



Engineering & Construction



Via Napoli, 363/1 – 70132 Bari – Italy
www.bfpgroup.net – info@bfpgroup.net
 tel. (+39) 0805046361 – fax (+39) 0805619384
AZIENDA CON SISTEMA GESTIONE
 UNI EN ISO 9001:2015
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PAGE

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TITLE: Road Survey

AVAILABLE LANGUAGE: ITA

ROAD SURVEY

SALICE

File: GRE.EEC.R.73.IT.W.15000.00.116.00 ROAD SURVEY.docx

00	18/12/2020	Emissione			BFP	BFP	BFP														
					Papapicco	Miglionico	Biscotti														
REV.	DATE	DESCRIPTION			PREPARED	VERIFIED	APPROVED														
PROJECT / PLANT		GRE CODE																			
		GROUP	FUNCION	TYPE	ISSUER	COUNTRY	TEC	PLANT			SYSTEM	PROGRESSIVE	REVISION								
		GRE	EEC	R	7	3	I	T	W	1	5	0	0	0	0	0	1	1	6	0	0
CLASSIFICATION					UTILIZATION SCOPE		<i>Basic Design, Detailed Design, Issue for Construction, etc.</i>														
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1. PREMESSA

Il presente documento si basa sullo studio di road survey redatto da ENEL GREEN POWER ITALIA s.r.l. che se ne assume ogni responsabilità circa i contenuti, per cui la società BFP s.r.l. declina ogni responsabilità circa i contenuti dello studio che rappresenta lo stato iniziale di sviluppo progettuale.

La proposta progettuale è finalizzata alla realizzazione di un impianto eolico per la produzione di energia elettrica da fonte rinnovabile eolica, costituito da 14 aerogeneratori, ciascuno di potenza nominale pari a 6.0 MW per una potenza complessiva pari a 84.0 MW, da realizzarsi nel territorio comunale di Salice Salentino e Veglie, in provincia di Lecce, con opere di connessione ricadenti nei territori comunali di San Pancrazio Salentino ed Erchie, entrambi in provincia di Brindisi, dove sarà ubicata la sottostazione utente di trasformazione AT/MT, in posizione adiacente alla stazione elettrica HV 380/150kV Terna Substation "ERCHIE".

Per quanto concerne lo studio della viabilità per il trasporto dei componenti degli aerogeneratori si fa riferimento alla relazione ad opera della Savino Del Bene S.p.A. di seguito riportata.

A completamento del presente documento, si faccia riferimento agli elaborati grafici di dettaglio GRE.EEC.D.26.IT.W.15000.00.118.0A - GRE.EEC.D.26.IT.W.15000.00.117.0A che riportano rispettivamente su ortofoto e su Carta Tecnica Regionale l'analisi svolta.



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Global Logistics and Forwarding Company

ITALIA – FIRENZE
Savino Del Bene S.p.A.
Worldwide Headquarters
Via del Botteghino, 24/26/28A
50018 Scandicci (FI)
Tel: +39 055 5219 1 – Fax: +39 055 721 288
Email: wartsila@savinodelbene.com
www.savinodelbene.com
savinodelbene@pec.savinodelbene.it

Savino Del Bene S.p.A.

TFS3 - Detailed Road Survey

Project Name: Salice- Veglie Wind Farm Project

Client: ENEL Green Power

REV.	DOC #	PAGES	STATUS	AUTHOR	DATE
01	TFS3-SV-WFP-2020-08	119	Detailed Route Survey	Eng. Tech. Department	09/09/2020

The information published within this document shall be treated as confidential and is subject to alteration during definitive engineering stages. It shall not in any way be disclosed to any other than those engaged in activities related to the above mentioned project, even then only after approval from Savino Del Bene S.p.A.. By accepting this information, the party to whom it is disclosed, warrants that it shall likewise treat the information as CONFIDENTIAL.



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Project Salice- Veglie Wind Farm Project
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1. INTRODUCTION

This Route Survey report provides a preliminary feasibility report for abnormal transports of wind elements from the Port of Taranto-Brindisi to the Salice - Veglie Wind Farm.

The GPS positions of Salice - Veglie WF Enter Gates has been considered are:

- Entry 1: 40.39594, 17.82156
- Entry 2: 40.36986, 17.80779

Considering the size and weight of the items to be transported, we have identified and evaluated two different routes as follows

- Blades: Taranto Port – Wind Farm Salice - Veglie
- Towers-Nacelles-Drive Train-Hub: Brindisi Port – Wind Farm Salice - Veglie

This document provides a description of the modes of transport, the critical points and the road adaptations necessary to carry out the transports.

Due to abnormal dimensions of main items in the scope of work, notably for blades 83.7m long, the outcomes of this TFS3 Study to be considered theoretical and subject to final check of detailed drawings of cargo to confirm the intended mean of transport, and the Road Authorities approval.

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2. PRELIMINARY CARGO DETAILS

Preliminary information provided by this document is based on dimensions and weight stated by Client as per table underneath.

Table hereunder shows preliminary dimensions and weight of main components of SIEMENS HH115m provided by Client.

Denomination	Length [mm]	Width [mm]	Height [mm]	Unit Weight [Kg]
Section 1	13.540	4.700	4.700	84.941
Section 2	18.190	4.670	4.670	85.087
Section 3	23.740	4.400	4.400	84.979
Section 4	27.000	4.430	4.430	74.187
Section 5	29.945	3.560	3.560	65.517
Nacelle	14.614	4.720	3.405	98.000
Drive Train	6.680	3.200	2.300	76.300
Rotor Hub	4.636	4.184	4.005	54.900
Blade	83.720	4.657	4.321	24.600
Transformer	NA	NA	NA	17700
Generator	NA	NA	NA	16500

For all main items Client has provided drawings like sample type on which we underline it wasn't possible to evaluate the Centre of Gravity, supports, lifting points and lashing points. Hence, all information included in this document assume all main items suitable for the intended main of transport. Support points on trailers, load modes, centre of gravity and anchor points shall be verified once preliminary drawings will be released by Client.

Due to what per above, this report remains only theoretical and shall be checked and verified once technical drawings of the items will be provided by Client.

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3. PRELIMINARY TRANSPORT CONFIGURATIONS

This section provide preliminary transport configurations SDB intend to use for the transports in the scope of work.

The following preliminary transport configurations are proposed based on information on cargo provided by Client at time this survey has been realized. Due to lack of information on centre of gravity, supports, lashing points, the following transport configurations assume the following statement valid.

- Items properly designed to spread its own weight around the Centre of Gravity symmetrically
- Items provided with suitable supports for the intended mean of transports
- Items provided with accessible lashing points

The composition of the convoys has been studied not to exceed 12 tons per axle (limited to the trailer) as required by Italian regulations.

For the purpose of this route survey the following two transport configuration has been considered like “critical convoys”.

- Blade (dolly configuration)
- Tower Section 5

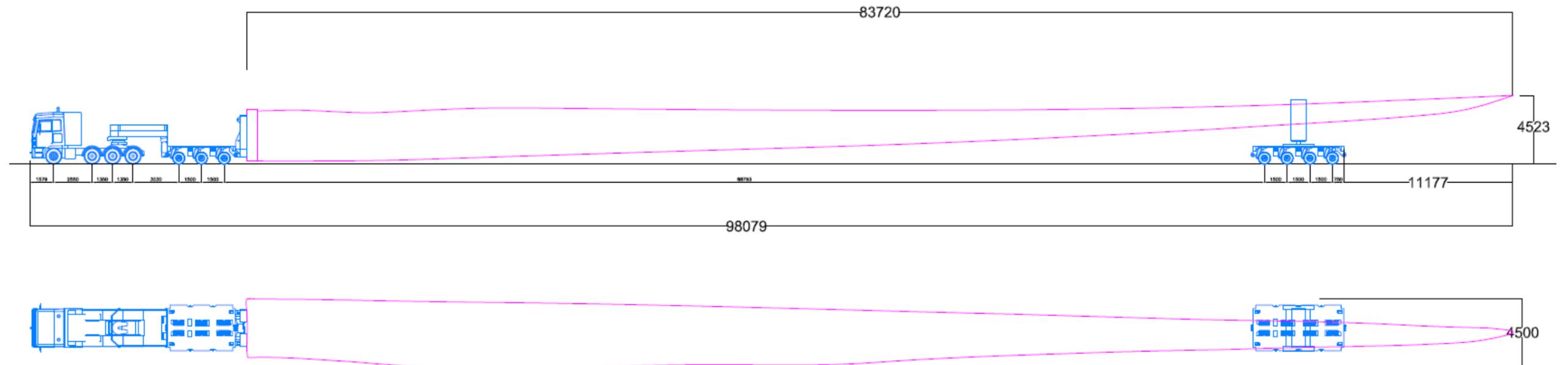
Hence, the road adjustments designed for the “critical convoys” will also allow the transit of all other convoys.

Prepared by Eng. Tech. Department

BLADE TRANSPORT DOLLY CONFIGURATION (PRELIMINARY)

CRITICAL CONVOY #1

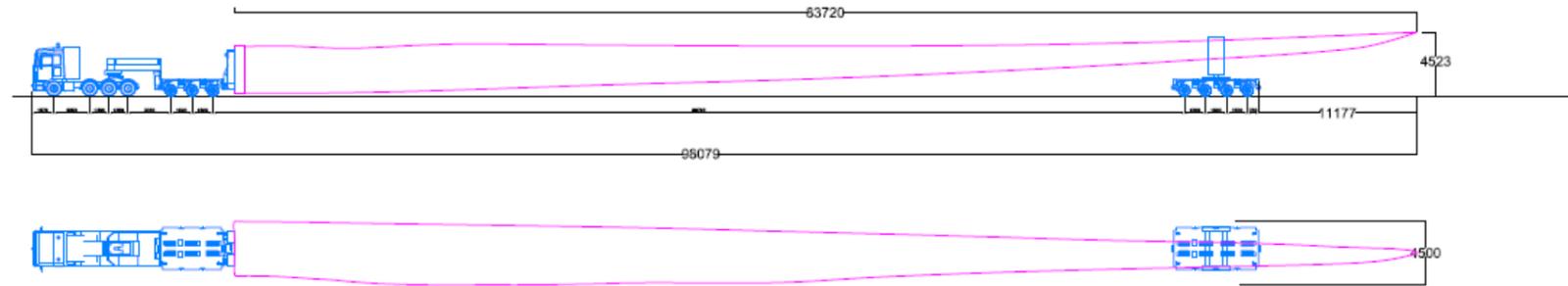
(1 OF 2)



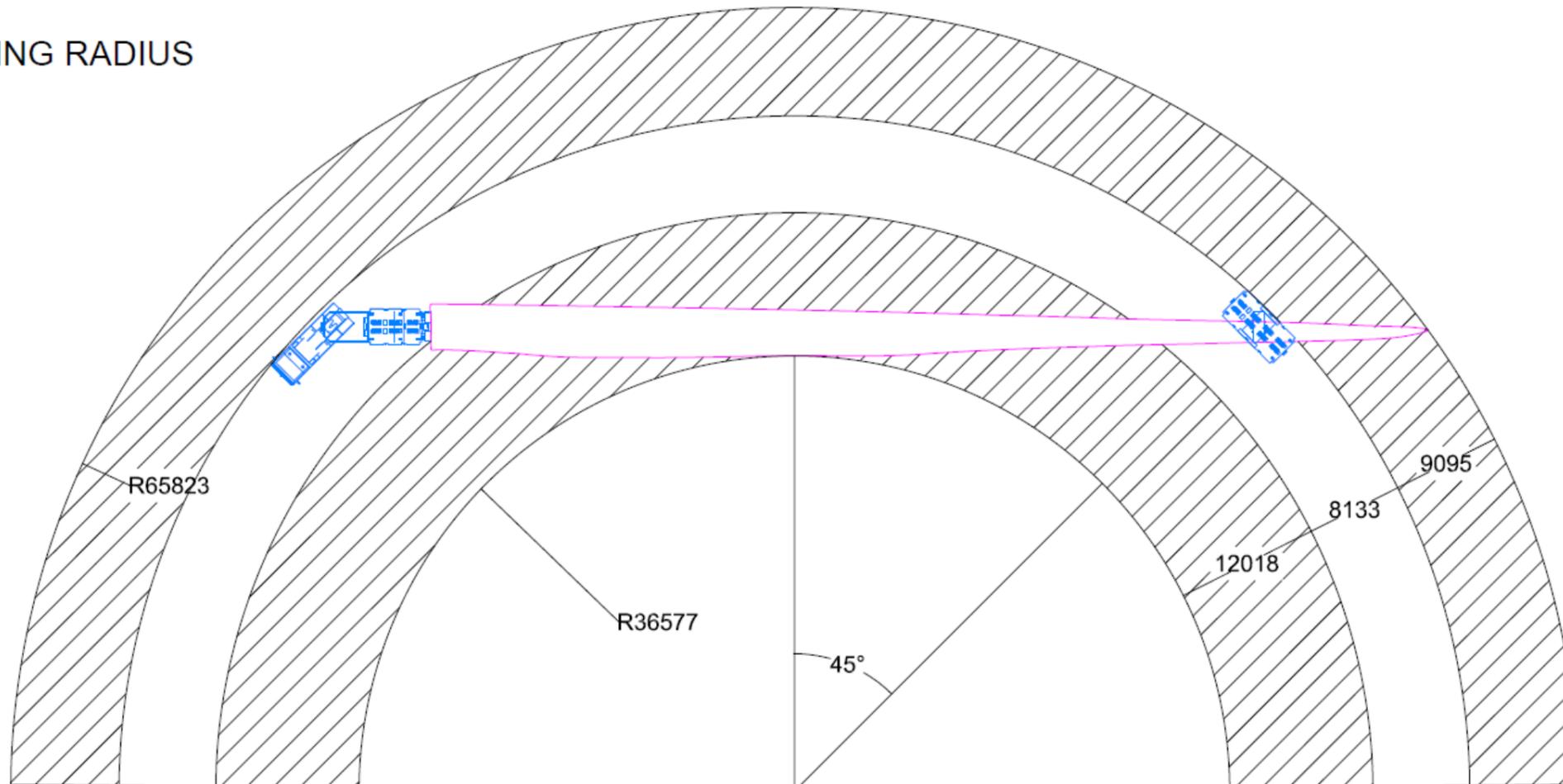
BLADE TRANSPORT DOLLY CONFIGURATION (PRELIMINARY)

