FIVE ESTUARIES
OFFSHORE WIND FARM

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10.20.3 ABNORMAL INDIVISIBLE LOADS

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In preparation of this document Five Estuaries Wind Farm Ltd has made reasonable efforts to ensure that the content is accurate, up to date and complete for purpose.

Revision	Date	Status/Reason for Issue	Originator	Checked	Approved
A	Oct-24	Deadline 2	VEOWF	VEOWF	VEOWF

CONTENTS

1. ACRONYMS & DEFINITIONS

For ease a list of commonly used acronyms related to this document is provided below:

AIL	Abnormal Indivisible Load
DCO	Development Consent Order
DMRB	Design Manual for Roads and Bridges
ECC	Export Cable Corridor
ESDAL	Electronic Service Delivery for Abnormal Loads
EXA	Examining Authority
LHA	Local Highway Authority
NF OWF	North Falls Offshore Wind
OnSS	Onshore Substation
SMO	Special Movements Order
STGO	Special Types General Order
VE	Five Estuaries Offshore Wind
The Road Vehicles Construction and Use Regulations 1986	The Road Vehicles Construction and Use Regulations 1986 cover the design, manufacture, maintenance, construction and use of motor vehicles and trailers used by road transport operators, amongst others.

1.1.1 For ease a list of the relevant documents from the DCO library is provided below:

REP1-018	6.3.8 Environmental Statement Traffic and Transport (Revision B)
REP1-043	9.24 Outline Construction Traffic Management Plan (Revision B)

2. OVERVIEW

2.1 CONTEXT

2.1.1 At Issue Specific Hearing 1, held over 18 and 19 September 2024. It was agreed that the Applicant would produce a technical note on Abnormal Indivisible Loads (AIL) setting out:

- The different categories of AIL;
- Where/how each category is considered in Environmental Statement and controlled in the Outline Construction Traffic Management Plan;
- Tracking and routeing; and
- AIL Assessment for Transformer Delivery

2.1.2 This note is supplementary only and does not supersede the suite of Traffic and Transport documents submitted with the Development Consent Order (DCO) application in March 2024, and subsequently amended to Rev B and submitted at Deadline 1 of the Examination on 03 October 2024.

2.2 SUMMARY

2.2.1 There are different categories of AILs, these are summarised as follows:

TRANSFORMER DELIVERIES

2.2.2 These are the largest category (270t excluding the vehicle) and will be transported by a multi axel vehicle and covered by a Special Movement Order (SMO). There will be a maximum of two of these being delivered. These will be transported from Harwich to the Onshore Substation Area. The delivery of these is covered by the AIL Technical note provided in Annex 1 that has been reviewed and accepted by National Highways. The use of a contraflow for these deliveries along the A120 past the Horsley Cross roundabout has been indicated as the preference from National Highways.

LARGE ELECTRICAL EQUIPMENT

2.2.3 These are the second largest category (<100t excluding the vehicle) and are likely transported by a multi axel vehicle and covered by a Special Movement Order (SMO). It is likely that these will come from Harwich, but they could come from the UK on the Strategic Road Network. These will be delivered to the Onshore Substation (OnSS).

CABLE DRUMS & LARGE PLANT

2.2.4 Cable drums & large construction plant are lighter and smaller than the electrical equipment, and will be delivered via vehicles such as low loaders. These do not need a SMO and have similar manoeuvrability to HGVs. The delivery of these has been included in the HGV numbers. These will be needed along the cable route from the landfall compound (noting no cable drums will be delivered to the beach compound area if this is used as the offshore cable is pulled from a vessel to the transition joint bay within the landfall compound). The vehicle tracking is shown in Annex 3.

3. ABNORMAL INDIVISIBLE LOADS

3.1 DEFINITION

3.1.1 An AIL vehicle is any vehicle that falls outside the scope of the Road Vehicles Construction and Use Regulations (1986). In simple terms it is any vehicle that exceeds any one of the following categories:

- over 44 tonnes total weight;
- has axle loadings over 10 tonnes;
- has a rigid length over 18.65m; or
- is greater than 2.9m wide.

3.1.2 These AIL vehicles require authorisation to move this is known as a Special Types General Order (STGO) issued under the Road Vehicles (Authorisation of Special Types) (General) Order 2003 or a special order issued by the appropriate authority.

3.1.3 There are three categories for STGO's, as detailed below:

- Cat 1 - 46T 5 axle /50T 6 axle;
- Cat 2 - 6 or more axles, maximum 12.5T per axle; and
- Cat 3 - 6 or more axles, maximum 16.5T per axle.

3.1.4 There are many different types of vehicles that are used for AILs, such as:

- Rigid vehicle;
- Articulated low loader;
- Articulated trailer;
- Articulated multi axle trailers; and
- Articulated girder trailers.

It should be noted that even if vehicles are categorized as AILs due to the mass, they will be similar in size to HGVs and they can move along roads with similar manoeuvrability and tracking. This is elaborated further in the sections below.

3.1.5 Vehicles outside these limits (i.e. greater axle loading or loads that are wider than 6.1m or longer than 30m) will require a separate Special Movements Order (SMO)

3.1.6 More details can be found in Annex 1 showing the UK Government Special Types Enforcements Guide.

3.1.7 It should be noted that the Construction and Use Regulations do not stipulate a maximum vehicle height, however bridges are built and maintained to ensure a minimum headroom of 5.03m plus a geometric allowance of up to 80mm.

3.1.8 The exception to this would be bridges built over a high load route, which are 6.45m minimum headroom, plus allowance.

3.1.9 Bridges that do not provide the necessary minimum headroom of 5.03m (16ft 6in) are required to have warning signs erected, these can be in either imperial or metric units. Further details can be found in Design Manual for Roads and Bridges (DMRB) CD 127 Chapter 4 and the Traffic Signs Manual Chapter 4.

3.1.10 The types of AILs necessary to construct the Onshore Electrical Infrastructure are summarised in Table 1 AILs needed for the Onshore Electrical Infrastructure

Table 1 AILs needed for the Onshore Electrical Infrastructure

Type	Description	Equipment / Plant	Mass (te) including vehicle	STGO (AIL) Category	Estimated Number of Movements[1]
Rigid Vehicle	Mobile Crane	Construction Equipment		Cat 3	Values included in the HGV numbers
Articulated Vehicle	Low Loader	Construction Equipment i.e. large excavators (along the route)		Cat 3	Values including in the HGV numbers
Articulated Vehicle	Low Loader	Cable Drums approximately 60 T (along the cable route excluding the beach compound)	Up to 105T (16T per axle)	Cat 3	560-580 (value included in the HGV numbers)
Multi Axle Vehicle	10-16 axle low load	Electrical Equipment < 100T such as shunt reactors (OnSS only)	141T (14.1T per axle)	SMO	10-30
Multi Axle Vehicle	16-24 axle Trailer	Large Electrical >100T such as 400 kV Transformers (OnSS only)	326T (20.38T per axle)[2]	SMO	2 - 4
Articulated Girder Trailer	20 axle		404T (20.2T per axle)[3]	SMO	
	24 axle		423.42T (17.65T per axle)[3]	SMO	
	28 axle		488.4T (17.44T per axle)[3]	SMO	

[1]Values are indicative, movements are two way (i.e one delivery results in two movements)

[2] Value aligns with 270T transformer as assumed in the Annex 2 WYNNS report and a 56T Multi Axle vehicle

[3] Values include allowance for articulated girder trailer

3.1.12 All the weights shown in the table above are indicative and have been taken from the Abnormal Indivisible Loads Access Report, prepared by WYNNS transport contained in Annex 2.

3.1.13 The actual vehicle combination and axle weights will depend upon the haulage company chosen. Each company has different modular equipment which they use to create these vehicles, which are configured to suit the load and the available equipment at the time of movement.

3.1.14 The movement of AILs to support construction projects is very common throughout the UK.

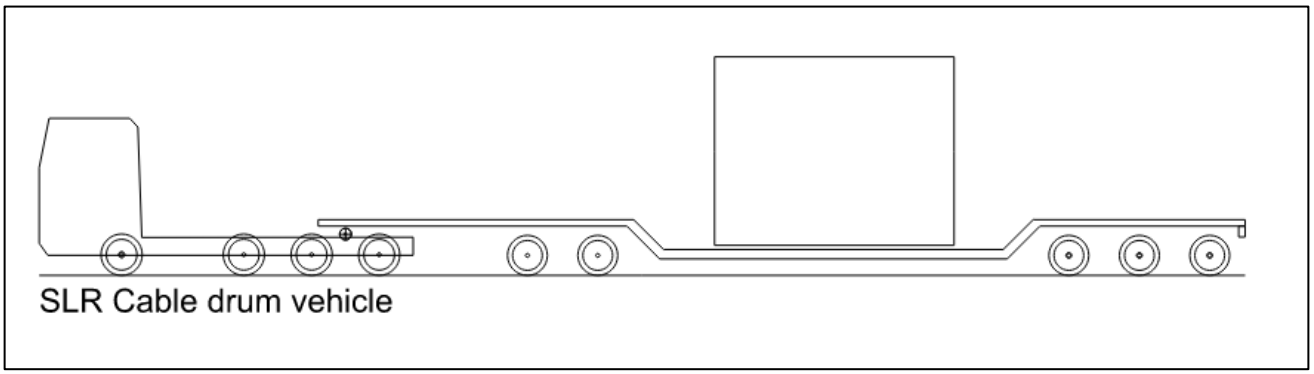
MOBILE CRANE

3.1.15 A mobile crane is required to lift equipment from vehicles and position it on site, the most likely use on this project will be to lift the transformers into position.

3.1.16 Mobile cranes are AILs due to their size, weight and axle loadings.

3.1.17 Where counterweights etc. are necessary these are transported separately to the main crane.

LOW LOADER CABLE DRUM / EXCAVATOR DELIVERIES


SLR Cable drum vehicle

3.1.18 The above vehicle has been modelled by SLR Consulting for use on cable installation projects. It is indicative only. The vehicle is capable of carrying a 60 tonne cable drum (approx. 1km length) or an excavator.

3.1.19 The vehicle has a gross weight in the region of 105T and would be classified as a Category 3 vehicle in accordance with the Road Vehicles (Authorisation of Special Types) (General) Order 2003 (STGO)

3.1.20 The axle loadings for this vehicle would be in the region of 16T for the rear of the trailer, which can be reduced or increased by changing the number of axles and their position on the trailer. The position of the axles can be amended to suit the load being carried.

The image above has been taken from Andovers Trailers Website and is provided for illustrative purposes only.

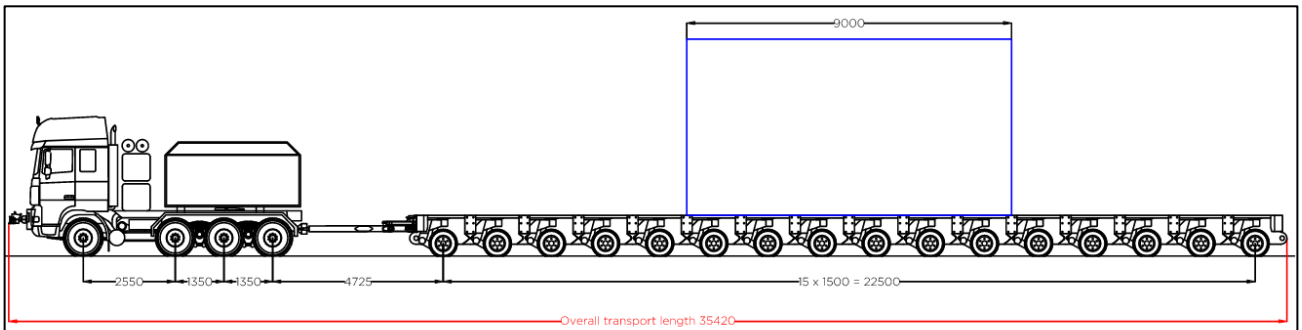
*Image showing **transportation** of cable drum.*

Image showing transportation of cable drum.

SHUNT REACTOR/ TRANSFORMER DELIVERIES

3.1.21 There are two main types of vehicles that can be used to deliver the transformers, which are shown below, with the actual choice determined by the route geometry and the maximum permitted axle loading. The diagrams have been taken from WYNNS drawings and are indicative only of the vehicles that are proposed.

3.1.22 A rigid multi axle trailer is suitable as it spreads the load through an increased number of axles, however the height of the load bed can result in the load being too high to get under bridges. Spreading the load across multiple axles can result in a very long rigid trailer which would have issues navigating some road geometry.

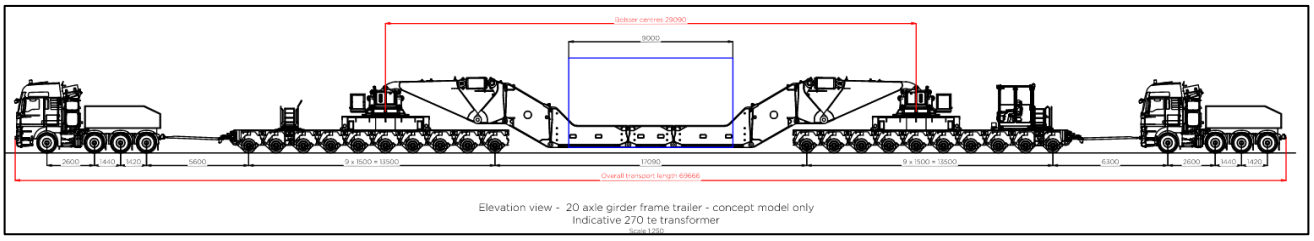


Elevation View - 16 axle flat top trailer - concept model only
Indicative 270te transformer

3.1.23 A girder trailer suspends the load between two bogies, resulting in the load being lower and capable of passing under bridges. The multiple articulation points makes the vehicle very manoeuvrable.

3.1.24 However, the weight of the girder bridge makes this vehicle very heavy and a larger number of axles are required. This vehicle will be in the region of 70m length.

3.1.25 The distance between the two bogies can assist when travelling over structures as only half of the weight of the load may be on the structure. (whereas with the rigid multi axle trailer, the whole load may be on the structure).



Elevation view - 20 axle girder frame trailer - concept model only
Indicative 270 te transformer

Image showing transportation of an offshore wind farm onshore substation transformer

Image from the London Array Limited website showing delivery of an onshore substation transformer across a rail bridge in the village of Graveney, Kent.

3.2 SPECIFIC CONSENTS

3.2.1 Permission to move an AIL has to be obtained prior to making the movement and an application for a STGO or an SMO needs to be made.

3.2.2 The application can be made using the Electronic Service Delivery for Abnormal Loads (ESDAL) system, as set out in detail in the Section 2.3 of 9.24: Outline Construction Traffic Management Plan – Revision B (REP1-043).

3.2.3 The electronic system will automatically notify the Local Highway Authority (LHA), the Police, National Highways and Network Rail as appropriate.

3.2.4 Depending on the STGO applied for, the notice period varies between two clear working days and eight weeks.

- Two clear working day's notice to be given for:
  - For vehicles up to 80 tonnes;
  - For vehicles between 3m and 5m width;
  - For vehicles with a rigid length exceeding 18.75m up to 27.4m; and
  - For vehicles exceeding 25.9m total length.
- Five clear working day's notice to be given for:
  - For vehicles between 80 and 150 tonnes.

  This would apply for the cable drums, shunt reactors and larger construction equipment.
- Ten clear working day's notice to be given for:
  - For vehicles between 5m and 6.1m width.
- Minimum 10 weeks' notice to be given for:
  - For vehicles greater than 150 tonnes – minimum 8 week's notice;
  - For vehicles greater than 6.1m width; and
  - For vehicles with a rigid length exceeding 30m

  This would apply to the transportation of the transformers.

3.2.5 Notice needs to be given separately to the police and all the relevant highway authorities along the route. Section 2.3 of 9.24: Outline Construction Traffic Management Plan – Revision B (REP1-043) sets out how the emergency services and local residents would be notified of AIL deliveries and kept informed throughout the delivery period.

3.2.6 Table 2.2 of 5.8 Details of Other Consents and Licenses document [APP-060] submitted with the application identifies that a 'Permit for transport of abnormal loads' under 'Road Vehicles (Authorisation of Special Types) (General) Order 2003/Road Traffic Act 1988/Road Vehicles (Construction and Use) Regulations 1989' will be applied for post consent.

4. AIL ROUTEING AND SWEPT PATH ANALYSIS

4.1 TRANSFORMERS AND SHUNT REACTORS

4.1.1 The WYNNS Transport report in Annex 2 assesses the delivery of 270te transformers and 95te shunt reactors to the proposed onshore Substation site, east of Little Bromley, Essex.

4.1.2 The proposed NF OWF Substation is adjacent to the site of the proposed VE Substation, and the access route for construction will be jointly shared.

4.1.3 The 270te transformers would be subject to a SMO and are required to be delivered via the nearest suitable port, to adhere to the National Highways water preferred policy. This has been identified as Harwich International Port.

4.1.4 The WYNNS report identified a number of transport configurations that could be used to move the 270te transformer, including a flat top trailer and three girder trailers with different axle loadings.

4.1.5 The WYNNS report has looked at bridge loading and clearances for the route between Harwich International Port and the haul road from Bentley Road and has undertaken discussions with Essex Highways, National Highways and the Port Authority.

4.1.6 Subject to a response from National Highways with regards to structural clearances, a route has been agreed in principle that leaves the international port using the new eastern exit, follows the A120 to Bentley Road and turns onto Bentley Road.

4.1.7 The 95te shunt reactors are subject to an STGO Category 3 and can therefore be delivered by road from a UK manufacturer or via the nearest suitable port.

4.1.8 The WYNNS report identified a 110te weight restriction on the A12 near Colchester, therefore delivery by road from a UK Manufacturer will require the load to pass through the centre of Colchester, with a low bridge (4.6m) identified along the route.

4.1.9 The WYNNS report identified the transport configuration for the 95te shunt reactors as a low loader with five axles each side of the load to enable the load to pass under the bridge, however this will be dependent upon the final dimensions of the Shunt Reactors.

4.1.10 The route from the Port of Harwich to the Onshore Substation location for VE and NF OWF is assessed in the Abnormal Indivisible Loads Access Report. VE choice of vehicle(s) and size of equipment is subject to project specific requirements and detailed design and therefore may differ from that included in the WYNNS Transport report.

4.2 PLANT AND EQUIPMENT

4.2.1 Vehicle tracking for the smaller AIL deliveries (plant and equipment) along the construction access routes would not be required, as the vehicles used would be similar to a standard Heavy Goods Vehicle (HGV).

4.3 CABLE DRUMS

ROUTEING

4.3.1 The cable drum transport would be classified as a STGO Category 3 movement, with a transport weight in the region of 105, te, though the vehicles used will be similar to a standard Heavy Goods Vehicle (HGV) which has been assessed and included in Annex 3.

4.3.2 The route for the cable drum vehicles, on the assumption they arrive from the Port of Harwich (noting these could also arrive from the A12), would be as follows:

- The exit from the international port would be via Phoenix Road to avoid passing under overhead lines at railway level crossings and then on the A120 travelling west to the Horsley Cross Roundabout.
- For vehicles en-route to Route Section 4b the vehicles will turn south at the Horsley Cross Roundabout,
- For vehicles en-route to Route Sections 5, 6 and 7 the vehicles will turn north at the Horsley Cross Roundabout, or u-turn at Harwich Road Roundabout and turn left onto Bentley Road.
- For vehicles heading to Route Sections 1 to 4a the vehicles will continue along the A120 towards Colchester where they will use the A12 Junction 29 to perform a u-turn to return along the A120.
- The vehicles will take the slip road onto the A133 towards Clacton.
- Vehicles for sections 2,3 and 4a will then turn left onto the B1033 at Weeley, then for Route Section 3 and 4a onto the B1035 and for Route Sections 2 and 3, turn onto the B1441, B1414, then the B1033.
- The vehicles en-route to Route Section 1 will continue into Clacton, turning left onto the B1027 at the St Johns Roundabout, and will then left onto the B1032 Clacton Road.

SWEPT PATH ANAYLSIS

4.3.3 A number of junctions along the various access routes for the cable drum vehicles, have been checked to ascertain if there would be any issues with the manoeuvre of a large low loader (25.6m in length) requiring physical mitigation.

4.3.4 The swept path analysis drawings are provided in Annex 3 and confirm there should be no issues with the manoeuvres, noting at some locations, the use of the opposing carriageway may be required, which may require an escort/pilot vehicle, to be discussed and agreed with the relevant highway authorities before such traffic movements commence as set out in Section 2.3, Report 9.24: Outline Construction Traffic Management Plan (REP1-043).

4.3.5 More detailed checks would be undertaken post consent (if required) once the vehicle type to be used to access each construction access is confirmed.

5. POTENTIAL IMPACT ON THE CARRIAGEWAY

5.1 TRANSFORMERS

5.1.1 AIL vehicle combinations are designed to spread the weight of the load evenly across all the axles, this is done to ensure that the axle loading is within acceptable limits for the relevant Highway Authority.

5.1.2 Standard trailer axle loading is 8.5 tonnes, with driving axles permitted to be 10.5 tonnes to ensure traction.

5.1.3 Issues with loading may arise at structures, where an excessive load may cause structural failure to occur. However, the length of many AIL transport configurations does result in the load being spread over a long distance, which would result in only part of the load being on the structure at any one time.

5.1.4 To reduce the loading on a structure other traffic can be prevented from crossing the structure at the same time as the AIL and the speed of the AIL transport configuration can be reduced to a walking pace as this reduces the impact loading from the moving vehicle.

5.1.5 For road pavements the weight of the axle load will not cause any damage, unless there are underlying issues such as poor ground conditions and/or the road pavement is thin or old such as:

- If the ground conditions are poor, then the ground may not be able to support the loads and there is a risk that movement may occur resulting in rutting of tarmac surfaces, or movement or breaking of a concrete slab;
- In the unlikely event of severe movement, it could result in a vehicle overturning or the road being uncomfortable or impractical for use;
- If the road pavement is thin, and this is coupled with poor ground conditions, then there is a risk that the surfacing may break up as the ground beneath moves;
- If a tarmac road pavement is old then there is a risk that the bituminous material that binds the surface together will be unable to hold the stones and the surfacing will disintegrate;
- If a concrete road pavement is old and has frost damage then there is a very small risk of disintegration of the concrete pavement; and
- The risk of surface disintegration is higher where vehicles turn or are climbing steep gradients.

5.1.6 National Highways has indicated in their written representation [REP1-066] that there is a section of the A120 that is currently in poor condition and may not be upgraded prior to the time VE need to transport the transformers. The limit is described as 300te. Ongoing discussions are being sought to ascertain whether this limit is including the weight of the transportation vehicle, what the limit per axel is in order to identify a suitable approach (i.e. additional axles) to ensuring the transportation of the transformers do not adversely impact the structure of the SRN, noting there would be between 2 and 4 movements of the largest AIL only.

5.1.7 **All of the above are very small risks and are unlikely to occur, particularly on the A120, which is already frequently used by HGVs.**

5.1.8 The two unclassified roads that would be used to deliver the transformer are Bentley Road and Ardleigh Road. Various improvements are proposed along these roads (as detailed in the WYNNS AIL access report) to enable the large transformer transport configurations to reach the proposed Substation sites. Once these improvements are complete the risk of damaging these roads will be mitigated, leaving only a minor risk of superficial wear damage being possible.

5.2 OTHER AILS

5.2.1 With regards to the other roads that would be used to deliver smaller AILs such as the cable drums, these are classified roads (A or B) with two or more traffic lanes.

5.2.2 The A133 is the main road to Clacton-on-Sea, built and maintained to high standards. This should mean that the surfacing is in good condition and is relatively young. **There is no realistic/ foreseeable risk of damage occurring to this roads.**

5.2.3 The B roads used are all two-lane roads, maintained to an acceptable standard for their use, providing substantial links between urban centres. Although the road may be surface dressed, the pavement will still have a high amount of cohesion and will be capable of holding together under loading. **There is no realistic/ foreseeable risk of damage occurring to these roads other than superficial wear.**

5.3 ROAD CONDITION SURVEYS

5.3.1 Prior to the start, and following completion, for each stage of the onshore works of the construction works, road condition surveys for some access roads will be undertaken and agreed with Essex County Council. These surveys will inform any works that may be required to rectify specific damage to the road network as a direct result of construction work. This is set out in Section 4.3 of Volume 9, Report 9.24: Outline Construction Traffic Management Plan (REP1-043).

5.3.2 A visual road condition survey is a simple survey to record the condition of the road only, the road is walked with photographs taken at regular intervals to record the condition of the road. Additional photographs are taken of any damage. No testing is undertaken to determine the expected life of the pavement.

5.3.3 The two surveys should be compared with each other to determine if any damage has been caused to the road surface by the construction traffic (including the AIL's) and appropriate repairs can be undertaken as necessary.

5.3.4 Subject to negotiation with the Highway Authority, repairs can either be undertaken by the developer, or a contribution can be made to the relevant Highway Authority to enable them to undertake the repairs.

ANNEX 1 – SPECIAL TYPE ENFORCEMENT GUIDE

Driver & Vehicle Standards Agency

Guidance

Special types enforcement guide

Updated 27 September 2018

Applies to England, Scotland and Wales

Contents

This publication is available at https://www.gov.uk/government/publications/special-types-enforcement-guide/special-types-enforcement-guide

1. Introduction

The dimensions and weights of vehicles used on British roads are regulated by the Road Vehicles (Construction & Use) Regulations 1986 (http://www.legislation.gov.uk/uksi/1986/1078/introduction/made) (C&U) Regs and the Road Vehicles (Authorised Weight) Regulations 1998 (http://www.legislation.gov.uk/uksi/1998/3111/contents/made) (AW) Regs.

Special types vehicles are those which don't meet the C&U and AW Regs but can be used outside these rules under the authority of the Road Vehicles (Authorisation of Special Types) (General) Order 2003 (http://www.legislation.gov.uk/uksi/2003/1998/contents/made) (STGO).

Vehicles which don't comply with an STGO order can be used on the road if Special Orders have been issued by:

- National Highways regarding abnormal loads not covered by C&U and STGO
- the Vehicle Certification Agency (VCA) regarding special vehicles and divisible loads such as crane ballast outside the scope of C&U and STGO

1.1 Vehicles most likely to be used under an STGO

Vehicles most likely to be used under an STGO, are:

- abnormal indivisible load (AIL): loads which can't be divided into 2 or more loads to be transported by road
- mobile cranes: specially built - or adapted - for lifting operations
- engineering plant: a moveable piece of plant or equipment which is a motor vehicle or trailer specially built for engineering operations
- road recovery vehicles: vehicles that are specially built for recovering broken-down vehicles

Under C&U - when trailers are built and normally used to carry indivisible loads of great length (that is, abnormal indivisible loads) - they can be longer (but not wider) than the normal legal maximum.

There's no limit to the number of items of exceptional length that can be carried. Depending on the size of load - if certain conditions are met - C&U Regs also allow loads to overhang the front, rear and sides of vehicles.

These conditions include:

- making the load easily visible
- informing the police and highways authorities

A brief guide to C&U rules for overhanging loads to the front, rear or side can be found in Annex A.

1.2 Abnormal indivisible load vehicles

AIL vehicles can be used if a load can't be divided for transportation by road. A good example is an aircraft wing: given the cost involved, it would be unreasonable to have to dis-assemble it first. On the other hand, a large load that can be easily divided in half by undoing a few bolts, must be split up for transport.

Loads which comply with C&U and AW Regs can't be carried on an AIL vehicle, even as a backload. When an AIL vehicle is dual-plated - for both C&U and STGO use - then normal loads can be carried, in line with the weights set out on the ministry plate for the vehicle or trailer.

When carrying a load - if possible and safe - a 'normal-sized' vehicle or vehicles must be used, even if there's some overhang at front, rear or one or both sides of the vehicle. Where it's not safe to use a 'normal-sized' vehicle, then a larger vehicle or combination of vehicles will need to be used, subject to any conditions in STGO.

AIL vehicles are divided into 3 categories and must comply with these conditions to operate under STGO:

Cat 1 (not exceeding 46,000 kgs / 50,000 kgs):

- up to 46,000 kgs with a minimum of 5 axles
- up to 50,000 kgs with a minimum of 6 axles
- AW Regs maximum weights apply to axle and vehicle gross weights (meaning, only the train weight can exceed AW Regs)

- display ‘STGO Cat 1’ plate to the front of the drawing vehicle
- 2 working days’ notice must be provided to highway and bridge authorities about the weight: the dimensions may need to be given to the police
- speed limits:
  - motorway 60 mph
  - dual carriageway 50 mph
  - other roads 40 mph

Cat 2 (not exceeding 80,000 kgs):

- minimum of 6 axles
- maximum axle weight of 12,500 kgs
- display ‘STGO Cat 2’ plate to the front of the drawing vehicle
- 2 working days’ notice to highway and bridge authorities in relation to weight: the dimensions may need to be given to the police
- speed limits:
  - motorway 40 mph
  - dual carriageway 35 mph
  - other roads 30 mph
- a plate must be fitted to the vehicle showing the maximum weight recommended by the manufacturer of the vehicle when travelling at certain maximum speeds: this must be marked ‘Special Types Use’ - the plate should show the weights for gross, train and axle weights

Cat 3 (Not exceeding 150,000 kgs):

- minimum of 6 axles
- maximum axle weight of 16,500 kgs
- display ‘STGO Cat 3’ plate to the front of the drawing vehicle
- 5 working days’ notice to highway and bridge authorities: the dimensions may need to be given to the police
- speed limits:
  - motorway 40 mph
  - dual carriageway 35 mph
  - other roads 30 mph
- a plate must be fitted to the vehicle showing the maximum weight recommended by the manufacturer of the vehicle when travelling at certain maximum speeds: this must be marked ‘Special Types Use’ - the plate should show the weights for gross, train and axle weights

There is no need to carry movement order notices in all categories of these types of vehicle.

1.3 Special order movements

You must have a special order for vehicles more than:

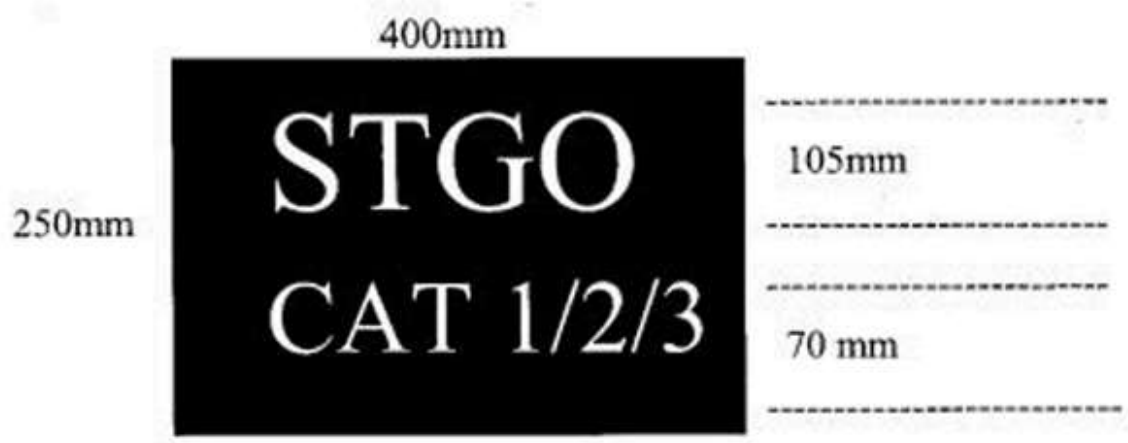
- 150,000 kgs or 16,500 kgs in weight per axle
- 6.1 metres wide
- 30 metres long in rigid length when loaded

You’ll need to give:

- 5 working days’ notice to highway and bridge authorities
- 2 working days’ notice to police

You must carry the special order authorisation for the vehicle movement (issued on behalf of the Secretary of State by National Highways, Birmingham office) in the vehicle. Otherwise, it will be operating under C&U and AW Regs.

1.4 Vehicle signage



This sign should be fixed in a vertical position to the front of the vehicle

Non-GB AIL vehicles usually display "Convoi Exceptionnel" signs

1.5 Multiple loads

Generally, multiple loads can't be carried, but they are allowed in 2 special cases:

- engineering plant - component parts can be carried in cases where:
  - the plant - without the detachable part - is an STGO AIL (meaning, can't legally be carried on a C&U/AW vehicle)

- the part is loaded and unloaded at the same place
- the part doesn't stick out beyond the vehicle more than the plant itself protrudes, whether forward, rearward or to the side - for example, a bulldozer with a detachable blade: a trailer towed by the bulldozer is not allowed to be carried on the same vehicle

- where 2 or more loads of a similar shape, size and weight need to be moved:
  - and one or both are STGO AIL (that is, can't legally be carried on a C&U/AW vehicle) falling into STGO category 1 or 2 only
  - the second (identical or smaller) load doesn't increase the overall width or length of the combination, or take it into a higher STGO category on weight

In addition to the above, long (but not heavy) loads can normally be carried on long trailers that still meet C&U. Multiple loads are allowed in this case as long as they aren't bigger than AW weights - for example, a number of 16 m long yacht masts could be carried by a longer length trailer.

1.6 Vehicle excise duty

A vehicle carrying goods under STGO is taxable in the 'Special Types' taxation class. Find out much you should be paying from the guidance on Rates of vehicle tax (V149) (https://www.gov.uk/government/publications/rates-of-vehicle-tax-v149).

1.7 Plating and testing

Vehicles and trailers operating under STGO and Special Order don't have to be tested or plated, if solely used for transport of AIL. Standard width vehicles and trailers used for AIL movements are normally 'dual-plated', which means that they're subject to a yearly test and plating because they can be used for both AIL and 'normal C&U' loads.

1.8 Drivers' hours and tachograph regulations

Goods vehicles operating under STGO and Special Order have to follow EU drivers' hours and tachograph regulations (https://www.gov.uk/government/publications/eu-rules-on-drivers-hours-and-working-time).

1.9 Drivers view to the rear mirrors

AIL vehicles and vehicles operated under STGO have to follow the rules on mirrors under the Construction and Use Regulations (http://www.legislation.gov.uk/uksi/1986/1078/made). The rear-view mirrors must provide the driver with a clear view to the rear and side of the vehicle. Because the load being carried projects out, the view from the standard mirrors won't normally be adequate. The view from standard mirrors should be good enough to see past the overhanging load. To allow a better view, the existing mirrors may need adjustment or additional mirrors or devices may have to be fitted: for example, cameras/monitors.

A camera system can be used in place of the mirrors as long as the driver can clearly see to the side and rear of the load. It's not suitable if the driver can't see fully down the side of the trailer past a wide load. Drivers must have a clear view regardless of whether there's an escort vehicle. But, where drivers don't have a clear view - and vehicles are operated under STGO where an additional rear steer driver is present on the vehicle combination or where the vehicle is under police escort - this may be allowed

2. Mobile cranes

STGO defines a mobile crane as:

- a motor vehicle that's specially designed or built to carry out lifting operations - that can't safely be carried out by a motor vehicle or trailer - which complies with C&U Regs, AW Regs and Goods Vehicle Type Approval Regs

- it's gross weight exceeds 12,000 kgs per axle
- a motor vehicle which has a crane permanently mounted as part of the vehicle chassis design (the definition excludes lorry mounted cranes)
- it's operated by the driver or other person riding on it
- it complies with Part 4 of Schedule 1 of Vehicle Excise & Registration Act 1994 (http://www.legislation.gov.uk/ukpga/1994/22/contents), as a mobile crane

A mobile crane which doesn't meet all these criteria may be defined as engineering plant.

2.1 Categories

Category A:

- maximum gross weight of 20,000 kgs on 2 axles
- maximum gross weight of 30,000 kgs on 3 axles
- maximum gross weight of 36,000 kgs on 4 axles
- maximum of 4 axles
- maximum of 11,500 kgs on a single driving axle
- maximum of 10,000 kgs on a single non-driving axle
- speed limits:
  - motorway 60 mph
  - dual carriageway 50 mph
  - other roads 40 mph

Category B:

- maximum axle weight of 12,500 kgs
- maximum gross weight of 12,500 kgs multiplied by the number of axles
- speed limits:
  - motorway 50 mph
  - dual carriageway 45 mph
  - other roads 40 mph

Category C:

- maximum axle weight of 16,500 kgs
- maximum gross weight of 16,500 kgs multiplied by the number of axles: up to a maximum of 150,000 kgs
- speed limits:
  - motorway 40 mph
  - dual carriageway 35 mph
  - other roads 30 mph

2.2 Notification

Mobile cranes with a gross weight of more than 80,000 kgs - but not exceeding 150,000 kgs - must give:

- 2 days' notice to the Police
- 5 days' notice to the road and bridge authorities

Vehicles weighing under 80 tonnes must give 2 days' notification to the roads and bridges authorities.

Those between 80 and 150 tonnes must give:

- 2 days' notice to the Police
- 5 days' notice to the roads and bridges authorities

Vehicles over 150 tonnes need to give special notification, which means:

- 5 days' notice to all authorities

- 10 weeks' consultation time with the owners of structures such as bridges and tunnels that have weight restrictions

If the STGO vehicle is over 3.05 metres, you need to tell the Police regardless of the weight of the vehicle.

2.3 Vehicle Excise Duty

A mobile crane is taxable in the 'special vehicle' class (sub-category mobile crane) at the same rate as the basic goods vehicle.

2.4 Plating and testing

Since May 2018, mobile cranes are no longer exempt from the plating and testing regulations.

2.5 Drivers' hours and tachograph regulations

Drivers of mobile cranes don't have to follow EU drivers' hours and tachograph regulations or GB domestic drivers' hours rules. This is because they're not carrying goods or passengers by road. If goods were carried then the normal rules would apply. You can find out more in the guide to Drivers' hours and tachographs rules: goods vehicles (GV262) (https://www.gov.uk/guidance/drivers-hours-goods-vehicles).

2.6 Driving licence

Drivers of mobile cranes must have a category C vocational licence qualification (https://www.gov.uk/driver-cpc-training).

2.7 Other conditions

Mobile cranes must be fitted with an amber illuminating beacon, can't draw a trailer, and mustn't carry any goods or burden (except if used for or to help lifting).

3. Engineering plant

Engineering plant can only be used under the STGO regulations if those operations can't safely be done using a vehicle that complies with C&U Regs and vehicle approval (https://www.gov.uk/government/publications/iva-inspection-manual-vehicle-categories-n2-and-n3-hgvs).

