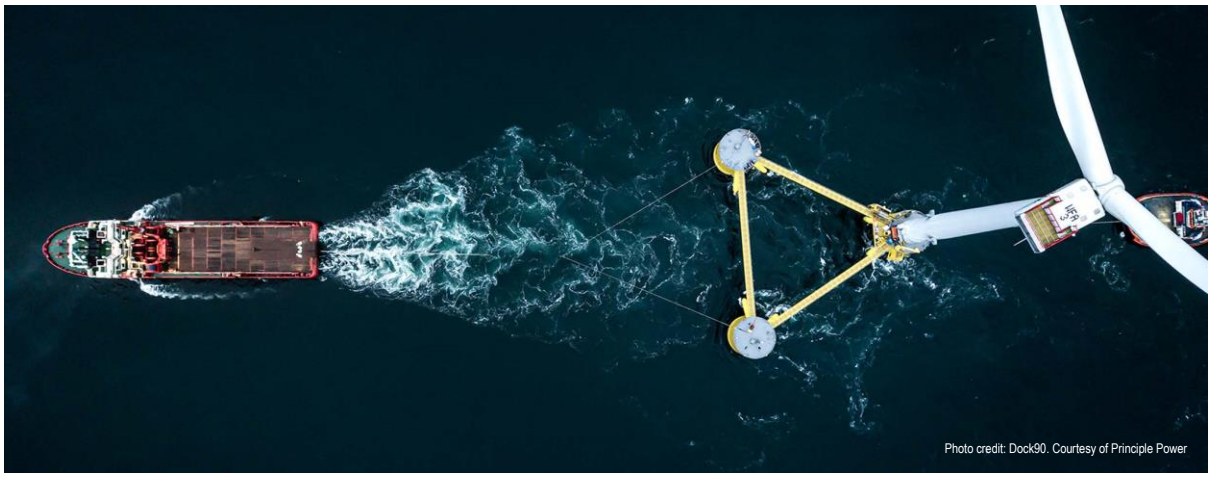

Project Erebus Environmental Statement
Chapter 25: Traffic and Transportation

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Acronyms

Term	Definition
AADT	Average Annual Daily Traffic
CTMP	Construction Traffic Management Plan
DMRB	Design Manual for Roads and Bridges
HGV	Heavy Goods Vehicle
IEMA	Institute of Environmental Management and Assessment
TA	Transport Assessment
HDD	Horizontal Directional Drilling

Chapter 25 Traffic and Transportation

25.1 Introduction

25.1.1.1 The following chapter examines the environmental impact of the traffic movements generated by the Proposed Development, focussing on the construction phase due to the minimal number of trips generated by the development's operational phase.

25.1.1.2 The onshore substation site is located to the south of Pembroke Power Station and will be connected to the landfall via a submerged cable. The location of the onshore substation site and the route of the onshore cable corridor is shown in Volume 2 Figure 25.1.

25.1.1.3 It is proposed to access the substation from the unclassified access to Lambeeth Farm, with the onshore export cable linking this with Pembroke Power Station to the north and the landfall at West Angle Bay to the west. The onshore export cable will be installed from separate sites accessed from the local highway network.

25.1.1.4 This chapter is based on the findings contained within the Transport Assessment (TA) as included within Volume 3 Technical Appendix 25.1. An outline Construction Traffic Management Plan (CTMP) has also been prepared to support the planning application, with the document included in Volume 3 Technical Appendix 25.2.

25.1.1.5 This chapter has been prepared in accordance with The Guidelines for the Environmental Assessment of Road Traffic (Institute of Environmental Assessment, 1993) and includes the following:

- identification of relevant legislation and policy referred to for the purpose of this chapter;
- details of the consultation process undertaken to inform the study;
- the methodology adopted within this assessment;
- the baseline conditions in the vicinity of the site;
- results of an assessment of potential effects to receptors;
- a review of the potential for measures to be introduced to mitigate the impact of traffic associated with the development's construction; and
- a summary of the residual effects following the implementation of mitigation measures.

25.1.1.6 The results of the analysis are summarised at the end of the chapter.

25.1.1.7 This chapter and the associated appendices have been prepared following:

- Initial consultation with Pembrokeshire County Council (PCC);
- Consultation with a local heavy haulage firm (Smiths Heavy Haulage);
- A video survey of the local highway network;
- A topographical survey of the Ferry Lane rail bridge to demonstrate the suitability of the route to accommodate a high abnormal load; and
- Surveys of the local highway network.

25.1.1.8 It has been assumed that all abnormal loads will pass through Pembroke Docks and require to be escorted between the docks and the sites.

25.1.1.9 This assessment has been undertaken by Cundall Johnston & Partners LLP. The chapter has been authored by Graeme Low (HND BSc (Hons) MCIHT CEng) who has over 20 years' experience in the field of Transport Planning.

25.2 Legislation, Policy and Guidelines

25.2.1 Legislation

25.2.1.1 The assessment has taken account of the following legislation:

- Active Travel Act Guidance (Welsh Government, 2021); and
- Well-being of Future Generations (Wales) Act (Commissioner for Wales, 2015).

25.2.2 Policy

25.2.2.1 The following planning policy was reviewed and taken into account as part of this assessment:

- National Planning Policy Framework (Ministry of Housing Communities & Local Government, 2021)
- The Wales Transport Strategy 2021 (Welsh Government, 2021);
- Future Wales: The National Plan to 2040 (2021); Planning Policy Wales 11 (PPW) (2021);
- Joint Transport Plan for South West Wales (2015-2020) (Carmarthenshire County Council, Neath Port Talbot County Borough Council, Pembrokeshire County Council and City and County of Swansea, 2015);
- Pembrokeshire County Council Local Development Plan (LDP) (2013 - currently undergoing review); and
- Pembrokeshire Coast National Park LDP (2020).

