

AECOM

TYRONE - CAVAN INTERCONNECTOR PROJECT

AIL FEASIBILITY 2019 REVALIDATION

May 2019

Author: Matthew Rushton
Title: Head of Projects
Issue Date: 17th May 2019
Revision: B



Confidentiality Clause

We require you, your advisers and representatives to undertake that they will each keep strictly confidential any information that they, or any one of them, may discover or become informed of during the course of our discussions or through seeing any of our specifications, drawings, papers, machines, equipment, methods, processes, products and so forth.

We further require that any information required to be kept confidential shall not be used by you in any way whatsoever, except to put into effect any terms we may subsequently agree. You must undertake that you will not disclose any confidential information to any third party or any employee of yours unless they are required to know such information for purposes specifically concerned with our discussions and, if such disclosure is essential, such third party or employee shall agree to be bound by these terms.

Client: AECOM
Project: T/C INTERCONNECTOR PROJECT
Reference: ALE/TS/AA5232-17 B
Dated: MAY 2019

CONTENTS PAGE

- 1.0** Executive Summary
- 2.0** Port Information – Warrenpoint Harbour.
- 3.0** Route Maps
- 4.0** Route Survey/Obstruction List
- 5.0** Photographic References
- 6.0** Key Factors
- 7.0** Conclusions
- 8.0** Summary of 2019 Route Revalidation
 - **Appendix A** Transformer Shipping Drawing
 - **Appendix B** Transport Equipment Data Sheets
 - **Appendix C** Swept Path Drawings

1.0 Executive Summary

ALE has been requested on behalf of AECOM, to revalidate the original survey completed in May 2014 for the T/C Interconnector Project under ALE Contract Reference 13186. And Document Reference: ALE - 13186 - AECOM - NS INTERCONNECTOR TRANSPORT STUDY - REV B.pdf

This physical revalidation assessment of the route was conducted on 2nd May 2019. The purpose this survey was to establish if there had been any significant changes to the infrastructure from a negotiability perspective which would identify cause for concern or the requirement to identify an alternative route from that previously established in 2014.

The original assessment identified a suitable route from the Port of Warrenpoint to the proposed substation development near Moy, Northern Ireland for 1 no. 500MVA Transformer.

This study was based on a proposed shipping drawing of 1 no. 500MVA, 222t transformer provided by NIE. Indicative transport carrying shelves were assumed. *Dwg 13186-001*.

As part of the overall study ALE were responsible for conducting a detailed route survey to determine the best possible route, noting obstacles and potential pinch points along that route. The survey was assessed in terms of physical clearance and potential issues with structural capacities.

Following initial correspondence with Roads Service in 2014, ALE was advised that transportation from Belfast was not an option as the M1 had numerous structures that failed based on the weights and dimensions provided.

The transport study continues to consider the use of the Warrenpoint Port, which is the closest and most suitable water connected port facility for onward transportation to the Moy since Belfast is unsuitable.

Since the original consultation with Roads Service, this department has now become Department for Infrastructure (DfI) Northern Ireland – Roads and the person with whom we originally liaised subsequently retired.

ALE has re-established contact with this department and the person now responsible for Abnormal Load Permit Applications.

The overall transport delivery concept remains unchanged and initially a 20-axle girder frame trailer is suggested, this is due to bridge and overhead line heights along the route. This trailer also spreads the weight of the load considerably which is beneficial when negotiating structures.

Once at Moy, the right hand turn off the A29 onto the B106 is too restrictive for the girder frame trailer and as such, transhipment to a smaller Self Propelled Trailer (SPT) trailer would be required. An SPT trailer would also be of greater benefit when negotiating the substation access roads.

ALE have previously completed drawings and carried out computer based swept path analysis to show negotiability of pinch point areas and have mapped out an area for transshipment. Following the assessment on 2nd May – there are no required amendments to these.

Matthew Rushton
Head of Projects

For and on behalf of Abnormal Load Engineering Limited
May 2019

Client: AECOM
Project: T/C INTERCONNECTOR PROJECT
Reference: ALE/TS/AA5232-17 B
Dated: MAY 2019

2.0 Port Information

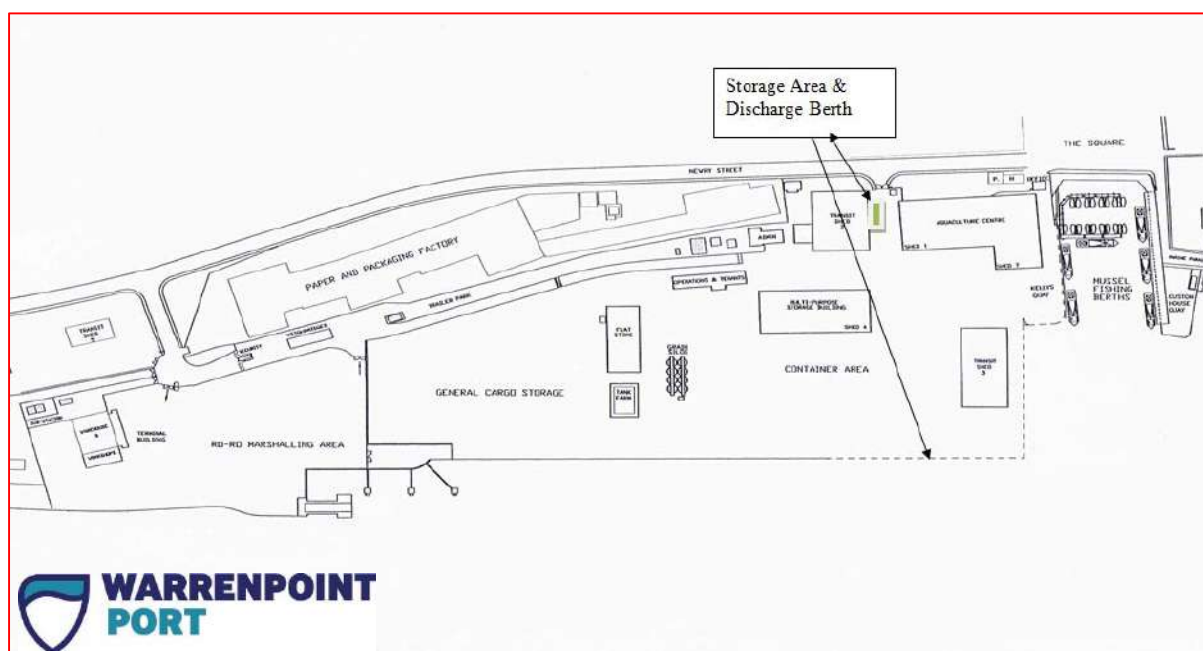
Warrenpoint Port

ALE considers Warrenpoint Port to be the closest and most suitable port facility for receiving project cargo for the onward transportation to Moy. Warrenpoint is strategically located at the head of Carlingford Lough on the East coast on the border of Northern Ireland and the Republic of Ireland.

The Port has 7 berths with a total quay length of 750 metres. 300 Metres of quay are dredged to 7.5m below Chart Datum and the remainder of the berths are dredged to a depth of 5.45m below Chart Datum. The maximum tidal range is 5.3m.

The port cranes at Warrenpoint are insufficient for lifting a transformer of this weight and the maximum ground bearing pressure allowed on the edge of the quay is 3t/m² which is unsuitable for mobile heavy lift crane(s) required for this lift. Because of these factors ALE would advise that the transformer be discharged via ships gear/crane or floating crane. Previous work carried out by ALE at Warrenpoint utilised ships own cranes for discharge.

Warrenpoint Port Overview Map



Port storage and charges

If required there are numerous storage locations around the port, however there is a specific area which is more suited to transformers shown above. This area allows large trailers to manoeuvre and gives adequate space for building girder frame trailers when loading.

In 2018, Warrenpoint Harbour Authority published its Masterplan for the next 25years. This will see development of the site and establishment of new freight facilities.

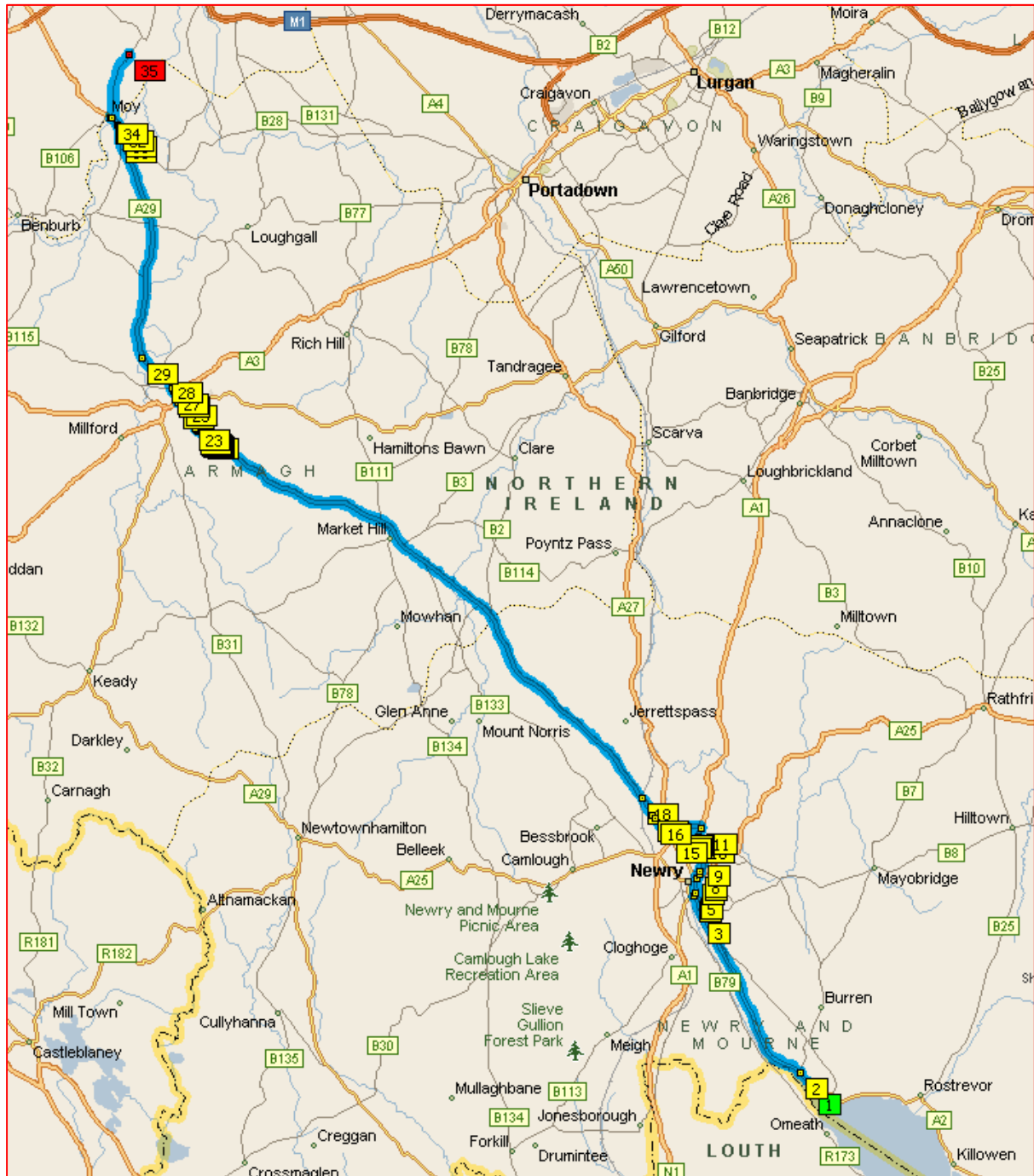
A copy of the Masterplan Document can be found at the below:

