Aberdeen South Harbour Link Road

DMRB Stage 3 Scheme Assessment Report

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1. Introduction

1.1. Scheme Background

1.1.1. The Aberdeen City Region Deal (ACRD) is an agreement between the Scottish Government, UK Government, Opportunity North East (ONE), Aberdeen City Council and Aberdeenshire Council. The ACRD has grown in value to £936million from £826 million primarily as a result of additional investment from the private sector alongside an additional £11.7million contribution from Scottish Enterprise.

1.1.2. The deal, signed in 2016, aims to stimulate investment in and the diversification of the local economy into new areas of activity through the programme area of: innovation, internationalisation, digital connectivity, and infrastructure across the region.

1.1.3. The ACRD sets out an intention to support the expansion of Aberdeen Harbour. The new Aberdeen South Harbour (ASH) at Nigg Bay opened in September 2023, see Figure 1.1. Both the UK Government and the Scottish Government have each committed an indicative amount of £12.5m (£25m in total) to provide improved land transport access arrangements to and from the South Harbour.

Figure 1.1 - Aberdeen South Harbour and Coast Road

1.1.4. The development of ASH occurred in response to constraints at the existing Aberdeen harbour. An expansion of activities is aimed at capitalising on new and emerging markets through being able to accommodate larger vessels. Due to the policies and potential for new more sustainable and lower/zero carbon energy resources, the Local Development Plan (2023) includes development opportunities to create an Energy Transition Zone (ETZ) as part of a long-term plan to achieve net-zero emissions.

1.1.5. The ETZ aims to transform an area into a hub for cleaner energy industry and it will contribute towards the Scottish Government's Just Transition principals as set out by the Scottish Just Transition Commission in March 2021. The location identified for the proposed ETZ, in close proximity of ASH and it is a key driver in the development of the zone.

1.1.6. Access to the harbour is paramount to encouraging and supporting the delivery of low carbon energy industry, technologies, and alternative fuel production within the ETZ. These will also be facilitating the transition from oil and gas to green energy production. ASH, the proposed ETZ, and the industrial areas located nearby at East Tullos and Altens will act as key drivers to improving the attractiveness of the region to international trade and investment and will support businesses in the oil, gas, and renewable energy supply chain to internationalise in global markets.

1.1.7. This aims to address the economic challenges facing the region and capitalise on new opportunities. Ensuring efficient, effective, and appropriate external transport infrastructure connecting the area to the strategic transport network and wider economy is vital to underpinning the economic success of ASH, and wider economic opportunities.

1.1.8. Aberdeen City Council (ACC) are the promotor of the "External Transportation Links to Aberdeen South Harbour Project" (ETLASH). The Scottish Transport Appraisal Guidance (STAG) work is now concluded, and Strategic Business Case approved on the basis of upgrades to Harness Road and upgrades / realignment of the Coast Road, including a new crossing of the Aberdeen to Dundee railway line.

1.1.9. In June 2022 ACC appointed Sweco UK Ltd as consultants to provide support and services leading to the submission of a planning application and any associated orders for the ASHLR Project based on the preferred road corridor identified from STAG process:

- Option A4 - links Aberdeen South Harbour to Wellington Road via an upgraded Coast Road and Hareness Road, with a new road bridge over the Aberdeen to Dundee railway line;
- Option C1 – walking, wheeling and cycling provision remote from the ASHLR scheme, on the northern side of East Tullos Industrial Estate; and
- Option C4 - walking, wheeling and cycling provision following a similar route along the upgraded road corridor.

1.1.10. Part of walking, wheeling and cycling Option C1 rests within land included in the Aberdeen Local Development Plan for the proposed ETZ, as such this walking, wheeling and cycling option is not included within the ASHLR project as the relevant path realignments and improvements will be considered as part of the development of the ETZ.

1.2. Scheme Development History

Previous Studies

1.2.1. A number of previous studies have been carried out by various parties. A summary of these studies is provided below. This Design Manual for Roads and Bridges (DMRB) Stage 3 assessment has taken into consideration these previous studies.

External Transportation Links to Aberdeen South Harbour STAG Pre and Part 1 Appraisal (2018)

1.2.2. In 2017 the External Transportation Links to Aberdeen South Harbour STAG Report was completed and then approved by Aberdeen City Council in 2018. The study examined transport connectivity to / from the new Aberdeen South Harbour and identified appropriate transport improvements to be taken forward for detailed appraisal. The study was carried out in line with Scottish Transport Appraisal Guidance (STAG) and covered the Pre and Part 1 Appraisal stages and generated a list of recommended options for further appraisal.

External Transportation Links to Aberdeen South Harbour, STAG Detailed Options Appraisal (2021)

1.2.3. Following the Pre and Part 1 Appraisal the recommended options were subjected to the STAG Detailed Options Appraisal. This report details the work undertaken to appraise the options and presents the findings of the appraisal.

External Transportation Links to Aberdeen South Harbour, Updated Strategic Business Case (2022)

1.2.4. The Strategic Business Case (SBC) presented the case for supporting transport infrastructure interventions to maximise the wider economic benefits associated with the new Aberdeen South Harbour (ASH) and the proposed adjacent Energy Transition Zone development.

1.2.5. This SBC documented the strategic and economic case for investment through the consideration of a range of potential transport options within the STAG appraisal recommending investment in Option A4 and the walking, wheeling and cycling options, the widening of the Coast Road access to the Harbour, including a new road alignment and bridge over the railway line. The SBC was approved by the ACRD Joint Committee om 20 August 2021 and subsequently the City Growth and Resources Committee of 25 August 2021.

DMRB Stage 2 Route Options Assessment

1.2.6. The DMRB Stage 2 Route Options Assessment Report discussed shortlisted route options in order to determine the preferred option for the link road, this included describing the existing conditions, estimating the cost and assessing the preferred option. The preferred option was subsequently reported to the Aberdeen City Region Deal Joint Committee of 9 September 2023.

1.2.7. Outline Business Case

1.2.8. The Outline Business Case (OBC) set out the case for supporting the Aberdeen South Harbour Link Road (ASHLR) intervention, which can help maximize the economic impacts of the new Aberdeen South Harbour (ASH) and would also benefit the proposed adjacent Energy Transition Zone (ETZ) development.

1.2.9. The OBC presented the strategic and economic case for investment for the preferred option identified following the SBC stage. Further work undertaken as part of this OBC, and in discussions with ACC, identified that C1 should be descoped from the package of interventions as other interested parties in the study area will be able to deliver these improvements. Therefore, the OBC only considered options C4 and A4 as being carried forward. The OBC was subsequently reported to the Aberdeen City Region Deal Joint Committee of 9 September 2023.

1.3. Adjacent Schemes

A956 Wellington Road

1.3.1. ASHLR interfaces with the Wellington Road corridor at Harness Road roundabout to access the strategic trunk road network (A956/A90/A92) via Wellington Road.

1.3.2. Previous appraisal work on the Wellington Road corridor, the Wellington Road Multimodal Corridor Study, has identified a hybrid package of multi-modal improvements along the length of the corridor.

1.3.3. The Aberdeen City Region Deal Strategic Transport Appraisal identified the opportunity to progress designs for a section of the corridor between Craigshaw Drive and Charleston Road North encompassing the two roundabouts and their influencing approaches, with the anticipation of achieving additional benefits for the ETLASH and ETZ, with the possibility of incorporating outcomes into the subsequent Business Cases.

1.3.4. In 2022 Aberdeen City Region Deal Joint Committee instructed activities to progress this section to Outline Business Case.

1.3.5. The previous study work considered historic options for the signalisation of the roundabouts but did not take the opportunity to develop further options, outline designs, confirm feasibility, or assess the impacts of such proposals. ACC commissioned SWECO

in March 2023 to progress the DMRB Stage 2 Option Assessment and OBC with an aspiration to align future stages with the ASHLR Project.

Aberdeen Western Peripheral Route (AWPR)

1.3.6. The Aberdeen Western Peripheral Route/Balmedie to Tipperty (AWPR/B-T) was one of the largest infrastructure projects in Scotland and was part of Transport Scotland's commitment to improving travel in the northeast.

1.3.7. The new road is 58km long and opened in Autumn 2018. It consisted of four sections:

- **Balmedie to Tipperty**: 12km from Blackdog to Tipperty
- **Northern Leg**: 16.1km from North Kingswells to Blackdog
- **Southern Leg**: 18.7km from Charleston to North Kingswells
- **Fastlink**: 11.5km from Stonehaven to Cleanhill

1.3.8. The project was delivered by Aberdeen City Council on behalf of Transport Scotland Aberdeen City Council and Aberdeenshire Council.

Craigshaw Drive Cycle Tracks

1.3.9. A walking, wheeling and cycling facility along Craigshaw Drive is being constructed to improve active travel opportunities in the Tullos area. The construction includes new segregated cycle tracks along Craigshaw Drive, a new parallel crossing on Abbotswell Road and an- additional cycle link on Abbotswell Road.

1.3.10. The construction of the project is jointly funded by Sustrans through the Places for Everyone programme, Nestrans and the Scottish Government through the Cycling, Walking and Safer Routes fund.

1.4. Scheme Objectives

1.4.1. When defining the scheme objectives, Aberdeen City Council have sought to use the existing evidence, Council policies, and City Deal guidance, to ensure that the scheme objectives are developed to be SMART (Specific, Measurable, Attainable, Relevant and Time-Bound). This will ensure that the ASHLR objectives can be specifically measured and monitored as part of the scheme's monitoring and evaluation plans and to specific timescales for benefit realisation.

1.4.2. The ASHLR scheme has six Transport Planning Objectives (TPO)as follows:

- TPO1a – Reduce journey times for HGVs between ASH / proposed ETZ sites and Aberdeen Western Peripheral Route (AWPR) / Charleston junction and King George VI Bridge

- TPO1b – Reduce the environmental and nuisance impacts of HGV traffic between ASH / proposed ETZ sites and Aberdeen Western Peripheral Route (AWPR) / Charleston junction and King George VI Bridge
- TPO2a - Improve connectivity by all modes (car, public transport, and walking, wheeling and cycling) between ASH / ETZ and prospective workers at the sites
- TPO2b - Improve connectivity between proposed ETZ and other energy-related businesses in the Aberdeen area (Business to Business)
- TPO3 – Improve access to the ETZ / ASH for the widest range of abnormal loads possible and minimise the impact on residential and business properties of abnormal loads travelling from and to the ETZ / ASH (which currently have to route through the residential area of Torry).
- TPO5 - Improve the intermodal opportunities between the proposed ETZ/ASH and the existing rail network.

1.4.3. Following a review of the previously identified TPOs, TPO4 was removed as it was considered resilience was no longer relevant due the identified corridor progressed from the STAG.

1.5. Consultations

1.5.1. The successful delivery of the ASHLR scheme will be dependent on effective engagement with key stakeholders and gaining their involvement through consultation. Consultations to be carried out during the assessment will:

- Engage and inform interested parties;
- Gather knowledge, expertise and opinions from Stakeholders to inform the assessment and decision making;
- Promote consultation with the community and their representatives, allowing issues and concerns to be understood and addressed; and
- Help de-risk the scheme promotion process.

1.5.2. During the public consultation in November 2023, concerns about freight rerouting were raised by residents of Burnbanks Village, a community located on the north side of Cove. There was concern about a historic increase in HGV traffic past Burnbanks Village, and concerns regarding potential future increases in HGVs.

1.6. Stakeholders

1.6.1. Stakeholders, statutory consultees and interested parties were identified and include the following, (amongst others):

- Aberdeen City Council (ACC)
- NESTRANS
- Network Rail

- Port of Aberdeen (PoA)
- Energy Transition Zone (ETZ)
- Landowners and businesses along the route of the scheme
- Scottish Environment Protection Agency (SEPA)
- Scottish Natural Heritage (SNH)
- Transport Scotland
- Statutory undertakers and utility apparatus owners (Openreach, CityFibre, Vodafone, Scottish and Southern Energy Networks, Scottish and Southern Energy Enterprise, Scottish and Southern Energy Utility Solutions Limited, Scottish Water, Scottish Gas Networks and Neos)

1.7. Method of Assessment

1.7.1. This Stage 3 Scheme Assessment Report for the ASHLR scheme has been prepared in accordance with the guidance for 'Preparation of the Stage 3 Report' as contained in DMRB TD 37/93 'Scheme Assessment Reporting' (herein TD 37)

1.7.2. At Stage 3, the Preferred Option has been sufficiently developed to enable a more detailed assessment of its cost as well as its engineering, traffic and environmental impacts.

1.8. Report Structure

1.8.1. The purpose of this report is to describe the Preferred Option in more detail whilst documenting the factors that have been considered in its design development, considering the scheme objectives and the engineering, environmental, traffic and economic impacts.

1.8.2. The chapter headings within this report generally follow the guidance given in Annex B of TD 37 with the addition of an environmental chapter as a result of a screening exercise to screen out environmental topics:

- Chapter 2 outlines the existing conditions.
- Chapter 3 describes the scheme.
- Chapter 4 discusses the cost estimate.
- Chapter 5 describes the engineering information.
- Chapter 6 describes the traffic and economic information.
- Chapter 7 describes the environmental topics that have been screened out of the process.

2. Existing Conditions

2.1. Introduction

2.1.1. This section of the report describes the engineering conditions of the existing B985 Hareness Road, and Coast Road shown with the scheme extents below.

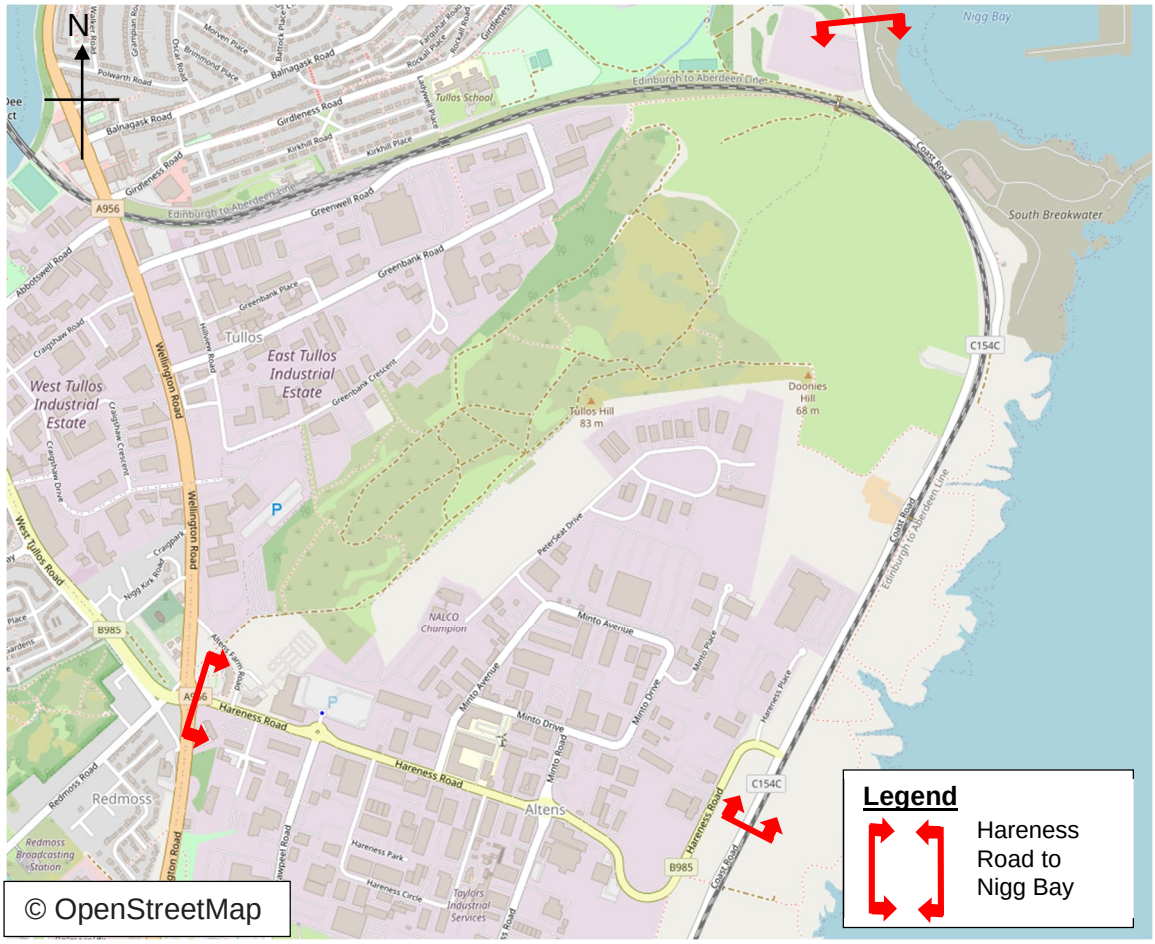


Figure 2.1 - Corridor Extents Aberdeen South Harbour Link Road

2.1.2. Refer to Figures 2.2 to 2.4 in Appendix A for further details.

2.2. Scheme Location and Environment

Location

2.2.1. The western extent of the scheme corridor terminates at the A956 Wellington Road/B985 Hareness Road roundabout, approximately 3.5 kilometres (km) to the south of Aberdeen City Centre and continues south-east along Hareness Road for around 2.1km interfacing with Coast Road at a T-junction. From there it travels north-east on Coast Road for approximately 2.1km crossing the Aberdeen to Dundee railway line and ends at the Coastguard Station.

Climate

2.2.2. Aberdeen has a coastal climate resulting in cold and rainy winters followed by cool and cloudy summers with the temperature ranging from -3° and 21° annually. Rainfall varies throughout the year averaging 70 millimetres (mm) a month with highs of 100mm in October and lows of 55mm in May. The average rainfall intensity is 0.36mm/hr in Aberdeen. Snowfall accounts for a small percentage of the annual precipitation and falls mostly between December and March. Aberdeenshire receives sunshine on average 4 hours a day annually with the summer months accounting for the most of it. The average annual windspeed in Aberdeen is 17km/h.

Hareness Road

2.2.3. Hareness Road is the central road through Altens Industrial Estate, extending from the roundabout on Wellington Road in the west, to the junction with Coast Road in the east, with an elongated 'S' shaped bend on the approach to Coast Road. In total, Hareness Road is approximately 1.9km long, and includes three roundabouts (including the one at Wellington Road), and several side roads to both the north and south, which connect Hareness Road with the rest of the industrial estate.

2.2.4. The land use of the study area around Hareness Road comprises primarily industrial and commercial premises of Altens Industrial Estate, and a single residential property. In the wider area, there are residential properties to the south around Cove Bay, and Loirston Country Park is located to the north. To the east is Coast Road and the North Sea and to the west is Wellington Road, residential properties, and Kincorth Hill Local Nature Reserve.

2.2.5. The topography of the study area at Hareness Road comprises a ridge/hill located directly at the midpoint of Hareness Road, at 80m above Ordnance Datum (AOD), and orientated north-south. The land west of the ridge falls gently towards Wellington Road roundabout which is at approximately 72m AOD. To the east of the ridge, the land falls gently towards the North Sea, with the gradient steepening along the far eastern extent of Hareness Road on the approach to the junction with Coast Road, at the 'S' bend, dropping to approximately 34m AOD at the junction itself.

Coast Road

2.2.6. The section of Coast Road included within the study area is approximately 2.4km long and extends from its junction with Hareness Road in the south, to St Fitticks Road in the north, adjacent to the Bay of Nigg and South Harbour.

2.2.7. The land within the study area surrounding Coast Road comprises open land, used for grazing animals. Coast Road runs parallel to the North Sea, which is located between 100m and 300m to the east and is demarcated by a steep cliff, approximately 25m in height. There are multiple inlets in the cliff, most of which also comprise caves. The

distance the caves cut into or extend beneath the cliff face is unclear. The Aberdeenshire Coastal Path is located on the land between the Coast Road and the cliff. Doonies Farm and associated land is located either side of the road along the middle stretch of Coast Road, Nigg Gully Treatment Centre to the west of the existing railway crossing, with industrial units located to the south around the junction with Hareness Road. A former landfill (Ness Farm Landfill) is located to the west of Coast Road over the northern extent of the Preferred Route.

2.2.8. A railway line runs parallel to Coast Road for the majority of the length of the Preferred Route, before turning inland (west) as Coast Road reaches the Bay of Nigg. In the southern half of the study area, the railway line is located on the eastern side of Coast Road on an embankment. However, approximately 1.1km north of the junction with Hareness Road, Coast Road crosses the railway line via a small bridge as the railway line enters a rock cutting several metres below the level of the bridge. From this point onwards (northwards) the railway line is located immediately to the west of Coast Road in cutting, eventually emerging from the cutting to be level with Coast Road at the northern extent of the study area. At the northern end of the study area are works to construct the new South Harbour and Greg Ness Coastguard Station to the east, and a Wastewater Treatment Works (WWTW) to the west.

2.2.9. The topography of the study area along Coast Road comprises a slope, falling from west to east, perpendicular to Coast Road towards the North Sea/cliff edge. Along the southern section of Coast Road, the topographical high to the west is denoted by the ridge previously described above (at centre of Hareness Road, extending to the north). However, along the northern section of Coast Road, this ridge is no longer noted due to the presence of the now closed Ness Farm landfill, which is topographically elevated compared to the surrounding land, reaching a peak of 65m AOD and located immediately west of Coast Road.

2.2.10. The topography of Coast Road itself is gently undulating as Coast Road follows the coastal topography along the top of the sea cliff, varying in elevation between approximately 33m and 38m AOD over its length.

Transport Infrastructure – Roads

2.2.11. The existing road network is described using the road names listed in Table 2.1 below.

Table 2.1 - Road Names

Road Name
Wellington Road (A956)
Hareness Road (B985)
Coast Road (C154C)
Minto Avenue
Crawpeel Road
Hareness Circle
Minto Road
Blackness Road
Altens Farm Road
Sir Ian Wood House Access Road
Altens Lorry Park Access Road
Hareness Place

2.2.12. Junctions between Hareness Road and Coast Road are referenced by their road classification in Table 2.1, e.g., “the Hareness Place junction”.

Transport Infrastructure – Railway

2.2.13. The Aberdeen to Dundee railway runs north to south through the study area.

2.2.14. It is adjacent to Coast Road over the length of the scheme with Coast Road crossing the railway south of the wastewater treatment facility.

2.2.15. Heading north, the railway consists of two tracks on embankment until approximately 100m south of Doonies Farm before entering a cutting to provide clearance for an accommodation structure (UB133/385) to the east side of the railway. From there, the railway remains in cutting to the end of the study area at an average depth of 7m below the existing level of Coast Road.

2.3. Existing Conditions

2.3.1. The existing road network has been divided into two sections, Hareness Road and Coast Road.

2.3.2. These sections are shown on Figures 2.2 to 2.4 in Appendix C.

Link Geometry Design Standards

2.3.3. The existing geometry was assessed using the topographical survey information received.

2.3.4. For both sections, the horizontal geometry, vertical geometry and stopping sight distance (SSD) were checked against the requirements set out in DMRB CD 109 Roads Link Design to identify where there are relaxations and departures from standard. As the cross section of both roads are urban single carriageways, Table 2.5 of DMRB CD 109 was used producing 60Bkph for Hareness Road and 100Akph for Coast Road.

2.3.5. Assessment of existing geometry has limitations and will not identify all relaxations and departures however it does provide a broad investigation of an existing roads standard.

Junction Design Standards

2.3.6. DMRB CD 123 Geometric Design of At-Grade Priority and Signal-Controlled Junctions and DMRB CD 116 Geometric Design of Roundabouts provides guidance on the geometric design of junctions and roundabouts. To comply with the standard, the following is required:

2.3.7. When approaching a minor road junction, a driver shall be able to see a car waiting at the give-way line from the desirable SSD on the minor road.

2.3.8. Visibility on immediate approach to a junction is considered 1.5 times the desirable SSD for the associated road. For major roads it is measured from centreline to centreline. For minor roads it is measured back from the give-way line.

2.3.9. From a point 15m back from the give-way line on the centreline of a minor road, an approaching driver shall be able to see the full junction form.

2.3.10. From a setback of between 2.4m and 9m, a driver shall be able to see the SSD of the major road unobstructed in both directions. For direct accesses this shall be between 2.0m and 4.5m.

2.3.11. An absolute minimum corner radii of 6m should be used for junctions. Tapers should be provided where large vehicles are making turning movements.

2.3.12. An entry radius of less than 100m shall be included in the design of roundabouts to ensure appropriate speeds are used entering and exiting the roundabout.

2.4. Hareness Road – Existing

2.4.1. This section of existing road is shown on Figures 2.2 and 2.3 in Appendix C.

Route Description

2.4.2. This section of the B985 Hareness Road from the A956 Wellington Road roundabout (4 arm) runs 1.17km to the south-east, past the Blackness Road/Minto Road roundabout (4 arm). It passes seven priority junctions, two of which are roundabouts and ten private accesses.

2.4.3. From the Blackness Road/Minto Road roundabout (4 arm) the road continues east for 100m before entering into an elongated 'S' shaped bend on the approach to Coast Road, exiting to the north-east and running for 500m, passing Hareness Place junction, and connecting to Coast Road with a T-junction. Over this stretch of road, one priority junction and 10 private accesses are crossed.

2.4.4. A footway exists on both sides of Hareness Road until the elongated 'S' shaped bend on the approach to Coast Road, following this the shared footway/cycleway is present on the west side of the road until the junction with Coast Road. Properties are primarily setback from the rear of the footway generally via landscaped areas and adjacent car parking with formalised vehicular accesses.

Speed Limit

2.4.5. Hareness Road has a speed limit of 30 miles per hour (mph).

Geometric Design Standards

2.4.6. A total of four relaxations and 11 departures from standard have been identified within this section, comprising:

- Three departures from desirable minimum standard to the horizontal alignment.
- Two relaxations and two departures from desirable minimum standard to vertical alignment, all of which constitute departures from standard as they are on approach to a junction.
- Two relaxations and six departures from desirable minimum standard to SSD, all of which constitute departures from standard as they are on approach to a junction.

Junction Provision

2.4.7. Table's 2.2 and 2.3 below, details the outcome of the assessment of major/minor priority junctions and direct accesses along the existing Hareness Road. In addition, there are three roundabouts in this section.

2.4.8. The location of the junctions is shown on Figures 2.2 and 2.3 and are described from west to east below.

Table 2.2 - Major/Minor Junctions - Hareness Road

Junction	Compliance to DMRB CD 123 Standards				
	Corner Radii	Major Road SSD	Minor Road SSD	15m Set-Back Junction Form Visibility	2.4m – 9m Junction Visibility
Altens Farm Road Junction	✓	✗	✓	✗	✗
AC1	✓	✓	✓	✓	✗
West Hareness Circle Junction	✓	✓	✓	✓	✗
Minto Avenue Junction	✓	✗	✓	✓	✓
East Hareness Circle Junction	✓	✓	✓	✓	✓
Hareness Place Junction	✓	✓	✓	✓	✗

Table 2.3 - Direct Accesses - Hareness Road

Direct Accesses	Compliance to DMRB CD 123 Standards	
	Major Road SSD	2m - 4.5m Set-Back Junction Form Visibility
AC2	✓	✓
AC3	✓	✓
AC4	✓	✓
AC5	✗	✗
AC6	✗	✓
AC7	✗	✗
AC8	✗	✓
AC9	✓	✓
AC10	✓	✓
AC11	✓	✓
AC12	✓	✓
AC13	✓	✓
AC14	✓	✓
AC15	✓	✓
AC16	✗	✗
AC17	✓	✓

Direct Accesses	Compliance to DMRB CD 123 Standards	
	Major Road SSD	2m - 4.5m Set-Back Junction Form Visibility
AC18	✗	✗
AC19	✗	✗
AC20	✗	✗
AC21	✗	✗
AC22	✓	✓
AC23	✓	✓
AC24	✓	✓
AC25	✗	✗

2.4.9. This is a simple T-junction connecting to Altens Farm Road, which provides access to ALDI and other businesses to the north of the existing Hareness Road.

First Hareness Circle Junction

2.4.10. This is a simple T-junction connecting to Hareness Circle, which provides access to properties to the south of the existing Hareness Road.

Minto Avenue Junction

2.4.11. This is a simple T-junction connecting to Minto Avenue, which provides access to properties to the north of the existing Hareness Road.

Second Hareness Circle Junction

2.4.12. This is a simple T-junction connecting to Hareness Circle, which provides access to properties to the south of the existing Hareness Road.

Hareness Place Junction

2.4.13. This is a simple T-junction connecting to Hareness Place, which provides access to the recycling facility and other businesses north of Hareness Road.

Roundabout Provision

2.4.14. Table 2.4 below details the outcome of the assessment of roundabouts along Hareness Road.

Table 2.4 - Roundabouts - Hareness Road

Roundabouts	Compliance to DMRB CD 116 Standards						
	Entry Width Ratio	Entry Lane Width	Entry Path Radius	Approach Visibility	Entry Visibility	Visibility to Right	Circulatory Visibility
A956 Wellington Road Roundabout	✓	✓	✗	✓	✓	✓	✓
Crawpeel Road Roundabout	✓	✓	✗	✓	✓	✓	✓
Blackness Road Roundabout	✓	✓	✗	✓	✓	✓	✓

A956 Wellington Road Roundabout

2.4.15. The existing A956 Wellington Road joins a roundabout on the western boundary of the Altens Industrial Estate which provides access to the Altens Industrial Estate (via the existing Hareness Road) to the west and to West Tullos Road to the east. A crossing with dropped kerbs is provided within the approach island on the west, east, and south arms of the roundabout and comply with DMRB CD 143 standards, there is a signal crossing provided approximately 60m from the roundabout to the north arm. Footways are provided around the full roundabout.

Crawpeel Road Roundabout

2.4.16. This roundabout is near the west side of the existing Hareness Road which joins Crawpeel Road to the south and access to Sir Ian Wood House to the north. A crossing with dropped kerbs is provided within the approach island on the each of the four arms of the roundabout with tactile pavement being provided on the north side where the parking access resides. Footways are provided around the full roundabout.

Blackness Road Roundabout

2.4.17. This roundabout is near the east side of the existing Hareness Road which joins Blackness Road to the south and Minto Road to the north. Currently, there are no pedestrian crossings on any arm of this roundabout as the approach islands are completely covered in landscaping.

2.5. Coast Road – Existing

2.5.1. This section of existing road is shown on Figures 2.3 and 2.4 in Appendix C.

Route Description

2.5.2. This section of Coast Road begins approximately 150m south of the T-junction with Hareness Road and travels approximately 1.3km north-east towards the crossing over the Aberdeen to Dundee railway.

2.5.3. The cross section varies along its length with intermittent sections of verge.

2.5.4. The geometry generally follows the existing topography resulting in a substandard alignment and impaired stopping sight distance.

2.5.5. Due to constrained road width and horizontal alignment the existing bridge over the railway is signal controlled reducing the traffic to shuttle working.

2.5.6. From the railway crossing, the road continues north for approximately 250m towards the Coastguard Station.

Speed Limit

2.5.7. A 40mph speed limit extends from the northern extent of the scheme southwards to the east side of the railway bridge, with the remainder of Coast Road subject to a derestricted (60mph) speed limit.

Geometric Design Standards

2.5.8. A total of four relaxations and 27 departures from standard have been identified within this section, comprising:

- Four relaxations and five departures from desirable minimum standard to the horizontal alignment, all of which constitute departures from standard as they are on approach to a junction.
- 22 departures from desirable minimum standard to vertical alignment, all of which constitute departures from standard.

Junction Provision

2.5.9. Table 2.5 and 2.6 below, details the outcome of the assessment of major/minor priority junctions and direct accesses along the existing Coast Road.

2.5.10. The location of the junctions is shown on Figures 2.3 and 2.4 and are described from west to east below.

Table 2.5 - Major/Minor Junctions - Coast Road

Junction	Compliance to DMRB CD 123 Standards				
	Corner Radii	Major Road SSD	Minor Road SSD	15m Set-Back Junction Form Visibility	2.4m – 9m Junction Visibility
B985 Hareness Road Junction	✓	✓	✗	✓	✓

Table 2.6 - Direct Accesses - Coast Road

Direct Accesses	Compliance to DMRB CD 123 Standards	
	Major Road SSD	2m – 4.5m Set-Back Junction Form Visibility
AC26	✗	✗
AC27	✗	✗
AC28	✗	✗
AC29	✗	✗

2.5.11. There are no roundabouts in this section.

2.5.12. Traffic signals restrict the existing bridge over the railway to single lane traffic shuttle working effectively creating a junction.

B985 Hareness Road Junction

2.5.13. This junction is a ghost island T-junction with right turn lane connecting to Hareness Road. The junction provides access to several warehouses and businesses as well as the Altens Industrial Estate.

2.6. Traffic Conditions

Existing Traffic Patterns

2.6.1. Traffic volume data has been utilised from the 2021 Wellington Road Multi Modal Corridor Study undertaken by AECOM. The data was used to inform the Wellington Road Base Model and was collected at various points in 2019 (June and December).

2.6.2. Surveyed turning count data includes AM Peak Period (0700 - 0900) and PM Peak Period (1600 - 1800) volumes. To determine 24-hour traffic volumes, factors have been derived from the permanent Transport Scotland Automatic Traffic Counters, NTC01563 and NTC01564, respectively situated on the northbound off-slip and southbound on-slip of the A92 Charleston Junction.

2.6.3. Figure 2.5 displays the survey locations.

Figure 2.5 - Surveyed Traffic Data Locations

2.6.4. Table 2.7: summarises the traffic volume data.

Table 2.7 - Two-Way Traffic Volume Data (2019)

Location	AM Peak Hour (0730 – 0830)	PM Peak Hour (1630 – 1730	24-hour flow	% HGV (24 hour)
Site 1 – Hareness Road / Crawpeel Road				
Hareness Road (W)	1,310	490	10,000	19.5%
Hareness Road (E)	1,170	810	10,500	11.6%
Car Park Access	310	310	3,600	0.3%
Crawpeel Road	490	520	5,100	7.3%
Site 2 – Hareness Road / Minto Road / Blackness Road				
Hareness Road (W)	530	420	4,900	23.8%
Hareness Road (E)	540	300	4,300	11.2%
Minto Road	230	400	3,200	8.7%
Blackness Road	290	200	2,500	12.8%
Site 3 – Hareness Road / Coast Road				
Hareness Road	450	420	4,200	4.7%

Location	AM Peak Hour (0730 – 0830)	PM Peak Hour (1630 – 1730	24-hour flow	% HGV (24 hour)
Coast Road (N)	280	500	3,200	5.6%
Coast Road (S)	240	330	2,700	1.2%

2.6.5. Table 2.7 shows higher traffic volumes on the western sections of Harness Road, closer to A956 Wellington Road. Higher levels of HGV traffic reflect the prevalence of industrial sites in the area.

Existing Personal Injury Accidents

2.6.6. Personal injury collision data was obtained from Aberdeen City Council for the road network in the vicinity of the site. In the 5-year period from May 2017 to May 2022 there were a total of 4 reported collisions. Two of these incidents occurred on Hareness Road, at the roundabout with Crawpeel Road, one was categorised as serious and one as slight. The other two incidents occurred on Coast Road, one categorised as serious and one as damage only. The location of each of these incidents is shown in Figure 2.6.

2.6.7. Only one of the identified incidents involved a cyclist. This was categorised as slight and occurred on the Roundabout of Hareness Road and Crawpeel Road in July 2019. The collision was caused by a car driver failing to give way to a cyclist travelling around the roundabout. The car collided with rear wheel of the bicycle causing the cyclist to fall from his bike and suffer cuts and scrapes.

Figure 2.6 - Reported incidents within the vicinity of the scheme (2017-2022)

2.7. Road Pavement Condition

2.7.1. The road pavement condition has been assessed during DMRB Stage 3 following receipt of the pavement core results from the ground investigation.

2.7.2. To inform the initial assessment a desktop study of the existing condition was undertaken visually to inform cost estimation.

2.7.3. Longitudinal and reflective cracking is visible throughout most of Hareness Road with signs of local patching in locations.

2.7.4. Coast Road is understood to have been overlayed in 2017 and appears to be in a reasonable condition.

2.8. Structures

Overbridge

2.8.1. The Coast Road Rail Overbridge (Network Rail reference OB133-388) located approximately 1km south of Aberdeen South Harbour, carries the existing Coast Road carriageway over the Aberdeen to Dundee railway line. The structure is a single span solid spandrel brick masonry arch on masonry abutment walls. The bridge and carriageway are almost perpendicular to the rail line. The road has steep vertical curves on its approaches to the structure. The clear span length of the deck is 10.3m and the deck width is approximately 7.0m with 6.4m of that being carriageway and the remaining 0.6m being masonry wall and narrow verge with kerbing. Road restraint systems have been provided along the road adjacent to the railway on the approaches to the bridge.

2.8.2. Limited vertical clearance information has been obtained via consultation with Network Rail, which has been supplemented by topographical survey. Stone masonry parapets are provided at the sides of the structure that are considered sub-standard for a structure over railway conveying a cycle route (NCN 1). The parapets are not high enough for cyclists.

2.8.3. No information has been provided at this stage on the condition of the structure; however, during a meeting that took place on the 08/03/2023, Network Rail indicated as part of the planned electrification of the line they intended to raise the bridge parapet to facilitate cyclists, protect from electrocution, and deter trespassing and errant objects.

2.8.4. To the southwest of Aberdeen South Harbour, approximately 300m, is a rail overbridge (Network Rail reference OB133-388) providing pedestrian access to paths over the former Ness Farm landfill and Tullos Wood.

2.8.5. Adjacent to Doonies Farm, an accommodation overbridge (Network Rail reference OB133-386) provides access to the east side of the railway for agricultural purposes and another access to the coastal path. A road restraint system has been provided adjacent to the east side of the road on the approach to the bridge.

Underbridges

2.8.6. Within the scheme extents rail underbridges are located approximately 135m north of Hareness Road, and roughly 365m south of Hareness Road. Both structures are single span solid spandrel brick masonry arches on masonry abutment walls.

Other Structures

2.8.7. A number of relatively minor retaining walls exist within the extents of the scheme and are typically adjacent to the road but outwith the road corridor and are associated with adjacent car parking or storage areas.

2.9. Roadside Features

Lighting

2.9.1. Road lighting is provided along Hareness Road (B985) but does not extend along the section of Coast Road within the study area. Table 2.6 below describes the locations of the existing lighting on the existing routes.

Table 2.8 - Street Lighting Locations on Existing Roads

LOCATION	START (Approx.)	END (Approx.)
Hareness Road	Wellington Road Roundabout	Junction of Hareness Road and Coast Road

Road Restraint System

2.9.2. A road restraint system (RRS has been provided along the existing Coast Road to protect errant vehicles from hazards. Table 2.7 below shows the approximate locations of the RRS, its length, and the hazard.

Table 2.9 - RRS Location on Existing Roads

BARRIER LOCATION	VERGE	LENGTH (m)	HAZARD
Coast Road (existing Railway Bridge approach)	Southbound	465	Embankment/ Railway
Coast Road (existing Railway Bridge approach)	Northbound	485	Embankment/ Railway

Signage

2.9.3. All signage along the sections of Hareness Road and Coast Road are written in English only. The location and carriageway direction of the signage is detailed in Table 2.8 below.

Table 2.10 - Existing Signage

SIGNAGE LOCATION	CARRIAGEWAY DIRECTION	SCHEDULE	DESCRIPTION
Wellington Road Roundabout	Eastbound	No parking on verge or footway	Dia. 664.3
116m East of Wellington Road Roundabout	Westbound	Parking information	Dia. 801
189m East of Wellington Roundabout	Eastbound	Parking information	Dia. 801
390m East of Wellington Roundabout	Westbound	Roundabout approach	Dia. 510
1,046m East of Wellington Roundabout	Westbound	Roundabout approach	Dia. 510

SIGNAGE LOCATION	CARRIAGEWAY DIRECTION	SCHEDULE	DESCRIPTION
1,163m East of Wellington Roundabout	Eastbound	Route for use by pedal cycles and pedestrians only	Dia. 956
Junction of Hareness Road (B985) and Coast Road (C154C)	Eastbound	End of controlled zone	Dia. 664
Junction of Hareness Road (B985) and Coast Road (C154C)	Eastbound	National Speed Limit	Dia. 671
Junction of Hareness Road (B985) and Coast Road (C154C)	Eastbound	Give Way	Dia. 602
Junction of Hareness Road (B985) and Coast Road (C154C)	Westbound	End of controlled zone	Dia. 664
Junction of Hareness Road (B985) and Coast Road (C154C)	Eastbound	National Speed Limit	Dia. 671
Junction of Hareness Road (B985) and Coast Road (C154C)	Westbound	No parking on verge or footway	Dia. 664.3
156m south of Junction of Hareness Road (B985) and Coast Road (C154C)	Southbound	30mph/ National Speed Limit	Dia. 671
66m south of Junction of Hareness Road (B985) and Coast Road (C154C)	Southbound	30mph/ National Speed Limit	Dia. 671
35m north of Junction of Hareness Road (B985) and Coast Road (C154C)	Northbound	Hidden dip	Dia. 563
83m north of Junction of Hareness Road (B985) and Coast Road (C154C)	Northbound	Cycle route ahead warning	Dia. 950
125m north of Junction of Hareness Road (B985) and Coast Road (C154C)	Northbound	End of cycle route	Dia. 965
194m north of Junction of Hareness Road (B985) and Coast Road (C154C)	Southbound	Cycle route ahead warning	Dia. 950
225m north of Junction of Hareness Road (B985) and Coast Road (C154C)	Southbound	Hidden dip	Dia. 563

SIGNAGE LOCATION	CARRIAGEWAY DIRECTION	SCHEDULE	DESCRIPTION
133m south of Doonies Farm Access	Northbound	"Doonies Rare Breeds Farm – 150 yards"	N/A
93m south of Doonies Farm Access	Northbound	Tractor Turning Warning	Dia. 553.2
88m south of Doonies Farm Access	Northbound	Blind summit	Dia. 563
85m south of Doonies Farm Access	Northbound	Children going to and from school or playground ahead	Dia. 545
85m south of Doonies Farm Access	Northbound	Bend ahead to the right	Dia. 512
90m north of Doonies Farm Access	Southbound	Children going to and from school or playground ahead	Dia. 545
90m north of Doonies Farm Access	Southbound	Bend ahead to the right	Dia. 512
120m north of Doonies Farm Access	Northbound	Blind summit	Dia. 563
258m south of Doonies Farm Access	Northbound	Traffic signals ahead	Dia. 543
350m south of Doonies Farm Access	Northbound	Double bend or series or bends ahead	Dia. 513
345m north of Coast Guard station	Northbound	Bend ahead to the right	Dia. 512
340m north of Coast Guard station	Northbound	Side road ahead (Left)	Dia. 506.1
Wellington Road Roundabout	Eastbound	No parking on verge or footway	Dia. 664.3
116m East of Wellington Road Roundabout	Westbound	Parking information	Dia. 801
189m East of Wellington Roundabout	Eastbound	Parking information	Dia. 801
390m East of Wellington Roundabout	Westbound	Roundabout approach	Dia. 510

Laybys

2.9.4. There are currently no laybys located on the existing Hareness and Coast Roads.

Rest Areas/Parking

2.9.5. There is one car park along the route of Hareness Road and Coast Road. The approximately 16 space car park is situated on the northbound side of Coast Road as shown in Figure 2.4. The location and carriageway direction of the rest area is detailed in Table 2.9 below.

Table 2.11 - Parking Areas

Approximate Location	Direction
820m north of Hareness Road / Coast Road junction	Northbound

2.9.6. Inappropriate parking has been identified along the west verge of Coast Road to the north of the junction with Harness Road.

2.9.7. A traffic regulation order (TRO) exists for the majority of Hareness Road to prevent waiting, with double yellow markings noted. Outwith this section, some lengths of carriageway are occupied by mobile catering vans.

2.10. Non-Motorised User Provision

Hareness Road

2.10.1. Footways are provided on both sides of Hareness Road with an approximate width of 3m.

2.10.2. At the majority of side road crossings and accesses there are no dropped kerbs or tactile paving, this can act as a barrier to those with mobility issues and wheelchair users.

2.10.3. A section of sub-standard width shared use cycle track/ footway exists on Hareness Road along the north side from its junction with AC 20 eastwards then northwards to its junction with Coast Road.

Coast Road

2.10.4. Along Coast Road there are sections of shared use footway/cycle track provided adjacent to the carriageway. However, there are also sections of road where there is no footway or cycle track provision adjacent to the carriageway.

2.10.5. There is a shared use path which runs along the eastern side of the railway line away from the carriageway. This path forms part of the wider Aberdeenshire Coastal Path and National Cycle Route 1 and can be accessed via an existing underbridge beneath the railway line around 120m north of Hareness Road.

Pedestrian Facilities

2.10.6. The Aberdeenshire Coastal path runs through the study area from North to South following the coastline to the east of Coast Road. This is a narrow, unbound path which runs along the top of sea cliffs. The path is mainly used for recreational walking with a small number of off-road cyclists also using it for leisure purposes despite signs warning against it.

2.10.7. There are a number of routes in the study area which have been designated as core paths by ACC, these include Coastal Path South, Kincorth Hill, North Balnagask Road to

Wellington Road, Balnagask, Souter Head Road to Cove Crescent, Cove – the Coast, and Cove Road. The condition and suitability of these paths is varied, some are only suitable for pedestrians whilst others are wheelchair accessible and suitable for cyclists.

2.10.8. There is also a network of unbound paths around Tullos Hill which are understood to be popular with recreational walkers and runners. These paths are fairly secluded and unlit and could be viewed as unsafe by some users.

Shared Use / Cycle Facilities

2.10.9. National Cycle Route 1 runs through the study area from North to South. It is made up of an on-road route with adjoining sections from off-road paths and cycle facilities.

2.10.10. There is a 3.7km circular route around Kincorth Hill in the east of the study area. This is made up of unbound material and tarmac sections of path, generally in good condition with varying gradients. This is a popular route for both walkers and cyclists.

2.10.11. To the south of the study area, Cove Road and Souter Head Road to Cove Crescent core paths are popular routes that connect to the Wellington Road cycle track.

Bus Services

2.10.12. There are a total of 10 bus stops along Hareness Road (5 eastbound, 5 westbound). Currently, these stops are serviced by two First buses (3B and 18) and one Stagecoach bus (7A), details of these buses are shown in the table below:

Table 2.12 - Bus Services

Service No.	Notes
First 3B: Mastrick – Cove (Thistle)	This service runs only once a day Monday to Friday, departing Mastrick at 07:36hrs and arriving at Altens Industrial Estate at 08:20hrs.
First 18: Charleston/Redmoss - Dyce (Northern Lights)	There are only 3 buses which service Hareness Road each day, Monday to Friday, running hourly in the AM peak.
Stagecoach 7A: Aberdeen Union Sq. – Stonehaven	This is a limited service which only runs in the AM and PM peak, Monday to Friday.

2.10.13. At detailed design, a review of the bus stops along the route will be undertaken to determine whether the route can be rationalised to reduce the number of stops.

2.10.14. There are currently no bus services on Coast Road.

2.11. Drainage

2.11.1. The road drainage systems along Hareness Road and Coast Road consist mainly of kerb and gullies.

2.11.2. Along the existing Coast Road, surface water run-off is collected via gullies conveyed by natural channels with raised verges and road camber.

2.11.3. Gullies on the existing B985 Harness Road collect surface water runoff and link to sub-surface carrier drains that form the local drainage network.

2.11.4. There are Sustainable urban Drainage System (SuDS) facilities adjacent to the existing Coast Road that are understood to provide treatment and attenuation to areas of Hareness Road.

2.11.5. Gullies on the existing Coast Road collect surface water runoff and link to a localised sub-surface carrier drain network that outfalls into the North Sea at three locations.

2.12. Public Utilities

2.12.1. To inform the assessment the New Roads and Street Work Act 1991 (NRSWA) procedure was followed with utility providers contacted as required (C2 enquiry) to identify the presence and locations of any apparatus. Aberdeen City Council has given formal notice of its intention to undertake major works in the area by registering the scheme on the Scottish Roadworks Register and issuing Section 144 notices. The companies listed below provided records that indicated their assets would likely be affected:

- Openreach
- CityFibre
- Vodafone
- Scottish and Southern Energy Networks
- Scottish and Southern Energy Enterprise
- Scottish and Southern Energy Utility Solutions Limited
- Scottish Water
- Scottish Gas Networks
- Neos

Gas

2.12.2. The existing gas network within the study area is operated by Scottish Gas Networks (SGN) and Scottish and Southern Energy Enterprise.

2.12.3. From its junction with Wellington Road, Hareness Road has an intermediate pressurised SGN underground gas line which runs along the north side of Hareness road for approximately 60m before it crosses underneath to the south side of the road. This underground gas line then continues east providing gas to the properties on Hareness road with numerous underground crossings before it crosses underground again just west

of Blackness Road and Minto Road roundabout. The SGN gas line then continues east for approximately 120m before terminating.

2.12.4. SSE Enterprise has an Intermediate and low pressurised main that continues from the SGN gas main, this follows parallel underground on the north side of Hareness road, serving the properties adjacent, before continuing north along Hareness Place and finishes by entering the substation.

Telecoms

2.12.5. The existing telecommunications within the study area is provided by Openreach, Neos, Vodafone and CityFibre.

2.12.6. Openreach's apparatus comprises of cables present underneath of both north and south footpaths of Hareness Road, the cables then continue further east with connections to live boxes which are located underneath Hareness Road at several locations. Openreach's live cable then continues to cross underneath Hareness road on a further two occasions before finally heading south when it reaches west of Coast Road.

2.12.7. An overhead Openreach cable connects Doonies farm to a nearby mast approximately 250m north of the waste processing facility, this then continues west of Coast Road before crossing over the railway bridge. This line continues north adjacent to both Coast Road and the railway line before finally crossing Coast Road and entering a Telecommunications box at the Greg Ness Coastguard Station. From here, an underground cable continues northeast of Coast Road before crossing underneath to the south of Scottish Water's wastewater treatment works before continuing along St Fitticks Road into Torry.

2.12.8. Openreach has advised that there are several planned new fibre optic cable installations in the study area, this includes an approximate 240m length on Hareness Road and connects into an existing live box on Hareness Place. A second planned line would start at the junction of Hareness Place and Hareness Road and follows underneath the footpath north along the west side of Coast Road for approximately 950m. There is understood to be a planned cable starting approximately 55m north of the Railway line overbridge, this should be in the east verge of Coast Road and would continue north and connect into a current live box just north of Nigg Wastewater Treatment Works.

2.12.9. CityFibre's apparatus includes underground cables on both the north and south side of Hareness road, serving most of the adjacent properties. The cable continues for approximately 270m north along Hareness Place and finishes by entering the live telecommunications box next to the waste processing facility.

2.12.10. Vodafone's apparatus comprises of underground cables on both the north and south side of Hareness Road, these cables continue throughout before terminating at the west boundary of Irvin House.

2.12.11. Neos' apparatus comprises of an underground telecoms cable that serves Crawpeel Road and heads north to Hareness Road. The cable then continues west under the footway for approx. 200m before crossing underneath Hareness Road and joining Altens Farm Road, this continues for 215m before terminating.

Electricity

2.12.12. The existing electricity network within the study area is provided by Scottish and Southern Energy Networks (SSEN).

2.12.13. The apparatus comprises of 11kV cables and Low Voltage mains that runs parallel on the north and south side of Hareness road through various underground cables. The distribution cables continue along Hareness place before they enter a substation located approximately 120m west of Coast Road.

2.12.14. North of Doonies farm, a SSEN 11kV overhead cable heads east towards Coast Road and continues north adjacent to Coast Road for approximately 600m, before crossing over both the railway line and Coast Road and terminating at the HM Coastguard facility.

2.12.15. East of Coast Road, approximately 130m north of the substation a SSEN 11kV underground cable runs adjacent of Coast Road providing power to the Greg Ness site before continuing north and terminating at Scottish Water's wastewater treatment works. The cable crosses underneath Coast Road just north of the wastewater treatment works before terminating approximately 145m north.

Water Supply and Sewage

2.12.16. Properties throughout Hareness Road are served by a Scottish Water (SW) main supply, a foul sewer, and a surface water sewer.

2.12.17. The mains supply line is present underneath the south footpath before it crosses underneath Hareness Road and continues heading east of Coast Road. The foul and surface water sewers are located directly underneath Hareness Road and continues to head east to Coast Road.

2.12.18. As Hareness Road meets Coast Road, a surface water sewer and a combined sewer are situated in the west verge of Coast Road, the combined sewer and surface water sewers cross beneath Coast Road with the surface water sewer heading east and discharging into the North Sea. The combined sewer continues north, adjacent to the railway line and passes approximately 28m east of Doonies Farm railway underbridge. This combined sewer then continues northwards adjacent to the railway line and around Greg Ness Coastguard Station before terminating at Scottish Water's wastewater treatment works.

2.13. Changes from DMRB Stage 2 Report

2.13.1. Since publication of the DMRB Stage 2 Route Assessment Report, there has been no change to the existing conditions of the site.

3. Description of the Proposed Scheme

3.1.1. Following completion of the DMRB Stage 2 Route Options Assessment, a value engineering exercise was undertaken to produce a scheme with the best value for money possible from information acquired from surveys and the public consultation process.

3.1.2. The value engineering exercise included the following aspects:

- Shortening of the scheme extents;
- Reducing the walking, wheeling and cycling level of service; and
- Steepening of earthwork slopes on embankments.

3.1.3. None of the value engineering options affect the Transport Planning Objectives (TPOs).

3.1.4. The scheme at DMRB Stage 2 terminated shortly after the Scottish Water Wastewater Treatment Works (SWWTW) on Coast, south of Aberdeen South Harbour (ASH). Following the receipt of pavement cores from the geotechnical investigation it was determined that existing road construction from the coastguard station to ASH does not require upgrade or reconstruction.

3.1.5. Following feedback from the DMRB Stage 2 Public Consultation, it was considered that the cycling facility design was unnecessarily wide for the level of expected/perceived use therefore it has been narrowed to the absolute minimum width of 2m as per Cycling by Design 2021.

3.1.6. At DMRB Stage 2, the embankment slopes were designed to 1:3 prior to any geotechnical investigation results. Following completion of the geotechnical investigation and extraction of earthworks quantities, it was determined that the embankment slopes could be steepened to 1:2.5 and 1:2 in several locations. The benefit of this is a reduced material import and earthworks footprint.

3.1.7. The general arrangement of the scheme is shown in Figures 3.1 to 3.4.

3.2. Engineering Description

Single Carriageway Alignment and Walking, Wheeling and Cycling Facility

3.2.1. The proposed scheme comprises approximately 3.24km of new or upgraded single carriageway with the easterly tie in at Wellington Road roundabout and northern tie in adjacent to the Coastguard Station on Coast Road.

3.2.2. The proposed scheme is an urban single carriageway (SU2) in accordance with DMRB CD 127 Cross-sections and Headrooms, Figure 2.1.1N1g. This reflects the urban nature of the scheme throughout Hareness Road but provides resilience to Coast Road for future industrial use.

3.2.3. The typical cross-section used on Hareness Road and Coast Road varies but still complies with DRMB CD 127 requirements, as shown below:

Hareness Road

- 3.65m wide lanes;
- 125mm wide kerb line with a 50mm upstand;
- 2.0m wide cycle track, includes 0.5m wide buffer (kerb width included);
- 125mm wide kerb line with a 50mm upstand; an
- 2.0m wide footway (typically).

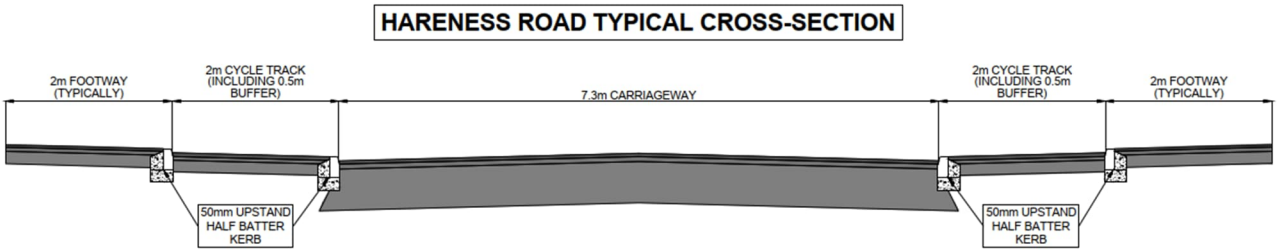


Figure 3.5 - Hareness Road Typical Cross-Section

Coast Road

- 2.5m verge (to provide space for a RRS)
- 3.65m wide lanes;
- 125mm wide kerb line with a 100mm upstand on both carriageway edges;
- 1m hardened buffer (kerb width included);
- 2.0m shared cycle track
- 125mm wide half-batter kerb line with a 50mm upstand; and
- 2.0m wide footway.

