APPENDIX 15.1: ABNORMAL LOAD ROUTE ASSESSMENT

TANGY IV WIND FARM

ABNORMAL LOAD ROUTE ASSESSMENT

MARCH 2018

Prepared By:

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TABLE OF CONTENTS

1 INTRODUCTION

Tangy IV Wind Farm is a proposed wind farm located on the Kintyre Peninsula in Argyll and Bute. This Abnormal Load Route Assessment (ALRA) provides an assessment of land based routes to the wind farm site for the delivery of wind turbine components.

2 METHODOLOGY

This ALRA is a desk based study which uses publically available Ordinance Survey (OS) mapping to conduct swept path analysis of points of constraint (PCs) on the proposed delivery route. Swept path analysis is conducted in AutoCAD using the Vehicle Tracking software and a bespoke delivery vehicle developed for this ALRA.

2.1 Mapping

Ordinance Survey (OS) Mastermap was used to conduct swept path analysis along the proposed delivery route. This mapping is two-dimensional and therefore the assessment only considers the horizontal geometry of pinch points on the route. Topographical surveys may be required in order to undertake an assessment of vertical constraints.

2.2 Site Visit

A site visit and route drive over was undertaken in February 2018 by an Arcus Engineer in order to verify results of an initial swept path analysis. During this drive over the locations of identified PCs were confirmed in order to verify the accuracy of the OS mapping.

2.3 Delivery Vehicle Specifications

A vehicle data sheet is included in Appendix A. Dimensions of the blade and corresponding delivery vehicle specifications are provided in the following tables.

Table 2.1: Turbine Blade Data

	Data Used in Assessment
Blade	Length 65.0m

Table 2.2: Assumed delivery vehicles for Turbine Blade

	Data	**Source**
Blade Trailer	Vehicle length – 59.4m Blade overhang – 10.3m	Volvo Cab / TSR Trailer

2.4 Route to Site

This assessment considered delivery from the Campbeltown Harbour. The route to site would be as follows:

- Campbeltown Harbour;
- Hall Street;
- Kinloch Road;
- Aqualibrium Avenue;
- Millknow Road;
- A83; and
- Unnamed Roads to Site Entrance.

Figure 1, included in Appendix B indicates the assessed abnormal load route from Campbeltown Harbour.

2.5 Tracking Methodology

At the request of SSE automatic rear wheel steering has been utilised at all PCs, except where noted on the drawings at PCs where manual override was required to negotiate the PC.

A 0.75m offset has been indicated on all overrun and oversail areas from the extent of the vehicle swept path. This is to provide a factor of safety and to indicate the area which should be allowed for in order to provide a margin of error during delivery.

2.6 Assumptions

In order to keep the results of assessment as concise as possible the following assumptions have been made at each PC:

- During transit, delivery vehicles will be accompanied by an escort vehicle and a police escort if required.
- At all locations where the delivery vehicle occupies the full road width, or is required to contraflow, appropriate traffic management procedures will be implemented by the escort. This will usually involve temporary closure of the road or junction whilst the vehicle passes.
- A detailed traffic management plan will be prepared prior to delivery to inform all relevant stakeholders of road closures and other procedures to be implemented during delivery.

3 RESULTS OF ASSESSMENT

Based upon swept path analysis of all PCs identified on the proposed delivery route, outcomes and mitigation requirements have been defined and are summarised in Table 3.1. Twenty PCs were identified between Campbeltown Harbour and the site entrance.

Table 3.1: Assessment of Constraints

Ref	Location	Assessment Outcome	Mitigation	Risk
PC/01	Campbeltown Harbour Entrance	Vehicle and blade tip to conflict with fence at harbour entrance. Blade tip to pass close to lighting column. Vehicle to overrun central reservation on Hall Street and conflict with mature tree and lighting column.	Fence at harbour entrance to be relocated. Topographical survey to establish position of lighting column. Load bearing surface to be laid in overrun area within central reservation. Tree to be removed. Lighting column to be relocated.	Medium
PC/02	Hall Street / Kinloch Road Roundabout	Blade tip to oversail central reservation of Hall Road and potentially conflict with sign. Load to oversail inside bend and potentially conflict with bench.	Clearance height of blade tip above sign to be established. Topographical survey to establish position of bench, to be relocated if required.	Low
PC/03	Kinloch Road / Aqualibrium Avenue Junction	Trailer rear wheels to overrun pedestrian footway on outside bend. Blade tip to oversail outside bend within third party land and conflict with lighting column. Trailer to oversail inside bend, clearance to wall below factor of safety.	Load bearing surface to be laid in overrun area. Lighting column to be relocated.	Medium
PC/04	Aqualibrium Avenue / Millknow Road Junction	Manual rear wheel steering was required to be invoked in order to avoid conflict between load and property at 124 Millknow Road. Blade tip to oversail outside bend within third party land and conflict with lighting column. Load to oversail inside and outside bend over pedestrian footway.	Manual rear wheel steering required to negotiate bend. Lighting column to be relocated.	Medium
PC/05	Bend in Millknow Road adjacent to Dalaruan Street	Blade tip to oversail outside bend and conflict with lighting column. Trailer to overrun inside bend on pedestrian footway. Trailer to oversail inside bend over pedestrian footway.	Lighting column to be relocated. Load bearing surface to be laid in overrun area on inside bend on pedestrian footway.	Medium
PC/06	Bend on A83 at Lag na Garach	Trailer to overrun inside bend on pedestrian footway. Blade tip to oversail outside bend.	Load bearing surface to be laid in overrun area on pedestrian footway, steel plating may be sufficient.	Low

Ref	Location	Assessment Outcome	Mitigation	Risk
PC/07	Bend on A83 south of Wellpark	Blade tip to oversail outside bend in third party land over stone wall.	Clearance height above wall to be checked.	Medium
PC/08	Bend on A83 at Kilkenzie	Blade tip to oversail outside bend over stone wall into third party land. Trailer to oversail inside bend into third party land and conflict with post and wire fence.	Clearance height above wall on outside bend to be checked. Fence on inside bend to be relocated outside oversail area.	Medium
PC/09	A83 / Unnamed Road Junction at Drum Farm	Rear of trailer to overrun outside bend into third party land and conflict with post and wire fence. Vehicle to overrun inside bend into third party land and conflict with field gates, post and wire fence, signpost and telegraph pole.	Load bearing surface to be laid in overrun areas on inside and outside bend. Post and wire fences and gates to be relocated outside of oversail areas. Signpost to be mounted on demountable supports. Telegraph pole to be relocated.	High
PC/10	Bends on unnamed road north of Drum Farm	Trailer rear to overrun outside bend and into third party land and conflict with post and wire fence in two areas. Vehicle to overrun inside bend into third party land and conflict with hedge and fence.	Load bearing surfaces to be laid in overrun areas. Fences to be relocated outside of oversail areas and hedge to be removed.	High
PC/11	Bend south of Drumaird	Rear of trailer to overrun outside and inside bend into third party land and conflict with post and wire fence and field gate.	Load bearing surfaces to be laid in overrun areas. Gates and fences to be relocated outside of overrun areas.	High
PC/12	Bend in unnamed road before High Ballevain	Overrun areas kept to right side of bend as requested by SSE. Vehicle to overrun inside bend into third party land and conflict with post and wire fence.	Load bearing surfaces to be laid in overrun areas. Post and wire fences to be relocated outside of overrun areas.	High
PC/13	Bend in unnamed road at High Ballevain	Blade tip to oversail east side of road into third party land over post and wire fence. Trailer to overrun inside bend adjacent to High Ballevain into third party land and conflict with post and wire fence.	Clearance height of blade tip over fence on approach to be checked. Load bearing surface to be laid in third party land adjacent to properties and post and wire fence to be relocated outside of overrun area.	High

Ref	Location	Assessment Outcome	Mitigation	Risk
PC/14	Bend in unnamed road after High Ballevain	Rear of trailer to overrun into third party land in several locations and conflict with post and wire fence.	Load bearing surfaces to be laid in overrun areas in third party land. Fences to be relocated out of overrun areas.	High
PC/15	Unnamed road / unnamed road junction by High Ballevain Cottage	Vehicle to overrun inside and outside of bend into third party land and conflict with post and wire fence, field gates and two telegraph poles.	Load bearing surfaces to be laid in overrun areas in third party land. Fences and gates to be relocated outside of overrun areas. Telegraph poles to be relocated.	High
PC/16	Bend on unnamed road at Breakachy	Widening areas kept to right side of road on second bend as directed by SSE. Trailer rear to overrun inside bends into third party land and conflict with post and wire fence.	Load bearing surfaces to be laid in overrun areas within third party land. Fences to be relocated outside of overrun areas.	High
PC/17	Bend at Dalnaspidal	Offline track section to be constructed across watercourse in third party land. Beyond Dalnaspidal trailer to overrun inside bend within third party land.	Load bearing surface to be laid in overrun area within third party land. Post and wire fence to be relocated outside overrun area.	High
PC/18	Bend north of Dalnaspidal	Trailer rear to overrun outside and inside of bend into third party land and conflict with post and wire fences.	Load bearing surfaces to be laid in overrun areas within third party land. Fences to be relocated outside overrun areas.	High
PC/19	Bend at Tangy	Trailer rear to overrun inside bend in two locations into third party land and conflict with stone wall, post and wire fences, telegraph pole and potentially with mature tree. Blade tip to oversail third party land within garden of residential property.	Load bearing surfaces to be laid in overrun areas within third party land on inside bend. Stone wall to be removed, post and wire fences to be relocated outside of overrun areas. Telegraph pole to be relocated. Topographical survey to establish exact position of mature tree to determine clearance.	High

Ref	Location	Assessment Outcome	Mitigation	Risk
PC/20	Bend at site entrance	Load to oversail bridge parapet with possible conflict. Rear of trailer to overrun outside and inside bend in several locations within third party land and conflict with fences and wall.	Clearance height of load above bridge parapet to be checked. Load bearing surfaces to be laid in overrun areas. Wall to be removed. Fences to be relocated outside overrun areas.	High

4 CONCLUSION

4.1 Summary

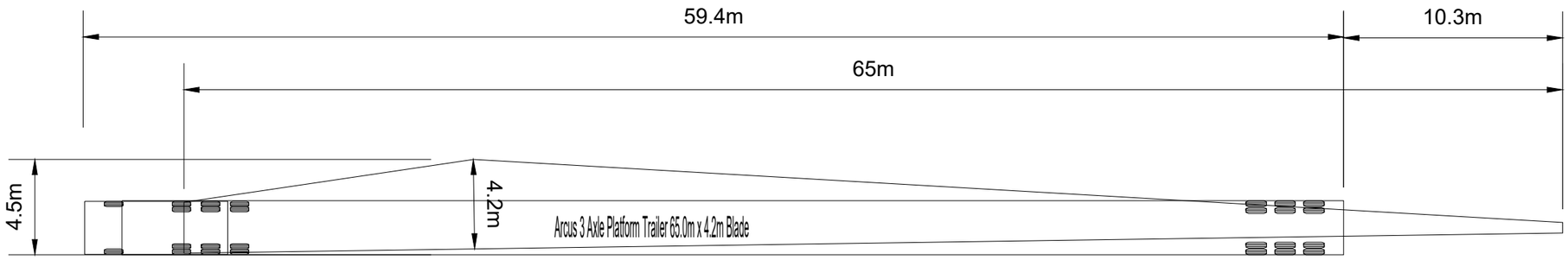
The delivery route was assessed for the candidate wind turbine blade vehicle. Twenty PCs are detailed within this report where swept path analysis has been conducted. Twelve PCs were assessed as being high risk owing to the requirement for construction works to be undertaken within third party land. Six PCs were assessed as medium risk, these PCs generally require oversail of third party land, or construction works within the highway boundary to be undertaken. Two PCs were assessed as low risk where minor works within the highway boundary may be required.