CRITICAL CONVOY #1

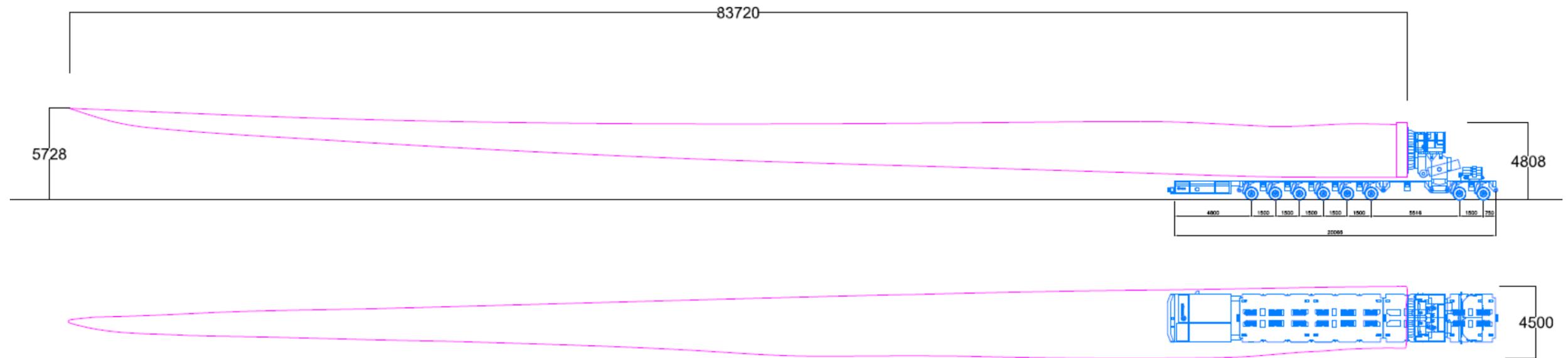
(2 OF 2)



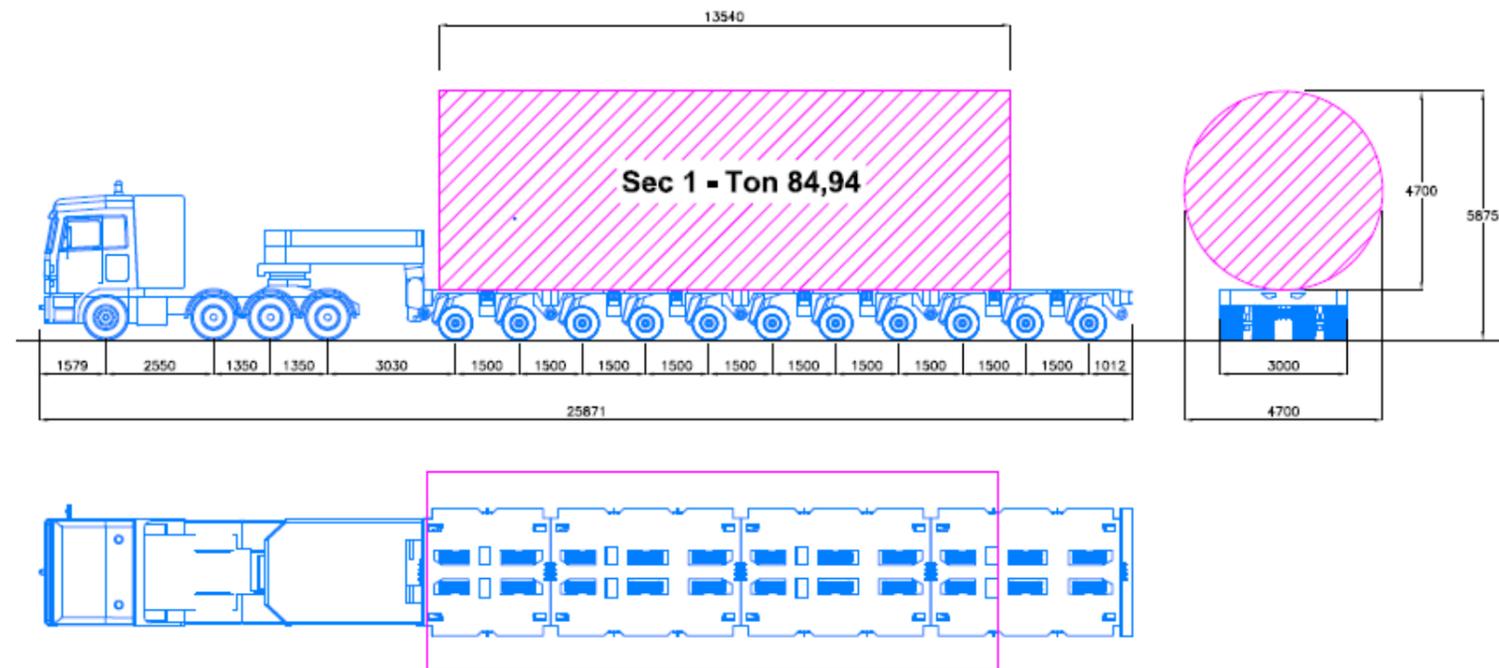
TURNING RADIUS



BLADE LIFTER TRANSPORT CONFIGURATION (PRELIMINARY)



TOWER SECTION 1 TRANSPORT CONFIGURATION (PRELIMINARY)



Total Deadweight

60.407 Kg

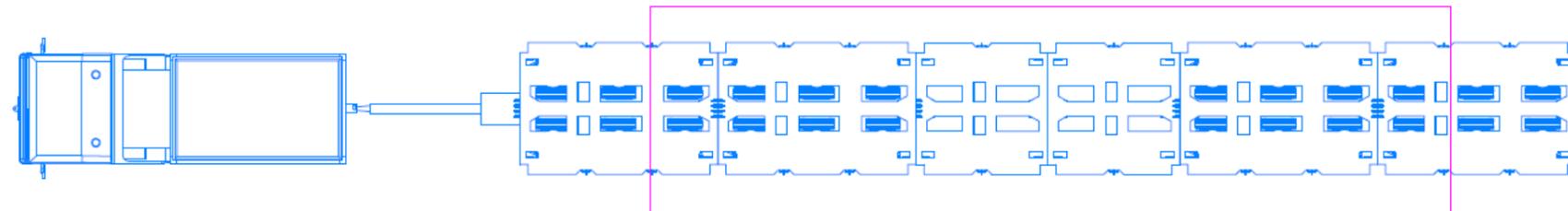
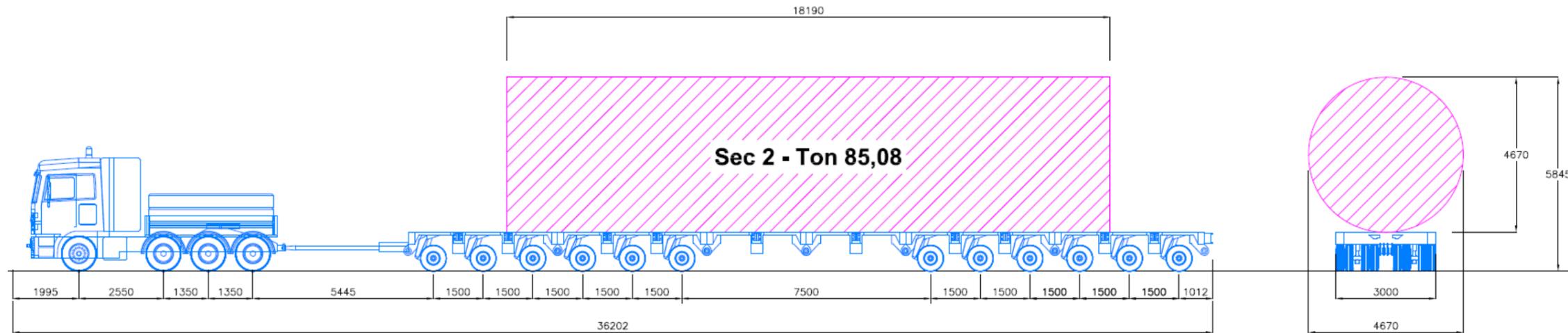
Total Payload

84.941 Kg

Gross Combination Weight

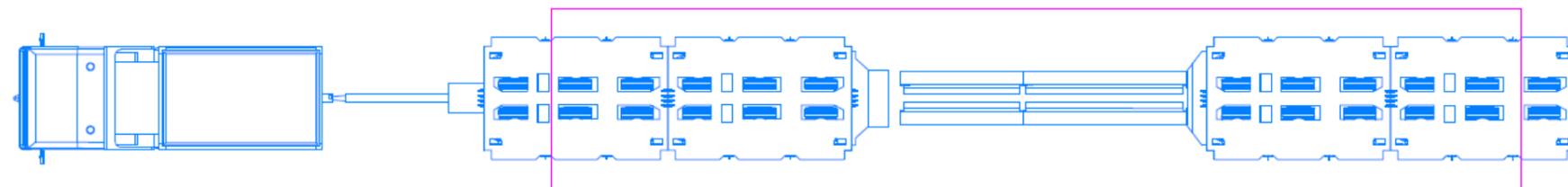
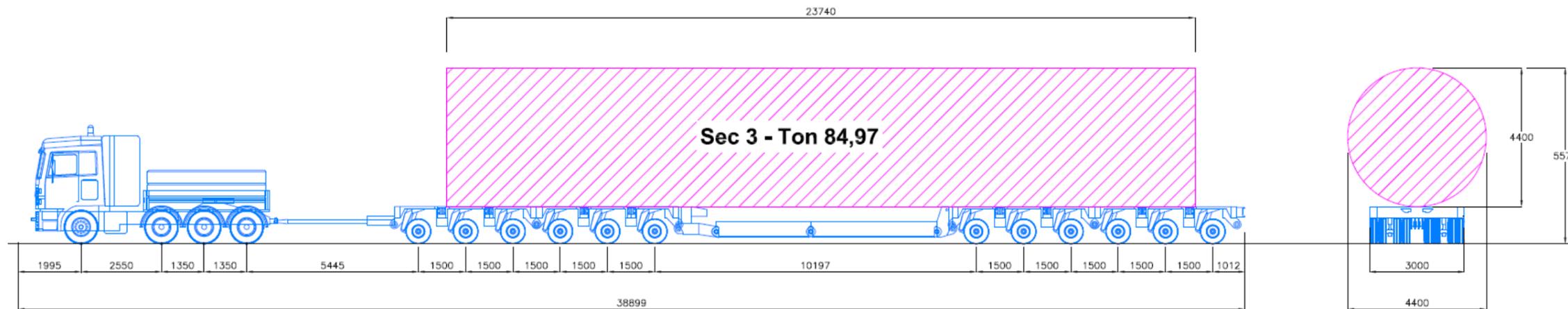
145.347 Kg

TOWER SECTION 2 TRANSPORT CONFIGURATION (PRELIMINARY)



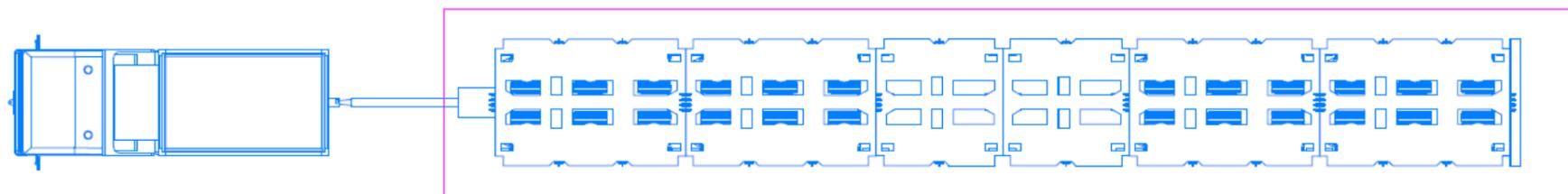
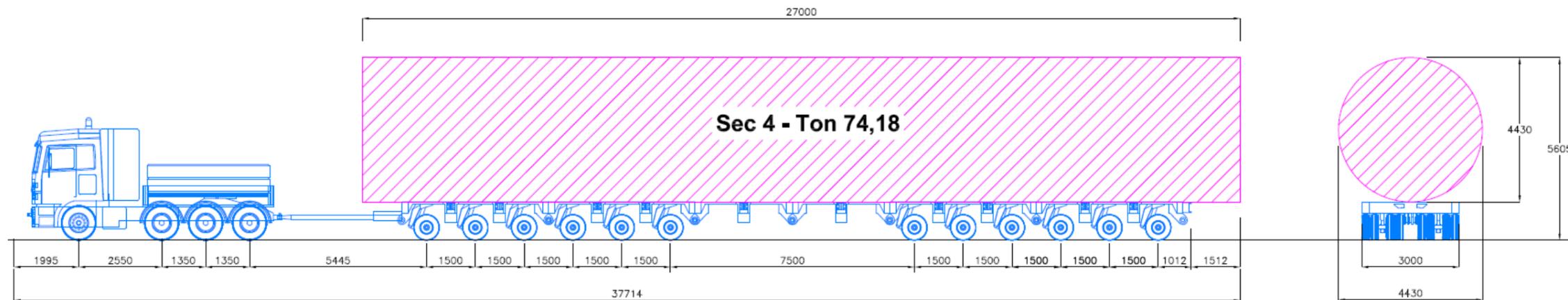
Total Deadweight	Total Payload	Gross Combination Weight
92.218 Kg	85.087 Kg	177.298 Kg