<https://warrenpointport.com/wp-content/uploads/2018/04/27550-WARRENPOINT-Port-Masterplan-Brochure-WEB2.pdf>

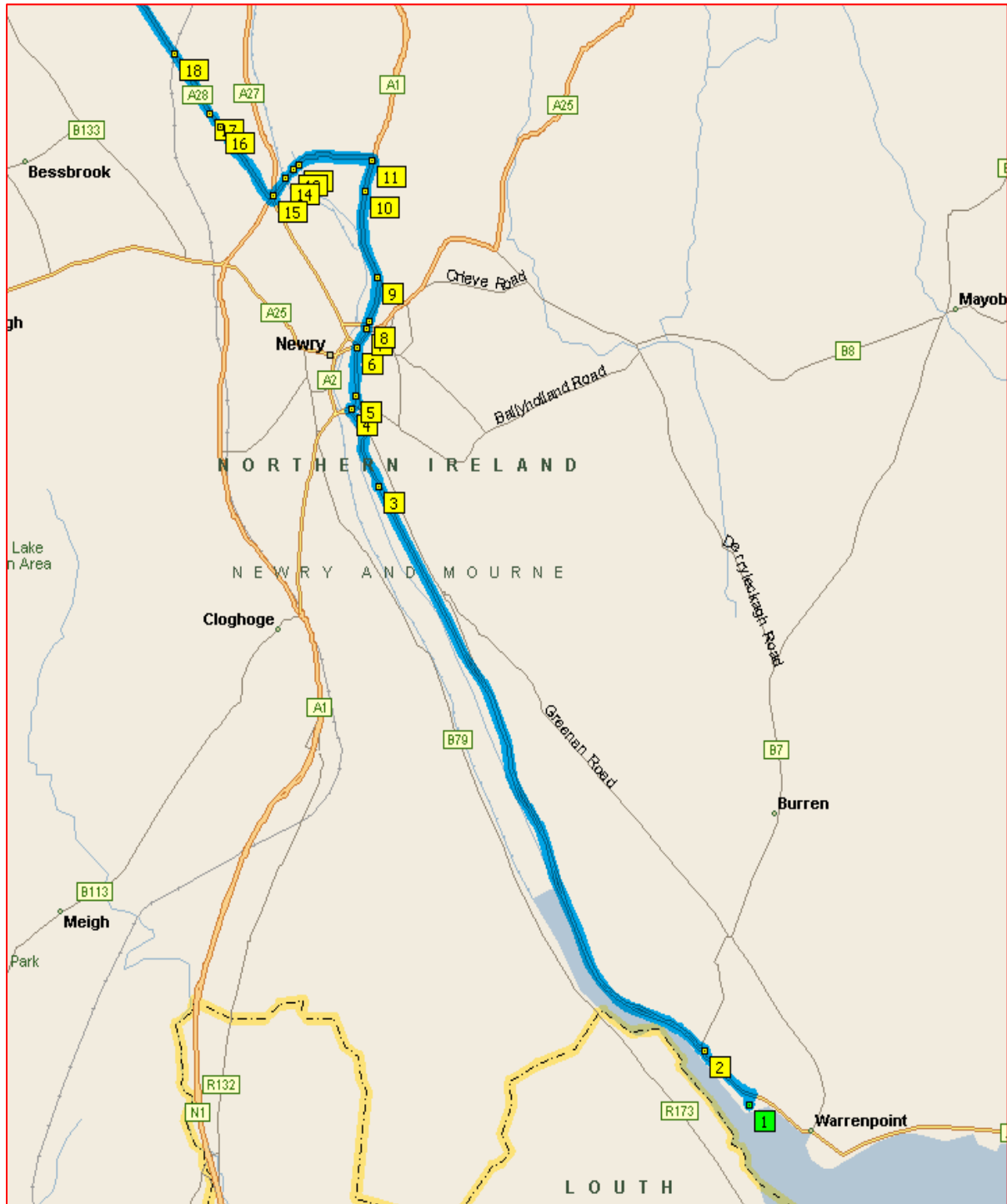
Client: AECOM
Project: T/C INTERCONNECTOR PROJECT
Reference: ALE/TS/AA5232-17 B
Dated: MAY 2019

3.0 Route Maps

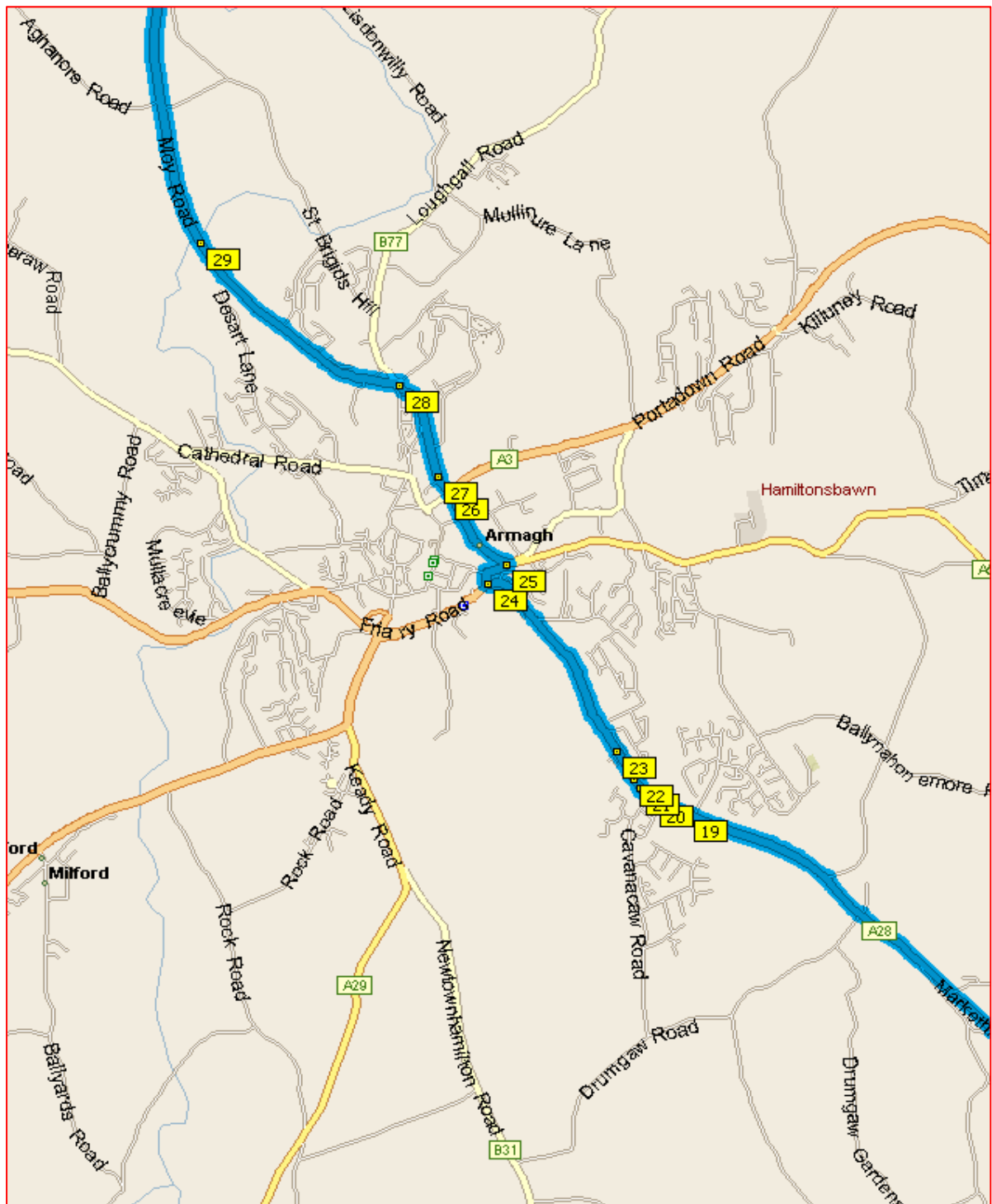
Route Overview



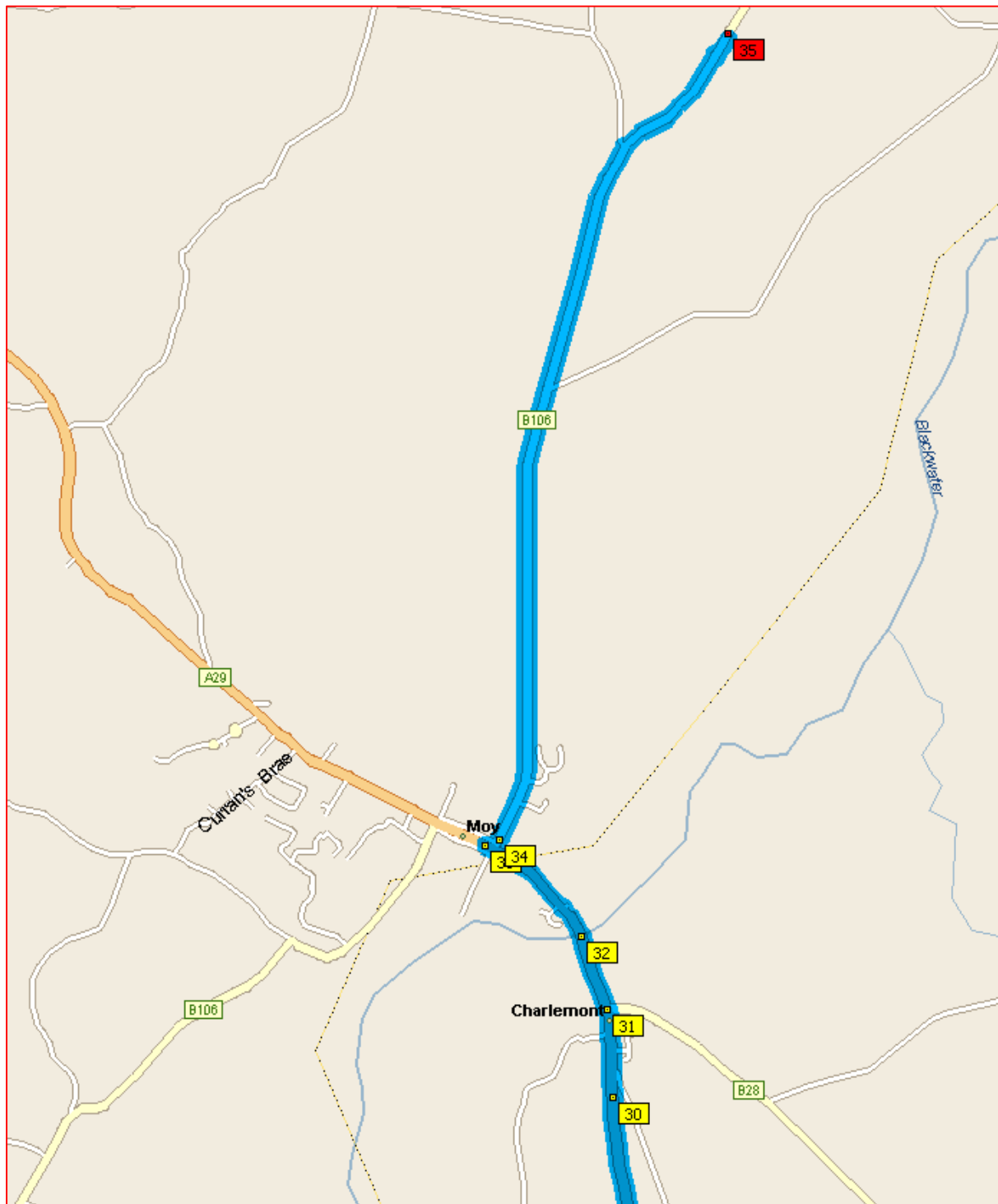
Section - Warrenpoint to Newry



Section - Armagh



Section – Moy to Substation



4.0 Route Survey/Obstruction List

Client: AECOM
Project: T/C INTERCONNECTOR PROJECT
Reference: ALE/TS/AA5232-17 B
Dated: MAY 2019