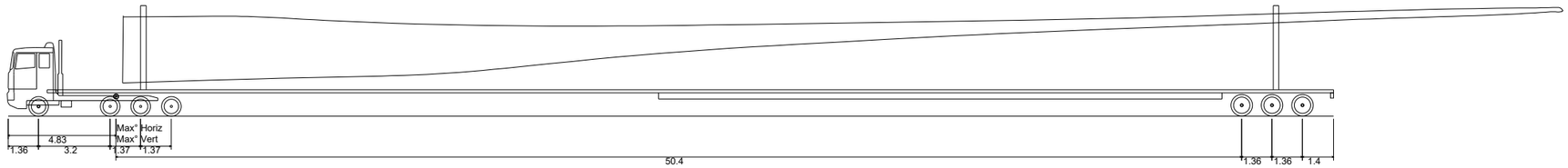
4.2 Recommendations for Further Work

Topographic surveys should be undertaken to confirm the viability of all PCs especially at those locations identified where clearance is low or the position of street furniture/trees is unknown.

Structural surveys should be undertaken at structures along the route in order to establish weight limits. An abnormal indivisible loads application should be submitted to the relevant authority which will initiate consultations with all relevant parties and identify areas where further review is required.

APPENDIX A – VEHICLE DATA SHEET





Arcus 3 Axle Platform Trailer 65.0m x 4.2m Blade

Overall Length	69.7m
Overall Width	4.5m
Overall Body Height	3.407m
Min Body Ground Clearance	0.331m
Max Track Width	2.550m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.600m

Project Title
TANGY IV WIND FARM
ABNORMAL LOAD
ROUTE ASSESSMENT

Client
SSE RENEWABLES UK LTD

Drawing Title
VEHICLE DATA SHEET

Purpose of issue
FOR INFORMATION

Designed	Drawn	Checked	Approved
KL	KL	TAT	TP

Arcus Internal Project No.
2913

Scale @ A3
1:250

Date
08/03/18

Drawing Number
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-

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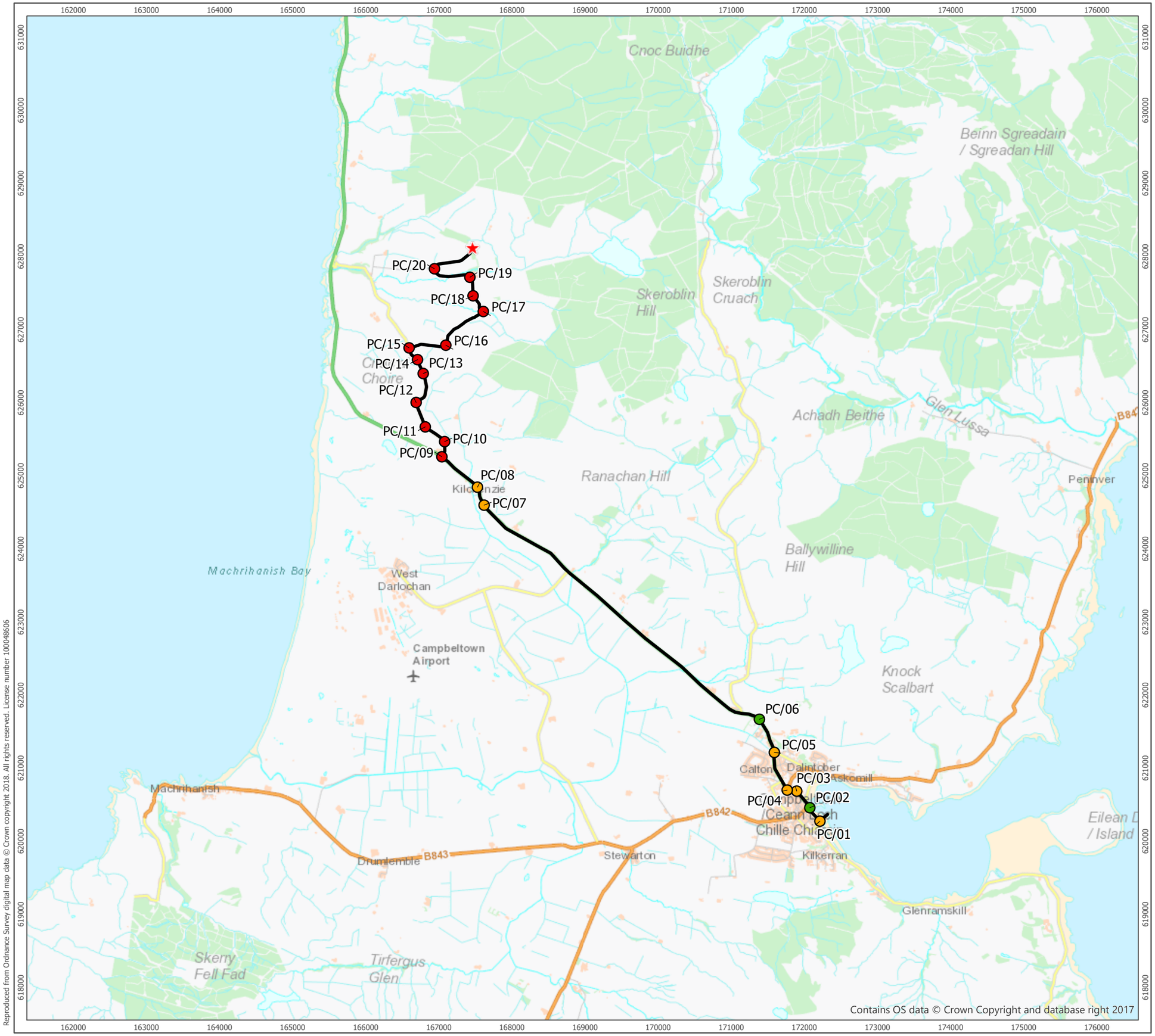
APPENDIX B – ROUTE TO SITE



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- Route to Site
- Low Risk Pinch Point
- Medium Risk Pinch Point
- High Risk Pinch Point
- Site Entrance Location

1:50,000 Scale @ A3

0 1 2 km

NORTH

Produced By: KL	Ref: 2913-PUB-001
Checked By: TAT	Date: 08/03/2018

Pinch Point Locations
Figure 1

Tangy IV Wind Farm
Abnormal Load Route Assessment

APPENDIX C – SWEPT PATH ANALYSIS DRAWINGS

LEGEND:

- VEHICLE
- VEHICLE WHEEL TRACK
- VEHICLE OVERHANG
- LOAD
- LOAD OVERHANG
- THIRD PARTY LAND
- EXTENT OF VEHICLE OVER-RUN
- EXTENT OF LOAD OVERHANG

NOTES:

1. AUTOMATIC REAR WHEEL STEERING USED UNLESS OTHERWISE INDICATED.
2. ANALYSIS HAS NOT CONSIDERED VERTICAL GROUND CLEARANCE OF THE VEHICLE AND LOAD.
3. FURTHER INVESTIGATION WORKS WILL BE REQUIRED IN ORDER TO IDENTIFY THE IMPROVEMENT WORKS REQUIRED INCLUDING BUT NOT LIMITED TO CARRIAGEWAY WIDENING, EARTHWORKS, DRAINAGE, SERVICES, PEDESTRIAN FACILITIES AND TRAFFIC MANAGEMENT.
4. ANALYSIS BASED ON 65.0m BLADE DELIVERY VEHICLE
5. ANALYSIS BASED ON OS MASTERMAP. WHERE REQUIRED TOPOGRAPHICAL SURVEY TO BE UNDERTAKEN AND USED AS A BASIS FOR DETAILED DESIGN.
6. A 0.75m FACTOR OF SAFETY INDICATED OUTSIDE OVERRUN AND OVERSAIL AREAS FROM THE EXTENT OF VEHICLE SWEPT PATH. THIS IS TO PROVIDE A FACTOR OF SAFETY AND TO INDICATE THE AREA WHICH SHOULD BE ALLOWED FOR IN ORDER TO PROVIDE A MARGIN OF ERROR DURING DELIVERY.

Mud

Mean High Water Springs

Slipway

Campbeltow
Ferry Termi

Tank

Harbour
View

APPROXIMATE LOCATION OF LIGHTING COLUMN. TO BE RELOCATED

LOAD BEARING SURFACE TO BE LAID IN OVERRUN AREA

APPROXIMATE LOCATION OF MATURE TREE. TO BE REMOVED.

Job Centre

El Sub Sta

se

55
57
59
61

48

OVERRUN WITHIN ESTABLISHED OVERRUN AREA

Sculpture

APPROXIMATE LOCATION OF LIGHTING COLUMN. TOPOGRAPHICAL SURVEY REQUIRED TO ESTABLISH EXACT POSITION.

FENCE AT HARBOUR ENTRANCE. TO BE TEMPORARILY REMOVED.

N

Project Title: TANGY IV WIND FARM ABNORMAL LOAD ROUTE ASSESSMENT	Drawing Title: PC/01 CAMPBELTOWN HARBOUR ENTRANCE	Purpose of issue: FOR INFORMATION	
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LEGEND:

- VEHICLE
- VEHICLE WHEEL TRACK
- VEHICLE OVERHANG
- LOAD
- LOAD OVERHANG
- THIRD PARTY LAND
- EXTENT OF VEHICLE OVER-RUN
- EXTENT OF LOAD OVERHANG

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APPROXIMATE LOCATION OF BENCH. TOPOGRAPHICAL SURVEY TO ESTABLISH EXACT POSITION.

APPROXIMATE LOCATION OF SIGN. CLEARANCE HEIGHT TO BLADE TIP TO BE ESTABLISHED.

N

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LEGEND:

- VEHICLE
- VEHICLE WHEEL TRACK
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LOAD BEARING SURFACE TO BE LAID IN OVERRUN AREA

APPROXIMATE LOCATION OF MATURE TREES. TOPOGRAPHICAL SURVEY MAY BE REQUIRED TO CONFIRM EXACT LOCATION.

