confirmed that Hull's Strategic FRA was reviewed and its recommendations have been taken into consideration in the updated scheme FRA. It was confirmed that the HA would work together with the EA following Preferred Route Announcement to finalise the scope of the FRA for the preferred route.

4.2.54. A meeting was held with several representatives of the EA in January 2013 to update them on recent progress made with regard to the scheme. The EA provided an update on recent flood modelling which has been undertaken and which they will make available to be used in the preparation of the ES.

4.2.55. A meeting was also held in January 2013 with Steve Wragg, the HCC Flood Risk Planning Manager to update date him on recent progress made with regard to the scheme.

4.3. PROPOSED CONSULTATION

Further consultation of the local community is planned prior to finalisation of the preliminary design and ES. A Statement of Community Consultation (SOCC) is in preparation and will be published as required under the Planning Act 2008. The content of the consultation process is not yet fixed, but at this stage, it is anticipated that it will include the following elements:

- Direct one-to-one consultation with individual land/property owners or tenants who may be adversely affected by the scheme;
- Direct consultation with local community groups, both in writing and through meetings;
- One or more consultation events, including a staffed exhibition at which the public can ask questions and give their feedback, either verbally, in writing or through completion of a questionnaire;
- Analysis of the outcome of the consultation and preparation of a Consultation report.

4.3.1. The outcome of the consultation process will be summarised within an Appendix of the Environmental Statement.

5. APPROACH TO ASSESSMENT

5.1. THE DESIGN MANUAL FOR ROADS AND BRIDGES

5.1.1. All aspects of the development and design of major highway projects are governed by guidance set out in the 15 volumes of the Design Manual for Roads and Bridges[2] (DMRB). Guidance on EIA for highway projects is given in Volume 11, with guidance on environmental design in Volume 10.

5.1.2. The guidance in DMRB Volume 11 on the general principles and approaches to EIA was substantially updated in 2006 and 2008. The previous guidance defined three sequential 'levels' of EIA assessment and reporting - Stage 1, Stage 2 and Stage 3.The new guidance still defines three 'levels' of EIA assessment and reporting ('Scoping', 'Simple' and 'Detailed'). However these levels are not intended to be sequential (i.e. applied one after another in order), but 'consequential', in that the level to be applied at any stage of environmental reporting is determined according to the following factors[3]:

- The results of any previous assessment work;
- The likely scale or significance of impact (not the scale of development);
- The nature of the decision-making process to which the report relates; and,
- The degree of uncertainty about the potential impact of the scheme.

5.1.3. DMRB volume 11, section 1, part 1 supplemented by IAN 125/09 Supplementary guidance for users of DMRB Volume 11 'Environmental Assessment (HA,2009) advises that the environmental assessment should consider the following environmental topics:

- Air Quality;
- Noise and Vibration;
- Nature Conservation;
- Landscape;
- Cultural Heritage;
- Geology and Soils;

- Materials;
- Effect on All Travellers;
- Community and Private Assets;
- Road Drainage and the Water Environment;
- Combined and Cumulative Effects.

5.1.4. The level of EIA assessment and reporting can vary between topics. For topics that benefit from new guidance issued since 2006, there is a clear definition of the requirements for each level of assessment. However, for some topics, the available guidance pre-dates the introduction of these levels, while for other topics there is no published guidance. For these topics, the level of detail required is determined on a project-specific basis, bearing in mind the principles set out in DMRB.

5.1.5. In the case of topics that have not been updated and therefore still refer to Stage 1, Stage 2 and Stage 3 assessments, for consistency they will be referred to in this report as 'Scoping', 'Simple' and 'Detailed' level of assessment.

5.1.6. The EIA will use the most up-to-date relevant guidance published in DMRB or Interim Advice Notes (IANs). The majority of the topics to be covered have been included in DMRB since its first publication in 1993. Other topics are new, or substantially modified, replacing old topic headings that are now superseded.

5.1.7. The new topic of 'Community and Private Assets' combines elements of the former Land Use topic with the Community Effects element of Pedestrians, Cyclists, Equestrians and Community Effects. Guidance has not been published, and the approach set out in this report is based on professional judgement, drawing on guidance from the superseded topics.

5.1.8. The new topic of 'Effects on All Travellers' incorporates the former Vehicle Travellers and relevant parts of Pedestrians, Cyclists, Equestrians and Community Effects , to ensure that the interests of all road users are given equal weight. Guidance has not been published, and the approach set out in this report is based on professional judgement, drawing on guidance from the superseded topics.

5.1.9. For the new topic of 'Materials', guidance has been published in the form of IAN 153/11 'Guidance on the Environmental Impact Assessment of Materials' (HA, 2011).

5.2. OBJECTIVES OF THE EIA PROCESS

5.2.1. The objectives of the EIA are to provide information, advice and reports to:

- Facilitate the consideration of environmental effects and opportunities in the development of the design;
- Enable the minimisation of environmental effects through design, and the identification of environmental mitigation measures where required;
- Seek the opportunity to provide environmental improvements where possible;
- Contribute to the information about the project to be presented at any public consultation; and
- Ensure that decision making about the project is based on sound environmental information and takes environmental effects into account.

5.3. STUDY AREA

5.3.1. Study areas have been defined individually for each topic, according to the geographic scope of the potential impacts relevant to that topic or of the information required to assess those impacts, and drawing on guidance in DMRB where this specifies the extent of study areas. The study areas are defined within each relevant chapter of this report.

5.4. EXISTING, BASELINE AND FUTURE CONDITIONS AND THE 'DO MINIMUM' SCENARIO

5.4.1. In order to identify the effects of the proposed scheme on the environment, it is important to understand the environment that would be affected by the proposed works (the 'baseline conditions'). Understanding the baseline allows the measurement of changes that would be caused by improvements.

5.4.2. The 'baseline' for the measurement of environmental effects is not the situation as it exists now, but the situation as it would exist immediately before the implementation of the scheme. This means that the identification of baseline

conditions will take into account predicted changes that would occur before implementation, that are entirely independent of the proposed scheme. Identification of the baseline therefore requires first the identification of the existing situation, and then the prediction of how it is likely to change between now and implementation of the scheme.

5.4.3. The baseline year for impacts that would be caused by the construction of the proposed scheme is therefore the predicted date when construction would start. For the impacts that would be caused by the operation of the new road after it is open, it is the predicted date of opening.

5.4.4. For some topics, impacts will be predicted both for the baseline year and for a future year (for example 15 years after opening, or the worst year in the first 15 years of operation). The process involves forecasting the effects by comparing a scenario with the project against one without the project over time.

5.4.5. The absence and presence of the proposed project are referred to as the Do-Minimum and Do-Something scenarios respectively. The potential significant environmental effects need to be defined for the Do-Minimum and Do-Something scenarios in the baseline year and a future year, or series of future year depending on the topic.

5.5. DATA GATHERING AND CONSULTATION

5.5.1. For each topic, data has previously been gathered from a number of sources. This report defines the scope of, and approach to, new data gathering for each topic, where relevant. The scope defined here is designed to build on and update information gathered at earlier stages of the project. The scope of work to be carried out is defined in each chapter. However, in most cases the work can be broken down into four elements:

- Consultation of third-party organisations to obtain factual information;
- Consultation of third-party organisations (including Statutory Consultees) for comment on the scope of work required, on the prediction and assessment of impacts and in relation to mitigation requirements;
- Desk-based surveys; and,
- Field surveys to be carried out specifically for the EIA or for other aspects of the project.

5.5.2. Consultations which have occurred to date and further proposed consultations are covered in more detail in Chapter 4 of this report.

5.6. IDENTIFYING POTENTIAL IMPACTS

5.6.1. The EIA will consider both direct and indirect effects of the Scheme. Direct impacts are those caused by the scheme itself. Indirect impacts in this context can be 'those that alter the character, behaviour or functioning of the affected environment because of encroachment of the scheme impacts over a wider area; the effects related to pressure for scheme-induced change'.

5.6.2. Cumulative effects will be identified. There are two types of cumulative effects. First are those cause only by the proposed scheme, and arise when an individual receptor or group of receptors would experience multiple impacts as a result of the scheme, for example an individual property experiencing noise, air quality and visual amenity impacts. Other cumulative effects arise due to receptors being affected by the proposed scheme and by other planned developments. In both cases, cumulative effects may be of greater significance than the individual significance of any of the identified non-cumulative impacts.

5.6.3. Relevant developments to be considered in the assessment of the cumulative effects will be identified through consultation with the HA and HCC.

5.7. SIGNIFICANCE OF IMPACTS

5.7.1. The significance of an environmental effect is a function of the 'value' or 'sensitivity' of the receptor and the 'magnitude' or 'scale' of the impact. Typical generic terminology and criteria for the description of both the sensitivity and magnitude are described in DMRB Volume 11, Section 2, Part 5, 'Assessment and Management of Environmental Effects' (HA 205/08), while terminology and associated criteria for some topics is given in the relevant parts of DMRB Volume 11 Section 3. However, the guidance given in DMRB does not necessarily use the same scales, terminology or criteria for all disciplines, while for some disciplines DMRB gives little or no guidance on the assessment of significance of impacts.

5.7.2. The intention during the EIA is that all specialist environmental disciplines assess the sensitivity of receptors and the magnitude and significance of impacts on the basis of professional judgement and experience, using the terminology specified in DMRB Volume 11 Section 3. This will be adjusted where necessary to achieve

consistency between disciplines and to conform to the guidance set out in HA 205/08. Professional judgements will be informed by criteria and methods specified in DMRB where these are available. Where no guidance is available, the approach to assessment will be based on professional judgement.

5.7.3. HA 205/08 recommends the definition of the sensitivity of receptors on a five point scale of 'very high', 'high', 'medium', 'low' or 'negligible' sensitivity. Typical definitions of these terms are set out in Table 2.1 of HA 205/08, but will vary from topic to topic. Valuations will be made on the basis of professional judgement.

5.7.4. Magnitude of impact is defined in terms of the amount of change from the baseline, on a five point scale of 'Major', 'Moderate', 'Minor', 'Negligible' or 'No Change', defined according to a typical generic set of criteria set out in Table 2.2 of HA 205/08. Again, assessments will be made on the basis of professional judgement.

5.7.5. Significance of impacts is defined in five categories ('very large', 'large', 'moderate', 'slight' or 'neutral'), typical definitions of which are set out in Table 2.3 of HA 205/08. With the addition of the terms 'adverse' or 'beneficial', these categories can be applied as a balanced nine-point scale (neutral; slight adverse; moderate adverse; large adverse; very large adverse; slight beneficial; moderate beneficial, large beneficial and very large beneficial).

5.7.6. The significance of any particular impact can typically be calculated through the use of a matrix, with the sensitivity of the affected receptor on one axis and the magnitude of the impact on the other axis. A typical matrix for this purpose is presented below in Table 5.1, conforming to the matrix presented as Table 2.4 in HA 205/08.

Table 5.1 Typical matrix for the assessment of Significance of Impacts

Value/ Sensitivity	Magnitude of impact				
	No change	**Negligible**	**Minor**	**Moderate**	**Major**
Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Large or Very Large
High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
Medium	Neutral	Neutral or Slight	Slight	Slight or Moderate	Moderate or Large
Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

5.7.7. Matrices for individual topics may be different, where the scales or terminology specified in the guidance for the definition of sensitivity, magnitude or significance are different. In some cases, the significance of impact calculated using a matrix may be adjusted to take account of other qualitative criteria. Wherever this is done, a reasoned justification for the alteration will be made.

5.7.8. Notwithstanding the above, certain topics do not use a matrix-based approach, including noise, air quality and aspects of water quality and flood risk, because they are more amenable to the calculation of impacts in terms of numerical values, (i.e. absolute noise levels, and the amount of change in noise levels caused by the scheme). Some other topics have no agreed methods of assessment or scales of measurement for either the value/sensitivity of the receptor or the magnitude of impact. For these topics, assessment will be based on the professional judgement of the assessor, taking into account any relevant considerations that are identified. Topics falling into this category include Materials, Geology and Soils, Community and Private Assets and Effects on All Travellers.

5.8. MITIGATION MEASURES, ENHANCEMENTS AND 'RESIDUAL IMPACTS

5.8.1. Where there would be adverse environmental effects, mitigation measures would be proposed. The purpose of any mitigation measure is to eliminate the impact or, where this is not possible, to reduce its significance.

5.8.2. Priority shall be given to the avoidance of impacts at source, whether through the re-design of the project or by regulating the timing or location of activities. If it is not possible to avoid significant negative impacts, opportunities shall be sought to reduce the impacts, ideally to the point that they are no longer significant. If this is not possible, but the scheme is permitted, compensation may be appropriate. This shall be designed to meet specific environmental objectives that would deliver meaningful compensation for the negative impacts that are predicted.

5.8.3. The first option in mitigating any impact is therefore to seek design measures that would enable the impact to be avoided, or at least reduced – for instance, through changes to the horizontal or vertical alignment of the scheme (locating the development away from key features of interest) or in the methods or timing of works (e.g. timing the works to avoid sensitive periods) and/or materials to be used in construction. Where such measures are not possible, or only partly effective, further measures are required, and such measures fall into three broad categories:

- Mitigation in the strict sense – i.e. measures taken to avoid or reduce negative impacts. Measures may include: locating the development and its working areas and access routes away from areas of high environmental sensitivity, fencing off sensitive areas during the construction period, or timing works to avoid sensitive periods.

- Compensation – the use of replacement areas to make up for the loss of, or permanent damage to resources. Any replacement area should be similar to or, with appropriate management, have the ability to reproduce the functions and conditions of those resources that have been lost or damaged.

- Offsetting – the provision of a beneficial effect that is related to the impact, but is not a like-for-like replacement of the feature to be lost. A typical example would be an archaeological excavation, which provides detailed

archaeological records of the archaeological remains to offset the loss of the remains themselves.

5.8.4. In some cases, it may be necessary to apply a combination of two or more of these approaches. Where appropriate, the measures or combinations of measures to be used in mitigation will be determined in consultation with statutory consultees and/or other third parties.

5.8.5. Impacts that would still occur after the mitigation measures are taken into account are referred to as 'residual' impacts. The assessments of the significance of impact to be set out in the ES shall take into account all mitigation measures that have been committed to and are deliverable, and shall therefore represent the residual impacts. Wherever there is doubt about the deliverability of a particular mitigation measure that is desirable, this uncertainty shall be identified in the ES and that mitigation measure shall not be taken into account in calculating the residual impact.

5.8.6. Some measures that are designed to mitigate an adverse impact may leave the environment improved over even its existing state. In these cases, the residual impact recorded would be beneficial. However, there may also be opportunities to provide measures that would enhance the environment without being targeted at a specific adverse impact. Where such enhancement measures are committed and deliverable, they would be identified as beneficial impacts in their own right.

6. AIR QUALITY

6.1. INTRODUCTION

6.1.1. The 'air quality' topic encompasses three sub-topics:

- local air quality, which is concerned principally with emissions of pollutants that are of concern in relation to human health and ecosystems, at a local level; and
- regional air quality, which is concerned with total emissions of pollutants that can disperse over longer distances, affecting both human health and ecosystems;
- climate change, which is concerned with the emissions of greenhouse gases that can contribute to changes in the climate at a global level.

6.2. STUDY AREA

6.2.1. The A63 Castle Street is located within Hull city centre, north of the River Humber. It forms part of the main west to east through route linking the M62 motorway and Humber Bridge to the west, with Hull docks to the east. The study area lies within an Air Quality Management Area (AQMA) which was designated due to exceedences of the annual mean objective for NO_2 in 2005. The Mytongate junction lies approximately at the centre of the Hull AQMA No. 1 (A).

6.2.2. To the west of the study area the Humber Estuary lies within approximately 200m of the A63 Clive Sullivan Way; The Estuary is designated for its nationally important habitats, which include coastal saltmarsh, intertidal mudflats and sandflats, saline lagoons and sand dunes. In addition to its Site of Special Scientific Interest (SSSI) status, the Humber Estuary is designated as a Special Protection Area (SPA) and Special Area of Conservation (SAC). It is a Wetland of International Importance and is therefore designated as a RAMSAR site.

6.2.3. The Design Manual for Roads and Bridges, Section 3, Part 7, HA 207/07 (DMRB 207/07) (HA, 2007a) requires an examination of the traffic data to identify roads which are likely to be affected by the proposals, and all residential dwellings and other sensitive receptors (e.g. Designated Sites) to be identified within 200m of affected roads.

6.2.4. Affected roads for the assessment of Local air quality are those that meet any of the following criteria;

- Road Alignment will change by 5m or more; or
- Daily traffic flows will change by 1,000 AADT or more; or
- Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more; or
- Daily average speed will change by 10 km/h or more; or
- Peak hour speed will change by 20 km/hr or more.

6.2.5. Affected roads for the assessment of Regional air quality are those that meet any of the following criteria;

- A change of more than 10% in AADT; or
- A change or more than 10% to the number of HDVs; or
- A change in the daily average speed of more than 20 km/hr.

6.2.6. The roads to be included explicitly within the modelling which will underpin the assessment (see below), and therefore define the study area, will be identified in accordance with these criteria. In addition, consideration will be given to roads where changes in traffic flows do not meet the criteria, but are could affect air quality within the AQMA or on Designated sites.

6.3. EXISTING AND BASELINE KNOWLEDGE

6.3.1. Hull City Council (HCC) declared an AQMA in 2005 as a result of identified exceedences of the annual mean nitrogen dioxide (NO_2) air quality objective (of 40µg/m^3). The AQMA encompasses the A63 trunk road from the junction with Madeley Street to Market Place.

6.3.2. HCC operate an automatic air quality monitoring station within the study area at the Myton Centre. This site is situated in a car park and is approximately 30 metres from the A63 near the Mytongate roundabout.

Table 6.1 HCC Automatic Air Quality Monitoring Station – Myton Centre

	Annual Mean 2010 (μg/m^3)	Annual Mean 2011 (μg/m^3)	Annual Mean 2012 (μg/m^3)
NO_2	**31.3**[(1)]	**31.2**	**33.5**
PM_{10}	**10.2**	**11.6**	**10**

Notes: (1) expressed in the data as 16.4 ppb
Data sourced from www.dataview247.com who manage the station on behalf of HCC

6.3.3. HCC also manage a network of diffusion tubes around the city, which provide additional data on ambient NO_2 concentrations around the study area. HCC provided the latest data for 2012. Data from diffusion tubes within the study area or along the A63 are presented in Table 6.2. This data shows that concentrations air above the objective at a number of locations in the study area, and have been for several years.

Table 6.2 Bias Adjusted HCC NO_2 Diffusion Tube Results Castle Street

Location	Annual Mean 2010 (μg/m^3)	Annual Mean2011 (μg/m^3)	Annual Mean 2012 (μg/m^3)
Blanket Row Car Park	42	40	41
Humber Dock Street	39	37	40
Castle Street Hotel	60	59	59
Spruce Road	50	48	53
Tadman Street	39	40	42
Hessle Rd	40	44	42
Ice House Road	32	29	31
Myton (Trailer) a	31	36	36
Myton (Trailer) b	36	37	38
Myton (Trailer) c	37	37	37
Daltry St	36	41	43
Earl De Grey	47	52	53
Princes Dock Side	50	52	58
Castle St (Road)	65	65	67
Castle St (Wall)	50	48	52
Lowgate	48	47	51

6.3.4. In a previous assessment of the scheme, carried out by Halcrow (2011), a six month diffusion tube study was commissioned in the study area. This study took place between June and November 2010. The results of this data are presented in Table 6.3

Table 6.3: 2010 Additional Diffusion Tube Monitoring Results

Reference	Period Mean Concentration ($\mu g/m^3$)
CS7a	46.8
CS7b	48.3
CS8	50.1
CS9	63.4
CS10	62.3
CS11	48.8
CS12	46.6
CS12a	48.3
CS12b	44.6
CS13	43.4
CS14	52.0
CS15	34.6
28La	52.2
28Lb	47.5
6La	51.5
6Lb	50.9

6.3.1. The monitoring data illustrates that NO_2 concentrations are consistently above the air quality objective at a number of locations in the study area. Monitoring at some of these locations has been continued by HCC.

6.3.2. As part of this assessment process, a further six months of NO_2 monitoring data using diffusion tubes will be undertaken. This will help to further establish the current pollutant concentrations within the study area.

6.4. VALUE OF THE ENVIRONMENTAL RESOURCES AND RECEPTORS

6.4.1. The Scoping stage of DMRB 207/07 (HA, 2007a) identifies sensitive receptors to include residential dwellings, locations of the young and elderly and other susceptible populations, such as schools and hospitals.

6.4.2. Designated Sites should also be identified where the designated features are sensitive to air pollutants, and where a potential change local air quality is identified. These are summarised in Table 6.4.

Table 6.4 Air quality resources and receptors

Resource/Receptor	Description
Residential properties	Residential properties in the study area
Sensitive community facilities	For example: hospitals, schools
Amenity areas	For example: parks and paths, sport facilities,
Designated Sites	Sensitive vegetation and ecosystems

6.4.3. Based on the above there are a number of receptors within the study area which could be affected by the Scheme. These will be identified in more detail, and presented within the assessment, following confirmation of traffic flows

6.5. POTENTIAL EFFECTS

6.5.1. The proposed scheme has the potential to cause air quality effects during the construction and operation phases. The key pollutants for consideration within the assessment of local air quality effects are:

- nitrogen oxides (NO_x), particularly nitrogen dioxide (NO_2);
- fine particles (particulate matter defined as those less than 10 microns in diameter; PM_{10}); and
- dust (defined as particulate matter in the size range 1-75 microns in diameter).

6.5.2. Impacts during the construction phase which have the potential to affect local air quality include:

- emissions associated with on-site plant and vehicles used in the construction of the scheme;

- emissions associated with construction traffic on the local road network;
- emissions associated with diversions/changes to base traffic flows on the local road network; and
- on-site dust emissions arising from construction activities and vehicle movements. Dust can be mechanically transported (either by wind or re-suspension by vehicles). It can also arise from wind erosion on material stock piles, earth moving etc.

6.5.3. Impacts during the operation phase which have the potential to affect local air quality include:

- changes in emissions associated with changes in traffic flows (including composition and speed) on the local road network; and
- changes in road layout which may bring road traffic emission sources closer to, or farther away from, sensitive receptors, including within AQMAs.

6.5.4. With respect to regional air quality, the scheme could result in changes of emissions of other vehicle related pollutants including carbon monoxide (CO); Tetrahydrocannabinol (THC); NOX and PM10.

6.5.5. The scheme could also affect emissions of greenhouse gases, the most relevant of which is carbon dioxide (CO2).

6.5.6. No assessment is considered necessary for emissions of any pollutants other than those identified above as no significant emission sources of these pollutants are introduced or affected by the scheme and concentrations are expected to be well below air quality objectives within the study area.

6.6. PROPOSED LEVEL AND SCOPE OF ASSESSMENT

Construction Phase

6.6.1. Emissions of construction dust are associated with the movement and handling of minerals and therefore predominantly composed of the larger fraction of this range which does not penetrate far into the respiratory system. Fine particles such as PM_{10} which have a greater potential for health effects normally represent a smaller fraction of emissions. Therefore, the primary air quality issue associated with construction phase dust emissions is loss of amenity and/or nuisance caused by, for example, soiling of buildings, vegetation and washing

and reduced visibility. There is no formally recognised methodology for determining these effects and, as described above, no statutory environmental quality standards for which to compare levels of deposited dust or concentrations in air.

6.6.2. The usefulness of numerical criteria to determine effects from construction dust is limited as the perception of loss of amenity or nuisance is affected by a wide range of factors such as character of the locality and sensitivity of receptors. As a result, assessment methodologies that are based on a qualitative approach are advocated in a range of guidance, including that produced by the Mayor of London, Buildings Research Establishment and Defra. On this basis, a qualitative approach will be adopted for the assessment based on key issues identified in the guidance described above. Key stages in the assessment will be the identification of potential dust raising activities, the locations and types of sensitive receptors in relation to Table 6.4 and resources and any other existing exacerbating or controlling factors such as meteorological conditions and screening. In accordance with mitigation/enhancement and monitoring assessment level within DMRB 207/07, construction dust impacts will be mitigated and reference made to appropriate Best Practicable Means (BPM) which will be incorporated into the scheme Construction Environmental Management Plan (CEMP).

6.6.3. Construction plant and vehicles are a source of the same pollutants as those associated with road traffic. If the potential exists for significant change in traffic flows as a consequence of construction or significantly increased levels of road traffic pollutants caused by traffic congestion or increased traffic flows on diversionary routes during construction, then local air quality effects will be assessed using the methodology set out for the operational phase assessment

Operational Phase

Local Air Quality Assessment

6.6.4. Based on the review of the traffic data to identify significant changes in the road network and the scheme's location within the Hull AQMA, air quality effects for the scheme will be assessed to detailed level using the dispersion model ADMS Roads. ADMS-Roads is a widely used dispersion model in the UK for assessing air quality effects for the purpose of EIA as well as by Local Authorities for their Review and Assessment work.

6.6.5. The model will be used to calculate NO_2, PM_{10} concentrations for road links within the study area for the base case and the worst year in the first 15 years of operation, which for the purpose of this assessment will be the opening year 'with' and 'without' scheme scenario. Subject to the traffic data, an additional future year may also be assessed however as highlighted within DMRB 207/07, the earlier years are more likely to be the worst case due to higher emissions . The model output will be verified and, if necessary, adjusted using local air quality monitoring results. Three years of meteorological data will be used to support the modelling to take account of future variations in conditions.

6.6.6. Key considerations within the assessment will be:

- the relative and absolute changes in concentrations as a result of the scheme;
- whether or not there is an exceedence of relevant air quality objectives; and
- the number of resources and receptors affected.

The air quality dispersion modelling will take account of the best practice guidance provided by the DMRB 207/07, Interim Advice Note (IAN) 170/12 and, the Defra technical guidance for undertaking air quality assessments TG (09).

Regional Air Quality

6.6.7. Calculations will be made of the change in total emissions that will result from the scheme in accordance with the DMRB 207/07 method using the available traffic data for the study area. Emissions with and without the scheme will be compared. For opening year and design year (opening year + 15 years) as well as the base case.

Greenhouse Gases

6.6.8. Calculations will be made of the change in total CO_2 emissions that will result from the scheme in accordance with the DMRB 207/07 method using the available traffic data for the study area. Emissions 'with' and 'without' the scheme will be compared. For opening year and design year (opening year + 15 years) as well as the base case.

Determination of Significant Impacts

6.6.9. Receptors as described within Table 6.4 will be considered as part of the air quality assessment. Evaluation of effects on local air quality within DMRB 207/07 focuses on the prediction of absolute levels of change in the concentrations of relevant pollutants set out in the UK air quality strategy.

6.6.10. In line with the general principles of EIA, it is considered necessary to go beyond the definition of absolute levels of change in order to determine what changes are 'significant'. This assessment will therefore be assessed against adopted significance criteria.

6.6.11. Regarding operational effects, a number of approaches can be used to determine whether the potential air quality effects of a scheme are significant. However, there remains no universally recognised definition of what constitutes 'significance' for air quality effects. Guidance is available from a range of regulatory authorities and advisory bodies on how best to determine and present the significance of effects within an air quality assessment. It is generally considered good practice that, where possible, an assessment should communicate effects both numerically and descriptively.

6.6.12. The HA is currently consulting on a methodology for defining the significance of air quality impacts associated with highway schemes. This document however is under consultation and not currently available for use. Any description of an effect of a development is informed by numerical results. However, an element of professional judgement must also be involved. To ensure that the descriptions of effects used within the assessment are clear, consistent and in accordance with appropriate guidance, a systematic approach to assessing the significance of any impacts will be applied to the assessment based on the principles set out in HA 205/08.

6.6.13. The criteria of the assessment of construction dust will be structured to ensure that conclusions are made based on a clear and logical framework. Key elements taken account of in the evaluation of effects will be:

- classification of dust emission potential for activities to be carried out;
- identification of impact magnitude based on the emission potential and length of time the activities will be carried out; and
- identification of receptor sensitivity based on type and distance from the emission source.

6.6.14. Mitigation strategies for any identified impacts from the construction and operational phases, as identified above, will be provided based on advice from recognised bodies as well as from previous project experience. Any significant effects remaining following consideration of incorporated mitigation will be classed as significant residual effects.

6.7. CONCLUSION

6.7.1. It is initially proposed that the DMRB assessment will be undertaken at the Detailed Assessment Level. This is due to current baseline monitoring highlighting exceedences of the nitrogen dioxide annual mean objective at a number of locations within the study area and that the scheme is likely to influence traffic flows in the area.

7. CULTURAL HERITAGE

7.1. INTRODUCTION

7.1.1. Cultural Heritage is considered to encompass three sub-topics (based on the guidance provided in DMRB;

- Archaeological Remains;
- Historic Buildings; and
- Historic Landscapes.

7.2. STUDY AREA

7.2.1. The previous EAR (PF, 2010a) for the A63 Castle Street scheme included a Detailed Cultural Heritage Assessment (as defined by DMRB volume 11 section 3) (HA, 2007b) of the 'Underground' and 'Overground' scheme options. The study area comprised a 250m wide corridor centred along the proposed new alignment of the A63 Castle Street, which accords with and allows for comparison with earlier studies. This study area was then varied in places to define historic landscapes, taking into account the various Historic Landscape Character Units (HLCU) that lay within it and which would be affected by the scheme proposals. This widened study area has been retained for this scoping report.

7.3. EXISTING AND BASELINE KNOWLEDGE

Information Sources

7.3.1. In line with standard archaeological practice, and the requirements of the Institute of Field Archaeologists (IFA, 1999a) and DMRB Volume 11 (HA, 2007b), a number of sources of information were examined when undertaking the 2009 Detailed Cultural Heritage Assessment. These sources included various national and county archaeological databases, information on Listed Buildings (both national and local designations) and other designated Cultural Heritage assets, details of previous archaeological investigations and research, various printed and manuscript maps, published and unpublished documentary sources, and geological and soil survey data. A number of walkover surveys were also undertaken of the study area, to determine current land use, to note the location, nature, extent and condition of any recorded and unrecorded

archaeological sites and historic buildings, and to assess the potential impact of the proposed scheme options. No Historic Landscape Characterisation project has yet been completed for Hull, and so the determination and assessment of historic landscapes was undertaken using examples of other urban area characterisation studies and the guidance published in DMRB (HA, 2007b).

7.3.2. A number of previous scheme-specific archaeological reports and surveys were also consulted for the 2009 Detailed Cultural Heritage Assessment. These works included a 1994 desk-based assessment by York Archaeological Trust (YAT, 1994a) two separate archaeological and exhumation assessments of the Trinity Burial Ground by York Archaeological Trust (YAT, 1994b) and the Necropolis Company (Necropolis, 1994), and a small-scale archaeological evaluation report by York Archaeological Trust (Brinklow 1994). These reports were summarised in an Environmental Statement produced by Acer Consultants in 1995 (Acer, 1995a).

7.3.3. A further desk-based assessment was produced in 2002 by the Humber Archaeology Partnership, which was updated and revised in June 2004 (Evans, 2004a). This revised report was included in a 2004 Environmental Scoping Study produced by Smeeden Foreman Partnership (SFP, 2004). A final TPI Entry Report was produced in November 2004 by Pell Frischmann (PF, 2004). More recently, an Explosive Ordnance Threat Assessment Report was produced in May 2008 (BACTEC, 2008).

7.3.4. Details of all these reports are contained in the Cultural Heritage section of the EAR (PF, 2010a). No further research has been carried out into the Cultural Heritage assets of the study area since then.

Archaeological Remains

7.3.5. A total of 190 archaeological assets have been identified within the 250m wide study corridor (see 7A). Full details of these sites, including a gazetteer, are contained in the EAR (PF 2010a). The 2009 Detailed Cultural Heritage Assessment also provides an archaeological and historical background, to put the identified sites into context.

7.3.6. There are no Scheduled Monuments (SM) within the study area. The Old Grammar School, on South Church Side, was previously a SM, but this was removed from the schedule on January 1997; it remains a Grade II* Listed Building. The buried remains of the medieval town walls, and their associated

gates, towers and posterns, are also considered to be of schedulable quality, but they have not yet been designated. The majority of the study area, with the exception of the westernmost section (i.e. east from Ferensway / Mytongate / Commercial Road) lies within the 'Area of Archaeological Interest' as defined by the Hull City Plan (see Figure 7A). The 190 archaeological assets range in date from Roman artefacts to post-medieval buildings and other structures. Archaeological excavation has shown that a considerable depth of well preserved archaeological deposits survive immediately below the present ground surface, particularly in the medieval Old Town.

Historic Buildings

7.3.7. A total of 46 historic buildings or structures have been identified within the study corridor (see Figure7A). Full details of these sites, including a gazetteer, are contained in the EAR (PF 2010a).

Listed Buildings

7.3.8. Twenty-two of the identified structures are Listed Buildings. Eighteen of these are listed as Grade II, two are Grade II* buildings (The Old Grammar School - and Minerva Lodge on Dagger Lane), and two are Grade I structures (Holy Trinity Churchand King William III's statue). In addition, there are six Locally Listed Buildings as well as several others which are described as being "unlisted buildings of historic townscape value" in the Old Town Conservation Area Character Appraisals (HCC, 1999) (HCC, 2004b) (HCC, 2005) . The Listed Buildings range in date from the 13th century (Holy Trinity Church) to 19th century dock infrastructure. All these structures are significant entities in their own right, and combine to make an important contribution to the historic character of the city.

Locally Listed Buildings

7.3.9. There are a further six buildings within the study area which appear on HCC's Local Buildings List (revised January 2008) (HCC, 2008a). These are the Whittington and Cat Public House on Commercial Road, the former telephone exchange on Castle Street, Burnett House on Castle Street , two lamp posts in the Trinity Burial Ground, and a post-war warehouse on High Street.

Other Historic Buildings

7.3.10. Several structures are named as being "unlisted buildings of historic townscape value" in the Old Town Conservation Area Character Appraisals (HCC, 1999)

(HCC, 2004b) (HCC, 2005), but they do not appear on the current Local Buildings List. Within the study area, perhaps the most notable are two groups of late 18th-19th century buildings on the north side of Humber Street which, together with other structures on the same street, form one of the most important surviving and unaltered parts of Hull's urban landscape.

Old Town Conservation Area

7.3.11. The central and eastern part of the study area falls within the Old Town Conservation Area, which was initially designated in 1973 and then extended in 1981, 1986 and 1994. The Conservation Area is divided into three parts; the Southern, the Central & Eastern, and the Western & Northern parts. The Southern part lies on the south side of the A63 Castle Street and extends between Commercial Road and the River Hull, and incorporates the Trinity Burial Ground, the Railway and Humber Docks, and Queen Street, Humber Street and Nelson Street. The other two parts lie on the north side of the A63, the division between the two roughly parallel to and just to the west of Market Place and Lowgate. The west side of the Western and Northern part coincides with the edge of Prince's Quay, while the Central and Eastern part encompasses Market Place and High Street. Conservation Area Character Appraisals have been produced for all three parts of the Old Town Conservation Area. Details of those elements which combine to make up the character of the Conservation Area are outlined in the EAR (PF 2010a).

Historic Landscapes

7.3.12. A total of 24 Historic Landscape Character Units (HLCUs) have been identified within the slightly widened study corridor (see Figure 7B). Full details of these units, including a gazetteer, are contained in the EAR (PF 2010a). These units are mostly commercial or residential in origin, and their predominate dates range from the late 18th to the 20th century. Many units exhibit considerable coherence and time-depth, especially in the Old Town, although others are characterised by single period landscapes. Despite subsequent development, many HLCUs still contain some historic elements. The Trinity Burial Ground is a particularly well preserved HLCU, with numerous late 18th-early 19th century historic elements surviving.