Survey performing company / person: ALE UK Limited – Matthew Rushton

Survey date: 02/05/2019

Start of surveyed route: Warrenpoint Port

End of surveyed route: B106, Moy

Extension of route: N/A

Map of route: As per enclosure

No. of photos appended: 36

Surveyed for : 1 no. 222t 500MVA transformer

Roads utilised: A2, Abbey Way, Upper Water Street, Trevor Hill, A27, A28, Gaol Square, A3, A29, B106

Photo Ref No.	Type of Obstacle	Location (e.g. road-no.)	Miles	Map Ref No.	Responsible Authority / Ownership	Required measure(s)	Remarks	Validated 2019	Further Notes Comments from 2019 Review
1	N/A	Warrenpoint Port	0.0	1	Warrenpoint Port Authority	NONE		✓	
2	Junction	Warrenpoint Port onto A2	0.0	1	Warrenpoint Port & Roads Service	NONE		✓	
3	Roundabout	A2	0.5	2	Roads Service	NONE		✓	
4	Roundabout & Street furniture	A2	5.2	3	Roads Service	Removal of 1 no. chevron board		✓	
5	Junction & Street furniture	A2 onto Abbey Way	5.8	4	Roads Service	Removal of 4 no. traffic lights & 1 no. keep left bollard		✓	Parking Restrictions required to assist on A2
6	Contraflow manoeuvre	Abbey Way	5.8	5	Roads Service	Contraflow manoeuvre required to allow cornering	PSNI to block road	✓	
7	Contraflow manoeuvre	Upper Water Street onto Trevor Hill	6.2	6	Roads Service	Contraflow manoeuvre required to allow cornering	PSNI to block road	✓	Removal of Pedestrian Railings
8	2 no. roundabouts & Contraflow manoeuvre	A27	6.4	7	Roads Service	Contraflow manoeuvre required to negotiate roundabouts	PSNI to block road	✓	
8A	Central Splitter Island	A28	6.45	7A	Roads Service	Removal of Central Items		NEW	
9	Overhead Electricity lines	A28	6.5	8	NIE	NIE to confirm safety clearance	Overhead line measured at 5.4m	✓	
10	Overhead Electricity line	A28	6.8	9	NIE	NIE to confirm safety clearance	Overhead line measured at 5.6m	✓	
10A	Pedestrian Crossing	A28	7.0	9A	Roads Service	Removal of Central Items		NEW	

11	Street furniture	A28	7.4	10	Roads Service	Removal of 1 no. keep left bollard & 1 no. post		✓	
12	Roundabout & Street furniture	A28	7.6	11	Roads Service	Removal of 1 no. Sign & 1 no. keep left bollard		✓	
13	Bridge over river	A28	8.1	12	Roads Service	NONE		✓	
14	Roundabout & Street furniture	A28	8.2	13	Roads Service	Removal of 2 no. Chevron boards		✓	
15	Bridge over river	A28	8.3	14	Roads Service	NONE		✓	
16	Roundabout	A28	8.4	15	Roads Service	NONE		✓	
17	Bridge under motorway	A28	9.1	16	Roads Service	NONE	Bridge measured at 5.4m	✓	
18	Roundabout & Street furniture	A28	9.3	17	Roads Service	Removal of 1 no. chevron board		✓	
18A	Street Furniture	A28	9.3	17A	Roads Service	Removal of Bollards to Allow Oversail of Trailer		NEW	
19	Bridge under railway	A28	9.7	18	NI Railways	NONE	Bridge measured at 9.1m	✓	
20	Street furniture	A28	24.2	19	Roads Service	Removal of 1 no. post & 2 no. keep left bollards		✓	
21	Street furniture	A28	24.3	20	Roads Service	Removal of 1 no. post & 2 no. keep left bollards		✓	
22	Street furniture	A28	24.4	21	Roads Service	Removal of 1 no. post & 2 no. keep left bollards		✓	
23	Street furniture	A28	24.4	22	Roads Service	Removal of 1 no. post & 2 no. keep left bollards		✓	
24	Street furniture	A28	24.5	23	Roads Service	Removal of 1 no. post & 2 no. keep left bollards		✓	New Photograph – Service Station Demolished
25	Junction	A28 onto A3	25.2	24	Roads Service	Contraflow manoeuvre required to negotiate turning	Dwg. 13186-002-0 Sheet 1&2	✓	Keep Left and Sign identified on central Island to be removed
26	Junction	A3 onto Gaol Square & A3	25.3	25	Roads Service	Contraflow manoeuvre required to negotiate turning	Dwg. 13186-002-0 Sheet 1&2	✓	
27	Street furniture	A3	25.3	25	Roads Service	Removal of 2 no. keep left bollards, 1 no. traffic light & 1 no. sign	Dwg. 13186-002-0 Sheet 1&2	✓	
28	Roundabout	A3	25.6	26	Roads Service	NONE		✓	

29	Street furniture	A3	25.7	27	Roads Service	Contraflow manoeuvre required to negotiate street furniture		✓	
30	Roundabout	A3 onto A29	26.0	28	Roads Service	NONE		✓	
31	Bridge over river	A29	26.8	29	Roads Service	NONE		✓	
32	Street furniture	A29	32.4	30	Roads service	Removal of 1 no. speed sign & 1 no. bollard		✓	
33	Street furniture	A29	32.6	31	Roads service	Removal of 1 no. give way/roundabout sign		✓	
33A	Street Furniture	A29	32.6	31	Roads service	Removal of 1 x Hatpin and 2 x Keep Left Bollards	Timber/Shims to be used around kerbs	NEW	Enables central position on Bridge
34	Bridge over river	A29	32.7	32	Roads service	NONE		✓	
35	Transshipment Area & Junction	A29	33.0	33	Roads service	Temporary road closure & traffic diversions	Dwg. 13186-003-0 Sheet 1&2	✓	
36	Parked Vehicles	A29 onto B106	33.1	34	Roads service	300m of parking restrictions required on both sides of the road	Dwg. 13186-003-0 Sheet 2of2	✓	
37	Overhead Power Lines	B106	33.1 – 33.5	34A	NIE/Telecoms	Further consultation required with NIE Networks.	Outages and Lifting	NEW	
NONE	Site Entrance TBC	B106	34.7	35	Roads service & NIE	TBC	TBC	✓	
END OF ROUTE									

5.0 Photographic References

Photo Reference 1



Photo Reference 2



Photo Reference 3

Client: AECOM
Project: T/C INTERCONNECTOR PROJECT
Reference: ALE/TS/AA5232-17 B
Dated: MAY 2019