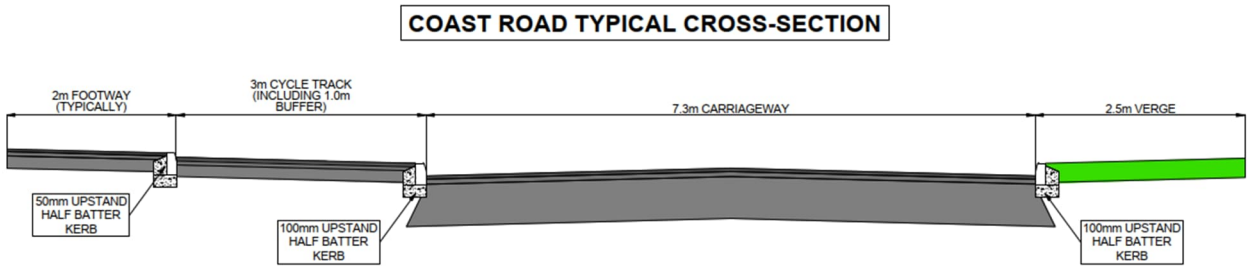


Figure 3.6 - Coast Road Typical Cross-Section

3.2.4. A new overbridge crossing over the Aberdeen to Dundee railway will be provided with a headroom clearance of 6.65m + S (sag curve compensation) following consultation with Network Rail.

3.2.5. The proposed single carriageway alignment and associated profiles are shown in Figures 3.7 to 3.11

Major Junction

3.2.6. There is one major junction as part of the proposed scheme, the Hareness Road/Coast Road ghost island junction.

3.2.7. The proposed ghost island junction is shown in detail on Figure 3.9.

Hareness Road/Coast Road Ghost Island (CH 1+665)

3.2.8. The Hareness Road/Coast Road ghost island is located approximately 20m west of the existing Hareness Road/Coast Road T-junction. The junction changes the priority of Coast Road by flowing directly into Hareness Road and introducing a right-left stagger into Coast Road to the south and Hareness Place.

Local Roads, Roundabouts and Accesses

3.2.9. A strategy has been developed to determine the type of provision over local road junctions and private accesses.

3.2.10. On Hareness Road the strategy for crossing junctions, accesses and roundabouts is as follows:

- At direct accesses, the walking, wheeling and cycling facilities continue across the junction however it ramps down to a 20mm upstand kerb from 50mm. This will be referred to as a ‘vehicle crossover’.
- At minor road junctions, the cycle track ramps down to carriageway level while the footway remains at the same level with a 100mm upstand before curving into the bell mouth. Tactile paving will be provided at the end of the bell mouth to demarcate the uncontrolled pedestrian crossing. This will be referred to as a ‘bellmouth junction’.
- At roundabouts, the walking, wheeling and cycling facilities will cross all four arms via shared uncontrolled crossings with tactile paving before and after the crossing facility.

3.2.11. On Coast Road the strategy for crossing junctions and accesses is the provision of an uncontrolled pedestrian crossing utilising tactile paving at the crossing locations.

3.2.12. The proposed local road junctions and private accesses are shown in Figure 3.12 and 3.13.

3.2.13. Table 3.1 below describes the crossing treatment over the local road junctions, roundabouts and private accesses.

Table 3.1 - Local Road, Accesses and Roundabout Strategy

Local Road/Access/Roundabout	Chainage	Treatment
Altens Farm Road	0+090	Bellmouth Junction
AC1	0+160	Bellmouth Junction
AC2	0+253	Vehicle Crossover
Hareness Road Roundabout (West)	0+322	Uncontrolled Shared Crossing
AC3	0+380	Vehicle Crossover
Hareness Circle (West)	0+482	Bellmouth Junction
AC4	0+500	Vehicle Crossover
AC5	0+552	Vehicle Crossover
AC6	0+637	Vehicle Crossover
Minto Avenue	0+650	Bellmouth Junction
AC7	0+680	Vehicle Crossover
AC8	0+700	Vehicle Crossover
AC9	0+740	Vehicle Crossover
AC10	0+755	Vehicle Crossover
Hareness Circle (East)	0+785	Bellmouth Junction
AC11	0+790	Vehicle Crossover
AC12	0+812	Vehicle Crossover
AC13	0+840	Vehicle Crossover
AC14	0+857	Vehicle Crossover
Hareness Road Roundabout (East)	0+945	Uncontrolled Shared Crossing
AC15	1+020	Vehicle Crossover
AC16	1+044	Vehicle Crossover
AC17	1+064	Vehicle Crossover
AC18	1+064	Vehicle Crossover
AC19/20	1+119	Vehicle Crossover
AC21	1+210	Vehicle Crossover
AC22	1+589	Vehicle Crossover
AC23	1+635	Vehicle Crossover
AC24	1+659	Vehicle Crossover
AC25	1+724	Vehicle Crossover
Coast Road (South)	1+850	Bellmouth Junction
AC26	1+850	Bellmouth Junction
Hareness Place	1+900	Bellmouth Junction
AC27	1+974	No Crossing Required
AC27	2+509	Bellmouth Junction
AC28	2+524	No Crossing Required

Local Road/Access/Roundabout	Chainage	Treatment
AC29(a)	2+660	No Crossing Required
AC29(b)	2+725	No Crossing Required
AC30	2+770	Bellmouth Junction
AC31	2+864	Bellmouth Junction
AC32	2+864	No Crossing Required
AC33	2+864	No Crossing Required

3.2.14. Each of the local roads, roundabouts and accesses are described below:

Altens Farm Road

3.2.15. This local road has a junction with Hareness Road approximately 90m east of Wellington Road Roundabout and runs north to accommodate commercial accesses.

3.2.16. The walking and wheeling provision will maintain its level and an uncontrolled pedestrian crossing will be provided at the end of the bellmouth.

3.2.17. The cycle track will slope down to carriageway level and continue across the minor road before ramping back to a 50mm upstand.

AC1

3.2.18. This access road has a junction with Hareness Road approximately 160m east of Wellington Road Roundabout and runs south to accommodate commercial and industrial units and carparks.

3.2.19. The walking and wheeling provision will maintain its level and an uncontrolled pedestrian crossing will be provided at the end of the bellmouth.

3.2.20. The cycle track will slope down to carriageway level and continue across the minor road before ramping back to a 50mm upstand.

AC2

3.2.21. This direct access from Hareness Road approximately 253m east of Wellington Road Roundabout runs south into a commercial business carpark.

3.2.22. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

Hareness Road Roundabout (West)

3.2.23. This roundabout has four arms serving Hareness Road (west and east), north to Wood plc premises and south to Crawpeel Road. The roundabout is approximately 322m east of Wellington Road Roundabout.

3.2.24. The walking, wheeling and cycling provision will cross via an uncontrolled shared crossing at all four arms.

AC3

3.2.25. This access road has a junction with Hareness Road approximately 380m east of Wellington Road Roundabout and runs south to accommodate commercial units and carparks.

3.2.26. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

Hareness Circle (West)

3.2.27. This local road has a junction with Hareness Road approximately 482m east of Wellington Road Roundabout and runs south to accommodate commercial and industrial accesses and carparks.

3.2.28. The walking and wheeling provision will maintain its level and an uncontrolled pedestrian crossing will be provided at the end of the bellmouth.

3.2.29. The cycle track will slope down to carriageway level and continue across the minor road before ramping back to a 50mm upstand.

AC4

3.2.30. This access road has a junction with Hareness Road approximately 500m east of Wellington Road Roundabout and runs north to a carpark.

3.2.31. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

AC5

3.2.32. This access road has a junction with Hareness Road approximately 552m east of Wellington Road Roundabout and runs north to a commercial unit and carpark.

3.2.33. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

AC6

3.2.34. This access road has a junction with Hareness Road approximately 637m east of Wellington Road Roundabout and runs south to a commercial unit and carpark.

3.2.35. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

Minto Avenue

3.2.36. This local road has a junction with Hareness Road approximately 650m east of Wellington Road Roundabout and runs north to accommodate commercial and industrial accesses and carparks.

3.2.37. The walking and wheeling provision will maintain its level and an uncontrolled pedestrian crossing will be provided at the end of the bellmouth.

3.2.38. The cycle track will slope down to carriageway level and continue across the minor road before ramping back to a 50mm upstand.

AC7

3.2.39. This access road has a junction with Hareness Road approximately 680m east of Wellington Road Roundabout and runs south to a commercial unit and carpark.

3.2.40. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

AC8

3.2.41. This access road has a junction with Hareness Road approximately 700m east of Wellington Road Roundabout and runs south to a commercial unit and carpark.

3.2.42. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

AC9

3.2.43. This access road has a junction with Hareness Road approximately 740m east of Wellington Road Roundabout and runs south to a commercial unit and carpark.

3.2.44. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

AC10

3.2.45. This access road has a junction with Hareness Road approximately 755m east of Wellington Road Roundabout and runs north to a commercial unit and carpark.

3.2.46. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

Hareness Circle (East)

3.2.47. This local road has a junction with Hareness Road approximately 785m east of Wellington Road Roundabout and runs north to accommodate commercial and industrial accesses and carparks.

3.2.48. The walking and wheeling provision will maintain its level and an uncontrolled pedestrian crossing will be provided at the end of the bellmouth.

3.2.49. The cycle track will slope down to carriageway level and continue across the minor road before ramping back to a 50mm upstand.

AC11

3.2.50. This access road has a junction with Hareness Road approximately 790m east of Wellington Road Roundabout and runs north to a commercial unit and carpark.

3.2.51. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

AC12

3.2.52. This access road has a junction with Hareness Road approximately 812m east of Wellington Road Roundabout and runs north to a commercial unit and carpark.

3.2.53. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

AC13

3.2.54. This access road has a junction with Hareness Road approximately 840m east of Wellington Road Roundabout and runs south to commercial units and carparks.

3.2.55. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

AC14

3.2.56. This access road has a junction with Hareness Road approximately 857m east of Wellington Road Roundabout and runs north to commercial units and carparks.

3.2.57. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

Hareness Road Roundabout (East)

3.2.58. This roundabout has four arms serving Hareness Road (west and east), north to Minto Road and south to Blackness Road. The roundabout is approximately 945m east of Wellington Road Roundabout.

3.2.59. The walking, wheeling and cycling provision will cross via an uncontrolled shared crossing at all four arms.

AC15

3.2.60. This direct access from Hareness Road approximately 1020m east of Wellington Road Roundabout runs south into a commercial business carpark.

3.2.61. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

AC16

3.2.62. This direct access from Hareness Road approximately 1044m east of Wellington Road Roundabout runs north into a commercial business carpark and yard.

3.2.63. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

AC17

3.2.64. This access road has a junction with Hareness Road approximately 1064m east of Wellington Road Roundabout and runs north to commercial units and carparks.

3.2.65. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

AC18

3.2.66. This direct access from Hareness Road approximately 1064m east of Wellington Road Roundabout runs south into an industrial business carpark and yard.

3.2.67. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

AC19/20

3.2.68. This shared direct access from Hareness Road approximately 1119m east of Wellington Road Roundabout runs north into two commercial business carparks and a yard.

3.2.69. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

AC21

3.2.70. This direct access from Hareness Road approximately 1210m east of Wellington Road Roundabout runs south into a commercial business carpark.

3.2.71. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

AC22

3.2.72. This direct access from Hareness Road approximately 1589m east of Wellington Road Roundabout runs west into a commercial business carpark.

3.2.73. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

AC23

3.2.74. This direct access from Hareness Road approximately 1635m east of Wellington Road Roundabout runs west into a commercial business carpark.

3.2.75. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

AC24

3.2.76. This direct access from Hareness Road approximately 1659m east of Wellington Road Roundabout runs west into a commercial business carpark and yard.

3.2.77. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

AC25

3.2.78. This direct access from Hareness Road approximately 1724m east of Wellington Road Roundabout runs west into an industrial yard.

3.2.79. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

Coast Road (South)

3.2.80. This local road has a junction with Hareness Road approximately 1850m east of Wellington Road Roundabout and runs south towards Cove and agricultural properties.

3.2.81. The walking and wheeling provision will maintain its level and an uncontrolled pedestrian crossing will be provided at the end of the bellmouth.

3.2.82. The cycle track will slope down to carriageway level and continue across the minor road before ramping back to a 50mm upstand.

AC26

3.2.83. This direct access from Coast Road (South) approximately 1850m east of Wellington Road Roundabout runs north-east into a proposed car park.

3.2.84. A pedestrian crossing will be provided to cross the junction, the cycle track runs around the back of the car park as its considered the desire line from Coast Road (South).

Hareness Place

3.2.85. This local road has a junction with Hareness Road approximately 1900m east of Wellington Road Roundabout and runs north-west to accommodate commercial and industrial accesses and carparks.

3.2.86. The walking, wheeling and cycling provisions will slope down to a 20mm upstand with the carriageway edge and continue across this junction to provide a vehicle crossover arrangement.

AC27

3.2.87. This direct access from Coast Road approximately 1974m east of Wellington Road Roundabout runs east under the Aberdeen to Dundee railway agricultural underpass.

3.2.88. The walking, wheeling and cycling provision does not cross this access.

AC28

3.2.89. This direct access from Coast Road approximately 2524m north-east of Wellington Road Roundabout runs east over the Aberdeen to Dundee railway accommodation overbridge.

3.2.90. The walking, wheeling and cycling provision does not cross this access.

AC29(a)

3.2.91. This direct access from Coast Road approximately 2660m north-east of Wellington Road Roundabout runs east into a proposed car park that replaces the existing Doonies car park.

3.2.92. The walking, wheeling and cycling provision does not cross this access.

AC29(b)

3.2.93. This direct access from Coast Road approximately 2725m north-east of Wellington Road Roundabout runs east into a proposed car park that replaces the existing Doonies car park.

3.2.94. The walking, wheeling and cycling provision does not cross this access.

AC30

3.2.95. This direct access from Coast Road approximately 2770m north-east of Wellington Road Roundabout runs north-west towards a proposed drainage basin.

3.2.96. The walking and wheeling provision will maintain its level and an uncontrolled pedestrian crossing will be provided at the end of the bellmouth.

3.2.97. The cycle track will slope down to carriageway level and continue across the minor road before ramping back to a 50mm upstand.

AC31

3.2.98. This direct access from Coast Road approximately 2864m north-east of Wellington Road Roundabout runs north-west towards a commercial building and former landfill.

3.2.99. The walking and wheeling provision will maintain its level and an uncontrolled pedestrian crossing will be provided at the end of the bellmouth.

3.2.100. The cycle track will slope down to carriageway level and continue across the minor road before ramping back to a 50mm upstand.

AC32

3.2.101. This direct access from Coast Road approximately 2864m north-east of Wellington Road Roundabout runs north-west towards a commercial building.

3.2.102. The walking, wheeling and cycling provision does not cross this access.

AC33

3.2.103. This direct access from Coast Road approximately 2864m north-east of Wellington Road Roundabout runs north-west towards a balancing pond.

3.2.104. The walking, wheeling and cycling provision does not cross this access.

Structures

3.2.105. In addition to the existing structures mentioned for AC27 and AC28 junction provision, a new Aberdeen to Dundee railway crossing is proposed for the scheme at chainage 2+905. This will be described in more detail within Chapter 5.

3.2.106. A retaining structure will be required at detailed design on the south side of Hareness Road approximately 150m east of Blackness Road roundabout.

3.2.107. The existing East Tullos Burn culvert requires replacement due to current loading conditions exceeding the existing structures load bearing capacity. A replacement culvert will be modelled at detailed design.

Lay-bys and Carparks

3.2.108. A modified Type A lay-by will be provided at the site of the existing carpark on Coast Road to allow people to park their vehicles safely and access the walking, wheeling and cycling facility, Tullos Wood footpath and the coastal path. The lay-by has been designed with departures from DMRB CD 169 to be compact and prevent HGVs stopping up.

3.2.109. A new carpark has been designed to provide a safe parking area for people accessing the coastal path at the accommodation structure with AC27. The carpark is accessed via the realigned Coast Road, south of the ghost island junction.

Public Transport Facilities

3.2.110. The existing public bus routes will be unaffected by the scheme following construction. The existing locations for bus stops will be retained with provision provided utilising a shared-use system based on the low walking, wheeling and cycling flows and infrequent buses. Due to low bus frequency and low pedestrian and cycle traffic volumes, a shared bus boarder area will be utilised at each stop.

4. Cost Estimate

Overview

4.1.1. A cost estimate has been prepared using the value engineered Preferred Option from the conclusion of the DMRB Stage 2 Route Option Assessment and value engineering exercise. The estimate is in Great British Pounds (GBP) with the rates based on Q4, 2023 using SPONS 2023 where possible.

4.1.2. The total project cost estimated at DMRB Stage 3 is calculated as £21.5m, excluding VAT.

4.1.3. The scheme cost has been derived from the total works and preparatory costs with the addition of project risk and optimism bias. This is shown below in Table 4.1.

Table 4.1 – Scheme Cost Estimate Summary

Element	Estimated Cost (Q4 2023 Cost Rate)
Works Cost	£15.3m
Preparatory Cost	£4.4m
Quantified Risk Assessment	£1.8m
Optimism Bias (at DMRB Stage 3)	£0.6m
Total	**£22.1m**

4.1.4. The items measured as part of the works costs are generally a cost per unit, based on elements of the scheme design. For other aspects not associated with elements, these are percentages of other costs. Unit prices are based upon SPONS 2023 whereas percentages have been based on past schemes of similar size.

4.1.5. The value engineering and design refinement exercise undertaken on the Stage 2 Preferred Option reduced the total scheme cost by approximately £5m from the combination of shortening the scheme, narrowing the cycle track and steepening embankment slopes.

Pre-Construction Costs

4.1.6. The preparatory costs have been estimated based on a percentage of the works costs but also includes specific land costs, utility diversions, site supervision and testing requirements.

4.1.7. Cost of land will be based on negotiation with landowners and Aberdeen City Council as part of the planning application and landownership discussions. At this stage, a percentage of the works costs has been proposed for the land cost.

4.1.8. Preliminaries costing has been quantified as 12% of the total works costs and include an allowance for general preliminaries, traffic management, temporary works and insurance.

4.1.9. The roadwork series costs have been developed from the design model and the required materials. Accommodation works and landscaping are assumed to be 2% of the total works cost each.

4.1.10. The cost of the structure has been assessed based on the choice of structural form and the total deck area.

4.1.11. The statutory undertaker costs have been determined from C3 budget estimates prepared by the relevant companies for carrying out diversionary and protection works resulting from the scheme.

Quantified Risk

4.1.12. Project risks have been quantified as part of the design process to account for uncertainties in the future of the design and construction stages. Each risk was allocated a total cost and probability of occurrence based on project knowledge, industry conditions and previous project experience. The quantified risk was calculated to be 6% of the total scheme cost without optimism bias.

Optimism Bias

4.1.13. In accordance with Transport Scotland's STAG technical database, Table 13.4, an assessment of optimism bias has been undertaken for this stage of the scheme taking into consideration the quantified risk assessment. An allowance of 3% for road works and 6% for the structure is included within the estimate.

Assumptions and Exclusions

4.1.14. The following assumptions have been made as part of the estimate:

- Adequate labour and plant are available throughout the construction period; and
- Access to the site is available on or before the contract start date and continues to be available throughout the contract period.

4.1.15. The cost estimate excludes the following:

- Inflation; the estimate has been prepared at Q4, 2023 prices;
- Financing or other charges; and
- Value Added Tax (VAT).

5. Engineering Information

Scheme Procurement

5.1.1. The proposed scheme will be procured by means of a standard works only contract. Under the terms of this contract, a client appointed designer will undertake the detailed design prior to tendering of the works to a suitable contractor. Upon completion of the proposed scheme, responsibility for operating and maintaining the Aberdeen South Harbour Link Road will remain with Aberdeen City Council.

5.2. Engineering Standards

Design Standards

5.2.1. The DMRB Stage 3 design has been developed in accordance with current design standards and good practice. References, when required, are made to sections of the DMRB and other relevant standards within each section of this chapter.

Single Carriageway

5.2.2. The proposed single carriageway has been designed in accordance with the following standards:

- DMRB CD 109 Highway Link Design (March 2020);
- DMRB CD 127 Cross-Sections and Headrooms (July 2021); and
- DMRB CD 169 The design of lay-bys, maintenance hardstandings, rest areas, service areas and observation platforms (November 2022).

5.2.3. The mainline alignment of Hareness Road has been designed to 60Bkph design speed.

5.2.4. The mainline alignment of Coast Road has been designed to 70Akph design speed.

Local Roads and Junctions

5.2.5. The ghost island and local road junctions have been designed to DMRB CD 123 Geometric design of at-grade priority and signal-controlled junctions (November 2021).

Roundabouts

5.2.6. The two roundabouts on Hareness Road have been redesigned to DMRB CD 116 Geometric design of roundabouts (May 2023) to compact roundabouts and to reduce the deflection radii to an appropriate value (<70m for compact roundabouts).

Walking, Wheeling and Cycling

5.2.7. The walking, wheeling and cycling facilities for Hareness Road and Coast Road have been developed in accordance with 'Cycling by Design 2021' and in line with similar schemes that Aberdeen City Council are planning and constructing.

Relaxations and Departures for DMRB Standard

5.2.8. In order to reduce the scheme footprint, minimise carbon impact, deter anti-social behaviour and reduce construction costs it has been appropriate to consider design elements which are below the desirable minimum standard recommended by the DMRB. The locations of these design elements are shown in Figure 5.1.

5.2.9. For the ASHLR scheme, the overseeing and local road authority, Aberdeen City Council, are responsible for approving or rejecting Departures from Standard applications.

5.2.10. There are 17 Departures from DMRB requirements associated with the proposed single carriageway. These are permissible Departures as outlined below:

- Two are a result of reduced horizontal curvature on the approach and around the S-shaped bend of Harness Road
- One is a result of reduced horizontal curvature on the approach to the rail crossing of Coast Road
- One is a result of reduced horizontal curvature after the rail crossing of Coast Road
- One is a result of reduced vertical curvature on approach to the Coast Guard Station of Coast Road
- One is a result of a reduced Y-Distance visibility on the junction of Altens Farm Road and Hareness Road
- Seven are a result of the carpark design, located on Coast Road

5.2.11. There are 6 Relaxations from DMRB Requirements associated with the proposed single carriageway. These are permissible Relaxations as outlined below:

- Reduced horizontal curvature on the approach to the hairpin bend of Harness Road
- Reduced vertical curvature on the hairpin bend of Harness Road
- Reduced horizontal curvature on the approach to the junction of Harness Road and Coast Road
- Reduced vertical curvature on the approach to the Coast Guard Station on Coast Road
- Reduced junction visibility for the access road located opposite Donnies Farm on Coast Road
- Non-standard lay-by design layout located on Coast Road.

Abnormal Load Route Assessment

5.2.12. To further understand the benefits provided by the project and to check the sub-standard horizontal curves, an abnormal load assessment was done by undertaking swept path analysis of various wind turbine transport vehicles on the schemes geometry to acquire a baseline vehicle.

5.2.13. From there, five junctions on the strategic road network were also checked to confirm whether a vehicle of that size can travel from ASH to other locations outside of Aberdeen.

5.2.14. The analysis was undertaken on the basis that trunk road apparatus such as traffic signals, lighting columns and traffic signs could not be removed as it falls outside of Aberdeen City Councils authority.

5.2.15. The baseline vehicle for the project can leave the A956 Wellington Road and successfully get onto the A92 southbound at Charlestown Junction.

5.2.16. The baseline vehicle can also exit north onto the AWPR at Cleanhill Roundabout from the A956.

5.2.17. On the AWPR, three junctions were investigated; Kingsford, Craibstone and Blackdog, to understand whether the vehicle could exit the AWPR onto the A944, A96 and A92 respectively. The testing showed that the baseline ASHLR vehicle could only leave at Blackdog Junction onto the A92 without striking any trunk road apparatus.

5.3. Published Geology, Ground Conditions Summary and Earthworks

Published Geology

5.3.1. Anticipated geology and ground conditions were established following a review of published geological information (British Geological mapping and publications). A summary of the ground conditions within the Scheme have been summarised below.

Made Ground

5.3.2. Three areas of made ground have been identified within the Scheme on the geological mapping. The largest is located within the footprint of the former Ness Farm landfill and is identified as 'infilled ground' by the BGS. The two other areas of made ground are located in the southern part of the Scheme. The first is a rectangular area of land, adjacent to the eastern extent of Hareness Road, with the southwest corner of the made ground intersecting Hareness Road, just prior to the 'S' bend. The second is located to the south of the first (immediately south of the bend in Hareness Road) and is square in shape.

5.3.3. Although no made ground deposits are shown on the BGS published mapping in other areas, this does not preclude the presence of made ground. Due to the built up and industrial nature of the land in the vicinity of Hareness Road, made ground of variable thickness should be expected across the entirety of the southern sections of the Scheme.

Superficial Deposits

5.3.4. The superficial geology across the Scheme predominantly comprises sandy diamicton of the Mill of Forest Till Formation in the south, and sand, gravel and boulders of the Lochton Sand and Gravel Formation in the north of the Scheme. There are also sections of the Scheme, on Coast Road adjacent to Doonies Farm, where the published mapping does not identify the presence of any superficial deposits. There are also Raised Tidal Flat Deposits to the north of the Coast Road, adjacent to Nigg Bay, and Marine Beach Deposits in an arc around the periphery of Nigg Bay, to the east of Coast Road.

5.3.5. A detailed description of the likely composition and thickness of the superficial deposits is provided below for each of the deposits identified.

Mill of Forest Till Formation

5.3.6. The Mill of Forest Till Formation is the main superficial deposit present across the Scheme and is present underlying Hareness Road from the junction with Hareness Circle in the west, to the junction with Coast Road to the east. The Mill of Forest Till Formation then underlies the majority of Coast Road north of the junction with Hareness Road, except for the section of road adjacent to Doonies Farm and north of Doonies Hill, where no superficial material is recorded by the published mapping.

5.3.7. The Mill of Forest Till Formation is described as a red-brown sandy diamicton, with clasts of predominantly Devonian rocks. In this area it lies unconformably on bedrock, and is of variable thickness, generally between 5 to 8m. The Mill of Forest Till Formation represents the base of the Mearns Glacigenic Sub-group, which in turn is part of the Caledonia Glacigenic Group. The Caledonia Galcigenic Group generally comprises till, sand, and gravel deposited by glacial ice originating from the East Grampian Highlands Neoproterozoic metamorphic and Caledonion igneous rocks (i.e., clasts of psammite, meta-wacke sandstone and slate (metamorphic) and/or granite, granodiorite and gabbro (igneous).

Lochton Sand and Gravel Formation

5.3.8. The Lochton Sand and Gravel Formation underlies the Preferred Route in the north and west of the Scheme. To the north the deposits underlie Coast Road at the northern extent of the Preferred Route, close to South Harbour. To the west, the Lochton Sand and Gravel Formation is present beneath Hareness Road from the roundabout with Wellington Road upto the junction with Hareness Circle.

5.3.9. The Lochton Sand and Gravel Formation comprises sand and gravel of variable thickness, but generally between 3m to 5m, but has been proven up to 14m in some locations. The parent group of the Lochton Sand and Gravel Formation is also the Caledonia Glacigenic Group, with the sand and gravel clasts in this deposit also originating from the East Grampian Highlands.

Raised Tidal Flat Deposits

5.3.10. Raised Tidal Flat Deposits comprising clay, silt, and sand are located at the far north of the Scheme, beyond the Wastewater Treatment Works. These deposits are generally encountered as soft silty clay, with layers of sand, gravel, and occasionally peat. The deposits generally represent areas of low relief, such as where the topography flattens at the northern end of Coast Road, on the approach to St Fitticks Road.

Marine Beach Deposits

5.3.11. Marine Beach Deposits comprising gravel, sand, and silt are present immediately to the east of Coast Road, around the periphery of Nigg Bay. The Marine Beach Deposits are unlikely to underlie the Preferred Route but are present immediately adjacent to Coast Road to the east. The Beach Deposits may be bedded or present as dunes, sheets or banks and are associated with the local marine environment.

Solid Geology

5.3.12. The solid geology underlying the Scheme in general comprises predominantly semipelite and psammite of the Aberdeen Formation. However, a large dyke is noted to be present, orientated northeast-southwest underlying Coast Road, just north of Doonies Farm. There are also several smaller dykes within the Scheme located to the east and north of the

Preferred Route, and a small area of Tonalite, part of the North-East Grampian Granitic Suite, located to the east of the Coast Road, immediately east of Hareness Road.

5.3.13. In the wider area the geology is dominated by a large fault located approximately 1.5km northwest of the Scheme at its closest point. To the north of the fault is granite of the Northeast Grampian Granitic Suite, conglomerates and sandstones of the Brig O'Balgownie Formation and further rocks of the Aberdeen Formation.

5.3.14. Details on the geological formations located within the Scheme are presented below.

Aberdeen Formation

5.3.15. The Aberdeen Formation is described as interlayered psammite and semipelite metasediments with subsidiary pelite and sporadic minor calcareous horizons. The thickness of the individual metasedimentary layers varies considerably, but rarely exceed 2m. However, the Aberdeen Formation as a whole is of significant thickness, likely up to several kilometres, but is not directly measurable due to intense folding and migmatisation. The parent group of the Aberdeen Formation is the Argyll Group, part of the Dalradian Super Group.

5.3.16. In the wider area, the lateral extent of the Aberdeen Formation is roughly rectangular in shape and extends at least 1.5km both northwest and southeast of the Study Area, and many tens of kilometres to the southwest. To the northeast is the sea, for which there is no available geological mapping.

5.3.17. The Aberdeen Formation is bounded to the northwest by a large fault (details of which are provided below) and to the southeast by psammite of the Glen Lethnot Grit Formation.

Tholeiitic Dyke Swarm

5.3.18. A single large dyke comprising microgabbro and basalt and identified as part of the Central Scotland Late Carboniferous Tholeiitic Dyke Swarm traverses the Study Area, specifically Coast Road, just north of Doonies Farm. The dyke is orientated northeast to southwest and is at least 1.2km in length, originating within Hareness Industrial Estate, immediately east of Hareness Place and terminating at the North Sea, just north of Doonies Hill, beyond which there is no available geological mapping.

Metamorphosed Igneous Rocks (Unnamed)

5.3.19. Two small dykes are located within the Scheme to the east of the Preferred Route. In both instances the dykes extend towards the North Sea, where there is no map coverage. The dykes comprise amphibolite and hornblende schist of the Pre-Caledonion to Caledonion. The dykes are unnamed, identified only as metamorphosed igneous rocks.

5.3.20. The first dyke is located in the north of the Scheme, is approximately 100m long and is in an approximate north-south orientation. The second dyke is located to the east of Coast

Road between Doonies Farm and Doonies Hill. The second dyke is also approximately 100m long and is oriented perpendicular to the large Tholeiitic Dyke described above but does not dissect it.

Northeast Grampian Granitic Suite

5.3.21. According to the published mapping the Northeast Grampian Granitic Suite does not underlie the Preferred Route but is present within the Scheme at multiple locations. The closest is a very small section located at the coast, immediately east of Doonies Farm, comprising granite and pegmatitic. Approximately 1.3km southwest of the Scheme is a further and much larger outcrop of granite and pegmatitic.

5.3.22. In addition to the above, the Northeast Grampian Granitic Suite in the local area also comprises a small area of Tonalite located at the coast directly east of Hareness Road.

North Britain Siluro-Devonion Calc-Alkaline Dyke Suite

5.3.23. There are two outcrops of the North Britain Siluro-Devonian Dyke Suite located within the Scheme. The closest to the Preferred Route is a (possibly folded) dyke comprising felsite located approximately 150m east of the junction between Hareness Road and Coast Road. The dyke is approximately 210m long, although the full length is not known as it extends beyond the edge of the published mapping and into the North Sea.

5.3.24. The second outcrop of the North Britain Siluro-Devonion Dyke Suite is a large, semi-circle shaped area approximately 370m southeast of the ‘s’-shape bend in Hareness Road, comprising mainly pyroclastic breccia. At least two small dykes of felsite penetrate the breccia at the coast.

Structural Geology

5.3.25. In general, the rocks of the Dalradian Super Group, to which the Aberdeen Formation belongs, have been subjected to a complex sequence of metamorphic and structural events. According to the BGS Memoirs11 for the area, the Aberdeen Formation within the Scheme has likely been subjected to at least two periods of folding, with the fold axis generally oriented north-south and foliation dipping to the south or southwest. In addition, various igneous intrusions have penetrated the Aberdeen Formation over a significant period, including prior to, throughout, and after periods of folding and deformation. Large scale faulting across the wider area, mostly oriented northeast to southwest, is also present and has in part controlled the emplacement of the late-Carboniferous dykes, such as the large dyke which transects Coast Road and the Industrial Estate.

5.3.26. As previously mentioned, Aberdeen is located directly on a fault, oriented northeast-southwest, which transects Aberdeen along the approximate location of the River Dee, at least 1.5km north of the Scheme. This fault is related to the larger scale faulting across Scotland, which includes the Highland Boundary Fault located to the south of the Scheme at Stonehaven. There are no other faults identified on published mapping on or within the

vicinity of the Scheme. However, due to the nature and structural history of the geology, small scale faults are likely to be present within the boundary of the Scheme the scale of which mean they are too small to show on the available published mapping.

5.3.27. In addition to the folding and faulting discussed above. Erosional and depositional features are present at the surface of the Aberdeen Formation as a result of the Devensian glaciation. These include several glacial meltwater channels, of which approximately six are noted to transect the Preferred Route (four on Hareness Road and two across Coast Road) as shown on the plan in section 15 of the Groundsure report in Appendix B. It is expected that the depth of made ground/superficial deposits will be greater in these channels.

5.3.28. The published mapping also identifies a large sedimentary filled channel in the Aberdeen Formation, orientated east-west and approximately 400m in width at its eastern extent. This channel lines up directly with South Harbour and is the underlying geological reason for the presence of the harbour at this location.

Ground Summary

5.3.29. An intrusive phase of ground investigation (GI) was specified by Sweco and undertaken by Concept Engineering Consultants between 24th July and 28th August 2023. Full details of this GI are included within the Concept Engineering Consultants Factual Report (Doc Ref. Concept:23/3850-GIR-F01). The GI comprised approximately 30 No. exploratory holes to varying depths up to 12m to obtain samples of superficial deposits and rock core.

A summary of the ground conditions encountered, including strata descriptions and depths encountered are presented in Table 5.1.

Table 5.1 - Summary of strata depths and thicknesses

Strata	Logged descriptions	Depth Range (mbgl)	Level Range (m AOD)	Maximum thickness (m)
Topsoil	Dark brown SAND with frequent rootlets Dark brown slightly sandy CLAY with frequent rootlets.	0.0 – 1.10	75.75 to 7.03	1.10 (BH09)
Cohesive Made Ground	Soft dark greyish brown sandy gravelly CLAY with high granite, basalt and brick content.	0.05 – 3.3	35.57 to 38.62	1.6 (BH18)
Granular Made Ground	Brown sandy slightly clayey GRAVEL with medium psammite and granite boulder and cobble content. Gravel comprises angular to subrounded fine to coarse psammite and granite fragments. Dark greyish brown gravelly slightly clayey fine to coarse	0.0 – 6.6	51.86 to 35.44	5.1 (BH18C)

Strata	Logged descriptions	Depth Range (mbgl)	Level Range (m AOD)	Maximum thickness (m)
	SAND with high granite, psammite and schist cobble content and rare glass fragments.			
Cohesive Mill of Forest Till Formation	Brown sandy gravelly SILT. Gravel is subrounded to rounded with fine various lithologies. Sand is fine to medium. Soft to firm reddish brown slightly sandy gravelly CLAY with medium psammite, schist and quartzite. Gravel comprises subangular to rounded fine to coarse psammite, schist, quartzite and various lithologies. Sand is fine to medium.	0.05 – 10.5	33.79 to 31.54	4.7 (BH11B)
Granular Mill of Forest Till Formation	Dense to very dense gravelly clayey fine to coarse SAND. Gravel comprises subangular to rounded fine to coarse psammite, schist and granite fragments. Dense to very dense sandy clayey GRAVEL. Gravel comprises subangular to angular fine to coarse quartz, schist and granite fragments.	0.2 – 12.1	35.96 to 29.94	4.25 (BH12)
Lochton Sand and Gravel Formation	Very loose reddish brown and grey sandy clayey GRAVEL with psammite cobbles. Gravel comprises angular to subangular coarse granite and quartz fragments. Medium dense reddish brown and brown very gravelly slightly clayey SAND.	1.6 – 4.7	74.15 to 2.43	1.5 (BH03)
Weathered Aberdeen Formation	Greenish grey SCHIST recovered as angular to subangular fine to coarse schist gravel.	0.6 – 11.6	33.34 to 25.85*	-
Aberdeen Formation	Strong to very strong light to dark grey and foliated white PSAMMITE, typically recovered as psammite gravel.	1.25 – 11.8	32.84 to 21.25*	-
Igneous Intrusions (Granite & Granodiorite)	Very strong pinkish grey, grey and dark grey GRANODIORITE.	1.7 – 10.90	32.24 to 21.57*	-

Strata	Logged descriptions	Depth Range (mbgl)	Level Range (m AOD)	Maximum thickness (m)
	Strong pinkish brown, dark grey and off-white GRANITE.			
***base not proven in all exploratory holes strata encountered in**				

Topsoil

5.3.30. Topsoil was encountered in 35 No. exploratory hole locations. Topsoil was encountered as one of the field descriptions provided in Table 5.1 and was located between ground level and depths of 0.3mbgl. A small number of localised locations encountered topsoil to depths of between 0.4 and 1.1mbgl, however these depths are not considered representative across the Scheme. It is considered that all topsoil on Site was natural.

Made Ground

5.3.31. Made Ground was encountered in 36 No. exploratory hole locations. Two distinct types of Made Ground were observed.

Granular Made Ground (gMG):

5.3.1. Granular material was encountered in 33 No. exploratory hole locations between depths of 0.0 and 6.6 mbgl, with a maximum thickness of 5.1m. It should be noted that the maximum thickness of 5.1m was located within a discrete location located within an existing made ground bund located at the junction between Hareness Road and Coast Road and is not representative of the overall granular made ground thickness encountered across the Scheme. Typical descriptions logged during the GI for this material can be found in Table 5.1 above.

Cohesive Made Ground (cMG):

5.3.2. Cohesive material was encountered in 4 No. exploratory hole locations between depths of 0.05 and 3.3 mbgl, with a maximum thickness of 1.6m. Typical descriptions logged during the GI for this material can be found in Table 5.1 above.

Mill of Forest Till Formation

5.3.3. The Mill of Forest Till Formation encountered was recovered as both cohesive and granular soil.

Granular Mill of Forest Till Formation (gMOFT):

5.3.4. Granular Mill of Forest Till Formation deposits were encountered in 30 No. exploratory hole locations between depths of 0.2 and 12.1 mbgl, with a maximum thickness proven

of 4.25m. Typical descriptions logged during the GI for this stratum can be found in Table 5.1 above.

Cohesive Mill of Forest Till Formation (cMOFT):

5.3.5. Cohesive Mill of Forest Till Formation deposits were encountered in 31 No. exploratory hole locations between depths of 0.05 and 10.5 mbgl, with a maximum thickness proven of 4.7m. Typical descriptions logged during the GI for this stratum can be found in Table 5.1 above.

Lochton Sand and Gravel Formation

5.3.6. Lochton Sand and Gravel Formation deposits were encountered in 4 No. exploratory hole locations between depths of 1.6 and 4.7 mbgl, with a maximum thickness proven of 1.5m. Typical descriptions logged during the GI for this stratum can be found in Table 5.1 above.

Weathered Aberdeen Formation

5.3.7. The Weathered Aberdeen Formation was encountered in 4 No. exploratory hole locations between depths of 0.6 and 11.6 mbgl. The base of the weathered Aberdeen Formation was not proven in all exploratory hole locations. Typical descriptions logged during the GI for this stratum can be found in Table 5.1 above.

Aberdeen Formation

5.3.8. The Aberdeen Formation was encountered in 11 No. exploratory hole locations between depths of 1.25 and 11.8 mbgl. The base of the Aberdeen Formation was not proven. Typical descriptions logged during the GI for this stratum can be found in Table 5.1 above.

Igneous Intrusions

5.3.9. Granite and Granodiorite igneous intrusions were encountered in 8 No. exploratory hole locations between depths of 1.7 and 10.9 mbgl. The base of the Igneous Intrusions was not proven. Typical descriptions logged during the GI for these intrusions can be found in Table 5.1 above.

Groundwater

5.3.10. During the 2023 ground investigation groundwater strikes were encountered between depths of 2.7 and 5.8 mbgl. A summary of the groundwater strikes recorded in exploratory holes is presented in Table 5.2.

Table 5.2 - Summary of groundwater strikes encountered during the ground investigation

Exploratory Hole ID	Strike Depth (mbgl) (Level m AOD)	Comment	Strata
BH12A	4.00 (30.38)	Rose to 3.30 mbgl after 20 minutes	Interface between cMOFT and gMOFT
BH13	5.50 (31.95)	Rose to 4.30 mbgl after 20 minutes	gMOFT
BH16	5.80 (29.58)	Rose to 5.30 mbgl after 20 minutes	Interface between cMOFT and gMOFT
BH18C	4.00 (38.04)	Rose to 3.7 mbgl after 20 minutes	cMG
BH25	4.90 (31.36)	Rose to 4.7 mbgl after 20 minutes	gMOFT
TP01	2.70 (42.79)	-	gMOFT

General Earthworks Designs Issues

5.3.11. The Scheme generally comprises variable height embankment to carry the proposed new road. Embankments and cuttings are typically of heights of up to 3.8m and 3.2m respectively although extend up to approximately 6.0m within proximity to the railway crossing. The most significant embankments and cutting sections are summarised in Table 5.3.

5.3.12. For the purposes of the DMRB Stage 3 the highways alignment has assumed that where cuttings are required, the side slopes will be at 1V:3H to ensure the maximum amount of site won material is excavated, and embankments will be constructed with side slopes varying between 1V:2H and 1V:2.5H.

5.3.13. The batters are required to be steepened to 1V:2H north of the proposed rail bridge due to space constraints. Embankments formed of Class 1 (granular) fill may be constructed at slope angles steeper than 1V:2.5H subject to further analyses specific to embankment height, groundwater levels and founding strata. Additional measures may be required to ensure stability of the earthwork.

Table 5.3 - Location of significant embankments and cuttings within the Scheme

Chainage	Embankment / Cutting	Details
Ch 870 to Ch 1120	Cutting	Up to 6m in depth
Ch 1570 to 1925	Embankment	Approach embankments to the proposed bridge structure. Maximum height 6.1m
Ch 1960 to Ch 2295	Embankment	Descent embankments to the proposed bridge structure. Maximum height 6.3m

5.3.14. The significant cutting is due to the presence of a known earthwork bund located in the Scheme. According to the ground investigation data, the cutting will be formed through the existing made ground present in the bund and will exposing the underlying natural deposits (Mill of Forest Till Formation), described as cohesive CLAY or granular SAND / GRAVEL.

5.3.15. An assessment of the potential re-use of excavated materials from the proposed main cutting has been undertaken using the results from the Ground Investigation carried out by Concept in July-August 2023. The results indicate that the cohesive Made Ground will be acceptable in its present condition as a Class 2C (stony cohesive material) and the granular Made Ground as a Class 1B (uniformly graded granular material) as dug, as defined in the Manual of Contract Documents for Highways Works (MCHW) Volume 1 Specification for Highway Works, Series 600 Earthworks.

Earthworks Volumes/Balance

5.3.16. The estimated earthworks quantities for the construction of the scheme are provided in Table 5.4. Ideally, the design would make use of cuttings and embankments to create a cut/fill balance however, due to the urban nature of the project and proximity to the Aberdeen to Dundee Railway, it has made it difficult to achieve this balance, therefore a quarry imported material will be required to mee the fill material volume requirements.

Table 5.4 - Earthworks Quantities

Material	Volume (m^3)
Bulk Fill Material	57,108
Bulk Excavated Material	39,755
Suitable Excavated Material	16,328
Bulk Import Required	40,780

5.4. Drainage, Hydrology and Hydrogeology

General

5.4.1. The preliminary drainage design has been modelled in accordance with the following design standards and guidance:

- DMRB CG 501 Design of highway drainage systems;
- DMRB CD 522 Drainage runoff from natural catchments; and
- CIRIA SuDS Manual C753.

5.4.2. The following stakeholders have been consulted as part of the design process:

- Scottish Environmental Protection Agency (SEPA);

- Scottish Water; and
- Aberdeen City Council.

5.4.3. The drainage design of Hareness Road requires the resetting of existing gullies to the proposed cycle track kerb line.

5.4.4. On Coast Road, new pipe networks are required with new gullies to account for the increase in impermeable area from the walking, wheeling and cycling facility and to address existing surface water flooding issues.

5.4.5. The drainage systems outfall to the North Sea therefore Sustainable urban Drainage Systems (SuDS) features are not required as per the guidance set out in the CIRIA SuDS manual.

5.4.6. There are existing SuDS basins east of Hareness Road as it approaches the Coast Road T-junction. These existing Scottish Water assets attenuate the surface water from the elongated S-shaped bend and straight section of Hareness Road to throttle the flow going into the existing culverts under the Aberdeen to Dundee railway.

Drainage Networks

5.4.7. The proposed drainage networks are dictated by the high and low points in the vertical alignment design and the location of existing outfall pipes. The exact location and size of the outfall pipes will be determined at detailed design following a drainage survey.

5.4.8. The drainage networks have been designed to accommodate the following:

- 1:1-year return period rainfall event without surcharging;
- 1:5-year return period rainfall event without surcharging into the formation layers of the road pavement;
- 1:30-year return period rainfall event without exceeding the road pavement; and
- 1:100-year return period rainfall event without flooding of the road surface.

5.4.9. Typically, a 1:200-year return period rainfall event check would be done however the absence of SuDS basins or ponds means this is unnecessary.

5.4.10. A climate change allowance of +40% has been applied to all rainfall simulations to design for resilience in the proposed networks.

5.4.11. The catchment areas have been factored to account for the permeability of the different materials such as grass verge, cuttings, the walking, wheeling and cycling facilities and the road pavement. The road pavement and footway/cycle track are 100% impermeable whereas the grass verges and cuttings are 26% impermeable due to the infiltration properties of the soil.

5.4.12. The drainage catchments are shown in Figure 5.2 of Appendix A.

5.5. Statutory Undertakers

5.5.1. The public utility companies mentioned in Chapter 2 were contacted at this stage in accordance with the New Roads and Street Works Act 1991 (NRSWA) for C3 budget estimates to inform the diversionary costs of the utilities based on the proposed design.

5.5.2. Following completion of the DMRB Stage 3 scheme assessment, C4 detailed estimates will be undertaken to allow for a more detailed design of utility apparatus protection or diversionary works in advance of the proposed Scheme construction.

5.5.3. Most of the envisaged works will be around the rearranged Hareness Road/Coast Road junction as it's the only section of cutting. The majority of the works require a diversion across the proposed ASHLR from Hareness Road onto Hareness Place.

5.5.4. As the works on Hareness Road, where most of the utilities are situated, is mostly changes to the top 100mm of the existing carriageway and footways, the need to divert utilities is lessened with the exception of junction boxes and masts and resetting of chambers.

5.5.5. Two empty ducts are to be provided under the walking and wheeling provision as part of the project design on Coast Road to allow for future installation of services.

5.6. Structures

5.6.1. The proposed Coast Road Rail Bridge Overbridge will carry the realigned Coast Road over the dual track of the Aberdeen-Dundee Railway. The proposed bridge is a single span, fully integral structure comprising precast prestressed concrete beams with an infill slab. The structure is square to the rail line cutting and the carriageway crosses it at an angle of 51º to the perpendicular. The railway line through the structure is on a slight bend.

5.6.2. The deck is supported on reinforced concrete abutment walls on proposed spread foundations. The type of foundation and substructure will be confirmed at detailed design.

5.6.3. The proposed bridge is a single-span structure, comprising precast pre-stressed concrete beams and an in-situ concrete infill deck slab supported by in situ reinforced concrete abutments. The deck is fully integral with the abutments.

5.6.4. The substructure will comprise in-situ reinforced concrete abutment walls on assumed spread foundations. The wingwalls are assumed to comprise reinforced concrete cantilever walls on spread foundations, these may change subject to finalization of levels following the completion of the GI, a reinforced earth solution may be considered subject to ground conditions. All foundation types are subject to change pending confirmation of ground conditions.

5.6.5. The general arrangement of the structure is shown in Figure 5.3.

5.7. Fencing

5.7.1. Where requested, boundary fencing will be provided along the scheme and will be the responsibility of the adjacent landowner to maintain.

5.7.2. During construction, temporary fencing may be erected where appropriate. This will be agreed between the appointed contractor and landowners.

5.8. Traffic Signs, Road Markings and Lighting

5.8.1. Traffic signs and road markings have been assessed and conceptually designed as part of the DMRB Stage 3 design. Both have been designed in accordance with Statutory Instrument The Traffic Signs Regulations and General Directions 2016 (TSRGD) and DfT Traffic Signs Manual.

5.8.2. As a result of the South Harbour construction and the proposed scheme, existing local signage outwith the extent of the study area will need to be amended to direct traffic to the South Harbour via the link road.

5.8.3. The street lighting on Hareness Road will be retained until the junction rearrangement where new streetlights will be required until the end of the scheme.

5.8.4. The lighting is specifically for the security of vulnerable users using the walking, wheeling and cycling facility as street lighting is not required for the Coast Road carriageway.

5.9. Road Restraint System

5.9.1. A road restraint risk assessment process (RRRAP) in line with CD 377 Requirements for road restraint system (January 2021) was carried out to determine the length and type of road restraint system (RRS) required on embankments and adjacent to the railway.

5.9.2. The results of the RRRAP proposes high containment (H4a) barrier on approach to the railway crossing and through sections within a minimum setback from the railway tracks.

5.9.3. For sections of high embankment away from the railway, a standard N2 RRS is proposed.

5.10. Road Pavement

5.10.1. The type and specification of road pavement surfacing will be determined at detailed design stage.

5.10.2. A preliminary outline pavement design has been undertaken to inform the Stage 3 cost estimate. This design has been carried out in accordance with the following DMRB design standards:

- DMRB CD 224 Traffic Assessment (March 2020); and
- DMRB CD 226 Design for new pavement construction (November 2021).

5.10.3. Following initial pavement core results during the early stages of the geotechnical investigation it was determined that the existing road pavement is in a suitable condition and that a surface course renewal is recommended in place of full depth reconstruction where the alignment allows.

5.11. Indicative Construction Sequence

5.11.1. The construction duration is estimated to start Summer 2025 until Spring 2027. The actual commencement date is dependent on the duration of the statutory process and procurement period for a contractor.

5.11.2. The construction would likely be phased into separate works to reduce the impact on traffic on Coast Road, specifically in the vicinity of the existing railway crossing.

5.11.3. An indicative potential construction phasing is shown on Figure 5.4. This approach would construct the offline permanent works to the south of the railway crossing (Phase 1) which could then be used as the diversion route to allow construction of the new railway overbridge.

5.11.4. Phase 2 would involve constructing the offline section north of the railway crossing within the Gregness site.

5.11.5. Phase 3(a) and Phase 3(b) would tie-in the southern and northern offline sections of phases 1 & 2 into the existing Coast Road respectively. This works would require short term road closures to construct due to level differences between the new and existing road.

5.11.6. Phase 4 involves construction of the railway overbridge which should be possible without road closures assuming one of the temporary diversion options shown in Figure 5.4 is provided.

5.11.7. Construction of the reconfigured junction arrangement between Hareness Road and Coast Road could also be phased into separate works with Phase A involving offline works over the made ground bund and construction of the new Hareness Place link. Phase B would likely require a road closure to construct the tie-in to Hareness Road and Coast Road to the south.

5.11.8. An indicative construction sequence is provided below in Table 5.5.

Table 5.5 - Indicative Construction Sequence – Railway Crossing

Phase/Activity	Year of Commencement	Indicative Duration (Weeks)
Compound Set-up and Site Access	2025	4
Phase 1 – Coast Road Northern Realignment	2025	10
Phase 2 – Coast Road Northern Realignment	2025	10
Phase 3A – Southern Tie-in to Coast Road	2025	4
Phase 3B – Northern Tie-in to Coast Road	2025	4
Phase 4 – Coast Road Bridge	2025	52

Table 5.6 – Indicative Construction Sequence - Hareness Road Improvements and Hareness Road/Coast Road Junction Reconfiguration

Activity	Year of Commencement	Indicative Duration (Weeks)
Hareness Road/Coast Road Junction Reconfiguration		
Utility Diversions	2026	8
Site clearance, earthworks on approach, drainage, and traffic management	2026	10
Pavement construction	2026	8
Signs, lines, finishing	2026	4
Hareness Road Improvements		
Site clearance, drainage and traffic management	2026	12
Kerbs and footway construction	2026	24
Pavement construction	2027	8
Signs, lines, finishing	2027	4

6. Traffic and Economic Assessment

6.1. Introduction

6.1.1. This chapter outlines the traffic modelling undertaken for the project, using the A956 Wellington Road Microsimulation Model. The model was originally developed for the Wellington Road Multi-Modal Corridor Study and was subsequently utilised for the External Links to Aberdeen South Harbour (ASH) STAG Detailed Options Appraisal. Sweco have adapted the ASH version of the model for the purposes of this DMRB Stage 3 assessment.

6.1.2. The model has been used to produce performance indicators such as changes to traffic volumes and journey times. Outputs from the model have informed the economic appraisal undertaken using Transport Users Benefit Appraisal (TUBA v1.9.20) and Cost and Benefit to Accidents – Light Touch (COBALT) software v2.4. These are aligned to the January 2023 revision of the TAG databook, v1.20.2. Outputs from the model have also been provided for a high-level screening exercise of environmental appraisals.

6.1.3. This chapter contains results relating to the “Do-Minimum” (without scheme) and the “Do-Something” (the Preferred Option selected at the culmination of Stage 2) which incorporates a new two-lane rail bridge and the Hareness Road / Coast Road junction re-configuration.

6.2. Modelling

Base Model

6.2.1. The Wellington Road Microsimulation Model was originally developed by AECOM using Paramics Discovery software for the Wellington Road Multi-Modal Corridor Study. The Wellington Road Base Model has a base year of 2019 and used a prior matrix from a cordon of the Aberdeen Sub-Area Model (ASAM14). It was calibrated using junction turning counts collected in 2019 and 2020 and validated against TomTom journey time data from 2019. The model was subsequently utilised by Stantec for the External Links to Aberdeen South Harbour (ASH) STAG Detailed Options Appraisal. Stantec produced a rudimentary Inter-Peak model, and independently produced forecast matrices for an assumed 2026 opening year and 2041 appraisal year.