TOWER SECTION 3 TRANSPORT CONFIGURATION (PRELIMINARY)



Total Deadweight	94.521 Kg	Total Payload	84.979 Kg	Gross Combination Weight	179.491 Kg
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TOWER SECTION 4 TRANSPORT CONFIGURATION (PRELIMINARY)

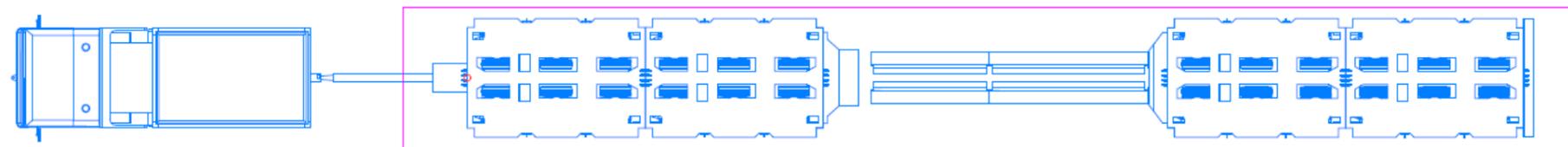
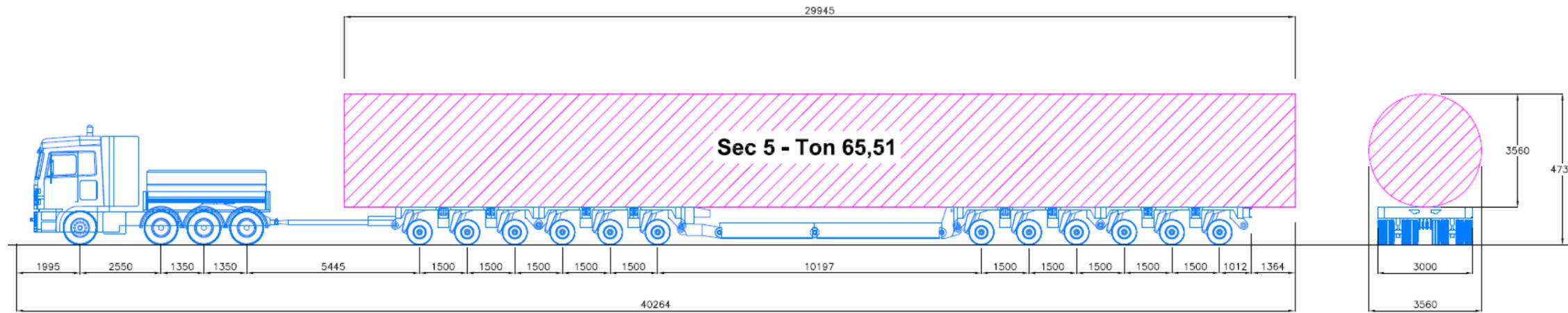


Total Deadweight	Total Payload	Gross Combination Weight
92.218 Kg	74.187 Kg	166.398 Kg

TOWER SECTION 5 TRANSPORT CONFIGURATION (PRELIMINARY)

CRITICAL CONVOY #2

(1 OF 3)



Total Deadweight

94.521 Kg

Total Payload

65.517 Kg

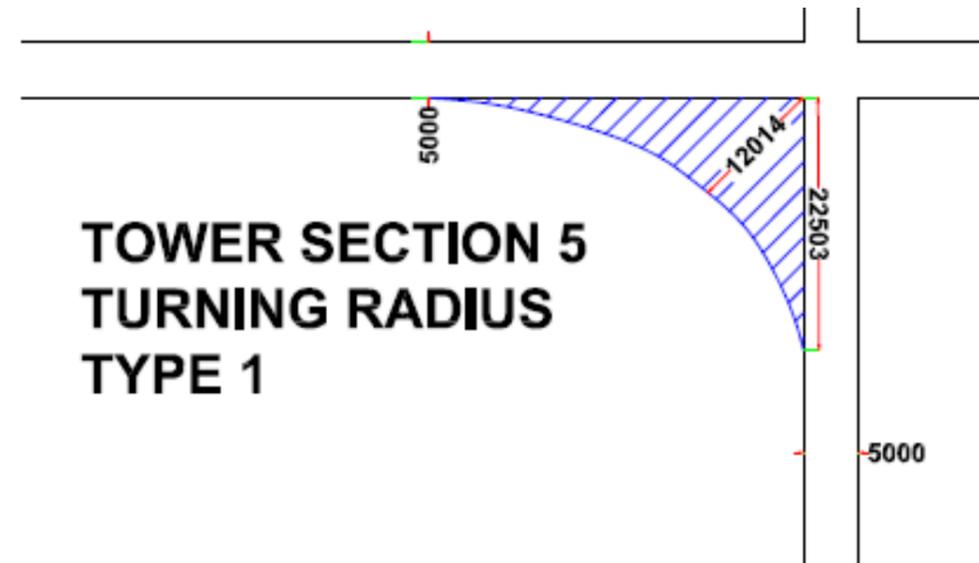
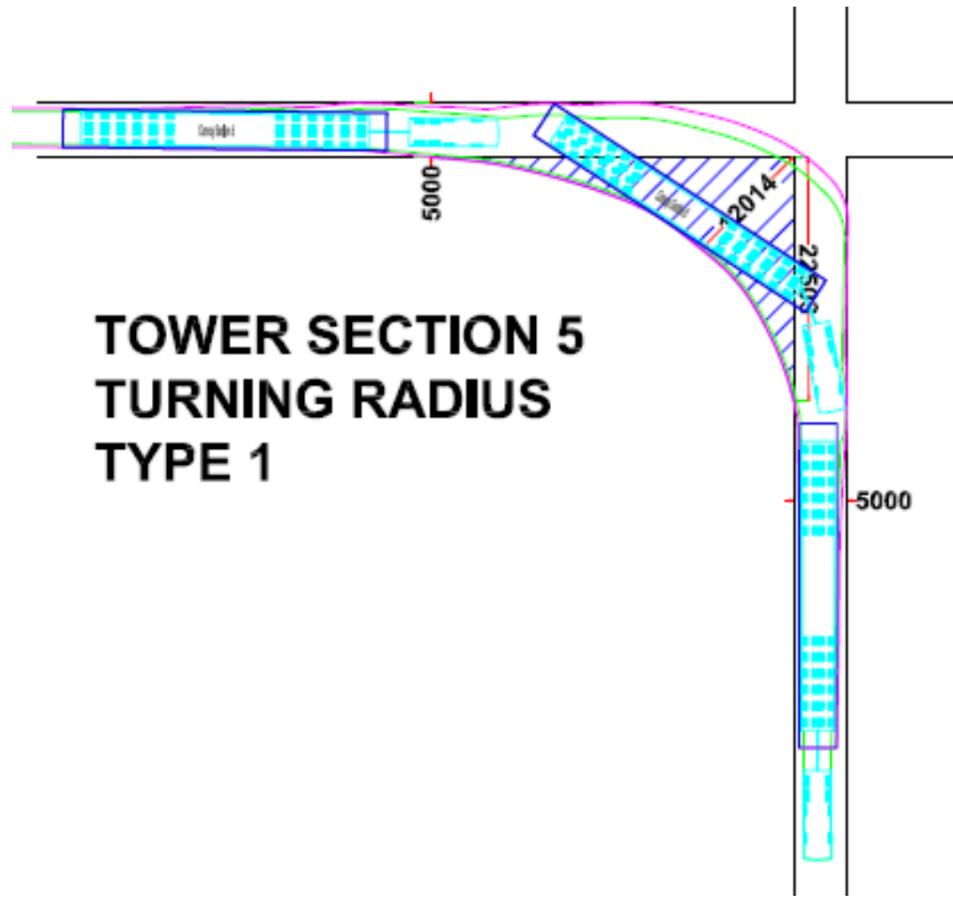
Gross Combination Weight

160.031 Kg

TOWER SECTION 5 TRANSPORT CONFIGURATION (PRELIMINARY)

CRITICAL CONVOY #2

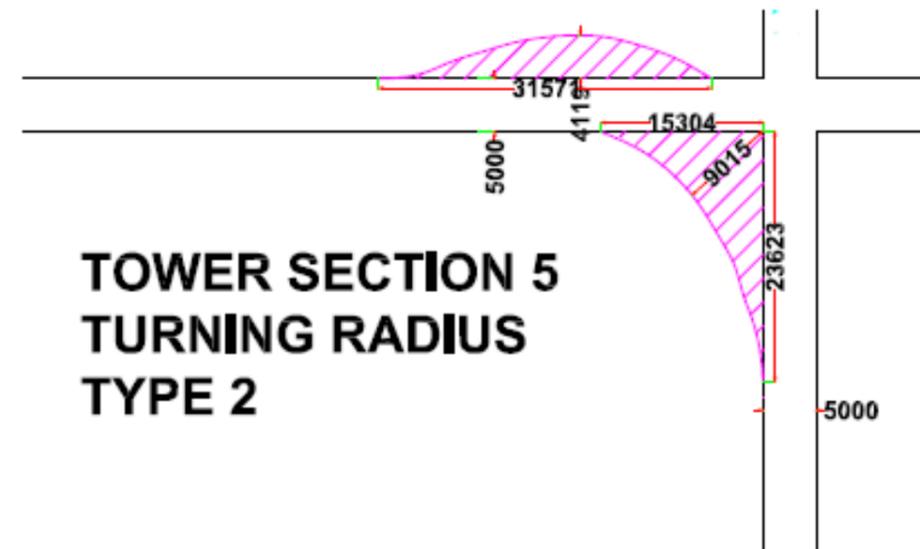
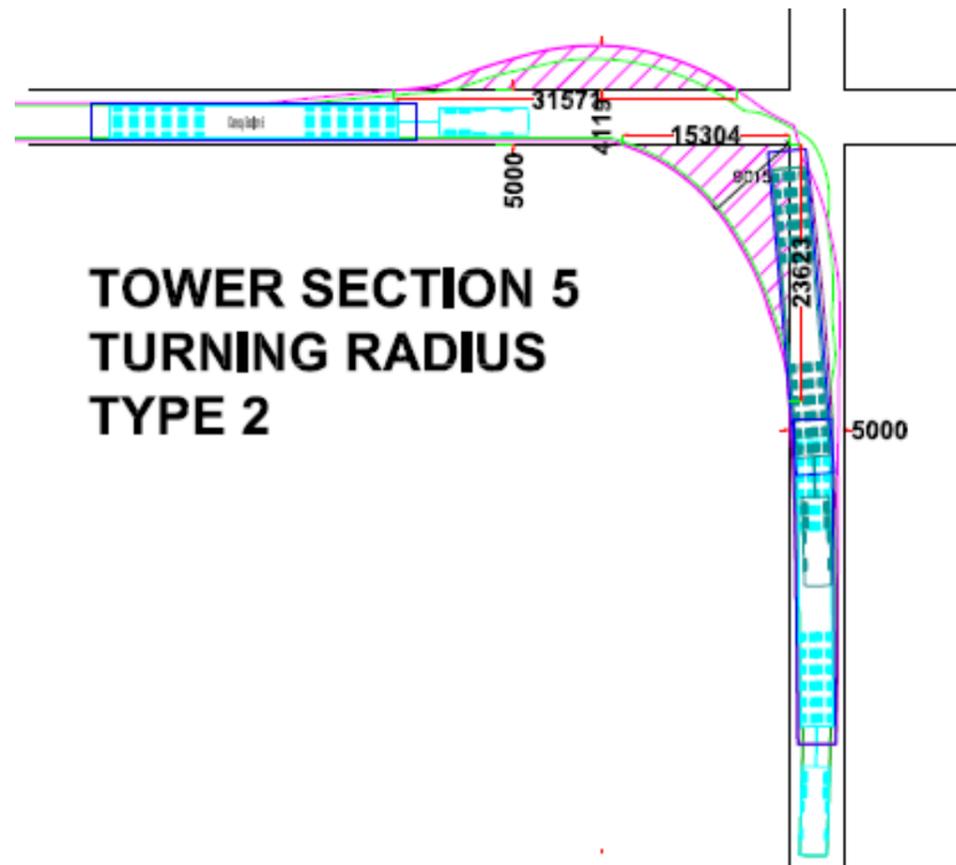
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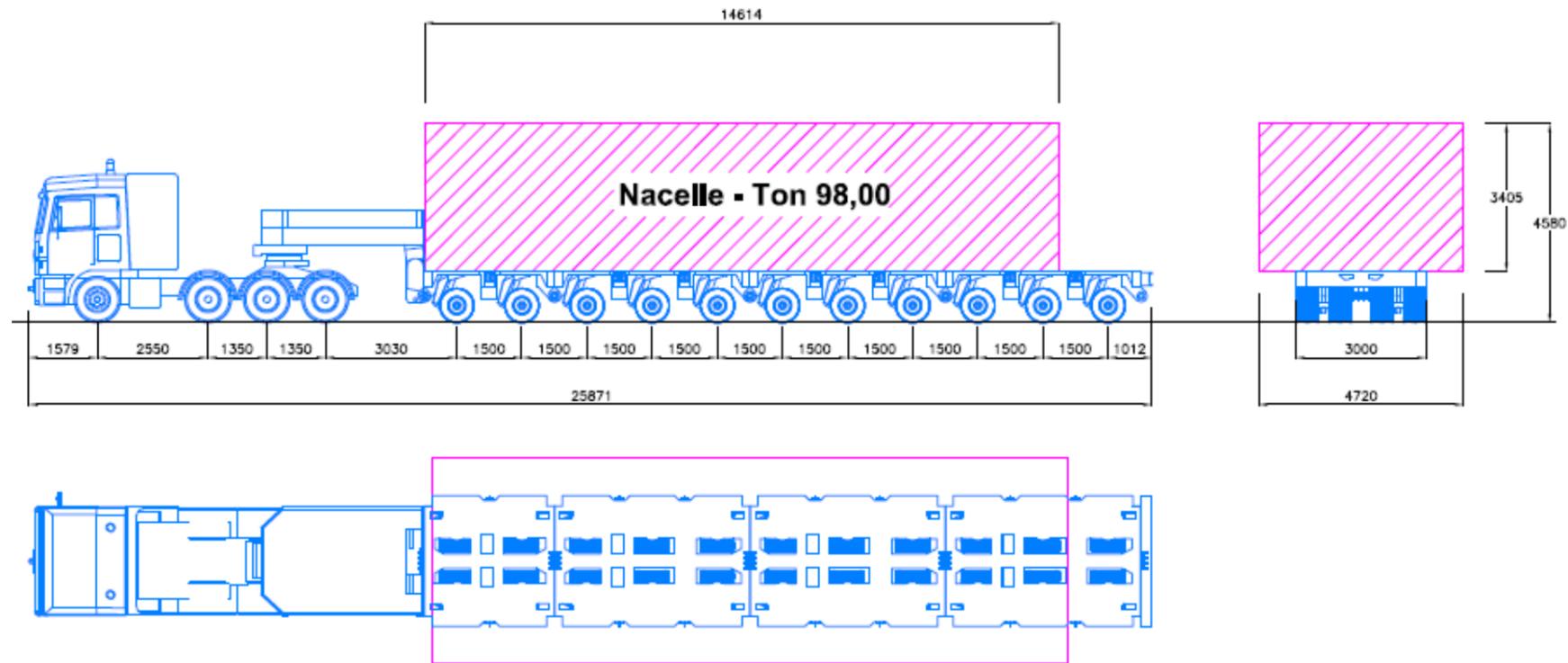
TOWER SECTION 5 TRANSPORT CONFIGURATION (PRELIMINARY)