25.2.3 Guidance

25.2.3.1 Recognisance has been taken of the following best practice guidelines / guidance:

- Guidance on Transport Assessment (Department for Transport, 2007);
- The Guidelines for the Environmental Assessment of Road Traffic (Institute of Environmental Assessment (IEA), 1993);
- Design Manual for Roads and Bridges: LA 104 – Environmental Assessment and Monitoring (Highways England et al., 2020);
- Design Manual for Roads and Bridges: LA 112 - Population and Human Health (Highways England et al., 2020); and
- Planning Policy Wales Technical Advice Note 18: Transport – Annex D – Transport Assessment (Welsh Assembly Government, 2007).

25.3 Consultation and Scoping

25.3.1.1 A scoping note was issued to Natural Resources Wales who distributed it to a wider group of stakeholders including Pembrokeshire County Council and Pembrokeshire Coast National Park Authority and the scoping response confirmed the following:

'*No comments were received from consultees in relation to Traffic and Transport and we have no comment to make on this section of the report (section 7.7). The ES should however include an assessment of impacts on Traffic and Transport, as set out in the scoping report*'.

25.3.1.2 This chapter provides an assessment which aligns with the above requirement.

25.3.1.3 This assessment and the associated TA and CTMP, have been informed through initial consultation with Pembrokeshire County Council's (PCC's) Bridge Engineer (Neil Morgan) on the 19th February 2021 to confirm the suitability of the identified abnormal load construction vehicle route to accommodate the largest abnormal load (a 90t transformer). PCC confirmed that there were no weight restrictions on the route including on Northgate Street where it crosses Pembroke's Mill Pond.

25.3.1.4 The assessment was also supported by consultation with a local heavy haulage firm (Smiths Heavy Haulage) in February 2021 to demonstrate the suitability of the identified route via Ferry Lane to accommodate the 90 t transformer's transportation to the onshore substation site.

25.3.1.5 Further information on the routes referred to above is set out in Section 25.5.

25.3.1.6 Public consultation events were held in Hundleton and Angle Bay and full details is provided with regard to this within Volume 3 Technical Appendix 2.3 Consultation Report. No issues were, however, raised in relation to the potential impact of construction activities on the local highway network as a result of the consultation exercise.

25.4 Review of Baseline Conditions

25.4.1.1 An assessment of the existing transport network has been undertaken to inform this ES, with this supported by the following elements:

- Initial consultation with Pembrokeshire County Council;
- Consultation with a local heavy haulage firm (Smiths Heavy Haulage);
- A video survey of the local highway network;
- A review of the existing transport network, including sustainable transport provision, via a desktop exercise;
- A topographical survey of the Ferry Lane rail bridge to demonstrate the suitability of the route to accommodate a high abnormal load; and
- A review of traffic surveys of the local highway network. undertaken in December 2018

25.5 Assessment Methodology and Significance Criteria

25.5.1.1 This assessment has taken account of the Guidelines for the Environmental Assessment of Road Traffic (Guidance Note No. 1) prepared by The Institute of Environmental Assessment (IEA) (now The Institute of Environmental Management & Assessment), hereafter referred to as 'the IEMA Guidelines'. The IEMA Guidelines suggests consideration of the following two rules when assessing the impact of development traffic on a road link:

- Rule 1: Include highway links where traffic flows will increase more than 30% or the number of heavy goods vehicles (HGVs) will increase by more than 30%; and
- Rule 2: Include any other specifically sensitive areas where traffic flows have increased by 10% or more.

25.5.1.2 The 30% threshold is based upon research and experience of the environmental effects of traffic, with less than a 30% increase generally resulting in imperceptible changes in the effects. At a simple level, the guidance considers that a projected change in traffic flow of less than 10% creates no discernible environmental effect, hence the second threshold as set out in Rule 2.

25.5.1.3 The environmental effects of road traffic resulting from the construction phase of the Proposed Development have been assessed on the local highway network in accordance with the above IEMA Guidelines. This assessment has focussed on the highway network provided between Pembroke and the sites on which all construction trips are expected to pass and on which the Proposed Development is expected to have the greatest impact.

25.5.1.4 In accordance with IEMA Guidelines, assessments have been undertaken across a typical working day and peak hours have been considered together with Average Annual Daily Traffic (AADT) flows.

25.5.1.5 As identified within the TA and CTMP (Volume 3 Technical Appendices 25.1 and 25.2, respectively), the Proposed Development will generate a negligible number of vehicle movements on a weekly basis associated with its operation, with these primarily supporting routine maintenance activities. The impact of the operational phase of the Proposed Development has therefore been scoped out of this study.

25.5.2 Study Area

25.5.2.1 This assessment has focussed on the highway network provided between Pembroke and the onshore substation site, export cable installation sites and two potential landfall sites, on which all construction trips are expected to pass and on which the Proposed Development is expected to have the greatest impact. The study area is shown in Volume 2 Figure 25.2.

25.5.2.2 The study area includes the following roads and Volume 2 Figure 25.3 shows the location of these in relation to the study area:

- B4319;
- Clay Lane;
- B4320;
- C3101 (Wallaston Green);
- Goldborough Road; and
- Lambeeth Farm Access.

25.5.3 Desk Study

25.5.3.1 The assessment has been based on a desk-based review of the local transport network including its accident history.

25.5.4 Site Visit / Surveys

25.5.4.1 The local highway network was subject to a video survey in October 2020 to review the form of the key routes expected to accommodate traffic associated with construction activities. The survey identified potential constraints to abnormal load movements and was used to develop an access strategy for construction traffic.