LOAD BEARING SURFACE TO BE LAID IN OVERRUN AREA

APPROXIMATE LOCATION OF LIGHTING COLUMN TO BE RELOCATED

MATE LOCATION OF COLUMN TO BE ED

0.82m

BRIUM AVENUE

The Aqualibrium (Swimming Pool above Library below)

Park Terrace

McCALLUM STR

Statue

PH

ESSs

Post

Sew

Ppg S

N

Project Title: TANGY IV WIND FARM ABNORMAL LOAD ROUTE ASSESSMENT	Drawing Title: PC/03 KINLOCH ROAD / AQUALIBRIUM AVENUE JUNCTION	Purpose of issue: FOR INFORMATION	
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LEGEND:

- VEHICLE
- VEHICLE WHEEL TRACK
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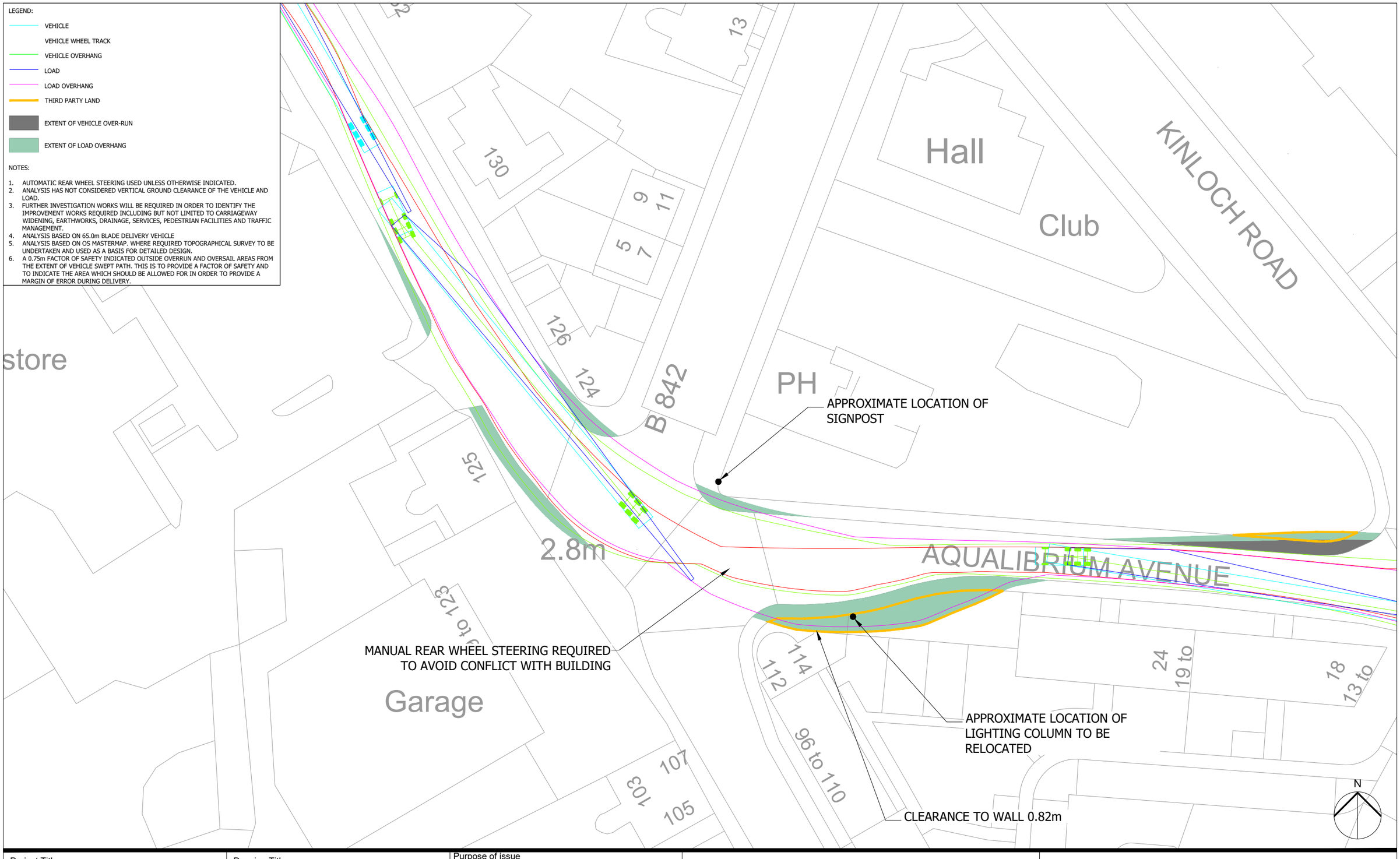

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LOAD BEARING SURFACE TO BE LAID IN OVERRUN AREA

APPROXIMATE LOCATION OF LIGHTING COLUMN. TOPOGRAPHICAL SURVEY TO ESTABLISH EXACT POSITION.

Millbank

Broomhill

Sinks

Playing Field

Drumore Park

11.5m

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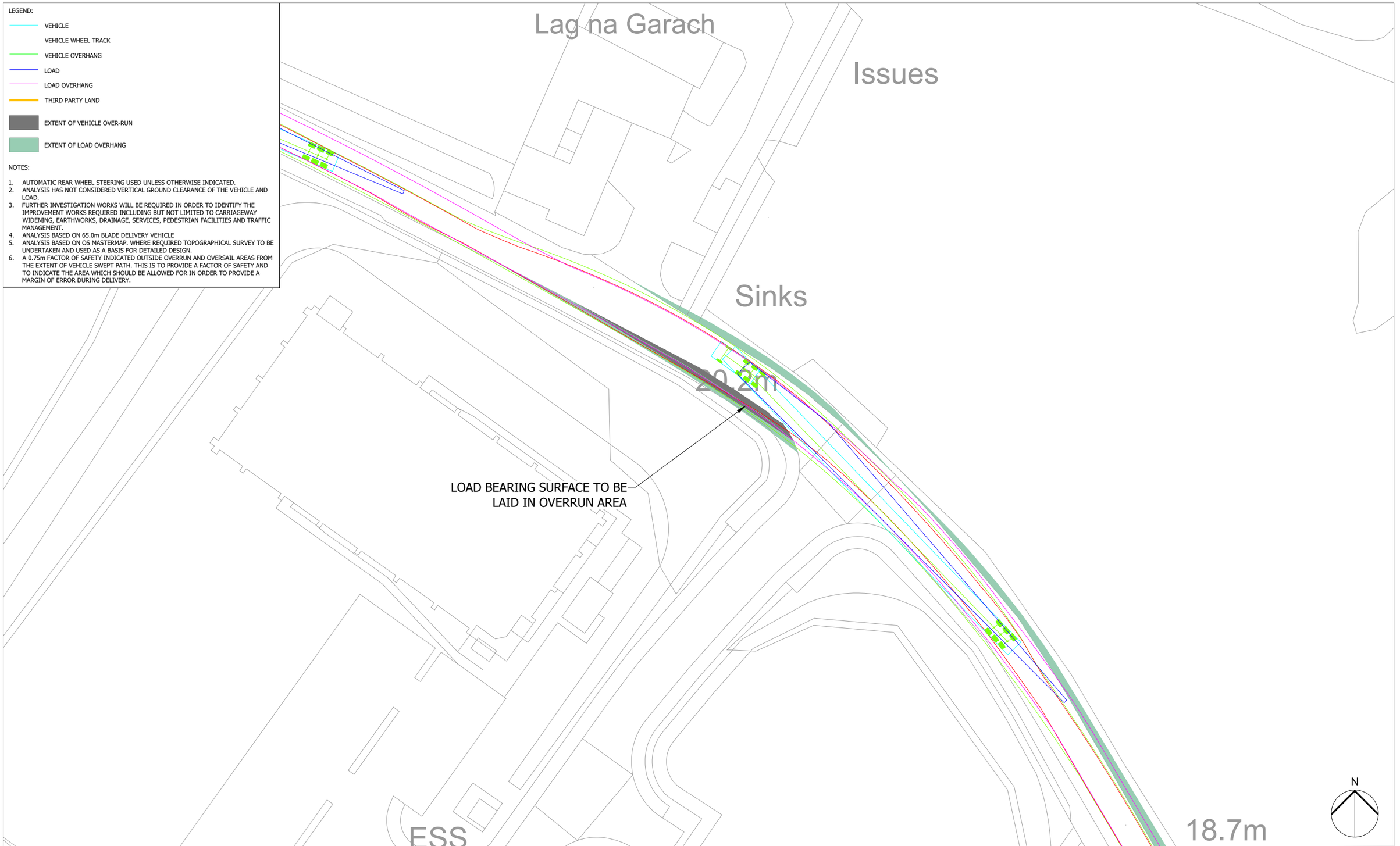
6. A 0.75m FACTOR OF SAFETY INDICATED OUTSIDE OVERRUN AND OVERSAIL AREAS FROM THE EXTENT OF VEHICLE SWEPT PATH. THIS IS TO PROVIDE A FACTOR OF SAFETY AND TO INDICATE THE AREA WHICH SHOULD BE ALLOWED FOR IN ORDER TO PROVIDE A MARGIN OF ERROR DURING DELIVERY.