Engineering plant mustn't carry any load or lift or transport goods or burden - except its own essential equipment - while it's being used in the construction, maintenance or repair of materials that:

- have been excavated and lifted by the apparatus on the plant
- the plant is specially designed to treat

3.1 Categories

Cat 1 (exceeds 44,000 kgs):

- up to 46,000 kgs with a minimum of 5 axles
- up to 50,000 kgs with a minimum of 6 axles

- construction and use maximum weights apply to vehicle axle and gross weights
- 2 working days' notice to highway and bridge authorities
- speed limits:
  - motorway 60 mph
  - dual carriageway 50 mph
  - other roads 40 mph

Cat 2 (not exceeding 80,000 kgs):

- minimum of 6 axles
- maximum axle weight of 12,500 kgs
- 2 working days' notice to highway and bridge authorities
- speed limits:
  - motorway 40 mph
  - dual carriageway 35 mph
  - other roads 30 mph

Cat 3 (not exceeding 150,000 kgs):

- minimum of 6 axles
- maximum axle weight of 16,500 kgs
- 5 working days' notice to highway and bridge authorities
- speed limits:
  - motorway 40 mph
  - dual carriageway 35 mph
  - other roads 30 mph

You don't have to carry movement order notices in the vehicle.

Slow plant:

- axle weight exceeding 16,500 kgs
- speed limits:
  - motorway 20 mph
  - other roads 12 mph

3.2 Vehicle special order movements

Used for:

- vehicles with weights in excess of 150,000 kgs or 16,500 kgs per axle:
- vehicle special order issued by the Vehicle Certification Agency (VCA)
- 5 working days' notice to highway and bridge authorities
- 2 working days' notice to police

Authorisation for the vehicle movement must be carried in the vehicle. If the authorisation isn't carried, the vehicle will be considered as operating under C&U and AW Regs.

3.3 Vehicle excise duty

Engineering plant is taxable under the 'special vehicle' class (at the same rate as a basic goods vehicle) if it meets the definition of mobile pumping vehicle, digging machine, or road roller. Other types of engineering plant are taxed under the heavy goods vehicle (HGV) rate, as if the machinery were a load carried on a goods vehicle, rather than being built into it.

3.4 Plating and testing

Engineering plant and non-engineering plant are no longer exempt from the plating and testing regulations.

3.5 Drivers' hours and tachograph regulations

Drivers of engineering plant don't have to follow EU drivers' hours and tachograph regulations or GB domestic drivers' hours rules. This is because they're not carrying goods or passengers by road. If goods were carried then the normal rules would apply. You can find out more in the guide to Drivers' hours and tachographs rules: goods vehicles (GV262) (https://www.gov.uk/guidance/drivers-hours-goods-vehicles).

3.6 Driving licence

Drivers of engineering plant (as defined under the STGO regulations) don't have to hold a vocational licence, and this class of vehicle can therefore be driven by the holder of a car driving licence (category B) (https://www.gov.uk/driving-licence-categories).

4. Special vehicles

Special vehicles don't have to follow the regulation of construction, weight and use contained in S41 of the Road Traffic Act 1988 (http://www.legislation.gov.uk/ukpga/1988/52/section/41) and may be used by Special Order issued by the Vehicle Certification Agency (VCA) under S44 of the Act.

An order can be issued about:

- special vehicles or trailers built for specific purposes or for tests or trials
- vehicles or trailers built for use outside the UK
- new or improved types of vehicles or trailers equipped with new or improved equipment
- vehicles or trailers carrying loads of exceptional size outside the construction and use permitted dimensions (http://www.legislation.gov.uk/uksi/1986/1078/made)

The order will say how the vehicle or trailer can be used in order to be authorised.

5. Over length/width vehicles

The rules about the over length/width of vehicles apply to all types of vehicle operating under STGO or Special Order. Similar rules about notification also apply to C&U vehicles which are transporting wide or long loads, where allowed. A C&U load is normally a long or wide load which overhangs the sides of the vehicle/trailer. Refer to section 1.2 for more information on the cases when larger loads or vehicles are permitted.

5.1 Over length

Defined as any single rigid unit (this may be either a rigid vehicle, or a trailer that forms part of a combination: for example, a semi-trailer being drawn by an articulated unit) exceeding 18.75 metres in length, including projections.

Or, a vehicle combination - such as a drawing vehicle and trailer - that exceeds 25.9 metres in length.

Requirements:

- 2 days notice given to the police in all areas where it's going to be used
- must be accompanied by an attendant

Front or rear projection:

- where a front or rear projection exceeds 3.05 metres – 2 days' notice to police
- an attendant is needed where a projection exceeds:
  - front 2 metres
  - rear 3.05 metres

5.2 Over-width projections

- vehicle with load width of 3 metres or less, but width of load projecting at one side exceeds 305 millimetres: 2 days' notice to police
- vehicle with load width exceeding 3 metres, including any projections: 2 days' notice to police
- vehicle with load width exceeding 3.5 metres, including any projections: 2 days' notice to police and attendant required
- vehicle with load width exceeding 5 metres, including any projections: approval from Secretary of State in the form of a VR1 permit (https://www.gov.uk/government/publications/abnormal-load-movements-application-and-notification-forms), 2 days' notice to police - and attendant required

5.3 Special order movements

You must have a special order for vehicles, that when loaded are more than:

- 150,000kg in gross weight
- 16,500kg in gross axle weight
- 6.1 metres wide

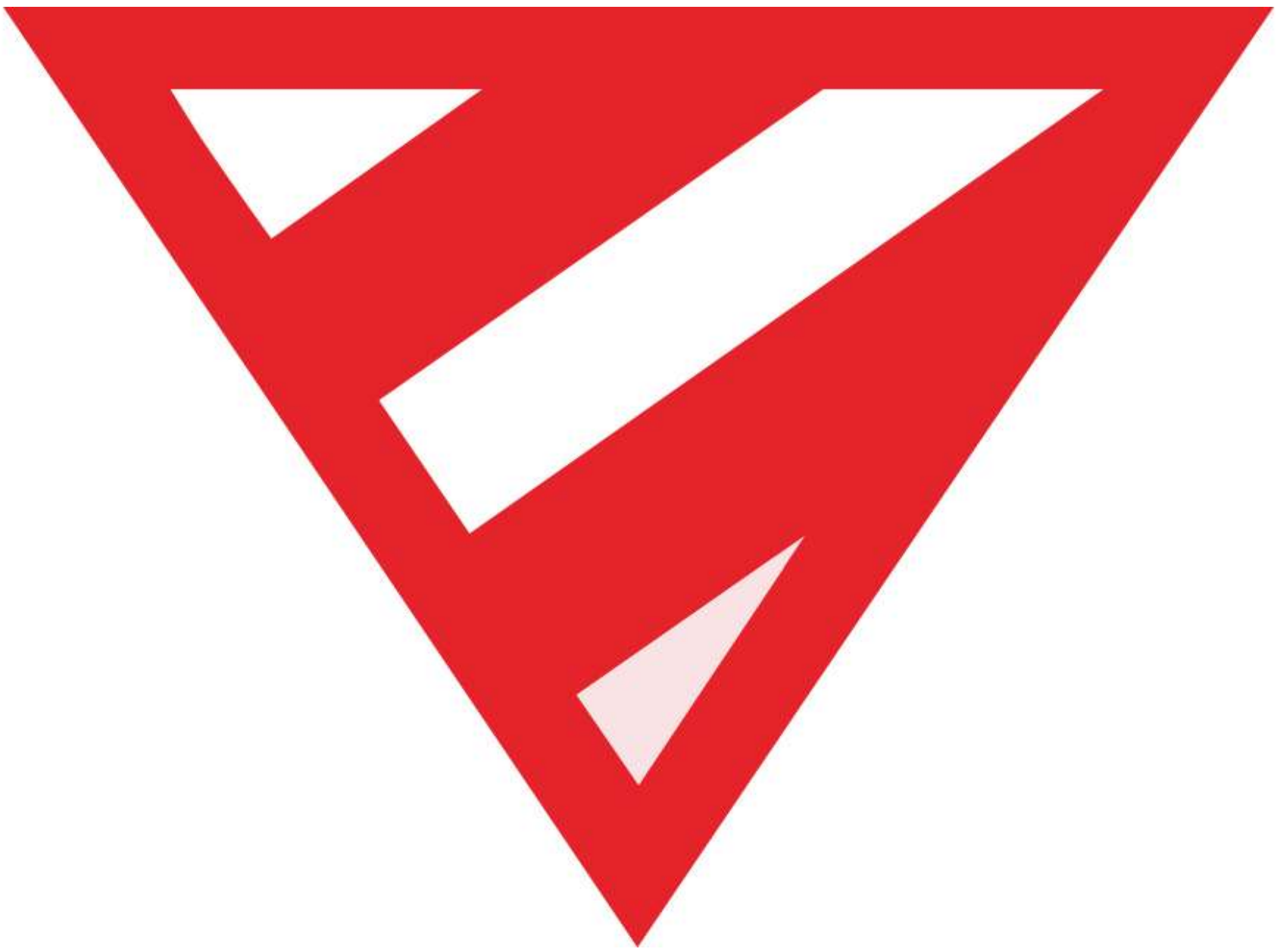
Special orders are issued on behalf of the Secretary of State by National Highways, Birmingham office. You'll need to give:

- 5 working days' notice to highway and bridge authorities
- 2 working days' notice to police

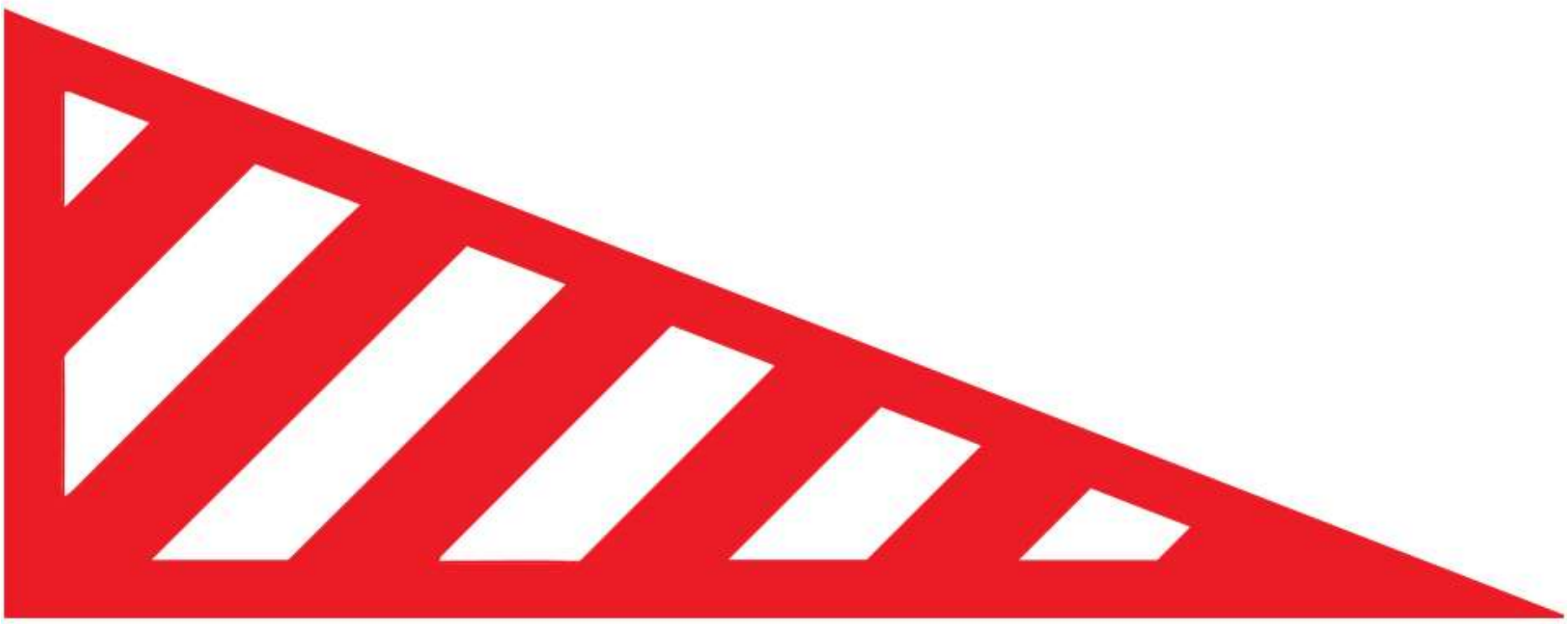
The order only covers the journey when the vehicle is laden. When it's unladen it's length should be below 30 metres so that it doesn't need a special order.

For example, many long trailers are made up of modular units allowing some to be disconnected and carried on the remaining units. This is allowed under STGO.

5.4 Projection markers



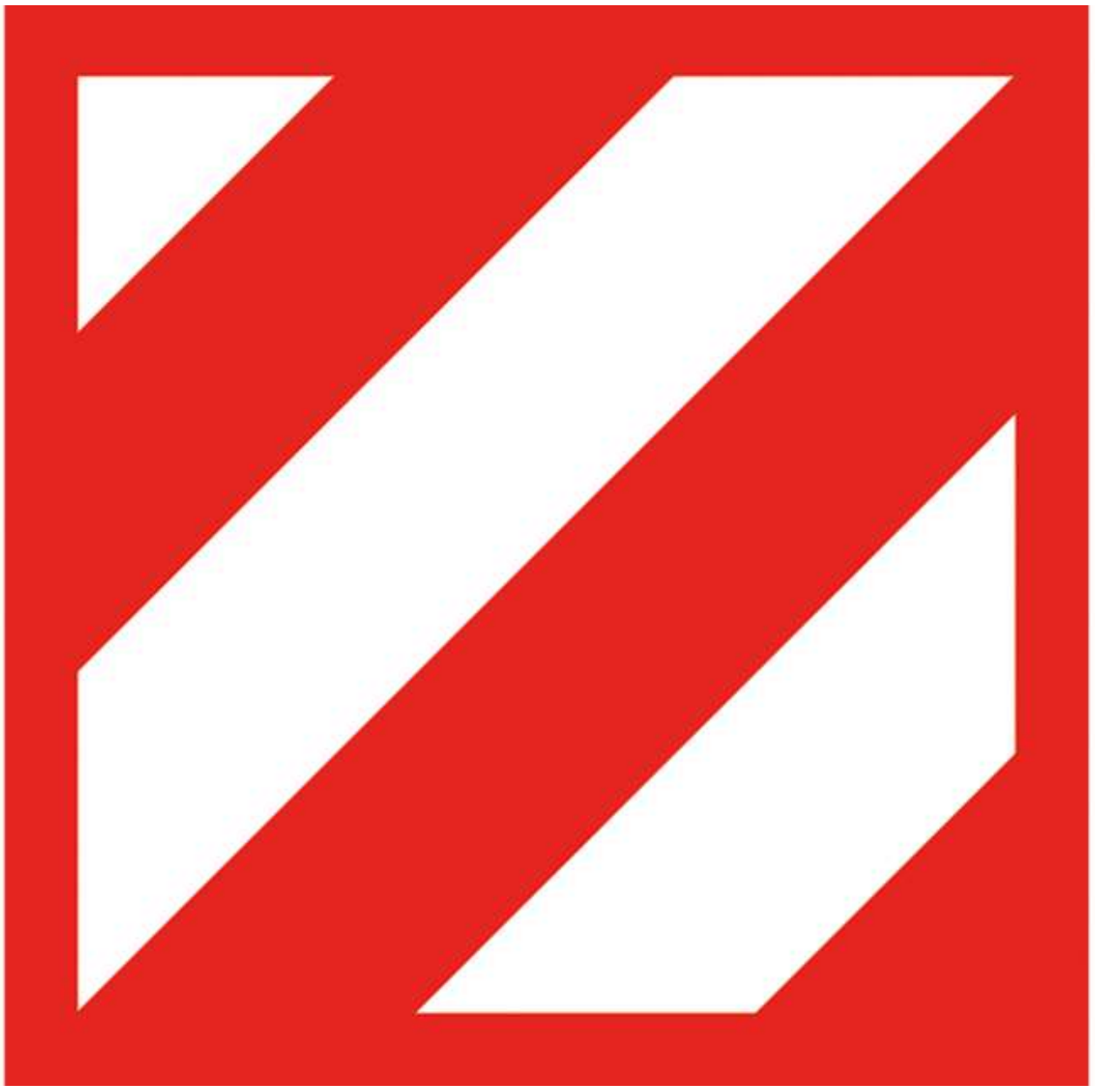
A projection exceeding 2 metres - to the front or rear of a vehicle - must be marked with an end-marker which faces the front or rear of the vehicle (above).



A projection exceeding 3 metres - to the front or rear of a vehicle - must (in addition) be marked with side-markers to both its right and left hand side, facing out sideways (above).

Any projection exceeding 305 millimetres widthwise must be marked with 2 side markers (as above), one visible to the front and one visible to the rear of the vehicle. Alternatively, it may be marked by day-glow, fluorescent or retro-reflective tape, which is coloured red, white or yellow (or any combination), so that the point where the width is at its greatest is clearly visible from the front, rear and side of the vehicle. If tape is used, then no retro-reflective material capable of showing red light can be fitted to the front of the vehicle and only red light can be fitted to the rear.

As an alternative to the end marker or side marker boards pictured above - in any cases where they're needed - it's alright to use a different form of marker which is authorised in another European country for use on projecting loads. A typical example is shown here.



5.5 Extendable trailers

Extendable trailers can be used for carrying long loads if they obey the rules within STGO.

6. Road recovery vehicles

A road recovery vehicle is one that's specially designed, built or adapted to recover broken-down vehicles. It must be fitted with a crane, winch or other lifting system specifically designed to recover vehicles.

3 categories of vehicle are allowed under STGO:

- locomotives are vehicles with an unladen weight heavier than 7,370 kgs not built to carry a load
- an N3 motor vehicle is a vehicle built to carry goods with a maximum mass heavier than 12,000 kgs
- a combination of an N3 motor vehicle and an O4 trailer is a trailer with a maximum weight heavier than 10,000 kgs

Where a vehicle or vehicle / trailer combination is broken, recovery can be carried out using a drawbar or 'lift and tow' method. It can't be carried or towed any further than is necessary in order to clear the road it obstructs - for example, to the nearest motorway services. At this point the broken-down vehicle must be either fixed or transported onwards under C&U rules, which may involve separating the towing vehicle and trailer, and/or unloading any load that is carried.

6.1 Maximum weights

- gross 36,000 kgs on 3 axles
- gross 50,000 kgs on 4 axles
- gross 80,000 kgs on 6 or more axles
- maximum axle weight of 12,500 kgs
- maximum axle group weight 25,000 kgs

- a road recovery vehicle must not, when towing a broken-down vehicle, exceed the maximum train weight specified on the plate fixed to it under regulation 66 of C&U Regs

6.2 Speed limits

While carrying or towing a broken-down vehicle:

- motorway: 40 mph
- dual carriageway: 30 mph
- other roads: 30 mph

6.3 Width

The maximum width can't be greater than that imposed by regulation 8 of C&U Regs of 2.55 metres. Though a trailer up to 3 metres in width can be used when its use would be the only safe method of recovering a broken-down vehicle.

6.4 Length

The maximum length of a road recovery vehicle is 18.75 metres but there is no restriction on the combined length when towing a broken-down vehicle or combination.

6.5 Vehicle excise duty

A road recovery vehicle with a maximum weight less than 25,000 kgs is taxable as a special vehicle at the same rate as a basic goods vehicle. One with a maximum weight greater than 25,000 kgs is taxable at 2.5 times the basic goods vehicle rate. One of the conditions of this taxation class is that the vehicle can only be used for break down recovery, and not for general haulage.

6.6 Plating and testing

Road recovery vehicles are no longer exempt from the plating and testing regulations. They must be fitted with a plate which gives the maximum weight that can be lifted by any crane, winch or another lifting system.

7. Non-GB vehicles

Non-GB vehicles operating within this country are subject to the same rules about dimensions and weights contained within the C&U and AW Regs. They are able to take advantage of the STGO exemptions to the above rules according to the same conditions. The use of alternative signage, typically the French 'Convoi Exceptionnel' and the square white/red 'chevron' plates shown above, is acceptable within GB.

8. Attendants

An attendant is required where:

- the vehicle width exceeds 3.5 metres
- the rigid length (excluding the drawing vehicle) exceeds 18.75 metres
- the total length exceeds 25.9 metres

- projections exceed 2 metres (front) 3.05 metres (rear)

Where an attendant is needed they can travel in the vehicle according to the STGO or Special Order movement. Alternatively they can travel in an escort vehicle, providing that they are:

- in radio contact with the vehicle concerned
- are able to see the vehicle concerned during the journey, as far as is reasonably practical

Where 3 or more loads are travelling in convoy, only the first and last vehicles need an attendant.

8.1 Escorts

There's no law requiring a vehicle moving under STGO or a Special Order to be accompanied by an escort vehicle, although the police can make sure an escort vehicle is used when necessary. Codes of practice relating to escorts are published by National Highways (https://www.gov.uk/government/publications/lighting-and-marking-for-abnormal-loads-vehicles-code-of-practice), various local authorities, and police forces.

9. Documentation

There's no set format for notifying the police, highways and bridge authorities. And you don't need to carry the notification document in the vehicle. The operator should be able to produce a copy if the examiner requests it.

The notice given to the relevant authorities is operator specific, so the movement of loads can't be sub-contracted without the consent of the relevant authority.

This sample form of notice to the police (https://www.gov.uk/government/publications/abnormal-load-movements-application-and-notification-forms) is for a load that complies with the Road Vehicles (Construction & Use) Regulations 1986 (http://www.legislation.gov.uk/uksi/1986/1078/introduction/made). The STGO version will have axle weights, axle spacing's and dimensions. It'll also include exemption from legal responsibility for the bridge and highways authority.

10. Enforcement

The STGO Regs and Special Orders provide certain exemptions to C&U and AW Regs, therefore no offence exists of failing to comply with STGO and Special Order regulations. A failure to comply with any of the rules relating to the particular STGO and Special Orders listed above, would result in the exemptions not being applicable and the C&U and AW Regs coming into force.

- exceed recommended speed limits: the offence of going faster than the stated speed limits ceases as soon as the vehicle is stopped and therefore no prohibition can be issued - records of excess speed while operating under STGO may be brought to the attention of the traffic commissioner if needed
- fail to display STGO signage: the STGO exemption would then be breached and the load would be subject to normal C&U and AW limits in relation to dimensions and weight. Enforcement action, as needed may then be taken
- fail to comply with movement order: if the vehicle does not comply with the notice provided to the relevant authorities in respect of the below, the exemptions will not apply and the necessary enforcement action may be taken:
  - weight
  - dimensions
  - operator
  - route

There is no need for the Movement Order to be carried on board. If the movement is covered by a Special Order (such as weight in excess of 150,000 kg) then this must be carried on board.

NB: Weight: if the axle, gross or train vehicle weight are more than those stated in the notice given to the relevant authorities, of the STGO category, the amount of the overload should be calculated against the AW

Regs: for example, 44,000 kgs train weight for a 3x3 artic.

11. Legislation

This guide should be used together with the legislation and regulations about Special Types vehicles (below):

- The Goods Vehicles (Plating & Testing) Regulations 1988 (http://www.legislation.gov.uk/uksi/1988/1478/contents/made)
  - Schedule 2(35) Exemption to plating and testing regarding vehicles defined within S42 (special vehicles) The Road Traffic Act 1972
- The Road Traffic Act 1972 (http://www.legislation.gov.uk/ukpga/1972/20/contents/enacted)
- The Road Traffic Act 1988 (http://www.legislation.gov.uk/ukpga/1988/52)
- The Road Vehicles (Construction & Use) Regulations 1986 (http://www.legislation.gov.uk/uksi/1986/1078/introduction/made)
- The Road Vehicles (Authorisation of Special Types) (General) Order 2003 (http://www.legislation.gov.uk/uksi/2003/1998/contents/made)
  - schedule 1: abnormal indivisible loads
  - schedule 2: mobile cranes
  - schedule 3: engineering plant
  - schedule 4: road recovery vehicles
- The Road Vehicles (Authorised Weight) Regulations 1988 (http://www.legislation.gov.uk/uksi/1998/3111/made)
- The Vehicle Excise and Registration Act 1994 (http://www.legislation.gov.uk/ukpga/1994/22/contents)

12. Annex A

The rules about loads that overhang the front, rear or sides of vehicles are set out in regulations 81 and 82 of the Road Vehicles (Construction and Use) Regulations 1986 (http://www.legislation.gov.uk/uksi/1986/1078/introduction/made) (C&U), as amended. This Appendix provides an overview of the main rules.

12.1 Loads overhanging the front or rear of the vehicle

The table below is a summary of the needs for front and rear overhanging loads set out in regulation 82(7) of the Road Vehicles (Construction and Use) Regulations 1986 (C&U), as amended.

Length of projection	Action if load projects rearwards	Action if load projects forwards
Not exceeding 1 metre	No requirements specified	No requirements specified
More than 1 m, but not exceeding 2 m	End must be made clearly visible (C&U Schedule 12, para 4)	No requirements specified
More than 2 m, but not exceeding 3.05 m	Marker boards required (C&U Schedule 12, para 3)	Attendant required (C&U Schedule 12, para 2) and Marker boards required (C&U Schedule 12, para 3)
Exceeding 3.05 m	2 clear working days' notice to police (C&U Schedule 12 paragraph 1), Attendant required (C&U Schedule 12, paragraph 2) and Marker boards required (C&U Schedule 12, paragraph 3)	2 clear working days' notice police (C&U Schedule 12, paragraph 1), Attendant required (C&U Schedule 12, paragraph 2) and Marker boards required (C&U Schedule 12, paragraph 3)

12.2 Loads overhanging the sides of the vehicle

The table below is a summary of the required needs for loads overhanging the sides of a vehicle as set out in regulation 82 of C&U.

Load projection or overall width	Action required
Over 305 mm lateral projection on either side	2 clear working days' notice to police (C&U Schedule 12, para 4), Marker boards front and rear (C&U Schedule 12, para 3) and Additional lights required during hours of darkness or poor visibility
More than 2.9 m, but no more than 3.5 m overall width	2 clear working days' notice to police (C&U schedule 12, para 4), Marker boards front and rear (C&U Schedule 12, para 3) and Additional lights required during hours of darkness or poor visibility
More than 3.5 m, but not exceeding to 4.3 m overall l width	2 clear working days' notice to police (C&U Schedule 12, para 4, Attendant required (C&U Schedule 12, para 2), Marker boards front and rear (C&U Schedule 12, para 3 and Additional lights required during hours of darkness or poor visibility

ANNEX 2 – NORTH FALLS WYNNS ABNORMAL INDIVISIBLE LOADS ACCESS REPORT

Abnormal Indivisible Load Access Report for the Proposed North Falls Offshore Wind Farm Onshore Substation Site

Prepared for RWE

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Contents

Executive Summary

The contents of this report consider marine and land transport feasibility investigations into achieving access for transformers at 270te nett and shunt reactors at 95te for future delivery to a proposed North Falls Offshore Wind Farm Onshore Substation site which is located in a field east of Little Bromley, Essex.

Due to the overall transport weight of the transformer being considered (plus carrying trailer) being in excess of 150te gross weight, the move will require a Special Order from National Highways. It should be noted that Government policy is to maximise the use of water for the movement of Special Order (above 150te gross) AIL's wherever possible. National Highways require that access via the nearest available water access should be considered, as RWE would be required to deliver via the nearest available marine offloading point that is practicable for AIL delivery in line with the requirements of the Department for Transports Water Preferred Policy which requires that the nearest practicable port of access is used to deliver Special Order Abnormal Indivisible Loads (AIL). National Highways (NH) Abnormal Loads Team has provided an Agreement in Principle (AiP) for Special Order deliveries to the proposed site via Harwich Port confirmed in a letter dated 21.03.24, reference 872.

It is expected that the shunt reactor will be delivered within Special Types General Order regulations (STGO) Category 3, as the gross load of the loaded trailer arrangement will be below 150te gross. Therefore, this move will not require a Special Order from National Highways. STGO Category 3 loads are expected to be delivered by road from the UK port of delivery or manufacturing facility and this report therefore focuses on the potential route from the M25 via the A12 and A120.

In terms of marine access, the port of Harwich has confirmed that there is a 4te/m^2 limit on the quays through the port area. There are three possible offloading locations at Harwich, at Berth 1, Berth 3 and the General Cargo Berth. The port is available for roll on-roll off, geared vessels and also for delivery via coaster cranes.

There are 4 potential exits from Harwich Port to join the A120 all of which have been explored and are discussed further in this report. All potential exits require barrier removal for all proposed trailers.

A selection of transport configurations have been submitted to the structural authorities who have structures on the proposed route from the port, which is via the A120. A formal Special Order application has been submitted to National Highways AIL Team in Birmingham to enable their regional area team contractors to respond to the requirements (WYNL/130).

There are several structures on the A120 trunk road, and a response has been received 17.07.24 from National Highways East in terms of their suitability for the proposed loads. The most significant structure would appear to be Bradfield Road (ID 13511) at Wix. The 24 and 28 axle girder frame trailers proposed have both been accepted without restrictions following the Abnormal Load Appraisal report provided by NH East Regions consulting engineers Atkins. 20 axle girder frame trailers and flattop trailers have been advised as unsuitable.

Essex County Council (Essex CC) have recently advised that they are now able to agree to the loads exiting the port of Harwich at the new eastern exit as the abnormal loads restriction on the Phoenix Bridge has been lifted. It is understood the bridge is 45HB, which is a design load considerate of heavy load access requirements, and as such will have reasonable heavy load

capacity. Essex County Council have confirmed that they have no structural restrictions on the remaining sections of the proposed route.

It should be noted that there is a structure located immediately prior to the proposed site access point. The structural status of this needs to be confirmed. It is however a small structure and if necessary temporary plating could be installed to enable AIL access. Following construction of the new haul road to the proposed site the structure would not be of concern.

A Swept Path Assessment (SPA) of the right turn into Bentley Road from the A120 has been carried out confirming the remedial works that are required in order to negotiate the turn which will be approached in contraflow on the eastbound carriageway. North Falls plans to undertake modification works to the alignment of the turn into Bentley Road and the SPA has been produced based on the plans currently proposed. This will require relocation of the telegraph pole. The conventional right turn would need the crash barriers removed on the centre of the carriageway, and it is understood that North Falls have discussed this junction with National Highways as part of wider project planning and there are no plans to remove the barrier even for temporary AIL access.

It may also be possible to consider the use of a flattop trailer from Harwich as there are no major overhead structures on the route. Such a trailer would have a higher running height in excess of the standard 5m and in terms of height restrictions there are 13 locations where wires cross along the A120 and Bentley Road to site. BT Openreach and the local electricity network distribution network operator (UK Power Networks) would need to carry out a survey to check the route and determine how many man hours are required to lift the wires. The survey would be charged, and full costs would be established after the survey. However, any flattop trailer would have to exit the port via the new eastern gate onto Phoenix Road due to the 5m safe clearance that limits access across the electrified railway line on the on the Station Road and Parkstone Bypass exits. At present this route is not structurally acceptable to Essex County Council so it is discounted at this time.

The proposed reactor will be delivered within Special Types General Order regulations (STGO) Category 3, where the gross load of the loaded trailer arrangement will be below 150te gross the move will not require a Special Order from National Highways. Due to a 110te weight limit on the A12 near Colchester, it has been necessary to divert via Colchester town centre. This route involves traveling under a low bridge with a 4.6m signed headroom. Site measurements do indicate additional clearance is available and depending on the final height of the reactors and associated road transport vehicles it is expected that the diversion route will be available., However, this will need to be reconfirmed once the reactor transport dimensions are known

In summary, the route from Harwich via the A120 is available for transformer transport in terms of structural clearance for 24 and 28 axle girder frame trailers.

This 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 marine and land transport feasibility investigations into achieving heavy load access for two transformers at 270te nett and reactors at 95te nett for future delivery to the proposed North Falls Offshore Wind Farm Onshore Substation Site east of Little Bromley, Essex.

1.2. This report is a summary of the status of the current AIL access investigations to the proposed site and seeks to present the situation as it presently 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.

1.3. This investigation considers the possible land transport routes from Harwich Port. Formal movement applications will be necessary upon appointment of a haulage contractor by the transformer manufacturer.

1.4. As the transformer is destined for a new area yet to be constructed, no detailed review of site access within the substation layout is included, this will need to be considered along with a detailed appraisal of the technical requirements for handling transformers on-site as the scheme progresses.

1.5. 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.

1.6. The report considers access to the proposed Substation site in terms of AIL transportation only.

2. National Highways Agreement in Principle and Legislative Requirements

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

2.1.1. The Department for Transport, of which National Highways (NH), 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).

2.1.2. 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.

2.2. *Legislation*

2.2.1. 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. National Highways have issued an aide memoir that explains notification requirements in more detail. This document has been attached as Appendix I.

2.2.2. Where dimensions exceed 6.1m in width, 30m in rigid length or 150 tonnes gross weight, Special Order from National Highways (NH) is required.

2.2.3. Special Order category AIL movements are authorised by the NH Abnormal Loads team, based in Birmingham. This is further discussed in section 3.3.

2.2.4. 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)

2.2.5. As the transformer is advised at 270te nett it therefore will be above 150te gross, and a Special Order permit and Agreement in Principle (AiP) would be required from NH. This would require the loads to be moved from the nearest available port, in line with the Department for Transports (DfT) 'Water Preferred Policy'.

2.3. *Water Preferred Policy Requirements*

2.3.1. 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 NH, will turn down the application where it is feasible for a coastal or inland waterway route to be used instead of road. NH 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 NH 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.

2.3.2. NH have advised (letter dated 21.03.24, AIP reference 872) that Special Order deliveries to the proposed North Falls On-Shore Substation, Great Bromley should be considerate of access from the Port of Harwich.

3. Abnormal Indivisible Load Movements - Highways Act 1980

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

3.1.1. 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 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.

3.2. *The Removal and Replacement of Street Furniture*

3.2.1. 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 circumstances the Highway Authority or LA will insist that their preferred contractors will carry out such work.

4. Transport Configurations

4.1. Based on the information available to date the transformer considered within this report is assumed to be 270te nett. The shunt reactor considered is assumed to be 95te. (Shown in Appendix 2).

4.2. At theses dimensions it is not possible to transport the transformers under the regulations governing Construction and Use (C&U) vehicles (44 tonne gross, 18.65m long and 2.9m wide). The weight of the shunt reactor considered in these investigations is 95te nett which is advised by RWE and as such will be transport at Special Types General Order (STGO) Category 3. It will therefore not be necessary to comply with legislation regarding Special Order movements for the reactor unit. As the load is not in need of Special Order permission there is no requirement by NH to be delivered via the nearest port of delivery.

4.3. As for the transformers, it is not possible within the Special Types General Order (STGO) regulations as the gross load will be in excess of 150te. It will therefore be necessary to comply with legislation regarding Special Order movements and to be delivered via the nearest port of delivery.

4.4. Based on information available at this moment in time it is assumed that the road transport configuration for the transformer would consist of a ballast tractor pulling a 20/ 28-axle girder frame trailer or a 16-axle flat top trailer.

4.5. The smaller shunt reactor would consist of a ballast tractor pulling a 5 axle bed 5 axle draw bar trailer for which the trailer element would weigh in the region of 141te. This has an expected reducible height of 4.650m based on the anticipated axle strokes for the trailer, though confirmation should be given by the appointed haulier as manufacturers can vary in equipment performance.

4.6. There are two main haulage contractors with equipment able to carry the transformer on a girder frame trailer in the UK, Allely's Heavy Haulage Ltd and Collett & Sons Heavy Haulage. Representative trailer arrangements have been produced and are included within Appendix 2 which shows the minimum turning radii and axle, wheel and overall ground loadings for girder frame.

4.7. As the route is relatively short from the Port of Harwich and also due to physical negotiability concerns from the A120 to the proposed site location a concept flat top trailer

has also been constructed as this could also be considered for transportation of the transformer as a high load from Harwich as there are no overhead structures on the route although consideration of overhead wires and vegetation is required.

4.8. This would avoid the need for larger girder frame trailers that are generally used for transformers of this size over longer journeys where loads have to pass underneath bridges. There are no overhead bridges on the routes from Harwich.

5. Marine Access

5.1. *Port of Harwich*

5.1.1. A site visit and meeting were held with the Harbour Master during April 2024. There are three possible offloading locations at Harwich, and these are detailed in the following notes and photographs that detail the facilities and the marine delivery options with additional information included within Appendix 3 as provided by the port. The three locations are Berth 1, Berth 3 and the General Cargo Berth.

5.1.2. The port is available for ro-ro, geared vessels and also for delivery via coaster cranes. Project cargo including wind turbines for on and offshore works and large cable drums have been offloaded at the port but not previously at the 270te weight required.

5.1.3. Vessels of up to 9.5m draft can be accommodated subject to tidal ranges. There is a 4m rise and fall that may need to be considered depending on the method of offloading. The length of the berth available is advised as 300m but with some current restrictions limiting vessels to approximately 200m Length Overall at the General Cargo Berth at present.

5.1.4. Storage is also advised to be available either short or long term on the project quay.

5.1.5. Berths No 1 and Berth No 3 could impact and would therefore need to avoid ferry offloading periods on the daily ferry operations, which are presently understood to be 4 a day. Any offloading operation at these berths would need to avoid ferry loading and offloading periods. This may make the use of large mobile cranes difficult to agree, not in terms of technical requirements, but in terms of the impact on other port traffic. This would be increased by the time needed to mobilise a large crane and demobilise as well as undertaking the lift itself. The use of geared vessels and roro barges may be preferable to the port at these berths due to the lesser impact port side on other traffic, but the exact requirements will be confirmed at the time of requirement with the port.

5.1.6. The port of Harwich have advised that there is a 4te/m^2 limit on the quays through the port area and any lifting plans will need to be approved. This may require additional load spreading to reduce loads to acceptable levels.

Photograph 1
View of Berth 3, there is a 4te/m² limit on the quays through the port area. No specific stand back distance is advised, and it is understood loads can be up to this figure up to the quay edge.

Photograph 2
Gate exit on the left of the Photograph from the Port on to Station Road.