25.5.4.2 A potential constraint was identified at the Ferry Lane rail bride and it was subject to a topographical survey to review the available clearance height and demonstrate that the largest abnormal load could be accommodated under the structure.

25.5.4.3 Traffic flow data has been sourced from a nearby study to ensure a robust dataset is used for the purpose of the assessment due to the impact of the current pandemic on travel patterns and associated traffic flows. The data was captured via surveys undertaken in December 2018.

25.5.5 Assessment of Potential Effect Significance

25.5.5.1 The following sections make reference to the Guidelines for the Environmental Assessment of Road Traffic published by the Institute of Environmental Assessment in 1993, including using the recommended descriptions of assessment set out within.

Types of Effect

25.5.5.2 Table 2.1 of the IEMA Guidelines sets out the following list of environmental effects which should be assessed for their significance in relation to a development's traffic and transportation impact:

- noise and vibration;
- visual effects;
- severance;
- driver delay;
- pedestrian delay;
- pedestrian amenity;
- accidents and safety;
- air pollution; and
- dust and dirt.

25.5.5.3 The following subsections describe each of the above environmental effects in turn.

Noise and Vibration

25.5.5.4 The environmental implications of noise and vibration arising from changes in traffic flow have been separately assessed within Chapter 22: Onshore Noise and Vibration.

Visual Effects

25.5.5.5 The visual effect of traffic is complex in addition to being subjective and takes cognisance of both visual obstruction and visual intrusion. The IEMA Guidelines acknowledge that "in the majority of situations, the changes in traffic resulting from a development will have little effect". The environmental implications of visual effects for the Proposed Development have been separately assessed and included within Chapter 21: Landscape and Visual Impact.

Severance

25.5.5.6 Severance can be physical or a perceived separation within a geographical area. It is described in DMRB LA 112 Population and Human Health as '*the extent to which members of communities are able (or not able) to move around their community and access services/facilities.*' The assessment of severance pays full regard to specific local conditions, in particular the location of pedestrian routes to key local facilities and whether crossing facilities are provided or not.

25.5.5.7 DMRB provides guidance, summarised in Table 25.1, as to the measures of community severance based on the volume of traffic on road(s) separating residential areas or residents from community facilities and services, offering some indication of pedestrian delay or diversion.

Table 25.1 – DMRB Community Severance

Level of severance	Average Annual Daily Traffic (AADT)
Low	<4,000
Medium	4,000 - 8,000
High	8,000 – 16,000
Very High	>16,000

Driver Delay

25.5.5.8 Delay to drivers generally occurs at junctions with opposing vehicle manoeuvres where vehicles give way to other vehicles. The local highway network has been altered in recent years to provide priority to traffic travelling to and from the nearby Pembroke Power Station and Valero Oil Refinery, removing the requirement for construction vehicles to give way at two key locations in the study area. Whilst there is the potential for increased delay where construction vehicles access or leave Goldborough Road, the junction is lightly trafficked with the impact of additional vehicle movements expected to be minimal.

Pedestrian Delay

25.5.5.9 The delay incurred by pedestrians is generally a direct consequence of their ability to cross roads. Therefore, the provision of crossing facilities, the geometric characteristics of the road, and the traffic volume, composition and speed are all factors that can affect pedestrian delay and have been considered when assessing this effect. It should be noted that the IEMA Guidelines advise that "*in assessing levels of, and changes in, pedestrian delay, assessors do not attempt to use quantitative thresholds*." Instead, the Guidelines recommend the use of professional judgement to determine whether pedestrian delay is a significant effect.

Pedestrian Amenity

25.5.5.10 The term pedestrian amenity is broadly defined as the relative pleasantness of a journey. It is considered to be affected by traffic flow, speed and composition as well as footway width and the separation / protection from traffic. It encompasses the overall relationship between pedestrians and traffic, including fear and intimidation which is the most emotive and difficult effect to quantify and assess. There are no commonly agreed thresholds for quantifying the significance of changes in pedestrian amenity, although the IEMA Guidelines identify traffic flow thresholds which could be referenced when considering any effect. These thresholds are replicated in Table 25.2.

Table 25.2 – IEMA Example of Fear and Intimidation

Degree of Hazard	Average Traffic Flow Over 18 Hour Day (Vehicles per Hour)
Slight	<8,000
Moderate	8,00 – 16,000
Severe	>16,000

Accidents and Safety

25.5.5.11 Injury Accident data has been extracted from the Crashmap database for the local highway network to establish the effect on road safety along the adjoining road network. These statistics provide information on the location and severity of accidents and the data obtained covers the period between 1st January 2016 and 31st December 2020.

Air Pollution

25.5.5.12 The environmental implications of air pollution arising from changes in traffic flow, have been separately assessed within Chapter 26: Air Quality.

Dust and Dirt

25.5.5.13 Potential dust and dirt arising from traffic is mainly associated with HGVs. The extent of any impact of dust and dirt arising from the construction and post construction phase would be dependent upon the management practices adopted on-site. Specifically, procedures such as washing down of wheels and sheeting of HGVs likely to shed debris, would prevent the occurrence of dust and dirt spreading from the site to the adjoining road network. Such procedures remove the possibility of dust and dirt impacting upon the surrounding road network. Assessment of effects associated with dust and dirt is included within Chapter 26: Air Quality.

Sensitivity

25.5.5.14 The significance of an effect is relative to the sensitivity or quantity of a receptor. Therefore, sensitive receptors within the surrounding area and the road network have been identified as those locations which will be most susceptible to any adverse effects of increased traffic generated by the Proposed Development's construction.

25.5.5.15 The sensitivity of the receptor has been identified based on the methodology identified in DMRB LA 104 - Environmental Assessment and Monitoring). The assessment of the environmental value of receptors is shown in Table 25.3.

