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Morlais Project
Environmental Statement

Chapter 23: Traffic and Transport

Volume III

Applicant: Menter Môn Morlais Limited

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Appendix 23.1: Abnormal Indivisible Load Access to the Proposed Offshore Tidal Energy Onshore Substation Anglesey (Wynns, 2019)

Volume III

Applicant: Menter Môn Morlais Limited

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Chapter 23: Traffic and Transport

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Abnormal Indivisible Load Access to the Proposed Offshore Tidal Energy Onshore Substation Anglesey

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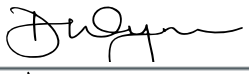
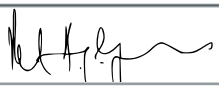
Checked by:	Daisy Wynn		24.05.18
Approved by:	Peter Wynn		25.05.18

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Contents

Executive Summary

The contents of this report include land transport feasibility investigations into achieving access to Four (4) potential new substation locations on the Isle of Anglesey where Morlais Marine Energy are considering construction of new substation connections to support offshore Tidal Energy generation projects. The substation will require the delivery of Abnormal Indivisible Loads (AIL) by way of transformers as part of a future development scheme and access for AILs is detailed within this report.

The final transport dimensions of the transformers for delivery to the sites remain unconfirmed at this early stage in the project but a selection of indicative worst case transport dimensions have been included for investigative purposes. The final dimensions of components will be significant to achieving access in terms of both structural suitability of highway infrastructure and also the physical negotiability of proposed loads in view of length, width and height. Consideration has been given to access for transformers of 55te nett weight (60MVA) and 110te weight (120MVA).

Route inspections were carried out during May 2018 to consider negotiability on potential routes to the new substation locations. These routes have subsequently been investigated in terms of structural suitability.

The proposed routes to the four substation locations being considered for the new connection substation have been advised as structurally acceptable for the proposed loads by all of the statutory structural authorities.

The headroom of the initial 132/33kv unit provided at the commencement of the investigations was given as 4.5m. This height means that the unit would require to be transported on a bed trailer arrangement such as a 5bed5 trailer in order to meet with the standard UK motorway and trunk road running heights of 5.03m headroom clearance. Such a trailer would by virtue of its nett deadweight increase the overall gross vehicle weight to in excess of 150te gross and as such this would mean it would be subject to the need to be transported with Special Order permissions.

If the nett transport height can be reduced to 4.0m then a flattop trailer arrangement could be utilised for UK road based transport which would keep the load height at 4.95m or below and which would also keep the gross trailer weight below 150te gross. It is strongly recommended that if transport weights remain at or in the region of 110te that the transport height is procured to be no greater than 4.0m where possible.

The flattop trailer is significantly less onerous than 5bed5 trailers in terms of physical negotiability and should be encouraged as the transport vehicle if possible to reduce any modification works that may be required on route and further surveys.

Routes to Sites K, J and H1 are recommended to approach from the south via routes 1, 2 3 or 4. The preferred route in terms of negotiability is route 1 exiting the A55 at Junction 3.

Assuming that a 10 row flattop trailer is procured for transport, the routes are all considered negotiable subject to street furniture removal, full occupation of the carriageway, parking restrictions and cautions with overhead lines where highlighted. If site A is identified as the preferred site the recommended route from Holyhead is via Route 5. This route is considered negotiable for 10 row flattop trailers although it is recommended that 3 confirmatory Swept Path Assessments (SPA) are carried out to confirm negotiability.

No specific consideration of onsite access within the sites themselves has been considered with all route investigations ceasing at the point at which the public road access to the site is proposed to be constructed.

The report is intended to be a summary of the Abnormal Indivisible Load (AIL) route access at the current time and is not a guarantee that the route will be cleared in the future. Specific movements will need to be assessed at the time on an individual basis. If any further information is required, it is available on request.

1. Introduction

1.1. The contents of this report include land transport feasibility investigations into achieving access to Four (4) potential new substation locations on the Isle of Anglesey where Morlais Marine Energy are considering construction of new substation connections to support offshore Tidal Energy generation projects. The substation will require the delivery of Abnormal Indivisible Loads (AIL) by way of transformers as part of a future development scheme and access for AILs is detailed within this report.

1.2. The locations to transport to would be one of four in the areas of the patches of land within the following OS grid references and as detailed on Map 1:

- SH219802 (Site K)
- SH218805 (Site J)
- SH222808 (Site H1)
- SH218821 (Site A)

1.3. The substation will require transformers to be delivered. This report is a summary of the status of the current AIL access investigations and seeks to present the situation as it currently stands. The issues highlighted in this report as risks to achieving AIL access in the future, will need to be revisited and progressed as the scheme develops.

1.4. This investigation considers the potential land transport routes from the A55 trunk road based on the assumption that movements will take place under Special Types General Order (STGO) Regulations although due to unconfirmed transformer transport dimensions high level reference is also made to possible Special Order delivery requirements.

1.5. No specific allowance is made for marine delivery locations at Holyhead or Port Penrhyn, which have traditionally been used for Special Order transport to the region, as it is expected, and also recommended, that transformers are designed and built to be transported at STGO and as such be able to meet with legislative requirements to be road transported from any suitable UK port, such as an east coast port at Hull or Immingham.

1.6. Formal movement applications will be necessary upon appointment of a haulage contractor by the component manufacturer(s).

1.7. No consideration of site access within the proposed new substation location(s) is included and the route surveys end at the point at which site access is potentially proposed to exit the public highway. A detailed appraisal of the technical requirements for handling components on-site will be required as the scheme progresses in the future.

1.8. The report is intended to be a summary of the AIL route access at the current time and is not a guarantee that the route will be cleared in the future. Specific movements will need to be assessed at the time on an individual basis. If any further information is required, it is available on request.

1.9. The report considers access in terms of AIL transportation only. No allowance is made for Construction and Use and general traffic requirements including traffic management plans that may be associated with the wider development plan.

2. Historical Information

2.1. *Wylfa Power Station and Substation*

2.1.1. The old Magnox Wylfa Power Station and the adjacent National Grid Substation have historically required heavy load deliveries to be facilitated from Holyhead with Special Order permissions required due to gross loads being in excess of 150te. Holyhead Port has been used for AIL deliveries of transformers of up to circa 227,000kg nett weight to Wylfa Power Station and Wylfa substation.

2.1.2. The port complex is managed by Stena Line Ports Ltd., and the Inner Harbour Public Quay has historically been identified as the preferred discharge site for heavy AILs. The Public Quay has in the past had adequate structural capacity to accept the loadings imposed by load-out arrangements for loads of up to 275,000kg nett and that previous crane operations on this quay have demonstrated that it is capable of accepting loads of 12te/m2.

2.1.3. The Port of Holyhead AIL requirements have it is understood changed in recent years and a further high level summary of the current status is provided in Section 5.3.

2.1.4. It is worthy of note that the Wylfa Newydd power station is considering building a Marine Offloading Facility (MOLF) adjacent to the site as it is not feasible to deliver the largest loads from Holyhead.

2.1.5. The new A55 from Holyhead to the mainland was built to be able to accommodate loads of 5.3m headroom clearance and 275te nett weight there would also be a requirement to confirm access over Britannia Bridge. Although we have information that suggests 275te nett loads have been cleared on this in the past (assessment only, not actual movement) this would need to be confirmed again by Network Rail prior to movement.

2.1.6. The new substation locations being considered for the Morlais Tidal Energy project are new locations with no specific history of AIL access. Access therefore is unproven from the A55 trunk road west to the new substation locations.

2.2. *Movement Along Welsh Routes (MAWR)*

2.2.1. The Movement Along Welsh Routes (MAWR) Group is a group consisting of companies with a requirement to move AILs in the North Wales area. Member companies include First Hydro Company, National Grid and Magnox. Each of these companies has a requirement for heavy load access to their associated power stations and substations in North Wales. MAWR meets every year, with representatives of the Welsh Government and local authority highway departments also in attendance, with a remit to discuss issues impacting on heavy load access to power stations and substations. This applies to routes that require AIL access and as such are regarded as being strategically important by MAWR. AIL movement requirements are infrequent but access needs to be maintained at all times to enable expedient movement in the event of a system failure at a power station or substation resulting in the need for an emergency AIL movement.

2.2.2. MAWR has spent considerable time and resources over the years in ensuring that access for heavy loads is maintained to member companies sites. Typically heavy load requirements are necessary from the ports of Holyhead, Port Penrhyn and Porthmadog to power station and substations sites at Dinorwig, Pentir, Wylfa, Trawsfynydd and Ffestiniog.

2.2.3. It has been discussed at MAWR meetings historically that if and when there is any specific requirement for AILs to cross Britannia Bridge from the mainland to Anglesey that a detailed plan for agreeing a Bridge Management Strategy with all interested parties, including Welsh Government, Network Rail, UK Highways A55, Gwynedd County Council, Isle of Anglesey County Council and North Wales Police is put into place to minimise the impact of AILs.

2.2.4. It is recommended that as the Morlais Tidal Energy project proceeds that representatives from the project seek to attend future MAWR meetings to update relevant interested parties of future AIL requirements.

3. Plant Dimensions Included within Study Work

3.1. All details of possible transport dimensions should be treated with caution and be understood to be in need of clarification as the scheme progresses. Table 1 shows a selection of potential equipment that has been included within the study for initial feasibility assessment work.

3.2. These dimensions have been used to derive indicative transport arrangement drawings for presentation to highway and structural authorities as detailed in Section 9. These should be treated with caution and are only based on currently available information.

Table 1. Selected Items to be considered.

Item	Length (m)	Width/ Diameter (m)	Height (m)	Weight (kgs)	Notes
60MVA 132/33kv transformer	6.0	2.5	3.5	55,000	As provided by ICCL at commencement of study.
120MVA 132/33kv transformer	6.5	3.0	4.5	110,000	As provided by ICCL at commencement of study.
120MVA 132/33kv transformer	6.5	3.0	4.0	110,000	Wynns recommended maximum transport height to enable units to be STGO loads rather than Special Order.

4. Transport Configurations

4.1. Based on the information available to date the transformer considered within this report is advised as being 110te nett transport weight (excluding bushings and oil etc.). The information available to date is indicative only and the following transport drawings have been submitted to structural authorities for comment.

- Drawing No 18.945-TC01 5bed5 trailer at 156te gross weight (Special Order category)
- Drawing No 18.945-TC02 10 row flattop trailer at 140te gross weight (STGO)
- Drawing No 18.945-TC03 6 axle step trailer at 91te gross weight (STGO)

4.2. The headroom of the initial 132/33kv unit provided at the commencement of the investigations was given as 4.5m. Unfortunately this height means that the unit would require to be transported on a bed trailer arrangement such as a 5bed5 trailer in order to meet with the standard UK motorway and trunk road running heights of 5.03m headroom clearance. Such a trailer would by virtue of its nett deadweight increase the overall gross vehicle weight to in excess of 150te gross and as such this would mean it would be subject to the need to be transported with Special Order permissions from the Secretary of State for Transport via Highways England. This is further discussed in Section 5.

4.3. If the nett transport height can be reduced to say no more than 4.0m then a flattop trailer arrangement could be utilised for UK road based transport which would keep the load height at 4.95m or below and which would also keep the gross trailer weight below 150te gross. It is strongly recommended that if transport weights remain at or in the region of 110te that the transport height is procured to be no greater than 4.0m.

4.4. There would be scope for units of in excess of 4.5m height to be transported on bed trailers but the weight of any such units should not typically exceed circa 100te nett weight.

4.5. A flattop road transport configuration would consist of a ballast tractor pulling an indicative 10 axle flat top modular trailer for which the trailer element would weigh in the region of 140-149te gross with axle loads less than the 16.5te restriction for STGO configurations.

4.6. The indicative transport configurations detailed show the minimum turning radii and axle, wheel and overall ground loadings for a 10 axle flat top modular trailer during transportation of the transformers considered.

4.7. There are numerous haulage contractors with equipment able to carry the transformer and competitive procurement of heavy transport is expected to be achievable.

5. Highways England Agreement in Principle and Legislative Requirements

5.1. *Definition of Abnormal Indivisible Load (AIL)*

5.1.1. The Department for Transport, of which Highways England (HE), formally the Highways Agency (HA), is a government-owned company with responsibility for managing the core road network in England, state that the strict definition of an AIL refers to a load which cannot, without undue expense or risk of damage, be divided into two or more loads for the purpose of carriage on roads and which, owing to its dimensions or weight, cannot be carried on a vehicle which complies in all respects with the 'standard vehicle regulations' these are:

- The Road Vehicles (Construction and Use) Regulations 1986 (as amended)
- The Road Vehicles (Authorised Weight) Regulations 1998 (as amended)
- The Road Vehicles Lighting Regulations 1989 (as amended).

5.1.2. All equipment should be stripped of their ancillaries before they are transported. HE will only accept that further dismantling is not required where it cannot be economically achieved due to the requirement for its construction within specific factory environments or where extremely high tolerances have to be maintained.

5.2. *Legislation*

5.2.1. Conventional heavy goods vehicles have an operating weight limit of 44 tonnes. The category known as abnormal indivisible loads (AIL) covers those vehicles where the gross weight exceeds 44 tonnes. An Abnormal Load is defined as that which cannot be carried under Construction and Use (C&U) Regulations. Items which, when loaded on the load carrying vehicle exceed the weights encompassed by the C&U Regulations, but do not exceed Special Order Permission Limits, are governed by Special Types General Order (STGO) categories 1 to 3 depending on size. Where dimensions exceed 6.1m in width, 30m in rigid length or 150 tonnes gross weight, Special Order from HE is required. Highways England have issued an aide memoir that explains notification requirements in more detail. This document has been attached as Appendix 3.

5.2.2. Special Order category AIL movements are authorised by the HE Abnormal Loads team, based in Birmingham.

5.2.3. STGO loads orders grant consent for loads that satisfy the following criteria:

Category 1 weight	44 – 50 tonnes and 11.5te axle weights
Category 2 weight	50 – 80 tonnes and 12.5te axle weights
Category 3 weight	80 – 150 tonnes and 16.5te axle weights
Width Restriction	3.0m (C&U) –5m (VR1 Required) – 6.1m (SO Required)
Length Restriction	18.65m (C&U) – 30.0m (SO Required)

5.2.4. The transformer components considered within these investigations are expected to be transported at STGO Category 2 or 3 as long as the height of the 120MVA unit can be reduced to a maximum of 4.0m as discussed in Section 4. Such loads are required to provide two clear working weekdays notice to be given to the Police forces on the proposed route and are required to provide 5 clear working weekdays notice together with an indemnity to the highway and bridge authorities on the route.

5.3. *Water Preferred Policy Requirements*

5.3.1. The Department for Transport has adopted a 'water-preferred' policy for the transport of AILs. This means that, where an application is sought for the movement of a Special Order or VR1 category load (more than 5.0m width) by road, the Department, via HE, will turn down the application where it is feasible for a coastal or inland waterway route to be used instead of road. HE advise that this decision is based on a number of factors including whether the load is divisible, the availability of a suitable route, the amount of traffic congestion that is likely to be caused and the justification for the load to be moved. The HE Abnormal Loads Team is the department responsible for the authorisation of Special Order AIL's and government policy is that the closest available port of access should be used for the delivery of such oversize items.

5.3.2. Wynns have not sought specific confirmation from Highways England in terms of an Agreement In Principle (AIP) with regard to the new substation project as it is recommend that transformers are designed to be transported within STGO. If transformers are to be procured that require Special Order approval it would be advisable to obtain an AIP from HE. This would be expected to be granted from Holyhead.

5.3.3. The above information is does not provide formal permission to move and the suitability of the delivery route is still subject to the statutory notification process and is subject to a route being available at the time of requirement.

5.3.4. As discussed previously the most appropriate way forward is to avoid the abnormal load Special Order (SO) process (8 to 12 weeks submission and consent period). To achieve this it will be necessary to ensure that the overall transport width would be less than 5.0 metres and the gross weight of the vehicle does not exceed 150te.

5.3.5. As the loads considered in these investigations are expected to be within STGO and therefore no specific consideration of Special Order requirements, including the Department for Transports (DfT) Water Preferred Policy for AILs is considered necessary and no specific marine access investigations are included.

5.3.6. Wynns do however have significant data on the port of Holyhead which would be the expected port of delivery required to support new substations on Anglesey future loads enter into Special Order category. Shipping to Holyhead would increase overall transport costs for the delivery of transformers into the UK from Europe (or elsewhere) as opposed to delivery via conventional freight ports on the east, south or west coasts.

5.3.7. The Port of Holyhead is owned and managed by Stena Ports as the port authority for the overall harbour area. The former heavy lift facility on the Public Quay access via Turkey Shore Road no longer needs to be considered for access as Terminal 1 and the Refit Berth are available, having historically not been feasible for use due to the ferry services using the inner harbour. The ferries have now relocated to the outer harbour and therefore berths on the inner harbour can be considered as appropriate and the port view this as a more preferable option than the Public Quay. This also assists with onward road transport as it aids access from the port area to the public highway, avoiding the narrow section of highway on Turkey Shore Road.

5.3.8. Offloading via a selection of marine delivery methods including coastal vessels and mobile cranes (lo-lo) roll on roll off (ro-ro) and geared vessels is feasible at Terminal 1 and the Refit Berth depending on the vessel chartered.

5.3.9. Storage can be arranged for transformers depending on what is operational within the port at the time of requirement. The exact commercial arrangements will need to be agreed with the port closer to the time of actual delivery of AILs.

5.3.10. As the loads are not expected to be restricted to Special Order requirements they will not necessarily be delivered to a North Wales Port and could arrive via any UK port and travel to the motorway and trunk road network to enter Wales on the A55 trunk road. It was assumed at the commencement of investigations that this will be feasible without difficulty for the proposed loads as has been the case for STGO loads to Pentir Substation and Ffestiniog power Station in recent years. The final approach to the sites from the A55 England/Wales border are discussed in terms of structural clearance in Section 9.

6. Abnormal Indivisible Load Movements - Highways Act 1980

6.1. *Recovery of Excessive Maintenance Costs - Section 59 Agreements*

6.1.1. Section 59 of the Highways Act 1980 allows the highways authority to raise a charge against a user of the highway to cover repair works necessitated by excessively heavy or unusual loads being carried on the road by that user. This provision is typically used where the passage of heavy lorries to and from industrial premises or building sites causes excessive damage to the road, requiring expensive remedial works by the Council. Under Section 59, the Council may charge on such costs to the organisation responsible for the damage, the amount payable being calculated as the excess cost of repair compared to normal maintenance costs for the road. Rather than wait to be charged such excessive repair costs, the Council and the third party may enter into an agreement under Section 59 whereby the third party accepts liability and makes payment of an agreed sum to the Council to cover the excessive repair costs.

6.2. *The Removal and Replacement of Street Furniture*

6.2.1. Where the removal and replacement of street furniture is required for the mobilisation of out of gauge vehicles into existing sites then these are generally managed under Temporary Traffic Regulation Order (TTRO) and Street Works Legislation. These are normally, but not necessarily, organised by the haulage contractor. These requirements are generally to ensure that the supervisors and operatives are competent and that the works will be carried out to a prescribe standard with the appropriate traffic management in place. In some circumstance the Highway Authority or LA will insist that their preferred contractors will carry out such work.

7. Physical Restrictions Affecting a Road Movement

7.1. *General*

7.1.1. An abnormal load is one that is incapable of division into two or more loads by reason of expense or risk of damage, and which cannot be carried by a trailer complying in all respects with the Road Traffic; Road Vehicles (Construction and Use) Regulations 1986 (SI No. 1078) (C12) (S38) as amended ("the Construction and Use Regulations") or where the trailer does so comply, the total laden weight exceeds 44 tonnes.

7.1.2. This section of the report examines the general factors that have to be considered when assessing the suitability of road routes for the movement of abnormal loads with a more specific appraisal of the current status of the possible land transport routes detailed in Sections 9 and 10.

7.2. *Headroom*

7.2.1. Movement is impossible unless sufficient headroom is available along the proposed route to accommodate the travelling height of the load. Generally maximum headroom of 5.03 metres (16'6") is maintained within the UK on major motorway and trunk road routes, but this is not guaranteed and the actual height is posted on structures, such as bridges and gantries, which are below this figure. The UK electricity supply industry and plant manufacturers generally work to a travelling height of 4.95 metres (16'3") to allow for a safe margin.

Source: Collett Heavy Haulage

Library Photograph 1

Unmarked bridges provide a minimum height clearance ≥5.03m. Below this height bridges are clearly marked and transport arrangements necessitating due diligence during the planning phase of a project need to account for low bridge heights.

7.2.2. The height of the load will be increased by the height of the trailer and any packing that may be utilised to give a gross travelling height.

