

Chapter 12 - Transport

Executive Summary

- 12.21 The site would be accessed in two places; the eastern access from an existing field access located within a large lay-by to the south of the entrance into the Pembroke Oil Refinery and the western access, located near the former Cheveralton Farm.
- 12.22 In order to construct the Proposed Development, bulk materials such as concrete and aggregate will be imported to the site from local sources, whilst specialist loads such the turbine components will arrive at Pembroke Dock by ship and will be transported to site using specialist vehicles.
- 12.23 The construction activities will lead to increased traffic volumes on the road study network during the construction phase only. Following commissioning of the Proposed Development, traffic flows will fall to two vehicles every fortnight.
- 12.24 An assessment of likely potential effects using IEMA guidelines has been undertaken. This determined that prior to the implementation of mitigation, only a minor, non-significant effect could be expected on the A477 in Pembroke Dock relating to the increase in HGV traffic operating on the route. All other receptors indicated a negligible effect caused by the Proposed Development within the study area.

Introduction

- 12.25 This Chapter considers the likely significant effects on receptors along the transport routes resulting from vehicle movements associated with the construction and operation of the Proposed Development. The specific objectives of the chapter are to:
- i. review the relevant policy and legislative framework;
 - ii. describe the baseline transport conditions;
 - iii. describe the assessment methodology and significance criteria used in undertaking the assessment;
 - iv. describe the likely potential effects, including direct, indirect and cumulative effects;

- v. describe the mitigation measures proposed to address likely significant effects; and
- vi. assess the residual effects remaining following the implementation of mitigation.

12.26 A high-level overview of the effects of the traffic movements has been considered in accordance with Institute of Environmental Assessment (now Institute of Environmental Management and Assessment (IEMA)) Guidelines for the Environmental Assessment of Road Traffic. The document is referred to as the IEMA Guidelines in this chapter.

Assessment Methodology and Significance Criteria

12.27 The methodology adopted in this assessment involved the following key stages:

- i. determine the baseline;
- ii. review the Proposed Development for impacts;
- iii. evaluate significance of effects on receptors;
- iv. identify mitigation; and
- v. assess residual effects.

Desk Study & Site Visit

12.28 The desk study included reviews and identification of the following:

- i. relevant transport planning policy
- ii. review of the previous application documents and consultee comments;
- iii. accident data;
- iv. any other traffic sensitive receptors in the area (core paths, routes, communities, etc);
- v. Ordnance Survey (OS) plans;
- vi. potential origin locations of construction staff and supply locations for construction materials to inform extent of local area roads network to be included in the assessment; and
- vii. constraints to the movement of Abnormal Indivisible Loads (AILs) through a Route Survey including swept path assessments.

12.29 The desk review was later confirmed by a site visit and walk over of the Proposed Development site. This was undertaken prior to the Covid 19 access restrictions.

Study Area and Sensitive Receptors

12.30 Access to the Development would be via two access points, the eastern access would be from an existing field entrance which is located within a large lay-by the opposite the Pembroke Oil Refinery. The western junction would be via a new priority located near the former Cheveralton Farm. Pembrokeshire County Council had previously agreed in principle that a junction could be located at this location subject to further detailed design and discussions.

12.31 The new access junction would be constructed by widening the existing lay-by and would link directly into the existing field access and onsite track that would continue to the proposed turbine locations. The western junction would be a new priority junction off the unclassified road to the site.

12.32 As discussed above, the proposed route for AILs to the site is via the A477, A4075, A4139, B4319, unclassified roads and B4320.

12.33 Much of the route is currently used by HGVs accessing the Pembroke Oil Refinery. The road network is not observed to be under any capacity pressures and is constructed to accommodate the movement of all vehicle classes

12.34 Construction material will be sourced from local suppliers, most of which are accessed via the A477. Due to weight restrictions on some local roads, construction traffic will be required to use the same route as AILs. Staff traffic is likely to approach from a variety of origins and may use alternative routes such as the B4320 and A4139 from Lamphey.

12.35 The study focuses on the impact on the A4075, A4139, B4319 and B4320.

12.36 The A4075, A4139 and B4319 pass through Pembroke which has several sensitive receptors close to the road, including schools, residential properties and churches.

Assessment of Likely Potential Effect Significance

12.37 The Institution of Environmental Management and Assessment (IEMA) ‘Guidelines for Environmental Impact Assessment’ (2005) notes that the separate ‘Guidelines for the Environmental Assessment of Road Traffic’ (1993) document should be used to characterise the environmental traffic and transport effects (off-site effects) and the assessment of significance of the effects of major new developments. The guidelines intend to complement professional judgement and the experience of trained assessors.

Receptor Sensitivity

12.38 In terms of traffic and transport impacts, the receptors are the users of the roads within the study area and the locations through which those roads pass.