7.3.13. There are no Historic Battlefields, Registered Parks and Gardens or areas of National Trust inalienable land within or immediately adjacent to the study area.

The nearest National Trust property is Maister House, located at 160 High Street.

Policies and Plans

7.3.14. The 2009 Detailed Cultural Heritage Assessment (PF, 2010a) contained a section on relevant policies and plans. In terms of the national legislation and guidance, the Highways Act 1980, the Ancient Monuments and Archaeological Areas Act 1979, the Planning (Listed Buildings and Conservation Areas) Act 1990, Planning Policy Guidance Note 16: Archaeology and Planning 1990 (PPG 16), Planning Policy Guidance Note 15: Planning and the Historic Environment 1994 (PPG 15), and Planning Policy Guidance Note 20: Coastal Planning 1992 (PPG 20) were considered. PPGs 15 and 16 were superseded by Planning Policy Statement 5: Planning for the Historic Environment, published on March 2010. This has subsequently been replaced by the National Planning Policy Framework (Department for Communities and Local Government, March 2011) The two available Regional Spatial Strategies were also considered, namely the Yorkshire and Humber Plan Regional Spatial Strategy to 2026 (published May 2008) and the Joint Structure Plan for Kingston Upon Hull and the East Riding of Yorkshire (adopted June 2005). Both these strategy documents contain policies relating to the protection and enhancement of the archaeological heritage and built and historic assets.

7.3.15. There are also some local plans and policy documents relevant to the protection, preservation and enhancement of archaeological sites, Listed Buildings and Conservation Areas. These documents include the Hull City Plan (adopted May 2000) and the Hull City Centre Action Area Plan (CCAAP) (February 2009, withdrawn July 2010). The Hull City Plan is important as it designates an Area of Archaeological Interest (AAI) under Policy BE31 within which important archaeological sites and their settings would normally be preserved; approximately the whole of the eastern two thirds of the current study area fall within the AAI (see Figure 7A). The Hull CCAAP provides a new policy framework to encourage and guide continued city centre regeneration up to 2016, and it defines five Strategic Development Areas (SDAs). For those SDAs which lie within the AAI, development proposals would need to include an acceptable plan for investigating archaeological sites and for removing or protecting in situ important archaeological remains. This plan also contains a specific policy dealing with the protection of locally listed buildings.

7.3.16. HCC have also prepared a number of Supplementary Planning Guidance Notes which aim to provide further information and details on some of the policies contained in the City Plan. These include Guidance Note 13 (Archaeology) (HCC, 2003) and Guidance Note 27 (Heritage and Development Management at Garrison Side, Hull) (HCC, 2004a).

Archaeological Research Frameworks

7.3.17. Work has been undertaken on the Intensive Urban Survey programme for Hull, while the Yorkshire Archaeological Research Framework Forum (YARFF) has produced an interim report. Information from both these sources will be reviewed. No period or topic research strategies have, as yet, been produced for Hull or East Yorkshire. It was not, therefore, possible to determine detailed research frameworks for the city, or to assess the current proposals in the light of any such frameworks.

7.4. VALUE OF THE ENVIRONMENTAL RESOURCES AND RECEPTORS

7.4.1. Using the data gathered at the time of the 2009 Detailed Cultural Heritage Assessment (PF, 2010a), and in accordance with the methodology outlined in DMRB Volume 11 (HA, 2007b), an initial assessment of the value of each cultural heritage asset identified within the study area can be made as follows:

Table 7.1: Value of Cultural Heritage Assets

Sub-topic	Assessment of Value					
	Very High	High	Medium	Low	Negligible	Unknown
Archaeological Remains (190 assets)	0	6	22	73	87	2
Historic Buildings (46 assets)	0	4	23	16	2	0
HLCU (24 assets)	0	5	5	4	10	0

Archaeological Remains

7.4.2. The study area contains six archaeological assets considered to be of High value. These are the three sections of the medieval town defences, the remains of the Myton Gate, the remains of the Augustinian Friary near Market Place , and the former course of Mytongate and its adjacent street frontage tenements . By definition, all of these remains lie below the present ground surface (in some

cases only c.0.3m below), and the results of previous excavations have suggested that the remains are of schedulable quality and importance, that could survive in good or very good condition and which will contribute significantly to acknowledged national research objectives.

7.4.3. There are also considered to be 22 assets of Medium value, 73 assets of Low value, 87 assets of Negligible value and two assets of Unknown value. The Medium value assets are characterised as designated or undesignated assets that contribute to regional research objectives. These include the Trinity Burial Ground, the site of an 18th century gaol, the potential remains of the Civil War defences, the sites of other medieval defensive structures, several former medieval/early post-medieval hospitals and civic buildings, and other important post-medieval places of entertainment and inns. Also included in this category are areas where previous archaeological assessment and evaluation has shown there to be surviving important medieval and later buried remains either on the site or in the immediate vicinity.

7.4.4. Many of the numerous Low value assets are post-medieval buildings and other structures which have since been demolished. It is assumed that at least some remains will survive below ground, and that these remains will have some potential to contribute towards regional and local research objectives. There are also many Negligible value assets, where the asset is considered to have only limited importance, or where it is assumed that all remains will have already been substantially destroyed or disturbed, for example by redevelopment or through previous archaeological investigation. It should be noted that these value grades may well change (either up or down) as more data is collected, particularly if archaeological fieldwork is carried out as part of scheme development (as recommended by DMRB volume 11, section 3 (HA, 2007b)).

Historic Buildings

7.4.5. The study area contains four High value assets. These are the Old Grammar School (Listed Grade II*), Holy Trinity Church (Grade I), no. 7 Dagger Lane (Grade II*) and King William III's statue (Grade I). Of these, no. 7 Dagger Lane (Minerva Lodge) is probably the least recognised and appreciated by the general public, as the external elevations of this meeting house were rebuilt in 1978 and only a commemorative stone now records the fact that the building originates to the late 17th century; it is the interior that retains much of the original arrangements and Masonic devices. The other three High value assets are all

very prominent and highly visible structures located in high use pedestrian areas where they can be appreciated. However, the setting of King William III's equine statue does leave room for improvement and enhancement.

7.4.6. There are also considered to be 23 Medium value assets, 18 Low value assets and two Negligible assets. The Medium value assets are all characterised as being either Grade II Listed Buildings (18 assets), or are unlisted structures which have exceptional qualities in their fabric or historical associations (five assets). The latter comprise the two ranges of buildings in Humber Street (nos 14 to 23 and nos 24 to 29) which lie within the study area, the recently restored Burnett House on Castle Street, and the two assets which combine to form the King William Hotel on Market Place. The range of the Grade II Listed Buildings in the rest of the study area include two public houses , four docks , several warehouses and offices , a school , a statue and other street furniture , toilets and various town houses. The majority of these buildings and structures date to the 19th century, although there are some earlier 18th century items, and all make an important contribution to the historic character of the city. As noted above, the settings and appreciation of some of these buildings could be improved.

7.4.7. The Old Town Conservation Area covers c.54 hectares and contains 159 Listed Buildings in total, comprising five at Grade I, eleven at Grade II*, and 143 at Grade II. The predominance of Grade II Buildings over Grade I and II* listings has resulted in the Conservation Area being graded of Medium importance, i.e. one that contains buildings that contribute significantly to its historic character, rather than of any higher grade. The combination and juxtaposition of the listed and unlisted buildings along South Church Side epitomise the character and architecture of the city as a whole. These structures range in date and function from the medieval Holy Trinity church, the 16th century former Grammar School, several 19th century former warehouses now converted to offices and shops, and more modern commercial buildings which broadly blend in with the historic character.

Historic Landscapes

7.4.8. Of the 24 identified HLCUs, five are considered to be of High value, namely Australia Houses, the Trinity Burial Ground, the Humber and Railway Docks, the Trinity House complex, and the area of Trinity Square, Holy Trinity Church and Market Place These units are all either undesignated landscapes of importance,

high quality and interest, and/or well preserved historic landscapes which exhibit considerable coherence and time-depth. Australia Houses is a good example of the former, a well-planned and designed complex of urban housing built within a short timeframe (the 1930-40s) in response to a specific social need. The buildings and their attendant designed landscape are virtually intact, and they represent an important and self-contained unit which deserves better recognition, protection and appreciation. The Humber and Railway Docks unit is a high quality example which serves to remind people and visitors of the town's maritime origins and heritage, and it is a well understood, used and appreciated unit. The Trinity Square, Holy Trinity Church and Market Place unit also displays considerable evolution and time-depth, with buildings and historic elements ranging in date from the 12th-13th century church right through to the street furniture of 1999. While this street furniture might appear heavy and over-designed, the unit forms a coherent whole which is well used and appreciated by the local population.

7.4.9. Of the remaining HLCUs, five are considered to be of Medium value, five are of Low value, and nine are of Negligible value. The Medium value units are English Town, the Prince's Dock area, Prince Street and Posterngate, the High Street and staiths, and the Fruit Market area .English Town still retains its early 19th century feel and character and, although it contains numerous modern industrial works, these remain small scale and broadly compatible with the historic street pattern and other historic elements which survive. All of these other Medium value units contain averagely well-preserved historic landscapes with reasonable coherence and time-depth, with many historic elements surviving (e.g. street alignments, buildings, property boundaries and infrastructure). However, the value of the Prince's Dock unit is diminished due to the presence of the out-of-scale and inappropriate nature of the Prince's Quay shopping centre within the historic dock.

7.4.10. The five Low Value units comprise Lister Street and English Street, the mixed urban housing developments on the north side of the A63, the Quay West development site, Lisle Court, Trinity Court and Grammar School Yard, and the Central dry dock area. In all cases, some historic elements survive, for example street alignments and property boundaries, but much has otherwise been lost. The mixed urban housing developments can be divided into several mid-late 20th century phases, and they all replaced the dense 19th century slums which previously occupied the area. The Central dry dock area lies in an important

riverfront location, and the surviving historic elements provide some visual and historic interest, although there is generally a depressed and melancholy air; as with the Quay West development area, this area is awaiting re-development.

7.4.11. The nine Negligible value units comprise the A63 road corridor, Kingston Retail Park, the Myton Street retail park, the Holiday Inn complex, the Hull Marina boat yard, the Kingston Wharf and Wellington Street housing developments, the Magistrates Courts and King William House development, the Marina Court development, and the Oldgate development area. These are all modern landscapes which contain virtually no surviving historic elements, other than a few earlier street alignments, and which have little respect for the heritage and history which they have replaced.

7.5. POTENTIAL EFFECTS

7.5.1. The 2009 Detailed Cultural Heritage assessment (PF, 2010a) considered two scheme options, the 'Underground' and 'Overground' options. This Scoping report only considers the Preferred Route scheme, the 'Underground' option.

Magnitude of Impact

7.5.2. Direct and permanent impacts may arise from construction include impacts arising from the extent of site clearance works, depths of excavations for the road sub-base or structures, the position and placement of pedestrian bridge supports, the scope and alignments of drainage and other service works (including any necessary balancing ponds), any statutory undertakers diversions, any changes in traffic volume, noise, vibration or pollution, any changes to lighting levels, and/or landscape enhancement works. Temporary and/or secondary impacts may arise from, for example, the locations of contractor's compounds and material storage areas, spoil dispersal, traffic diversions, and changes in the water table.

7.5.3. Of particular importance in determining the direct impacts on the identified Archaeological Remains will be the depths of excavation required for new foundations and sub-bases of the new carriageways and road structures, even when at grade. Given the relatively shallow depths of below ground archaeological deposits in most parts of the scheme footprint (estimated and known to be about 0.3m below existing ground levels), the worst case scenario, i.e. the removal of all affected archaeological deposits, should be assumed. In addition, further research or archaeological investigation of individual sites (e.g.

the 18th century gaol at Mytongate), or within the scheme corridor as a whole, will provide additional information on the scale, extent and importance of the underlying archaeological deposits. It is therefore probable that the impacts of the 'Underground' scheme option may change (either up or down), as further data on each identified site is collected or as the design progresses.

7.5.4. With the exception of the Trinity Burial Ground, the affected Archaeological Remains all lie below ground. Assessed impacts are therefore based on the assumed extent of the sites, established from a combination of map evidence, previous investigations, other historical sources and professional judgement, and there are no visual effects to consider. Conversely (and by definition), the affected Historic Buildings exist above ground, and so their physical sites and areas are easier to define and identify. The visual impacts on these assets and their settings can be considered and assessed, utilising the data gathered for the Townscape and HLCU assessment coupled with professional judgement, and informed decisions should be made on other aspects such as approach and context. As noted above, the magnitude of many of the direct and indirect impacts cannot yet be determined, perhaps most crucially any changes in the below ground water table for the buried Archaeological Remains and the effects arising from increased traffic noise, vibration and pollution on the Historic Buildings.

7.5.5. Based on the extent of current knowledge, the 2009 Detailed Cultural Heritage Assessment (PF, 2010a) summarised the magnitude of impacts for the 'Underground' option as follows. It should be noted that one of the assets is covered by two sub-topics (the Trinity Burial Ground) and so it is only considered once, as an HLCU, to avoid double counting.

Table 7.2: Summary of Scheme Impacts

		Underground
Total no of affected assets (i.e. Archaeological Remains, Historic Buildings and HLCUs)		73
Values of assets	High	9
	Medium	15
	Low	31
	Negligible	18
Magnitude of impacts	Major negative	23
	Moderate negative	13
	Minor negative	28
	Negligible negative	8
	No change	1
	Negligible positive	0
	Minor positive	0
	Moderate positive	0
	Major positive	0

7.5.6. One of the greatest impacts would be on the Trinity Burial Ground, where the underpass and associated infrastructure would cut through the northern half of the site. A previous assessment suggested that between 2,500 and 11,000 human burials might be affected by the scheme, and there would be impacts on large numbers of historic elements such as lamp columns, sections of boundary walls and many of the gravestones and tombs. The historic integrity of the burial ground, which has survived previous road improvement schemes, would be lost as a result of the scheme, meaning that the existing understanding and appreciation of the HLCU will be severely comprised. There will also be a major adverse impact of the setting of the surviving parts of this unit.

7.5.7. There would also be major negative impacts on 19 other archaeological sites, including the 18th century gaol , the sites of the former Salem Chapel , another former chapel and Lutheran churches, several former timber yards, saw mills and warehouses and a former brass and copper works. In terms of the Built Heritage, two Large adverse impacts arise from the requirement to demolish two Grade II Listed Buildings, the Castle Street Chambers and the Earl de Grey public house. Another Slight adverse impact on a Grade II Listed Building

occurs at the north end of the Humber Dock, where the dock wall will need to be rebuilt to the south of its original position. The majority of the HLCUs would suffer only minor or negligible impacts, apart from the Trinity Burial Ground mentioned above.

7.5.8. The scale of impacts within the Old Town was generally considered to be Slight adverse, as most of the proposed works will be at grade. However, it should be noted that the final significance of effects will be determined by the depth of the new construction. This is especially important at Myton Gate, where the existing carriageway lies directly on top of the archaeological remains and so any excavation here is likely to have an impact on the uppermost parts of the structure, potentially resulting in a Large adverse impact. The impacts on the adjacent Civil War earthworks, and those parts of the medieval town walls either side of the Myton Gate, were considered to be Moderate adverse because only a relatively small section of each site would be affected. Further to the east, there will be a combination of impacts on the former lock linking the Prince's and Humber Docks, and there will also be significant, but localised, impacts around the site of the new Market Place footbridge.

7.5.9. The 'Underground' option was considered to have a Large Adverse overall cultural heritage effect. However, this might be reduced to Moderate Adverse if the demolition of two Listed Buildings (Castle Street Chambers and the Earl de Grey Public House) could be avoided, and if the disturbance to other High value sites could be kept to a minimum.

Archaeological Potential

7.5.10. The archaeological potential of the proposed A63 Castle Street improvement scheme has previously been highlighted by a number of the earlier desk-top surveys. The 2009 Detailed Cultural Heritage Assessment (PF, 2010a), which was based on additional research, the results from more recent archaeological excavations and a re-interpretation of some of the earlier findings, suggested that some of the previous conclusions were slightly downplayed, and that the archaeological implications of the scheme will be significant. This assessment considered the archaeological potential of the study area to the west of the Old Town to be 'Medium', while the 'Underground' option itself was considered to have a Medium archaeological potential.

7.6. PROPOSED LEVEL AND SCOPE OF ASSESSMENT

7.6.1. It is clear from Section 7.5 above that the proposed scheme has the potential to have a significant effect on the Cultural Heritage resource. In accordance with DMRB Volume 11 Section 3 (HA, 2007b), this level of impact will require the completion of a 'Detailed' Cultural Heritage assessment.

7.6.2. Consultation with EH and the HAP was carried out after the preparation of an earlier Cultural Heritage Assessment. There was no consideration of any national, regional and local research frameworks or research priorities (which would help to inform proposed mitigation strategies), insufficient attention was paid to the visual impacts and the settings of the historic buildings/Conservation Area, and there was no discussion of Historic Landscapes, the third Cultural Heritage sub-topic. The HAP also provided detailed comments arising from their local knowledge and up-to-date information, and they were concerned that more detail and weight should be given to the medieval tenements along Castle Street. In general, the HAP was more concerned about the impacts to the buried archaeological remains rather than the built heritage. The 2009 Detailed Cultural Heritage Assessment (PF, 2010a) addressed all these concerns.

7.6.3. EH were particularly concerned about the potential demolition of the Listed Buildings, and thought there was insufficient justification for this demolition. They also requested a greater consideration of the impacts on the Old Town Conservation Area. EH were most concerned about the impacts on the Listed built heritage, which meant they could not support any scheme option, but made no comment on the scale of the archaeological impacts.

7.6.4. Despite significant revisions in the light of the above comments, particularly in the identification of the HLCUs, the existing 2009 Detailed Cultural Heritage Assessment report (PF, 2010a) is deficient in a number of areas, particularly relating to archaeological and historic building fieldwork. DMRB volume 11 (HA, 2007b) makes it clear that any Detailed Cultural Heritage Assessment should include the results of non-intrusive and intrusive survey. For the A63 Castle Street scheme, this should include a detailed topographical/archaeological survey of the Trinity Burial Ground, trial trenching or test pitting over specific buried remains to assess the extent of their survival and condition, and historic building assessment and/or survey of those structures directly affected by the works. The 2009 Detailed Cultural Heritage Assessment (PF, 2010a) contained a series of recommendations for these evaluation works, together with other

research and investigation that was needed to enhance the existing baseline data.

7.6.5. The revised Detailed Cultural Heritage Assessment report will detail the findings of this archaeological and historic building fieldwork, as well as reviewing and updating the 2009 assessment to take account of any new archaeological research or investigations in the study area. It will also consider the impact of relevant sections of the National Planning Policy Framework (2012) and revisit the visual impacts on the historic buildings, Conservation Area and the HLCUs and their settings. Existing, revised or new national policies, regional spatial strategies, and local plans and policies, will also need to be assessed in terms of the proposed scheme. This work, together with the preliminary design work, will allow the impacts of the scheme proposals on the Cultural Heritage resource to be assessed in greater detail.

7.7. PROPOSED METHODOLOGY INCLUDING SIGNIFICANCE

7.7.1. The revised Detailed Cultural Heritage assessment will be carried out in accordance with the guidance published in DMRB Volume 11 (HA, 2007b), for all three Cultural Heritage sub-topics (Archaeological Remains, Historic Buildings and Historic Landscapes).

Assessment Methodology

Assessment of Value

7.7.2. DMRB Volume 11 (HA, 2007b) states that assessment of value should consider how far the particular Cultural Heritage asset will contribute to an understanding of the past, through individual or group qualities, either directly or potentially. This requires a consideration of whether the assets belong to a group or subject of study that is of acknowledged importance, and how far it retains the characteristics that can contribute to an understanding of that group or subject, or whether it offers the potential for such understanding. Although the assessment of value is partly a professional judgement, other factors should be considered, such as regional research frameworks, existing characterisation initiatives, the Secretary of State for Culture, Media and Sport's criteria for scheduling Monuments and listing Buildings of Special Architectural or Historic Interest, and the criteria developed by EH in their Monuments Protection Programme (i.e. period, rarity, documentation, group value, survival/condition, fragility/ vulnerability, diversity and potential).

7.7.3. Guidance given by DMRB (HA, 2007b) suggests that a six tier value grading system can be applied to archaeological remains and historic buildings, while historic landscapes have a five tier system. DMRB details those factors which need to be taken into account when assessing the value of these assets.

Magnitude of Impact

7.7.4. The magnitude of impact is defined as the degree of change that would be experienced by the specific Cultural Heritage asset and its setting if the proposed scheme was to be implemented. This assessment should take into account any mitigation that is proposed as part of the design. Sources of potential impacts, before mitigation, should be identified, but the assessment of their magnitude should include the agreed mitigation.

7.7.5. There are numerous sources of impacts relating to a road scheme, both direct and indirect/secondary, and temporary/permanent/cumulative. These are highlighted in detail in DMRB Volume 11 (HA, 2007b), and guidance is given as to how to assess the magnitude of impact. Any new detailed assessment will need to consider these sources carefully, in the light of the current scheme design.

Significance of Effects

7.7.6. By combining the magnitude of impact of the scheme proposals and the value of each affected asset, an assessment can then be made of the significance of the effects (i.e. the overall effect) on each identified cultural heritage asset. Following the advice in DMRB, these significances can be defined as being Very Large, Large, Moderate, Slight or Neutral. It should be noted that these significances can be adverse or beneficial, and that the agreed mitigation should be incorporated into the equation.

Overall Cultural Heritage Effect

7.7.7. It is also necessary to produce an overview of the significance of effect on the combined Cultural Heritage resource (i.e. the three sub-topics of Archaeological Remains, Historic Buildings and Historic Landscapes) for any proposed scheme as a whole. For an individual cultural heritage asset, there may be differing degrees of effect according to each sub-topic. In these cases, the highest reading is taken as the significance of effect for that asset, and it is important that it is not ‘double counted’.

7.7.8. If all the effects on all assets are adverse, the highest Significance of Effect value would normally be taken to be the overall cultural heritage effect, although professional judgement should be used to ensure that this does not distort the assessment. Conversely, a scheme with wholly beneficial effects would not necessary be assessed at the highest beneficial value, in case this also distorts the assessment. A scheme normally has a combination of both adverse and beneficial effects, and it is important to ensure that this is brought out in the assessment and recorded separately; they do not cancel each other out.

Mitigation

7.7.9. Mitigation aims to avoid, lessen or repair adverse impacts on the cultural heritage resource resulting from a scheme, and there is a presumption in favour of 'preservation in-situ'. Only for significant remains that cannot be avoided would the option of 'preservation by record' (i.e. archaeological investigation or other recording) be adopted, and in these instances the mitigation would also include the analysis, interpretation and appropriate dissemination of the results of the investigations. The increase in knowledge gained through such recording is not normally counted as a benefit, although it should be offset against the loss of information that would otherwise occur if the site was to be damaged or destroyed without recording.

7.7.10. Once the presence and value of the cultural heritage assets have been established, or the potential for them, the mitigation of any potential impacts is an iterative process, and mitigation measures should be considered at all stages of the scheme design.

7.7.11. Possible mitigation measures for Archaeological Remains were described in the previous DMRB Volume 11 as locating the route away from archaeological remains and their settings, designing the scheme's vertical alignment and associated earthworks so that archaeological remains are not disturbed, providing for the excavation and recording of remains before the start of earthmoving, and provide for an archaeologist to be 'on call' so that any finds during construction can be recorded. In practice, a combination of these measures is often used. In addition, opportunities may exist or be found to improve the setting of archaeological remains, and for enhancing the access and amenity values of specific sites or features.

7.7.12. Possible mitigation measures for Historic Buildings were described in the previous DMRB Volume 11 as locating the route away from historic buildings or

sites (the demolition of these features should be avoided wherever possible), keeping a route low within the natural topography to exploit any natural screening and enhance this by the use of cuttings and, in exceptional circumstances, tunnels (these measures will also help to reduce noise and vibration), and using other landscaping techniques to integrate a scheme into its setting. Once again, a combination of these measures is often used. Additional measures to mitigate against partial or complete demolition can include moving or rebuilding the structure, to ensure either appropriate reuse or for a museum exhibit, or the partial recovery of some of the historic fabric for museum display. Possibilities may also exist or be found to improve the setting of an historic building, and for enhancing the access and amenity values of specific sites or features.

7.7.13. For Historic Landscapes, mitigation measures can include conservation, preservation, restoration, renovation, reconstruction, replication, rebuilding and alteration, as well as demolition or destruction. Mitigation strategies may involve any of these approaches, or a combination of them.

7.7.14. The revised Detailed Cultural Heritage assessment will need to consider a range of potential mitigation measures to offset the impacts of the scheme (in as far as the impacts can be predicted), and will make a series of recommendations. It is envisaged that the mitigation measures will involve up to five separate phases of work, the results of each phase influencing and setting the parameters for the next. In general terms, Phases 1 and 2 deal with the assessment and pre-construction works, Phase 3 deals with the recording of archaeological deposits while construction is in progress, and Phases 4 and 5 deal with the assimilation, publication and deposition of any results resulting from the previous phases.

7.7.15. All recommended mitigation works will follow existing national and regional guidelines, and all proposals and methodologies will be discussed with English Heritage, and the relevant County Archaeologists and Local Authority Conservation Officers (as appropriate) prior to their detailed design and implementation.

7.8. CONCLUSION

7.8.1. It is proposed that the DMRB assessment of Cultural Heritage issues - Archaeology, Historic Buildings and Historic Townscape - will all be undertaken at the Detailed Assessment level. This is because further detailed information is

necessary to inform options appraisal and to enable the development of appropriate mitigation strategies in respect of all three areas of Cultural Heritage.

8. LANDSCAPE

8.1. INTRODUCTION

8.1.1. The landscape takes its character from a combination of elements (topography, watercourses land use and pattern, land cover/vegetation, public open space and cultural heritage influences). Landscapes vary considerably in character and quality, and are a key component of the distinctiveness of any local area. The same principles apply within built-up areas. Within this assessment, therefore, no distinction has been made between the concepts of the 'landscape' and the 'townscape', which is taken to mean a landscape dominated by the built environment. The assessment of impacts on landscape therefore addresses changes in any of these components both in the countryside and in built-up areas.

8.1.2. To a large extent, human beings experience the landscape and townscape visually. The quality of views available in any given area can influence the quality of life. Visual Impact Assessment (VIA) therefore forms a key element of the landscape assessment. VIA addresses potential changes in the quality of existing views, taking into account the extent to which the scheme would be visible from surrounding houses, farms, footpaths and bridleways, open spaces and offices.

8.2. STUDY AREA

8.2.1. For the Detailed Assessment of landscape and visual effects, the study area will be centred along the line of the A63 dual carriageway with a 500m offset zone (as seen at the previous stage). In addition to this, the visual assessment will also consider receptors outside of the study area that could potentially experience significant visual effects from a greater distance, i.e. upper floor windows from distant properties. The study area is shown on Figure 8A.

8.2.2. A feature of the existing road is the large, 'at grade' Mytongate Junction which links the A63 to Ferensway (and the city centre to the north), and to the retail and dock areas to the south. The through flow of traffic along Castle Street and interconnecting roads is restricted due to the traffic lights on the Mytongate Junction. Historically the area developed due to its close proximity with the confluence of the River Hull and River Humber, with its built form heavily influenced by the historic dock related commerce (fishing, trading, and distribution).

8.3. EXISTING AND BASELINE KNOWLEDGE

8.3.1. The EAR (PF, 2010a) included a DMRB 'Simple Assessment' of two options; the 'Underground' and 'Overground' options. It was noted that at the time of the previous assessment updated DMRB guidance for landscape and visual assessment had still to be published by the HA. The methodology section, produced in consultation with HA, outlined the approach taken during the interim period.

8.3.2. Consultation with the HA during the previous assessment confirmed that due to the entirely urban nature of the scheme corridor, all reference to landscape should be removed from the text, and the process referred to as a townscape assessment. From this point on the landscape assessment was referred to as townscape assessment.

8.3.3. The study area is typical of an urban area, but with the particular characteristics of a river front location containing a historic core and docks. The assessed section of A63 travels within a section of the Old Town Conservation Area (as designated by HCC). This area contains buildings of historic and townscape merit and many of these either adjoin the road corridor or are found within the study area. The boundary of the Old Town Conservation Area borders Commercial Road and Trinity Burial Ground in the west, Nelson Street riverfront to the south, Central Dry Dock and the River Hull to the east and the historic core of the city centre and Trinity Church to the north.

8.3.4. The Conservation Area appraisal, that formed part of the previous assessment, defined the qualities for noting the Old Town as an 'area of special architectural or historic interest'. The appraisal formed the basis for the formulation of proposals for the preservation or appearance of the area. The single most significant feature of the Old Town Conservation Area is the largely intact medieval street pattern. Within the locality Castle Street is the exception to this pattern; although it broadly follows the alignment of the former Mytongate. The appraisal highlighted the listed buildings, structures, and townscape features; some of which have the potential to be affected by the scheme proposals.

8.3.5. Vegetation cover is limited along the A63 Castle Street corridor and within the study area due to the urban nature of the city centre. Small blocks of trees are found beside the road, but the main areas of vegetation are found in two pocket parks and, most significantly, in Trinity Burial Ground. This is the largest area of

public open green space within the study area, and the southern half of the city centre. The area contains a large number of mature trees surrounded by attractive brick walls which enclose the green space.

8.3.6. The previous assessment divided the study area into 23 distinctive townscape character areas, shown on Figure 8B. Each individual character area was described in detail and then judgements made on the townscape quality and sensitivity of each character area. The magnitude of impact that the options would have on the townscape character areas was then assessed. This enabled the overall impact significance of townscape for each option to be determined.

Townscape Character Areas

8.3.7. The townscape quality and the sensitivity of the townscape character areas were assessed with reference to the methodology outlined in the previous Simple Assessment stage. The findings are shown in the following tables and these will be reassessed at the Detailed Stage.

Townscape Quality

8.3.8. Within the study area there are; two areas of high townscape quality, four areas of very attractive quality, nine areas of good quality, eleven areas of ordinary quality and one area of poor townscape quality.

Table 8.1: Summary of Townscape Quality

Townscape Quality	Townscape Character Areas
High Quality	16 – Prince Street and Posterngate 17 – Holy Trinity Church
Very Attractive	8 – Humber and Railway Dock 9 – Trinity Burial Ground 14 – Nelson Street riverfront 23 – Central Dry Dock/The Deep
Good	1C, 1D – A63 Castle Street 7 – Princes Quay Shopping Centre 10 – Railway Dock surrounding areas 11 – marina small scale urban housing 13 – Island Wharf riverfront redevelopment 15 – Castle Street small scale urban housing 20 – Marina Court 22 – Central Fruit Market
Ordinary	1A, 1B, 1E – A63 Castle Street 3 – Large scale leisure and retail 4 – Large scale urban housing with pocket parks

Townscape Quality	Townscape Character Areas
	5 – Mixed scale urban housing 6 – Quay West development site 12 – Hull marina boat yard 18 – Market Place east 19 – River Hull wharf frontages 21 – Oldgates development area
Poor	2 – Light industrial and commercial

Townscape Sensitivity

8.3.9. Following the assessment of townscape quality and in accordance with the guidelines set out in the methodology used within the EAR (PF, 2010a); four areas of very high townscape sensitivity, three areas of high sensitivity, six areas of medium sensitivity and fourteen areas of low townscape sensitivity.

Table 8.2 Townscape Value (Sensitivity)

Townscape Value (Sensitivity)	Townscape Character Areas
Very High	8 – Humber and Railway Dock 9 – Trinity Burial Ground 16 – Prince Street and Posterngate 17 – Holy Trinity Church
High	7 – Princes Quay Shopping Centre 14 – Nelson Street riverfront 15 – Castle Street small scale urban housing
Medium	4 – Large scale urban housing with pocket parks 10 – Railway Dock surrounding areas 13 – Island Wharf riverfront redevelopment 20 – Marina Court 22 – Central Fruit Market 23 – Central Dry Dock/The Deep
Low	1A, 1B, 1C, 1D, 1E – A63 Castle Street 2 – Light industrial and commercial 3 – Large scale leisure and retail 5 – Mixed scale urban housing 6 – Quay West development site 11 – Marina small scale urban housing 12 – Hull marina boat yard 18 – Market Place east 19 – River Hull wharf frontages 21 – Oldgates development area
Negative	-

Policies

8.3.10. The relevant planning policies applicable to the landscape and visual assessment within the study area are listed in the following section. These will be reviewed during the Detailed Assessment process.

8.3.11. Yorkshire and Humber RSS, May 2008:

- Policy ENV6: Forestry, trees and woodland

8.3.12. Hull City Council Local Plan (City Plan), May 2000, saved policies:

- Policy BE6, Designing Landscape
- Policy BE22, Trees in a Conservation Area
- Policy NE1, Protecting Urban Greenspace (0.25 hectares and above)
- Policy NE3, Replacing Urban Greenspace
- Policy NE18, Protecting Trees and Woodland.
- Policy ME14, Trees, Woodlands and Hedgerows

8.4. VALUE OF THE ENVIRONMENTAL RESOURCES AND RECEPTORS

8.4.1. Environmental resources and receptors of relevance to townscape within the study area include; public open space (both formal and informal), listed buildings, the 'Old Town Conservation Area' and the numerous visual receptors including residential areas.

Public Open Space

8.4.2. The three main areas of public open space within the study area include William Street pocket park, Great Passage Street pocket park and Trinity Burial Ground. The southern boundary of William Street pocket park adjoins the A63 highway verge beyond areas of ornamental planting. This area is used by the residents in the adjacent 'Australia Houses' blocks. The Great Passage Street pocket park fronts the north western edge of Mytongate Junction, and is set back from the highway verge.

8.4.3. Trinity Burial Ground is a valuable public open space in the southern part of the city centre. The mature trees contribute to the townscape setting of the central area whilst helping to screen views to the road from some receptors.

8.4.4. The pedestrian areas around the docks are valuable areas of public open space, and key pedestrian routes between the city centre and the River Humber foreshore.

Listed Buildings

8.4.5. Two prominent listed buildings front the A63 to the east of Mytongate Junction; Castle Buildings and the Earl de Grey public house. Castle Buildings is undergoing renovation but the Earl de Grey public house is derelict. Both buildings are Grade II Listed and provide important historic references to the areas past at this key location on Castle Street.

8.4.6. Within the Old Town Conservation Area there are a large number of Listed Buildings; although the majority do not front the A63 and are found in the vicinity of Trinity Church. A former dock building borders the A63 between Prince's Dock and Humber Dock, the Grade II Listed building, previously known as Warehouse No. 6, is now a restaurant. The building is constructed from the locally distinctive red brick and forms a prominent landmark to road users. At the eastern end of the study area, the Grade I Listed King William III statue and lamps are found above the Grade II listed Market Place Toilets.

8.4.7. The dock walls of both Humber and Prince's Dock are Grade II Listed; the A63 passes between both docks in close vicinity to the walls.

8.4.8. Further details of listed buildings and structures are discussed in the Cultural Heritage section of this scoping report; Chapter 7.

Conservation Area

8.4.9. The Old Town Conservation Area is an important part of the city centre. The buildings and materials are locally distinctive and form a valuable local resource. The A63 passes through the area, forming a key component of the area with the potential to negatively (and positively) influence the townscape character, and the user's perception of the area.