7.2.3. Where restrictions are caused by overhead services such as telephone lines and local power distribution lines, it is feasible to raise or underground these along relatively short routes. Arrangements are made with the responsible undertakers. This is, however, not usually feasible over longer routes or where there are a large number of lines involved. It is usually impossible to do anything to raise low bridges, but steel gantries with bolted connections can sometimes be temporarily lifted.

7.2.4. Although there is no legal limit on the travelling height of load, the Department for Transport does advise hauliers to inform the Regional Electricity Company's (REC), British Telecom and any other company with overhead service lines, of the route of proposed movements with a travelling height in excess of 5.0 metres. This enables arrangements to be made for temporary or permanent re-arrangement of facilities.

7.2.5. It should be noted, that the Electricity Supply Regulations 1988 refer to the minimum height for overhead lines. Part IV, Section 13 of these regulations states that the height above ground of any overhead line or wire shall not be less than a specific height at any point where the line is over a road depending on the voltages outlined below:

- Not Exceeding 33000 Volts – 5.8m
- Exceeding 33000 Volts but Not Exceeding 66000 – 6.0m
- Exceeding 66000 Volts but Not Exceeding 132000 – 6.7m
- Exceeding 132000Volts but Not Exceeding 275000 – 7.0m
- Exceeding 275000 Volts but Not Exceeding 400000 – 7.3m

7.2.6. It is recommended that overhead line authorities are approached to confirm recorded and safe height clearances for all wires above the often-referred to high load cut of point of 16'6" (5.03m). Just because a line is of a given height it does not mean that high loads will automatically be permitted to pass underneath due to flashover and safe height clearance requirements of the line owner. Further information can be obtained from the Health & Safety Executive Guidance note GS6 'AVOIDANCE OF DANGER FROM OVERHEAD ELECTRIC POWER LINES' (HSE Books 1997 ISBN 0717613488).

Source: Abnormal Load Engineering
Library Photograph 2
Overhead services being lifted to accommodate the transit of a vehicle height in excess of 6.0m en-route between London Thamesport and Grain Power Station.

7.2.7. No liaison with national or regional electricity companies or with British Telecom has been carried out at this stage.

7.3. *Negotiability*

7.3.1. Assuming that sufficient headroom is available, or can be achieved, it is necessary to establish that the route can be negotiated in terms of the overall width and length of the transporter arrangement. Selection of transporter is often influenced by the load carrying capability of the route. If a large number of axles are needed in order to obtain the required load distribution on the road and bridge decks, this may result in a configuration that is unable to negotiate the particular route.

7.3.2. Where negotiability is restricted by the width or the curvature of the route, it can be increased by the temporary removal of 'street furniture' such as lamp posts, traffic signs etc., but normally little can be done if passage is restricted by more permanent objects such as buildings. These works are done with the agreement of the relevant local and highway authorities.

7.3.3. The negotiability of the proposed routes are detailed within Section 10.

7.4. *Structural Capability and Highway Capacity*

7.4.1. The load carrying capability of roads depends to a great extent on axle loading rather than total weight of the load being transported. The load carrying capability of the route has to be assessed in relation to the loadings that would be imposed by the total gross weight of the load plus transporter for each item to be transported. The factors to be considered are the axle and wheel pair loadings; the road crust; the effect of such loadings on bridges; underground services and speed. The tractor unit is normally considered as a separate unit in terms of imposed axle and wheel loadings. Indemnities are given to highway and bridge authorities for any damage caused, usually by the appointed haulage contractor.

A. Road Crust
   1. Road crust strength is important, but with the spread of load obtained with modern multi-wheeled transporters, it is not normally a problem, providing the road is maintained to a reasonable standard.

2. Damage of the road crust especially at the fringes of un-kerbed roads can become prevalent during the construction phase of projects within remote areas. This effect can have a damaging effect on the available track width for abnormal loads due to the risk of wheels becoming sunken into damaged road edges or soft verges. Prior to the delivery phase it would be advisable to inspect the road surface especially at pinch points to ensure its compatibility to the abnormal load transport configurations.

B. Bridges

1. Bridges in Great Britain are designed and constructed in accordance with the loading standard set down in British Standard BS 5400-2:2006 Steel, concrete and composite bridges. Specification for loads, which in 2006 replaced the British Standard BS 5400: Part 2: 1978. This Part of BS 5400 specifies nominal loads and their application, together with the partial factors, to be used in deriving design loads. The loads and load combinations specified are for highway, railway and foot/cycle track bridges in the United Kingdom.
2. This standard provides for two types of loading: Type HA and Type HB. Older bridges may not have necessarily been designed to these standards but that does not prevent them from being assessed for abnormal load carrying capability.
3. Type HA is the normal design loading in Great Britain suitable for normal vehicles permitted under the Construction and Use Regulations rather than for those used for the carriage of abnormal loads.
4. Type HB loading is suitable for exceptional industrial loads likely to use the roads in the area. It takes account of the loading that would be imposed on to the highway by a "standard" 4 axle, 16 wheeled HB vehicle, conforming to the dimensions set down in the Standard.
5. The HB Vehicle is a theoretical vehicle that represents an abnormal vehicle and consists of a group of sixteen identical wheel loads. A unit of HB loading corresponds to four axles and should be taken as equal to 10kN per axle; each axle has four equally loaded wheels. The overall length of the HB vehicle is taken as 10, 15, 20, 25 and 30 metres corresponding to inner axle spacing of 6, 11, 16, 21 and 26 metres respectively. The effects of the most severe of these cases must be adopted. The overall vehicle width is taken as 3.5 metres. In all cases, the longitudinal axis of the HB vehicle is taken as parallel to the lane markings.
6. Unless the axle configuration of the transporter matches that of the "standard" exactly, it is not possible to say directly whether passage of a particular abnormal load would be permissible. Notwithstanding that it is known that a road meets a particular HB loading standard, it is necessary to access routes with respect to individual loads. However, if bridges have been designed to meet a known standard this greatly assists the assessment process.
7. In general terms the UK motorway and trunk road network is nominally designed to be able to accommodate 45HB units. Depending on the class of roads, and the age of a structure, county roads are often lower rated at 37.5HB/30HB etc.
8. For example 45 units of HB therefore correspond to a 180 tonne vehicle on four axles at the worst case spacing of those given above and with the vehicle fully aligned with the structure. None of this is precisely duplicated within any of the transport configurations or in the track geometry during transit of structures hence the variations indicated.

C. Underground Services

1. When assessing the effect of weight on underground services, such as water pipes, sewers and service ducts, the loading imposed by individual wheels is normally considered.

2. The weight that can be safely borne by underground services varies depending on their age and condition; the depth to which they are buried; and the strength of the road crust covering. All these factors have to be considered when assessing the suitability of a road for the passage of abnormal loads and assessment is usually carried out by the relevant authority or undertaker concerned.
3. Risk to services can be considered in relation to the weight to which they could be exposed by the passage of normal vehicles permitted by the Construction and Use Regulations. This can then be compared with that which would be imposed by the passage of the proposed abnormal load movements, and with the pressure to which they may have been subjected by previous movements of abnormal loads.
4. Experience gained by the heavy haulage industry generally is that underground services are not damaged providing that road crust strength is to a reasonable standard and that the depth of cover and condition of services are normal. In any event, the haulage contractor would be required to provide indemnities against possible damage as a result of the movements by the terms of the Special Orders.

7.4.2. The structural status of the proposed routes are detailed within Section 9.

7.5. *Speed*

7.5.1. A slow moving abnormal load imposes less impact loading than a relatively fast moving vehicle permitted under the Construction and Use Regulations. This helps to mitigate the effect of the additional wheel loading imposed by the abnormal load.

8. The Width of Highways, Fences and Verges, Overrun and Over-Sail

8.1. *Width of Highway*

8.1.1. Orlick (1993) states that in general there will not be documentary evidence of the width of a highway and, if there is, it may well not be conclusive. "*What matters more is what exists on the ground.*" If the Highway Authority has maintained land at the side of the road, as well as the metalled road itself, that is strong evidence that the land is part of the highway.

8.1.2. The rights of public passage and the consequential restrictions on the powers of owners to deal with their land as they see fit have meant that there have been plenty of disputes as to the width of particular highways. As well maintenance by Highway Authorities, the existence of statutory undertakers' apparatus such as telephone cables, electric cables and gas mains can indicate extent of highway.

Library Photograph 3

The services markers are a clear indicator that the wall forms the edge of the highway. Similarly manhole covers in the verge probably shows that the verge forms part of the highway.

8.1.3. If the undertakers have obtained wayleave consents from adjoining owners to place their apparatus in, say, a verge at the side of the road, that suggests that the verge is not part of the highway. If, on the other hand, they have not obtained any wayleaves, then this suggests that they are using their statutory powers and the Public Utilities Streetworks Code to lay services in the highway without the need to obtain consents of any private party.

8.2. *Fences and Verges*

8.2.1. The existence of a metalled road may be a good indication of the extent of the highway when such a road crosses unenclosed land such as a heath or common. It is no indication of the extent of the highway in other cases for example where there are fences or ditches on both sides of the highway the public right of passage will be taken to be the extent of the whole space between the fences or ditches even through the width of the highway may be varying and unequal and even though there may be a substantial amount of land lying between the metalled road and the fence. However it should be noted that the presumption that the fences mark the highway boundary can often be rebutted and confirmation of the highway boundary, where there exists ambiguity should be confirmed with the relevant highway authority.

8.3. *Over-sail*

8.3.1. Over-sail is a common occurrence when moving large components and therefore it is important to understand the law. The law that needs to be considered is the law of trespass which is defined as the unauthorised interference with the possession of someone's home, garden or other land interests. It is useful to note that trespass is not a criminal offence and trespassers cannot usually be prosecuted. They can, however, be sued as trespass is a civil offence.

8.3.2. The boundary of a property may be indicated by a physical marker such as a river, a wall, or a fence. The actual boundary may fall on either side of the boundary feature or fall along the median line through the boundary feature itself or bear no resemblance to the physical boundary feature. The starting point for establishing a boundary is the title deeds. Theoretically speaking, it is an established legal principle that a vertical boundary also extends from the subsoil beneath the boundary to the centre of the earth and also extends

to the sky above. This means that ownership of property includes the airspace above it and also the ground beneath it.

8.3.3. There is established protocol for over-sail in the construction sector where an over-sail licence is issued as this is often an issue if, for example, a large crane is being used. An over-sail licence is an agreement which provides a land owner (and its developer) with the legal right to pass through another's air space. If a crane is used in a construction project the jib of the crane may well swing in and out of neighbouring airspace. Without an over-sail licence this could constitute a trespass and the land owner could be faced with an injunction.

8.3.4. Guidance states that the licence should cover issues such as time of day (and night) that the item of plant may over-sail neighbouring land, the heights of the over-sail and the duration of the licence. An indemnity for any damage caused by the crane may also be included.

8.3.5. It is essential to try and negotiate an agreement for any financial compensation payable for the use of land which is either owned by another party or subject to rights in favour of a third party. As with any dispute, a reasonable approach can produce savings in terms of costs awards should the matter reach court even if the other party to the dispute refuses to negotiate with you.

9. Structural Route Information

9.1. *Routes to Substation Sites K, J and H1*

9.1.1. These routes are those which are considered the most appropriate to access three of the proposed sites following initial route inspections. These sites are:

- SH219802 (Site K)
- SH218805 (Site J)
- SH222808 (Site H1)

9.1.2. Access to site A is discussed in 9.2. Due to the physically limiting nature of the unclassified road approximately between sites A and J it is not suitable for AIL access unless major remedial works are undertaken, hence the different approaches to the separate areas being considered for development.

9.1.3. The routes from the A55, a recognised heavy load route, are shown below as they have been presented to structural and highway authorities for comment.

Route 1
Assume entry to Welsh Trunk Road Network on A55 Chester Bypass and continue to Bangor
Continue A55 onto Anglesey via Britannia Bridge
Exit A55 westbound at Jct 3
Turn right A5
Turn left B4545 to Trearddur Bay
Turn left unclassified road at OS Ref SH 2559 7924
Continue Penrhosfeilw
Exact site access locations and access points to 3 possible sites on this road are being considered but it is expected they will be no further west that OS Ref SH 2179 8066

Route 2
Exit A55 westbound at Jct 2
Turn left A5153
Turn left B4545 to Trearddur Bay
Turn right unclassified road at OS Ref SH 2559 7924 and join route 1

Route 3
Exit A55 westbound at Jct 1 roundabout turning left to B4545 to Trearddur Bay and joining route2

Route 4
Exit A55 westbound at Jct 1 roundabout turning left to B4545
Turn immediately right unclassified road at OS Ref SH 2483 8175
Continue unclassified road to unclassified road at OS Ref SH 2338 8010
Turn right and join route 1

9.1.4. The routes has been cleared by the structural authorities detailed below.

- Canal & Rivers Trust
- Highways England Historic Railways Estate
- Network Rail
- Isle of Anglesey County Council (IoACC)
- UK Highways (A55)

9.1.5. IoACC have confirmed that they do not expect there to be any structural issues on any of the proposed routes provided. They have also (email dated 25.05.18) provided comments on more general access requirements such as construction traffic. In terms of routes 1, 2 3 and 4 these comments are as detailed below:

- *Option 1 – J3 – This route involves negotiating Valley traffic lights and traveling past a very busy Shopping Precinct and residential area – so not suitable for any large vehicles or construction traffic.*
- *Option 2 – J2 – Good roads and fairly quiet until you get to TBay – again you would be travelling through residential areas so traffic volumes need to be considered. The road off the B4545 is very busy in summer months and children crossing to the park etc.*
- *Option 3 – J1 – The turning from the roundabout to the B4545 is quite tight and worse than option 3 as you would be travelling through Holyhead residential areas – lots of parked cars*
- *Option 4 – Porthdafarch Road - This road at the start is not suitable for any large vehicles due to the amount of parked cars.*

9.1.6. IoACCs comments should be noted in terms of future movement planning and timings and also for wider Construction and Use traffic requirements and the points highlighted are valid observations. None of these issues are regarded as specific technical restrictions to AIL for one or two transformer deliveries access in terms of structures or negotiability and it is expected that with appropriate traffic management and movement planning that the routes could be accessed if required. Further discussion with IoACC will be required to confirm the exact method of delivery and traffic management by the appointed haulage contactor prior to movements.

9.1.7. North Wales Police have been approached for comment on the proposed route submitted for consultation and although they have not provided a written response to date, no major objections to the proposed routes are expected. It is expected that a police escort rather

than private escort will be required for the loads, especially on the final approach to site upon exiting the A55. This would be confirmed at the time of formal movement notification by the appointed haulage contractor when further discussions are undertaken with respect to confirming escort requirements and acceptable moving timings.

9.2. *Routes to Substation Site A*

9.2.1. It is proposed that to access site A that the preferred route is to route north and west from Holyhead via Route 5 which is detailed below.

Route 5
At end of A55 Black Bridge Junction continue A5154 Victoria Road
At Marine Square turn left Prince of Wales Road
Turn left at roundabout onto Walthew Avenue at OS Ref SH 2446 8319
Continue New Park Road
Turn right South Stack Road
Continue to proposed site access location to be confirmed but at this stage assume OS Ref SH 2200 8188

9.2.2. The route has been cleared by the structural authorities detailed below.

- Canal & Rivers Trust
- Highways England Historic Railways Estate
- Network Rail
- Isle of Anglesey County Council (IoACC)
- UK Highways (A55)

9.2.3. IoACC have confirmed that they do not expect there to be any structural issues on route 5. They have also (email dated 25.05.18) provided comments on more general access requirements such as construction traffic. In terms of route 5 these comments are as detailed below:

- *Option 5 – This route along Walthew Ave and Parc Road and through Llaingoch is very populated – but if it was just a one off delivery it may not be so bad? Need to understand vehicle movements for this option*

9.2.4. IoACCs comments should be noted in terms of future movement planning and timings and also for wider Construction and Use traffic requirements and the points highlighted are valid observations. None of these issues are regarded as specific technical restrictions to AIL for one or two transformer deliveries access in terms of structures or negotiability and it is expected that with appropriate traffic management and movement planning that the routes could be accessed if required. Further discussion with IoACC will be required to confirm the exact method of delivery and traffic management by the appointed haulage contactor prior to movements.

9.2.5. The comments in Section 9.1 in terms of North Wales Police also apply on this route.

9.3. *Routes from Holyhead Port at Special Order*

9.3.1. In the event that transformers are delivered via Holyhead, either as Special Order loads as previously discussed, or as a preferred delivery option for the project (unlikely due to significant extra costs) the egress from the port to the A55 via Black Bridge has also been investigated and is discussed below.

Route 6 (Special Order from Holyhead)
Exit main port gate onto Llanfawr Road
Turn right A55 and cross Black Bridge
Turn left A55
Exit A55 at Jct 1 roundabout to B4545 to and join route 3
(or turn right Victoria Road and join route 5)

9.3.2. The route has been cleared by the structural authorities detailed below.

- Canal & Rivers Trust
- Highways England Historic Railways Estate
- Network Rail
- Isle of Anglesey County Council (IoACC)
- UK Highways (A55)

9.3.3. The comments in Section 9.1 in terms of North Wales Police also apply on this route.

10. Route Negotiability

10.1. *Routes to Substation Sites K, J and H1 General Information*

The first section of the A55 from Chester Bypass top the wider study area is not specifically detailed within this report but is not restrictive to the proposed loads. The A55 to the A5/A55 junction is negotiable without difficulty for the proposed loads, including the tunnels and roundabouts at Llanfairfechan (J15) and Penmaenmawr (J16). However, it is understood that there are plans for the removal of the roundabouts at Jct 15 and Jct 16 being progressed by Welsh Government who are planning to replace the roundabouts with height separated junctions. This means that side roads will go either under or over the main A55, with traffic joining the trunk road via a slip road instead of a roundabout. This will improve AIL negotiability although caution with associated roadworks during construction is required. Further information is available here: https://beta.gov.wales/a55-junctions-15-and-16.

10.1.1. Welsh Government are also working on a scheme to improve a 2.2km length of the A55 between the Tai'r Meibion and the Abergwyngregyn interchange. No significant impact on AIL access is expected but the roadworks associated the scheme could impact on access in the future. Further information is available here: http://gov.wales/topics/transport/roads/schemes/a55/abergwyngregyn/?lang=en

10.1.2. The STGO AIL load route proceeds onto Anglesey and is negotiable to all the A55 exits considered in the proposed routes detail in the following notes and photographs.

10.2. *Routes to Substation Sites K, J and H1 (Route 1)*

10.2.1. Route 1 is discussed in the notes and photographs below.

Photograph 1
A55 Jct 5 with A5 at Valley. Exit to east roundabout. Negotiable.

Photograph 2
A55 Jct 5 with A5 at Valley. Exit from east roundabout to bridge. Negotiable.

Photograph 3
A55 Jct 5 with A5 at Valley. Exit from west roundabout to bridge. Negotiable.

Photograph 4
A5/A5025/B4545 Valley Crossroads. Load moves away from camera and turns left. Negotiable.

Photograph 5
A5/A5025/B4545 Valley Crossroads. Load approaches from right, turning left towards camera. Negotiable.

Photograph 6
A5/A5025/B4545 Valley Crossroads. Load approaches from right, turning left towards camera. Negotiable.

Photograph 7

B4545 south of Valley Crossroads. Load moves away from camera. Negotiable although caution with parked cars is required. Note double yellow parking restrictions on south carriageway to be enforced.

Photograph 8

B4545 Valley level crossing on Station Road. Load moves away from camera. Standard Network Rail cautions apply.

10.2.2. Although Network Rail have confirmed (email dated 22.05.18) that access is structurally acceptable to them on this route they advised that this did not specifically consider the structural suitability of level crossings although no major concerns are expected. If this was a problem in the future it is not expected to be significant as alternative routes exist.

10.2.3. Network Rail have not raised any specific concerns in respect to the level crossing but it is is expected that any load will need to adhere to the standard caution when crossing level crossings as below:

> *"Before the trailer crosses any automatic half-barrier railway level crossing or any other railway level crossing, equipped with a telephone, the driver of the towing vehicle shall telephone the railway signaller of the intention to cross the railway with the trailer. The trailer and the vehicles used with it shall not cross except with the permission of and in accordance with the instructions of the railway signaller. After crossing the driver shall again telephone the signaller to inform him that the crossing is clear."*

Photograph 9

B4545 south of Valley level crossing. Load moves away from camera. Negotiable.

Photograph 10

B4545 south of Valley level crossing. Load moves away from camera. Negotiable. Note caution with overhead wires which are not expected to be restricted for loads of 5m or less. Full occupation of highway required.

Photograph 11

B4545 bridge over A55 at Bryn-hyfryd. Load moves away from camera. Negotiable.

Photograph 12

B4545 roundabout at Bryn-hyfryd. Load moves away from camera. Negotiable for proposed loads. Splitter island could be removed if necessary for wider loads.