12.39 The IEMA Guidelines includes guidance on how the sensitivity of receptors should be assessed. Using that as a base, professional judgement was used to develop a classification of sensitivity for users based on the characteristics of roads and locations. This is summarised in Table 12.1.

Table 12.1 – Classification of Receptor Sensitivity

Receptor	Sensitivity			
	High	Medium	Low	Negligible
Users of Roads	Where the road is a minor rural road, not constructed to accommodate	Where the road is a local A or B class road, capable of regular use by HGV traffic.	Where the road is Trunk or A-class, constructed to accommodate significant	Where roads have no adjacent settlements. Includes new strategic trunk roads that would be little

Receptor	Sensitivity			
	High	Medium	Low	Negligible
	<p>frequent use by HGVs.</p> <p>Includes roads with traffic control signals, waiting and loading restrictions, traffic calming measures.</p>	<p>Includes roads where there is some traffic calming or traffic management measures.</p>	<p>HGV composition.</p> <p>Includes roads with little or no traffic calming or traffic management measures.</p>	<p>affected by additional traffic and suitable for Abnormal Loads and new strategic trunk road junctions capable of accommodating Abnormal Loads.</p>
Users / Residents of Locations	<p>Where a location is a large rural settlement containing a high number of community and public services and facilities.</p>	<p>Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.</p>	<p>Where a location is a small rural settlement, few community or public facilities or services.</p>	<p>Where a location includes individual dwellings or scattered settlements with no facilities.</p>

- 12.40 The classifications are based upon the activities that can be expected in different areas and different types of streetscape. Professional judgement is used to reflect these generalised descriptions to study areas, especially those in remote areas where settlement size, function and facilities are more important than the category descriptors suggest.
- 12.41 Where a road passes through a location, users are considered subject to the highest level of sensitivity defined by either the road or location characteristics.

Magnitude of Impact

- 12.42 The following rules, also taken from the IEMA Guidelines are used to determine which links within the study area should be considered for detailed assessment:
- i. Rule 1 – include highway links where traffic flows are predicted to increase by more than 30% (or where the number of heavy goods vehicles is predicted to increase by more than 30%); and
 - ii. Rule 2 – include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more.
- 12.43 The IEMA Guidelines identify the key impacts that are most important when assessing the magnitude of traffic impacts from an individual development: the impacts and levels of magnitude are discussed below:
- i. Severance – the IEMA Guidance states that, “severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery.” Further, “Changes in traffic of 30%, 60%, and 90% are regarded as producing ‘slight’, ‘moderate’, and ‘substantial’ [or minor, moderate, and major] changes in severance respectively”. However, the Guidelines acknowledge that “the measurement and prediction of severance is extremely difficult”. (Para 4.28).

- ii. Driver delay – the IEMA Guidelines note that these delays are only likely to be “significant [or major] when the traffic on the network surrounding the development is already at, or close to, the capacity of the system” (Para 4.32).
- iii. Pedestrian delay – the delay to pedestrians, as with driver delay, is likely only to be major when the traffic on the network surrounding the development is already at, or close to, the capacity of the system. An increase in total traffic of approximately 30% can double the delay experienced by pedestrians attempting to cross the road and would be considered major.
- iv. Pedestrian amenity – the IEMA Guidelines suggests that a tentative threshold for judging the significance of changes in pedestrian amenity would be where the traffic flow (or its lorry component) is halved or doubled (Para 4.39). It is therefore considered that a change in the traffic flow of -50% or +100% would produce a major change in pedestrian amenity.
- v. Fear and intimidation – there are no commonly agreed thresholds for estimating levels of fear and intimidation, from known traffic and physical conditions. However, as the impact is considered to be sensitive to traffic flow, changes in traffic flow of 30%, 60% and 90% are regarded as producing minor, moderate and major changes respectively.
- vi. Accidents and safety – professional judgement would be used to assess the implications of local circumstances, or factors which may elevate or lessen risks of accidents.

12.44 While not specifically identified, as more vulnerable road user, cyclists are considered in similar terms to pedestrians.

Significance of Effects

12.45 To determine the overall significance of effects, the results from the receptor sensitivity and magnitude of change assessments are correlated and classified using a scale set out in Table 2.4 of Volume 11, Section 2, Part 5 of the Design Manual for Roads and Bridges (DMRB) and summarised in Table 12.2.

Table 12.2 – Significance of Effects

Receptor Sensitivity	Magnitude of Impacts			
	Major	Moderate	Minor	Negligible
High	Major	Major / Moderate	Moderate / Minor	Minor
Medium	Major / Moderate	Moderate	Minor	Minor / Negligible
Low	Moderate / Minor	Minor	Minor	Minor / Negligible
Negligible	Minor	Minor	Minor / Negligible	Negligible

12.46 In terms of the EIA Regulations, effects would be considered of significance where they are assessed to be major or moderate. Where an effect is Moderate/Minor, professional judgement will be used to determine whether the effect is significant on a case by case basis.