CRITICAL CONVOY #2

(3 OF 3)

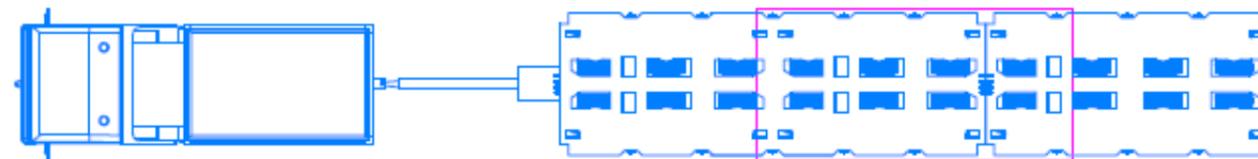
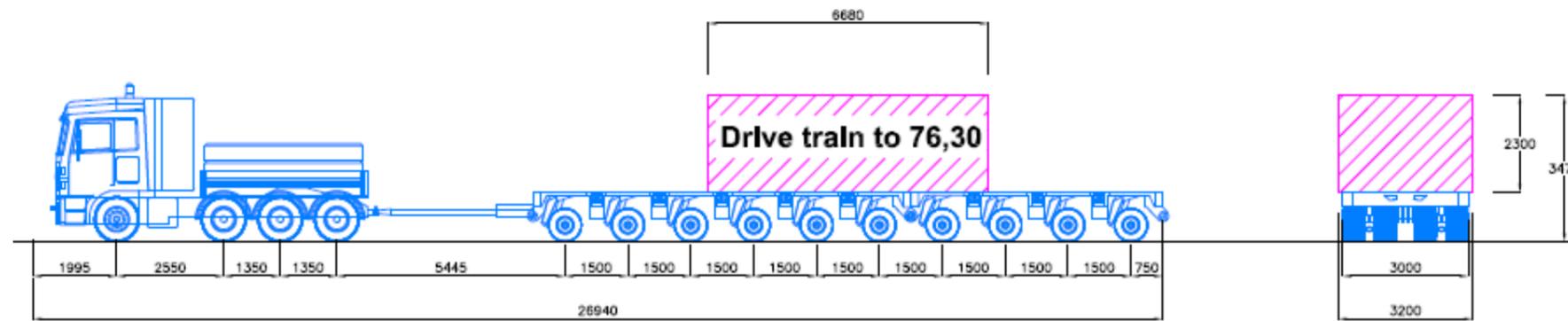


NACELLE TRANSPORT CONFIGURATION (PRELIMINARY)



Total Deadweight	Total Payload	Gross Combination Weight
60.407 Kg	98.000 Kg	158.407 Kg

DRIVE TRAIN TRANSPORT CONFIGURATION (PRELIMINARY)



Total Deadweight

67.241 Kg

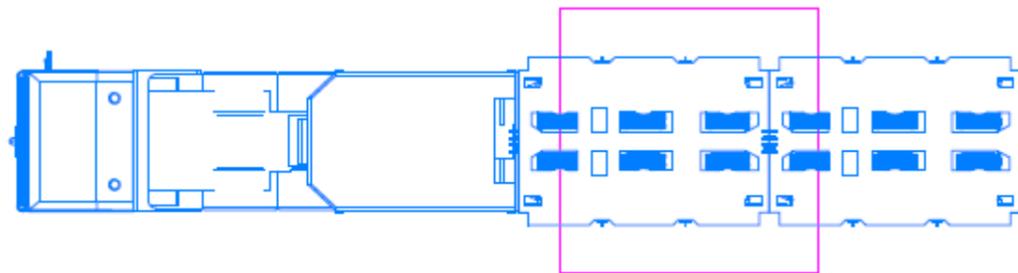
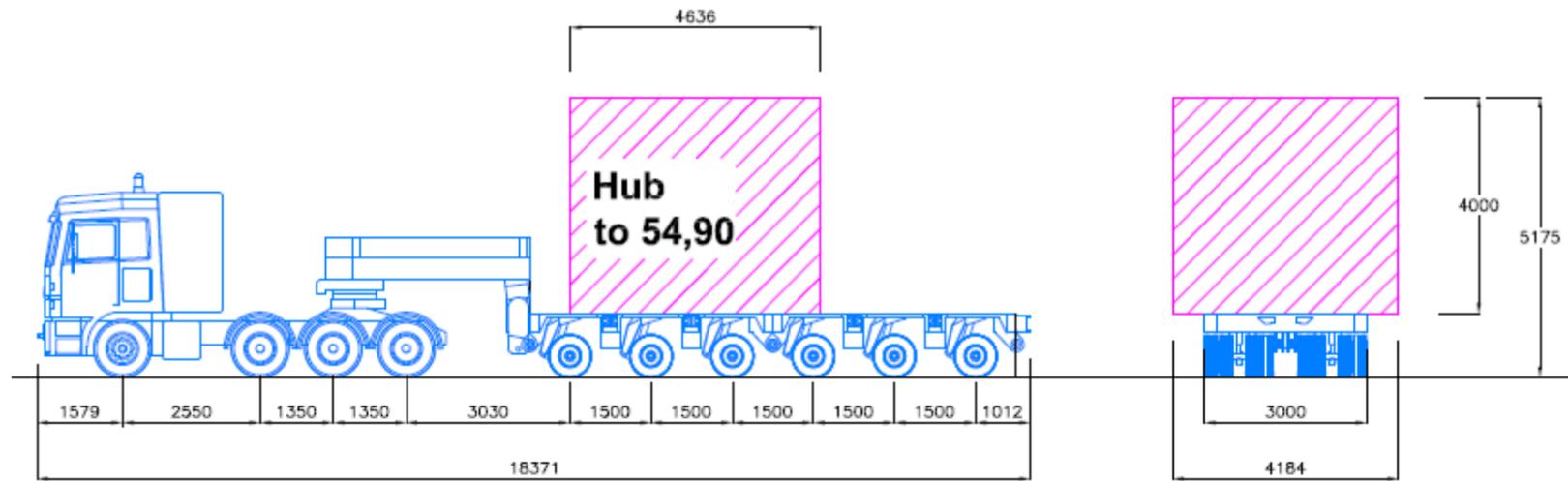
Total Payload

76.300 Kg

Gross Combination Weight

143.541 Kg

HUB TRANSPORT CONFIGURATION (PRELIMINARY)



Total Deadweight

41.832 Kg

Total Payload

54.900 Kg

Gross Combination Weight

96.732 Kg

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4. PRELIMINARY ROUTING

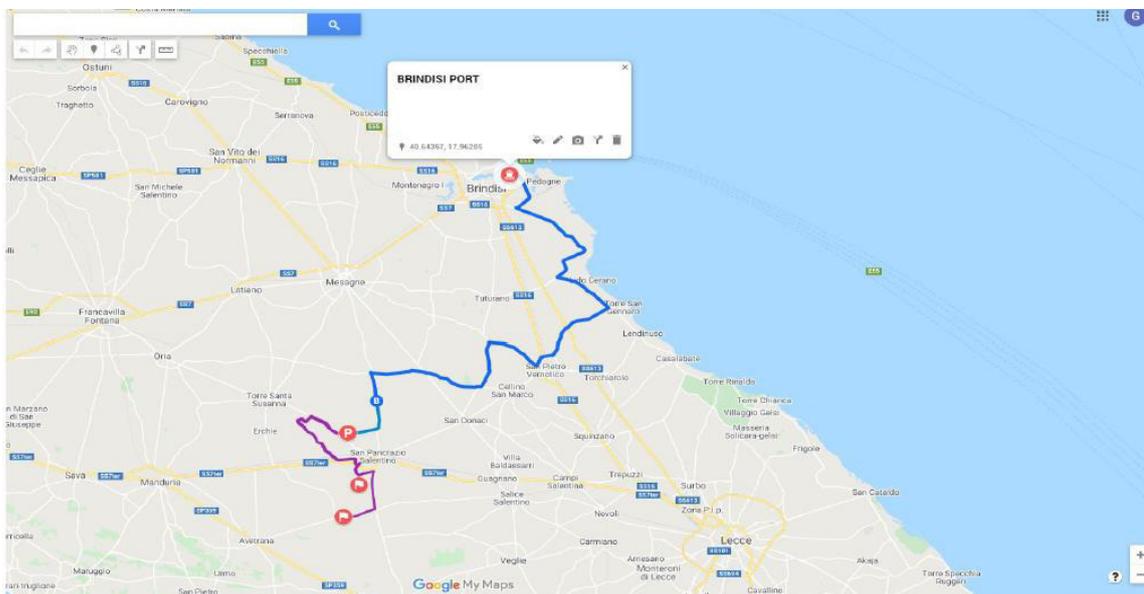
SDB has evaluated two different routing because out-of-gauge dimensions of main items doesn't allow to use a unique port of arrival.

The shipment of main items shall be break in two separated lots for the following reasons.

- TOWERS - NACELLE - DRIVE TRAIN - HUB shall be shipped via Brindisi port only due to over-height dimensions. Indeed, based on dimensions provided by Client (ref. Ch.2) these items cannot be shipped via Taranto port because of clearance limitations to cross under bridges.
- BLADES shall be shipped via Taranto port only due to over-length dimensions. The extreme over-length of blades impose turning radius very high, and from Brindisi port there is no routing which fit the geometry of the convoy and allow to get Salice - Veglie Wind Farm.

TOWERS - NACELLE - DRIVE TRAIN - HUB

Picture hereunder shows the preliminary routing from Brindisi (Costa Morena) to Salice - Veglie WF Enter Gate.



Be it noted that from GPS point 40.44659, 17.77303 to GPS point 40.41566, 17.80166 (after Transshipment Area for blades) it is required to drive on gravel roads. It'll be important enlarge and compact this part of itinerary in order to allow the transit of the convoy.



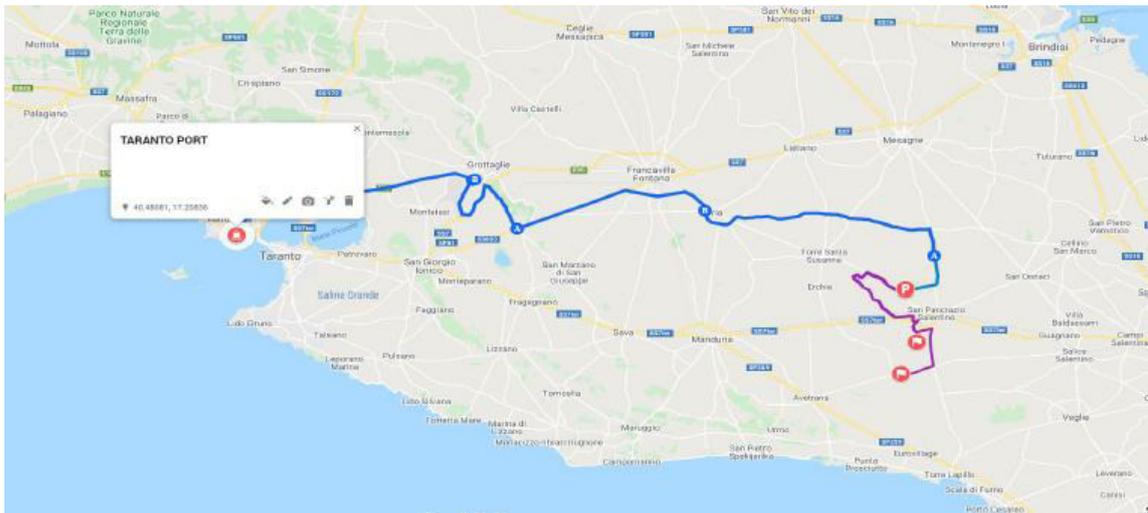
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For additional information on the routing see the Google Earth file attached (Route Tower-Nacelle SALICE VEGLIE.kmz).