6.2.2. The base model extents are shown in Figure 6.1.

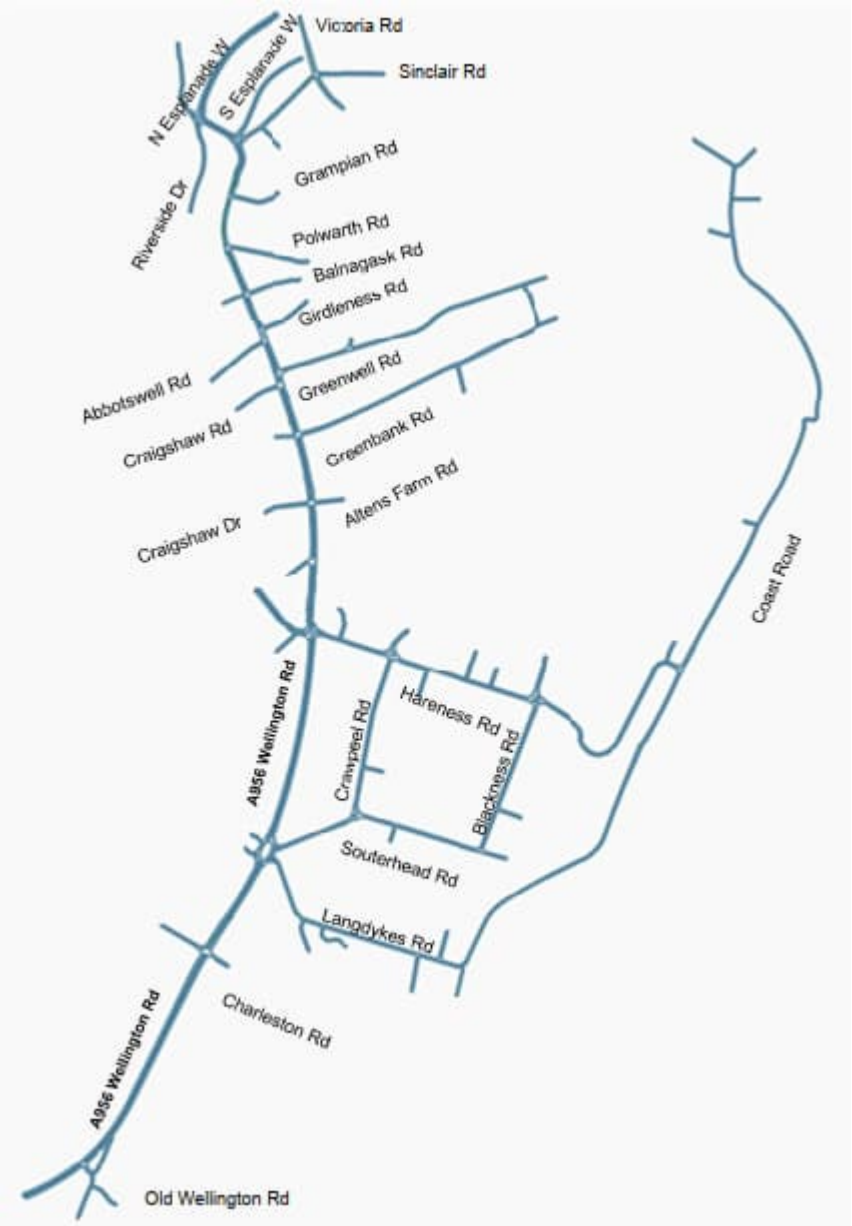


Figure 6.1 - A956 Wellington Road Base Model Network

6.2.3. The 2019 base model includes the following periods:

- AM Peak Period: (0700 – 0900),
- IP Period (0900 – 1600), and
- PM Peak Period (1600 – 1800).

6.2.4. Vehicle types include:

- Lights (Cars and Light Goods Vehicle (LGVs))
- Heavies (Other Goods Vehicles (OGV)1 and OGV2)

6.2.5. Public transport routes in the form of bus services have also been coded in the model across all modelled periods.

6.2.6. Calibration and validation were undertaken on the AM and PM peak period models only.

Model Development Reports

6.2.7. Full details of the development of the Wellington Road base model, including calibration and validation information, can be found in the *Wellington Road Multi-Modal Corridor Study – Detailed Appraisal: Model Development Report*, produced by AECOM for ACC in June 2020.

6.2.8. Details of the development of the Inter-Peak model can be found in the *STAG Detailed Options Appraisal – Appendix C Traffic Modelling* report produced by Stantec.

Impacts of the Covid-19 Pandemic to Traffic

6.2.9. To determine the impact of the COVID-19 pandemic on traffic volumes in the Study area since the 2019 base year, Aberdeen City Council provided Automatic Traffic Count (ATC) data for three locations: -

- Wellington Road: (394302, 804775);
- Lang Stracht: (388682, 806604); and
- North Deeside Road: (390282, 803345).

6.2.10. The ATC data provided included Average Daily Flows (ADF) for the months of February, May and September, for the years 2019, 2020, 2021 and 2022, shown in Table 6.1.

Table 6.1 - COVID-19 Traffic Flow Comparison (2019 - 2022)

Location	2019 ADF	2020 ADF	2021 ADF	2022 ADF	2019 to 2020 % Diff	2019 to 2021 % Diff	2019 to 2022 % Diff
February							
Wellington Road	18,100	18,000	12,700	15,100	0%	-30%	-16%
Lang Stracht	15,300	15,100	8,800	11,800	-1%	-43%	-23%
North Deeside Road	11,400	10,900	6,300	10,100	-4%	-44%	-11%
May							
Wellington Road	20,500	9,100	15,800	15,900	-56%	-23%	-23%
Lang Stracht	16,000	6,800	14,200	14,300	-58%	-12%	-11%

Location	2019 ADF	2020 ADF	2021 ADF	2022 ADF	2019 to 2020 % Diff	2019 to 2021 % Diff	2019 to 2022 % Diff
North Deeside Road	11,700	4,500	9,400	10,400	-62%	-20%	-11%
September							
Wellington Road	17,900	15,500	16,600	17,700	-14%	-7%	-1%
Lang Stracht	15,700	13,100	14,900	14,900	-16%	-5%	-5%
North Deeside Road	13,100	8,800	10,100	10,500	-33%	-23%	-20%

6.2.11. Table 6.1 indicates that traffic volumes fell by up to 62% in 2020 with a gradual rebound towards pre-pandemic flows seen up to September 2022. For the three locations provided and including February, May and September results, there is an average reduction of 13% between 2019 and 2022.

6.2.12. Considering Wellington Road ATC data in isolation also gives an average reduction of 13% between 2019 and 2022. However, comparisons for Wellington Road based on September data gives a reduction of only 1% between 2019 and 2022. Continued monitoring will reveal longer term trends. Interpretation of model results should take these comparisons into account, given all models are derived from a 2019 Base. Post-Covid impacts (including increased homeworking) are incorporated into the forecasts used from ASAM19 in this assessment.

Do-Minimum Network

6.2.13. The Do-Minimum model comprises assumptions around committed infrastructure and traffic forecasts (including those relating to committed development in the area). Two future years are used for undertaking the economic assessment of options: 2027 and 2042.

6.2.14. The linking up of Palmerston Road to North Esplanade West at the northern extent of the model has been included in the 2027 and 2042 Do-Minimum models. This enables vehicles travelling between North Esplanade West and South College Street to route via Palmerston Place instead of the roundabout of North Esplanade West / South College Street / Wellington Road / Riverside Drive. As Palmerston Place is just outside the model extent, for modelling purposes the trips between the two route zones have been removed from all matrices in the Do-Minimum model. This provides an improvement to the roundabout as there is a reduction in the number of right turn movements from North Esplanade Way to South College Street.

6.2.15. Hareness Road is currently the designated route to the new harbour. In order to represent on-street signage and route designation within the model, Langdykes Road, Blackness Road and Crawpeel Road (within Altens industrial estate) have HGV restrictions in place for harbour (and proposed ETZ) traffic. This means all HGV traffic to the new harbour / proposed ETZ area is constrained to use Hareness Road.

6.2.16. The Wellington Road Microsimulation Model was first developed for the appraisal of the Wellington Road corridor and extended to include the HGV route via Hareness Road and the Coast Road to Aberdeen South Harbour. In order to capture benefits of scheme proposals for unrestricted light vehicle traffic associated with the harbour and proposed ETZ sites in the ASH STAG Appraisal, 'ghost links' were added to the base model network to enable routeing between the Coast Road, Torry and the northern extents of the model network.

6.2.17. The 'ghost links' included:

- St. Fitticks Road – to join up the route between Victoria Road and the Coast Road
- Balngask Road – to join up Wellington Road with St. Fitticks Road

6.2.18. Girdleness Road - to join up Wellington Road with Balnagask Road / St. Fitticks RoadThe ghost links were constrained to allow only light vehicle traffic associated with the new harbour and proposed ETZ sites to use them. In this way, base traffic was maintained as is and HGV traffic associated with the harbour / proposed ETZ sites was still required to route via the defined Aberdeen freight routes.

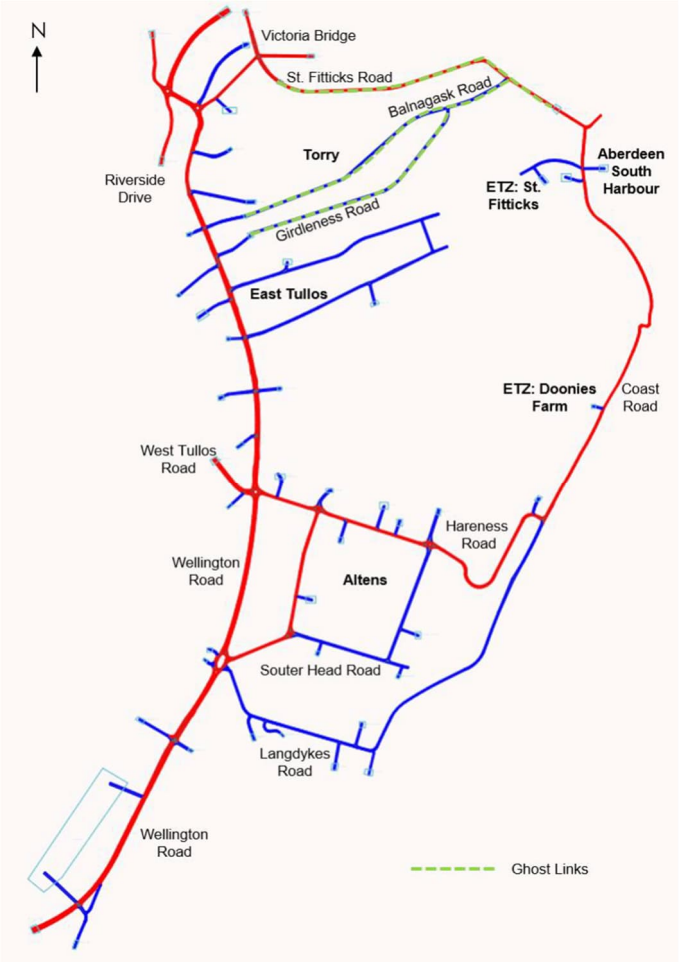


Figure 6.2 - Do-Minimum Network

6.2.19. The Do-Minimum Network is shown in Figure 6.2.

Do-Something Network

6.2.20. The Do-Something network is consistent with the Do-Minimum network with the addition of the Preferred Option identified at the end of the Phase 2.

6.2.21. The Preferred Option comprises:

- a new two-lane rail bridge on the Coast Road resulting in the removal of the existing traffic signals with shuttle operation; and
- re-configuration of the Harness Road / Coast Road junction to give priority to vehicles on the Coast Road accessing the harbour. The southern Coast Road approach has become a minor arm.

6.2.22. The Do-Something Network is shown in Figure 6.3 below.

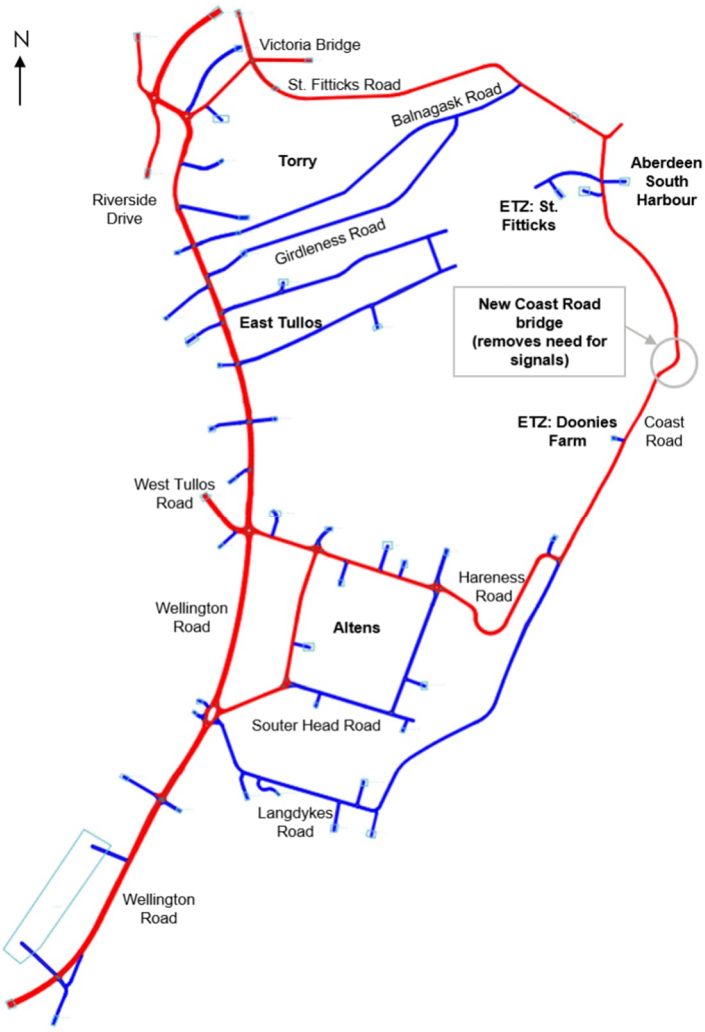


Figure 6.3 - Do-Something Network

6.3. Forecasting

6.3.1. The Aberdeen Sub-Area Model (ASAM) 19, the strategic multi-modal transport model for the North-East of Scotland, has been used to inform forecasts for the A956 Wellington Road Microsimulation Model used in this assessment. ASAM was recently updated to a base year of 2019, which incorporates the opening of the Aberdeen Western Peripheral Route (AWPR).

6.3.2. Forecasts include a 2027 opening year and a 2042 design year. Traffic cordon matrices from ASAM19 covering the extents of microsimulation model network have been created for this purpose.

6.3.3. Matrices were provided for the AM, IP and PM peak hours covering the 2019 Baseline year and forecast scenarios for 2025, 2030, 2040, and 2045 – covering both 'With Policy' and 'Without Policy' scenarios. Separate matrices were provided for cars, lights and heavy goods vehicles.

6.3.4. The 'Without Policy' or 'High Traffic' growth scenario's input assumptions contain a number of future year scheme investment proposals, transport behaviours and policy proposals. Both the 'With' and 'Without Policy' scenarios represent the impact of the Aberdeen City Centre Low Emission Zone proposals within the 2025 forecast year.

6.3.5. The 'With Policy' or 'Low Traffic' growth scenario contains consistent scheme proposals as the 'Without Policy' scenario, but also represents wider policy proposals, such as the Government target of reducing car kilometres by 20% by 2030.

6.3.6. In the ASAM outputs provided, there is a considerable reduction in commuting jobs between 2019 and 2025, as the forecasting takes account of behavioural responses with a higher proportion of people working at home post-Covid.

6.3.7. Zone equivalence was determined between the Paramics zone system and that of the ASAM cordon. In some cases, several ASAM zones have been aggregated to one Paramics zone and conversely there are cases where multiple Paramics zones have been matched to one ASAM zone. For the latter, differences in forecast trips have been spread evenly across the Paramics zones.

6.3.8. To apply the forecasts to the A956 Wellington Road Model and create demands for 2027 and 2042, absolute differences in forecast trips for ASAM zone origins have been applied to the Paramics 2019 base year demands. This preserves the trip patterns from the locally validated microsimulation model. To create forecasts for the 2027 opening year and 2042 design year, interpolation was applied to the available ASAM forecast years of 2025 and 2030 for 2027 and 2040 and 2045 for 2042.

6.3.9. Based on planning data provided with the forecasts, it is assumed that ASAM has not accounted for trips associated with the opening of ASH or the ETZ. As such, trip generations have been determined for these separately and added to the forecasts. The

Loirston development situated to the west of Wellington Road, north of Charleston junction is accounted for in the ASAM forecasts. It is assumed that other smaller local developments in the area are included within aggregate trip differences predicted by the ASAM forecasts.

ASH Trip Generation

6.3.10. To determine the vehicle trip generation for ASH, the methodology applied in the External Transportation Links to Aberdeen South Harbour STAG Detailed Options Appraisal Report was applied with more recent freight data. ASH tonnage was estimated based on the relationship between quay length and cargo tonnage recorded at comparator UK ports. Data on cargo tonnage was sourced from the Department for Transport's (DfT's) Port and Domestic Waterborne Freight statistics. For the purposes of this study, an average was taken of freight from the dataset for 2017-2021. The process is as follows: -

- Estimation of annual cargo tonnage at ASH based on the relationship between quay length and cargo tonnage seen at comparator UK ports;
- Estimation of annual trip generation influenced by the anticipated cargo to be handled by the port and freight types seen at comparator UK ports; and
- Profiling trips across an average day, based on profiles from the 2015 Transport Assessment developed for ASH.

6.3.11. Estimated tonnage was calculated using the equation for the line of best fit from the comparator port data. It is estimated that with a 1400m quay ASH might handle approximately 900,000 tonnes of freight per year. It was assumed that ASH will not handle crude oil, coal or Ro-Ro traffic.

6.3.12. To convert freight tonnages into vehicular movements, high level vehicle capacity estimates were made on a consistent basis with the ASH STAG Appraisal. HGVs were assumed to carry 2/3 of maximum payload on average.

6.3.13. Most large ports are in continual operation, so daily trip generation was calculated by dividing annual trip generation by 365.

6.3.14. It was assumed that cars/LGVs would make up 40% of total ASH traffic in accordance with the 2015 Transport Assessment.

6.3.15. The resultant trip generation for Aberdeen South Harbour is shown in Table 6.2

Table 6.2 - Aberdeen South Harbour Daily Trip Generation

	Arrivals			Departures		
	Car/LGV	HGV	Total	Car/LGV	HGV	Total
0700-0800	21	5	26	4	8	12
0800-0900	14	5	19	7	6	14
0900-1000	14	7	21	11	6	17

	Arrivals			Departures		
	Car/LGV	HGV	Total	Car/LGV	HGV	Total
1000-1100	14	10	24	14	9	23
1100-1200	17	11	28	24	9	33
1200-1300	17	7	24	16	8	24
1300-1400	13	9	22	13	7	19
1400-1500	13	18	31	13	14	27
1500-1600	9	14	23	11	15	26
1600-1700	8	11	18	11	9	19
1700-1800	1	6	8	18	9	27
1800-0700	40	16	56	39	20	59
Daily	**180**	**120**	**300**	**180**	**120**	**300**

6.3.16. The trip distribution for ASH was taken from the 2015 Transport Assessment as shown in Table 6.3.

Table 6.3 - ASH Trip Distribution

To/from	Car/LGV Proportion	HGV Proportion
A956 South	37%	60%
West Tullos Road	8%	10%
Market Street	55%	0%
N Esplanade West	0%	30%

6.3.17. The above trip generation has been included in the Do-Minimum trip matrices.

ETZ Trip Generation

6.3.18. The proposed ETZ development is expected to open in 2026. The site will support businesses associated with the generation of renewable energy and green technologies.

6.3.19. As part of the External Links to Aberdeen South Harbour STAG Detailed Options Appraisal, Stantec developed a methodology for vehicle trip generation associated with the ETZ site. This is based on a Transport Assessment produced for the Siemens Green Port Hull (SGPH) development in Hull, a site assumed to be comparable in form to the ETZ. Sweco have applied consistent assumptions in this assessment.

6.3.20. The methodology uses trip generation estimates for the SGPH site for Light and Heavy vehicle trips gathered from the Transport Assessment, with a scaling factor of 41% applied to account for the relative difference in scale of the two sites. It is assumed the ETZ will have a 'developable' area of 23 hectares.

6.3.21. Trip distribution was calculated differently for Light and Heavy vehicles. For Light vehicles, the trip distribution was based on the home origins of those working in the Cove North

Intermediate Zone taken from Travel to Work data from the 2011 Census. For Heavy vehicles, the trip distribution was assumed to be consistent with the trip distribution for Aberdeen South Harbour.

6.3.22. It is assumed the proposed ETZ will be split across the St Fitticks and Doonies Farm development sites which are estimated to have 12.1 and 10.9 hectares of developable area, respectively. On this basis, it was assumed that 53% of proposed ETZ traffic volumes would be associated with the St Fitticks site and 47% with the Doonies Farm site.

6.3.23. Trip generation associated with ETZ for the Opening Phase and Operational Phase is respectively shown in Table 6.4 and Table 6.5. The trip generation seen has been included in the Do-Minimum trip matrices.

Table 6.4 - ETZ Trip Generation 2027 (Opening Phase)

	Arrivals			Departures		
	Car/LGV	HGV	Total	Car/LGV	HGV	Total
0700-0800	4	0	4	30	0	30
0800-0900	89	9	98	19	9	28
0900-1000	10	0	10	10	0	10
1000-1100	10	0	10	10	0	10
1100-1200	10	0	10	10	0	10
1200-1300	10	0	10	10	0	10
1300-1400	10	0	10	10	0	10
1400-1500	10	0	10	10	0	10
1500-1600	23	0	23	35	0	35
1600-1700	13	0	13	93	0	93
1700-1800	0	0	0	0	0	0
1800-0700	61	0	61	13	0	13
Daily	250	9	259	250	9	259

Table 6.5 - ETZ Trip Generation 2042 (Operational Phase)

	Arrivals			Departures		
	Car/LGV	HGV	Total	Car/LGV	HGV	Total
0700-0800	6	0	6	45	0	45
0800-0900	120	12	132	20	12	33
0900-1000	16	0	16	16	0	16
1000-1100	16	0	16	16	0	16
1100-1200	16	0	16	16	0	16
1200-1300	16	0	16	16	0	16
1300-1400	16	0	16	16	0	16
1400-1500	16	0	16	16	0	16
1500-1600	37	0	37	54	0	54

	Arrivals			Departures		
	Car/LGV	HGV	Total	Car/LGV	HGV	Total
1600-1700	13	0	13	125	0	125
1700-1800	0	0	0	0	0	0
1800-0700	90	0	90	21	0	21
Daily	360	12	373	360	12	373

6.4. Updates since Stage 2

Modelling

6.4.1. Since the completion of Stage 2, there have been no refinements made to the traffic model. Slight alterations have been made to the design of the Preferred Option with the update in layout to the proposed Coast Road / Hareness Road junction however, this is thought to have negligible impact on model performance so has not been updated.

Economics

6.4.2. Since the completion of DMRB Stage 2 and commencement of DMRB Stage 3 an updated OBC has been produced. Slight revisions to the economic appraisal have been undertaken:

- The adoption of updated scheme costs as part of DMRB Stage 3. The scheme capital costs have become more detailed and subject to a degree of value engineering and adoption of a Quantified Risk Assessment (QRA) which has reduced the base costs of the scheme.
- Inclusion of a high-level assessment of potential Wider Economic Impacts (Labour supply impacts and move to more productive jobs) in line with TAG Unit A2-1 guidance.

6.4.3. As part of the scheme cost update within the updated OBC, the scheme costs have been adjusted for inflation as per the process outlined within the financial and economic cases. However, use of the recent November 2023 TAG Databook GDP deflators for general inflation adjustment has been carried out. The impact of these changes is a reduction in scheme outturn costs (inflation and risk adjusted) from £25.82m to £22.40m. It must be noted that the £22.40m does not include historical costs which have already been funded by the CRD.

6.4.4. The inclusion of high-level wider economic impacts arising from move to more productive jobs and labour supply impacts yield an extra £3m in Present Value of Benefits (PVB) for the High scenario and £3.5m for the low scenario.

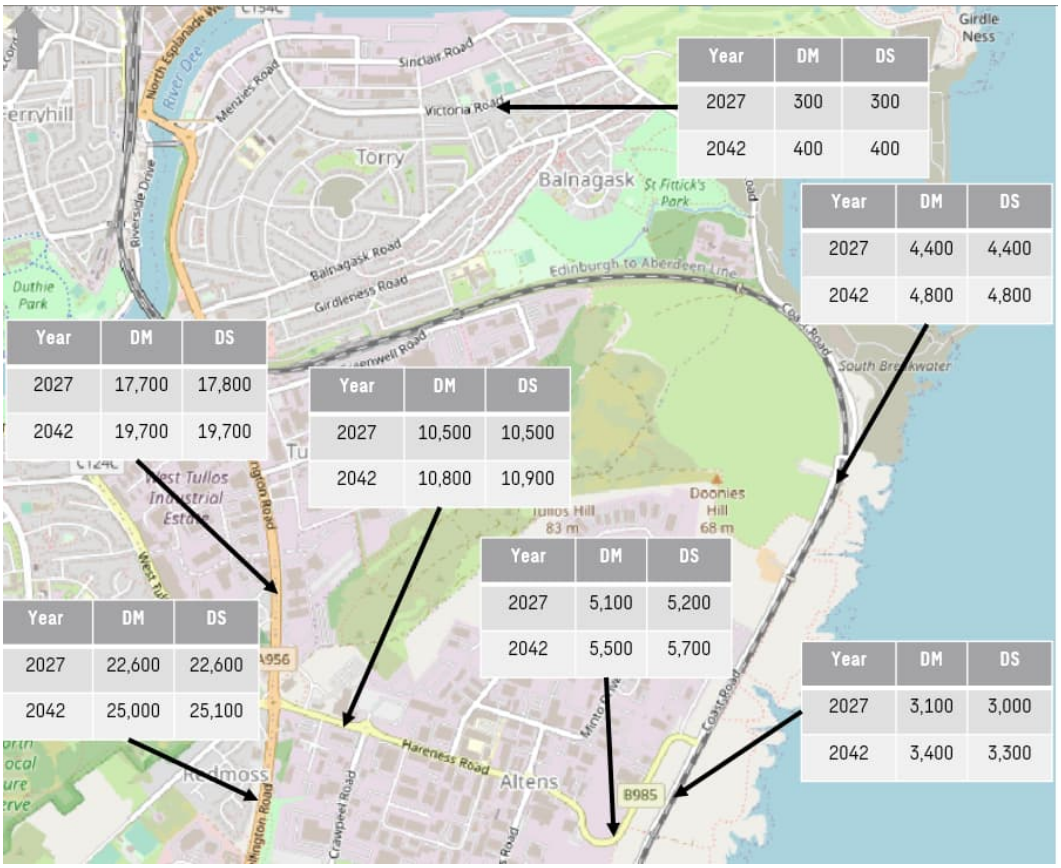
6.5. Effect of Preferred Option

Annual Average Daily Traffic (AADT)

6.5.1. To calculate AADT flows from the model outputs, factors have been derived from permanent Transport Scotland ATC sites adjacent to the Study area using neutral months between March 2022 and March 2023. This provided a years' worth of data classified by vehicle type and profiled by hour. The sites used are:

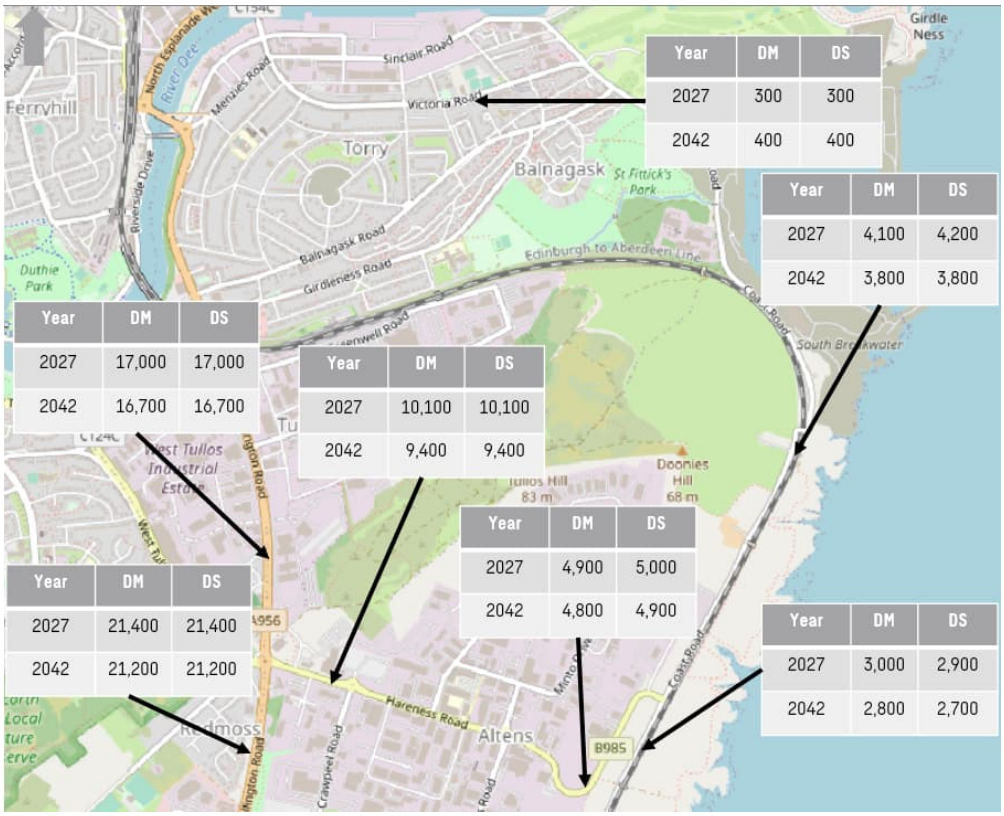
- NTC01563: A92 3076NO Off slip at Charleston Junction; and
- NTC01564: A92 3097SI On slip at Charleston Junction.

6.5.2. Daily traffic flows for key links in the Do-Minimum and Do-Something scenarios are shown in Figure 6.4 and Figure 6.5 for 'Without Policy' and 'With Policy' forecast scenarios respectively. These demonstrate small changes to traffic patterns (up to approximately 200 vehicles/day two-way) with some rerouting of vehicles via Hareness Road with the scheme in place with a corresponding reduction in flows on Langdykes Road and Coast Road south of Hareness Road.



** These model flows only reflect light vehicles associated with the new harbour and proposed ETZ sites.*

Figure 6.4 - Do-Minimum vs Do-Something AADT Flows ('Without Policy' Forecasts)



** These model flows only reflect light vehicles associated with the new harbour and proposed ETZ sites.*

Figure 6.5 - Do-Minimum vs Do-Something AADT Flows ('With Policy' Forecasts)

Operational Analysis of Do-Something

6.5.3. In addition to the redistribution of some traffic onto Hareness Road, the only significant traffic operational difference between the Do-Minimum and Do-Something is the improved journey time on Coast Road due to the removal of traffic signals at the railway crossing.

6.5.4. These journey time savings (in 2027), shown in Table 6.6 are predicted to be:

Table 6.6 - Average Journey Time Savings Per Vehicle - 2027 Opening Year

		Journey Time Savings (Seconds)
AM Peak	Eastbound	-8
	Westbound	-18
Inter Peak	Eastbound	-7
	Westbound	-2
PM Peak	Eastbound	-7

		Journey Time Savings (Seconds)
	Westbound	-17

6.6. Economic Performance of Options

6.6.1. An economic assessment has been undertaken for the Preferred Option and is described in detail in the Outline Business Case. In summary the costs, benefits and subsequent benefit cost ratio are shown in Table 6.7. All values presented within the table below are in 2010 prices and reported in millions of pounds.

Table 6.7 - Preferred Option Economic Assessment

Item	'Without Policy' High Traffic Scenario (£m's)	'With Policy' Low Traffic Scenario (£m's)
Accidents	£1.11	£0.11
Air quality (MEC's from AMAT)	£0.06	£0.06
Noise (MEC's from AMAT)	£0.02	£0.02
Greenhouse Gases	-£0.42	£0.05
Active Travel	£0.20	£0.20
Economic efficiency: consumer users (commuting)	£1.49	£0.72
Economic efficiency: consumer users (other)	£3.74	£1.48
Economic efficiency: business users and providers	£4.31	£2.18
Wider public finances	-£0.18	-£0.06
Level 1 present value of benefits (PVB)	**£10.33**	**£4.77**
Broad transport budget present value of costs (PVC)	**£13.61**	**£13.61**
Net present value (NPV)	**-£3.28**	**-£8.85**
Level 1 benefit to cost ratio (BCR)	**0.76**	**0.35**
WI 1 – 10% uplift as a result of imperfectly competitive markets	£0.43	£0.55
WI 2 – 40% uplift as a result of labour supply impacts	£1.73	£2.18
WI 3 – 30% uplift as a result of a move to more productive jobs	£1.29	£1.64
Level 2 PVB	**£3.45**	**£1.75**
Adjusted PVB (level 1 + level 2)	**£13.79**	**£6.51**

Item	'Without Policy' High Traffic Scenario (£m's)	'With Policy' Low Traffic Scenario (£m's)
PVC	**£13.61**	**£13.61**
Adjusted NPV (level 1 + level 2)	**£0.17**	**-£7.10**
Adjusted BCR (level 1 + level 2)	**1.01**	**0.48**

6.6.2. Under the 'Without Policy' scenario, the ASHLR scheme can achieve an adjusted, or 'Level 2' benefit to cost ratio (BCR) of 0.48 when considering all the monetised assessments that have been undertaken as part of the economic case. Under the 'With Policy' scenario, the ASHLR scheme can achieve an adjusted BCR of 1.01.

7. Environmental Assessment

7.1. Introduction

7.1.1. This chapter presents an environmental assessment of the construction and operational phases of the proposed scheme to identify any significant impacts from an environmental perspective, as part of the DMRB Stage 3 assessment.

7.1.2. The assessment has been generally desk-based, informed by a review of existing studies, design information and online sources, including:

- Stantec (2021) External Transportation Links to Aberdeen South Harbour – STAG Detailed Appraisal Report (Chapter 9, Section 9.2: Environmental Appraisal; Appendix F – STAG Environmental Appraisal)
- Stantec (2022) External Transportation Links to Aberdeen South Harbour – Updated Strategic Business Case
- AECOM (2021) Wellington Road Multi-Modal Corridor Study – Detailed Appraisal (Sections 3.4 & 9.2)
- AECOM (2021) Wellington Road Multi-Modal Corridor Study – Detailed Appraisal: Appendices (Appendix G – Environment Appraisal)
- Port of Aberdeen (2015) Aberdeen Harbour Expansion Project – Environmental Statement (ES). Available online: https://www.portofaberdeen.co.uk/south-harbour/environmental-mitigation/2016-documents/ (the suite of documentation supporting the ES, Planning Permission in Principle (PPP) Application and Marine Licence Application were also available and reviewed at the weblink above)[1]
- Sweco UK (2022) Aberdeen South Harbour Link Road Outline Business Case – Appendix E: Environmental Appraisal Report
- Sweco UK (2024) Wellington Road Junction Improvements – DMRB Stage 2 Options Assessment Report

7.1.3. Key policies and plans that provide the policy and environmental context for the proposed scheme is provided in Section 7.4.

7.1.4. In addition, the assessment was informed by:

- A Preliminary Ecological Appraisal (PEA) (including Phase 1 habitat survey), which was undertaken in January 2023, to identify any potentially present protected species, map the habitats present on site and assess their potential to support notable and protected species.

[1] The Aberdeen Harbour Expansion Project EIA consent decision was made on 4 November 2016, and the decision was in favour of the development, subject to the inclusion of stated conditions being attached to any marine licences granted

- Additional surveys for badger, bats and invasive non-native species (INNS) were undertaken in summer 2023.
- Monthly wintering bird surveys between November 2022 and March 2023, on appropriate habitat adjacent to the scheme.
- Data received from North East Biological Records Centre (NESBReC) and Wetland Bird Survey (WeBS) Data from the British Trust for Ornithology (BTO).

7.1.5. A Preliminary Sources Study Report (PSSR) was produced by Sweco in January 2023 and has been used to provide baseline information on the proposed scheme for the assessment of geology, soils and contaminated land. This is supplemented by information obtained from an intrusive ground investigation undertaken between July 2023 and August 2023. Information from the PEA and wintering bird surveys is provided in Section 7.8.

7.1.6. The environmental assessment is supported by the following figures and reports included in the appendices:

- Appendix B:
  - Figure 7.1 – Environmental Constraints (65207249-SWE-LE-XX-D-O-30018)
  - Figure 7.2 – Aberdeen Local Development Plan (LDP) Constraints (65207249-SWE-LE-XX-D-O-30019)
  - Figure 7.3 – Location Plan (65207249-SWE-LE-XX-D-O-30020)
  - Figure 7.4 – National Coastal and Landscape Character (65207249-SWE-LE-XX-D-O-30015)
  - Figure 7.5 – Phase 1 Habitat Survey Map Sheet Overview (65207249-SWE-LE-XX-D-O-30016)
  - Figure 7.6 – Phase 1 Habitat Survey (65207249-SWE-LE-XX-D-O-30017)
- Appendix C – ASHLR Stage 3 Carbon Assessment Report (Sweco, 2024)
- Appendix D – Air Quality and Noise and Vibration Technical Notes

7.2. Structure and Scope of chapter

7.2.1. This chapter is structured around the key environmental topics and receptors that are considered to be important considerations for the proposed scheme. Relevant DMRB guidance[2] has been taken into account for each topic area to ensure the assessment was sufficiently robust and followed due process, as follows:

- Section 7.3 – Study area

[2] Standards for Roads – Design Manual for Roads and Bridges (DMRB): Sustainability & Environment guidance series. Available online: https://www.standardsforroads.co.uk/search?discipline=SUSTAINABILITY_AND_ENVIRONMENT&lifecycle=&dmrbSection&mchwVolume&mchwSection&to=2023-03-30&from=2023-03-30&pageNumber=1&suite=DMRB

- Section 7.4 – Key policies and plans
- Section 7.5 – Landscape and Visual (DMRB LA 107: Landscape and visual effects)
- Section 7.6 – Biodiversity (DMRB LA 108: Biodiversity; and LA 115: Habitats Regulations Assessment)
- Section 7.7 – Heritage Assets (DMRB LA 106: Cultural heritage assessment)
- Section 7.8 - Geology, Soils and Contaminated Land (DMRB LA 109: Geology and soils)
- Section 7.9 – Materials Assets and Waste (DMRB LA 109: Geology and soils; and LA 110: Material assets and waste)
- Section 7.10 - Road Drainage and the Water Environment (DMRB LA 113: Road drainage and the water environment)
- Section 7.11 – Climate (DMRB LA 114: Climate)
- Section 7.12 – Air quality (DMRB LA 105: Air quality) and Noise & vibration (DMRB LA 111: Noise and vibration)

7.3. Study area

7.3.1. A buffer of up to 1km surrounding the proposed scheme boundary has generally been used for this assessment. A wider buffer of up to 2km was used for ecologically designated sites (see Figure 7.1: Environmental Constraints and Figure 7.2: Aberdeen LDP Constraints).

7.3.2. The land within and around the proposed scheme is a mix of agricultural and commercial. To the west of the proposed scheme are the communities of Torry, Tullos and Altens, with Cove Bay to the south and Kincorth to the south-west. The River Dee is located to the west (approx. 1.2km away at its closest extent) and is a designated Special Area of Conservation (SAC). To the west of the River Dee is the city of Aberdeen.

7.3.3. On the eastern extent of the proposed scheme is agricultural land with the cliffs and the North Sea coast beyond. The land within the proposed scheme is primarily flat with a cliff on the eastern extent falling towards the North Sea.

7.3.4. The land within the proposed scheme is designated ‘Green Belt’ and ‘Green and Blue Infrastructure’; policies NE1 and NE2, respectively, in the 2023 Aberdeen Local Development Plan (see Figure 7.2 and Section 7.4 for more information).

7.3.5. Between the communities of Tullos and Altens is Tullos Wood, which has a stretch of designated ancient woodland, scheduled monuments, and recreational paths.

7.3.6. National Cycle Route 1 runs through the study area from north to south. To the south of the study area, Cove Road and Souter Head Road to Cove Crescent core paths are popular routes that connect to the Wellington Road cycle track.

7.4. Key Policies and Plans

7.4.1. As well as DMRB, the assessment has been informed by, and taken due cognisance of, key policies and plans, particularly:

- National Planning Framework 4 (NPF4)[3];
- Aberdeen Local Development Plan (LDP)[4]; and
- Net Zero Aberdeen[5].

7.4.2. Relevant information on NPF4, the Aberdeen LDP and Net Zero Aberdeen is provided below.

7.4.3. Any specific legislation, policies and guidance relevant to the assessment is included in the relevant topic sections of this chapter (Sections 7.5 to 7.12).

National Planning Framework 4 (NPF4)

7.4.4. NPF4 is the national spatial strategy for Scotland and sets out spatial principles, regional priorities, national developments and national planning policy. The strategy was published in February 2023 and replaces NPF3 and Scottish Planning Policy.

7.4.5. The national framework identifies a number of developments considered to be vital to the delivery of the spatial strategy. One of these national developments is the expansion of Aberdeen Harbour at Nigg Bay. Refer to National Development No. 14 (Aberdeen Harbour) in NPF4 for more information:

Aberdeen Harbour facilitates completion of the South Harbour and access to it as well as a more mixed-use waterfront for Aberdeen on areas of the harbour that will not in future be required for port uses. This will contribute to international and national connectivity, freight and the renewable energy sector.

7.4.6. The proposed scheme is situated on green belt land. Policy 8 of NPF4 is policy on development in, and protection of, Green Belts, which is a key element of achieving 'Sustainable Places':

[3] Scottish Government (2023) National Planning Framework 4. Available online: https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2023/02/national-planning-framework-4/documents/national-planning-framework-4-revised-draft/national-planning-framework-4-revised-draft/govscot%3Adocument/national-planning-framework-4.pdf

[4] Aberdeen City Council (2023) Aberdeen Local Development Plan (adopted June 2023). Available online: https://www.aberdeencity.gov.uk/services/planning-and-building-standards/local-development-plan/aberdeen-local-development-plan

[5] Aberdeen City Council (2022) Net Zero Aberdeen. Available online: https://www.aberdeencity.gov.uk/net-zero-aberdeen

Local Development Plans (LDPs) should consider using green belts, to support their spatial strategy as a settlement management tool to restrict development around towns and cities.

7.4.7. The national position statement is generally against development within designated greenbelts, unless they are for (selection provided only):

- *development associated with agriculture, woodland creation, forestry and existing woodland (including community woodlands);*
- *outdoor recreation, play and sport or leisure and tourism uses; and developments that provide opportunities for access to the open countryside (including routes for active travel and core paths); and*
- *essential infrastructure or new cemetery provision.*

7.4.8. If development is supported within Green Belt, the following requirements must be met (selection provided only):

- *reasons are provided as to why a green belt location is essential and why it cannot be located on an alternative site outwith the green belt;*
- *the purpose of the green belt at that location is not undermined; and*
- *there will be no significant long-term impacts on the environmental quality of the green belt.*

Aberdeen Local Development Plan (LDP)

7.4.9. Aberdeen City's LDP was adopted in June 2023. The following policies reinforce the position statements within NPF4 on development within greenbelt land, and other policies relevant to the proposed scheme.

Green Belt (LDP Policy NE1)

7.4.10. The aim of the Green Belt is to maintain the distinct identity of Aberdeen and the communities within and around the city, by defining their physical boundaries clearly. Safeguarding the Green Belt helps to avoid coalescence of settlements and sprawling development on the edge of the city, maintaining Aberdeen's landscape setting and providing access to open space. The Green Belt directs planned growth to the most appropriate locations and supports regeneration.

7.4.11. Development in areas defined as Green Belt on the Proposals Map will not be supported. Exceptions to this general presumption will only be supported where the proposal [selection provided only]:

e) *Is directly associated with essential infrastructure such as telecommunications, electricity grid connections, transport proposals identified in the Plan or roads planned through masterplanning of sites, if they cannot be accommodated anywhere other than the Green Belt*

7.4.12. There will be some direct impacts on green belt land within the proposed scheme footprint, but this is only a very small proportion of the green belt land available in the wider area.

Green and Blue Infrastructure (LDP Policy NE2)

7.4.13. Development proposals will seek to protect, support and enhance the Green Space Network (GSN) (identified on the Proposals Map). This broadly encompasses the wildlife, biodiversity, ecosystem services & functions, access, recreation, landscape and townscape value of the GSN. Development that does not achieve this will not be supported.

7.4.14. Coherence of the Green Space Network should also be maintained when considering any development and infrastructure proposals. Where infrastructure projects or certain developments necessitate crossing the GSN, they should maintain and enhance the coherence and quality of the network. In doing so, appropriate provision should be made for access across roads for wildlife and outdoor recreation.

7.4.15. Aberdeen City Council's online mapping tool[6] provides information about individual areas of Aberdeen's GSN, including opportunities for improvement and enhancement. In the vicinity of the scheme boundary, this comprises:

- GSN Site no 70 – Balnagask. This is a 'core area' (i.e. large/key area of existing green space), mainly classified as open semi-natural/foreshore/rocks/farmland. The area includes a designated LNCS (Balnagask to Cove) and Nigg Bay is a geological SSSI. There are various informal recreation uses including walks along the coastal path, links to Tullos Hill and St Fittick's Park.
- GSN Site no 71 – Tullos Hill. This is a 'core area' of GSN, mainly classified as open semi-natural/farmland. The area includes a designated LNCS (Tullos Hill), and is a popular site for informal recreation.

7.4.16. Similar for green belt land, there will be some direct impacts on the GSN within the proposed scheme footprint; however this is only a very small proportion of the GSN resource in the wider area.

LDP Opportunity Sites

7.4.17. There are four 'Opportunity Sites' in the Aberdeen LDP within or adjacent to the Preferred Route (see Figure 7.2: Aberdeen Local Development Plan (LDP) Constraints):

- OP56 – Energy Transition Zone & Green Space Network at St. Fittick's Park.
- OP61 – Energy Transition Zone & Green Space Network at Doonies Farm.
- OP62 (Economic Development) – Aberdeen Harbour expansion at Nigg Bay. A Masterplan is required including environmental and transport assessments.

[6] Aberdeen City Council (2023) Green Space Network online mapping tool. Available online: https://www.aberdeencity.gov.uk/services/environment/open-spaces/green-space-network

- OP64 – a Solar Farm occupying Green Belt land in the area of the 'Former Ness Tip'.

7.4.18. In terms of these LDP sites, a feasibility study report was produced for the Aberdeen ETZ in February 2020[7]. The expansion of ASH at Nigg Bay (OP62) has been completed and is now operational. For the solar farm development (OP64), a feasibility study was commissioned by ACC in 2017, which included an options assessment to determine the most appropriate size of a solar farm on the land available. A Strategic Outline Case (SOC) was prepared by ACC in 2021[8].

7.4.19. At this stage it is assumed that the proposed scheme could benefit the LDP opportunity sites by providing improved access.

Net Zero Aberdeen

7.4.20. The Net Zero Aberdeen Routemap, approved in February 2022, sets out a pathway towards Aberdeen becoming net zero by 2045. It is built upon six enabling strategies, comprising:

- Mobility Strategy;
- Buildings and Heat Strategy;
- Circular Economy Strategy;
- Energy Supply Strategy;
- Natural Environment Strategy; and
- Empowerment Strategy.

7.4.21. Alongside the Routemap, three other frameworks / initiatives have been set up to help the city meet its net zero target, as follows:

- Aberdeen Adapts – a framework for city-wide climate adaptation, responding to the impacts of climate change.
- H2 Aberdeen – focus on the city's green energy transition, including innovations in hydrogen technology helping to establish Aberdeen as a centre of excellence for hydrogen and fuel cell technology.
- Aberdeen Climate and Nature Pledge – a pledge was launched November 2022 to give organisations and individuals an opportunity to pledge their commitment to delivery of the Net Zero Aberdeen Routemap and Aberdeen Adapts climate adaptation framework.

7.4.22. The proposed scheme is considered to facilitate Aberdeen's ambition to achieving net zero, with a focus on the transport sector. Indirectly, it may contribute towards improving

[7] Barton Willmore (2020) Aberdeen Energy Transition Zone Feasibility Study Report, February 2020. Available online: https://www.aberdeencity.gov.uk/sites/default/files/2020-04/ETZ%20Feasibility%20Study%20Report.pdf

[8] Aberdeen City Council (2021) Strategic Outline Case – Ness Solar PV Project. Available online: https://www.aberdeencity.gov.uk/sites/default/files/2021-06/Ness%20Solar%20Farm%20StrategicOutlineCase%20110621.pdf

access to greener jobs and infrastructure within the city, including the proposed Energy Transition Zone and Aberdeen South Harbour developments.

7.5. Landscape and Visual

Introduction

7.5.1. This chapter provides a desktop assessment of the likely impacts upon the landscape and visual amenity which could arise from the proposed scheme and reports upon those potential adverse or beneficial effects in terms of the following:

- The likely general effect of the proposed scheme on local landscape and townscape character and the ability of the landscape to accommodate the change; and
- Likely visual effects on key receptors such as people in residential areas, at recognised viewpoints, and using key transport routes.

Approach and Methods

7.5.2. This assessment has been carried out in accordance with the DMRB LA 107 – Landscape and Visual Effects[9].

7.5.3. For clarity, the landscape is considered a resource inclusive of townscape (as stated in DMRB).

Assumptions and Limitations

- Consideration has been given to landscape and visual receptors within a 2km study area, however the detail of this assessment focusses on those receptors within 1km of the proposed scheme as beyond this distance, landform, vegetation and built form provides visual and physical separation from the proposed scheme.
- No statutory and non-statutory consultation has been undertaken at this stage. This will be conducted in future project stages as required.
- Outline proposals for landscape mitigation have been considered and have been used to inform the appraisal of landscape and visual impacts.
- Landscape and visual appraisal has been undertaken in year 1 (scheme opening year) and year 15 (design year).

Baseline

Landscape Designations

7.5.4. There are no protected national or local landscape designations within the study area.

[9] Design Manual for Roads and Bridges (DMRB) (2020) LA 107 – Landscape and Visual Effects. Available online: https://www.standardsforhighways.co.uk/dmrb/search/bc8a371f-2443-4761-af5d-f37d632c5734

7.5.5. The following designations, which are relevant to landscape and visual amenity, are present within the study area and are shown on Figure 7.1 (Environmental Constraints) and Figure 7.2 (Aberdeen LDP Constraints) in Appendix B:

- St Fittick's Community Park is located in the north of the study area and Loirston Country Park (including Kincorth Hill) lies to the west of the study area.
- Core Path (CP) 78 follows the coastline to the east of the study area, CP95 connects CP78 with Altens/Cove Bay to the south-east of the study area, and CP 83 and CP81 follow routes in and around Cove Bay and Altens to the south of the study area.
- National Cycle Route (NCR) 1 follows Coast Road from the north to the south of the study area and beyond, providing both localised access and forming part of a wider recreational network.

Planning Policy

7.5.6. Plans and policies relevant to landscape and visual amenity are summarised below. Refer to Section 7.4 for information on plans and policies relevant to the general environment. Refer to Figure 7.2 for LDP constraints.

Aberdeen Local Development Plan (LDP), 2023

Policy NE1 Green Belt

7.5.7. Green Belt land follows the coast to the eastern side of Coast Road. In the north of the study area it includes the areas of Loirston Park and Tullos Hill (see Figure 7.2, Appendix B):

"Development in areas defined as Green Belt on the Proposals Map will not be supported. Exceptions to this general presumption will only be supported where the proposal:

a) is directly associated with and required for agriculture, woodland or forestry; or

b) is for leisure or recreational uses compatible with an agricultural or natural setting; or

c) is for the extraction of minerals that meets an established need, if no other suitable site is available, or quarry restoration; or

d) is associated with existing activities in the Green Belt and is within the boundary of that activity, is small-scale, does not significantly increase the intensity of the activity and the proposed built construction is subordinate to what already exists (including extensions to existing dwellings); or

e) is directly associated with essential infrastructure such as telecommunications, electricity grid connections, transport proposals identified in the Plan or roads planned through masterplanning of sites, if they cannot be accommodated anywhere other than the Green Belt; or

f) is related to the generation of renewable energy (wind turbine, solar farm, or hydro scheme) and/or heat; or

g) is for a dwelling house to replace a dwelling house. This will be on a 'one for one' basis for development of a similar scale within the same footprint or existing curtilage of the site. This may be applicable to vacant properties in poor condition. All applications will be considered on a case by case basis; or

h) is for the appropriate change of use of a building with a historic or architectural interest that makes a worthwhile contribution to the landscape character of the Green Belt; or

i) is for a conversion/ rehabilitation scheme of a historic building. If extending, the original building will remain visually dominant to the new extension, the design and siting of the extension will be sympathetic in terms of massing, detailing and materials, and it will relate well to the original building."

Policy NE2 Green and Blue Infrastructure

7.5.8. The Green Space Network and Urban Green Spaces covered by this policy largely follow the pattern of Green Belt land described above (see Figure 7.2, Appendix B):

Green Space Network

7.5.9. "Development proposals will seek to protect, support and enhance the Green Space Network (identified on the Proposals Map). This broadly encompasses the wildlife, biodiversity, ecosystem services & functions, access, recreation, landscape and townscape value of the Green Space Network. Development that does not achieve this will not be supported.

7.5.10. Coherence of the Green Space Network should also be maintained when considering any development and infrastructure proposals. Where infrastructure projects or certain developments necessitate crossing the Green Space Network, they should maintain and enhance the coherence and quality of the network. In doing so, appropriate provision should be made for access across roads for wildlife and outdoor recreation.

7.5.11. Masterplans will determine the location, extent and configuration of the Green Space Network within the area, and its connectivity with the wider network."

Urban Green Space

7.5.12. "We will protect, support and enhance the city's Urban Green Space (parks, playing fields, sports pitches, outdoor sport facilities, woods, food-growing spaces, or all other areas including smaller spaces not identified on the Proposals Map such as amenity space or garden ground). Development proposals that do not achieve this will not be supported.

7.5.13. Exceptions may be made when a suitable alternative and equally convenient and accessible area for public space is provided by the applicant for Urban Green Space purposes, for example through the replacement of school buildings, within the locality of the site. Where proposals would affect an outdoor sports facility, development may also

be acceptable where it would be ancillary to and/or not affect its current and potential principal use for sport and training; or a clear excess of provision is demonstrated. In all cases, development will only be acceptable if it meets criteria set out in the Aberdeen Planning Guidance: Open Space and Green Infrastructure."