Photograph 3
Maximum headroom 5m barrier restriction would require removal.

Photograph 4
Alternative view from level crossing looking back at port exit gate. 5m safe clearance limit advised due to electrified railway line.

5.1.7. The Network Rail Standard Caution for crossing a level crossing with an AIL is detailed below for information.

"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."

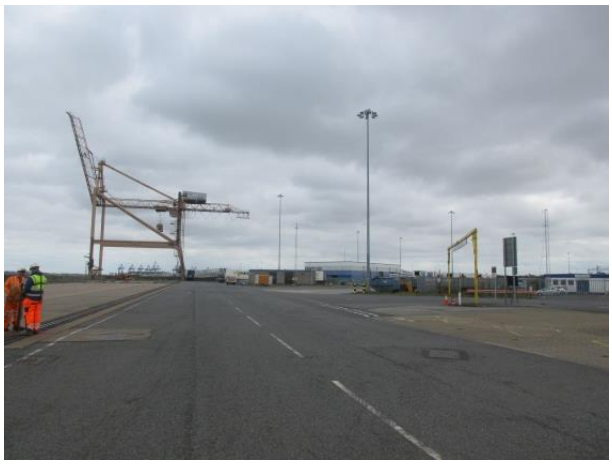
Photograph 5
View of Berth 1, there is a 4te/m^2 limit on the quays through the port area. No specific stand back distance is advised, and it is understood loads can be up to this figure up to the quay edge.

Photograph 6
View of Berth 1, there is a 4te/m² limit on the quays through the port area. No specific stand back distance is advised, and it is understood loads can be up to this figure up to the quay edge.

Photograph 7
Gate exit from Berth 1 onto the cruise terminal leading to East Dock Road or Phoenix Road.

Photograph 8
Alternative view looking back at Berth 1 gate exit from the cruise terminal.

Photograph 9
Two max headroom 5m barriers prior to East Dock Road would require removal



Photograph 10
View of General Cargo Berth, there is a 4te/m² limit on the quays through the port area. No specific stand back distance is advised, and it is understood loads can be up to this figure up to the quay edge.

Photograph 11
Third exit with no overhead restrictions leading to Phoenix Road.

6. Physical Restrictions Affecting a Road Movement

6.1. *General*

6.1.1. The weight and/or dimensions of the components may be such that they are only transportable on specialised transporters, the general arrangements of which are discussed further in Section 5. An AIL 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.

6.1.2. 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 7 and 8.

6.2. *Headroom*

6.2.1. 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 m (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 m (16'3") to allow for a safe margin.

Library Photograph 1
Unmarked bridges provide a minimum height clearance ≥5.03 m. 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.

6.2.2. 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.

6.2.3. 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.

6.2.4. Although there is no legal limit on the travelling height of a load, the DfT does advise hauliers to inform the Distribution Network Operators (DNOs), British Telecom (Openreach) and any other company with overhead service lines, of the route of proposed movements with a travelling height in excess of 5.0 m. This enables arrangements to be made for temporary or permanent re-arrangement of facilities.

6.2.5. 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 – 5.8 m
- Exceeding 33000 Volts but Not Exceeding 66000 – 6.0 m
- Exceeding 66000 Volts but Not Exceeding 132000 – 6.7 m
- Exceeding 132000Volts but Not Exceeding 275000 – 7.0 m
- Exceeding 275000 Volts but Not Exceeding 400000 – 7.3 m

6.2.6. 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 off point of 16'6" (5.03 m). 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).

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

6.2.7. No liaison with national or regional electricity companies or with British Telecom (Openreach) has been carried out at this stage.

6.3. *Negotiability*

6.3.1. 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.

6.3.2. 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.

6.3.3. The negotiability of the proposed routes are detailed within Section 8.

6.4. *Structural Capability and Highway Capacity*

6.4.1. 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.

6.4.2. Bridges in Great Britain were previously designed and constructed in accordance with the loading standard set down in British Standard BS 5400-2:2006 Steel, concrete and composite bridges. Although this standard is no longer current it is still referenced in some structural assessment data. In 2020 there were significant changes in standards for the management and assessment of structures as part of a review of the Design Manual for Roads and Bridges (DMRB) by the Department for Transport/National Highways. The DMRB is accessed from the Standards for Highways website, but in a new format for accessing the DMRB documents as of March 2020. Many of the latest revisions were needed to bring DMRB documents up to date with the new document reference codes and titles. Examples of documents where assessment codes have changed as relevant to AILs are detailed below.

- CS 458 The assessment of highway bridges and structures for the effects of special type general order (STGO) and special order (SO) vehicles
- CS 470 Management of sub-standard highway structures

6.4.3. Previous standards were 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. 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.

6.4.4. 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.

6.4.5. 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 m respectively. The effects of the most severe of these cases must be adopted. The overall vehicle width is taken as 3.5 m. In all cases, the longitudinal axis of the HB vehicle is taken as parallel to the lane markings.

6.4.6. 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. It is known that if a road meets a particular HB loading standard, it is necessary to assess routes with respect to individual loads. However, if bridges have been designed to meet a known standard this greatly assists the assessment process.

6.4.7. 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. 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.

6.4.8. The new codes referenced above in document CS 458 The assessment of highway bridges and structures for the effects of special type general order (STGO) and special order (SO) vehicles now refer to SOV Vehicles of carrying load arrangements from 80te to 196te for STGO loads and from SOV 250 to SOV 600 for Special Order loads. These are now used in new assessments and compared against former HB ratings and to ascertain whether AILs are able to safely use the structures on a prescribed route.

6.4.9. Road crust, which is the pavement layer above the substructure 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.

6.4.10. 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.

6.4.11. Underground Services also need to be considered in terms of road capacity. 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. 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.

6.4.12. 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 C&U 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. 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 to the public highway as a result of the movements by the terms of the Special Orders.

6.4.13. In terms of private site access roads, haulage contractors would expect the end client to be able to confirm that access roads are designed to accommodate proposed loadings. If this is not possible then additional geotechnical investigations may be necessary.

6.4.14. The structural status of the proposed routes are detailed within Section 8.

6.4.15. A slow moving abnormal load generally imposes less impact loading than a relatively fast moving vehicle permitted under the C&U Regulations. This helps to mitigate the effect of the additional wheel loading imposed by the abnormal load.

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

7.1. *Width of Highway*

7.1.1. 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.

7.1.2. 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 as 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.

7.1.3. 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.

7.2. *Fences and Verges*

7.2.1. 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.

7.3. *Over-sail*

7.3.1. Over-sail is a common occurrence when moving large components. 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.

7.3.2. 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.

7.3.3. 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 landowner (and 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 landowner could be faced with an injunction.

7.3.4. 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.

7.3.5. 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.

8. Structural Route Information Special Order

8.1. The routes considered in the structural checks to the proposed substation from the Port of Harwich are shown below. The routes are also illustrated in map 1 sheet 2 appended to this report.

8.2. *Proposed Route 1*

Exit the Port of Harwich via one of the three possible exits onto A120 westbound
Continue A120 through Wix
Turn right Bentley Road (travelling A120 contraflow)
Turn left on to Haul Road that is to be constructed to site at approx. OS Grid Reference TM 10529 27470

8.2.1. There were 4 potential routes that were explored regarding the exit from the Port of Harwich to the A120. The Port exit routes are also illustrated in map 1 sheet 1 appended to this report and listed below:

8.3. *Option 1 via Parkeston Bypass*

Exit port of Harwich via AIL gates onto A136 Parkstone Bypass
Continue past supermarket
Turn right A120
Continue as route 1 above

8.3.1. The first exit from the Port of Harwich via Station Road, and Parkeston Bypass involves crossing the Dovercourt River Bridge on the A136 and Bathside Culvert on the A120 are owned by Essex County Council (ECC) who have advised them to be structurally acceptable for all trailers proposed via emails dated 24.06.24 and a meeting held 28.06.24.

8.4. *Option 2 via Phoenix Road*

Exit port of Harwich via new Pheonix Road eastern road
Turn right A120
Continue as route 1 above

8.4.1. The second exit is via the ports New East Access Road onto Phoenix Road and turning right onto the A120, this route was initially rejected structurally on the Phoenix Road Bridge on all abnormal load vehicles by ECC. Following recent discussions with ECC as to the rejection and the blanket restriction that has been set on the Phoenix Road Bridge, ECC have confirmed during a phone conversation on 05.07.24 the restriction has been lifted to allow AILs as the bridge has a 45HB rating and as such is now an acceptable route option.

8.5. *Option 3 via Station Road*

Exit port of Harwich via Station Road and West Dock Road
Turn left Station Road
Turn right A120
Continue as route 1 above
Note. There is another exit via West Dock Road that avoids the security gateposts on Station Road exit that can also be considered.

8.5.1. The third option exiting the Port via Station Road as per the first exit and continuing onto West Dock Road although the road layout from this point was altered, with the historic roundabout removed and replaced by a new junction between 2000 and 2005. A grass island with street furniture and underground services separates West Dock Road from continuing straight to join Station Road. A 180° turn using Foster Road is not negotiable for the trailers considered here. The depth and status of the underground services would need to be confirmed in order to cross over the island. Any temporary access route would need to be considerate of underground services and would be subject to further engineering studies as well as confirmation that any proposal for temporary access were acceptable to ECC as the highway authority.

8.5.2. The fourth option encounters the same issue from West Dock Road although approaching from the Western exit from the Port using the access road adjacent to the rail line. A return to the previous alignment would benefit heavy AIL access if the structures on the other routes needed to be avoided.

8.6. *All Routes West of Harwich*

8.6.1. Once out of the port of Harwich and on the A120 responsibility for the highway lies with National Highways (NH) East Region. A formal response has been received 17.07.24 from NH East Region regarding the structural capacity of the route, which was sent for assessment with their consulting engineers, Atkins on 30.05.24. Following their Abnormal Load Appraisal (Shown in Appendix 4) they have concluded the 24 and 28 axle girder frame trailers are acceptable over the 5 NH East Region structures assessed without restrictions. The Bradfield Road Bridge at Wix was however found not to be sufficient to carry the load on the smaller 16 axle flat top trailer or 20 axle girder frame trailer.

8.6.2. It should be noted that there is a highway structure located immediately prior to the proposed site access point. The structural status of this needs to be confirmed and there are no records of the structure on the NH ESDAL system. It is however a small structure and if necessary temporary plating could be installed to enable AIL access although the exact requirements will need to be confirmed with ECC as the highway authority. However, following construction of the new haul road to the proposed site the structure would not be of concern.

8.7. No specific issues have been identified by the police although a police escort would be required for movement the with private escort arrangements also in place and it is recommended that further discussions are undertaken with respect to confirming escort requirements prior to deliveries with the relevant police forces. Very careful consideration

on escort requirements will be needed and where traffic must be halted, consultation with the police is necessary as only police escorts can manage the movement. Private escorts are not allowed to direct traffic.

9. Route Negotiability Information Transformers at Special Order

9.1. *Route 1 via Parkeston Bypass from the Port of Harwich*

Photograph 12
Port of Harwich AIL gate onto Parkstone Bypass. Vehicle travels towards the camera following exit from the 'Wide Load Gate' shown below. Negotiable.

Photograph 13
'Wide Load Gate' exiting the Port of Harwich.

Photograph 14
View from the 'Wide Load Gate' looking at the exit of the Port of Harwich. Negotiable.

Photograph 15
Vehicle travels away from the camera crossing the Dovercourt Dock River Bridge (All vehicles accepted by Essex CC).

Photograph 16
Vehicle travels away from the camera on A136 Parkeston Bypass approaching the Morrisons roundabout, centre island street furniture removal would be required to negotiate.

Photograph 17
Vehicle travels away from the camera approaching St Nicholas Roundabout to take second exit joining A120. Centre island furniture removal would be required.

Photograph 18
Vehicle travels away from the camera on St Nicholas Roundabout approaching exit onto A120.

Photograph 19
Vehicle travels away from the camera A120 approaching Parkeston Road crossing Bathside Culvert (All vehicles advised as accepted by Essex CC).

Photograph 20
Bathside Culvert.

Photograph 21
Alternative view of Bathside Culvert.

Photograph 22
Vehicle travels away from the camera on Parkeston Roundabout, negotiable.

Photograph 23
Vehicle travels away from the camera continuing on A120, negotiable.

9.1.1. It is understood that there are plans for a new housing estate on this section of the A120 that will involve the construction of a new roundabout. Wynns are of the view following a dimensional check of the proposed new roundabout as shown in Persimmon Homes Drawing Number 830_010_WLD_XX_XX_DR_CH_0001 (A07). General Arrangement that it would be negotiable for the trailers considered with the appropriate street furniture removal. There should be no protrusions above ground level positioned in the swept area, or should street furniture be installed as shown, it should be easily de-mountable. Oversail on the outside of the turn approaching the island and oversail on the inside on the centre island would be necessary and it is expected that some further oversail on the outside of the turn would be needed as the vehicle exits the island. See A120 General Arrangement Check Appendix 5. These observations are high level and would need to be confirmed by checking the final design drawings in AutoCAD format.

Photograph 24
Vehicle travels away from the camera on A120 road narrows but remains negotiable approaching B1352 roundabout.

Photograph 25
Vehicle travels away from the camera A120 approaching B1352 roundabout, street furniture removal required to negotiable roundabout.

Photograph 26
Vehicle travels away from the camera approaching B1352 roundabout, street furniture removal would be required.

Photograph 27
Vehicle travels away from the camera on B1352 roundabout

Photograph 28
Vehicle travels away from the camera exiting roundabout onto A120 Tinker Street, street furniture removal required in order to negotiate.

Note: roundabout could be negotiated in contraflow with less street furniture removal.

Photograph 29
Vehicle travels away from the camera on A120 Tinker Street, full occupation of carriageway required. Traffic management and escort requirements will need to be agreed with Essex Police by the appointed haulage contractor prior to movement.

Photograph 30
Vehicle travels away from the camera continuing A120 Harwich Road, full occupation of carriageway required.

Photograph 31
Vehicle travels away from the camera continuing A120 Harwich Road, full occupation of carriageway required, and tree pruning may be required depending on time of movement.

Photograph 32
Vehicle travels away from the camera on A120 Wix Bypass crossing Bradfield Road Bridge (formal response received from NH East Region, 24 & 28 axle girder frame trailers accepted without restriction).

Photograph 33
View of A120 Bradfield Road Bridge from Bradfield Road.

Photograph 34
Vehicle travels away from the camera on A120 possible rest area at approx. OS Grid Reference TM 13823 27766.

Photograph 35
Vehicle travels away from the camera approaching B1035 Horsely Cross roundabout, SPA Drawing Number 24-1232SPA02 refers. Street furniture removal required.

Photograph 36
Vehicle travels away from the camera crossing B1035 roundabout Drawing Number 24-1232SPA02 refers. Street furniture removal required.

Photograph 37
Vehicle travels away from the camera exiting the B1035 roundabout. Street furniture removal required.

Photograph 38
Vehicle travels away from the camera on A120, full occupation of carriageway required.

Photograph 39
Vehicle travels away from the camera on A120 towards Bentley Road.

Note: vehicle to contraflow and turn right onto Bentley Road.

Photograph 40

Vehicle travels away from the camera in contraflow on A120 turning right onto Bentley Road, Drawing Number 24-1232SPA01 details negotiability for the 28-axle girder frame trailer based on the new RWE road layout, street furniture removal would be required, including the electricity pole to the right hand side of the entrance to Bentley Road. Based on where the pole is and expected oversail, it would require removal and it is understood that RWE are in discussions with Essex CC and UK Power Networks on this matter.

9.1.2. To travel A120 conventionally the central reservation would need to be removed to carry out right turn onto Bentley Road which is advised by RWE to not to be an option due to wider concerns with road safety.

Photograph 41

Vehicle travels towards the camera on A120 in contraflow turning right onto Bentley Road, Drawing Number 24-1232SPA01 details the negotiability for 28-axle trailer on the new RWE proposed road layout, street furniture removal required.

Photograph 42
View from Bentley Road of A120, vehicle travels towards the camera. Drawing Number 24-1232SPA01 refers.

Photograph 43
Vehicle travels towards the camera following right turn from A120 in contraflow. Drawing Number 24-1232SPA01 refers.

Photograph 44
View of Benley Road from the central reservation on A120. Showing street furniture, electrical pole, centre island and fencing and hedges to the left.

9.1.3. A number of overhead wires (telecom and electricity) are encountered from this point to the proposed site access, If a flattop trailer was to be used, BT Openreach would need to

carry out a survey to check the route and determine how many man hours are required to lift the wires. The survey would be charged, and full costs would be established after the survey. Haulage contractor to arrange with BT Openreach.

9.1.4. None of the wires were observed as being of low height and as such no major issues are expected for transport on girder frame trailers although confirmation of heights before movement would be advisable by the appointed haulage contractor to ensure there is no conflict. If necessary temporary lifting can be facilitated with the relevant asset owners.

Photograph 45
Environmental weight restriction sign upon turn into Bentley Road.

Photograph 46
Vehicle travels away from the camera on Bentley Road, tree pruning may be required depending on time of movement. North Falls are proposing road widening of Bentley Road from the A120 to the site access point to 6.5m wide and the final section of route will therefore be negotiable when these improvements have been implemented.

Photograph 47

Vehicle travels away from the camera continuing on Bentley Road, tree pruning may be required depending on time of movement. Full occupation of highway required.

Photograph 48

Vehicle travels away from the camera continuing on Bentley Road, tree pruning may be required North Falls are proposing road widening of Bentley Road from the A120 to the site access point to 6.5m wide and the final section of route will therefore be negotiable when these improvements have been implemented.

Photograph 49

Vehicle travels away from the camera continuing on Bentley Road, tree pruning may be required depending on time of movement.

Photograph 50

Vehicle travels away from the camera continuing on Bentley Road, tree pruning may be required depending on time of movement. Example of location where overhead wires may need to be lifted.

Photograph 51

Vehicle travels away from the camera continuing on Bentley Road, tree pruning may be required depending on time of movement. The road bends to the right. North Falls are proposing road widening of Bentley Road from the A120 to the site access point to 6.5m wide and the final section of route will therefore be negotiable when these improvements have been implemented.

Photograph 52

Vehicle travels away from the camera on Bentley Road, approximate location for haul road to the proposed site that is to be constructed ahead at approx. OS Grid Reference TM 10529 27470

Photograph 53
Approximate location for haul road to the proposed site that is to be constructed from this point approx. OS Grid Reference TM 10529 27470.

It should be noted that there is a highway structure located immediately prior to the proposed site access point. The structural status of this would need to be confirmed. It is however a small structure and if necessary temporary plating could be installed to enable AIL access, however, following construction of the new haul road to the proposed site the structure would not be of concern.

Photograph 54
View of highway culvert.

9.2. *Option 2 via Phoenix Road*

Photograph 55

Vehicle travels towards the camera following exit from the new East Port of Harwich access Road. Barrier fencing and centre island furniture would require removal to negotiate. Approximately 3.2m width from the centre island to the kerb edge. Kerb would need to be levelled due to height to enable trailer overrun. The gate measures approximately 8m wide.

Photograph 56

Vehicle travels away from the camera on Phoenix Road following barrier exit from the east access road of the Port of Harwich, road bends to the right and crossing roundabout, negotiable.

Photograph 57
Vehicle travels away from the camera continuing on Phoenix Road, negotiable.

Photograph 58
Vehicle travels away from the camera approaching roundabout to join A120.

Photograph 59
Vehicle travels away from the camera joining A120 roundabout.

Photograph 60
Vehicle travels away from the camera exiting roundabout onto A120.

Photograph 61
Vehicle travels away from the camera on A120 crossing Phoenix Road Bridge (now approved by Essex CC on all vehicles proposed)

Photograph 62
Vehicle travels away from the camera on A120 towards St Nicholas Roundabout, centre island street furniture removal required.

Photograph 63
Vehicle travels away from the camera over St Nicholas Roundabout to continue as route 1.

9.3. *Option 3 via Station Road*

9.3.1. The previous road layout continued straight onto Station Road although this has since been grassed over and services laid underground and therefore may not be suitable for AILs without major remedial works. As access via the Parkstone Bypass has been structurally approved by Essex CC it is not recommended that this access is considered further. However, the following notes and photographs detail the current road layout for information.

Photograph 64
Vehicle travels away from the camera following exit of the Port of Harwich via West Dock Road, road bends 90°.

Photograph 65
Reverse view of above, looking back at West Dock Road showing services in grass island between West Dock Road and Station Road. Any temporary access route would need to be considerate of underground services.

Photograph 66

Vehicle travels away from the camera on West Dock Road, right turn onto Foster Road not negotiable, SPA required to confirm amount of overrun onto grass island and amount of street furniture removal required. Plating and packing would be required to cross grass island and any design to be considerate of underground services.

Photograph 67

Reverse view of above, vehicle travels towards the camera onto Station Road.

Photograph 68

Vehicle travels away from the camera on Station Road, full occupation on carriageway required, tree pruning may be required depending on time of movement.

Photograph 69
Vehicle travels away from the camera approaching Parkeston Roundabout, centre island and additional street furniture removal would be required, SPA required to confirm.

Photograph 70
Vehicle travels away from the camera on Parkeston Roundabout. Street furniture removal required.

Photograph 71
Vehicle travels away from the camera exiting Parkeston Roundabout onto A120, negotiable.

10. Structural Route Information Reactors at STGO

10.1. *STGO Reactor Route 1*

10.1.1. As previously highlighted, STGO loads are not restricted to the nearest port. It is reasonable to assume that the reactors would be shipped to a suitable east coast port such as Hull or Immingham which are well served by European ferry services for heavy haulage, from where established AIL routes to the M25 would be used. Therefore, consultation on the route from the M25 to the site has been undertaken. This would be initially expected to be directly via the A12 to the A120 north east of Colchester.

10.1.2. East Anglian Ports such as Ipswich, Kings Lynn, Lowestoft, Felixstowe and Harwich itself are not regularly served by ferry traffic for AILs and are unlikely to be used for STGO loads unless specific route restrictions mean that the charter of heavy lift shipping to such a port would be needed. In the event of such a requirement, then the most suitable port would be Harwich, although as stated, this is not a legislative requirement under STGO regulations.

10.1.3. The STGO route as listed below was suggested by NH East Region following the rejection of the initial proposed route along the A12 due to a 110te weight limit on Orchard Railway Bridge between junctions 27 and 28 at approximate OS Grid Reference TL 97196 26416. The 110te weight limit is a significant concern and it is understood that Essex CC are highlighting this to NH East Region as any diversion has a significant impact on them.

10.1.4. It was suggested to exit at junction 27 and continue through Colchester and rejoin the A12 at junction 28 to avoid the structure, which was initially thought not to be an option due to a low bridge on the A134, LTN1/207 North Station Road listed as 4.6m in height. Following the route survey, detailed in Section 11, it was measured to be in fact 4.9m height at the lowest point, therefore negotiable for the proposed 5 bed 5 axle draw bar trailer proposed. When surveying the route it was found, an additional SPA would be required for the right turn onto Mill Road, therefore an alternative route was surveyed as listed below which avoids the need for the SPA on the right turn onto Mill Road as it continues A134 onto Turner Road providing a more direct route to junction 28. No structural issues have been advised by Essex CC on this route.

10.1.5. No further structural issues have been advised following the ESDAL notification submission.

Exit M25 junction 28 via A12
Exit A12 junction 27 via A133 Cymbeline Way
Turn left A134
Continue A134 Turner Road
Continue A134 Northern Approach Road
Continue A134 Via Urbis Romanae
Continue as STGO Reactor route 1

10.1.6. In the event loads did exceed the 4.9m low bridge clearance height and a suitable diversion to avoid the 110te weight limit could not be secured, then it would be possible to ship the reactors to Harwich and transport via road on the route detailed for heavier transformers. Therefore, although there are issues with access for reactors, they can be avoided.

11. Route Negotiability Information Reactors at STGO

11.1. *STGO Reactor Route 1*

Photograph 72
Vehicle travels away from the camera exiting A12 junction 27.

Photograph 73
Vehicle travels away from the camera towards Spring Lane Roundabout, 2nd exit onto A133 Cymbeline Way, negotiable.

Photograph 74
Vehicle travels away from the camera exiting Spring Lane Roundabout onto A133 Cymbeline Way.

Photograph 75
Vehicle travels away from the camera on A133 Cymbeline Way, tree pruning may be required depending on time of movement.

Photograph 76
Vehicle travels away from the camera approaching Colne Bank Roundabout, negotiable.

Photograph 77
Vehicle travels away from the camera exiting Colne Bank Roundabout onto A134.

Photograph 78
Vehicle travels away from the camera approaching Essex Hall Roundabout, negotiable.

Photograph 79
Vehicle travels away from the camera exiting Essex Hall Roundabout to continue A134, negotiable.

Photograph 80
Vehicle travels away from the camera on A134 approaching Station Road Bridge.

Photograph 81

Station Road low bridge is signed at 4.6m height and Essex CC advised the safe clearance height of 4.53m, however, when surveyed the bridge measured 4.9m from front beam, 5.18m from the centre beam and 5.02m from the rear beam, sufficient height for the 5 bed 5 trailer proposed (4.850m running height, reducible to 4.650m).

Photograph 82

Vehicle travels towards the camera following passing under Station Road Bridge.

Photograph 83

Vehicle travels away from the camera on A134 to join Turner Road, negotiable.

Photograph 84
Alternative view of continuing A134 passing through the N Station Roundabout.

Photograph 85
Vehicle travels away from the camera A134 approaching left bend A134 Turner Road, negotiable.

Photograph 86
Vehicle travels away from the camera A134 Turner Road, negotiable.

Photograph 87
Vehicle travels away from the camera A134 Turner Road, continuing to Northern Approach Road, negotiable.

Photograph 88
Vehicle travels towards the camera A134 Northern Approach Road, negotiable.

Photograph 89
Vehicle travels towards the camera continuing on A134 Via Urbis Romanae, negotiable.

Photograph 90
Vehicle travels towards the camera on A134 Via Urbis Romanae, negotiable.

Photograph 91
Vehicle travels towards the camera on A134 Via Urbis Romanae approaching roundabout, negotiable.

Photograph 92
Vehicle travels away from the camera exiting the roundabout to continue on Via Urbis Romanae, negotiable.

Photograph 93
Vehicle travels away from the camera approaching roundabout prior to crossing over the A12, negotiable.

Photograph 94
Vehicle travels away from the camera exiting the roundabout crossing over the A12, negotiable.

Photograph 95
Vehicle travels away from the camera on Via Urbis Romanae crossing A12 'Cuckoo Farm Gateway' Road Bridge (NH East Region) and approaching roundabout, negotiable.

Photograph 96
Vehicle travels away from the camera exiting the roundabout, rejoining the A12, negotiable.

12. Summary and Conclusions

12.1. The NH Abnormal Loads Team, who authorise Special Order permissions has provided an Agreement in Principle (AIP) for the new substation to be facilitated from the Port of Harwich in line with the Department for Transport's Water Preferred Policy which requires Special Order AILs to be transported from the nearest suitable port.

12.2. The Port of Harwich can be considered for marine delivery of the heavy AILs. Various marine delivery options are available at the port.

12.3. Essex CC have advised that that Route 1 from the Port of Harwich via the East Dock Road and crossing the Dovercourt Dock River Bridge and Bathside structures is structurally acceptable for the 270te Transformer on all trailers proposed. Essex CC have recently advised that all vehicles are now acceptable via the second potential port exit which crosses the Phoenix Road as the abnormal load restriction has now been lifted..

12.4. It should be noted that there is a highway structure located immediately prior to the proposed haul road that is to be constructed from Bentley Road. The structural status of this needs to be confirmed and there are no records of the structure on the NH ESDAL system. It is however a small structure and if necessary temporary plating could be installed to enable AIL access although the exact requirements will need to be confirmed with ECC as the highway authority. However, following construction of the new haul road to the proposed site the structure would not be of concern.

12.5. There are several structures on the A120 trunk road and following the response (17.07.24) from National Highways East Region in terms of their suitability for the proposed loads the most significant structure would appear to be Bradfield Road (ID 13511) at Wix. Structural clearance has been approved for the proposed 24 and 28 axle girder frame trailers without restrictions. 20 axle girder frame trailers and flattop trailers have been advised as unsuitable.

12.6. A SPA of the turn from the A120 onto Bentley Road has been carried out for the 28-axle girder frame trailer based off of the new RWE proposed road layout. Remedial works will be required, and RWE are in discussions with Essex CC as to the permanent improvement works at this junction to enable not only AILs but wider site construction traffic.

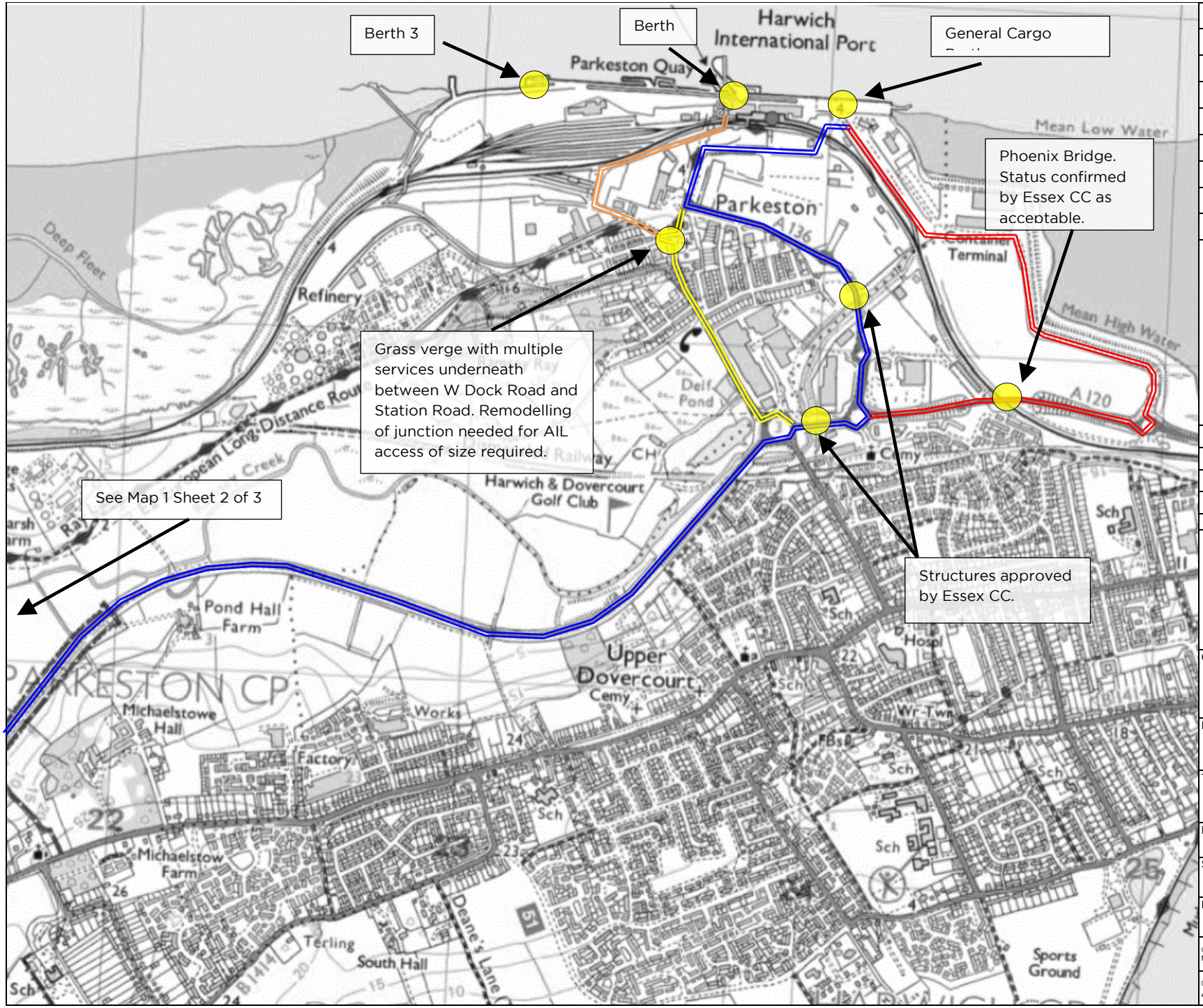
12.7. North Falls are proposing road widening of Bentley Road from the A120 to the site access point to 6.5m wide and the final section of route will therefore be negotiable when these improvements have been implemented.

12.8. In summary, the route from Harwich via the A120 is available for transformer transport in terms of structural clearance for 24 and 28 axle girder frame trailers.

12.9. The proposed reactor will be delivered within Special Types General Order regulations (STGO) Category 3, where the gross load of the loaded trailer arrangement will be below 150te gross the move will not require a Special Order from National Highways. Due to a 110te weight limit near Colchester, it has been necessary to divert via Colchester town centre. This route involves traveling under a low bridge with a 4.6m signed headroom. Site measurements do indicate additional clearance is available and depending on the final height of the reactors and associated road transport vehicles it is expected that the route will be available., However, this will need to be reconfirmed once the reactor transport dimensions are known.

Appendix 1

Maps



Key

	Route 1 via Parkstone Bypass
	Route 2 via new East access road
	Route 3 via Station Road
	Alternative Route to Station Road
	Approximate Cable Route
	Point of Interest
	Proposed Substation Site
	SPAs Required

Rev	Date	Amendments:
B	16.07.24	Third Issue
A	12.07.24	Second Issue
0	12.04.24	First Issue

Revisions

Wynns Ltd.
Independent Transportation Consultants.

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

Client: North Falls Offshore Wind Farm

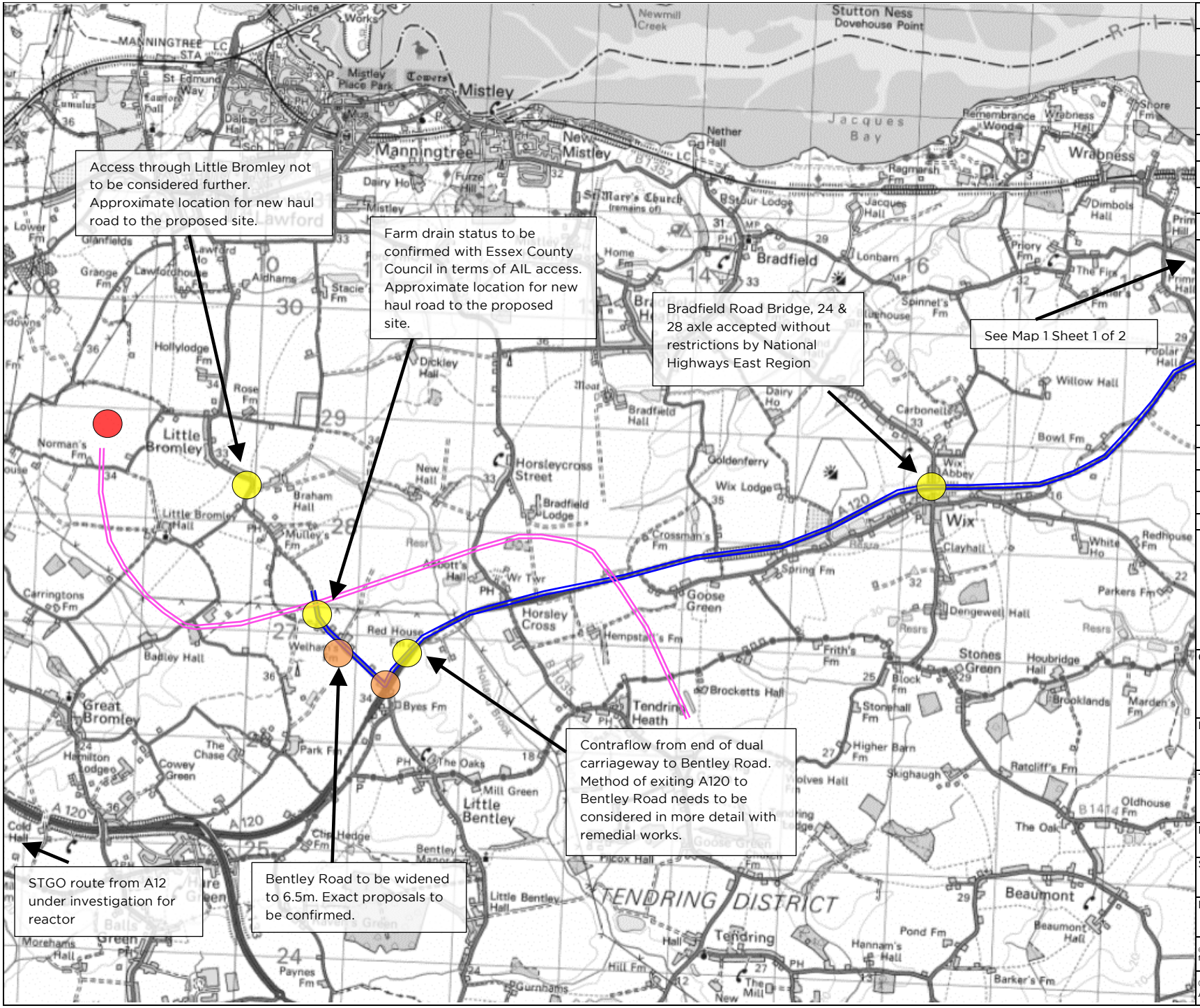
Project: North Falls Proposed On-shore Substation Site

Title: Map 1 – Routes from Harwich Port proposed North Falls Substation Site

Drawing Status: Final Report

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

Ref No.:	Sheet:	Rev.:
24-1232 Map1	1 of 2	2



Key

	Route 1
	Route 2
	Route 3
	Alternative Route to Station Road
	Approximate Cable Route
	Point of Interest
	Proposed Substation Site
	SPAs Required

Rev	Date	Amendments:
B	19.07.24	Third Issue
A	12.07.24	Second Issue
0	12.04.24	First Issue

Revisions

Wynns Ltd.
Independent Transportation Consultants.