BLADES

Picture hereunder shows the preliminary routing from Taranto port to Salice - Veglie WF Enter Gate.



Near Grottaglie the blades shall be transported driving on reverse way for about 7 km. Picture hereunder shows the roads that shall be driven reverse gear.

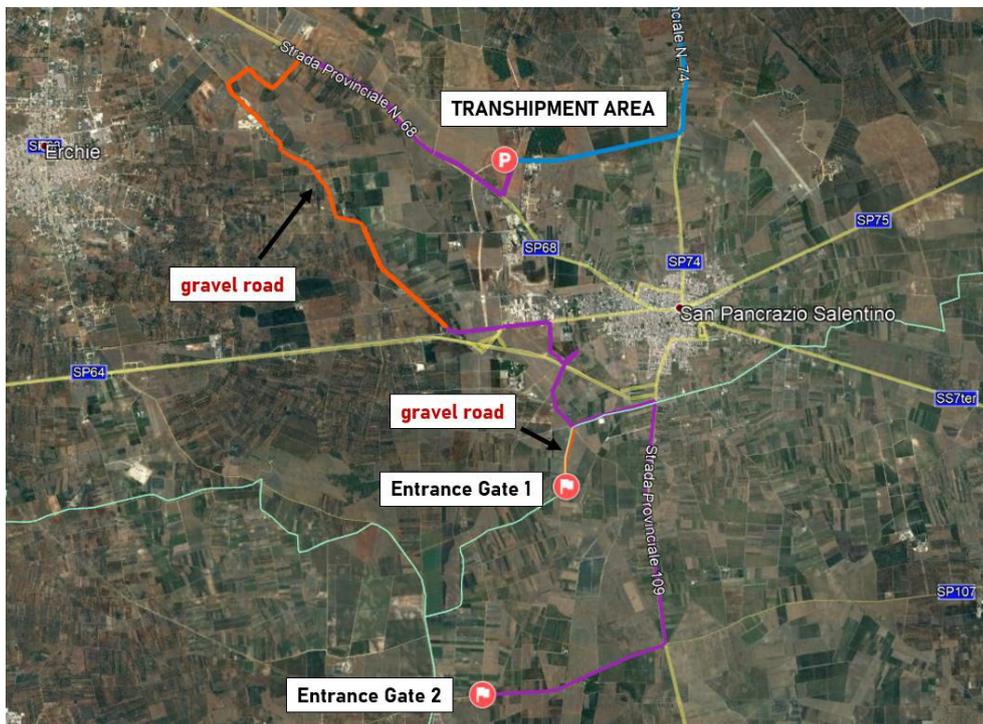




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In order to get the Salice - Veglie WF Enter Gate it'll be required to drive the last part of the itinerary by blade lifter. SDB has evaluated to use a Transshipment Area near San Pancrazio Salentino to change the road trailer (from the dolly configuration to blade lifter configuration). Picture hereunder shows location of Transshipment Area evaluated the best solution by SDB (GPS position 40.43737, 17.81114) and the routing from the Transshipment Area to Entrance Gate 1 and Entrance Gate 2 (performed by blade lifter).



The roads from the Transshipment Area to the Salice Veglie Entrance Gates are in common with Towers - Nacelle - Drive Train - Hub. Hence, for the blade lifter transit will be required the same adjustments asked for the transit of towers and nacelles. As anticipated above on Nacelle-Towers general description of routing to drive on gravel roads is required in order to reach Entrance Gate 1. Gravels roads to be arranged in order to allow the transit of over-size/over-weight convoys in the scope of work.

In addition, be it noted that all the electrical and telephone cables along this part of itinerary to be buried to allow the blade lifter transit.

For additional information on the routing see the Google Earth file attached (Route Blade SALICE VEGLIE.kmz).

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5. ROUTE CRITICAL POINTS / ADJUSTMENT WORKS

TOWERS - NACELLE - DRIVE TRAIN - HUB

The route of the Towers-Nacelles-Drive Train-Hub from Brindisi port to Salice - Veglie WF Enter Gate has modest transportation issues. The followings pages provide a description of main road adjustments required to reach the Salice - Veglie WF Enter Gate.

The GPS positions of Salice - Veglie WF Enter Gates has been considered are:

- Entry 1: 40.39594, 17.82156
- Entry 2: 40.36986, 17.80779

The critical convoy ``Tower Section 5`` was used as reference for the examination of the necessary road adjustments. The necessary adjustments required for the convoy `` Tower Section 5`` will allow the transit of all other convoys.

The turning radius ``type`` of this convoy indicated in the previous section are the minimum necessary to allow transit.

Be it noted the Towers, Nacelle, Drive Train, and Hub transports are subject to check the final transportation drawings. The actual position of the centre of gravity of above mentioned items and other relevant technical details were unknown at time this survey has been realized. Due to this, the following technical information to be considered preliminary and subject to be confirmed once final technical drawings will be released by Client.

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ID 01 Brindisi port – Costa Morena (GPS position 40.64351, 17.96267)



GATE EXIT

ID 02 SP 88 (GPS position 40.61674, 17.97088)



ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Internal curve to be compacted.

Preliminary road adjustments details as per following picture.

ID 02 SP 88 (GPS position 40.61674, 17.97088) – ADJUSTMENT WORK REQUIRED (preliminary details)



ID 03 SP 87-SP 86 (GPS position 40.53703, 18.05585)



ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

External curve to be compacted / obstacle removal required.

Preliminary road adjustments details as per following picture.

ID 03 SP 87-SP 86 (GPS position 40.53703, 18.05585) – ADJUSTMENT WORK REQUIRED (preliminary details)



ID 04 SS 16 – SP 82 (GPS position 40.49159, 17.98859)



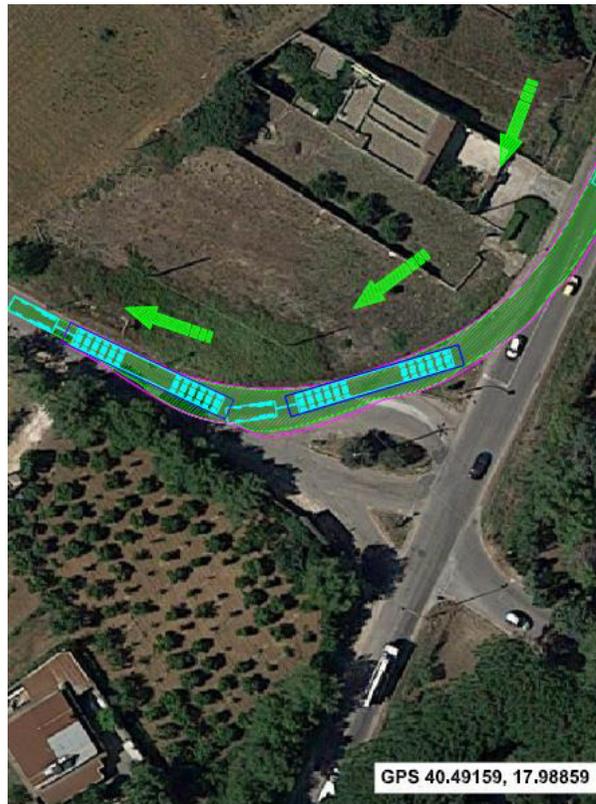
ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

External curve to be compacted / obstacle removal required / tree trimming.

Preliminary road adjustments details as per following picture.

ID 04 SS 16 – SP 82 (GPS position 40.49159, 17.98859) – ADJUSTMENT WORK REQUIRED (preliminary details)



ID 05 SS 51 (GPS position 40.48571, 17.83406)



ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Roundabout to be enlarged / obstacle removal required.

Preliminary road adjustments details as per following picture.

ID 05 SS 51 (GPS position 40.48571, 17.83406) – ADJUSTMENT WORK REQUIRED (preliminary details)



ID 06 SP 74 (GPS position 40.44073, 17.84048)



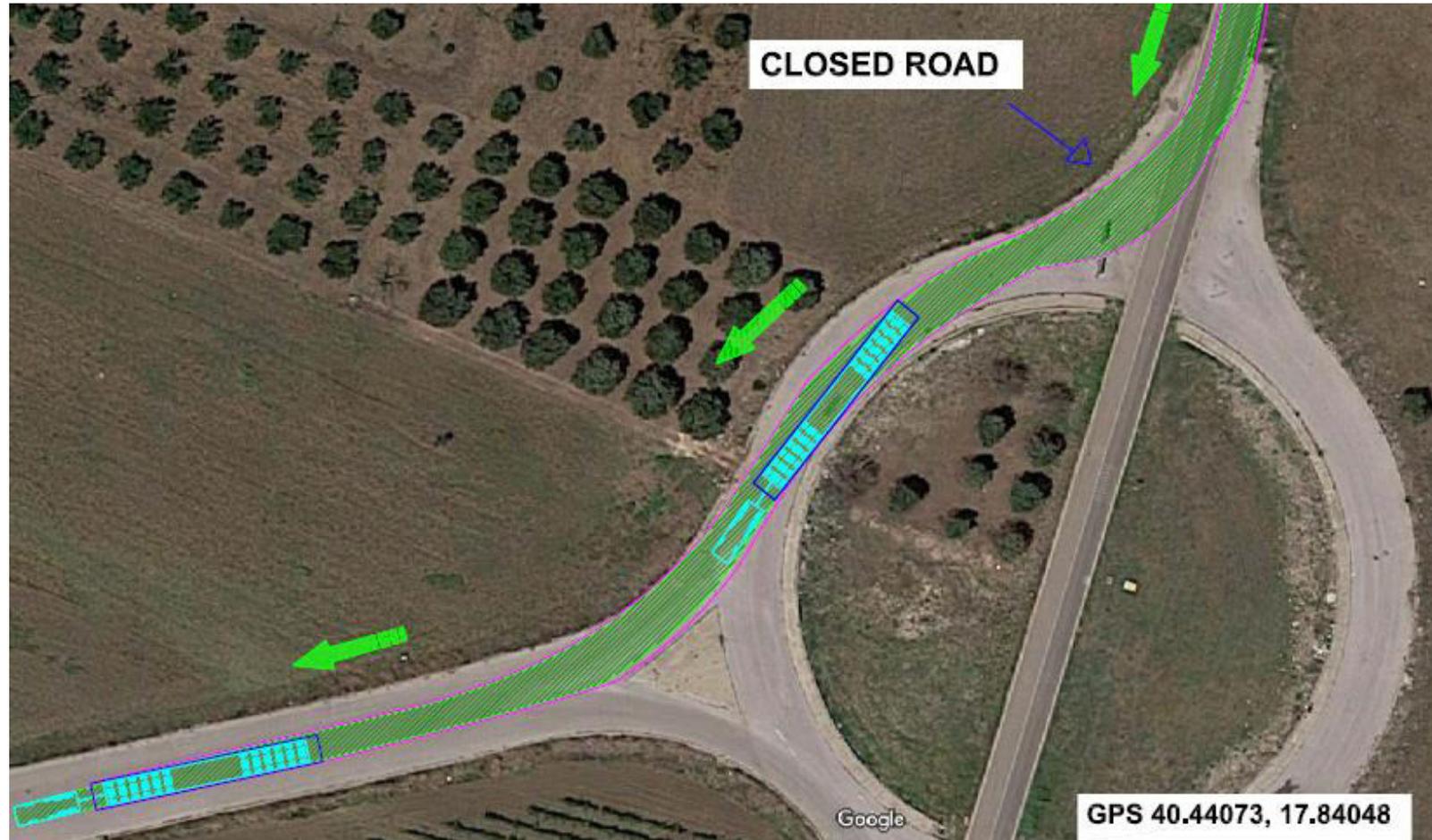
ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be compacted /obstacle removal required.

Preliminary road adjustments details as per following picture.

ID 06 SP 74 (GPS position 40.44073, 17.84048)



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ID 07 (GPS position 40.43744, 17.81307)



ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be enlarged /obstacle removal required.

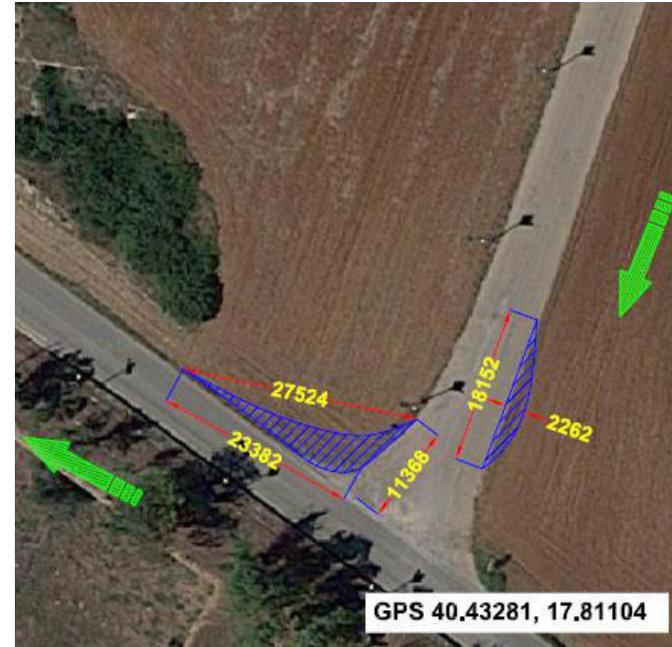
Preliminary road adjustments details as per following picture.