8.5. POTENTIAL EFFECTS

Magnitude of Impact

8.5.1. Two scheme options (the underground option and the overground option) were previously assessed (PF, 2010a) to determine the magnitude of townscape impact. The extent of footprint required for the two options was very similar and

both were assessed to have a Moderate Adverse townscape impact. The Detailed Assessment will consider the potential effects of the preferred route option; the underground option.

8.5.2. The assessed townscape impacts associated with the underground option included:

- Loss of large areas of verge side vegetation, including mature trees;
- Loss of an area of William Street pocket park;
- Loss of a significant area of Trinity Burial Ground, including mature trees and boundary walls;
- Demolition of the Grade II Listed Castle Buildings and the Earl de Grey public house; and
- Demolition of the Grade II listed north wall to Humber Dock, a reduction in the area of the dock, in addition to the loss of dockside features.

8.5.3. The magnitude of impact upon the townscape character area was assessed as follows:

Table 8.3: Potential Magnitude of Townscape Impact on Individual Character Areas (Year 0 Opening).

Townscape Character Areas	Value(Sensitivity)	Underground Option
		Magnitude
1 - A63, Castle Street	LOW	MODERATE ADVERSE
2 - Light Industrial and Commercial	LOW	MINOR ADVERSE
3 - Large Scale Leisure and Retail	LOW	MINOR ADVERSE
4 - Large Scale Urban Housing with Pocket Parks	MEDIUM	MINOR ADVERSE
5 - Mixed Scale Urban Housing	LOW	MINOR ADVERSE
6 - Quay West Development Site	LOW	MODERATE ADVERSE
7 - Princes Quay Shopping Centre	HIGH	MINOR ADVERSE
8 - Humber and Railway Dock	VERY HIGH	MODERATE ADVERSE
9 - Trinity Burial Ground	VERY HIGH	MODERATE ADVERSE
10 - Railway Dock Surrounding Areas	MEDIUM	MODERATE ADVERSE
11 - Marina Small Scale Urban Housing	LOW	NO CHANGE

Townscape Character Areas	Value(Sensitivity)	Underground Option
		Magnitude
12 - Hull Marina Boat Yard	LOW	NO CHANGE
13 - Island Wharf Riverfront Redevelopment	MEDIUM	NO CHANGE
14 - Nelson Street Riverfront	HIGH	NO CHANGE
15 - Castle Street Small Scale Urban Housing	HIGH	MINOR ADVERSE
16 - Prince Street and Posterngate	VERY HIGH	NO CHANGE
17 - Holy Trinity Church	VERY HIGH	NO CHANGE
18 - Market Place East	LOW	NO CHANGE
19 - River Hull Wharf Frontages	LOW	NO CHANGE
20 - Marina Court	MEDIUM	MINOR ADVERSE
21 - Oldgates Development Area	LOW	MINOR ADVERSE
22 - Central Fruit Market	MEDIUM	NO CHANGE
23 - Central Dry Dock / The Deep	MEDIUM	NO CHANGE
SUMMARY SCORES		Major Adverse - 0 Moderate Adverse – 5 Minor Adverse – 8 Negligible – 0 No Change - 10
OVERALL MAGNITUDE OF EFFECT OF SCHEME OPTION UPON TOWNSCAPE (AT SCHEME OPENING, Year 0)		MODERATE ADVERSE
OVERALL MAGNITUDE OF EFFECT OF SCHEME OPTION UPON TOWNSCAPE (AT Year 15 Summer)*		MINOR ADVERSE 'Minor Adverse' subject to enhanced mitigation proposals e.g. pedestrian bridge design

8.5.4. The Simple Assessment previously undertaken outlined the significance of townscape impact of the underground option. This is based on the existing sensitivities of the character areas and the overall magnitude of impact of the option. Significance was assessed with reference to the adapted methodology in the previous Simple Assessment. It is proposed that significance will be reassessed at the next stage in accordance with the Detailed Assessment guidance as set out in Interim Advice Note 135/10 'Landscape and Visual Effects Assessment', November 2010 (HA, 2010c).

Table 8.4: Potential Significance of Townscape Impact on Individual Character Areas (Year 0 Opening)

Townscape Character Areas	Value (Sensitivity)	Underground Option	
		Magnitude	Significance
1 - A63, Castle Street	LOW	MODERATE ADVERSE	SLIGHT ADVERSE
2 - Light Industrial and Commercial	LOW	MODERATE ADVERSE	SLIGHT ADVERSE
3 - Large Scale Leisure and Retail	LOW	MODERATE ADVERSE	SLIGHT ADVERSE
4 - Large Scale Urban Housing with Pocket Parks	MEDIUM	MODERATE ADVERSE	MODERATE ADVERSE
5 - Mixed Scale Urban Housing	LOW	MODERATE ADVERSE	SLIGHT ADVERSE
6 - Quay West Development Site	LOW	MODERATE ADVERSE	SLIGHT ADVERSE
7 - Princes Quay Shopping Centre	HIGH	MODERATE ADVERSE	LARGE ADVERSE
8 - Humber and Railway Dock	VERY HIGH	MODERATE ADVERSE	VERY LARGE ADVERSE
9 - Trinity Burial Ground	VERY HIGH	MODERATE ADVERSE	VERY LARGE ADVERSE
10 - Railway Dock Surrounding Areas	MEDIUM	MODERATE ADVERSE	MODERATE ADVERSE
11 - Marina Small Scale Urban Housing	LOW	MODERATE ADVERSE	SLIGHT ADVERSE
12 - Hull Marina Boat Yard	LOW	MODERATE ADVERSE	SLIGHT ADVERSE
13 - Island Wharf Riverfront Redevelopment	MEDIUM	MODERATE ADVERSE	MODERATE ADVERSE
14 - Nelson Street Riverfront	HIGH	MODERATE ADVERSE	MODERATE ADVERSE
15 - Castle Street Small Scale Urban Housing	HIGH	MODERATE ADVERSE	LARGE ADVERSE
16 - Prince Street and Posterngate	VERY HIGH	MODERATE ADVERSE	VERY LARGE ADVERSE
17 - Holy Trinity Church	VERY HIGH	MODERATE ADVERSE	VERY LARGE ADVERSE
18 - Market Place East	LOW	MODERATE ADVERSE	SLIGHT ADVERSE
19 - River Hull Wharf Frontages	LOW	MODERATE ADVERSE	SLIGHT ADVERSE
20 - Marina Court	MEDIUM	MODERATE ADVERSE	MODERATE ADVERSE
21 - Oldgates Development Area	LOW	MODERATE ADVERSE	SLIGHT ADVERSE

Townscape Character Areas	Value (Sensitivity)	Underground Option	
		Magnitude	Significance
22 - Central Fruit Market	MEDIUM	MODERATE ADVERSE	MODERATE ADVERSE
23 - Central Dry Dock / The Deep	MEDIUM	MODERATE ADVERSE	MODERATE ADVERSE
SUMMARY SCORES			VLA – 4 LA – 2 MA – 7 SA – 10 N - 0
OVERALL SIGNIFICANCE OF EFFECT OF SCHEME OPTION UPON TOWNSCAPE (AT SCHEME OPENING, Year 0)			VERY LARGE ADVERSE
OVERALL SIGNIFICANCE OF EFFECT OF SCHEME OPTION UPON TOWNSCAPE (AT Year 15 Summer)* assumes mitigation implemented			MODERATE ADVERSE

Visual Impact

8.5.5. The proposed scheme has the potential to result in significant visual effects. Visual impact is the result of a change in view, most likely from residential properties, public rights of way, roads and offices. The receptors were grouped according to their sensitivities in accordance with the agreed methodology. The sensitivity of receptors principally relates to three factors:

- The location and context of the viewpoint;
- The expectations, occupation or activity of the receptor; and
- The importance of the view (which may be determined with respect to its popularity or numbers of people affected).

8.5.6. Due to the urban nature of the study area there are a large number of potential visual receptors. These include; residential, commercial, road and leisure users. For the majority of the receptors identified in the EAR (PF, 2010a), it was determined that current views over the A63 exist, but it was likely that the magnitude of effect may be intensified by the scheme proposals.

8.5.7. The Simple Assessment determined that:

- There are no ‘Very High Sensitivity’ visual receptors affected by the scheme;

- There are 25 ‘High Sensitivity’ visual receptors potentially affected by the scheme. These included; residential properties, users of public open space and users of public rights of way.
- There are 20 ‘Medium Sensitivity’ visual receptors potentially affected by the scheme including; Listed Buildings, retail and leisure areas.
- There are 33 ‘Low Sensitivity’ visual receptors potentially affected by the scheme including commercial / industrial areas and road users.

8.5.8. At the previous Simple Assessment stage, from a visual impact perspective, the significance of impact ranged from Neutral through to Large Adverse. A cautious approach was taken to the overall scoring of the visual impact and the worst case scenario was presented as the overall score.

8.5.9. The magnitude of visual impact was assessed according to the scale of effect, which depends largely upon the size and type of development.

Table 8.5: Summary of Significance of Visual Impact

PREDICTED OVERALL SIGNIFICANCE OF VISUAL IMPACT OF THE SCHEME OPTIONS (YEAR 0 WINTER)	
Summary of Significance	**UNDERGROUND**
Moderate beneficial	0
Slight beneficial	0
Neutral	8
Slight adverse	31
Moderate adverse	25
Large adverse	16
Very large adverse	0
*Overall Significance of Effects (Yr 0 Winter) with mitigation	Large Adverse
*RANK (Yr 0 Winter 1 = least adverse)	1
*Predicted Overall Significance of Effects (Yr 15 Summer) with mitigation	Moderate Adverse

8.5.10. The three footbridges proposed over the A63 for preferred scheme option have the potential to provide a significant adverse visual impact, as all three would be highly visible within the flat road corridor and surrounding areas. The positioning of the bridges within the Old Town Conservation Area will have the potential to negatively affect the setting of the Listed Buildings, the Conservation Area and surrounding areas. This potential impact will be considered in the Detailed Assessment when detail design information for the bridges will be available.

8.5.11. All visual receptors will be reviewed in any further assessment Stage in accordance with the new guidance now published, Interim Advice Note 135/10 'Landscape and Visual Effects Assessment', November 2010 (HA, 2010c).

8.6. PROPOSED LEVEL AND SCOPE OF ASSESSMENT

8.6.1. In order to complete the assessment, it is proposed that both the Landscape and Visual Impact Assessment should proceed to Detailed Assessment. The assessment will utilise and build on the EAR (PF, 2010a) which comprised an adapted Simple Assessment.

8.6.2. The assessment of landscape and visual impacts will be carried out by Chartered Landscape Architects and rely on desk top studies and fieldwork.

Information gained from parallel assessments for Cultural Heritage, Nature Conservation, Noise, and Community and Private Assets will also contribute to the assessment.

8.6.3. In accordance with the guidance it is proposed that the following should be undertaken in order to evaluate the landscape resource and visual impact in more detail:

- Undertake a detailed desk study and fieldwork to identify the character of the landscape, including its condition and value, and the nature and sensitivity of the visual receptors that may be affected by the project.
- A review and update of the baseline information including relevant planning policies, regional and district landscape character guidance.
- A review of the Landscape Character Areas (LCAs) and determine if any changes are needed to the boundaries and descriptions considering new development / demolition within the study area.
- Undertake a landscape sensitivity assessment of the LCAs as to the degree that the proposed changes could be accommodated without altering landscape character.
- Undertake a detailed assessment of the magnitude of landscape impact to determine the significance of landscape impact upon the LCAs
- Assessment of the visual impacts of the scheme. Undertake a Zone of Theoretical Visibility, identify visual receptors and determine the magnitude and significance of visual impact through site survey and assessment. For the sensitive views, photomontages will be used to illustrate the potential change.
- Mitigation to avoid, reduce or remedy the changes should be taken into consideration in determining the significance of resultant effects. A detailed landscape mitigation strategy will be developed.
- The scheme proposal will be assessed against existing local authority landscape and planning policies. Consideration will be given to local authority restoration and management guidelines especially the Conservation Area Appraisals.

8.7. PROPOSED METHODOLOGY INCLUDING SIGNIFICANCE

8.7.1. The revised guidance 'Landscape and Visual Effects Assessment' IAN 135/10 (HA, 2010cC was published in November 2010. The IAN has taken immediate effect and is applicable to the reporting of EIA projects, replacing the guidance in DMRB Volume 11 Section 3 Part 5.

8.7.2. IAN 135/10 (HA, 2010c) states that *'Landscape encompasses the whole of our external environment, whether within villages, towns, cities or in the countryside' (GLVIA para 2.1).* Therefore the IAN does not differentiate between 'landscape' and 'townscape', and the approach taken applies to any landscape whether the context is urban, rural or a combination of both. This supercedes the approach taken in the EAR (PF, 2010a). Therefore in the subsequent Detailed assessment all reference to townscape will be replaced with landscape.

8.7.3. The assessment of landscape effects takes account of designations by local authorities, quality of elements and features within the landscape, the historical and cultural associations in the area, and visual appraisal. Visual appraisal is a term used to indicate value based on character, condition and aesthetic appeal.

8.7.4. Guidance recommends that the assessment should be undertaken for both day and night time situations and considered without the scheme and compared to the situation if the scheme were built. Adverse or beneficial changes can then be classified according to the magnitude scale in Table 8.7

8.7.5. The assessment of visual effects determines the sensitivity of potential visual receptors within the ZVI. Visual receptors include people in their homes, users of Public Rights of Way and other areas of open space or recreational landscapes, people at work and people travelling along roads.

8.7.6. The guidance on landscape and visual assessment requires use of a matrix-based assessment as shown in Table 8.6, based on a specific landscape criteria that defines the sensitivity of landscape and visual effects against the magnitude of landscape and visual impact. These criteria are specified in IAN 135/10 (HA, 2010c). The criteria for their application are set out in Tables 8.6 to 8.8.

Table 8.6 Landscape and visual sensitivity criteria

Sensitivity	Landscape -typical criteria descriptors	Visual – typical criteria descriptors
High	Landscapes which by nature of their character would be unable to accommodate change of the type proposed. Typically these would be; • Of high quality with distinctive elements and features making a positive contribution to character and sense of place. • Likely to be designated, but the aspects which underpin such value may also be present outside designated areas, especially at the local scale. • Areas of special recognised value through use, perception or historic and cultural associations. • Likely to contain features and elements that are rare and could not be replaced.	Residential properties. Users of Public Rights of Way or other recreational trails (e.g. National Trails, footpaths, bridleways etc.). Users of recreational facilities where the purpose of that recreation is enjoyment of the countryside (e.g. Country Parks, National Trust or other access land etc.)
Moderate	Landscapes which by nature of their character would be able to partly accommodate change of the type proposed. Typically these would be; • Comprised of commonplace elements and features creating generally unremarkable character but with some sense of place. • Locally designated, or their value may be expressed through non-statutory local publications. • Containing some features of value through use, perception or historic and cultural associations. • Likely to contain some features and elements that could not be replaced.	Outdoor workers Users of scenic roads, railways or waterways or users of designated tourist routes. Schools and other institutional buildings, and their outdoor areas.
Low	Landscapes which by nature of their character would be able to accommodate change of the type proposed. Typically these would be; • Comprised of some features and elements that are discordant, derelict or in decline, resulting in indistinct character with little or no sense of place. • Not designated. • Containing few, if any, features of value through use, perception or historic and cultural associations • Likely to contain few, if any, features and elements that could not be replaced.	Indoor workers Users of main roads (e.g. trunk roads) or passengers in public transport on main arterial routes. Users of recreational facilities where the purpose of that recreation is not related to the view (e.g. sports facilities).

Table 8.7 Magnitude of Impact Landscape Criteria

Magnitude of Impact	Typical Criteria descriptors
Major	Total loss or large scale damage to existing character or distinctive features and elements, and/or the addition of new but uncharacteristic conspicuous features and elements. (adverse) Large scale improvement of character by the restoration of features and elements, and/or the removal of uncharacteristic and conspicuous features and elements, or by the addition of new distinctive features. (beneficial).
Moderate	Partial loss or noticeable damage to existing character or distinctive features and elements, and/or the addition of new but uncharacteristic noticeable features and elements. (adverse). Partial or noticeable improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic and noticeable features and elements, or by the addition of new characteristic features. (beneficial).
Minor	Slight loss or damage to existing character or features and elements, and/or the addition of new but uncharacteristic features and elements. (adverse) Slight improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic features and elements, or by the addition of new characteristic elements. (beneficial).
Negligible	Barely noticeable loss or damage to existing character or features and elements, and/or the addition of new but uncharacteristic features and elements. (adverse) Barely noticeable improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic features and elements, or by the addition of new characteristic elements. (beneficial).
No change	No noticeable loss, damage or alteration to character or features or elements.

Table 8.8 Magnitude of Impact Visual Criteria

Magnitude of Impact	Typical Criteria descriptors
Major	The project, or a part of it, would become the dominant feature or focal point of the view.
Moderate	The project, or a part of it, would form a noticeable feature or element of the view which is readily apparent to the receptor.
Minor	The project, or a part of it, would be perceptible but not alter the overall balance of features and elements that comprise the existing view.
Negligible	Only a very small part of the project would be discernible, or it is at such a distance that it would form a barely noticeable feature or element of the view.
No change	No part of the project, or work or activity associated with it, is discernible.

8.7.7. In accordance with IAN 135/10 (HA, 2010c), the significance assessment methodology for ‘Landscape and Visual Effects Assessment’ varies from that

described in Chapter 5. The matrix for assessment of significance under this topic is provided in Table 8.9.

Table 8.9 Significance of Effect Categories

Landscape/ Visual Sensitivity	**Magnitude of impact**				
	No change	**Negligible**	**Minor**	**Moderate**	**Major**
High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
Moderate	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate

8.8. CONCLUSION

8.8.1. It is proposed that the DMRB assessment will be undertaken at the Detailed Assessment Level. This is due to the potential impact of the scheme on the character of the surrounding landscape and visual receptors.

9. NATURE CONSERVATION

9.1. INTRODUCTION

9.1.1. Ecology is the scientific study of living organisms and their inter-relationships. Nature conservation is concerned with maintaining a viable population of the country's characteristic fauna, flora and wildlife communities.

9.1.2. Previous reports (listed in Table 9.1) summarise and evaluate the work completed to-date. This report uses updated guidance to evaluate the preferred scheme option and to describe the further assessments which are required.

9.1.3. New guidance for reporting has been introduced in the intervening period which includes DMRB Volume 11, Section 2, Part 6, HD48/08 (HA, 2008a), Interim Advice Note (IAN) 125/09 *Supplementary Guidance for Users of DMRB Volume 11 Environmental Assessment* (HA, 2009a) and IAN 130/10 *Ecology and Nature Conservation: Criteria for Impact Assessment* (HA, 2010a). IAN 130/10 provides guidance for assessment that aligns with DMRB Volume 11, SECTION 3 Part 4 *Ecology and Nature Conservation* (HA, 1993a), and current industry best practice.

9.1.4. This report acknowledges these changes and makes use of the latest methodologies. The requirements for detailed assessments in the future have also been identified, and methodologies provided. The aim of nature conservation is to maintain viable populations and communities of plant and animal species.

9.2. STUDY AREA

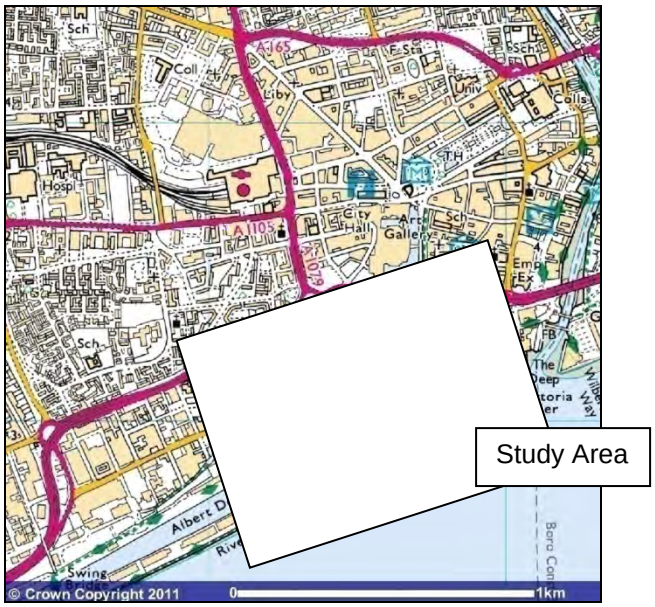
9.2.1. The 'site' refers to the extent of the A63 Castle Street under consideration for improvement. The study area for the previous EAR (PF, 2010a) was the area from which ecological records of sites and species have been requested during the desk studies (1km from the site). The impact on sites more than 250 metres away from the proposed construction area has previously been assessed as being of very low significance, and are no longer under consideration for direct impacts. For example, local wildlife sites which are located approximately 500m from the project site will not be affected.

9.2.2. Indirect impacts on the Humber Estuary protected sites have been considered within the Initial Screening Report for Appropriate Assessment (PF, 2010b).

Although adverse impacts on the estuary are thought to be most unlikely, a final impact assessment cannot be undertaken until a drainage survey has been completed, and road drainage design finished.

9.2.3. The study area therefore consists of the Scheme extent, where direct impacts may occur, and all the land to the south of the scheme as far as the Humber Estuary, where indirect impacts currently remain.

Figure 9.1: Study Area and Location



9.3. EXISTING AND BASELINE KNOWLEDGE

9.3.1. A summary of previous reports and surveys is given in Table 9.1.

Table 9.1: Previous Reports and Surveys for Castle Street Improvements

Report	Date	Purpose	Key valuation results
Smeeden Foreman Partnership *Environmental survey*	2003	Desk top study and walk over survey	Identification of principal ecological receptors
An Environmental Building Assessment, Bat Emergence and Dawn Swarming Survey for Castle Buildings, Quay West, dated 26 May 2005 (WSP, 2005)	2005	An Environmental Building Assessment, Bat Emergence and Dawn Swarming Survey for Castle Buildings, Quay West	Presence of legally protected species within scheme area. (Evidence of Pipistrelle bats within Castle Buildings)

Report	Date	Purpose	Key valuation results
Phase 1 Ecological Survey Golder Associates (2007) Report on A63 Castle Street, Hull, Ecological Assessment Stage 2, Report reference 06588242.501 Rev B0	May 2007	A desktop study and walk over survey of entire site.	Presence of non statutory site of nature conservation importance (Trinity Burial Ground)
Pell Frischmann (2008) A63 Castle Street Improvements – Hull, *Environmental Assessment Report (Options Identification Stage)*, report reference W11189/VAA/03	2008	Desktop study of existing data and reports. Ecological impact assessment of road options.	Overall slight adverse impact for the scheme with no significant differences between options.
Environmental Scoping Report (Options Selection Stage) W11189/T13/01	December 2009	Comparison of impacts between scheme options. Update of records and site data.	No significant differences in ecological impact between schemes. Local records confirming the presence of breeding birds.
Pell Frischmann (2010) Initial Screening Report for Appropriate Assessment (Options selection stage) W11189/T13/06)	January 2010	Initial project screening of potential impacts on European protected sites	Drainage design required before final assessment can be completed. Report findings will be used to inform the design process.

9.3.1. The EAR (PF, 2010a) identified the following features, which have the potential to be affected either directly or indirectly by the agreed scheme option.

- The Humber Estuary;
- Mature Trees;
- Bats; and
- Nesting Birds.

Policies and Plans relevant to Nature Conservation

9.3.2. Bats are protected species and have been recorded at Castle Street. All species of bat are protected under The Conservation of Habitats and Species Regulations 2010 and under Section 9 of the Wildlife and Countryside Act 1981 (as amended by Schedule 5) (Mitchell-Jones, 2004).

9.3.3. Provisions are made within UK legislation to allow for the disturbance of bats or their roosts to take place under license. A licence is issued by the relevant Statutory Nature Conservation Organisation (Natural England for the purposes of this study).

9.3.4. A range of birds are known to feed and breed in the Castle Street area including UK BAP species. All birds are protected under the Wildlife and Countryside Act 1981 (as amended), making it an offence, with certain exceptions (e.g. game birds), to intentionally: kill, injure or take any wild bird; take, damage or destroy the nest of any wild bird while it is in use or being built; or take or destroy the egg of any wild bird.

9.3.5. The National Planning Policy Framework (NPPF, CLG 2012) paragraphs 111 to 125set out the Government's national planning policies on protection of biodiversity through the planning system. These policies are incorporated into development planning documents at regional and local scales, and are also of material worth in considering individual planning applications.

9.3.6. Sites of international importance, including SACs, SPAs and RAMSAR sites receive statutory protection through international conventions and European Directives.

9.3.7. The NPPF (CLG, 2012) places particular emphasis upon promoting the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations, linked to national and local targets.

9.3.8. Hull currently has 109 Sites of Nature Conservation Interest (SNCIs), covering a total of 850 hectares. Most sites are designated as Urban Greenspace and are therefore owned and maintained by HCC. This is a non statutory designation. These sites are now largely being managed in accordance with the Hull Local Biodiversity Action Plan (HBP, 2002), and include Trinity Burial Ground.

9.3.9. The Hull Core Strategy Publication Version (June 2011) contained biodiversity policies but this document was withdrawn in the wake of the NPPF: a 'strategic policies document is now proposed to replace the withdrawn core strategy'. Other key local plan policies concerning nature conservation can be found within the Joint Structure Plan for Kingston Upon Hull and the East Riding of Yorkshire (adopted June 2005) and Hull City Plan Adopted Local Plan May 2000.

9.3.10. Section 40 of the Natural Environment and Rural Communities Act 2006 concerns biodiversity and states: 'Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercising of those functions, to the purpose of conserving biodiversity.'

9.3.11. The Act also states that: 'it is important that public authorities seek not only to protect important habitats and species, but actively seek opportunities to enhance biodiversity through development proposals, where appropriate.'

9.3.12. British Standard 5837:2005 Trees in relation to construction gives recommendations and guidance on the principles to be applied to achieve satisfactory juxtaposition of trees, including shrubs and hedges with structures.

Biodiversity Action Plans (BAPs)

9.3.13. Three types of Action Plan (Species Action Plans (SAPs), Habitat Action Plans (HAPs) and Local Biodiversity Action Plans (LBAPs)) have been developed by the UK Biodiversity Action Plan steering group which set priorities for nationally and locally important habitats and wildlife. It is this BAP framework that forms the basis of the habitat and, to a certain extent, the species surveys for this scheme.

9.3.14. The statutory basis for species and habitats listed in BAPs is provided by Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. The UK, Hull Biodiversity Partnership and Highways Agency Biodiversity Action Plans are relevant to the area surveyed.

9.3.15. Pipistrelle Bat, Song Thrush and Hedge Accentor (Dunnock) are all UK BAP species which have been recorded within the study area.

9.3.16. Habitat Action Plans which have been included within the Hull BAP (HBP, 2002), and which are relevant to the study area include: Estuary, Gardens, Industrial, Parks, Built, Trees, Grassland, hedgerow and Scrub. Species Action Plans included within the Hull BAP and which are relevant to the study area include: Elm Trees, Pipistrelle Bats, Song Thrush and lichens.

9.4. VALUE OF THE ENVIRONMENTAL RESOURCES AND RECEPTORS

9.4.1. The value given to an ecological receptor takes into account any statutory or non statutory designations, the intrinsic value of the receptor and if it supports legally protected or notable species.

9.4.2. The value of the identified ecological receptors was last updated following the surveys undertaken in 2007. However, a new interim advice note, IAN 130/10 (HA, 2010a), providing resource valuation guidance has recently been published.

9.4.3. The resource valuation guidance set out in IAN 130/10 (HA, 2010a) regarding interim assessment criteria for ecology and nature conservation has been applied to these ecological resources which are summarised in the Table 9.2.

Table 9.2: Value of Ecological Receptors

Receptors	Site/Habitat/Species	Value
Humber Estuary	Tidal mud flats and shales alongside docks	International
Mature Trees	Mature trees at Trinity Burial Ground and along roadside	Local
Bats	Roost within Castle Buildings. Old walls and two trees in Trinity Burial Ground	Unitary Authority Area
Nesting Birds	Trinity Burial Ground, old wall, roadside trees and shrubs	Unitary Authority Area

9.4.4. The valuation of features listed in Table 9.2 uses different criteria than those previously described in the EAR (PF, 2010a). The values shown here are based on the application of the definitions set out within Table 1 *Resource Valuation* in IAN 130/10 *Ecology and Nature Conservation: Criteria for Impact Assessment* (HA, 2010a) which was not available at the time of writing of the EAR (PF, 2010a). These new criteria are based on a hierarchical approach that removes a number of levels of valuation in those previously applied. Professional judgement has been applied, therefore, to place the value of these resources where they fit best. The values shown here will be used in the detailed assessment.

9.5. POTENTIAL EFFECTS

9.5.1. The effects listed below have previously been identified at the Simple Assessment stage. The potential effects of the scheme proposals include the following:

- Loss of known Pipistrelle bat roost within Castle Building due to demolition;
- Loss of potential bat roost due to the demolition of Earl de Grey public house;

- Loss of up to 100m of old wall parts of which have potential for bat roosts and breeding birds;
- Potential disturbance to breeding birds through removal of habitat and during the construction phase;
- Loss of 24 mature trees within Trinity Burial Ground which is a SNCI, and further mature trees within the scheme corridor;
- Loss of 2400 m² of Trinity Burial Ground SNCI;
- Possible impact on mature poplar trees due to site compound location adjacent to Hessle Road; and
- Potential indirect impacts on Humber Estuary through unidentified drainage channels.

9.5.2. The initial screening for Habitat Regulations Assessment has been discussed with Natural England (PF, 2010b). Natural England acknowledge the work that has been undertaken but conclude that there is insufficient information available for them to comment on potential impacts at this stage.

9.6. PROPOSED LEVEL AND SCOPE OF ASSESSMENT

9.6.1. To complete the assessment for the scheme, updated information will be required on the status of bats. Existing data is over five years old and is no longer valid.

9.6.2. Further information is required relating to trees along the A63 to ensure that the impact of the scheme is minimised and that trees are adequately protected during the construction phase. There are also issues relating to tree safety within Trinity Burial Ground.

9.6.3. The presence of a European Protected Species, potential impacts on a European Protected Site and construction disturbance on nesting birds, require that a Detailed Assessment for Ecology and Nature Conservation is undertaken. This should include the following scope of works:

- Consultation with statutory bodies, including HCC and Natural England, will be undertaken to discuss the mitigation, enhancement and compensatory measures. These measures will be fully detailed in the Assessment report;
- A second screening for Habitats Regulations Assessment will be undertaken to identify any potential of significant effects on the Humber

Estuary SPA SAC Ramsar and any need for an Appropriate Assessment. This should be undertaken using the drainage information which will become available at Preliminary Design stage. Interceptor design must ensure that there is minimal risk of pollutants, which arise from accidents, reaching the estuary from the road. It is also possible that the application of the DMRB/IAN emerging guidance on air quality may alter predictions of air quality in the 2011 modelling report. Consultation with Natural England will be undertaken and subsequent reporting of their response.

9.6.4. Further ecological surveys will be undertaken in respect of:

- Bats: No positive records for bats have been made since the internal survey of the Castle Building in 2005. Further detailed surveys are required to confirm their presence or absence at Castle Street. All external surveys should be undertaken between April and September. As bat numbers appear to be low it is recommended that surveys should be undertaken at the optimum time between June and the end of August.
- Trees: An arboricultural survey (in accordance with BS 5837: 2012 *trees and construction*) is required for all trees within the site area. This will evaluate all trees and will describe the root protection areas of trees alongside the proposed route. This information will inform the project design and will ensure that as few trees as possible will be removed. A tree protection plan can then be drawn up and included within the CEMP. Currently 24 trees within Trinity Burial Ground (including 18 mature trees) and Poplar trees adjacent to Hessle Road are likely to be at risk from the scheme.

9.6.5. It is noted that two trees have been identified as having high potential for roosting bats. These trees are in poor physical condition with a range of clearly visible structural defects. It is a possibility that these may be removed following HCC tree safety surveys which are undertaken on a regular basis. If any trees are removed, future surveys and assessments will need to be amended accordingly.

9.7. PROPOSED METHODOLOGY INCLUDING SIGNIFICANCE: CHARACTERISATION OF ECOLOGICAL IMPACTS

9.7.1. The proposed methodology for the Assessment will follow the guidance provided in DMRB Volume 11, Section 3, Part 4 (HA,1993a) and in DMRB Volume 11,

Section 2, Part 5, HA 205/08 (HA, 2008b) for assessing the Significance of Effects of road schemes upon Ecology and Nature Conservation.

9.7.2. The environmental design, that will form part of the scheme proposals, will be carried out in accordance with the guidance provided in DMRB Volume 10, Section 4, Part 1 to 7 (HA, 2001) for ecology mitigation.

9.7.3. Relevant Interim Advice Notes (IAN) will be used, including the following:

- IAN 130/10 *Ecology and Nature Conservation: Criteria for Impact Assessment* (this IAN is supplementary to the extant advice in DMRB Volume 11, SECTION 3 Part 4 *Ecology and Nature Conservation*);
- IAN 110/08 *Assessment of Implications on European Sites (including Appropriate Assessment)* (Highways Agency, 2008); and
- IAN 125/09 *Supplementary Guidance for Users of DMRB Volume 11 Environmental Assessment*

9.7.4. An assessment of construction effects will be undertaken and a review of nature conservations policies and plans in accordance with DMRB Vol 11 part 12 (HA, 1994). The assessment will also draw upon the Institute for Ecology and Environmental Management (IEEM) 2006 guidelines entitled Guidelines for Ecological Impact Assessment in the United Kingdom to complement the DMRB guidance and WebTag 2004 (DfT, 2004) where appropriate and relevant. References to legislation, government guidance and local development policy will be made accordingly.

9.7.5. The methodology for assessment of bats is given in IAN 116/08 Nature Conservation in Relation to Bats (section 5.5) (HA, 2008c). Bats are present in low numbers and most previous surveys have been inconclusive. As existing surveys are now out of date, further survey work is required to determine how the project will impact on bats and what mitigation can be included to reduce the effects.

9.7.6. A survey should be undertaken no later than a full active season (April to September) prior to construction commencing. This will give sufficient time to obtain a European protected species licence, should it be necessary to disturb bats or their roosts, and to provide any required mitigation. It is likely that Castle Buildings, where Pipistrelle bats were found in 2005, will require demolition, so

mitigation for this roost will need to be in place prior to demolition taking place. It is likely that time constraints will apply to the demolition works.

9.7.7. The key objectives of the survey shall be to establish the presence of bats within Castle Buildings where they have been previously sighted, species of bat (there are three different species of Pipistrelle bat in the UK), and whether the roost is of maternity or hibernation status. It will also be necessary to determine the occurrence of bats at other locations which have been assessed as having a high likelihood of supporting roosts, including:

- Earl de Grey Public House
- Old walls around Trinity Burial Ground
- Trees in Trinity Burial Ground already identified as high bat potential.

9.7.8. Both buildings will require internal daytime surveys, undertaken by an experienced bat ecologist with an appropriate protected species licence. Trees and the boundary wall located within Trinity Burial Ground would also require daytime surveys and assessments. Bat Surveys; Good Practice Guidelines 2nd Edition (Bat Conservation Trust, 2012) should be referred to for detailed information, as well as the Bat Workers Manual (JNCC, 2004) and Bat Mitigation Guidelines (English Nature, 2004).