Project Title: TANGY IV WIND FARM ABNORMAL LOAD ROUTE ASSESSMENT	Drawing Title: PC/06 BEND ON A83 AT LAG NA GARACH	Purpose of issue: FOR INFORMATION	
Client: SSE RENEWABLES UK LTD		Designed: KL; Drawn: KL; Checked: TAT; Approved: TAT	
		Arcus Internal Project No.: 2913	Date: 07/03/2018
		Scale @ A3: 1:500	

Drawing Number	Rev
2913_DR_ALR_0006	1

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Plot Date : 18 April 2018 15:12:38
File Name :P:\PROJECTS\2913 TANGY IV\CAD\01-WORKING\01_01-DRAWINGS\2913_DR_P_0001-0020_P1

LEGEND:

- VEHICLE
- VEHICLE WHEEL TRACK
- VEHICLE OVERHANG
- LOAD
- LOAD OVERHANG
- THIRD PARTY LAND
- EXTENT OF VEHICLE OVER-RUN
- EXTENT OF LOAD OVERHANG

NOTES:

1. AUTOMATIC REAR WHEEL STEERING USED UNLESS OTHERWISE INDICATED.
2. ANALYSIS HAS NOT CONSIDERED VERTICAL GROUND CLEARANCE OF THE VEHICLE AND LOAD.
3. FURTHER INVESTIGATION WORKS WILL BE REQUIRED IN ORDER TO IDENTIFY THE IMPROVEMENT WORKS REQUIRED INCLUDING BUT NOT LIMITED TO CARRIAGEWAY WIDENING, EARTHWORKS, DRAINAGE, SERVICES, PEDESTRIAN FACILITIES AND TRAFFIC MANAGEMENT.
4. ANALYSIS BASED ON 65.0m BLADE DELIVERY VEHICLE
5. ANALYSIS BASED ON OS MASTERMAP. WHERE REQUIRED TOPOGRAPHICAL SURVEY TO BE UNDERTAKEN AND USED AS A BASIS FOR DETAILED DESIGN.
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CLEARANCE HEIGHT OF BLADE TIP ABOVE DRYSTONE WALL TO BE CHECKED

N

Project Title
TANGY IV WIND FARM
ABNORMAL LOAD
ROUTE ASSESSMENT

Client
SSE RENEWABLES UK LTD

Drawing Title
PC/07
BEND ON A83
SOUTH OF WELLPARK

Purpose of issue
FOR INFORMATION

Designed	Drawn	Checked	Approved
KL	KL	TAT	TAT

Arcus Internal Project No.: 2913
Scale @ A3: 1:500
Date: 07/03/2018

Drawing Number: 2913_DR_ALR_0007
Rev: 1

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Plot Date : 18 April 2018 15:12:43
File Name P:\PROJECTS\2913 TANGY IV\CAD\01-WORKING\01_01-DRAWINGS\2913_DR_P_0001-0020_P1

LEGEND:

- VEHICLE
- VEHICLE WHEEL TRACK
- VEHICLE OVERHANG
- LOAD
- LOAD OVERHANG
- THIRD PARTY LAND
- EXTENT OF VEHICLE OVER-RUN
- EXTENT OF LOAD OVERHANG

NOTES:

1. AUTOMATIC REAR WHEEL STEERING USED UNLESS OTHERWISE INDICATED.
2. ANALYSIS HAS NOT CONSIDERED VERTICAL GROUND CLEARANCE OF THE VEHICLE AND LOAD.
3. FURTHER INVESTIGATION WORKS WILL BE REQUIRED IN ORDER TO IDENTIFY THE IMPROVEMENT WORKS REQUIRED INCLUDING BUT NOT LIMITED TO CARRIAGEWAY WIDENING, EARTHWORKS, DRAINAGE, SERVICES, PEDESTRIAN FACILITIES AND TRAFFIC MANAGEMENT.
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5. ANALYSIS BASED ON OS MASTERMAP. WHERE REQUIRED TOPOGRAPHICAL SURVEY TO BE UNDERTAKEN AND USED AS A BASIS FOR DETAILED DESIGN.
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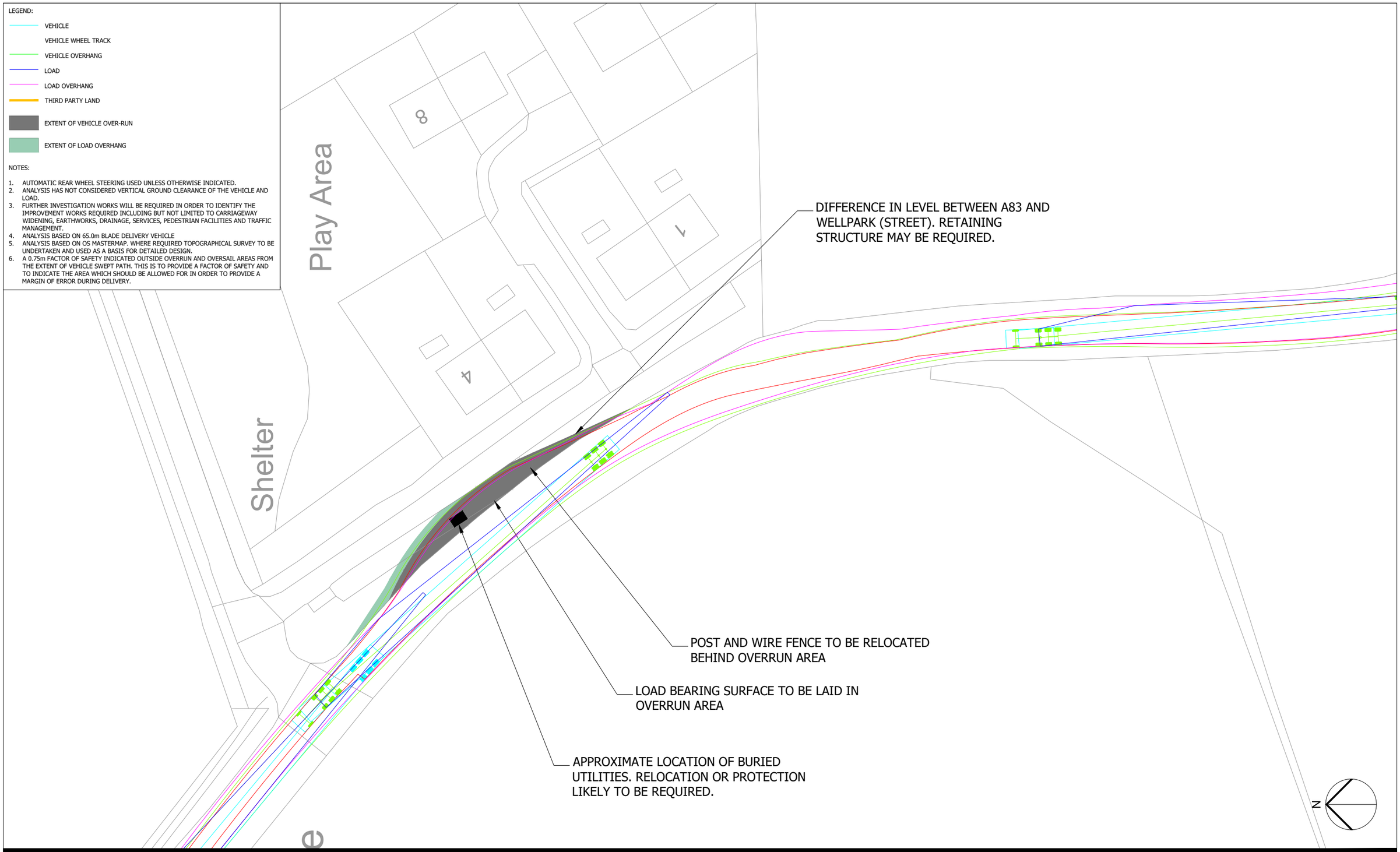

Project Title
TANGY IV WIND FARM
ABNORMAL LOAD
ROUTE ASSESSMENT

Client
SSE RENEWABLES UK LTD

Drawing Title
PC/08
BEND ON A83
AT KILKENZIE

Purpose of issue
FOR INFORMATION

Designed	Drawn	Checked	Approved
KL	KL	TAT	TAT

Arcus Internal Project No.: 2913
Scale @ A3: 1:500
Date: 07/03/2018

Drawing Number: 2913_DR_ALR_0008
Rev: 1

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Plot Date : 18 April 2018 15:12:48
File Name P:\PROJECTS\2913 TANGY IV\CAD\01-WORKING\01_01-DRAWINGS\2913_DR_P_0001-0020_P1

LEGEND:

- VEHICLE
- VEHICLE WHEEL TRACK
- VEHICLE OVERHANG
- LOAD
- LOAD OVERHANG
- THIRD PARTY LAND
- EXTENT OF VEHICLE OVER-RUN
- EXTENT OF LOAD OVERHANG

NOTES:

1. AUTOMATIC REAR WHEEL STEERING USED UNLESS OTHERWISE INDICATED.
2. ANALYSIS HAS NOT CONSIDERED VERTICAL GROUND CLEARANCE OF THE VEHICLE AND LOAD.
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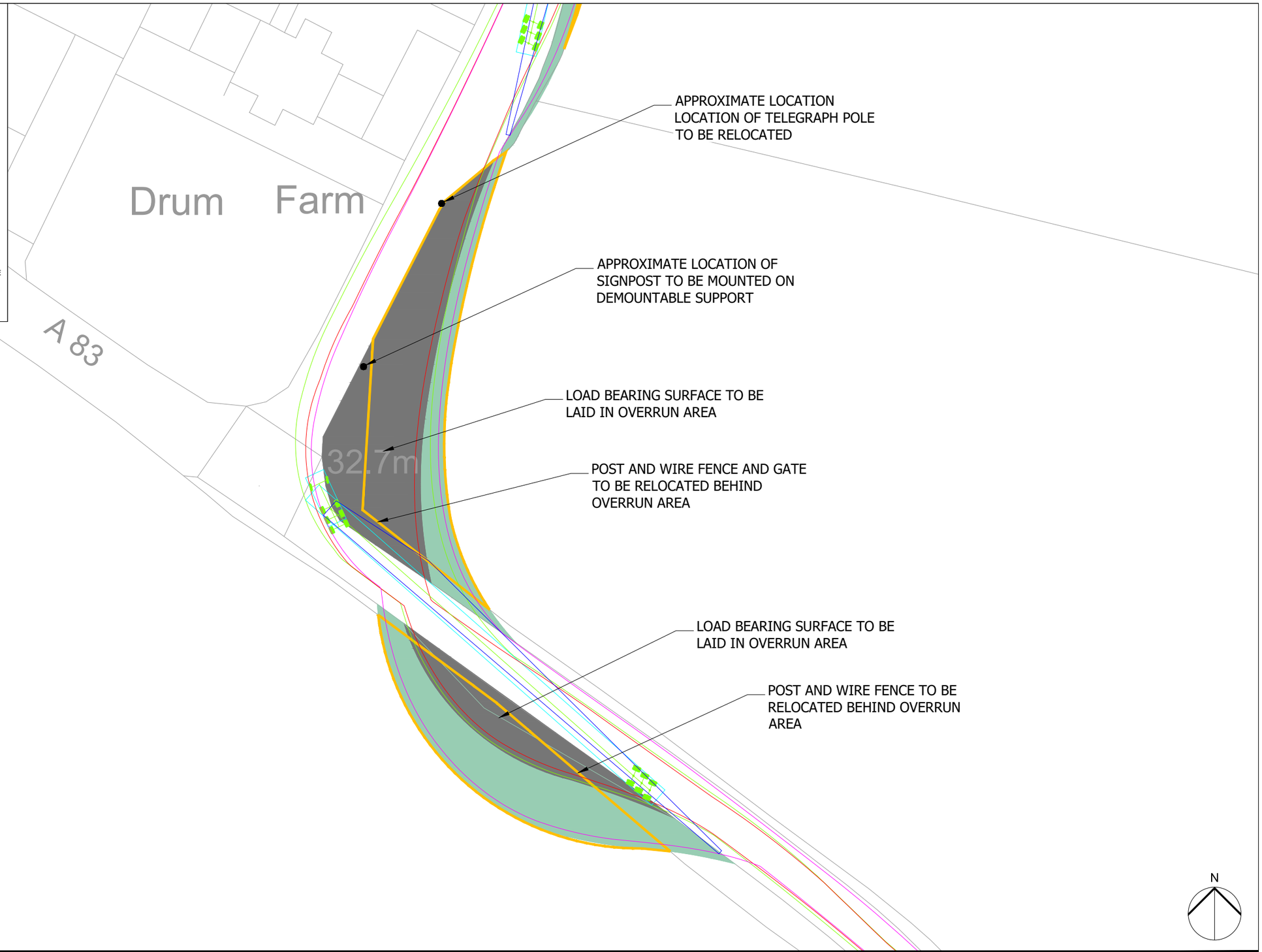