ID 07 (GPS position 40.43744, 17.81307)



ID 08	(GPS position 40.43281, 17.81104)	<p>ADJUSTMENT REQUIRED</p> <p>The highlighted area shall be suitable for transit : levelled ground and obstacle free.</p> <p>Curve to be enlarged and compacted /obstacle removal required.</p> <p>Preliminary road adjustments details as per following picture.</p>
 A photograph showing a road intersection. A black arrow points to a curve on the road that needs to be enlarged and compacted. Two yellow highlights mark areas that need to be levelled and obstacle-free for transit. The background shows trees and a clear sky.		

ID 08 (GPS position 40.43281, 17.81104)



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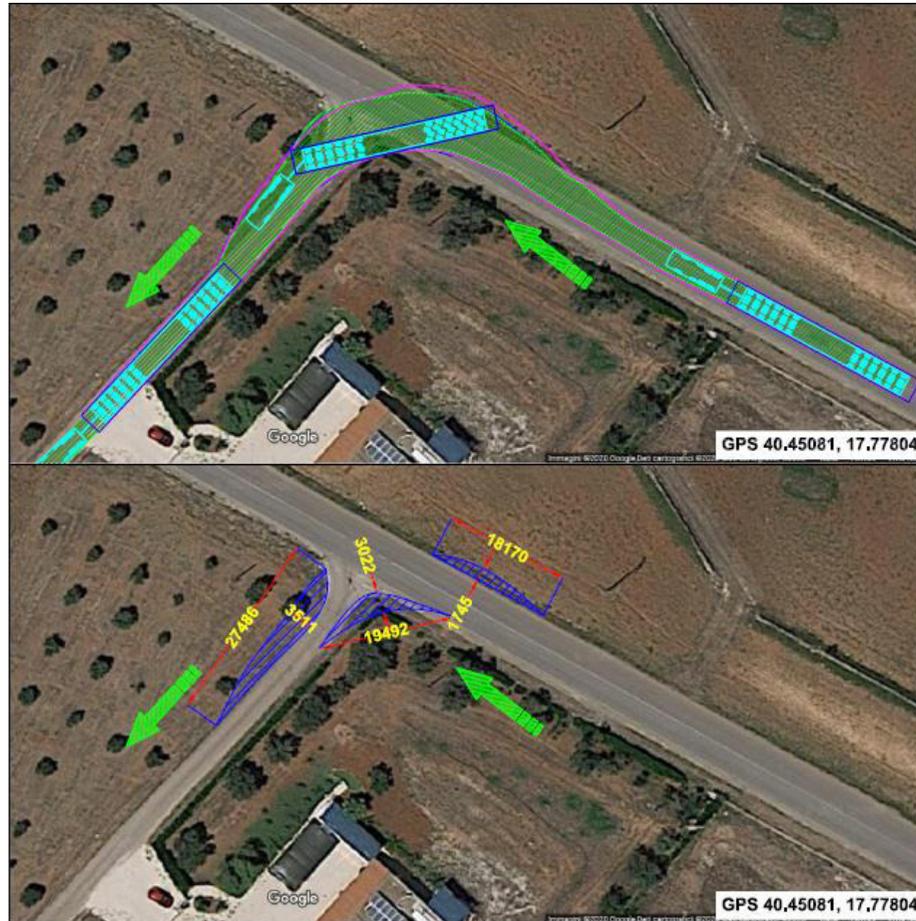


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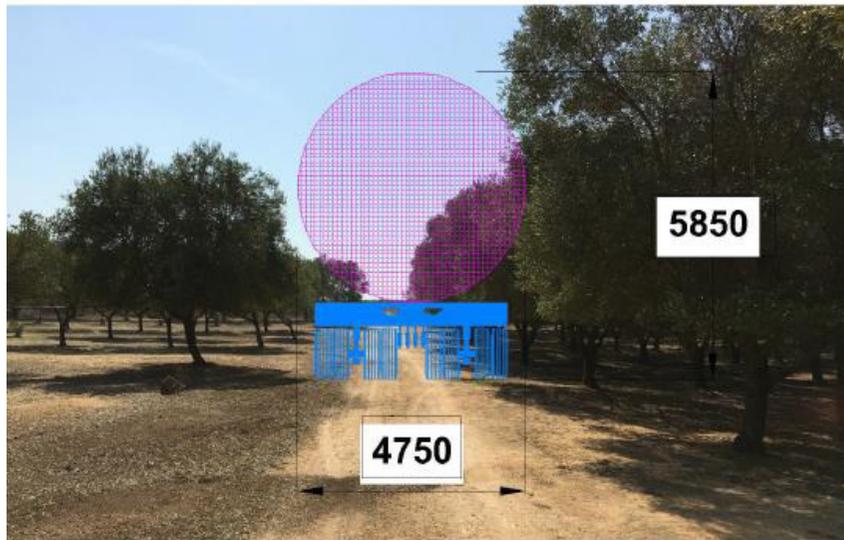
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ID 09	SP 68 (GPS position 40.45081, 17.77804)	<p>ADJUSTMENT REQUIRED</p> <p>The highlighted area shall be suitable for transit : levelled ground and obstacle free.</p> <p>Curve to be enlarged and compacted /obstacle removal required.</p> <p>Preliminary road adjustments details as per following picture.</p>
		

ID 09 SP 68 (GPS position 40.45081, 17.77804)



START UNPAVED ROAD - (GPS position 40.44659, 17.77303)



DRIVING ON GRAVEL ROADS REQUIRED

ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be enlarged and compacted /obstacle and vegetation removal required.

These conditions must be re-checked near the start of the transport and adapt the route to the measures indicated.

ID 10	(GPS position 40.44714, 17.7654)		DRIVING ON GRAVEL ROADS REQUIRED
			ADJUSTMENT REQUIRED
			The highlighted area shall be suitable for transit : levelled ground and obstacle free.
			Curve to be enlarged and compacted /obstacle removal required.
			Preliminary road adjustments details as per following picture.

ID 10 (GPS position 40.44714, 17.7654)



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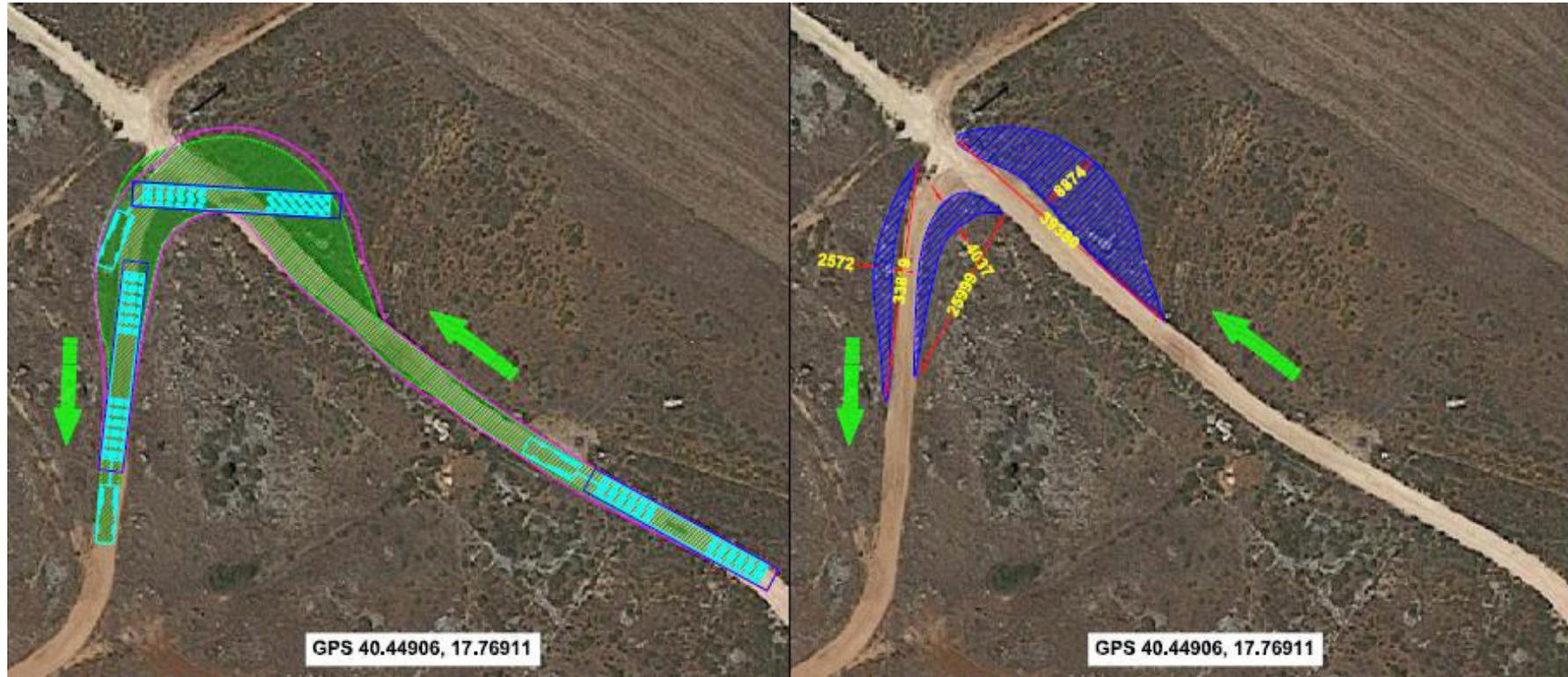


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ID 11	(GPS position 40.44906, 17.76911)	 A photograph of a dirt road in a field. The road is light brown and curves to the right. Two areas of the road and surrounding field are highlighted in bright green. A black arrow points to the curve. In the background, there are utility poles and a clear blue sky.	<p>DRIVING ON GRAVEL ROADS REQUIRED</p> <p>ADJUSTMENT REQUIRED</p> <p>The highlighted area shall be suitable for transit : levelled ground and obstacle free.</p> <p>Curve to be enlarged and compacted.</p> <p>Preliminary road adjustments details as per following picture.</p>
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ID 11 (GPS position 40.44906, 17.76911)



ID 12 (GPS position 40.44714, 17.7654)



DRIVING ON GRAVEL ROADS REQUIRED

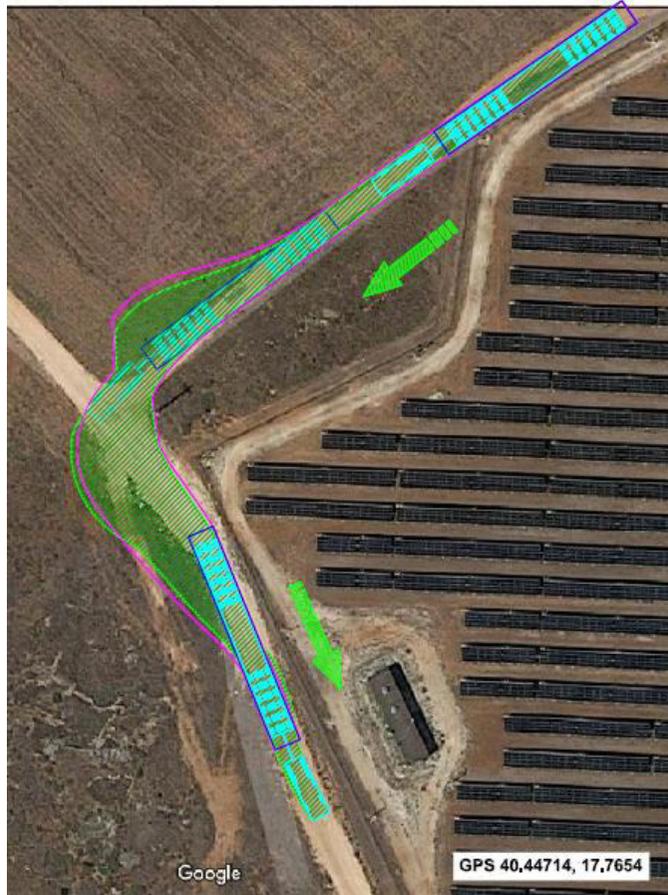
ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be enlarged and compacted.

Preliminary road adjustments details as per following picture.

ID 12 (GPS position 40.44714, 17.7654)



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ID 13	<p>(GPS position 40.44158, 17.7716)</p> 	<p>DRIVING ON GRAVEL ROADS REQUIRED</p> <p>ADJUSTMENT REQUIRED</p> <p>The highlighted area shall be suitable for transit : levelled ground and obstacle free.</p> <p>Curve to be enlarged and compacted.</p> <p>Preliminary road adjustments details as per following picture.</p>
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ID 13 (GPS position 40.44158, 17.7716)



ID 14 (GPS position 40.43047, 17.7833)



DRIVING ON GRAVEL ROADS REQUIRED

ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be enlarged and compacted /Obstacle removal required.

Preliminary road adjustments details as per following picture.