12.47 A review of potential receptors has been undertaken and a summary of receptor sensitivities based upon the various criteria has been established. This is illustrated in Table 12.3.

Table 12.3: Receptor Sensitivity Summary

Receptor	Sensitivity	Justification
Users of the U6307 and C3101 roads	Medium	Road is capable of accommodating HGV traffic to service developments at the nearby refinery and power station developments.
Users of the B road network between Pembroke and the B4320 / C3101 junction	Medium	Road is capable of accommodating HGV traffic for the refinery and power station site and has featured improvements to ease access to these sites.
Users of the road and footways with Pembroke	Medium	Some traffic management measures are in place however, the roads do provide wider HGV access to the south and west of Pembroke
Users of the A4075	Low	A class road with little or no traffic management measures
Users of the trunk road network	Low	A class road with little or no traffic management measures

Receptor	Sensitivity	Justification
Residents of road side properties between Pembroke and the site access	Negligible	Mainly locations with scattered individual properties along the access routes
Residents of road side properties within Pembroke	Medium	Access roads are located in an intermediate settlement with some community facilities located off them.
Residents of road side properties between the A477 and Pembroke	Negligible	A class road with little or no traffic management measures
Residents of road side properties in Pembroke Docks	Medium	Access roads are located in an intermediate settlement with some community facilities located off them.

Requirements for Mitigation

12.48 If significant likely potential effects are identified appropriate mitigation will be implemented to remove and reduce the significance of the effects where possible.

Residual Effects

12.49 Residual effects will be assessed following a similar methodology as the potential effects but taking into consideration the identified mitigation.

Cumulative Effects

12.50 Cumulative effects will take into consideration other developments in planning, under construction or in operation which, with the addition of the Proposed Development could cumulatively impact upon receptors.

Limitations to Assessment

12.51 The assessment is based upon an assumed construction programme for the Proposed Development. Alterations in this programme, may increase or decrease traffic flows per month.

12.52 This assessment is based upon average traffic flows. There may be localised peaks with construction days where flows can be higher for a specific hour, such as a shift change on site.

12.53 Assumptions on the original points for materials have been made to provide a worst-case assessment scenario. Should these origin points change, the effects on surrounding areas may alter to those presented in the assessment.

Baseline Conditions

Pedestrian and Cyclist Networks

12.54 There are no existing footpaths within the site, nor footways alongside the carriageway adjacent to the site.

12.55 The Sustrans website (www.sustrans.org.uk) indicates that National Cycle Route (NCR) 4 Fishguard – London bisects the A4139 within Pembroke, immediately to the south of the roundabout with Main Street.

12.56 Pembrokeshire County Council's website (<https://www.pembrokeshire.gov.uk/cycle-pembrokeshire>) notes that two on-road cycle trails bisect the proposed access route to the

site. The Heritage Coast Trail crosses the A4075 to the north of Pembroke, whilst the Castle 2 Castle Trail crosses the Valero access road at Wollaston Cross.

12.57 Construction drivers will be briefed on the likely presence of cyclists on particular lengths of the route so that their safety is safeguarded. This commitment will be included in a Construction Method Statement (CMS) which would be prepared if planning permission is granted.

Road Access

12.58 The roads that form the study area are as follows:

- i. Western Way: Local access, two lane road that provides local access within Pembroke Dock and provides connections from the port to the trunk road network;
- ii. A477: Welsh trunk road that provides national distributor linkages from Pembroke Docks to the A40 at St Clears;
- iii. A4075: two lane local distributor road that provides connections from the A477 trunk road to the east of Pembroke town;
- iv. Holyland Road, Well Hill and Orange Way: two lane roads within Pembroke that provide connections between the A4075 and B4319
- v. B4319: two lane road connecting southern Pembroke with Maiden Wells;
- vi. Clay Lane: two lane road connecting the B4320 with the B4319 to the east of Maiden Wells;
- vii. B4320: two lane road between the junction with the C3101 and Clay Lane;
- viii. C3101: two lane road connecting the B4320 to Wallaston Cross; and
- ix. U6307: two lane road connecting Wallaston Cross to the Valero Refinery.

Existing Traffic Conditions

12.59 A review of traffic data on the study network has been undertaken using Automatic Traffic Count (ATC) data collected in November 2019, prior to the start of the school holiday

periods. Further data was obtained from the UK Department for Transport (DfT) statistics website.

Data was collected at the following locations.

- i. Location 1: U6307 near the proposed site accesses
- ii. Location 2: C3101 to the south of Wallaston Cross;
- iii. Location 3: Clay Lane on the Maiden Wells Bypass;
- iv. Location 4: B4319 in southern Pembroke;
- v. Location 5: A4075 to the north of Pembroke;
- vi. Location 6: A477 near Milton;
- vii. Location 7: A477 near Slade Cross; and
- viii. Location 8: A477 at Waterloo, Pembroke Docks.