Project Title: TANGY IV WIND FARM ABNORMAL LOAD ROUTE ASSESSMENT	Drawing Title: PC/09 A83 / UNNAMED ROAD JUNCTION AT DRUM FARM	Purpose of issue: FOR INFORMATION	
Client: SSE RENEWABLES UK LTD		Designed: KL; Drawn: KL; Checked: TAT; Approved: TAT	
		Arcus Internal Project No.: 2913	Date: 07/03/2018
		Scale @ A3: 1:500	

Drawing Number: 2913_DR_ALR_0009

Rev: 1

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Plot Date : 18 April 2018 15:12:53
File Name :P:\PROJECTS\2913 TANGY IV\CAD\01-WORKING\01_01-DRAWINGS\2913_DR_P_0001-0020_P1

LEGEND:

- VEHICLE
- VEHICLE WHEEL TRACK
- VEHICLE OVERHANG
- LOAD
- LOAD OVERHANG
- THIRD PARTY LAND
- EXTENT OF VEHICLE OVER-RUN
- EXTENT OF LOAD OVERHANG

NOTES:

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Project Title: TANGY IV WIND FARM ABNORMAL LOAD ROUTE ASSESSMENT	Drawing Title: PC/10 BENDS ON UNNAMED ROAD NORTH OF DRUM FARM	Purpose of issue: FOR INFORMATION	
Client: SSE RENEWABLES UK LTD		Designed: KL; Drawn: KL; Checked: TAT; Approved: TAT	
		Arcus Internal Project No.: 2913	Date: 07/03/2018
		Scale @ A3: 1:1000	

Drawing Number	Rev
2913_DR_ALR_0010	1

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Plot Date : 18 April 2018 15:12:58
File Name P:\PROJECTS\2913 TANGY IV\CAD\01-WORKING\01_01-DRAWINGS\2913_DR_P_0001-0020_P1

LEGEND:

- VEHICLE
- VEHICLE WHEEL TRACK
- VEHICLE OVERHANG
- LOAD
- LOAD OVERHANG
- THIRD PARTY LAND
- EXTENT OF VEHICLE OVER-RUN
- EXTENT OF LOAD OVERHANG

NOTES:

1. AUTOMATIC REAR WHEEL STEERING USED UNLESS OTHERWISE INDICATED.
2. ANALYSIS HAS NOT CONSIDERED VERTICAL GROUND CLEARANCE OF THE VEHICLE AND LOAD.
3. FURTHER INVESTIGATION WORKS WILL BE REQUIRED IN ORDER TO IDENTIFY THE IMPROVEMENT WORKS REQUIRED INCLUDING BUT NOT LIMITED TO CARRIAGEWAY WIDENING, EARTHWORKS, DRAINAGE, SERVICES, PEDESTRIAN FACILITIES AND TRAFFIC MANAGEMENT.
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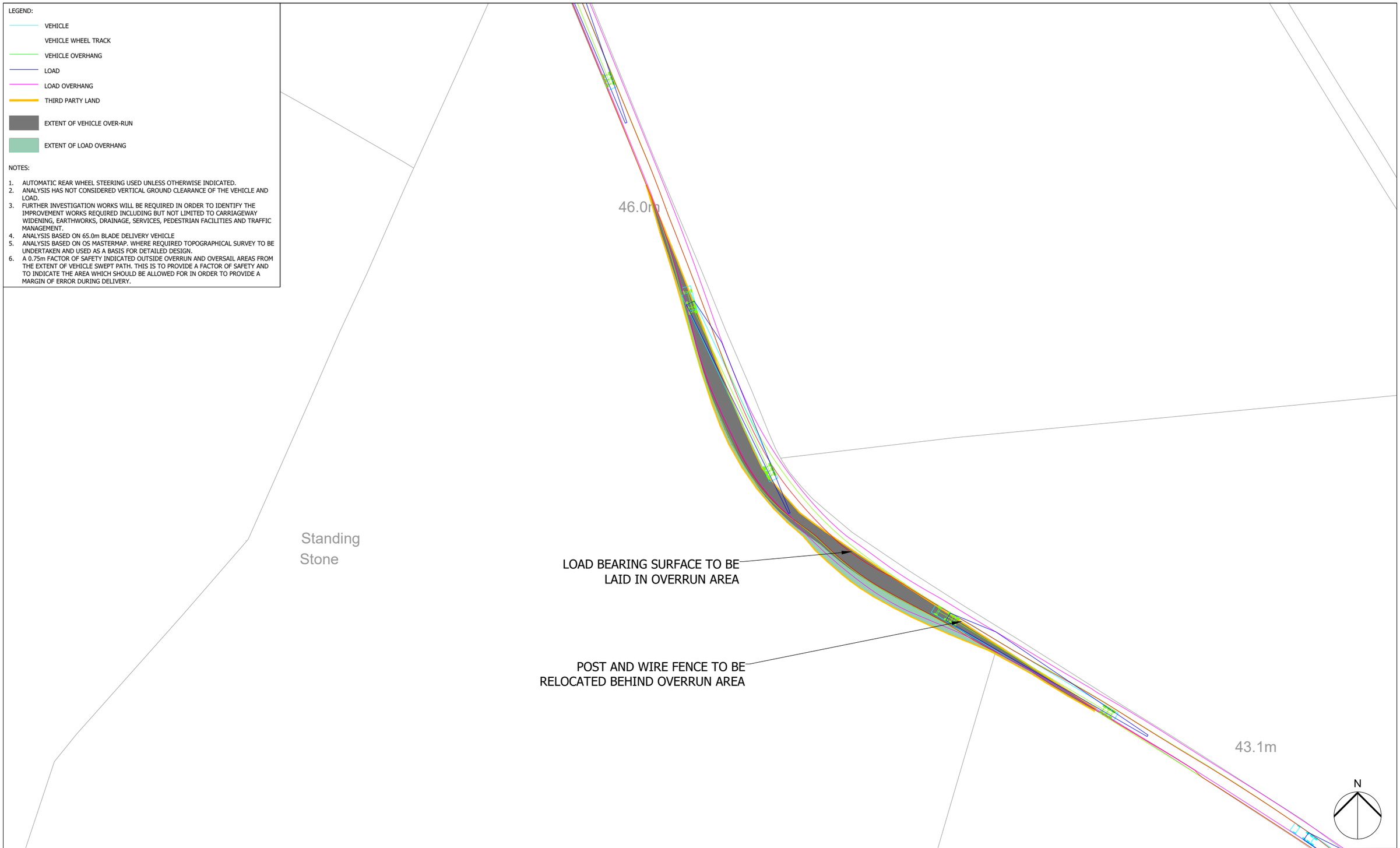

Project Title: TANGY IV WIND FARM ABNORMAL LOAD ROUTE ASSESSMENT	Drawing Title: PC/11 BEND SOUTH OF DRUMAIRD	Purpose of issue: FOR INFORMATION	
Client: SSE RENEWABLES UK LTD		Designed: KL; Drawn: KL; Checked: TAT; Approved: TAT	
		Arcus Internal Project No.: 2913	Date: 07/03/2018
		Scale @ A3: 1:1000	

Drawing Number	Rev
2913_DR_ALR_0011	1

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Plot Date : 18 April 2018 15:13:03
File Name P:\PROJECTS\2913 TANGY IV\CAD\01-WORKING\01_01-DRAWINGS\2913_DR_P_0001-0020_P1

LEGEND:

- VEHICLE
- VEHICLE WHEEL TRACK
- VEHICLE OVERHANG
- LOAD
- LOAD OVERHANG
- THIRD PARTY LAND
- EXTENT OF VEHICLE OVER-RUN
- EXTENT OF LOAD OVERHANG

NOTES:

1. AUTOMATIC REAR WHEEL STEERING USED UNLESS OTHERWISE INDICATED.
2. ANALYSIS HAS NOT CONSIDERED VERTICAL GROUND CLEARANCE OF THE VEHICLE AND LOAD.
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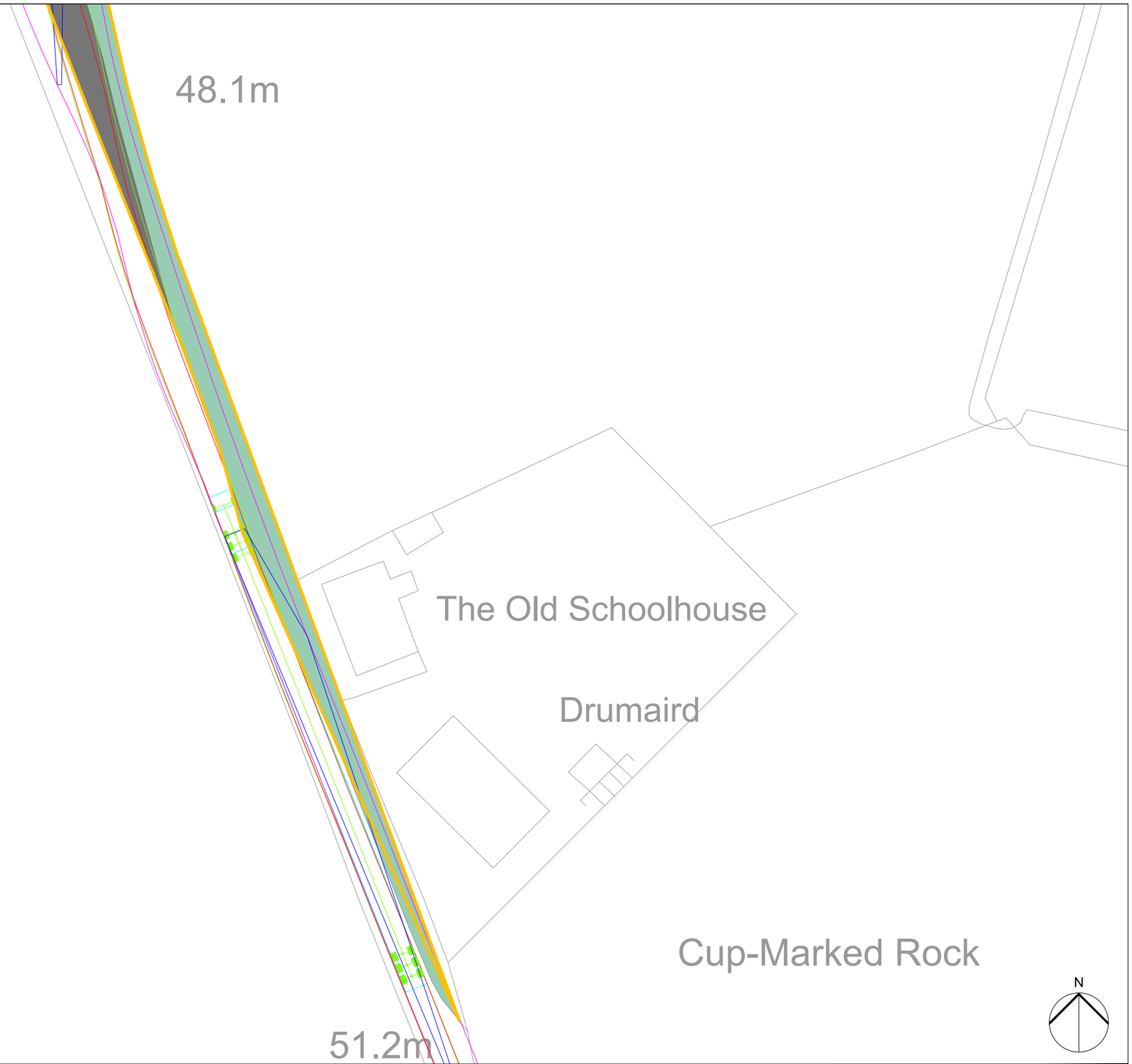