9.7.9. In accordance with published guidelines, it is recommended that bat dusk/dawn surveys are undertaken on the buildings, trees and walls that have potential to be used by roosting bats. These dusk/dawn surveys should be undertaken between the optimal period for this survey technique (May - August) due to the overall low level of bat activity recorded in previous surveys. Four surveyors will be required to undertake this survey work.

9.7.10. Activity surveys should be undertaken to assess the level of bat activity across the entire scheme and highlight any potential impacts to foraging or commuting bats. These surveys will include two transects covering the entire length of the scheme and the installation of two remote recording devices to undertake automated surveys. Automated survey data to be collected on four consecutive nights in spring, summer and autumn. Automated surveys will provide data on the species present and the frequency of bat passes. This will improve the accuracy of the surveys and will help to inform mitigation.

9.7.11. If suitable bird nesting habitat is to be removed or impacted upon during the bird breeding season (generally accepted to be March – August, weather dependant) then a nesting bird survey will be required 24 hours prior to vegetation removal works commencing.

9.7.12. Ecological mitigation proposals were detailed in the EAR (PF, 2010a).

9.7.13. These proposals for the preferred scheme option are summarised in Table 9.3. An update to the mitigation works will be required following assessment, in particular any specific mitigation obligations relating to European Protected Species licences.

Table 9.3: Mitigation Summary

Feature	Mitigation and Compensation
Trinity Burial Ground SNCI	Retain mature trees wherever possible. Plant new trees to compensate for those lost, and shrubs such as Wild privet.
Other habitats	Retain deadwood for invertebrates
	Plant native trees on new road verges.
Mature Trees	Plant new trees to compensate for those lost.
Bats	Features with bat roost potential to be retained wherever possible. If removed, to be supervised by licensed bat worker.
	Erect bat boxes on mature trees to be retained.
	Re-build brick wall with bat potential + ivy and other climbing plants.
	Demolition of confirmed roost(s) to be carried out under licence from Natural England.
Birds	Retain mature trees and other vegetation wherever possible.
	Vegetation removal to take place outside the bird breeding season (March to August) wherever possible. If removal required within the bird breeding season, area must be checked by an Ecologist beforehand.
	Native shrub, hedgerow and species-rich neutral grassland planting on new road verges
	Bird boxes to be erected on retained mature trees and along re-built wall.

9.7.14. Mitigation details from the EAR (PF, 2010a) will need to be updated as part of the assessment, to ensure that sufficient measures have been provided to mitigate for all the potential effects which have been identified. The statutory agencies must be satisfied with the proposals and details should then be incorporated into the landscape design.

9.7.15. Proposals for ecological enhancement were also included in the EAR (PF, 2010a). A summary of the options which apply to the approved scheme option are shown in Table 9.4. These should be described in greater detail at the Detail Design stage, and should also be incorporated into the landscape design.

Table 9.4: Summary Recommendations for Ecological Enhancement

Feature	Ecological Enhancement Recommendations
Trinity Burial Ground SNCI	Replace Euonymus japonica with native shrubs
	Plant native bulbs and wildflowers
Pocket Park	Plant native bulbs and wildflowers
Area alongside underpass	Establish areas of shade tolerant semi natural grassland.
	Establish areas of Hazel and native shrub coppice
	Create wetland areas
	Plant native hedgerows
Area West of Trinity Burial Ground	Establish areas of Hazel and native shrub coppice
	Establish area wildflower meadow
	Extend old wall around north side (bat and bird habitat)
	Plant native bulbs and wildflowers
Other	Explore management agreement with voluntary sector
	Set up local wildlife volunteer groups
	Train local residents and build local capacity
	Involve local people in long term management and monitoring

9.7.16. Guidance from IAN 130/10 (HA, 2010a) Ecology and Nature Conservation Criteria for Impact Assessment, recommends that where Detailed Assessment of specific receptors is considered appropriate, impacts on these receptors should be described and assessed in detail. This characterisation process has been followed in Table 9.5 overleaf. The characteristics of the ecological impacts, and their magnitude, will be used to inform the determination of impact significance within the assessment.

9.7.17. Having assessed significant impacts on receptors at different levels of value, IAN 130/10 Ecology and Nature Conservation Criteria for Impact Assessment (HA, 2010a) allows us to assign overall ‘significance categories’.

Table 9.5: Characterisation Process for Receptors

Resource	Proposed activity, biophysical change, related to receptor structure and function	Characterisation of Impact	Mitigation Proposals	Summary of characterisation
Humber Estuary Value: International Conservation of Habitats and Species Regulations 2010	Potential discharge of pollution from A63 to enter the estuary through drainage system. Unknown impact on tidal mud and shales. Potential air quality impact.	SI: -ve PO: unlikely CO: indirect EC: v small SZ: not assessed RE: not assessed DU: Permanent TF: n/a	Drainage design will ensure that adequate surface water interceptors are incorporated. Temporary protection during construction detailed in CEMP	Residual risk of accidental Impact. Not likely to be Significant but further survey and design work required. (Design must ensure no residual impact) Scheme likely to be beneficial in terms of improving air quality, but awaiting outcomes of detailed assessment
Bats Pipistrelle bats Unitary Authority Area Conservation of Habitats and Species Regulations 2010. Wildlife & Countryside Act 1981 (as amended)	Destruction of roost in Castle building. Loss of potential roosts within trees and old wall in Trinity Burial Ground. Roost type requires confirmation in order to determine mitigation and timing of works.	SI: -ve PO: Probable CO: Direct EC: to be assessed SZ: to be assessed RE: not reversible DU: permanent	Assessment required at least 12 month prior to commencement. Mitigation will include provision of bat boxes, reconstruction of old wall with suitable crevices and improved foraging areas.	Assessment required No residual impacts following mitigation Potential for habitat enhancement

Resource	Proposed activity, biophysical change, related to receptor structure and function	Characterisation of Impact	Mitigation Proposals	Summary of characterisation
		TF: important constraint		
Mature Trees Local importance Trees are located within Trinity Burial Ground SNCI and old town conservation area.	Construction work will require 18 mature trees to be removed	SI: -ve PO: certain CO: direct EC: 0.24 ha SZ: 20% loss RE: not reversible DU: permanent TF: Avoid bird breeding season	Retain and protect as many mature trees as possible. Tree planting incorporated into landscape plan.	Assessment required to ensure maximum number of trees are retained and they are adequately protected during construction. No residual impact following mitigation
Birds Unitary Authority Area Hull BAP Wildlife & Countryside Act 1981 (as amended)	Loss of breeding habitat	SI: -ve PO: probable CO: direct EC: 0.24 ha SZ: partial loss RE: reversible	Remove habitat outside of breeding season. Replace asap. Mitigation planting and wall construction will replace lost habitat. Habitat enhancement will improve bird nesting and feeding opportunities	No further assessment required No residual impacts following mitigation

Resource	Proposed activity, biophysical change, related to receptor structure and function	Characterisation of Impact	Mitigation Proposals	Summary of characterisation
		DU: temporary TF: avoid breeding season		

Key

SI (Sign): Positive (beneficial (+ve)) or Negative (adverse (-ve))

PO (Probability of Occurring): Certain, Probable, Unlikely

CO (Complexity): Direct, Indirect, Cumulative

EC (Extent): Area measures and percentage of total (e.g. area of habitat/ territory lost)

SZ (Size): Description of level of severity of influence (e.g. complete loss, number of animals affected)

RE (Reversibility): Reversible or Not Reversible (can the effect be reversed, whether or not this is planned)

DU (Duration): Permanent (P) or Temporary (T) in ecological terms. Where differing timescales are determined in relation to the life-cycle of the receptor, these should be defined.

TF (Timing and frequency): Important seasonal and/or life-cycle constraints and any relationship with frequency considered.

9.7.18. The assessment carried out to date has established that the overall significance category relating to nature conservation is Moderate, based on the impact on one or more receptors of County or Unitary Authority area. These effects are important, but are not likely to be key decision-making factors. Suitable mitigation measures can be adopted within the site itself.

9.7.19. The current information from the Initial Screening Report for Appropriate Assessment (PF, 2010b) would suggest that impacts on the Humber Estuary site, which is of international importance, are not likely to be significant but this require further information before a final assessment can be made.

9.8. CONCLUSION

9.8.1. The scheme has the potential to result in direct impacts on the following receptors: bats, mature trees, nesting birds and a SNCI. Therefore a Detailed level of assessment will be carried out.

9.8.2. A screening for a Habitat Regulations Assessment will be undertaken to establish the potential impacts on the Humber Estuary, an European protected site.

10. GEOLOGY AND SOILS

10.1. INTRODUCTION

10.1.1. Soils and geology are a key factor in determining the environmental character and quality of any given geographic area. Underlying rocks are a key determinant of landform, while the physical and chemical properties of the rocks and the overlying soils influence the type and variety of vegetation that will grow, agricultural quality, flood risk and water storage capacity.

10.1.2. Geological conditions and resources can also determine the distribution and scale of some industries, particularly the extractive industries such as mining and quarrying and other industries dependent on extracted minerals. Such industries, even if long since closed, can themselves have long-term effects on the environment, through alteration of landforms and of the nature of surface deposits, changes in drainage or the contamination of land.

10.1.3. Highway construction can have a significant effect on geological and soil resources, while the nature and condition of soil and underlying rocks can be a key constraint on scheme design. Under some circumstances, construction work can also compound the environmental effects caused by previous activity, for instance by mobilising pollution left in the ground by former industrial activities.

10.2. STUDY AREA

10.2.1. The study area adopted for the geology and soils (entitled Materials) assessment undertaken as part of the EAR (PF, 2010a) encompassed the project site at Castle Street which is located within Hull City centre close to the Rivers Humber and Hull. For the collection of baseline data and the initial assessment a 1km buffer was utilised.

10.2.2. For this Geology and Soils assessment, it is proposed to reduce the study area to 500m either side of the carriageway. With reference to the EAR (PF, 2010a), the reduced size of the study area is considered to be appropriate to identify any areas of potential concern with the potential to constrain the proposed improvement scheme, and the likely area which could be impacted by the scheme.

10.2.3. In addition to the EAR produced in 2010, an Envirocheck Report was obtained in January 2013 to ensure the information summarised as existing and baseline knowledge was still current.

10.3. EXISTING AND BASELINE KNOWLEDGE

10.3.1. The EAR (PF, 2010a), which was compiled during Options Selection stage, assessed the impact from the two preferred options considered during this stage. The following section presents a summary of the baseline information gathered during the EAR (PF, 2010a) relevant to the Preferred Route.

Geology and Geomorphology

10.3.2. The EAR (PF, 2010a) identified that the study area is underlain by superficial (drift) deposits of the Quaternary period. Located within a flood plain the site is underlain by a series of Estuarine Alluvial deposits (including Peat), underlain in turn by Glacial Deposits that overlie the solid geology.

10.3.3. The geological memoir (Gaunt *et al*, 1992) indicates that the Alluvial deposits at the mouth of the River Hull comprise thin impersistent basal sands and gravels succeeded by a thin clay layer locally containing peat. This is overlain by Estuarine Clays and Sands followed by Estuarine Silts which grade up to Clays at the surface.

10.3.4. Previous intrusive investigations have proven Made Ground in all of the boreholes. Made Ground comprises ground created by infilling an area with material taken from elsewhere; typically reworked soils, rubble, gravel, sand or former waste material e.g. ash, dredged material etc.

10.3.5. Within the study area the base of the drift recorded in the borehole logs was found to range between 22.9m and 34.2m below ground level (bgl). This corresponds to an ordnance datum level of between -9.2m aOD and -20.7m aOD from the western end of the study area to Mytongate Junction and between -26.8m aOD to -27.5m aOD from Prince's Dock to the River Hull.

10.3.6. The solid geology underlying the study area comprises deposits of Burnham Chalk Formation of the Upper Cretaceous Chalk Group.

10.3.7. Chalk was proven in seven of the previous exploratory holes drilled along the length of the scheme. It comprises weak to moderately strong, fresh to slightly weathered, yellowish white fine grained well cemented Chalk with very thin

horizontal fractures and vertical jointing. The chalk was found to contain strong flint nodules.

10.3.8. No records of current or historic mining, quarrying, coal reserves or mineral deposits were identified in the study area.

10.3.9. The Humber Estuary lies within 0.5km of the site. It has been designated principally for its nationally important habitats, including coastal saltmarsh, intertidal mudflats and sandflats, saline lagoons and sand dunes. The site is also of national importance for the geological interest at South Ferriby Cliff and for the coastal geomorphology of Spurn. However, the geological / geomorphological units do not lie within the study area.

10.3.10. East Yorkshire GeoconservationUK Group (formerly RIGS UK) has previously been consulted to identify whether any Regional Important Geological and Geomorphological Sites (RIGS) were located within the study area. They confirm that there are no geological or soils RIGS within the study area, however they note that eight urban RIGS, designated for their educational value, are present in the study area (see Table 10.1).

Table 10.1: Urban RIGS in the Study Area

Structure	Location	Designated For
Lloyds TSB Bank	On Corner of Chapel Street and Paragon Street	Granite with Rapakivi structures
King William Statue and Toilets	Market Place	Various rocks
Methodist Church	King Edward Square	Tiberthwaite Tuff
Festival House	93 St James Street	Fossils in Ironstone
HSBC Bank	Near War memorial	Granite Pillars
Williamsons Solicitors	Lowgate	Ashburton “marble”
Monument Buildings	Carr Lane	Granite pillars with xenoliths
Police Station	Queens Gardens	Tiberthwaite Tuff

Soils and Agricultural Land

10.3.11. The soils within the study area have been identified as Loamy and Clayey soils of coastal flats with naturally high groundwater. The soil unit is not a rarity at a local scale.

10.3.12. Given the urban nature of the proposed scheme, there are only limited areas of soils likely to be affected; principally Trinity Burial Ground and Pocket Park.

10.3.13. The EAR (PF, 2010a) confirmed that the A63 Castle Street Improvement scheme is located within an urban area and that no agricultural land will be affected.

Land Contamination

10.3.14. The following information on potential receptors and Areas of Potential Concern (APC), with respect to contaminated land, were identified in the EAR (PF, 2010a).

Hydrogeology

10.3.15. Within the EAR (PF, 2010a) the drift within the study area was identified as unproductive strata i.e. drift deposits with low permeability that have negligible significance for water supply or river base flow. The solid geology (chalk) was identified as a Principal Aquifer (strata that have a high intergranular and/or fracture permeability, meaning that they usually provide a high level of water

storage and may support water supply and/or river base flow on a strategic scale).

10.3.16. Although the drift is classed as unproductive strata, it contains bands and lenses of more permeable, granular material. Moreover, the more cohesive drift close to ground level is desiccated and fissured in places, which suggests that groundwater movement within these deposits may occur.

10.3.17. The study area is not situated within a Groundwater Source Protection Zone. There are two licensed chalk groundwater abstractions for commercial use within 1km of the site, details of unlicensed abstractions, if any, are available at present.

10.3.18. The Environment Agency's River Basin Management Plan (RBMP) for the Humber River Basin District indicates that the site is underlain by the Hull and East Riding Chalk groundwater body, from which a significant proportion of Hull's drinking water is abstracted. The RBMP indicates that both the quantitative status and chemical status of this groundwater body are poor due to saline intrusion, and that the drinking water status is poor due to chemicals that could affect potable water supply. Environment Agency online data maps indicate that the site lies within a Groundwater Drinking Water Protection Area (DrWPA) that is classed as being At Risk.

10.3.19. Groundwater monitoring from the scheme's previous site investigation (AEG, 1994) and interpretive report ,Acer, 2005, indicated that groundwater levels vary significantly (from 0.2m to 13.8m bgl) throughout the study area. However, the groundwater levels were typically expected to be present within 1.5m and 4m of the ground surface.

10.3.20. Limited tidal monitoring during the site investigation demonstrated that groundwater within the chalk is affected by tidal levels with a time lag of between 40 and 60 minutes.

10.3.21. Aquifer units within the drift may be perched or may act as pathways, either for the lateral migration of near-surface groundwater or estuarine water, or for upwards leakage from the underlying chalk. Evidence from other major below-ground construction projects in the area confirms the presence of multiple aquifer units and suggests that granular horizons within the drift can become mobile under differential pressures

10.3.22. High groundwater levels and upwards leakage from the underlying chalk may need to managed within excavations during construction. Due consideration of potential groundwater contaminants which may be present as a result of land contamination will be required and shall be assessed as part of the planned intrusive investigations and follow-up monitoring.

Hydrology

10.3.23. The nearest surface watercourses are the Humber Estuary, located to the south of the site, and the River Hull which is located to the east of the scheme. Both rivers have flows which are subject to tidal influence

10.3.24. Data maps provided in the RBMP indicate that the current overall potential of the Humber Estuary is 'Moderate'. The Estuary has the potential to achieve a 'Moderate' ecological status, however it is currently failing to achieve a good chemical status.

10.3.25. For the River Hull, the RBMP indicates that the current overall potential of the watercourse is Moderate. The biological potential is deemed moderate, while the chemical potential does not required assessment.

10.3.26. There are no surface water abstractions within the study area.

10.3.27. The study area lies within a Flood Zone 3 and has a high probability of flooding. However the site is currently protected from flooding by the existing River Hull and Humber Estuary flood defences. These protect the city of Hull from flood events arising 1 in 100 and 1 in 200 years respectively.

Human Health

10.3.28. The A63 runs through an urban area passing a mixture of residential and commercial developments. Local residents along with construction and maintenance workers represent potential receptors where APC have been identified.

Ecology

10.3.29. The Humber Estuary and the lower reaches of the River Hull, which are classified as a RAMSAR site, a SPA, a SAC and a SSSI, are present within the study area. The Humber Estuary lies to the south of the study area, approximately 500m south of the section of the A63 under consideration and the River Hull is located immediately east of the site.

10.3.30. There are also four non-statutory nature conservation sites or SNCIs within the study area. The EAR (PF, 2010a) has shown that there will be no direct impact on three of these sites but part of the Trinity Burial Ground SNCI will be affected.

Areas of Potential Concern

10.3.31. The EAR (PF, 2010a) confirmed that the study area has historically been heavily developed for industrial uses including docklands, works, warehouses, railways and timber yards. In addition, Trinity Burial Ground is present immediately adjacent to Mytongate Junction.

10.3.32. A summary of previous land uses, which could have resulted in contamination, on site and within the study area are given in Tables 10.2 and 10.3 respectively.

Table 10.2: APC from Historical On-Site Activities

Map Dates	Description
1856 – Present (Warehousing removed by 1979)	Docklands (Humber and Prince's Dock) and associated warehousing lie within the site boundary in the central portion of the site
	Trinity Burial Ground present directly to south of area in question, northern boundary lies within development area
1893	Saw Mill immediately east of Trinity Burial Ground
	Timber Yard immediately west of Trinity Burial Ground
1893 – 1970's	Railway lines run through central portion of site along Humber Dock Street/Princes Dock Street and along Railway Street, traversing Castle Street.
1928-1968	Pig Market located immediately west of Mytongate Junction
1928-1968	The Humber Works (Brass and Copper), Humber Lead Works and a timber yard are located to the west of Trinity Burial Ground
1948-1968	Metal Works / Warehousing located within the centre of Mytongate Junction

Table 10.3: APC from Historical Off-Site Activities (500m Buffer)

Map Dates	Description
1856 - Present	Railway Dock present to south of central portion of site
1893 - Present	Infrastructure related to Prince's Dock and Humber Dock including railway lines, goods stations/sheds and warehouses located south of Railway Dock and English Street. Reduction in infrastructure from 1968 to present day
1893 - 1990's	Albert Dock and associated Infrastructure is located approximately 450m to south west of the site. Most infrastructure removed by early 1990's
1893	Timber Yard located to the south of Trinity Burial Ground
1893 - 1968	Warehouse located on the current site of the Holiday Inn hotel
1893 - 1979	Cattle Market located to the south of Mytongate Junction
1910	Various timber yards to the east of Waterhouse Lane
1928 - 1979	Alexander Works (Brass and Copper) located between Waterhouse Lane and Trundle Street
1948	Two garages present on the former timber yard sites to the east of Waterhouse Lane
1948 - 1979	Various works including engineering, leather and rubber and warehousing located to the east of Princes Dock Street
1948 - 1968	Various industrial uses intermixed with residential housing. Industrial uses include chemical works, paint works, oil works and electricity/telephone repeater station to north of Mytongate Junction
1968 - 1979	Central Abattoir located south west of Mytongate Junction (within area now developed as Kingston Retail Park)
1991	Kingston Retail Park developed to south of A63

10.3.33. The EAR (PF, 2010a) confirmed that there were twelve pollution incidents to controlled waters recorded; the River Hull and the River Humber are recorded as the receiving water for nine and three of the incidents respectively.

10.4. VALUE OF THE ENVIRONMENTAL RESOURCES AND RECEPTORS

Geology and Geomorphology

10.4.1. There is no current or historical mining and no geological or geomorphological features, e.g. SSSI, RIGS, within the study area. It is therefore considered that the resource value and sensitivity for geology and geomorphology is negligible.

Soils and Agricultural Land

10.4.2. The soil units identified extend beyond the boundary of the study area, i.e. they are not a rarity at local level. It is therefore considered that the resource value and sensitivity is negligible.

10.4.3. There is no agricultural land within the study area.

Land Contamination

10.4.4. Historically the study area has housed a large number of industrial usages. This may have resulted in contamination of the underlying soils and groundwater. The baseline assessment identified a number of APC with respect to contamination; the extent of any actual contamination has yet to be investigated.

10.4.5. Potential receptors to impacts from contaminated land include groundwater, surface water, ecology, human health, buildings/building occupants and buried structures/services.

10.4.6. The site is immediately underlain by drift deposits, which are classed unproductive strata, although shallow groundwater has been identified within the study area drift is underlain by chalk, which is classed as a Principal Aquifer. The RBMP indicates that both the quantitative status and chemical status of this groundwater body are poor due to saline intrusion, and that the drinking water status is poor due to chemicals that could affect potable water supply. The chalk in this area is also classed as a Groundwater Drinking Water Protection Area (DrWPA) that is at risk.

10.4.7. Both the high groundwater levels within the chalk (within a few metres of the ground surface) and the presence of cohesive, more impermeable deposits within the drift will provide protection against potential contamination of the chalk. However more permeable, granular horizons within the drift may act as potential pathways for contamination, particularly if local groundwater levels are lowered as a result of dewatering activities. The presence of groundwater contamination will be assessed as part of the planned intrusive investigations and follow-up monitoring.

10.4.8. The site is located close to two rivers and drainage from the proposed scheme will outfall into the Humber Estuary. The RBMP for the Humber River Basin District indicates that the current overall potential of the watercourses is ‘Moderate’.

10.4.9. The resource value for the water environment, assessed in accordance with DMRB volume 11 section 3 part 10 (HA, 2009b) is given in Section 15.4 of this report and varies from low to high.

10.4.10. The Humber Estuary is classified as a RAMSAR site, a SPA, a SAC and a SSSI and therefore is of International Resource Value in accordance with IAN 130/10 (HA, 2010a). Trinity Burial Ground is a SNCI and therefore is of Unitary Authority Area Value.

10.4.11. Given the city centre location, the study area typically comprises hardstanding (roads, car parks etc) and built environment (houses, shops and commercial units etc) with only limited areas of soft landscaping (e.g. verges, pocket park by William Booth House and Trinity Burial Ground). The potential for exposure by human receptors to contamination (if present) within the underlying soils from direct contact is therefore limited. The potential risk for migration of mobile contaminants, volatile or soil gases may also be limited given the anticipated low permeability soils underlying the study area, although the presence of more permeable granular horizons within the drift may act as higher permeability pathways for the migration of contaminants. The risk to human health, buildings, building occupants and buried structures/services shall be reviewed pending the results of the planned intrusive investigations.

10.4.12. Construction of the proposed improvement scheme involves significant excavation, particularly in the vicinity of Mytongate junction. Dust generated during the earthworks could mobilise contamination present. Measures for the control of dust and other emissions arising from potentially contaminated soils /groundwater shall also be included within the CEMP (Construction Environmental Management Plan) for the scheme.

10.5. POTENTIAL EFFECTS

10.5.1. The potential effects of a road improvement scheme include the following:

- Improvement works may affect geological strata indirectly through altering the hydrogeology of an area, affecting groundwater levels and flow, or preventing aquifer recharge;
- The use of vehicles and machinery during construction and operation/maintenance may lead to the compaction and erosion of soils;

- There may be a loss of soil through land-take associated with earthworks and the construction of new roads and bridges;
- There is potential for soil contamination from materials such as spills or leaks of fuel, oil during construction and operation of the scheme. These shall be minimised through implementation of the CEMP for the scheme;
- There is the potential for contamination of soils from surface runoff during operation of the road along with direct deposition on soils. These shall be minimised through implementation of the CEMP for the scheme;
- Soil sealing commonly associated with road construction may occur in which the function of soils is lost through a reduction in the absorption, infiltration and filtration of rain water, that in turn may increase surface run-off and risk of flooding;
- Where land has been contaminated from previous site uses / activities, the presence and disturbance of toxic or other hazardous material may pose a risk to human health, the environment or impose constraints on the proposed road improvements; and
- Construction work (including ground works) undertaken within the vicinity of APCs associated with potential land contamination may lead to the disturbance and remobilisation of contaminants within the soil and/or groundwater. This may lead to potential migration to down gradient receptors.

10.6. PROPOSED LEVEL AND SCOPE OF ASSESSMENT

Geology and Geomorphology

10.6.1. No significant areas of geological concern were identified during the EAR (PF, 2010a). The report concluded that there is not anticipated to be any significant impacts on the local geology as the site has already been disturbed by the construction of the A63 and adjacent developments. The impact of the scheme was assessed as neutral and therefore no further assessment of Geology and Geomorphology, other than Geotechnical Investigations for parametric analysis, will be undertaken

10.6.2. There are no geologically designated SSSI units within the study area. The impact of the scheme was assessed in the EAR (PF, 2010a) as neutral and therefore no further assessment of Designated Sites will be undertaken.

10.6.3. There may be potential hydrogeological impacts arising from the construction and operation of the scheme. A hydrogeological assessment of the area around the Mytongate Junction will be undertaken through groundwater monitoring, testing and water quality sampling as part of the site investigation, which is due to commence in May 2013. The findings of this investigation will be used to inform the design and to assess potential impacts on groundwater receptors.

Soils and Agricultural Land

10.6.4. Given the urban nature of the proposed scheme, the limited areas of soils impacted and the fact that the area has already been disturbed by the existing A63 and adjacent urban development, the EAR (PF, 2010a) confirmed that there would be no major impacts on soils. No further assessment of Soils is therefore required.

10.6.5. The EAR (PF, 2010a) confirmed that the A63 Castle Street Improvement scheme is located within an urban area and therefore there is no impact on land utilised for Agricultural use. The potential for impact on Agricultural Land was scoped out during the EAR (PF, 2010a).

Land Contamination

10.6.6. The scheme is located in an area that has been utilised for numerous industrial purposes. The main areas of potential concern due to historic industrial uses are associated with Trinity Burial Ground and dockyard industry. It is anticipated that contaminated land may be encountered within the study area.

10.6.7. A number of previous site investigations have been undertaken along the route and proved that made ground is present beneath the site, however only limited chemical testing has been completed. In addition, although no records of a landfill site were revealed, by the environmental searches previously completed, domestic waste was encountered in a number of trial pits in the vicinity of Mytongate Junction.

10.6.8. Further site investigation is due to commence in May 2013. In addition to obtaining further geotechnical ground information and samples for testing to inform the design, the site investigation will also assess the presence of any waste materials in the vicinity of Mytongate Junction and obtain soil and groundwater samples for testing, in order to determine the level of any potential

contamination within the study area, and define the contamination regime beneath the study area.

10.7. PROPOSED METHODOLOGY INCLUDING SIGNIFICANCE

10.7.1. The HA has developed a set of criteria for establishing the environmental value of individual assets (HA205/08, HA, 2008b), however new guidance is not currently available for the Geology and Soils topic. Until new guidance is published for all environmental sub topics IAN 125/09 (HA, 2009a) provides supplementary advice for users of DMRB Volume 11 and clarifies the assessment approach to be used where up to date topic specific guidance has not yet been published.

10.7.2. A Detailed (Stage 3) assessment will be carried out in accordance with DMRB Volume 11 Section 3 Part 11 (HA, 1993b) in order to identify any potential impacts on potential areas of contamination which may affect the Scheme. The results of this assessment will be reported in the Environmental Statement with significance of impacts assessed in line with HA 205/08 as set out in Chapter 5 of this report.

10.8. CONCLUSIONS

10.8.1. It is proposed that Land Contamination and Hydrogeology should proceed to a Detailed assessment. Further site investigation, contamination testing and risk assessment shall be undertaken to categorise the contamination regime in the study area, assess the impacts of the proposed scheme and to identify appropriate mitigation measures that may be required.

10.8.2. A hydrogeological investigation will be carried out as part of the 2013 site investigation. This will include groundwater monitoring, testing and water quality sampling, and will be used to inform the design and to assess potential impacts of the scheme on hydrogeological receptors.

11. MATERIALS

11.1. INTRODUCTION

11.1.1. A limited assessment for Materials was included as part of the previous Geology and Soils Assessment (PF, 2010a). The Interim Advice Note (IAN 153/11), Guidance on the Environmental Assessment of Materials Resources has since been published which has been referenced for this chapter of the Scoping Report.

11.1.2. IAN 153/11 covers the consumption of material resources and the management of waste which may give rise to environmental impacts. Environmental risks will need to be managed and waste generation minimised as far as practical.

11.1.3. As defined by the Memorandum of Understanding between the Environment Agency and the Highways Agency (November 2009), the adoption of practices to reduce waste, increase recycling and increase the use of recycled/recovered materials shall be encouraged.

11.1.4. Material resources are defined as materials and construction products required for construction, improvement and major maintenance of the trunk road network; These include primary raw materials (e.g. aggregates, manufactured construction products) and materials arising from site (e.g. excavated soils, recycled road plannings). Energy use associated with the operation of the network (such as lighting) is excluded from this assessment.

11.1.5. Waste is not specifically defined in IAN 153/11 since this depends on whether the producer or holder is discarding or is required to discard the material as waste. Waste however will arise from two sources : site materials (e.g. concrete from demolition, excavated soils); and materials bought to site but not used (e.g. damaged stock, off cuts, surplus materials)

11.1.6. Note that off-site impacts relating to the extraction of raw materials, depletion of non-renewable resources and the manufacture of construction materials are excluded from the scope of IAN 153/11. The embodied energy associated with the manufacture and transport of material however shall be considered.

11.1.7. The potential impacts associated the production, movement, transport, processing and disposal of waste and surplus materials from site is addressed.

The impacts may be assessed once the type and quantify of wastes have been established.

11.1.8. The concept of responsible sourcing of materials is adopted under the BRE Framework Standard for the Responsible Sourcing of Construction Products BES 6001: 2009. BES 6001 provides criteria against which sustainable construction products can be assessed and shall be considered, where appropriate, as part of the specification requirements for materials.

11.1.9. This section should be read in conjunction with Chapter 10 – Geology and Soils, which also considers land contamination issues which are relevant to materials management.

11.2. STUDY AREA

11.2.1. For the collection of baseline data and the initial assessment a 1km buffer was utilised as the study area. As with for the Geology and Soils assessment, it is proposed to reduce the study area to 500m either side of the carriageway. The reduced size of the study area is considered to be appropriate to identify any areas of potential concern with the potential to constrain the proposed improvement scheme, and the likely area which could be impacted by the scheme.

11.2.2. The locations of regional and appropriate waste management facilities in relation to the site are still to be determined.

11.3. EXISTING AND BASELINE KNOWLEDGE

11.3.1. Consultation and collation of existing information in relation to Geology and Soils and potential for land contamination was included in the Assessment for Geology and Soils (refer to chapter 10).

11.3.2. No specific consultation or baseline data collation has been undertaken to date in relation to the assessment of Materials and shall be subject to refinement of the existing desk study information and collation of data from planned intrusive investigations across the study area.

11.3.3. Construction of the scheme however will include the production, procurement, transport and use of material resources and the production of waste streams, as detailed in **Table 11.1.**

Table 11.1 Summary of materials and waste that have the potential to generate significant environmental effects

Project Activity	Material use and potential to generate significant effects	Potential waste arisings and potential to generate significant effects
Site remediation / preparatory / earthworks works	• Bulk materials for earthworks • Timber (e.g. temporary use for shuttering)	• Hazardous or contaminated soil/materials encountered on-site • Injurious weeds and invasive plants • Surplus topsoil or subsoil materials arising from earthworks • Vegetation and other above-ground materials produced by site clearance
Demolition		• Demolition waste
Site Construction	• Road surface materials • Concrete, steel and other structural materials • Precast or prefabricated concrete, steel or other components • Timber (e.g. temporary use for shuttering)	• Surplus construction materials

11.3.4. Current estimates on the volumes of excavated materials (70,000m^3) and total imports (45,000m^3) given in the EAR will be reviewed. A full breakdown of each material requirement and waste generated is not available at this stage.

11.3.5. The proposed scheme will require substantial earthworks. This will include the excavation, re-distribution and potential reuse of made ground and natural material. The proposed intrusive investigations will collate information relating to the geotechnical and geoenviromental suitability of this material for reuse on or off site.

11.4. POTENTIAL EFFECTS

11.4.1. The materials used and waste generated by the scheme have potential to give rise to environmental impacts that need to be managed and mitigated.

11.4.2. Key potential environmental impacts include:

- Depletion of natural resources
- Demand on handling capacity of regional waste management and disposal facilities
- Release of chemical contaminants to air, land or the water environment
- Energy/fuel consumption and climate change through plant use and transportation of materials and waste

11.4.3. Energy/fuel consumption and climate change through manufacture of materials. The improvement works will utilise primary raw materials, manufactured construction products alongside site won materials where suitable and appropriate for re-use. The selection criteria for materials to be used in the scheme will contribute to their potential environmental impact, including the material flow cycle.

11.4.4. The scheme is also likely to result in production of surplus materials and waste including excavation arisings. Where possible waste should be minimised, and re-use and recycling maximised where it is environmentally and geotechnically appropriate to do so within the statutory framework.

11.4.5. The Geology and Soils topic has identified areas of potential land contamination which require further assessment. The extent and concentration levels of any contaminated land encountered would have implications for the management of any contaminated soils which need to be excavated and / or disposed of. The results of the contaminated land assessment will be considered in the assessment of materials to be excavated from the site.

11.4.6. For Materials resource use the potential environmental effects are associated with the extraction and transport of primary raw materials, the manufacture of products and their subsequent transport to and use on construction sites. Projects that consume large quantities of raw materials may have permanent and direct effects on the environment.

11.4.7. For surplus materials and waste the potential environmental effects are associated with the production, movement, transport, processing and disposal of arisings from sites.

11.4.8. Energy is also an aspect of materials use and waste management. Energy is consumed during raw material extraction, the manufacture of products, transport and their use on site. Energy is also consumed in the management of waste from transport and for reprocessing and disposal and also the reprocessing of waste into secondary products.

11.4.9. The use of materials and management of waste may also give rise to other impacts, (e.g. increased noise, dust, suspended soils/ potential contaminants to controlled waters. Such impacts are already considered in other sub-topic of this Scoping Report (Chapter 6 – Air Quality, Chapter 12 – Noise & Vibration and Chapter 15 - Road Drainage and the Water Environment) and are not revisited in this chapter.)