Table 25.3 – Receptor Types and Associated Sensitivity

Receptor Sensitivity	Typical Description	Typical Examples
Very High	Very high importance and rarity, international scale and very limited potential for substitution	Main airports, ferry terminals or other international transport connections
High	High importance and rarity, national scale, and limited potential for substitution	Key motorway junctions or transport hubs or commercial government facilities of national importance
Medium	Medium or high importance and rarity, regional scale, limited potential for substitution	Major junctions on the strategic roads network, major transport interchanges, accident blackspots, hospitals, city/town centres and major employment sites
Low	Low or medium importance and rarity, local scale	Principal routes on the local road network, congested local roads/junctions, roads with a significant number of accidents, cycle routes and road without pedestrian facilities. Important local facilities sensitive to traffic increase including schools, colleges, playgrounds, retirement homes and doctors' surgeries.
Negligible	Very low importance and rarity, local scale	Local roads with no capacity issues, industrial roads with regular HGV movement and roads with low sensitivity to traffic flows

25.5.5.16 All impacts associated with Traffic and Transportation are adverse and Table 25.4 summarises the magnitude of impact and their associated descriptions as defined in LA 104.

Table 25.4 – Magnitude of Impact

Magnitude of Impact	Typical Description
Major	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements
Moderate	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements
Minor	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements
No Change	No loss or alteration of characteristics, features or elements; no observable impact in either direction

25.5.5.17 The significance of the potential effects has been determined using the matrix presented in Table 25.5 which is adapted from the matrix presented in LA 104. The significance is based on a combination of the sensitivity or importance of the receptor and the magnitude of a potential impact.

Table 25.5 – Effect Significant Matrix

		Sensitivity			
		High or Very High	**Medium**	**Low**	**Negligible**
Magnitude	**Major**	Major	Major	Moderate	Minor
	Moderate	Major	Moderate	Minor	Minor
	Slight / Minor	Moderate	Minor	Minor	Negligible
	Negligible	Minor	Minor	Negligible	Negligible

25.5.5.18 Table 25.6 summarises the significance of effects, as adapted from LA 104, which are to be used for the purpose of this assessment.

Table 25.6 – Significance Criteria

Significance Category	Typical Description
Major	Effects at this level are material in the decision-making process
Moderate	Effects at this level can be considered to be material decision-making factors
Minor	Effects at this level are not material in the decision-making process
Negligible	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error

25.5.6 Standard Mitigation

25.5.6.1 A range of standard mitigation measures has already been applied to the Project as part of the over-arching site selection and iterative design process (see below and Chapter 3: Site Selection and Alternatives). These have been introduced in order to minimise potential impacts of the Project on any affected receptors.

25.5.6.2 Standard mitigation measures which the Project has already implemented, or is committed to in the future, in order to minimise potential impacts on traffic and transportation are fully detailed within the accompanying outline CTMP (Volume 3, Technical Appendix 25.2) and summarised below:

- Signage will be erected on the C3101 in the vicinity of its junction with Goldborough Road, on Goldborough Road and on the unclassified road supporting access to the onshore substation site, highlighting the potential for drivers to meet construction related traffic;

- Temporary speed limits will be implemented on the route from the C3101 to the onshore substation site;
- PCC will be contacted to provide advance warning of the intention to use the identified routes to accommodate abnormal loads;
- Dyfed-Powys Police will be consulted to agree the most appropriate times for abnormal loads to deliver components to the onshore substation site and identify any specific sections of the route requiring police assistance;
- Route plans will be prepared and distributed to contractors prior to construction activities commencing to ensure that vehicles stay on the key access routes;
- Abnormal load movements will be escorted along the length of the access route to manage the interaction with general traffic and mitigate the impact of identified constraints;
- A 15 mph speed limit will be implemented in the vicinity of the onshore substation site;
- Wheel washing facilities will be provided on-site for vehicles to reduce the amount of mud and debris on the public highway network; and
- Workers will be encouraged to car share when accessing and leaving the onshore substation site.

25.5.6.3 Deliveries would be scheduled in consultation with the appropriate authorities to minimise disruption as far as reasonably practicable and confirmed within the full CTMP. These authorities may include Pembrokeshire County Council, South Wales Police, Pembrokeshire Coast National Park Authority, and Highways England.

25.5.6.4 The identified measures will also be implemented to support the formation of new temporary accesses to individual sites associated with cable installation activities and construction of the landfall. An indicative layout of traffic management measures is included in outline CTMP (Volume 3, Technical Appendix 25.2).

25.5.6.5 The requirement for a CTMP can be secured through an appropriately worded planning condition.

25.5.7 Assessment for Residual Effect Significance

25.5.7.1 The impact assessments and conclusions on significance of effect presented in Section 25.7 assume that these standard mitigation measures listed above have been successfully implemented. Where significant environmental effects remain even after these standard measures have been factored in, then project-specific mitigation measures are detailed and the residual significance of effect presented.

25.5.8 Limitations to Assessment

25.5.8.1 The assessment has been based on an estimate of construction vehicle movements in advance of the Contractor being appointed and detailed design works being undertaken. The detailed means by which the onshore substation will be constructed, and onshore export cable will be installed have yet to be confirmed and whilst this study is considered to present a robust estimate of the Proposed Development's impact on the operation of the local highway network, this is likely to be refined following appointment of the Contractor.

25.6 Baseline Conditions

25.6.1 Local Highway Network

25.6.1.1 The onshore substation site is located immediately to the south of an unclassified road providing access to Lambeeth Farm, with this connecting to Goldborough Road approximately 500 m to the southwest of the site. Both roads are restricted to approximately 3 m in width. Goldborough Road connects to the C3101 via a ghost island priority junction located approximately 350 m to the west of the junction providing access to Lambeeth Farm.