ID 14 (GPS position 40.43047, 17.7833)



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END UNPAVED ROAD - (GPS position 40.41566, 17.80166)

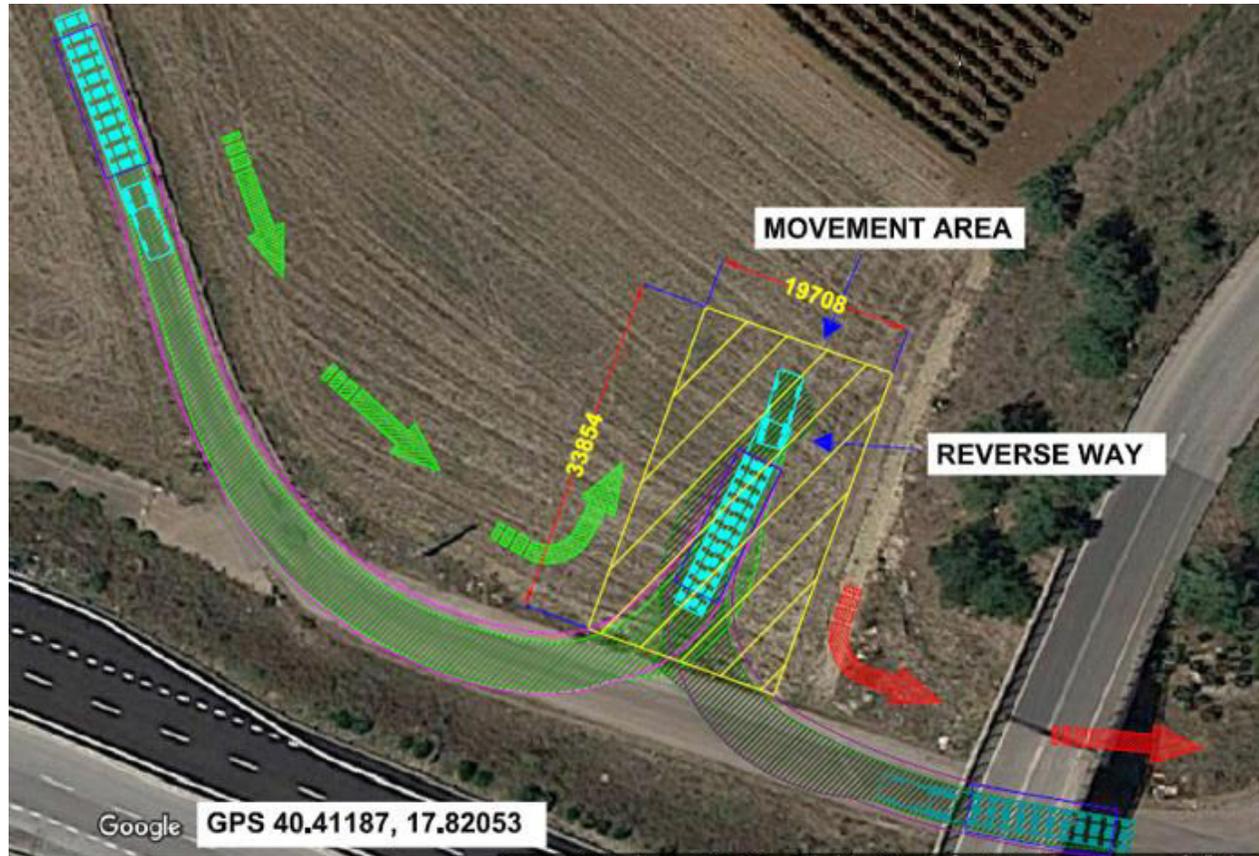


DRIVING ON GRAVEL ROADS REQUIRED

End of the impervious route on a gravel road, which goes from GPS point 40.44659, 17.77303 to GPS point 40.41566, 17.80166.

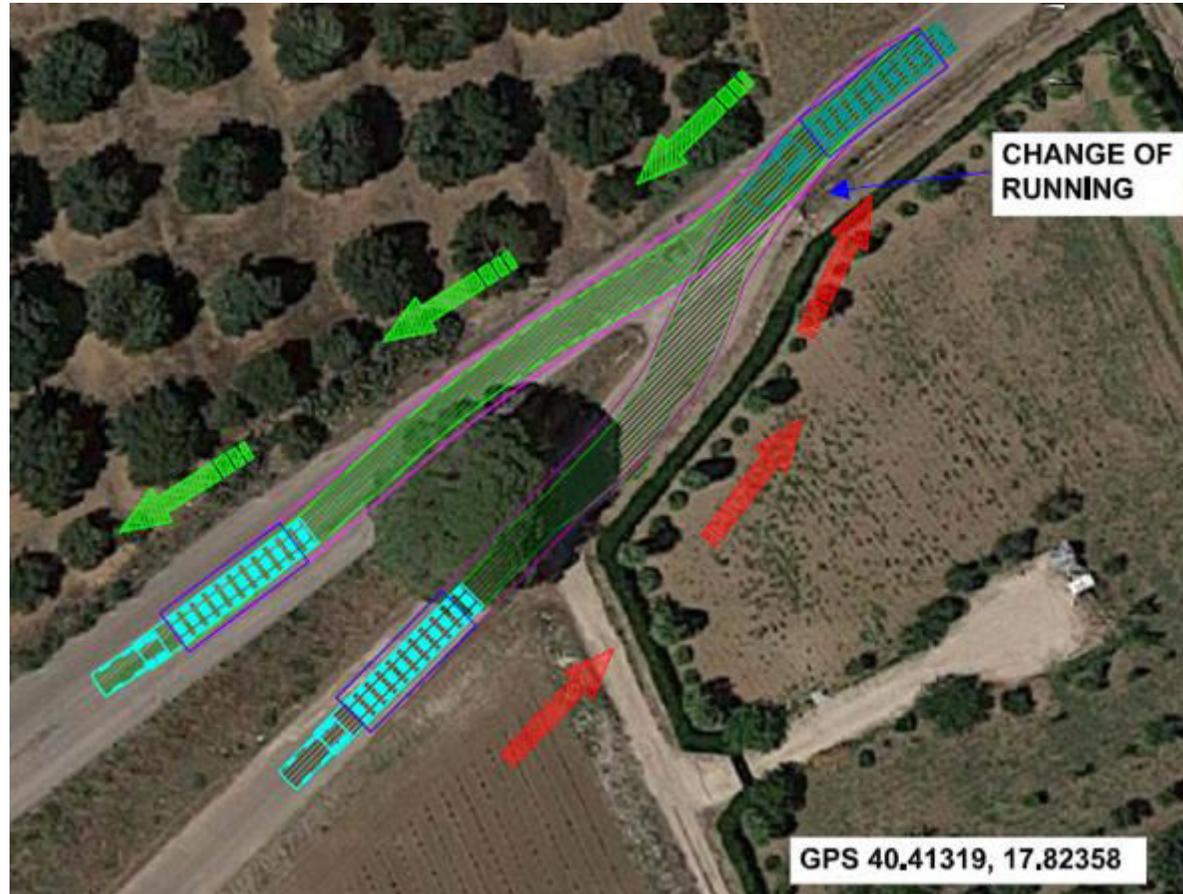
ID 15	(GPS position 40.41187, 17.82053)  <p>A photograph showing a road leading to a bridge. A yellow rectangular area is highlighted on the left side of the road, with a black arrow pointing to it from the text 'AREA FOR REVERSING DIRECTION'. A larger black arrow points to a curve in the road ahead.</p>	ADJUSTMENT REQUIRED The highlighted area shall be suitable for transit : levelled ground and obstacle free. Curve to be enlarged and compacted. Preliminary road adjustments details as per following picture.
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ID 15 (GPS position 40.41187, 17.82053)



ID 16	SP65 - (GPS position 40.41319, 17.82358) - CHANGE OF RUNNING 	<p>DRIVING REVERSE REQUIRED</p> <p>ADJUSTMENT REQUIRED</p> <p>The area shall be suitable for transit: levelled ground and obstacle free.</p> <p>Curve to be enlarged and compacted/ tree trimming.</p> <p>Preliminary road adjustments details as per following picture.</p>
-------	---	--

ID 16 SP65 - (GPS position 40.41319, 17.82358)



ID 17 (GPS position 40.40788, 17.81919)



ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be enlarged and compacted/
Obstacle removal required.

Preliminary road adjustments details as per following picture.

ID 17 (GPS position 40.40788, 17.81919)



ID 18	<p>(GPS position 40.40351, 17.82261)</p> 	<p>ADJUSTMENT REQUIRED</p> <p>The highlighted area shall be suitable for transit : levelled ground and obstacle free.</p> <p>Curve to be enlarged and compacted.</p> <p>Preliminary road adjustments details as per following picture.</p>
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ID 19 (GPS position 40.36986, 17.80779) - SITE ENTRY 1



DRIVING ON GRAVEL ROADS REQUIRED TO REACH ENTRANCE GATE 1

ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be enlarged and compacted.

Preliminary road adjustments details as per following picture.

ROUTE TO ENTRANCE GATE 1 FINISHED

ID 20 (GPS position 40.40351, 17.82261) – proceeding to Entrance Gate 2



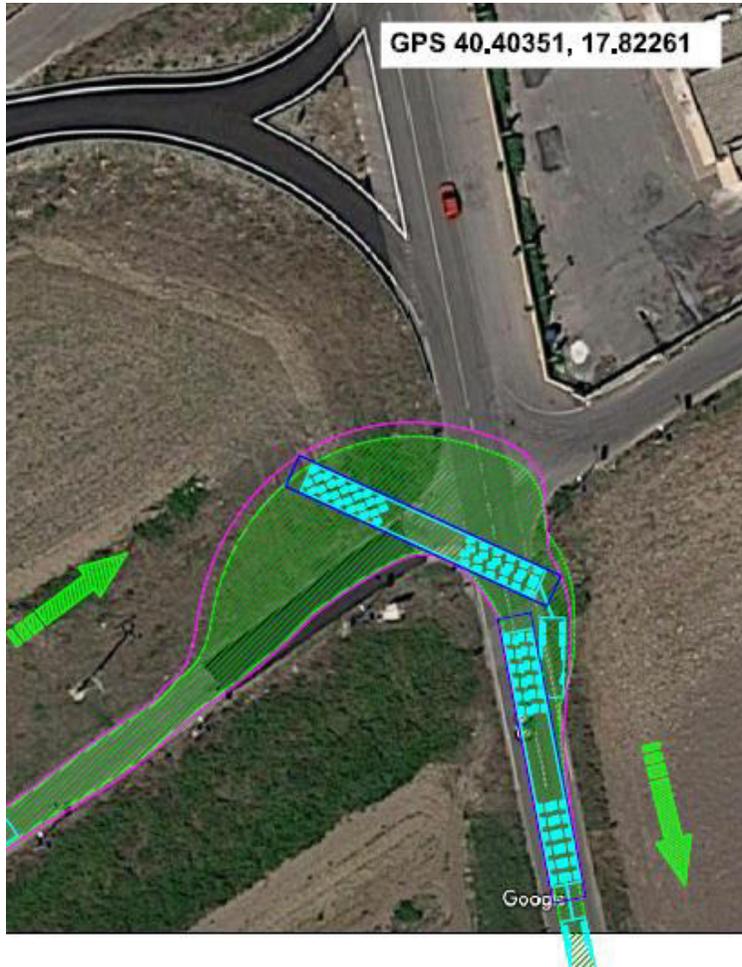
ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be enlarged and compacted.

Preliminary road adjustments details as per following picture.

ID 20 (GPS position 40.40351, 17.82261) - proceeding to Entrance Gate 2



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ID 22 (GPS position 40.39594, 17.82156)- SITE ENTRY 2



ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be enlarged and compacted.

Preliminary road adjustments details as per following picture.

ROUTE TO ENTRANCE GATE 2 FINISHED

ID 22 (GPS position 40.39594, 17.82156)- SITE ENTRY 2



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BLADES

The blades routing from Taranto port to Salice - Veglie Wind Farm has several critical points. The following pages provide the main road adjustments required in order to get the Salice - Veglie WF Enter Gate.

The GPS position of Salice - Veglie WF Enter GateS has been considered are:

- Entry 1: 40.39594, 17.82156.
- Entry 2: 40.36986, 17.80779.

In order to reach the Salice - Veglie WF Enter Gate it'll be required to use the blade lifter. SDB has evaluated to use a Transshipment Area near Salice - Veglie WF Enter Gate. The GPS position of Transshipment Area is 40.43737, 17.8114.

The road adjustments provided on the following pages are up to the Transshipment Area. From the Transshipment Area to Salice - Veglie WF Enter Gate the blade transport (by blade lifter) will have the same requirements of Towers - Nacelle - Drive Train - Hub.

Be it noted the blade transports are subject to check the blades' final transportation drawings, notably for the feasibility to use the blade lifter to reach each pitch-tower (i.e. final delivery place). The actual position of the centre of gravity of blades and other relevant technical details were unknown at time this survey has been realized. Due to this, the following technical information to be considered preliminary and subject to be confirmed once final technical drawings will be released by Client.