11.5. PROPOSED LEVEL AND SCOPE OF ASSESSMENT

11.5.1. As defined under IAN 153/11 and the Site Waste Management Plans Regulations 2008, the overall cost of the project is above the financial threshold at which Site Waste Management Plans (SWMPs) are required.

11.5.2. A SWMP is an important tool for improving environmental performance, managing potential environmental impacts, meeting regulatory commitments and helping to reduce waste and therefore overall project costs. The SWMP aims to determine the waste types and amounts to be produced during design and construction and to identify appropriate waste management controls.

11.5.3. A Materials Management Plan (MMP) will also form part of the SWMP and used to demonstrate that any material reuse strategy does not pose any risk to human health or the environment and in accordance with ‘The Definition of Waste: Development Code of Practice’ Version 2 CLAIRE March 2011, is not a waste disposal activity.

11.5.4. The MMP documents how materials anticipated in the ground as part of the works are to be dealt with, including details on potential use, relative volumes, storage areas, intended final destination of the materials, protocols to track movements of these materials and any contingency arrangements.

11.5.5. There are potential environmental effects relating to the consumption of raw and manufactured materials and generation of waste on site during construction as part of the improvement scheme.

11.5.6. The Materials chapter in the EAR (PF, 2010a) was completed prior to issue of IAN 153/11. Limited information on materials has been historically available, however given the likely production of surplus materials and waste including excavation arisings from substantial excavations, with limited potential for site re-use a Simple Assessment is needed, followed by a Detailed Assessment, if required.

11.5.7. The Simple Assessment is a qualitative exercise and aims to identify the environmental impacts and measures to mitigate the impacts from readily available data and information. Where environmental impacts cannot be clearly identified from the Simple Assessment, Detailed Assessment may be required to inform project decisions.

11.6. PROPOSED METHODOLOGY INCLUDING SIGNIFICANCE

11.6.1. The environmental assessment of materials will be carried out in accordance with the principles set out in IAN 153/11 :

- Consultation with statutory bodies including the Environment Agency and Local Authority to obtain baseline data on the available waste management infrastructure in the local area;
- Identification and review of relevant legislation, policy and statutory targets influencing materials and resource use;
- An assessment of available waste management facilities in relation to the project and capacities of the facilities for each type of waste forecast to be produced;
- Collation of baseline data for materials resource use including quantification of major materials resources for each phase of the project, information on the sources of materials and products, including recycled materials and cut and fill balance;
- Classification and where possible quantification, of main waste streams for each phase of the project including site preparation and earthworks, construction and maintenance phases;

- Identification and quantification of any hazardous waste from construction phase of the projects such as contaminated soils from excavation and earthworks;
- The assessment will include a review of the scope of site investigation works for Geology, Soils and land contamination sub-topics to include information to allow an assessment of likely classification of waste or potential for re-use of materials from excavation arisings; and
- Reporting of the likely impacts associated with materials resource use and waste management and identification of appropriate mitigation measures. Reporting will be in accordance with IAN153/11, with data presented using the Simple Assessment reporting matrix (Annex 1, Table A and B of IAN153/11). The reporting will include a description of how material resource efficiency will be maximised throughout the project and how waste minimisation and optimal use of surplus waste will be prioritised.

11.6.2. IAN 153/11 does not include specific guidance on assessing the 'significance of effect'. For this scheme, as per the guidance set out in HA 205/08, the 'significance of effects' shall be reviewed based on professional judgement in relation to whether the resulting environmental impact has a:

- Net adverse or beneficial effect
- Long or short term impact
- Direct or indirect impact; or
- Significant or insignificant effect.

11.7. CONCLUSIONS

11.7.1. The maintenance, construction and improvement of highways result in the consumption of raw materials and resources and generation of waste that have potential to give rise to environmental impacts that need to be managed and mitigated. As a result of this further assessment will need to be undertaken to determine total volumes and types of materials / wastes and enable future development of the SWMP and MMP.

11.7.2. A Simple Assessment is recommended at this stage. A Detailed Assessment may be required if the environment impacts cannot be clearly identified by the Simple

Assessment. The requirement for a Detailed Assessment shall be considered following completion of the Simple Assessment.

12. NOISE & VIBRATION

12.1. INTRODUCTION

12.1.1. The construction and operation of the proposed A63 Castle Street Improvements scheme have the potential to give rise to both temporary and permanent noise and vibration impacts that may affect sensitive receptors in the area of the scheme extents and affected road links. Consequently, these impacts may generate effects, adverse or beneficial, at sensitive receptors. The EIA is intended to identify and assess these effects so that significant adverse effects can be identified and the scope to mitigate them can be considered

12.1.2. The purpose of this chapter is to identify the key noise and vibration impacts, describe the study area and key receptors, and how the effects will be assessed within the EIA.

12.1.3. The HA Standard DMRB Volume 11, Section 3, Part 7 Noise and Vibration, HD 213/11 (HA, 2011) provides guidance on the assessment of noise and vibration associated with road projects and the management of environmental effects. The appropriate level of assessment in dependent on thresholds for the magnitude of noise and vibration being exceeded. Given the proposed change in the vertical alignment of carriageway and proximity of sensitive receptors, it is initially expected that the EIA will consider noise and vibration due to the scheme at the Detailed level of assessment as described within HD 213/11. However, if the assessment demonstrates that threshold values are not likely to be exceeded then the assessment will be taken to Simple level.

12.1.4. HD 213/11 recommends the liaison with stakeholders which will include consultation with Local Environmental Health Officers to obtain information regarding any known sources of noise complaints and any specific details of the noise climate within the study area. HCC was consulted in January 2013 as part of this scoping assessment

12.2. THE STUDY AREA

12.2.1. Section A1.11 within Annex 1 of HD 213/11 provides an objective method to define the study area based on plan distances from scheme boundaries and affected road links as follows:

- The extents of the works and sections of the highway to be physically altered/improved or bypassed plus a 600-metre buffer from the edge of all carriageways this applies to;

- A 600-metre buffer from the edge of the carriageway for affected links within 1 kilometre of the scheme extents; and

- A 50-metre buffer from the edge of the carriageway for affected links beyond 1 kilometre of the scheme extents.

12.2.2. The study area will be defined in accordance with HD 213/11 by by the calculation of expected noise impacts, using the procedures within the Department of Transport memorandum 'Calculation of Road Traffic Noise' (1988) and based on road traffic data for the baseline, opening and design years.

12.2.3. Section A1.22 of HD 213/11 requires that the study area for the assessment for the assessment of temporary impacts should be as minimum the same as that defined for the assessment of permanent impacts. It may be extended to adequately assess impacts associated with haul routes and contractors compounds. will be set out within the EIA along with supporting assumptions.

12.3. BASELINE CONDITIONS

Existing Noise Climate

12.3.1. It is expected that the main source of environmental noise affecting the majority of the study area is road traffic on the A63 and connecting links. Noise from building services and activities associated with light industrial/commercial premises adjacent to the A63 are also expected to be features of the baseline noise climate. Baseline surveys have been conducted as part of previous assessments of the project however the description of the baseline will be updated for the new EIA.

12.3.2. Consultation for a previous assessment of the scheme noted that HCC suggested that the major noise issue, as perceived by local residents and suggested by received noise complaints, comes from noise associated with entertainment premises such as pubs and bars.

12.3.3. Strategic noise mapping published by DEFRA in 2008 has been used in developing the first round of Noise Action Plans within the UK. This is focused on 28 metropolitan areas which includes the Hull agglomeration. The purpose of the

Noise Action Plans is to assist competent authorities in identifying areas where the management of environmental noise should be prioritised. This process is ongoing however DEFRA has published mapping which indicates that areas falling within the scheme extents have been designated as First Priority Locations. This suggests that the baseline noise climate in these areas is particularly affected by road traffic noise.

12.3.4. Reference to mapping shows that there is expected to be a large number of dwellings and other sensitive receptors within 600m of the project boundary as would be expected from a scheme within an urban environment.

12.3.5. A previous assessment found that approximately 4000 residential properties lie within 600 metres of affected routes.

12.3.6. The previous Stage 1 DMRB assessment identified sensitive receptors described in Table 12.1 (other than dwellings) within 300 metres of the proposed scheme.

Table 12.1: Previously identified sensitive receptors other than dwellings

Location	Grid Reference		Description
	x	y	
Park 1	509192	428521	Green open space bordered by Melville Street
Park 2	509114	428437	Green open space bordered by Porter Street and Adelaide Street
Park 3	509141	428310	Green open space bordered to the north by William Street and the A63 to the south
Park 4	508760	428509	Green open space bordered to the north by Great Thornton Street
Myton Centre	509042	428252	Riverside area children and family resource centre bordering William street to the north and the A63 to the south
Octagon Centre	508839	428394	Conference centre and community fitness centre located on Walker Street
Playing Field	508738	428360	Playing field located to the west of the Octagon Centre
Jetty	509666	428485	Public open space to the south of the Princes Quay Shopping Centre bordered to the south by the A63
Shopping Centre	509628	428509	Princes Quay Shopping Centre
Naval School*	509744	428514	Hull Trinity House School located on Prince's Dock Street
Market Square	509891	428558	Located between North Church side and South Church side to the west of Holy Trinity Parish Church

12.3.7. The Holiday Inn Hull Marina is also noted from aerial photography as a being within 300m of the scheme.

12.3.8. In addition to these previously identified receptors the following schools, hospitals and public open spaces were identified as being within 2km of the project boundary:

- Hull Trinity House School
- Victoria Dock Primary School
- Adelaide Primary School
- Hull College
- Princess Royal Hospital
- Queens Gardens

12.3.9. It is understood that three designated areas lie within 2 kilometres of the project boundary:

- Trinity Burial Ground SNCI
- River Hull SNCI
- Humber Estuary SSSI

12.3.10. The detailed identification of sensitive receptors will be updated following baseline studies to be carried out for the EIA.

12.4. POTENTIAL EFFECTS

Temporary Impacts

12.4.1. It is proposed that the construction phase will begin in 2016 and take between 2 and 3 years to complete. The main activities that are expected to be occur in redeveloping the carriageway, which generate noise and vibration, include:

- Demolition of existing structures and carriageway;
- Excavation, compaction and foundations works;
- Construction of bridges, retaining structures, services, drainage and the new carriageway;

- Surfacing; and
- Installation of signage, gantries and road markings.

Vehicles accessing the site and compounds for the delivery of materials and equipment, removal of excavated materials, attendance of site personnel are also expected to generate noise.

12.4.2. Noise impacts due to construction activities associated with the scheme are expected to be perceptible at nearby sensitive receptors; particularly frontline properties on Castle Street that are directly adjacent to the scheme extents. Residential properties are particularly close to the carriageway on a section just east of the centre of the scheme extents..

12.4.3. The variable nature of construction noise is such that it is difficult to accurately predict the noise impacts at given receptors over the period of the constriction phase. However, given the proximity of some residential to the scheme extents and that some phases of work will require night work then there is potential for impacts to have significant effects without careful management. However, the impacts would be temporary and it is considered that adherence to a Construction Environmental Management Plan (CEMP) will provide reasonable mitigation of these impacts.

12.4.4. Vibration impacts may also arise during demolition of structures, break-up of the existing carriageway, piling and surfacing if vibratory rollers are used.

Permanent Impacts

12.4.5. Operational impacts due to noise and vibration is expected to be attributable to changes in road traffic flows and position of the carriageway.

12.4.6. Road traffic may generate effects associated with vibration due to ground-borne or airborne impacts. Ground-borne vibration may be generated by the dynamic interaction of vehicle wheels on road surface irregularities and may be transmitted to adjacent buildings (generally 8 – 20 Hz). This is a complex function of road surface profile, vehicle speed, weight and suspension characteristics, pavement construction, underlying geology etc. and there exists no simple model for predicting such impacts. It may reasonably be assumed, however, that newly constructed carriageways are unlikely to generate significant levels of such vibration and this impact has been considered no further.

12.4.7. Airborne-induced vibration may be generated by high levels of low-frequency noise (20 – 100 Hz) from vehicle exhausts, which can induce vibration in nearby building elements. This may be perceptible and/or in turn generate noise at different frequencies (window-rattle etc.). A broad method for predicting and assessing airborne vibration is given in the previous version of DMRB. Surveys have indicated that the relationship between such vibration and the resulting nuisance follows that for noise, except that the percentage bothered by a given noise level is some 10% lower. These surveys were restricted to properties within 40m of the carriageways where there were no noise barriers or other screening

12.5. PROPOSED LEVEL AND SCOPE OF ASSESSMENT

12.5.1. HD 213/11 states '*Determining the appropriate level of assessment is dependent upon threshold criteria being met. The threshold criteria used for traffic noise is a permanent change in magnitude of 1 dB(A) in the short term (i.e. on opening) or a 3 dB(A) change in the long term (i.e. between opening and future assessment year). These noise changes should also apply for the consideration of nighttime noise impacts but only where an* $L_{night,outside}$ *greater than 55 dB is predicted in any scenario*. *The threshold criterion for traffic induced vibration is a PPV rise to above a level of 0.3 mm/s, or an existing level above 0.3 mm/s is predicted to increase*' Furthermore: '*A Simple Assessment would normally be appropriate where sensitive receptors are present but neither of the threshold values (i.e. noise and vibration) are expected to be exceeded*.' and '*A Detailed Assessment would be appropriate in situations where sensitive receptors are present and either or both of the threshold values are expected to be exceeded, for example where a new road is proposed*.' The key decisions are summarised using the flow chart in Annex 1 of HD 213/11.

12.5.2. Whilst the EAR (PF, 2010a) indicated that no further assessment of noise and vibration impacts was necessary it must be noted that there will be an updated traffic model for the Preliminary Design which may change the predicted impacts.

12.5.3. Guidance within DMRB, HD213/11 (HA, 2011), has also recently been published which revises and updates the assessment procedures to be followed for noise and vibration.

12.5.4. Given that the level of the road is to be lowered by a maximum of 7 metres, it is expected that this will result in a change in the magnitude of traffic noise at

receptors of 1 dB or more on scheme opening. It is therefore recommended that a Detailed Assessment is undertaken. Should the calculation of the noise impacts with respect to the DMRB thresholds demonstrate that a Simple Assessment would be appropriate then the assessment will be modified accordingly.

12.6. PROPOSED METHODOLOGY

Temporary Impacts

12.6.1. BS 5228–1:2009 provides a methodology for calculating noise levels generated by fixed and mobile plant used for a range of typical construction operations. The standard does not define strict criteria to determine the significance of effects of noise impacts although examples of how limits of acceptability have been applied historically and some examples of assessing significance are presented. 'Example Method 1 – The ABC method' (Annex E 'Significance of Noise Effects' section E.3.2) is adopted for the assessment of effects at residential receptors as the approach considers the expected changes in ambient noise levels and better reflects conventional EIA methodologies compared with the use of fixed/absolute noise limits.

12.6.2. The method is summarised in Table 12.2 below. The method uses threshold noise levels for daytimes, evenings and weekends and night-times which are derived from the baseline LAeq noise levels at the façade of receptor rounded to the nearest 5 dB(A).

Table 12.2 BS 5228 Threshold values used in the ABC Method

Assessment category threshold value period	Threshold Value L_{Aeq} dB(A)		
	Category A	Category B	Category C
Night-time (23:00-07:00)	45	50	55
Evenings and weekends	55	60	65
Daytime (07:00-19:00) and Saturdays (07:00-13:00)	65	70	75
Category A threshold values apply where baseline noise levels rounded to the nearest 5 dB are less than these values. Category B threshold values apply where baseline noise levels rounded to the nearest 5 dB are equal to Category A values. Category C threshold values apply where baseline noise levels rounded to the nearest 5 dB are higher than the Category A values			
A significant effect is indicated where the overall ambient noise level exceeds the threshold level in the category appropriate to the baseline noise level at the receiver			
Where baseline noise levels exceed the Category C threshold values then a significant effect is indicated where the overall ambient noise level is 3 dB greater than the baseline			

12.6.3. In assessing the significance of effects on other building type receptors such as hotels, commercial premises, offices etc (defined in BS 5228–1:2009) the 'Example method 2 – 5 dB(A) change method' will be adopted. A significant effect is indicated where noise levels due to the works exceeds the Category A levels defined above. For public open space, a significant impact is indicated where activities increase the ambient noise level (LAeq,period) by 5 dB or more.

12.6.4. In order to assign significance to impacts identified by the BS 5228 – 1:2009 assessment method, the scales indicated in Table 12.3 will be adopted.

Table 12.3 Criteria for the significance of construction noise effects based on the output of the BS 5228 – 1:2009 assessment method.

BS 5228	Magnitude of impact	Significance of effect
Construction noise level is below the threshold value for the receptor	No change	Neutral
Construction noise level is up to 5 dB above the threshold value for less than one month	Negligible adverse	Neutral or Slight adverse
Construction noise level is up to 5 dB above the threshold value for one month or more	Minor adverse	Slight adverse
Construction noise level is 5 dB or more above the threshold value for less than one month	Moderate adverse	Moderate adverse
Construction noise level is 5 dB or more above the threshold value for one month or more	Major adverse	Large adverse

12.6.5. Vibration from construction will be estimated in accordance with the recommendations within BS 5228 – 2:2009 and assessed with regard to building damage risk and disturbance of occupiers of affected properties.

Permanent Impacts

12.6.6. The HD 213/11 assessment methodology for permanent impacts is based on changes in absolute noise levels from road traffic in terms of the LA10,18h descriptor; also known as the UK traffic noise index. This is the A-weighted noise level (in decibels) exceeded for 10% of the 18-hour period between 06:00 and 24:00. The assessment of traffic noise will be based on calculations made in accordance with the CRTN procedures and supplementary advice given in HD 213/11, and latest traffic flows.

12.6.7. For short-term changes in road traffic noise, the smallest change in road traffic noise level (LA10,18h) that is considered perceptible is 1 dB. In the long-term, a 3 dB change in road traffic noise is considered to the smallest perceptible change.

Consequently, HD 213/11 classifies magnitudes of impact separately for short and long-term changes as summarised in Table 12.4.

Table 12.4 Classification of magnitude of road traffic noise impacts in the short term

Noise change LA10,18h	Magnitude of Impact
0	No change
0.1 – 0.9	Negligible
1 – 2.9	Minor
3 – 4.9	Moderate
5+	Major

Table 12.5 Classification of magnitude of road traffic noise impacts in the long term

Noise change LA10,18h	Magnitude of Impact
0	No change
0.1 – 2.9	Negligible
3.0 – 4.9	Minor
5 – 9.9	Moderate
10+	Major

12.6.8. HD 213/11 states: '*Section 2 of Volume 11 includes HA 205/08. This provides a method for the classification of the magnitude of impact and the significance of an effect in order to arrive at an overall level of significance. In terms of road traffic noise, a methodology has not yet been developed to assign a significance according to both the value of a resources and the magnitude of an impact. However, the magnitude of traffic noise impact from a road project should be*

classified into levels of impact in order to assist with the interpretation of the road project. *Therefore, for the assessment of traffic noise that is covered by this document, a classification is provided for the magnitude of impact.* Therefore, the assessment of permanent impacts will be reported as described in Chapter 7 of HD 213/11.

12.7. CONCLUSION

12.7.1. This chapter identifies the key noise and vibration impacts of the scheme, as short-term temporary impacts associated with construction activities and long-term permanent impacts due to road traffic noise. The HA Standard HD 213/11 within the DMRB provides the main guidance with regard to noise and vibration associated with highway projects and the EIA is to be undertaken in compliance with it.

12.7.2. The criteria used to define the study area for the assessment of potential effects are defined. For construction noise, this is based on absolute noise levels that receptors are likely to be exposed to from construction activities alone. In the case of operation noise, due to road traffic, the study area is defined in by change in the level of traffic noise levels on scheme opening and in the design year.

12.7.3. A review of the receptors within the likely study area indicates that the key receptors are residential which are immediately adjacent to the scheme extents. Previous assessments have identified that schools and places of worship also fall within the 600metre buffer from the scheme extents. The identification of receptors will be updated as part of the baseline studies for the EIA.

12.7.4. The baseline conditions affecting the majority of receptors is expected to be road traffic noise from the existing A63 corridor and adjoining links. Sections of the route have been designated as First Priority Locations under the first round of the UK Noise Action Plans published by DEFRA. The locations are centred on the A63 corridor and are therefore attributable to road traffic noise.

12.7.5. It is initially proposed that the DMRB assessment will be undertaken at the Detailed Assessment level. This is because a change in the magnitude of noise impact of 1 dB due to traffic noise, affecting sensitive receptors on scheme opening, is considered likely. This is because the scheme involves lowering the carriageway to a maximum of 7 metres below its existing level. However, if the

calculation of noise impacts demonstrates that no threshold levels will be exceeded then the assessment will be taken to Simple level.

13. EFFECTS ON ALL TRAVELLERS

13.1. INTRODUCTION

13.1.1. The aim of this scoping report is to provide a baseline of the Effects on all Travellers known to date and to outline where further assessment, to consider the potential impact of the scheme on All Travellers, is required.

13.1.2. Effects on All Travellers is identified as a DMRB Topic within Interim Advice Note 125/09 Supplementary guidance for users of DMRB Volume 11 'Environmental Assessment'. However, the guidance contained within Volume 11, Section 3 has not yet been updated. As a result, the Effects on All Travellers assessment incorporates two of the "old" DMRB Topics. These are:

- Volume 11, Section 3, Part 8: Pedestrians, Cyclists and Community Effects (Pedestrians, Equestrians and Cyclists only; the assessment of Community Effects is to be included within the Community and Private Assets Chapter of the Environmental Statement); and,

- Volume 11, Section 3, Part 9: Vehicle Travellers.

13.1.3. The overall approach for the assessment of Effects on All Travellers will be to examine the existing pedestrian, cyclist, equestrian and vehicle traveller provision, assess the type and level of provision to be provided by the scheme and the resultant effect on all traveller movements.

13.2. STUDY AREA

13.2.1. For Effects on all Travellers, the study area has been chosen to ensure that the effect on all receptors as a result of the scheme is determined. The study area is variable and is dependent on the receptor under consideration.

13.2.2. Vehicle Travellers are principally concerned about factors on the road which affected drivers, for example their potential view. Therefore, the assessment has been undertaken using the study area determined as part of the Landscape assessment, which extents 500m either side of the existing A63 carriageway.

13.2.3. The assessment for pedestrians and cyclists looks at the effects of the scheme on these receptors. Given the nature of the scheme i.e. urban and the presence of existing crossing points the assessment had been based on existing and proposed routes/rights of way which will be directly affected by the scheme.

Using professional judgement and knowledge of the scheme, a buffer of 250m from the scheme is therefore considered to be suitable to enable assessment of the effects of the scheme on pedestrians and cyclists.

13.3. EXISTING AND BASELINE KNOWLEDGE

13.3.1. The EAR (PF, 2010a), which was compiled during Options Selection stage, assessed the impact from the two preferred options considered during this stage. The following section presents a summary of the baseline information gathered during the EAR (PF, 2010a) relevant to the Preferred Route.

Equestrians

13.3.2. Previous assessment of the scheme has confirmed that there are no bridleways in the study area. In addition, no equestrians have been observed during any of the traffic or pedestrian surveys. Therefore, given the urban nature of the scheme and the lack of evidence of equestrian use, this sub topic was scoped out in the EAR (PF, 2010a).

Pedestrians and Cyclists

Existing Rights of Way and Cycle Routes

13.3.3. As shown on Figure 13A (Appendix A) there are footways on both sides of the A63, except for the south side between St James Street and Spruce Road where a grassed verge is present.

13.3.4. On the north side of Hessle Road the footway is a combined pedestrian and cycle route. It commences approximately 400m west of Porter Street at Rawling Way continuing to Ferensway. Further shared pedestrian and cycle routes are provided to the northeast, southeast and southwest sides of Mytongate Junction. On all these shared routes pedestrian and cycle use is segregated by a white line.

13.3.5. There are several designated at-grade crossing points along the A63. Crossing at intermediate points is restricted in places by means of pedestrian guard rails located along the footway and in the central reserve. The designated crossing points on the A63 are as follows:

- A63 crossing adjacent to Porter Street – signal controlled, pedestrian only;

- A63 crossing adjacent to Spruce Road / Kingston Retail Park – uncontrolled crossing;
- Mytongate West Crossing – signal controlled, toucan crossing;
- Mytongate East Crossing – signal controlled, toucan crossing;
- A63 crossing adjacent to Princes Dock West – signal controlled, pedestrian only;
- A63 crossing adjacent to Humber Dock Street – signal controlled, pedestrian only;
- Market Place Junction – signal controlled, pedestrian only; and
- High Street – footway under the A63 prior to Myton Bridge (European Path 8).

13.3.6. Other designated crossings of side roads adjacent to the A63 are as follows:

- Ferensway – uncontrolled crossing;
- Commercial Road – uncontrolled crossing;
- Myton Street/Waterhouse Lane – uncontrolled crossing;
- Private access, Holiday Inn – uncontrolled crossing;
- Princess Dock Street – uncontrolled crossing;
- Humber Dock Street – uncontrolled crossing;
- Fish Street – uncontrolled crossing;
- Vicar Lane – uncontrolled crossing;
- Market Place (westbound) – signal controlled, pedestrian only;
- Market Place (eastbound) – signal controlled, pedestrian only;
- Queen Street (westbound) – signal controlled, pedestrian only; and
- Queen Street (eastbound) – signal controlled, pedestrian only;

13.3.7. In addition to the roadside footways there are a number of Public Rights of Way (PRoW) in the study area.

13.3.8. To the north of Castle Street three PRoW are present, comprising:

- FP25 which runs along the eastern side of Princes Dock Street;

- The Trans Pennine Trail (European Footpath E8 and National Cycleway Route 65) which is present running roughly west east skirting the edge of the 500m buffer zone; and
- A spur of the Trans Pennine Trail which runs north south along High Street, under the A63 at Myton Swing bridge and terminates near the footbridge over the River Hull to the Deep.

13.3.9. To the south of Castle Street five PRoW are present, comprising:

- FP23 which runs along the eastern side of Humber Dock Street;
- FP24 which runs, for a short distance, west from Humber Dock street along the southern edge of the Humber Dock;
- FP28 which runs from the junction of Wellington Street and Manor House Street, across the lock at Albert Dock then west along the bank of the Humber Estuary;
- FP26 which runs west from the southern tip of St James Street along the northern side of Albert Dock; and
- FP4 which runs north connecting FP28 to FP26 and terminates at the footbridge over Clive Sullivan Way near Strickland Street.

13.3.10. To the east of the River Hull two PRoW are present comprising

- FP11 which runs from the Deep north along the eastern bank of the River Hull terminating near George Street Bridge; and
- FP12 which runs east from the Deep through the Victoria Dock development, along the bank of the Humber Estuary past Alexandra Dock.

13.3.11. The PRoW plan produced by HCC also highlights recommended cycle routes which run through quiet streets and traffic calmed areas within the study area. These include Jackson Street/English Street to the south, Market Place/Liberty Lane/High Street to the east and St Luke's Street/Osborne Street/St Anne's street to the north of the proposed scheme.

Trip Generators

13.3.12. The current likely generators of pedestrian and cycle traffic across the A63 would appear to be:

- The residential area around Porter Street;

- Paragon Interchange on Ferensway;
- The commercial and entertainment area south of Hessle Road, including Kingston Retail Park and the Hull Arena;
- City centre shopping and commercial areas in the Prince's Quay area, including the Princes Quay Shopping Centre;
- The Humber Marina area with nearby residential areas;
- The mixed residential, shopping and commercial area to the east of Prince's Quay, including the indoor market;
- The commercial and tourist attractions adjoining the River Humber including The Deep; and
- Marina Court commercial development area.

Desire Lines

13.3.13. Being in a busy city centre, desire lines are not clearly defined due to the multitude of pedestrian routes approaching both sides of the A63 from trip generators. The present formal crossing locations on the A63 would dictate the pedestrian routes currently chosen on the approach to the A63.

13.3.14. The higher pedestrian usage at certain existing crossing points suggests that the routes approaching the crossings at Mytongate, Prince's Dock, Market Place and High Street are linked to the main desire lines. The main desire lines would appear to be:

- Along the A63 itself - Along the whole scheme length using either the north or south footways;
- Commercial Road - Between the Mytongate crossings towards Albert Dock;
- Ferensway - Between the Mytongate crossings and the Paragon Interchange and city centre;
- Waterhouse Lane - Between the Mytongate crossings and the city centre
- Prince's Dock Street and Humber Dock Street - Linking the mixture of residential, leisure and commercial properties around the Marina with the city centre shopping areas;

- Queen Street and Market Place - Linking the mixture of residential and commercial properties in the southern area of the old town with the city centre; and
- High Street - Providing an alternative route to that on Queen Street and Market Place.

13.3.15. Pedestrians travelling between Kingston Retail Park and the city centre shopping areas/Paragon Interchange would presumably use the Ferensway and Waterhouse Lane routes.

13.3.16. Other pedestrian desire lines, possibly more lightly used, appear to include:

- Porter Street and St James Street - Between the residential areas north of the A63 and the residential/commercial area to the south
- Railway Street - Providing an alternative route to Humber Dock Street and Commercial Road towards the city centre at Prince's Quay

13.3.17. Future housing and renewal developments envisaged in the adopted Newington and St Andrew's Area Action Plan (2010) would be expected to generate additional pedestrian and cycle flows to and from the areas south of the A63. Although no details of expected flows are presently available it seems likely that additional pedestrians trips would be generated along the principal routes on Railway Street, Humber Dock Street and Queen Street which link with the city centre.

Vehicle Travellers

Traveller Care

13.3.18. The main users of the existing travel network at the A63 are vehicle travellers.

13.3.19. The en-route facilities for road users are limited to standard directional road signage. There are footways on both sides of the A63 except on the south side between St James Street and Spruce Road which has a grassed verge. There is a shared pedestrian and cycle route on the north side of Hessle Road and further shared pedestrian and cycle routes are provided on the northeast, southeast and southwest sides of the Mytongate Junction. There are several designated at-grade crossing points along the A63.

View from the Road

13.3.20. Vehicle travellers presently experience views into the surrounding urban areas whilst travelling along the scheme corridor. At the western end of the study area between Porter Street and Mytongate Junction the road lies at existing ground level, channelled through the surrounding townscape.

13.3.21. Views are possible to the north of the A63 into the mixed scale residential areas between the verge-side trees. Views to the south of the A63 are intermittent and restricted by verge-side screening vegetation into the light industrial. On the approach to Mytongate Junction views are possible to the south into the Kingston Retail Park area. The alignment of the carriageway through Mytongate Junction prevents distant views along the carriageway for both westbound and eastbound.

13.3.22. At Mytongate Junction views are restricted, north towards Ferensway and south down Commercial Road by the two wedges of vegetation growing on either side of the throughabout. Views are also restricted by the large number of road signs and barriers in this cluttered area.

13.3.23. Between Mytongate Junction and the Prince's/Humber Dock there are open views south of the road towards the large mature trees within Trinity Burial. There are also open views to the north of the carriageway into the retail and derelict areas around Myton Street. The listed Castle Buildings and Earl de Grey Pub are prominent alongside the A63 in what is otherwise an ordinary area of townscape quality.

13.3.24. Between Prince's Dock and Humber Dock the road is located in slight cutting providing a restricted view to the dock areas either side of the carriageway. The red brick listed Warehouse No. 6 to the north of the carriageway by Prince's Dock Street is a prominent feature.

13.3.25. Between Prince's Dock Street and Fish Street the road is at ground level and channelled between the surrounding good quality residential and office developments restricting views to along the road corridor only. The residential areas north of the carriageway form a uniform appearance allowing only glimpsed views north along the side roads that link into Castle Street. This contrasts with the open and partly derelict areas to the south of the carriageway around Finkle Street. Views south are partially screened by a brick wall but it is still possible to see the upper areas of the Fruit Market warehouses beyond.

13.3.26. At the Junction between Market Place and Queen Street the built areas alongside the road open out allowing open views north along Market Place towards the listed King William III statue and south along Queen Street towards the warehouses of the Fruit Market. When travelling east it is possible to see the road rising up towards the Myton swing bridge. When travelling west views are channelled along the A63 corridor to the docks and over to the derelict Fruit Market areas.

13.3.27. The elevated section of Myton swing bridge provides extensive open views over the flat city centre. Views are possible north along the River Hull corridor and northwest towards the tower of Trinity Church. Open views are possible south towards 'The Deep' and the River Hull tidal barrier and to the Fruit Market area to the southwest.

Driver Stress

13.3.28. The current traffic flows high along the Castle Street stretch of the A63 and the presence of signalised junctions at both Mytongate and Market Place reduced ability of the A63 to cope with the high traffic flows leading to low traffic speeds, congestion and poor journey time reliability. This contributes to driver frustration.

13.3.29. At present the Mytongate Junction and its approaches are likely to cause driver stress and uncertainty as a result of the layout of the junction, the low traffic speeds in relation to the design speed of the approach roads, the amount of congestion particularly during peak periods and the difficulty in entering the circulatory flow on the roundabout. Drivers approaching the junction from the west and wishing to turn right onto Commercial Road are required to enter the left hand lane on approach to the junction, and go around the roundabout. No right hand turn is possible from the main A63 carriageway. This may cause confusion and stress to drivers not familiar with the junction. There is also the potential for accidents with drivers attempting to change lanes at the 'last minute'.

13.3.30. Drivers faced with the difficulty of merging with the circulatory traffic on the roundabout are likely to fear a potential accident. This fear may be worsened by potential contact with pedestrians.

13.3.31. There are a number of side road junctions and intersections which may also contribute to frustration through vehicles leaving and joining the main route including the presence of slower moving vehicles.

13.3.32. The extensive lengths of footpaths and cycleways together with a number of 'at-grade' designated crossing points along the A63, could potentially bring vehicle travellers and pedestrians into conflict; thus contributing to the fear of potential accidents. The changing of pedestrian crossing lights also results in an interruption in the flow of traffic adding to driver frustration.

13.3.33. The A63 is the designated strategic route to the Port of Hull for HGVs, and almost all port traffic passes along the A63 at this location. As a result the traffic on the A63 contains a significant proportion of HGV traffic, typically around 10% to 15%, which can result in stress for some vehicular travellers.

13.3.34. Accident records for a five year period (2005-2009) were obtained for the study area as part of the EAR (PF, 2010a). These records show that during the five year period there were 553 Personal Injury Accidents (PIAs) within the confines of the study area; 13.4% of these were KSI (Killed or Seriously Injured) accidents.

13.4. VALUE OF THE ENVIRONMENTAL RESOURCES AND RECEPTORS

Pedestrians, Cyclists and Equestrians

Rights of Way - Pedestrian Flows

13.4.1. Pedestrian movement counts were carried out in March and May 2004. The pedestrian movements were observed during a 12-hour period between 07:00 and 19:00 on a weekday. The counts at the two sites at Prince's Dock Street were also extended to midnight to observe the pedestrian movements from the city centre to and from the recreational areas at the waterfront area to the south.

13.4.2. Further counts at the previous survey locations were undertaken in July 2009. The pedestrian movements were again observed during a 12-hour period between 07:00 and 19:00 on a weekday. Given the low number of pedestrians (i.e. less than 23 per hour) previously observed between 19:00 and midnight, no extended surveying was undertaken.