Open Space in New Development

7.5.14. *"We will require the provision of biodiverse, usable and appropriate open space in new developments to ensure functionality. Please see Aberdeen Planning Guidance: Open Space and Green Infrastructure for information on how to calculate open space requirements, as well as different types of provision (including food-growing) and the expected accessibility and quality standards.*

7.5.15. *We will seek open space provision in all developments, including on brownfield sites. It may not be possible to increase the amount of open space on some brownfield sites, for example where existing buildings on the site are being retained. In these cases, appropriate design solutions to deliver on-site amenity will be sought in the first instance and commuted sums towards off-site provision or enhancement of existing open spaces will be sought where appropriate.*

7.5.16. *In areas where the Open Space Audit has shown that there is opportunity for improvement of existing open space, contributions may be sought to enhance existing provision instead of new provision being required. The Open Space Audit and Strategy provides details of any improvements or enhancements that may be required to open spaces in different areas of the city, and how the linkages between them may be improved. Further guidance is included in Aberdeen Planning Guidance: Open Space and Green Infrastructure."*

Outdoor Access and Core Paths

7.5.17. *"New development will maintain and enhance the integrity of existing access rights to; land and water, Core Paths, other paths and rights of way, or safeguard potential access opportunities to these. This includes any impacts on access during the construction, operation, decommissioning and reclamation phases of development.*

7.5.18. *In exceptional circumstances routes may be affected by development. In these cases it will be necessary to maintain their condition, enhance their amenity value, or provide an alternative path or access (which links the same locations) that is safe, high quality and convenient for the public to use.*

7.5.19. *Development proposals should include new or improved provision for public access, permeability, and links to the core path network and green spaces for recreation and active travel within their design. We may seek Developer Obligations for Core Paths where appropriate."*

Policy NE5 – Trees and Woodlands

7.5.20. *"Development should not result in the loss of, or damage to, trees and woodlands.*

7.5.21. *Development proposals will seek to increase tree and woodland cover and achieve the long-term retention of existing trees and woodlands that the planning authority consider worthy of retention. Particular emphasis is placed on the protection and ongoing management of Ancient Woodlands. Where tree removal takes place or is necessary for good arboricultural reasons, replacement planting will be required to ensure an overall net gain in tree cover. Development that does not achieve this will not be supported.*

7.5.22. *Buildings and infrastructure should be sited to allow adequate space for a tree's natural development, taking into account the predicted mature height, canopy spread and future rooting environment.*

7.5.23. *Where applicable, root protection areas should be established, and protective barriers erected prior to any work commencing."*

Policy D2 – Amenity

7.5.24. *"In order to ensure provision of amenity the following principles will be applied.*

7.5.25. *Development will be designed to:*

- *make the most of any opportunities offered by the site to optimise views and sunlight through appropriate siting, layout and orientation;*
- *ensure that occupiers are afforded adequate levels of amenity in relation to daylight, sunlight, noise, air quality and immediate outlook;*
- *ensure that occupiers are afforded adequate levels of amenity in relation to daylight, sunlight, noise, air quality and immediate outlook;*
- *have a public face to the street to ensure natural surveillance, and active street frontages;*
- *ensure that refuse and recycling facilities, cycle storage, low and zero carbon technology, plant and services are sensitively integrated into the design;*
- *ensure that external lighting minimises light spillage into adjoining areas and the sky."*

Policy D4 – Landscape

7.5.26. *"Landscape / seascape / townscape character and existing elements which provide, or contribute to, a distinct 'sense of place' will not be adversely affected by development. Development will provide opportunities for conserving or enhancing existing landscape / seascape / townscape elements (natural and built), including linear and boundary features or other components which contribute to character and 'sense of place'.*

7.5.27. *Development should avoid adversely affecting the character of landscapes and seascapes which are important for the setting of the city, including the coast, river valleys and hill landscapes.*

7.5.28. *Important views of the city's townscape, landmarks and features (including the coast, river valleys, and hills) when seen from busy or important publicly accessible vantage points such as roads, railways, recreation areas, and path networks and particularly from the main city approaches (gateways) will not be adversely affected by development. Where development is permitted on gateways routes it will be expected to enhance the gateway route frontage.*

7.5.29. *Development should avoid disturbance to, or loss or damage to important recreation, wildlife or natural resources (such as woodland, rivers, coast) or to the physical and functional links between them.*

7.5.30. *Green spaces between and around places or communities, and those which can provide opportunities for countryside activities, will not be eroded by development."*

Policy D5 – Landscape Design

7.5.31. *"Development proposals will be designed with an effective, functional and attractive landscape framework supported by clear design objectives. The level of detail required will be appropriate to the scale of development.*

7.5.32. *Landscape design will:*

- *be integrated early into the layout and design of the site, informing the spatial arrangement of both built and natural elements;*
- *ensure a sense of place is maintained and enhanced through an assessment of the site and its surrounding landscape/seascape/townscape character; and sympathetically incorporate existing key characteristics and features that contribute to landscape/seascape/townscape character;*
- *mitigate any negative landscape and visual impacts;*
- *ensure physical connectivity to adjoining and nearby green spaces, buildings and features;*
- *maximise adaptation and resilience of the built and natural environment to the effects of climate change, and mitigate the impacts of climate change;*
- *protect and enhance biodiversity by designing the spatial arrangement of new and existing habitats to maximise connectivity between habitats within and around the site, including the design of SuDS, and through the careful use of informed habitat creation and planting design techniques;*
- *impact positively on health and wellbeing; ensure active travel routes and areas of recreational / open space are designed to be well connected, inclusive and safe; and help to mitigate air, light and noise pollution.*
- *be designed for low maintenance where feasible and appropriate to the design objectives."*

Landscape Character/Sensitivity

7.5.33. The Landscape character types and areas described below are shown on Figure 7.4, Appendix B.

National Landscape Character Assessment (NatureScot, 2019)[10]

7.5.34. The study area falls within the following two landscape character types:

Landscape Character Type 2: Cliffs and Rocky Coast

7.5.35. Key characteristics include:

- *"Steep rugged slopes and cliffs cut by narrow inlets and with fissured headlands and occasional small coves.*
- *Grazed fields extend close to the top of cliffs while semi-natural coastal grassland covers rocky headlands.*
- *Business and industrial buildings, a quarry and a landfill site form the urban edge abutting this coast.*
- *A narrow road and the East Coast Mainline railway are aligned tight against this coast.*
- *A long cultural heritage associated with the fishing industry.*
- *The battery and lighthouse on the headland of Girdle Ness form landmark features seen from the city.*
- *Dramatic sea views from cliff-top paths and the railway.*
- *Rugged cliffs and exposure to the elements instil a sense of wildness unusual in a city."*

Landscape Character Type 5: Low Hills – Aberdeen

7.5.36. Key characteristics include:

- *"Prominent hills which form distinctive landmark features seen from the city.*
- *A gently rounded landform with relatively steep slopes gives these hills a well-defined profile.*
- *Large areas of open moorland and woodland cover summits and upper slopes.*
- *Farmland is associated with the lower slopes of the western hills.*
- *These hills are largely undeveloped apart from telecommunication masts on some summits.*

[10] NatureScot (2019) Scottish Landscape Character Types Map and Descriptions. Available online: https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions

- *Small farms are generally situated at the foot of the larger western hills.*
- *Prehistoric monuments are associated with many of these hills.*
- *Many of these hills are well-used for recreation.*
- *Areas of higher open ground provide panoramic views across the city, Aberdeenshire and the sea.*
- *A sense of seclusion can be experienced on summits and within the more extensive woodlands."*

Coastal Character Assessment[11]

7.5.37. The coastal characterisation of Scotland by NatureScot has identified thirteen National Coastal Character Types at a very broad scale.

7.5.38. The coastline of the study area is characterised as a mix of Type 2: Rocky Coastline/Open Sea Views and Type 3: Deposition Coastline, Open views. There are no published descriptions of these coastal character types.

The Aberdeen Landscape Study: Coastal Character Assessment, 202112

7.5.39. A more detailed level of characterisation of the Aberdeen coastline has been undertaken with the Types divided into Coastal Character Areas (CCA). The coastline of the study area is characterised as a mix of the following:

CCA 5: Bay of Nigg

- *"A distinctive crescent-shaped bay contained by the headlands of Girdle Ness and Greg Ness. The coastal edge is largely undeveloped, with a natural and relatively sheltered form.*
- *The outer parts of the shoreline are predominantly rock but, within the sheltered parts of the bay, there is a relatively wide, flat area of shingle, backed by a raised platform, with some sand exposed at low tide. Sand and shingle are constantly shifting and sometimes, sand can be seen higher up the beach.*
- *Above the shoreline, the sloping cliffs are designated a Local Nature Conservation Site for their conservation interest including coastal and neutral grassland, pockets of scrub and other coastal plants and associated insects. The glacial deposits exposed in the cliff section to the south-east of the bay are a Site of Special Scientific Interest (SSSI) and regarded as a classic location for understanding the glacial history of Scotland.*
- *With several interpretation panels, the area is important for informal recreation. The North Sea Coast Path follows the coastal edge and a nearby coastal road follows the curve of the bay. There is a car park located near to the beach, which is used for informal recreation.*

[11] NatureScot (16 August 2023) Coastal Character Assessment. Available online: https://www.nature.scot/professional-advice/landscape/coastal-character-assessment

[12] Aberdeen City Council (2021) The Aberdeen Landscape Study. Coastal Character Assessment. Available online: https://www.aberdeencity.gov.uk/sites/default/files/2023-03/CoastalCharacterAssessmentFinal2021.pdf

- *Beyond the coastal road, the rising ground of Girdle Ness and the lower slopes of Tullos Hill provide a degree of shelter and containment to the lower-lying coastal edge.*
- *To the west of the road, where the River Dee once drained out to sea, recent environmental improvements have re-naturalised the Tullos Burn. There is some woodland along the burn and around the water treatment works although apart from these areas, the hinterland is largely tree-less.*
- *The ruined St Fitticks Church overlooks the bay and is a notable feature in views from the sea. Together with its surrounding graveyard, it is a Scheduled Monument. The church was founded in the late 12th Century, rebuilt in the 18th Century and abandoned in 1829. The walls survived, along with one gable topped with a bell frame, which creates a distinctive profile. The open and undeveloped setting of the church is currently used for recreation."*

7.5.40. Due to the local/regional importance of the landscape, the industrial influences of the area and the capacity of the coastal character area to accommodate change of the type proposed, the sensitivity is considered to be medium.

CCA 6: Souter Coast

- *"A dramatic, rugged and exposed rocky coastline with striking geological features. Along most of its length, the coastal edge has a very strong natural form and undeveloped appearance.*
- *Jagged rock platforms form obvious discontinuous features along the entire length of the coast, mostly occurring at or slightly above the intertidal zone. Sea caves can be seen at various places usually at, or slightly above, sea level. There are several steep-sided narrow ravines and near-vertical igneous dykes and storm beaches with isolated boulders perched on cliff tops.*
- *Above the shoreline, the sloping cliffs are designated a Local Nature Conservation Site for their conservation interest including coastal and neutral grassland, pockets of gorse scrub and other coastal plants and associated insects.*
- *The North Sea Coast Path follows the cliff top and provides views of spectacular coastal scenery. In the spring and summer, the cliffs are home to a multitude of nesting seabirds. Sea fishing also takes place from the cliff edge.*
- *Above the undeveloped coastal cliffs, there is a strong pattern of medium-sized rectilinear fields, enclosed by dry stone dykes and post and wire fences running perpendicular to the cliff tops. To the south of Cove, coastal land is used for rough grazing and a large opencast quarry. Apart from some occasional trees near settlement, the area has no woodland or notable tree cover.*
- *Land use is mainly pastoral, although recreation is provided by cluttered appearance of Doonies Model Farm. There is also some limited fishing at Burnbanks and Cove Bay.*
- *A coastal footpath along the cliff and a coastal road which runs beside the East Coast Mainline railway provide easy access to most of the coast although car parking is often very difficult.*

- *In the northern part of the area the coastal hinterland comprises medium-sized rectilinear fields and farms while the southern part is primarily rough grazing land. Fields are generally divided by stone dykes."*

7.5.41. Due to the local/regional importance of the landscape, the industrial influences of the area and the capacity of the coastal character area to accommodate change of the type proposed, the sensitivity is considered to be medium.

The Aberdeen Landscape Study: Landscape Character Assessment, 2021[13]

7.5.42. There are three landscape character areas in the vicinity of the proposed scheme:

LCA 25 Souter Coast

7.5.43. The key characteristics of this area include:

- *"A highly indented, rocky coastline with a series of striking, rugged coastal forms comprising cliffs, narrow ravines, jagged rock platforms, small rocky headlands, sea caves and storm beaches.*
- *A strong pattern of medium-sized rectilinear fields, enclosed by dry stone dykes and post and wire fences slope gently towards the coastal edge, contrasting with the natural character of the coastline.*
- *With intensive farming across much of the area, semi-natural habitats are limited to the narrow coastal strip. These include occasional shingle beaches and, along the sloping cliffs, swathes of dry heath and coastal heath, neutral grassland and pockets of gorse scrub.*
- *The landscape retains a traditional agricultural character although there is a strong connection with fishing at Cove and Burnbanks.*
- *The area generally has no woodland or notable trees, other than occasional trees associated with settlement.*
- *A mainly undeveloped character with isolated farmsteads and dwellings scattered across the open farmland.*
- *The coast road and prominent railway emphasis the linear nature of the area and a coastal footpath follows the intended coastline.*
- *There are impressive views along the rocky coast and out to sea, but views inland are limited by the railway embankment, rising ground, woodland blocks and nearby development.*
- *Despite proximity to nearby development, the coast has a rugged, natural and exposed coastal character with a sense of detachment from the city."*

7.5.44. Due to the local/regional importance of the landscape, the industrial influences of the area and the capacity of the character area to accommodate change of the type proposed, the sensitivity is considered to be medium.

LCA 24 Tullos Hill

[13] Aberdeen City Council (2021) The Aberdeen Landscape Study. Landscape Character Assessment. Available online: https://www.aberdeencity.gov.uk/sites/default/files/2023-03/Landscape%20Character%20Assessment%20Final%202021.pdf

7.5.45. The key characteristics of this area include:

- *"A prominent ridge of gently undulating elevated open ground which, although relatively low, forms an important well-wooded backdrop to the city.*
- *A mainly semi-natural character with large swathes of broadleaved woodland on the northern slopes, and a mosaic of scrub woodland, bracken, acid and neutral grassland and dry heath with small patches of lowland birch woodland and wet heath on areas of higher ground.*
- *The area is free of settlement with a mixed land use of informal recreation, rough grazing, woodland and former landfill.*
- *An undeveloped and open summit contrasts with an area of a restored landfill site enclosed by prominent security fencing and woodland across the northern slopes.*
- *With a good network of well used footpaths, the area is important for informal recreation.*
- *Prominent in views from the north-western parts of the city, with extensive views across Aberdeen and the North Sea from parts of the open summit.*
- *The undeveloped hill has a coastal influence and its mainly recreational land use contrasts with the surrounding built-up areas."*

7.5.46. Due to the local/regional importance of the landscape, the industrial influences of the area and the capacity of the character area to accommodate change of the type proposed, the sensitivity is considered to be medium.

LCA 22 Girdle Ness

7.5.47. The key characteristics of this area include:

- *"An exposed low-lying rocky headland with a distinctive crescent-shaped bay and associated flat floodplain hinterland, interspersed with a few pockets of shingle and sandy beach.*
- *Above the rocky shore, semi-natural habitat consists of a narrow swathe of coastal habitats along the sloping cliffs and inland, pockets of wetland and woodland.*
- *The headland is entirely treeless and unenclosed, with a very open and exposed character. In contrast, the floodplain to the west of the Bay of Nigg has a more sheltered appearance.*
- *A curved, open coastal road follows the coastline with several small car parks providing ready access to the area.*
- *From the open and exposed headland, panoramic views extend across the expansive North Sea and northward, across the harbour to the city, and of the beach curving away towards Balmedie. Inland, views are more varied, including those of the urban area and the rising flanks of Tullos Hill.*
- *The windswept landscape has a mainly natural coastal character with a sense of relative seclusion along the shore and some parts of the coastal road when backed by higher ground. Inland, rising ground and development provides a sense of containment."*

7.5.48. Due to the local/regional importance of the landscape, the industrial influences of the area and the capacity of the character area to accommodate change of the type proposed, the sensitivity is considered to be medium.

Landscape of the Study Area

7.5.49. Land to the east of Coast Road is predominantly undeveloped along this coastal stretch and includes agricultural land and the rocky coastline, as described in the character descriptions above. There are numerous industrial influences, including Aberdeen South Harbour, the Aberdeen to Dundee railway line and Coast Road itself. Altens and East Tullos industrial estates occupy a large part of the study area.

7.5.50. Loirston Country Park, Tullos Hill and St Fittick's Community Park account for large areas of green space within the study area. Vegetation cover is sparse and comprises mainly rough grassland/arable farmland with some native hedgerow along Coast Road and a small area of scrub/woodland in the vicinity of the Wastewater Treatment Works in the north of the study area. Tree cover is more prevalent within Loirston Park.

7.5.51. The remaining part of the study area to the east comprises the North Sea.

Visual Amenity

7.5.52. The study area comprises exposed elevated coastline with open views along Coast Road to the mid and north of the study area and along the section of Hareness Road which runs parallel to Coast Road. At the south of the study area, where Hareness Road turns west into Altens Industrial Estate, views become enclosed by the built form of the industrial units.

7.5.53. The preliminary appraisal of visual amenity has considered:

- Road/rail users: users of the railway line, Coast Road and Hareness Road have open views of the study area (except within Altens Industrial Estate) and are of low sensitivity to the type of development proposed due to their activity not being focussed on the view.
- Footpath/cycle route users: users of Core Paths 78, 81, 83 and 95 and NCN Route 1 have predominantly open views of the study area and are of medium sensitivity to the type of development proposed within the context of the existing road corridor.
- Recreational users: visitors to Doonies Farm, Tullos Hill and St Fittick's Community Park have open views of the study area. Visitors to Loirston Country Park have enclosed views due to landform and vegetation. Recreational users are considered to be of medium sensitivity to the type of development proposed. Whilst recreational users have some appreciation of views, within the context of the existing road corridor, this is generally not the primary purpose of activity.
- Users of employment sites: users of Altens Industrial Estate have enclosed views, apart from on the eastern edge of the estate and along Hareness Road. Users of the Wastewater Treatment Works and Aberdeen South Harbour have open views. Such users are of low sensitivity to the type of development proposed due to their activity not being focussed on the view.
- Residential receptors: From Doonies Farm there are open views of the proposed scheme. From the residential area of Cove Bay to the south of Altens Industrial Estate, views towards the proposed scheme are screened by the industrial estate

itself and are not considered further in this assessment. Residential receptors are considered to be high sensitivity to the type of development proposed. Residential receptors tend to be more vulnerable to change and are therefore likely to be the most sensitive visual receptor.

Mitigation Design

7.5.54. The General Arrangement plans for the proposed scheme show the alignment of the proposed scheme and the areas where there is potential for soft landscape and mitigation planting.

7.5.55. Along Hareness Road, within Altens Industrial Estate, there is limited opportunity for mitigation planting beyond the central islands of the two roundabouts due to space constraints within the urban area.

7.5.56. As the proposed scheme exits the industrial estate and curves to the north, continuing along Hareness Road, soft verges are proposed as the route continues north to join Coast Road. As the road progresses north there are numerous requirements for cut and fill which will create a series of embankments which could be seeded or planted as appropriate.

7.5.57. There are three detention basins along the proposed route and there is the opportunity to seed or plant these with wetland/aquatic mixes to serve the dual purpose of enhancing visual amenity and ecological value.

7.5.58. Due to the open, exposed character of this rocky coastline, tree planting is not considered appropriate, however species rich grassland, low scrub planting, native hedgerows and wetland/aquatic planting in the aforementioned areas to mitigate the proposed scheme and replace vegetation which has been lost would enhance the appearance of the road corridor and provide biodiversity benefit in terms of habitat creation. Consideration of Policy 3 of NPF4 is recommended during the development of detailed landscape proposals to ensure opportunities to promote landscape and biodiversity enhancements have been taken where possible.

7.5.59. In addition to mitigation planting, where practical, dry stone walls will be re-built to maintain the rural character of the area.

Assessment of Effects

Construction

7.5.60. Activities anticipated to be undertaken during the construction of the proposed scheme, which are likely to have temporary and short-term effects on the landscape and visual amenity of the site and its surroundings area, include:

- Removal of existing vegetation.
- Earthworks associated with:
    - excavation associated with sections of the new road alignment in cutting
    - grading of levels for the new embankments and realigned carriageway
- Construction associated with the new bridge crossing including site clearance, earthworks, and abutment and deck construction, with associated heavy plant.

- The presence of construction compounds, which are anticipated to be lit during core working hours during periods of darkness.
- The general presence of construction activity, stockpiles of materials, construction vehicles, heavy plant, and associated traffic management interventions.

Impacts on Landscape

7.5.61. The open coastal character of LCA25 and CCA6 would be affected to the greatest degree within the study area and would experience moderate adverse effects on landscape and coastal character during construction due to vegetation removal, earthworks and the presence of construction plant, materials, machinery, construction compounds, construction lighting and increased construction traffic.

7.5.62. In the north of the study area, given that LCA24, LCA22 and CCA5 are on the periphery of the proposed scheme the effects on landscape and coastal character would be slight adverse.

Impacts on Visual Amenity

7.5.63. Footpath/cycle route users (NCN Route 1 and Core Path 78): the open nature of the landscape, coupled with vegetation removal, would mean there are open views of construction activity, as well as construction lighting and increased construction traffic resulting in a moderate adverse effect during construction.

7.5.64. Recreational users: due to distance from the site, the proposed scheme would be barely noticeable from Tullos Hill and views from Loirston Country Park and St Fittick's Community Park would be screened by intervening landform and vegetation, as such visual impacts during construction would be neutral. From Doonies Farm there would be open views in close proximity of construction activity, as well as construction lighting and increased construction traffic resulting in a moderate adverse effect during construction.

7.5.65. Users of employment sites: there would be no views of the proposed scheme from within Altens Industrial Estate due to screening by the industrial units; where there are open views of the scheme from the eastern edge of Altens Industrial Estate, the Wastewater Treatment Works and Aberdeen South Harbour, the construction activity would be viewed in the context of the existing industrial estate. As such there would likely be slight adverse impacts on visual amenity for users of employment sites during construction.

7.5.66. Road/rail users: due to views of the proposed scheme being transient and in the context of the existing road, there would likely be slight adverse impacts on visual amenity during construction.

Operation

7.5.67. The aspects of the proposed scheme which are likely to have permanent effects on the landscape and visual amenity of the site and its surroundings are as follows:

- Potential loss of native hedgerow, areas of grassland and areas of scrub/woodland as a result of the route realignment and widening between Hareness Road and Aberdeen South Harbour.
- Widened road corridor.
- Proposed railway bridge (larger in scale than the existing bridge).
- Increased traffic volumes, including heavy goods vehicles (HGVs).

Impacts on Landscape

7.5.68. No landscape designations would be affected as a result of the proposed scheme.

7.5.69. The open coastal character of LCA25 and, CCA6 would likely be affected due to the realignment and widening of Coast Road and the new railway crossing necessitating vegetation removal leading to a slight adverse effect. There would be no landscape impacts on the section of Hareness Road as it passes through Altens Industrial Estate due to the proposed alignment being contained within the urban area, leading to a neutral effect. As such there would likely be direct, permanent, slight adverse impacts on landscape and coastal character in both Year 1 (scheme opening year) and Year 15 (design year).

7.5.70. In the north of the study area, given that LCA24, LCA22 and CCA5 are on the periphery of the proposed scheme, which follows the existing alignment it is considered this would cause no perceptible change to the landscape character. As such the impacts on LCA24, LCA22 and CCA5 would likely be neutral in both Year 1 and Year 15.

Impacts on Visual Amenity

7.5.71. Footpath/cycle route users: due to the road realignment/widening, an increase in traffic volume and the increased scale of the proposed railway bridge, all of which would be viewed in the context of the existing road corridor, there would likely be direct, long-term and permanent slight adverse impacts on visual amenity in both Year 1 and Year 15.

7.5.72. Recreational users: due to distance from the site, the proposed scheme would be barely noticeable from Tullos Hill and views from Loirston Country Park and St Fittick's Community Park would be screened by intervening landform and vegetation. As such visual impacts during year 1 and year 15 would be neutral. Views from Doonies Farm would be predominantly open and in close proximity, however the realignment/widening, increase in traffic volumes and the increased scale of the proposed railway bridge would be viewed in the context of the existing road corridor leading to a slight adverse effect. As such there would likely be direct, long-term and permanent slight adverse impacts on visual amenity for recreational users in both Year 1 and Year 15.

7.5.73. Users of employment sites: where there are open views of the proposed scheme from Altens Industrial Estate, the Wastewater Treatment Works and Aberdeen South Harbour, the realignment, increase in traffic volume and the increased scale of the proposed

railway bridge would be viewed in the context of the existing road corridor and industrial coastline. As such there would likely be direct, long-term and permanent slight adverse impacts on visual amenity for users of employment sites in both Year 1 and Year 15.

7.5.74. Road/rail users: due to views of the proposed scheme being transient and in the context of the existing road corridor, there would likely be direct, long-term and permanent slight adverse impacts on visual amenity in both Year 1 and Year 15.

Summary of Assessment

7.5.75. In landscape terms, this area of coastline has numerous industrial influences, including the railway line, Aberdeen South Harbour, Altens Industrial Estate and the existing Coast Road itself. The proposed scheme would be in character with the existing infrastructure and would largely follow the alignment of the existing road. There would be some loss of vegetation due to the footprint of the proposed scheme, but this would be mitigated by a replacement planting scheme to be developed in detail at future project stages.

7.5.76. It is considered there would be a moderate adverse impact on landscape and visual amenity during the construction phase.

7.5.77. It is considered there would be a direct, long-term, individual and permanent slight adverse impact on landscape in both Year 1 (scheme opening year) and Year 15 (design year).

7.5.78. It is considered there would be a direct, long-term, individual and permanent slight adverse impact on visual amenity in both Year 1 and Year 15.

7.5.79. Overall, the long-term residual effects of the scheme on landscape and visual amenity are considered to be Slight Adverse.

7.6. Biodiversity

Introduction

7.6.1. This section provides a review of the ecological baseline (including habitats, species and designated sites) of the proposed scheme and an assessment of the potential impacts upon ecological features, which could arise from the proposed scheme. This section also outlines proposed mitigation measures to help mitigate impacts on ecological features.

Approach and Methods

7.6.2. A desk study which included the purchase of species data and non-statutory designated site information within 2km of the proposed scheme from the North East Scotland

Biological Records Centre (NESBReC) and a search for designated site information within 5km of the proposed scheme from NatureScot Sitelink[14] was undertaken.

7.6.3. A Preliminary Ecological Appraisal (PEA) including a Phase 1 habitat survey was carried out in January 2023 following standard guidance[15]. The survey included all DMRB Stage 2 route options and the immediate surroundings. A Phase 1 habitat survey is a standardised method of recording and mapping characteristic vegetation and habitat types in accordance with Joint Nature Conservation Committee (JNCC) guidelines[16]. Phase 1 habitat types were recorded along with an indication of the plant species present, together with the structure, condition, and extent of the habitat. The survey was extended to include a protected species scoping survey of the proposed scheme, whereby the locations of any evidence of, or habitats with potential for, protected or notable species were noted (see Figure 7.5 and Figure 7.6, Appendix B).

7.6.4. All structures and trees within 30m of the DMRB Stage 2 route options were assessed for their bat roosting potential as per the current Bat Conservation Trust (BCT) guidelines at the time of survey[17]. Signs of badger, including setts (defined by law as "any structure or place which displays signs indicating current use by badger"), badger paths, latrines/dung and hair were searched for within 100m of the proposed scheme following standard guidance[18]. The watercourses on site were surveyed up to 200m from the proposed scheme for signs of otter, including footprints, sign heaps and anal jelly, as well as resting sites following standard guidance[19]. Watercourses were also assessed for suitability for water vole using a Habitat Suitability Assessment[20], the score indicating overall suitability as follows: <3 Unsuitable; 3-5 Sub-optimal; and >5 Optimal. Evidence of, and suitability for other protected species and Invasive Non-Native Species (INNS) were assessed within 30m of the scheme.

7.6.5. Additional surveys were recommended from the results of the PEA. These were undertaken based on the DMRB Stage 3 design (i.e. the proposed scheme).

7.6.6. An additional survey for INNS was carried out along the proposed scheme in July 2023 due to the initial PEA being undertaken in winter when many plant species have died back and are unidentifiable. The update survey included the scheme and immediate surroundings.

[14] NatureScot (2021) SiteLink. Available online: https://sitelink.nature.scot/home
[15] Chartered Institute of Ecology and Environmental Management (CIEEM) (2017) Guidelines for Preliminary Ecological Appraisal (2nd Edition), Winchester
[16] JNCC (2010) Handbook for Phase 1 Habitat Survey – a Technique for Environmental Audit. Joint Nature Conservation Committee, Peterborough
[17] Collins, J. (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd ed., London: The Bat Conservation Trust
[18] Harris, S., Creswell, P. and Jefferies, D. (1989) Surveying Badgers, *Mammal Society*
[19] Chanin, P. (2003) Monitoring the Otter Lutra lutra, *Conserving Natura 2000 Rivers*
[20] Harris, J.E., Markwell, H.J. and Raybould, B.R. (2009) A method for assessing water vole habitat suitability, no. 65, pp. 28-31

7.6.7. Following the results of the PEA, an additional targeted badger survey was carried out in all habitats identified as being suitable for the creation of badger setts, within 100m of the proposed scheme.

7.6.8. One building (B13) was assessed as having moderate potential to support roosting bats and identified as being directly impacted by the proposed scheme. As per BCT guidelines two dusk emergence surveys were undertaken on the building in summer 2023.

7.6.9. Due to the close proximity (approximately 2.5km) of Ythan Estuary, Sands of Forvie and Meikle Loch Special Protection Area (SPA), which is designated for its bird assemblage, monthly wintering bird surveys were undertaken between November 2022 and March 2023, which comprised a survey at high tide to determine whether the assemblage was using the site and surrounding area. A Habitats Regulations Appraisal (HRA) screening report was drafted at DMRB Stage 2. This was sent to NatureScot who agreed with the conclusion that no Likely Significant Effects would arise as a result of the proposed scheme. An updated HRA for the DMRB Stage 3 stage will be submitted to NatureScot in early 2024 and the outcome is expected to be the same.

Assumptions and Limitations

- There were no limitations to the surveys or the biodiversity assessment presented in this section.

Baseline

Statutory Designated Sites

7.6.10. Five statutory designated sites are located within 5km of the proposed scheme. These are described in Table 7-1 and are shown on Figure 7.1 (Environmental Constraints) in Appendix B. As Nigg Bay Site of Special Scientific Interest (SSSI) is designated for geological interests only, it has not been assessed further within this section.

Table 7.1 - Statutory designated sites within 5km of the proposed scheme

Site Name	Distance and Direction from Site	Description/reason for Designation
Nigg Bay Site of Special Scientific Interest (SSSI)	0.3km north	The site is designated for its geological interest only.
Kincorth Hill Local Nature Reserve (LNR)	0.3km west	The site comprises extensive areas of gorse scrub, heathland, young coniferous and broadleaved woodland.
River Dee Special Area of Conservation (SAC)	1.7km north	The site has been designated as it supports populations of the following Annex II species: - 1029 Freshwater pearl mussel (*Margaritifera margaritifera*) - 1106 Atlantic salmon (*Salmo salar*) - 1355 Otter (*Lutra lutra*)

Site Name	Distance and Direction from Site	Description/reason for Designation
Ythan Estuary, Sands of Forvie and Meikle Loch Special Proection Area (SPA)	2.5km north	The site qualifies under Article 4.1 as it supports internationally important populations of Sandwich tern (*Sterna sandvicensis*), common tern (*Sterna hirundo*) and little tern (*Sterna albifrons*). The site further qualifies under Article 4.2 as it supports internationally important populations of the migratory species pink-footed goose (*Anser brachyrhynchus*) and regularly supports in excess of 20,000 individual waterfowl.
Cove SSSI	1.3km south	The site supports a colony of the rare plant Dickie's bladder-fern (*Cystopteris dickieana*).

Non-Statutory Designated Sites

7.6.11. Five non-statutory designated sites are located within 2km of the proposed scheme. These are described in Table 7-2 and are shown on Figure 7.1 (Environment Constraints) in Appendix B.

Table 7.2 - Non-Statutory designated sites within 2km of the proposed scheme

Site Name	Distance and Direction from Site*	Description/reason for Designation
Balnagask to Cove Local Nature Conservation Site (LNCS)	Adjacent to eastern boundary of the proposed scheme	The site comprises a mosaic of herb rich grasslands, wet flushes, coastal heathland, rocky cliffs and rock pools. The site supports populations of nesting seabirds.
Tullos Hill LNCS	0.2km north	The site comprises a mosaic of broadleaved woodland, neutral grassland, scrub, bracken, acid grassland and dry heath.
Kincorth Hill LNCS	0.2km west	The site comprises scrub, woodland, neutral grassland and dry heath habitats.
River Dee Corridor LNCS	1.1km north-west	The river supports a diverse range of plants and animals.
Loirston Loch LNCS	1.7km south-west	The site comprises a mosaic of open water, reed beds and marshy grassland which is important for overwintering wildfowl.

Ancient Woodland and Native Woodland Survey of Scotland (NWSS) Sites

7.6.12. There is a single parcel of ancient woodland within 2km of the proposed scheme which is located 0.4km to the north of Hareness Road. Given the distance between the scheme and the woodland, this ecological feature is unlikely to be impacted by the scheme and will not be considered further within this section.

7.6.13. There are multiple NWSS Sites within 2km of the proposed scheme, however none are located within or adjacent to the scheme boundary and are unlikely to be impacted by the proposals. Therefore, NWSS sites have not been considered further within this section.

Habitats

7.6.14. The results of the Phase 1 habitat survey undertaken during the PEA are shown on Figure 7.5 and Figure 7.6 (Appendix B).

Waterbodies

7.6.15. There were three waterbodies recorded during the Phase 1 habitat survey. The first is a small circular pool adjacent to Coast Road at the former Ness Farm Landfill site. The second and third are SuDS basins at the Hareness Road/Coast Road junction, which showed significant signs of surface water pollution during the Phase 1 survey.

Watercourses

7.6.16. There is one unnamed watercourse that crosses the proposed scheme adjacent to the south of the Hareness Road/Coast Road junction, which was recorded as dry during the Phase 1 habitat survey. It is likely that it will only contain water during prolonged periods of heavy rainfall.

7.6.17. A small ground sourced stream is present in the brownfield site off Hareness Road; however, it is only 2cm-3cm deep and continues underground after approximately 20m.

7.6.18. The two watercourses present are not considered suitable for otter or water vole.

Protected Species and Species Groups
Flora and Fungi

7.6.19. The data search returned a single notable plant species; early dog-violet (*Viola reichenbachiana*) within 2km of the proposed scheme, located adjacent to Coast Road, which is listed on the Scottish Biodiversity List (SBL).

7.6.20. There were no notable flora and fungi recorded during the Phase 1 habitat survey.

Invertebrates

7.6.21. The data search returned records for grey dagger (*Acronicta psi*), garden tiger (*Arctia caja*), northern brown argus (*Aricia Artaxerxes*), latticed heath (*Chiasmia clathrate*), small heath (*Coenonympha pamphilus*), small square-spot (*Diarsia rubi*), grass rivulet (*Perizoma albulata*) and shaded broad-bar (*Scotopteryx chenopodiata*) within 2km of the scheme, which are all listed on the SBL. The closest record is a sighting of latticed heath which was recorded approximately 100m west of the proposed scheme.

7.6.22. The species returned during the desk study are common species and are not expected to be impacted by the proposed scheme due to the small area of habitat being lost, and the abundance of similar habitat available in the surrounding area. Therefore, impacts on invertebrates have not been considered further within this section.

Birds

7.6.23. Table 7-3 contains notable bird species returned from the data search within 2km of the proposed scheme. These include bird species listed on Schedule 1 of the Wildlife and Countryside Act (WCA-Sch 1), SBL Priority Species and those with a conservation status currently listed as red or amber by the 5th review of Birds of Conservation Concern (BoCC)[21].

Table 7.3 - Results of the database search for bird species records within 2km of site (* denotes qualifying species of the Ythan Estuary, Sands of Forvie and Meikle Loch SPA)

Common Name	Scientific Name	Designation(s)
Lesser redpoll	*Acanthis cabaret*	Red BoCC
Goshawk	*Accipiter gentilis*	WCA-Sch 1
Reed warbler	*Acrocephalus scirpaceus*	SBL
Skylark	*Alauda arvensis*	SBL, Red BoCC
Kingfisher	*Alcedo atthis*	WCA-Sch 1, SBL, Amber BoCC
Garganey	*Anas querquedula*	Amber BoCC
Greylag goose	*Anser anser*	Amber BoCC
Pink-footed goose*	*Anser brachyrhynchus*	Amber BoCC
Swift	*Apus apus*	SBL, Red BoCC
Short-eared owl	*Asio flammeus*	SBL, Amber BoCC
Pochard	*Aythya ferina*	Red BoCC
Scaup	*Aythya marila*	Red BoCC
Brent goose	*Branta bernicla*	Amber BoCC
Barnacle goose	*Branta leucopsis*	WCA-Sch 1
Goldeneye	*Bucephala clangula*	Red BoCC
Dunlin	*Calidris alpina*	SBL
Purple sandpiper	*Calidris maritima*	SBL, Red BoCC
Black-headed gull	*Chroicocephalus ridibundus*	Amber BoCC
Cuckoo	*Cuculus canorus*	SBL, Red BoCC
Whooper swan	*Cygnus cygnus*	WCA-Sch 1, SBL, Amber BoCC,
Yellowhammer	*Emberiza citrinella*	SBL, Red BoCC
Reed bunting	*Emberiza schoeniclus*	SBL, Amber BoCC
Merlin	*Falco columbarius*	WCA-Sch 1, SBL, Red BoCC
Peregrine falcon	*Falco peregrinus*	WCA-Sch 1, SBL
Kestrel	*Falco tinnunculus*	SBL, Amber BoCC
Brambling	*Fringilla montifringilla*	WCA-Sch 1, SBL

[21] Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D. and Win, I. (2021) Birds of Conservation Concern 5: The population status of birds in the UK, Channel Islands and Isle of Man British Birds" vol. 108, pp. 708-746

Common Name	Scientific Name	Designation(s)
Snipe	*Gallinago gallinago*	Amber BoCC
Black-throated diver	*Gavia arctica*	WCA-Sch 1, SBL, Amber BoCC
Great Northern diver	*Gavia immer*	WCA-Sch 1, SBL
Red-throated diver	*Gavia stellata*	WCA-Sch 1, SBL
Storm petrel	*Hydrobates pelagicus*	SBL, Amber BoCC
Herring gull	*Larus argentatus*	SBL, Red BoCC
Bar-tailed godwit	*Limosa lapponica*	SBL, Amber BoCC
Black-tailed godwit	*Limosa limosa*	WCA-Sch 1, SBL, Red BoCC
Linnet	*Linaria cannabina*	Red BoCC
Twite	*Linaria flavirostris*	Red BoCC
Grasshopper warbler	*Locustella naevia*	SBL, Red BoCC
Common scoter	*Melanitta nigra*	WCA-Sch 1, SBL, Red BoCC
Red kite	*Milvus milvus*	WCA-Sch 1, SBL
Yellow wagtail	*Motacilla flava*	SBL, Red BoCC
Spotted flycatcher	*Muscicapa striata*	SBL, Red BoCC
Curlew	*Numenius arquata*	SBL, Red BoCC
Osprey	*Pandion haliaetus*	WCA-Sch 1, SBL, Amber BoCC
House sparrow	*Passer domesticus*	SBL, Red BoCC
Tree sparrow	*Passer montanus*	SBL, Red BoCC
Snow bunting	*Plectrophenax nivalis*	WCA-Sch 1, SBL, Amber BoCC
Golden plover	*Pluvialis apricaria*	SBL
Slavonian grebe	*Podiceps auritus*	SBL, Red BoCC
Dunnock	*Prunella modularis*	Amber BoCC
Balearic shearwater	*Puffinus mauretanicus*	SBL, Red BoCC
Manx shearwater	*Puffinus puffinus*	SBL, Amber BoCC
Bullfinch	*Pyrrhula pyrrhula*	SBL, Amber BoCC
Woodcock	*Scolopax rusticola*	SBL, Red BoCC
Eider*	*Somateria mollissima*	Amber BoCC
Artic skua	*Stercorarius parasiticus*	SBL, Red BoCC
Common tern	*Sterna hirundo*	SBL, Amber BoCC
Arctic tern	*Sterna paradisaea*	SBL, Amber BoCC
Sandwich tern	*Sterna sandvicensis*	SBL, Amber BoCC
Starling	*Sturnus vulgaris*	SBL, Red BoCC
Wood sandpiper	*Tringa glareola*	WCA-Sch 1, SBL, Amber BoCC
Redshank*	*Tringa totanus*	Amber BoCC
Redwing	*Turdus iliacus*	WCA-Sch 1, SBL, Amber BoCC
Song thrush	*Turdus philomelos*	SBL, Amber BoCC

Common Name	Scientific Name	Designation(s)
Ring ouzel	*Turdus torquatus*	SBL, Red BoCC
Barn owl	*Tyto alba*	WCA-Sch 1, SBL
Lapwing*	*Vanellus vanellus*	SBL, Red BoCC

7.6.24. There is suitable habitat for a variety of breeding birds adjacent to the proposed scheme including: woodland, scrub, grassland, hedgerows and buildings. The cliffs to the east of the scheme offer nesting habitat for a number of seabirds and could potentially also be suitable for the Schedule 1 species peregrine falcon.

7.6.25. The wintering bird surveys conducted in 2022/23 recorded low numbers of birds using the fields adjacent to the proposed scheme. There was a maximum count of 14 curlew, 21 oystercatcher and ten of the SPA qualifying species redshank recorded feeding and loafing in the fields to the east of the scheme during a single survey. Full details of the surveys, and detailed assessments for each qualifying species of the SPA, will be outlined in the DMRB Stage 3 HRA Screening Report (to be prepared and submitted to NatureScot in early 2024).

Bats

7.6.26. The data search returned two records of bats within 2km of the proposed scheme; however they were not classified to species level. The closest record was located 1.5km to the north-west of the proposed scheme.

7.6.27. Trees and structures within 30m of the route options at DMRB Stage 2 were assessed for their bat roost potential (BRP). There were ten structures that were assessed as having BRP ranging from low to moderate, the locations of which can be seen on Figure 7.6 (Appendix B), a further eight were assessed as having negligible BRP. No trees were found to have potential to support roosting bats within 30m of the proposed scheme.

7.6.28. An old barn building forming part of Doonies Farm (B13 on Figure 7.6) was identified as likely to be directly impacted by the proposed scheme. It was assessed as having moderate summer roosting potential and negligible winter hibernation potential for bats. This assessment was primarily due to it having several large openings into the main structure but no actual roof cavity suitable for hibernating bats. As per BCT guidelines two dusk emergence surveys were undertaken on the building on 26 July and 17 August 2023. Both surveys were undertaken in optimal conditions. There were no bats recorded emerging from the building and the overall level of bat activity was classified as very low.

7.6.29. The habitat on site was considered to be of low suitability for commuting and foraging bats. This was primarily due to the presence of the coast to the east, Altens Industrial Estate to the west of the proposed scheme and lack of linear commuting habitat.

Badger

7.6.30. The data search returned four records of badger (*Meles meles*) within 2km of the proposed scheme. The closest badger record appears to be 1.2km to the south-west of the scheme; however, the grid reference provided is only accurate to 1km, therefore, the badger record may be closer or further from the scheme.

7.6.31. No definitive evidence of badger was recorded during the initial PEA; however, several large mammal push-throughs were recorded under a fence at Doonies Farm (Figure 7.6 (sheet 3) in Appendix B) and the habitat in this wider area was considered suitable for both commuting badger and sett building.

7.6.32. A targeted badger survey was undertaken in all habitats identified as suitable for badger connected to the proposed scheme; primarily the grassland and scrub habitats surrounding Doonies Farm, either side of the Hareness Road Junction, and north of the large Hareness Road bend. No setts or evidence of badger was recorded within the survey area, however, a number of mammal runs were noted to the west of Doonies farm, including a push through under a fence and several badger hairs. These signs were all recorded outside the survey area and over 200m from the proposed scheme.

Great Crested Newt

7.6.33. The data search returned no records of great crested newt (*Triturus cristatus*) within 2km of the proposed scheme.

7.6.34. Great crested newt populations are restricted in Scotland to the central belt and around Inverness[22]. Given the location of the proposed scheme, and that there were no records of great crested newt returned from the desk study, they have not been assessed further within this section.

Red Squirrel and Pine Marten

7.6.35. The data search returned nine records for red squirrel (*Sciurus vulgaris*) with the closest located 0.25km to the west of the proposed scheme. Three records of pine marten (*martes martes*) were returned within 2km of the scheme, all from 2016.

7.6.36. There was no evidence of red squirrel or pine marten recorded during the survey. No suitable woodland habitat for either species is located within 200m of the proposed scheme, therefore, they have not been assessed further within this section.

Reptiles

7.6.37. The data search returned no records of reptiles within 2km of the proposed scheme.

[22] NatureScot (2020) Great crested newt. Available online: https://www.nature.scot/plants-animals-and-fungi/amphibians-and-reptiles/great-crested-newt

7.6.38. No habitat within the footprint of the proposed scheme was considered suitable for reptiles and they have not been considered further within this section.

Otter

7.6.39. The data search returned 18 records of otter within 2km of the proposed scheme. All records were located along the River Dee and Aberdeen Bay with the closest located 0.74km to the north-west of the scheme.

7.6.40. No flowing watercourses suitable for otter are located within 200m of the proposed scheme and therefore, they have not been considered further in this section.

Water Vole

7.6.41. The data search returned no records of water vole (*Arvicola amphibius*) within 2km of the proposed scheme.

7.6.42. No flowing watercourses suitable for water vole are located within 100m of the proposed scheme and therefore, they have not been considered further in this section.

Other notable species

7.6.43. The data search returned records for the notable terrestrial species hedgehog (*Erinaceus europaeus*) and brown hare (*Lepus europaeus*) within 2km of the proposed scheme.

7.6.44. There was no evidence of these species recorded during the survey and it is considered unlikely that either species would be significantly impacted by the proposed scheme. Therefore, they have not been considered further within this section.

Invasive Non-Native Species (INNS)

7.6.45. The data search returned records for Japanese knotweed (*Fallopia japonica*), giant hogweed (*Heracleum mantegazzianum*) and Himalayan balsam *(Impatiens glandulifera*) within 2km of the proposed scheme. The closest record is Japanese knotweed which is located adjacent to the northern section of the scheme.

7.6.46. During the targeted INNS survey undertaken in July 2023 several instances of INNS were recorded under the footprint of the proposed scheme including: two stands of butterfly-bush (*Buddleia davidii*), one stand of cotoneaster (*Cotoneaster* sp.) and one stand of silver grass (*Miscanthus sinensis*) at the Hareness Road bend; and one large hedgerow of Japanese rose (*Rosa rugosa*) at Doonies Farm. Additionally, there were a number of INNS recorded adjacent to the proposed scheme, primarily along Hareness Road in ornamental hedgerows, including cotoneaster, butterfly-bush, Portugal laurel (*Prunus lusitanica*) and fuchsia (*Fuchsia magellanica*).

Assessment of Effects

7.6.47. There is potential for significant effects arising from the proposed scheme as a result of potential impacts as outlined below. It may be possible to reduce the effects through the adoption of appropriate mitigation, which is detailed below.

Construction

7.6.48. The statutory site Kincorth Hill LNR is located 0.2km west of the proposed scheme. The site is not anticipated to be impacted by the proposed scheme, assuming good practice pollution prevention measures are followed during construction, which will be detailed in a Construction Environmental Management Plan (CEMP). With mitigation, the proposed scheme is expected to have a neutral effect on designated sites.

7.6.49. The non-statutory site Balnagask to Cove LNCS is located adjacent to the eastern boundary of the proposed scheme. The site has been chosen for its mosaic of herb rich grasslands, wet flushes, coastal heathland, rocky cliffs and rock pools and supports a population of nesting seabirds. The site is not expected to be impacted by the proposed scheme, assuming that good practice mitigation for noise and pollution is in place during construction, which will be detailed in a CEMP. With mitigation the scheme is expected to have a neutral effect on this site.

7.6.50. The majority of habitats on site to be lost under the footprint of the proposed scheme are considered to be of low ecological importance, primarily comprising semi-improved and improved grassland. There are also smaller areas of scrub and field boundary hedgerows present within the footprint of the scheme. The loss of habitats will be mitigated by roadside planting along the scheme which will be chosen to include native species, species which provide nectar sources for pollinators, berry-bearing species, and species which flower at differing times. The details and exact location of these planting areas will be shown on a landscape masterplan, and management detailed in a CEMP. With mitigation the proposed scheme is expected to have a slight beneficial effect on habitats to be lost.

7.6.51. There is suitable habitat for a variety of breeding birds adjacent to the proposed scheme including: woodland, scrub, grassland, hedgerows and buildings. The habitats are likely support a range of common bird species. Small areas of grassland and scrub are expected to be permanently lost. Without the implementation of recommended mitigation, a slight adverse effect is anticipated upon breeding birds as a result of the potential loss of nests and injury/mortality of birds during the construction phase. With mitigation such as timing vegetation clearance outside the nesting bird period (March-August) or undertaking checks of vegetation prior to clearance by a suitably qualified ecologist; and compensation such as the installation of nesting bird boxes and roadside planting including berry-bearing species, the proposed scheme is expected to have a slight beneficial effect.

7.6.52. Without the implementation of mitigation, a slight adverse effect upon roosting bats is anticipated due to the demolition of the building (B13) during the construction phase. With the implementation of mitigation and compensation measures, including the installation of bat boxes to increase the roosting habitat in the wider area, a neutral effect on roosting bats is anticipated.

7.6.53. No badger setts are expected to be impacted during the construction phase. However, badger have been identified as present in the area around Doonies Farm and a slight adverse effect on badgers is anticipated as a result of the potential harm to badgers during the construction phase. With the implementation of mitigation, such as the covering of excavations at night and no night-time working, a neutral effect on badgers is anticipated as a result of the proposed scheme.

7.6.54. There is the potential for the spread of INNS during construction which would constitute a slight adverse effect. With implementation of the recommended mitigation, including the development of an INNS management plan to be included in the CEMP, there is expected to be a neutral effect.

Operation

7.6.55. Both Kincorth Hill LNR and Balnagask to Cove LNCS may be affected by pollution during operation. There are ongoing design discussions regarding the prevention of pollution during operation with the current proposal comprising the installation of oil interceptors and/or penstock chambers to prevent pollutants entering adjacent habitat and subsequently the North Sea. Furthermore, consultation with SEPA and NatureScot will be undertaken prior to finalising drainage design. With mitigation the proposed scheme is expected to have a neutral effect on the designated sites.

Summary and Next Steps

7.6.56. Ecological surveys found the presence of the following features which could potentially be impacted by the proposed scheme:

- statutory and non-statutory designated sites;
- breeding birds;
- bats;
- badger; and
- invasive species.

7.6.57. The following mitigation items are proposed in order to reduce the potential effects on the above features:

- A CEMP will be developed by the contractor and include good practice pollution prevention measures, management of compensatory planting, and an INNS management plan.
- Drainage (SuDS) designed to prevent pollution during construction and operation, and developed in consultation with SEPA and NatureScot.
- Roadside planting along the proposed scheme which will be chosen to include native species, species which provide nectar sources for pollinators, berry-bearing species, and species which flower at differing times.
- Vegetation clearance to be timed outside the nesting bird period (March-August) or undertaking checks of vegetation prior to clearance by a suitably qualified ecologist.
- Installation of bat and bird boxes to increase nesting and roosting habitats along the proposed scheme.
- Night-time working will be avoided and any excavations will be covered at night.

7.7. Heritage Assets

Introduction

7.7.1. This section provides an overview of the heritage assets within a 1km study area of the proposed scheme boundary and an assessment on these heritage assets resulting from the proposed scheme.

7.7.2. Heritage assets in the context of this scheme include:

- listed buildings;
- scheduled monuments;
- gardens and designed landscapes (GDL); and
- conservation areas.

7.7.3. Impacts on the cultural heritage resource can either be direct (e.g. complete or partial permanent loss due to the footprint of a scheme) or indirect (e.g. impacts on peoples' views, amenity and/or enjoyment of the asset due to visual or other disturbances, thereby affecting its 'setting').

Approach and Methods

7.7.4. A desk-based assessment was undertaken based on the guidance provided by DMRB LA 106: Cultural Heritage Assessment[23]. In addition to DMRB guidance, other policy documents and published guidelines taken into account in the preparation of this chapter included:

- Scottish Historic Environment Policy (Historic Scotland, 2011);
- Planning Advice Note 2/2011: Planning and Archaeology (Scottish Government 2011) (hereafter referred to as PAN 2/2011);
- Managing Change in the Historic Environment: Setting (Historic Environment Scotland, 2016); and
- Standard and guidance for historic environment desk-based assessment (Chartered Institute for Archaeologists, 2014).

Assumptions and Limitations

7.7.5. No assumptions or limitations were noted for the cultural heritage assessment.

Baseline

7.7.6. Heritage assets within the study area include (refer to Figure 7.1: Environmental Constraints):

- Conservation areas – there are no conservation areas within close proximity to the proposals; the closest being located in Cove to the south and Aberdeen City Centre on the opposite side of the River Dee to the north-west.
- Listed buildings – the closest listed buildings are located adjacent to Coast Road, approximately 400m to the south of the site boundary. There are also a number of listed buildings in the north of the Torry residential area (Sinclair Road, Menzies Road, Victoria Road, Walker Road and Grampian Road). Two are on Girdleness Road, one is adjacent to the River Dee at Wellington Road, another lies at the junction of West Tullos Road and Wellington Road, and a cluster of others further south in Cove Bay.
- Scheduled monuments (SMs) – there are a handful of scheduled monuments within and surrounding Loirston Country Park and Tullos Wood to the west, but none within 200m of the scheme boundary. The closest is Cat Cairn (SM4125) and Crab's Cairn (SM4060), which are located approximately 300m from the scheme boundary at their closest extents.

[23] https://www.standardsforhighways.co.uk/tses/attachments/8c51c51b-579b-405b-b583-9b584e996c80?inline=true

- Beyond the River Dee, Aberdeen City contains a number of listed buildings and conservation areas, as well as Duthie Park which is a designated GDL, all located at least 1km from the scheme boundary.

Assessment of Effects

7.7.7. The proposed scheme does not interact with any conservation areas and there are no listed buildings or scheduled monuments in close proximity to the scheme. Due to this distance the impact of both the construction and operational phases of the proposed scheme are expected to be negligible.

7.7.8. During the construction phase, there is the potential for previously unrecorded archaeological assets to be present within the study area. However due to the existing developed nature of the road infrastructure and relatively small scale of scheme footprint, this is considered to be low risk and negligible impact.

7.7.9. There are considered to be negligible impacts, either directly or on the setting, of heritage assets for the proposed scheme.

Summary of Assessment

7.7.10. Overall, there are considered to be no significant impacts on the nearest heritage assets. No direct impacts or adverse impacts on setting are predicted from the proposed scheme.

7.8. Geology, Soils and Contaminated Land

Introduction

7.8.1. This section provides an assessment of the effects of the proposed scheme on the geology and soils of the local area, as well as an assessment of any significant environmental issues associated with contaminated land. This assessment has been undertaken in general accordance with DMRB LA109 Geology and Soils[24].

[24] DMRB (2019) LA 109 Geology and soils, Revision 0. Available online: https://www.standardsforhighways.co.uk/tses/attachments/adca4c7d-4037-4907-b633-76eaed30b9c0?inline=true

2 Sweco, Preliminary Sources Study Report (PSSR) for Aberdeen South Harbour Link Road, January 2023.

3 Concept Engineering Consultants, Ground Investigation Factual Report, Aberdeen South Harbour Link Road, December 2023.

4 British Standard 5930:2015+A1:2020 Code of practice for ground investigations, May 2020.

5 British Standard 10175:2011+A2:2017 Investigation of potentially contaminated sites - code of practice. December 2017.

6 Construction Industry Research and Information Association (CIRIA) C552 Contaminated Land Risk Assessment - A Guide to Good Practice, 2001.

7.8.2. In order to complete this assessment, a review of the baseline geological conditions across the proposed scheme has been undertaken, followed by consideration of the potential effects during both the construction and operational phases.

Approach and Methods

7.8.3. The existing Preliminary Sources Study Report (PSSR) produced by Sweco in January 2023[2] has been used to provide baseline information on the proposed scheme, specifically information relating to the existing ground conditions, statutory and non-statutory designations, and historical and present-day land uses which may indicate the presence of land contamination.

7.8.4. The baseline information contained within the PSSR has been supplemented by information obtained from an intrusive ground investigation undertaken between July 2023 and August 2023. The scope and factual results of the ground investigation are provided in the Ground Investigation Factual Report[3], produced by Concept Engineering Consultants, in December 2023, and are also summarised in the engineering assessment section of this report.

7.8.5. The significance of the impact on geology and soils has been determined based on the predicted deviation from baseline conditions and the scale of impact has been assessed qualitatively, as per Table 3.11 of LA109.

7.8.6. The assessment of the potential for significant environmental issues associated with contaminated land is based on aspects of site investigation and contaminated land risk assessment best practice in British Standard 5930:2015+A1:2020 Code of practice for ground investigations[4], British Standard 10175:2011+A2:2017 Investigation of potentially contaminated sites[5], code of practice, and Construction Industry Research and Information Association (CIRIA) C552 Contaminated Land Risk Assessment - A Guide to Good Practice[6].