Photo Reference 4



Photo Reference 5



Photo Reference 6

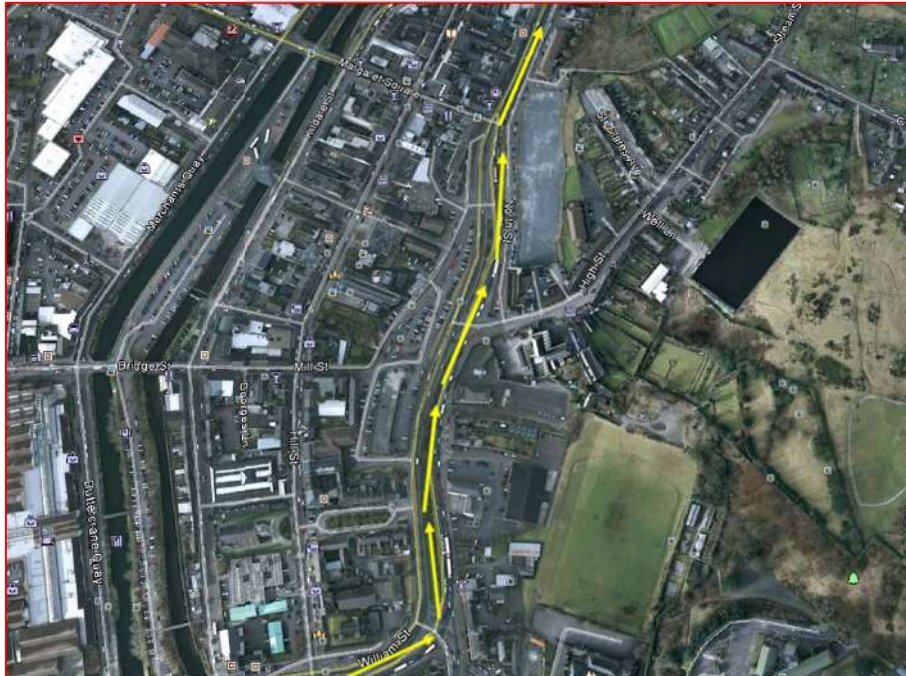


Photo Reference 7



Photo Reference 8



Photo Reference 8A

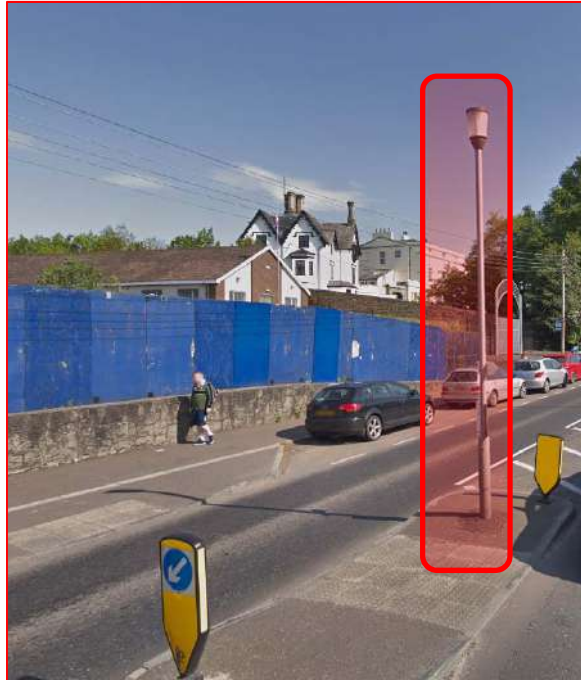


Photo Reference 9



Photo Reference 10



Photo Reference 10A



Photo Reference 11

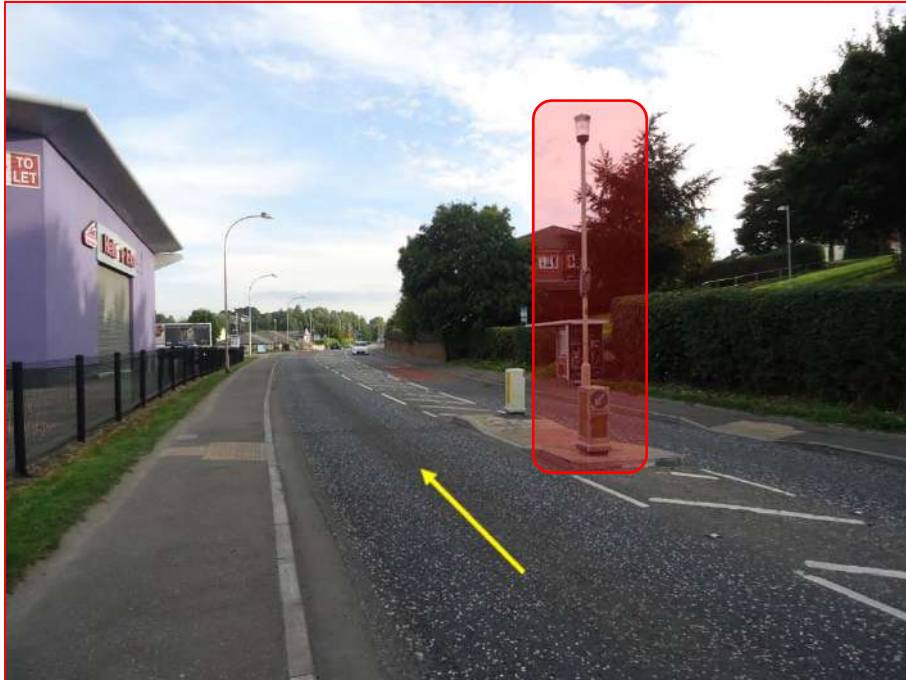


Photo Reference 12



Photo Reference 13



Photo Reference 14



Photo Reference 15



Photo Reference 16



Photo Reference 17



Photo Reference 18



Photo Reference 18A



Photo Reference 19



Photo Reference 20



Photo Reference 21



Photo Reference 22



Photo Reference 23

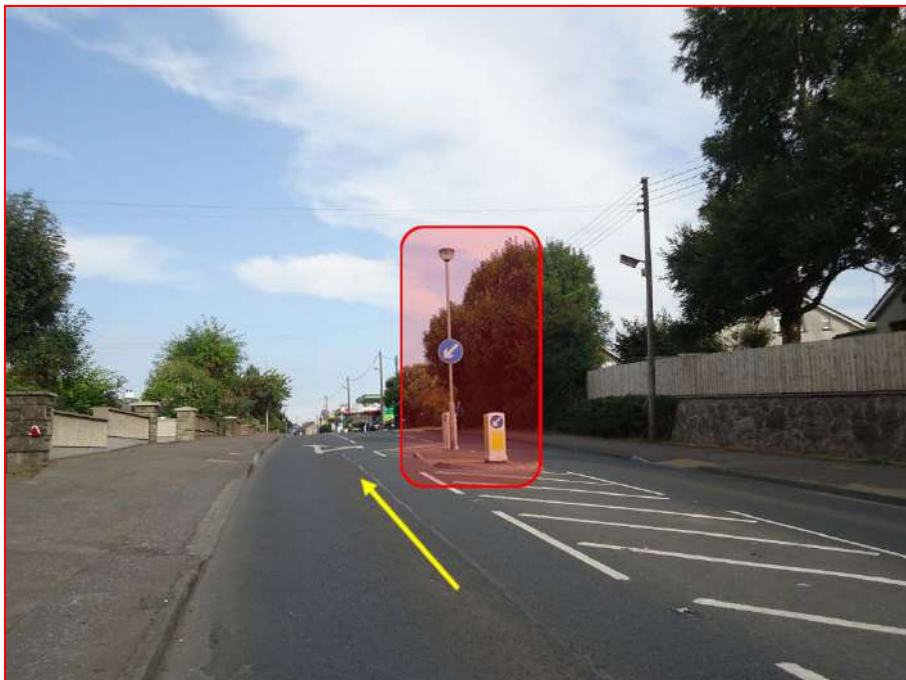


Photo Reference 24



Photo Reference 25 *Reverse arrows show reverse manoeuvre*

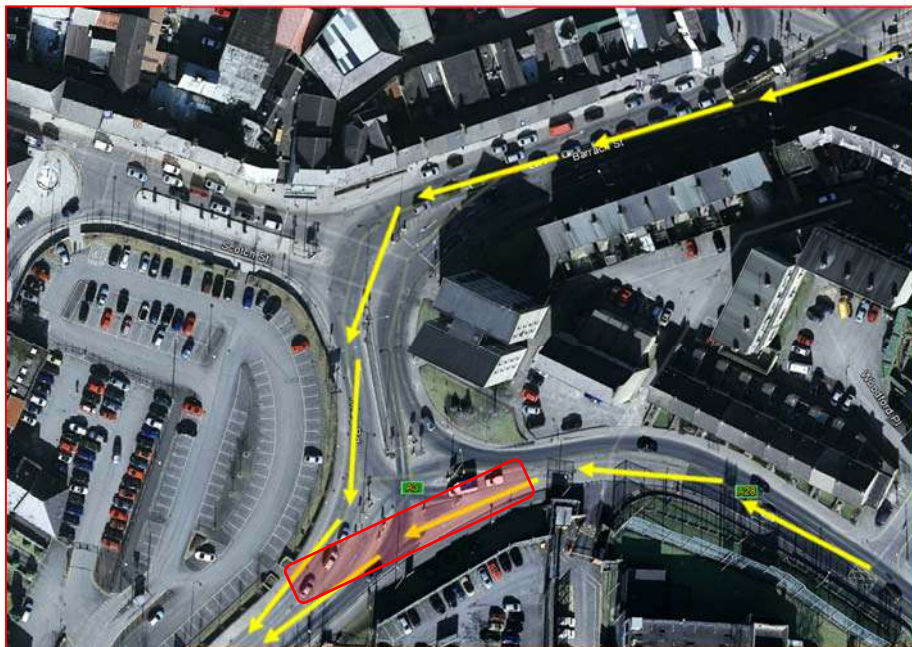


Photo Reference 26 *Reverse arrows show reverse manoeuvre*

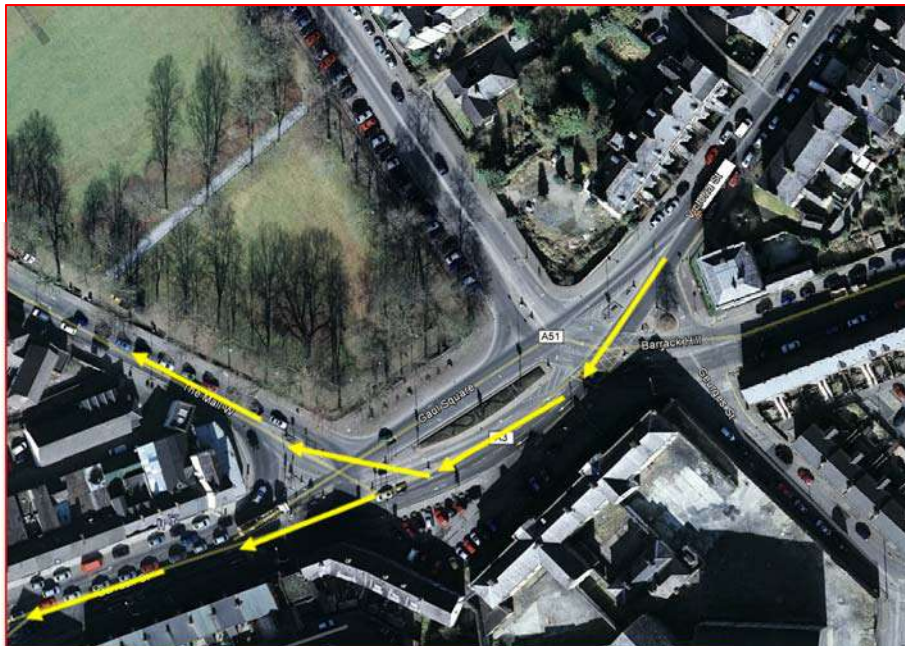


Photo Reference 27

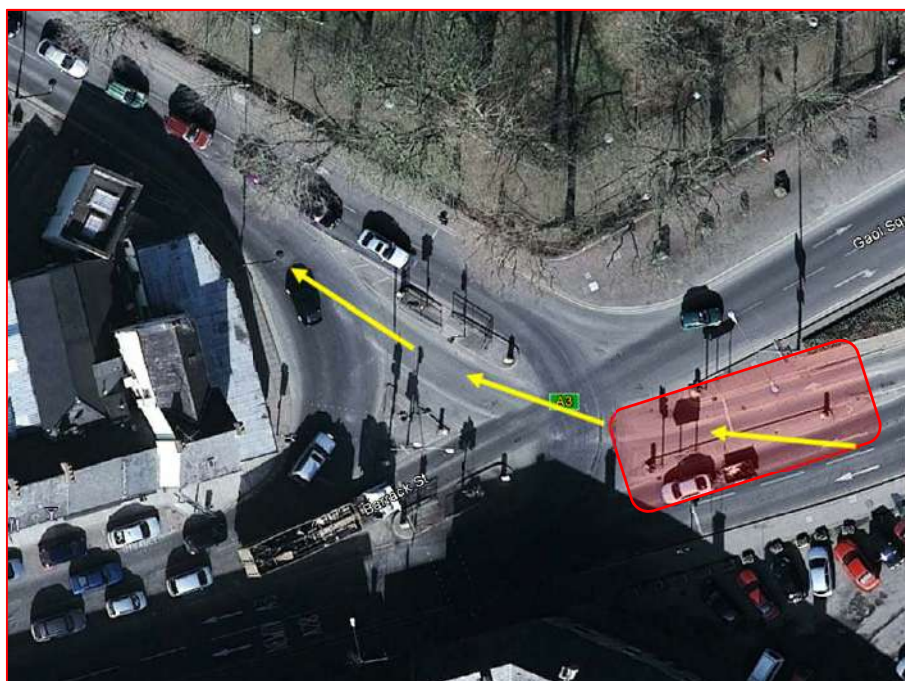


Photo Reference 28



Photo Reference 29



Photo Reference 30



Photo Reference 31



Photo Reference 32



Photo Reference 33



Photo Reference 33A



Photo Reference 34



Photo Reference 35



Photo Reference 36



Photo Reference 37



6.0 Key Factors

Structures (Over/Under)

During consultation with DFI- Northern Ireland – Roads, ALE indicated axle and wheel loads to be imposed on the route, from this there were no structures to be passed over which were highlighted as fail or risk and as such the above route was agreed in principle.

There are two bridges crossing over the route, one rail and one A road, both of which are at a sufficient height to pass under without concern.

Street Furniture

Removal of street furniture has been surveyed and highlighted above showing all necessary removals due to the overall width, length or general path of the transport arrangement. This assessment was carried out whilst carefully considering the commercial and environmental impact of removing such equipment.

A street furniture removal report will be issued to the local authorities prior to delivery, street furniture will be removed prior to the movement taking place. Depending on the level of work required the removal of street furniture generally takes place two hours ahead of the movement and is reinstated once the load has passed by the location. Temporary traffic management will be put in place during the period of works if required.

Overhead lines

Only overhead lines considered to pose a hazard or obstruction to the transport arrangement were highlighted in the obstruction list. Those noted were 2 no. sets of overhead electricity overhead lines which could present an obstruction to the transport movement. These lines will be discussed with NIE prior to movement to ensure there is adequate safety distance. If the lines do present an obstruction, there are a number of measures that can be used. This includes temporary lifting the lines up while the transport passes to ensure clearance without interrupting supply. If an interruption of supply is required, this will be a temporary disruption and would be completed in-line with NIE's standard procedures. All affected customers would be given advance warning so that disruption will be minimised. In-line with their procedures, NIE would ensure that arrangements would be put into place for sensitive customers.

There were a number of telecom lines crossing the route but none were noted as an obstruction.

Manoeuvring & Escorts

The load would be escorted by ALE for close manoeuvring communication and by the PSNI with a rolling road block throughout for traffic management. This road block will be further enforced during contraflow driving through Newry and for the reversing manoeuvre required in the centre of Armagh. This manoeuvre is necessary to mitigate a large amount of street furniture removal in the town, which would result in a high volume of disruption due to the amount of traffic lights and railings that would need to be removed. This manoeuvre will take approximately 20 minutes from the PSNI halting traffic to the trailer continuing on the correct side. The reverse manoeuvre in Armagh will also take approximately 20 minutes and will allow for a smaller amount of street furniture to be removed, *Dwg. 13186-002-0 Sheet 1&2*.