25.6.1.2 Whilst the C3101 is an unclassified road, it is of a good standard as it supports access to both the adjacent Pembroke Power Station and the Valero Oil Refinery. The unclassified road connects to the B4320 via a recently altered priority junction, with priority now provided for vehicles accessing the power station and oil refinery from the east. The B4320 is also of a reasonable standard between its junctions with the C3101 and the unclassified road providing the eastern access to the village of Angle. The B4320 reduces to approximately 3 m in width to the west of this, becoming a single track road supported by passing places, prior to providing an increased carriageway width within Angle. An unclassified road connects the village with the West Angle Bay car park at which the northern landfall option is located. The southern landfall option would be accessed via an unclassified road which is approximately 3 m in width and connects to the B4320 to the south of Angle at a hairpin bend.

25.6.1.3 The majority of the local highway network is of a good standard and therefore considered to be suitable to accommodate construction traffic accessing sites associated with the onshore export cable installation. Whilst the western section of the B4320 is of a reduced standard, measures associated with the implementation of the outline CTMP, will minimise the impact of construction traffic.

25.6.1.4 The B4320 supports access from Pembroke via the B4319 and Clay Lane which are both of a good standard having been improved in recent years through construction of a bypass of Maiden Wells and altered junction priority at the interchange of the B4319 and the unclassified road which becomes Clay Lane. The B4319 is supported by a climber lane for traffic leaving Pembroke, with an escape lane provided for northbound traffic in advance of its junction with the A4139.

25.6.1.5 Larger components are expected to arrive via Pembroke Dock prior to being used to support construction activities. The A4139 provides a route able to accommodate larger construction vehicles, including abnormal loads, with infrastructure installed in a manner which enables easy removal on a temporary basis. There is also sufficient clearance provided under the Ferry Lane rail bridge to enable the largest substation component (a 90 t transformer) to be transported via this route. Whilst there is a signed weight restriction for the town centre's road network, this is aimed at dissuading larger vehicles from passing through this area rather than supporting any actual weight restrictions. The A4139 connects to the A477 via a signalised junction and to the B4319 via a priority junction. The road is generally of a good standard being urban in nature for the majority of its length.

25.6.1.6 The A4075 provides a means for construction traffic to access the sites from the east via the A477. The road is rural and of a good standard for the majority of its length, with parking restrictions provided at key locations as it passes through Pembroke. A rail bridge crosses the road at its western end, providing a maximum clearance height of 4.5 m, with the restriction well signed from both directions. The A4075 interchanges with the A477 via a large priority junction supported by single lane dualling, at its eastern end, and with the A4139 via a mini-roundabout at its western end.

25.6.1.7 The local and wider highway network is generally of a good standard having been improved in recent years to accommodate vehicles accessing the nearby power station and oil refinery, and it is therefore of a standard able to accommodate traffic associated with constructing the onshore substation and installing the associated onshore export cables. Further detail is provided with regard to the local highway network and its ability to accommodate larger construction vehicles within the outline CTMP (Volume 3, Technical Appendix 25.2).

25.6.1.8 The operation of the following junctions was surveyed over a 24 hour period:

- B4320 / C3101 (Wallaston Green) priority junction; and
- C3101 / Goldborough Road priority junction.

25.6.1.9 Both junctions were surveyed to be lightly trafficked throughout the majority of the day with the peak hours of network operation were identified to be as follows:

- AM peak hour – 08:00 – 09:00; and
- PM peak hour – 18:00 – 19:00.

25.6.1.10 Table 25.7 summarises the daily traffic flow in terms of total traffic and the percentage of HGVs recorded on the local highway links which construction traffic will use in association with the onshore substation's construction and onshore export cable's installation.

Table 25.7 – Traffic Flow Summary

Highway Link	AADT	HGV %
B4320 East	2986	7.4%
B4320 West	652	5.5%
C3101 between the B4320 and Goldborough Road	2410	7.8%
Goldborough Road	34	29.4%

25.6.1.11 As can be seen from Table 25.7, the majority of traffic routes along the B4320 and C3101 and it is expected that it is associated with the nearby power station and oil refinery operations. All of the roads accommodate a daily traffic flow of less than 3,000 vehicles, with, Goldborough Road and the B4320 west of its junction with the C3101, surveyed to accommodate a significantly lower traffic volume. The proportion of HGVs using Goldborough Road is a reflection of recorded traffic flows being so low, with the remainder of the network accommodating a proportion of HGVs ranging from 5.5% - 7.8%.

25.6.2 Sensitive Receptors

25.6.2.1 Volume 2 Figure 25.4 provides an overview of the sensitive receptors and their associated importance which have been identified between Pembroke and the sites.

25.6.2.2 As can be seen in Volume 2 Figure 25.4, there are no high sensitivity receptors, including hospitals or care homes, within close proximity to the construction route from Pembroke to the sites. There are, however, a number of medium sensitivity (County, Regional) receptors in the form of residential properties located within 200 m of the construction routes, with the majority of these located within Maiden Wells and adjacent to Clay Lane. Only a few of the properties are located immediately adjacent to the carriageway, with the majority set back.

25.6.2.3 Whilst there are additional sensitive receptors located at the western end of the route to the northern landfall location, the number of vehicle movements associated with the landfall's construction will be a small proportion of the overall number of generated vehicle movements.

25.6.2.4 The proposed site compound for the northern landfall location crosses over an unnamed road that provide access to the Chapel Bay Fort & Museum; the area of crossing is required to facilitate the Horizontal Directional Drilling (HDD) operation proposed for the landfall and does not require for the road to be closed.