Assumptions and Limitations

7.8.7. Whilst a detailed Unexploded Ordnance (UXO) Risk Assessment produced by Safe Lane Global, in March 2023 identified that UXO posed a medium risk for the entirety of the Coast Road section of the scheme, potential effects from UXO are not considered as part of this assessment as it is assumed that they generally pose a construction phase design risk, rather than environmental impact risk. It should also be noted that a UXO survey and watching brief was undertaken as part of the intrusive ground investigation, as required by the detailed risk assessment. No evidence of UXO was identified at any of the exploratory hole locations.

7.8.8. Initial ground gas monitoring completed as part of the intrusive ground investigation recorded localised elevated concentrations of ground gas in three boreholes, which are assumed to be related to the presence of made ground. As the proposed scheme involves the realignment and widening of the existing road, along with provision of active travel

routes (i.e. future scheme users will be in the open air), there is an absence of enclosed structures that may be considered sensitive receptors to ground gas build up. Potential effects to construction workers from the collection of ground gas within temporary enclosed spaces such as deep excavations are not considered as part of this assessment as they are assumed to be a construction phase design risk, rather than environmental impact risk.

7.8.9. No consultation with statutory or non-statutory consultees has been undertaken to date with regards to the proposed scheme.

Baseline

7.8.10. The baseline conditions for the proposed scheme presented below are based on the findings of the PSSR and Factual Ground Investigation report. Further details on the geology across the proposed scheme are also provided in the engineering section of this report (see Section 5.3).

Geology - Made Ground

7.8.11. Three areas of made ground are shown on published geological mapping within the vicinity of the proposed scheme. The largest is located within the footprint of the former Ness Farm landfill. The two other areas of made ground are located in the southern part of the proposed scheme. The first is a rectangular area of land, adjacent to the eastern extent of Hareness Road, with the south-west corner of the made ground intersecting Hareness Road. The second is located to the south of the first but does not intersect Hareness Road.

7.8.12. During the 2023 ground investigation, made ground was identified in 36 out of 42 exploratory holes, at an average thickness of 1m. The made ground was generally encountered as a reworked natural clayey sand or gravel. Chemical analysis undertaken on samples of the made ground did not record concentrations of any potential contaminants above relevant published generic assessment criteria for the protection of human health.

Geology - Superficial Strata

7.8.13. The superficial geology across the proposed scheme predominantly comprises sandy diamicton of the Mill of Forest Till Formation in the south, and sand, gravel, and boulders of the Lochton Sand and Gravel Formation in the north.

7.8.14. The Mill of Forest Till Formation was encountered in nearly all of the exploratory holes. It was encountered as either a very sandy gravel or a sandy gravelly clay with a maximum thickness of 4.7m.

7.8.15. The Lochton Sand and Gravel Formation was encountered in two exploratory hole locations. It was encountered as a very gravelly silty sand with a maximum thickness of 1.5m.

7.8.16. Chemical analysis undertaken on samples of the natural superficial geology did not record concentrations of any potential contaminants above relevant published generic assessment criteria for the protection of human health.

Geology - Bedrock

7.8.17. The solid geology underlying the proposed scheme predominantly comprises the Aberdeen Formation, however, localised igneous intrusions are also present. The solid geology of the proposed scheme is described in further detail in the engineering assessment section of this report (see Section 5.3).

7.8.18. The Aberdeen Formation is described by the British Geological Society (BGS) as interlayered psammite and semipelite metasediments with subsidiary pelite and sporadic minor calcareous horizons. During the intrusive ground investigation, the Aberdeen Formation was encountered in 15 locations as a greenish grey schist or a grey and white psammite, at depths ranging between 0.60m to 11.80m below ground level (bgl).

7.8.19. Igneous intrusions of pinkish grey granodiorite or granite were encountered in eight exploratory locations, at depths ranging between 1.7 to 10.90m bgl.

7.8.20. The base of the Aberdeen Formation and/or igneous intrusions were not proven.

Mining and Mineral Reserves

7.8.21. Several BritPits (British Pits) have been identified within the vicinity of Coast Road and Hareness Road, mostly relating to the extraction of gravel or sand, which is noted as a potential resource within the local area. None are currently active.

7.8.22. The potential for historical non-coal mining activities at the proposed scheme have been identified for vein minerals in relation to the presence of outcroppings of the Northeast Grampian Granitic Suite, and the North Britain Siluro-Devonio Calc-Alkaline Dyke Suite. The closest outcrop is located approximately 150m east of the junction between Hareness Road and Coast Road.

7.8.23. There are no known areas of coal, gypsum, tin, or clay mining within, or within the vicinity of the proposed scheme.

Nigg Bay Site of Special Scientific Interest (SSSI)

7.8.24. The Nigg Bay SSSI is located to the north of the proposed scheme, at national grid reference NJ966045. The existing Coast Road comprises the western boundary of the SSSI, which then extends to the east into the foreshore of Nigg Bay. The SSSI is approximately 4.4 hectares (ha) in size and has been designated a SSSI due to its

geological importance, predominantly relating to the exposed cliff face which is a key reference site for the Quaternary stratigraphy in north-east Scotland. It illustrates several of the characteristic glacial deposits for the area, as well as demonstrating the complexity of deposits which may be produced by a single glacial episode. The condition of the SSSI was last assessed in March 2014, as 'Favourable Recovered'.

7.8.25. The cliff face of the SSSI is currently assessed as being over-steep with evidence of localised historical slope failures. As natural weathering occurs, progressive failures are likely to continue until the slope achieves a naturally stable angle.

Agricultural Soil Quality

7.8.26. Data from the James Hutton Institute has been reviewed to identify the agricultural land classification of the soils of the proposed scheme. The land surrounding Coast Road has been mainly classified as Grade 3.2 – Suited to Arable Cropping, with a small area of land to the west of Coast Road classified as Grade 5.3 – Suited Only to Improved Grassland and Rough Grazing. The land around Hareness Road has not been classified.

7.8.27. None of the land surrounding Hareness Road and Coast Road is currently used for agricultural purposes (crops). However, Doonies Farm (animal husbandry) is located immediately west of Coast Road.

Contamination – General Made Ground and Other Potential Sources

7.8.28. Several potential sources of contamination were identified for the proposed scheme, or within the vicinity of the proposed scheme within the PSSR. These are:

- Infilled ground as shown on published mapping and historical borehole logs for the eastern section of Hareness Road.
- General made ground associated with the present day and historical land of the proposed scheme, especially the industrial land use around Hareness Road, including but not limited to; unspecified works and warehouses, depots, garages, petrol stations and substations.
- Contaminated soils associated with the Edinburgh to Aberdeen Railway Line which runs parallel with the proposed scheme along Coast Road or the Coastguard Station, or the Wastewater Treatment Works.

7.8.29. The intrusive ground investigation has not encountered any visual or olfactory evidence of contamination. Chemical analysis undertaken on soil samples obtained during the investigation have not recorded concentrations of any potential contaminants above relevant published generic assessment criteria for the protection of human health.

Contamination – Landfill

7.8.30. There are two former landfills which are noted to be present close to the proposed scheme. These are the former Ness Farm Landfill located to the west of Coast Road in the northern section of the scheme, and the former Taylor's Industrial Landfill located to the east of Coast Road immediately south of the bridge across the Aberdeen – Dundee Railway Line.

7.8.31. The former Ness Farm Landfill is known to have operated between 1970 and 2001, accepting a wide range of wastes which were deposited into a former sand and gravel quarry. Landfill restoration works were undertaken in 2009 and completed in 2012. The landfill was licensed for the disposal of household, industrial, commercial, fragmented, and stabilised drilling muds, asbestos, low level radioactive materials, silt dredgings and inert wastes and is known to comprise 90% commercial/industrial waste and 10% domestic waste, with much of the latter pre-treated.

7.8.32. There is little available information on the former Taylor's Industrial Landfill, other than its approximate location, as shown on historical mapping dating from 1962. It is understood that the landfill was licenced to accept liquid cesspool waste and sludge cesspool waste and the maximum input rate was 'Very Small (less than 10,000 tonnes per year)'.

7.8.33. Intrusive ground investigation data for the proposed scheme within the vicinity of both the Ness Landfill and former Taylors Landfill did not identify the presence of any landfill materials or any visual or olfactory evidence of contamination.

Assessment of Effects

Geology - Nigg Bay SSSI

7.8.34. According to the NatureScot citation[25], Nigg Bay SSSI is of national and local importance as a reference site. Therefore, for the purposes of this assessment, Nigg Bay SSSI is considered to be a highly sensitive receptor, as per Table 3.11, LA109.

7.8.35. The shortening of the proposed scheme extents at the northern end of the scheme means that the Nigg Bay SSSI is approximately 300m north of the end of the proposed scheme area. Due to this distance the impact of both the construction and operational phases of the scheme on the SSSI are considered to be 'Neutral'.

Geology - Mining and Mineral Reserves

7.8.36. The area local to the proposed scheme is noted to historically have been used for the abstraction of sand and gravel and potential vein minerals. However, there are no known,

[254] Nigg Bay, Site of Special Scientific Interest (SSSI) Citation. Available at: https://sitelink.nature.scot/site/1224

current or future (planned) abstractions within the proposed scheme area. As such, the sensitivity of the mineral reserves is considered to be 'Low'.

7.8.37. The proposed scheme is therefore unlikely to have a negative impact on the potential for future abstraction works, or the mining of vein minerals, where present. The mineral reserves (vein minerals and sand and gravels) are of local importance only, with alternative sites located nearby. The impact of the proposed scheme on mineral reserves is therefore considered to be 'Neutral'.

Soils - Agricultural Soil Quality

7.8.38. The agricultural soils have been classified as Land Capability for Agriculture (LCA) Grade 3.2 and are therefore considered to be of medium sensitivity (as per Table 3.11, LA109).

7.8.39. The land take associated with the proposed scheme route is unlikely to be significantly in excess of the land currently occupied by the existing Hareness Road and Coast Road. No segregation of agricultural land beyond what is currently present is likely. The impact of the proposed scheme on agricultural land is therefore considered to be 'Neutral'.

Contamination

7.8.40. The proposed scheme has the potential to intersect areas of made ground where soil contamination may be present. This may result in the disturbance of contaminated soils or hazardous materials and/or the creation of new pathways. Effects are possible during both the construction and operational phases of the proposed scheme:

- Disturbance of the ground resulting in the creation of new pathways for the migration of contamination which was previously immobile.
- The re-use of potentially contaminated soils in other areas of the scheme introducing new sources of contamination to these areas.
- The import of unsuitable materials for earthworks which have the potential to introduce new contamination sources.

7.8.41. The potential receptors include human health (construction and maintenance workers, members of the public), surface waters and groundwater, buildings and infrastructure. The overall sensitivity of these receptors is considered to be 'Low' to 'Medium' (as per Table 3.11, LA109).

7.8.42. The findings of the recent intrusive ground investigation did not identify the presence of any contamination of soils or waters which are considered likely to pose a significant risk to human health or the Water Environment. Assuming a suitable Construction Environmental Management Plan (CEMP) is implemented during the construction phase, then it is considered that the effect of the proposed scheme from intersecting soil contamination during both the construction and operational phase is 'Neutral'.

Contamination - Landfill

7.8.43. The intrusive ground investigation did not encounter any evidence of landfill materials or visual or olfactory evidence of contamination. The proposed scheme does not encroach on the Ness Bay Landfill, and although the extent of the former Taylors landfill remains unknown, the existing ground investigation suggests that it does not extend into the area where the new road and bridge is to be constructed. However, as is the case for any ground investigation, the data is based on point locations only and therefore although unlikely, the potential for landfill materials to be present which were not intercepted by the ground investigation cannot be completely discounted.

7.8.44. The potential receptors include human health (construction and maintenance workers, members of the public), surface waters and groundwater, buildings and infrastructure. The overall sensitivity of these receptors is considered to be 'Low' to 'Medium' (as per Table 3.11, LA109). The effect of intersecting potentially hazardous landfill waste materials during both the operational and construction phase is 'Neutral'.

Summary

7.8.45. As the proposed scheme has been shortened, the Nigg Bay SSSI is now located over 300m north of the proposed scheme. Therefore, adverse effects on the SSSI are not considered likely.

7.8.46. No adverse effects to geology and soils are considered likely.

7.8.47. The intrusive ground investigation undertaken in July 2023 and August 2023 did not identify any significant soil or water contamination. Therefore, adverse effects due to contaminated land are not considered likely.

7.8.48. No landfill materials were encountered during the ground investigation for the proposed scheme therefore adverse effects due to the presence of landfill are not considered likely.

7.8.49. A CEMP should be produced for the construction phase of the scheme to ensure that best practice is followed during the construction phase. This should include a Materials Management Plan to minimise the excavation of soils and encourage re-use of site won materials.

7.8.50. Amongst other things, the CEMP should consider methodologies for dealing with the potential for UXO along the Coast Road section of the proposed scheme, and the potential for unidentified contamination, including landfill materials during construction of the railway bridge.

7.8.51. The remaining ground gas data still to be obtained as part of the ongoing ground investigation monitoring should be assessed and ground gas risk to construction workers should be considered as part of the detailed design process.

7.8.52. Consultations with relevant third parties, including Aberdeen City Council and SEPA, will be undertaken during the detailed design process.

7.9. Material Assets and Waste

Introduction

7.9.1. This section identifies potential impacts with regards to material assets and waste that could occur during construction and operation of the proposed scheme.

7.9.2. This assessment generally follows the approach detailed within DMRB LA 110 Material assets and waste (hereafter referred to as DMRB LA 110)[26].

Relevant legislation and policy

7.9.3. The foundation for waste management is the five-step waste hierarchy of the EU[27] Waste Framework Directive (WFD) 2008/98/EC[28] which establishes an order of preference for managing and disposing of waste where preventing waste generation is the preferred option and sending waste to landfill is the last resort. Article 11(2)(b) of the EU WFD (2008/98/EC) requires Member States to achieve 70% recovery and recycling by weight of non-hazardous construction and demolition waste (CDW) arisings (excluding naturally occurring material). This includes backfilling operations using waste to substitute other materials.

7.9.4. The Waste (Scotland) Regulations 2012[29] enshrine the key principles of the waste hierarchy, seeking to maximise the re-use of materials, promote recycling and minimise waste disposal.

7.9.5. The Scottish Government's Zero Waste Plan 2010[30] included the aim to secure 70% recycling of CDW (excluding naturally occurring material) by 2020 to contribute to achievement of the UK target set out in the EU WFD (2008/98/EC). The Plan sets out the Scottish Government's vision for a zero-waste society and aims to minimise the generation of waste and view it as a valuable resource rather than for disposal to landfill.

[26] Highways England (2019) Design Manual for Roads and Bridges (DMRB) LA 110 Material assets and waste, Revision 0. Available online at: https://standardsforhighways.co.uk/search?discipline=SUSTAINABILITY_AND_ENVIRONMENT&lifecycle=&dmrbSection&mchwVolume&mchwSection&to=2024-01-16&from=2024-01-16&pageNumber=1&suite=DMRB&suite=MCHW&suite=IAN

[27] The UK left the EU on 31 January 2020, however, Scottish legislation which implements requirements of EU law such as the Waste Framework Directive remains in force and has been largely unaltered.

[28] EU Waste Framework Directive 2008/98/EC. Available online at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0098

[29] The Waste (Scotland) Regulations 2012. Available online at: https://www.legislation.gov.uk/sdsi/2012/9780111016657/contents

[30] Scottish Government (2010). Scotland's Zero Waste Plan, June 2010. Available online at: https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2010/06/scotlands-zero-waste-plan/documents/00458945-pdf/00458945-pdf/govscot%3Adocument/00458945.pdf

7.9.6. In February 2016, the Scottish Government published the strategy: Making Things Last, a Circular Economy Strategy for Scotland[31]. A priority area within the strategy is construction and the built environment. The construction sector generates approximately 50% of all waste produced in Scotland and the sector is the biggest consumer of materials, therefore, it offers a significant opportunity to increase resource efficiency. The strategy sought to take key targets and ambitions in the earlier Zero Waste Plan and in Safeguarding Scotland's Resources and place them in the context of action towards a more circular economy.

7.9.7. The Waste Management Licensing (Scotland) Regulations 2011[32] consolidate the waste management licensing and exemption system of the Waste Management Licensing Regulations 1994.

7.9.8. A range of other UK and Scottish policies and strategies address the need for more sustainable resource management. These include NPF4; Scotland's national spatial strategy which sets out their spatial principles, regional priorities, national developments and national planning policy.

7.9.9. As well as DMRB, the assessment has been informed by, and taken into account key local policies and plans as detailed in the baseline section of this assessment.

Approach and Methods

7.9.10. The assessment of material assets and waste in this chapter has been undertaken in accordance with DMRB LA 104 (Environmental assessment and monitoring), which states that the assessment shall report on the construction phase and first year of operational activities (opening year).

7.9.11. For the construction phase, and in accordance with the process summarised above, the assessment is limited to the following receptors:

- consumption of materials and products;
- sterilisation of peat and mineral reserves; and
- production and disposal of waste.

7.9.12. During the opening year, limited material use and waste generation from infrequent maintenance activities are predicted. Therefore, significant environmental effects from material assets use and waste generation are not predicted. Consequently, their further assessment is not considered necessary.

[31] Scottish Government (2016). Making Things Last: A Circular Economy Strategy for Scotland, February 2016. Available online at: https://www.gov.scot/publications/making-things-last-circular-economy-strategy-scotland/
[32] Waste Management Licensing (Scotland) Regulations 2011. Available online at: https://www.legislation.gov.uk/sdsi/2011/9780111012147/contents

7.9.13. Section 3 (Assessment methodology - Scoping) of DMRB LA 110 sets out the proposed scope for further assessment. If the response to one or more of the following scoping assessment questions is 'yes', further assessment should be undertaken:

- Is the project likely to recover or reuse little on site material thereby requiring materials to be imported to site?
- Is the project likely to use little or no recycled or secondary materials thereby requiring the majority of materials used on the project to comprise primary materials?
- Is the project likely to sterilise (substantially constrain or prevent existing and potential future use of) mineral sites or peat resources?
- Will the project generate large quantities of waste relative to regional landfill capacity?
- Will the project have an effect on the ability of waste infrastructure within the region to continue to accommodate waste from other sources?

Assumptions and Limitations

- Baseline information is based on a desk study of currently available information at the time of writing and the findings of the Concept Engineering Consultants Limited (Concept) ground investigation (December 2023).
- Key material assets and earthworks quantities used during this assessment were provided in the Principal Contractor's bill of quantities. On the assumption of no substantial changes to the overall design, subsequent changes to these quantities during the progression of the detailed design are not considered significant enough to alter the outcomes of this assessment.
- Mitigation identified in this assessment shall be secured in the contractor's Construction Environmental Management Plan (CEMP).
- This assessment does not consider environmental impacts associated with extraction of raw materials and the manufacture of products. These impacts are subject to the applicable environmental assessment, permitting and planning approval requirements for the relevant manufacturing facilities.
- Landfill capacity is considered and not the capacity of all waste management infrastructure as disposal to landfill and use of available landfill capacity is, overall, a permanent, irreversible impact. Impacts on other types of waste management infrastructure (for example material recovery facilities) are temporary, with such waste management infrastructure better placed to react to demands of the waste management market.
- There are limitations associated with the use of baseline information from SEPA's Waste Sites and Capacity Tool, which are detailed in full on the tool's website.
- To date, no specific consultation has been undertaken regarding material assets and waste.

Baseline

7.9.14. In accordance with DMRB LA 110, the assessment has established two geographically different study areas to examine the use of material assets and generation of waste:

- The first covers land within the proposed scheme extent and includes areas where site clearance, earthworks and construction are proposed and materials will be consumed (used, re-used and recycled) and waste generated. The study area for considering mineral site or peat resource sterilisation is also defined by the proposed scheme extent.
- The second considers the location of appropriate regional (Aberdeenshire) waste processing, treatment, recovery and landfill facilities. It also considers feasible sources and availability of construction materials typically required for road projects.
    - As there are no hazardous waste landfills anticipated to be active within Scotland for the anticipated construction period (summer 2025 to spring 2027), using the proximity principle, the study area for the management of hazardous wastes therefore extends to include the North-East England region.

Primary (virgin) aggregates

7.9.1. NPF4 details the long-term planning strategy for Scotland to 2045 and sets out planning policies which will ensure that a steady supply of construction aggregates is maintained. Local development plans are required to maintain a landmark of permitted reserves equivalent to a minimum of 10 years supply.

7.9.2. The Aberdeen Local Development Plan 2023 (covering the wider Aberdeen city area) outlines the mechanisms by which the City Council will maintain a 10-year landbank by protecting existing quarry reserves and steering development of new extraction activities away from the most sensitive areas (Policy R1).

7.9.3. Based on the collation of the results of the 2019 Aggregate Minerals Survey for Scotland (published September 2023), the north-east of Scotland (including Aberdeenshire):

- Has sand and gravel (aggregates) permitted reserves totalling 5,071,000 tonnes. This equates to an approximate landbank of 10 years (based on 2019 sales levels)
- Has crushed rock (for aggregate) permitted reserves totalling 140,496,000 tonnes. This equates to an approximate landbank of 121 years (based on 2019 sales levels)

Alternative (secondary and recycled) aggregates

7.9.4. Alternative aggregates comprise secondary aggregates which are by-products from industrial and mining operations and recycled aggregates which are produced from CDW.

7.9.5. NPF4 outlines a series of National Developments Statements of Need, including Statement 4: Circular Economy Materials Management Facilities. This statement seeks to highlight the Scottish Government's focus on the construction of facilities required to manage secondary materials and their circulation back into the economy. The overall aim (nationally) is reducing consumption of primary materials, particularly within the construction and demolition industries.

7.9.6. Net Zero Aberdeen sets out a roadmap to achieving net zero carbon by 2045. As part of this, the Net Zero Delivery Unit has identified a series of enabling strategies which includes a Circular Economy Strategy. The Circular Economy Strategy seeks to reduce consumption of primary materials through the promotion of the following design and construction management considerations:

- Engaging with stakeholders in construction, including consideration of potential for materials exchange and ways to integrate principles of circular construction and design and development of local projects.
- Making a net zero/circular construction commitment to integrate principles of circular construction into the design and development of major local developments.
- Engagement with the construction sector to explore opportunities to avoid waste, embedding circular principles in design to robust site waste management plans.

7.9.7. A Waste Prevention Programme (published in 2013), as part of the Zero Waste Agenda, to reduce waste and create a more productive and circular economy (Safeguarding Scotland's Resources: Blueprint for a More Resource Efficient and Circular Economy) aims to reduce all waste in Scotland by 15% by 2025.

7.9.8. In December 2020, the Scottish Government published an update to its 2018 to 2032 Climate Change Plan which sets out the Government's pathway to new and ambitious targets set by the Climate Change Act 2019. The update reiterated the requirement for waste prevention programme targets, including reducing all waste sent to landfill to 5% and recycling 70% of all waste by 2025. It also emphasised the need to move to a circular economy to reduce the demand for raw material in products; encourage re-use and repairs through responsible production; and recycle waste and energy to maximise the value of any waste generated.

7.9.9. In May 2022 the Scottish Government published their consultation on proposals for a Route Map to 2025, their strategic plan to deliver Scotland's zero waste and circular economy ambitions. This included a statement on the successful state of CDW management:

"Construction and demolition accounts for around half of all waste produced in Scotland. Construction and demolition waste is largely soil excavations from housing and infrastructure projects as well as bricks, tiles and concrete from demolition. Scotland has met the European Union target of 70% recycling and reuse of construction

and demolition waste by 2020 every year since 2011 and latest data suggests a recycling rate of 97% in 2018".

7.9.10. National or regional targets for alternative aggregates (that comprise both secondary aggregates, which are by-products from industrial and mining operations, and recycled aggregates that are produced from construction waste) are not set out for Scotland in DMRB LA 110 or any other guidance currently available. The national target for England is 25% by weight and has been used to inform this assessment. This is supported by the Mineral Products Association Sustainable Development Report 2020/2021 (published in 2022), which reported that 28% of the aggregates market in Great Britain (approximately 180 million tonnes[33]) was supplied from recycled sources.

7.9.11. The Aggregates Tax and Devolved Administration (Scotland) Bill was laid before the Scottish Parliament on 14 November 2023. The bill seeks to incentivise the use of secondary/recycled aggregates with the construction industry (and others). If approved, the Scottish Government intends to introduce the tax from April 2026.

7.9.12. The evidence review completed by the Scottish Government in preparation for the Scottish Aggregates Levy published in 2020 suggests that the projected Construction and demolition related aggregates waste will increases to from 1.2 million tonnes to 1.28 million tonnes in 2030. This potentially equates to an increase in the national supply of secondary aggregates to 1.12 million tonnes in 2030.

Non-aggregates

7.9.13. Non-aggregate based materials such as wood, plastic and steel will be used within the proposed scheme, however, the overall quantities are anticipated to be relatively small and, in some cases, negligible.

Mineral sites

7.9.14. The Aberdeen Local Development Plan 2023 notes the key safeguarded mineral resources in the wider city area are hard rock which continues to be quarried at Blackhills (south of Cove) and North Lasts (north of Peterculter) plus sand and gravel which has been extracted in the north of the city in recent times.

7.9.15. The sterilisation of mineral resources of local, regional or national importance or posing a serious hindrance to future winning and working of minerals are considered unlikely to occur as the adopted Aberdeen Local development Plan 2023 indicates there are no existing or allocated mineral sites (which according to DMRB LA 110 are operational sites or sites identified within strategic planning documents for the extraction of minerals) within the proposed scheme's extents.

[33] https://www.mineralproducts.org/MPA/media/root/Publications/2023/Contribution_of_Recycled_and_Secondary_Materials_to_Total_Aggs_Supply_in_GB_2021_Estimates.pdf

Safeguarded peat resources

7.9.16. Policy NE3 ('Our Natural Heritage') included within the Aberdeen Local Plan 2023 states that development should not have a detrimental effect (directly or indirectly) on areas of peatland or other carbon-rich soils. There is a presumption against development which would involve significant draining or disturbance of peatland or carbon-rich soils.

7.9.17. The Carbon and Peatland 2016 map produced by Scottish Natural Heritage indicates that soil beneath the proposed scheme is classified as having a Carbon and Peatland score of 0 indicating it to be a 'mineral' soil rather than peat or peaty soil.

7.9.18. Peat deposits were not encountered during the 2023 ground investigation.

Regional landfill capacity: Construction generated wastes

7.9.19. The national target for the recovery of CDW either on or off the proposed scheme is 70% by weight as set out in the European Union (EU) Waste Framework Directive 2008/98/EC (EU WFD 2008) and the Waste Management Plan for England (January 2021). This target specifically excludes naturally occurring materials with List of Waste (LoW) Code 17 05 04 (non-hazardous soil and stones) (as defined by Waste Classification Technical Guidance WM3 (Environment Agency et al, 2021).

7.9.20. DMRB LA 110 states that projects should aim to achieve at least 90% (by weight) material recovery of non-hazardous construction and demolition waste.

Waste generation: landfill capacity

7.9.21. Baseline information comprises the current landfill capacity in the waste disposal authority (Aberdeenshire).

7.9.22. The urban nature of Aberdeen and the lack of quarrying activity means there is no opportunity for existing or future landfill capacity, therefore, the City relies on landfill capacity within surrounding authorities. Aberdeen City Council's Local Development Plan 2023 includes several policies and objectives relating to waste and material management, and the implementation of circular economy. This includes Policy R3: New Waste Management Facilities, which states that proposals for waste management must comply with the waste hierarchy and conform to the Zero Waste Plan and Aberdeen Waste Strategy. The Council states that construction of a landfill is 'the option of last resort'.

7.9.23. Landfill capacity data (as at the end of 2022) provided by the SEPA has been assessed. Statistics on remaining landfill capacities for Aberdeenshire are summarised in Table 7-4.

7.9.24. There are no hazardous waste or Stable Non-Reactive Hazardous Waste (SNRHW) landfills anticipated to be active within Scotland for the construction period of summer 2025 to spring 2027. In accordance with DMRB LA 110, using the proximity principle,

landfill site data published by the Environment Agency, landfill capacity data (as at the end of 2022) provided by the Environment Agency for the North-East of England region has been assessed.

Table 7.4 - Remaining landfill capacity summary (end 2022)

Landfill type	Remaining capacity
	Aberdeenshire
Non-hazardous	There are three non-hazardous landfill sites within Aberdeenshire with a combined total remaining capacity of approximately 1,470,000 m^3 (2,499,000 million tonnes)[34].
Inert	There are two inert landfill sites within Aberdeenshire with a combined total remaining capacity of approximately 453,000 m^3 (770,100 tonnes).
SNRHW cell[35] within non-hazardous landfill	None within Scotland. The closest non-hazardous landfill with a SNRHW cell is the Ellington Road Landfill site in Ashington, Northumberland (Permit Ref: DP3238B). The remaining capacity of this site is approximately 208,000 m^3 (353,600 tonnes).
Landfill type	**North East Region (England)**
Hazardous	None within Scotland. The closest hazardous waste landfills are located in the north-east region of England: • Augean North Ltd, Port Clarence Landfill Site (Permit Ref:BV1399IT) located in Stockton on Tees, approximately 284 miles from the proposed scheme with a remaining capacity of 2,241,230 m^3 (3,810,091 tonnes). • Highfield Environmental Ltd, ICI No 3 Teesport (Permit Ref:DP3331DJ) located in Teesport, approximately 280 miles from the proposed scheme with a remaining capacity of 2,008 m^3 (3,414 tonnes).

Waste processing, treatment and recovery facilities

7.9.25. Estimates from SEPA waste data indicates there are numerous operational waste processing, treatment and recovery facilities within the region. Professional experience has shown that waste markets are flexible and adapt to changing markets within a region. Whilst the actual waste processing, treatment and recovery facilities may change during the construction period, the overall capacity is likely to remain similar as the market responds.

7.9.26. As a result, in accordance with the Scottish Government's vision for a zero-waste economy (viewing waste as a valuable resource rather than for disposal to landfill), there would be significant opportunity for the re-use, recycling or recovery of appropriate wastes generated during the anticipated construction period (summer 2025 to spring 2027).

[34] Assuming 1m^3 of soils and stones weighs approximately 1.7 tonnes.
[35] Some non-hazardous sites can accept some SNRHW into a dedicated cell, but this is usually permitted as a small part of the overall capacity of the site

Assessment of Effects

Potential impacts

7.9.27. The likely potential impacts during construction are:

- Depletion of natural resources through the use of primary aggregates and the use of recycled and or secondary aggregates below the 25% guideline target.
- Depletion of natural resources through recycling and or recovery of CDW (excludes naturally occurring non-hazardous materials (LoW Code 17 05 04)) below the Government's 70% recovery target and DMRB LA 110 target to achieve at least 90% (by weight) material recovery of non-hazardous construction and demolition waste.
- Sterilisation of one or more mineral and peat safeguarding sites.
- Reduction in the landfill capacities (inert, non-hazardous, SNRHW and hazardous) by greater than 1% through the generation of surplus excavation materials, generation and disposal of CDW, packaging materials and construction material wastage through damage and over-ordering.

Embedded mitigation

7.9.28. The proposed scheme is designed to avoid and minimise the environmental impacts of material assets and waste (as far as reasonably practicable) through a process that assesses alternatives and 'embedded mitigation' as defined in DMRB LA 104 (Environmental assessment and monitoring).

Essential mitigation

7.9.29. This section reports on essential mitigation required in addition to embedded mitigation to reduce and offset likely significant adverse environmental effects associated with material assets and waste, to reduce and offset likely significant adverse environmental effects associated with the use of material assets and generation of waste.

7.9.30. In accordance with DMRB LA 104 (Environmental assessment and monitoring), essential mitigation is defined as '*Mitigation critical for the delivery of a project which can be acquired through statutory powers*'.

7.9.31. The following mitigation measures have been assumed in this assessment:

Waste hierarchy implementation

7.9.32. The principles of the EU WFD 2008 waste hierarchy (see Image 7-1) will continue to be considered during the design development to achieve mitigation of potential impacts within the design process.

Figure 7.1: The waste hierarchy[36]

7.9.33. The proposed scheme aims to prioritise waste prevention, followed by preparing for re-use, recycling and recovery and lastly disposal to landfill. This will include, but is not limited to:

- Where possible, any site-won materials will be re-used within the proposed scheme.
- Where CDW and excavation arisings generated during construction cannot be used in the proposed scheme, opportunities will be sought where possible to re-use the materials on other construction projects.
- If encountered, suitable marketable timber and biomass from clearance of the proposed scheme will be fed into the timber / chip board / biomass market. Green waste from the proposed scheme clearance works (vegetation other than timber and unusable waste wood such as dead trees, stumps and root balls) will, depending on suitability be re-used or recycled through on-site landscaping or ecological improvement works. Off-site disposal through a green waste disposal contractor could also offer recycling through composting.
- The re-use of road surfacing, paving, concrete and rubble in temporary haul roads or as make-up for the new road layout.
- The principal contractor will also adopt the good practice in construction waste management principles outlined in the Waste and Resources Action Programme (WRAP) guidance document Achieving Good Practice, Waste Minimisation and Management, Guidance for Construction Clients, Design Teams and Contractors (2008) and WRAP's Net Waste Tool[37].

Waste legislation compliance

7.9.34. The principal contractor will comply with all relevant waste legislation in relation to waste handling, storage, transport and disposal. They will consult with SEPA for advice on waste practices, licences and exemptions where appropriate.

Designing out waste

7.9.35. Designing out waste is one of the key tenets of a circular economy. The principal contractor will implement the principles of designing out waste in accordance with Zero

[36] Source: https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en
[37] WRAP Net Waste Tool. Tool no longer available on the WRAP website due to funding issues

Waste Scotland's five 'Principles of Designing Out Waste' to reduce waste and minimise the total material assets demand of the detailed design:

- Design for waste efficient procurement: by setting resource and waste efficiency requirements into the procurement process; working throughout the design process to select resource efficient construction methods; and when waste does arise, making provision to select the waste contractor who can offer the best overall re-use and recycling performance.
- Design for resource optimisation: by designing roads and road infrastructure that can be constructed and used with reduced consumption of material assets, selecting responsibly sourced material assets, and producing minimal waste.
- Design for off-site construction: by designing prefabricated road structures and components, which offer reduced consumption of material assets and reduced waste; and thinking about how activities on the proposed scheme can become a process of assembly rather than construction.
- Design for re-use and recovery: by salvaging and re-use of components and material assets from the proposed scheme or elsewhere locally; on-site or off-site recycling of materials, and ensuring new materials brought onto the proposed scheme have a high recycled content.
- Design for the deconstruction and flexibility: by considering the potential future uses of the proposed scheme and incorporating flexibility and adaptability into the design; selecting materials and components to match the intended use and durability; designing the road assets to be easy to maintain and refurbish, and taking into account future needs to update, modernise and eventually deconstruct.

Use of secondary or recycled materials

7.9.36. The principal contractor will prioritise the use of secondary or recycled materials (and consider alternatives to traditional construction materials) in accordance with the relevant legislation, standards and specification for these works. This will include:

- Recovery of road planings in accordance with SEPA Guidance on the Production of Fully Recovered Asphalt Road Planings (2012).
- The use of suitable CDW and excavation arisings within the proposed scheme that meets the Wrap Quality Protocol: Aggregates from Inert Waste, End of Waste Criteria for the Production of Aggregates from Inert Waste, (October 2013).

Local and responsible sourcing of material assets

7.9.37. The principles of local and responsible sourcing of key material assets will be adopted by the principal contractor.

- Where feasible, key materials, such as aggregates, asphalt, cement, concrete and steel used within the proposed scheme will be responsibly sourced from suppliers who have a minimum ISO 1400138 certification (or equivalent) and, if available, Buildings Research Establishment (BRE) developed BES 6001 (Framework

[38] Available at: https://www.achilles.com/product/responsible-sourcing/

Standard for the Responsible Sourcing of Construction Products) certification for the material.

- All timber and timber products will be sourced from independently verifiable, legal and sustainable sources.

Construction environmental management plan

7.9.38. In accordance with DMRB LA 120 (Environmental management plans)[39], a CEMP will be produced for the proposed scheme as part of the design stage. It will be prepared in parallel to the development of the proposed scheme design and construction methodologies. Measures and procedures within the CEMP include design, construction and operational mitigation.

7.9.39. The CEMP will be developed before construction works commence and include the adoption and implementation of industry standard practice and measures for controlling the impacts of the proposals on material assets and waste. It will comprise three core documents specifically relating to the management of these aspects:

- Materials Logistics Plan (MLP)
  - Developed in accordance with WRAP Material logistics plan good practice guidance (WRAP MLP guidance 2007). It will detail how all construction phase material assets be managed and identify opportunities to substitute recycled or secondary materials and products for those using primary materials. It will also set out the following performance targets:
    - At least 25% (by weight) of aggregates imported for use within the proposed scheme should comprise alternative (re-used, recycled or secondary) aggregates, for those applications where it is technically and economically feasible to substitute these alternatives to primary aggregates
    - Recovery of at least 70% (by weight) of non-hazardous CDW (excluding naturally occurring soils and stones with LoW Code 17 05 04), with the aim to achieve recovery of 90% (by weight)
- Site Waste Management Plan (SWMP)
  - The SWMP will identify the types and likely quantities of wastes that may be generated, and set out, in an auditable manner, how waste will be reduced, re-used, managed and disposed.
- Materials Management Plan (MMP)
  - Where applicable, an MMP will be developed to guide the re-use of excavated soils during construction and detail the procedures and measures to be implemented to classify, track, store, re-use and dispose of all excavated waste generated during the construction phase.
  - Re-using soil arisings, construction and demolition wastes (either on or off site) is a more sustainable approach than their disposal off site as it reduces haulage

[39] DMRB (2020) LA 120 – Environmental management plans, Revision 1. Available online: https://www.standardsforhighways.co.uk/tses/attachments/a3a99422-41d4-4ca1-bd9e-eb89063c7134?inline=true

requirements and minimises disposal costs. Guidance on the situations where such re-use is suitable and the situations where SEPA will not regulate under waste legislation is provided in their publication "Land remediation and waste management guidelines". The overriding purpose of which is to ensure there is no pollution of the environment or harm to human health. To avoid regulation, schemes must have a remediation plan in place incorporating all of the following six criteria:

- the use is a necessary part of the planned works
- the material is suitable for that use
- the material does not require any processing or treatment before it is reused
- no more than the quantity necessary is used
- the use of the material is not a mere possibility but a certainty
- the use of the soil will not result in pollution of the environment or harm to human health

o Certain wastes (including but not limited to concrete and brick structures) may require processing in line with permitted controls before they can be considered suitable for re-use as a non-waste. This will have been accomplished as part of the preceding demolition and site clearance activities and in accordance with the aforementioned SWMP.

7.9.40. Excavation arisings should be managed in accordance with Ciria publication C809: Sustainable Management of Surplus Soil and Aggregates from Construction (London, 2023).

Enhancement measures

7.9.41. In accordance with DMRB LA 110, enhancement opportunities will be identified as the proposed scheme progresses associated with the re-use of suitable excavation arisings on developments concurrent with the construction phase of the proposed scheme. For example, this may include:

- provision of materials to other major developments in the wider region, e.g., road and rail improvement projects;
- construction of noise and landscape bunding off the proposed scheme, for example on other Transport Scotland projects where improvements are planned; and
- use of surplus recycled or recovered wastes in community projects e.g., use of recycled mulch from tree felling on local community facilities.

Design information

7.9.42. To inform the evaluation of predicted residual effects, the estimated main types and quantities of material assets anticipated to be used (and waste generated) during construction have been assessed.

Consumption of material assets

7.9.43. Detailed information on the key materials assets required to construct the proposed scheme are not available at this stage in the design however they are anticipated to predominantly be aggregate based (asphalt, concrete and aggregates) with relatively small and, in some cases, negligible quantities of non-aggregate based materials such as wood, plastic and steel.

7.9.44. By achieving 'good practice' during construction, and in consideration of material specific 'good practice' recycled content levels provided in WRAP's Designing Out Waste Tool for Civil Engineering and WRAP's Net Waste Tool and given the local and regional availability of secondary and recycled aggregates, the proposed scheme is anticipated to meet (and potentially exceed) the guideline target of 25% for the use of alternate aggregates.

7.9.45. Construction works are predicted to generate approximately 39,755m^3 (67,584 tonnes[40]) of excavation arisings which based on ground investigation data to date are anticipated to be suitable for retention and use during construction of the proposed scheme as a combination of structural fill and use as general fill for topsoiling and landscaping.

7.9.46. Construction works are anticipated to require the import of approximately 40,780m^3 (69,326 tonnes) of structural fill, which based on 'good practice' is likely to be a secondary material sourced from local development projects or recycling facilities within the locality of the proposed scheme.

Construction and demolition waste generation

7.9.47. Detailed information on the key CDW generated through preparation, clearance, demolition and excavation works; and through the wastage of construction materials is not available at this stage in the design however:

- Achieving 'good practice' during construction, it is predicted that the Government's 70% target for the recovery / recycling of construction waste (either on or off the proposed scheme or both) and the 90% target set within DMRB LA110 would be achieved where technically appropriate and economically feasible.
  - For example, it is known that the construction will generate in the region of 19,180m^3 of asphalt. It is understood that 100% of this is proposed to be re-used during construction. If this is not possible it would be re-used/recycled off the proposed scheme
- Resource recovery, as part of a circular economy, aims to reduce the amount of waste generated, thereby reducing the need for landfill space, effectively commodifying the waste. In the context of this assessment, it relates to the recovery, re-use and recycling (on or off the proposed scheme) of non-hazardous CDW to substitute the use of primary materials.

[40] Assuming an average density of 1.7 tonnes per m^3 for general soils and stones

7.9.48. Construction works are predicted to generate approximately 39,755m^3 (67,584 tonnes) of excavation arisings which based on ground investigation data to date are anticipated to be suitable for retention and use during construction of the proposed scheme as a combination of structural fill and use as general fill for topsoiling and landscaping.

Summary of assessment

7.9.49. The assessment draws upon available baseline and design information. **Error! Reference source not found.** presents a summary of the assessment for the construction phase. It identifies whether and which likely environmental effects are predicted as a result of the proposed scheme.

7.9.50. The proposed scheme is designed to avoid and minimise the environmental impacts of material assets and waste (as far as reasonably practicable) through assessment of alternatives, mitigation and enhancement measures secured in the CEMP. The assessment has applied these established and reliable design, committed mitigation and best practice measures.

7.9.51. Based upon the assessment presented in Table 7-5, no significant environmental effects are predicted as a result of the proposed scheme.

Table 7.5 - Summary of proposed scope

Potential impact	Reason
Is the project likely to recover or re-use little on-site material thereby requiring materials to be imported to the proposed Scheme?	**Significant environmental effects from this potential impact are not predicted** • By applying 'good practice' during construction, it is predicted that through the recovery and re-use of CDW either on or off the proposed scheme, the Government's 70% target for the recovery / recycling of construction waste and the 90% target set within DMRB LA110 could be achieved where technically appropriate and economically feasible. • Whilst the 70% target does not include uncontaminated, excavated soils and stones, construction earthworks are anticipated to generate approximately 39,755m^3 (67,584 tonnes) of excavation arisings which based on ground investigation data to date are anticipated to be suitable for retention and use during construction of the proposed scheme as a combination of structural fill and use as general fill for topsoiling and landscaping. • Construction works are anticipated to require the import of approximately 40,780m^3 (69,326 tonnes) of structural fill which based on 'good practice' is likely to be a secondary material sourced from local development projects or recycling facilities within the locality of the proposed scheme.
Is the project likely to use little or no recycled or secondary materials thereby requiring the majority of materials used on the project to comprise primary materials?	**Significant environmental effects from this potential impact are not predicted** • The choice of whether to use primary or secondary or recycled aggregates, or a combination of both, would ultimately be made by the principal contractor after considering a combination of factors, such as sources, specifications, production and transport of available materials and technical suitability. • By achieving 'good practice' during construction, and in consideration of material specific 'good practice' recycled content levels provided in WRAP's Designing Out Waste Tool for Civil Engineering and WRAP's Net Waste Tool and given the local and regional availability of secondary and recycled aggregates, the proposed scheme is anticipated to meet (and potentially exceed) the guideline target of 25% for the use of alternate aggregates. • Construction works are predicted to generate approximately 39,755m^3 (67,584 tonnes) of excavation arisings which based on ground investigation data to date are anticipated to be suitable for retention and use during construction of the proposed scheme as a combination of structural fill and use as general fill for topsoiling and landscaping. • Construction works are anticipated to require the import of approximately 40,780m^3 (69,326 tonnes) of structural fill which based on 'good practice' is likely to be a secondary material sourced from local development projects or recycling facilities within the locality of the proposed scheme
Is the project likely to sterilise (substantially constrain or prevent existing and potential future use of) peat resources?	**Significant environmental effects from this potential impact are not predicted** Available mapping shows peat is not present within the area of the proposed scheme, with no peat deposits encountered during ground investigations undertaken to date. Therefore, needless sterilisation is not envisaged. Notwithstanding this, the works would be undertaken in consideration of best practice mitigation and if encountered, any excavated any peat would be dealt with as a commodity for re-sale or beneficial re-use. This would avoid waste and make best use of a finite resource.
Is the project likely to sterilise (substantially constrain or prevent existing and	**Significant environmental effects from this potential impact are not predicted** • The adopted Aberdeen Local development Plan 2023 indicates there are no existing or allocated mineral sites within the proposed scheme's extents. • If opportunities arise, any excavated any minerals would be dealt with as a commodity for re-sale or beneficial re-use. This would avoid waste and make best use of a finite resource. Safeguarded minerals would therefore be re-used either immediately or via an intermediary site rather than disposed to landfill. This approach is in accordance

Potential impact	Reason
potential future use of) mineral sites?	with the WFD 2008 waste hierarchy and is considered to present an appropriate means of ensuring proven mineral resources are not needlessly sterilised by non-mineral development. • Where deposits of safeguarded minerals are present outside of the scheme extents, the proposed scheme is not considered likely to further constrain future extraction of deposits.
Would the project generate large quantities of waste relative to regional landfill capacity?	**Significant environmental effects from this potential impact are not predicted** • The significance threshold for quantities of waste requiring disposal is greater than 1% of available local landfill capacity. o Aberdeenshire's remaining inert/non-hazardous landfill capacity is approximately 1,923,000m^3 / 3,269,100 tonnes (1% significance threshold of 19,230m^3 / 32,691 tonnes). o The closest hazardous landfills (North-East region of England) has a capacity of approximately 2,243,238m^3 / 3,813,505 tonnes (1% significance threshold of 22,432m^3/38,135 tonnes). o The closest SNRHW landfill (Northumberland) has a capacity of approximately 208,000m^3 /353,600 tonnes (1% significance threshold of 2,080m^3/ 3,536 tonnes). • The anticipated quantity of wastes are expected to be less than these threshold values as: o The proposed scheme is not anticipated to generate large quantities of CDW. If generated, by applying 'good practice' during construction, it is predicted that the Government's 70% target for the recovery / recycling of construction waste (either on or off the proposed scheme or both) and the 90% target set within DMRB LA110 would be achieved where technically appropriate and economically feasible. o Construction works are predicted to generate approximately 39,755m^3 (67,584 tonnes) of excavation arisings which based on ground investigation data to date are anticipated to be suitable for retention and use during construction of the proposed scheme as a combination of structural fill and use as general fill for topsoiling and landscaping. o Hazardous and SNRHW are not expected to be encountered during construction. • If CDW and excavation wastes requires disposal from the proposed scheme, they would likely be processed, treated or recovered regionally at non landfill facilities, with any surplus excavation arisings likely to be diverted from landfill to local or regional developments concurrent with the proposed scheme's construction phase. Consequently, a greater than 1% reduction in the capacity of regional landfill facilities (as a result of accommodating both CDW and excavation arisings generated during construction) is considered unlikely. • Furthermore, waste arisings requiring disposal to landfill would be expected to decline in the future in line with waste management targets and a drive to a more circular economy. Taking into account the committed mitigation, enhancement measures and the Scottish Government's vision for a zero-waste economy, there would be significant opportunity for the reuse, recycling or recovery of these residual wastes during the construction period.

7.10. Road Drainage and the Water Environment

Introduction

7.10.1. This section comprises the following sub-topics:

- Water Quality: various attributes of watercourses and water bodies including water supply/quality, dilution and removal of waste products, recreation, value to the economy and biodiversity.

- Drainage: a system of collecting overland surface water or underground waters, often by channels, drains and sewers to a point of discharge or treatment.

- Hydrology and Flood Risk: the flow of water on or near the land surface. Flooding has many sources including coastal, river (fluvial), surface water (pluvial), sewer and groundwater.

7.10.2. This section provides an overview of the baseline water environment within a 1km study area of the proposed scheme boundary, and existing drainage provision on the local road network, followed by an assessment of effects on the water environment resulting from the scheme.

Approach and Methods

7.10.3. A desk-based assessment has been undertaken in accordance with the principles of DMRB LA 113 (Road Drainage and the Water Environment).

7.10.4. SEPA's online flood maps were also reviewed, showing river, surface water, groundwater flood extents at https://map.sepa.org.uk/floodmap/map.htm.

Assumptions and Limitations

7.10.5. No assumptions or limitations were noted for the RDWE assessment.

Baseline

The Stantec 2021 Report stated:

7.10.6. The key water environment features within the study area are:

- The Bay of Nigg - open tidal bay which encompasses the marine, intertidal, and terrestrial environments

- East Tullos and Ness Farm Landfill Burns, both of which discharge to the North Sea at the Bay of Nigg. East Tullos Burn runs between Calder Park in the south and St Fittick's Park in the north and is culverted under the East Tullos Industrial Estate

- River Dee - runs throughout Aberdeen and discharges to the North Sea at the existing Aberdeen Harbour. The river is not hydrologically connected to the East Tullos BurnThere is a high to medium risk of surface water flooding along the length of Coast Road extending to the east of Altens Industrial Estate.

7.10.7. The area containing the proposed scheme is not generally affected by coastal flooding owing to its elevated topography, however there is some potential for surface groundwater flooding in northern and south-eastern areas.

7.10.8. The road drainage systems present on both the existing Hareness Road and Coast Road sections consist mainly of kerb and gullies. Along Coast Road, surface water runoff is collected via gullies conveyed by natural channels with raised verges and road camber.

7.10.9. Gullies on the existing Hareness Road collect surface water runoff and link to sub-surface carrier drains that form the local drainage network, discharging to SuDS basins adjacent to the existing Coast Road. Gullies on Coast Road collect surface water runoff and link to a localised subsurface carrier drain network that outfalls into the North Sea at various locations.

Assessment of Effects

7.10.10. The Coast Road section of the proposed scheme would cross small drainage ditches, which convey existing road drainage to the North Sea cliff with no attenuation and limited SuDS treatment. No other watercourses are proposed to be crossed or impacted within the study area (the River Dee is located to the west, approx. 1.2km away at its closest extent).

7.10.11. In alignment with Stantec (2021), a review of SEPA's Flood Maps[18] show no river or coastal flood risk in the proposed scheme, whilst surface water (pluvial) flooding is patchy and localised, particularly in the commercial and residential areas of Altens and Tullos to the west. The area containing the proposed scheme is within a groundwater potentially vulnerable area (PVA 02/06/25)[19].

7.10.12. Surface water drainage and risk of increased pluvial flooding as a result of the proposals would be appropriately dealt with through a drainage / SuDS strategy for the scheme, as discussed in Section 5.4. Consultation was held with SEPA, Scottish Water and Aberdeen Council and it was determined that as the drainage systems outfall to the North Sea, SuDS features would not strictly be required as per the guidance set out in the CIRIA SUDS Manual.

7.10.13. As such, there would be no increase in surface water flooding within the proposed scheme or as a result of it, and there is anticipated to be a betterment in the quality of road drainage outfalling to the coast, through SuDS, compared to the existing road drainage scenario. Any potential for untreated road drainage adversely impacting on sensitive coastal ecological designations would also be reduced. This is considered to result in an impact significance of Slight Beneficial.

Summary of Assessment

7.10.14. There are considered to be no significant impacts caused by the proposed scheme with regards to flood risk and drainage during both construction and operational phases.

7.10.15. With design, there should be no increase in surface water flooding on the site. Drainage should not impact on coastal designations (improve existing drainage scenario which is generally direct discharge to coast).

7.11. Climate/Carbon

Introduction

7.11.1. A Carbon Report was produced at DMRB Stage 3, to estimate carbon emissions associated with the Stage 3 project design (see Appendix C).

Approach and Methods

7.11.2. Embodied carbon (A1-A5) emissions were assessed in line with the requirements set out in *PAS2080:2023 - Carbon Management in Buildings and Infrastructure*.

7.11.3. Embodied carbon has been estimated using the CESMM4 Carbon & Price Book 2013. Where specific elements were not available to be estimated using CESMM4, National Highways data has been utilised.

7.11.4. Quantity data was obtained from the project Design Team. CESMM4 Carbon & Price Book 2013 has been used for per unit carbon values (i.e., 'factors'), in tCO_2e, associated with relevant design elements. These factors were applied to total quantities on a per unit basis to obtain approximate embodied carbon values.

7.11.5. Transport data was estimated using the RICS Whole Life Carbon Assessment for the Built Environment, where specific data relating to the scheme is unavailable at DMRB Stage 3.

Assumptions and Limitations

- Emissions associated with certain life cycle modules (e.g. operation and end-of life) have been excluded from this assessment due to data limitations and inherent uncertainty at this stage of the project. The scope of the assessment will be expanded in future phases as more design information becomes available.
- Due to the high-level nature of this assessment, as well as the assumptions and limitations stated above, all carbon values are intended to be used on a relative/comparative basis and should be considered indicative only.

Summary of Assessment

7.11.6. As part of the Value Engineering exercise, there was a reduction to the overall required materials of the proposed scheme. At present this equates to an estimated 20% reduction in material use at DMRB Stage 3. Table 7-6 demonstrates the impact of the exercise per series element.

Table 7.6 - Impact of Value Engineering on Embodied Carbon Emissions (A1-A5), Estimate by Series

Series	Description	tCO_2e without Value Engineering	tCO_2e with Value Engineering	Total tCO_2e Reduction
200	**Site Clearance**	10.21	8.51	**1.7**
300	**Fencing**	12.63	10.52	**2.1**
400	**Road Restraint System**	307.72	256.44	**51.29**
500	**Drainage and Service Ducts**	130.11	108.42	**21.68**
600	**Earthworks**	2660.32	2,216.93	**443.39**
700	**Pavement**	1775.21	1,479.34	**295.97**
1100	**Kerbs, Footways, and Paved Areas**	1252.08	1,043.40	**208.68**
1200	**Traffic Signs and Road Markings**	14.46	12.05	**2.41**
1300	**Road Lighting Columns, Brackets, and CCTV Masts**	163.65	136.38	**27.28**

Series	Description	tCO_2e without Value Engineering	tCO_2e with Value Engineering	Total tCO_2e Reduction
2500	**Special Structures**	1168.71	973.92	**194.78**
-	**Total**	**7495.11**	**6,245.92**	**1,249.18**

7.11.7. Following the Value Engineering exercise there would be a reduction of approximately 1,249 tCO_2e.

Next steps

7.11.8. During the next stage of design, efforts should be made to reduce the capital carbon hotspots highlighted in this assessment. These can be assessed against this baseline.

7.11.9. It will be important to conduct a further assessment of capital carbon for the scheme once the design has been further developed at detailed design stage. The scope of the assessment should also be expanded to include emissions resulting from operation (e.g., street lighting) and maintenance (e.g., replacement of road surface). This will then ensure that all potential emissions from the proposed scheme have been considered.

7.12. Air Quality and Noise and Vibration

7.12.1. There have been no changes to the traffic modelling undertaken for the assessment of the DMRB Stage 2 preferred option to the proposed scheme at DMRB Stage 3. As such, the high level air quality and noise and vibration appraisals undertaken at DMRB Stage 2 are still valid. These were undertaken to determine if the forecasted changes to the local traffic network would likely generate a significant effect in terms of air quality and noise and vibration in the surrounding area.