Photograph 13

B4545 on approach to Four Mile Bridge. Load moves away from camera. Negotiable. Caution with overhead wires.

Photograph 14

B4545 Four Mile Bridge at OS Ref SH 2800 7836. Load moves away from camera. Negotiable.

Photograph 15
B4545 Four Mile Bridge at OS Ref SH 2800 7836. North side.

Photograph 16
B4545 Four Mile Bridge at OS Ref SH 2800 7836. South side. Note presence of other services as part of the structure.

Photograph 17
B4545 Four Mile Bridge at OS Ref SH 2800 7836. South side. Note presence of other services as part of the structure.

Photograph 18

B4545 south of Four Mile Bridge. Load moves away from camera. Negotiable. Note overhead wires.

Photograph 19

B4545 south of Four Mile Bridge. Load moves away from camera. Negotiable. Note overhead wires and parked cars where caution will be required. It may be necessary to enforce temporary parking restrictions to enable access.

Photograph 20

B4545 west of Four Mile Bridge. Load moves away from camera. Negotiable. Note overhead wires and parked cars where caution will be required.

Photograph 21
B4545 at Trearddur Bay. Load moves away from camera. Negotiable.

Photograph 22
B4545 at Trearddur Bay. Load moves away from camera. Negotiable. Parking restrictions may be required.

Photograph 23
B4545/Unclassified road junction at Trearddur Bay (OS Ref SH 2560 7925). Load on route 1 approaches from behind camera and turns left. Negotiable with full occupation of road in places. Caution with overhead wires.

Photograph 24

B4545/Unclassified road junction at Trearddur Bay (OS Ref SH 2560 7925). Load on route 1 approaches from top right and turns right towards camera. Negotiable with full occupation of road in places. Caution with overhead wires.

Photograph 25

B4545/Unclassified road junction at Trearddur Bay (OS Ref SH 2560 7925). Load on route 2 and 3 approaches from top left and turns right towards camera. Negotiable with full occupation of road in places. Caution with overhead wires.

Photograph 26

Unclassified road at Trearddur Bay. Load moves away from camera Humped crossing is negotiable.

Photograph 27

Unclassified road at Trearddur Bay. Load moves away from camera Negotiable with full occupation of the carriageway under police escort. Caution with overhead wires required.

Photograph 28

Unclassified road at Trearddur Bay. Load moves away from camera Negotiable with full occupation of the carriageway under police escort. Caution with overhead wires required.

Photograph 29

Unclassified road at Trearddur Bay. Load moves away from camera Negotiable with full occupation of the carriageway under police escort. Caution with overhead wires required.

Photograph 30
Unclassified road at Trearddur Bay. Load moves away from camera Negotiable with full occupation of the carriageway under police escort.

Photograph 31
Unclassified road at Trearddur Bay. Load moves away from camera Negotiable with full occupation of the carriageway under police escort. Caution with overhead wires required.

Photograph 32
Unclassified road at Trearddur Bay. Load moves away from camera Negotiable with full occupation of the carriageway under police escort.

Photograph 33
Unclassified road at Trearddur Bay. Load moves away from camera. Negotiable with full occupation of the carriageway under police escort.

Photograph 34
Unclassified road at Trearddur Bay. Load moves away from camera Negotiable with full occupation of the carriageway under police escort.

Photograph 35
Unclassified road at OS Ref SH 2444 7936. Load moves away from camera. Negotiable with full occupation of the carriageway under police escort. There is a gradient at this location but this is not considered restrictive to the proposed 5bed5 or flattop trailers.

Photograph 36

Unclassified road at OS Ref SH 2444 7936. Load moves towards camera. Negotiable with full occupation of the carriageway under police escort. There is a gradient at this location but this is not considered restrictive to the proposed 5bed5 or flattop trailers.

Photograph 37

Unclassified road at approximate OS Ref SH 2440 7946. Load moves away from camera. There is a gradient at this location which is potentially restrictive in terms of access for 5bed5 trailers with the bed of the trailer at risk from grounding. However 10 row flattop trailers would negotiate the gradient without difficulty.

Photograph 38

Unclassified road at approximate OS Ref SH 2438 7953. Load moves away from camera. There is a gradient at this location which is potentially restrictive in terms of access for 5bed5 trailers with the bed of the trailer at risk from grounding. However 10 row flattop trailers would negotiate the gradient without difficulty.

Photograph 39

Unclassified road at OS Ref SH 2438 7953. Load moves towards camera. Negotiable although caution with potential grounding would necessitate additional surveys if bed trailers are to be utilised.

Photograph 40

Unclassified road at OS Ref SH 2432 7963. Load moves away from camera. Negotiable.

Photograph 41

Unclassified road at OS Ref SH 2432 7963. Load moves away from camera. Negotiable.

Photograph 42
Unclassified road at OS Ref SH 2432 7963. Load moves away from camera. Negotiable.

10.2.4. There are several more areas where there are changes in levels and where 5bed5 trailers would need more detailed topographical surveys to be carried out to confirm negotiability with respect to possible grounding.

Photograph 43
Unclassified road at approximate OS Ref SH 2427 7971. Load moves away from camera. Potential grounding issues for bed trailers.

Photograph 44
Unclassified road at approximate OS Ref SH 2425 7974. Load moves away from camera.

Photograph 45
Unclassified road at approximate OS Ref SH 2425 7974. Load moves away from camera. Potential grounding issues for bed trailers.

Photograph 46
Unclassified road at approximate OS Ref SH 2413 7979. Load moves away from camera. Negotiable.

Photograph 47
Unclassified road at approximate OS Ref SH 2359 7991. Load moves away from camera. Potential grounding issues for bed trailers.

Photograph 48
Unclassified road at approximate OS Ref SH 2342 8005. Load moves away from camera. Negotiable.

Photograph 49
Unclassified road at approximate OS Ref SH 2305 8029. Load moves away from camera. Negotiable with overrun of the outer section of the bend which is surfaced.

Photograph 50
Unclassified road at approximate OS Ref SH 2304 8032. Load moves away from camera. Negotiable.

Photograph 51
Unclassified road at approximate OS Ref SH 2297 8038. Load moves away from camera. Negotiable.

Photograph 52
Unclassified road at approximate OS Ref SH 2242 8067. Load moves away from camera. Negotiable for flattop trailers.

10.2.5. The road narrows from this point west to the proposed sites. It is negotiable with full occupation of the road and traffic management in place for flattop trailers. As previously highlighted 10 row flattops are the preferred arrangement providing transformer transport height can be reduced to 4.0m. If this is not feasible and 5bed5 trailers require to be utilised then the route from this point to site would benefit form more detailed topographical surveys to confirm access requirements.

Photograph 53
Unclassified road at approximate OS Ref SH 2235 8067. Load approaches camera. Negotiable for flattop trailers. Caution with gradient required.

Photograph 54
Unclassified road at approximate OS Ref SH 2225 8065. Load moves away from camera. Negotiable. Caution with telegraph pole on the inside of the turn required.

10.2.6. Site reference H1 is to the right of the above photograph. Exact access into the site remains to be confirmed at this early stage of the project. However, it will be necessary for the final access design to be considerate of the local topography and land ownership before the access road can be confirmed as acceptable for the proposed loads.

Photograph 55
Unclassified road at approximate OS Ref SH 2211 8057. Load moves away from camera. Negotiable for flattop trailers.

10.2.7. Site reference K is to the left of the above photograph in the vicinity of Ty-mawr. Exact access into the site remains to be confirmed at this early stage of the project. However, it will be necessary for the final access design to be considerate of the local topography and land ownership before the access road can be confirmed as acceptable for the proposed loads.

Photograph 56
Unclassified road at approximate OS Ref SH 2205 8060. Load approaches camera. Negotiable.

Photograph 57
Unclassified road at approximate OS Ref SH 2205 8060. Load moves away from camera. Negotiable.

10.2.8. Site reference J is to the left of the above photograph in the vicinity of Gors-Goch. Exact access into the site remains to be confirmed at this early stage of the project. However, it will be necessary for the final access design to be considerate of the local topography and land ownership before the access road can be confirmed as acceptable for the proposed loads.

Photograph 58
Unclassified road at approximate OS Ref SH 2189 8057. Load moves away from camera.

10.2.9. Site reference J is to the left of the above photograph in the vicinity of Gors-Goch. Exact access into the site remains to be confirmed at this early stage of the project. However, it will be necessary for the final access design to be considerate of the local topography and land ownership before the access road can be confirmed as acceptable for the proposed loads. The natural alignment of the road at this location would lend itself to the new access road being constructed straight ahead of the photograph, avoiding the need to turn right as remedial works are expected to be necessary to enable the right turn to be made if access via a location further west would be required.

Photograph 59
Unclassified road at approximate OS Ref SH 2182 8063. Access road to South Stacks Nature Reserve car park at Gors-Goch.

10.2.10. If site reference J is to be accessed view this road, not only would remedial works at the proceeding bend be needed but the left turn shown would also need to be upgraded. The survey did not consider access via this road as it is assumed that new access roads would be considered to the proposed substation.

10.2.11. The road to the north from this point to proposed site reference A is restrictive to the proposed loads and would need significant upgrading works at several bends to enable extension of routes 1, 2, 3 and 4 to a possible entry point. As an alternative route (Route 5) is considered negotiable, it is recommended that if site A is developed that route 5 is considered the preferred access as discussed in Section 10.3 and therefore the section north is not considered further.

10.3. *Routes to Substation Sites K, J and H1 (Route 2)*

10.3.1. Route 2 is discussed in the notes and photographs below;

Photograph 60
Exit from A55 Jct 2 to A5153. Load approaches from right and turns left towards camera. Negotiable.

Photograph 61
A5153 roundabout with Parc Cybi. Load approaches camera. Negotiable.

Photograph 62
B4545/A5153 roundabout. Loads on route 2 approach from right and turn left towards camera. Loads on route 3 approach camera and drive straight over roundabout. Negotiable.

Photograph 63
B4545. Load moves away from camera. Negotiable with full occupation of road in places, caution with overhead wires also required.

Photograph 64

B4545. Load moves away from camera. Negotiable with full occupation of road in places, caution with overhead wires also required.

Photograph 65

B4545. Load moves away from camera. Negotiable with full occupation of road in places, caution with overhead wires also required.

Photograph 66

B4545. Load moves away from camera. Negotiable with full occupation of road in places, caution with overhead wires also required.

10.3.2. Route 2 merges with Route 1 as previously discussed at Treaddur Bay.

10.4. *Routes to Substation Sites K, J and H1 (Route 3)*

10.4.1. Route 3 is discussed in the notes and photographs below.

Photograph 67

End of A55 dual carriageway at Jct 1, Holyhead. Load moves away from camera and turns left to B4545. Considered negotiable although if preferred loads could circumnavigate the roundabout in full to aid left turn

Photograph 68

End of A55 dual carriageway at Jct 1, Holyhead. Load moves away from camera and turns left to B4545. Considered negotiable although if preferred loads could circumnavigate the roundabout in full to aid left turn

Photograph 69

B4545 Kingsland Road. Load moves away from camera. Parking restrictions may be required.

Photograph 70

B4545/A5153 roundabout. Load moves away from camera and drives straight over roundabout to merge with route 2. Negotiable.

10.5. *Routes to Substation Sites K, J and H1 (Route 4)*

10.5.1. Route 4 is discussed in the notes and photographs below.

Photograph 71

B4545 exit from A55 roundabout. Load moves towards camera. Negotiable.

Photograph 72

B4545/ Unclassified road at Porthdafarch Road. Load moves away from camera and turns right. Negotiable with full occupation of the carriageway.

Photograph 73

B4545/ Unclassified road at Porthdafarch Road. Load moves towards camera. Negotiable with full occupation of the carriageway.

Photograph 74

Unclassified road at Porthdafarch Road. Load moves away from camera. Negotiable with full occupation of the carriageway.

Photograph 75

Unclassified road at Porthdafarch Road. Load moves away from camera. Negotiable with full occupation of the carriageway. Parking restrictions would be required.

Photograph 76

Unclassified road at Porthdafarch Road. Load moves away from camera. Negotiable with full occupation of the carriageway.

Photograph 77

Unclassified road. Load moves away from camera. Negotiable with full occupation of the carriageway. Caution with trees which may need pruning depending on growth present at the time of movement.

Photograph 78
Unclassified road. Load moves away from camera. Negotiable with full occupation of the carriageway. Parking restrictions required.

Photograph 79
Unclassified road. Load moves away from camera. Negotiable with full occupation of the carriageway.

Photograph 80
Unclassified road near activity centre. Load moves away from camera. Negotiable with full occupation of the carriageway.

Photograph 81

Load moves away from camera and turns right, joining route 1 previously discussed. Negotiable.

10.6. *Routes to Substation Site A (Route 5)*

10.6.1. The A55 to Holyhead and Victoria Road is negotiable. The route from Holyhead to proposed site A is discussed in the notes and photographs below.

Photograph 82

Victoria Road Holyhead. Load approaches camera if exiting from Refit Berth. Port advises the Celtic Gateway Bridge height is approximately 7m and will not be restrictive for AILs.

Photograph 83

Victoria Road Holyhead. Load moves away from camera and turns left into Prince of Wales Road. Swept Path Assessment of the left turn advised for 5bed5 trailers due to present of bollards on kerbs which may need to be overrun. 10 row flattop trailer expected to be negotiable.

Photograph 84

Victoria Road Holyhead. Load approaches camera turning left into Prince of Wales Road. Swept Path Assessment of the left turn advised for 5bed5 trailers due to present of bollards on kerbs which may need to be overrun. 10 row flattop trailer expected to be negotiable.

Photograph 85

Prince of Wales Road at OS Ref SH 2446 8319. Load moves away from camera and turns left into Walthew Avenue. Street furniture removal of centre island bollards and railings on the inside of the turn required. Swept Path Assessment of the left turn advised to confirm access.

Photograph 86

Prince of Wales Road at OS Ref SH 2446 8319. Load turns left into Walthew Avenue towards camera. Street furniture removal of centre island bollards and railings on the inside of the turn required. Swept Path Assessment of the left turn advised to confirm access.

Photograph 87

Walthew Avenue. Load moves away from camera. Potential requirement for tree pruning may be necessary depending on growth at the time of movement requirement.

Photograph 88

New Park Road/South Stack Road junction. Load moves away from camera and turns right. Negotiable.

Photograph 89

South Stack Road new roundabout at housing estate. Load moves away from camera. Negotiable with caution. Street furniture could be removed if necessary but not expected to be needed for 10 row flattop trailers.

Photograph 90

South Stack Road. Load moves away from camera. South Stack Road is generally negotiable with full occupation of the road although parking restrictions are advisable. Note also overhead wires.

Photograph 91

South Stack Road at OS Ref SH 2446 8319. Load moves away from camera into Tre Ambrose.

Photograph 92
South Stack Road at OS Ref SH 2446 8319. Load moves towards camera.

10.6.2. The left turn is adjacent to No 5 Tre Ambrose which is on the inside of the turn and a measurement of 2.6m was taken approximately from the wall to the centre line of the load. It is expected that 10 row flattop trailers will negotiate the turn but 5bed5 trailers would require a confirmatory survey and swept path assessment to confirm negotiability.

Photograph 93
Tre Ambrose at Llaingoch Village Hall. Load moves away from camera. Parking restrictions to be enforced to enable access.

Photograph 94
South Stack Road at Twr (OS Ref SH 2216 8212). Load moves away from camera. Note that there is a quarry access road that exist the public highway on the right. This is probably not suitable for development of the proposed access point to site A.

Photograph 95
South Stack Road at OS Ref SH 2197 8185. Load moves away from camera. Potential site access road could be developed on the right.

Photograph 96
South Stack Road at OS Ref SH 2197 8185. Load moves towards camera.

10.6.3. Site reference A is to the left of photograph 96. Exact access into the site remains to be confirmed at this early stage of the project. However, it will be necessary for the final access design to be considerate of the local topography and land ownership before the access road can be confirmed as acceptable for the proposed loads.

10.6.4. There is an existing farm field access gate and it may be easier to obtain planning consents to develop the existing gate rather than to create new access points. Although outside of the scope of this works the impact on sight lines for the access road for Construction and Use traffic could be a significant part of planning permissions.

10.7. *Route from Holyhead to A55 via Black Bridge*

10.7.1. The short route from Holyhead to the A55 Black Bridge junction is discussed in the notes and photographs below;

Photograph 97
Turkey Shore Road/Llanfawr Road/Holyhead Port main access roundabout. Load moves towards camera. Negotiable.

Photograph 98
A55 Black Bridge junction at Holyhead. There are two choices for access. Firstly, as per larger Special Order transformer loads the load drives forward away from camera to the left and then reverses back over Black Bridge to the right of the photograph. Alternatively smaller 10 row flattop of 5 bed 5 trailers could look at accessing the turn in the conventional manner, possibly in contraflow. The haulage contractor would advise of their preferred method of access prior to final route selection.

10.7.2. A shunt manoeuvre at this location to aid with negotiability would minimise the impact of the camber on the junction and also generally be more accessible. When the A55 and Black Bridge junction layout was originally constructed as part of the A55 DBFO it was designed to be considerate of 20 axle girder frame trailers carrying 275te nett transformers.

Photograph 99

A55 Black Bridge junction at Holyhead. View looking towards London Road. Load comes from left of camera and turns right towards camera (possible shunt required depending on preference of haulage contractor).

Photograph 100

A55 Black Bridge at Holyhead..

Photograph 101

A55 Black Bridge junction at Holyhead. Load comes from behind camera and turns right away from camera on Route 5 or turns left to merge with routes 2,3 and 4 at A55 Jct 1 at Holyhead. Negotiable.

10.7.3. As additional information it is understood that the West Dock Gate has been used to exit the port by AILs in the past these are believed to have been for smaller loads such as wind turbine components rather than heavy transformer requirements. The following notes and photographs detail the status of the access route out from the port West Dock Gates to the A55 at the time of survey.

Photograph 102
Victoria Road Holyhead. Load approaches camera if exiting from Refit Berth.

Photograph 103
Victoria Road Holyhead. Load approaches camera from left if exiting from Refit Berth.
It is recommended that with removal of fence panels and plating of kerbs that the AIL would be accessible in order to provide access to route 5.

10.8. *Final access into site*

10.8.1. The construction of a new access road to any of the proposed new locations for the substation access road will be feasible for AIL access as long as the new access road is designed to be considered of AIL requirements as detailed in the transport drawings attached to this report to provide adequate opportunity to leave the principal highway with expediency. The turning circles identified within the transport configuration drawings should be applied within the design phase.

10.8.2. Much of the access design criteria on which the planning authorities relies upon is contained in "*Places Streets and Movement",* a national document published in 1998. In particular this sets out the visibility standards at access onto the road network. The sight line information, shown in Table 2, should be considered in conjunction with the turning radii information detailed within the transport configuration drawings.

10.8.3. To enable drivers emerging from the access to see and be seen by drivers proceeding along the carriageway unobstructed visibility is needed within the proximity of the junction. The distance along the centreline of the new access from the carriageway edge to the point where the emerging driver should be able to see a specified distance in each direction of the principal carriageway can be derived from the aforementioned documentation.

Table 2. Junction Visibility Splays

Measured Major Road Speed - **Mph**/kph	**70**/ 120	**60**/ 100	**50**/ 85	**40**/ 70	**35**/ 60	**30**/ 50
Major Road Distances (m)	295	215	160	120	90	70

11. Summary and Conclusions

11.1. The final transport dimensions of the transformers for delivery to the sites remain unconfirmed at this early stage in the project. These will be significant to achieving access in terms of both structural suitability of highway infrastructure and also the physical negotiability of proposed loads in view of length, width and height. Consideration has been given to access for transformers of 55te nett weight (60MVA) and 110te weight (120MVA).

11.2. The headroom of the initial 132/33kv unit provided at the commencement of the investigations was given as 4.5m. This height means that the unit would require to be transported on a bed trailer arrangement such as a 5bed5 trailer in order to meet with the standard UK motorway and trunk road running heights of 5.03m headroom clearance. Such a trailer would by virtue of its nett deadweight increase the overall gross vehicle weight to in excess of 150te gross and as such this would mean it would be subject to the need to be transported with Special Order permissions from the Secretary of State for Transport via Highways England.

11.3. If the nett transport height can be reduced to say no more than 4.0m then a flattop trailer arrangement could be utilised for UK road based transport which would keep the load height at 4.95m or below and which would also keep the gross trailer weight below 150te gross. It is strongly recommended that if transport weights remain at or in the region of 110te that the transport height is procured to be no greater than 4.0m.

11.4. The flattop trailer is significantly less onerous than 5bed5 trailers in terms of physical negotiability and should be encouraged as the transport vehicle if possible to reduce any modification works that may be required on route and further surveys.