25.6.2.5 Furthermore, the impact of the vehicles will be mitigated through the implementation of the measures identified within the outline CTMP (Volume 3, Technical Appendix 25.2).

25.6.2.6 The area is rural in nature and is able to be conveniently accessed from the wider highway network. Although this limits the potential effects of the Proposed Development on built development, there are residential properties located close to the construction route which require to be considered in association with this study.

25.6.2.7 The Proposed Development is forecast to have a negligible impact on the operation of the local highway network, with construction traffic being able to disperse onto the wider network when travelling to and from the sites.

25.6.3 Accident Data

25.6.3.1 The most recently available five year personal injury accident data (January 2016 to December 2020) have been obtained from CrashMap for the key construction access routes and Volume 2 Figure 25.5 summarises the location and severity of accidents recorded between Pembroke and the sites.

25.6.3.2 Whilst only seven accidents were reported on the B4319, Clay Lane and the B4320 between the A4139 and the onshore substation site on the main access route, three of these resulted in serious injuries, with one of these accidents reported at the B4320 / C1301 (Wallaston Green) junction. This serious accident involved a single vehicle and is therefore likely to have been as a result of driver error as opposed to an existing issue with the form of the local road network.

25.6.3.3 Five injury accidents were reported on the B4320 between the Wallaston Green junction and West Angle Bay, the route which will be used to support onshore cable laying activities and installation of the northern landfall option. One serious accident was reported at Newton and involved two vehicles, whereas the second serious accident, which was reported in Angle, involved only one vehicle and likely to be as a result of driver error.

25.7 Potential Environmental Effects

25.7.1 Increase in Vehicle Flows

25.7.1.1 The IEMA Guidance confirms that assessments should be undertaken for the opening year as this is the period which represents the greatest potential effect. However, as construction activities are currently planned to start in 2024 and run until September 2026, the assessment of the construction vehicles impact has been undertaken for 2026.

25.7.1.2 Whilst the construction programme cannot be finalised until the Contractor is appointed, Table 25.8 provides an estimate of the daily construction vehicle movements associated with the onshore substation's construction and onshore export cable's installation, based on experience in developing similar schemes.

Table 25.8 – Daily Construction Traffic Generation

	0 – 9 months		9 – 18 months	
Scheme Element	**AADT**	**HGV**	**AADT**	**HGV**
Onshore Substation	40	18	30	5
Onshore Export Cable	10	5	10	5
Total	50	23	40	10

25.7.1.3 As can be seen from the above summary, it is expected that the initial construction phase will generate the greatest number of daily trips and this assessment has therefore focussed on this for the purpose of reviewing the Proposed Development's traffic and transportation impact.

25.7.1.4 It is proposed to undertake general construction activities in 12-hour days (07:00 – 19:00) with the result that the majority of employees will access and leave the sites prior to and following the morning and evening peak hours of highway network operation. Whilst there will be vehicle movements associated with the transport of materials to and from the sites, these will be spread across the day, minimising the impact on the operation of the local and wider highway network.

25.7.1.5 The 2018 traffic survey data has been factored to 2026 when construction activities are planned to commence using a local Tempro growth factor (1.0584). Table 25.9 summarises the factored traffic flow data for the key local highway links in addition to quantifying the impact of development generated trips. It assumes that all onshore substation traffic accesses the site via Goldborough Road with all onshore export cable traffic accessing each of the installation sites via the B4320 west.

Table 25.9 – Development Impact on Daily Traffic Flows

Highway Link	2026 Base Traffic Flow	2026 Base + Development	Percentage Increase
B4320 East	3160	3210	1.58%
B4320 West	690	700	1.45%
C3101 between the B4320 and Goldborough Road	2551	2591	1.57%
Goldborough Road	36	76	111.11%

25.7.1.6 Table 25.10 summarises the impact on daily HGV movements generated by the Proposed Development.

Table 25.10 – Development Impact on Daily HGV Flows

Highway Link	2026 Base HGV Flow	2026 Base + Development	Percentage Increase
B4320 East	234	257	9.83%
B4320 West	38	43	13.17%
C3101 between the B4320 and Goldborough Road	199	222	11.56%
Goldborough Road	11	34	217.40%

25.7.1.7 The assessment of traffic related environmental effects for the Proposed Development is based on the review of the anticipated change in network traffic conditions between the "base" and "base + development" positions. As detailed in Section 25.4, only those links where a 10% increase in traffic flows where there are sensitive receptors, or where HGV flows will increase by more than 30%, need to be assessed further. As shown in Table 25.9 and 25.10, the Proposed Development is forecast to generate a minimal increase in traffic flows (no more than 1.58%) and a maximum increase of 13.17% in terms of the HGV proportion on all but one of the links. The reason for the increased impact on Goldborough Road is that the highway link is currently little used as it does not provide a through route for traffic.

25.7.2 Sensitive Receptors

25.7.2.1 As set out in Section 25.5.2 and illustrated in Volume 2 Figure 25.4, there are no high sensitivity receptors, including hospitals or care homes, within close proximity to the construction access route, although there are a number of medium sensitivity (County, Regional) receptors in the form of residential properties located within 200 m of the B4319, Clay Lane and the B4320. The majority of properties are set back from the trunk road rather than being located immediately adjacent to the carriageway.

25.7.2.2 The Proposed Development is forecast to have a negligible impact on the operation of the adjacent highway network either during its construction or its operation. Whilst traffic generated by the onshore substation's construction will result in an increase in traffic flows and HGV movements on Goldborough Road, this should be seen in the context of the minimal level of traffic currently using the road. Furthermore, there are no sensitive receptors located in the vicinity of the route between the C3101 and the onshore substation site. The local highway network is also of a good standard and providing convenient access to and from the wider highway network via Pembroke.