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

Client: NORTH FALLS Offshore Wind Farm

Project: North Falls Proposed On-shore Substation Site

Title: Map 1 – Routes from Harwich Port proposed North Falls Substation Site

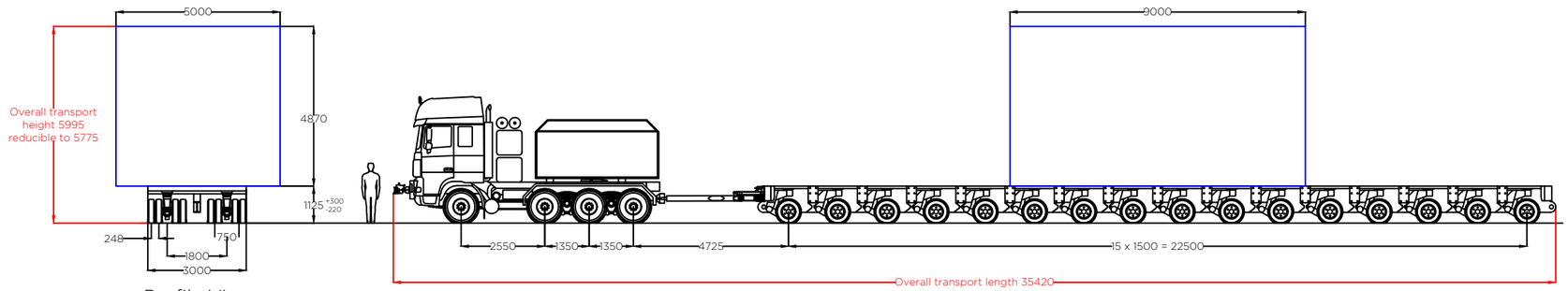
Drawing Status: Final Report

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

Ref No.:	Sheet:	Rev.:
24-1232 Map1	2 of 2	2

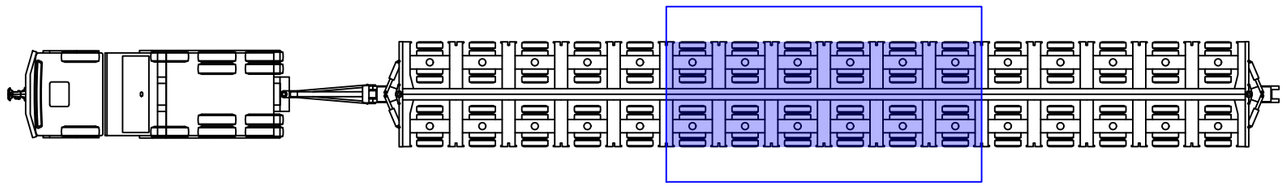
Appendix 2

Drawings

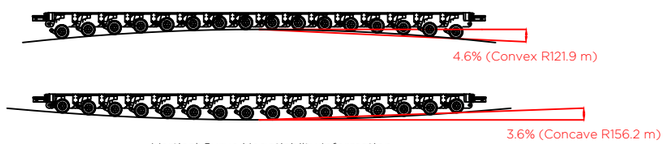


Profile View
Scale 1:175

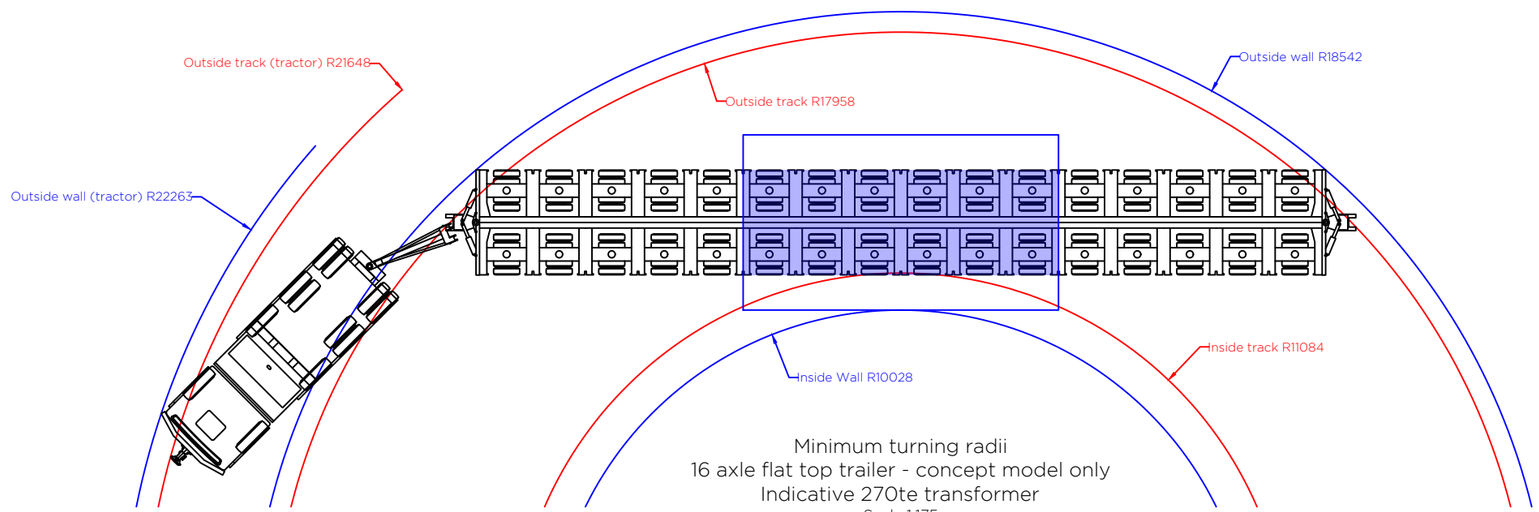
Elevation View - 16 axle flat top trailer - concept model only
Indicative 270te transformer
Scale 1:175



Plan View - 16 axle flat top trailer - concept model only
Indicative 270te transformer
Scale 1:175



Vertical Curve Negotiabilty Information
based on manufacturers literature
Scale: 1:350



Minimum turning radii
16 axle flat top trailer - concept model only
Indicative 270te transformer
Scale 1:175

Load Table

16 axle flat top trailer	
Self weight of load	270.0 te
Self weight of trailer	56.0 te
Total combined weight	326.0 te
Load per axle line	20.38 te
Load per axle	10.186 te
Load per wheel (4 per axle)	2.55 te
Overall ground bearing pressure	4.83 te/m²

Tractor (42 te)	
Front axle	8.0 te
Second steer	10.0 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 millimetres unless stated otherwise.

[4] Consideration to be given to transformer COG. Assumed to be central to trailer, exact positioning to be confirmed.

[5] Lifting/Transport Lug locations are subject to design of the transformer and will need to be confirmed.

Rev.	Date	Amendments
1	12.07.24	Client Logo Updated
0	25.03.24	Issued for comment

Revisions

Prepared By:

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Tel: (01785) 850411

Independent Transportation Engineers

Client:

NORTH FALLS
Offshore Wind Farm

Project:

North Falls Offshore Wind Farm

Title:

Indicative Transport Configuration of
270 te transformer carried on 16 axle flat top trailer
showing minimum turning radii

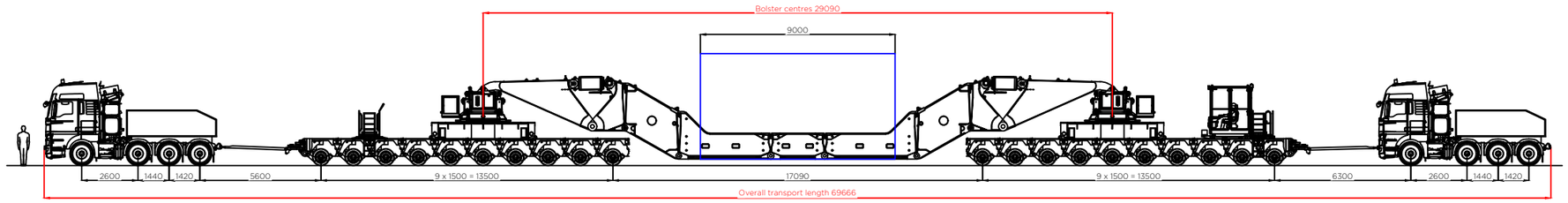
Drawing Status:

Final report

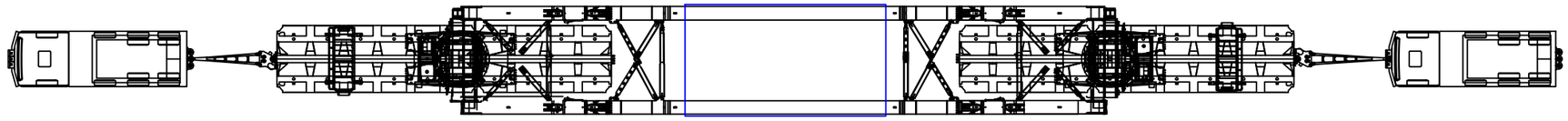
Scale (A3):	Drawn By:	Checked By:
As shown	JMB	PW

DWG. No:	Sheet:	Rev:
24-1232.TC04	1 of 1	1

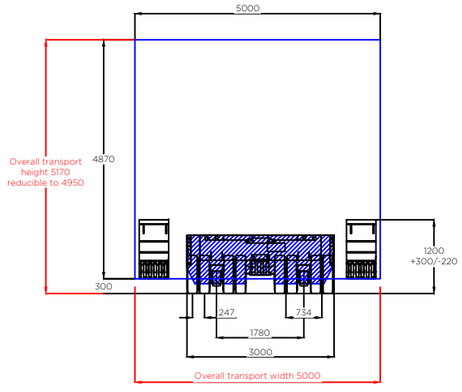
P:\Clients\Existing Clients\RWE\24-1232 North Falls Offshore Wind Farm\Transport Configuration\24-1232.TC04 North Falls Offshore Wind Farm 270te transformer 16 axle flattop.R0.dwg



Elevation view - 20 axle girder frame trailer - concept model only
Indicative 270 te transformer
Scale 1:250



Plan view - 20 axle girder frame trailer - concept model only
Indicative 270 te transformer
Scale 1:250

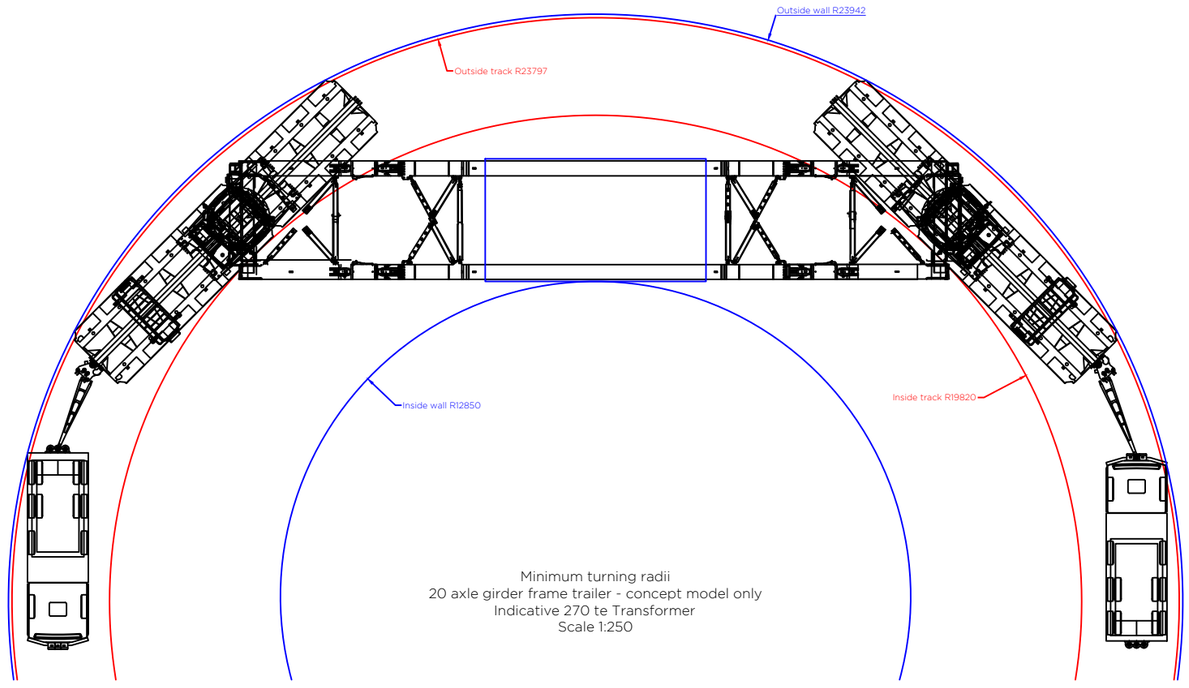


Profile view
Scale 1:125

Note: Exact Carrying Height and Packing Method to be Confirmed by Appointed Haulier

CoG is assumed to be central to trailer, exact positioning to be confirmed.

Lifting/Transport Lug locations are subject to design of the transformer and will need to be confirmed.



Minimum turning radii
20 axle girder frame trailer - concept model only
Indicative 270 te Transformer
Scale 1:250

Load table	
20 axle girder frame trailer	
Self weight of transformer	270.0 te
Self weight of trailer	134.0 te
Self weight of aux. steelwork (for L&S)	0.0 te
Total combined weight	404.0 te
Load per trailer	202.0 te
Load per axle line	20.2 te
Load per axle	10.1 te
Load per wheel (4 per axle)	2.53 te
Overall ground bearing pressure	4.99 te/m²
Tractor(s) (42 te)	
Front axle	7.0 te
Second steer	8.0 te
Rear axle	13.5 te
Rear axle	13.5 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] Consideration to be given to transformer COG. Assumed to be central to trailer, exact positioning to be confirmed.

[5] Lifting/Transport Lug locations are subject to design of the transformer and will need to be confirmed.

Rev.	Date	Amendments
1	12.07.24	Client Logo Updated
0	25.03.24	Issued for comment

Revisions

Prepared by:

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

Independent Transportation Engineers

Client:

NORTH FALLS
Offshore Wind Farm

Project:

North Falls Offshore Wind Farm

Title:

Indicative transport configuration
Conceptual 270 te transformer carried within 20 axle girder frame trailer showing minimum turning radii

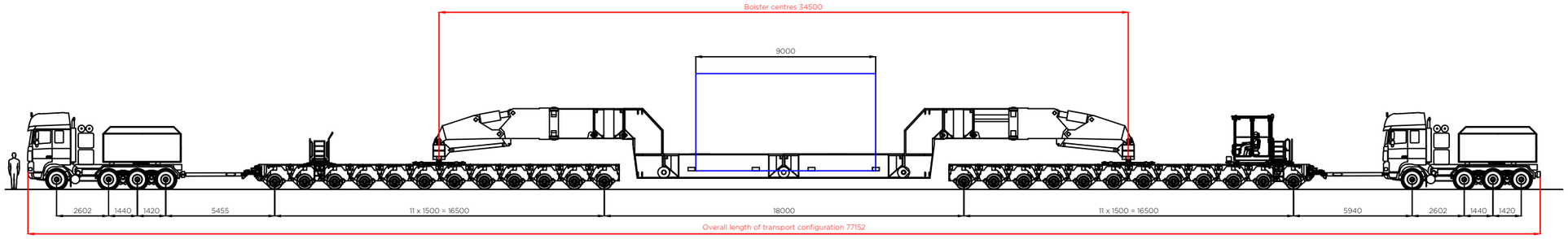
Drawing status:

Final report

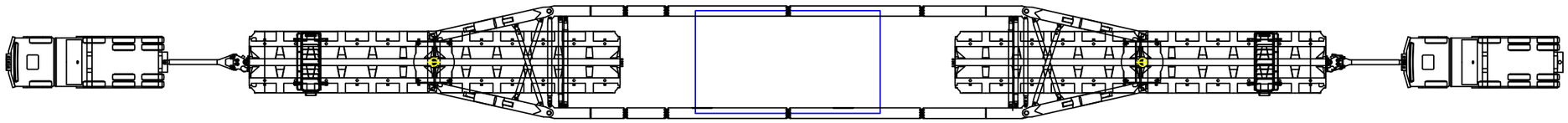
Scale (A3):	Drawn By:	Checked By:
As shown	JMB	AP

Dwg. no:	Sheet:	Rev:
24-1232.TC01	1 of 1	1

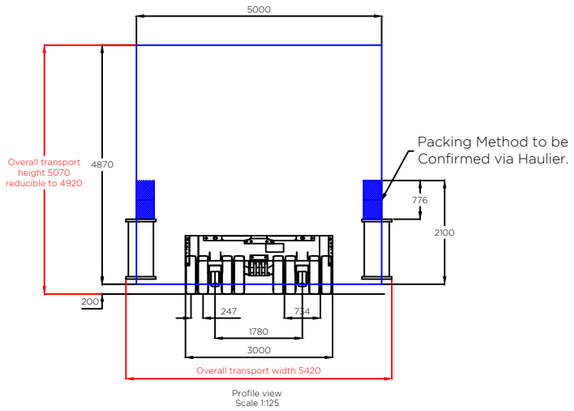
P:\Clients\Existing Clients\RWE\24-1232 North Falls Offshore Wind Farm\Transport Configuration\24-1232.TC01 North Falls Offshore Wind Farm 270 te transformer 20 axle girder frame R0.dwg



Side Elevation - 24 axle girder frame trailer - concept model only
270 te transformer



Plan View - 24 axle girder frame trailer - concept model only
270 te transformer

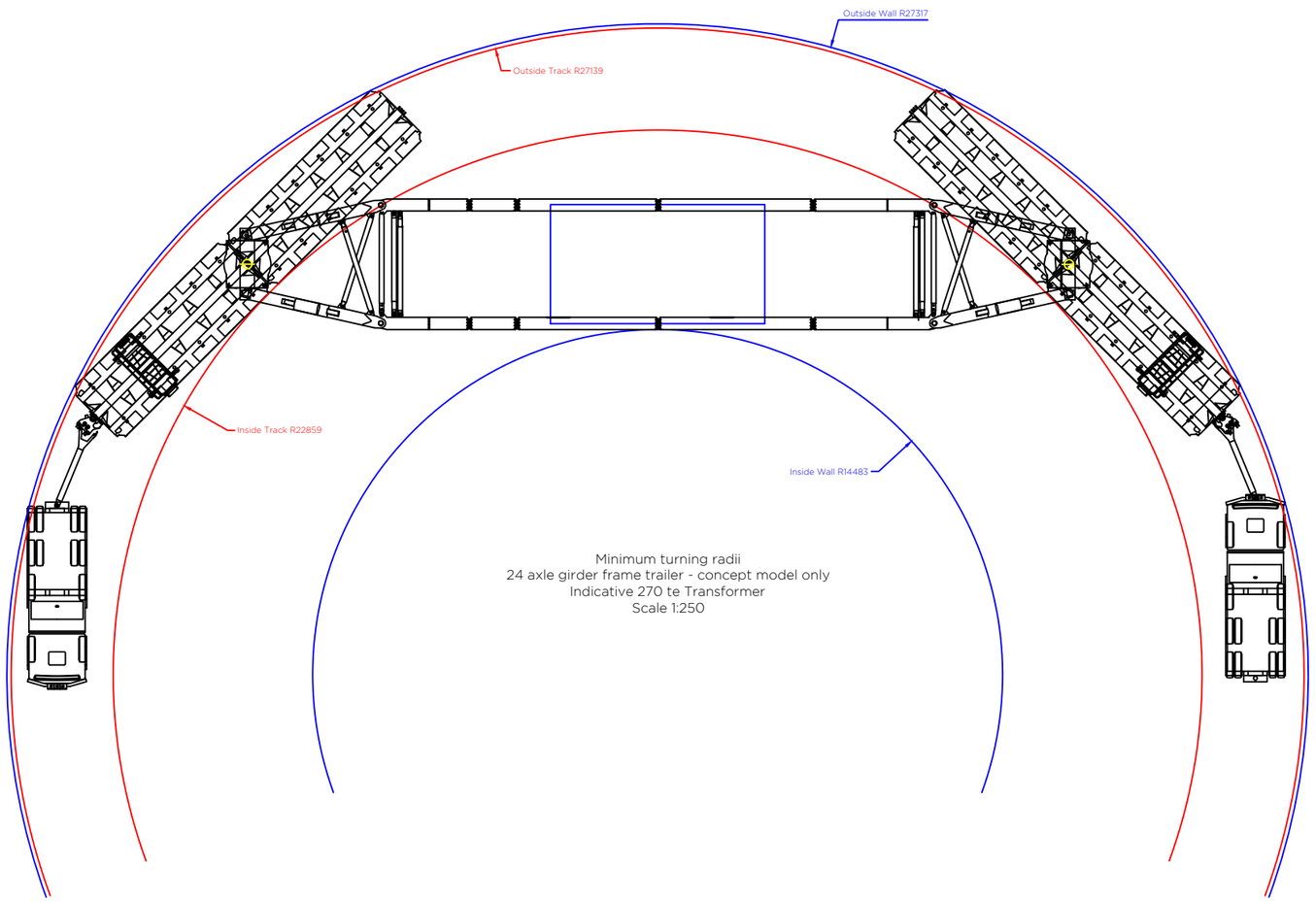


Profile view
Scale 1:125

Note: Exact Carrying Height and Packing Method to be Confirmed by Appointed Haulier

CoG is assumed to be central to trailer, exact positioning to be confirmed.

Lifting/Transport Lug locations are subject to design of the transformer and will need to be confirmed.



Minimum turning radii
24 axle girder frame trailer - concept model only
Indicative 270 te Transformer
Scale 1:250

Load Table	
24 axle girder frame trailer	
Self weight of transformer	270.0 te
Self weight of trailer	153.42 te
Self weight of aux. steelwork (for L&S)	0.0 te
Total combined weight	423.42 te
Load per trailer	211.71 te
Load per axle line	17.65 te
Load per axle	8.83 te
Load per wheel (4 per axle)	2.21 te
Overall ground bearing pressure	4.28 te/m²
Tractor(s) (42 te)	
Front axle	8.0 te
Second steer	10.0 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 millimetres unless stated otherwise.

[4] Consideration to be given to transformer COG. Assumed to be central to trailer, exact positioning to be confirmed.

[5] Lifting/Transport Lug locations are subject to design of the transformer and will need to be confirmed.

Rev.	Date	Amendments
1	12.07.24	Client Logo Updated
0	25.03.24	Issued for comment

Revisions

Prepared By:

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

Independent Transportation Engineers

Client:

NORTH FALLS
Offshore Wind Farm

Project:

North Falls Offshore Wind Farm

Title:

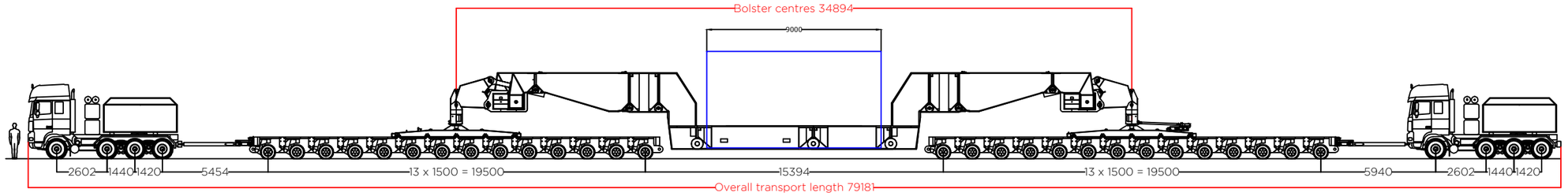
Indicative Transport Configuration
Conceptual 270 te transformer carried within
24 axle girder frame trailer
showing minimum turning radii

Drawing Status:

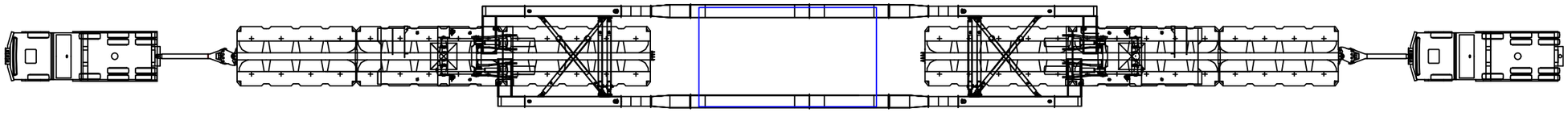
Final Report

Scale (A3):	Drawn By:	Checked By:
As shown	JMB	AP
DWG. No:	Sheet:	Rev:
24-1232.TC02	1 of 1	1

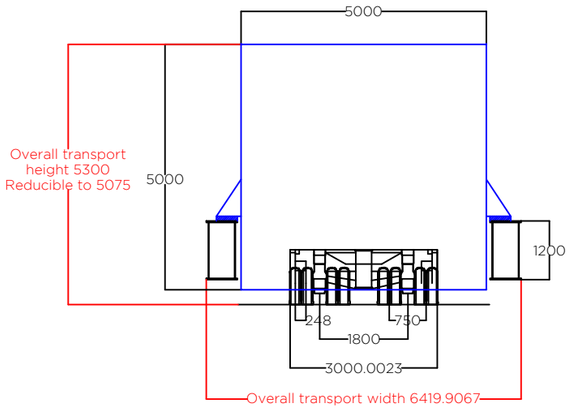
P:\Clients\Existing Clients\RWE\24-1232 North Falls Offshore Wind Farm\Transport Configuration\24-1232.TC02 North Falls Offshore Wind Farm 270 te transformer 24 axle girder frame trailer.R0.dwg



Side Elevation - 28 axle girder frame trailer - concept model only
270 te transformer
(Scale 1:250)



Plan View - 28 axle girder frame trailer - concept model only
270 te transformer
(Scale 1:250)

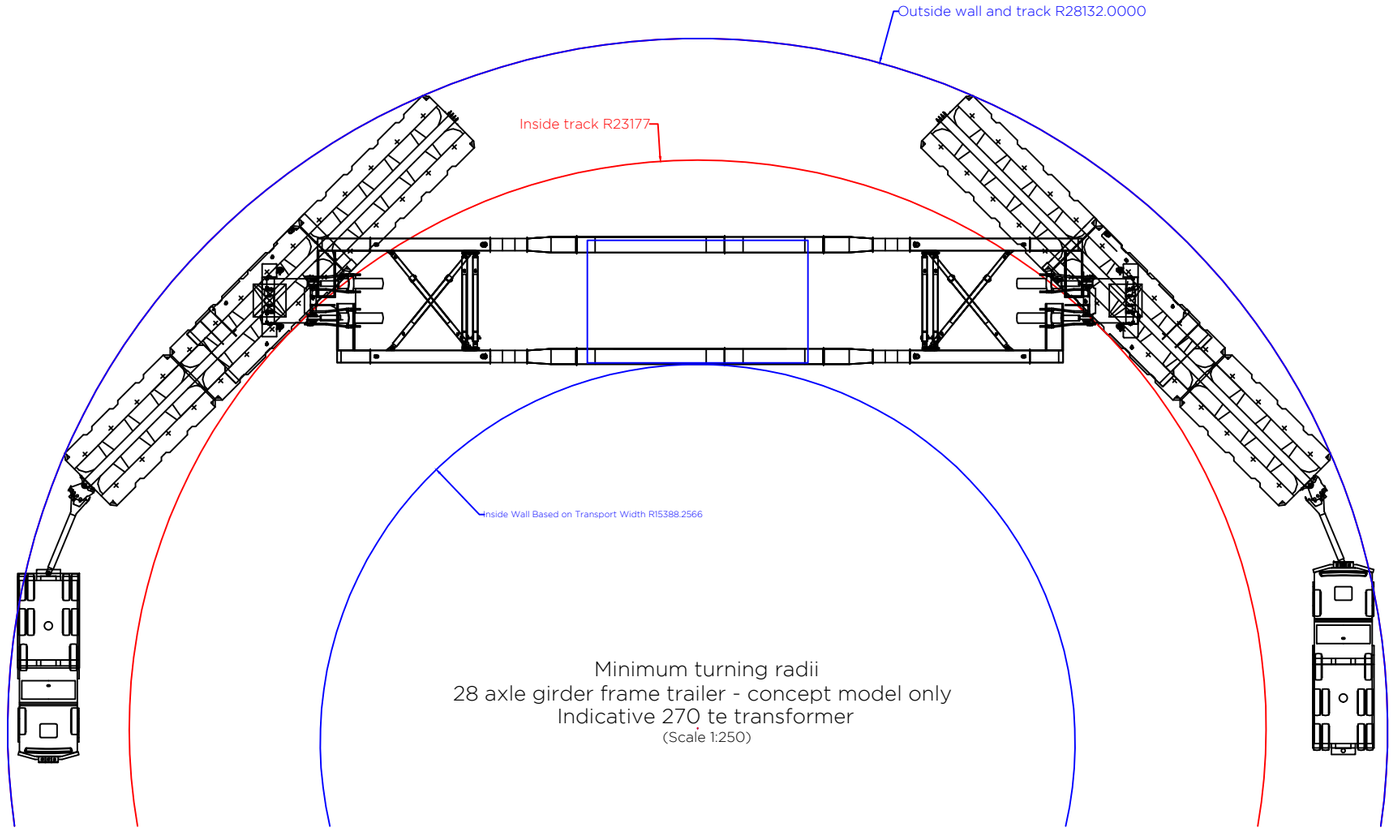


Profile view
(Scale 1:125)

Note: Exact Carrying Height and Packing Method to be Confirmed by Appointed Haulier

CoG is assumed to be central to trailer, exact positioning to be confirmed.

Lifting/Transport Lug locations are subject to design of the transformer and will need to be confirmed.



Minimum turning radii
28 axle girder frame trailer - concept model only
Indicative 270 te transformer
(Scale 1:250)

Load Table	
28 axle girder frame trailer	
Self weight of transformer	270.0 te
Self weight of trailer	213.0 te
Self weight of aux. steelwork (for L&S)	5.4 te
Total combined weight	488.4 te
Load per trailer	244.2 te
Load per axle line	17.44 te
Load per axle	8.73 te
Load per wheel (4 per axle)	2.18 te
Overall ground bearing pressure	4.17 te/m²
Tractor(s) (42 te)	
Front axle	8.0 te
Second steer	10.0 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 millimetres unless stated otherwise.

[4] Consideration to be given to transformer COG. Assumed to be central to trailer, exact positioning to be confirmed.

[5] Lifting/Transport Lug locations are subject to design of the transformer and will need to be confirmed.

Rev.	Date	Amendments
1	12.07.24	Client Logo Updated
0	17.04.24	Issued for comment

Revisions

Prepared By:
Shaftesbury House, 2 High Street,
Eccleshall, Stafford, ST21 6BZ
Tel: (01785) 850411
Independent Transportation Engineers

Client:
NORTH FALLS
Offshore Wind Farm

Project:
North Falls Offshore Wind Farm

Title:
Indicative Transport Configuration
Conceptual 270 te transformer carried within
28 axle girder frame trailer
showing minimum turning radii

Drawing Status:
Final Report

Scale (A3):	Drawn By:	Checked By:
As shown	JMB	AP
DWG. No:	Sheet:	Rev:
24-1232.TC03	1 of 1	1

P:\Clients\Existing Clients\RWE\24-1232 North Falls Offshore Wind Farm\Transport Configuration\24-1232.TC03 North Falls Offshore Wind Farm 270 te transformer 28 axle girder frame R1.dwg

Appendix 3

Port of Harwich Information

Andy Pearce

From: Hume, Steve [redacted]@harwich.co.uk>
Sent: 26 April 2024 09:41
To: Andy Pearce
Cc: Brad Dyke
Subject: RE: North Falls Offshore Wind Farm - Onshore Substation Transformer AILs
Attachments: S-24-03-01.pdf; Port GA.dwg

Hi Andy,

Please find attached drawings as promised.

Working on the quay structural / loading information and will get back to you ASAP.

B.Rgds
Steve

From: Hume, Steve
Sent: Tuesday, April 23, 2024 10:19 AM
To: 'Andy Pearce' [redacted]@wynnslimited.com>
Cc: Brad Dyke [redacted]@wynnslimited.com>
Subject: RE: North Falls Offshore Wind Farm - Onshore Substation Transformer AILs

Hi Andy,

The promised drawings should be with you soon.

With regards to the ground loadings, it's rather complicated.

The quay structure is of different ages and designs, current limits based to some degree on estimates and surveys taking this into account.

Basically, there is probably quite a lot of information that builds up into this, which I will have to try and pull together. Will get back to you as soon as I can.

B.Rgds
Steve

Steven Hume
Commercial Manager
Commercial Department

Harwich International
T (+44) [redacted]
M (+44) [redacted]
F (+44) [redacted]
[redacted]@harwich.co.uk

www.harwich.co.uk

From: Andy Pearce [redacted]@wynnslimited.com>
Sent: Thursday, April 18, 2024 4:49 PM
To: Hume, Steve [redacted]@harwich.co.uk>
Cc: Brad Dyke [redacted]@wynnslimited.com>
Subject: RE: North Falls Offshore Wind Farm - Onshore Substation Transformer AILs

Hi Steve,

No rush on the below but we met the client this week and they have asked if it would be possible to get from the port additional information on quay strength. RWE would like to do their own checks to confirm the structural status if possible. Do you have drawings available confirming ground strength, design of quay etc. I know you said you could get a plan for us but this is a bit more detail that they are asking for ref where the 4/te/m2 comes from I think.

Happy to discuss and could arrange meeting with RWE if needed?

Kind Regards

Andy

From: Hume, Steve [redacted]@harwich.co.uk>
Sent: Friday, April 12, 2024 3:07 PM
To: Andy Pearce [redacted]@wynnslimited.com>
Cc: Brad Dyke [redacted]@wynnslimited.com>
Subject: RE: North Falls Offshore Wind Farm - Onshore Substation Transformer AILs

Hi Andy,

You are both very welcome.

I will pull the information together for you, but I'm afraid that due to absences within our Engineering Department, this is unlikely to be early w/c 22nd April.

Have a great weekend.

B.Rgds
Steve

Steven Hume
Commercial Manager

Commercial Department

Harwich International
T (+44) [redacted]
M (+44) [redacted]
F (+44) [redacted]
[redacted]@harwich.co.uk

www.harwich.co.uk
Please consider the environment before printing this email

From: Andy Pearce [redacted]@wynnslimited.com>
Sent: Friday, April 12, 2024 10:54 AM
To: Hume, Steve [redacted]@harwich.co.uk>
Cc: Brad Dyke [redacted]@wynnslimited.com>
Subject: RE: North Falls Offshore Wind Farm - Onshore Substation Transformer AILs

Hi Steve,

Thank you very much for your time and assistance yesterday. It was good to meet you.

If you are able to provide a .dwg/cad drawing of the port areas and overall plan for reference in our reporting that would be very helpful.

Also any pictures of any previous loads, cable drums, geared vessels offloading etc that would be great.

Kind Regards

Andy Pearce

From: Hume, Steve [redacted]@harwich.co.uk>
Sent: Wednesday, April 10, 2024 3:19 PM
To: Andy Pearce [redacted]@wynnslimited.com>
Cc: Brad Dyke [redacted]@wynnslimited.com>
Subject: RE: North Falls Offshore Wind Farm - Onshore Substation Transformer AILs

Hi Andy,

Apologies for the late response on this. Please find our answers below.

Look forward to seeing you tomorrow.

B.Rgds
Steve

From: Andy Pearce [redacted]@wynnslimited.com>
Sent: Thursday, April 4, 2024 10:50 AM
To: Hume, Steve [redacted]@harwich.co.uk>
Cc: Brad Dyke [redacted]@wynnslimited.com>
Subject: North Falls Offshore Wind Farm - Onshore Substation Transformer AILs

Hello Steve,

Good to talk to you again and I look forward to meeting you at Harwich next Thursday. I will be accompanied by my colleague Brad Dyke and we will have PPE and photo ID. In the meantime please see below some background to the project and questions I would like to confirm in respect to the current status of the port of Harwich for possible future heavy load requirements at the proposed North Falls Offshore Wind Farm - Onshore Substation Transformer AILs. Further information on the project is here.
https://www.northfallsoffshore.com/

Wynns Ltd. have been appointed by RWE, to undertake a review of the access for Abnormal Indivisible Loads associated with the transformers required for the substation. These could be in the region of up to 270te nett weight. Expected delivery is 2029/2030 (exact date TBC). Therefore, would you be able to confirm the following some of which is based on our discussions back in 2021.

1. Port of Harwich would be willing and able to take delivery of components. Please confirm at which berth this would be feasible.
   This is likely to be on either Berth 1, or the General Cargo Berth.
2. There is a 4te/m2 limit on the quay.
   Correct.
3. My file data indicates that vessels of up to 9.5m draft can be accommodated subject to tidal ranges. There is a 4m rise and fall that may need to be considered depending on how offloaded.
   9.0m at Chart Datum.
4. The length of berth available is advised as 300m.
   Yes, but with some current restrictions limiting vessels to approx. 200m LOA. 300m will be the case during the timeframe of your requirements.
5. Can we confirm if the port is available for ro-ro, geared vessels and also for delivery via coaster cranes and discharge via mobile cranes. By roro I mean using specialist barges rather than the ferry roro ramps.

Potentially, dependent upon specific vessel and operation. This has been handled before at the port.

- Is there any standoff distance from the quay edge is required?
  For jack-ups, usually 10m. For all other craft, just the distance required for suitable fendering.
- Storage is available either short term on the project quay or longer term.

- There are two routes available to exit the port complex to the public highway, either via Phoenix Road to the east that would require the load to cross the A120 Railway Bridge and out via the roundabout or via Parkstone Bypass next to Morrisons supermarket that would require crossing of the level crossing in the port.
  Yes.
- The wind turbines years ago were about 225te on SPMTs.
  Yes.

Please note that this enquiry should remain confidential at this time as it is a preliminary review of possible options only. I trust that the above make sense and look forward to seeing you next week but if you need any further information please do not hesitate to contact me.