11.5. Various routes have been considered from the A55 trunk road to the four substation sites.

11.6. Routes to Sites K, J and H1 are recommended to approach from the south via routes 1, 2 3 or 4. The preferred route in terms of negotiability is route 1 exiting the A55 at Junction 3.

11.7. Route 1 has some vertical gradients on the section from Treaddur Bay to the sites potential exit points from the public highway that would require additional topographical surveys to confirm is there are any potential grounding requirements for 5bed5 trailers carrying the transformer load to the ground if the transform is 4.5m high. 10 row flattop trailers would not be limited by these vertical gradients and are preferred for access.

11.8. On this basis the routes are all considered negotiable subject to street furniture removal, full occupation of the carriageway, parking restrictions and cautions with overhead lines where highlighted.

11.9. If site A is identified as the preferred site the recommended route from Holyhead via Route 5. This route is considered negotiable for 10 row flattop trailers although it is recommended that 3 confirmatory Swept Path Assessments (SPA) are carried out to confirm negotiability at the following locations:

a) Victoria Road Holyhead, left into Prince of Wales Road.
b) Prince of Wales Road at OS Ref SH 2446 8319. Left turn into Walthew Avenue.
c) Left bend at South Stack Road at OS Ref SH 2446 8319.

11.10. Although outside of the current scope of works comment has been provided on potential site access points from the public road network to site where relevant. The access roads will need to be designed to be considerate of the transport drawings provided within this report and will also be subject to land access agreements which will also impact on what may be technically suitable for site access road design.

11.11. All structural authorities have advised that the routes are acceptable for the proposed loads.

11.12. IoACC have confirmed that the routes are structurally acceptable although the exact traffic management associated with movements will need careful consideration at the time of requirement.

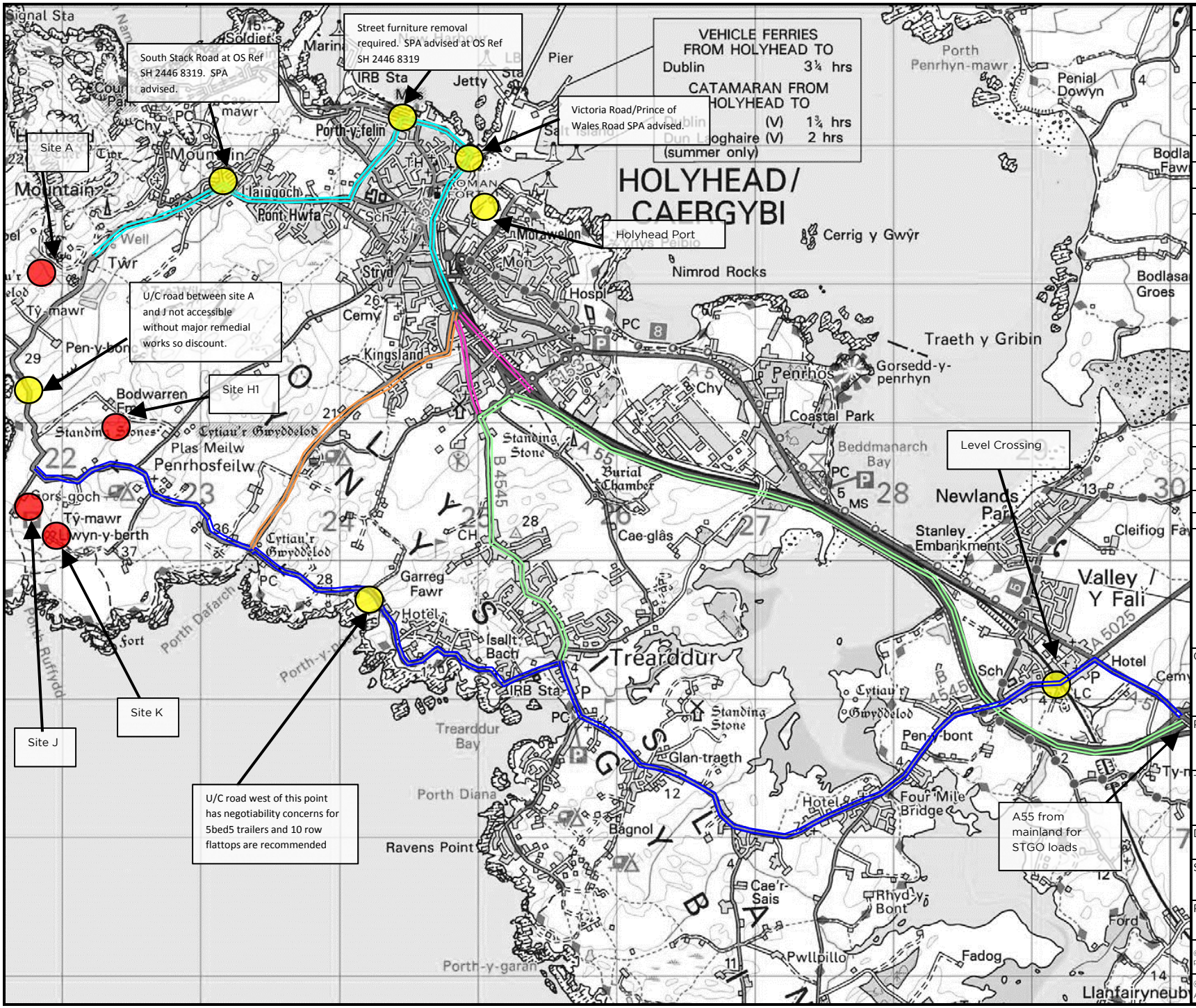
11.13. Due to the physically limiting nature of the unclassified road approximately between sites A and J it is not suitable for AIL access unless major remedial works are undertaken, hence the different approaches to the separate areas being considered for development.

11.14. The route investigations detailed reflect the current status of the proposed heavy load route options and the future status of the route can change, especially after routine structural inspections and assessments by highway authorities. The report is intended to be a summary of the AIL route access at the current time and is not a guarantee that the route will be cleared in the future. Specific movements will need to be assessed at the time on an individual basis.

11.15. The final transport dimensions of the components for delivery to the site remain unconfirmed at this early stage in the project and the final dimensions selected will be critical for remedial measures that are expected to be required to enable road transport to be facilitated.

Appendix 1

Maps



Key

Route 1	
Route 2	
Route 3	
Route 4	
Route 5	
Point of Interest	
Potential Substation Loction	

Rev	Date	Amendments:
B		
A		
0	11.05.18	First Issue

Revisions

Wynns Ltd.
Independent Transportation Engineers

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Client:
ICCL (Hydro)
11 Ffordd Crwys
Bangor
LL57 2NT

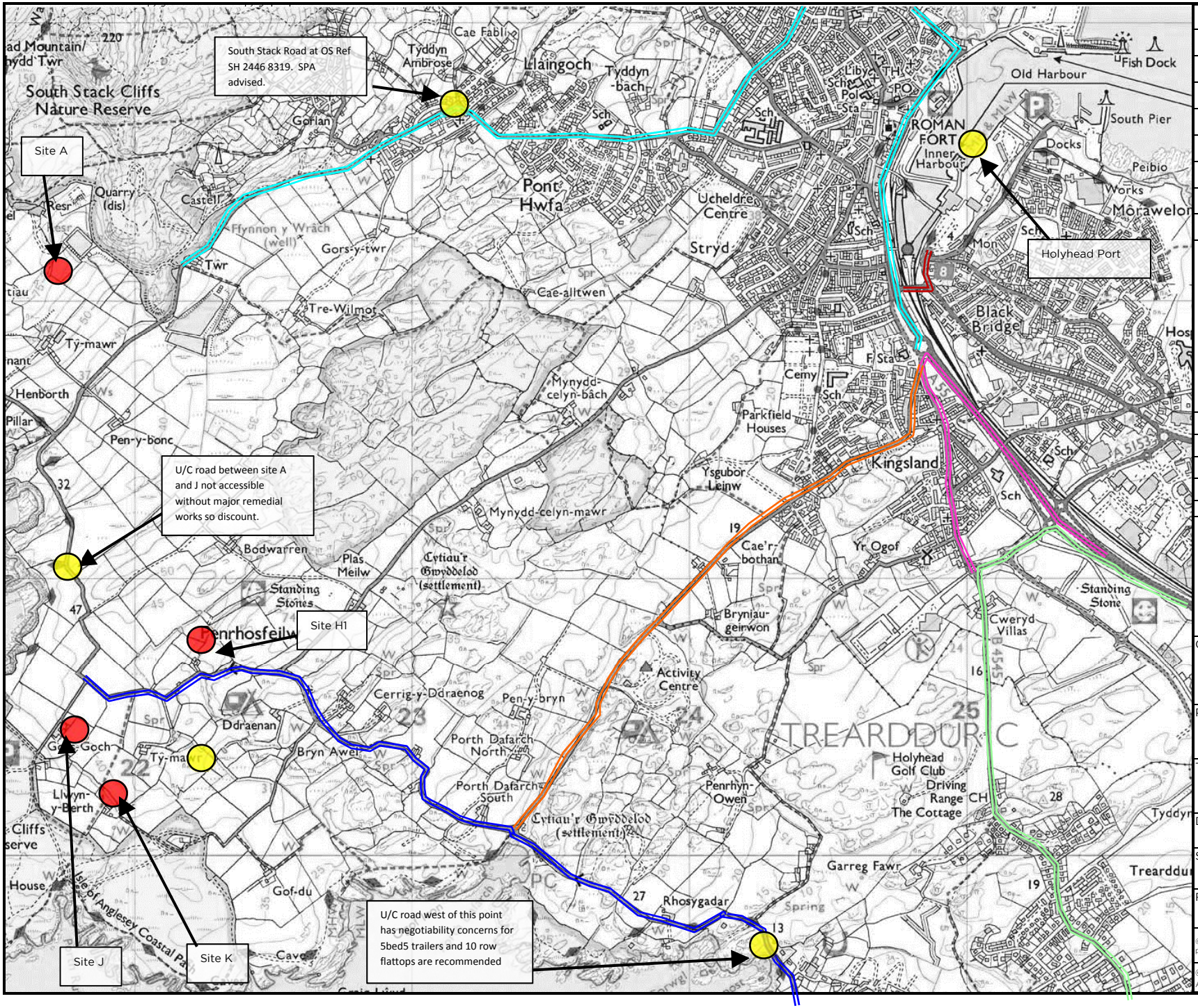
Project:
Holy Islands AIL Access

Title:
Map 1 – Route to Holy Island

Drawing Status:
Final Report

Scale (A4):	Drawn by:	Checked by:
NTS	DMW	ARP

Ref No.:	Sheet:	Rev.:
NG-HI-Map1	1 of 3	0



Key

Route 1	
Route 2	
Route 3	
Route 4	
Route 5	
Route 6	
Point of Interest	
Site	

Rev	Date	Amendments:
B		
A		
0	11.05.18	First Issue

Revisions

Wynns Ltd.
Independent Transportation Engineers

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Bangor
LL57 2NT

Project:
Holy Islands AIL Access

Title:
Map 1 – Route to Holy Island

Drawing Status:
Final Report

Scale (A4):	Drawn by:	Checked by:
NTS	DMW	ARP

Ref No.:	Sheet:	Rev.:
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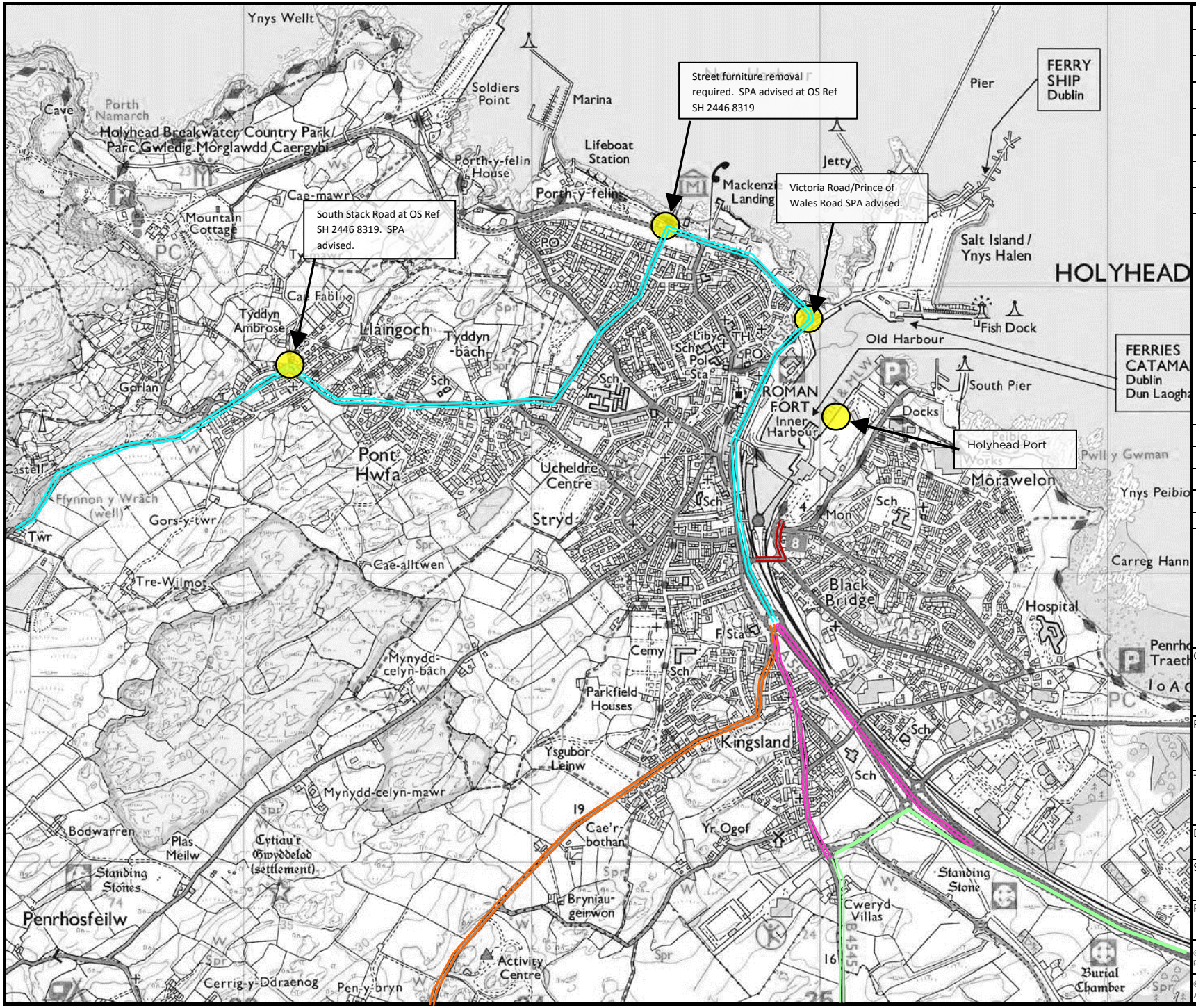

Key

Route 1	
Route 2	
Route 3	
Route 4	
Route 5	
Route 6	
Point of Interest	

Rev	Date	Amendments:
B		
A		
0	11.05.18	First Issue

Revisions

Wynns Ltd.
Independent Transportation Engineers

Shaftesbury House, 2 High Street, Eccleshall, Stafford, ST21 6BZ. Tel: (01785) 850411

Client:
ICCL (Hydro)
11 Ffordd Crwys
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LL57 2NT

Project:
Holy Islands AIL Access

Title:
Map 1 – Route to Holy Island

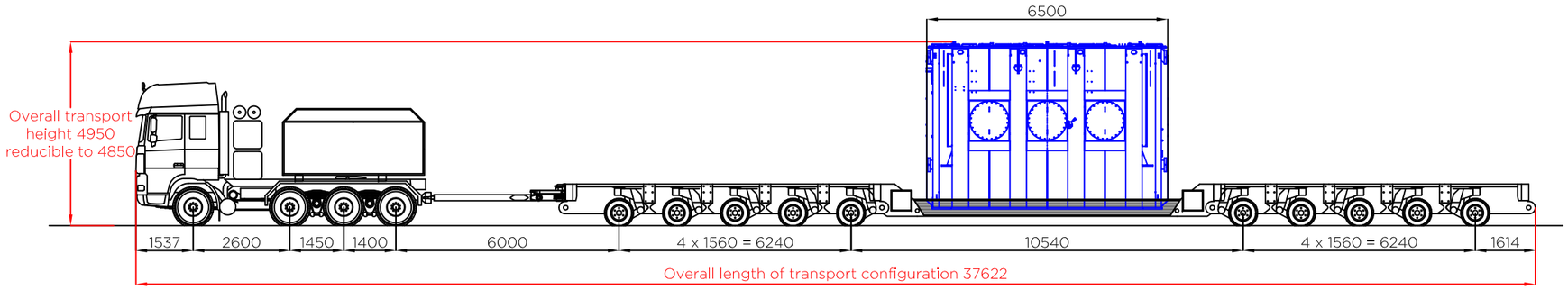
Drawing Status:
Final Report

Scale (A4):	Drawn by:	Checked by:
NTS	DMW	ARP

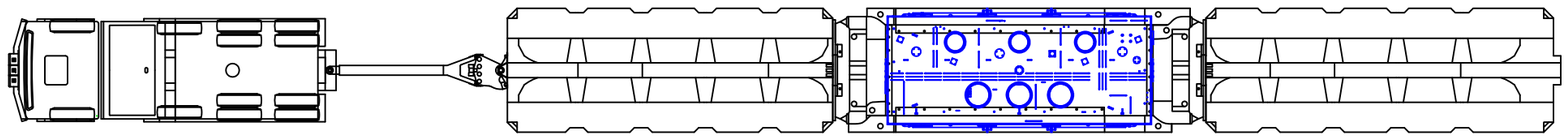
Ref No.:	Sheet:	Rev.:
NG-HI-Map1	3 of 3	0

Appendix 2

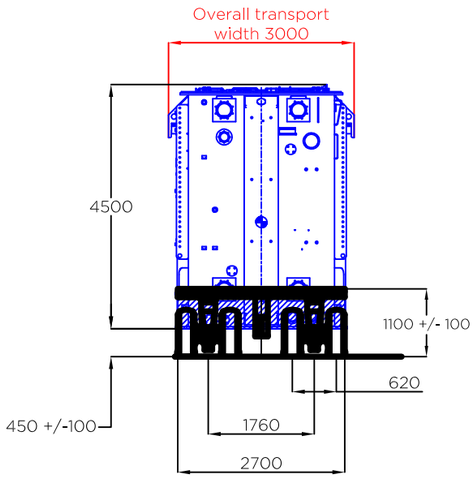
Drawings & Transport Configurations



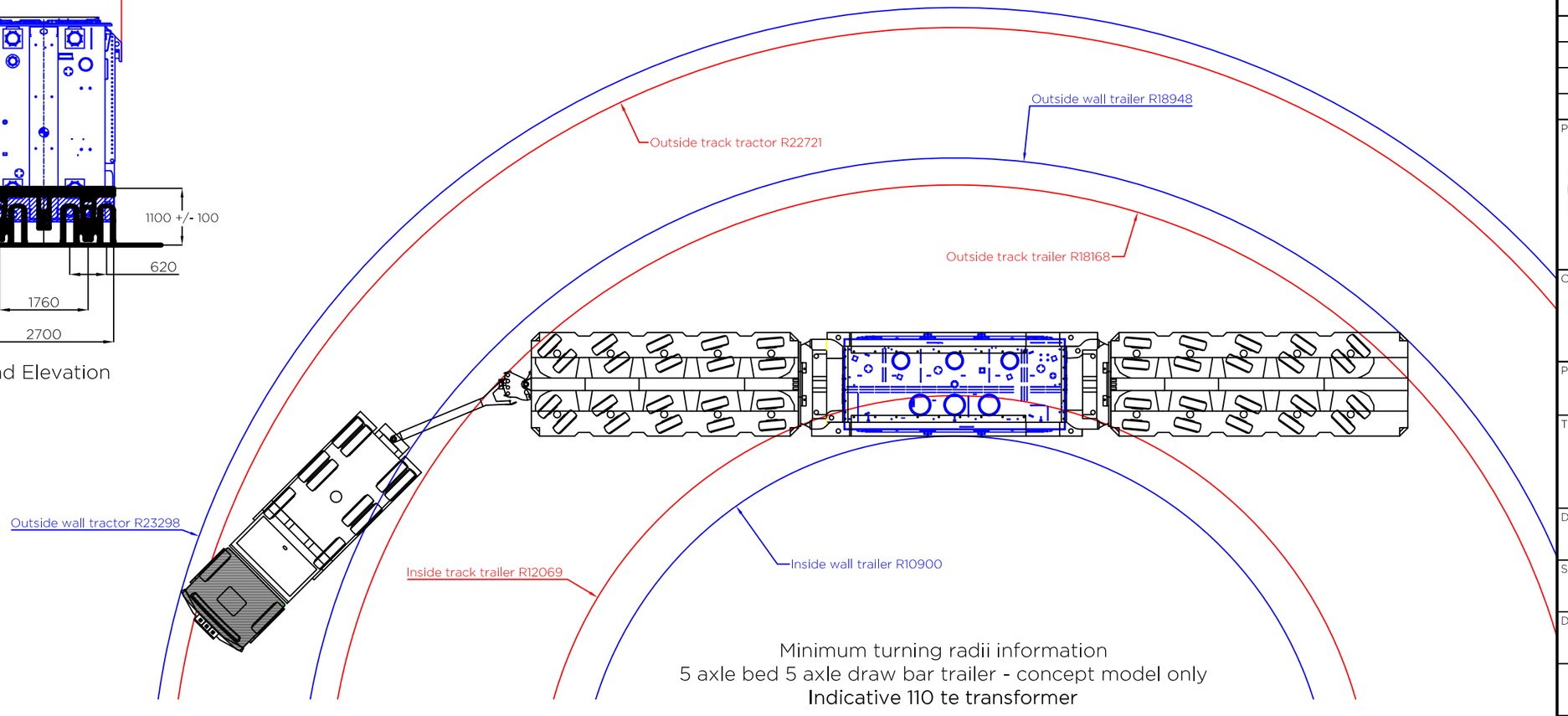
Side Elevation - 5 axle bed 5 axle draw bar trailer - concept model only
Indicative 110 te transformer



Plan View - 5 axle bed 5 axle draw bar trailer - concept model only
Indicative 110 te transformer



End Elevation



Minimum turning radii information
5 axle bed 5 axle draw bar trailer - concept model only
Indicative 110 te transformer

Load Table	
5 axle bed 5 axle draw bar trailer	
Self weight of load	110.0 te
Self weight of trailer	46.0 te
Self weight of aux. steelwork	0.0 te
Total combined weight	156.0 te
Load per axle line	15.6 te
Load per axle	7.8 te
Load per wheel (2 per axle)	3.9 te
Overall ground bearing pressure	4.63 te/m²
Tractor (40 te)	
Front axle	7.0 te
Second steer	7.0 te
Rear axle	13.0 te
Rear axle	13.0 te

Notes:-
[1] The figures shown above are representative of the transport configuration portrayed. However as tractor and trailer arrangements vary then the loads and dimensions indicated should be treated as probable values.