Project Title: TANGY IV WIND FARM ABNORMAL LOAD ROUTE ASSESSMENT	Drawing Title: PC/12 OLD SCHOOLHOUSE	Purpose of issue: FOR INFORMATION	
Client: SSE RENEWABLES UK LTD		Designed: KL; Drawn: KL; Checked: TAT; Approved: TAT	
		Arcus Internal Project No.: 2913	Date: 07/03/2018
		Scale @ A3: 1:1000	

Drawing Number	Rev
2913_DR_ALR_0012	1

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Plot Date : 18 April 2018 15:13:07
File Name :P:\PROJECTS\2913 TANGY IV\CAD\01-WORKING\01_01-DRAWINGS\2913_DR_P_0001-0020_P1

LEGEND:

- VEHICLE
- VEHICLE WHEEL TRACK
- VEHICLE OVERHANG
- LOAD
- LOAD OVERHANG
- THIRD PARTY LAND
- EXTENT OF VEHICLE OVER-RUN
- EXTENT OF LOAD OVERHANG

NOTES:

1. AUTOMATIC REAR WHEEL STEERING USED UNLESS OTHERWISE INDICATED.
2. ANALYSIS HAS NOT CONSIDERED VERTICAL GROUND CLEARANCE OF THE VEHICLE AND LOAD.
3. FURTHER INVESTIGATION WORKS WILL BE REQUIRED IN ORDER TO IDENTIFY THE IMPROVEMENT WORKS REQUIRED INCLUDING BUT NOT LIMITED TO CARRIAGEWAY WIDENING, EARTHWORKS, DRAINAGE, SERVICES, PEDESTRIAN FACILITIES AND TRAFFIC MANAGEMENT.
4. ANALYSIS BASED ON 65.0m BLADE DELIVERY VEHICLE
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66.1m

LOAD BEARING SURFACE TO BE LAID IN OVERRUN AREA

POST AND WIRE FENCE TO BE RELOCATED

53.9m

LOAD BEARING SURFACE TO BE LAID IN OVERRUN AREA

POST AND WIRE FENCE TO BE RELOCATED

Drain

LOAD BEARING SURFACE TO BE LAID IN OVERRUN AREA

48.1m

POST AND WIRE FENCE TO BE RELOCATED

N

Plot Date : 18 April 2018 15:13:13
File Name :P:\PROJECTS\2913 TANGY IV\CAD\01-WORKING\01_01-DRAWINGS\2913_DR_P_0001-0020_P1

Project Title: TANGY IV WIND FARM ABNORMAL LOAD ROUTE ASSESSMENT	Drawing Title: PC/13 BEND IN UNNAMED ROAD BEFORE HIGH BALLEVAIN	Purpose of issue: FOR INFORMATION	
Client: SSE RENEWABLES UK LTD		Designed: KL / Drawn: KL / Checked: TAT / Approved: TAT	
		Arcus Internal Project No.: 2913	Date: 07/03/2018
		Scale @ A3: 1:1000	

Drawing Number	Rev
2913_DR_ALR_0013	1

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LEGEND:

- VEHICLE
- VEHICLE WHEEL TRACK
- VEHICLE OVERHANG
- LOAD
- LOAD OVERHANG
- THIRD PARTY LAND
- EXTENT OF VEHICLE OVER-RUN
- EXTENT OF LOAD OVERHANG

NOTES:

1. AUTOMATIC REAR WHEEL STEERING USED UNLESS OTHERWISE INDICATED.
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High Ballevain

POST AND WIRE FENCE TO BE RELOCATED

LOAD BEARING SURFACE TO BE LAID IN OVERRUN AREA

69.8m

N

Project Title
TANGY IV WIND FARM
ABNORMAL LOAD
ROUTE ASSESSMENT

Client
SSE RENEWABLES UK LTD

Drawing Title
PC/14
BEND IN UNNAMED ROAD
AT HIGH BALLEVAIN

Purpose of issue
FOR INFORMATION

Designed	Drawn	Checked	Approved
KL	KL	TAT	TAT

Arcus Internal Project No.: 2913
Scale @ A3: 1:500
Date: 07/03/2018

Drawing Number: 2913_DR_ALR_0014
Rev: 1

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Plot Date : 18 April 2018 15:13:18
File Name : P:\PROJECTS\2913 TANGY IV\CAD\01-WORKING\01_01-DRAWINGS\2913_DR_P_0001-0020_P1

LEGEND:

- VEHICLE
- VEHICLE WHEEL TRACK
- VEHICLE OVERHANG
- LOAD
- LOAD OVERHANG
- THIRD PARTY LAND
- EXTENT OF VEHICLE OVER-RUN
- EXTENT OF LOAD OVERHANG

NOTES:

1. AUTOMATIC REAR WHEEL STEERING USED UNLESS OTHERWISE INDICATED.
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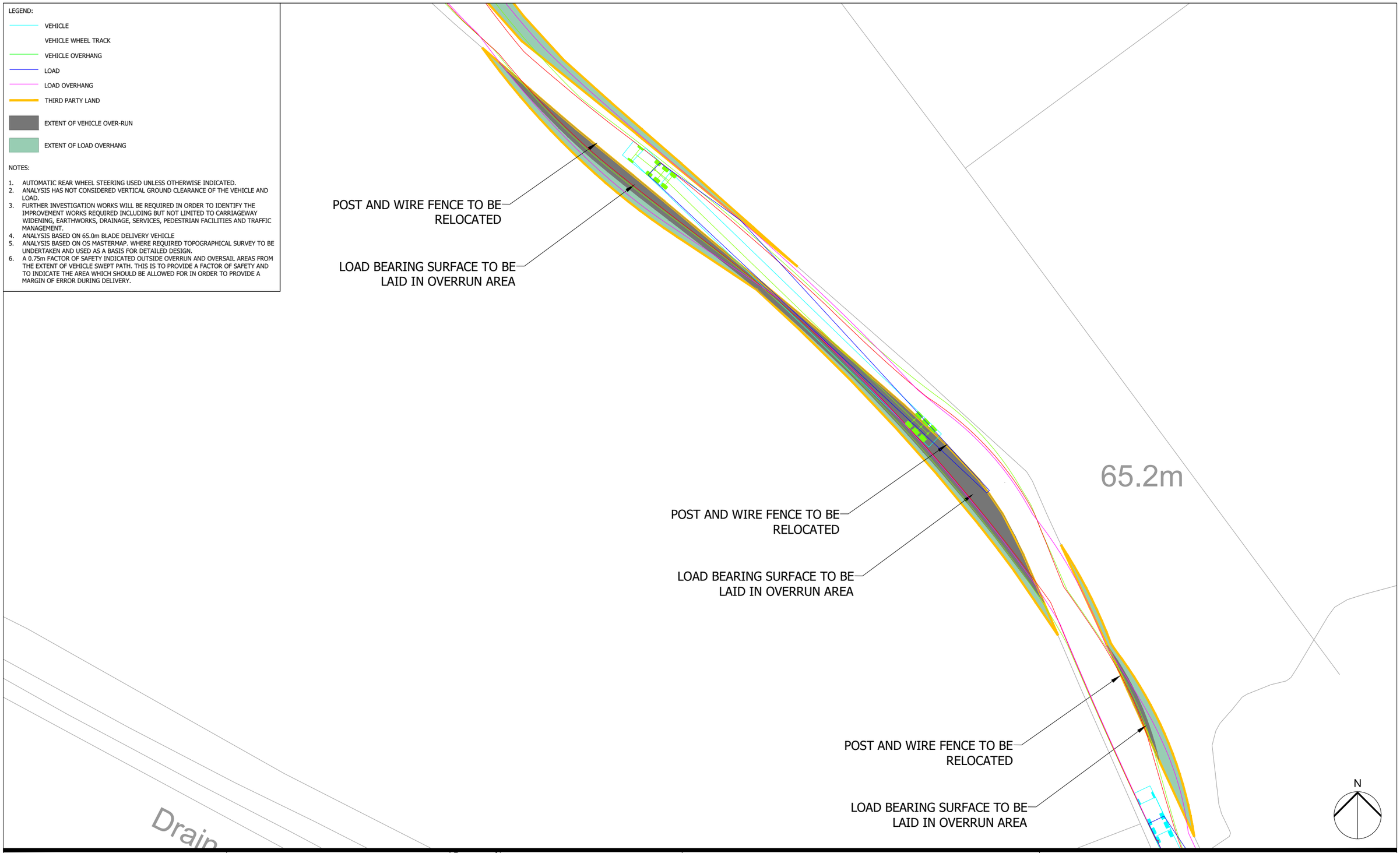

Plot Date : 18 April 2018 15:13:23
File Name P:\PROJECTS\2913 TANGY IV\CAD\01-WORKING\01_01-DRAWINGS\2913_DR_P_0001-0020_P1

Project Title: TANGY IV WIND FARM ABNORMAL LOAD ROUTE ASSESSMENT	Drawing Title: PC/15 BEND IN UNNAMED ROAD AFTER HIGH BALLEVAIN	Purpose of issue: FOR INFORMATION	
Client: SSE RENEWABLES UK LTD		Designed: KL; Drawn: KL; Checked: TAT; Approved: TAT	
		Arcus Internal Project No.: 2913	Date: 07/03/2018
		Scale @ A3: 1:500	

Drawing Number	Rev
2913_DR_ALR_0015	1

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LEGEND:

- VEHICLE
- VEHICLE WHEEL TRACK
- VEHICLE OVERHANG
- LOAD
- LOAD OVERHANG
- THIRD PARTY LAND
- EXTENT OF VEHICLE OVER-RUN
- EXTENT OF LOAD OVERHANG