25.7.2.3 The IEMA Guidelines identify rules to be considered when assessing the impact of development traffic on a road link and the significance of effect obtained through the application of Table 25.4. It is therefore considered that the negligible increase in vehicle flows coupled with the low number of medium sensitive receptors located adjacent to the access route, results in the Proposed Development anticipated to have a **negligible** effect on the sensitive receptors, which is not significant in EIA terms.

25.7.3 Severance

25.7.3.1 The construction sites are located in an area that is rural in nature and the construction access route from Pembroke passes through a predominantly rural area, with Maiden Wells the only settlement which the route passes through. There is therefore limited existing demand for pedestrians to cross the route used to support construction access and it is considered that there is not an existing issue with severance.

25.7.3.2 Nevertheless, the level of severance has been assessed for the highway links in the vicinity of the sites which will accommodate all construction traffic. Table 25.11 compares the current level of severance (based on the thresholds identified in Table 25.5), with the level following the addition of Proposed Development generated traffic.

Table 25.11 – Impact on Severance

	2018 Existing		2026 Base (with development)	
Highway Link	**AADT**	**Severance**	**AADT**	**Severance**
B4320 East	3160	Low	3210	Low
B4320 West	690	Low	700	Low
C3101 between the B4320 and Goldborough Road	2551	Low	2591	Low
Goldborough Road	36	Low	76	Low

25.7.3.3 The scale of change is forecast to be negligible with the addition of construction traffic and the level of severance is forecast to remain at existing 2018 levels (i.e., low), with none of the links experiencing an AADT of close to 4,000 vehicles.

25.7.3.4 It is considered that the negligible level of community severance coupled with the low number of medium sensitive receptors located adjacent to the construction route will result in the Proposed Development having a **negligible** effect on severance, which is not significant in EIA terms.

25.7.4 Driver Delay

Highway Junctions

25.7.4.1 Delays to drivers are generally caused by junctions and are only likely to be significant when traffic flows on the network are close to capacity.

25.7.4.2 As detailed earlier, the Proposed Development is forecast to have a **negligible** impact on the operation of the adjacent highway network and the majority of junctions on the construction route will provide priority for the majority of traffic accessing the onshore substation and onshore export cable installation sites. Whilst there is the potential for a greater impact at the C3101 / Goldborough Road junction, it is currently lightly trafficked and able to accommodate an increased demand.

Highway Links

25.7.4.3 DMRB TA79/99 provides an estimate of the capacity of road links suggesting that the B4320 and C3101 have a two-way capacity of approximately 2,200 vehicles per hour. The highest two-way traffic flows on either of the roads is forecast to be less than 700 vehicles in 2026 when construction activities are planned to commence, equating to approximately 32% of the road's capacity.

25.7.4.4 It is therefore considered that the negligible increase in vehicle flows for an 18 month period coupled with the low number of medium sensitive receptors located adjacent to the construction access route from Pembroke, results in the Proposed Development anticipated to have a **negligible** effect on the sensitive receptors, which is not significant in EIA terms.

25.7.5 Pedestrian Delay

25.7.5.1 There are few quantitative measures of pedestrian delay. The IEMA Guidelines recommend that, rather than relying on thresholds of pedestrian delay, the assessor should use their judgement to determine whether there is a significant impact to pedestrian delay.

25.7.5.2 The Proposed Development will bring about increases in the number of vehicle movements during the 18 months construction period, however there are currently minimal pedestrian movements in the vicinity of the sites or the construction traffic route as a result of its rural location. For the purpose of this assessment pedestrian delay is therefore considered as part of severance and is included above.

25.7.6 Pedestrian Amenity

25.7.6.1 The rural location of the sites and rural nature of the area through which the main construction route passes through, results in there being limited pedestrian facilities in the area. Table 25.12 compares 2018 traffic flows with the impact of 2026 flows including construction traffic.

Table 25.12 – Daily Traffic Flows

Highway Link	2018 Existing	2026 Base (with development)
B4320 East	3160	3210
B4320 West	690	700
C3101 between the B4320 and Goldborough Road	2551	2591
Goldborough Road	36	76

25.7.6.2 Although vehicle flows are predicted to increase during the 18 months construction period, the actual numbers remain well below the level which could result in a slight level of fear and intimidation as specified by IEMA (8,000 vehicles).

25.7.6.3 Using the IEMA example of fear and intimidation and the significance of effect obtained through the application of Table 25.5, the resultant increase in vehicle flow as a result of construction activities is anticipated to have a **negligible** effect on pedestrian amenity, which is not significant in EIA terms.

25.7.7 Accidents and Safety

25.7.7.1 A review of the most recently available 5 years injury accident data (between 1st January 2016 and 31st December 2020) confirms that the local highway network is currently operating in a safe manner, with a total of 12 accidents reported on the construction route between Pembroke and the onshore substation site and onshore cable corridor.

25.7.7.2 It is considered that there are no safety issues on the local highway network which would be exacerbated through the addition of traffic associated with the onshore substation's construction or onshore export cable's installation. The movements would also be supported by the implementation of a number of measures outlined within the associated outline CTMP (Volume 3, Technical Appendix 25.2), with these including the implementation of a compressive signage strategy in the vicinity of the sites.

25.7.7.3 It is therefore considered that the impact of the Proposed Development upon accidents and safety would be **negligible**, which is not significant in EIA terms.

25.7.8 Dust and Dirt

25.7.8.1 Dust and dirt arising from traffic is mainly associated with HGV traffic. The outline CTMP (Volume 3, Technical Appendix 25.2) includes the introduction of wheel washing facilities and use of tarpaulins and will ensure that any dust and dirt that may be generated through construction activities is controlled. Additional standard mitigation is discussed in Chapter 26 Air Quality. It is therefore considered that any impact upon dust and dirt as a result of the Proposed Development would be negligible during construction. The significance effect due dust and dirt is **negligible**, which is not significant in EIA terms.