[2] Actual dimensions, including axle spacing and mean running height, may vary slightly depending on manufacturer of trailer deployed.

[3] All linear measures in millimetres unless stated otherwise.

[4] Transformer drawing indicative only.

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Revisions

Prepared By:
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Independent Transportation Engineers

Client: morlais ANGLESEY MARINE ENERGY

Project: **Morlais Marine Energy**

Title: **Indicative Transport Configuration**
110 te transformer carried upon typical 5 axle bed 5 axle draw bar trailer
showing minimum turning radii

Drawing Status: Final report

Scale (A3):	Drawn By:	Checked By:
DNS	SJW	AP

DWG. No:	Sheet:	Rev:
18.945-TC01	1 of 1	0

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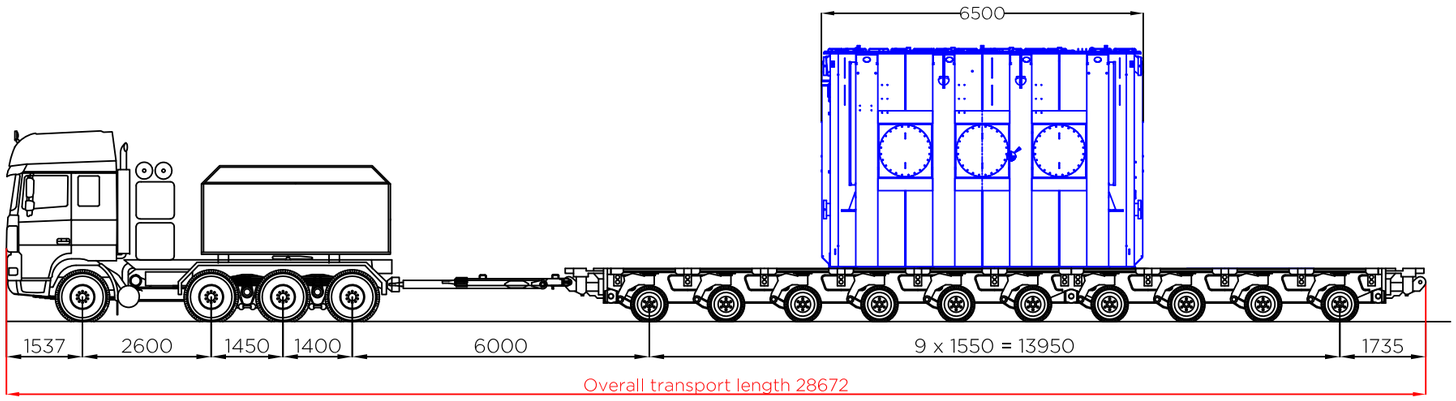
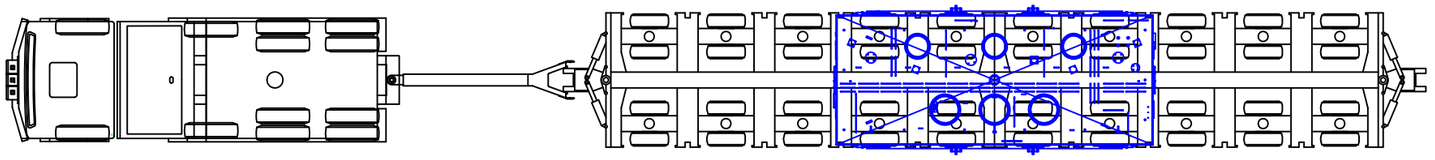
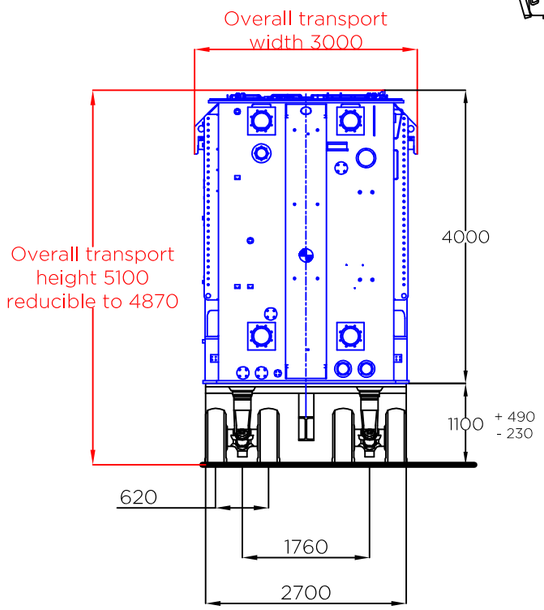


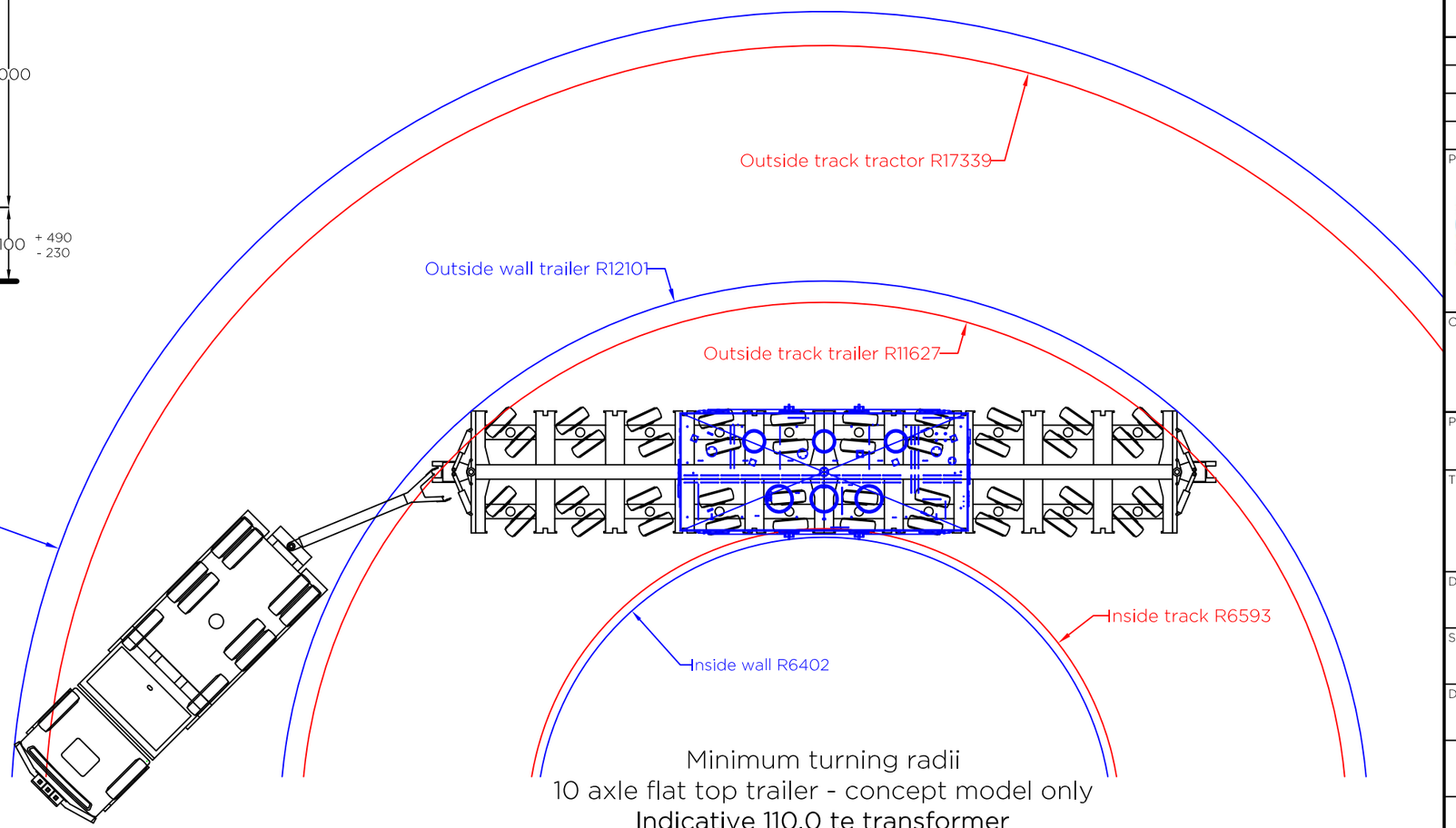
Side Elevation - 10 axle flat top trailer - concept model only
Indicative 110.0 te transformer



Plan View - 10 axle flat top trailer - concept model only
Indicative 110.0 te transformer



End Elevation



Minimum turning radii
10 axle flat top trailer - concept model only
Indicative 110.0 te transformer

Load Table	
10 axle flat top trailer	
Self weight of load	110.0 te
Self weight of trailer	30.0 te
Self weight of aux. steelwork (for L&S)	0.0 te
Total combined weight	140.0 te
Load per axle line	14.0 te
Load per axle	7.0 te
Load per wheel (2 per axle)	3.5 te
Overall ground bearing pressure	3.72 te/m²
Tractor (40 te)	
Front axle	7.0 te
Second steer	7.0 te
Rear axle	13.0 te
Rear axle	13.0 te

Notes:-
[1] The figures shown above are representative of the transport configuration portrayed. However as tractor and trailer arrangements vary then the loads and dimensions indicated should be treated as probable values.

[2] Actual dimensions, including axle spacing and mean running height, may vary slightly depending on manufacturer of trailer deployed.

[3] All linear measures in millimetres unless stated otherwise.

[4] Transformer drawing indicative only.

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Revisions

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Independent Transportation Engineers

Client: morlais ANGLESEY MARINE ENERGY

Project: **Morlais Marine Energy**

Title: **Indicative Transport Configuration**
110 te transformer at 4 m height carried upon typical 10 axle flat top draw bar trailer showing minimum turning radii

Drawing Status: Final Report

Scale (A3):	Drawn By:	Checked By:
DNS	SJW	AP

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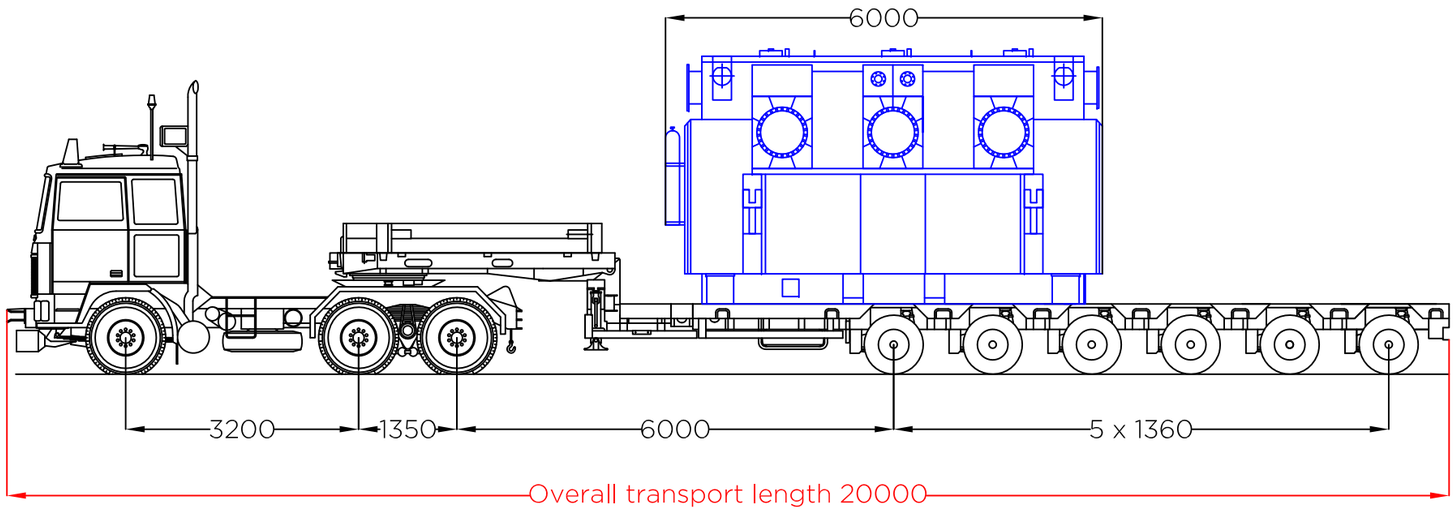
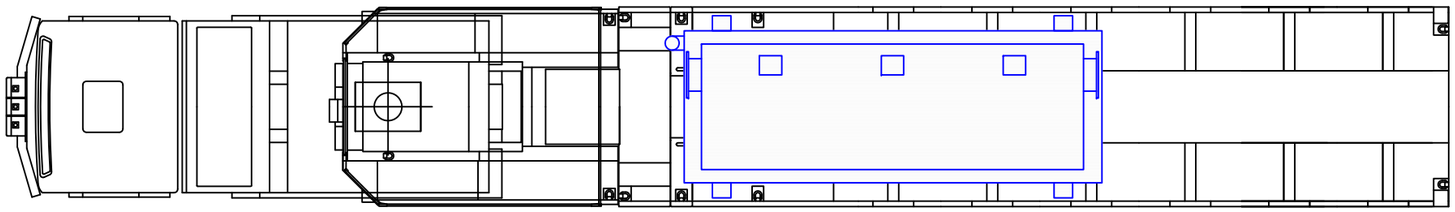
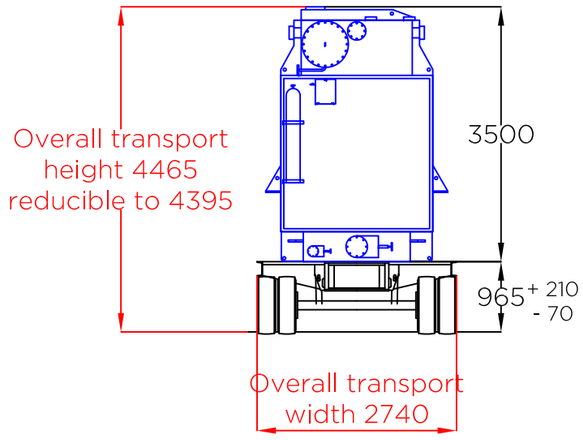


Side Elevation - 6 axle step frame trailer - concept model only
Indicative 55.0 te transformer



Plan View - 6 axle step frame trailer - concept model only
Indicative 55.0 te transformer



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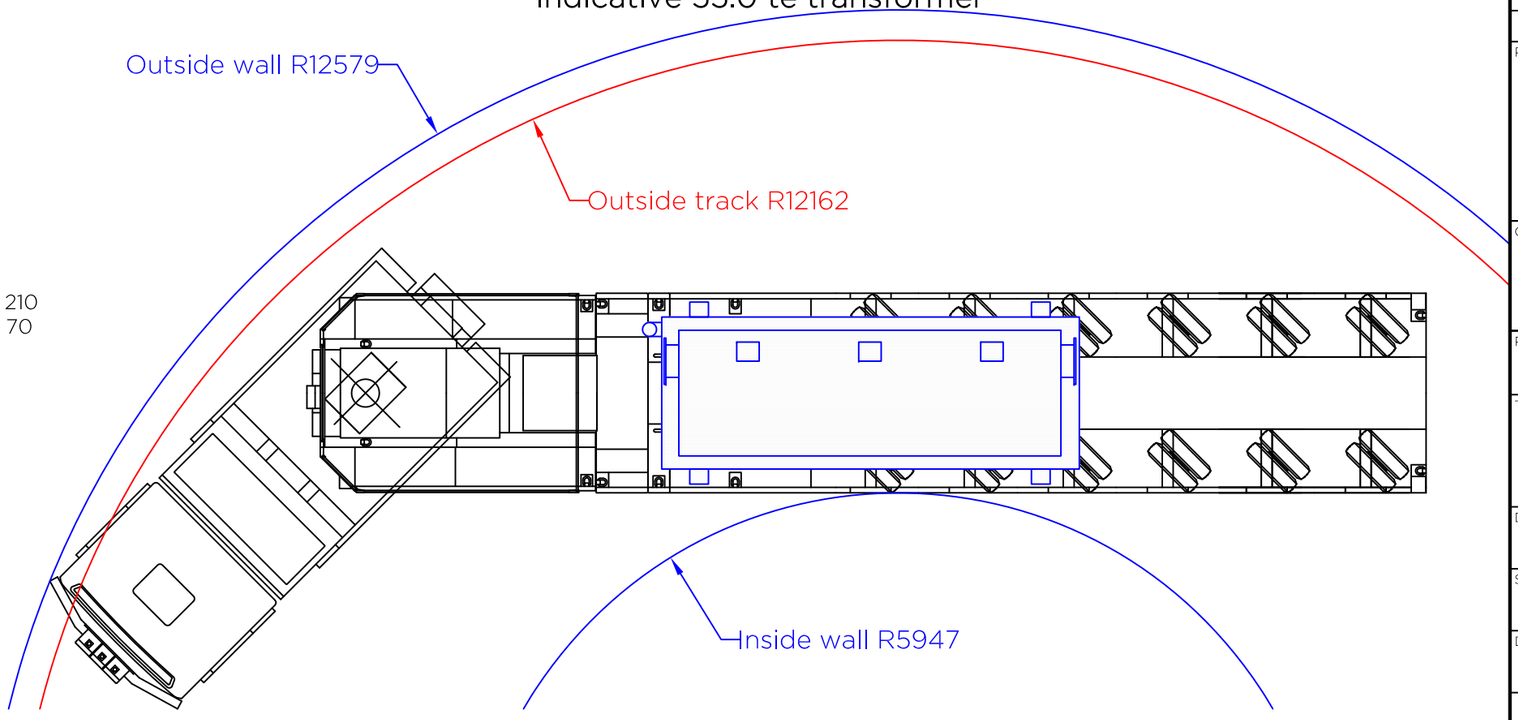

Minimum Turning Radii - 6 axle step frame trailer - concept model only
Indicative 55.0 te transformer

Load Table	
6 axle step frame trailer	
Self weight of load	55.0 te
Self weight of trailer	23.0 te
Self weight of tractor	12.0 te
Self weight of aux. steelwork (for L&S)	Say 1.0 te
Total combined weight	91.0 te
Load per axle line	10.0 te
Load per axle	5.0 te
Load per wheel (2 per axle)	2.5 te
Tractor (12 te)	
Front axle	6.0 te
Rear axle	12.0 te
Rear axle	12.0 te

Notes:-
[1] The figures shown above are representative of the transport configuration portrayed. However as tractor and trailer arrangements vary then the loads and dimensions indicated should be treated as probable values.