The travel time from Warrenpoint to the transhipment area in Moy will take 5 to 7 hours including all manoeuvres. Following the transhipment to SPT, travel time from Moy to site will take approximately 1 hour.

The day on which the transport will take place will be dictated by the authorities on permit application. Abnormal moves predominantly take place on a Sunday and following an overnight stop at the transhipment area in Moy, the transhipment and subsequent SPT move will take place on the Monday.

Transshipment & Road Closure

Due to the overall envelope of the 20 axle girder frame, the right hand turn from the A29 onto the B106 cannot be achieved. This has resulted in the requirement for transshipment to a smaller, more manoeuvrable, Self Propelled Trailer (SPT) to negotiate the turn. The modular trailer will also be better suited to the more restrictive site roads once entering the substation.

ALE have an agreement in principle from Road Service to use a section of the A29 in central Moy to complete the transshipment to SPT, this is under the condition that works are only carried out in daylight hours. A temporary road closure with diversions will be required during the transshipment period; this will be covered under a Temporary Traffic Regulation Order (TTRO). ALE has been informed that a TTRO of this nature has a 4 week application lead time. *Dwg 13186-003-0 Sheet 1 of 2.*

Transshipment

The transshipment from girder frame trailer to SPT could take up to 15 hours due to the nature of the equipment being prepared such as mobile crane, load spreading mats, SPT build and the split and demobilisation of girder frame. These works will have to be split over a period of two days due to daylight working restrictions. This period could be greatly reduced if the SPT could mobilised using the mobile crane at site and then drove empty along the B106 to the transshipment area. *Dwg 13186-003-0 Sheet 1 of 2.*

Parking Restriction

A parking restriction will be required for a short period on a section of the B106 to enable the loaded SPT to negotiate the turn from the A29. This restricted area will be marked by no parking cones and signs and will also come with an application lead time of 4 weeks. *Dwg 13186-003-0 Sheet 2 of 2.*

Indicative Movement Programme

- Day 1. Mobilise to Warrenpoint Port
- Day 2. Build 20 axle Girder Frame Trailer
- Day 3. Receive transformer via crane to Girder Frame Trailer
- Day 4. (am) Transport transformer / Prepare tranship area & build SPT
- Day 4. (pm) Tranship to SPT / Deliver Transformer to Moy Substation via SPT
- Day 5. De-mobilise Girder Frame at tranship area / De- mobilise SPT at site
- Day 6 – 9. Install transformer

7.0 Conclusions

Following liaison with local authorities, the completion of the physical survey and subsequent analysis of the suggested route, ALE can advise that transportation of the 500MVA transformer can be successfully carried out from Warrenpoint Port to Moy Substation via road.

This result is based on the utilisation of 20 axle girder frame trailer *Dwg. 13186-001* followed by a transshipment to a 12 axle Self Propelled Trailer (SPT) *Dwg. 13186-004*.

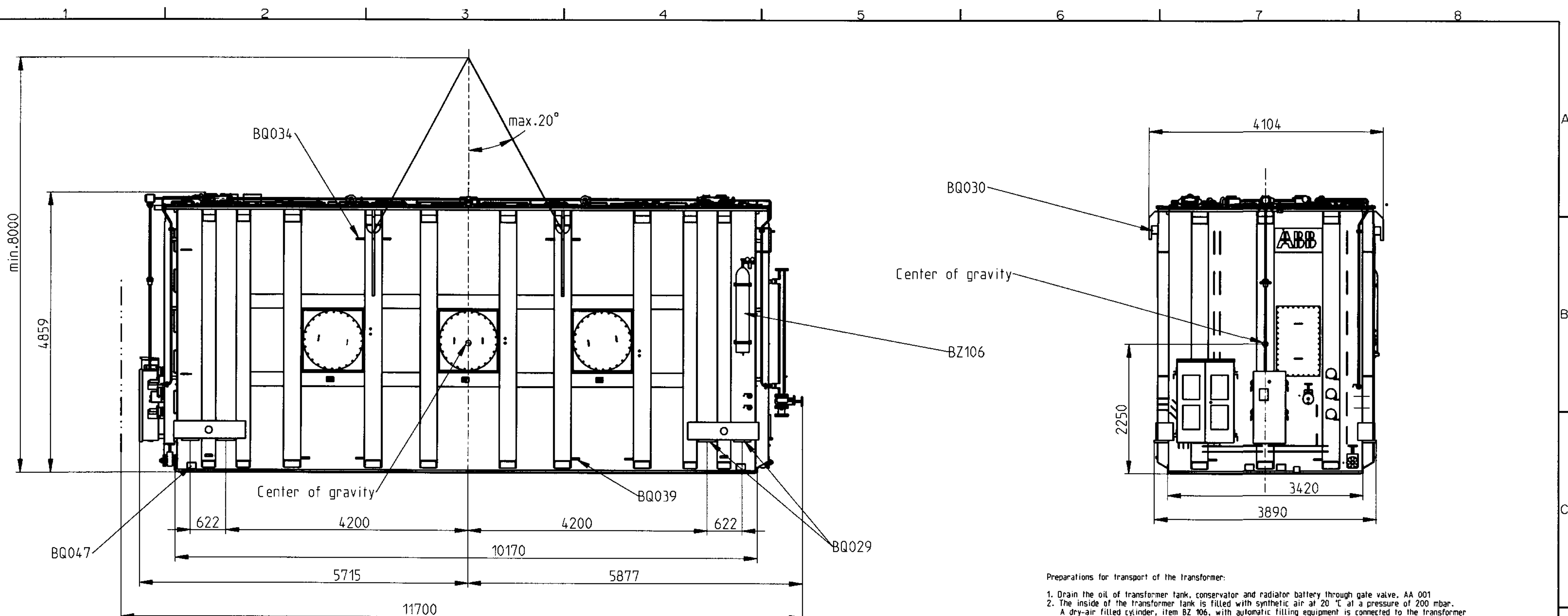
8.0 Summary of 2019 Route Revalidation

Following ALE's physical reassessment of the route on 2nd May 2019, it is confirmed that no significant variations between the report of 2014 and the current condition were identified from the viewpoint of negotiability that would prevent the load from travelling along the route from Warrenpoint.

APPENDIX A

Client: AECOM
Project: T/C INTERCONNECTOR PROJECT
Reference: ALE/TS/AA5232-17 B
Dated: MAY 2019





Preparations for transport of the transformer:

1. Drain the oil of transformer tank, conservator and radiator battery through gate valve, AA 001
2. The inside of the transformer tank is filled with synthetic air at 20 °C at a pressure of 200 mbar. A dry-air filled cylinder, item BZ 106, with automatic filling equipment is connected to the transformer tank during transport. The pressure valve for the reduced pressure at the dry-air cylinder is set to an overpressure of 35 mbar. The pressure relief valve is factory-set at 600 mbar.
3. Drain 15 dm³ oil from each OLTC (= 3 x 15 dm³) through valve, AA 004
4. The pressure relief vent, BZ105, factory-set at 350 mbar, is mounted into the blind flange of pressure relief vent, CP081, which is dismantled during transport.
5. The transformer is filled with oil at site; the necessary quantity of 139 000 dm³ oil will be provided
6. All valves must be closed oil-tight
7. A three-way Impact Recorder, item BZ 123 is mounted on the cover during transport

The following parts must be dismantled for transport:

1. Oil conservator, item BB 085 and BB 089 and bracket, item BQ 150
2. HV-bushings, item GD 001 with turrets
3. LV-bushings, item GD 009 with turrets
4. LV-bushing, item GD 010
5. TV-bushings, item GD 013
6. Pressure relief vent, items CP 101, CP 102, CP 103
7. Fans, items AN 701 AN 705
8. Radiators, item AC 600
9. Pipes between transformer tank and conservator
10. Pressure relief devices, items CP 081, CP 082
11. All pipes at transformer cover

The following items must be provided with a transport protection:

1. Dial-type thermometers, items CT 031, CT 033 and CT 034
2. Oil level indicators, items CL 060 and CL 064

All joint flanges and openings at transformer tank, conservator, pipes and radiators must be closed oil-tight with blind flanges.

Weights:

Active part	167 000 kg
Oil incl. bound oil	129 000 kg
Oil excl. bound oil	126 000 kg
Total	376 000 kg
Transport unit without oil	222 000 kg

- BZ105
- BQ029 Lifting device for hydraulic lifting jack
- BQ030 Lifting lug for complete transformer
- BQ034 Lashing lug $\varnothing 60$
- BQ039 Pulling eye $\varnothing 60$ for lashing
- BQ047 Blocking device
- BZ105 Pressure relief vent during transport
- BZ106 Automatic filling device for synthetic air
- BZ123 Three-way shock recorder

Model Name TRANSPORT	Drawing Name TRANSPORT	Title Transport drawing	Scale 0.02
Prepared U.C.	Responsible department LT 02/04	Order 110077	Page 1
Approved U.Christ	Take over department ---	Document No. XDE294520-DBH	Language en
Revision	Mass 0.0 kg		Total 1

Rev	Ind	Revision	Appd	Date

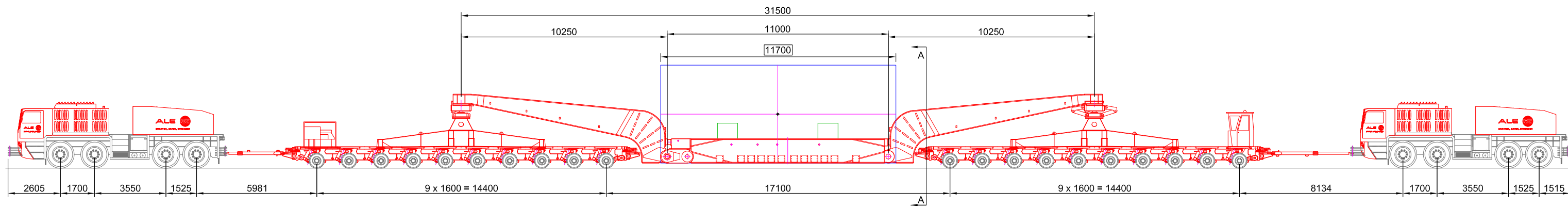
We reserve all rights in this document and in the information contained therein. All rights are reserved. Any disclosure to third parties without express authority is strictly forbidden.