12.60 The baseline data is illustrated in Table 12.4 for 2019 flows.

Table 12.4: Baseline Traffic Flows (2019)

Survey Location	Cars & Lights	HGV	Total
U6307 Site Access	1160	371	1531
C3101 Wallaston Cross	1583	502	2085
Clay Lane at Maiden Wells	2602	642	3243
B4319 South Pembroke	6799	824	7623
A4075 North of Pembroke	3536	318	3854
A477 Milton	14317	747	15064
A477 Slade Cross	11991	660	12651

Survey Location	Cars & Lights	HGV	Total
A477 Waterloo	21298	948	22246

Accident Review

- 12.61 Road traffic accident data for the three years from 1st January 2017 to the 31st December 2019 for the road links that connect the A477 with the development site, including accidents noted within 100m of the A477 / A4075 junction were obtained from the website www.crashmap.co.uk.
- 12.62 The statistics are categorised into three categories, namely “Slight” for damage only incidents, “Serious” for injury accidents and “Fatal” for accidents that result in a death.
- 12.63 A summary analysis of the incidents indicates that:
- i. A total of thirteen accidents are recorded from the A477 through to the site access junctions;
 - ii. Of the recorded accidents, nine are recorded at “Slight”, whilst four are noted as “Serious”. No “Fatal” accidents were recorded;
 - iii. The junction of the A477 and A4075 has two “Slight” and two “Serious” accidents recorded at it. One accident involved a Young Driver;
 - iv. Two “Slight” accidents were recorded in Pembroke on the A4139. One “Slight” and two “Serious” accident were noted on the B4319 within the south of Pembroke;
 - v. One “Slight” and one “Serious” accident were noted on the B4320, with the latter incident located at the junction for the Valero access road;
 - vi. No accidents were noted on the Valero access road;
 - vii. The records indicated that there were no recorded pedestrian or child casualties within the study area;

- viii. Cars were involved in all accidents noted in the study area. One incident to the south of Pembroke involved a motorcycle;
- ix. Young drivers were involved in three accidents; and
- x. HGV were involved in three accidents, both within close proximity to each other to the south of Pembroke on the B4319. The “Serious” incident involved two other cars and involved five casualties.

12.64 The statistics indicate that the vast majority of accidents are “Slight” in nature and that there are a limited number of HGV incidents occurring in the three year review period.

Construction Phase

12.65 During the assumed 10-month construction period, the following traffic would require access to the Development site:

- i. staff transport (cars and / or staff minibuses);
- ii. construction equipment and materials, deliveries of machinery and supplies such as stone, reinforcement steel and concrete;
- iii. abnormal loads consisting of the wind turbine sections and also a heavy lift crane; and
- iv. abnormal load escort vehicles.

12.66 Construction works are expected to commence in 2022 should consent for the application be given. The baseline traffic survey data was factored to 2022 using National Road Traffic Forecasts (NRTF) Low Growth factors. The resulting baseline flow information is detailed below in Table 12.5.

Table 12.5: Future Baseline Traffic Flows (2022)

Survey Location	Cars & Lights	HGV	Total
U6307 Site Access	1186	379	1565

Survey Location	Cars & Lights	HGV	Total
C3101 Wallaston Cross	1618	513	2131
Clay Lane at Maiden Wells	2659	656	3315
B4319 South Pembroke	6948	842	7791
A4075 North of Pembroke	3614	325	3938
A477 Milton	14632	763	15395
A477 Slade Cross	12255	675	12930
A477 Waterloo	21767	968	22735

Construction Staff

- 12.67 Staff would arrive in non-HGV vehicles and where possible will be encouraged to car share. The workforce onsite will depend on the activities undertaken, but, based on previous wind farm construction site experience for a project of this scale which suggests three staff per turbine during the short peak period of construction is likely, the maximum number of staff expected onsite would be around 9 per day.
- 12.68 For the purposes of estimating traffic movements, it was assumed that 100% of staff would arrive by car (single car occupancy was assumed as the worst case at this stage with potentially fewer movements through car sharing).
- 12.69 Based on these assumptions, staff transport cars and light vehicles would account for a maximum of 18 vehicle trips (9 car trips inbound and 9 car trips outbound) per day during the peak period of construction

12.70 All staff trips are estimated to originate from Pembroke and will access the site via the B4319, Clay Lane, B4320, the C3101 and U6307.

Abnormal Indivisible Loads (AIL)

12.71 All abnormal loads would be unloaded at Pembroke Docks and would access the site via Western Way, A477, A4075, B4319, Clay Lane, B4320, the C3101 and U6307. Full details of these loads and the proposed route are provided in ES Appendix 12.1 “Route Survey Report”.