13.4.3. The following sites along the A63 were included in the pedestrian count and are listed below, together with the total two-way pedestrian flow between 07:00 and 19:00:-

Table 13.1: Summary of Pedestrian Numbers Observed During 2004 and 2009 Surveys

Crossing Point	2004 12-hr total (no pedestrians)	2009 12-hr total (no pedestrians)	Change in pedestrian Nos.
Porter Street Crossing	190	188	-2
Spruce Road Crossing	16	18	+2
Mytongate West Crossing	1229	1133	-96
Mytongate East Crossing	531	612	+81
Prince's Dock West Crossing	798	891	+93
Prince's Dock East Crossing	892	1067	+175
Market Place West Crossing	442	974	+532
Commercial Road	-	678	-
Ferensway	-	1090	-

13.4.4. The surveys undertaken to date are all weekday surveys. Professional experience and information from HCC would indicate that these are the busiest times for crossing use for the scheme.

Rights of Way - Cycle Flows

13.4.5. A survey of pedal cycle movements was originally carried out in March 2004. The pedal cycle movement counts were undertaken during a 12-hour period between 07:00 and 19:00 on a weekday.

13.4.6. The survey included the following sites along the A63:

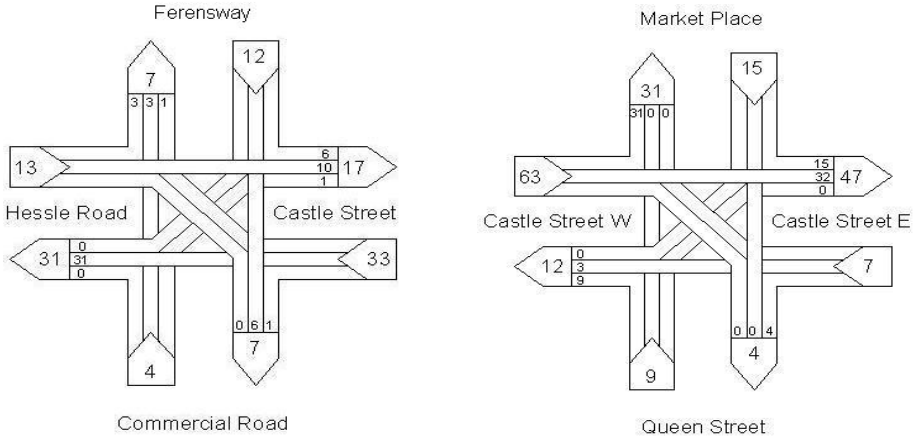
- Mytongate Junction
- Myton Street
- Humber Dock Street
- Dagger Lane
- Fish Street
- Vicar lane
- Prince's Dock Street
- Market Place Junction

13.4.7. The numbers of movements to/from the side roads adjoining the A63 between the junctions at Mytongate and Market Place were very small, with the largest being at Prince's Dock Street where four cyclists left the A63 and six joined.

13.4.8. Further surveys of cyclists were undertaken at Mytongate Junction and Market Place in 2008 as part of the traffic survey. No additional counts were undertaken for the local access roads due to the very small number of cyclist previously noted (i.e. less than 6).

13.4.9. Figure 13.1 below indicates diagrammatical representation of the 2008 total movements over a 12-hour period at both junctions.

Figure 13.1 Cycle flows at Mytongate and Market Place junctions



13.4.10. No data is available on the use of the designated cycle routes.

Future Potential

13.4.11. HCC is currently preparing new local plan documents which will include a Core Strategy, Site Allocations document and Area Action Plans. Although these have yet to be finalised previous Masterplan and planning documents envisaged significant changes to areas around the scheme corridor that could generate additional pedestrian and cycle traffic. Such documents include the adopted HCC Newington and St Andrew's Area Action Plan (2010) and saved Urban Regeneration policies within the 2000 adopted HCC Local Plan

13.4.12. The changes south of the A63 at Humber Quays and The Fruit Market Area would be likely to have the greatest effect on pedestrians and cyclists crossing the A63 given that there are proposals for significant new office, retail, leisure and residential developments; including 450 dwellings at Humber Quays at The Fruit Market Area. The timescale for development of these areas is undefined however, development at Humber Quays has begun and the Fruit Market Area is

already becoming known as a place for cultural and creative activity in advance of the longer term mixed use cultural and creative based regeneration.

Vehicle Travellers

Traveller Care

13.4.13. The value of traveller Care Facilities relates to the frequency, standard and availability of such facilities to all travellers.

13.4.14. There are no existing facilities (fuel, rest areas, food etc) present along the short length of Castle Street. Given the urban nature of the study area and the short length of the scheme this is not considered to be an issue.

Driver Stress

13.4.15. The A63 Castle Street is a vital link between the M62 motorway, as well as the Humber Bridge and A15, to the west of the city and the Port of Hull to the east of the city. It is a key route of both local and strategic importance and is part of the E20 Trans European Route. The dual carriageway forms part of a dense urban network characterised by single carriageway roads with frequent junctions. The HA Traffic Information Database TRADS shows AM peak flows of 1,115 flow units per hour per lane eastbound. In accordance with DMRB, this equates to High levels of driver stress on the A63.

13.5. POTENTIAL EFFECTS

Pedestrians and Cyclists

13.5.1. The A63 crossing provisions are generally located on or close to the main desire lines and all, except for Spruce Road, are signal controlled. The A63 crossing locations, together with the associated junctions at Mytongate and Market Place, constitute the principal conflict points between pedestrians and cyclists with motorised vehicles.

13.5.2. As part of the proposed scheme the four existing at-grade signalised crossings at Porter Street, Princes Dock West, Humber Dock Street and Market Place would be closed and replaced with three footbridges. The existing crossings at Prince Dock West and Humber Dock Street would be replaced by a single footbridge adjacent to the Ask restaurant on Princes Street. This would eliminate the conflict between pedestrians and vehicles, creating a safer route and resulting in a Beneficial change to amenity. However, the provision of a footbridge in place

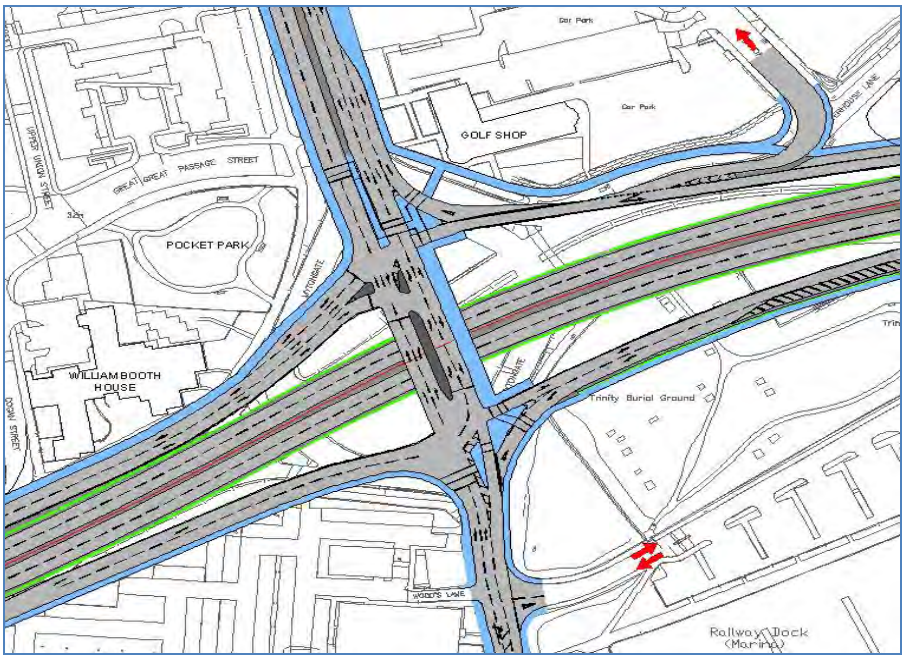
of the existing at-grade signalised crossing may increase journey times slightly for pedestrians and particularly for vulnerable users requiring physical assistance. However, for the majority of users a potential increase in journey time would be negligible, increasing to Slight Adverse for vulnerable users.

13.5.3. The existing uncontrolled at-grade crossing at Spruce Road would be closed on safety grounds. Pedestrians currently using this crossing would need to divert to the new footbridge at Porter Street or the remodelled Mytongate Junction, a detour of between 215m and 250m. Although an increase in journey time would result, pedestrian counts at Spruce Road in 2008 were low. Therefore, due to potentially low pedestrian use and the improved safety of the new crossings the Scheme would result in an overall Slight Beneficial effect at Spruce Road.

13.5.4. The new grade separate junction at Mytongate would provide alternative at-grade crossing facilities, see Figure 13.2.

13.5.5. Pedestrians and cyclists would cross over the A63 via shared wide footway on the east side of Ferensway/Commercial Road. This would offer scope to enhance the amenity of the journey through this junction. Pedestrians and cyclists would need to cross the eastern slip roads of the A63 which would be signalised. The current uncontrolled crossings on Ferensway and Commercial Road would be replaced by signalised crossings forming part of the junction, making it safer for pedestrians to cross these busy side roads resulting in a Beneficial effect.

Figure 13.2: Proposed Layout of Mytongate Junction Showing the Cycleways and Footpaths in Blue



13.5.6. The Scheme would result in a neutral effect on Public Rights of Way. In addition High Street (E8) would provide a suitable alternative route for pedestrians and cyclists affected by the changes proposed at the Market Place junction.

13.5.7. The cycleway to the north of the A63 would be affected by the Preferred Route, however as a minimum the proposed scheme would replace the cycleway. Therefore resulting in no change to existing facilities and a Neutral effect. However, there remains an opportunity to consider the enhancement and extension of cycle facilities during the preliminary design which would result in a Beneficial effect on amenity. The cycle routes through quiet streets and traffic calmed areas would not be affected by the proposed scheme.

Vehicle Travellers

Traveller Care

13.5.8. Changes to en-route facilities would include revised or additional directional signs to reinforce the new road layout, in particular the restricted access to Waverley Street, Waterhouse Lane and Princess Dock Street resulting in a potentially Beneficial effect.

View from the Road

13.5.9. The re-modelling of the Mytongate Junction and lowering of the A63 as it passes through Mytongate Junction, would alter the view from the road for vehicle travellers for a short section of carriageway. Vehicle traveller views on the lowered section of the A63 would be 'worse' as the carriageway would be in a cutting whereas those travelling on the slightly raised Mytongate Junction would be neutral, potentially better due to a raise in the carriageway of 1m.,

13.5.10. The Scheme would also result in the introduction of new infrastructure, for example new footbridges, at Porter Street, Princess Quay and Market Place. However, which would potentially result in 'worse' views, however such changes would be set within an existing road corridor and may therefore reduce to 'Neutral'.

Driver Stress

13.5.11. The DMRB significance criterion for driver stress relates to an 'open road' scenario where consistent traffic flows and speeds exist over at least a one kilometre length of route and hence is not applicable to this proposed improvement scheme.

13.5.12. The risk of pedestrians crossing the present highway and the proportion of heavy goods vehicles are contributory factors to present driver stress. Provision of footbridges would remove the conflict between pedestrians and vehicles reducing driver stress resulting in a Slight to Moderate Beneficial effect.

13.5.13. A short term increase in driver stress is likely during the construction stage where uncertainty and unfamiliarity of layout changes would be contributory factors. Traffic management during construction may also lead to a short term increase in congestion and thus raise driver stress. However this increase in driver stress would be temporary; reducing to Neutral once the scheme opens and drivers become familiar with the new layout.

13.6. PROPOSED LEVEL AND SCOPE OF ASSESSMENT

13.6.1. It is proposed that the Effect on All Travellers assessment is taken forward to Detailed Assessment level. This is due to potential beneficial effects resulting from a reduction in driver stress and improvements to Pedestrian and Cyclist amenity,

13.6.2. The scope of the assessment should continue to consider the following topic areas.

- Pedestrians and Cyclists: including journey length, amenity and severance; and
- Vehicle travellers: including Traveller Care, View from the Road and Driver Stress.

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13.6.1. As part of the further assessment a Traffic Survey Report and Forecast Report will be undertaken for the Scheme. The results of this assessment will inform elements of the detailed Effects on Travellers assessment.

13.7. PROPOSED METHODOLOGY INCLUDING SIGNIFICANCE

13.7.1. The method of assessment will be reviewed following publication of new DMRB guidance on this topic, if it becomes available prior to completion of the assessment. However, in the absence of this specific guidance it is proposed that a Detailed (Stage 3) assessment be undertaken in accordance with DMRB Volume 11 (HA, 1993d, 1993e). The assessment would consider pedestrians, cyclists and vehicle travellers.

13.7.2. The Detailed Assessment will report the potential significance of environmental effects using established significance criteria outlined in Tables 2.1 to 2.4 contained in HA 205/08 (HA, 2008b). This requires an assessment of the receptor or resource environmental value (or sensitivity) and the magnitude of project impact (change). The magnitude of impact and environmental value "scores" are combined to determine the likely significance of the environmental effect. The approach to assigning significance of effect relies on reasoned argument, professional judgement and taking on board the advice and views of appropriate organisations.

13.7.3. The Webtag Journey Ambience Sub-Objective guidance (Tag Unit 3.3.13) which includes an assessment of Traveller Care would also be included (Department for Transport, 2003).

13.8. CONCLUSIONS

13.8.1. It is proposed that the DMRB Effect on All Travellers assessment is undertaken at the Detailed (Stage 3) Assessment level. This is due to potential significant beneficial effects resulting from a reduction in driver stress and improvements to Pedestrian and Cyclist amenity.

14. COMMUNITY AND PRIVATE ASSETS

14.1. INTRODUCTION

14.1.1. Community and Private Assets is identified as a DMRB Topic within Interim Advice Note 125/09 Supplementary guidance for users of DMRB Volume 11 'Environmental Assessment'. However, the guidance contained within Volume 11, Section 3 has not yet been updated. As a result, the Community and Private Assets assessment incorporates two of the "old" DMRB Topics. These are:

- Volume 11, Section 3, Part 6 Land Use; and,
- Volume 11, Section 3, Part 8: Pedestrians, Cyclists and Community Effects (Community Effects element only; the assessment of pedestrians, cyclists and equestrians is to be included within the Effects on All Travellers Chapter of the Environmental Statement).

14.1.2. The overall approach for the assessment of Community and Private Assets is to examine the existing land use pattern, assess the areas of land lost and the resultant effect on land use. In addition, access to community facilities, services, employment and other key destinations and residential amenity will be considered.

14.2. STUDY AREA

14.2.1. For land use, the study area will extend to 200m from the scheme boundary. This is considered adequate for an urban area. Given the urban nature of the scheme, Agricultural Land was scoped out in the EAR (PF, 2010a) and will not be considered further.

14.2.2. DMRB does not define a set study area for community effects. Instead, using professional judgement and knowledge of the scheme, a buffer of 250m from the Scheme is considered suitable. This will encompass potential community facilities in the vicinity of the A63 and any desire lines associated with them.

14.2.3. National, regional and local polices and plans which are relevant to the Scheme and Community and Private Assets are also considered in this chapter.

14.3. EXISTING AND BASELINE KNOWLEDGE

Land Use

Private Property

14.3.1. Existing private property, community land and development was previously identified through site visits and desk based study in the EAR (PF, 2010a) and reviewed in 2013.

14.3.2. Due to the urban nature of the Scheme and the established patterns of development in the area there are a large number of residential dwellings located within the study area. The majority of residential dwellings are concentrated in an area on the north side of the A63; to the west of Mytongate Junction and to the east of Princes Quay. The property ranges from medium to high density consisting of a mixture of house types and flats in both public and private ownership.

14.3.3. The layout of the adjacent residential areas is influenced by the alignment of the road corridor through the urban centre which may also impact the amenity of the residential areas and tends to form a 'block' pattern with continuous frontages following the local road layouts.

14.3.4. Within the study area there is also a large range of typical urban land uses including employment and retail properties of various sizes from small to very large scale. A large retail park development, 'Kingston Park', is found to the south west of Mytongate Junction. Further retail areas are found to the north east of the junction extending north in the city centre and east towards Princes Quay shopping centre. There is also a mixture of leisure and recreation assets within the project area which support the existing community and the tourism sector of the local economy, uses include such sites as the Humber Dock Marina and a number of eating and drinking establishments which provide community facilities and places for meeting and social interaction.

Community Land

14.3.5. There are a variety of different community land uses within the study area including; two pocket parks fronting the A63 and Trinity Burial Ground (an Urban Greenspace) which borders Mytongate Junction. Other areas of community open space include the three docks; Prince's, Humber and Railway and the pedestrianised areas surrounding them.

14.3.6. Where community land has a wider heritage, ecological or townscape value this aspect is dealt with in detail in the respective sections of this report.

Land Allocated for Development

14.3.7. The HCC Core Strategy was withdrawn in December 2012 in light of recommendations received from the Planning Inspector. A strategic policies document is now proposed to replace the withdrawn Core Strategy which will form an important part of a Local Plan as required by the new National Planning Policy Framework (NPPF).

14.3.8. In the interim the route is highlighted within the HCC's adopted Local Plan as 'Castle Street Scheme'. Saved Policy M18 states that Castle Street is allocated as 'a new road and widening scheme' and that the land required for this will be protected from other development.

14.3.9. The CCAA (published by HCC in February 2009) included both the Fruit Market and Quay West as SDA's, both of which lie within the study area. However, on 15 July 2010 the CCAAP was formally withdrawn due to the continuing impact of the recession and as a result the document no longer forms part of Hull's local development scheme. Nevertheless, both sites, together with Humber Quays, were identified as large scale development opportunities within the recently withdrawn Core Strategy. This would suggest that these sites are likely to continue to remain important areas of potential future development.

14.3.10. The Fruit Market lies close to the Marina; one of Hull's key tourist attractions. HCC's long term aim for this site is to establish a mixed use cultural and creative based regeneration scheme. However as a medium term measure, this former home of the city's fruit trade is already becoming known as a place for cultural and creative activity.

14.3.11. Quay West is a retail led development to extend the existing Princes Quay shopping centre out to the west, transforming a large area of the city and centre substantially improving the city's retail offer. Although outline planning permission was granted in 2007, a change in ownership of Princes Quay saw the extension of the shopping centre shelved in 2010 with the new owners looking instead to improve and maximise the potential of the existing shopping centre. Long term, however, they were quoted as interested in compatible adjacent development but stated that this would be dependent on the wider economic circumstances. (Hull Daily Mail, 2010)

Community Effects

14.3.12. The proposed scheme is located within Hull city centre and by its nature the area surrounding the route of the A63 will typically contain local amenities including shops, public houses, schools, church, doctors and public parks.

14.3.13. Several schools and tertiary education facilities are located within the vicinity of the scheme, including:

- Adelaide Primary School
- Victoria Dock Primary School
- Hull Trinity House
- University of Humberside – School of Arts
- Goodwin Research Centre
- Children's Centre

14.3.14. Being a city centre there are retail facilities present to either side of the A63 Castle Street. Kingston Retail Park, located immediately south west of the junction at Mytongate, is the main retail area present to the south of the A63.

14.3.15. To the north of the A63 lies the city centre of Hull. There are two main shopping complexes to the north, Princes Quay Shopping centre, which is situated within Prince's Dock, and Paragon Shopping centre which is located off Ferensway, immediately north of the railway station.

14.3.16. There are a number of public houses present both within the city centre to the north of the A63 and within the Fish Market area to the south of the A63, with one, the Whittington and Cat, located on Commercial Road next to Kingston Retail Park.

14.3.17. There are four churches present in the study area. These include Holy Trinity Church, St Mary's Church, St Nicholas Parish Church and SA Citadel, all of which are located to the north of the A63.

14.3.18. There is one care home, St James Care Home, present in close proximity to the site; it lies approximately 120m north of the junction of the A63 with Porter Street. Hull Royal Infirmary is located over 800m north west of the site.

14.3.19. There are six main recreational areas located in the vicinity of the site. These are Hull Arena (ice rink) located approximately 200m south of Mytongate junction, Trinity Burial Ground (Green Open space) located in the south east quadrant of Mytongate Junction, Pocket Park located in the north west quadrant of Mytongate Junction, Humber Dock located immediately south of the site and the Deep which is located on the eastern bank of the River Hull, approximately 100m from the edge of the site.

14.3.20. Typically desire lines in a busy city centre, to and from community facilities, are not clearly defined due to the multitude of pedestrian and cyclist routes present in within the city centre. However there are a number of existing rights of way which run alongside and cross the A63 within the vicinity of the study area, full details of the existing rights of way are given in Section 13.3 of this report. The present formal crossing locations on the A63 currently dictate the pedestrian routes chosen to move between communities facilities on opposite sides of the A63 and will influence future provision. New footbridges are, therefore, proposed at Porter Street, Princess Dock and Market Place in addition to the crossing point included in the new Mytongate Junction to support and maintain the existing 'desire lines' and permeable route networks that have developed over time.

Policies and Plans

14.3.21. The Local Plan Adopted May advises in Para 2.31 that 'many areas of the city suffer from congestion, traffic danger and a degraded environment' and in Para 2.62 it advises that 'Improving the transport system should assist urban regeneration, encourage investment, enhance the environment and improve mobility for all sections of the community', and that 'Improvements to the main trunk and principal road networks are supported'. Community needs are recognised in the plan in Para 2.71 the City Council recognise the problems of the city and its particular urban problems and the needs to develop partnerships with local people, employers, voluntary and statutory organisations.

14.3.22. The Hull Local Plan sets out its strategy "*to maintain and improve the range and accessibility of community facilities*". It delineates a list of planning policies that seek to protect, enhance and encourage the provision of 'community facilities' which is advise include '*education, health, indoor sport, recreation and leisure and voluntary, religious, utility, emergency and advice facilities*'. The policies generally cover developments coming within the generic descriptions of Use Classes C2 Residential Institutions, D1 Non Residential Institutions and D2

Assembly and Leisure of the Use Classes Order together with a number of community Sui Generis Uses.

14.4. VALUE OF THE ENVIRONMENTAL RESOURCES AND RECEPTORS

14.4.1. Within the city centre of Hull numerous community facilitates are present to both the north and south of the improvement scheme.

14.4.2. The existing severance between Hull City centre to the north of the road and the waterfront area to the south of the road potentially affects the use, and hence value, of community facilities.

14.4.3. Potentially valuable development land is located to the west of Princess Quay shopping centre and would be directly affected by the scheme; the two Grade II listed buildings, the 'Castle Buildings' and the 'Earl de Grey Public House' would need to be demolished if the scheme was to proceed adjacent to the site of the currently stalled Quay West redevelopment (which was previously granted outline planning permission).

14.4.4. Development land is also present to the south east of Castle Street in the Fish Market area. This land has the potential to be indirectly affected by the scheme.

14.5. POTENTIAL EFFECTS

Land Use

Private Property

14.5.1. The scheme would result in the demolition of the Grade II Listed 'Castle Buildings' and 'Earl de Grey Public House'. These buildings which are currently derelict, front Castle Street on its northern side to the east of Mytongate Junction. The demolition of these buildings are assessed in terms of their historic and landscape values in Chapters 7 and 8 respectively. In terms of Community Effects the Scheme would potentially result in an adverse effect on private property.

14.5.2. The Waverley Street and Spruce Road access onto the A63, which provides access to Arco and Kingston Retail Park, would be closed and a new access is proposed from St James Square through a current industrial office unit, owned by Arco, on the corner of St James Street and St James Square. At this stage

the new access results in the loss of the car park to the building but does not impact directly on the building structure resulting in a potentially Adverse effect.

Community Land

14.5.3. The southeastern boundary of the pocket park, located between the A63 and William Street to the west of Mytongate Junction, that fronts the A63 would be lost to the proposed alignment resulting in a potentially Adverse impact on Community Land. The park provides an area of public open space within the surrounding housing areas however it is not allocated as a public open space in the HCC Local Plan. In addition, previous site observations of the use of the park noted that the park has a low number of users, approximately less than ten users per day.

14.5.4. The scheme alignment would result in the loss of the north and north-western areas of Trinity Burial Ground reducing its total area by approximately one third. Although the area is presently used as a public open space the area of burial ground to be impacted by the scheme corridor is classified as highway development land within the HCC Local Plan. Nevertheless this would potentially result in an effect on Community Land.

14.5.5. The Grade II Listed north wall to Humber Dock would be impacted upon due to the alignment of the scheme options. The wall would be demolished and constructed approximately 15m south into the dock between the western and eastern walls (approximately 1800m^2 of the dock area would be lost) resulting in a potentially Adverse effect.

Land Allocated for Development

14.5.6. The proposed footbridge at Market Place would impact on a small area of development land to the south of the A63 which lies within the Fish Market SDA potentially resulting in a Negligible effect.

Community Effects

14.5.7. The presence of the A63 is already considered to create severance between facilities in the city centre and those in the waterfront area. The EAR (PF, 2010a) confirmed that the scheme would have no direct impact on any of the community facilities identified. The Scheme does however, have the potential to result in significant improved access to employment, facilities and services for the community as a whole rather than a discrete section of it or, individuals

through the anticipated reduction of journey times. This would result in a relief of severance with a potentially significant overall Beneficial impact on the wider community.

14.5.8. Key crossing points have been identified in five locations within the scheme at Porter Street, Mytongate Junction, outside Princes Shopping Centre, Humber Dock Street and Market Place.

14.5.9. At Mytongate junction new 'at-grade' crossings would be provided. Three footbridges would be provided in place of the remaining four 'at-grade' crossings. The design of the new footbridges would need to ensure that the amenity value of the crossings is not impacted upon and that diversions from the crossings near Princes Quay are minimised.

Policies and Plans

14.5.10. The aims of the project are to reduce congestion on A63 Castle Street, which is the key access route to the Port of Hull, improve journey times and accessibility to the docks, improve safety and reduce severance. Reducing congestion and reducing severance are also key ambitions in terms of planning and regeneration policy. Therefore the regeneration aims for Hull are inextricably linked with and reflected in the transport policies relevant to this road scheme. While transport and regeneration policies are considered separately there is considerable overlap which is reflected in the objectives of both sets of policies and the key priorities set out in the relevant development plans to facilitate development and aid regeneration.

14.5.11. The A63 Castle Street is a Strategic Transport Corridor in the Yorkshire and the Humber region and also an internationally important route to the Port of Hull and onward to Europe. The roadline is also protected and promoted in the Local Plan; therefore the option is supported in terms of planning policy in relation to transport at all levels. This includes the community benefit derived from a balanced transport system and the access it provides to community and private assets. The policies of the local plan are indicative of the inclusive nature of the 'community' interests potentially affected by the proposed improvements to the A63. The Local Plan deals with transport and access under the 'Movement' section and a number of policies are considered pertinent to this section of the assessment including Policy M1 which encourages a balanced transport system promoting walking and cycling, M5 improvements to the city centre public

transport interchanges, M9 improving facilities for cyclists and pedestrians and M11 deals with the design of such facilities.

14.5.12. All of the planning and related policy documents recognise the poor economic situation of the City of Hull. Multiple deprivation is marked in Hull. A key element of addressing this is considered to be improved access to the Port of Hull, which requires improvements to A63 Castle Street. It is widely considered that these improvements will support a step change in the economic fortunes of the City and will facilitate redevelopment and is considered to consist of an 'enabling' development. Therefore the option is supported in terms of planning policy in relation to economic regeneration.

14.6. PROPOSED LEVEL AND SCOPE OF ASSESSMENT

14.6.1. It is proposed that the Community and Private Effects assessment is taken forward to Detailed Assessment level. This is due to potential adverse and beneficial effects resulting from the loss of private property and community land together with potentially significant improvements to community severance as well as wider economic benefits,

14.6.2. In accordance with DMRB Volume 11, Section 3, Part 6 (HA, 2001b) and Volume 11, Section 3, Part 8 the assessment will look at the following recommended aspects to enable an assessment of the impacts of the scheme to be undertaken:

- Demolition of private property and associated land take;
- Loss of land used by the community;
- Effects on development land; and,
- Community severance.

14.6.3. In addition, an analysis of impacts on local socio-economic conditions, such as employment, the labour market and deprivation, and receptors, primarily local residents and businesses will also be undertaken. Socio-economic / community receptors are individuals, groups or entities whose access to, and control over, socioeconomic and community assets, resources and opportunities may be affected by the project. In terms of this scheme, receptors include existing and potential local businesses, employees and job-seekers, local residents and users of community facilities. Resources could be commercial, residential and recreational. Examples include:

- Local business customer bases and growth opportunities,
- Employment and training opportunities; and,
- Community facilities and services, including for example public transport, healthcare, education, retail outlets, recreational and leisure, religious etc.

14.6.4. Impacts and effects relating to other environmental topics such as noise, visual amenity, traffic and air quality will be addressed in the respective topic-specific chapters of this EIA. Issues will only be raised in the socio-economic / community assessment if there is a particular effect which is likely to be realised above and beyond the impacts identified in the topic specific chapters or where effects combine so as to affect amenity value of properties, community infrastructure or private assets. This will avoid double counting of significant effects.

14.6.5. Only limited consultation with local land and property owners potentially affected by the scheme has been carried out to date. Consultation would be undertaken with affected landowners to discuss any potential issues, constraints and opportunities and mitigation.

14.7. PROPOSED METHODOLOGY INCLUDING SIGNIFICANCE

14.7.1. The method of assessment will be reviewed following publication of new DMRB guidance on this topic, if it becomes available prior to completion of the assessment. However, in the absence of this specific guidance it is proposed that a Detailed (Stage 3) assessment be undertaken in accordance with DMRB Volume 11 Section 3 specific topic chapters for Land Use (HA, 2001b) and the Community Effects element of Volume 11, Section 3, Part 8: Pedestrians, Cyclists and Community Effects.

14.7.2. The Detailed Assessment will report the potential significance of environmental effects using established significance criteria outlined in Tables 2.1 to 2.4 contained in HA 205/08 (HA, 2008b). This requires an assessment of the receptor or resource environmental value (or sensitivity) and the magnitude of project impact (change). The magnitude of impact and environmental value “scores” are combined to determine the likely significance of the environmental effect. The approach to assigning significance of effect relies on reasoned argument, professional judgement and taking on board the advice and views of appropriate organisations.

14.8. CONCLUSIONS

14.8.1. It is proposed that the Community and Private Effects assessment is taken forward to DMRB Detailed (Stage 3) Assessment level. This is due to potential adverse and beneficial effects resulting from the loss of private property, the loss of community land and potentially significant improvements to community severance. In addition, it is noted that a key element of addressing multiple deprivation in Hull is considered to be improved access to the Port of Hull, which requires improvements to A63 Castle Street. The Scheme therefore has the potential to alter the economic fortunes of the city and facilitate redevelopment.

15. ROAD DRAINAGE AND THE WATER ENVIRONMENT

15.1. INTRODUCTION

15.1.1. This topic addresses the potential effects of construction and operation of the highway on the quality of surface water and groundwater, on water resources and on flood risk.

15.1.2. During construction, the principal risks to the water environment relate to suspended soils contained in runoff from the site, airborne dust and accidental spillage of fuel, oil or other chemicals used on site. Construction work can also create new pathways by which pollution can reach surface water or groundwater.

15.1.3. During operation, the principal areas of concern arise from pollutants washed from the road surface by rainwater draining from the site, and spillages of fuel or other contaminants as a result of road traffic accidents.

15.1.4. Creation of new highways can affect flood risk due to increased areas of impermeable surfaces (which increases the rate of run-off during rainfall), due to loss of floodplain capacity, or due to the obstruction of overland flows.

15.2. STUDY AREA

15.2.1. The study area, which encompasses the site of the A63 Castle Street Improvement Scheme project, is located within Hull city centre, North of the River Humber, close to the Humber Estuary and to the West of the River Hull. Previous studies and assessments, used the information within the EAR (PF, 2010a), and it was considered that a 500m wide zone either side of the section of Castle Street would provide a suitable study area. However, in line with the most recent flood modelling results available from the EA (River Humber flood modelling was completed in early 2013 and is expected to be published in April 2013), the extent of the study area, as well as the surface water catchment areas for any drainage intercepting points required for the detailed assessment has to be confirmed.

15.2.2. Similarly, for groundwater, the potential zone of impact during the construction and operation phases will need to be assessed.

15.3. EXISTING AND BASELINE KNOWLEDGE

Surface Water

15.3.1. The assessment undertaken for the EAR (PF, 2010a) identified two sensitive surface water features within the study area that have the potential to be either directly or indirectly affected by the Preferred Route. These are:

- The Humber Estuary, which is located between 250m and 500m south of the scheme and whose flows are subject to tidal flows; and
- The lower reach of the River Hull, which is present approximately 100m east of the site, at its convergence with the Humber Estuary. This stretch of the River Hull is also subject to tidal flow.

15.3.2. The Environment Agency's River Basin Management Plan (RBMP) for the Humber River Basin District describes the Humber Estuary as the largest in the United Kingdom, with a catchment draining a fifth of the area of England. The Humber Estuary is vital to the region's economy, particularly their contribution to the tourism and leisure industry and the ports, harbours, shipping and associated industries they support.

15.3.3. Data maps provided in the RBMP indicate that the Humber Estuary is failing to achieve a good chemical status but has the potential to achieve a moderate ecological status. The main pressures on the Humber Estuary are recognised as pollution from industrial discharges, nutrient and microbiological contamination from run-off and sewage.

15.3.4. For the River Hull, the RBMP indicates the current overall potential of the watercourse is Moderate. The biological potential is deemed moderate, while the chemical potential does not require assessment.

15.3.5. The EAR (PF, 2010a) noted that there are two surface water abstractions within 2km of the proposed scheme. Both of these relate to industrial processes. These are shown in Table 15.1.

Table 15.1 Surface Water Abstractions

Location (approx)	Use	Source	Distance and Direction	Operator
509400 430400	Industrial	River Hull	1929m north	Quibell & Son (Hull) Ltd
509900 430400	Industrial	River Hull	1930m north	Major & Company Ltd

15.3.6. The EAR (PF, 2010a) confirmed that there are no fisheries present on the stretch of the Humber under consideration.

15.3.7. From our investigations to date it would appear that all the highway drainage within the footprint of the scheme ultimately discharges into Yorkshire Water combined sewers. The combine sewer drains to Hull Wastewater Treatment Works not the Humber Estuary. Consequentially impacts from existing runoff are considered to be unlikely at present.

15.3.8. Liaison with the HA Managing Agents Contractor (MAC) confirms that the majority of storm water sewers in the study area are public sewers, however there may be small lengths of private highways drainage in some areas.

15.3.9. No details of existing drainage flow and capacities are currently available. It is believed that the majority of the existing highway drainage may discharge into Yorkshire Water sewers. Yorkshire Water has been contacted to obtain their current drainage details/drawings.

Groundwater

15.3.10. In the EAR (PF, 2010a) the drift in the study area was identified as comprising Unproductive Strata. These are drift deposits with low permeability that have negligible significance for water supply or river base flow.

15.3.11. Although the drift is classed as unproductive strata, it contains bands and lenses of more permeable, granular material. Moreover, the more cohesive drift close to ground level is desiccated and fissured in places, which suggests that groundwater movement within these deposits may occur.

15.3.12. The underlying solid geology (chalk) was identified as being classified as a Principal (formerly Major) Aquifer (strata that have a high intergranular and/or fracture permeability, meaning that they usually provide a high level of water

storage and may support water supply and/or river base flow on a strategic scale).

15.3.13. The EA's RBMP for the Humber River Basin District indicates that the site is underlain by the Hull and East Riding Chalk groundwater body, from which a significant proportion of Hull's drinking water is abstracted. The RBMP indicates that both the quantitative status and chemical status of this groundwater body are poor due to saline intrusion, and that the drinking water status is poor due to chemicals that could affect potable water supply.

15.3.14. EA online data maps indicate that the site lies within a Groundwater Drinking Water Protection Area (DrWPA) that is classed as being At Risk.