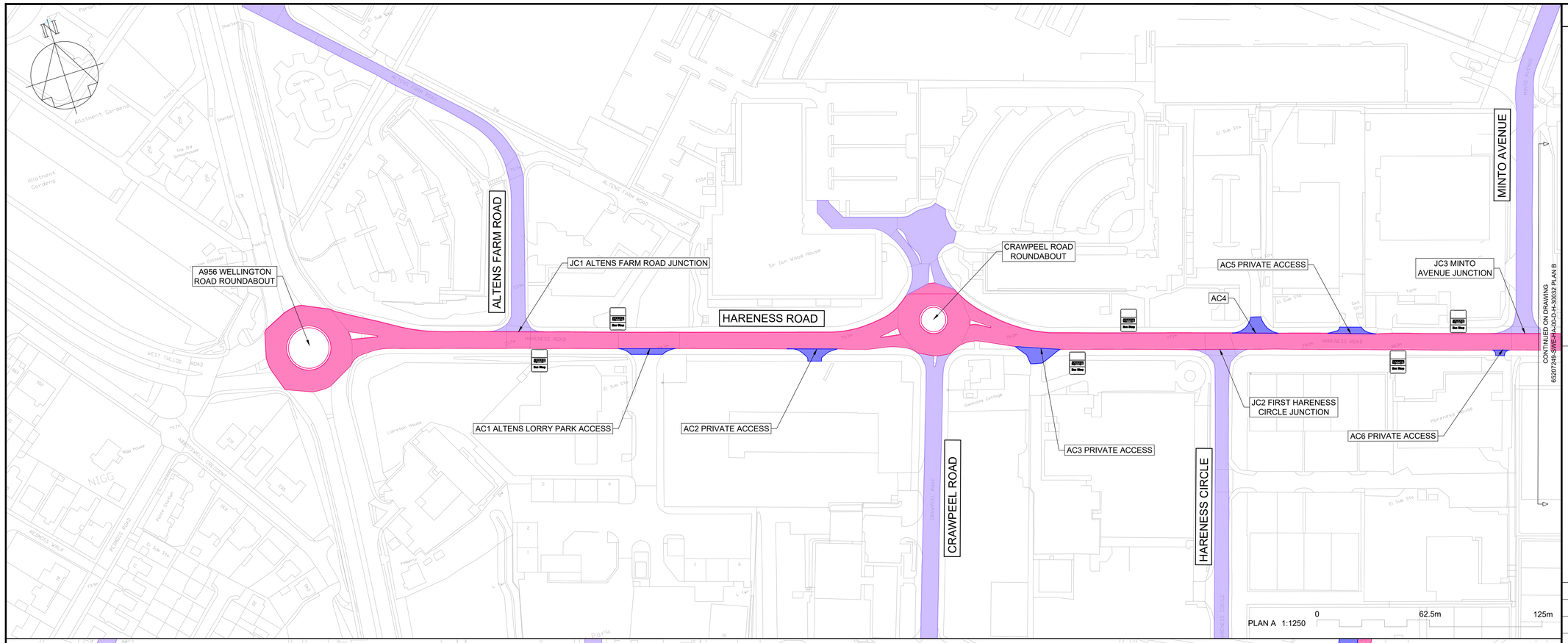
7.12.2. Based on the findings of the air quality appraisal, three road links were identified as exceeding the traffic screening criteria. However, no sensitive receptors (human, designated ecological or Air Quality Management Areas (AQMAs)) were located within 100m of these links. Where receptors are located within 200m of a triggered link (i.e. ‘Link 1’ on Hareness Road), a review of baseline air quality demonstrated that the forecast change in traffic flows would not have a material impact on local air quality and emission concentrations fall well within relevant air quality objectives. Therefore, negligible effects on air quality were predicted.

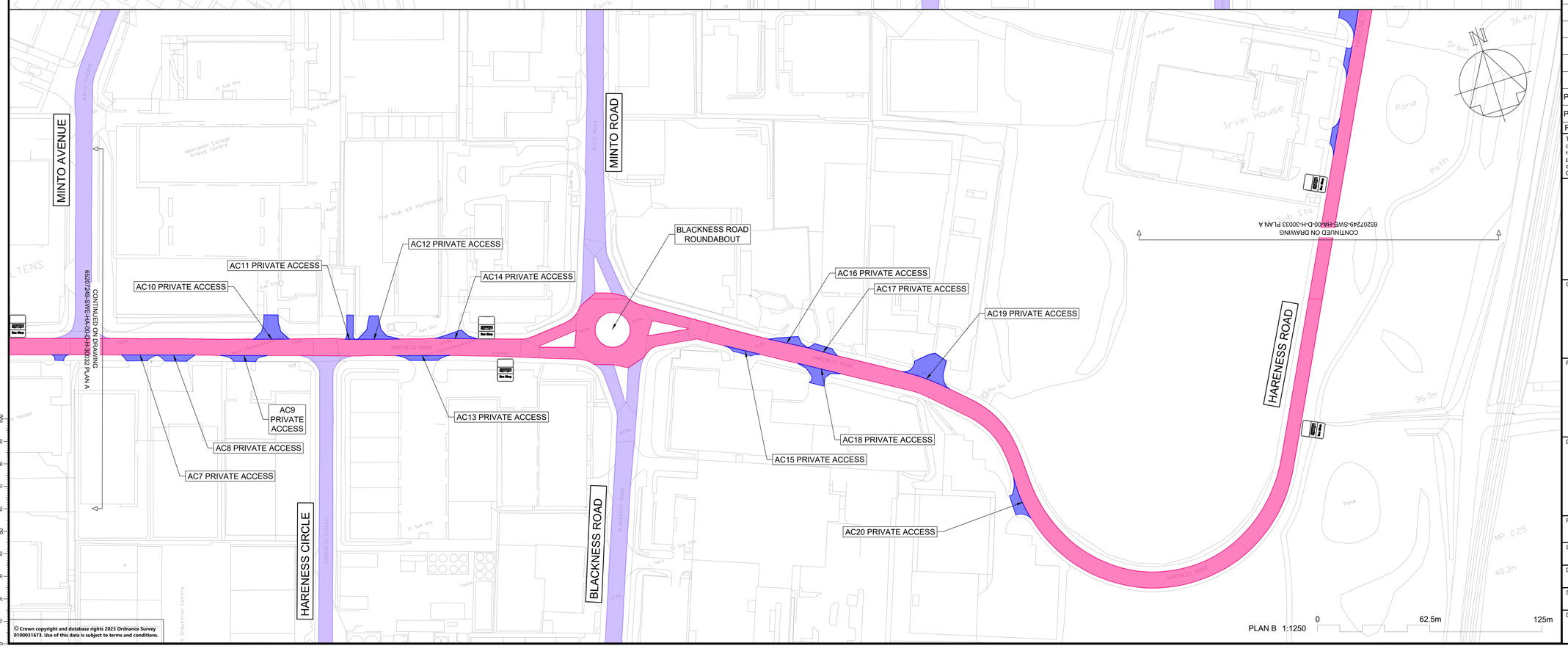
7.12.3. Based on the findings of the noise appraisal, eight links were identified where the noise level change triggered the short-term noise threshold for further assessment. Review of the traffic links that exceeded the short-term threshold level identified one location as being within 100m of a noise sensitive receptor (at the northern end of Langdykes Road, located near the Aberdeen Altens Hotel). In this instance, the change in noise level along this road link was predicted to be a decrease

of -1.1dB, which is a positive effect. Therefore, predicted effects on noise and vibration were considered to be negligible overall.

7.12.4. The Air Quality and Noise and Vibration Technical Notes produced for the Outline Business Case at the DMRB Stage 2 stage are appended for information (see Appendix D).

Appendix A. Engineering Figure List





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HAZARD REF AND BRIEF DESCRIPTION OF HAZARD:-

HAZARD REF	BRIEF HAZARD DESCRIPTION

KEY TO SYMBOLS

- BUS STOP
- EXISTING HARENESS ROAD / COAST ROAD
- PUBLIC SIDE ROAD
- VERGE CROSSING / PRIVATE ACCESS

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P01	14/12/23	FOR REVIEW AND COMMENT	JPot	MW	GGra
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Client: ABERDEEN CITY COUNCIL

Project Title: Aberdeen South Harbour Link Road

Drawing Title: FIGURE 2.2 ASHLR EXISTING ENGINEERING CONDITIONS SHEET 1 OF 3

Project Stage: STAGE 3

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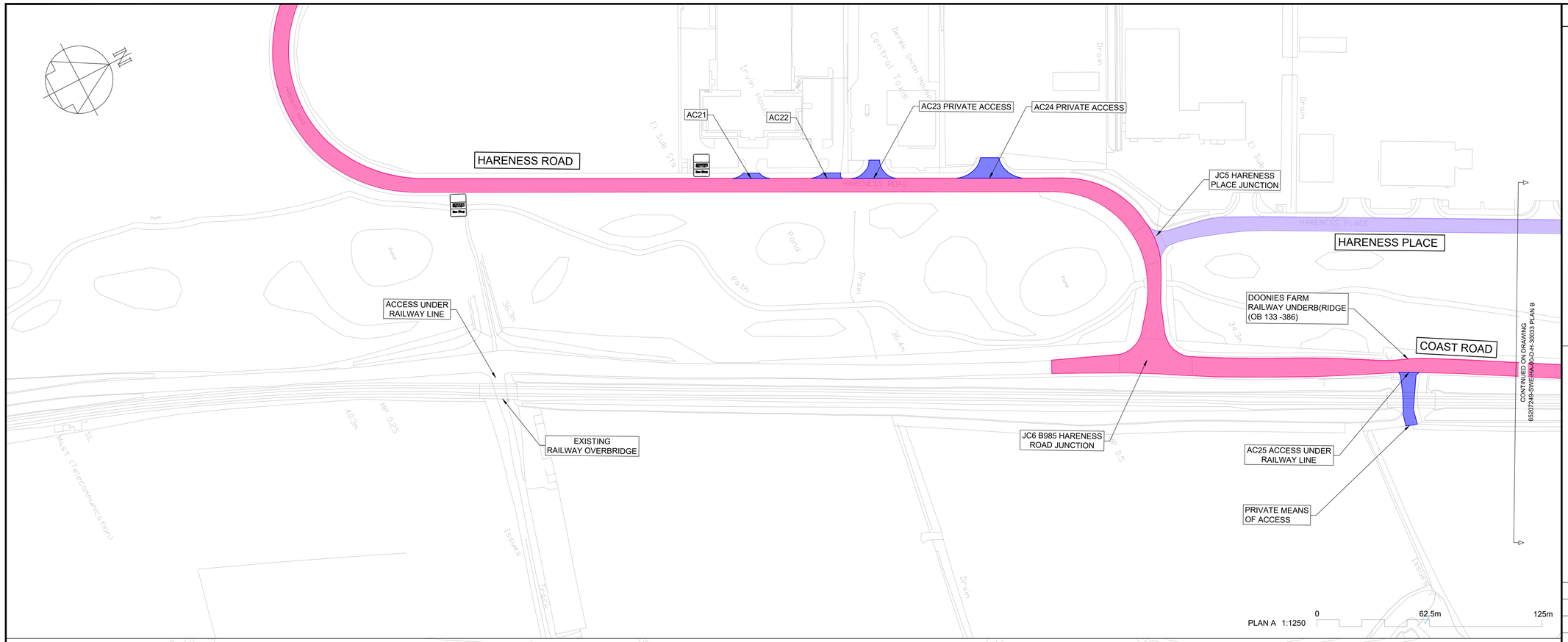

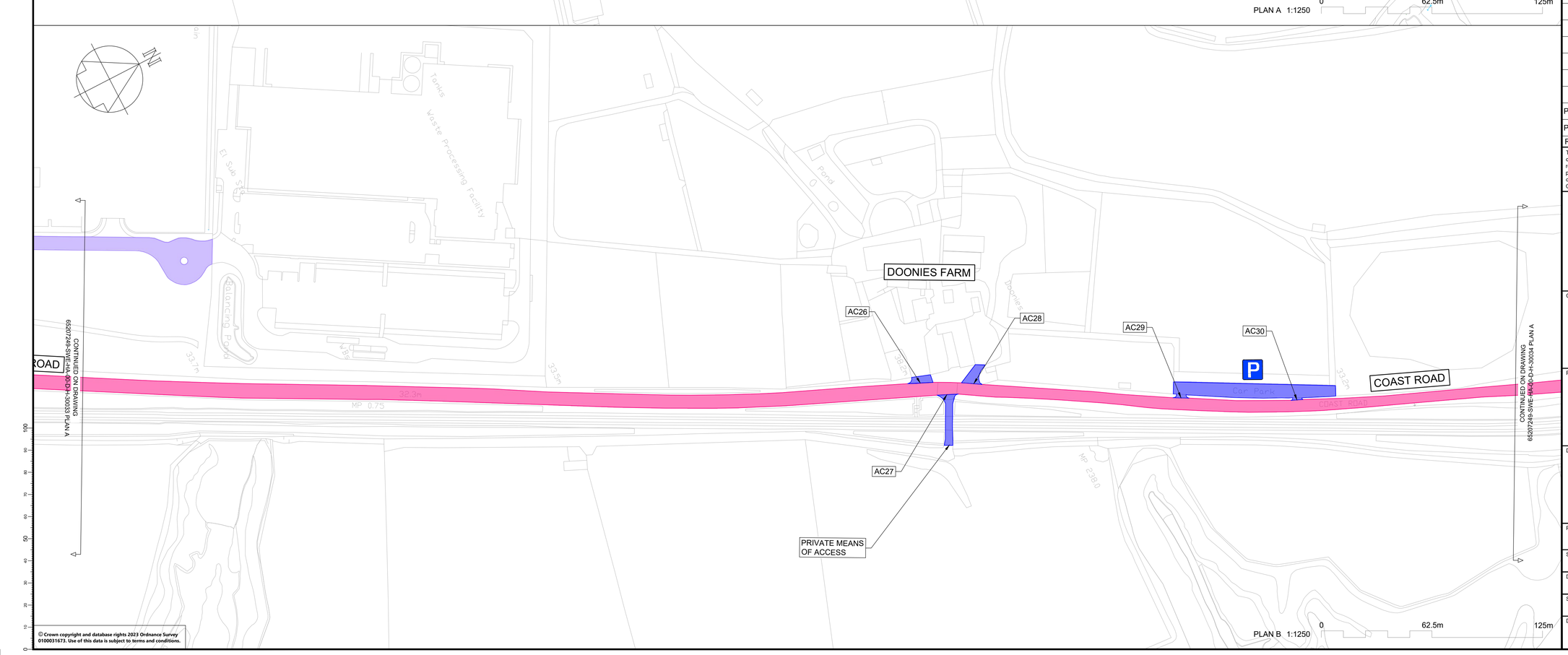

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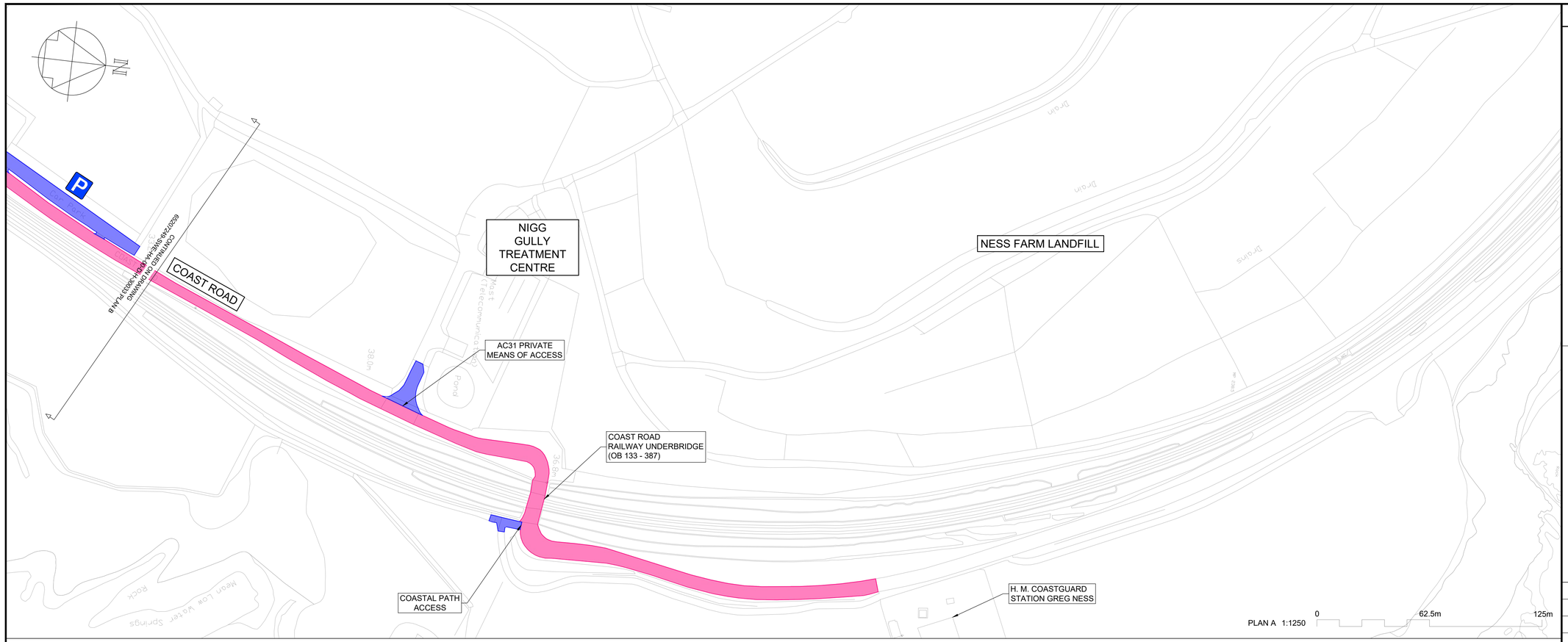

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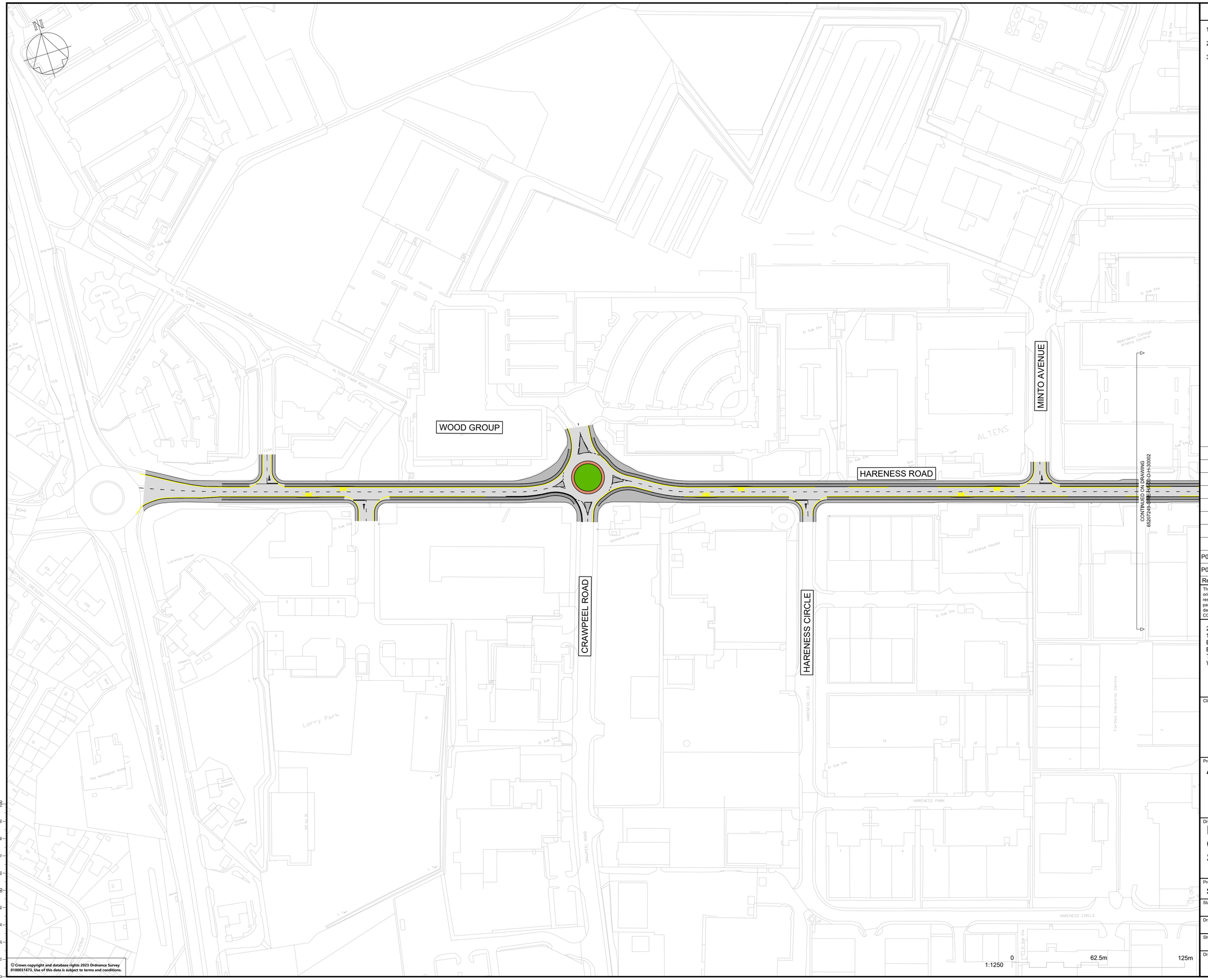

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FIGURE 3.1 ASHLR STAGE 3
GENERAL ARRANGEMENT
SHEET 1 OF 4

Project Stage

STAGE 3

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FIGURE 3.3 ASHLR STAGE 3 GENERAL ARRANGEMENT SHEET 3 OF 4

Project Stage

STAGE 3

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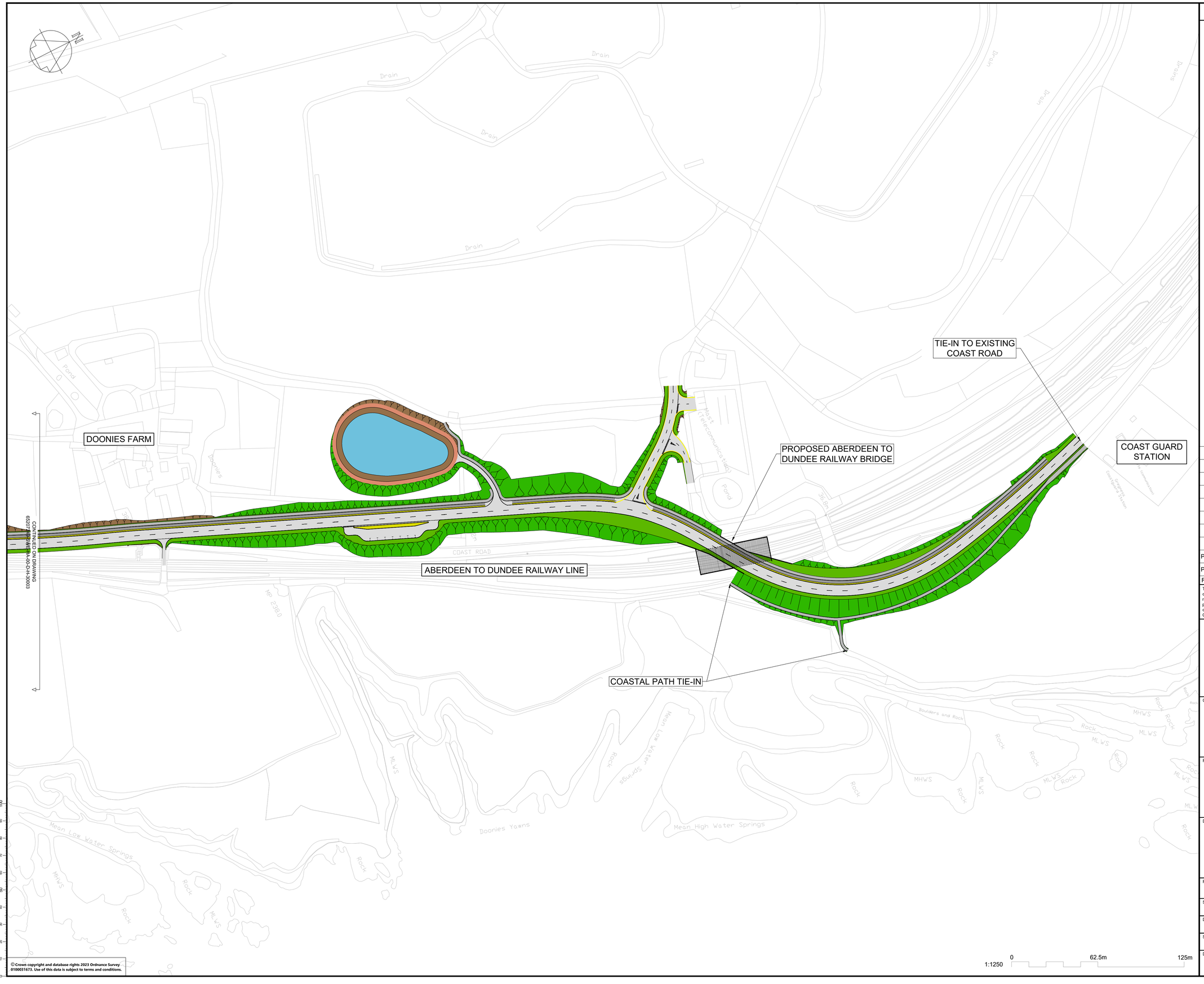

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FIGURE 3.4 ASHLR STAGE 3 GENERAL ARRANGEMENT SHEET 4 OF 4

Project Stage
STAGE 3

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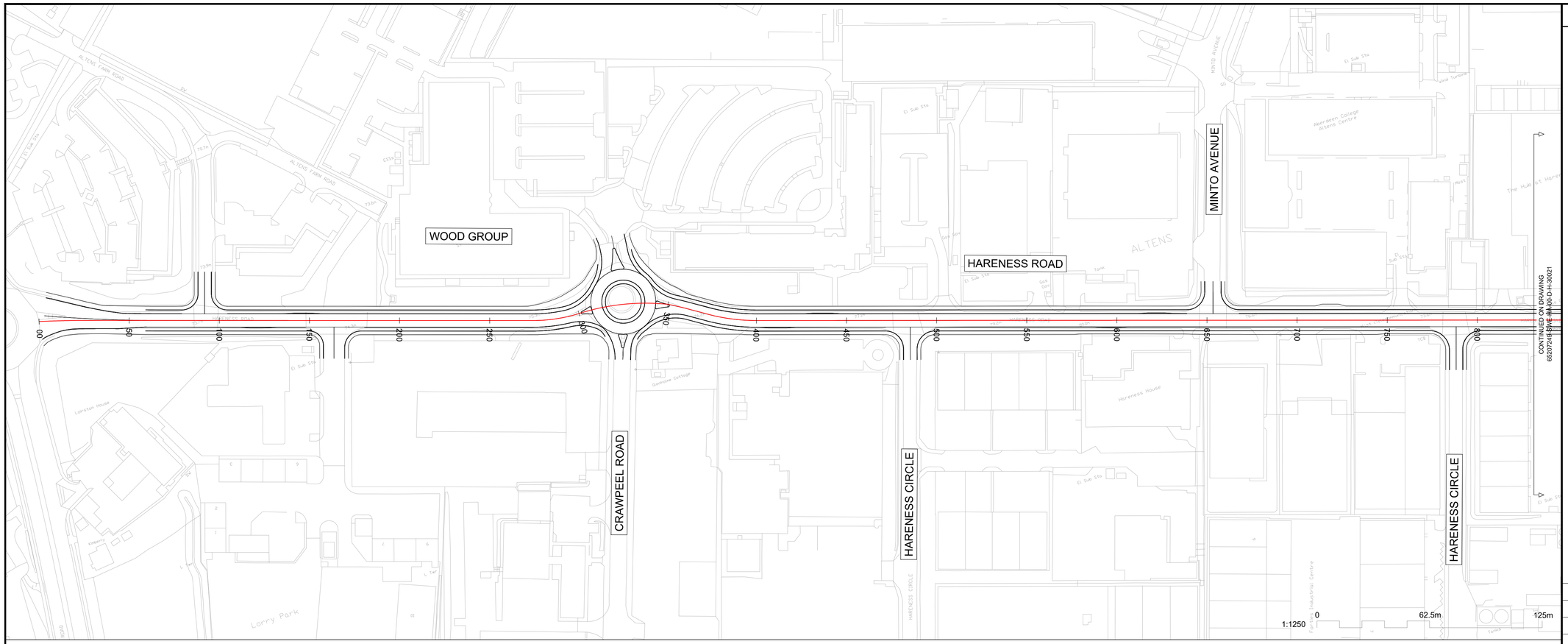

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Existing Ground	70.79	70.979	71.186	71.544	72.033	72.637	72.949	73.169	73.172	73.396	73.481	73.612	73.683	73.741	73.842	73.944	74.045	74.151	74.246	74.350	74.386	74.488	74.658	74.758	74.841	74.865	75.043	75.124	75.315	75.365	75.552	75.502
Proposed Levels	70.790	70.954	71.191	71.536	72.042	72.637	72.947	73.172	73.174	73.394	73.482	73.612	73.682	73.731	73.834	73.937	74.040	74.142	74.246	74.350	74.401	74.488	74.657	74.764	74.844	74.876	75.025	75.123	75.315	75.392	75.468	75.576
Level Difference	0.000	-0.025	0.005	-0.007	0.009	0.000	-0.001	0.002	0.001	-0.003	0.002	0.000	-0.001	-0.010	-0.008	-0.007	-0.006	-0.009	0.000	0.000	0.014	0.000	-0.001	0.007	0.003	0.010	-0.018	-0.001	0.000	0.027	-0.084	0.074
Horizontal Geometry	R: 800.000 L: 206.891							L =206.891																					R: 86.675 L: 35.036			

Chainage	330	340	350	360	370	380	390	400	410	420	430	440	450	460	470	480	490	500	510	520	530	540	550	560	570	580	590	600	610	620	630	640	650	660	670	680	690	700	710
Existing Ground	75.93	75.958	76.099	76.113	76.120	76.237	76.343	76.393	76.566	76.635	76.770	76.901	76.941	77.236	77.389	77.648	77.973	78.157	78.433	78.733	78.938	79.223	79.427	79.774	79.770	79.713	79.567	79.188	78.771	78.333	77.953	77.496	77.009	76.775	76.411	76.020	75.658	75.320	74.968
Proposed Levels		75.922	76.002	76.102	76.122	76.235	76.343	76.395	76.566	76.631	76.770	76.904	76.929	77.244	77.388	77.637	77.972	78.146	78.438	78.723	78.941	79.226	79.427	79.767	79.785	79.694	79.520	79.233	78.830	78.349	77.974	77.496	77.009	76.775	76.412	76.026	75.663	75.310	74.993
Level Difference		-0.036	-0.097	-0.011	0.002	-0.003	0.000	0.002	0.000	-0.004	0.000	0.003	-0.012	0.008	0.000	-0.011	-0.002	-0.010	0.006	-0.009	0.003	0.003	0.000	-0.007	0.015	-0.019	-0.047	0.044	0.059	0.016	0.021	0.000	0.000	0.000	0.002	0.005	0.005	-0.009	0.025
Horizontal Geometry	R: 152.526 L: 29.264			L =11.469		R: 106.000 L: 27.714		L =119.339													L =370.615																		

AL-S1-01 - LONGSECTION
SCALE: H 1:1250,V 1:500. DATUM: 50.000

AL-S2-01 - LONGSECTION
SCALE: H 1:1250,V 1:500. DATUM: 50.000

1:1250 0 62.5m 125m

NOTES

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Rev	Date	Amendment Details	Dr'n	Chk'	App'
P01	10/11/23	FOR REVIEW AND COMMENT	FZ	MW	GGra
P02	14/12/23	FOR REVIEW AND COMMENT	JPot	MW	GGra
P03	01/02/24	UPDATED AFTER COMMENTS	FZ	MW	GGra

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Web: www.sweco.co.uk

Client: ABERDEEN CITY COUNCIL

Project Title: Aberdeen South Harbour Link Road

Drawing Title: FIGURE 3.7 ASHLR STAGE 3 PLAN AND PROFILE SHEET 1 OF 5

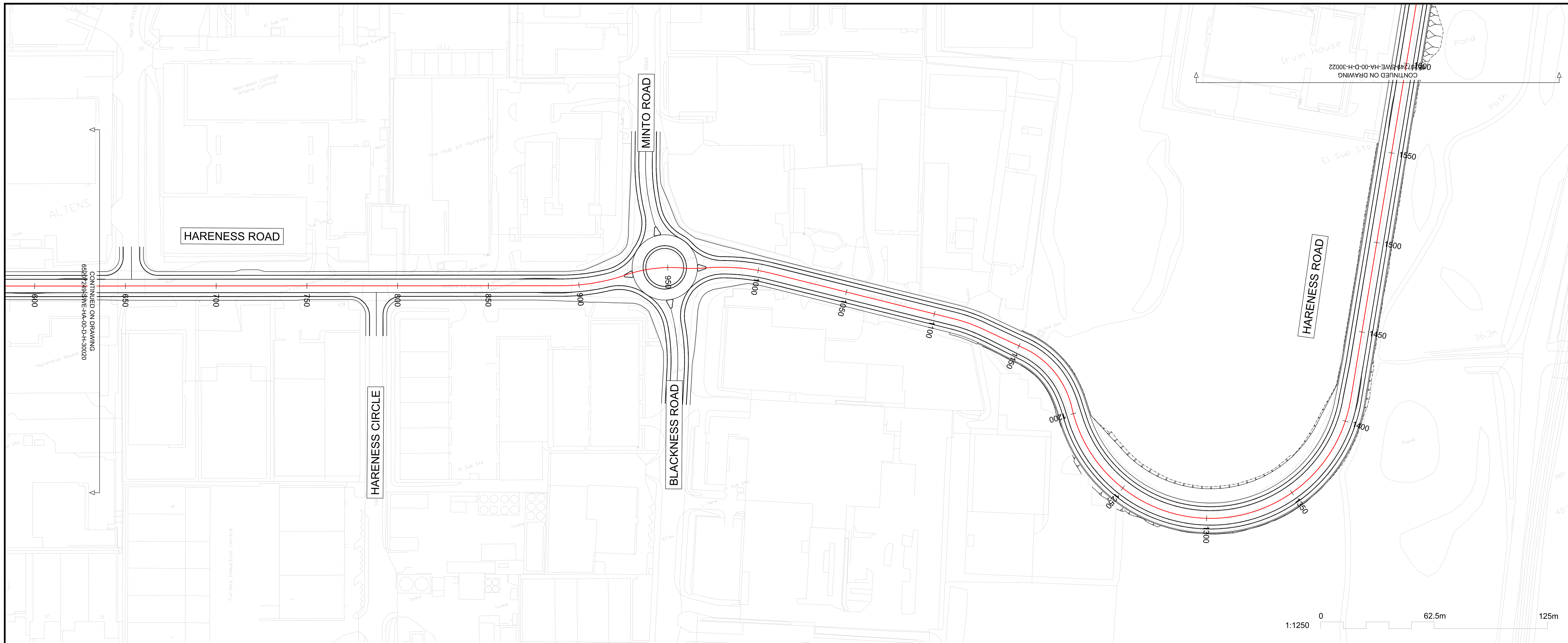
Project Stage: STAGE 3

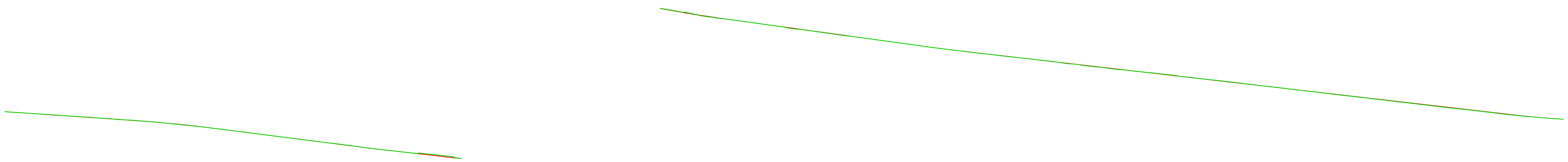
Status	Status Description
S5	FOR REVIEW AND ACCEPTANCE

Drawn	Designed	Checked	Approved
FZ	FZ	MW	GGra

Sheet Size	Scale	Sweco Ref	Revision
A1	1:1250		P03

Drawing Number: 65207249-SWE-HA-00-D-H-30020





Chainage	720	730	740	750	760	770	780	790	800	810	820	830	840	850	860	870	880	890	900	910	920	930	940
Existing Ground	74.968	74.718	74.461	74.182	73.943	73.660	73.379	73.053	72.679	72.263	71.797	71.308	70.798	70.292	69.789	69.275	68.794	68.257	67.745	67.287	66.986	66.572	65.955
Proposed Levels	74.993	74.712	74.441	74.169	73.898	73.617	73.341	73.044	72.699	72.288	71.810	71.300	70.790	70.281	69.771	69.261	68.751	68.242	67.739	67.297	66.856	66.388	
Level Difference	0.025	-0.006	-0.021	-0.013	-0.045	-0.043	-0.038	-0.009	0.020	0.025	0.013	-0.008	-0.007	-0.012	-0.018	-0.014	-0.043	-0.016	-0.006	0.010	-0.130	-0.183	
Horizontal Geometry	L =370.615																			R: 111.090 L: 70.382			

AL-S2-01 - LONGSECTION
SCALE: H 1:1250,V 1:500. DATUM: 50.000

Chainage	965	970	980	990	1000	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100	1110	1120	1130	1140	1150	1160	1170	1180
Existing Ground	64.898	64.568	63.899	63.177	62.654	62.103	61.546	60.926	60.418	59.834	59.333	58.787	58.246	57.684	57.152	56.676	56.182	55.724	55.294	54.841	54.301	53.838	53.377
Proposed Levels	64.870	64.504	63.823	63.211	62.654	62.102	61.550	60.998	60.446	59.894	59.342	58.789	58.237	57.685	57.153	56.670	56.207	55.745	55.282	54.819	54.357	53.894	53.431
Level Difference	-0.029	-0.064	-0.076	0.034	0.000	-0.002	0.004	0.072	0.028	0.060	0.008	0.003	-0.009	0.001	0.001	-0.006	0.025	0.021	-0.012	-0.022	0.056	0.056	0.054

Chainage	1190	1200	1210	1220	1230	1240	1250	1260	1270	1280	1290	1300	1310	1320	1330	1340	1350	1360	1370	1380	1390	1400
Existing Ground	52.958	52.529	52.106	51.617	51.141	50.705	50.211	49.753	49.269	48.794	48.312	47.852	47.384	46.909	46.443	45.966	45.519	45.062	44.585	44.145	43.803	43.535
Proposed Levels	52.969	52.506	52.044	51.581	51.118	50.656	50.193	49.730	49.268	48.805	48.342	47.880	47.417	46.954	46.492	46.029	45.567	45.104	44.641	44.185	43.809	43.533
Level Difference	0.011	-0.023	-0.062	-0.036	-0.023	-0.049	-0.018	-0.023	-0.001	0.011	0.030	0.028	0.033	0.045	0.049	0.063	0.048	0.042	0.057	0.040	0.007	-0.002

Horizontal Geometry	R: 109.324 L: 103.928 / L =103.928 / R: 90.000 L: 17.364 / L =24.796 / R: 48.000 L: 43.679 / R: 78.338 L: 215.692
Vertical Geometry	R =1451.984 K =14.520 L =34.263 / G =-5.521% L =97.436 / R =2000.000 K =20.000 L =17.889 / G =-4.626% L =267.333 / R =1000.000 K =10.000 L =36.374

AL-S3-01 - LONGSECTION
SCALE: H 1:1250,V 1:500. DATUM: 20.000

1:1250 0 62.5m 125m

NOTES

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Rev	Date	Amendment Details	Dr'n	Chk'	App'
P01	10/11/23	FOR REVIEW AND COMMENT	FZ	MW	GGra
P02	14/12/23	FOR REVIEW AND COMMENT	JPot	MW	GGra
P03	01/02/24	UPDATED AFTER COMMENTS	FZ	MW	GGra

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Client
ABERDEEN CITY COUNCIL

Project Title
Aberdeen South Harbour Link Road

Drawing Title
FIGURE 3.8 ASHLR STAGE 3
PLAN AND PROFILE
SHEET 2 OF 5

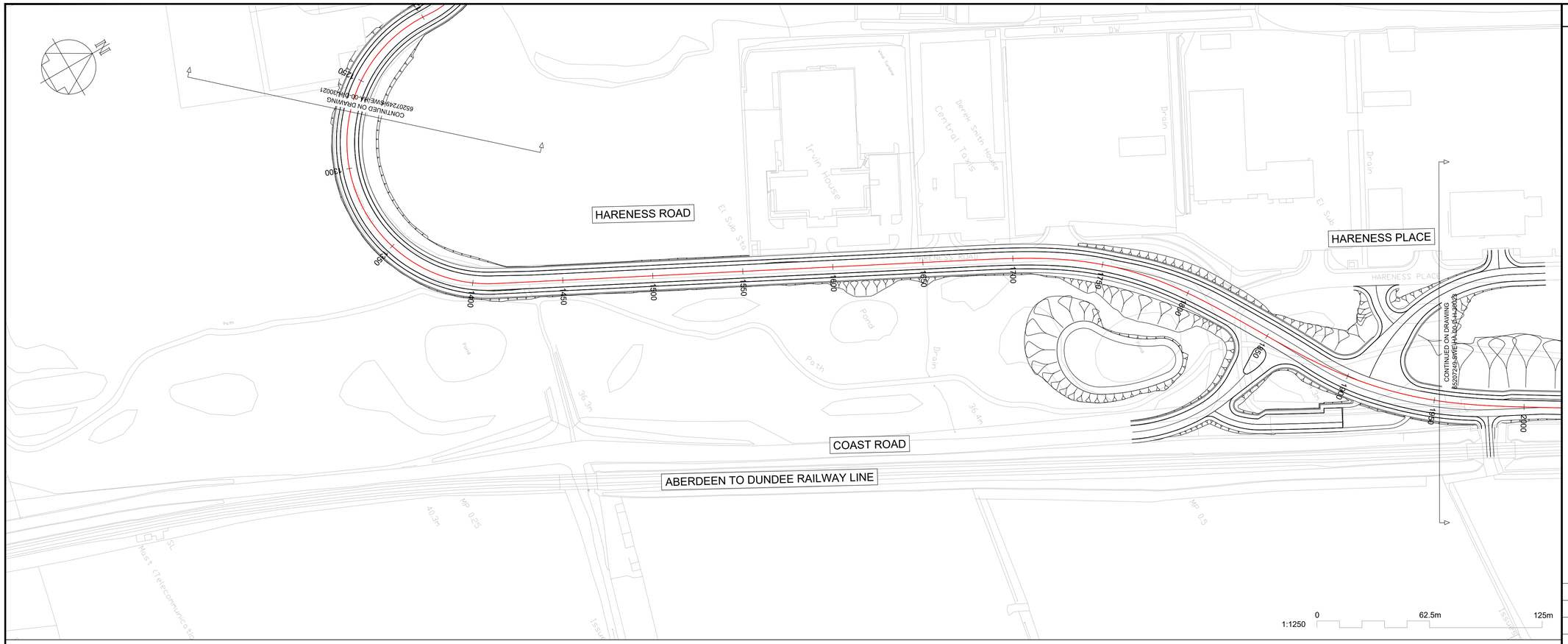
Project Stage
STAGE 3

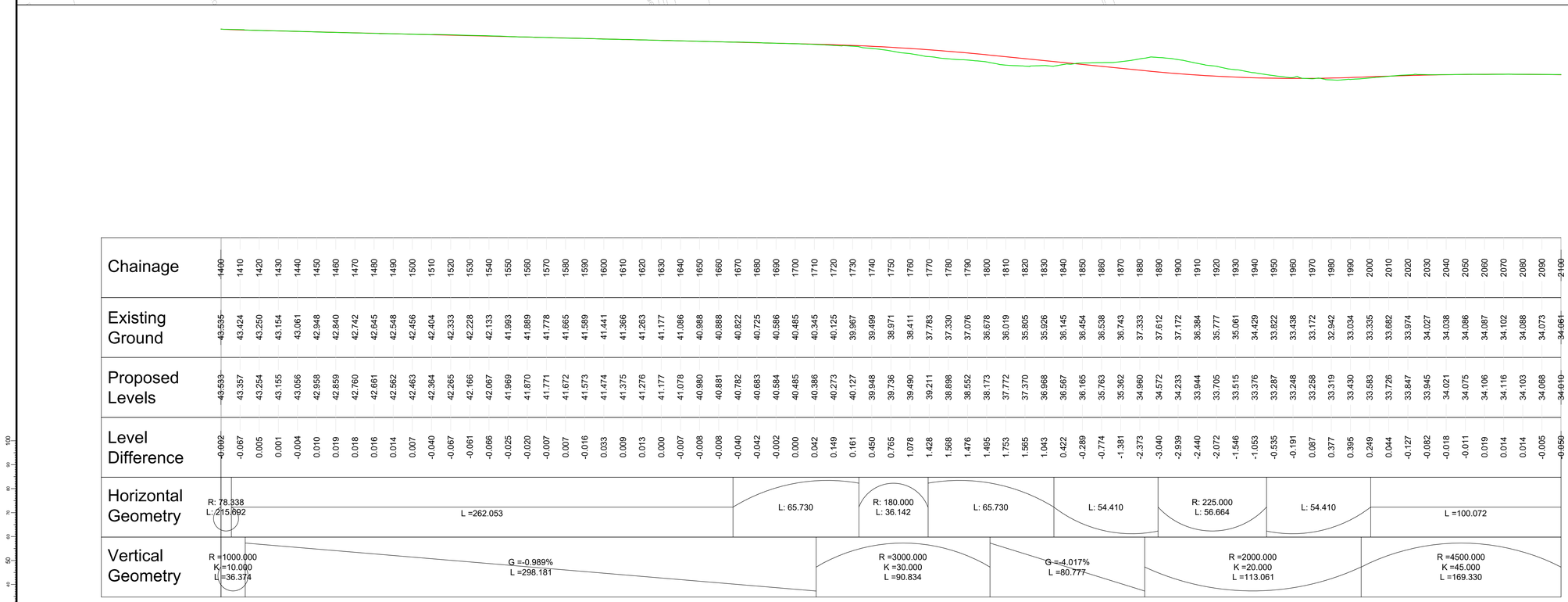
Status	Status Description
S5	FOR REVIEW AND ACCEPTANCE

Drawn	Designed	Checked	Approved
FZ	FZ	MW	GGra

Sheet Size	Scale	Sweco Ref	Revision
A1	1:1250		P03

Drawing Number
65207249-SWE-HA-00-D-H-30021





AL-S3-01 - LONGSECTION
SCALE: H 1:1250,V 1:500. DATUM: 0.000

1:1250 0 62.5m 125m

NOTES

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IMPORTANT

SAFETY, HEALTH & ENVIRONMENTAL INFORMATION

TO BE READ IN CONJUNCTION WITH HAZARD REGISTER DOC. REF: 6520XXXX-SWE-XX-00-L-X-00001.

HAZARD REF AND BRIEF DESCRIPTION OF HAZARD:-

	HAZARD REF	BRIEF HAZARD DESCRIPTION

Rev	Date	Amendment Details	Dr'n	Chk'	App'
P01	10/11/23	FOR REVIEW AND COMMENT	FZ	MW	GGra
P02	14/12/23	FOR REVIEW AND COMMENT	JPot	MW	GGra
P03	01/02/24	UPDATED AFTER COMMENTS	FZ	MW	GGra

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Web: www.sweco.co.uk

Client: ABERDEEN CITY COUNCIL

Project Title: Aberdeen South Harbour Link Road

Drawing Title: FIGURE 3.9 ASHLR STAGE 3 PLAN AND PROFILE SHEET 3 OF 5

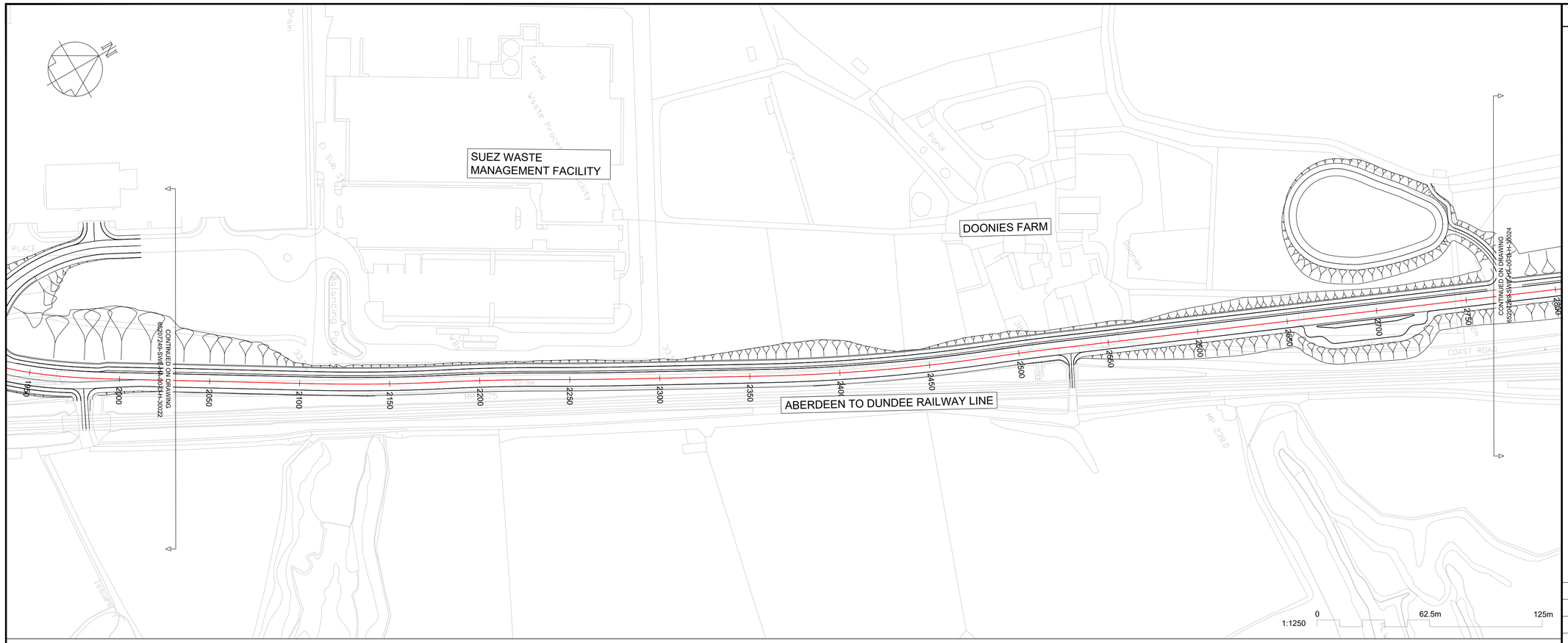
Project Stage: STAGE 3

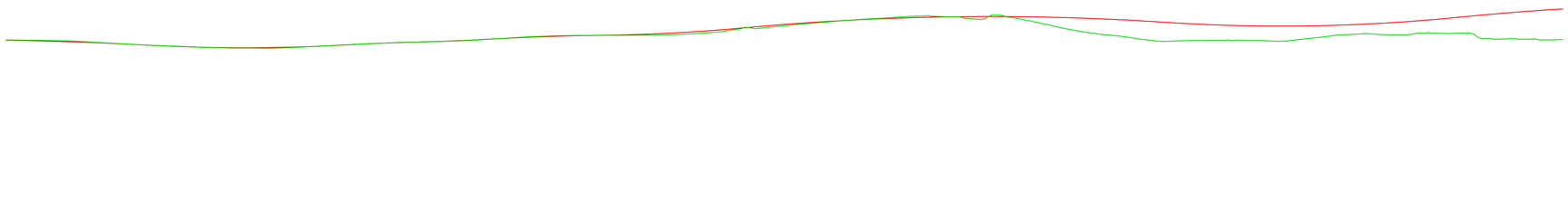
Status	Status Description
S5	FOR REVIEW AND ACCEPTANCE

Drawn	Designed	Checked	Approved
FZ	FZ	MW	GGra

Sheet Size	Scale	Sweco Ref	Revision
A1	1:1250		P03

Drawing Number: 65207249-SWE-HA-00-D-H-30022





Chainage	2100	2110	2120	2130	2140	2150	2160	2170	2180	2190	2200	2210	2220	2230	2240	2250	2260	2270
Existing Ground	34.061	34.010	33.960	33.853	33.635	33.406	33.184	33.017	32.862	32.701	32.606	32.573	32.579	32.717	32.912	33.121	33.322	33.481
Proposed Levels	34.010	33.931	33.829	33.705	33.559	33.390	33.200	32.996	32.834	32.722	32.660	32.647	32.685	32.773	32.911	33.099	33.309	33.488
Level Difference	-0.050	-0.079	-0.131	-0.148	-0.077	-0.015	0.015	-0.021	-0.028	0.021	0.053	0.074	0.106	0.056	-0.002	-0.022	-0.013	0.007

Chainage	2280	2290	2300	2310	2320	2330	2340	2350	2360	2370	2380	2390	2400	2410	2420	2430	2440	2450
Existing Ground	33.610	33.714	33.831	34.009	34.254	34.501	34.703	34.823	34.867	34.887	34.898	34.927	35.022	35.214	35.486	36.042	36.214	36.618
Proposed Levels	33.633	33.746	33.871	34.047	34.263	34.457	34.617	34.745	34.838	34.901	34.987	35.124	35.310	35.546	35.833	36.169	36.526	36.850
Level Difference	0.024	0.031	0.040	0.038	0.009	-0.044	-0.086	-0.078	-0.029	0.014	0.089	0.196	0.288	0.333	0.346	0.127	0.312	0.232

Chainage	2460	2470	2480	2490	2500	2510	2520	2530	2540	2550	2560	2570	2580	2590	2600	2610	2620	2630
Existing Ground	36.995	37.323	37.631	37.879	38.150	38.355	38.267	38.091	37.896	38.200	37.523	36.659	35.806	35.196	34.767	34.203	33.780	33.909
Proposed Levels	37.141	37.398	37.623	37.814	37.971	38.095	38.186	38.244	38.268	38.259	38.217	38.141	38.032	37.889	37.714	37.504	37.262	37.020
Level Difference	0.146	0.075	-0.009	-0.065	-0.179	-0.259	-0.080	0.153	0.372	0.059	0.693	1.482	2.226	2.693	2.946	3.302	3.482	3.111

Chainage	2640	2650	2660	2670	2680	2690	2700	2710	2720	2730	2740	2750	2760	2770	2780	2790	2800
Existing Ground	33.987	34.007	33.952	33.842	34.064	34.505	34.965	35.173	35.010	34.973	35.350	35.222	35.122	34.198	34.207	34.067	34.143
Proposed Levels	36.828	36.686	36.594	36.552	36.560	36.618	36.726	36.884	37.092	37.351	37.659	38.017	38.404	38.763	39.088	39.380	39.639
Level Difference	2.841	2.680	2.643	2.710	2.497	2.113	1.762	1.712	2.083	2.377	2.309	2.794	3.282	4.565	4.881	5.313	5.496

Horizontal Geometry	L =100.072	R: 1020.000 L: 74.320	R: 1020.000 L: 53.634	R: 2040.000 L: 47.792	L =74.065	R: 1020.000 L: 129.355	R: 1020.000 L: 30.375	L =287.845	L: 55.210

Vertical Geometry	R =4500.000 K =45.000 L =169.330	R =2000.000 K =20.000 L =87.013	R =3000.000 K =30.000 L =37.461	R =2000.000 K =20.000 L =25.806	R =3000.000 K =30.000 L =52.709	R =2000.000 K =20.000 L =63.647	R =3000.000 K =30.000 L =189.405	R =2000.000 K =20.000 L =132.117	R =3000.000 K =30.000 L =241.617

AL-S3-01 - LONGSECTION
SCALE: H 1:1250,V 1:500. DATUM: 0.000

1:1250 0 62.5m 125m

NOTES

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IMPORTANT

SAFETY, HEALTH & ENVIRONMENTAL INFORMATION

TO BE READ IN CONJUNCTION WITH HAZARD REGISTER DOC. REF: 6520XXXX-SWE-XX-00-L-X-00001.