12.72 The turbines are broken down into components for transport to the Site. The nacelle, blade and tower sections are classified as Abnormal Indivisible Loads (AIL) due to their weight, length, width and height when loaded. The numbers of components requiring transport are illustrated in Table 12.6.

12.73 In addition to the turbine deliveries, two high capacity erection cranes would be needed to offload components and erect the turbines. The cranes are likely to be mobile cranes with a capacity up to 800 tonnes that are escorted by boom and ballast trucks to allow full mobilisation onsite. Smaller erector cranes would also be present to allow the assembly of the main cranes and to ease the overall erection of the turbines.

12.74 Escort vehicles would accompany the AIL convoys to support the traffic management measures. Up to four vehicles would be deployed and it is assumed that three turbine components would be delivered per convoy. This would result in 10 convoys on the network, with a total of 58 escort journeys (29 trips in and 29 trips out).

12.75 The escort vehicles have been assumed to be police cars and light goods vehicles. Motorcycles may be deployed, depending upon Police resources.

Table 12.6: Turbine Components

Component	Number of Components per turbine	Component	Number of Components per turbine
Rotor Blades	3	Nose Cone	1
Tower Sections	3	Transformer	1
Nacelle	1	Ancillary	1
Hub	1	Site Parts	0.2

General Deliveries

12.76 Throughout the construction phase, general deliveries will be made to site via HGV. These would include fuel, site office supplies and staff welfare. At the height of construction, it is assumed that up to 40 journeys to site are made (20 in and 20 out) per month.

Material Deliveries

12.77 Various materials will need to be delivered to site to form the onsite infrastructure. At the outset, Heavy Goods Vehicles (HGV) will deliver plant and initial material quantities to the site to enable the formation of the site compound and to delivery construction machinery.

12.78 All turbine and substation foundation concrete will be imported to site from ready mix plants located to the northeast of Pembroke. Delivery will be made by HGV mixers.

12.79 Reinforcement deliveries will be made via standard HGV, with access being taken from the from the east of the A477. Foundation calculations for the turbine bases and the substation are detailed in Tables 12.7 and 12.8 below.

Table 12.7: Ready Mix Concrete Deliveries

Element	Volume / installation (m3)	Total Volume (m3)	Lorry Capacity (m3)	Inbound Trips	Total Journeys
Turbine Foundation	350	1750	6	292	584
Substation / Control Building Foundation	100	100	6	17	33

Table 12.8: Reinforcement Deliveries

Element	Weight / installation (t)	Total Weight (t)	Lorry Capacity (t)	Inbound Trips	Total Journeys
Turbine Foundation	50	250	30	9	18
Substation / Control Building Foundation	20	20	30	1	2

12.80 The onsite access roads, crane pads and hardstanding areas will be constructed from crushed rock and the material would be imported to site from external quarries. The

closest suitable quarry locations are located to the north of Pembroke Docks with access taken via the A477 from the west of the A477 / A4075 junction.

12.81 The imported material required at the site is detailed in Table 12.9.

Table 12.9: Imported Material Deliveries

Element	Volume / installation (m3)	Total Weight (t)	Lorry Capacity (t)	Inbound Trips	Total Journeys
Access tracks, hardstands and crane pads	14373	31620	20	1582	3164

12.82 Geotextile will be delivered to site in rolls. 12 inbound deliveries would be required and these would be delivered by HGV. Access for these loads will be from the east of the A477.

12.83 Cables will connect each turbine to the internal substation and control building. Trip estimates for the cable materials are provided below in Tables 12.10 and 12.11.

Table 12.10: Cable Trip Estimate

Element	Total Cable Length (m)	Length per Drum (m)	Number of Drums	Inbound Trips	Total Journeys
Cables	3900	500	8	1	2

Table 12.11: Cabling Sand Trip Estimate

Element	Volume / installation (m3)	Lorry Capacity (t)	Inbound Trips	Total Journeys
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Cabling Sand	439	20	36	72
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12.84 Geotextile is required across the site for a variety of uses. The estimate for trips associated with these deliveries is outlined in Table 12.13.

Table 12.13: Cable Trip Estimate

Element	Number of Drums	Inbound Trips	Total Journeys
Geotextile	43	3	6

12.85 A substation and control building will be constructed on the site. This will require deliveries of building materials and structural elements and would result in 150 journeys.

Construction Traffic Generation

12.86 The resulting traffic generation estimates have been plotted onto the indicative construction programme to illustrate the peak journeys on the network. Table 12.14 (overleaf) illustrates the trip generation throughout the construction programme.