[2] Actual dimensions, including axle spacing and mean running height, may vary slightly depending on manufacturer of trailer deployed.

[3] All linear measures in millimeters unless stated otherwise.

[4] Transformer drawing indicative only.

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Revisions

Prepared By:
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Tel: (01785) 850411
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Client: morlais ANGLESEY MARINE ENERGY

Project: **Morlais Marine Energy**

Title: **Indicative Transport Configuration**
55 te transformer carried upon typical
6 axle step frame trailer
showing minimum turning radii

Drawing Status: Final Report

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DNS	SJW	PAGW

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18.945-TC03	1 of 1	0

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Appendix 3

Highways England aide memoir

Aide Memoire for notification requirements for the movement of Abnormal Indivisible Loads or vehicles by road when not complying with The Road Vehicles (Construction and Use) Regulations 1986 (commonly known as C & U)

Weight

Gross weight of vehicle carrying the load exceeding C & U limits up to 80,000kgs (78.74 tons)	2 clear days notice with indemnity to Road and Bridge Authorities.
Gross weight of vehicle carrying the load exceeding 80,000kgs up to 150,000kgs (147.63 tons)	2 clear days notice to Police and 5 clear days with indemnity to Road and Bridge Authorities.
Gross weight of vehicle carrying the load exceeding 150,000kgs (147.63 tons)	Highways England Special Order* plus 5 clear days notice to Police and 5 clear days notice with indemnity to Road and Bridge Authorities

Width

C & U loads:- width exceeding 2.9m (9ft 6ins) up to 4.3m (14ft 1 ins) STGO loads:- width exceeding 3.0m (9ft 10ins) up to 5.0m (16ft 5ins)	2 clear days notice to Police
Width exceeding 5.0m (16ft 5ins) up to 6.1m (20ft)	Highways England form VR1** plus 2 clear days notice to Police
Width exceeding 6.1m (20ft)	Highways England Special Order* plus 5 clear days notice to Police and 5 clear days notice with indemnity to Road and Bridge Authorities

Length

C&U loads:- length exceeding 18.65m (61ft 2in) up to 27.4m (90ft) - See C&U Regulations 1986 for definition of length STGO loads:- length exceeding 18.75m (61ft 6 ins) - See part 2, article 12 of the Road Vehicles (Authorisation of Special Types) (General) Order 2003 (Commonly known as STGO) for definition of length	2 clear days notice to Police
Overall length of a part 2 vehicle-combination exceeding 25.9m (85ft)	2 clear days notice to Police
Maximum length exceeding 30.0m (98ft 5ins) – see STGO Schedule 1, part 4, paragraph 25 for definition of maximum length NB For some very light loads, such as yacht masts, that are moved on conventional motor vehicles not exceeding 12 tonnes gross weight or trailers not exceeding 10 tonnes gross weight, a Highways England Special Order* will be required if the rigid length exceeds 27.4m (89ft 11ins)	Highways England Special Order* plus 5 clear days notice to Police and 5 clear days notice with indemnity to Road and Bridge Authorities.

NOTE 1 "Clear days Notice" excludes Saturdays, Sundays or a public holiday in any part of Great Britain in relation to movements authorised by the Special Types General Order only, there being no such exclusion in Special Orders unless specifically stated.

NOTE 2 There is no statutory limit governing the overall height of a load, however, when applying for a Special Order or VR1 it should, wherever possible, not exceed 4.95m (16ft 3ins) in order that the maximum use can be made of the motorway and trunk road network.

NOTE 3 The notification requirements for mobile cranes can be found in the Road Vehicles (Authorisation of Special Types) (General) Order 2003, statutory instrument number 1998 (Part 2 Articles 10 to 18), which is available on the OPSI website: http://www.legislation.gov.uk/uksi/2003/1998/contents/made

NOTE 4 Application to move Special Types or Special Purpose vehicles, such as very large agricultural vehicles, that may not be fully permitted by the Construction & Use (C&U) Regulations or fall outside the scope of the Special Types General Order should be made to the Vehicle Certification Agency (VCA). Their website is at http://www.dft.gov.uk/vca/

*A Special Order application can be completed and submitted online at www.highways.gov.uk/esdal. The Special Order application form BE16 can also be downloaded and e-mailed to the address below. Approval is not automatic and is at the discretion of the Highways England abnormal loads team acting on behalf of the Secretary of State for Transport. To ensure that the necessary clearances can be obtained in good time from the Police, Highway and Bridge Authorities, you should request permission for the move by returning the completed form 10 weeks prior to the scheduled date of the move. In fact you cannot apply too early and we invite manufacturers or hauliers to contact us at pre tender stage, before making a financial commitment to supply the load, to check whether permission would be granted.

** A VR1 application can be completed and submitted online at www.highways.gov.uk/esdal. The form can also be downloaded but must not be e-mailed or faxed because the VR1 form is a legal document and so we must receive the original signed form. Approval is not automatic and is at the discretion of the Highways England abnormal loads team acting on behalf of The Secretary of State for Transport. To ensure that the necessary formalities can be completed in good time, you should request permission for the move by posting the completed form 2 weeks prior to the date of the scheduled move. Again, you cannot apply too early and we invite manufacturers or hauliers to contact us at pre tender stage, before making a financial commitment to supply the load, to check whether permission would be granted.

Forms and enquiries to:
Highways England
Abnormal loads team
9th Floor, The Cube
199 Wharfside Street
Birmingham B1 1RN

E-mail: abnormal.loads@highwaysengland.co.uk
Tel: 0300 470 3004

Andrew Pearce

From: Jones Owen Rhys (YGC) <owenrhysjones@gwynedd.llyw.cymru>
Sent: 11 July 2018 11:48
To: Andrew Pearce; Roberts Emlyn John (PAB)
Subject: RE: AIL Route Assessment - Holy Island near Holyhead

We have screened the information and the load configurations, and can confirm that they are acceptable for the B4545 station Road Overbridge.

Regards,

Rhys

Owen Rhys Jones
Rheolwr Uned / Unit Manager

From: Andrew Pearce <Andy.Pearce@wynnslimited.com>
Sent: 10 July 2018 10:35
To: Roberts Emlyn John (PAB) <emlynjohnroberts@gwynedd.llyw.cymru>
Cc: Ian Cook <ian.michael.cook@googlemail.com>; Debbie.Hudd@gov.wales; Jones Owen Rhys (YGC) <owenrhysjones@gwynedd.llyw.cymru>
Subject: RE: AIL Route Assessment - Holy Island near Holyhead

Emlyn,

Thanks for this. I too have just returned from holiday. It would be good to get this closed off as soon as we can to hopefully confirm what we suspect in that there are no structural issues.

Kind Regards

Andy

From: Roberts Emlyn John (PAB) [mailto:emlynjohnroberts@gwynedd.llyw.cymru]
Sent: 04 July 2018 22:18
To: Andrew Pearce <Andy.Pearce@wynnslimited.com>
Cc: Ian Cook <ian.michael.cook@googlemail.com>; Debbie.Hudd@gov.wales; Jones Owen Rhys (YGC) <owenrhysjones@gwynedd.llyw.cymru>
Subject: RE: AIL Route Assessment - Holy Island near Holyhead

Hi Andy,

I am on leave until next Wednesday, but I have passed on the information to our Structures team at Gwynedd Council (YGC) who have kindly agreed to respond to this particular route assessment.

I have copied Rhys Jones into the conversation so that he can hopefully send the information directly to yourselves. I am aware that you are urgently chasing this.

Rhys – please include me in any correspondence. I will catch up on this upon my return.

Many thanks,

Emlyn

From: Andrew Pearce <Andy.Pearce@wynnslimited.com>
Sent: 26 June 2018 09:41
To: Roberts Emlyn John (PAB) <emlynjohnroberts@gwynedd.llyw.cymru>
Cc: Ian Cook <ian.michael.cook@googlemail.com>; Debbie.Hudd@gov.wales
Subject: FW: AIL Route Assessment - Holy Island near Holyhead
Importance: High

Emlyn,

As discussed yesterday I would be grateful if you could urgently confirm the position of the A55 DBFO structures that we have discussed at length and as per the routes highlighted previously below. I am making an assumption from our discussions that there are NO structural problems expected as far as UK Highways and the DBFO section of the A55 is concerned but as always I would be grateful if you could confirm this is the situation, especially for the bridges that carry roads OVER the A55 which I have marked as belonging to UK Highways DBFO, even though the carriageway is the local council.

Many thanks.

Andy Pearce

From: King Steven Gruffudd (CEFNFFYRDD) [mailto:StevenKing@nmwtra.org.uk]
Sent: 19 June 2018 15:59
To: 'Emma M. Collett' <EmmaCollett@ynysmon.gov.uk>; Andrew Pearce <Andy.Pearce@wynnslimited.com>; Roberts Emlyn John (PAB) <emlynjohnroberts@gwynedd.llyw.cymru>; Wright Nic (CEFNFFYRDD) <NicWright@nmwtra.org.uk>
Cc: Daisy Wynn <Daisy.Wynn@wynnslimited.com>; 'Ian Cook' <ian.michael.cook@googlemail.com>; 'Dewi R. Williams' <DewiWilliams@ynysmon.gov.uk>; 'Debbie.Hudd@gov.wales' <Debbie.Hudd@gov.wales>; 'Dylan L. Jones' <DylanJones@ynysmon.gov.uk>
Subject: RE: AIL Route Assessment - Holy Island near Holyhead

Hi Andy,

Thank you for the configurations, they are all currently acceptable to us for travel on the NMWTRA A55 stretch but when it comes to the A55 DBFO stretch, that is outside our jurisdiction/territory and hopefully others will be able to respond to you.

Thanks

Steve

From: King Steven Gruffudd (CEFNFFYRDD)
Sent: 04 June 2018 17:39
To: 'Emma M. Collett' <EmmaCollett@ynysmon.gov.uk>; Andrew Pearce <Andy.Pearce@wynnslimited.com>; Roberts Emlyn John (PAB) <emlynjohnroberts@gwynedd.llyw.cymru>; Wright Nic (CEFNFFYRDD) <NicWright@nmwtra.org.uk>
Cc: Daisy Wynn <Daisy.Wynn@wynnslimited.com>; Ian Cook <ian.michael.cook@googlemail.com>; Dewi R. Williams <DewiWilliams@ynysmon.gov.uk>; Debbie.Hudd@gov.wales; Dylan L. Jones <DylanJones@ynysmon.gov.uk>
Subject: RE: AIL Route Assessment - Holy Island near Holyhead

Hi Andy,

Hope you are well. Can I trouble you for the original attachments please? - I will have to get Nic to do his calcs to confirm for you. I will consult with him as to what he knows re the inspections of this B4545 bridge too.

Thanks

Steve

Steven Gruffudd King LLB PGDip
Swyddog Meddiannaeth y Rhwydwaith a Llwythau Annormal /
Network Occupancy and Abnormal Loads Officer
Asiant Cefnffyrdd Gogledd a Chanolbarth Cymru
North & Mid Wales Trunk Road Agent
Neuadd y Sir, Aberaeron SA46 0AT
☎ 01545 571960
✉ stevenking@nmwtra.org.uk

Yn gweithio ar ran Llywodraeth Cymru
Working on behalf of the Welsh Government
Cymraeg

From: Emma M. Collett <EmmaCollett@ynysmon.gov.uk>
Sent: 31 May 2018 11:11
To: Andrew Pearce <Andy.Pearce@wynnslimited.com>; Roberts Emlyn John (PAB) <emlynjohnroberts@gwynedd.llyw.cymru>
Cc: Daisy Wynn <Daisy.Wynn@wynnslimited.com>; Ian Cook <ian.michael.cook@googlemail.com>; Dewi R. Williams <DewiWilliams@ynysmon.gov.uk>; Debbie.Hudd@gov.wales; King Steven Gruffudd (CEFNFFYRDD) <StevenKing@nmwtra.org.uk>; Dylan L. Jones <DylanJones@ynysmon.gov.uk>
Subject: RE: AIL Route Assessment - Holy Island near Holyhead

Hi Andy,

There are two bridges on the B4545 in the vicinity, one that cross the A55 and one that crosses a redundant highway now footpath.

We have recently had discussions with NMWTRA with regard to who is responsible for the one that crosses the redundant highway as it was not on our list of Structures to inspect. We think it may be ours?

We have noted some cracks in the footways that form part of this bridge due to some potential settlement of the abutments, but we do not think this is deteriorating and we are monitoring at present.

I have requested any as builts from Jones Bros and will chase this.

Hope this helps

Emma

From: Andrew Pearce <Andy.Pearce@wynnslimited.com>
Sent: 31 May 2018 11:02
To: Roberts Emlyn John (PAB) <emlynjohnroberts@gwynedd.llyw.cymru>
Cc: Daisy Wynn <Daisy.Wynn@wynnslimited.com>; Ian Cook <ian.michael.cook@googlemail.com>; Emma M. Collett <EmmaCollett@ynysmon.gov.uk>; Dewi R. Williams <DewiWilliams@ynysmon.gov.uk>; Debbie.Hudd@gov.wales; King Steven Gruffudd (CEFNFFYRDD) <StevenKing@nmwtra.org.uk>

Subject: RE: AIL Route Assessment - Holy Island near Holyhead
Importance: High

Hello Emlyn,

Thank you for your email. It is good to confirm the A55 remains acceptable for the loads which is what we would have expected. For clarity however I also copy Debbie Hudd of Welsh Government and Steven King of NMWTRA into this email as I need to be sure that both UK Highways and NMWTRA are agreeable to the route following the comments you provided in your separate email on Sunday. You are correct in that the route will be considered further closer to the time of requirement with appointed haulage contractors making formal notifications in the normal manner etc.

In terms of the B4545 we are having separate discussions with Isle of Anglesey County Council with regard to their structures on this route and I also copy them in on this email but as per my other email of 24.05.18 ESDAL appears to indicate that the bridge that carries the B4545 over the A55 is under the responsibility of UK Highways A55 or North and Mid Wales Trunk Road Agency. Please see the extract below of relevant information again for reference.

ESRN	:	S-SH287789-1
Name	:	STATION ROAD OVERBRIDGE
Unique Id	:	DBFOA55 1570
Coordinates	:	228743 , 378925
Owner/Stakeholder	:	Welsh Government North and Mid Wales Trunk Road Agency
Category	:	Road Bridge
Class	:	Under And Over Bridge
Length	:	38.38 m

I trust that this makes sense and look forward to your further comments that this bridge is hopefully able to also accommodate the proposed loads. I am of course happy to discuss further if you wish.

Kind Regards

Andy Pearce

From: Roberts Emlyn John (PAB) [mailto:emlynjohnroberts@gwynedd.llyw.cymru]
Sent: 27 May 2018 12:45
To: Andrew Pearce <Andy.Pearce@wynnslimited.com>
Cc: Daisy Wynn <Daisy.Wynn@wynnslimited.com>
Subject: RE: AIL Route Assessment - Holy Island near Holyhead

Hi Andy,

Further to our telephone discussion last week, I've had a look at the route proposals below.

As for the A55 Network, it is envisaged that the unit weight and dimensions should not be an issue on any of the trunk road network route, including Blackbridge. As for the overbridge you mentioned, B4545 towards Trearddur Bay, have you contacted Isle of Anglesey Council regarding any weight restriction? I would not foresee any issue, but as it is their network they could confirm this.

Again, as this project is potentially a number of years away, it would be expected that another route assessment is carried out nearer to the project date if it goes ahead?

Kind Regards,
Emlyn

From: Andrew Pearce <Andy.Pearce@wynnslimited.com>
Sent: 21 May 2018 15:51
To: Roberts Emlyn John (PAB) <emlynjohnroberts@gwynedd.llyw.cymru>
Cc: Daisy Wynn <Daisy.Wynn@wynnslimited.com>
Subject: AIL Route Assessment - Holy Island near Holyhead

Dear Emlyn,

I wish to consult with you on a new access enquiry we are working on. I did try to call you today to discuss but was advised you were in a meeting. If you would like to call me once you have considered the information below that would be useful. Wynns have been appointed by Morlais Marine Energy to undertake a feasibility study into Abnormal Indivisible Load (AIL) access in respect to the possible routes for new transformers to a new onshore substation connection on Anglesey associated with the installation of marine energy devices. Our work is solely in relation to the potential for heavy load access to the new onshore substation site at an as yet unconfirmed location. I show below routes that we have inspected as possible access routes based on the assumption that we can get onto Anglesey via the A55 heavy load route but I would welcome your confirmation that this remains the case. We are of course aware that the A55 was originally designed and built for much larger loads some years ago. I would be grateful if you could advise as to the structural suitability of the proposed routes as far UK Highways A55 is concerned.

The exact size of transformer is as yet unconfirmed and will be subject to further scheme development. We are currently basing assumptions on two sizes of unit at either 110te nett weight or 55te nett. The trailers are attached as flows and show drawings:

18.945-TC01 5bed5 trailer at 156te gross weight (Special Order category)
18.945-TC02 10 row flattop trailer at 140te gross weight (STGO)
18.945-TC03 6 axle step trailer at 91te gross weight (STGO)

We would prefer to route at STGO thus avoiding the need for expensive shipping to Holyhead if possible. However, depending on the final size of unit there may be a need to also consider Special Order loads from Holyhead via Black Bridge to the A55 and I allow for these also in the routes below. As well as the main A55 carriageway there are also structures crossing the A55 at Jct 3 and on the B4545 and the suitability of these bridges will impact on the most feasible route.

Possible Routes:

Route 1
Assume entry to Welsh Trunk Road Network on A55 Chester Bypass and continue to Bangor
Continue A55 onto Anglesey via Britannia Bridge
Exit A55 westbound at Jct 3
Turn right A5
Turn left B4545 to Trearddur Bay
Turn left unclassified road at OS Ref SH 2559 7924
Continue Penrhosfeilw
Exact site access locations and access points to 3 possible sites on this road are being considered but it is expected they will be no further west that OS Ref SH 2179 8066

Route 2
Exit A55 westbound at Jct 2
Turn left A5153
Turn left B4545 to Trearddur Bay
Turn right unclassified road at OS Ref SH 2559 7924 and join route 1

Route 3
Exit A55 westbound at Jct 1 roundabout turning left to B4545 to Trearddur Bay and joining route2

Route 4
Exit A55 westbound at Jct 1 roundabout turning left to B4545
Turn immediately right unclassified road at OS Ref SH 2483 8175
Continue unclassified road to unclassified road at OS Ref SH 2338 8010
Turn right and join route 1

Route 5
At end of A55 Black Bridge Junction continue A5154 Victoria Road
At Marine Square turn left Prince of Wales Road
Turn left at roundabout onto Walthew Avenue at OS Ref SH 2446 8319
Continue New Park Road
Turn right South Stack Road
Continue to proposed site access location to be confirmed but at this stage assume OS Ref SH 2200 8188

Route 6 (Special Order from Holyhead)
Exit main port gate onto Llanfawr Road
Turn right A55 and cross Black Bridge
Turn left A55
Exit A55 at Jct 1 roundabout to B4545 to and join route 3
(or turn right Victoria Road and join route 5)

Please note that the above information should be treated as confidential. I trust that this is acceptable and look forward to hearing from you in due course. If you need any additional information please do not hesitate to contact me.

Kind Regards

Andy Pearce
General Manager
Tel: +44 (0)1785 850411 | andy.pearce@wynnslimited.com
Shaftesbury House, High Street, Eccleshall, Staffordshire ST21 6BZ, UK
Mobile: + 44 (0)7834 621269
wynnslimited.com
Registered in England & Wales No. 3162297

Appendix 4

Selected Correspondence

Andrew Pearce

From: King Steven Gruffudd (CEFNFFYRDD) <StevenKing@nmwtra.org.uk>
Sent: 19 June 2018 15:59
To: 'Emma M. Collett'; Andrew Pearce; Roberts Emlyn John (PAB); Wright Nic (CEFNFFYRDD)
Cc: Daisy Wynn; 'Ian Cook'; 'Dewi R. Williams'; 'Debbie.Hudd@gov.wales'; 'Dylan L. Jones'
Subject: RE: AIL Route Assessment - Holy Island near Holyhead

Hi Andy,

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Thanks

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Thanks

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Network Occupancy and Abnormal Loads Officer
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✉ stevenking@nmwtra.org.uk

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Turn left at roundabout onto Walthew Avenue at OS Ref SH 2446 8319
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Turn right A55 and cross Black Bridge
Turn left A55
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(or turn right Victoria Road and join route 5)

Andrew Pearce

From: Emma M. Collett <EmmaCollett@ynysmon.gov.uk>
Sent: 25 June 2018 12:17
To: Andrew Pearce
Cc: dylanwynnjones@gwynedd.llyw.cymru; Dewi R. Williams; Ian Cook; Dylan L. Jones
Subject: RE: AIL Route Assessment - Holy Island near Holyhead

Hi Andy that is correct.