Production engineering review

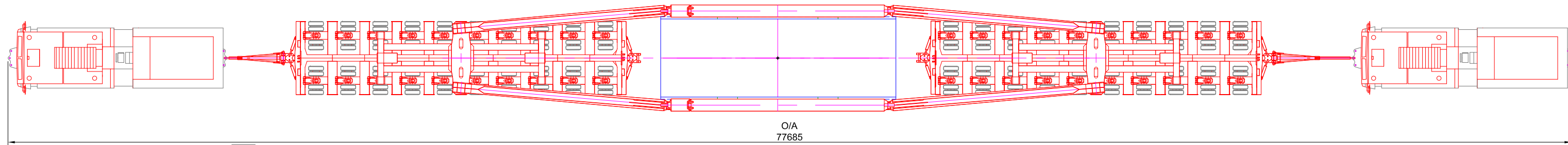
APPENDIX B

Client: AECOM
Project: T/C INTERCONNECTOR PROJECT
Reference: ALE/TS/AA5232-17 B
Dated: MAY 2019

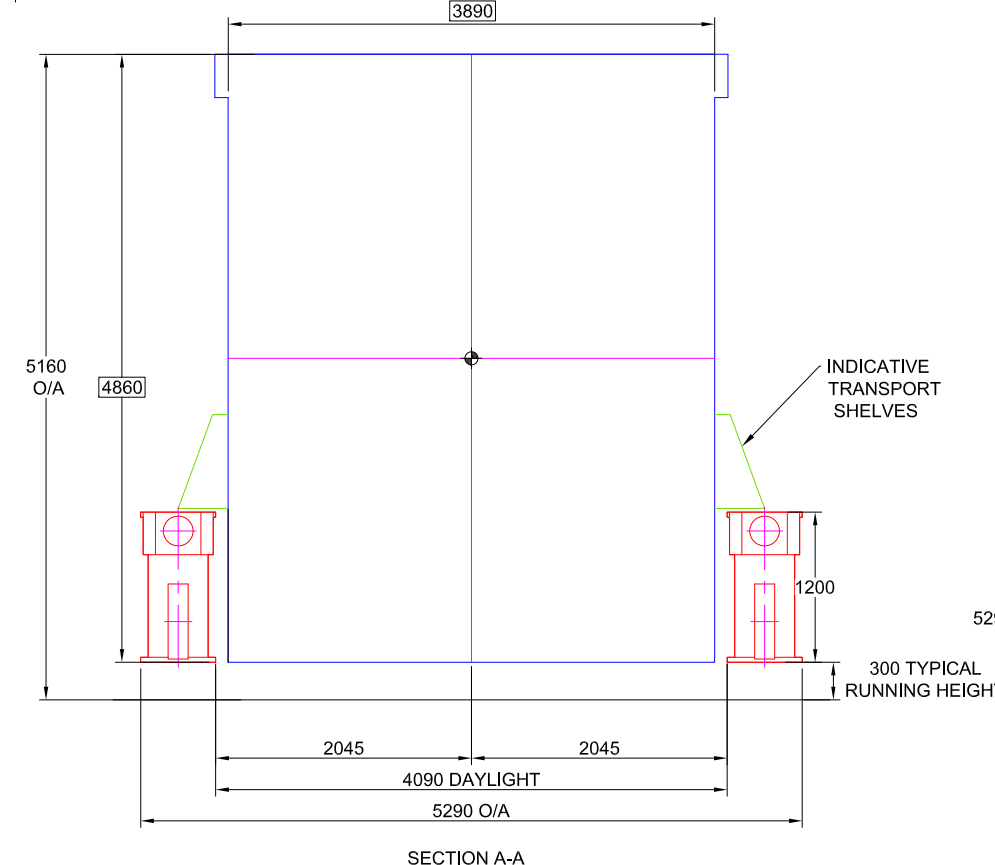




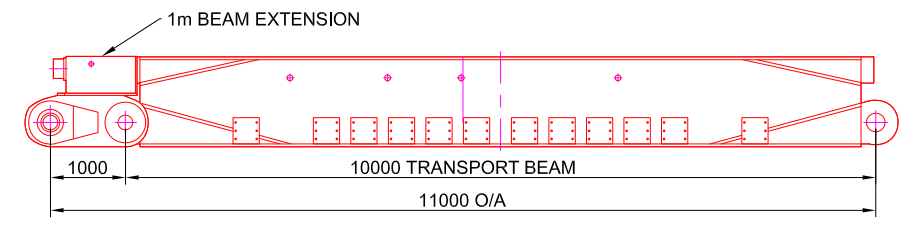
ELEVATION



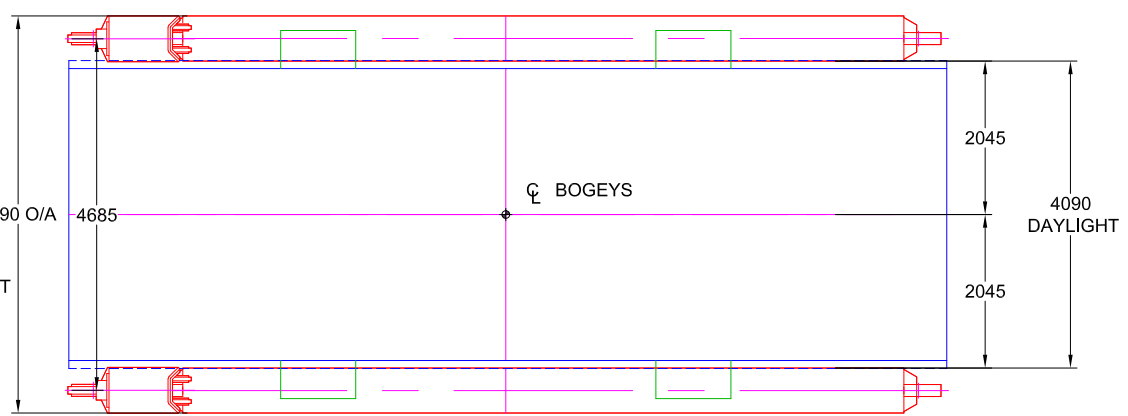
PLAN



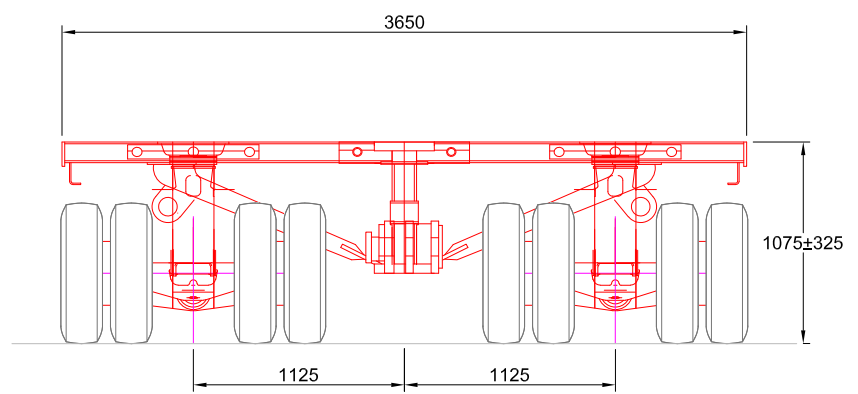
SECTION A-A



SIDE ELEVATION - BEAM DETAIL



PLAN - BEAM DETAIL



TRAILER DETAIL

DRAWING NOTES:


- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED.
- ALL WEIGHTS ARE IN t (METRIC TONNES) UNLESS OTHERWISE STATED.
- ALL DETAILS ARE PROVISIONAL AND ARE SUBJECT TO CONFIRMATION.
- ORIENTATION TO BE CONFIRMED

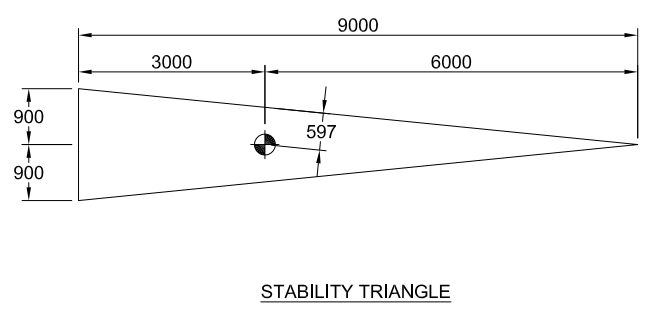
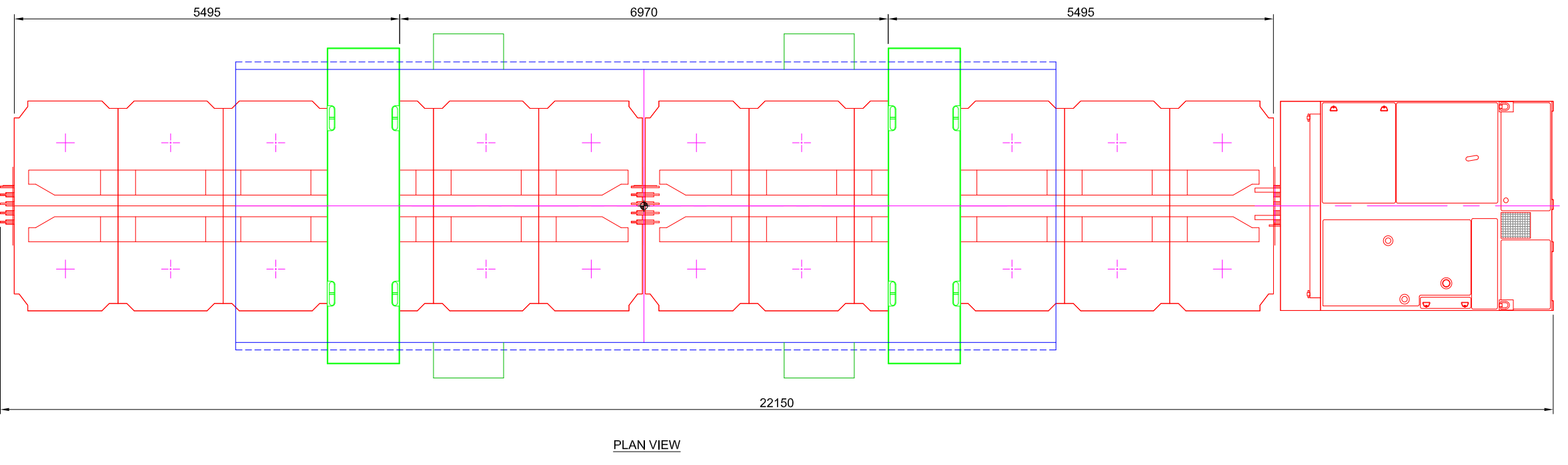
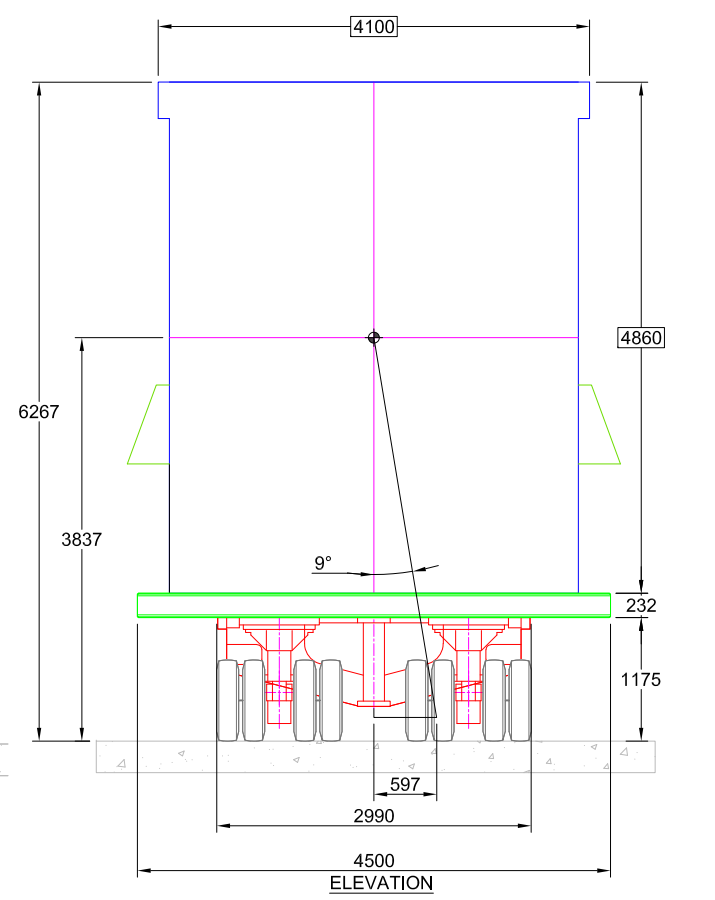
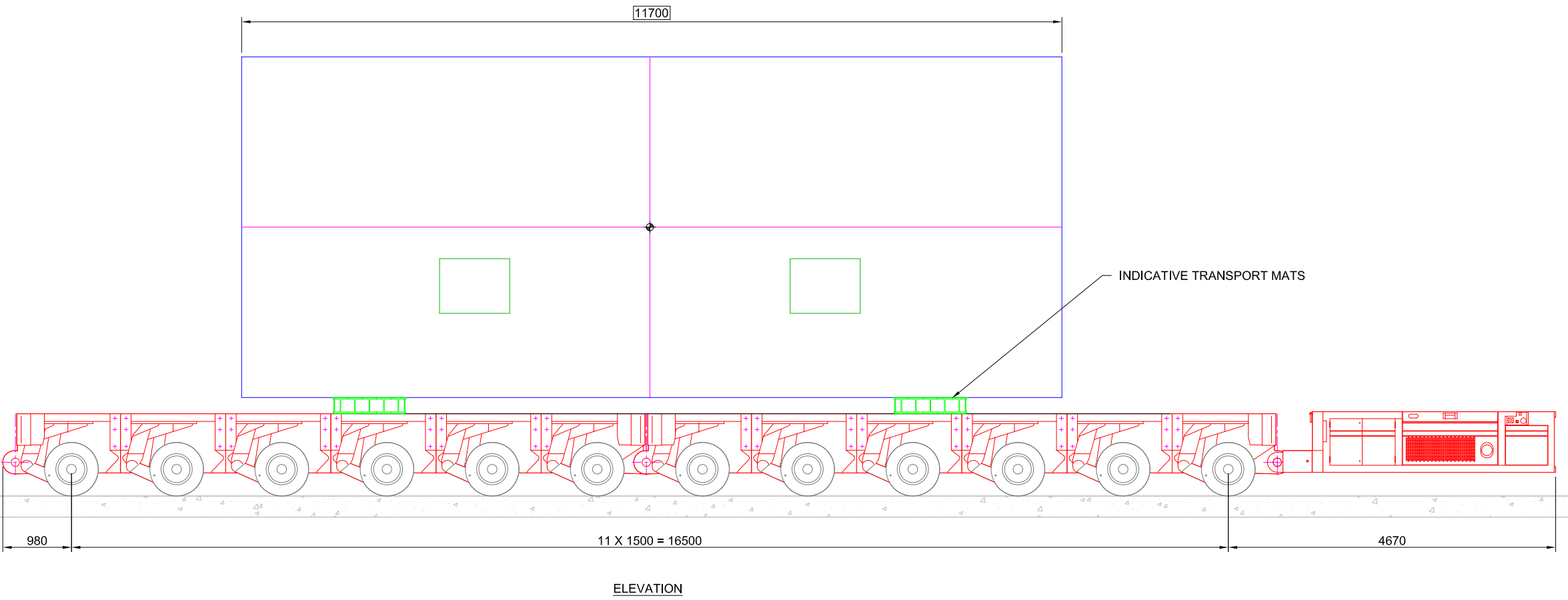
DO NOT SCALE IF IN DOUBT ASK The content of this drawing is confidential and must not be disclosed without the written permission of ALE.