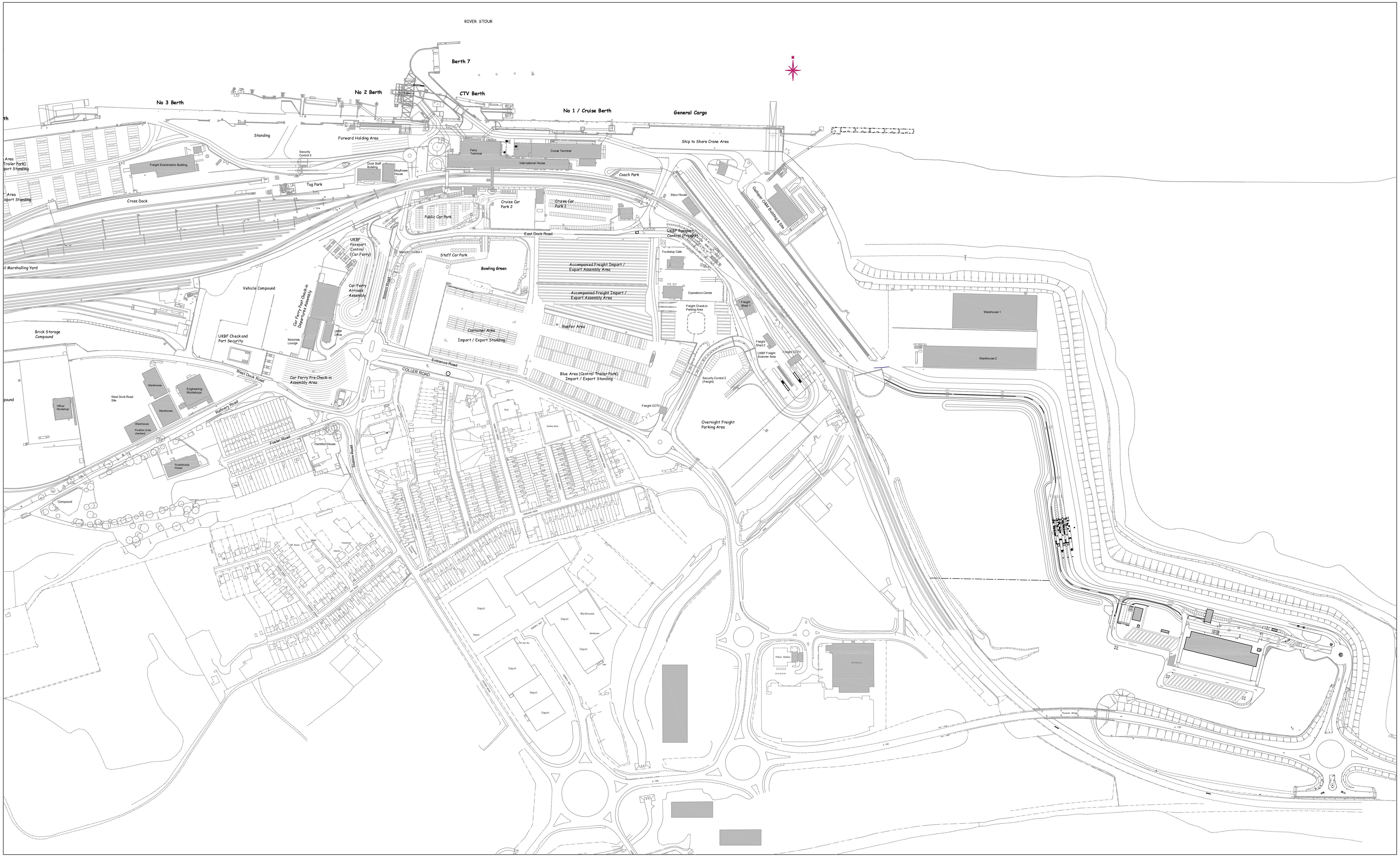
Kind Regards

Andy Pearce
General Manager (IOSH)

Tel: [redacted]
Mobile: [redacted]
Email: [redacted]@wynnslimited.com

Find out more visit wynnslimited.com

Shaftesbury House, 2 High Street, Eccleshall, Staffordshire, ST21 6BZ
Registered in England & Wales No. 3162297



RIVER STOUR
Berth 7
No 3 Berth
No 2 Berth
CTV Berth
No 1 / Cruise Berth
General Cargo
Standing
Forward Holding Area
Ship to Shore Crane Area
Freight Examination Building
Tug Park
Cross Dock
Ferry Terminal
Cruise Terminal
International House
Coach Park
Cruise Car Park 2
Cruise Car Park 1
Public Car Park
East Dock Road
UKBF Passport Control (Freight)
Staff Car Park
Bowling Green
Accompanied Freight Import / Export Assembly Area
Operations Centre
Vehicle Compound
Car Ferry Post Check-in Departures Assembly
Car Ferry Arrivals Assembly
Container Area
Import / Export Standing
Reefer Area
Blue Area (Central Trailer Park) Import / Export Standing
Brick Storage Compound
UKBF Check and Port Security
Car Ferry Pre Check-in Assembly Area
Entrance Road
COLLER ROAD
West Dock Road
Station Road
Overnight Freight Parking Area
Warehouse 1
Warehouse 2
Engineering Workshops
Marshalling Yard

HUTCHISON PORTS
HARWICH INTERNATIONAL

Harwich International Port Limited.
Engineering Department, Parkeston, Harwich, Essex. CO12, 4SR.
Tel. 01255 252111. Fax. 01255 252182. email. tatumd@harwich.co.uk. www.harwich.co.uk

Notes

Paper Scale. 50mm at A 3 (0 – 50)

LET	REVISION	PROJECT	TITLE
		Port Plans	No 3 Berth to Freight Exit Road

DO NOT SCALE Original A 3

SCALE	1/500	CHECKED	DT
DATE	20-09-23	APPROVED	
PREP'D	SA	ASSET No.	
STATUS	Sketch	REV' N	
DWG No.	S-23-14-01		

Appendix 4

Correspondence

Andy Pearce

From: Emmanuel Anum [redacted]@nationalhighways.co.uk>
Sent: 29 May 2024 16:46
To: Andy Pearce
Subject: FW: WYNL/130 Harwich to North Falls
Attachments: FW: Special Order Proposal (WYNL/130/S1); RE: WYNL/130/S1 - Harwich Port to Manningtree (430 te)

Andy,

Please see email attached and below FYI.

Kind Regards
[redacted]

Emmanuel Anum, Senior Engineer
Abnormal Loads (Structures)
Operations (East) | National Highways
Woodlands | Manton Lane | Bedford | MK41 7LW
Mob: [redacted] | www.nationalhighways.co.uk

From: Emmanuel Anum [redacted]@nationalhighways.co.uk>
Sent: Tuesday, May 21, 2024 9:17 PM
To: Brad Dyke [redacted]@wynnslimited.com>
Cc: Alidan, Zakariya [redacted]@atkinsrealis.com>
Subject: RE: WYNL/130 Harwich to North Falls

Hi Brad,

Atkins are working on the Special Order WYNL/130 Harwich to North Falls.

There is no major update for now. I will get back to you once I hear from Atkins.

Thank you for your understanding and cooperation.

Kind Regards
[redacted]

Emmanuel Anum, Senior Engineer
Abnormal Loads (Structures)
Operations (East) | National Highways
Woodlands | Manton Lane | Bedford | MK41 7LW
Mob: [redacted] | www.nationalhighways.co.uk

From: Brad Dyke [redacted]@wynnslimited.com>
Sent: Tuesday, May 21, 2024 11:44 AM
To: Emmanuel Anum [redacted]@nationalhighways.co.uk>
Subject: WYNL/130 Harwich to North Falls

Good morning Emmanuel,

Following our recent phone call, is there any update you can provide on the above Special Order application.

Brad Dyke

From: Emmanuel Anum [redacted]@nationalhighways.co.uk>
Sent: 17 July 2024 16:22
To: Sarah Hollender; [redacted]@nationalhighways.co.uk
Cc: Brad Dyke; Jeremy McGraham; Andrei Popa; Alidan, Zakariya; Simon Blakeman
Subject: FW: ER DSC TO-831 Abnormal Load Project - WYNL/130/S1 Route Appraisal
Attachments: HE602066-ATK-SBR-ZZ-RP-CB-000008_C01.pdf

Hi David / Sarah,

Atkins have completed their work on WYNL/130/S1 and issued final appraisal report. See attached.

The report was issued on 5th July 2024, but I was off last week, so I did not have the time to go through.

I have now finished review the appraisal report and happy to issue to everyone.

Please see below the summary, conclusions, and recommendations from the attached appraisal report.

4. Summary of appraisal, Conc Recommendations

The conclusions are contingent on the following:

- The previous load assessment was completed properly in accordance with the load rating is valid.
- The latest information on IAMIS regarding the condition of the structure ar

4.1. Loading

Based on the analysis that has been undertaken on the listed structures that wou abnormal vehicles, the following can be concluded:

The following NH-owned structures have been appraised and can carry the propc traffic restrictions:

- Links Culvert (Structure key 13501)
- Vicarage Culvert (Structure key 13502)
- Pond Hall Culvert (Structure key 13503)

The following NH-owned structures have been appraised and found insufficient to vehicle -16 Axle Flat top trailer and 20 Axle Girder frame trailer:

- Bradfield Road Bridge (Structure key 13511)

However, the same structure was found adequate to carry the proposed abı restrictions - 24 Axle Girder frame trailer and 28 Axle Girder frame trailer.

The following NH owned structures required a qualitative assessment as they ha They have been appraised and are found suitable for the proposed vehicle to pas

- Ramsey Bypass Culvert (Structure key 13500)

Kind Regards

[redacted]

Emmanuel Anum, Senior Engineer
Abnormal Loads (Structures)
Operations (East) | National Highways

Woodlands | Manton Lane | Bedford | MK41 7LW
Mob: [redacted] | www.nationalhighways.co.uk

From: Alidan, Zakariya [redacted]@atkinsrealis.com>
Sent: Friday, July 5, 2024 2:48 PM
To: Emmanuel Anum [redacted]@nationalhighways.co.uk>
Subject: ER DSC TO-831 Abnormal Load Project - WYNL/130/S1 Route Appraisal

Hi Emmanuel,

Kindly find attached the appraisal report (which contains also summary sheet in the appendix of the document) for WYNL/130/S1 route.

The document has also been saved onto SharePoint in the link below.

East Region Community - Issue 05-07-2024 - All Documents (sharepoint.com)

Please advise if any further information or action is needed or if you have any comments.

Kind regards,

Zakariya Alidan MSc MEng GMICE
Assistant Engineer
Bridges and Civils
AtkinsRéalis
T: [redacted]
90-96 Victoria Road
Chelmsford, Essex, CM1 1QU, United Kingdom

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National Highways Limited | General enquiries: 0300 123 5000 |National Traffic Operations Centre, 3 Ridgeway, Quinton Business Park, Birmingham B32 1AF |
https://nationalhighways.co.uk | info@nationalhighways.co.uk

Special Order Load Movement – WYNL/130/S1 - Harwich to Manningtree

WYNL/130/S1 Appraisal Report

National Highways

HE602066-ATK-SBR-ZZ-RP-CB-000008
05/07/24

Notice

This document and its contents have been prepared and are intended solely as information for National Highways and their use in relation to the special-order load movement reference WYNL/130/S1 Harwich to Manningtree.

Atkins Limited assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

Document history

Document title: WYNL/130/S1 Appraisal Report

Document reference: HE602066-ATK-SBR-ZZ-RP-CB-000008

Revision	Suitability	Purpose description	Originated	Checked	Reviewed	Authorised	Date
C01	A1	First issue	JN	RDN	MW	RM	05/07/24

KEY:

JN Jayanth Nagendra

RDN DN Rakesh

MW Michal Wiciak

RM Rachel Mitchell

Client signoff

Client	National Highways
Project	Special Order Load Movement – WYNL/130/S1 - Harwich to Manningtree
Job number	HE PIN – 602066
Client signature/date	

Contents

Tables

1. Introduction

National Highways instructed Atkins to carry out Abnormal Load Appraisal under HE PIN 602066 for the proposed Special Order Load Movement from Port of Harwich, Harwich, CO12 4SR to National Grid Manningtree Site, Off Ardleigh Road, Manningtree, CO11 2QA.

The objectives of this appraisal are:

- To determine which structures are affected by the abnormal load movement.
- To verify the headroom clearances for abnormal load movement below the structures (overbridges).
- To carry out a high-level review comparison of the effects of the proposed abnormal load movement against the original designed or assessed capacity for Underbridges and Culverts.
- Give Recommendations based on initial appraisal.

The proposed vehicle movement notified by National Highways are as follows:

- 16 Axle Flat top trailer – 42000 kg – 4 axle tractor front, and 326000 kg – 16 axle girder set trailer with an overall height of 5.995m and reducible height of 5.775m
- 20 Axle Girder Set – 42000 kg – 4 axle tractor front and rear, and 404000 kg – 20 axle girder set trailer with an overall height of 5.17m and reducible height of 4.95m.
- 24 Axle Girder Set – 42000 kg – 4 axle tractor front and rear, and 423420 kg – 24 axle girder set trailer with an overall height of 5.07m and reducible height of 4.92m.
- 28 Axle Girder Set – 42000 kg – 4 axle tractor front and rear, and 483000 kg – 28 axle girder set trailer with an overall height of 5.07m and reducible height of 4.92m.

Client instruction has been provided to the appraisal team to only conduct the appraisal for the structures listed in the WYNL/130/S1 instruction email dated 25/04/2024. Therefore, a review of the entire proposed abnormal load route between CO12 4SR to CO11 2QA to confirm all affected structures has not been conducted within the scope of this work. Only structures under the ownership of the National Highways carrying the A120 carriageway were appraised.

Refer to Appendix A for details of the abnormal vehicle proposed.

2. List of Structures Appraised

The route (ESDAL[2] reference WYNL/130/S1) for Special Order Load Movement starts at Harwich International Port, Essex, CO12 4SR and ends at North falls substation, North of Great Bromley, Ardleigh Road, Manningtree, CO11 2QA. The abnormal load vehicle will be traveling via several unclassified roads.

The plan of the WYNL/130/S1 route is as shown in Figure 2-1 and Figure 2-2. Two alternative routes are provided. In Alternative 1, there is an option to exit the port via East Dock Road after 10m, while in Alternative 2, option to exit the port via Phoenix Road after 200m. Furthermore, both the routes have option to exit the port via Phoenix Road after 200m.

Although the abnormal load vehicle is traveling via the roads mentioned above, AtkinsRéalis was instructed to only carry out an appraisal of the structures listed in the WYNL/130/S1 instruction emails dated 25/04/2024, which are located on the A120 road.

Figure 2-1 - Plan of WYNL/130/S1 Route (Alternate 1)

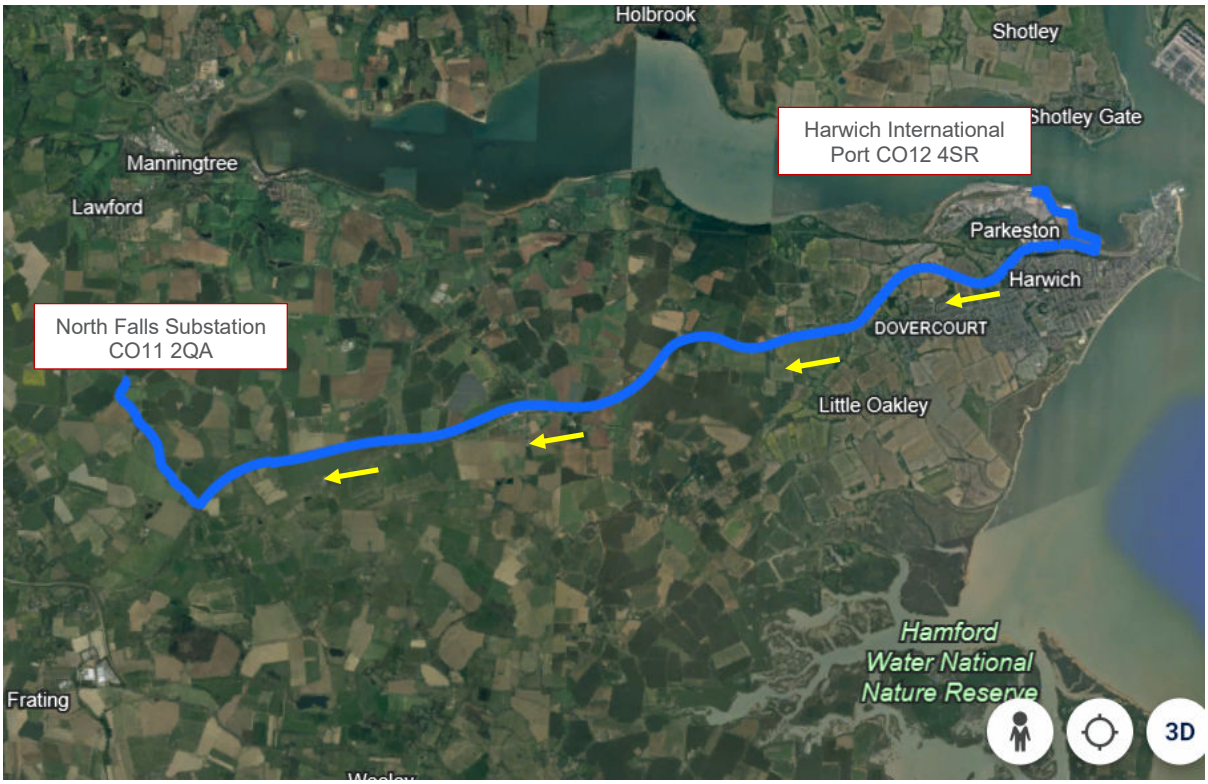


Figure 2-2 - Plan of WYNL/130/S1 Route (Alternative 2)

Table 2-1 - List of structures

Bridge Name	Structure Number	Structure Key	Brief Description
Links	/A120//86.40/Q/	13501	Corrugated Steel Armco Pipe Culvert – 3 pipes
Vicarage Road	/A120//85.50/Q/	13502	In-situ Reinforced Concrete Box Culvert – Single span
Pond Hall	/A120//84.20/Q/	13503	In-situ Reinforced Concrete Box Culvert – Single span
Ramsey Bypass	/A120//83.20/Q/	13500	Corrugated Steel Armco Pipe Culvert – 3 pipes
Bradfield Road	/A120//77.70/Q/	13511	Precast prestressed concrete deck beams and cast-in-situ slabs – Single span

3. Methodology

3.1. Loading

Load effects caused by the proposed vehicle were compared against the load effects from the confirmed load rating of the structure. The source of the confirmed load rating of the structure must be one of the following:

- A Design AIP with attached design certificate and construction completion certificate / maintenance manual, both signed and accepted by the Technical Approval Authority.
- An Assessment Certificate which shows the load rating, signed and accepted by the Technical Approval Authority.
- In the absence of the mentioned documents above, the load rating will then be referred to from the Effective Load (the load to which the structure is being managed), under the load management tab on the IAMIS platform.

According to the guidance document on IAMIS, the Effective Load is defined as follows:
Each bridge, retaining wall and small span structure has a structural load capacity derived from the design or assessment; this capacity is recorded against the asset resulting in an Effective Load and the structural capacity of an asset may change over time, which may affect the load carrying capacity (effective load) of the structure. It is therefore taken that the load rating provided in the Effective Load tab in IAMIS is the load carrying capacity of the structure.

3.1.1. Bridges

For underbridges with a known load rating and a skew of under 15 degrees, a simple line beam analysis was completed using a spreadsheet.

For bridges with a deck skew angle in excess of 15 degrees, they were analysed via simple 2D grillage modelling. Gross cross-sectional properties were used, and the resulting abnormal load effects, which included ULS, Overload, and Dynamic Amplification factors were compared against the load effects under the recorded load carrying capacity, which included the ULS factor, to obtain a percentage utilisation.

3.1.2. Culverts

For culverts with a confirmed recorded load capacity, If the span was over 5m and it was an arch type of culvert, RING software was used to determine the percentage utilisation. Corrugated steel buried structures were appraised by comparing the compressive hoop load of the proposed vehicle to the recorded HB loading.
If the span was below 5m and the fill cover above the culvert was more than 1m, an axle load comparison was made between the proposed vehicle and the recorded HB loading.

Any culverts that did not have a recorded, reliable load capacity were qualitatively appraised, for which the report is in Appendix B.

3.2. Sources

Record drawings were used to determine properties, sections, and material strengths. In the absence of as-built drawings, the spans of the structures were captured from the GI/PI reports.

4. Summary of appraisal, Conclusions and Recommendations

The conclusions are contingent on the following:

- The previous load assessment was completed properly in accordance with the applicable standards, and the load rating is valid.
- The latest information on IAMIS regarding the condition of the structure and effective load rating is valid.

4.1. Loading

Based on the analysis that has been undertaken on the listed structures that would be loaded by the proposed abnormal vehicles, the following can be concluded:

The following NH-owned structures have been appraised and can carry the proposed abnormal vehicle without traffic restrictions:

- Links Culvert (Structure key 13501)
- Vicarage Culvert (Structure key 13502)
- Pond Hall Culvert (Structure key 13503)

The following NH-owned structures have been appraised and found insufficient to carry the proposed abnormal vehicle -16 Axle Flat top trailer and 20 Axle Girder frame trailer:

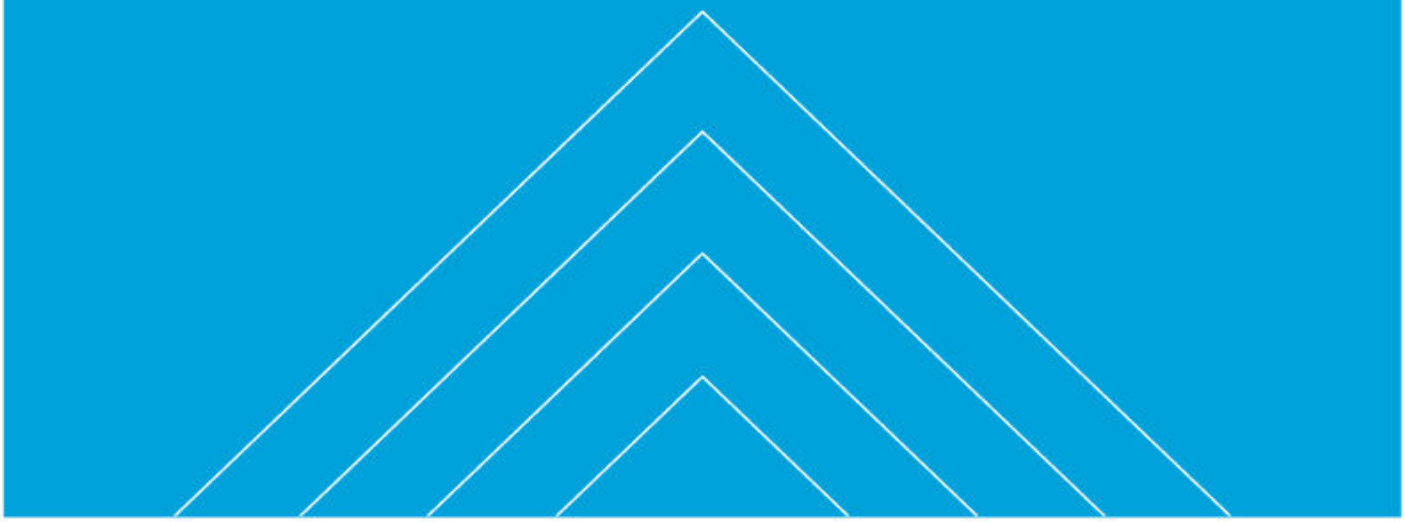
- Bradfield Road Bridge (Structure key 13511)

However, the same structure was found adequate to carry the proposed abnormal vehicle without traffic restrictions - 24 Axle Girder frame trailer and 28 Axle Girder frame trailer.

The following NH owned structures required a qualitative assessment as they had no verifiable load capacity. They have been appraised and are found suitable for the proposed vehicle to pass over:

- Ramsey Bypass Culvert (Structure key 13500)

Appendices



Appendix A. Abnormal Vehicle Details

A.1. 16 Axle Flat top trailer

Summary:	**Allelys 42te Tractor (Pulling) + 16 Axle Flat top trailer**
Overall length:	35.42 m (including projections), 35.42 m (excluding projections),
Rigid length:	24.0 m
Front overhang:	0 m
Overall width:	5 m
Overall height:	5.995 m
Gross weight:	368000 kg
Max axle weight:	20375 kg
Leg: Harwich to North fall substation 20 km or 20 km	
Tractor	**Tractor (Pulling)**
Gross weight:	42000 kg
Axle weight:	8000 kg x 1, 10000 kg x 1, 12000 kg x 2
Wheel per axle:	2 x 2, 4 x 2
Axle spacing:	2.60 m x 1, 1.44 m x 1, 1.42 m x 1
Tyre size:	385/80/22.5385/80/22.5 x 4
Tyre centres:	1.98 x 2, 0.248,1.810,0.248 x 2
Length:	8.221 m
Axle spacing to following:	4.725 m
Trailer	**16 Axle flat top trailer**
Gross weight:	326000 kg
Axle weight:	20375 kg x 16
Wheel per axle:	8 x 16
Axle spacing:	1.5 m x 15
Tyre size:	215/75/17.5 x 16
Tyre centres:	0.248,0.486,0.248,0.798,0.248,0.486,0.248 x 16
Length:	24.0 m
Width:	5 m
Max. height:	5.995 m
Reducible height:	5.775 m
Wheelbase:	22.5 m
Left overhang:	0 m
Right overhang:	0 m

Front overhang:	0 m
Rear overhang:	0 m
Ground clearance:	0.3 m
Reduced ground clearance:	0.1 m
Outside track:	3 m
Axle spacing to following:	0 m

A.2. 20 Axle Girder Frame trailer

Summary:	**Allelys 42te Tractor (Pulling) + 20 Axle Flat top trailer + Allelys 42te Tractor (Pushing)**
Overall length:	69.666 m (including projections), 69.666 m (excluding projections),
Rigid length:	45.59 m
Front overhang:	0 m
Overall width:	5 m
Overall height:	5.17 m
Gross weight:	488000 kg
Max axle weight:	20200 kg
Leg: Harwich to North fall substation 20 km or 20 km	
Tractor	**Tractor (Pulling)**
Gross weight:	42000 kg
Axle weight:	7000 kg x 1, 8000 kg x 1, 13500 kg x 2
Wheel per axle:	2 x 2, 4 x 2
Axle spacing:	2.60 m x 1, 1.44 m x 1, 1.42 m x 1
Tyre size:	385/80/22.5385/80/22.5 x 4
Tyre centres:	1.98 x 2, 0.248,1.810,0.248 x 2
Length:	8.221 m
Axle spacing to following:	5.6 m
Trailer	**20 Axle Girder frame trailer**
Gross weight:	404000 kg
Axle weight:	20200 kg x 20
Wheel per axle:	8 x 20
Axle spacing:	1.5 m x 9, 17.09m x 1, 1.5m x 9
Tyre size:	215/75/17.5 x 20
Tyre centres:	0.248,0.486,0.248,0.798,0.248,0.486,0.248 x 20
Length:	45.59 m
Width:	5 m

Max. height:	5.17 m
Reducible height:	4.95 m
Wheelbase:	44.09 m
Left overhang:	0 m
Right overhang:	0 m
Front overhang:	0 m
Rear overhang:	0 m
Ground clearance:	0.3 m
Reduced ground clearance:	0.1 m
Outside track:	3 m
Axle spacing to following:	6.3 m
Tractor	**Tractor (Pushing)**
Gross weight:	42000 kg
Axle weight:	7000 kg x 1, 8000 kg x 1, 13500 kg x 2
Wheel per axle:	2 x 2, 4 x 2
Axle spacing:	2.60 m x 1, 1.44 m x 1, 1.42 m x 1
Tyre size:	385/80/22.5385/80/22.5 x 4
Tyre centres:	1.98 x 2, 0.248,1.810,0.248 x 2
Length:	8.221 m
Axle spacing to following:	0 m

A.3. 24 Axle Girder Frame trailer

Summary:	**Allelys 42te Tractor (Pulling) + 24 Axle Flat top trailer + Allelys 42te Tractor (Pushing)**
Overall length:	77.152 m (including projections), 77.152 m (excluding projections)
Rigid length:	52.5 m
Front overhang:	0 m
Overall width:	5.42 m
Overall height:	5.07 m
Gross weight:	507420 kg
Max axle weight:	17642.5 kg
Leg: Harwich to North fall substation 20 km or 20 km	
Tractor	**Tractor (Pulling)**
Gross weight:	42000 kg
Axle weight:	8000 kg x 1, 10000 kg x 1, 12000 kg x 2
Wheel per axle:	2 x 2, 4 x 2
Axle spacing:	2.60 m x 1, 1.44 m x 1, 1.42 m x 1

Tyre size:	385/80/22.5385/80/22.5 x 4
Tyre centres:	1.98 x 2, 0.248,1.810,0.248 x 2
Length:	8.221 m
Axle spacing to following:	5.455 m
Trailer	**24 Axle Girder frame trailer (North falls 270te)**
Gross weight:	423420 kg
Axle weight:	17642.5 kg x 24
Wheel per axle:	8 x 24
Axle spacing:	1.5 m x 11, 18m x 1, 1.5m x 11
Tyre size:	215/75/17.5 x 24
Tyre centres:	0.248,0.486,0.248,0.798,0.248,0.486,0.248 x 24
Length:	52.50 m
Width:	5.42 m
Max. height:	5.07 m
Reducible height:	4.92 m
Wheelbase:	51 m
Left overhang:	0 m
Right overhang:	0 m
Front overhang:	0 m
Rear overhang:	0 m
Ground clearance:	0.0 m
Reduced ground clearance:	0.1 m
Outside track:	3 m
Axle spacing to following:	5.94 m
Tractor	**Tractor (Pushing)**
Gross weight:	42000 kg
Axle weight:	8000 kg x 1, 10000 kg x 1, 12000 kg x 2
Wheel per axle:	2 x 2, 4 x 2
Axle spacing:	2.60 m x 1, 1.44 m x 1, 1.42 m x 1
Tyre size:	385/80/22.5385/80/22.5 x 4
Tyre centres:	1.98 x 2, 0.248,1.810,0.248 x 2
Length:	8.221 m
Axle spacing to following:	0 m

A.4. 28 Axle Girder Frame trailer

Summary:	**Allelys 42te Tractor (Pulling) + 28 Axle Flat top trailer + Allelys 42te Tractor (Pushing)**
Overall length:	79.181 m (including projections), 79.181 m (excluding projections),
Rigid length:	55.894 m
Front overhang:	0 m
Overall width:	5.42 m
Overall height:	5.07 m
Gross weight:	567000 kg
Max axle weight:	17250 kg
Leg: Harwich to North fall substation 20 km or 20 km	
Tractor	**Tractor (Pulling)**
Gross weight:	42000 kg
Axle weight:	8000 kg x 1, 10000 kg x 1, 12000 kg x 2
Wheel per axle:	2 x 2, 4 x 2
Axle spacing:	2.60 m x 1, 1.44 m x 1, 1.42 m x 1
Tyre size:	385/80/22.5385/80/22.5 x 4
Tyre centres:	1.98 x 2, 0.248,1.810,0.248 x 2
Length:	8.221 m
Axle spacing to following:	5.455 m
Trailer	**28 Axle Girder frame trailer (North falls 270te)**
Gross weight:	483000 kg
Axle weight:	17250 kg x 28
Wheel per axle:	8 x 28
Axle spacing:	1.5 m x 13, 15.39m x 1, 1.5m x 13
Tyre size:	215/75/17.5 x 28
Tyre centres:	0.248,0.486,0.248,0.798,0.248,0.486,0.248 x 28
Length:	55.894 m
Width:	5.42 m
Max. height:	5.07 m
Reducible height:	4.92 m
Wheelbase:	54.394 m
Left overhang:	0 m
Right overhang:	0 m
Front overhang:	0 m
Rear overhang:	0 m
Ground clearance:	0.3 m

Reduced ground clearance:	0.1 m
Outside track:	3 m
Axle spacing to following:	5.94 m
Tractor	**Tractor (Pushing)**
Gross weight:	42000 kg
Axle weight:	8000 kg x 1, 10000 kg x 1, 12000 kg x 2
Wheel per axle:	2 x 2, 4 x 2
Axle spacing:	2.60 m x 1, 1.44 m x 1, 1.42 m x 1
Tyre size:	385/80/22.5385/80/22.5 x 4
Tyre centres:	1.98 x 2, 0.248,1.810,0.248 x 2
Length:	8.221 m
Axle spacing to following:	0 m

Appendix B. Qualitative Appraisal of Ramsey Bypass

B.1. Structures Considered

The purpose of this report is to specifically record the review undertaken into the buried structures, which do not have a verifiable design capacity or an assessed load carrying capacity.

B.2. Buried Structures Considered

Ramsey Bypass (Structure Key 13500), which do not have a verifiable design capacity, or an assessed load carrying capacity, is specifically covered by this report.

The review methodology is as derived below.

B.3. Structure Review

The method of producing an acceptable, qualitative appraisal of the buried structures, to consider the movement of abnormal vehicle, was discussed with National Highways SES team on 20-10-2022. The method below was considered appropriate.

B.3.1. Reporting

The buried structures with over 1m depth of cover are considered to fall outside of the scope of CS 451 'Structural Review and Assessment of Highway Structures' due to their lack of previous assessments. CS 451 Cl 1.3 explains that these types of structures were previously omitted from assessment programmes and do not fall within the scope of CS 451 for various reasons, including that they pose a low risk of failure.

With the agreement of the National Highways SES team (Teams call 20-10-2022), this structure review was agreed to be presented in the form of a technical report. The review and technical report would broadly follow the process and considerations presented in CS 459 'The Assessment of Bridge Substructures, Retaining Structures and Buried Structures'.

This report presents the information available for structure Ramsey Bypass (Structure Key 13500) and arrives at a recommendation for the passage of the proposed abnormal vehicles, with justifications given.

B.3.2. Method of Review

The technical review of the structure follows the methodology below:

IAMIS Search
An IAMIS search is undertaken initially for the structure considered. Relevant documents are obtained from IAMIS that may support the review.

Structure Details
The structure name, number, structure key, location, the road carried, and purpose of the structure are noted.

Structure Type
The structure type (RC box, steel pipe, multiplate arch), span, overall dimensions, location in relation to the carriageway are considered. Depth of fill is taken into account, if available.

Structure Commissioning Date
The date of structure commissioning is considered. The date gives an indication of what the relevant design standard was at the time of design and fabrication and may provide an indication of the likely design capacity.

Original Design Records
Any records of the original design are reviewed, if available. These would ideally include calculations, AIPs, original drawings/ specifications etc.

Modification/ Strengthening Records
Any records of strengthening or modification to the original structure. These could include calculations, AIPs, drawings/ specifications etc.

Existing Assessments
Any existing assessment details are reviewed, if available. These would ideally include calculations, AIPs, assessment reports.

Other Records
Any other records which may provide an indication of the structure's design or assessed capacity. Many of the structures may have originally been designed by or on behalf of the local authority to their requirements at the time of construction. Structures later came under National Highways control when routes were given trunk road status or became part of the national network. Other records typically encountered may include original construction drawings, structure reports, Roads 277 Forms.

Structure Condition
Principal, General and Special inspection reports are reviewed to confirm structural defects or deterioration identified for the structures, as well as determining if defects are historical, ongoing, or newly identified. The review also considers whether the inspections included an inspection of internal elements of the structure, as culverts may be classed as confined spaces or require working within watercourses, which require special arrangement for access. The CS 450 requires that "A general inspection shall comprise a visual inspection of all parts of the structure that can be inspected without the need for additional access equipment, using safe, ground level viewing positions around the structure" hence the structures may not have been inspected internally during the General Inspection.

When considering the effect of any noted defects, CS 459 Cl 2.2 provides a list of relevant defects for consideration.

Hidden Elements
Consideration is given to critical structure elements that are hidden and may not have been inspectable during inspections.

ESDAL[2]
Previous historical movements over the structures are considered and reviewed for similarities in the magnitude of loading applied, similarities of vehicles, axle spacings, axle numbers, axle loading etc.

Load Comparison
When considering a comparison between the assumed demonstratable existing structure capacity and a proposed abnormal vehicle movement, the following was considered as a method of producing a comparison.

The existing structure capacity is based on either a load rating stated in IAMIS, available assessment report, or is based on a previous abnormal vehicle movement over the structure from ESDAL[2]. For HB loading the vehicle layout, basic axle weights etc are taken directly from design standards. For previous abnormal vehicle movements, the basic axle weights and layout are taken from records held on ESDAL[2].

The proposed vehicle movement to be compared is based on the hauliers' submissions.
The load comparison is intended to be a comparison of the applied basic axle loading from the applied vehicles, i.e., not including safety factors etc.

Wheel contact areas were taken as 350mm x 350mm in accordance with CS 458 Cl 3.37, including the HB vehicle.

Wheel loads were dispersed longitudinally in accordance with CS 458 Cl 3.36 and therefore CS 454 Cl 6.7.1 at 2 verticals to 1 horizontal (2V:1H) and dispersal was taken from the edge of the wheel contact area. Dispersal was taken to the level of the highest parts of pipes and arch culverts and to the mid-depth of the top slab of reinforced concrete box culverts. In accordance with CS 454 Cl 6.7.2 dispersal was taken at 1V:1H through the reinforced concrete of box culvert top slabs.

For longitudinal dispersal, the zone 1 and zone 2 dispersion zones were considered in accordance with CD 375 Cl 3.9. Similar guidance is given in PD 6694 Cl 10.2.7 for zones where axle dispersion zones combine. When axle load dispersion zones combine, the load is taken to be dispersed equally over the full dispersal length. This provides an equivalent UDL beneath the vehicle for comparison purposes.

For load comparisons, transverse dispersal was not considered. To consider the effects of transverse dispersals, the depth of fill would need to be known to some level of accuracy to obtain a meaningful comparison. Depths of fill are not known to any accuracy.

The comparison of loads was made comparing basic axle loads, or the applied vehicle loading. The effects of live load factors, dynamic amplification factors, overload factors were not considered. Again, these would require a full understanding of the structure depth to be applied accurately and meaningfully and was seen as going beyond the load comparison proposed and moving more towards a quantitative assessment.

The load comparison arrives at an equivalent UDL beneath the proposed vehicles at various depths of fill. The equivalent UDL is used for comparison purposes against assessed/design load or against previously passed abnormal vehicles.

B.4. Ramsey Bypass

B.4.1. Structure Details

Structure name:	Ramsey Bypass
Structure key:	13500
Structure number:	/A120//83.20/Q/
Date commissioned:	1961
Structure crosses:	Ramsey creek
Structure carries:	A120 road
Grid Ref.	621190 / 230240

The structure comprises of three corrugated steel Armco pipes located adjacent to each other. Each pipe is 1.68m diameter, 32m long and passes under the A120 at an angle of 33.5 degrees. The structure was extended to the south by approximately 14m in the late 1970's to accommodate widening of the A120. The depth of cover over the pipe is indicated as 0.85m in the general arrangement drawing excluding pavement layers. The depth of fill can be considered as more than 1m when the pavement layers are taken into account.