The bridge near J2 is a relatively new bridge and I am currently trying to get hold of some info on this as we are still not sure if it's is in our ownership.
Four Mile bridge was last inspected in 2008 and is due a Principal Inspection this year – the repointing works/recommendations were carried out in 2009.
The structural check identified an Arch Capacity of 32.1 Tonnes. If the calculation check would be of assistance I can let you have this.

Thanks

Emma

From: Andrew Pearce <Andy.Pearce@wynnslimited.com>
Sent: 18 June 2018 16:13
To: Emma M. Collett <EmmaCollett@ynysmon.gov.uk>
Cc: dylanwynnjones@gwynedd.llyw.cymru; Dewi R. Williams <DewiWilliams@ynysmon.gov.uk>; Ian Cook <ian.michael.cook@googlemail.com>
Subject: RE: AIL Route Assessment - Holy Island near Holyhead

Emma,

This is useful thank you. I am assuming therefore that there are no problems with the structures within your ownership in terms of their ability to accommodate the loadings previously provided. I will report on this basis to our client unless you advise otherwise.

Kind Regards

Andy Pearce

From: Emma M. Collett [mailto:EmmaCollett@ynysmon.gov.uk]
Sent: 18 June 2018 14:32
To: Andrew Pearce <Andy.Pearce@wynnslimited.com>
Cc: dylanwynnjones@gwynedd.llyw.cymru; Dewi R. Williams <DewiWilliams@ynysmon.gov.uk>; Ian Cook <ian.michael.cook@googlemail.com>
Subject: RE: AIL Route Assessment - Holy Island near Holyhead

Hi Andrew,

Please find attached drawing that shows the bridges and culverts (we do not inspect the culverts).

The only two bridges in our control are Four Mile Bridge and the bridge close to J2.

It is still questionable whether the one by J2 is ours and does have some signs of settlement, but nothing to be too concerned about I don't think.

Four Mile Bridge is due a Principal inspection which is about to be undertaken.

Please let me know if you need any further info.

Thanks

Emma

From: Andrew Pearce <Andy.Pearce@wynnslimited.com>
Sent: 13 June 2018 12:41
To: Emma M. Collett <EmmaCollett@ynysmon.gov.uk>
Cc: dylanwynnjones@gwynedd.llyw.cymru; Dewi R. Williams <DewiWilliams@ynysmon.gov.uk>; Ian Cook <ian.michael.cook@googlemail.com>
Subject: FW: AIL Route Assessment - Holy Island near Holyhead

Good Afternoon Emma,

I understand that you are out of the office today and tomorrow. Can I ask you to respond to my email below please in respect to confirmation as to the structural status of the routes as far as the local council are concerned? I will chase A55 UK Highways and NMWTRA separately ref the A55 bridges discuss in the attached emails.

I look forward to hearing from you so that I can complete our final report for our client.

Kind Regards

Andy Pearce

From: Andrew Pearce
Sent: 25 May 2018 14:48
To: 'Emma M. Collett' <EmmaCollett@ynysmon.gov.uk>
Cc: Peter Wynn <Peter.Wynn@wynnslimited.com>; Dewi R. Williams <DewiWilliams@ynysmon.gov.uk>
Subject: RE: AIL Route Assessment - Holy Island near Holyhead

Good Afternoon Emma,

Thank you for your email and the comments provided. I accept the comments ref parked cars, busy roads etc. Whilst of course these are physical restrictions that present inconvenience to other road users they can in our experience be managed for infrequent AIL delivery requirements with appropriate planning with highway authorities and police where necessary including of movement times. It is not uncommon for example for TTROs to be secured to enable parking restrictions to be temporarily in place to enable movements.

In terms of movement numbers, at this stage my understanding is that there will either be 1 transformer of the larger size load or 2 of the smaller size so the actual numbers of movements are not in our view significant. Please note however that our scope of work is specific to the heavy transformer loads only. We are not considering the wider access requirements for Construction and Use traffic that would be associated with the wider scheme development. This would I expect need to be considered as part of wider construction traffic management plans.

What will ultimately determine whether a route is feasible will be the structural status of the route and whether there are structures that cannot technically accommodate the loads proposed. Can you therefore confirm that there are no significant structural concerns for the proposed loads on the routes provided? Depending on the response you provide in terms of structures, this may impact what may or may not be necessary for physical remediation matters.

In terms of route 6 from the port we were at the port earlier this year and they have advised that the former heavy lift facility on the Public Quay access via Turkey Shore Road no longer needs to be considered for access as Terminal 1 and the Refit Berth are available, having historically not been feasible for use due to the ferry services using the inner harbour. The ferries have now relocated to the outer harbour and therefore berths on the inner harbour can be considered as appropriate. This aids access considerably by avoiding the narrow sections of Turkey Shore Road.

There will also be other factors that impact on the proposed new substation location in addition to transport which is only one element of the development considerations which explains why 4 locations are under consideration at present.

I trust that this additional information makes sense and I look forward to hearing from you later next week as I am out until Thursday also.,

Have a good weekend.

Kind Regards

Andy Pearce

From: Emma M. Collett [mailto:EmmaCollett@ynysmon.gov.uk]
Sent: 25 May 2018 13:58
To: Dewi R. Williams <DewiWilliams@ynysmon.gov.uk>; Andrew Pearce <Andy.Pearce@wynnslimited.com>
Subject: RE: AIL Route Assessment - Holy Island near Holyhead

Hi Andy,

Dewi had forwarded your email to me and I have discussed the various options with him.

Please find below just a few comments that may assist. You probably have observed his all for yourself but I just thought I would check!

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Option 1 – J3 – This route involves negotiating Valley traffic lights and traveling past a very busy Shopping Precinct and residential area – so not suitable for any large vehicles or construction traffic.
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Option 6 – This route is very bendy and could cause problems especially when the ships dock.

Hope these help for now – I am in Manchester in a meeting all day on Tuesday but please feel free to give me a call after that to discuss if you need to.

Thanks

Emma

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Sent: 21 May 2018 12:49
To: Dewi R. Williams <DewiWilliams@ynysmon.gov.uk>; Dewi R. Williams <DewiWilliams@ynysmon.gov.uk>
Cc: Daisy Wynn <Daisy.Wynn@wynnslimited.com>
Subject: AIL Route Assessment - Holy Island near Holyhead

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18.945-TC02 10 row flattop trailer at 140te gross weight (STGO)
18.945-TC03 6 axle step trailer at 91te gross weight (STGO)

The grid references of the 4 proposed site locations being considered and our reference for these are shown below.

SH219802	K
SH218805	J
SH222808	H1
SH218821	A

We would prefer to route at STGO thus avoiding the need for expensive shipping to Holyhead if possible. However, depending on the final size of unit there may be a need to also consider Special Order loads from Holyhead via Black Bridge to the A55. And I allow for these also in the routes below.

Possible Routes:

Route 1
Exit A55 westbound at Jct 3
Turn right A5
Turn left B4545 to Trearddur Bay
Turn left unclassified road (C class XXX?) at OS Ref SH 2559 7924
Continue (C class XXX?) Penrhosfeilw
Exact site access locations and access points to 3 possible sites on this road are being considered but it is expected they will be no further west that OS Ref SH 2179 8066

Route 2
Exit A55 westbound at Jct 2
Turn left A5153
Turn left B4545 to Trearddur Bay
Turn right unclassified road (C class XXX?) at OS Ref SH 2559 7924 and join route 1

Route 3

Exit A55 westbound at Jct 1 roundabout turning left to B4545 to Trearddur Bay and joining route2

Route 4
Exit A55 westbound at Jct 1 roundabout turning left to B4545
Turn immediately right unclassified road (C class XXX?) at OS Ref SH 2483 8175
Continue unclassified road (C class XXX?) to unclassified road (C class XXX?) at OS Ref SH 2338 8010
Turn right and join route 1

Route 5
At end of A55 Black Bridge Junction continue A5154 Victoria Road
At Marine Square turn left Prince of Wales Road
Turn left at roundabout onto Walthew Avenue at OS Ref SH 2446 8319
Continue New Park Road
Turn right South Stack Road
Continue to proposed site access location to be confirmed but at this stage assume OS Ref SH 2200 8188

Route 6 (Special Order from Holyhead)
Exit main port gate onto Llanfawr Road
Turn right A55 and cross Black Bridge
Turn left A55
Exit A55 at Jct 1 roundabout to B4545 to and join route 3
(or turn right Victoria Road and join route 5)

Please note that the above information should be treated as confidential. I trust that this is acceptable and look forward to hearing from you or Emma in due course. If you need any additional information please do not hesitate to contact me.

Kind Regards

Andy Pearce
General Manager
Tel: +44 (0)1785 850411 | andy.pearce@wynnslimited.com
Shaftesbury House, High Street, Eccleshall, Staffordshire ST21 6BZ, UK
Mobile: + 44 (0)7834 621269
wynnslimited.com
Registered in England & Wales No. 3162297

Andrew Pearce

From: Dewi R. Williams <DewiWilliams@ynysmon.gov.uk>
Sent: 13 June 2018 16:06
To: Andrew Pearce; Emma M. Collett
Cc: dylanwynnjones@gwynedd.llyw.cymru; Ian Cook
Subject: RE: AIL Route Assessment - Holy Island near Holyhead
Attachments: RE: AIL Route Assessment - Holy Island near Holyhead

Andy,
I don't envisage any problems with the route and the settlement referred to by Emma has been a long standing issues which should not affect heavy loads.

Emma will contact you with details and full confirmation.
Regards,
Dewi

Dewi R. Williams B.Sc., C.Eng., F.I.C.E., C.I.H.T.,
Pennaeth Gwasanaeth Priffyrdd, Gwastraff ac Eiddo / Head of Service Highways, Waste and Property,
Cyngor Sir Ynys Môn / Isle of Anglesey County Council,
Swyddfa'r Sir, Llangefni,
Ynys Môn / Isle of Anglesey,
LL77 7TW.
01248 752303

From: Andrew Pearce <Andy.Pearce@wynnslimited.com>
Sent: 13 June 2018 12:41
To: Emma M. Collett <EmmaCollett@ynysmon.gov.uk>
Cc: dylanwynnjones@gwynedd.llyw.cymru; Dewi R. Williams <DewiWilliams@ynysmon.gov.uk>; Ian Cook <ian.michael.cook@googlemail.com>
Subject: FW: AIL Route Assessment - Holy Island near Holyhead

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Andrew Pearce

From: Emma M. Collett <EmmaCollett@ynysmon.gov.uk>
Sent: 31 May 2018 11:11
To: Andrew Pearce; Roberts Emlyn John (PAB)
Cc: Daisy Wynn; Ian Cook; Dewi R. Williams; Debbie.Hudd@gov.wales; King Steven Gruffudd (CEFNFFYRDD); Dylan L. Jones
Subject: RE: AIL Route Assessment - Holy Island near Holyhead

Hi Andy,

There are two bridges on the B4545 in the vicinity, one that cross the A55 and one that crosses a redundant highway now footpath.

We have recently had discussions with NMWTRA with regard to who is responsible for the one that crosses the redundant highway as it was not on our list of Structures to inspect. We think it may be ours?

We have noted some cracks in the footways that form part of this bridge due to some potential settlement of the abutments, but we do not think this is deteriorating and we are monitoring at present.

I have requested any as builts from Jones Bros and will chase this.

Hope this helps

Emma

From: Andrew Pearce <Andy.Pearce@wynnslimited.com>
Sent: 31 May 2018 11:02
To: Roberts Emlyn John (PAB) <emlynjohnroberts@gwynedd.llyw.cymru>
Cc: Daisy Wynn <Daisy.Wynn@wynnslimited.com>; Ian Cook <ian.michael.cook@googlemail.com>; Emma M. Collett <EmmaCollett@ynysmon.gov.uk>; Dewi R. Williams <DewiWilliams@ynysmon.gov.uk>; Debbie.Hudd@gov.wales; King Steven Gruffudd (CEFNFFYRDD) <StevenKing@nmwtra.org.uk>
Subject: RE: AIL Route Assessment - Holy Island near Holyhead
Importance: High

Hello Emlyn,

Thank you for your email. It is good to confirm the A55 remains acceptable for the loads which is what we would have expected. For clarity however I also copy Debbie Hudd of Welsh Government and Steven King of NMWTRA into this email as I need to be sure that both UK Highways and NMWTRA are agreeable to the route following the comments you provided in your separate email on Sunday. You are correct in that the route will be considered further closer to the time of requirement with appointed haulage contractors making formal notifications in the normal manner etc.

In terms of the B4545 we are having separate discussions with Isle of Anglesey County Council with regard to their structures on this route and I also copy them in on this email but as per my other email of 24.05.18 ESDAL appears to indicate that the bridge that carries the B4545 over the A55 is under the responsibility of UK Highways A55 or North and Mid Wales Trunk Road Agency. Please see the extract below of relevant information again for reference.

ESRN	:	S-SH287789-1
Name	:	STATION ROAD OVERBRIDGE
Unique Id	:	DBFOA55 1570
Coordinates	:	228743 , 378925

Andrew Pearce

From: Nicholson Katie <Katie.Nicholson@networkrail.co.uk> on behalf of Network Rail Abnormal Loads <NetworkRailAbnormalLoads@networkrail.co.uk>
Sent: 22 May 2018 15:52
To: Andrew Pearce
Subject: RE: Q-633 AIL Route Assessment - Holy Island near Holyhead

Hi Andy,

Your proposed movement does not affect any Network Rail owned road over rail bridges or tunnels therefore we have no objection to any of your proposed routes starting from the A55 in Anglesey.

Please note we only check the load carrying capacity of Network Rail owned road over rail bridges affected we do not check anything else including:

- Load carrying capacity of level crossings
- Clearance to bridge parapets
- Clearance under a rail bridge
- Clearance to overhead wires at level crossings

If you believe you are crossing one of our structures, please get in touch.

Many Thanks

Katie Nicholson
Abnormal Loads Assistant
Abnormal Loads Help Desk: 01908 783 140

NetworkRail Route Services

Abnormal Loads | National Records Group | Route Services
The Quadrant | Elder Gate | Milton Keynes | MK9 1EN
D 01908 783 140 | **E** Katie.Nicholson@networkrail.co.uk **W** Network Rail Abnormal Loads

---

From: Andrew Pearce [mailto:Andy.Pearce@wynnslimited.com]
Sent: 21 May 2018 13:02
To: Lisa Wheelwright-Brown; 'RSGBRB@jacobs.com'; AbLoads; 'Jones, Susan'
Cc: Daisy Wynn
Subject: FW: AIL Route Assessment - Holy Island near Holyhead

Sorry all. It would help if I included the attachments.

Regards

Andy

From: Andrew Pearce
Sent: 21 May 2018 12:56

Andrew Pearce

From: Lisa Wheelwright-Brown <Lisa.Wheelwright-Brown@canalrivertrust.org.uk>
Sent: 23 May 2018 14:18
To: Andrew Pearce
Subject: FW: AIL Route Assessment - Holy Island near Holyhead

Hi Andrew

These proposed routes do not affect any of the Canal & River Trust's bridges.

Kind Regards

Lisa Wheelwright-Brown

Technical Administrator

T 0113 2005759

Operations & Asset Management Directorate
Canal & River Trust, Fearns Wharf, Neptune Street, Leeds LS9 8PB

From: Andrew Pearce <Andy.Pearce@wynnslimited.com>
Sent: 21 May 2018 12:56
To: Lisa Wheelwright-Brown <Lisa.Wheelwright-Brown@canalrivertrust.org.uk>; 'RSGBRB@jacobs.com' <RSGBRB@jacobs.com>; 'AbLoads (Abnormal.Loads@networkrail.co.uk)' <Abnormal.Loads@networkrail.co.uk>; 'Jones, Susan' <Susan.Jones@nthwales.pnn.police.uk>
Cc: Daisy Wynn <Daisy.Wynn@wynnslimited.com>
Subject: AIL Route Assessment - Holy Island near Holyhead

Dear All,

I wish to consult with you on a new access enquiry we are working on. Wynns have been appointed by Morlais Marine Energy to undertake a feasibility study into Abnormal Indivisible Load (AIL) access in respect to the possible routes for new transformers to a new onshore substation connection on Anglesey associated with the installation of marine energy devices. Our work is solely in relation to the potential for heavy load access to the new onshore substation site at an as yet unconfirmed location. I show below routes that we have inspected as possible access routes based on the assumption that we can get onto Anglesey via the A55 heavy load route. I would be grateful if you could advise as to the structural suitability of the proposed routes as far as they are concerned.

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The grid references of the 4 proposed site locations being considered and our reference for these are shown below.

Andrew Pearce

From: Howell, Tania <Tania.Howell@jacobs.com>
Sent: 21 May 2018 15:43
To: Andrew Pearce
Subject: RE: AIL Route Assessment - Holy Island near Holyhead

Hi Andy,

All of these routes are OK with me, since none of them impact on any HRE structures.

Regards
Tania

Tania Howell
Abnormal Loads Officer
Jacobs
DDI: 0118 946 8911

If your mail concerns abnormal load movements, please reply to RSGBRB@jacobs.com

---

From: Andrew Pearce [mailto:Andy.Pearce@wynnslimited.com]
Sent: 21 May 2018 12:56
To: Lisa Wheelwright-Brown <Lisa.Wheelwright-Brown@canalrivertrust.org.uk>; RSGBRB@jacobs.com; 'AbLoads (Abnormal.Loads@networkrail.co.uk)' <Abnormal.Loads@networkrail.co.uk>; 'Jones, Susan' <Susan.Jones@nthwales.pnn.police.uk>
Cc: Daisy Wynn <Daisy.Wynn@wynnslimited.com>
Subject: [EXTERNAL] AIL Route Assessment - Holy Island near Holyhead

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SH219802	K
SH218805	J

gwerth mewn gwahaniaeth
delivering on distinction

Morlais Project
Environmental Statement

Appendix 23.2: Landfall Substation Access Concept Design (Construction) (Royal HaskoningDHV)

Volume III

Applicant: Menter Môn Morlais Limited

Document Reference: PB5034-ES-0232

Chapter 23: Traffic and Transport

Appendix 23.2: Landfall Substation Access Concept Design (Construction) (Royal HaskoningDHV)

Morlais Document No.:	Status:	Version No:	Date:
MOR/RHDHV/APP/0053	Final	F3.0	July 2019

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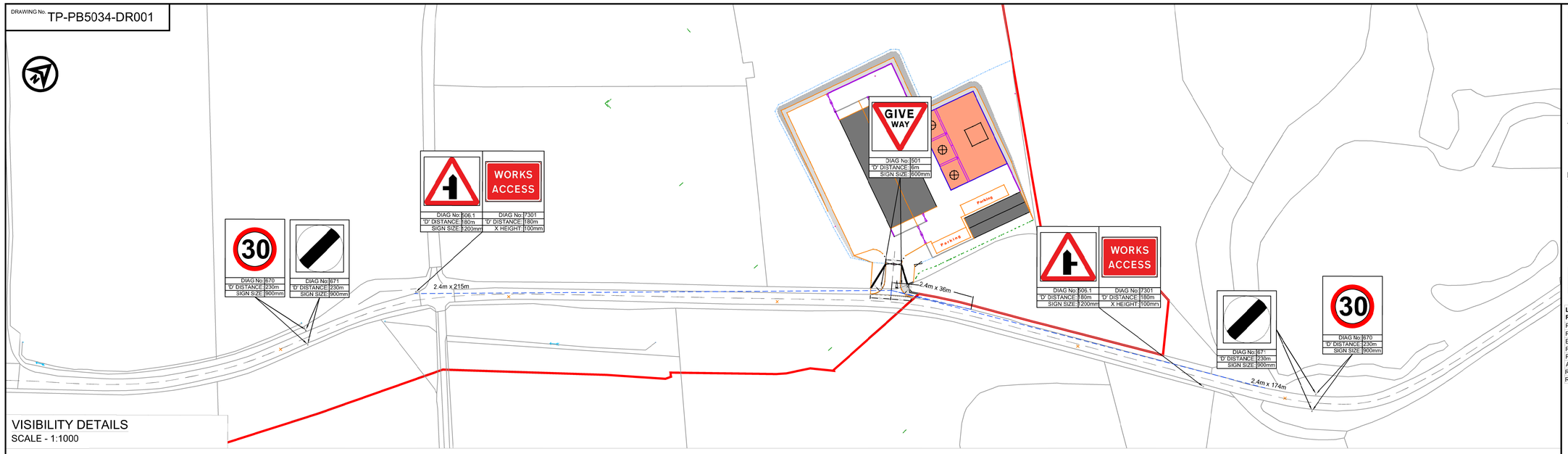
DRAWING No. TP-PB5034-DR001