TECHNICAL NOTES:

- TRANSPORT SHELVES SHOWN ARE INDICATIVE
- WEIGHT, COG AND SHIPPING DIMENSIONS TAKEN FROM 500MW Transformer weights GA XDE294520-DBH RECEIVED 1/04/14
- ORIENTATION TBC
- 3.6M BOLSTER BEAMS

File Location: Z:\Public\Job Files\AA5000+AA5232 - TURLEENAN SUBSTATION\17 - AECOM BELFAST - TORLEENAN - SURVEY - 07-03-2019\Engineering\2_Drawings\2_DWG - Drawings\AA5232-17-DWG-001-A - TA - AL100 20 AXLES TROJAN.dwg

TRAILER SPECIFICATION						
AL100 (20 AXLE)						
all weights in t (metric tonnes)	Total					
NUMBER OF AXLE LINES	20	A	17/05/2019	GGB	MR	FIRST ISSUE
NUMBER OF FILES	2	Rev.	Date	Drawn	Check	Description
LOAD DETAILS		QF19 (Issue 5)				
PAY LOAD	222.0	 Abnormal Load Engineering Ltd, New Road, Hixon, Staffordshire, ST18 0PE, U.K. Tel: +44 (0) 1889 272 500 Fax: +44 (0) 1889 271 750 Web: www.ale-heavylift.com				
TRANSPORTER WEIGHT	135.3					
ENGINE WEIGHT	-					
AUXILIARY STEEL WEIGHT	-					
TOTAL LOAD	357.3					
LOAD PER AXLE LINE / TRAILER	17.87	Project Title				
LOAD PER FILE	8.93	TC INTERCONNECTOR SURVEY				
LOAD PER WHEEL	2.23	Drawing Title				
GROUND BEARING PRESSURE t/m ²	3.32	TRANSPORT ARRANGEMENT FOR 222t TRANSFORMER ON AL100 (20 AXLE)				
Date	17/05/2019	Drawn	GGB	Checked	MR	Scale (A1) N.T.S
Project No.	AA5232-17	Drawing No.	DWG-001		Sheet	1 of 1
		Rev.	A			



DRAWING NOTES:

- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED.
- ALL WEIGHTS ARE IN t (METRIC TONNES) UNLESS OTHERWISE STATED.
- ALL DETAILS ARE PROVISIONAL AND ARE SUBJECT TO CONFIRMATION.
- ORIENTATION TO BE CONFIRMED

TECHNICAL NOTES:

- WEIGHT, COG AND SHIPPING DIMENSIONS TAKEN FROM 500MW Transformer weights GA XDE294520-DBH RECEIVED 1/04/14
- TRANSVERSE OPERATIONAL LIMIT ± 81 mm
- LONGITUDINAL OPERATIONAL LIMIT ± 300 mm

TRAILER SPECIFICATION																																																																															
12 ROW GH SPT																																																																															
all weights in t (metric tonnes)	Total	Group 1	Group 2	Group 3																																																																											
NUMBER OF AXLE LINES	12	4	8	8	A	17/05/2019	GGB	MR	FIRST ISSUE																																																																						
NUMBER OF FILES	2	2	1	1	Rev.	Date	Drawn	Check	Description																																																																						
LOAD DETAILS																																																																															
PAY LOAD	222	74.0	74.0	74.0																																																																											
TRANSPORTER WEIGHT	40.0	13.3	13.3	13.3																																																																											
ENGINE WEIGHT	7.0	7.0	-1.0	-1.0																																																																											
AUXILIARY STEEL WEIGHT	4.0	1.3	1.3	1.3																																																																											
TOTAL LOAD	273.0	95.6	87.6	87.6																																																																											
LOAD PER AXLE LINE / TRAILER		23.9	10.95	10.95																																																																											
LOAD PER FILE		11.95	10.95	10.95																																																																											
LOAD PER WHEEL		2.99	2.74	2.74																																																																											
GROUND BEARING PRESSURE t/m ²		5.33	4.88	4.88																																																																											
<table border="0"> <tr> <td colspan="2">Client</td> <td colspan="8"> Abnormal Load Engineering Ltd. New Road, Hixon, Staffordshire, ST18 0PE, U.K. Tel: +44 (0) 1889 272 500 Fax: +44 (0) 1889 271 750 Web: www.ale-heavylift.com </td> </tr> <tr> <td colspan="2">Project Title</td> <td colspan="8">TC INTERCONNECTOR SURVEY</td> </tr> <tr> <td colspan="2">Drawing Title</td> <td colspan="8">TRANSPORT ARRANGEMENT FOR 222t TRANSFORMER ON 12 ROW GOLDHOFER SPT</td> </tr> <tr> <td>Date</td> <td>Drawn</td> <td>Checked</td> <td>Scale (A1)</td> <td>Sheet</td> <td colspan="5"></td> </tr> <tr> <td>17/05/2019</td> <td>GGB</td> <td>MR</td> <td>N.T.S</td> <td>1 of 1</td> <td colspan="5"></td> </tr> <tr> <td colspan="2">Project No.</td> <td colspan="2">Drawing No.</td> <td colspan="4">Rev.</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">AA5232-17</td> <td colspan="2">DWG-004</td> <td colspan="4">A</td> <td colspan="2"></td> </tr> </table>										Client		Abnormal Load Engineering Ltd. New Road, Hixon, Staffordshire, ST18 0PE, U.K. Tel: +44 (0) 1889 272 500 Fax: +44 (0) 1889 271 750 Web: www.ale-heavylift.com								Project Title		TC INTERCONNECTOR SURVEY								Drawing Title		TRANSPORT ARRANGEMENT FOR 222t TRANSFORMER ON 12 ROW GOLDHOFER SPT								Date	Drawn	Checked	Scale (A1)	Sheet						17/05/2019	GGB	MR	N.T.S	1 of 1						Project No.		Drawing No.		Rev.						AA5232-17		DWG-004		A					
Client		Abnormal Load Engineering Ltd. New Road, Hixon, Staffordshire, ST18 0PE, U.K. Tel: +44 (0) 1889 272 500 Fax: +44 (0) 1889 271 750 Web: www.ale-heavylift.com																																																																													
Project Title		TC INTERCONNECTOR SURVEY																																																																													
Drawing Title		TRANSPORT ARRANGEMENT FOR 222t TRANSFORMER ON 12 ROW GOLDHOFER SPT																																																																													
Date	Drawn	Checked	Scale (A1)	Sheet																																																																											
17/05/2019	GGB	MR	N.T.S	1 of 1																																																																											
Project No.		Drawing No.		Rev.																																																																											
AA5232-17		DWG-004		A																																																																											

DO NOT SCALE IF IN DOUBT ASK The content of this drawing is confidential and must not be disclosed without the written permission of ALE.

File Location: Z:\Public\Job Files\AA5000+AA5232 - TURLEENAN SUBSTATION\17 - AECOM BELFAST - TORLEENAN - SURVEY - 07-03-2019\Engineering\2_Drawings\2_DWG - Drawings\AA5232-17-DWG-004-A - TA - SPT.dwg

APPENDIX C

Client: AECOM
Project: T/C INTERCONNECTOR PROJECT
Reference: ALE/TS/AA5232-17 B
Dated: MAY 2019





DRAWING NOTES:

- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED.
- ALL WEIGHTS ARE IN t (METRIC TONNES) UNLESS OTHERWISE STATED.
- ALL DETAILS ARE PROVISIONAL AND ARE SUBJECT TO CONFIRMATION.
- ORIENTATION TO BE CONFIRMED

TECHNICAL NOTES:

KEY :-

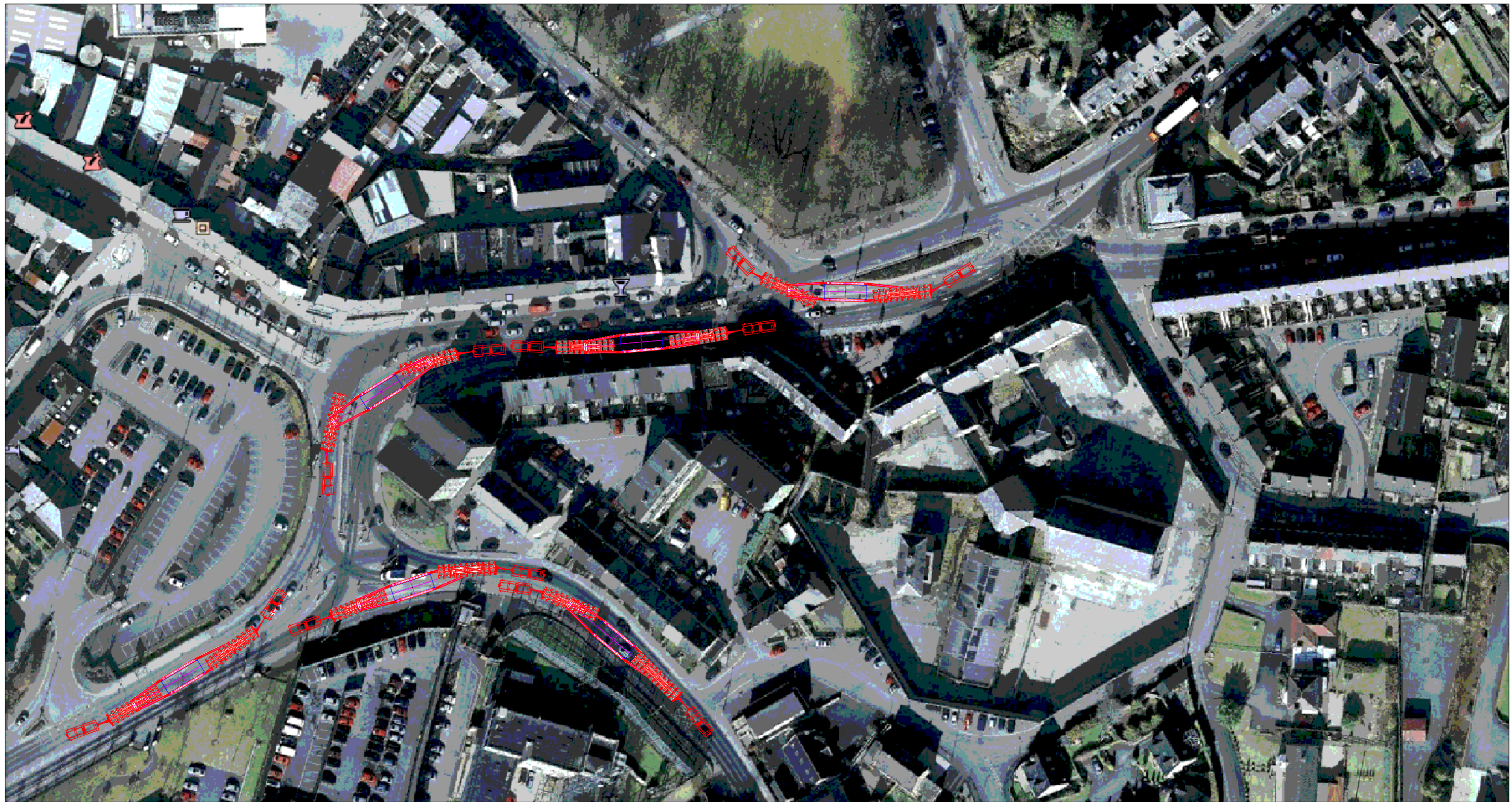
- APPROX. TRANSPORT ROUTE SWEEP BY AL100 20 AXLE TRAILER

A	17/05/2019	GGB	MR	FIRST ISSUE			
Rev.	Date	Drawn	Check	Description	QF19 (Issue 5)		
Client		Abnormal Load Engineering Ltd. New Road, Hixon, Staffordshire, ST18 0PE, U.K. Tel: +44 (0) 1889 272 500 Fax: +44 (0) 1889 271 750 Web: www.ale-heavylift.com					
Project Title		AECOM					
Drawing Title		TC INTERCONNECTOR SURVEY					
Date		Drawn		Checked		Scale (A1)	
17/05/2019	GGB	GGB	MR	N.T.S	Sheet 1 of 2		
Project No.		Drawing No.		Rev.			
AA5232-17		DWG-002		A			

DO NOT SCALE IF IN DOUBT ASK The content of this drawing is confidential and must not be disclosed without the written permission of ALE.

File Location: Z:\PublicJob Files\AA5000+AA5232 - TURLEENAN SUBSTATION\17 - AECOM BELFAST - TORLEENAN - SURVEY - 07-03-2019\Engineering\2_Drawings\2_DWG - Drawings\AA5232-17-DWG-002-A - SP - ARMAGH SWEEP PATH.dwg






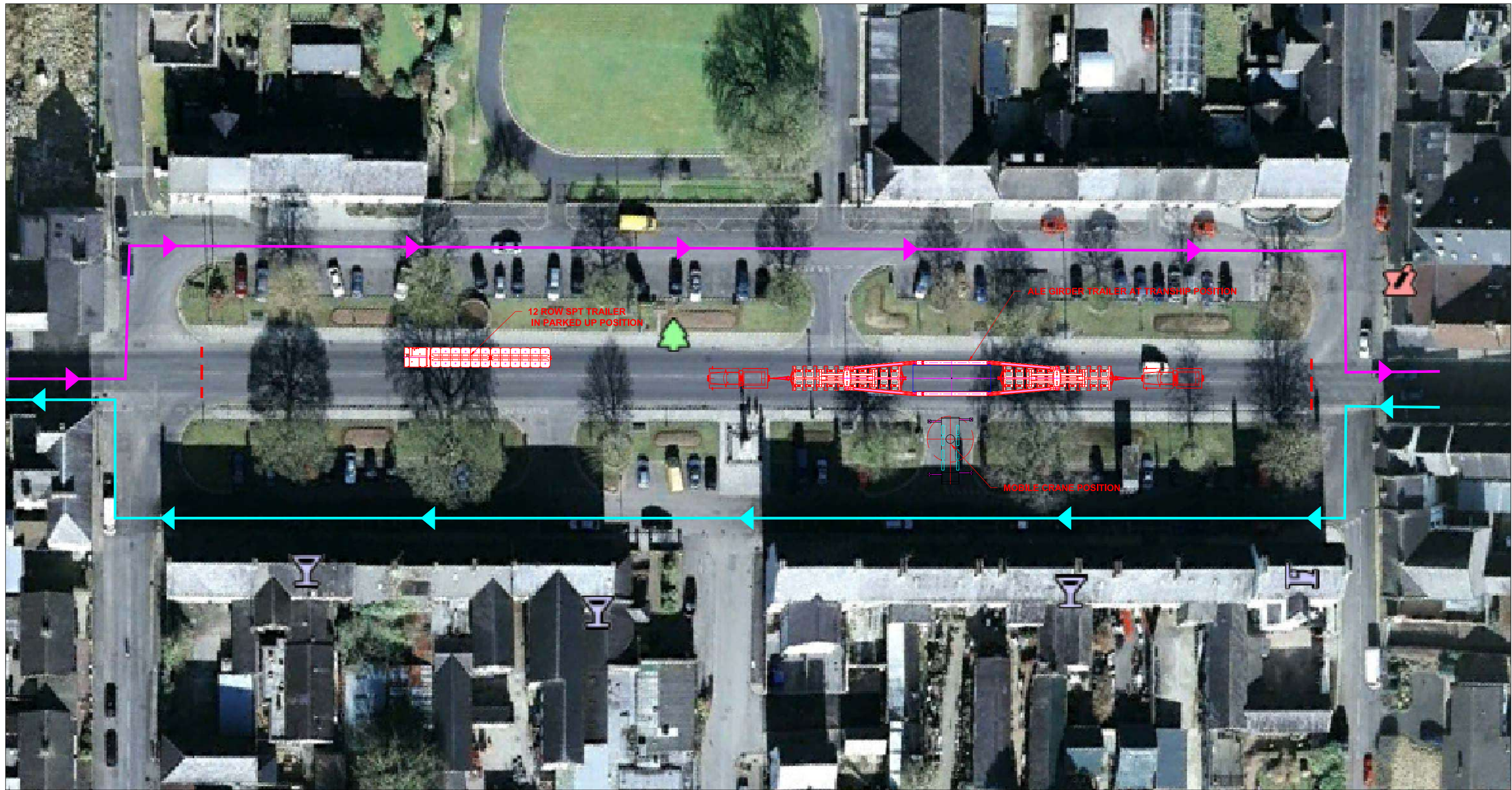
DRAWING NOTES:

- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED.
- ALL WEIGHTS ARE IN t (METRIC TONNES) UNLESS OTHERWISE STATED.
- ALL DETAILS ARE PROVISIONAL AND ARE SUBJECT TO CONFIRMATION.
- ORIENTATION TO BE CONFIRMED

TECHNICAL NOTES:

File Location: Z:\Public\Job Files\AA5000+AA5232 - TURLEENAN SUBSTATION\17 - AECOM BELFAST - TORLEENAN - SURVEY - 07-03-2019\Engineering\2_Drawings\2_DWG - Drawings\AA5232-17-DWG-002-A - SP - ARMAGH SWEEP PATH.dwg

A	17/05/2019	GGB	MR	FIRST ISSUE
Rev.	Date	Drawn	Check	Description
				QF19 (Issue 5)
		Abnormal Load Engineering Ltd. New Road, Hixon, Staffordshire, ST18 0PE, U.K. Tel: +44 (0) 1889 272 500 Fax: +44 (0) 1889 271 750 Web: www.ale-heavylift.com		
Client		AECOM		
Project Title				
TC INTERCONNECTOR SURVEY				
Drawing Title				
SWEPT PATH LAYOUT A28/A3 FRIARY ROAD AND BARRACK ST, ARMAGH				
Date	Drawn	Checked	Scale (A1)	Sheet
17/05/2019	GGB	MR	N.T.S	2 of 2
Project No.		Drawing No.		Rev.
AA5232-17		DWG-002		A



DRAWING NOTES:

- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED.
- ALL WEIGHTS ARE IN t (METRIC TONNES) UNLESS OTHERWISE STATED.
- ALL DETAILS ARE PROVISIONAL AND ARE SUBJECT TO CONFIRMATION.
- ORIENTATION TO BE CONFIRMED

TECHNICAL NOTES:

KEY :-

- DIVERSION ROUTE FOR EASTBOUND TRAFFIC
- DIVERSION ROUTE FOR WESTBOUND TRAFFIC
- ROAD CLOSURE EXTENTS

A	17/05/2019	GGB	MR	FIRST ISSUE	
Rev.	Date	Drawn	Check	Description	QF19 (Issue 5)
		Abnormal Load Engineering Ltd. New Road, Hixon, Staffordshire, ST18 0PE, U.K. Tel: +44 (0) 1889 272 500 Fax: +44 (0) 1889 271 750 Web: www.ale-heavylift.com			
Client		AECOM			
Project Title TC INTERCONNECTOR SURVEY					
Drawing Title A29 HILLVIEW TERRACE, MOY TRANSHIPMENT LAYOUT					
Date	Drawn	Checked	Scale (A1)	Sheet	
17/05/2019	GGB	MR	N.T.S	1 of 2	
Project No. AA5232-17		Drawing No. DWG-003		Rev. A	






DRAWING NOTES:

- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED.
- ALL WEIGHTS ARE IN t (METRIC TONNES) UNLESS OTHERWISE STATED.
- ALL DETAILS ARE PROVISIONAL AND ARE SUBJECT TO CONFIRMATION.
- ORIENTATION TO BE CONFIRMED

TECHNICAL NOTES:

A	17/05/2019	GGB	MR	FIRST ISSUE
Rev.	Date	Drawn	Check	Description
				QF19 (Issue 5)
		Abnormal Load Engineering Ltd. New Road, Hixon, Staffordshire, ST18 0PE, U.K. Tel: +44 (0) 1889 272 500 Fax: +44 (0) 1889 271 750 Web: www.ale-heavylift.com		
Client		AECOM		
Project Title				
TC INTERCONNECTOR SURVEY				
Drawing Title				
A29 HILLVIEW TERRACE, MOY SWEPT PATH DRAWING				
Date	Drawn	Checked	Scale (A1)	Sheet
17/05/2019	GGB	MR	N.T.S	2 of 2
Project No.		Drawing No.		Rev.
AA5232-17		DWG-003		A