Figure B-1 – Ramsey Bypass

B.4.2. Existing Assessment / Design Information

A search of any existing assessment or design records has been undertaken within IAMIS and the following was located.

B.4.2.1. Assessment Records

No previous structure assessment records exist (AIP, calculations, assessment reports, certification).

There are no Load Management data for C&U and STGO Live Loading entered onto IAMIS.

B.4.2.2. Design Records

No original design records exist (AIP, calculations, certification).

B.4.2.3. Other Records

The Roads 277 Form produced from IAMIS on 11-01-2023 states that the design load is unknown.

B.4.3. Existing Structure Condition

A search for existing inspection records has been undertaken on IAMIS.

B.4.4. Inspection Records

The following inspection record was located.

Table B-1 - Ramsey Bypass – Inspection Records

Principal / General Inspection	Inspection Date	Overall Condition Recorded	Comment
Principal Inspection	14-03-2024	Fair	No significant signs of deterioration since last inspection
General Inspection	14-10-2021	Fair	Structure not internally inspected.
General Inspection	20-01-2020	Good	Report not reviewed.
Principal Inspection	11-09-2017	Good	Structure internally inspected.
General Inspection	03-09-2015	No significant defects	Report not reviewed.
General Inspection	9-12-2013	Good	Report not reviewed.
Special Inspection	30-4-2013	Good	Report not reviewed.
Principal Inspection	5-10-2011	Good	Report not reviewed.
General Inspection	07-12-2010	Fair	Report not reviewed.
General Inspection	02-03-2009	Fair	Report not reviewed.
Principal Inspection	08-02-2006	Fair	Report not reviewed.
General Inspection	29-04-2003	Nil entry	Report not reviewed.
General Inspection (BE11)	05-09-2001	Nil entry	Report not reviewed.
Principal Inspection (BE11)	19-05-1999	Nil entry	Report not reviewed.
General Inspection (BE11)	03-06-1997	Nil entry	Report not reviewed.
General Inspection (BE11)	26-03-1997	Nil entry	Report not reviewed.
General Inspection (BE11)	02-10-1992	Nil entry	Report not reviewed.
General Inspection (BE11)	15-05-1990	Nil entry	Report not reviewed.

General (BE11)	Inspection	01-06-1988	Nil entry	Report not reviewed.
Principal (BE11)	Inspection	01-12-1986	Nil entry	Report not reviewed.
General (BE11)	Inspection	01-05-1984	Nil entry	Report not reviewed.

B.4.5. Inspection Findings

The latest General Inspection dated 14-10-2021 of the structure did not include an internal inspection of the structure. The inspection records the following relevant defects:

- The structure was reported to be in a fair condition.
- Vegetation growth was noted at the south end of the structure primarily located at the south head wall making access difficult. Some of the vegetation is building up within the watercourse, which could affect the waterflow, within the watercourse in the future.
- Defects noted in 2017 Principal Inspection report are not confirmed due to inaccessibility inside.

Maintenance measures listed are:

- Remove vegetation growth.

The Principal Inspection dated 14-03-2024 included an internal inspection of the structure and records the following relevant notes and defects:

- The structure was reported to be in fair condition.
- Areas of protective coating loss with surface corrosion throughout the pipes, typically observed at the water level and the joint's location.
- Several missing rivets from the joints within all pipes.
- Areas of deformation within the first northern joint to the east armco pipe and the third southern joint to the centre armco pipe.
- Dense vegetation growth and silt accumulation at both ends of the structure.

Maintenance measures listed were:

- Reapply the protective coating at water level and above within all pipes.
- Carry out minor repairs to seal open gaps between mis aligned plate sections and replace missing rivets as required.
- Remove vegetation and silt from both ends of the structure prior next inspection as part of ongoing routine maintenance.

B.4.6. Inspection Discussion

The structure was last fully inspected, including internal elements on 14-3-2024 and then again visually inspected externally only on 14-10-2021. It was not reported in the PI/GI reports that the defects identified were structurally significant defects such as:

- Structure condition (changes in alignment, cross sectional shape, signs of settlement, reverse curvature of plates, integrity of joints and seems, bolt integrity).
- Material condition (significant effects of corrosion, material integrity).
- Backfill condition (voids, settlement over structure, depressions in surfacing).
- Scour action.

It was however noted that areas of deformation, missing rivets at various joints and plate separation. The severity was noted to be unlikely to be causing damage to the structure by the inspectors, with comments that some rivets may have been not installed at the time of construction. No other evidence was found that the structure is affected by defects compromising its structural integrity.

B.4.7. Historical Abnormal Vehicle Loading

A search was made on the National Highways ESDAL[2] database to consider previous abnormal vehicle loading that the structure had been exposed to. The following recorded load movements were located.

Table B-2 – Ramsey Bypass – Abnormal Vehicle Loading

ESDAL[2] ref.	Haulier name	Received date	Movement date	ICA	Axle weight	Movement status
ALLS/13472/1#1	Abnormal Load Logistics Ltd	03/06/2021	09/06/2021 to 09/07/2021	Pass	16500 kg	✓
APS/4985/1#1	SJH - All Plant Sales	25/04/2019	04/05/2019 to 17/05/2019	Pass	16500 kg	✓
APS/4966/1#1	SJH - All Plant Sales	09/04/2019	20/04/2019 to 03/05/2019	Pass	16500 kg	✓
APS/4947/1#1	SJH - All Plant Sales	26/03/2019	06/04/2019 to 19/04/2019	Pass	16500 kg	✓
APS/4927/1#1	SJH - All Plant Sales	14/03/2019	23/03/2019 to 05/04/2019	Pass	16500 kg	✓
APS/4908/1#1	SJH - All Plant Sales	01/03/2019	09/03/2019 to 22/03/2019	Pass	16500 kg	✓
APS/4870/1#1	SJH - All Plant Sales	15/02/2019	23/02/2019 to 08/03/2019	Pass	16500 kg	✓
APS/4832/1#1	SJH - All Plant Sales	31/01/2019	09/02/2019 to 22/02/2019	Pass	16500 kg	✓
APS/4812/1#1	SJH - All Plant Sales	15/01/2019	26/01/2019 to 08/02/2019	Pass	16500 kg	✓
APS/4754/1#1	SJH - All Plant Sales	03/01/2019	12/01/2019 to 25/01/2019	Pass	16500 kg	✓
APS/4733/1#1	SJH - All Plant Sales	13/12/2018	29/12/2018 to 11/01/2019	Pass	16500 kg	✓
APS/4694/1#1	SJH - All Plant Sales	29/11/2018	15/12/2018 to 28/12/2018	Pass	16500 kg	✓
APS/4658/1#1	SJH - All Plant Sales	15/11/2018	01/12/2018 to 14/12/2018	Pass	16500 kg	✓
APS/4604/1#1	SJH - All Plant Sales	01/11/2018	17/11/2018 to 30/11/2018	Pass	16500 kg	✓
APS/4583/1#1	SJH - All Plant Sales	18/10/2018	03/11/2018 to 16/11/2018	Pass	16500 kg	✓
APS/4531/1#1	SJH - All Plant Sales	02/10/2018	20/10/2018 to 02/11/2018	Pass	16500 kg	✓

Looking more closely at some of the above movements:

ALLS/13472
Movement occurred: 3rd June 2021
Gross vehicle weight: 82,500kg
Vehicle comprised: A 2-axle Conventional tractor with a 3-axle semi-trailer with max axle load of 16,500kg. The spacing of the axles are 2.75, 1.65, 2.45 and 1.7m.

Route: The vehicle travelled from Harwich Dock to Ainscough Group Ltd, Rugby.

APS/4985
Movement occurred: 25th April 2019
Gross vehicle weight: 89,000kg
Vehicle comprised: A 3-axle Conventional tractor having single axle of 9000kg and two axles of 16,500kg at 1.445 centres.
A 4-axle semi-low loader with 11,750kg axle loads at 1.36m centres.

Route: The vehicle travelled from New Farm, Cambridgeshire to Harwich International Port Ltd, Harwich

SMS/765
Movement occurred: 21st June 2017
Gross vehicle weight: 150,000kg
Vehicle comprised: A 2-axle Semi vehicle with 9000kg followed by 10 axle 13,200kg at a minimum 1.36m centres.

Route: The vehicle travelled from K J Services, Rhymney to Harwich International Port Ltd, Harwich

B.4.8. Discussion

The structure was originally constructed in 1961. The 2021 GI stated that the road carried was a trunk road. Although design capacity is not stated in any of the record documents, it is likely that the structure would have been originally designed in accordance with loading requirements from BS 153, the relevant design standard at the time, but no evidence was found to support such statement.

The previous abnormal load movements over the structure have been considered and found that two previous abnormal load movements are of similar magnitude and application to the proposed movements.

- ALLS/13472 includes a 16.5t axle load with axles at 1.65m minimum spacing. The vehicle passed over the structure circa 09-06-2021 to 09-07-2021. The structure was subsequently inspected, during the General Inspection of 14-10-2021. The General Inspection recorded no significant defects following this movement.
- APS/4985 includes a 16.5t axle loads with axles at 1.445m spacing. The vehicle passed over the structure circa 04-05-2019 to 17-05-2019.
- SMS/765 included a semi-trailer with 13.2t axle loads with axles at 1.36m centres. The vehicle passed over the structure circa 21-6-2017. The structure was subsequently inspected, including internally during the Principal Inspection of 11-9-2017. The Principal Inspection recorded no significant defects following this movement.

It has not been reported in the available PI/GI reports that the structure is affected by defects, which could affect its load carrying ability. There are no reported signs of structural distress, which could be attributable to overstressing, or a reduction in material strengths or section capacities. It is therefore deemed that the structure can continue to carry the loading, that has been historically subjected to.

Based on a comparison of the basic axle loads for the previous ALLS/13472 movement, the following is found:

- 16 Axle Flat top trailer - bogie loads of 19.98t per axle over 16 axles is found to be more onerous than ALLS/13472 and APS/4985 movement.
- 20 Axle Girder frame trailer - bogie loads of 19.81t per axle over 20 axles is found to be more onerous than ALLS/13472 and APS/4985 movement.
- 24 Axle Girder frame trailer - bogie loads of 17.30t per axle over 24 axles is found to be more onerous than ALLS/13472 and APS/4985 movement.
- 28 Axle Girder frame trailer - bogie loads of 16.91t per axle over 28 axles is found to be more onerous than ALLS/13472 and APS/4985 movement.

The critical vehicle movement across this structure historically is not as onerous as the proposed movement. The standard at the time of construction, BS 153, can be used to derive the probable design capacity of the culvert. This standard specified a HB Loading depending on the class of road. The A120 is a trunk road. Thus, it is likely the culvert was built to a capacity of HA + 45 HB, as specified in BS 153.

Repeating the axle load comparison:

- 45 Units HB vehicle has an axle load of 45.9t at 1.8m spacing, whilst the 16 Axle Flat top trailer has a bogie axle load of 19.98t at 1.5m spacing, 20 Axle Girder Trailer has a bogie axle load of 19.81t at 1.5m spacing, 24 Axle Girder Trailer has a bogie axle load of 17.30t at 1.5m spacing, and lastly 28 Axle Girder Trailer has a bogie axle load of 16.91t at 1.5m spacing. Thus, it is found that loading from each of the abnormal load vehicles to be less onerous than the assumed design loading.

B.4.9. Recommendation

Although there is no record of the structure's past performance in carrying abnormal load vehicles that were equal or greater than the axle weights of the proposed vehicle in this application, the design standards at the time (when the structure was designed) and the lack of significant structural defects allow a conclusion that the structures is adequate for carrying the proposed abnormal vehicle loading.

Appendix C. Summary Spreadsheet

T831 - WYNL/130/S1 - Port of Harwich, Harwich, CO12 4SR to National Grid Manningtree Site, Off Ardleigh Road, Manningtree, CO11 2QB: ATKINS AFFECTED STRUCTURES SUMMARY REPORT

AtkinsRéalis | national highways

		ORIGINATED BY			CHECKED BY			REVIEWED BY		
Project:	Movement of Special Order Loads T831 - WYNL/130/S1 - Port of Harwich, Harwich, CO12 4SR to National Grid Site, Off Ardleigh Road, Manningtree, CO11 2QA	**NAME**	**DATE**	**SIGN**	**NAME**	**DATE**	**SIGN**	**NAME**	**DATE**	**SIGN**
Task Description:	'First-pass' comparison of abnormal load against recorded Load Ratings	JN	03/06/2024		Rakesh D N	05/06/2024		Michal Wiciak	02/07/2024	
Vehicle Details:	16 Axle Flat top trailer									

Sl No.	Bridge Name	Structure Number	Structure Key	Year of construction	Brief Description	Skew (Angle in Degrees)	Load Movement (Over/Under)	Over/Underbridge Or Culvert	Route Carried	Design / Assessment Load Rating	Source Of Load Rating	Number Of Spans	Span Lengths	Headroom (m)	Articulation	d' Horizontal distance from support (for shear consideration)	Load effects for recorded load ratings (HB Loadings)		Load Effects For Abnormal Loads		Abnormal Load Compared To Recorded Load Rating		Pass / Fail	Comments
																	Bending Moment (kN.m)	Shear (kN)	Bending Moment (kN.m)	Shear (kN)	Bending Moment Utilisation	Shear Utilisation		
1	Links	/A120//86.40/Q/	13501	1977	Corrugated steel Armco pipe culvert - 3 Number of culverts	25	Over	Large Culvert or Underbridge	Carries A120	32T ALL + 37.5 units HB	Form 277 and 2023 PI Report	3	2m	Not applicable	Not applicable	Not applicable	The 37.5 Units of HB vehicle has a critical axle load of 375kN with an axle spacing of 1.8m. Whereas, the abnormal vehicle (16 axle girder set) has a critical axle load of 199.8kN with an axle spacing of 1.5m. For the span of 2m, the HB vehicle will accommodate 2 axle (750kN) and the abnormal vehicle will accommodate 2 axle (399.6kN). Hence the abnormal vehicle is 53% of 37.5 units of HB vehicle.						Pass	The structure is capable of carrying 37.5 units of HB. The applied abnormal vehicle axle load is smaller than the axle load due to 37.5 HB units
2	Vicarage Road	/A120//85.50/Q/	13502	1977	In-situ reinforced concrete box culvert - single span	0	Over	Box Culvert (Agricultural access)	Carries A120	32T ALL + 37.5 units HB	2023 PI Report	1	4.5m (clear span)	Not applicable	Not applicable	Not applicable	434 (Hogging)	587	283 (Hogging)	377	65%	64%	Pass	Verified using moving loads spreadsheet.
																	250 (Sagging)		160 (Sagging)		64%			
3	Pond Hall	/A120//84.20/Q/	13503	1977	In-situ reinforced concrete box culvert - single span	0	Over	Box Culvert (Agricultural access)	Carries A120	32T ALL + 37.5 units HB	2023 PI Report	1	4.5m (clear span)	Not applicable	Not applicable	Not applicable	434 (Hogging)	587	283 (Hogging)	377	65%	64%	Pass	Verified using moving loads spreadsheet.
																	250 (Sagging)		160 (Sagging)		64%			
4	Ramsey Bypass	/A120//83.20/Q/	13500	1961	Corrugated steel Armco pipe culvert - 3 culverts adjacent to each other	34	Over	Large Culvert or Underbridge	Carries A120	Not available	Not available	3	1.68m	Not applicable	Not applicable	Not applicable	Refer Appendix B						Pass	Design/Assessment load rating is unavailable. Hence, qualitative assessment has been undertaken and the findings have been presented in the technical report HE602066-ATK-SBR-ZZ-RP-CB-000008, Rev C01.
5	Bradfield Road	/A120//77.70/Q/	13511	1973	Precast prestressed concrete deck beams and cast-in-situ slab - single span	18	Over	Underbridge	Carries A120	24T ALL + 45 units HB	2021 GI Report	1	12.2m	Not applicable	Simply supported	Not applicable	337	193	342	176	101%	91%	Fail	Verified using grillage model. The values provided are per metre width.

T831 - WYNL/130/S1 - Port of Harwich, Harwich, CO12 4SR to National Grid Manningtree Site, Off Ardleigh Road, Manningtree, CO11 2QB: ATKINS AFFECTED STRUCTURES SUMMARY REPORT

		ORIGINATED BY			CHECKED BY			REVIEWED BY		
Project:	Movement of Special Order Loads T831 - WYNL/130/S1 - Port of Harwich, Harwich, CO12 4SR to National Grid Site, Off Ardleigh Road, Manningtree, CO11 2QB	**NAME**	**DATE**	**SIGN**	**NAME**	**DATE**	**SIGN**	**NAME**	**DATE**	**SIGN**
Task Description:	'First-pass' comparison of abnormal load against recorded Load Ratings	JN	03/06/2024		Rakesh D N	05/06/2024		Michal Wiciak	02/07/2024	
Vehicle Details:	20 Axle Girder Set									

Sl No.	Bridge Name	Structure Number	Structure Key	Year of construction	Brief Description	Skew (Angle in Degrees)	Load Movement (Over/Under)	Over/Underbridge Or Culvert	Route Carried	Design / Assessment Load Rating	Source Of Load Rating	Number Of Spans	Span Lengths	Headroom (m)	Articulation	d' Horizontal distance from support (for shear consideration)	Load effects for recorded load ratings (HB Loadings)		Load Effects For Abnormal Loads		Abnormal Load Compared To Recorded Load Rating		Pass / Fail	Comments
																	Bending Moment (kN.m)	Shear (kN)	Bending Moment (kN.m)	Shear (kN)	Bending Moment Utilisation	Shear Utilisation		
1	Links	/A120//86.40/Q/	13501	1977	Corrugated steel Armco pipe culvert - 3 Number of culverts	25	Over	Large Culvert or Underbridge	Carries A120	32T ALL + 37.5 units HB	Form 277 and 2023 PI Report	3	2m	Not applicable	Not applicable	Not applicable	The 37.5 Units of HB vehicle has a critical axle load of 375kN with an axle spacing of 1.8m. Whereas, the abnormal vehicle (20 axle girder set) has a critical axle load of 198.1kN with an axle spacing of 1.5m. For the span of 2m, the HB vehicle will accommodate 2 axle (750kN) and the abnormal vehicle will accommodate 2 axle (396.2kN). Hence the abnormal vehicle is 53% of 37.5 units of HB vehicle.						Pass	The structure is capable of carrying 37.5 units of HB. The applied abnormal vehicle axle load is smaller than the axle load due to 37.5 HB units
2	Vicarage Road	/A120//85.50/Q/	13502	1977	In-situ reinforced concrete box culvert - single span	0	Over	Box Culvert (Agricultural access)	Carries A120	32T ALL + 37.5 units HB	2023 PI Report	1	4.5m (clear span)	Not applicable	Not applicable	Not applicable	434 (Hogging)	587	281 (Hogging)	374	65%	64%	Pass	Verified using moving loads spreadsheet.
																	250 (Sagging)		159 (Sagging)		64%			
3	Pond Hall	/A120//84.20/Q/	13503	1977	In-situ reinforced concrete box culvert - single span	0	Over	Box Culvert (Agricultural access)	Carries A120	32T ALL + 37.5 units HB	2023 PI Report	1	4.5m (clear span)	Not applicable	Not applicable	Not applicable	434 (Hogging)	587	281 (Hogging)	374	65%	64%	Pass	Verified using moving loads spreadsheet.
																	250 (Sagging)		159 (Sagging)		64%			
4	Ramsey Bypass	/A120//83.20/Q/	13500	1961	Corrugated steel Armco pipe culvert - 3 Culverts adjacent to each other	34	Over	Large Culvert or Underbridge	Carries A120	Not available	Not available	3	1.68m	Not applicable	Not applicable	Not applicable	Refer Appendix B						Pass	Design/Assessment load rating is unavailable. Hence, qualitative assessment has been undertaken and the findings have been presented in the technical report HE602066-ATK-SBR-ZZ-RP-CB-000008, Rev C01.
5	Bradfield Road	/A120//77.70/Q/	13511	1973	Precast prestressed concrete deck beams and cast-in-situ slab - single span	18	Over	Underbridge	Carries A120	24T ALL + 45 units HB	2021 GI Report	1	12.2m	Not applicable	Simply supported	Not applicable	337	193	339	176	101%	91%	Fail	Verified using grillage model. The values provided are per metre width

T831 - WYNL/130/S1 - Port of Harwich, Harwich, CO12 4SR to National Grid Manningtree Site, Off Ardleigh Road, Manningtree, CO11 2QB: ATKINS AFFECTED STRUCTURES SUMMARY REPORT

		ORIGINATED BY			CHECKED BY			REVIEWED BY		
Project:	Movement of Special Order Loads T831 - WYNL/130/S1 - Port of Harwich, Harwich, CO12 4SR to National Grid Site, Off Ardleigh Road, Manningtree, CO11 2QB	**NAME**	**DATE**	**SIGN**	**NAME**	**DATE**	**SIGN**	**NAME**	**DATE**	**SIGN**
Task Description:	'First-pass' comparison of abnormal load against recorded Load Ratings	JN	03/06/2024		Rakesh D N	05/06/2024		Michal Wiciak	02/07/2024	
Vehicle Details:	24 Axle Girder Set									

Sl No.	Bridge Name	Structure Number	Structure Key	Year of construction	Brief Description	Skew (Angle in Degrees)	Load Movement (Over/Under)	Over/Underbridge Or Culvert	Route Carried	Design / Assessment Load Rating	Source Of Load Rating	Number Of Spans	Span Lengths	Headroom (m)	Articulation	d' Horizontal distance from support (for shear consideration)	Load effects for recorded load ratings (HB Loadings)		Load Effects For Abnormal Loads		Abnormal Load Compared To Recorded Load Rating		Pass / Fail	Comments
																	Bending Moment (kN.m)	Shear (kN)	Bending Moment (kN.m)	Shear (kN)	Bending Moment Utilisation	Shear Utilisation		
1	Links	/A120//86.40/Q/	13501	1977	Corrugated steel Armco pipe culvert - 3 Number of culverts	25	Over	Large Culvert or Underbridge	Carries A120	32T ALL + 37.5 units HB	Form 277 and 2023 PI Report	3	2m	Not applicable	Not applicable	Not applicable	The 37.5 Units of HB vehicle has a critical axle load of 375kN with an axle spacing of 1.8m. Whereas, the abnormal vehicle (24 axle girder set) has a critical axle load of 173.02kN with an axle spacing of 1.5m. For the span of 2m, the HB vehicle will accommodate 2 axle (750kN) and the abnormal vehicle will accommodate 2 axle (346.04kN). Hence the abnormal vehicle is 46% of 37.5 units of HB vehicle.						Pass	The structure is capable of carrying 37.5 units of HB. The applied abnormal vehicle axle load is smaller than the axle load due to 37.5 HB units
2	Vicarage Road	/A120//85.50/Q/	13502	1977	In-situ reinforced concrete box culvert - single span	0	Over	Box Culvert (Agricultural access)	Carries A120	32T ALL + 37.5 units HB	2023 PI Report	1	4.5m (clear span)	Not applicable	Not applicable	Not applicable	434 (Hogging)	587	245 (Hogging)	327	56%	56%	Pass	Verified using moving loads spreadsheet.
																	250 (Sagging)		139 (Sagging)		56%			
3	Pond Hall	/A120//84.20/Q/	13503	1977	In-situ reinforced concrete box culvert - single span	0	Over	Box Culvert (Agricultural access)	Carries A120	32T ALL + 37.5 units HB	2023 PI Report	1	4.5m (clear span)	Not applicable	Not applicable	Not applicable	434 (Hogging)	587	245 (Hogging)	327	56%	56%	Pass	Verified using moving loads spreadsheet.
																	250 (Sagging)		139 (Sagging)		56%			
4	Ramsey Bypass	/A120//83.20/Q/	13500	1961	Corrugated steel Armco pipe culvert - 3 culverts adjacent to each other	34	Over	Large Culvert or Underbridge	Carries A120	Not available	Not available	3	1.68m	Not applicable	Not applicable	Not applicable	Refer Appendix B						Pass	Design/Assessment load rating is unavailable. Hence, qualitative assessment has been undertaken and the findings have been presented in the technical report HE602066-ATK-SBR-ZZ-RP-CB-000008, Rev C01.
5	Bradfield Road	/A120//77.70/Q/	13511	1973	Precast prestressed concrete deck beams and cast-in-situ slab - single span	18	Over	Underbridge	Carries A120	24T ALL + 45 units HB	2021 GI Report	1	12.2m	Not applicable	Simply supported	Not applicable	337	193	303	153	90%	79%	Pass	Verified using grillage model. The values provided are per metre width

T831 - WYNL/130/S1 - Port of Harwich, Harwich, CO12 4SR to National Grid Manningtree Site, Off Ardleigh Road, Manningtree, CO11 2QB: ATKINS AFFECTED STRUCTURES SUMMARY REPORT

		ORIGINATED BY			CHECKED BY			REVIEWED BY		
Project:	Movement of Special Order Loads T831 - WYNL/130/S1 - Port of Harwich, Harwich, CO12 4SR to National Grid Site, Off Ardleigh Road, Manningtree, CO11 2QB	**NAME**	**DATE**	**SIGN**	**NAME**	**DATE**	**SIGN**	**NAME**	**DATE**	**SIGN**
Task Description:	'First-pass' comparison of abnormal load against recorded Load Ratings	JN	03/06/2024		Rakesh D N	05/06/2024		Michal Wiciak	02/07/2024	
Vehicle Details:	28 Axle Girder Set									

Sl No.	Bridge Name	Structure Number	Structure Key	Year of construction	Brief Description	Skew (Angle in Degrees)	Load Movement (Over/Under)	Over/Underbridge Or Culvert	Route Carried	Design / Assessment Load Rating	Source Of Load Rating	Number Of Spans	Span Lengths	Headroom (m)	Articulation	d' Horizontal distance from support (for shear consideration)	Load effects for recorded load ratings (HB Loadings)		Load Effects For Abnormal Loads		Abnormal Load Compared To Recorded Load Rating		Pass / Fail	Comments
																	Bending Moment (kN.m)	Shear (kN)	Bending Moment (kN.m)	Shear (kN)	Bending Moment Utilisation	Shear Utilisation		
1	Links	/A120//86.40/Q/	13501	1977	Corrugated steel Armco pipe culvert - 3 Number of culverts	25	Over	Large Culvert or Underbridge	Carries A120	32T ALL + 37.5 units HB	Form 277 and 2023 PI Report	3	2m	Not applicable	Not applicable	Not applicable	The 37.5 Units of HB vehicle has a critical axle load of 375kN with an axle spacing of 1.8m. Whereas, the abnormal vehicle (28 axle girder set) has a critical axle load of 169.17kN with an axle spacing of 1.5m. For the span of 2m, the HB vehicle will accommodate 2 axle (750kN) and the abnormal vehicle will accommodate 2 axle (338.34kN). Hence the abnormal vehicle is 45% of 37.5 units of HB vehicle.						Pass	
2	Vicarage Road	/A120//85.50/Q/	13502	1977	In-situ reinforced concrete box culvert - single span	0	Over	Box Culvert (Agricultural access)	Carries A120	32T ALL + 37.5 units HB	2023 PI Report	1	4.5m (clear span)	Not applicable	Not applicable	Not applicable	434 (Hogging)	587	240 (Hogging)	319	55%	54%	Pass	Verified using moving loads spreadsheet.
																	250 (Sagging)		136 (Sagging)		54%			
3	Pond Hall	/A120//84.20/Q/	13503	1977	In-situ reinforced concrete box culvert - single span	0	Over	Box Culvert (Agricultural access)	Carries A120	32T ALL + 37.5 units HB	2023 PI Report	1	4.5m (clear span)	Not applicable	Not applicable	Not applicable	434 (Hogging)	587	240 (Hogging)	319	55%	54%	Pass	Verified using moving loads spreadsheet.
																	250 (Sagging)		136 (Sagging)		54%			
4	Ramsey Bypass	/A120//83.20/Q/	13500	1961	Corrugated steel Armco pipe culvert - 3 culverts adjacent to each other	34	Over	Large Culvert or Underbridge	Carries A120	Not available	Not available	3	1.68m	Not applicable	Not applicable	Not applicable	Refer Appendix B						Pass	Design/Assessment load rating is unavailable. Hence, qualitative assessment has been undertaken and the findings have been presented in the technical report HE602066-ATK-SBR-ZZ-RP-CB-000008, Rev C01.
5	Bradfield Road	/A120//77.70/Q/	13511	1973	Precast prestressed concrete deck beams and cast-in-situ slab - single span	18	Over	Underbridge	Carries A120	24T ALL + 45 units HB	2021 GI Report	1	12.2m	Not applicable	Simply supported	Not applicable	337	193	297	153	88%	79%	Pass	Verified using grillage model. The values provided are per metre width

AtkinsRéalis Delivery Team
AtkinsRéalis
4th Floor, Regent House
90-96 Victoria Road
Chelmsford
Essex CM1 1QU

Brad Dyke

From: David Byrne [redacted]@nationalhighways.co.uk>
Sent: 24 June 2024 09:07
To: Brad Dyke
Subject: RE: Special Order Application: WYNL/130 - Harwich to North Falls Sub Bromley

Hi Brad,

Essex CC have responded saying the below:

Bridge no 716/43134 Phoenix on the A120 has had an abnormal load ban on it since 2018

They would most likely expect the application to be revised to avoid the bridge before they send an official acceptance.

Kind regards,

David Byrne
Senior Route Planner |Abnormal Loads Team|Operations Customer Services Division
National Highways |The Cube |199 Wharfside Street | Birmingham | B1 1RN
Work - [redacted]
Web: www.nationalhighways.co.uk

From: Brad Dyke [redacted]@wynnslimited.com>
Sent: Tuesday, June 18, 2024 4:19 PM
To: David Byrne [redacted]@nationalhighways.co.uk>
Subject: RE: Special Order Application: WYNL/130 - Harwich to North Falls Sub Bromley

Understood, that's great news, thanks David.

If when you speak with Essex CC they could confirm that in writing that the other route out of Harwich which crosses Dovercourt Dock River Bridge and Bathside are acceptable on all vehicles, again for our records that would be most helpful.

Much appreciated.

Regards,

Brad Dyke
Transport Planner

Tel: [redacted]
Mobile: [redacted]
Email: [redacted]@wynnslimited.com

Shaftesbury House, 2 High Street, Eccleshall, Staffordshire, ST21 6BZ
Registered in England & Wales No. 3162297

From: David Byrne [redacted]@nationalhighways.co.uk>
Sent: Tuesday, June 18, 2024 4:07 PM
To: Brad Dyke [redacted]@wynnslimited.com>
Subject: RE: Special Order Application: WYNL/130 - Harwich to North Falls Sub Bromley

Hi Brad,

Although they have not referenced them I believe they have no issues with those structures being used. Usually they would reference all structures that have failed.

> Dear Sirs
>
> SPECIAL ORDER - PROVISIONAL ROUTE REF - WYNL/130/S1
> UNACCEPTABLE MOVEMENT NOTIFICATION - RESUBMISSION REQUIRED
>
> I acknowledge receipt of your PROVISIONAL Special Order application as detailed above.
>
> I am sorry, but unfortunately due to new structural data received, it has not been possible to register your notificatic
>
> Bridge no 716/43134 Phoenix on the A120 about 1.15 miles SW of Harwich and about 0.61 miles SW of Parkestor
> (1.265114°E 51.940085°N) - ALL Vehicles

All vehicles on the proposal have failed on the Phoenix bridge.

Kind regards,

David Byrne
Senior Route Planner |Abnormal Loads Team|Operations Customer Services Division
National Highways |The Cube |199 Wharfside Street | Birmingham | B1 1RN
Work - [redacted]
Web: www.nationalhighways.co.uk

From: Brad Dyke [redacted]@wynnslimited.com>
Sent: Tuesday, June 18, 2024 4:04 PM

To: David Byrne [redacted]@nationalhighways.co.uk>
Subject: RE: Special Order Application: WYNL/130 - Harwich to North Falls Sub Bromley

Thank you David, that would be helpful.

Just to confirm is the Dovercourt Dock River Bridge which is crossed over on the other exit of the Port of Harwich via the Parkeston Bypass therefore accepted by Essex CC structurally acceptable?

The routes proposed also cross one final structure Essex CC owned 'Bathside' could you advise if this is also acceptable?

Structure details

Structure general details

ESRN	: S-TM239317-1
Name	: BATHSIDE
Unique Id	: 715
Coordinates	: 623982 , 231786
Owner/Stakeholder	: Essex County Council Abnormal Load Service
Category	: Culvert
Class	: Underbridge
Length	: 6.6 m

Structure sections

Please select a section to view details .

Underbridge section 1

Would you also be able to confirm which of the trailers submitted pass/fail please?

Thank you again.

Regards,

Brad Dyke
Transport Planner

Tel: [redacted]
Mobile: [redacted]
Email: [redacted]@wynnslimited.com

From: David Byrne [redacted]@nationalhighways.co.uk>
Sent: Tuesday, June 18, 2024 3:59 PM
To: Brad Dyke [redacted]@wynnslimited.com>
Subject: RE: Special Order Application: WYNL/130 - Harwich to North Falls Sub Bromley

Hi Brad,

I can speak with the council to see if they can provide us with any information regarding the rate of failure. I will get back to you when I hear off them.

Kind regards,

David Byrne
Senior Route Planner |Abnormal Loads Team|Operations Customer Services Division
National Highways |The Cube |199 Wharfside Street | Birmingham | B1 1RN
Work - [redacted]
Web: www.nationalhighways.co.uk

From: Brad Dyke [redacted]@wynnslimited.com>
Sent: Tuesday, June 18, 2024 3:28 PM
To: David Byrne [redacted]@nationalhighways.co.uk>
Subject: RE: Special Order Application: WYNL/130 - Harwich to North Falls Sub Bromley

Good afternoon David,

Sorry for the delay, this was missed

Could the information as to the rate of failure over this structure be obtained for our record without advancing further structural assessment?

Thank you, David,

Regards,

Brad Dyke
Transport Planner

Tel: [redacted]
Mobile: [redacted]
Email: [redacted]@wynnslimited.com

Find out more visit wynnslimited.com

Shaftesbury House, 2 High Street, Eccleshall, Staffordshire, ST21 6BZ
Registered in England & Wales No. 3162297

From: David Byrne [redacted]@nationalhighways.co.uk>
Sent: Tuesday, May 21, 2024 9:41 AM
To: Brad Dyke [redacted]@wynnslimited.com>
Subject: FW: Special Order Application: WYNL/130 - Harwich to North Falls Sub Bromley

Morning Brad,

Hope you are well 😊 have you had a chance to review the below email regarding the rejection?

Kind regards,

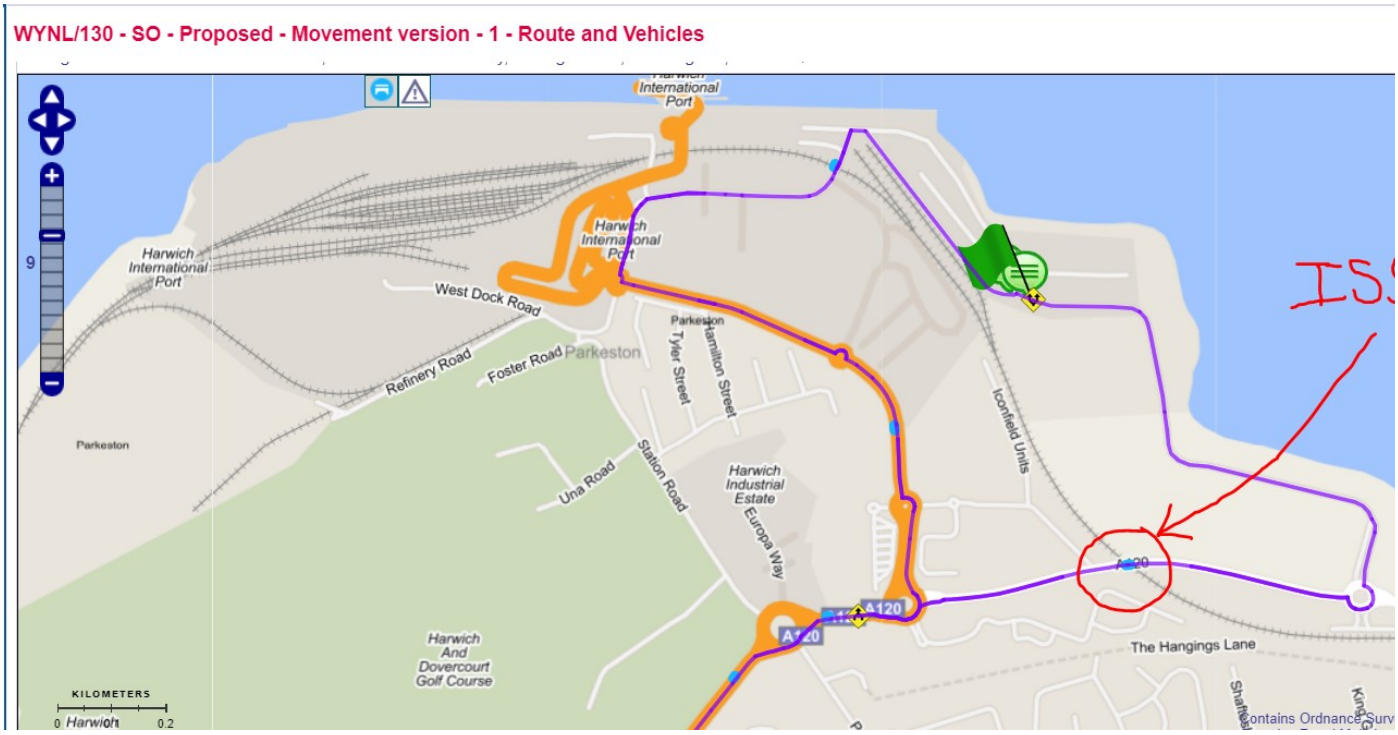
David Byrne
Senior Route Planner |Abnormal Loads Team|Operations Customer Services Division
National Highways |The Cube |199 Wharfside Street | Birmingham | B1 1RN
Work - [redacted]
Web: www.nationalhighways.co.uk

From: Simon Blakeman [redacted]@nationalhighways.co.uk>
Sent: Monday, April 29, 2024 4:43 PM
To: [redacted]@wynnslimited.com
Cc: David Byrne [redacted]@nationalhighways.co.uk>; Shazia Ahmed [redacted]@nationalhighways.co.uk>
Subject: Special Order Application: WYNL/130 - Harwich to North Falls Sub Bromley

Afternoon Brad,

Please find attached the rejection by **Essex CC** of one of the alternative paths out of Harwich Docks – that via Phoenix Road (see below screenshot).