12.87 The trip generation programme indicates that Month 5 is the peak period for construction activities. This corresponds with the delivery of ready mix concrete for the turbine foundations, completion of the access track network, start of cable trenching and general site deliveries and staff. The activities are anticipated to generate an average of 56 movements per day (28 trips in and 28 trips out), of which 18 would be made by light vehicles (site staff, etc.) and 38 by HGV.

12.88 Using the distribution of traffic described above, the proposed traffic flows on the study area network at the peak of construction are illustrated in Table 12.15.

Table 12.15 – Peak Construction Month Daily Traffic Data

Survey Location	Cars & Lights	HGV	Total
U6307 Site Access	38	18	56
C3101 Wallaston Cross	38	18	56
Clay Lane at Maiden Wells	38	18	56
B4319 South Pembroke	38	18	56
A4075 North of Pembroke	38	18	56
A477 Milton	8	0	8
A477 Slade Cross	30	0	30
A477 Waterloo	30	0	30

Table 12.14: Construction Traffic Generation Profile

Activity	Month									
	1	2	3	4	5	6	7	8	9	10
Site Establishment	130	20							100	50
General Site Deliveries	20	40	40	40	40	40	40	40	40	20
Imported Stone	633	633	633	633	633					
Reinforcement				6	6					
Ready Mix Concrete					128	128	128			
Cable Deliveries						2				
Cabling Sand Deliveries					24	24	24			

Activity	Month									
	1			1		1				
Geotextile Deliveries	1			1		1				
Substation Building						75	75			
Cranes							20		20	
AIL Deliveries								37	37	
AIL Escorts								29	29	
Staff	238	396	396	396	396	396	396	396	297	198
Total HGV	783	693	673	679	831	269	287	77	197	70
Total Cars / LGV	238	396	396	396	396	396	396	425	326	198
Total Movements	1021	1089	1069	1075	1227	665	683	502	523	268
Total HGV per Day	36	31	31	31	38	12	13	3	9	3
Total Cars / LGV per Day	11	18	18	18	18	18	18	19	15	9
Total per Day	46	49	49	49	56	30	31	23	24	12

Traffic Impact and Capacity Review

12.89 The peak month traffic data was combined with the future year (2022) traffic data to allow a comparison between the baseline results to be made. The increase in traffic volumes is presented in percentage increases for each class of vehicle and is illustrated in Table 12.16.

Table 12.16 – 2022 Peak Month Daily Traffic & Link Capacity Review

Survey Location	Cars & Lights	HGV	Total Traffic	Cars & Lights % Increase	HGV % Increase	Total Traffic % Increase
U6307 Site Access	1204	417	1621	1.52%	9.96%	3.56%
C3101 Wallaston Cross	1636	551	2187	1.11%	7.40%	2.63%
Clay Lane at Maiden Wells	2677	694	3371	0.68%	5.79%	1.69%
B4319 South Pembroke	6966	880	7846	0.26%	4.48%	0.72%
A4075 North of Pembroke	3632	362	3994	0.50%	11.63%	1.42%
A477 Milton	14632	771	15403	0.00%	1.03%	0.05%
A477 Slade Cross	12255	705	12960	0.00%	4.46%	0.23%
A477 Waterloo	21767	998	22765	0.00%	3.11%	0.13%

12.90 A review of existing road capacity has been undertaken using the Design Manual for Roads and Bridges, Volume 15, Part 5 “The NESAs Manual”. The theoretical road capacity has been estimated for each of the road links that makes up the study area. The assessment clearly indicates that there are no road capacity issues associated with the Proposed Development. The results are summarised in Table 12.17.

Table 12.17: 2022 Daily Traffic Capacity Review

Location	2022 Baseline Flow	2022 Base + Development Flows	Theoretical Road Capacity (12hr)	Spare Road Capacity %
U6307 Site Access	1565	1621	43200	96.25%
C3101 Wallaston Cross	2131	2187	43200	94.94%
Clay Lane at Maiden Wells	3315	3371	43200	92.20%
B4319 South Pembroke	7791	7846	38400	79.57%
A4075 North of Pembroke	3938	3994	43200	90.75%
A477 Milton	15395	15403	57600	73.26%
A477 Slade Cross	12930	12960	57600	77.50%
A477 Waterloo	22735	22765	38400	40.72%

Operational Review

12.91 It is predicted that during the operation of the site there would be up to two vehicle movements per week for maintenance purposes. There may be occasional abnormal load movements to deliver replacement components in the unlikely event of a major failure.

12.92 Given the low level of traffic generation associated with the operational phase, no further assessment has been undertaken.

Receptors Brought Forward for Assessment

12.93 The impact assessment indicates that traffic levels will not exceed the 30% threshold for total traffic or HGV flows at any point within the study area. As such, Rule 1 of the IEMA guidance is not exceeded.