15.3.15. An Envirocheck report commissioned in January 2013 confirmed that there are no Source Protection Zones within the study area, and that the nearest is located around 4km to the north west of the scheme.

15.3.16. There is one licensed groundwater abstraction located approximately 240m south west of the proposed scheme and relates to the abstraction of industrial cooling water from the chalk by Smith and Nephew. A second licensed chalk abstraction is located 690m to the north west of the proposed scheme, which is operated by Hull Truck Enterprises for cooling.

15.3.17. The study area does not lie within an areas designated as a Nitrate Vulnerable Zone. However there is a Nitrate Vulnerable Zone present approximately 700-800m north of the proposed scheme.

15.3.18. Groundwater monitoring from the scheme's previous site investigation (AEG, 1994) and interpretive report (Acer, 2005), indicated that groundwater levels vary significantly (from 0.2m to 13.8m bgl) throughout the study area. However, groundwater levels were typically expected to be present within 1.5m and 4m of the ground surface.

15.3.19. Limited tidal monitoring during the site investigation demonstrated that groundwater within the chalk is affected by tidal levels with a time lag of between 40 and 60 minutes.

15.3.20. Aquifer units within the drift may be perched or may act as pathways, either for the lateral migration of near-surface groundwater or estuarine water, or for upwards leakage from the underlying chalk. Evidence from other major below-

ground construction projects in the area confirms the presence of multiple aquifer units.

Flood Risk

15.3.21. A FRA has been carried out for the scheme (PF, 2009c). The FRA confirmed that the proposed scheme lies within a Flood Zone 3a of the indicative flood plain.

15.3.22. The whole of the proposed scheme lies within a widespread area that is protected from inundation by the existing flood defences along the banks of the River Hull and the River Humber.

15.4. VALUE OF THE ENVIRONMENTAL RESOURCES AND RECEPTORS

15.4.1. The value of the water environment receptors identified within or close to the study area during the EAR (PF, 2010a) is included in Table 15.2. These values will be reviewed. The definitions of the Values of the Receptors are given in Tables 2.1 and 2.2, HA205/08 (DMRB Volume 11, Section 2 Part 5).

Table 15.2 Value of Receptors

Feature	Attribute	Value	
		Quality	Importance
Humber Estuary and Dock	Water Supply	Moderate	Medium
	Dilution of waste products	Moderate	Medium
	Biodiversity	High	High
	Recreation	Moderate	Medium
	Value to Economy	High	High
River Hull	Water Supply	Moderate	Low
	Dilution of waste products	Moderate	Low
	Biodiversity	Low	Low
	Recreation	Moderate	Medium
	Value to Economy	High	High
Floodplain	Conveyance of Flow	High	High
Groundwater, Principal Aquifer (Chalk)	Water Supply	Low	Low
	Dilution of waste products	Low	Low
	Biodiversity	Low	Low
	Recreation	Low	Low
	Value to Economy	High	High

15.5. POTENTIAL EFFECTS

15.5.1. The potential effects of the scheme proposals include the following:

- Damage to aquatic ecosystems due to pollution of watercourses and groundwater from mobilised suspended solids, heavy metal contamination and spillages of fuel and oil during construction and operation;
- Effects on habitats associated with the Humber Estuary European protected sites.
- Potential for the pollution of watercourses and groundwater from accidental spillage of harmful chemicals and materials caused by road traffic accidents;
- Inundation due to high water levels from either the River Hull or Humber could result in site flooding due to the reduced levels through the cut at Mytongate Junction;

- Effects on property owners within or near the flood plain, who may become exposed to a new or increased risk of flooding due to changes in nature and extent of the floodplain in the areas of construction and operation.
- Effects on local structures, including property and infrastructure, due to subsidence arising from changes in groundwater level, for example due to dewatering during the construction phase, or groundwater flooding should the proposed scheme act as a groundwater dam.
- Effects on recreational users of the watercourses due to pollution during construction and/or operation.

15.6. PROPOSED LEVEL AND SCOPE OF ASSESSMENT

Flood Risk

History of Previous Work

15.6.1. In 2009, during the options appraisal stage of the project, the HAs Consultants prepared a Flood Risk Report in accordance with the requirements of PPS25, 'Development and Flood Risk', to provide an overall strategic review of the proposed works.

15.6.2. Exception test was applied at this stage of the planning process as required in Sections 18 to 20 of the Planning Policy Statement 25 (PPS 25). The FRA (PF, 2009) states that according to Table D.1 of (PPS 25) the site is located within Flood Zone 3a with an annual probability of tidal flooding of 1 in 200 or greater in any year. Essential infrastructure should only be permitted in this zone if the Exception Test is passed. For the Exception Test to be passed, certain conditions have to be met (refer to PPS25, D9). With reference to the findings of the FRA (PF, 2009) report, these conditions were met and the proposal passed the Exception Test.

15.6.3. The FRA Report (PF, 2009) concluded that the site is protected from flooding from the River Hull and River Humber by flood defences serving the City of Hull. The defences along River Humber protect the area against flooding for return period up to 1 in 200 years. These defences include River Hull tidal barrier. The defences along River Hull are designed to protect against a flood with a return period of 1 in 100 years and could be overtopped in the event of tidal gate falling to close. It is recommended in the Report that the scheme's highway drainage system is designed to current standards. It also states that emergency traffic

diversion and evacuation procedures including under flood conditions will be developed as the part of the detailed design of the scheme.

15.6.4. In their letter dated 12 May 2009 the EA states that they would object to the proposal to lower the existing level of A63 at Mytongate junction by approximately 7m stating an increase of flood risk would result from this proposal. Following the final issue of the FRA (PF, 2009), in their letter dated 06 Nov 2009, the EA stated they consider that the FRA was inadequate mainly due to the lack of detail for the Emergency procedures presented in the report. The EA requires a detailed Emergency Plan to be incorporated in the FRA report. In addition, during a meeting between the EA, PF and the HA on 18 Sep 2009, it was agreed that "once a preferred option is chosen an evaluation of the impact of potential changes to overland flow routes would be undertaken and appropriate mitigation measures proposed where required". It was also agreed that the "risk of flooding from breach of the permanent Humber defences would be considered as part of the assessment".

15.6.5. At the time of the EAR (PF, 2010a) there was limited information on the existing and proposed drainage and therefore a number of assumptions were made regarding the location of outfalls and receiving watercourses to undertake the quantitative assessment. A Detailed Assessment will be performed after obtaining the current drainage information.

Preliminary Consultations

15.6.6. A meeting was held with representatives of the EA on 18th January 2013. In this meeting the reasons for the EA objection to the FRA (PF 2009) were discussed. It was also agreed that in broad terms the FRA for the current stage of the project would use the latest EA modelling results and analyse their impact on the site. Several EA modelling scenarios would be considered and the scenarios to be used in the assessment will be agreed with the EA. It was also discussed that the EIA should look at all potential sources of water, including surface water which could end up in the drainage system, and design the system accordingly.

15.6.7. On 30 Jan 2013 a meeting was held with Steve Wragg – Flood Risk Planning Manager at HCC. He confirmed that the surface water flood risk is not considered to be high in the project scheme area. He also stated that the HCC's Surface Water Management Plan (SWMP) model and the model outputs are available to be used for the purpose of this FRA. It is understood that the EA's River Hull

model outputs will not be available until April 2013, and so in the interim HCC's model prepared for the Strategic Flood Risk Assessment (SFRA) could be used.

Scope of the Proposed Work

15.6.8. The proposed option for the development includes the underpass and as such a significant area of the road will drain down to the below ground area. The current proposal with respect to discharging surface water from the highway within the proposed scheme is to utilise existing outfalls where possible. The excess surface water from the underpass shall drain via a proposed pumping station and rising main with a direct outfall into River Humber. When undertaking the drainage analyses the interaction between the surface water runoff and the sewerage system should also to be considered, to ensure that the assessment is consistent with the recommendations in the SWMP guidance. The Detailed Assessment for Road Drainage will include the following scope of works:

- Survey of existing road drainage including location and construction of outfalls and their condition
- Undertake an assessment to ascertain the existing discharge rates from the existing highway drainage networks to each existing outfall. The proposed highway drainage networks discharge rates will be design to match or reduce the existing rate. Any additional discharge in excess of the existing will be diverted to the proposed pumping station network and ultimately into the River Humber.
- The underpass drainage system shall be designed to mitigate the impacts of flows flooding the underpass from storm events up to 1:100 yrs, including +20% allowances for climate change, ground water ingress and as agreed previously with the EA surface water storage shall be provided upstream of the pumping station to accommodate a 30 minute power outage at the pumping station. A desktop assessment will be undertaken to determine the flow rate for the required storm event and the size of the mitigation storage.
- Update of baseline information including recent abstraction licences, and surface water quality;
- Provision for dealing with pollution from accidental spillage/ road traffic accidents will be confirmed upon completion of the Environmental Statement.

- Undertaking of methods in accordance with DMRB Volume 11, Section 3, Part 10, HD 45/09 (HA, 2009b) using updated drainage information and Annual Average Daily Traffic flow data to establish potential impacts of the proposed scheme upon the Humber Estuary and the requirement for mitigation measures to adequately reduce the risk

Groundwater

15.6.9. Preliminary design work has shown that the excavations will not be self supporting and that it will be necessary to install piles to support the excavation sides. It is proposed to make use of secant pile walls that will extend into the top of the glacial till. The EAR (PF, 2010a) concluded that this method would eliminate groundwater ingress into the structure. The EAR also noted also that an earlier report showed, via the use of flow nets, that any water ingress during the construction and operation phases could be adequately dealt with using sump pumps, and that it was unlikely that there would be a significant effect on groundwater levels outside the excavation area.

15.6.10. Previous reports have assumed that the significant thickness of glacial till overlying the chalk will prevent upwards leakage from the chalk, which is sub-artesian in this area. However, evidence from other major below-ground construction projects in the area suggests that more permeable horizons within the drift associated with granular deposits and the differential groundwater heads between these can result in groundwater leakage and potential ground failure due to running sand under some conditions.

15.6.11. The more permeable horizons within the drift, particularly within the shallow, alluvial deposits may also act as pathways for the lateral migration of near-surface groundwater or estuarine waters.

15.6.12. High groundwater levels and potential upwards leakage from the underlying chalk is likely to require managing within excavations during construction through dewatering. Due consideration of potential groundwater contaminants which may be present as a result of land contamination will be required and shall be assessed as part of the planned intrusive investigations and follow-up monitoring.

15.6.13. The assessment will also consider whether the structure could potentially act as a groundwater dam, interrupting flow through more permeable horizons within the drift.

15.6.14. Both the construction and operation phases have the potential to impact on local groundwater levels outside the scheme

15.6.15. A detailed groundwater assessment will be carried out, which will take into account the findings of previous investigations as well as those of the site investigation, which is due to commence in May 2013. The site investigation will include construction of groundwater monitoring boreholes, groundwater level and quality monitoring, and implementation of a testing programme to measure aquifer parameters and to understand hydraulic relationships between the different aquifer units.

15.6.16. A numerical groundwater model will be developed to both inform the design and to assess the impact on groundwater receptors up- and down-gradient of the scheme, as well as the impact of mitigation measures.

15.6.17. The assessment will consider both groundwater level, flow and quality impacts taking into account the requirements of the Water Framework Directive. Consideration will be given to the potential volumes and water quality of pumped drainage during both the construction and operation phases.

15.6.18. It is not anticipated that pumped groundwater will be discharged to soakaway during either the construction or operation phases. Therefore assessments relating to these will not be undertaken. Issues regarding the quality of the discharged ground water during construction and operation of the scheme (in particular, potential mobilisation of contaminants during construction) will also be investigated and addressed with sustainable mitigation measures.

Tidal and Fluvial Flooding

15.6.19. A detailed FRA, will be carried out, to comply with PPS 25 (CLG, 2010b). The extent of the work involved at this stage of the project will be discussed and confirmed in consultations with the EA. The proposed detailed scope of work required for the FRA assessment is as follows:

- Undertake a detailed desk study using the most recent flood models and results obtained from the EA in order to assess the available range of flood scenarios and select the scenarios relevant for the purpose of this FRA. Consideration of joint tidal and fluvial probabilities will be required in this work. It is proposed that if the EA's River Hull model is not available for use at this stage of the project, then the outputs from the HCC's SWMP model

could be used. The scenarios to be considered will be discussed and confirmed with the EA and should include but should not be limited to the following cases:

- Flooding from River Humber - current case scenario, with flood defences in place, for events with selected range of recurrence intervals including the required allowance for climate change
- An extreme event case scenario with overtopping of the Humber flood defences (1 in 500 year/ 1 in 1000);
- A breach of the permanent Humber defences scenario.
- Scenarios with fluvial and tidal flooding from River Hull.

- Based on the topographic survey and detailed design of the future road levels and using the model input data provided by the EA, a scenario will be developed for the proposed road re-development case. This scenario will also be assessed for a range of different flood events.
- Following the flood modelling process the results from all scenarios will be compared and analysed. This will assist in determining the extent of flooding under different conditions. The flooding vulnerability of the scheme and the significance of the potential impacts can be ascertained through appropriate hazard/vulnerability mapping if so required. In case of flooding as a result of overtopping of the defence, the modelling will allow the analysis of water levels and velocities in the flooded areas, including inundation times.
- Undertake detailed analyses of potential changes to overland flow routes due to the construction of embankments. The scheme should be designed to take into account the existing flow routes. The extent of the existing surface water catchment draining to the proposed area will be determined utilising the sewer network and local integrated catchment modelling. Should the analyses indicate that new surface water flow path are created by the embankments, then the impact on the surrounding buildings and infrastructure will be considered and mitigation measures proposed.
- Once the extent of flooding for the different scenario cases is determined, an Emergency Procedure will be put in place to ensure that the underpass is evacuated well in advance of any flood events. The detailed flood analyses as described above will allow an estimate of the time for reaction (the time between the flood warning and actual flooding), and along with

flood warning procedures will assist in the preparation of the Emergency evacuation plan and traffic management plan.

15.7. PROPOSED METHODOLOGY INCLUDING SIGNIFICANCE

15.7.1. The proposed methodology for the Detailed Assessment will follow the methodology and guidance provided in DMRB Volume 11, Section 3, Part 10 (HA45/09) (HA, 2009b) for assessing the Significance of Effects of Road Schemes on Road Drainage and the Water Environment. The potential ecological impacts of routine runoff on surface waters will be assessed using the Highways Agency Water Risk Assessment Toll (HAWRAT).

15.7.2. No Q95 flow data is currently available for this stretch of the River Humber because it is tidally influenced. As a result, an assessment of pollution impacts from routine runoff cannot be fully undertaken. It is proposed that Step 1 of Method A is undertaken, for which Q95 data is not required.

15.7.3. No discharges to groundwater are being considered as part of the proposed improvement scheme therefore the Method C - Assessment of Pollution Impacts from Runoff to Groundwater will not be required. However, an assessment of the potential impacts of the scheme on groundwater levels, flows and quality will be undertaken.

15.7.4. An assessment of pollution impacts from accidental spillages shall be undertaken in line with Method D detailed within Annex I of HA45/09. Predicted AADT data for the proposed scheme shall be used in order to undertake this assessment.

15.7.5. A detailed flood risk assessment will be undertaken to assess the risk of all forms of flooding and the potential impacts. The FRA will be carried out in accordance with the requirements of PPS 25 (CLG, 2010b) ‘Development and flood Risk’ to provide an overall strategic review of the proposed works.

15.8. CONCLUSIONS

15.8.1. A detailed assessment of the Flood Risk of the proposed improvement scheme will be undertaken. This shall include an assessment of the existing flood protection being breached, and overtopping due to extreme 500 year and 1000 year return period events, with scenarios to be agreed with the EA. The results will be reported in line with the requirements stated in Chapter 7 of HD45/09 (DRMB, Volume 11)

15.8.2. A detailed groundwater assessment will be carried out, which will take into account the findings of previous investigations as well as those of the site investigation. The assessment will inform the design of the scheme and will consider the potential impacts on groundwater receptors during the construction and operation phases, as well as the impact of mitigation measures.

16. CONSIDERATION OF COMBINED AND CUMULATIVE EFFECTS

16.1. INTRODUCTION

16.1.1. This chapter brings together the principal findings of each of the topic chapters in order to identify and assess the combined effects of the Scheme and the cumulative effects of the Scheme in association with other existing or future significant development projects within the study area.

16.1.2. It expands on the generic approach to the identification and assessment of cumulative effects set out in Chapter 5. Chapter 6 to 15 above each address the potential effects of the proposed highway improvements on an individual aspect of the environment. Where an individual environmental receptor may be affected by more than one element of the proposed works, these effects are addressed within the topic chapter.

16.1.3. However, there are instances where an individual element of the proposed development may affect multiple environmental receptors, or may be relevant to more than one environmental topic. There is also potential for the effects of this project on the environment to be compounded by other projects within the region. This chapter sets out the approach to be taken to the identification, assessment and mitigation of such cumulative effects.

16.2. METHOD OF ASSESSMENT

Overview

16.2.1. Environmental effects can result from incremental changes caused by the interactions between impacts within a project and/or the interaction with the effects from other developments. For the purpose of this assessment, combined effects are defined as the interrelationship between impacts associated with the Scheme, whilst the assessment of cumulative effects concerns incremental changes caused by other reasonably foreseeable future actions (i.e. developments) together with the proposed Scheme.

16.2.2. The assessment of the combined and cumulative effects of the Scheme draws upon the guidance provided by the DMRB Volume 11 Section 2 Part 5: Assessment and Management of Environmental Effects.

16.3. INTERACTION WITH OTHER PROJECTS

16.3.1. There are currently no other HA projects identified in the close vicinity of the Scheme.

16.3.2. The new traffic model will take account of the operational traffic effects of any proposed major developments in the area and wider surrounding region.

16.3.3. Other developments and strategic planning for development in the surrounding region that could be of relevance will be identified and classified in line with criteria identified in Table 16.1.

Table 16.1 Certainty of Outcome and Development Status

Certainty of Outcome	Development Status
Near Certain: The outcome will happen or there is a high probability of it occurring	• Intent announced by proponent to regulatory agencies. • Approved development proposals. Projects under construction.
More than likely: The outcome is likely to happen but some uncertainty	• Development application within the consent process and in accordance with development plan. • Development conditional upon the transport strategy/project proceeding.
Reasonably foreseeable: The outcome may happen but significant uncertainty	• Identified within a development plan and, although not directly associated with the transport project, may occur if the project is implemented.
Hypothetical: There is considerable uncertainty whether the outcome would ever happen	• Conjecture based upon currently available information. • Discussed on a conceptual basis. • One of a number of possible inputs in an initial consultation process.

16.4. INTERACTIONS BETWEEN TOPICS

16.4.1. As is the case for most highway projects, there are close interactions between the cultural heritage, landscape & visual and ecology assessments, where they

share receptors that have different values, or where mitigation measures proposed for one topic may have knock-on benefits or adverse impacts for another topics. The interests of these topics could be seen to be in conflict or to influence highway design decisions in a contradictory manner.

16.4.2. The materials and geology and soils assessments will always interact, as they both address the earthworks for the scheme in different ways.

16.4.3. Given that the communities in the study area suffer at present from significant traffic-related problems, there are likely to be significant interactions between the communities and private assets topic and the assessment of effects on all travellers topic.

16.5. RECOMMENDED SCOPE OF WORK

16.5.1. Potential cumulation between impacts will be identified through close liaison between members of the EIA team, facilitated by the Environmental Coordinator.

16.6. APPROACH TO ASSESSMENT

16.6.1. Cumulative assessment will be undertaken when the assessment of all the other environmental effects of the project is complete. DMRB (HA, 2008a) recommends that the reporting of cumulative assessments should be included toward the end of the assessment report after consideration of the effects on the respective subject areas.

16.6.2. Rather than reporting every interaction, the proposed methodology for the assessment of cumulative effects will concentrate on the main significant effects, and will aim to differentiate between permanent, temporary, direct, indirect and secondary effects, positive or negative.

16.6.3. The methodology and report of cumulative effects will follow that set out in DMRB and the simple tabular layout given in Table 3.2 (HA, 2008a). The temporal limit of the assessment will be the design year (i.e. 15 years after opening of the scheme). The spatial boundaries of the assessment will be defined by the boundaries of the individual environmental assessment topics, as described in the relevant chapters of this Scoping Report (i.e. the maximum area will be the extent of the traffic model for the assessment of the effects on air quality and noise).

16.6.4. A review of planning decisions will be undertaken to determine whether any new 'committed' projects in the locality will need to be considered as part of the assessment, as defined by current DMRB guidance (HA, 2008b).

16.6.5. The traffic forecast generated from the updated traffic model will be utilised in the Air Quality and Noise Impact assessment chapters. The new traffic model will include predicted vehicle movements associated with all the relevant proposed developments identified

16.6.6. The principal environmental constraints identified for the A63 Castle Street Scheme are shown on Figures 1A - E in Appendix A.

16.7. CONCLUSIONS

16.7.1. An assessment of the combined and cumulative effects of the Scheme will be undertaken in line with the guidance provided by the DMRB Volume 11 Section 2 Part 5: Assessment and Management of Environmental Effects. It will examine the interactions between the various environmental topic areas, as well as the Scheme and other developments.

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18. GLOSSARY

Glossary Term	Description
Aquifer	Water is present almost everywhere underground, but some geological formations are impermeable – meaning that water can hardly flow through them – and some are permeable – they contain fine holes that allow water to flow. Permeable formations that contain groundwater are known as aquifers.
Annual Average Daily Traffic (AADT)	This is a measure used in transportation engineering and is number of vehicles that will use new or improved road on an average day.
Area of Potential Concern	In contaminated land assessment, an Area of Potential Concern, is an area of soil or groundwater which may have been contaminated from historical use e.g. soil underlying a former gas works. The assessment of looks at whether the area has been contaminated, the extent of any contamination both laterally and with depth, and whether the contamination presents a hazard to potential users of the land or the environment.
At-grade	On the same level i.e. an at-grade pedestrian crossing would be one where the road occurs at road level as the pedestrian crossing.
Benefit Cost Ratio (BCR	The benefit/cost ratio (BCR) of a scheme is the discounted sum of all the future benefits divided by the discounted sum of the future cost and is given by the formula: *BCR = PVB / PVC* *Where PVB is the Present Value of Benefits and PVC is the Present Value of Costs. If the scheme returns a positive BCR value greater than 2, the scheme is said to provide good value for money on economic grounds.* The benefits used to calculate a BCR include journey time savings, vehicle operating cost savings and accident savings (obviously if a scheme increases these then these will be a dis-benefit) These savings are often split between consumer users, business users and PSVs. Benefits can also include savings resulting from the maintenance of roads after the implementation of the scheme when compared to the Do Minimum scenario. Costs include the construction costs of the scheme, which include capital costs of the scheme, land costs, supervision, etc..).Costs during construction are also included. The costs also include costs to the government such as loses from indirect taxes. Benefits and costs are derived for a 60 year appraisal period In order to compare costs and benefits that occur at different times throughout the appraisal period, discounting is employed to reduce these values back to a present value year which is currently 2002. This is based on the principal that society in general prefers goods and services now rather than at some point in the future.
Bias Adjustment	Diffusion tubes are affected by several sources of interference that can result in substantial under or overestimation when compared to the chemiluminescent analyser (Reference Method), this is known as Bias. Adjustment is applied to the diffusion tubes to account for this bias.

Glossary Term	Description
Biodiversity Action Plan	In the UK, Biodiversity: the UK Action Plan was produced in 1994 with an overall goal "to conserve and enhance biodiversity within the U and contribute to the conservation of global; biodiversity through all appropriate mechanisms". The UK Biodiversity Steering Group was set up to prepare a detailed plan of action to achieve these objectives. There are now 45 national Habitat Action Plans and 391 Species Action Plans. The UK Biodiversity Steering Group recommended the production of Local Biodiversity Action Plans, which should have two main objectives – to reflect and help implement the national priorities identified in the UK Action Plans, and to identify and address local priorities and local distinctiveness. The Hull Biodiversity Action Plan shows how to conserve the biodiversity within Hull and contribute to improving biodiversity on a global scale. It also attempts to link up with the biodiversity plans of the wider Humber sub-Region.
Congestion Reference Flow (CRF)	The CRF of a link is an estimate of the Annual Average Daily Traffic (AADT) flow at which the carriageway is likely to be congested at peak periods on an average day.
Hull city centre area action plan (CC AAP)	The CCAAP was published in February 2009 as part of the LDF to outline how the future development of the city centre would be taken forward. Due to the continuing impact od the recession , including the effects of the public sector funding cuts and possible changes to regional planning poliies HCC formally withdrew the CCAAP on 15 July 2010 to allow the council to reassess on how future development would be taken forward.
Diffusion tube monitoring	diffusion tubes are widely used in the UK for indicative measurement of ambient concentrations of nitrogen dioxide (NO_2) in the context of Local Air Quality Management.
Drift Geology	In the UK, the term drift is commonly used to describe any deposits of quaternary or recent age.
Environmental Impact Assessment (EIA)	EIA is a procedure required under the terms of European Union Directives 85/337/EEC and 97/11/EC on assessment of the effects of certain projects on the environment. The procedure is a means of drawing together, in a systematic way, an assessment of a project's likely significant environmental effects. This helps to ensure that the importance of the predicted effects, and the scope for reducing them, are properly understood by the public and the relevant competent authority before it makes its decision.
Grade Separation	Is the process of aligning junctions where two or more roads coincide at different heights (known as grades) to minimise disruption of traffic and allow free flow movements as the roads cross over each other. Typcial examples are junctions on motorways.
Groundwater	Groundwater is the largest available reservoir of fresh water. Water falls as rain and snow onto the land; a proportion of this rainfall soaks into the soil. Once the needs of plant roots and soil moisture have been satisfied, the remaining water continues its journey downward to rock layers beneath the soil. These underground rock layers have the capacity to let water flow through them, either through large cracks and openings in the rock, or through tiny inter-connected spaces between individual rock grains. The water contained in these rocks is groundwater; and these bodies of rock are known as aquifers.
HGV (Heavy Goods Vehicle)	term in the United Kingdom for goods vehicles over 3.5 tonnes Gross Vehicle Weight

Glossary Term	Description
LIDAR	LiDAR is an acronym for Light Detection And Ranging but it is also referred to as laser scanning. The technology is not new but the relatively recent integration with dGPS and inertial measurement data has provided a step change in the accuracy of airborne sensors over the last few years. The laser scanning unit is mounted either in a pod below a helicopter or through a hole in the fuselage of fixed wing aircraft. The laser source emits light pulses towards a rotating mirror which re-directs the pulses down in a scanning pattern. This pattern can either be a simple side-to-side motion or in some systems as a helical spiral. The frequency of laser pulses emitted was typically in the range from 5000 to 55,000 per second but the latest systems are now operating at up to 100,000 pulses per second. The pulses are returned to a receiver in the sensor after reflecting back from both the ground surface and objects above ground such as structures, trees and buildings. Pulse travel times are recorded and the distance from the sensor to the scanned object or ground surface can then be determined using speed of light calculations. As the exact position of the sensor is known from dGPS and inertial data the xyz co-ordinates of each point of reflection can be derived.
Local Development Framework (LDF)	Local planning authorities must prepare a local plan known as a Local Development Framework (LDF) which includes Development Plan Documents (DPDs). These are very important when deciding planning applications. Independent planning inspectors must look at all DPDs that local authorities in England prepare for an examination. The examination is the last stage of the process for producing a DPD. The process should have fully involved everyone who has an interest in the document and they should have had the chance to comment. The LDF also includes Supplementary Planning Documents, which expand polices set out in DPDs or provide additional detail; a Statement of Community Involvement; the Local Development Scheme (which sets out the programme for the production of documents) and the Annual Monitoring Report. Within the Local Planning Authority's LDF, DPDs must be 'sound' (section 20 of the Planning and Compulsory Purchase Act 2004) both in terms of their content and the process by which they are produced. They must also be founded on a robust and credible evidence base.
Made Ground	Ground created by infilling an area with material taken from elsewhere; typically reworked soils, rubble, gravel, sand or former waste material e.g. ash.
Principal Aquifer	Strata that has high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage and may support water supply and/or river base flow on a strategic scale.
RAMSAR	The Convention on Wetlands of International Importance, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.
Severance	the separation of residents from facilities and services in their community. The separation may be a physical barrier, e.g. fence, or a perceived barrier, e.g. busy road, which hinders or deters the movement of vulnerable users or requires a significant reorganisation of their activities.
Solid Geology (Bedrock	comprises the native consolidated rock underlying the surface soils or drift deposits.
Unproductive strata	Drift deposits with low permeability that have negligible significance for water supply or river base flow
Vulnerable Users	pedestrians, cyclists, horse riders and people with disabilities collectively known as 'vulnerable users'.

19. LIST OF ABBREVIATIONS

AADT	Annual Average Daily Traffic
APC	Areas of Potential Concern
APCh	Areas of Potential Change'
AIES	Assessment of Implication on European Sites
APC	Areas of Potential Concern (with respect to contamination)
BAP	Biodiversity Action Plan
bgl	below ground level
CEMP	Construction Environmental Management Plan
CCAAP	City Centre Area Action Plan
COI	Central Office of Information
DEM	Digital Elevation Model
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
EA	Environment Agency
EH	English Heritage
EIA	Environmental Impact Assessment
FRA	Flood Risk Assessment
GA	Golder Associates
GIS	Geographic Information System
HA	Highways Agency
HAP	Humber Archaeological Partnership
HAPs	Habitat Action Plans
HBP	Hull Biodiversity Partnership
HCC	Hull City Council
HGV	Heavy Goods Vehicle
HLCU	Historic Landscape Character Units
Humber INCA	Humber Industries Nature Conservation Association
IAN	Interim Advice Note
IEEM	Institute for Ecology and Environmental Management
JNCC	Joint Nature Conservation Committee
KSI	Killed or Seriously Injured
PCF	Project Control Framework
LBAPs	Local Biodiversity Action Plans
LCA	Landscape Character Areas
LDF	Local Development Framework
LQMA	Local Air Quality Management
LSE	Likely Significant Effects
MAC	Managing Agents Contract
NS	Network Services
NPS	National Planning Statement
PF	Pell Frischmann Consultants Ltd
PIA	Personal Injury Accident
PRA	Preferred Route Announcement
PSF	Project Support Framework
RIGS	Regional Important Geological and Geomorphological Sites
RBMP	River Basin Management Plan
RSS	Regional Spatial Strategy
SAC	Special Areas of Conservation
SAPs	Species Action Plans
SAR	Scheme Assessment Report
SDA	Strategic Development Area

SM	Scheduled Monuments
SNCI	Site of Nature Conservation Interest
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TAME	Traffic Modelling and Economics (Netserv)
TAR	Technical Appraisal Report
VfM	Value for Money
VM	Value Management
YARFF	Yorkshire Archaeological Research Framework Forum

APPENDIX A

ARCHEOLOGICAL SITES

LISTED BUILDING

PREVIOUS ARCHEOLOGICAL INVESTIGATIONS

OTHER BUILDINGS

CONSERVATION AREA

AREA OF ARCHEOLOGICAL INTEREST

OTHER BAT RECORD

BROWN LONG

AMENITY GRASSLAND

INTRODUCED SHRUB

DENSE SHRUB

TARGET NOTE

HEDGE

TREE

HIGH BAT ROOST POTENTIAL

MODERATE BAT ROOST POTENTIAL

LOW BAT ROOST POTENTIAL

NEGLIGIBILE BAT ROOST POTENTIAL

BUILDING WITH MODERATE POTENTIAL

WALL WITH MODERATE BAT ROOST POTENTIAL

GROUP OF TREES WITH NEGLIGIBILE BAT ROOST POTENTIAL

AQM SE RECEPTOR POINTS

HARD SURFACES

AIR QUALITY MANAGEMENT AREA

HIGHWAYS AGENCY

FIGURE: 1A-ENVIRONMENTAL CONSTRAINTS PLAN (KEY)

Mott MacDonald Grontmij

Grove House Mansion Gate Drive Leeds LS7 4DN
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FOR KEY SEE FIGURE 3A

Old Chapel existed here - possible foundations at depth

Old Foundation Slab encountered

Various houses and other buildings were located here prior to road construction. It is not known how much of the foundations remain in situ.

Many trees exist along this section on either side of the road.