The structure in question is on the A120 and is called Phoenix.



We haven't been given any more information on the failure (and how much it fails by) but before I engage further with Essex CC I wondered what your thoughts were on this recent rejection of the route, and how you would like to take it forward?

At this stage, the options would be to go with the route out of the docks via East Dock Road and discount the Phoenix Road route, or get some further assessments carried out as a further alternative path does not look achievable with the roads available in that area.

Happy to take instruction on the next phase of this application.

Best regards

Simon Blakeman
Senior Strategy and Customer Manager
Abnormal Indivisible Loads Team
Operations Customer Services Division
National Highways | The Cube | 199 Wharfside Street | Birmingham | B1 1RN
Tel: [redacted]
Mobile: TBC
Web: http://www.nationalhighways.co.uk
Team Tel: 0300 470 3004

Brad Dyke

From: Emmanuel Anum [redacted]@nationalhighways.co.uk>
Sent: 10 April 2024 08:14
To: Brad Dyke
Cc: [redacted]@ringway.co.uk; East Region Abnormal Loads; Lee Cornwell; PATEL Nilesh
Subject: Collaboration note on movement WYNL/131/1#1
Attachments: FW: Movement notification alert (WYNL/131/1#1)

Hi Jodi,

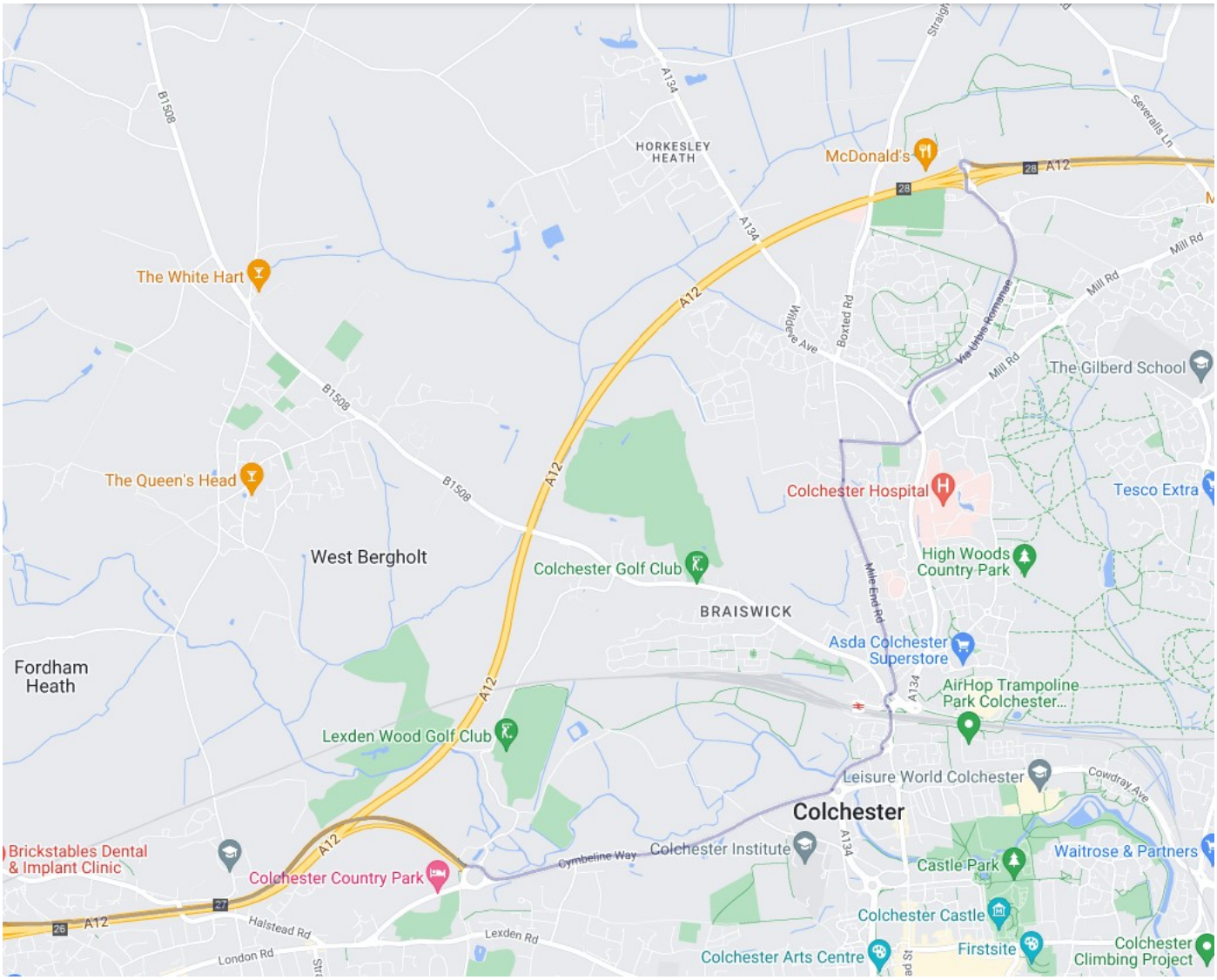
We are in receipt of your proposed notification with reference WYNL/131/1#1.

Unfortunately, your proposal exceeds the 110 tonnes weight restriction of the carrying capacity of Orchard Railway Bridge on A12. Please click on the link below to take you to the location of the bridge.

(110 tonne limit; A12 Colchester 05860 A12/75.20// Orchard Railway 597199E 226419N both directions)

Available Options

Propose a reroute through Colchester by exiting A12 junction 27 and re-joining the A12 probably at junction 28 (for northbound direction) thus avoiding Orchard Railway Bridge. See map below.



Alternatively, you can use a different route convenient to you.

Could you please amend your proposed notification and resubmit for consideration and acceptance? Thanks.

Kind Regards

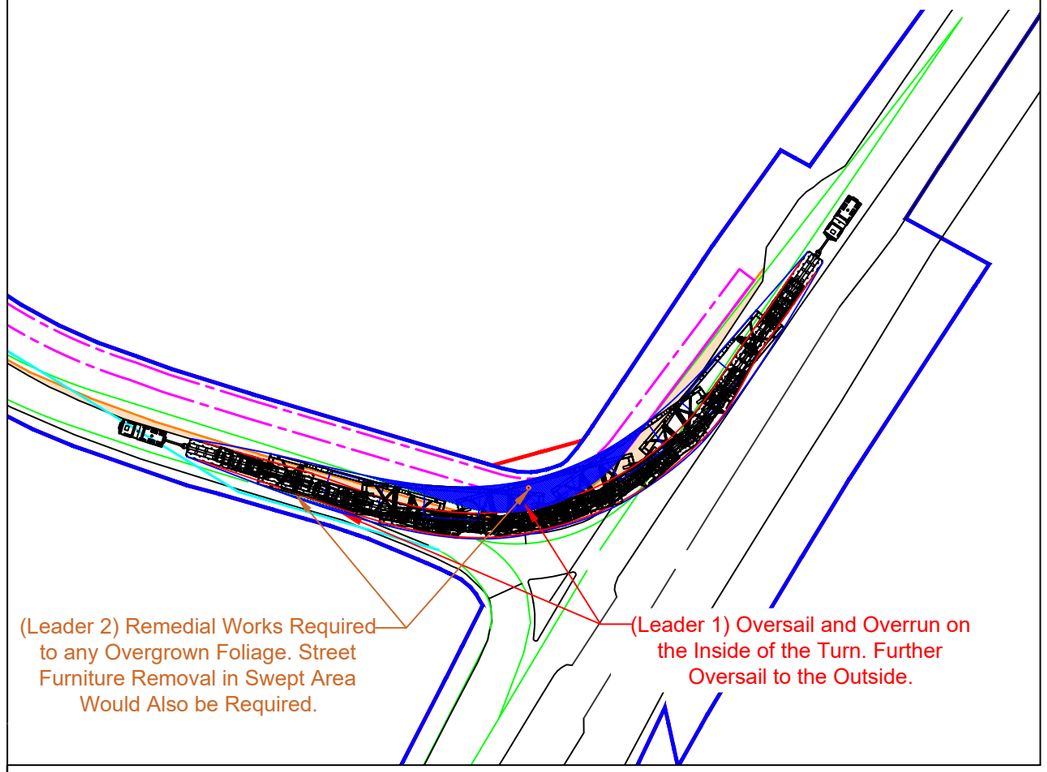
[redacted]

Emmanuel Anum, Senior Engineer
Abnormal Loads (Structures)
Operations (East) | National Highways
Woodlands | Manton Lane | Bedford | MK41 7LW
Mob: [redacted] | www.nationalhighways.co.uk

Appendix 5

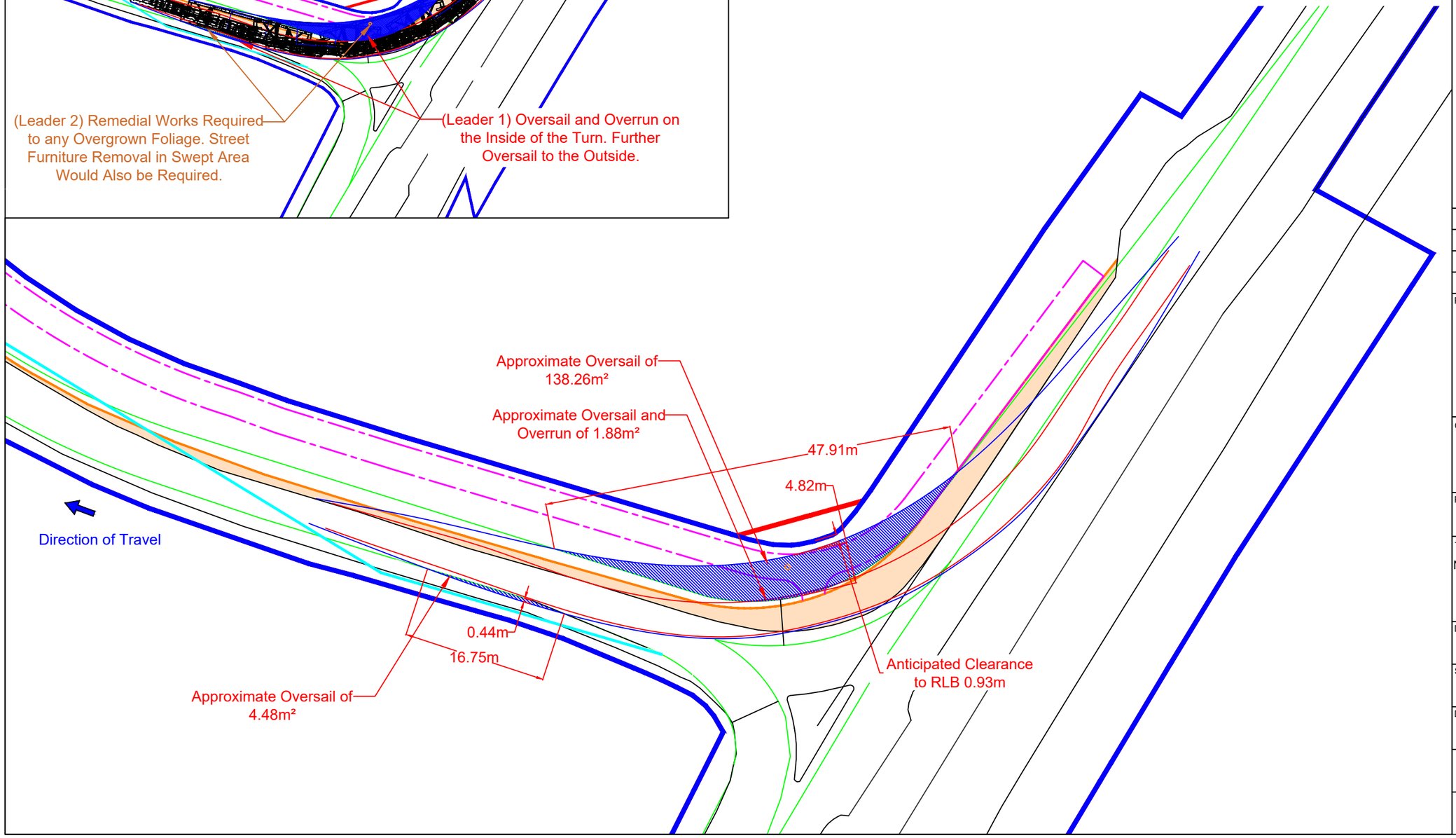
Swept Path Assessments

Swept Path Assessment
Indicative of 28 Axle Girder Frame Trailer
Constructed from Client Supplied Design Data
Scale 1:1000



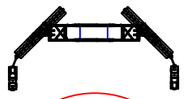
Swept Path Assessment
Indicative of 28 Axle Girder Frame Trailer
Constructed from Client Supplied Design Data
Scale 1:500

The delivery vehicle can be seen turning right from A120 onto Bentley Road, at approximate OS grid reference: TM 11293 26572.
The configuration is recommended to take the turn in contraflow. The configuration is anticipated to oversail and minimal overrun on the inside of the turn, as well as further oversail on the outside of the turn (Leader 1). Where overrun occurs, plating and packing of any present kerbs/pavements/verges must be carried out to facilitate. Any overgrown foliage into the roadway may need trimming depending on growth at the time of movement. Additionally, Street furniture within the swept area will need to be removed, this would include the telecoms pole and street signs (Leader 2).
Based on carrying out the proposed remedials, section is considered to be negotiable.

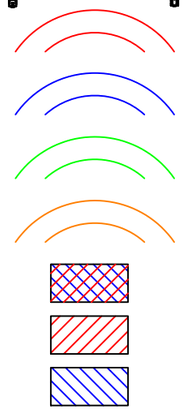


Location Plan

Legend:



28 axle girder frame trailer minimum turning arrangements Drawing ref. 24-1232.TC03



Extent of Tractor Track

Extent of Oversail

Proposed Road Bboundary

Proposed Road Widening

Overrun and oversail beyond kerb

Overrun beyond kerb

Oversail beyond kerb

Rev.	Date	Amendments
1	12.07.24	Client Logo Updated
0	21.06.24	Issued for comment

Revisions

Prepared by:

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

Independent Transportation Engineers

Client:

NORTH FALLS
Offshore Wind Farm

Project:

North Falls

Title:

Swept Path Assessment
Negotiability of turning right from A120 onto Bentley Road, at approximate OS grid reference: TM 11293 26572, considerate of indicative te transformer transported on 28 axle girder frame trailer.

Drawing status:

Final Report

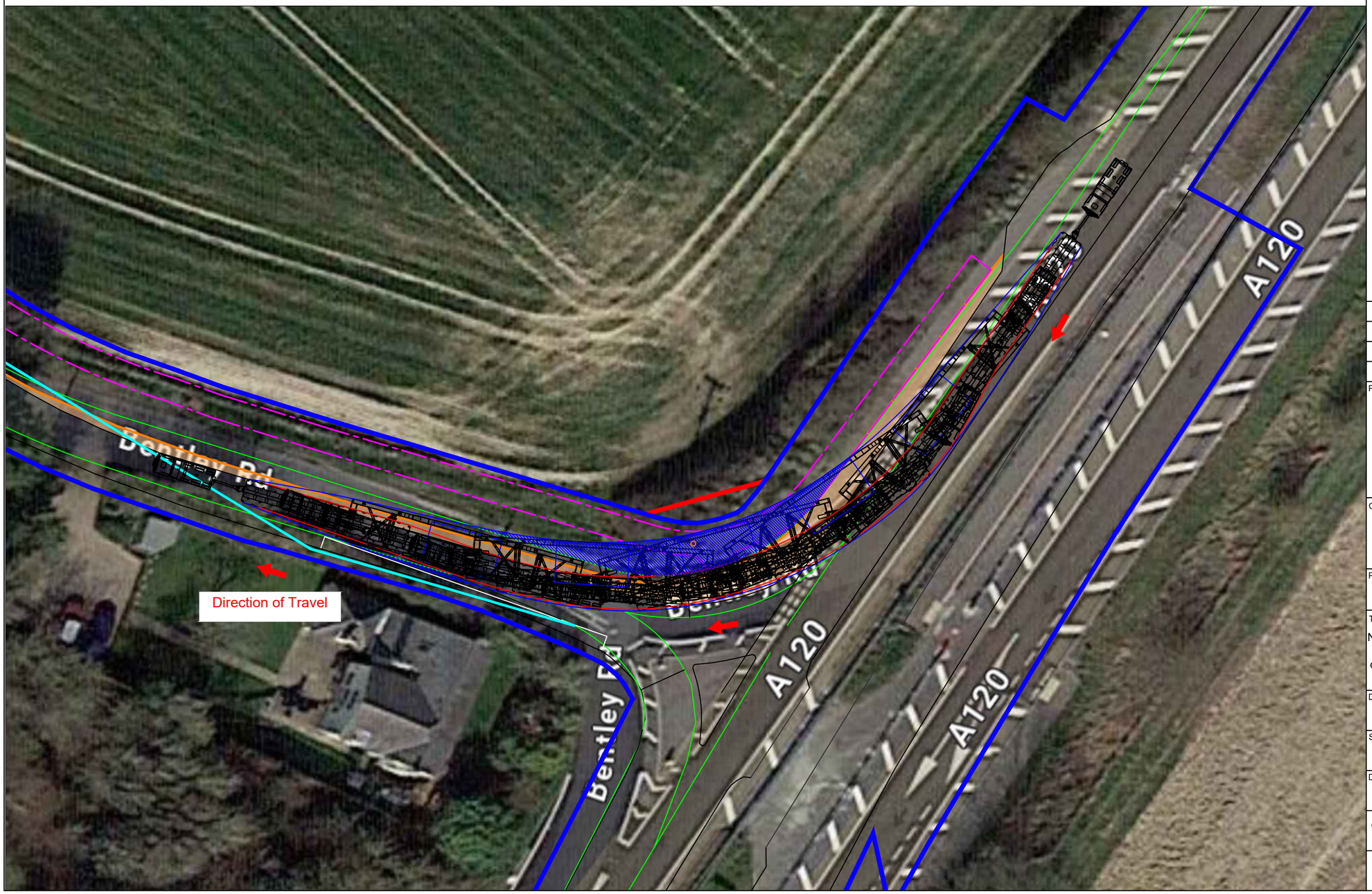
Scale (A3):	Drawn by:	Checked by:
As shown	MTO	ARP
Dwg. no:	**Sheet:**	**Rev:**
24-1232.SPA01	1 of 2	1

P:\Clients\Existing Clients\RWE\24-1232 North Falls Offshore Wind Farm\Swept Path Assessments

N

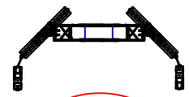
Swept Path Assessment
Indicative of 28 Axle Girder Frame Trailer
Constructed from Client Supplied Design Data
Scale 1:1000

NOTE: Overlay onto aerial image is not representative of the configuration relative to the environment. This is for illustrative purposes only, and should only be taken as such.



Location Plan

Legend:



28 axle girder frame trailer minimum turning arrangements Drawing ref. 24-1232.TC03

Extent of Tractor Track

Extent of Oversail

Proposed Road Bboundary

Proposed Road Widening

Overrun and oversail beyond kerb

Overrun beyond kerb

Oversail beyond kerb

Rev.	Date	Amendments
1	12.07.24	Client Logo Updated
0	21.06.24	Issued for comment

Revisions

Prepared by:

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

Independent Transportation Engineers

Client: North Falls Offshore Wind Farms

Project: North Falls

Title: Swept Path Assessment
Negotiability of turning right from A120 onto Bentley Road, at approximate OS grid reference: TM 11293 26572, considerate of indicative te transformer transported on 28 axle girder frame trailer.

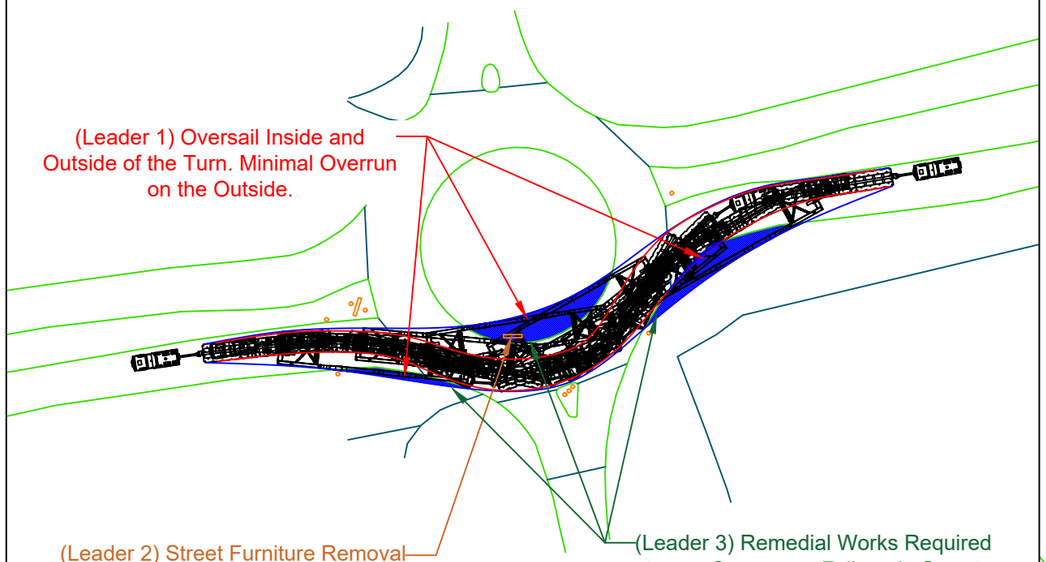
Drawing status: Final Report

Scale (A3):	Drawn by:	Checked by:
As shown	MTO	ARP

Dwg. no:	Sheet:	Rev:
24-1232.SPA01	2 of 2	1

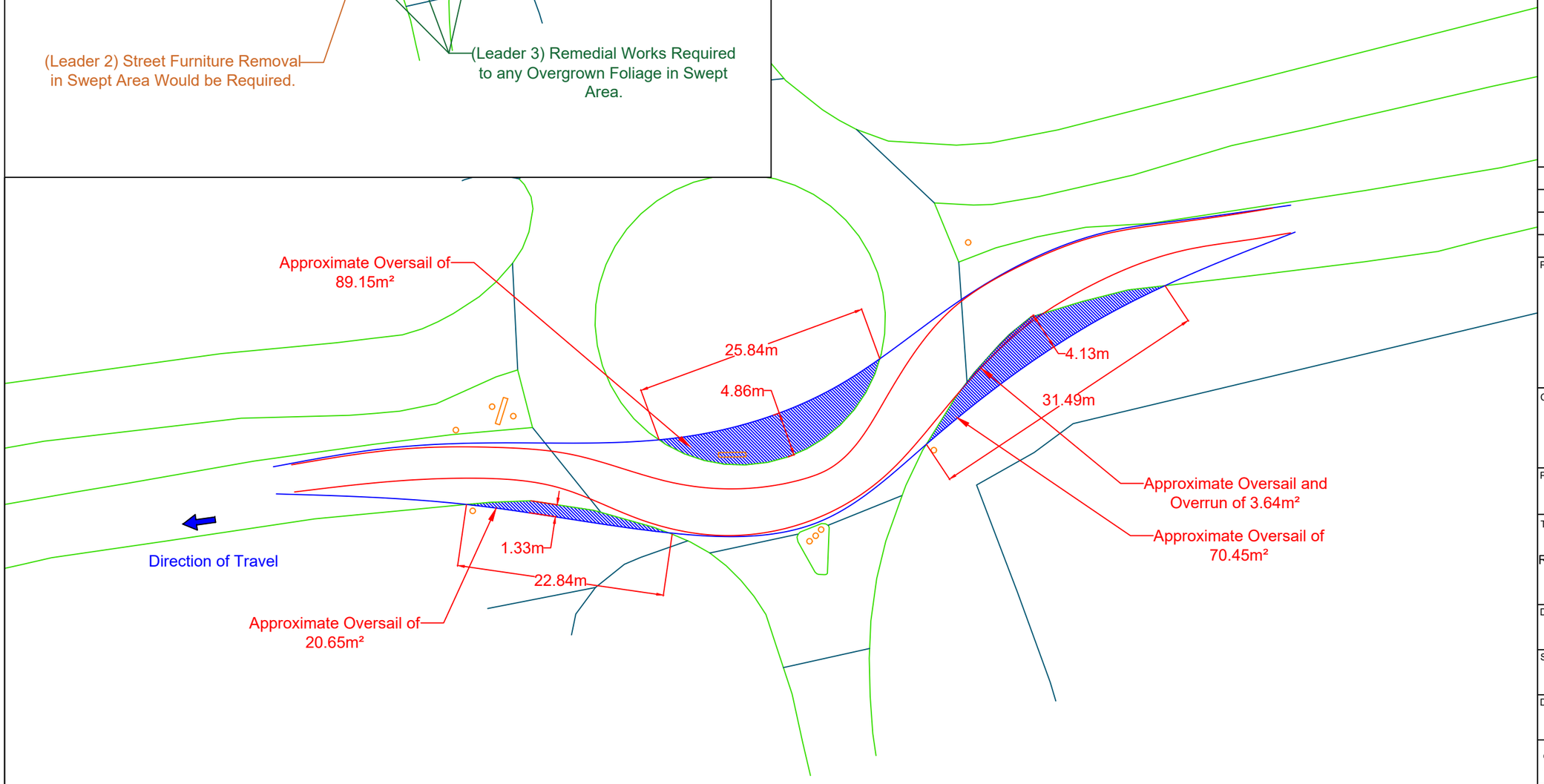
P:\Clients\Existing Clients\RWE\24-1232 North Falls Offshore Wind Farm\Swept Path Assessments

Swept Path Assessment
Indicative of 28 Axle Girder Frame Trailer
Constructed from OS mastermap Data
Scale 1:1000

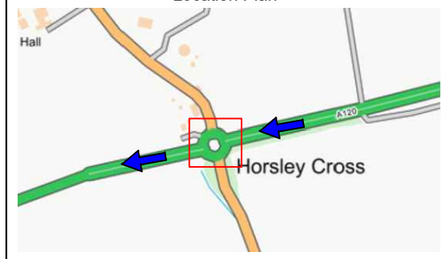


Swept Path Assessment
Indicative of 28 Axle Girder Frame Trailer
Constructed from OS mastermap Data
Scale 1:500

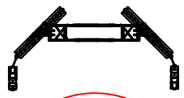
The delivery vehicle can be seen continuing along A120, moving straight over at Horsley Cross Roundabout continuing along A120, at approximate OS grid reference: TM 12398 27340.
The configuration is expected to oversail on the inside and outside of the turn, as well as minimal overrun on the outside of the turn (Leader 1). Where overrun occurs, appropriate plating and packing to any present kerbs/pavements/verges will be required to facilitate. Oversail on the inside of the of the turn anticipates conflicts with street furniture on the island, this would require the removal of the street sign to facilitate (Leader 2). Depending on growth at time of movement, trimming to foliage may be required to prevent conflict with the transport configuration on the inside and outside of the turn (Leader 3).
Based on carrying out the recommended remedials, section is considered to be negotiable.



Location Plan



Legend:



28 axle girder frame trailer minimum turning arrangements Drawing ref. 24-1232.TC03

Extent of Tractor Track

Extent of Oversail

Proposed Road Bboundary

Proposed Road Widening

Overrun and oversail beyond kerb

Overrun beyond kerb

Oversail beyond kerb

Rev.	Date	Amendments
1	12.07.24	Client Logo Updated
0	21.06.24	Issued for comment

Revisions

Prepared by:
Shaftesbury House, 2 High Street,
Eccleshall, Stafford, ST21 6BZ
Tel: (01785) 850411
Independent Transportation Engineers

Client: NORTH FALLS Offshore Wind Farms

Project: North Falls

Title: Swept Path Assessment
Negotiability of continuing along A120 Horsley Cross Roundabout, at approximate OS grid reference: TM 12398 27340, considerate of indicative te transformer transported on 28 axle girder frame trailer.

Drawing status: Final Report

Scale (A3):	Drawn by:	Checked by:
As shown	MTO	ARP

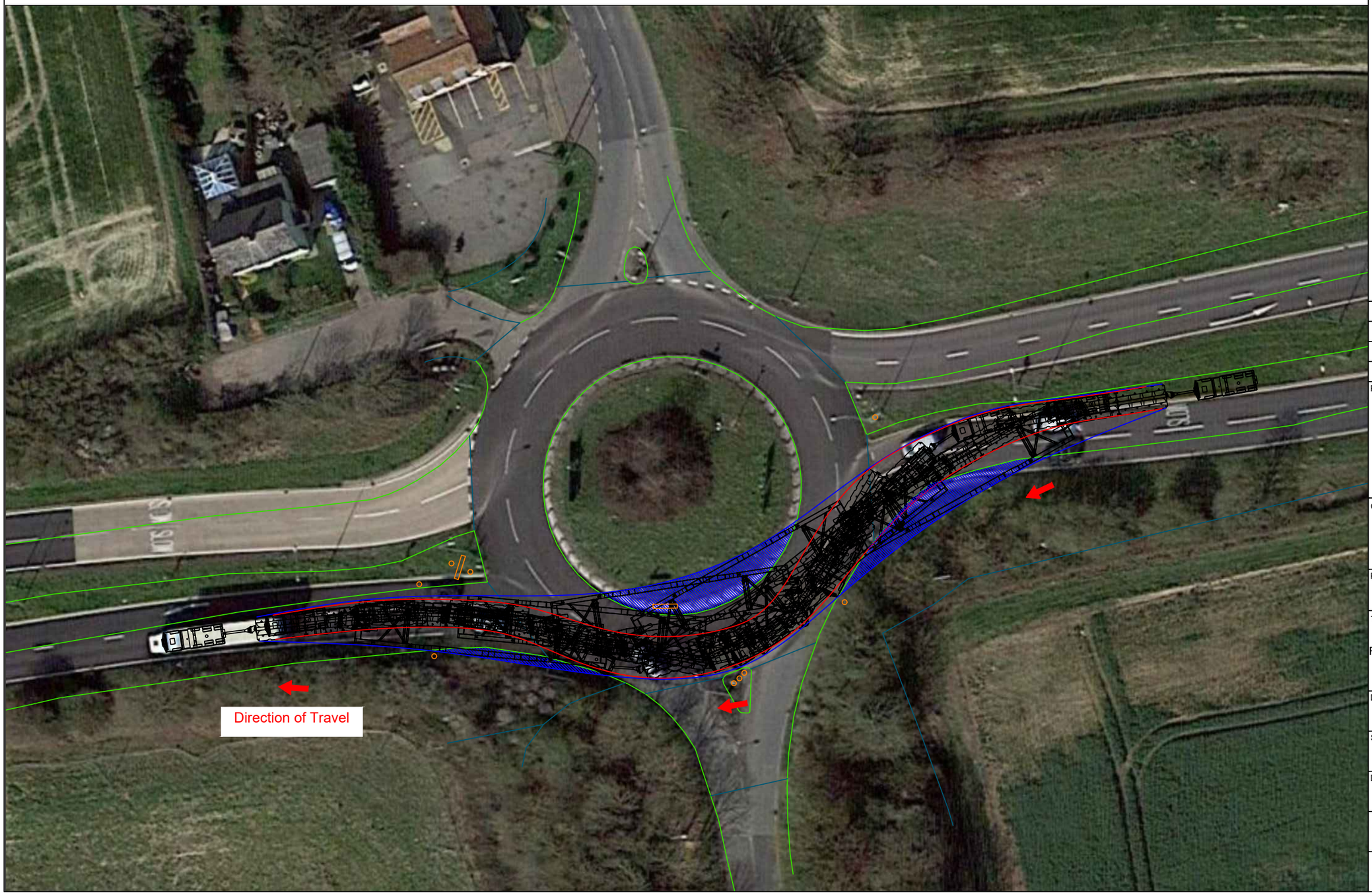
Dwg. no:	Sheet:	Rev:
24-1232.SPA02	1 of 2	1

P:\Clients\Existing Clients\RWE\24-1232 North Falls Offshore Wind Farm\Swept Path Assessments

N

Swept Path Assessment
Indicative of 28 Axle Girder Frame Trailer
Constructed from Client Supplied Design Data
Scale 1:500

NOTE: Overlay onto aerial image is not representative of the configuration relative to the environment. This is for illustrative purposes only, and should only be taken as such.



Location Plan

Legend:

28 axle girder frame trailer minimum turning arrangements Drawing ref. 24-1232.TC03

Extent of Tractor Track

Extent of Oversail

Proposed Road Bboundary

Proposed Road Widening

Overrun and oversail beyond kerb

Overrun beyond kerb

Oversail beyond kerb

Rev.	Date	Amendments
1	12.07.24	Client Logo Updated
0	21.06.24	Issued for comment

Revisions

Prepared by:

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

Independent Transportation Engineers

Client: North Falls

Project: North Falls

Title: Swept Path Assessment
Negotiability of continuing along A120 Horsley Cross Roundabout, at approximate OS grid reference: TM 12398 27340, considerate of indicative te transformer transported on 28 axle girder frame trailer.

Drawing status: Final Report

Scale (A3):	Drawn by:	Checked by:
As shown	MTO	ARP

Dwg. no:	Sheet:	Rev:
24-1232.SPA02	2 of 2	1

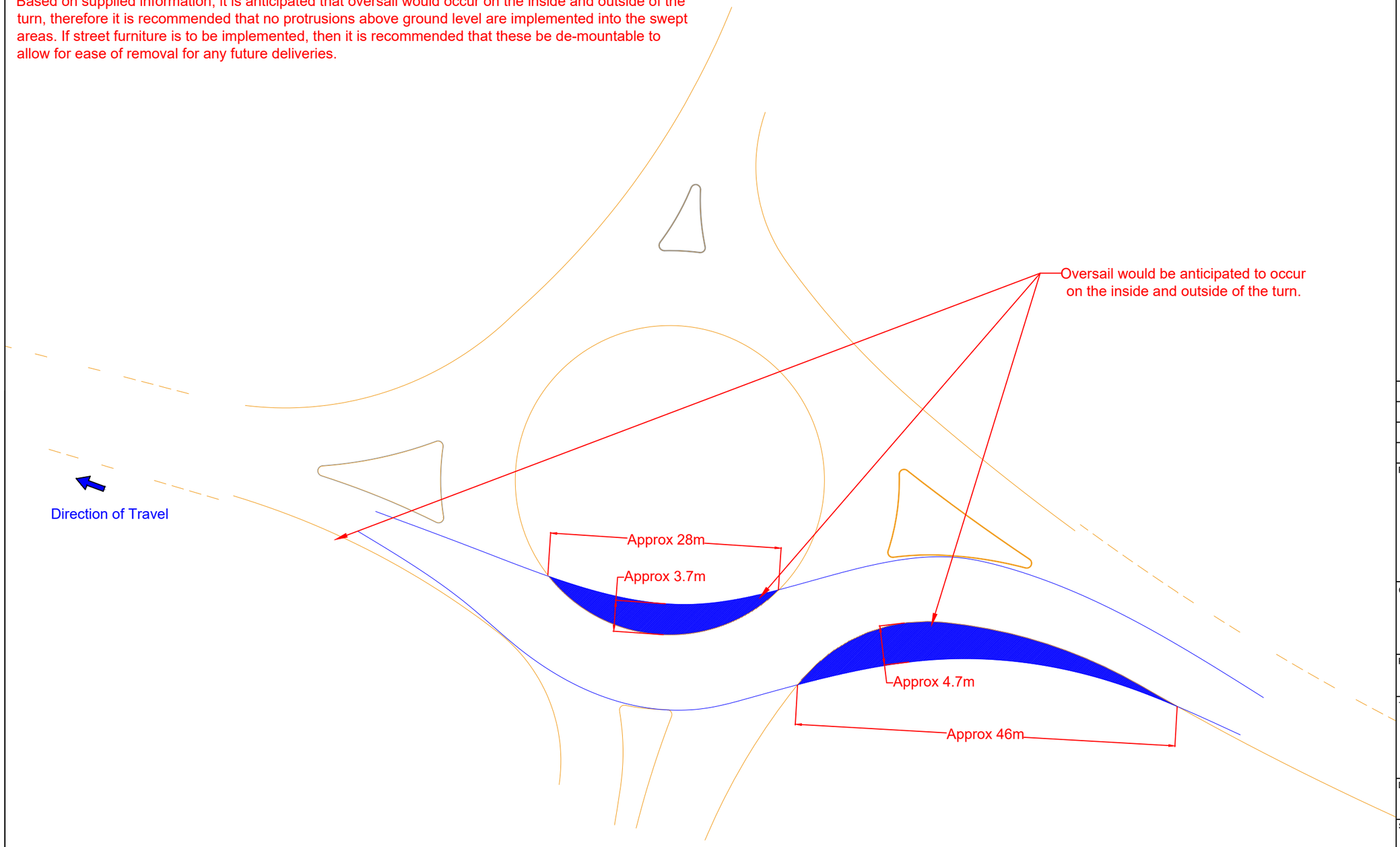
P:\Clients\Existing Clients\RWE\24-1232 North Falls Offshore Wind Farm\Swept Path Assessments

N

Swept Path Assessment
Indicative of 28 Axle Girder Frame Trailer
Constructed from Client Supplied Design Data (PDF)
Not to Scale

Indicative assessment/review of proposed design of new roundabout along A120.
It should be cautioned that the assessment has been based on client supplied data in PDF format, and therefore, the full extent of anticipated remedials and impacts that the proposed AIL will have on the environment cannot be confirmed.

Based on supplied information, it is anticipated that oversail would occur on the inside and outside of the turn, therefore it is recommended that no protrusions above ground level are implemented into the swept areas. If street furniture is to be implemented, then it is recommended that these be de-mountable to allow for ease of removal for any future deliveries.