NOTES:

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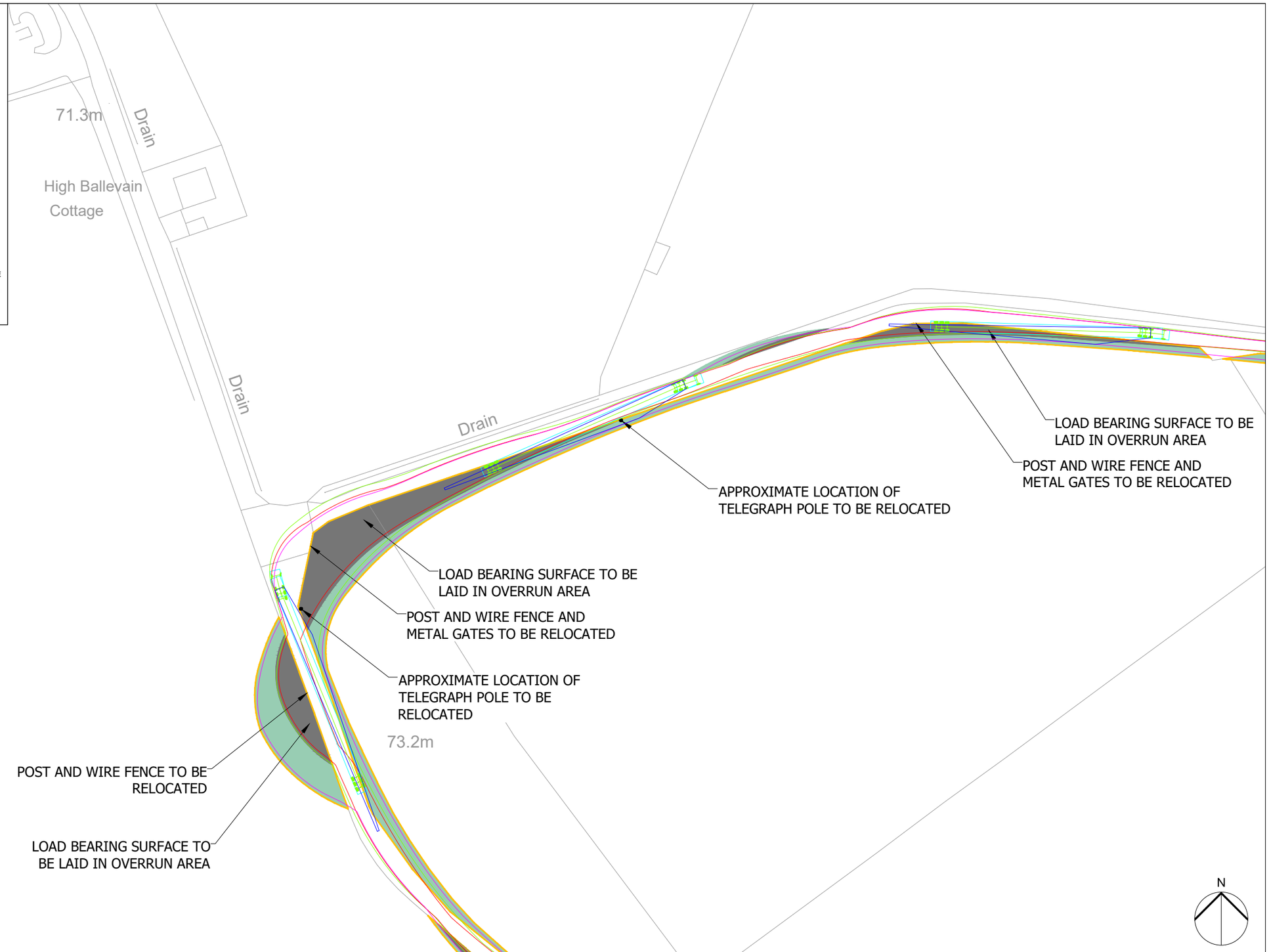

Project Title: TANGY IV WIND FARM ABNORMAL LOAD ROUTE ASSESSMENT	Drawing Title: PC/16 UNNAMED ROAD / UNNAMED ROAD JUNCTION	Purpose of issue: FOR INFORMATION	
Client: SSE RENEWABLES UK LTD		Designed: KL; Drawn: KL; Checked: TAT; Approved: TAT	
		Arcus Internal Project No.: 2913	Date: 07/03/2018
		Scale @ A3: 1:1000	

Drawing Number: 2913_DR_ALR_0016 | Rev: 1

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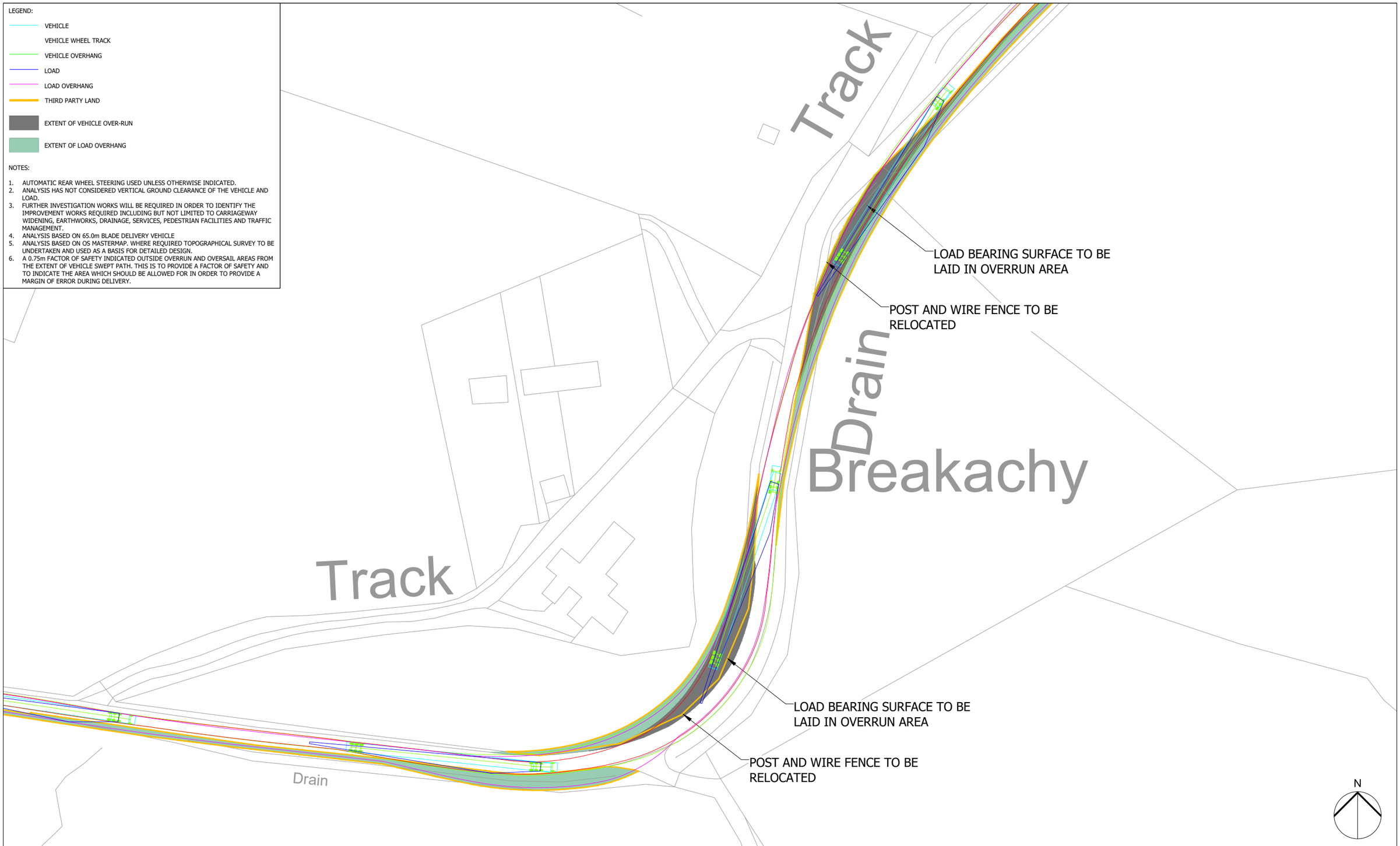
Plot Date : 18 April 2018 15:13:28
File Name :P:\PROJECTS\2913 TANGY IV\CAD\01-WORKING\01_01-DRAWINGS\2913_DR_P_0001-0020_P1

LEGEND:

- VEHICLE
- VEHICLE WHEEL TRACK
- VEHICLE OVERHANG
- LOAD
- LOAD OVERHANG
- THIRD PARTY LAND
- EXTENT OF VEHICLE OVER-RUN
- EXTENT OF LOAD OVERHANG

NOTES:

1. AUTOMATIC REAR WHEEL STEERING USED UNLESS OTHERWISE INDICATED.
2. ANALYSIS HAS NOT CONSIDERED VERTICAL GROUND CLEARANCE OF THE VEHICLE AND LOAD.
3. FURTHER INVESTIGATION WORKS WILL BE REQUIRED IN ORDER TO IDENTIFY THE IMPROVEMENT WORKS REQUIRED INCLUDING BUT NOT LIMITED TO CARRIAGEWAY WIDENING, EARTHWORKS, DRAINAGE, SERVICES, PEDESTRIAN FACILITIES AND TRAFFIC MANAGEMENT.
4. ANALYSIS BASED ON 65.0m BLADE DELIVERY VEHICLE
5. ANALYSIS BASED ON OS MASTERMAP. WHERE REQUIRED TOPOGRAPHICAL SURVEY TO BE UNDERTAKEN AND USED AS A BASIS FOR DETAILED DESIGN.
6. A 0.75m FACTOR OF SAFETY INDICATED OUTSIDE OVERRUN AND OVERSAIL AREAS FROM THE EXTENT OF VEHICLE SWEPT PATH. THIS IS TO PROVIDE A FACTOR OF SAFETY AND TO INDICATE THE AREA WHICH SHOULD BE ALLOWED FOR IN ORDER TO PROVIDE A MARGIN OF ERROR DURING DELIVERY.