12.94 Rule 2 notes that an assessment should be undertaken if traffic flows exceed 10% in particularly sensitive areas. Table 12.16 indicates that the HGV impact exceeds the 10% threshold only on the A4075 to the north of Pembroke.

12.95 A review of receptors has been undertaken to allow assessment against the criteria laid out in the IEMA guidance and the supporting thresholds.

12.96 Using the significance of effect criteria outlined previously, an IEMA assessment has been prepared for receptors where the sensitivity is classified as Medium or High (receptors with low sensitivity will have Slight or Neutral effects).

12.97 The significance of the potential effects has been determined using the rules and thresholds discussed previously. Table 12.18 summarises the significance on the receptors for the construction phase.

Table 12.18: Overall Construction Phase Effects

Receptors	Severance	Driver Delay	Pedestrian Delay	Amenity	Fear	Accidents & Safety
Users of the A4075	Minor	Minor	Minor	Minor	Minor	Minor
Residents along the A4075	Minor / Negligible	Minor / Negligible	Minor	Minor	Minor / Negligible	Minor

12.98 It should be noted that the assessment has considered the peak of construction activities and that this period is restricted to one month. These movements at the peak of construction equate to an average of 3 inbound HGV movements per hour. The peak period is transitory in nature and these movements will cease upon the completion of construction activities.

Standard Mitigation

12.99 The mitigation measures set out in the following section are considered good practice for wind farm construction sites and can be considered to be part of normal construction mitigation for a site of this nature.

Construction Phase

12.100 During the construction period, the Applicant will update the project website (www.rhoscrowtherwindfarm.co.uk) to ensure that it contains the latest information relating to the traffic movements and potential disruptions associated with vehicles accessing the site.

12.101 Subject to consent, the Applicant will prepare a Construction Traffic Management Plan (CTMP) for agreement with Pembrokeshire County Council prior to construction works commencing. The following measures would be implemented through the CTMP during the construction phase:

- i. All materials delivery lorries (dry materials) will be sheeted to reduce dust and stop spillage on public roads.
- ii. Specific training and disciplinary measures will be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway.
- iii. Wheel cleaning facilities will be established on the site.
- iv. Appropriate traffic management measures will also be put in place at the site access junction to advise drivers to slow down and be aware of turning traffic.
- v. Provision of construction updates on the project website and distribution of a newsletter to residents within an agreed distance of the site.
- vi. Requirement for all delivery drivers to attend an induction to include a safety briefing, the need for appropriate care and speed control, particularly in sensitive areas, identification of specific sensitive areas, identification of the specified route, and the requirement not to deviate from the specified route.
- vii. The production and implementation of a Staff Travel Plan which will include pick up times and car sharing information for those travelling to and from site.

12.102 The Applicant will cover the cost of abnormal wear and tear on roads not designed for that purpose and propose that this imposed by a planning condition.

12.103 Video footage of the pre-construction phase condition of the abnormal loads access route and the construction vehicles route will be recorded to provide a baseline of the state of the road prior to any construction work commencing. This baseline will inform any change

in the road condition during the construction stage of the Proposed Development. Any necessary repairs will be coordinated with Pembrokeshire County Council. Any damage caused by traffic associated with the Proposed Development, during the construction period that would be hazardous to road users, will be repaired immediately.

- 12.104 Any damage to road infrastructure caused directly by construction traffic will be made good, and street furniture that is removed on a temporary basis would be fully reinstated.
- 12.105 There will be a daily road edge review and any debris and mud removed from the public carriageway using an onsite road sweeper to keep the road clean and safe during the initial months of construction activity, until the construction junction and immediate access track works were complete.

Specific Abnormal Load Mitigation

- 12.106 Appropriate permits would be obtained in order to facilitate the transportation of abnormal loads at specified times to be agreed with the roads and other statutory authorities. Likewise, appropriate permits would be obtained in order to facilitate the temporary removal of street furniture (e.g. signage) where this could be required during the transportation of abnormal loads.
- 12.107 All abnormal load deliveries will be undertaken at appropriate times (to be discussed and agreed with the relevant roads authorities and police) with the aim to minimise the effect on the local road network. It is likely that the abnormal load convoys will travel in the early morning periods, before peak times while general construction traffic would generally avoid the morning and evening peak periods.
- 12.108 The majority of potential conflicts between construction traffic and other road users will occur with abnormal load traffic. General construction traffic is not likely to come into

conflict with other road users as the vehicles are narrower and road users are generally more accustomed to them.

12.109 Potential conflicts between the abnormal loads and other road users can occur at a variety of locations and circumstances. The main potential conflicts are likely to occur:

- i. Where the loads may straddle the centre line, where fast moving oncoming traffic may be encountered, etc.;
- ii. Where traffic turns at a road junction, requiring other traffic to be restrained on other approach arms; and
- iii. In locations where high speeds of general traffic are predicted.