Location Plan

Legend:

28 axle girder frame trailer minimum turning arrangements Drawing ref. 24-1232.TC03

Extent of Tractor Track

Extent of Oversail

Proposed Road Bboundary

Proposed Road Widening

Overrun and oversail beyond kerb

Overrun beyond kerb

Oversail beyond kerb

Rev.	Date	Amendments
1		
0	11.07.24	Issued for comment

Revisions

Prepared by:
Shaftesbury House, 2 High Street,
Eccleshall, Stafford, ST21 6BZ
Tel: (01785) 850411
Independent Transportation Engineers

Client: North Falls Offshore Wind Farms

Project: North Falls

Title: Swept Path Assessment
Initial Assessment of A120 Roundabout, considerate of indicative te transformer transported on 28 axle girder frame trailer.

Drawing status: Indicative Review

Scale (A3):	Drawn by:	Checked by:
As shown	MTO	ARP

Dwg. no:	Sheet:	Rev:
24-1232 Design Check	1 of 1	0

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ANNEX 3 - SWEPT PATHS FOR ECC CABLE DRUM DELIVERIES

SLR Cable drum vehicle

Overall Length	25.660m
Overall Width	3.000m
Overall Body Height	4.900m
Min Body Ground Clearance	0.427m
Max Track Width	3.000m
Lock to lock time	6.00s
Wall to Wall Turning Radius	9.800m

SLR

www.slrconsulting.com

Drawing Status & Suitability Code: **DRAFT**

Designed	Drawn	Checked	Authorised
DPP	DPP		
Date	Date	Date	Date
OCT 24	OCT S4		

Drawing Number: **H1000 - Sheet 1**

Rev.: **R0**

Scale: 1:1000 @ A3

SLR Project No.: SHE:404.05356.00010

Client: Go-Be Consultants Ltd.

Project: Five Estuaries Offshore Wind

Drawing Title: Cable Delivery Vehicle Swept Path Analysis

Rev	Amendments	Date	By	Chk	Auth

Rev	Amendments	Date	By	Chk	Auth

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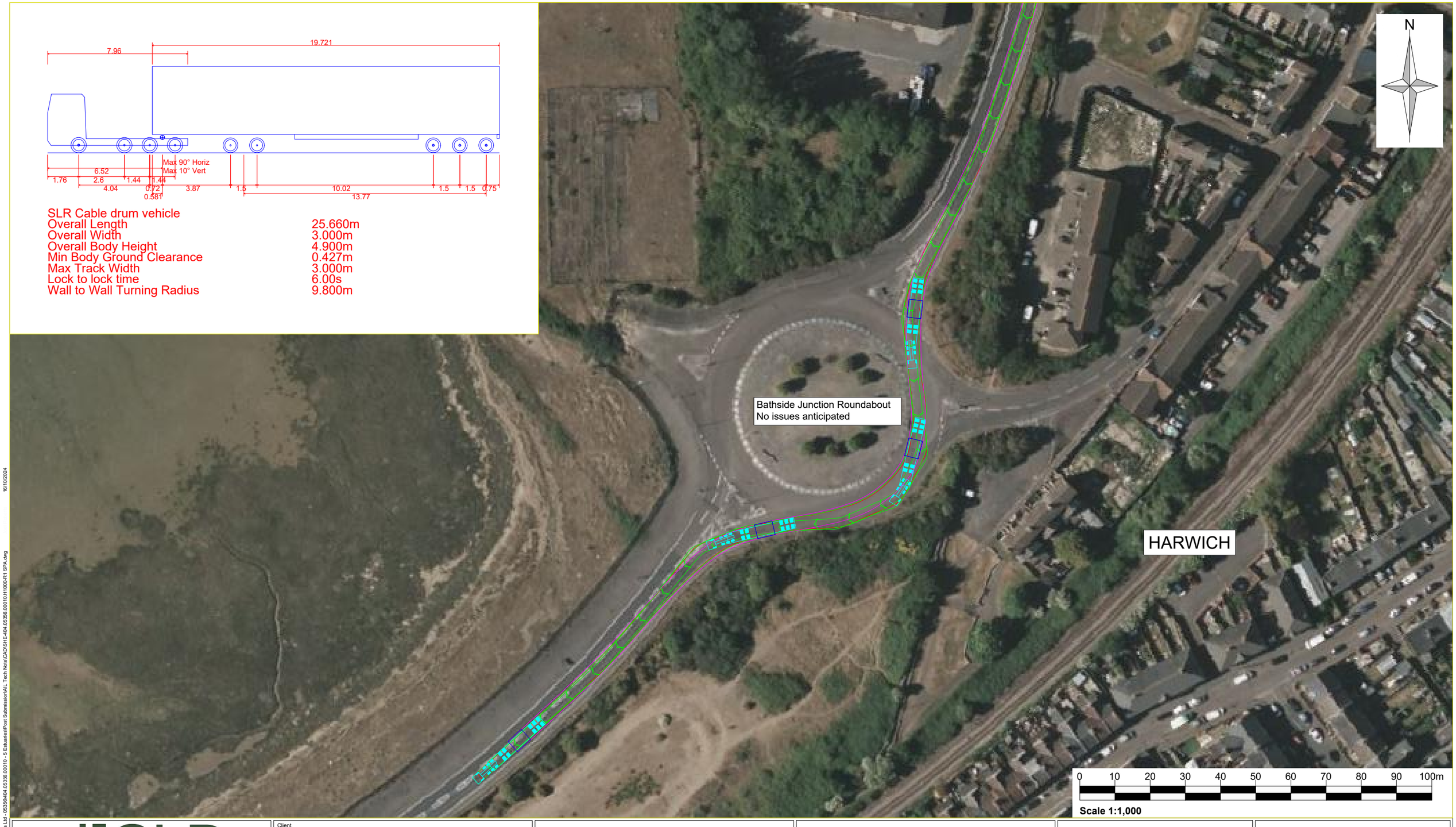
16/10/2024

SLR Cable drum vehicle

Overall Length	25.660m
Overall Width	3.000m
Overall Body Height	4.900m
Min Body Ground Clearance	0.427m
Max Track Width	3.000m
Lock to lock time	6.00s
Wall to Wall Turning Radius	9.800m



16/10/2024

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SLR

www.slrconsulting.com

Drawing Status & Suitability Code: **DRAFT**

Designed	Drawn	Checked	Authorised
DPP	DPP		
Date	Date	Date	Date
OCT 24	OCT 24		

Drawing Number: **H1000 - Sheet 2**

Rev.: **R0**

Client: Go-Be Consultants Ltd.

Project: Five Estuaries Offshore Wind

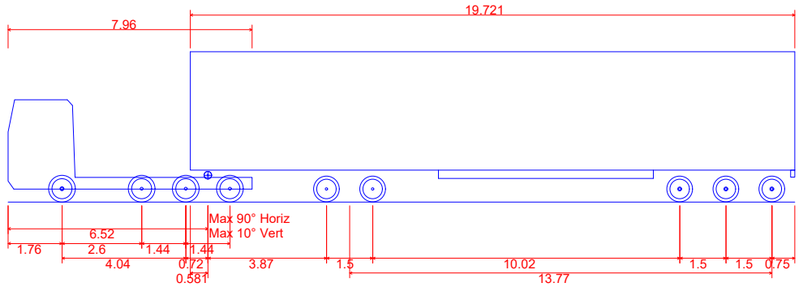
Drawing Title: Cable Delivery Vehicle Swept Path Analysis

Scale: 1:1000 @ A3

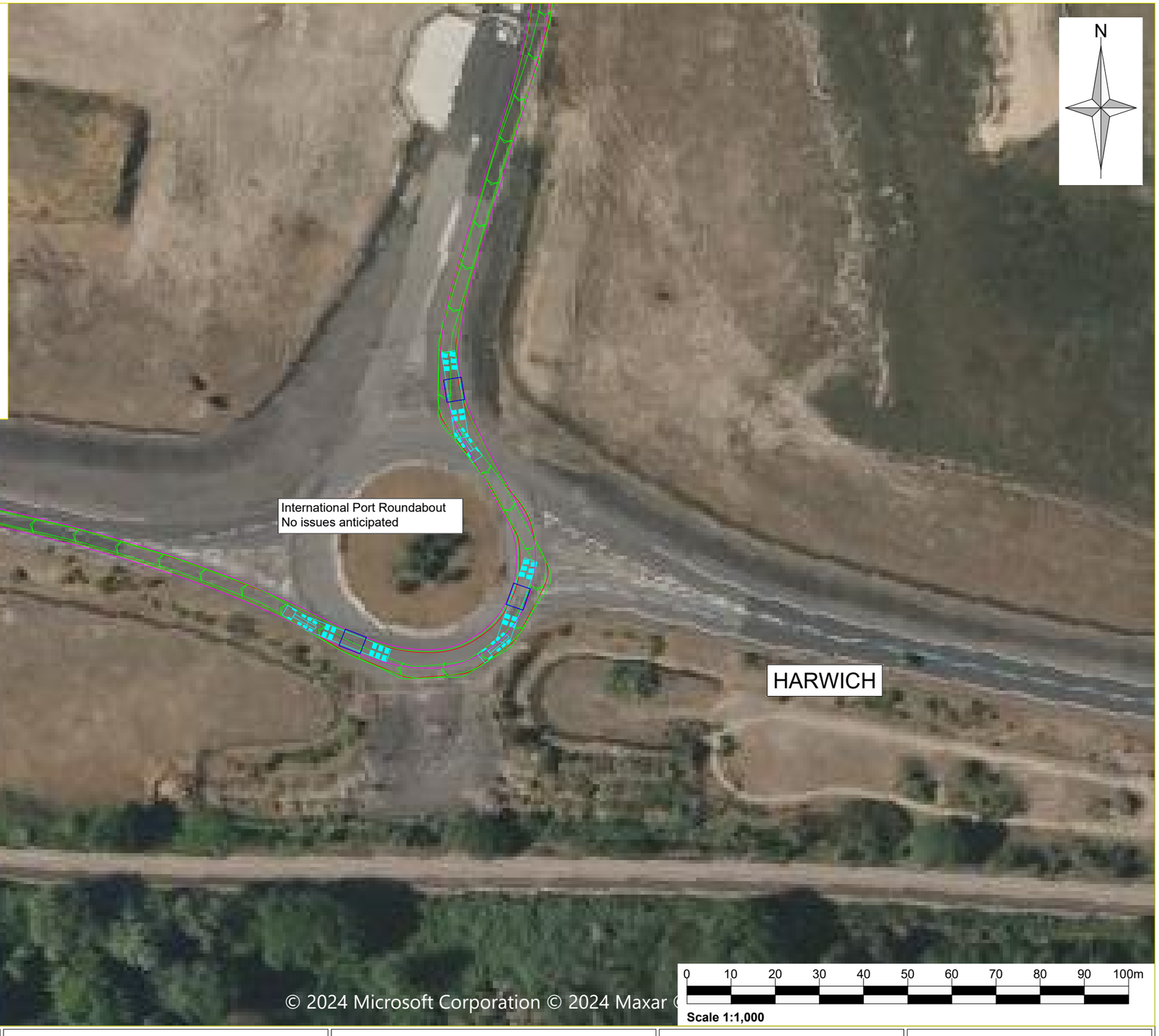
SLR Project No.: SHE:404.05356.00010

Rev	Amendments	Date	By	Chk	Auth

Rev	Amendments	Date	By	Chk	Auth



SLR Cable drum vehicle	
Overall Length	25.660m
Overall Width	3.000m
Overall Body Height	4.900m
Min Body Ground Clearance	0.427m
Max Track Width	3.000m
Lock to lock time	6.00s
Wall to Wall Turning Radius	9.800m



SLR

www.slrconsulting.com

Drawing Status & Suitability Code: **DRAFT**

Designed	Drawn	Checked	Authorised
DPP	DPP		
Date	Date	Date	Date
OCT 24	OCT 24		

Drawing Number: **H1000 - Sheet 3** Rev.: **R0**

Client: Go-Be Consultants Ltd.

Project: Five Estuaries Offshore Wind

Drawing Title: Cable Drum Delivery Vehicle Swept Path Analysis

Scale: 1:1000 @ A3

SLR Project No.: SHE:404.05356.00010

Rev	Amendments	Date	By	Chk	Auth

Rev	Amendments	Date	By	Chk	Auth

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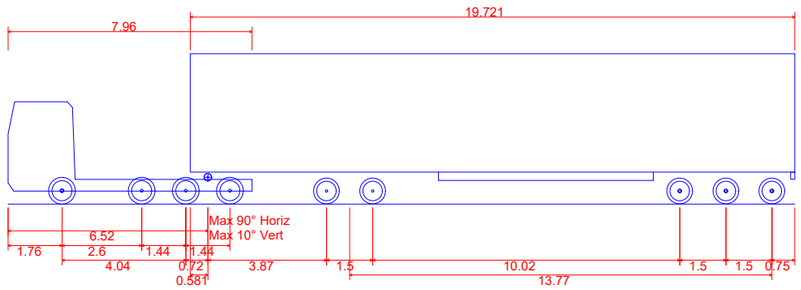
16/10/2024



SLR Cable drum vehicle

Overall Length	25.660m
Overall Width	3.000m
Overall Body Height	4.900m
Min Body Ground Clearance	0.427m
Max Track Width	3.000m
Lock to lock time	6.00s
Wall to Wall Turning Radius	9.800m

Parkside Roundabout
No anticipated issues

St Nicolas Roundabout
No anticipated issues

N

0 10 20 30 40 50 60 70 80 90 100m

Scale 1:1,000

SLR

www.slrconsulting.com

Client: Go-Be Consultants Ltd.

Project: Five Estuaries Offshore Wind

Drawing Status & Suitability Code: **DRAFT**

Designed	Drawn	Checked	Authorised
DPP	DPP		
Date	Date	Date	Date
OCT 24	OCT 24		

Drawing Title: Cable Route
Swept Path Analysis

Drawing Number: **H1000 - Sheet 4**

Rev.: **R0**

Scale: 1:1000 @ A3

SLR Project No.: SHE:404.05356.00010

Rev	Amendments	Date	By	Chk	Auth

Rev	Amendments	Date	By	Chk	Auth

16/10/2024

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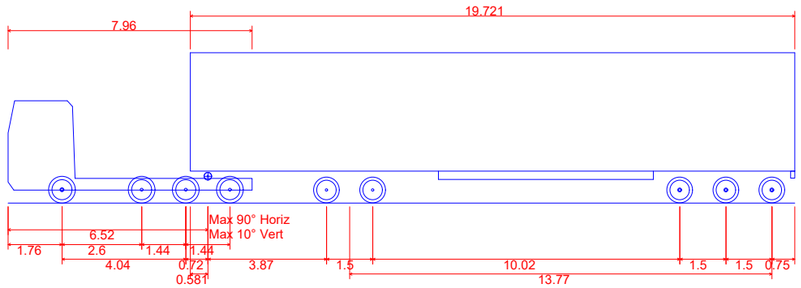

SLR Cable drum vehicle	
Overall Length	25.660m
Overall Width	3.000m
Overall Body Height	4.900m
Min Body Ground Clearance	0.427m
Max Track Width	3.000m
Lock to lock time	6.00s
Wall to Wall Turning Radius	9.800m

Ramsey Roundabout
No anticipated issues

N

0 10 20 30 40 50 60 70 80 90 100m

Scale 1:1,000

SLR

www.slrconsulting.com

Client: Go-Be Consultants Ltd.

Project: Five Estuaries Offshore Wind

Drawing Status & Suitability Code: **DRAFT**

Designed	Drawn	Checked	Authorised
DPP	DPP		
Date	Date	Date	Date
OCT 24	OCT 24		

Drawing Title: Cable Route
Swept Path Analysis

Drawing Number: **H1000 - Sheet 5**

Rev.: **R0**

Scale: 1:1000 @ A3

SLR Project No.: SHE:404.05356.00010

Rev	Amendments	Date	By	Chk	Auth

Rev	Amendments	Date	By	Chk	Auth

16/10/2024

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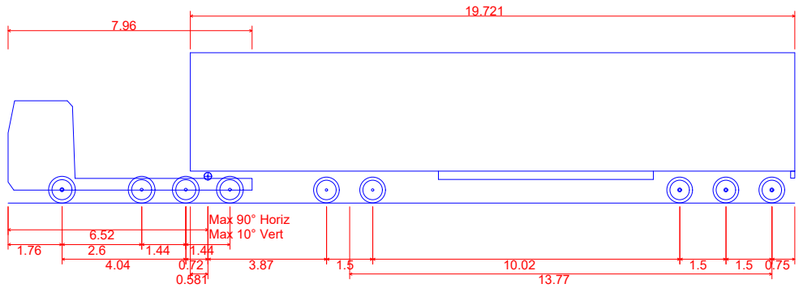
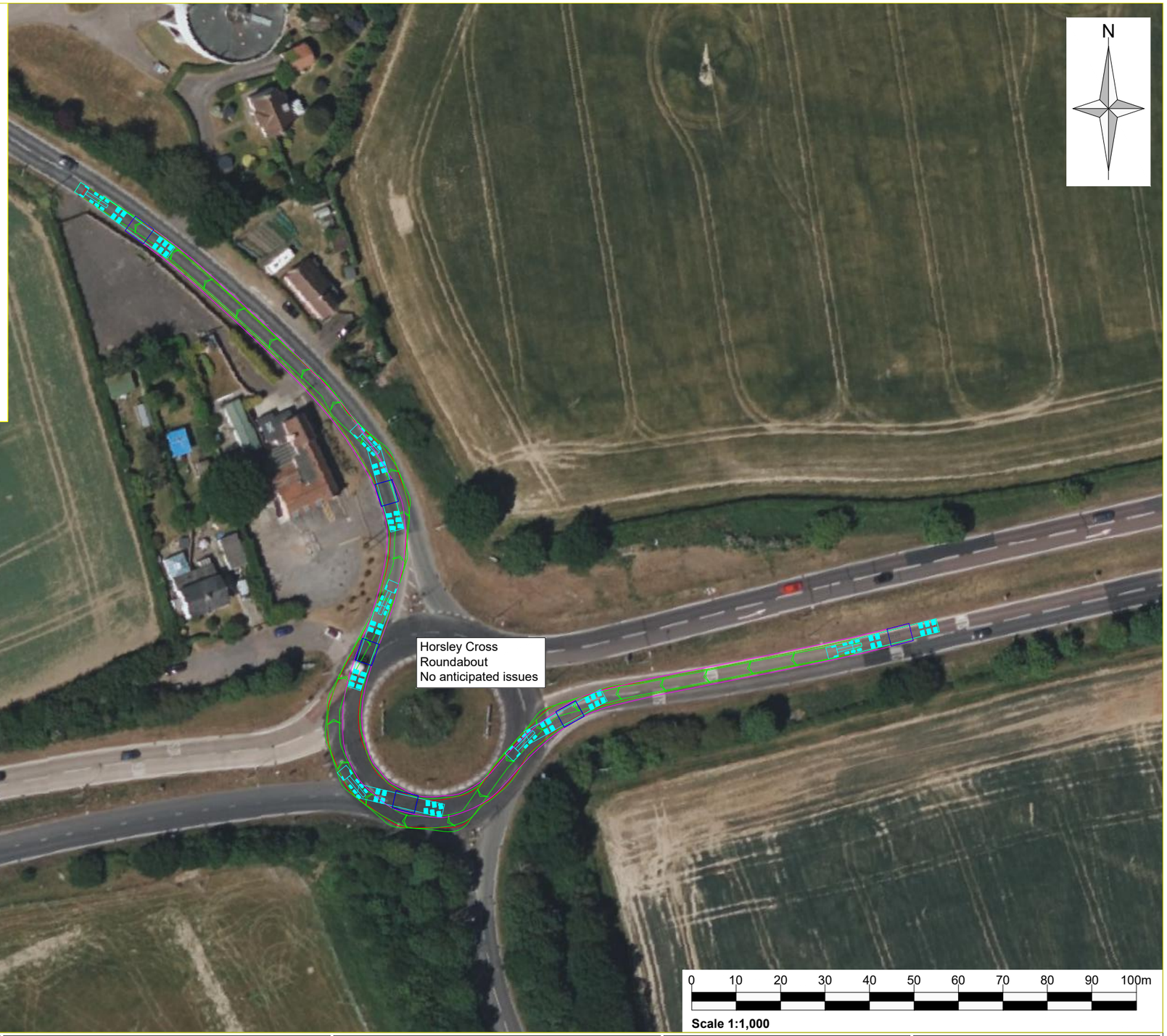


SLR Cable drum vehicle

Overall Length	25.660m
Overall Width	3.000m
Overall Body Height	4.900m
Min Body Ground Clearance	0.427m
Max Track Width	3.000m
Lock to lock time	6.00s
Wall to Wall Turning Radius	9.800m



SLR

www.slrconsulting.com

Client: Go-Be Consultants Ltd.

Project: Five Estuaries Offshore Wind

Drawing Status & Suitability Code: **DRAFT**

Designed	Drawn	Checked	Authorised
DPP	DPP		
Date	Date	Date	Date
OCT 24	OCT 24		

Drawing Title: Cable Route Swept Path Analysis

Drawing Number	Rev.	Scale	SLR Project No.
H1000 - Sheet 6	**R0**	1:1000 @ A3	SHE:404.05356.00010

Rev	Amendments	Date	By	Chk	Auth

Rev	Amendments	Date	By	Chk	Auth

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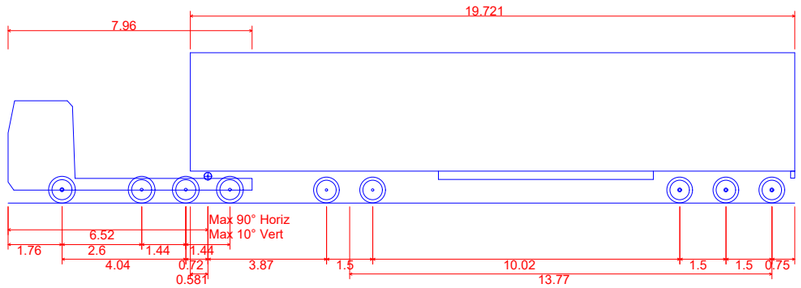
16/10/2024



SLR Cable drum vehicle	
Overall Length	25.660m
Overall Width	3.000m
Overall Body Height	4.900m
Min Body Ground Clearance	0.427m
Max Track Width	3.000m
Lock to lock time	6.00s
Wall to Wall Turning Radius	9.800m

A120 Roundabout
No anticipated issues

N

0 10 20 30 40 50 60 70 80 90 100m

Scale 1:1,000

16/10/2024

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SLR

www.slrconsulting.com

Client: Go-Be Consultants Ltd.

Project: Five Estuaries Offshore Wind

Drawing Status & Suitability Code: **DRAFT**

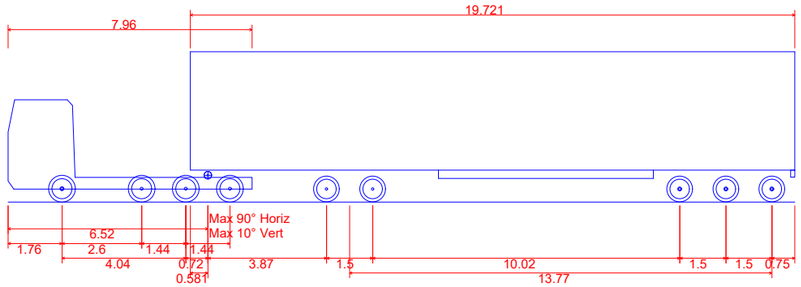
Designed	Drawn	Checked	Authorised
DPP	DPP		
Date	Date	Date	Date
OCT 24	OCT 24		

Drawing Title: Cable Route
Swept Path Analysis

Drawing Number	Rev.	Scale		SLR Project No.
H1000 - Sheet 7	**R0**	1:1000	@ A3	SHE:404.05356.00010

Rev	Amendments	Date	By	Chk	Auth

Rev	Amendments	Date	By	Chk	Auth



SLR Cable drum vehicle

Overall Length	25.660m
Overall Width	3.000m
Overall Body Height	4.900m
Min Body Ground Clearance	0.427m
Max Track Width	3.000m
Lock to lock time	6.00s
Wall to Wall Turning Radius	9.800m

A133 Roundabout
No anticipated issues

N

0 10 20 30 40 50 60 70 80 90 100m

Scale 1:1,000

SLR

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Drawing Status & Suitability Code: **DRAFT**

Designed	Drawn	Checked	Authorised
DPP	DPP		
Date	Date	Date	Date
OCT 24	OCT 24		

Drawing Number: **H1000 - Sheet 9**

Rev.: **R0**

Client: Go-Be Consultants Ltd.

Project: Five Estuaries Offshore Wind

Drawing Title: Cable Route
Swept Path Analysis

Scale: 1:1000 @ A3

SLR Project No.: SHE:404.05356.00010

Rev	Amendments	Date	By	Chk	Auth

Rev	Amendments	Date	By	Chk	Auth

16/10/2024

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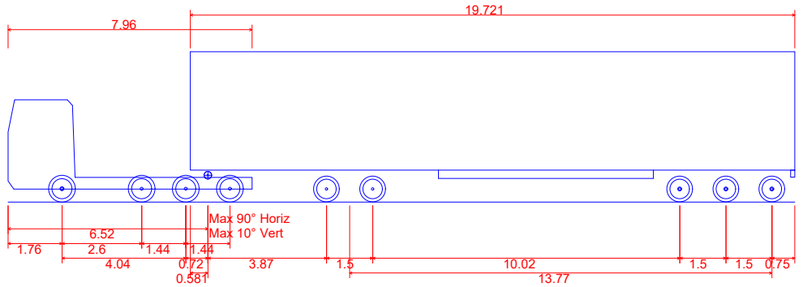

SLR Cable drum vehicle

Overall Length	25.660m
Overall Width	3.000m
Overall Body Height	4.900m
Min Body Ground Clearance	0.427m
Max Track Width	3.000m
Lock to lock time	6.00s
Wall to Wall Turning Radius	9.800m

A133 Roundabout Weeley
No anticipated issues

N

0 10 20 30 40 50 60 70 80 90 100m

Scale 1:1,000

16/10/2024

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SLR

www.slrconsulting.com

Client: Go-Be Consultants Ltd.

Project: Five Estuaries Offshore Wind

Drawing Status & Suitability Code: **DRAFT**

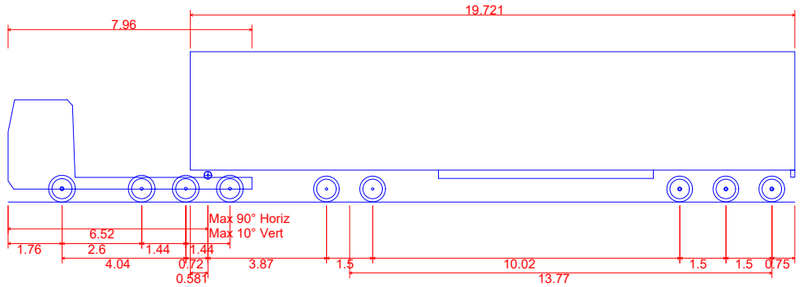
Designed	Drawn	Checked	Authorised
DPP	DPP		
Date	Date	Date	Date
OCT 24	OCT 24		

Drawing Title: Cable Route
Swept Path Analysis

Drawing Number	Rev.	Scale		SLR Project No.
H1000 - Sheet 10	**R0**	1:1000	@ A3	SHE:404.05356.00010

Rev	Amendments	Date	By	Chk	Auth

Rev	Amendments	Date	By	Chk	Auth



SLR Cable drum vehicle

Overall Length	25.660m
Overall Width	3.000m
Overall Body Height	4.900m
Min Body Ground Clearance	0.427m
Max Track Width	3.000m
Lock to lock time	6.00s
Wall to Wall Turning Radius	9.800m

B1033/B1441 Roundabout Weeley
No anticipated issues

N

0 10 20 30 40 50 60 70 80 90 100m

Scale 1:1,000

16/10/2024

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SLR

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Drawing Status & Suitability Code: **DRAFT**

Designed	Drawn	Checked	Authorised
DPP	DPP		
Date	Date	Date	Date
OCT 24	OCT 24		

Drawing Number: **H1000 - Sheet 11**

Rev.: **R0**

Client: Go-Be Consultants Ltd.

Project: Five Estuaries Offshore Wind

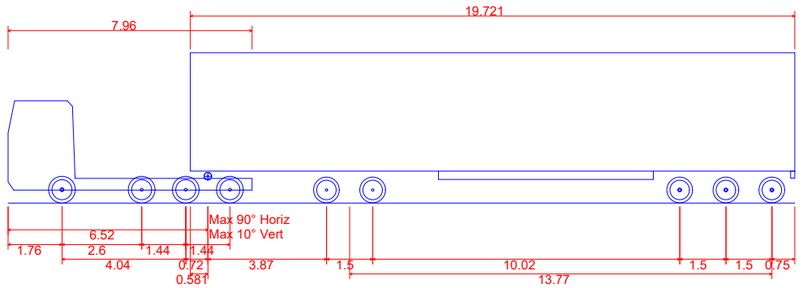
Drawing Title: Cable Route Swept Path Analysis

Scale: 1:1000 @ A3

SLR Project No.: SHE:404.05356.00010

Rev	Amendments	Date	By	Chk	Auth

Rev	Amendments	Date	By	Chk	Auth



SLR Cable drum vehicle

Overall Length	25.660m
Overall Width	3.000m
Overall Body Height	4.900m
Min Body Ground Clearance	0.427m
Max Track Width	3.000m
Lock to lock time	6.00s
Wall to Wall Turning Radius	9.800m

N

B1033/B1035 Junction
Thorpe Green
No anticipated issues

0 10 20 30 40 50 60 70 80 90 100m

Scale 1:1,000

SLR

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Client: Go-Be Consultants Ltd.

Project: Five Estuaries Offshore Wind

Drawing Status & Suitability Code: **DRAFT**

Designed	Drawn	Checked	Authorised
DPP	DPP		
Date	Date	Date	Date
OCT 24	OCT 24		

Drawing Title: Cable Drum Delivery Vehicle Swept Path Analysis

Drawing Number: **H1000 - Sheet 12** Rev. **R0**

Scale: 1:1000 @ A3

SLR Project No.: SHE:404.05356.00010

Rev	Amendments	Date	By	Chk	Auth

Rev	Amendments	Date	By	Chk	Auth

16/10/2024

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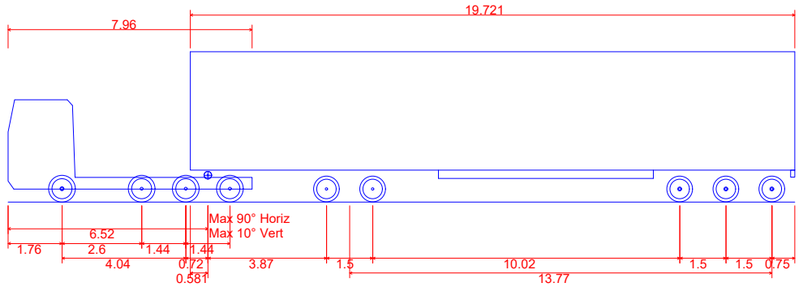

SLR Cable drum vehicle

Overall Length	25.660m
Overall Width	3.000m
Overall Body Height	4.900m
Min Body Ground Clearance	0.427m
Max Track Width	3.000m
Lock to lock time	6.00s
Wall to Wall Turning Radius	9.800m

B1441/B1414 Junction
Weeley Heath
No anticipated issues

B1441 Bend
Weeley Heath
No anticipated issues

N

0 10 20 30 40 50 60 70 80 90 100m

Scale 1:1,000

SLR

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Client: Go-Be Consultants Ltd.

Project: Five Estuaries Offshore Wind

Drawing Status & Suitability Code: **DRAFT**

Designed	Drawn	Checked	Authorised
DPP	DPP		
Date	Date	Date	Date
OCT 24	OCT 24		

Drawing Title: Cable Drum Delivery Vehicle Swept Path Analysis

Drawing Number: **H1000 - Sheet 13** Rev. **R0**

Scale: 1:1000 @ A3

SLR Project No.: SHE:404.05356.00010

Rev	Amendments	Date	By	Chk	Auth

Rev	Amendments	Date	By	Chk	Auth

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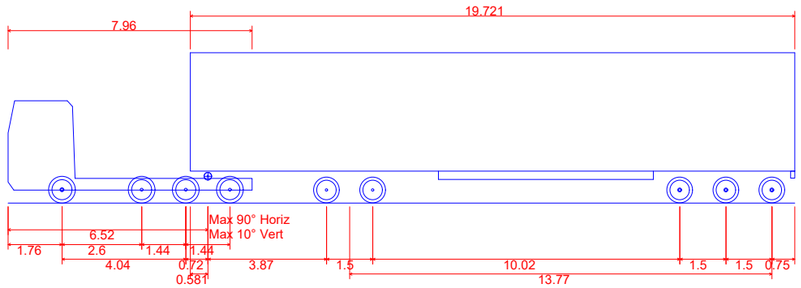

SLR Cable drum vehicle

Overall Length	25.660m
Overall Width	3.000m
Overall Body Height	4.900m
Min Body Ground Clearance	0.427m
Max Track Width	3.000m
Lock to lock time	6.00s
Wall to Wall Turning Radius	9.800m

A133/B1027 Roundabout
No issues anticipated

N

0 10 20 30 40 50 60 70 80 90 100m

Scale 1:1,000

SLR

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Client: Go-Be Consultants Ltd.

Project: Five Estuaries Offshore Wind

Drawing Status & Suitability Code: **DRAFT**

Designed	Drawn	Checked	Authorised
DPP	DPP		
Date: OCT 24	Date: OCT 24	Date	Date

Drawing Title: Cable Route
Swept Path Analysis

Drawing Number: **H1000 - Sheet 17** Rev. **R0**

Scale: 1:1000 @ A3

SLR Project No.: SHE:404.05356.00010

Rev	Amendments	Date	By	Chk	Auth

Rev	Amendments	Date	By	Chk	Auth

16/10/2024

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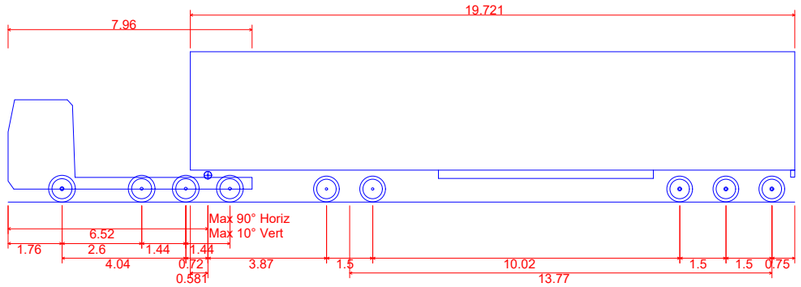

SLR Cable drum vehicle

Overall Length	25.660m
Overall Width	3.000m
Overall Body Height	4.900m
Min Body Ground Clearance	0.427m
Max Track Width	3.000m
Lock to lock time	6.00s
Wall to Wall Turning Radius	9.800m

SLR

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Client: Go-Be Consultants Ltd.

Project: Five Estuaries Offshore Wind

Drawing Status & Suitability Code: **DRAFT**

Designed	Drawn	Checked	Authorised
DPP	DPP		
Date	Date	Date	Date
OCT 24	OCT 24		

Drawing Title: Cable Drum Delivery Vehicle Swept Path Analysis

Drawing Number	Rev.	Scale		SLR Project No.
H1000 - Sheet 18	**R0**	1:1000	@ A3	SHE:404.05356.00010

Rev	Amendments	Date	By	Chk	Auth

Rev	Amendments	Date	By	Chk	Auth

16/10/2024

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SLR Cable drum vehicle

Overall Length	25.660m
Overall Width	3.000m
Overall Body Height	4.900m
Min Body Ground Clearance	0.427m
Max Track Width	3.000m
Lock to lock time	6.00s
Wall to Wall Turning Radius	9.800m

SLR

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Client: Go-Be Consultants Ltd.

Project: Five Estuaries Offshore Wind

Drawing Status & Suitability Code: **DRAFT**

Designed	Drawn	Checked	Authorised
DPP	DPP		
Date	Date	Date	Date
OCT 24	OCT 24		

Drawing Title: Cable Route Swept Path Analysis

Drawing Number	Rev.	Scale	SLR Project No.
H1000 - Sheet 19	**R0**	1:1000 @ A3	SHE:404.05356.00010

Rev	Amendments	Date	By	Chk	Auth

Rev	Amendments	Date	By	Chk	Auth

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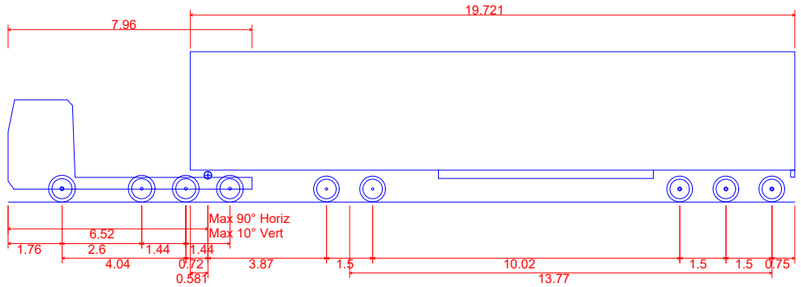
16/10/2024



SLR Cable drum vehicle	
Overall Length	25.660m
Overall Width	3.000m
Overall Body Height	4.900m
Min Body Ground Clearance	0.427m
Max Track Width	3.000m
Lock to lock time	6.00s
Wall to Wall Turning Radius	9.800m

B1032 Roundabout
No issues anticipated

N

0 10 20 30 40 50 60 70 80 90 100m

Scale 1:1,000

SLR

www.slrconsulting.com

Client: Go-Be Consultants Ltd.

Project: Five Estuaries Offshore Wind

Drawing Status & Suitability Code: **DRAFT**

Designed	Drawn	Checked	Authorised
DPP	DPP		
Date	Date	Date	Date
OCT 24	OCT 24		

Drawing Title: Cable Route
Swept Path Analysis

Drawing Number	Rev.	Scale	SLR Project No.
H1000 - Sheet 20	**R0**	1:1000 @ A3	SHE:404.05356.00010

Rev	Amendments	Date	By	Chk	Auth

Rev	Amendments	Date	By	Chk	Auth

16/10/2024

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