HAZARD REF AND BRIEF DESCRIPTION OF HAZARD:-

⚠	HAZARD REF	BRIEF HAZARD DESCRIPTION

Rev	Date	Amendment Details	Dr'n	Chk'	App'
P01	10/11/23	FOR REVIEW AND COMMENT	FZ	MW	GGra
P02	14/12/23	FOR REVIEW AND COMMENT	JPot	MW	GGra
P03	01/02/24	UPDATED AFTER COMMENTS	FZ	MW	GGra

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Client
ABERDEEN CITY COUNCIL

Project Title
Aberdeen South Harbour Link Road

Drawing Title
FIGURE 3.10 ASHLR STAGE 3
PLAN AND PROFILE
SHEET 4 OF 5

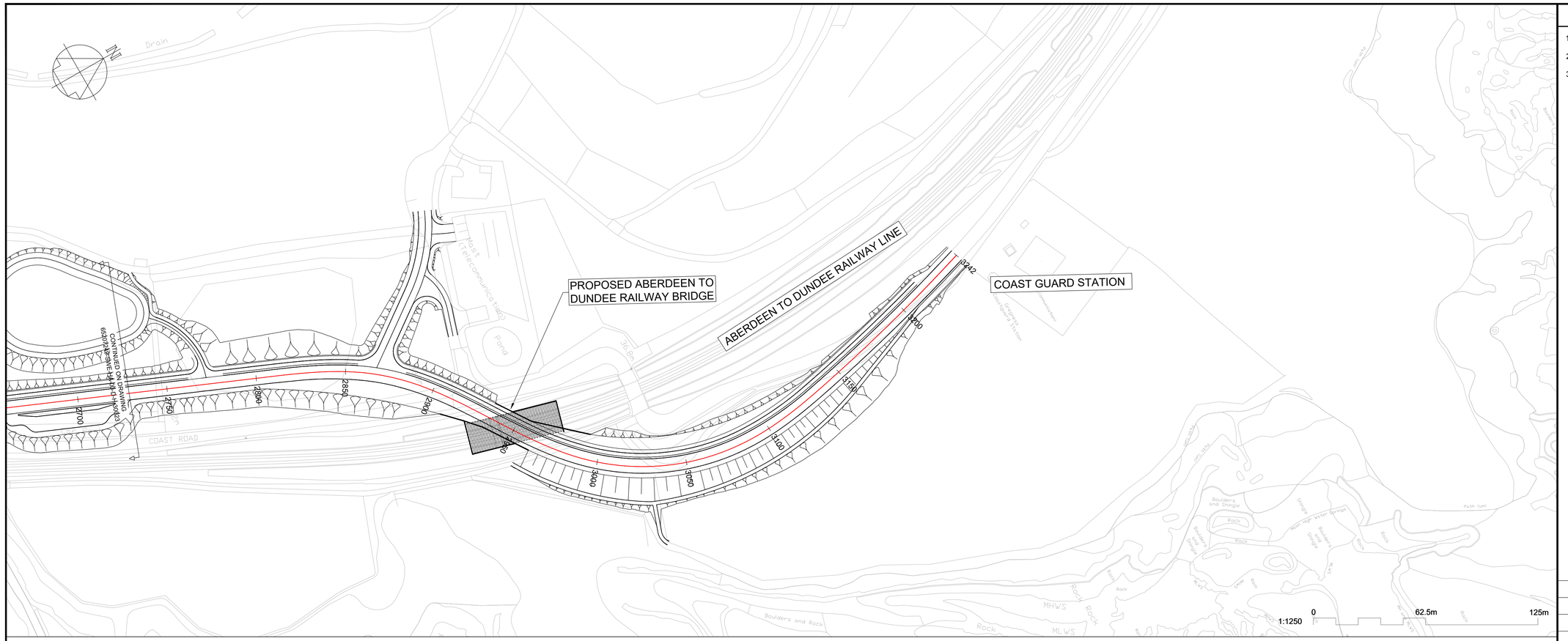
Project Stage
STAGE 3

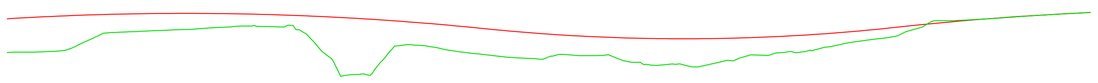
Status	Status Description
S5	FOR REVIEW AND ACCEPTANCE

Drawn	Designed	Checked	Approved
FZ	FZ	MW	GGra

Sheet Size	Scale	Sweco Ref	Revision
A1	1:1250		P03

Drawing Number
65207249-SWE-HA-00-D-H-30023





Chainage	2800	2810	2820	2830	2840	2850	2860	2870	2880	2890	2900	2910	2920	2930	2940	2950	2960	2970	2980	2990	3000	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3180	3190	3200	3210	3220	3230	3242
Existing Ground	34.143	34.198	34.351	35.568	37.308	37.512	37.690	37.858	38.066	38.288	38.465	38.322	37.632	33.828	30.507	31.378	35.270	35.251	34.516	33.985	33.542	33.229	33.259	33.732	33.627	33.009	32.164	32.209	31.775	32.502	33.363	33.658	34.273	34.601	35.452	36.107	36.612	37.899	39.331	39.410	39.634	39.905	40.166	40.416	40.53
Proposed Levels	39.639	39.864	40.056	40.214	40.340	40.431	40.490	40.515	40.507	40.466	40.391	40.283	40.141	39.966	39.758	39.517	39.242	38.934	38.592	38.218	37.821	37.466	37.160	36.905	36.699	36.544	36.438	36.382	36.377	36.421	36.515	36.660	36.854	37.098	37.393	37.737	38.131	38.554	38.948	39.309	39.636	39.930	40.190	40.418	40.527
Level Difference	5.496	5.666	5.705	4.646	3.032	2.919	2.800	2.657	2.441	2.178	1.926	1.961	2.510	6.138	9.251	8.139	3.972	3.683	4.076	4.232	4.279	4.237	3.901	3.173	3.073	3.535	4.274	4.174	4.602	3.919	3.152	3.002	2.581	2.497	1.940	1.629	1.519	0.656	-0.383	-0.101	0.002	0.024	0.024	0.001	0.000
Horizontal Geometry	L: 55.210		R: 127.000 L: 21.082		L: 55.210		L: 55.210			R: 127.000 L: 95.242				L: 55.210				R: 1020.000 L: 106.781																											
Vertical Geometry	R =3000.000 K =30.000 L =241.617																												R =2000.904 K =20.009 L =168.285																R =3000.000 K =30.000 L =79.034				

AL-S3-01 - LONGSECTION
SCALE: H 1:1250,V 1:500. DATUM: 0.000

1:1250 0 62.5m 125m

NOTES

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Rev	Date	Amendment Details	Dr'n	Chk'	App'
P01	10/11/23	FOR REVIEW AND COMMENT	FZ	MW	GGra
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Client
ABERDEEN CITY COUNCIL

Project Title
Aberdeen South Harbour Link Road

Drawing Title
FIGURE 3.11 ASHLR STAGE 3
PLAN AND PROFILE
SHEET 5 OF 5

Project Stage
STAGE 3

Status	Status Description
S5	FOR REVIEW AND ACCEPTANCE

Drawn	Designed	Checked	Approved
FZ	FZ	MW	GGra

Sheet Size	Scale	Sweco Ref	Revision
A1	1:1250		P03

Drawing Number
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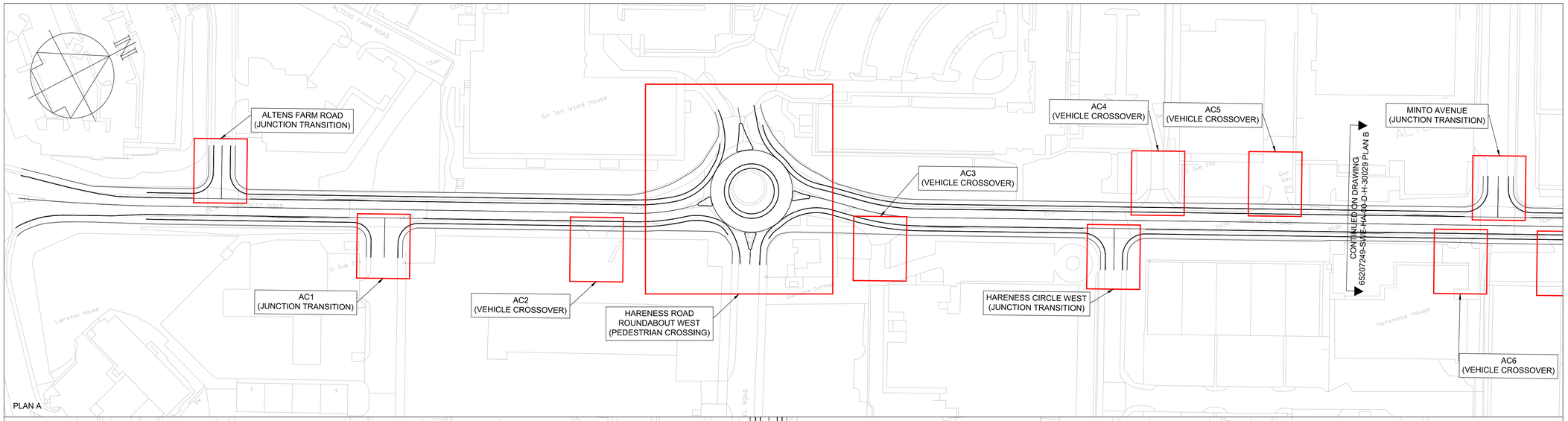

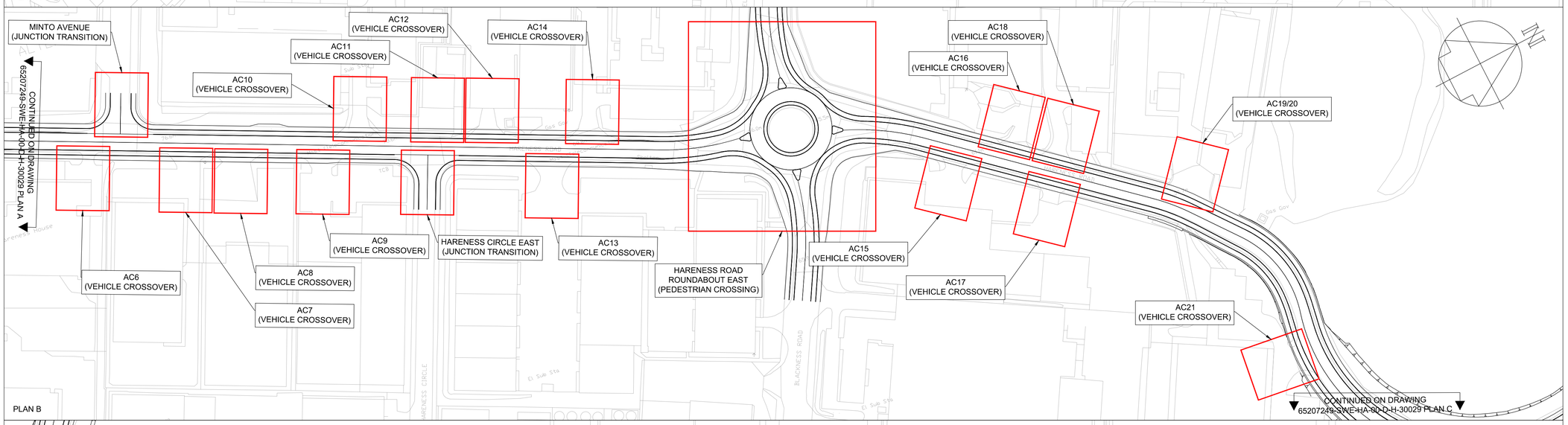

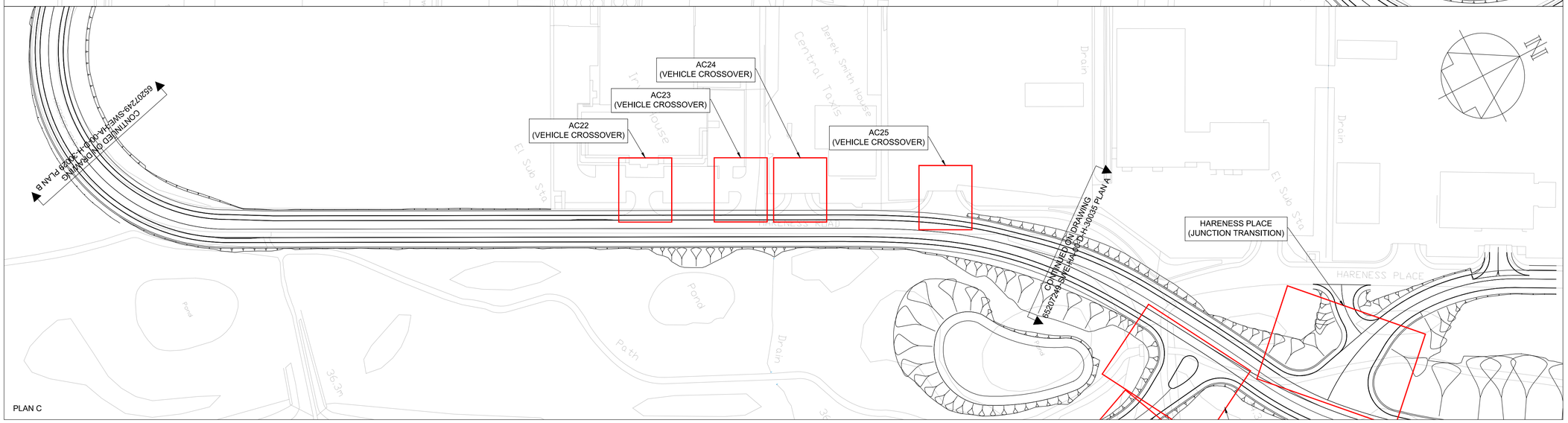

1:1000 0 50m 100m

NOTES

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P01	14/12/23	FOR REVIEW AND COMMENT	JPot	MW	GGra
P02	01/02/24	UPDATED AFTER COMMENTS	FZ	MW	GGra

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Project Title: Aberdeen South Harbour Link Road

Drawing Title: FIGURE 3.12 ASHLR JUNCTIONS AND ACCESSES SHEET 1 OF 2

Project Stage: STAGE 3

Status	Status Description		
S5	FOR REVIEW AND ACCEPTANCE		
Drawn	Designed	Checked	Approved
FZ	FZ	MW	GGra
Sheet Size	Scale	Sweco Ref	Revision
A1	1:1000		P02

Drawing Number: 65207249-SWE-HA-00-D-H-30029

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HARENESS PLACE (JUNCTION TRANSITION)

AC26 (COAST ROAD PARKING ACCESS)

COAST ROAD SOUTH (JUNCTION TRANSITION)

AC27 (NO CROSSING REQUIRED)

CONTINUED ON DRAWING 65207249-SWE-HA00-D-H-30035 PLAN B

CONTINUED ON DRAWING 65207249-SWE-HA00-D-H-30035 PLAN C

PLAN A

AC32 (GULLY TREATMENT ACCESS)

AC33 (ACCESS TO EXISTING POND))

AC30 (JUNCTION TRANSITION)

AC31 (JUNCTION TRANSITION)

CONTINUED ON DRAWING 65207249-SWE-HA00-D-H-30035 PLAN A

CONTINUED ON DRAWING 65207249-SWE-HA00-D-H-30035 PLAN C

AC28 (NO CROSSING REQUIRED)

AC29(a) (COAST ROAD PARKING ACCESSES)

AC29(b) (COAST ROAD PARKING ACCESSES)

PLAN B

AC30 (JUNCTION TRANSITION)

AC31 (JUNCTION TRANSITION)

CONTINUED ON DRAWING 65207249-SWE-HA00-D-H-30035 PLAN B

AC29(b) (COAST ROAD PARKING ACCESSES)

PLAN C

1:1000 0 50m 100m

Rev	Date	Amendment Details	Dr'n	Chk'	App'
P01	14/12/23	FOR REVIEW AND COMMENT	JPot	MW	GGra
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Client: ABERDEEN CITY COUNCIL

Project Title: Aberdeen South Harbour Link Road

Drawing Title: FIGURE 3.13 ASHLR JUNCTIONS AND ACCESSES SHEET 2 OF 2

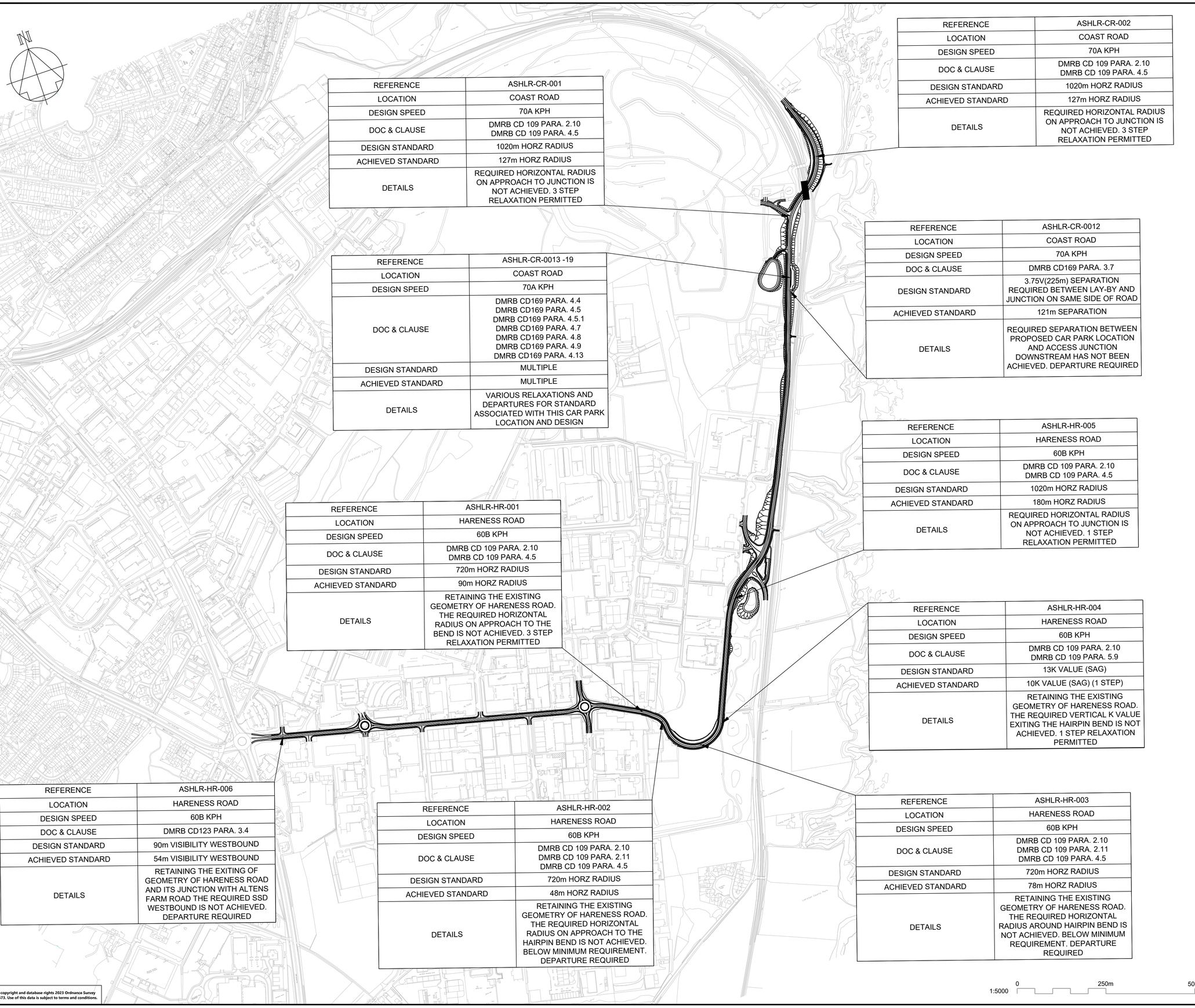
Project Stage: STAGE 3

Status	Status Description
S5	FOR REVIEW AND ACCEPTANCE

Drawn	Designed	Checked	Approved
FZ	FZ	MW	GGra

Sheet Size	Scale	Sweco Ref	Revision
A1	1:1000		P02

Drawing Number: 65207249-SWE-HA-00-D-H-30035



REFERENCE	ASHLR-CR-001
LOCATION	COAST ROAD
DESIGN SPEED	70A KPH
DOC & CLAUSE	DMRB CD 109 PARA. 2.10 DMRB CD 109 PARA. 4.5
DESIGN STANDARD	1020m HORZ RADIUS
ACHIEVED STANDARD	127m HORZ RADIUS
DETAILS	REQUIRED HORIZONTAL RADIUS ON APPROACH TO JUNCTION IS NOT ACHIEVED. 3 STEP RELAXATION PERMITTED

REFERENCE	ASHLR-CR-002
LOCATION	COAST ROAD
DESIGN SPEED	70A KPH
DOC & CLAUSE	DMRB CD 109 PARA. 2.10 DMRB CD 109 PARA. 4.5
DESIGN STANDARD	1020m HORZ RADIUS
ACHIEVED STANDARD	127m HORZ RADIUS
DETAILS	REQUIRED HORIZONTAL RADIUS ON APPROACH TO JUNCTION IS NOT ACHIEVED. 3 STEP RELAXATION PERMITTED

REFERENCE	ASHLR-CR-0013 -19
LOCATION	COAST ROAD
DESIGN SPEED	70A KPH
DOC & CLAUSE	DMRB CD169 PARA. 4.4 DMRB CD169 PARA. 4.5 DMRB CD169 PARA. 4.5.1 DMRB CD169 PARA. 4.7 DMRB CD169 PARA. 4.8 DMRB CD169 PARA. 4.9 DMRB CD169 PARA. 4.13
DESIGN STANDARD	MULTIPLE
ACHIEVED STANDARD	MULTIPLE
DETAILS	VARIOUS RELAXATIONS AND DEPARTURES FOR STANDARD ASSOCIATED WITH THIS CAR PARK LOCATION AND DESIGN

REFERENCE	ASHLR-CR-0012
LOCATION	COAST ROAD
DESIGN SPEED	70A KPH
DOC & CLAUSE	DMRB CD169 PARA. 3.7
DESIGN STANDARD	3.75V(225m) SEPARATION REQUIRED BETWEEN LAY-BY AND JUNCTION ON SAME SIDE OF ROAD
ACHIEVED STANDARD	121m SEPARATION
DETAILS	REQUIRED SEPARATION BETWEEN PROPOSED CAR PARK LOCATION AND ACCESS JUNCTION DOWNSTREAM HAS NOT BEEN ACHIEVED. DEPARTURE REQUIRED

REFERENCE	ASHLR-HR-005
LOCATION	HARENESS ROAD
DESIGN SPEED	60B KPH
DOC & CLAUSE	DMRB CD 109 PARA. 2.10 DMRB CD 109 PARA. 4.5
DESIGN STANDARD	1020m HORZ RADIUS
ACHIEVED STANDARD	180m HORZ RADIUS
DETAILS	REQUIRED HORIZONTAL RADIUS ON APPROACH TO JUNCTION IS NOT ACHIEVED. 1 STEP RELAXATION PERMITTED

REFERENCE	ASHLR-HR-001
LOCATION	HARENESS ROAD
DESIGN SPEED	60B KPH
DOC & CLAUSE	DMRB CD 109 PARA. 2.10 DMRB CD 109 PARA. 4.5
DESIGN STANDARD	720m HORZ RADIUS
ACHIEVED STANDARD	90m HORZ RADIUS
DETAILS	RETAINING THE EXISTING GEOMETRY OF HARENESS ROAD. THE REQUIRED HORIZONTAL RADIUS ON APPROACH TO THE BEND IS NOT ACHIEVED. 3 STEP RELAXATION PERMITTED

REFERENCE	ASHLR-HR-004
LOCATION	HARENESS ROAD
DESIGN SPEED	60B KPH
DOC & CLAUSE	DMRB CD 109 PARA. 2.10 DMRB CD 109 PARA. 5.9
DESIGN STANDARD	13K VALUE (SAG)
ACHIEVED STANDARD	10K VALUE (SAG) (1 STEP)
DETAILS	RETAINING THE EXISTING GEOMETRY OF HARENESS ROAD. THE REQUIRED VERTICAL K VALUE EXITING THE HAIRPIN BEND IS NOT ACHIEVED. 1 STEP RELAXATION PERMITTED

REFERENCE	ASHLR-HR-006
LOCATION	HARENESS ROAD
DESIGN SPEED	60B KPH
DOC & CLAUSE	DMRB CD123 PARA. 3.4
DESIGN STANDARD	90m VISIBILITY WESTBOUND
ACHIEVED STANDARD	54m VISIBILITY WESTBOUND
DETAILS	RETAINING THE EXITING OF GEOMETRY OF HARENESS ROAD AND ITS JUNCTION WITH ALTENS FARM ROAD THE REQUIRED SSD WESTBOUND IS NOT ACHIEVED. DEPARTURE REQUIRED

REFERENCE	ASHLR-HR-002
LOCATION	HARENESS ROAD
DESIGN SPEED	60B KPH
DOC & CLAUSE	DMRB CD 109 PARA. 2.10 DMRB CD 109 PARA. 2.11 DMRB CD 109 PARA. 4.5
DESIGN STANDARD	720m HORZ RADIUS
ACHIEVED STANDARD	48m HORZ RADIUS
DETAILS	RETAINING THE EXISTING GEOMETRY OF HARENESS ROAD. THE REQUIRED HORIZONTAL RADIUS ON APPROACH TO THE HAIRPIN BEND IS NOT ACHIEVED. BELOW MINIMUM REQUIREMENT. DEPARTURE REQUIRED

REFERENCE	ASHLR-HR-003
LOCATION	HARENESS ROAD
DESIGN SPEED	60B KPH
DOC & CLAUSE	DMRB CD 109 PARA. 2.10 DMRB CD 109 PARA. 2.11 DMRB CD 109 PARA. 4.5
DESIGN STANDARD	720m HORZ RADIUS
ACHIEVED STANDARD	78m HORZ RADIUS
DETAILS	RETAINING THE EXISTING GEOMETRY OF HARENESS ROAD. THE REQUIRED HORIZONTAL RADIUS AROUND HAIRPIN BEND IS NOT ACHIEVED. BELOW MINIMUM REQUIREMENT. DEPARTURE REQUIRED

NOTES

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FIGURE 5.1
ASHLR DEPARTURES
SUMMARY PLAN

Project Stage

STAGE 3

Status	Status Description
S5	FOR REVIEW AND ACCEPTANCE

Drawn	Designed	Checked	Approved
FZ	FZ	MW	GGra

Sheet Size	Scale	Sweco Ref	Revision
A1	1:5000		P02

Drawing Number

65207249-SWE-HA-00-D-H-30036

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KEY TO SYMBOLS

- NETWORK 1
- NETWORK 2
- NETWORK 3
- NETWORK 4
- NETWORK 5

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P01	14/12/23	FOR REVIEW AND COMMENT	JPot	MW	GGra
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FIGURE 5.2 ASHLR
DRAINAGE NETWORK

Project Stage

STAGE 3

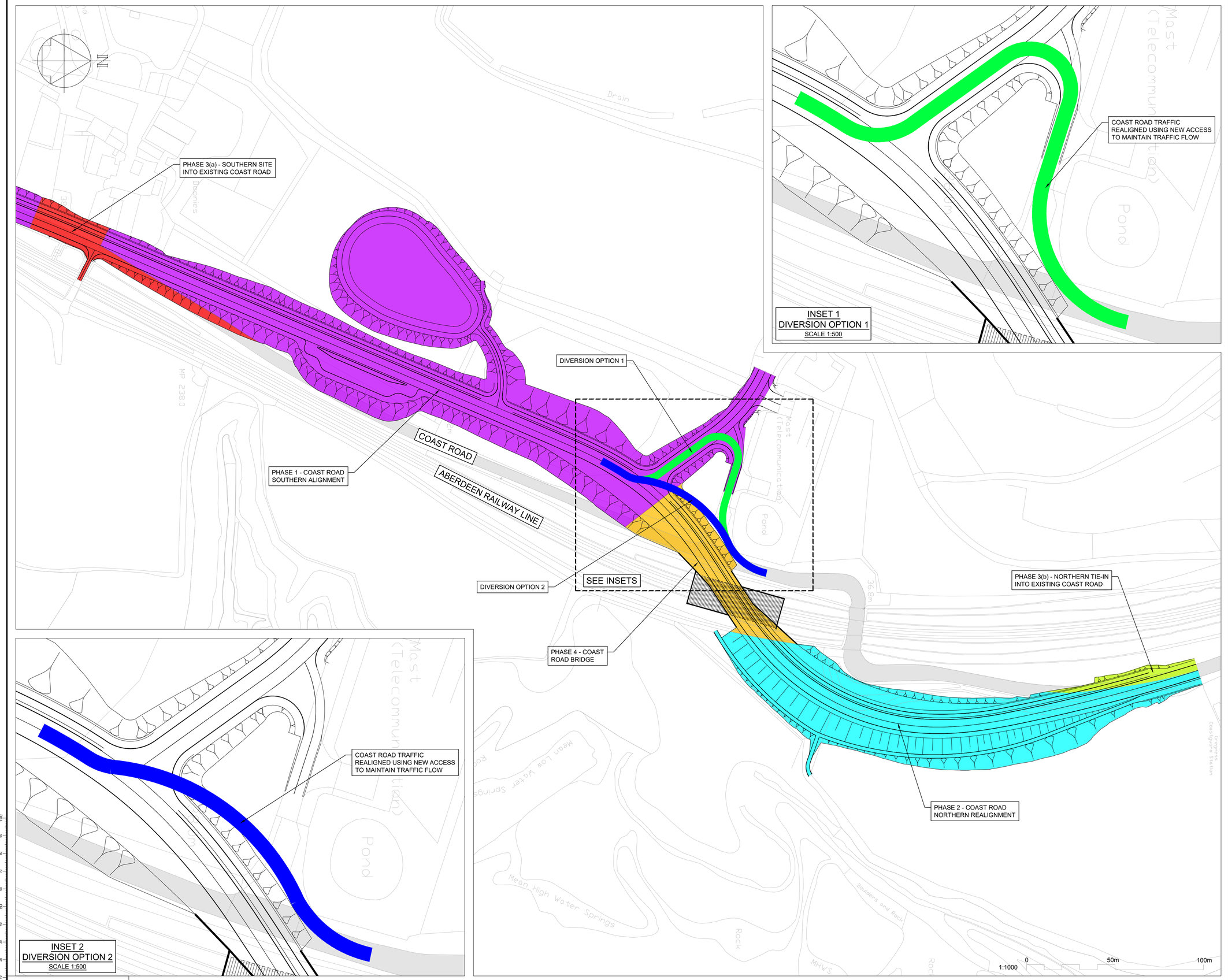
Status	Status Description
S5	FOR REVIEW AND ACCEPTANCE

Drawn	Designed	Checked	Approved
FZ	FZ	MW	GGra

Sheet Size	Scale	Sweco Ref	Revision
A1	1:5000		P02

Drawing Number

65207249-SWE-DG-00-D-W-30003



INSET 1
DIVERSION OPTION 1
SCALE 1:500

INSET 2
DIVERSION OPTION 2
SCALE 1:500

NOTES

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KEY TO SYMBOLS

- DIVERSION OPTION 1
- DIVERSION OPTION 2
- PHASE 1
- PHASE 2
- PHASE 3(a)
- PHASE 3(b)
- PHASE 4
- EXISTING COAST ROAD

Rev	Date	Amendment Details	Dr'n	Chk'	App'
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FIGURE 5.4
INDICATIVE CONSTRUCTION PHASING AND TEMPORARY DIVERSIONS

Project Stage
STAGE 3

Status	Status Description
S5	FOR REVIEW AND ACCEPTANCE

Drawn	Designed	Checked	Approved
FZ	FZ	MW	GGra

Sheet Size	Scale	Sweco Ref	Revision
A1	AS SHOWN		P02

Drawing Number
65207249-SWE-HA-00-D-H-30030

Appendix B. Environmental Figure List

FIGURE 7.1 ENVIRONMENTAL CONSTRAINTS

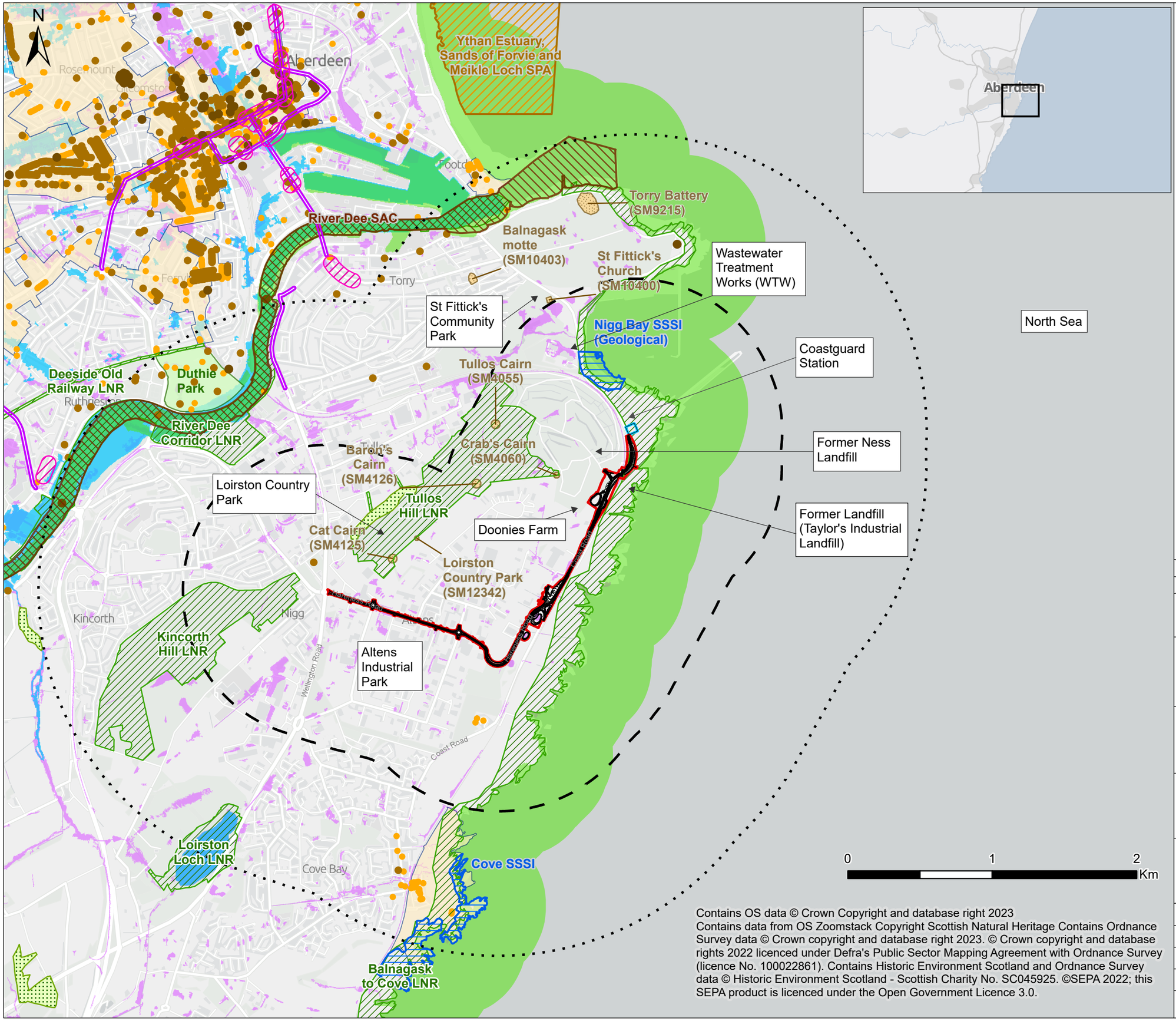
FIGURE 7.2 ABERDEEN LOCAL DEVELOPMENT PLAN (LDP) CONSTRAINTS

FIGURE 7.3 LOCATION PLAN

FIGURE 7.4 NATIONAL COASTAL AND LANDSCAPE CHARACTER

FIGURE 7.5 PHASE 1 HABITAT SURVEY MAP SHEET OVERVIEW

FIGURE 7.6 PHASE 1 HABITAT SURVEY SHEETS



KEY:

- Proposed Scheme
- Red Line Boundary
- Blue Line Boundary

Study Area

- 1km buffer
- 2km buffer
- Air Quality Management Area (AQMA)
- Candidate Quiet Areas (CQA)
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland Inventory (AWI)

Listed building

- Category A
- Category B
- Category C
- Scheduled Monument
- Garden and Designed Landscape (GDL)
- Conservation Area
- Aberdeen City Local Nature Conservation Sites

SEPA flood risk data (medium likelihood, 1 in 200 year)

- Coastal
- Surface Water
- River

Rev	Date	Amendment Details	Dr'n	Chk'	App'
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FIGURE 7.1 - ENVIRONMENTAL CONSTRAINTS

Project Stage			
STAGE 3			
Status	Status Description		
S2	For Information		
Drawn	Designed	Checked	Approved
FC	JM	RM	RB
Sheet Size	Scale	Sweco Ref	Revision
A3	1:25,000	65207249	P01

Drawing Number

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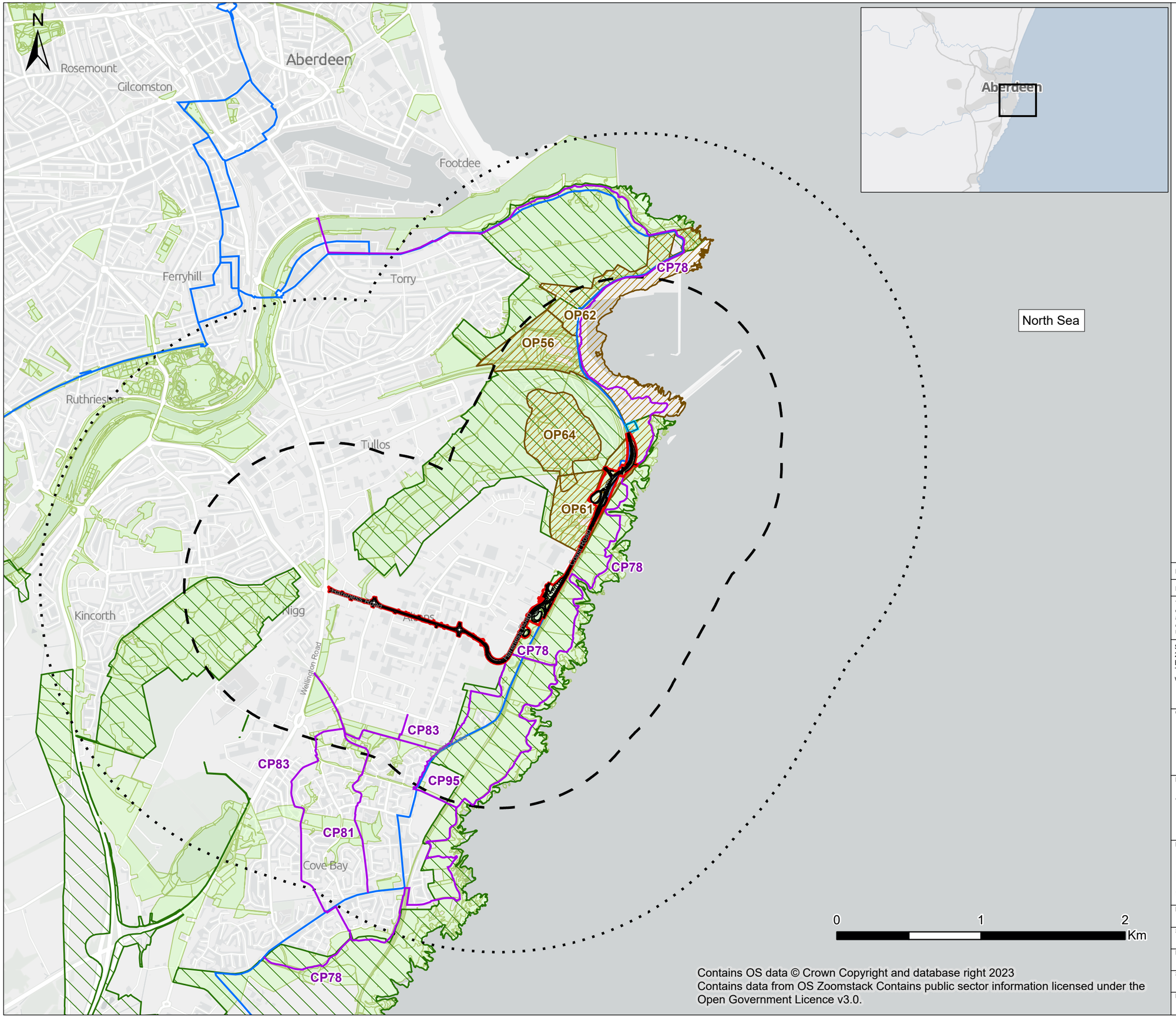

KEY:

- Proposed Scheme
- Red Line Boundary
- Blue Line Boundary

Study Area

- 1km buffer
- 2km buffer
- Core Path
- NCN Route 1
- LDP Opportunity Sites
- Green Belt (LDP Policy NE1)
- Green and Blue Infrastructure (LDP Policy NE2)

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FIGURE 7.2 - ABERDEEN LOCAL DEVELOPMENT PLAN (LDP) CONSTRAINTS

Project Stage	STAGE 3		
Status	S2	Status Description	For Information
Drawn	FC	Designed	JM
Checked	RM	Approved	RB
Sheet Size	A3	Scale	1:25,000
Sweco Ref	65207249	Revision	P01

Drawing Number

65207249-SWE-LE-XX-D-O-30013

KEY:

Site boundary

- Red Line Boundary
- Blue Line Boundary
- Land owned by Aberdeen City Council in the vicinity of the application site

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FIGURE 7.3 - LOCATION PLAN OVERVIEW

Project Stage			
STAGE 3			
Status	Status Description		
S2	For Information		
Drawn	Designed	Checked	Approved
AC	JM	RM	RB
Sheet Size	Scale	Sweco Ref	Revision
A3	1:14,000	65207249	P01

Drawing Number

65207249-SWE-LE-XX-D-O-30014

N

KNC26938

SS131

SS132
(44 SoS)

KNC1847

SS25339

SS25339

Cairn
s Hill

PETERSEAT DRIVE

COAST ROAD

0 500 Meters

KEY:

- Proposed Scheme
- Red Line Boundary
- Blue Line Boundary
- Land owned by Aberdeen City Council in the vicinity of the application site

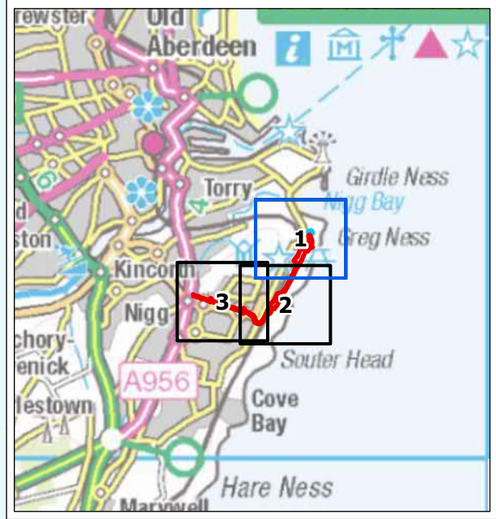

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FIGURE 7.3 - LOCATION PLAN
SHEET 1 OF 3

Project Stage			
STAGE 3			
Status: S2	Status Description: For Information		
Drawn: AC	Designed: JM	Checked: RM	Approved: RB
Sheet Size: A3	Scale: 1:5,000	Sweco Ref: 65207249	Revision: P01

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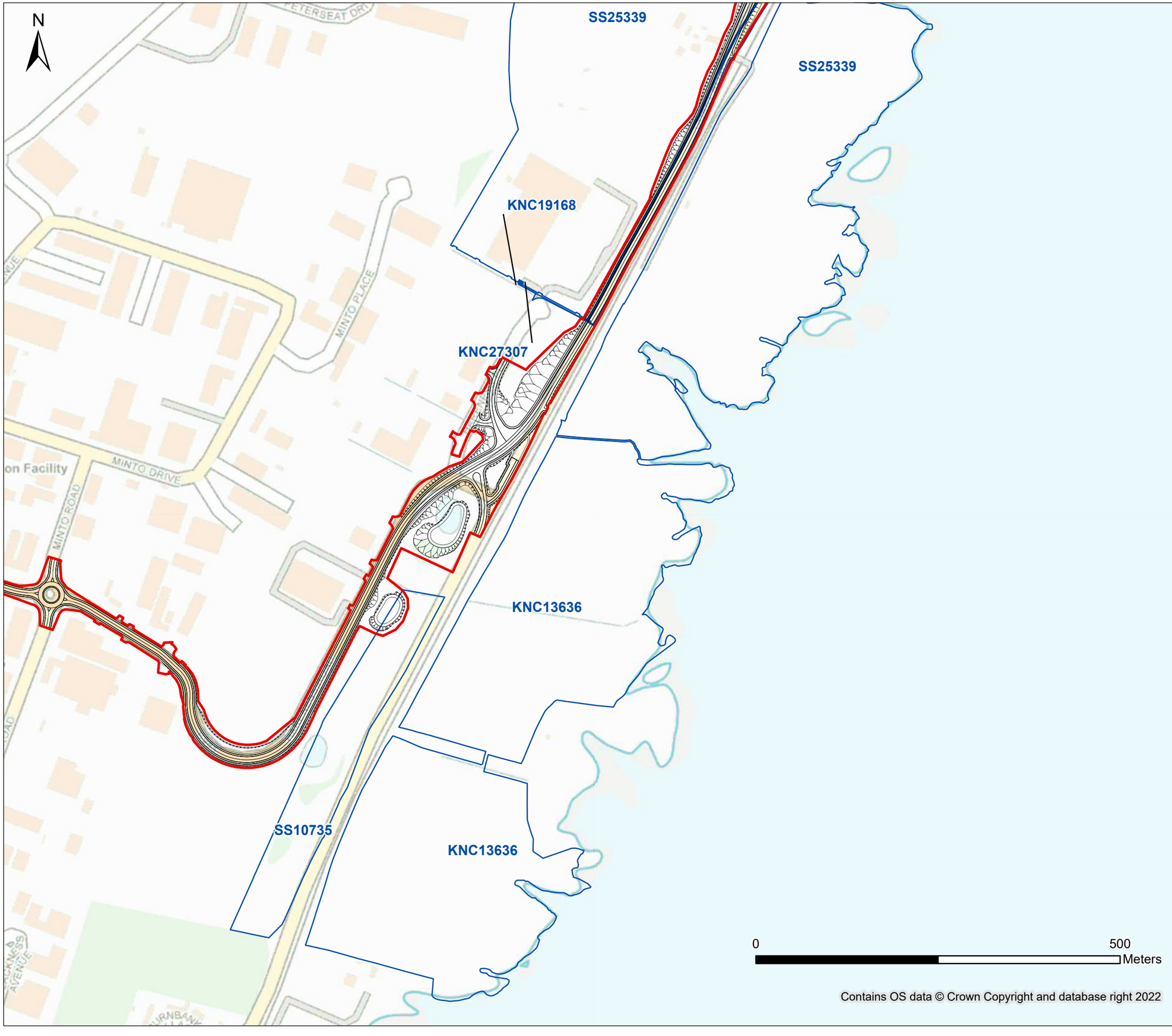

KEY:

- Proposed Scheme
- Red Line Boundary
- Blue Line Boundary
- Land owned by Aberdeen City Council in the vicinity of the application site

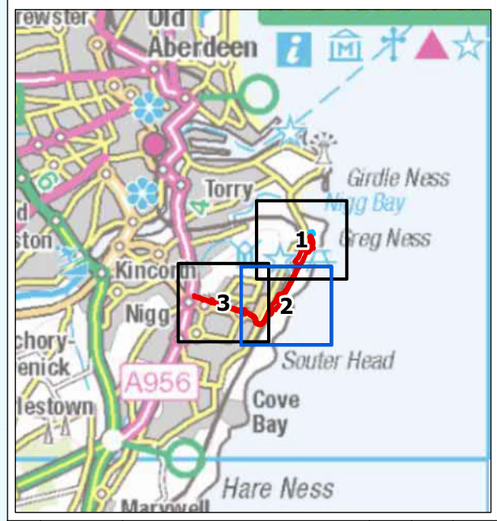

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FIGURE 7.3 - LOCATION PLAN SHEET 2 OF 3

Project Stage			
STAGE 3			
Status: S2	Status Description: For Information		
Drawn: AC	Designed: JM	Checked: RM	Approved: RB
Sheet Size: A3	Scale: 1:5,000	Sweco Ref: 65207249	Revision: P01

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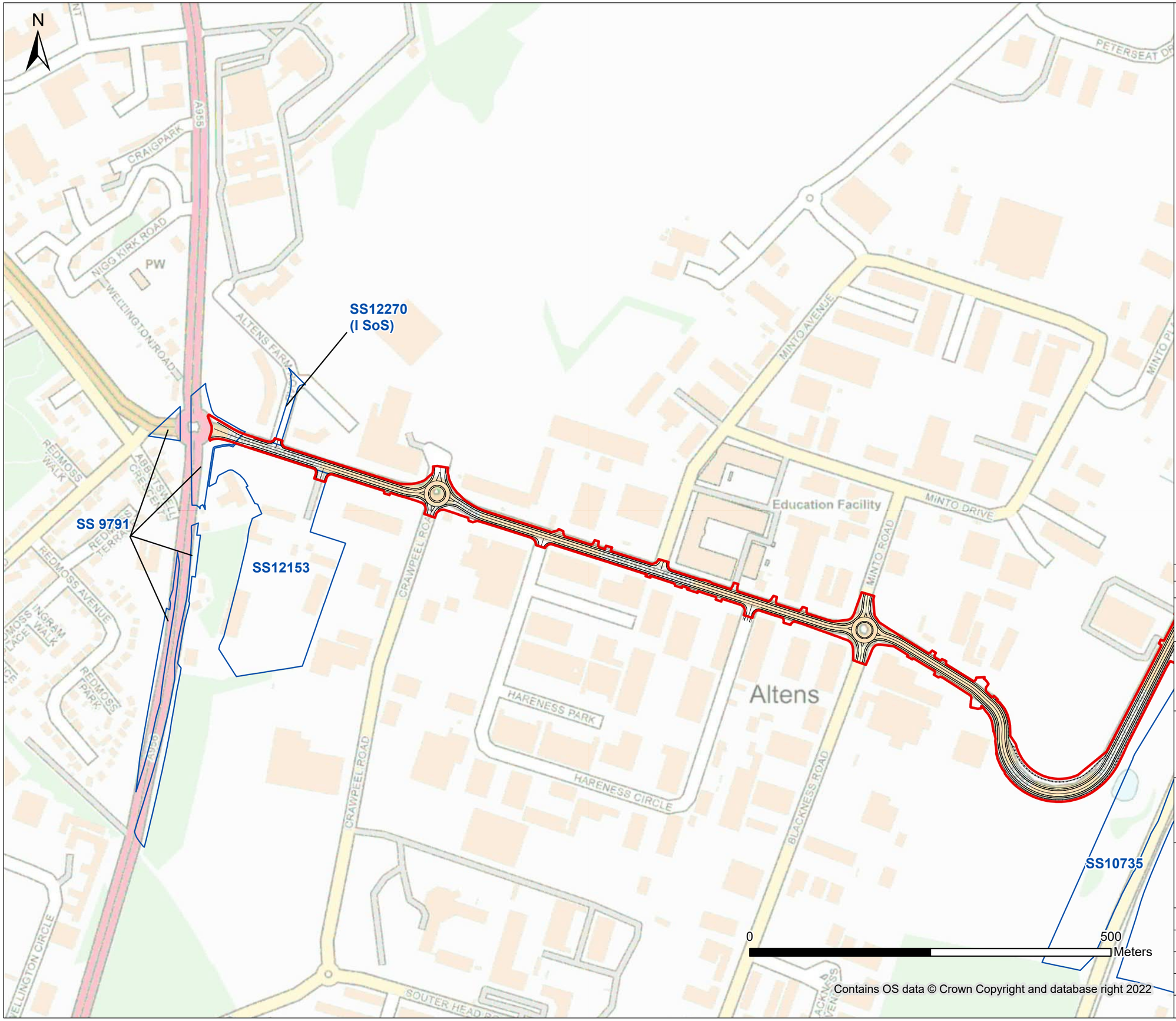

KEY:

- Proposed Scheme
- Red Line Boundary
- Blue Line Boundary
- Land owned by Aberdeen City Council in the vicinity of the application site

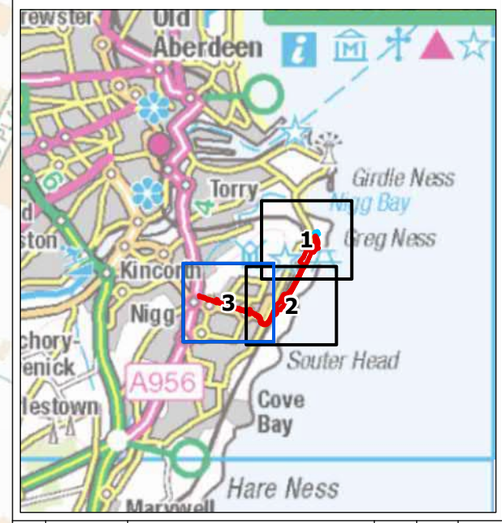

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FIGURE 7.3 - LOCATION PLAN
SHEET 3 OF 3

Project Stage			
STAGE 3			
Status: S2	Status Description: For Information		
Drawn: AC	Designed: JM	Checked: RM	Approved: RB
Sheet Size: A3	Scale: 1:5,000	Sweco Ref: 65207249	Revision: P01