12.110 Advance warning signs will be installed on the approaches to the affected road network. Information signage could be installed to help improve driver information and allow other road users to consider alternative routes or times for their journey (where such options exist).

12.111 The location and numbers of signs will be agreed post consent and would form part of the wider traffic management proposals for the Proposed Development.

12.112 Information on the turbine convoys will be provided to local media outlets such as local papers and local radio to help assist the public.

12.113 Information would relate to expected vehicle movements from Pembroke Docks through to the site access junction. This will assist residents becoming aware of the convoy movements and may help reduce any potential conflicts.

- 12.114 The Applicant will also ensure information was distributed through its communication team via the project website, local newsletters and social media.
- 12.115 A police escort will be required to facilitate the delivery of the predicted loads. The police escort would be further supplemented by a civilian pilot car to assist with the escort duty. It is proposed that an advance escort would warn oncoming vehicles ahead of the convoy, with one escort staying with the convoy at all times. The escorts and convoy would remain in radio contact at all times where possible.
- 12.116 The abnormal loads convoys will be no more than three AILs long, or as advised by the police, to permit safe transit along the delivery route and to allow limited overtaking opportunities for following traffic where it is safe to do so.
- 12.117 The times in which the convoys would travel will need to be agreed with Dyfed Powys Police who have sole discretion on when loads can be moved.

Abnormal Load Transport Management Plan

- 12.118 An Abnormal Load Transport Management Plan will be prepared to cater for all movements to and from the Proposed Development site. This would include:
- i. Procedures for liaising with the emergency services to ensure that police, fire and ambulance vehicles are not impeded by the loads. This is normally undertaken by informing the emergency services of delivery times and dates and agreeing communication protocols and lay over areas to allow overtaking.
 - ii. A diary of proposed delivery movements to liaise with the communities to avoid key dates such as popular local events etc.
 - iii. A protocol for working with local businesses to ensure the construction traffic does not interfere with deliveries or normal business traffic.

- iv. Proposals to establish a construction liaison committee to ensure the smooth management of the project / public interface with the applicant, the construction contractors, the local community, and if appropriate, the police forming the committee. This committee would form a means of communicating and updating on forthcoming activities and dealing with any potential issues arising.

12.119 Further details are provided in the Transport Management Plan appended to the application.

Operational Phase Mitigation

12.120 Site entrance roads will be well maintained and monitored during the operational life of the development. Regular maintenance will be undertaken to keep the site access track drainage systems fully operational and the road surface in good condition and to ensure there are no adverse issues affecting the public road network.

Likely Potential Effects

Construction Phase

12.121 An assessment of the likely effects has been undertaken using the previously described thresholds. The effects on the study area have been reviewed and have been classified as being minor and non-significant.

Operational Phase

12.122 As noted earlier in the assessment, no operational effects are anticipated.

Decommissioning

12.123 In the event of decommissioning, or replacement of turbines, it is anticipated that the levels of effect would be similar but of a lesser level than those during construction. Decommissioning would be undertaken in line with best practice processes and methods at that time and will be managed through an agreed Decommissioning Environmental Management Plan.

Residual Effects

Construction

12.124 The assessment confirms that the effects will be minor and non-significant. The traffic effects associated with the construction phase are temporary in nature and are confined to the construction period only. No long-lasting detrimental transport or access issues are associated with the Proposed Development.

Operation

12.125 There are no residual effects associated with the operational phase of the Proposed Development.

Cumulative Assessment

12.126 Inclusion of proposed development traffic flows with the peak traffic flows associated with the Proposed Development will dilute the percentage impact that the Proposed Development will have, thus potentially understating the impact of the proposed development. Given that there are no network capacity issues on the study area during normal conditions and that the construction phases are transitory in nature, it is considered reasonable to not include other development traffic at this point in time and to state the maximum possible impact that the Proposed Development may have on the network and receptors.

12.127 Should the construction phases of any other construction phases of nearby developments coincide, any potential adverse impact could be addressed through the use of an enhanced Construction Traffic Management Plan (CTMP).

Summary

12.128 Traffic survey data established a base point for determining the impact during the construction phase and was factored to future levels to help determine the effect of construction traffic on the local road network.

- 12.129 The construction traffic would result in a temporary increase in traffic flows on the road network surrounding the proposed development. The maximum traffic effect associated with construction of the Proposed Development is predicted to occur in Month 5 of the programme.
- 12.130 These movements at the peak of construction equate to an average of 3 inbound HGV movements per hour. The peak period is transitory, and these movements will cease upon the completion of construction activities.
- 12.131 A series of mitigation measures and management plans have been proposed to help mitigate and offset the impacts of both the construction and operational phase traffic flows.
- 12.132 No link capacity issues are expected on any of the roads assessed due to the additional movements associated with the Proposed Development. The effects of construction traffic are temporary in nature and are transitory.