VISIBILITY DETAILS
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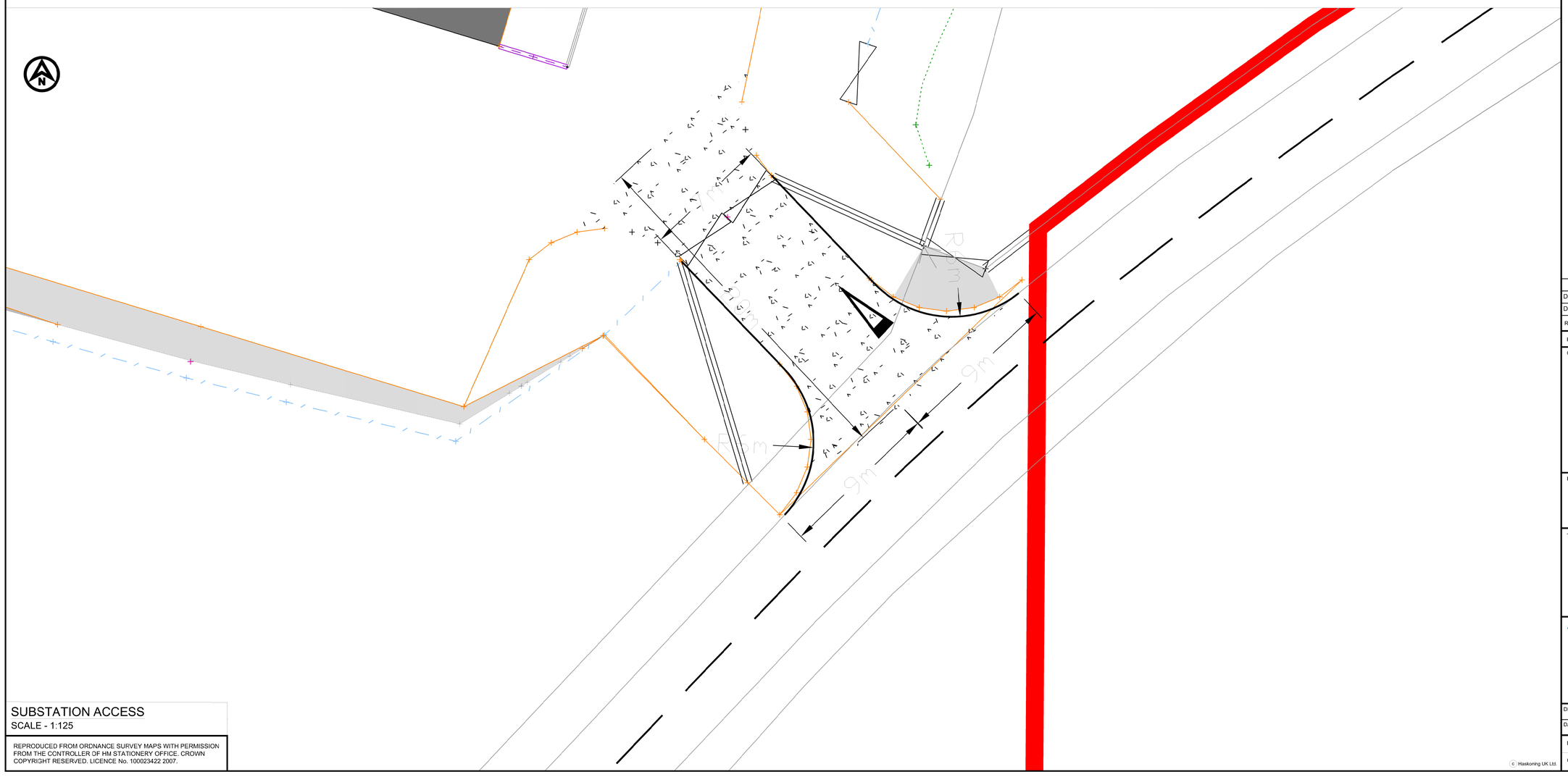


SUBSTATION ACCESS
SCALE - 1:125

NOTES

1. Do not scale from this drawing. all dimensions are in metres unless noted otherwise.
2. This drawing has been basec upon Ordnance Survey Maps and Royal Haskoning can not guerentee the accuracy of data.

Visibility

3. Stopping Sight Distance (SSD) for cesign speed of the road.
4. X-distance - the set back from the nearest edge of the carriageway from which the access will be taken
5. Y-distance - the SSD measured along the nearest edge of the carriageway to its intersection with the centreline of the access.
6. All vegetation to be cleared/trimmec within identified visibility envelope.

Road Signs

7. All permanent traffic signs to be set out in accordance with the requirements of Traffic Signs Manual Chapter 1-7 and Traffic Signs Regulations General Direction 2016 and DMRB TDI/42 during the detailed cesign stage.
8. Setting out of signs to be undertaken only by approved traffic management operatives.

KEY

- RED LINE BOUNDARY
- EXISTING METALLED ROAD BOUNDARY
- PROPOSED ACCESS BOUNDARY/ROAD MARKINGS
- VISIBILITY SPLAY (DMRB) - see visibility table
- PROPOSED GATE
- APPROXIMATE SIGN LOCATION
- FULL DEPTH CARRIAGEWAY CONSTRUCTION WITH BOUND SURFACE

LANDFALL SUBSTATION ACCESS - SOUTH STACK ROAD	VISIBILITY	
	NORTH	SOUTH
Posted Speed Limit (PSL) (mph)	60	
Requirec Y-distance SSD for PSL (m)	215	
Existing achievable Y-distance SSD (m)	215	174
Requirec Y-distance SSD achievable?	Yes	No
Proposed Reduced Speed Limit (RSL) (mph)	30	
Assumed design speed (mph)	30	
Required Y-distance SSD for design speed (m)	70	
Requirec Y-distance SSD acheivable?	Yes	Yes

REV	DATE	DESCRIPTION	BY	CHK	APP
D.02	17.05.19	REVISED ACCESS	JW	SKT	ADR
D.01		FIRST ISSUE			

REVISIONS

CLIENT

PROJECT

MORLAIS TIDAL ARRAY

TITLE

LANDFALL SUBSTATION ACCESS CONCEPT DESIGN (CONSTRUCTION)

Rightwell House, Bretton
Peterborough, Cambridgeshire, PE3 8DW
Tel +44(0)1733 334455
Email info@rhdhv.com
www.royalhaskoningDHV.com

Royal HaskoningDHV
Enhancing Society Together

DRAWN	CHECKED	APPROVED
JW	SKT	ADR

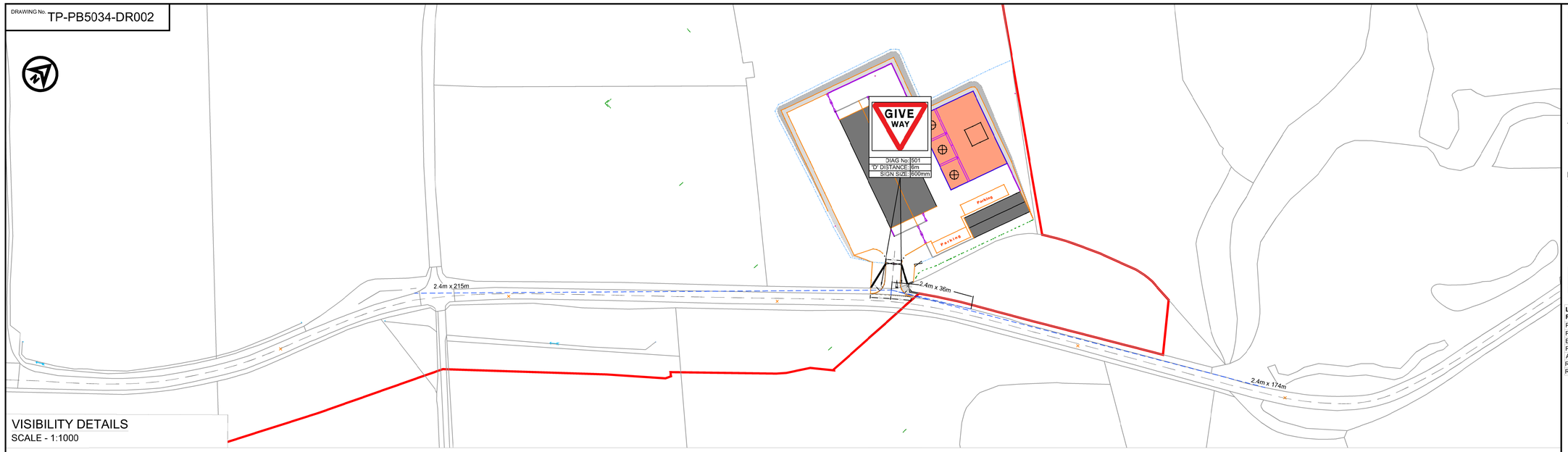
DATE	SCALE AT A1	CLIENTS REF.
17.05.19	VARIES	

DRAWING No. TP-PB5034-DR001

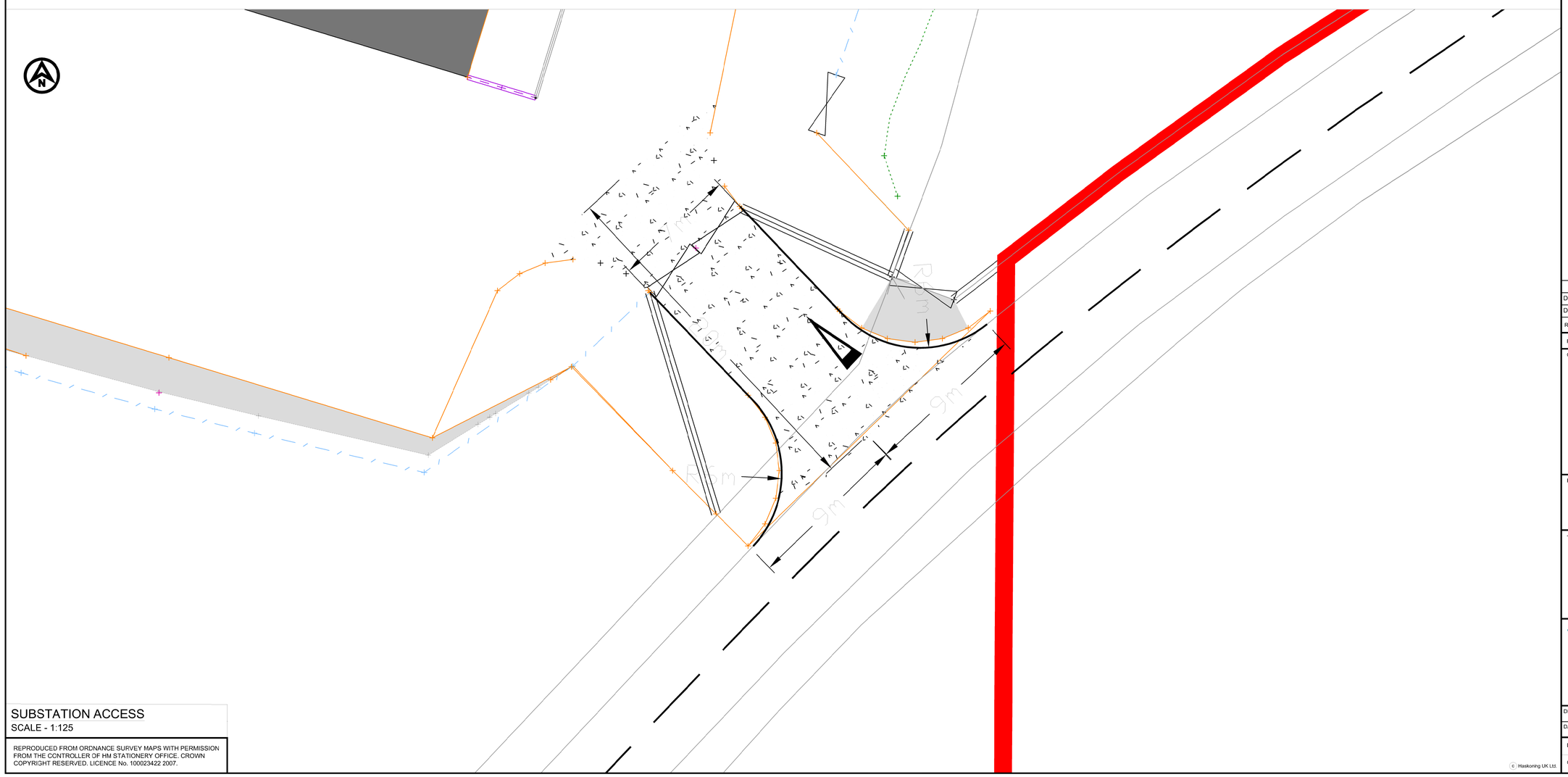
REVISION D0.2

CLIENT DWG No.

DRAWING No. TP-PB5034-DR002



VISIBILITY DETAILS
SCALE - 1:1000



SUBSTATION ACCESS
SCALE - 1:125

NOTES

1. Do not scale from this drawing. all dimensions are in metres unless noted otherwise.
2. This drawing has been basec upon Ordnance Survey Maps and Royal Haskoning can not guarentee the accuracy of data.

Visibility

3. Stopping Sight Distance (SSD) for cesign speed of the road.
4. X-distance - the set back from the nearest edge of the carriageway from which the access will be taken
5. Y-distance - the SSD measured along the nearest edge of the carriageway to its intersection with the centreline of the access.
6. All vegetation to be cleared/trimmec within identified visibility envelope.

Road Signs

7. All permanent traffic signs to be set out in accordance with the requirements of Traffic Signs Manual Chapter 1-7 and Traffic Signs Regulations General Direction 2016 and DMRB TDI42 during the detailed cesign stage.
8. Setting out of signs to be undertaken only by approved traffic management operatives.

KEY

- RED LINE BOUNDARY
- EXISTING METALLED ROAD BOUNDARY
- PROPOSED ACCESS BOUNDARY/ROAD MARKINGS
- VISIBILITY SPLAY (DMRB) - see visibility table
- PROPOSED GATE
- APPROXIMATE SIGN LOCATION
- FULL DEPTH CARRIAGEWAY CONSTRUCTION WITH BOUND SURFACE

LANDFALL SUBSTATION ACCESS - SOUTH STACK ROAD	VISIBILITY	
	NORTH	SOUTH
Posted Speed Limit (PSL) (mph)	60	
Requirec Y-distance SSD for PSL (m)	215	
Existing achievable Y-distance SSD (m)	215	174
Requirec Y-distance SSD achievable?	Yes	No
Assumed design speed (kph)	85	
Requirec Y-distance SSD for design speed (m)	160	
Required Y-distance SSD acheivable?	Yes	Yes

REV	DATE	DESCRIPTION	BY	CHK	APP
D.02	17.05.19	REVISED ACCESS	JW	SKT	ADR
D.01		FIRST ISSUE			

REVISIONS

CLIENT

PROJECT

MORLAIS TIDAL ARRAY

TITLE

LANDFALL SUBSTATION ACCESS CONCEPT DESIGN (OPERATION)

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Enhancing Society Together

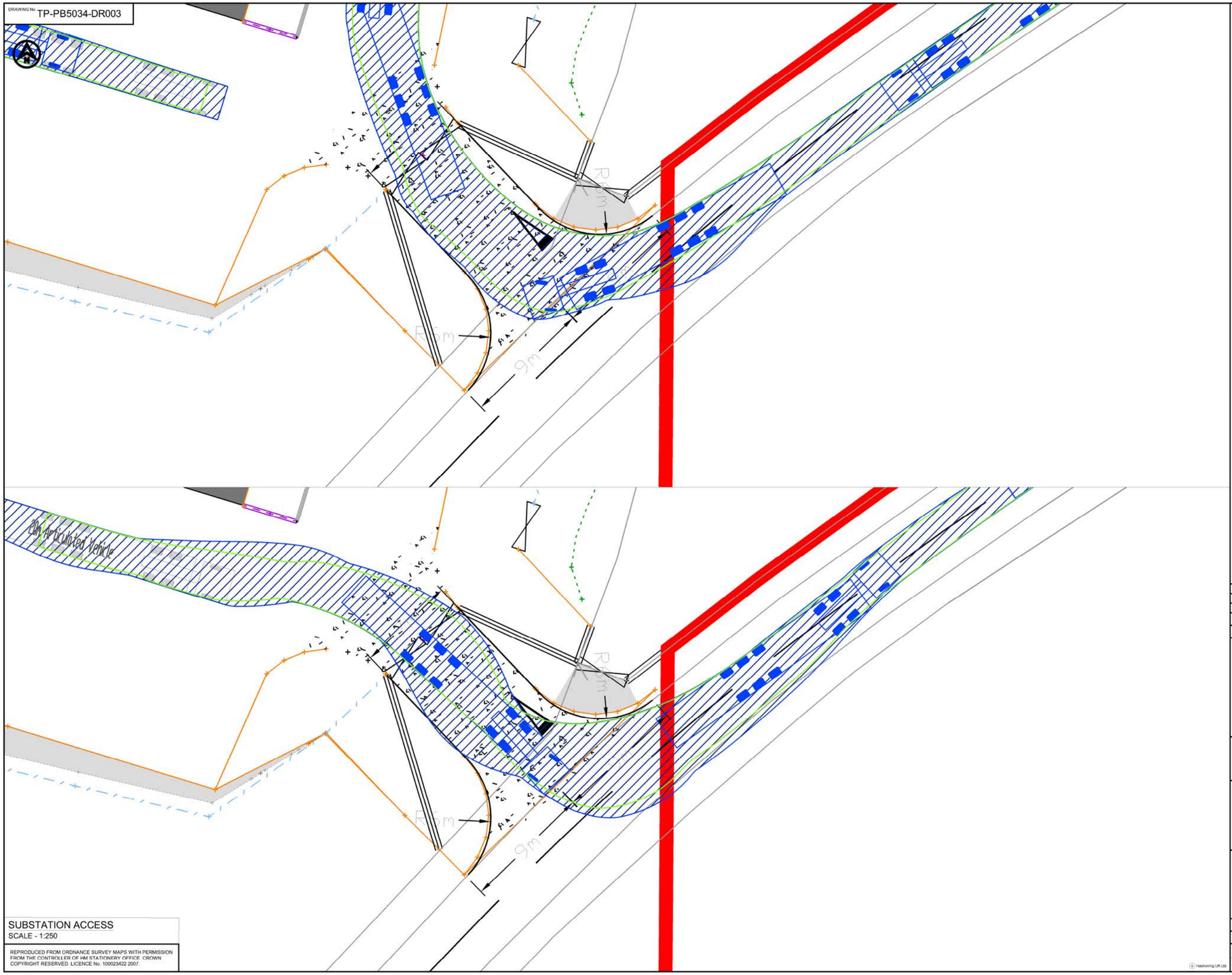
DRAWN	CHECKED	APPROVED
JW	SKT	ADR

DATE	SCALE AT A1	CLIENTS REF.
17.05.19	VARIES	

DRAWING No.	REVISION
TP-PB5034-DR002	D0.2

CLIENT DWG No.

DRAWING No. TP-PB5034-DR003



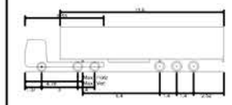
SUBSTATION ACCESS
SCALE - 1:250

NOTES
1. Do not scale from this drawing. all dimensions are in metres unless noted otherwise.
2. This drawing has been based upon Ordnance Survey Maps and Royal Haskoning can not guarentee the accuracy of data.

KEY

- EXISTING METALLED ROAD BOUNDARY
- PROPOSED ACCESS BOUNDARY/ROAD MARKINGS
- APPROXIMATE SIGN LOCATION
- FULL DEPTH CARRIAGEWAY CONSTRUCTION WITH BOUND SURFACE

VEHICLE TRACKING



Max Legal Length (UK) Articulated Vehicle (16.5m)

Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.681m
Min Body Ground Clearance	0.411m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

- VEHICLE BODY SWEPT PATH (FORWARD GEAR)
- VEHICLE CHASIS SWEPT PATH

REV	DATE	DESCRIPTION	BY	CHK	APP
D.02	D.01	D.01	D.01	D.01	D.01
D.01		FIRST ISSUE			

REVISIONS

CLIENT

morlais MENTER MÔN

PROJECT

MORLAIS TIDAL ARRAY

TITLE

LANDFALL SUBSTATION ACCESS
CONCEPT DESIGN
SWEPT PATH ANALYSIS

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JW	SKT	ADR

DATE	SCALE AT A3	CLIENTS REF.
15.04.19	1:250	

DRAWING No. TP-PB5034-DR003

REVISION D0.2

CLIENT DWG No.