25.7.9 Assessment Summary

25.7.9.1 A summary of the assessment presented in this section is contained in Table 25.13.

Table 25.13 - Traffic and Transportation Assessment Summary

Potential Pathway Change / Impact	Realistic Worst Case Scenario	Justification
Construction		
Increase in vehicle flows	Negligible	Minimal increase in vehicle trips
Sensitive receptors	Negligible	Limited number of residential properties close to the construction route
Severance	Negligible	Minimal increase in vehicle trips on a route which passes through only one settlement between Pembroke and the sites
Driver Delay	Negligible	Minimal increase in vehicle trips
Pedestrian Delay	Assessed within severance	-

Potential Pathway Change / Impact	Realistic Worst Case Scenario	Justification
Pedestrian Amenity	Negligible	Limited pedestrian facilities provided in the rural area
Accidents and Safety	Negligible	Minimal increase in vehicle trips
Dust and Dirt	Negligible	Provision of measures as set out within the outline CTMP will minimise issues associated with construction vehicles leaving sites
Decommissioning		
Increase in vehicle flows	Negligible	Minimal increase in vehicle trips
Sensitive receptors	Negligible	Limited number of residential properties close to the construction route
Severance	Negligible	Minimal increase in vehicle trips on a route which passes through only one settlement between Pembroke and the sites
Driver Delay	Negligible	Minimal increase in vehicle trips
Pedestrian Delay	Assessed within severance	-
Pedestrian Amenity	Negligible	Limited pedestrian facilities provided in the rural area
Accidents and Safety	Negligible	Minimal increase in vehicle trips
Dust and Dirt	Negligible	Provision of measures as set out within the outline CTMP will minimise issues associated with construction vehicles leaving sites

25.7.9.2 As can be seen from the above summary, the Proposed Development is assessed to have a negligible effect on all environmental criteria identified by IEMA.

25.8 Residual Effects

25.8.1.1 No additional mitigation beyond the standard mitigation set out in Section 25.5.6 is considered to be required, given that potential effects have been assessed as non-significant.

25.9 Inter-Related Effects

25.9.1.1 Traffic generated by the Proposed Development's construction and decommissioning will have a negligible impact on the highway links on which it will travel. These movements will also have a negligible impact in relation to sensitive receptors living on the construction route, with these receptors unlikely to be affected by any inter-related works associated with the Proposed Development's delivery. There is therefore no real potential for Traffic and Transportation effects to contribute to significant combined or inter-related effects.

25.10 Cumulative Assessment

25.10.1.1 The list of projects with the potential for cumulative impact have been examined.

25.10.1.2 There is potential for additional construction activities to be occurring at the time of that planned in 2026 in association with the Proposed Development and the Contractor will work with others operating in the area and PCC Highways, to coordinate activities and minimise the impact on the adjacent highway network and local receptors as far as possible.

25.10.1.3 The Proposed Development is forecast to have a negligeable impact on the operation of the local highway network and it is expected that the final CTMP will be able to be more specific closer to the time when construction activities will commence.

25.11 Summary

25.11.1.1 The Proposed Development is forecast to generate a minimal number of trips associated with its operation, with a greater number of trips generated by construction and decommissioning activities.

25.11.1.2 The rural nature of the area results in there being a limited number of sensitive receptors located in the vicinity of the sites or close to the route to be used for construction traffic between Pembroke and the sites. Construction activities will also generate a minimal number of additional trips over the course of an average day and will therefore have a negligible effect on key traffic and transportation criteria identified within the IEMA Guidelines.

25.11.1.3 The implementation of measures identified within the outline CTMP (Volume 3, Technical Appendix 26.2) will further mitigation the impact of traffic generated by the onshore substation's construction and onshore export cable's installation. The Contractor will also liaise with others operating in the area to minimise the potential cumulative impacts generated by construction activities.

25.11.1.4 Table 25.14 provides a summary of the anticipated traffic and transportation effects associated with the Proposed Development.

Table 25.14 – Summary of Effects.

Description of Effect	Significance of Potential Effect (assuming standard mitigation implemented)		Additional Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial/ Adverse		Significance	Beneficial/ Adverse
Construction					
Increase in vehicle flows	Negligible	-	No mitigation proposed as Proposed Development forecast to have a minimal impact on the operation of the local road network.	Negligible	-
Noise and Vibration	Assessed in Chapter 22.				
Visual Effects	Assessed in Chapter 21.				
Severance	Negligible	-	No mitigation proposed as traffic flows on all assessed links remain less than 4,000 AADT.	Negligible	-
Driver Delay	Negligible	-	No mitigation proposed as Proposed Development forecast to have a minimal impact on the operation of the local road network.	Negligible	-
Pedestrian Delay	Assessed within Severance.				
Pedestrian Amenity	Negligible	-	Limited pedestrian activity in the vicinity of the sites or construction traffic route from Pembroke, therefore no requirement to introduce any measures to mitigate	Negligible	-

Description of Effect	Significance of Potential Effect (assuming standard mitigation implemented)		Additional Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial/ Adverse		Significance	Beneficial/ Adverse
			the impact of construction activities.		
Accidents and Safety	Negligible	-	No mitigation proposed as Proposed Development forecast to have a minimal impact on the operation of the local road network.	Negligible	-
Air Pollution	Assessed in Chapter 26.				
Dust and Dirt	Negligible	-	Construction Traffic Management Plan will be used to manage construction traffic movements and minimise impacts.	Negligible	-
Decommissioning					
The effects are likely to be similar but no worse than that identified for the construction phase.					

25.12 References

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