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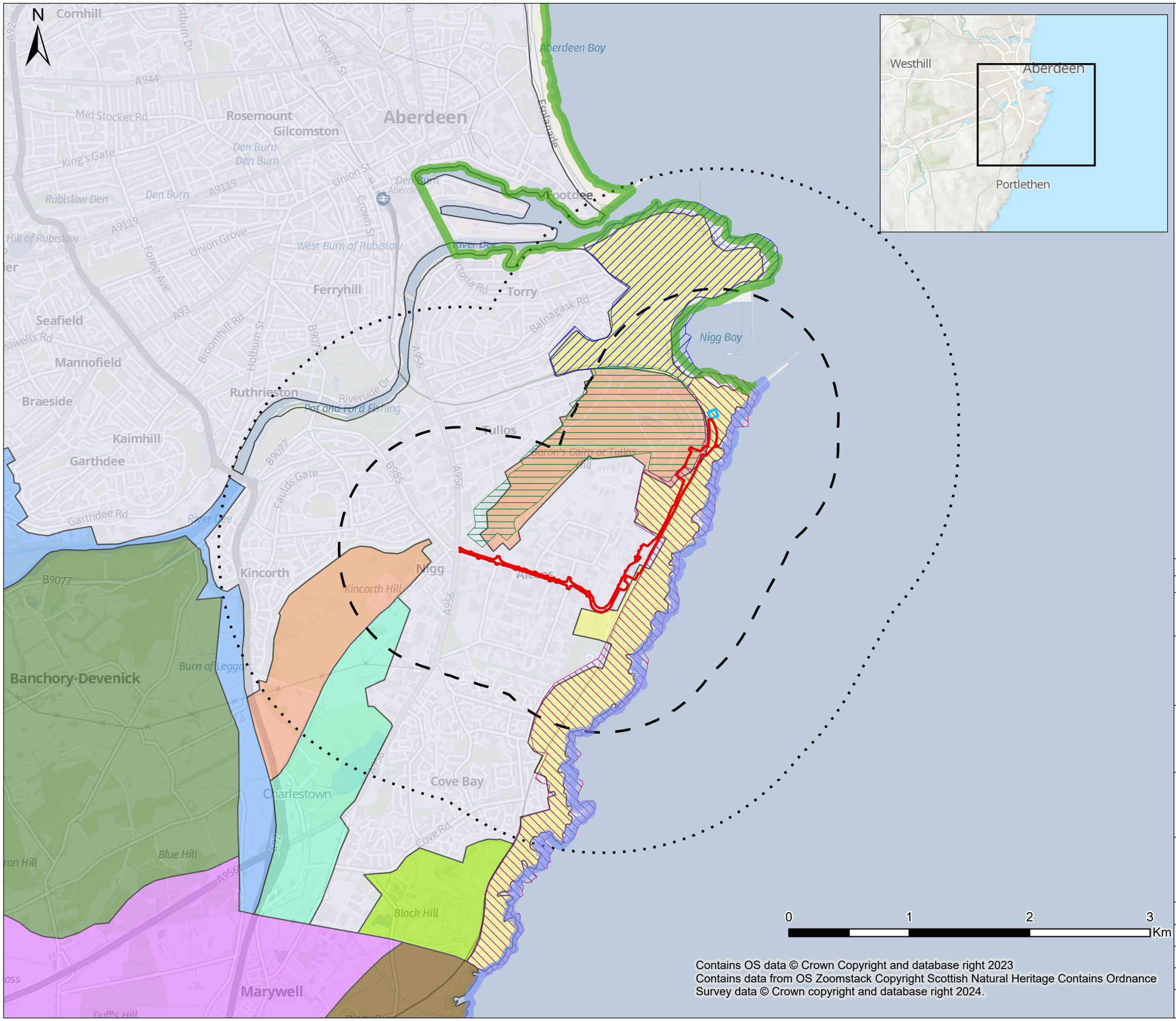

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KEY:

- Red Line Boundary
- Blue Line Boundary

Study Area

- 1km buffer
- 2km buffer

National Coastal Character Types

- 2. Rocky Coasline with Open Sea Views
- 3. Deposition Coastline with Open Sea Views

Landscape Character Area

- LCA 22: Girdle Ness
- LCA 24: Tullos Hill
- LCA 25: Souter Coast

Landscape Character Assessment (LCA)

- Broad Wooded and Farmed Valley
- Cliffs and Rocky Coast - Aberdeen
- Coastal Farmed Plain
- Farmed Moorland Edge - Aberdeenshire
- Fragmented Rocky Coast
- Low Hills - Aberdeen
- River Valley - Aberdeen
- Urban
- Urban and Farmland

Note:
- The location of the National Coastal Character Types and Landscape Character Area are indicative and have been digitised from other reports, for the purposes of inclusion on this figure
- Local designated areas have not been included due to limited public information

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FIGURE 7.4 – NATIONAL COASTAL AND LANDSCAPE CHARACTER

Project Stage	STAGE 3		
Status	S2	Status Description	For Information
Drawn	PK	Designed	JR
Checked	JR	Approved	JM
Sheet Size	A3	Scale	1:30,000
Sweco Ref	65207249	Revision	P01

Drawing Number

65207249-SWE-LE-XX-D-O-30015

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P02	31/01/2024	First Issue	FC	AC	LMc

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FIGURE 7.5 PHASE 1 HABITAT SURVEY MAP SHEET OVERVIEW

Project Stage: STAGE 2			
Status: S2	Status Description: For Information		
Drawn: FC	Designed: MC	Checked: AC	Approved: LMc
Sheet Size: A3	Scale: 1:10,000	Sweco Ref: 65207249	Revision: P02

Drawing Number: 65207249-SWE-LE-XX-D-O-30016

KEY:

- Proposed Scheme
- Survey boundary
- 100m survey buffer

Badger Signs

- Mammal push through at fence

Phase 1 habitat survey

- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- B4 - Improved grassland
- B6 - Poor semi-improved grassland
- C3.1 - Other tall herb and fern - ruderal
- G1 - Standing water
- J1.2 - Cultivated/disturbed land - amenity grassland
- J2.1.2 - Intact hedge - species-poor
- J3.6 - Buildings
- J4 - Bare ground
- J5 - Other habitat (hard standing)
- J2.2.2 - Defunct hedge - species-poor

N

0 50 100 Meters

Rev	Date	Amendment Details	Dr'n	Chk'	App'
P02	31/01/2024	First Issue	FC	AC	LMc

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Client

ABERDEEN CITY COUNCIL

Project Title

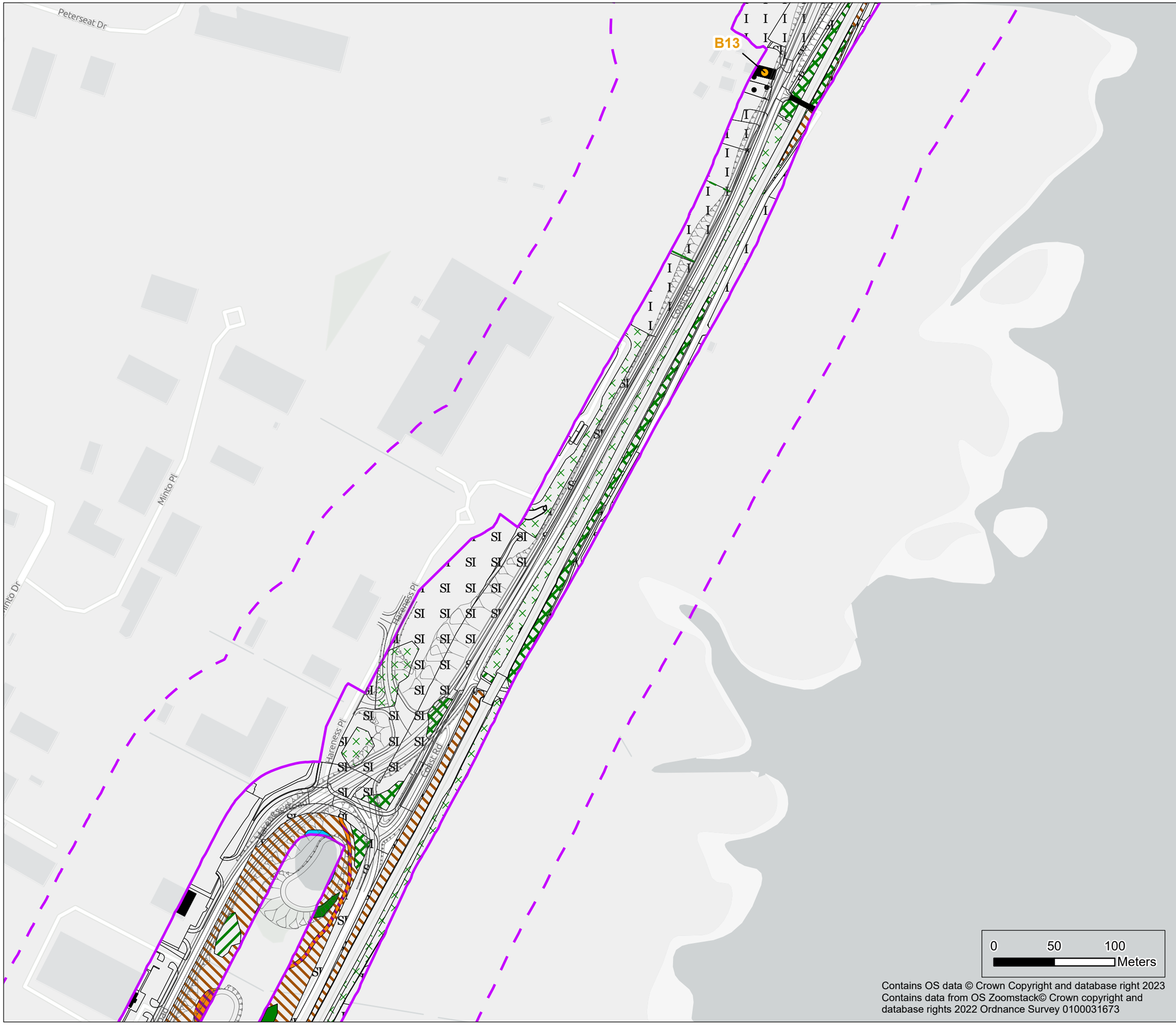
Aberdeen South Harbour Link Road

Drawing Title

FIGURE 7.6 PHASE 1 HABITAT SURVEY SHEET 1 OF 4

Project Stage			
STAGE 2			
Status: S2	Status Description: For Information		
Drawn: FC	Designed: MC	Checked: AC	Approved: LMc
Sheet Size: A3	Scale: 1:3,000	Sweco Ref: 65207249	Revision: P02

Drawing Number: 65207249-SWE-LE-XX-D-O-30017



KEY:

N

Proposed Scheme

Survey boundary

100m survey buffer

Bat Roost Potential

- Moderate

Phase 1 habitat survey

- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- B4 - Improved grassland
- B5 - Marsh/marshy grassland
- B6 - Poor semi-improved grassland
- C3.1 - Other tall herb and fern - ruderal
- G1 - Standing water
- J3.6 - Buildings
- J4 - Bare ground
- J5 - Other habitat (hard standing)
- J2.1.2 - Intact hedge - species-poor
- J2.2.2 - Defunct hedge - species-poor

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FIGURE 7.6 PHASE 1 HABITAT SURVEY SHEET 2 OF 4

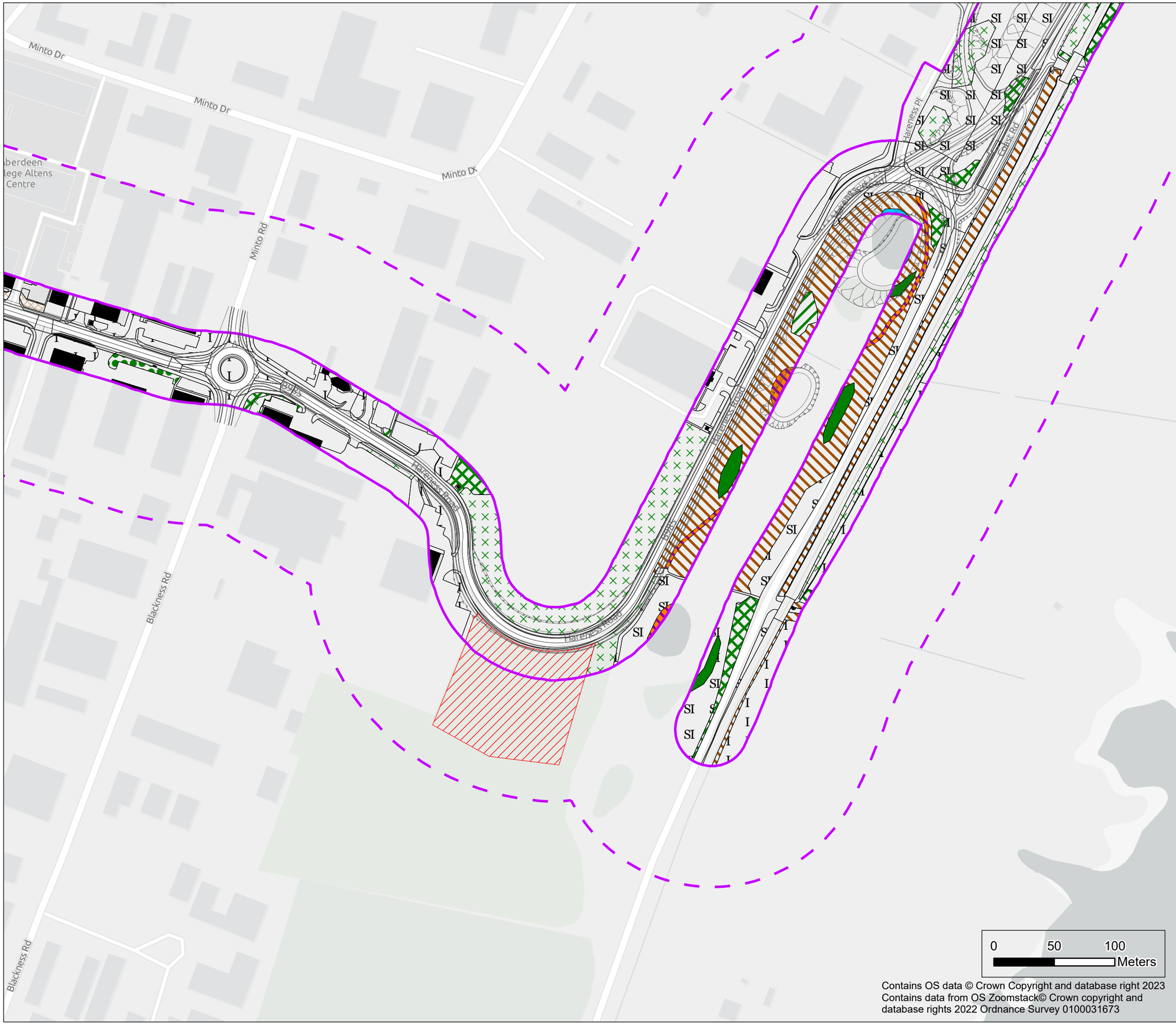
Project Stage: STAGE 2

Status	Status Description
S2	For Information

Drawn	Designed	Checked	Approved
FC	MC	AC	LMc

Sheet Size	Scale	Sweco Ref	Revision
A3	1:3,000	65207249	P02

Drawing Number: 65207249-SWE-LE-XX-D-O-30017



KEY:

N

- Proposed Scheme
- Survey boundary
- 100m survey buffer

Phase 1 habitat survey

- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved Parkland/scattered trees
- B4 - Improved grassland
- B5 - Marsh/marshy grassland
- B6 - Poor semi-improved grassland
- C3.1 - Other tall herb and fern - ruderal
- G1 - Standing water
- J1.4 - Introduced shrub
- J3.6 - Buildings
- J4 - Bare ground
- J5 - Other habitat (hard standing)
- Not accessible

Rev	Date	Amendment Details	Dr'n	Chk'	App'
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Aberdeen South Harbour Link Road

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FIGURE 7.6 PHASE 1 HABITAT SURVEY
SHEET 3 OF 4

Project Stage

STAGE 2

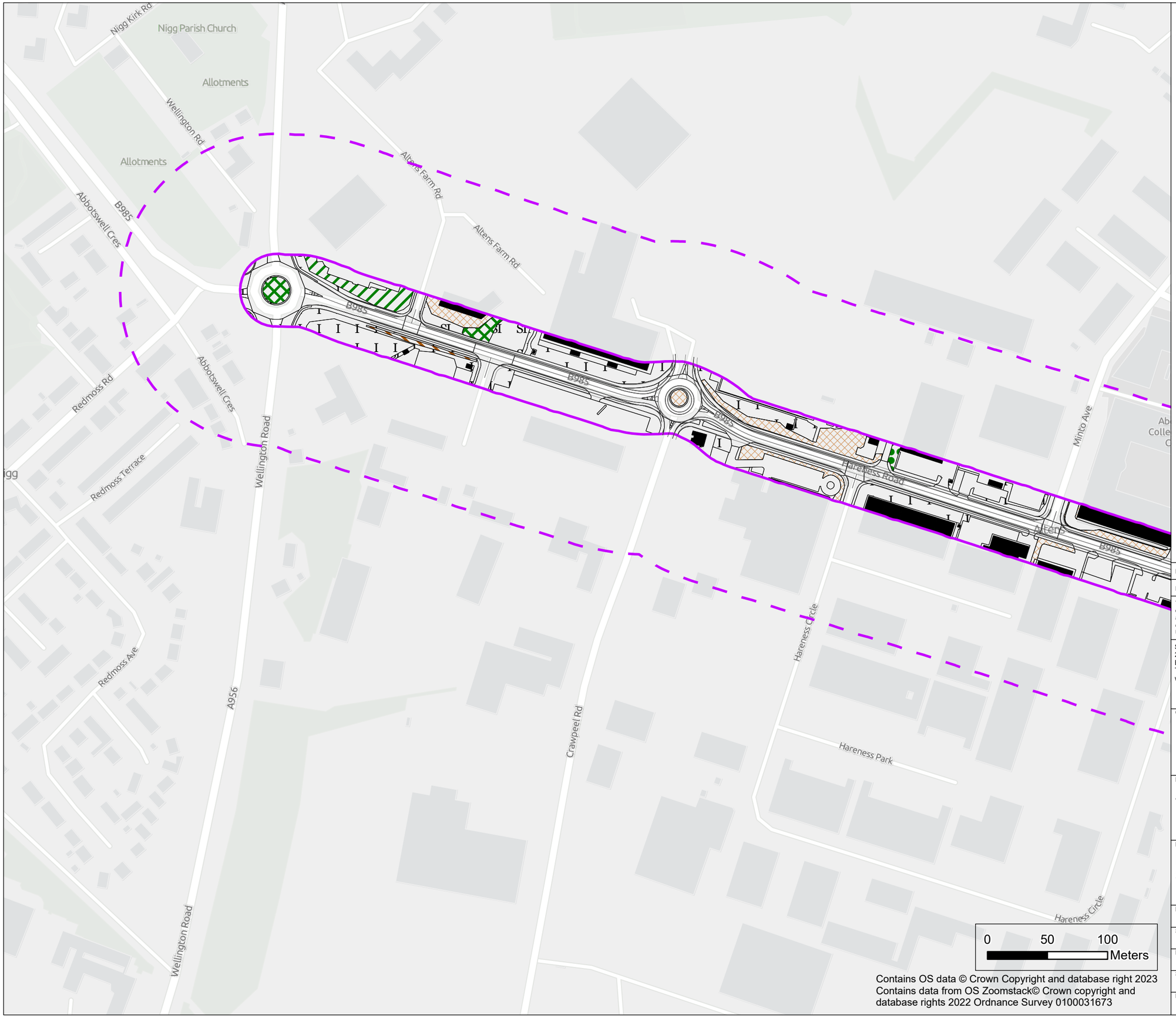
Status	Status Description
S2	For Information

Drawn	Designed	Checked	Approved
FC	MC	AC	LMc

Sheet Size	Scale	Sweco Ref	Revision
A3	1:3,000	65207249	P02

Drawing Number

65207249-SWE-LE-XX-D-O-30017



KEY:

N

Proposed Scheme

Survey boundary

100m survey buffer

Phase 1 habitat survey

- A1.1.2 - Broadleaved woodland - plantation
- A2.1 - Scrub - dense/continuous
- A3.1 - Broadleaved Parkland/scattered trees
- B4 - Improved grassland
- B6 - Poor semi-improved grassland
- C3.1 - Other tall herb and fern - ruderal
- J1.4 - Introduced shrub
- J2.1.2 - Intact hedge - species-poor
- J3.6 - Buildings
- J5 - Other habitat (hard standing)

Rev	Date	Amendment Details	Dr'n	Chk'	App'
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FIGURE 7.6 PHASE 1 HABITAT SURVEY SHEET 4 OF 4

Project Stage: STAGE 2

Status	Status Description
S2	For Information

Drawn	Designed	Checked	Approved
FC	MC	AC	LMc

Sheet Size	Scale	Sweco Ref	Revision
A3	1:3,000	65207249	P02

Drawing Number: 65207249-SWE-LE-XX-D-O-30017

Appendix C. Stage 3 Carbon Assessment

Aberdeen South Harbour Link Road

ASHLR Stage 3 Carbon Assessment

STAGE 3
FOR REVIEW AND COMMENT | S3
65207249-SWE-XX-00-T-Z-00019 | P01
17/01/24

Notice

Document control

Client	Aberdeen City Council
Project	Aberdeen South Harbour Link Road
Document title	ASHLR Stage 3 Carbon Assessment
Document reference	65207249-SWE-XX-00-T-Z-00019

Revision history

Revision	Purpose description	Originator	Checked	Approved	Authorised	Date
P01	FOR REVIEW AND COMMENTFOR REVIEW AND COMMENT	JM	SB	GGra	---	17/01/24

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Table of contents

1. Introduction

1.1. Regulatory Background

1.1.1. A number of legislative drivers are in place in the UK to combat climate change by reducing greenhouse gas (GHG) emissions. The foremost of these is the Climate Change (Scotland) Act 2009 which sets the target of net zero for the UK by 2045 as well as implementing a system of carbon budgets which drive progress towards this target by gradually reducing the total amount of emissions allowed in each period. It is, therefore, critical that the GHG emissions resulting from all new infrastructure is assessed to determine the assets impact on the UK reaching its climate targets.

1.1.2. Furthermore, Aberdeen City Council has its own policies and targets for climate which the scheme should align to, including the Net Zero Vision for Aberdeen plan, approved in 2020, which sets a pathway for the city to achieve net zero emissions by 2045 whilst accelerating the transition of the cities industry from fossil fuel-based energy production to renewable alternatives. These ambitious and stretching targets will put the region ahead of national targets and in place to lead on climate action. This local perspective further emphasises the importance of considering the impact of new infrastructure on climate and how investments fit within local and national targets.

1.2. Terminology

1.2.1. The term tonnes of carbon dioxide equivalent (tCO_2e) refers to the equivalent global warming potential of carbon dioxide (CO_2) and is used to represent all greenhouse gas emissions in a common unit. Embodied carbon (or capital carbon) refers to the GHG emissions associated with the creation of an asset and applies to the construction phase of a project. It is comparable to capital cost. Operational carbon refers to the GHG emissions associated with the operation and maintenance of an asset and is comparable to operational cost. Whole life carbon is the combination of both embodied and operational carbon and is comparable to whole life cost. Finally, end-user carbon refers to the GHG emissions associated with the use of an asset (e.g. vehicle emissions) and can only be influenced, not directly controlled.

1.2.2. For the purpose of this report, the term *carbon* has been used as shorthand to refer to all relevant GHG emissions.

2. Methodology

2.1. Assessment Approach

2.1.1. The following section outlines the methodology applied to estimate carbon emissions associated with the Aberdeen South Harbour Link Road design at Stage 3.

2.1.2. For the purposes of this DMRB Stage 3 assessment, only embodied carbon (A1-A5) emissions have been assessed, in line with the requirements set out in *PAS2080:2023 - Carbon Management in Buildings and Infrastructure*.

2.1.3. Embodied carbon has been estimated using the CESMM4 Carbon & Price Book 2013. Where specific elements are not available to be estimated using CESMM4, National Highways data has been utilised.

2.1.4. Quantity data was obtained from the project Design Team. CESMM4 Carbon & Price Book 2013 has been used for per unit carbon values (i.e. 'factors'), in tCO_2e, associated with relevant design elements. These factors were applied to total quantities on a per unit basis to obtain approximate embodied carbon values.

2.1.5. Transport data was estimated using the RICS Whole Life Carbon Assessment for the Built Environment, where specific data relating to the scheme is unavailable at DMRB Stage 3.

2.2. Value Engineering

2.2.1. Following completion of the DMRB Stage 2 Route Options Assessment, it was determined that the project, in its current form, exceeded the available Aberdeen City Region Deal (ACRD) funding. This led to the completion of a value engineering exercise to refine certain elements of the project, these include:

- Shortening of the scheme extents;
- Reducing the walking, wheeling and cycling level of service; and
- Steepening of earthworks slopes on embankments.

2.2.2. The scheme at DMRB Stage 2 terminated shortly after the Scottish Water Wastewater Treatment Works (SWWTW) on Coast, south of Aberdeen South Harbour (ASH). The preferred route design from the Coastguard Station on Coast Road to the SWWTW followed the existing alignment, both horizontally

and vertically, therefore it was considered unnecessary to continue with that design with no real benefit to the scheme as a whole.

2.2.3. Following feedback from the DMRB Stage 2 Public Consultation, it was considered that the cycling facility design was too wide for the level of expected/perceived use therefore it has been narrowed to the absolute minimum width of 2m as per Cycling by Design 2021.

2.2.4. At DMRB Stage 2, the embankment slopes were designed to 1:3 prior to any geotechnical investigation results which is common practice when designing schemes at an early stage. Following completion of the geotechnical investigation and extraction of earthworks quantities, it was determined that the embankment slopes could be steepened to 1:2.5 and 1:2 in several locations. The benefit of this is a reduced material import and earthworks footprint.

2.3. Assumptions

2.3.1. In the absence of detailed design information at DMRB Stage 3, several assumptions were necessary to develop representative carbon factors for key scheme quantities.

2.3.2. Emissions associated with certain life cycle modules (e.g. operation and end-of life) have been excluded from this assessment due to data limitations and inherent uncertainty at this stage of the project. The scope of the assessment will be expanded in future phases as more design information becomes available.

2.3.3. Due to the high-level nature of this assessment, as well as the assumptions and limitations stated above, all carbon values are intended to be used on a relative/comparative basis and should be considered ***indicative only.***

3. Results and Discussion

3.1. Results

3.1.1. This section provides the results of the DMRB Stage 3 Carbon Option Appraisal, which has focused on approximate embodied carbon emissions during construction (A1-A5).

3.1.2. Table 3.1 provides a summary of the embodied carbon assessment results by Series.

Table 3-1: DMRB Stage 3 Embodied Carbon Results by Series.

Series	Description	Materials tCO_2e	Plant tCO_2e (where not included in Materials)	Transport tCO_2e	Total tCO_2e
200	**Site Clearance**	8.51	0.00	0.00	**8.51**
300	**Fencing**	10.43	0.00	0.10	**10.52**
400	**Road Restraint System**	84.96	171.48	0.00	**256.44**
500	**Drainage and Service Ducts**	108.08	0.00	0.34	**108.42**
600	**Earthworks**	994.71	0.00	1,222.22	**2,216.93**
700	**Pavement**	1,429.71	0.00	49.63	**1,479.34**
1100	**Kerbs, Footways, and Paved Areas**	954.23	36.21	52.97	**1,043.40**
1200	**Traffic Signs and Road Markings**	12.05	0.00	0.00	**12.05**
1300	**Road Lighting Columns, Brackets, and CCTV Masts**	131.94	4.39	0.05	**136.38**
2500	**Special Structures**	952.27	0.00	21.65	**973.92**
-	**Total**	**4,686.89**	**212.07**	**1,346.96**	**6,245.92**

3.1.3. Figure 3.1 below presents the embodied carbon emission estimates for the scheme, as per the methodology described in Section 2. Earthworks has the largest contribution to the overall emissions of the scheme during construction, at 2,217 tCO_2e. Pavement and Kerbs, Footways and Paved Areas have the next highest contributions to the overall emissions, at 1,479 tCO_2e and 1,043 tCO_2e, respectively.

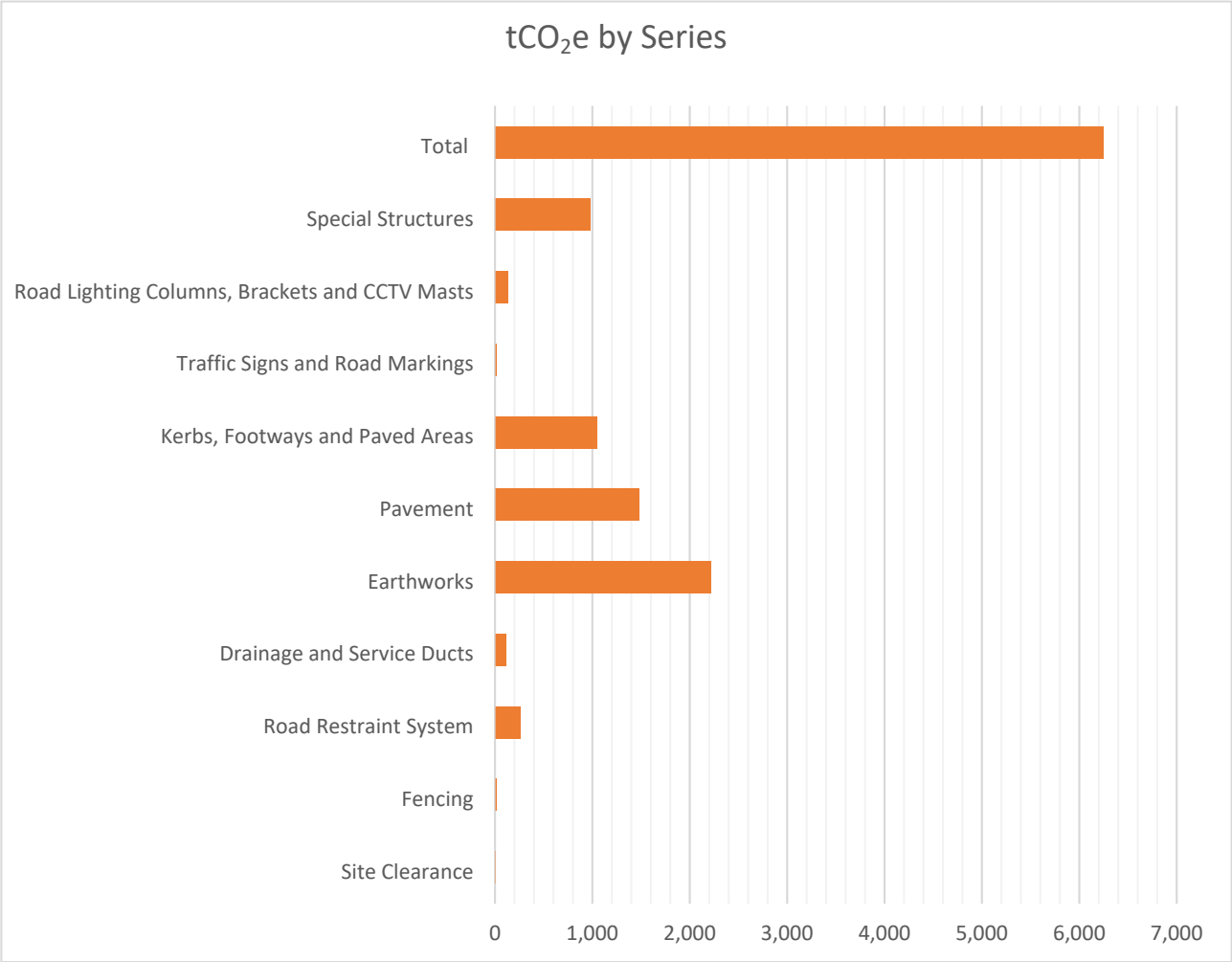

Figure 3.1: Embodied Carbon Emissions (A1-A5) Estimate by Series.

3.2. Discussion

3.2.1. Figure 3.2 overleaf, presents the embodied carbon emission estimates for the scheme separated by Materials/Plant, and Transport. The total estimated Materials and Plant emissions for Pavement is the largest contributor at 1,430 tCO_2e, significantly higher than Earthworks at 995 tCO_2e. However, Earthworks is the largest contributor to Transport emissions, producing an estimated 1,222 tCO_2e.

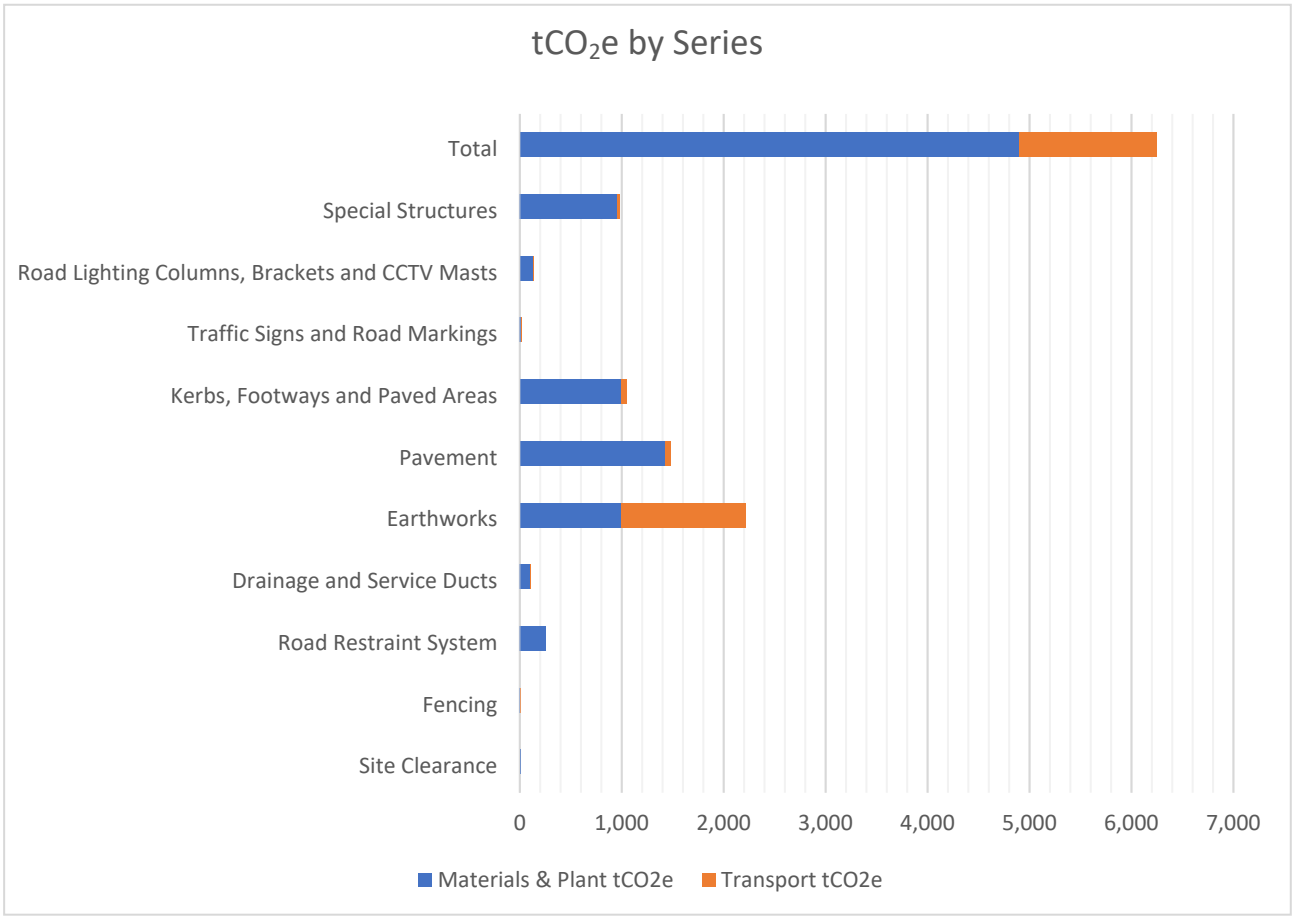

Figure 3.2: Materials & Plant, Transport Embodied Carbon Emissions (A1-A5) by Series.

3.2.2. For reductions in the overall emissions of the scheme, optimisation of the materials selected for Pavement, Kerbs, Footways, and Paved Areas, and Special Structures would have the most significant impact. Additionally, optimisation of selected materials, as well as plant and transport processes for Earthworks would also have a significant impact in reducing the total scheme emissions.

3.2.3. For specific optimisation opportunities bespoke to the scheme, continued engagement with the carbon team is recommended to ensure reductions in overall emissions are achieved. Additionally, feedback from contractors and suppliers as to why low carbon approaches may or may not be currently feasible is crucial in ensuring effective emission reductions across future schemes.

3.3. Value Engineering

3.3.1. As part of the optimisation process, the design team have undertaken an exercise in Value Engineering to reduce the overall required materials of the scheme. At present this equates to an estimated 20% reduction in material use at DMRB Stage 3, as shown in Figure 3.3.

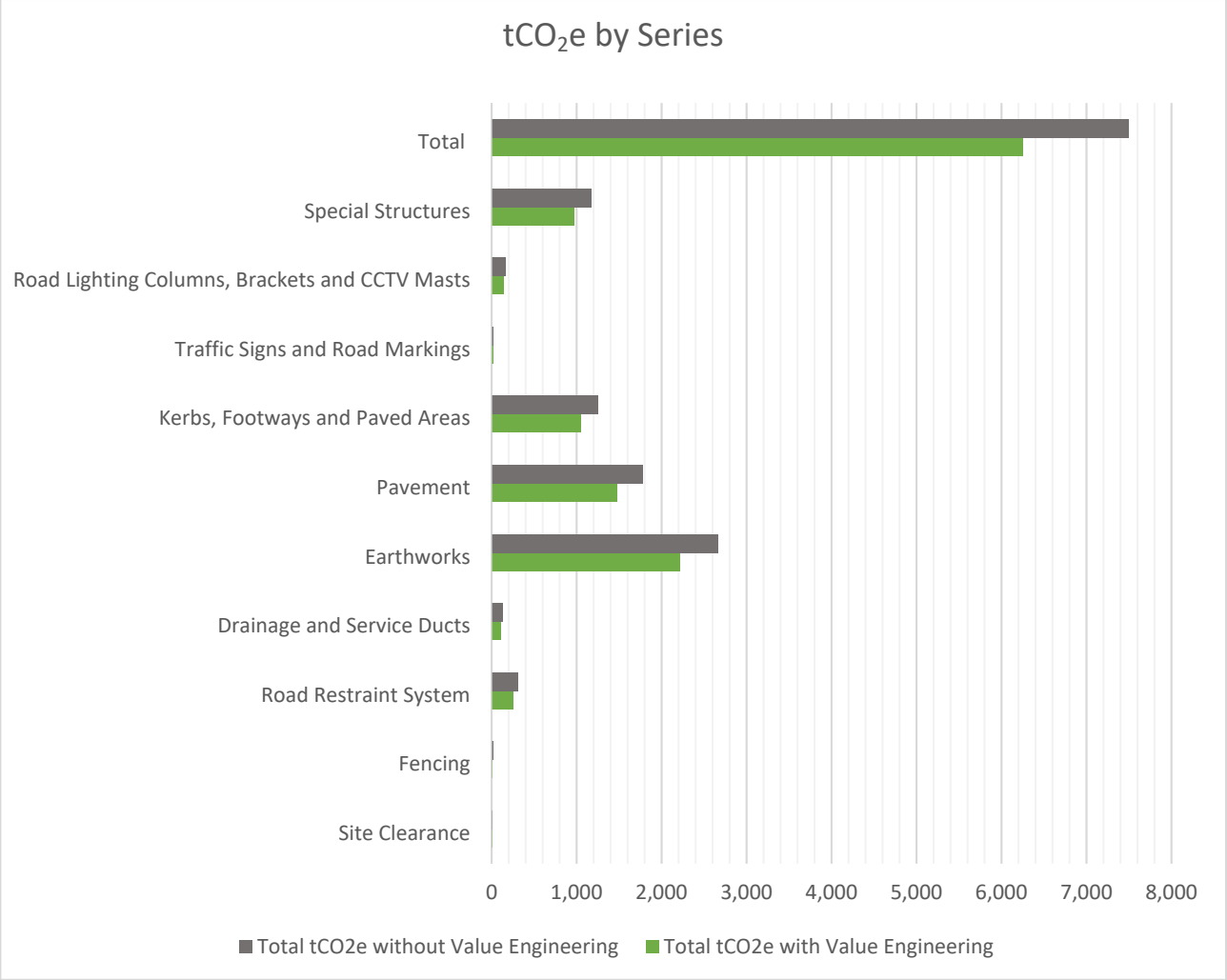

Figure 3.3: Impact of Value Engineering on Embodied Carbon Emissions (A1-A5), Estimate by Series.

3.3.2. Across the entire scheme, Value Engineering optimisation has led to a reduction of 1,249 tCO_2e.

3.3.3. Table 3-2 overleaf demonstrates the impact of such Value Engineering per series element. These results should be considered indicative only, demonstrating the total reduction of emissions in tCO_2e following a 20% reduction in material requirements, per series element.

Table 3-2: Impact of Value Engineering on Embodied Carbon Emissions (A1-A5), Estimate by Series.

Series	Description	tCO_2e without Value Engineering	tCO_2e with Value Engineering	Total tCO_2e Reduction
200	**Site Clearance**	10.21	8.51	**1.7**
300	**Fencing**	12.63	10.52	**2.1**
400	**Road Restraint System**	307.72	256.44	**51.29**
500	**Drainage and Service Ducts**	130.11	108.42	**21.68**
600	**Earthworks**	2660.32	2,216.93	**443.39**
700	**Pavement**	1775.21	1,479.34	**295.97**
1100	**Kerbs, Footways, and Paved Areas**	1252.08	1,043.40	**208.68**
1200	**Traffic Signs and Road Markings**	14.46	12.05	**2.41**
1300	**Road Lighting Columns, Brackets, and CCTV Masts**	163.65	136.38	**27.28**
2500	**Special Structures**	1168.71	973.92	**194.78**
-	**Total**	**7495.11**	**6,245.92**	**1,249.18**

4. Next Steps

4.1.1. As mentioned above, during the next stage of design efforts should be made to reduce the capital carbon hotspots highlighted in this assessment. These can be assessed against this baseline.

4.1.2. It will be important to conduct a further assessment of capital carbon for the scheme once the design has been developed, ensuring that all items have detailed design information. This will limit the number of assumptions required, improve the accuracy of the assessment and account for any reduction actions implemented through design.

4.1.3. Finally, the scope of the assessment should be expanded to include emissions resulting from operation (e.g., street lighting) and maintenance (e.g., replacement of road surface). This will then ensure that all potential emissions from the scheme have been considered.

Appendix D. Air Quality, Noise and Vibration Technical Notes

Appendix B – Noise and Vibration Technical Note

Introduction

The scheme proposes changes to the local road network that could change existing road traffic flows and therefore the noise levels in the immediate area. The purpose of this appraisal was to determine if there were any changes in traffic that could be considered large enough to require full assessment and/or be potentially significant with regards to noise.

Approach and Methods

The high level appraisal undertaken utilised the calculation methodology set out in the Department of Transport's (DfT) guidance document 'Calculation of Road Traffic Noise' (CRTN)[46] and the threshold assessment criteria identified in the Design Manual for Roads and Bridges (DMRB) 'LA 111 Noise and Vibration'[47].

Using the traffic data provided for the scheme, in accordance with CRTN an initial 'scoping' exercise was undertaken to remove all road links identified as having less than 1,000 vehicles over an 18 hour day in all traffic modelled scenarios. Once this process was complete, a corrected basic noise level for each road link was calculated using the two-way traffic flow and a correction for speed and percentage of heavy goods vehicles on that link. These were compared in the appropriate scenarios to determine if any potentially significant changes could occur.

The scenarios considered in this high-level appraisal were:

- Do Minimum (without scheme) Opening Year[48] against Do Something (with scheme) Opening Year; and
- Do Minimum (without scheme) Opening Year against Do Something (with scheme) Design Year[49].

For the purpose of this appraisal, the DMRB identifies a change of 1dB $_{LA10,18h}$ as being the threshold for full assessment in the short-term (scenario 1) and 3dB $_{LA10,18h}$ in the long-term (scenario 2).

Any traffic 'links' that were identified as being above the defined thresholds, were then reproduced in the QGIS mapping software package to determine both the geographic location in relation to the scheme and the proximity to noise sensitive receptors.

[46] Department of Transport (1988) Calculation of Road Traffic Noise (CRTN)
[47] DMRB (2020) LA 111 – Noise and vibration, Revision 2. Available online: https://www.standardsforhighways.co.uk/search/cc8cfcf7-c235-4052-8d32-d5398796b364
[48] Opening Year was defined as 2026
[49] Future year defined as the year with the highest flow of traffic within 15 years of the Opening Year (defined for this assessment as 2041)

Assumptions / Limitations

The following assumptions/limitations were considered within this high level appraisal:

- The traffic model data used in this analysis accounted for changes in traffic associated with the ASH and ETZ committed developments.
- No consultation with Aberdeen City Council (ACC) or Transport Scotland has been undertaken to date.

Appraisal

The results of the high level appraisal indicated eight links where the change in short-term noise level was predicted to be greater than 1dB $_{LA10,18h}$; the maximum predicted increase in the short-term was 2.1dB. These links were reviewed in relation to the nearest noise sensitive receptors and the majority were found to be located at a distance greater than 100m from the nearest noise sensitive receptor. No traffic links within the preferred corridor study area were found to have exceeded the long-term noise threshold level.

The only short-term link that exceeded the threshold, and is within 100m of a sensitive receptor, is the northern section of Langdykes Road, situated near the Aberdeen Altens Hotel (see Figure B-1). This is one of the few links identified as having a decrease in noise level, which is predicted to be a maximum of -1.1dB in the short-term.

The other short links displaying noise exceedances occur in areas away from noise sensitive receptors, such as at the junction of Coast Road / Hareness Road.

Figure B-1: Graphical overlay of the links assessed as part of the noise screening (assessed traffic network (blue); scoped out (green); and exceeded threshold (red))

Although the threshold for assessment was exceeded on certain links in the short-term assessment, due to the locations of these links and their respective distance to nearby noise sensitive receptors, it was considered that operational noise effects from the scheme could be reasonably scoped out of further appraisal.

Summary

A high level assessment of the predicted changes in road traffic noise was undertaken for the scheme. Eight links were identified where the noise level change triggered the short-term noise threshold for further assessment.

Review of the traffic links that exceeded the short-term threshold level identified one location as being within 100m of a noise sensitive receptor (at the northern end of Langdykes Road, located near the Aberdeen Altens Hotel). However, the change in noise level along this link is predicted to be a decrease of -1.1dB.

As the only noise sensitive location was identified as having a decrease in noise level, it was considered that noise impacts could reasonably be scoped out of further appraisal.

Appendix C – Air Quality Technical Note

Introduction

The scheme proposes changes to the local road network that could result in changes to; traffic flows, average speeds and alignment of roads across the local road network. There is risk that these changes would lead to increased vehicle emissions with the potential to adversely impact local air quality at nearby sensitive receptors.

A high level appraisal was undertaken to determine if the forecasted changes to the local traffic network would likely generate a significant effect in terms of air quality, which would then either require further detailed appraisal, or if further appraisal could be justifiably scoped out.

Approach and Methods

A high-level traffic screening exercise has been undertaken in accordance with two key guidance documents:

- Design Manual for Roads and Bridges (DMRB) Air Quality (LA 105)[50]; and
- Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK) (2017) Land-use Planning & Development Control: Planning for Air Quality v1.2[51].

Both guidance documents include traffic screening criteria that, if exceeded, indicate the need for further assessment of potential air quality impacts and likely significant effects. The screening criteria in the DMRB LA 105 guidance is specifically intended for strategic highways schemes, whereas the relatively more stringent IAQM & EPUK criteria are more applicable to urban roads and/or those within designated Air Quality Management Areas (AQMAs).

The scheme is in proximity to two AQMAs, as shown on Figure C-1, which are likely to be sensitive to small changes in local air quality. Therefore, the more stringent IAQM & EPUK criteria have been adopted to provide a conservative screening appraisal of link roads with the potential to experience local air quality impacts.

Traffic data were supplied by the appointed transport consultant for two scenarios; 'without scheme' (Do Minimum) and 'with scheme' (Do Something) scenarios for the assumed scheme opening year (2026). The traffic data were provided as Annual Average Daily Traffic (AADT) flows, with percentage breakdown of heavy goods vehicles (HGV) and average link speeds (km/h) across the transport model domain.

[50] DMRB (2019) LA 105 – Air Quality, Revision 0. Available online: https://www.standardsforhighways.co.uk/search/10191621-07df-44a3-892e-c1d5c7a28d90

[51] IAQM and EPUK (2017) Land-use Planning & Development Control: Planning for Air Quality, V1.2. Available online: https://iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf

The following screening criteria have been used within this appraisal:

- Changes in AADT >100 for links inside / within 200m of an AQMA, and >500 AADT elsewhere.
- Changes in HGV AADT >25 for links inside / within 200m of an AQMA, and >100 AADT elsewhere.
- Changes in speed >10km/h.
- Changes in road alignment >5m.

The difference between the Do Minimum and Do Something traffic data on each road link was calculated and compared to the above criteria, which enabled all affected road links to be identified. A subsequent review of potentially sensitive receptors (human and designated ecological sites) was undertaken based on a 200m buffer around each affected road link, in addition to a review of existing air quality conditions, to determine the potential for the scheme to have an adverse local air quality impact.

All traffic links exceeding one, or more, of the above criteria are presented on Figure C-1.

Assumptions / Limitations

The following assumptions and limitations are inherent within this high-level appraisal:

- The traffic model data used in this analysis accounted for changes in traffic associated with the ASH and ETZ committed developments.
- No consultation with Aberdeen City Council (ACC) or Transport Scotland has been undertaken to date.

Appraisal

The results of the high level appraisal demonstrated that three road links exceed the traffic screening criteria when comparing the ‘Do Something’ and ‘Do Minimum’ scenario traffic data, as depicted on Figure C-1, which are all within 5km to the south-east of Aberdeen city centre. None of the triggered road links are located within or near to an existing AQMA designated by ACC.

The three tiggered road links are:

- Link 1 – Hareness Road (a section of) located to the east of the roundabout junction with the A956 Wellington Road.
- Link 2 – Coast Road (a section of) located adjacent to the east of the SUEZ recycling and recovery site (Hareness Place).
- Link 3 – Coast Road (a section of) located approximately 230m to the north of Doonies Farm.

A 200m buffer area around each of these links was reviewed to identify the presence, if any, of receptors potentially sensitive to changes in air quality.

- Link 1 – Hareness Road:
  - There are 17 residential properties located within 200m of the triggered road link, specifically at Abbotswell Crescent (9 in total), Redmoss Terrace (6 in total) and Wellington Road (2 in total). These properties are all located more than 100m from the triggered link, which is the distance within which changes in vehicle emissions would have the greatest impact on local air quality.
  - A review of local monitoring[52] and latest Defra pollutant background maps[53] was undertaken to establish existing air quality conditions in the local area. The review demonstrated that current levels of annual mean nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$) are well below the respective health-based national air quality objectives.
  - The nearest monitoring site was identified at 137 Wellington Road (DT37), located approximately 800m to the north of the triggered link, which measures annual mean NO_2 concentrations. This site has recorded annual mean concentrations consistently below the national air quality objective (40µg/m^3) since 2007, with the 2019 concentration reported as 22µg/m^3 (note, this was pre-Covid pandemic, with monitored data for 2020 and 2021 not considered due to travel restrictions imposed during the pandemic).
  - The Defra background annual mean NO_2 (10.0µg/m^3), PM_{10} (9.1µg/m^3) and $PM_{2.5}$ (5.5µg/m^3) concentrations for 2023 (current year) for the 1km x 1km grid square encompassing the triggered link are projected to be well below the respective objectives[54].
- Link 2 – Coast Road:
  - There are no receptors within 200m of the triggered link that would be sensitive to changes in annual mean pollutant concentrations.
- Link 3 – Coast Road:
  - There are no receptors within 200m of the triggered link that would be sensitive to changes in annual mean pollutant concentrations.

It is evident that for each of the three links that were triggered by the traffic screening criteria, there are no sensitive human or designated ecological receptors located within 100m of each link. For Hareness Road, where there are sensitive receptors within 200m of the triggered link, existing levels of air pollution have been shown to be well below the respective national air quality objectives. Therefore, given the road to receptor distance and baseline air quality, the forecasted change in traffic flows on this link is not expected to have a material impact on local air quality.

[52] Available online: https://www.scottishairquality.scot/latest
[53] Available online: https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018
[54] Annual mean NO_2 objective = 40µg/m^3; PM_{10} objective = 18µg/m^3; Annual mean $PM_{2.5}$ limit value = 10µg/m^3

Based on the above traffic screening exercise, further appraisal of operational phase air quality impacts associated with the scheme can be reasonably scoped out.

Summary

A preliminary traffic screening exercise has been undertaken to review the potential for air quality impacts associated with the scheme operation. Three links within the modelled traffic network were identified as exceeding the conservative screening criteria applied in this exercise and therefore at risk of potentially leading to a local air quality impact. None of the triggered links are located within or near to an existing AQMA designated by ACC.

The review of each triggered link demonstrated that there are no sensitive human or designated ecological receptors located within 100m of each link. Where receptors are located within 200m of a triggered link (i.e. Link 1 on Hareness Road), a review of baseline air quality demonstrated that the forecasted change in traffic flows on this link would not have a material impact on local air quality.

Therefore, it is considered that local air quality impacts could reasonably be scoped out of further appraisal.

It is recommended that this appraisal is discussed further with ACC and Transport Scotland to seek agreement on the approach and findings.

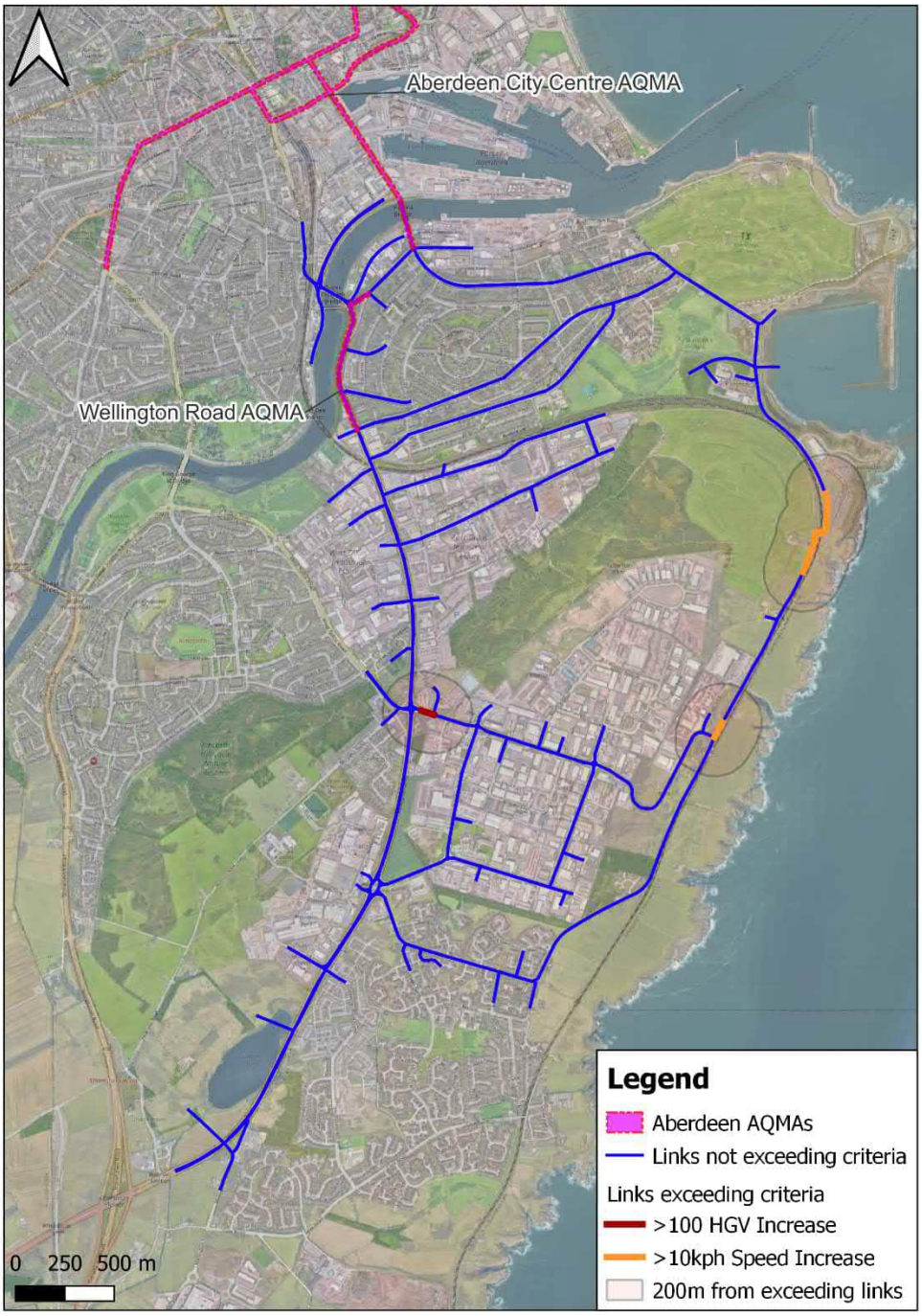

Figure C-1: Map showing the extent of the supplied traffic data and the location of links exceeding the relevant traffic screening criteria for air quality