FIGURE: 1B-ENVIRONMENTAL CONSTRAINTS PLAN

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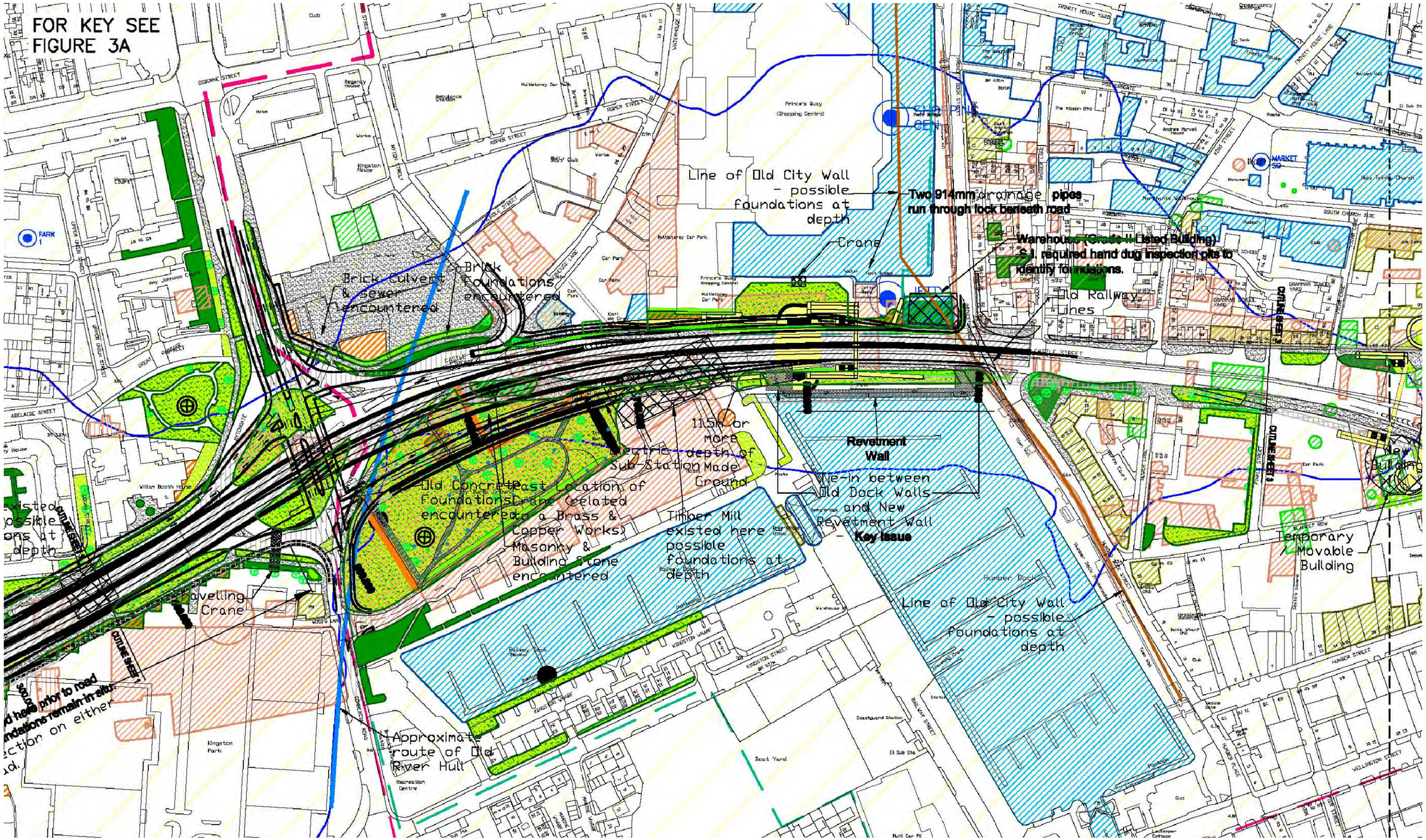

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FIGURE: 1C-ENVIRONMENTAL CONSTRAINTS PLAN

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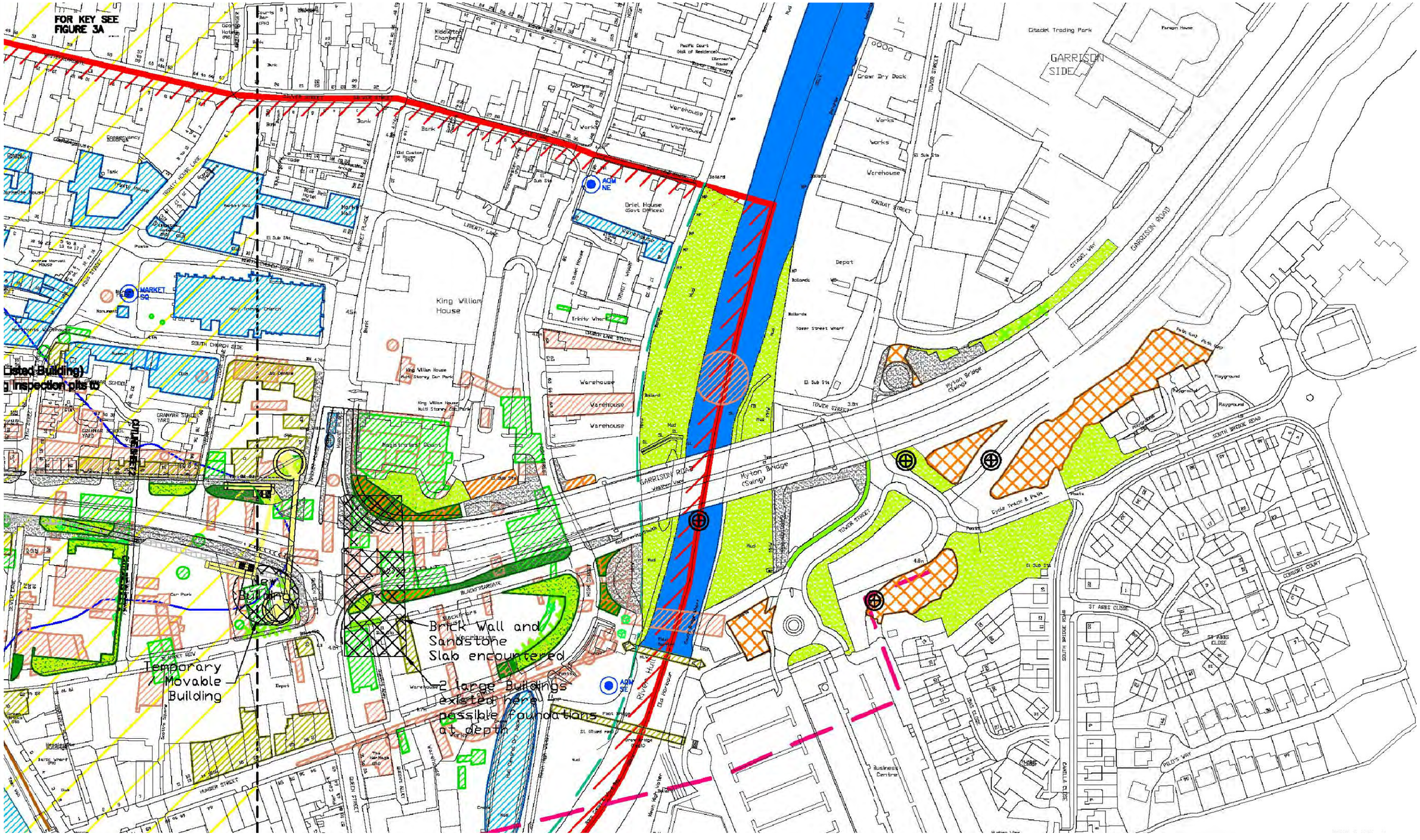

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FIGURE: 1D-ENVIRONMENTAL CONSTRAINTS PLAN

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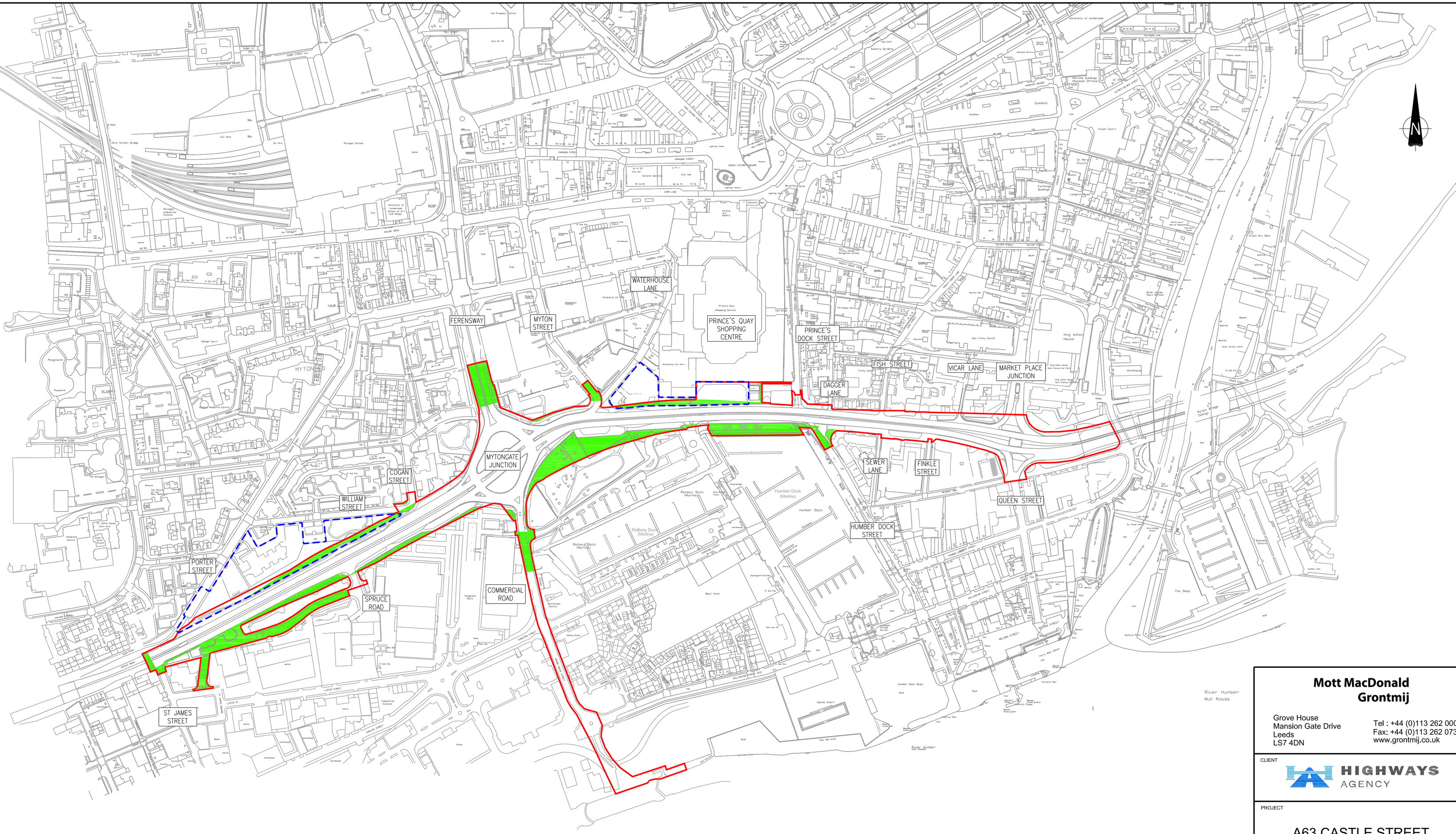

REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	ENG	CAT II	APP'D

NOTES:

KEY:

- DCO BOUNDARY AND LOCATION OF NSIP
- POTENTIAL SITE COMPOUND OR SITE MATERIAL STORAGE
- PROPOSED LAND TAKE

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CLIENT

HIGHWAYS AGENCY

PROJECT

A63 CASTLE STREET IMPROVEMENTS

TITLE

CURRENT DCO SITE BOUNDARY

STATUS

FOR INFORMATION

DRAWN	CHECKED	APPROVED
PSN	BJ	DP
DATE 15/02/13	DATE 15/02/13	DATE 15/02/13

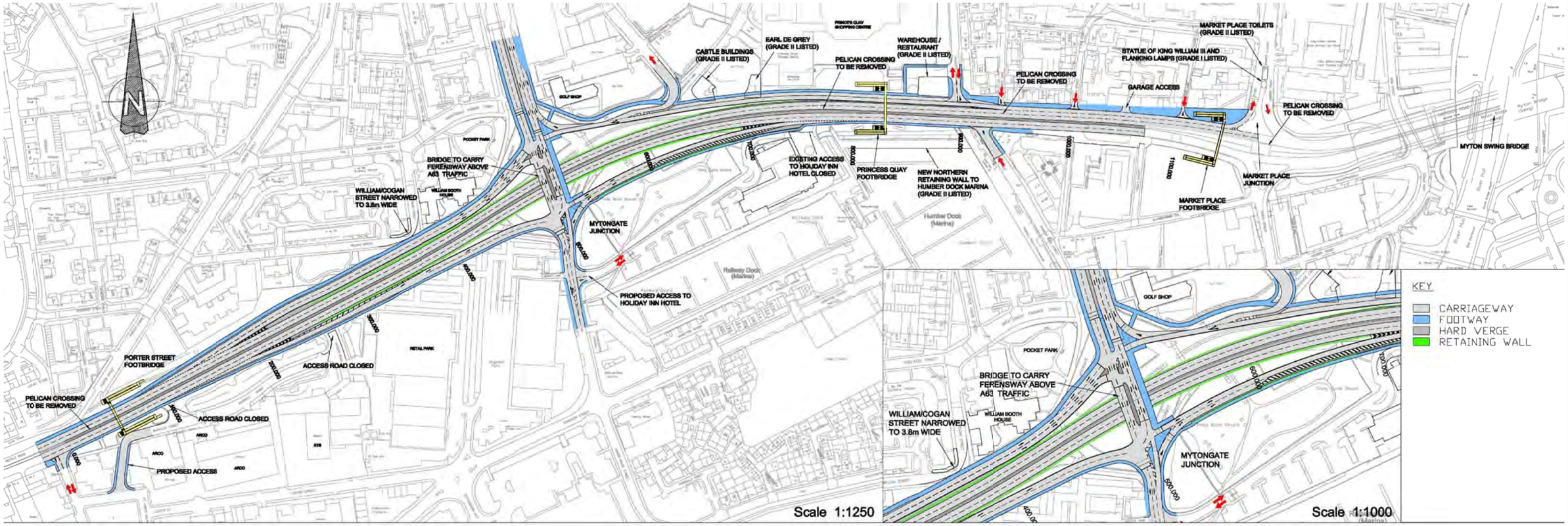
DRAWING SCALE: 1:2500

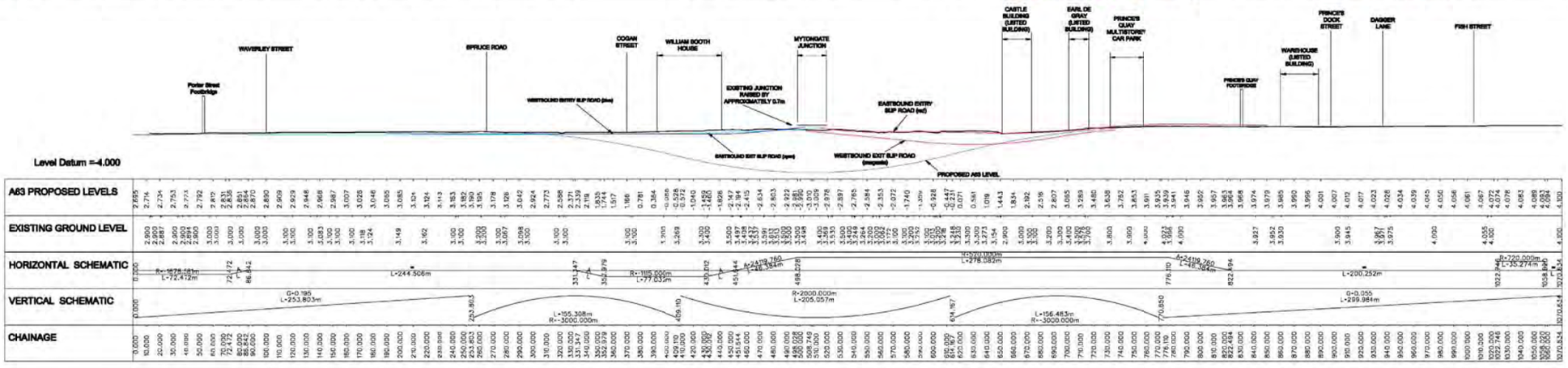
ORIGINAL DRAWING SIZE: 841 x 594 - A1

DRAWING No: Figure 1E

REV.: PD1

F:\U2013\proj\112630 A63 Castle Street\10 Environment\Scoping report\Figure 1E.dwg [AutoCAD Location]





Longsection

Scale H 1:1250 V 1:250 Slope Units =%

FIGURE: 3A-SCHEME PLAN AND LONG SECTION

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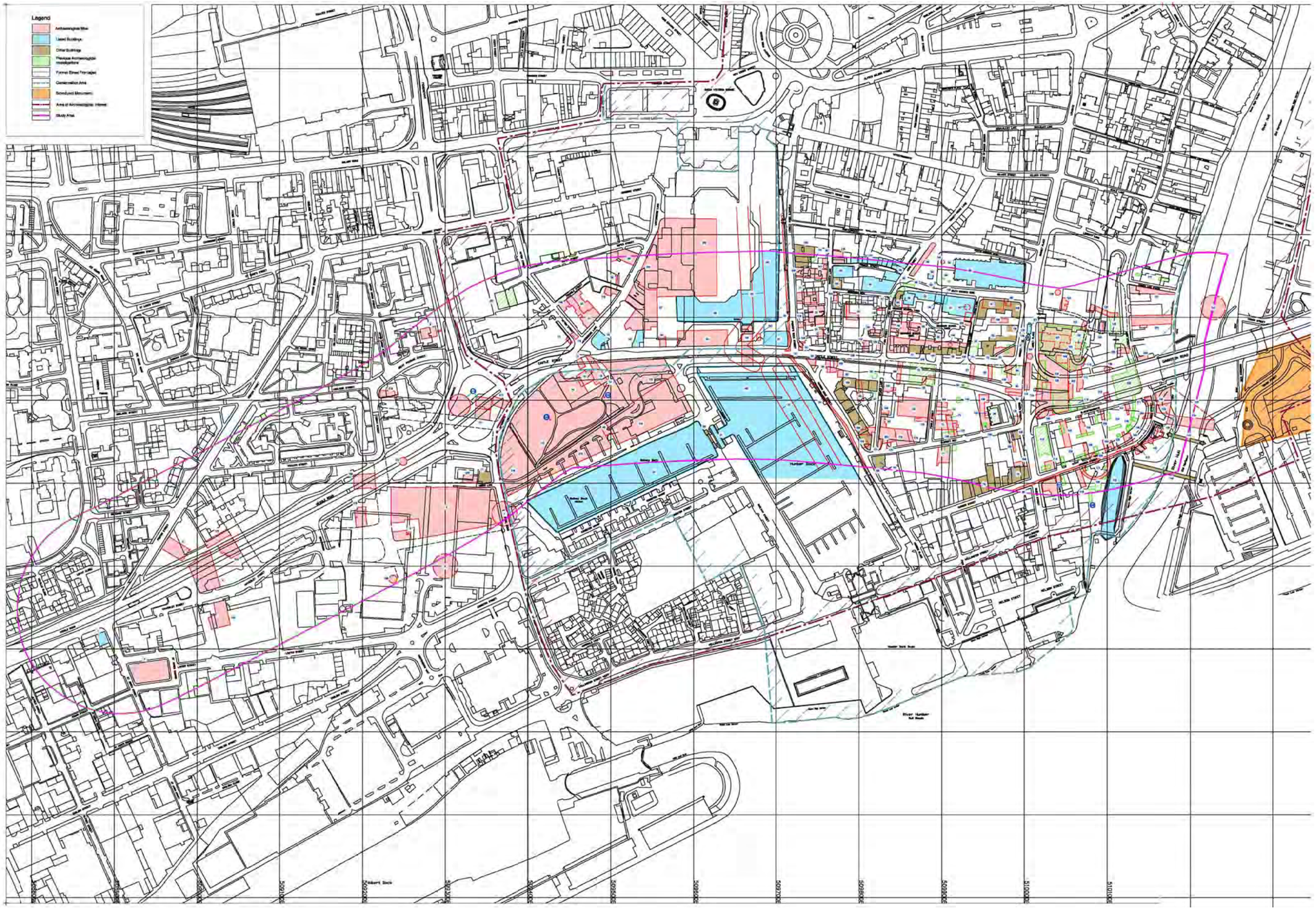

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FIGURE: 7A- CULTURAL HERITAGE CONSTRAINTS

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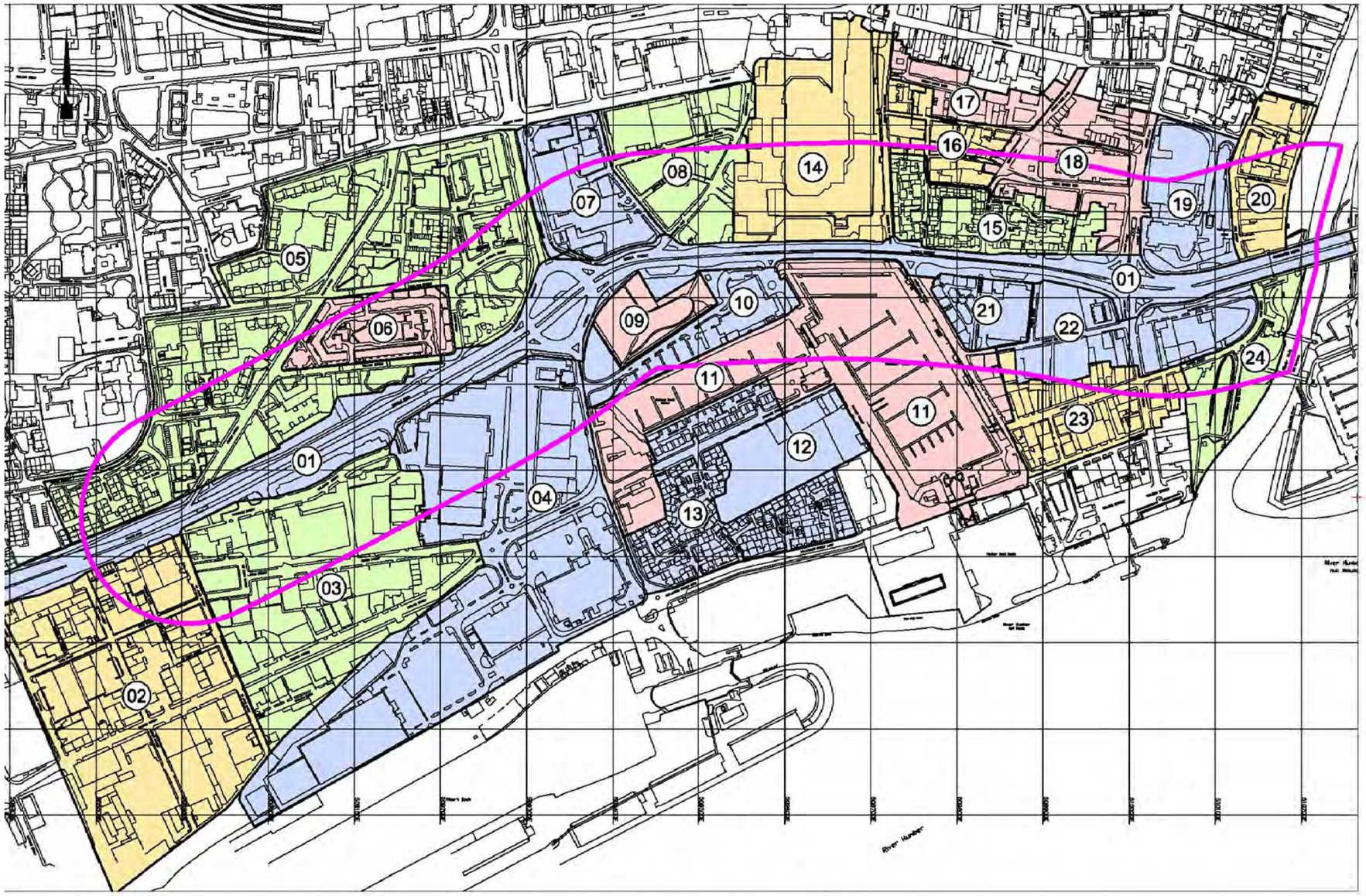

Historic Landscape Character Units

1 - A63 Castle Street
2 - English Town
3 - Lister Street and English Street
4 - Kingston Retail Park
5 - Mixed urban housing developments
6 - Australia Houses
7 - Myton Street retail park
8 - Quay West development site
9 - Holy Trinity burial ground
10 - Holiday Inn complex
11 - Humber Dock and Railway Dock
12 - Hull Marina boat yard
13 - Kingston Wharf and Wellington Street housing developments
14 - Prince's Dock, Prince's Quay and Prince's Dock Street
15 - Lisle Court, Trinity Court and Grammar School Yard
16 - Prince Street and Posterngate
17 - Trinity House complex
18 - Trinity Square, Holy Trinity Church and Market Place
19 - Magistrates Courts and King William House
20 - High Street and staiths
21 - Marina Court
22 - Oldgates development area
23 - Fruit Market area
24 - Central dry dock area

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FIGURE: 7B- HISTORIC LANDSCAPE CHARACTER UNITS

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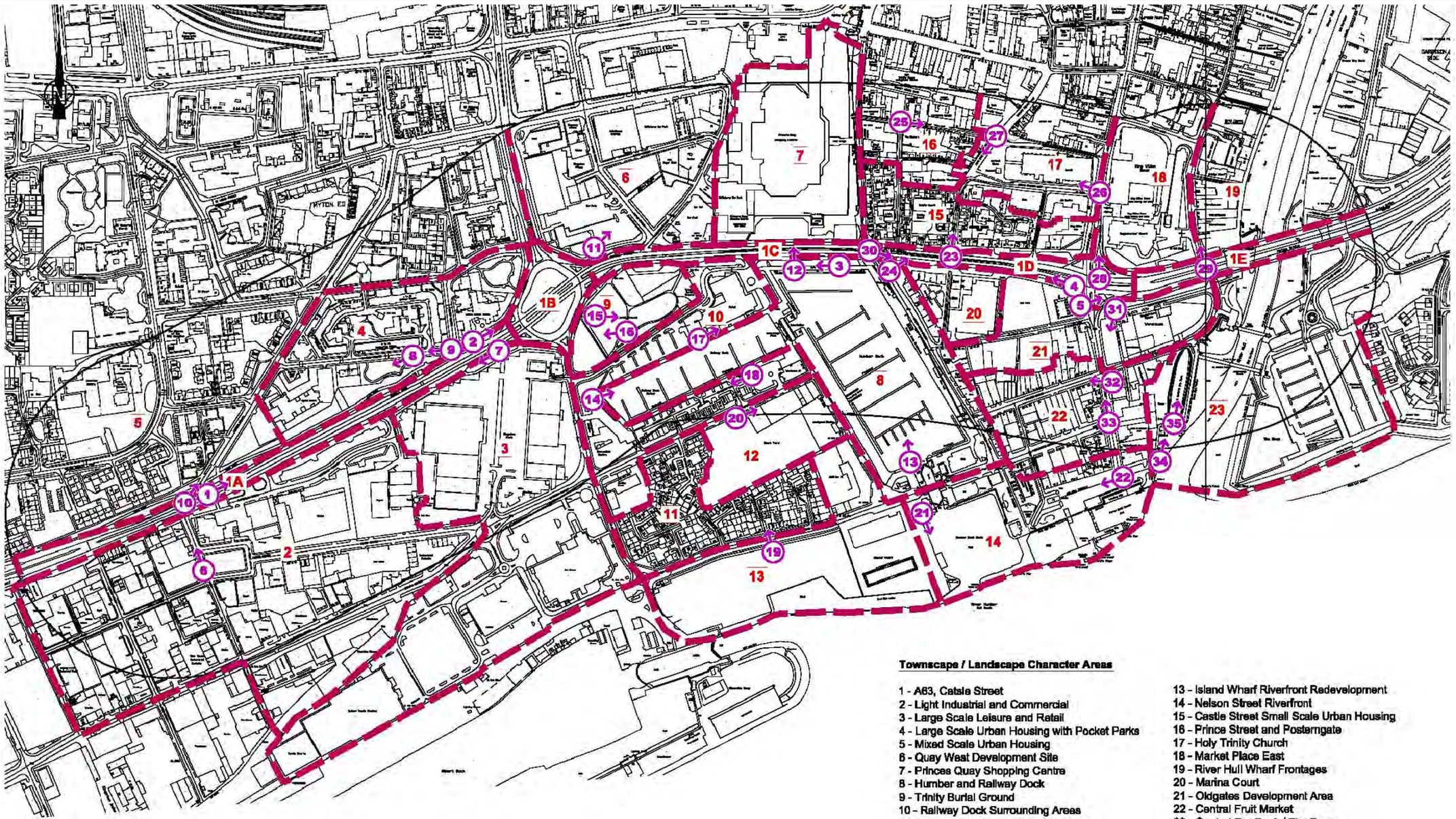

Townscape / Landscape Character Areas

1 - A63, Castle Street
2 - Light Industrial and Commercial
3 - Large Scale Leisure and Retail
4 - Large Scale Urban Housing with Pocket Parks
5 - Mixed Scale Urban Housing
6 - Quay West Development Site
7 - Princes Quay Shopping Centre
8 - Humber and Railway Dock
9 - Trinity Burial Ground
10 - Railway Dock Surrounding Areas
11 - Marina Small Scale Urban Housing
12 - Hull Marina Boat Yard
13 - Island Wharf Riverfront Redevelopment
14 - Nelson Street Riverfront
15 - Castle Street Small Scale Urban Housing
16 - Prince Street and Posterngate
17 - Holy Trinity Church
18 - Market Place East
19 - River Hull Wharf Frontages
20 - Marina Court
21 - Oldgates Development Area
22 - Central Fruit Market
23 - Central Dry Dock / The Deep

HIGHWAYS AGENCY

FIGURE: 8A- LANDSCAPE CHARACTER AREAS

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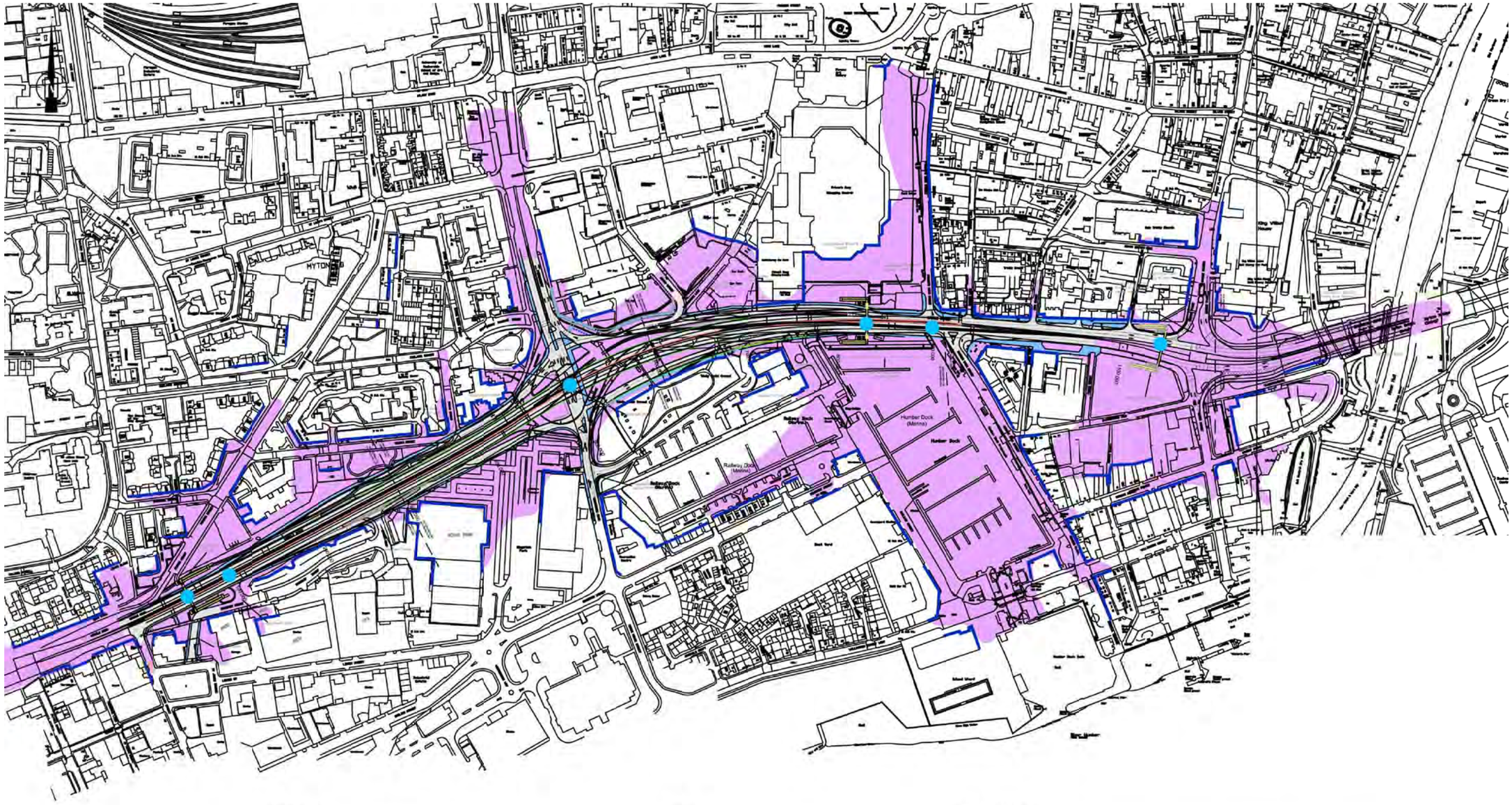

LEGEND

- ZVI Survey Points
- Visual Barriers
- Zone of Theoretical Visibility

NOTE

ZTV based on drawing: W11189_09_01 E

ZTV MAPPING:

ZTV has been produced using specialist ground modelling software based upon 1:10,000 scale OS information and Digital Surface Model Model (DSM) data at 5m intervals.

The ZTV incorporates the largest significant visual barriers and shows the worse case scenario, it does not take into account all areas of vegetation and structures that may provide additional screening. The analysis represents an eye level of 1.5m.

HIGHWAYS AGENCY

FIGURE: 8B- ZONE OF THEORETICAL VISIBILITY

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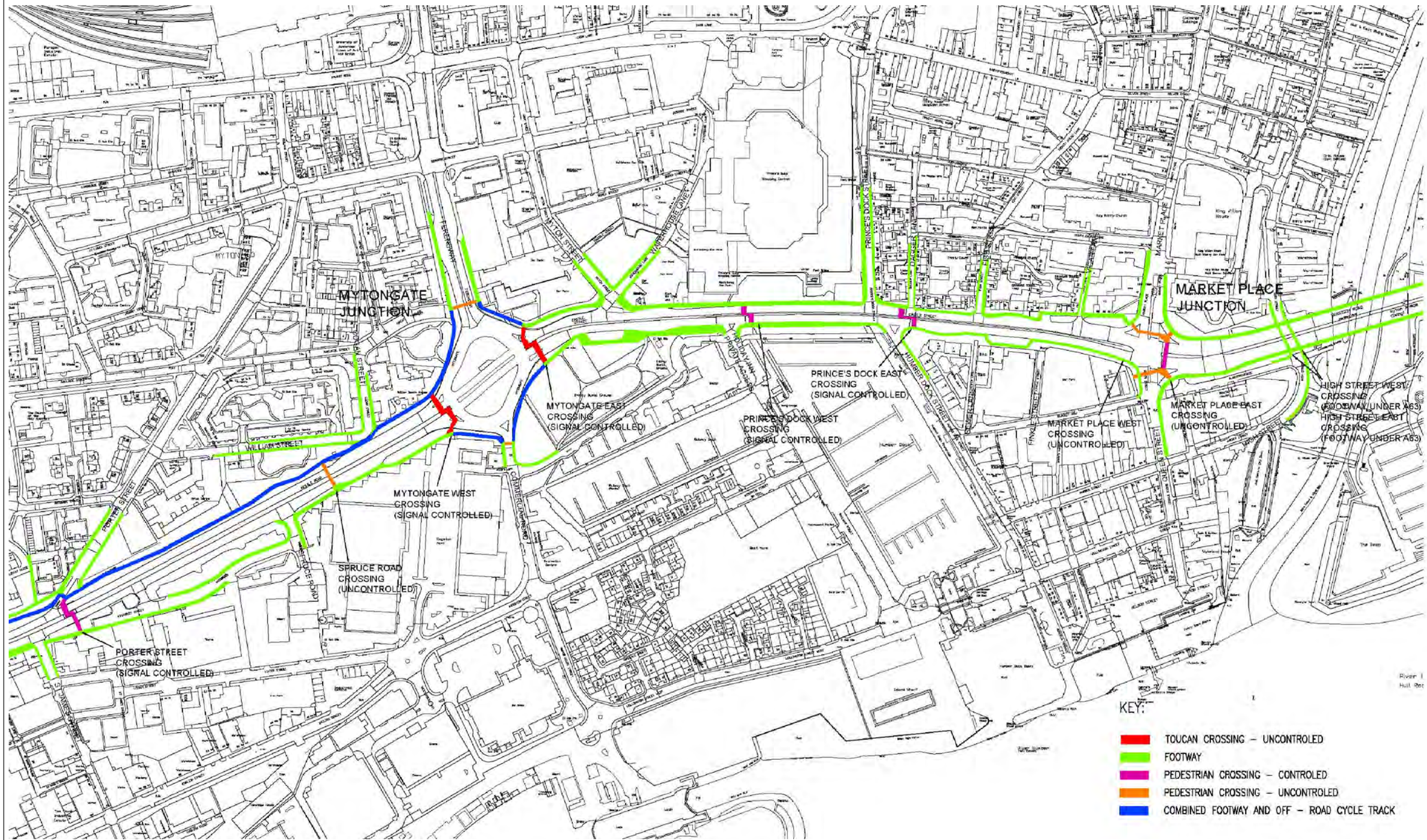

HIGHWAYS AGENCY

FIGURE: 13A-EXISTING PROVISIONS FOR PEDESTRIANS AND CYCLISTS

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