Project Title: TANGY IV WIND FARM ABNORMAL LOAD ROUTE ASSESSMENT	Drawing Title: PC/17 BEND ON UNNAMED ROAD AT BREAKACHY	Purpose of issue: FOR INFORMATION			THIS DOCUMENT HAS BEEN PREPARED IN ACCORDANCE WITH THE SCOPE OF ARCUS' APPOINTMENT WITH ITS CLIENT AND IS SUBJECT TO THE TERMS OF THAT APPOINTMENT. ARCUS ACCEPTS NO LIABILITY FOR ANY USE OF THIS DOCUMENT OTHER THAN BY ITS CLIENT AND ONLY FOR THE PURPOSES FOR WHICH IT WAS PREPARED AND PROVIDED
		Designed: KL	Drawn: KL	Checked: TAT	Approved: TAT
Client: SSE RENEWABLES UK LTD		Arcus Internal Project No.: 2913		Date: 07/03/2018	
		Scale @ A3: 1:1000			
				Drawing Number: 2913_DR_ALR_0017	Rev: 1

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Plot Date : 18 April 2018 15:13:33
File Name P:\PROJECTS\2913 TANGY IV\CAD\01-WORKING\01_01-DRAWINGS\2913_DR_P_0001-0020_P1

LEGEND:

- VEHICLE
- VEHICLE WHEEL TRACK
- VEHICLE OVERHANG
- LOAD
- LOAD OVERHANG
- THIRD PARTY LAND
- EXTENT OF VEHICLE OVER-RUN
- EXTENT OF LOAD OVERHANG

NOTES:

1. AUTOMATIC REAR WHEEL STEERING USED UNLESS OTHERWISE INDICATED.
2. ANALYSIS HAS NOT CONSIDERED VERTICAL GROUND CLEARANCE OF THE VEHICLE AND LOAD.
3. FURTHER INVESTIGATION WORKS WILL BE REQUIRED IN ORDER TO IDENTIFY THE IMPROVEMENT WORKS REQUIRED INCLUDING BUT NOT LIMITED TO CARRIAGEWAY WIDENING, EARTHWORKS, DRAINAGE, SERVICES, PEDESTRIAN FACILITIES AND TRAFFIC MANAGEMENT.
4. ANALYSIS BASED ON 65.0m BLADE DELIVERY VEHICLE
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POST AND WIRE FENCE TO BE RELOCATED

LOAD BEARING SURFACE TO BE LAID IN OVERRUN AREA

Hazels Cottage

CG

Dalnaspidal

NEW OFFLINE TRACK SECTION WITH WATERCOURSE CROSSING

N

Plot Date : 27 August 2018 11:58:35
File Name P:\PROJECTS\2913 TANGY IV\CAD\01-WORKING\01_01-DRAWINGS\2913_DR_P_0001-0020_P2

Project Title: TANGY IV WIND FARM ABNORMAL LOAD ROUTE ASSESSMENT	Drawing Title: PC/18 BEND AT DALNASPIDAL	Purpose of issue: FOR INFORMATION	
Client: SSE RENEWABLES UK LTD		Designed: KL; Drawn: KL; Checked: TAT; Approved: TAT	
		Arcus Internal Project No.: 2913	Date: 27/08/18
		Scale @ A3: 1:1000	

Drawing Number: 2913_DR_ALR_0018

Rev: 2

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ARCUS

LEGEND:

- VEHICLE
- VEHICLE WHEEL TRACK
- VEHICLE OVERHANG
- LOAD
- LOAD OVERHANG
- THIRD PARTY LAND
- EXTENT OF VEHICLE OVER-RUN
- EXTENT OF LOAD OVERHANG

NOTES:

1. AUTOMATIC REAR WHEEL STEERING USED UNLESS OTHERWISE INDICATED.
2. ANALYSIS HAS NOT CONSIDERED VERTICAL GROUND CLEARANCE OF THE VEHICLE AND LOAD.
3. FURTHER INVESTIGATION WORKS WILL BE REQUIRED IN ORDER TO IDENTIFY THE IMPROVEMENT WORKS REQUIRED INCLUDING BUT NOT LIMITED TO CARRIAGEWAY WIDENING, EARTHWORKS, DRAINAGE, SERVICES, PEDESTRIAN FACILITIES AND TRAFFIC MANAGEMENT.
4. ANALYSIS BASED ON 65.0m BLADE DELIVERY VEHICLE
5. ANALYSIS BASED ON OS MASTERMAP. WHERE REQUIRED TOPOGRAPHICAL SURVEY TO BE UNDERTAKEN AND USED AS A BASIS FOR DETAILED DESIGN.
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Track

LOAD BEARING SURFACE TO BE LAID IN OVERRUN AREA

POST AND WIRE FENCE TO BE RELOCATED

LOAD BEARING SURFACE TO BE LAID IN OVERRUN AREA

POST AND WIRE FENCE TO BE RELOCATED

N

Plot Date : 18 April 2018 15:13:43
File Name :P:\PROJECTS\2913 TANGY IV\CAD\01-WORKING\01_01-DRAWINGS\2913_DR_P_0001-0020_P1

Project Title: TANGY IV WIND FARM ABNORMAL LOAD ROUTE ASSESSMENT	Drawing Title: PC/19 BEND NORTH OF DALNASPIDAL	Purpose of issue: FOR INFORMATION	
Client: SSE RENEWABLES UK LTD		Designed: KL; Drawn: KL; Checked: TAT; Approved: TAT	
		Arcus Internal Project No.: 2913	Date: 07/03/2018
		Scale @ A3: 1:500	

Drawing Number: 2913_DR_ALR_0019	Rev: 1

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LEGEND:

- VEHICLE
- VEHICLE WHEEL TRACK
- VEHICLE OVERHANG
- LOAD
- LOAD OVERHANG
- THIRD PARTY LAND
- EXTENT OF VEHICLE OVER-RUN
- EXTENT OF LOAD OVERHANG

NOTES:

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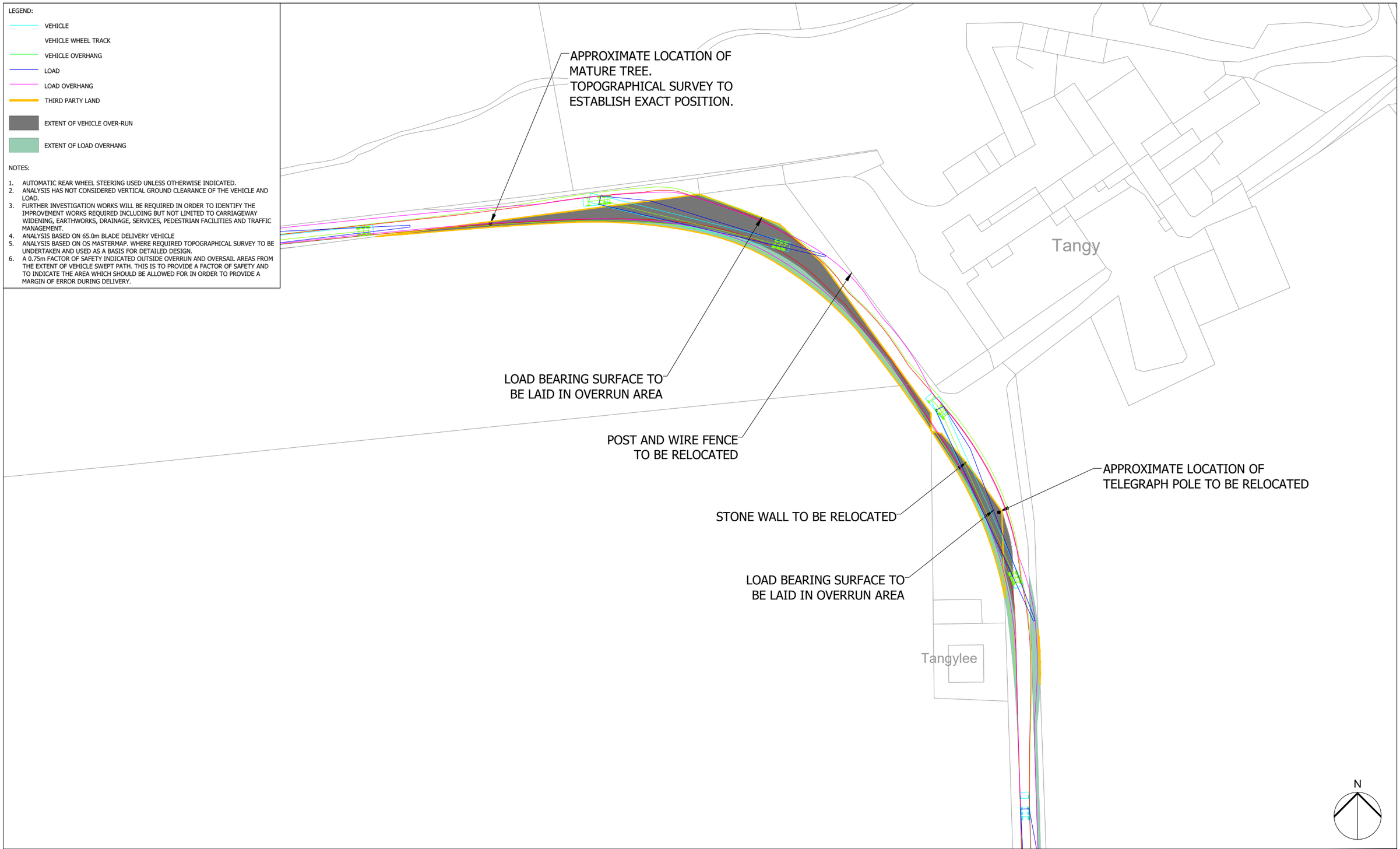

Project Title: TANGY IV WIND FARM ABNORMAL LOAD ROUTE ASSESSMENT	Drawing Title: PC/20 BEND AT TANGY	Purpose of issue: FOR INFORMATION			
Client: SSE RENEWABLES UK LTD		Designed: KL	Drawn: KL	Checked: TAT	Approved: TAT
		Arcus Internal Project No.: 2913		Date: 07/03/2018	
		Scale @ A3: 1:1000			

Drawing Number	Rev
2913_DR_ALR_0020	1

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Plot Date : 18 April 2018 15:13:48
File Name P:\PROJECTS\2913 TANGY IV\CAD\01-WORKING\01_01-DRAWINGS\2913_DR_P_0001-0020_P1

LEGEND:

- VEHICLE
- VEHICLE WHEEL TRACK
- VEHICLE OVERHANG
- LOAD
- LOAD OVERHANG
- THIRD PARTY LAND
- EXTENT OF VEHICLE OVER-RUN
- EXTENT OF LOAD OVERHANG

NOTES:

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Project Title: TANGY IV WIND FARM ABNORMAL LOAD ROUTE ASSESSMENT	Drawing Title: PC/21 BEND AT SITE ENTRANCE	Purpose of issue: FOR INFORMATION	
Client: SSE RENEWABLES UK LTD		Designed: KL; Drawn: KL; Checked: TAT; Approved: TAT	
		Arcus Internal Project No.: 2913	Date: 07/03/2018
		Scale @ A3: 1:1000	

Drawing Number	Rev
2913_DR_ALR_0021	1

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Plot Date : 18 April 2018 15:13:53
File Name :P:\PROJECTS\2913 TANGY IV\CAD\01-WORKING\01_01-DRAWINGS\2913_DR_P_0001-0020_P1