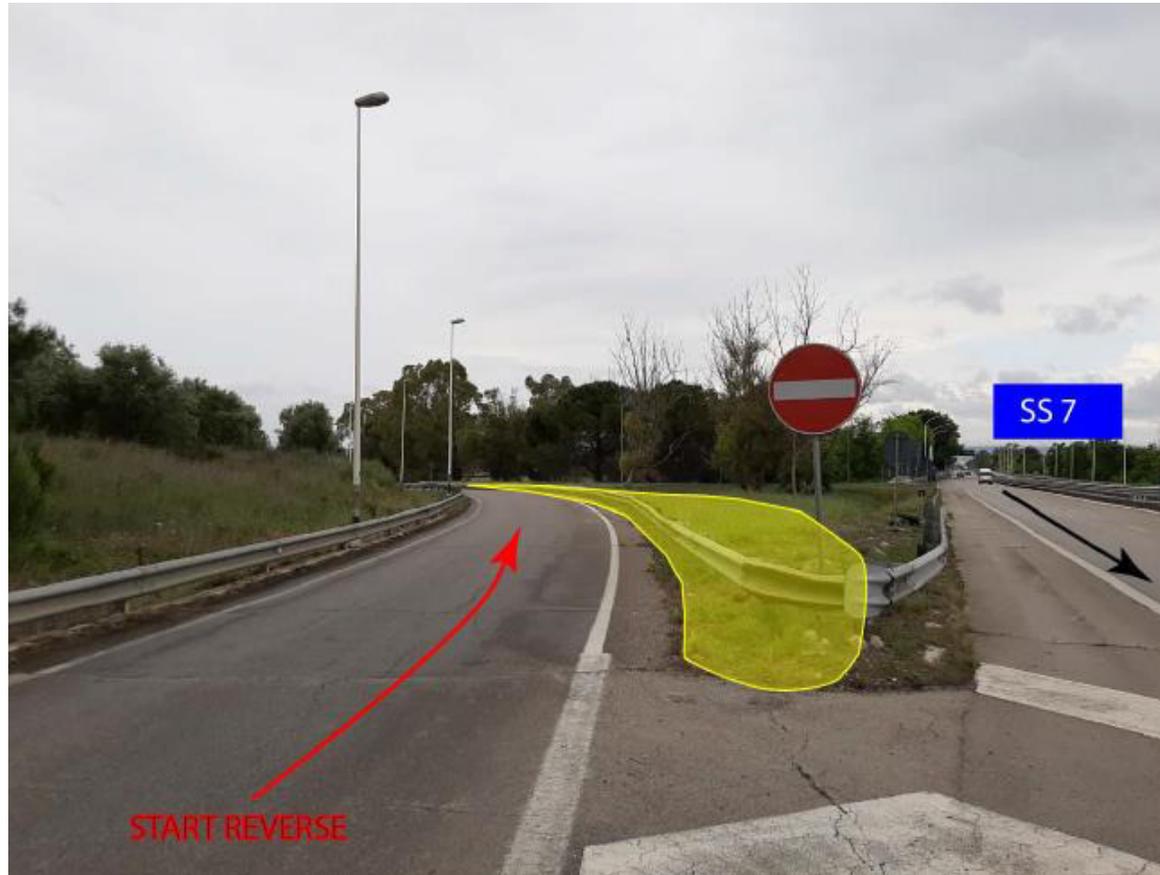
Prepared by Eng. Tech. Department

ID 21 Taranto port (GPS position 40.48076, 17.20819)

PORT EXIT - NORTH GATE



ID 22 SS7 (GPS position 40.52554, 17.4224)



START REVERSE DRIVE

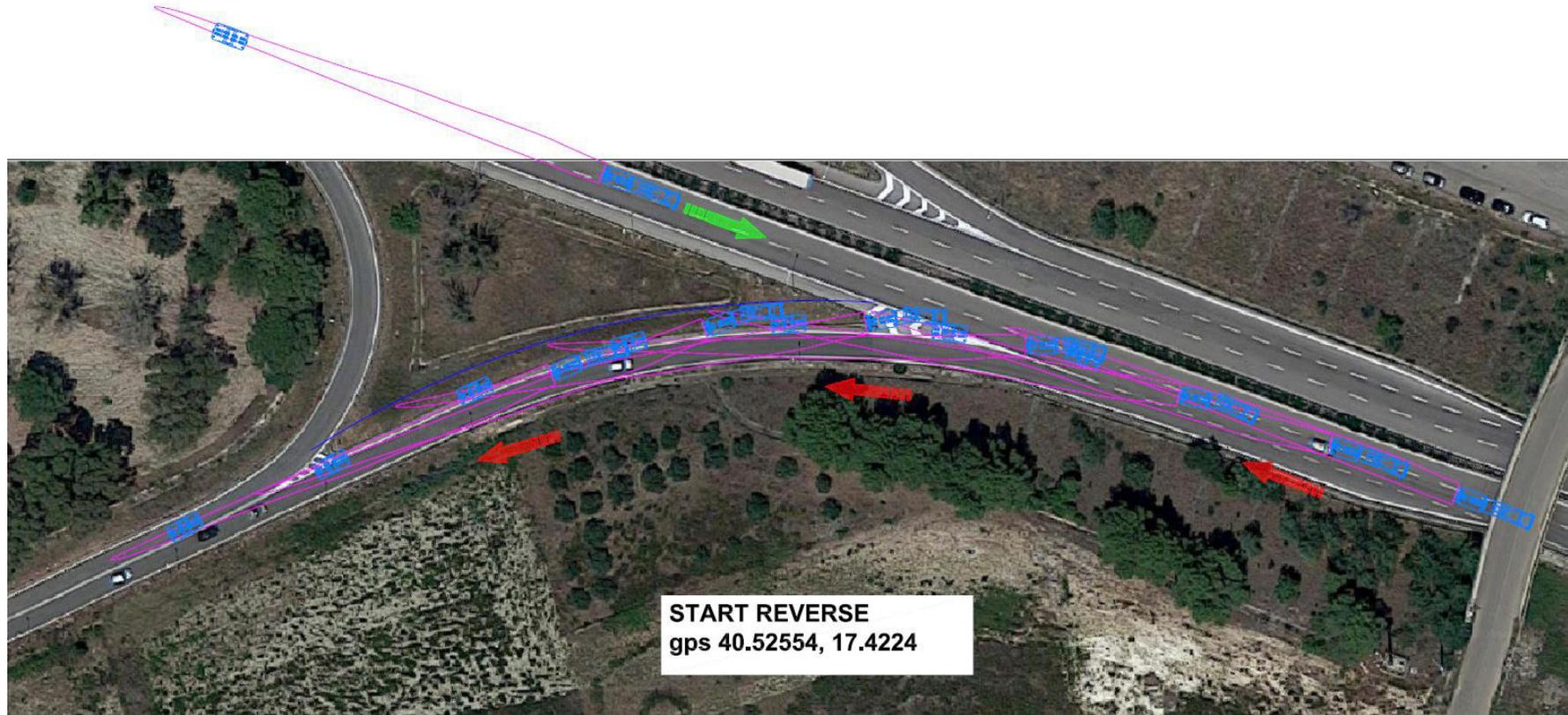
ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be enlarged / obstacle removal required.

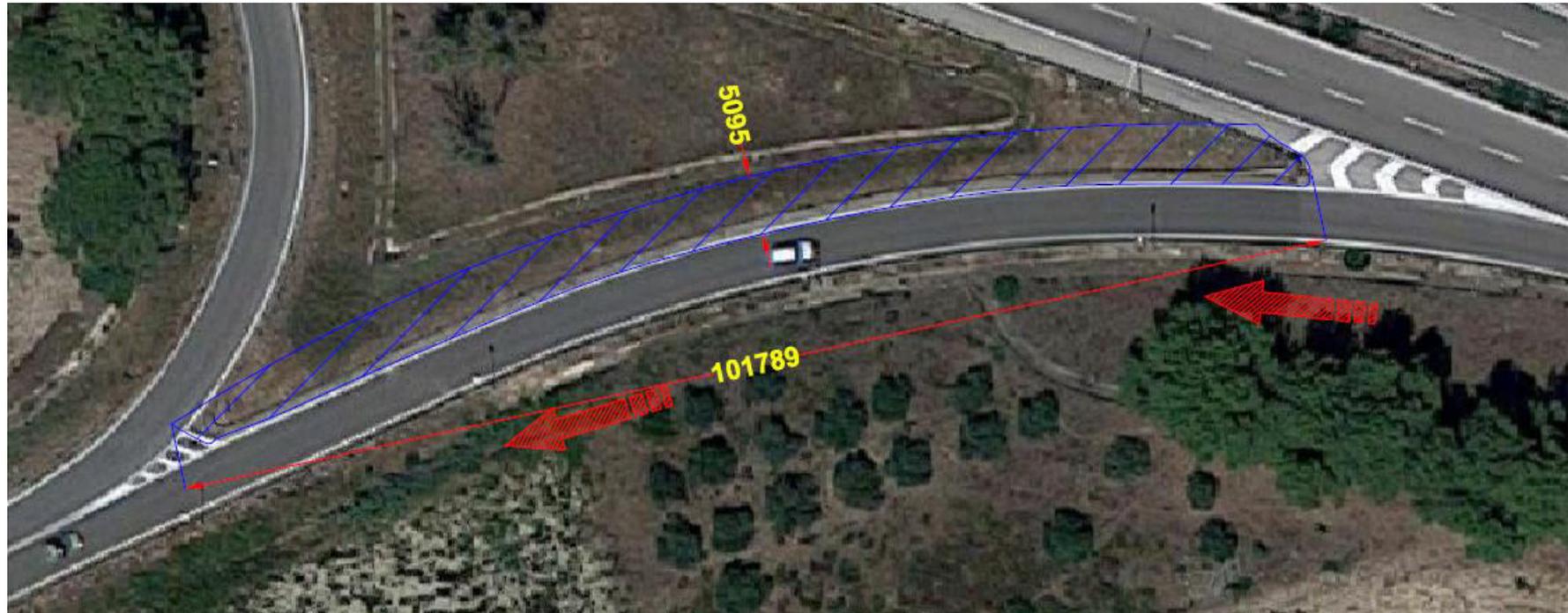
Preliminary road adjustments details as per following picture.

ID 22 SS7 (GPS position 40.52554, 17.4224) - ADJUSTMENT WORK REQUIRED (preliminary details)



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ID 22 SS7 (GPS position 40.52554, 17.4224) - ADJUSTMENT WORK REQUIRED (preliminary details)



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ID 23 SS7 (GPS position 40.52472, 17.41973) - ADJUSTMENT WORK REQUIRED (preliminary details)



REVERSE DRIVE CONTINUE

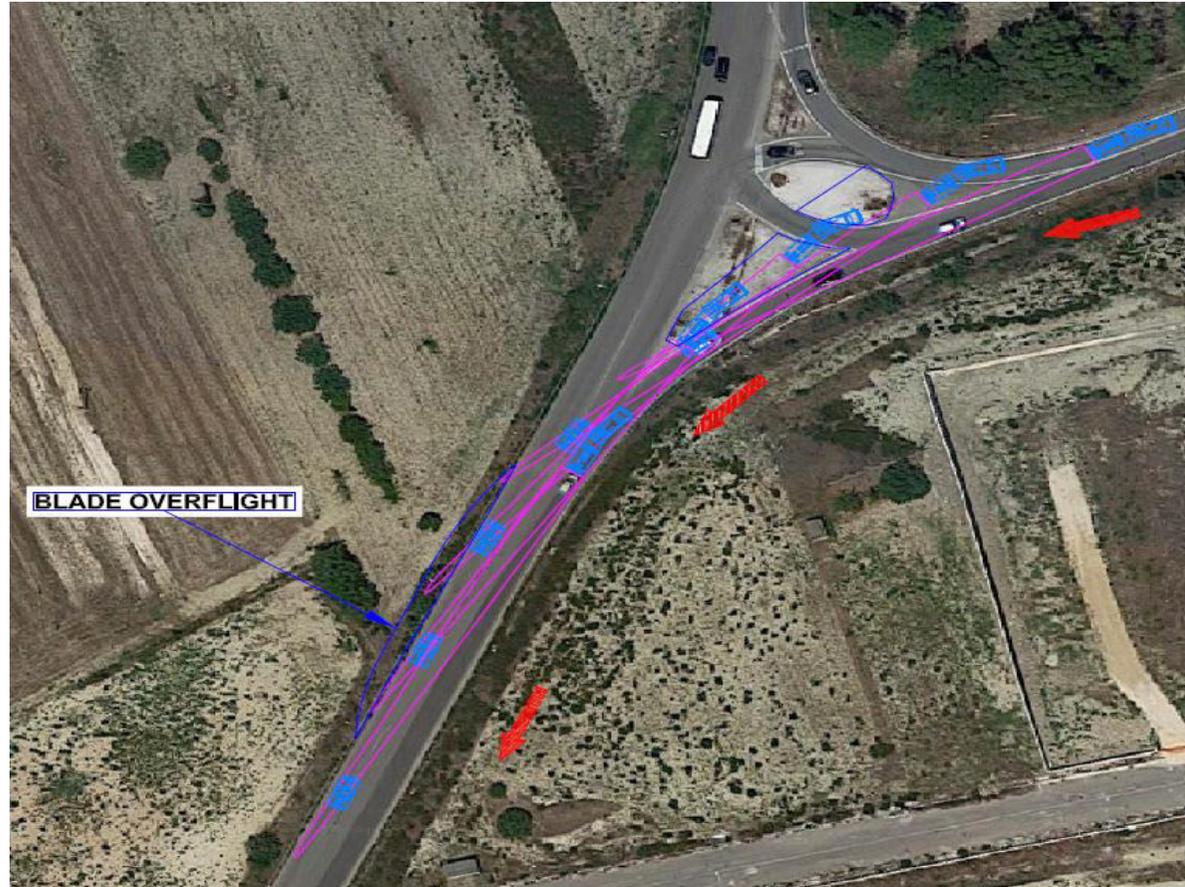
ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be enlarged / obstacle removal required.

Preliminary road adjustments details as per following picture.

ID 23 SS7 (GPS position 40.52472, 17.41973) - ADJUSTMENT WORK REQUIRED (preliminary details)



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ID 23 SS7 (GPS position 40.52472, 17.41973) - ADJUSTMENT WORK REQUIRED (preliminary details)



ID 23 SS7 (GPS position 40.52472, 17.41973) - ADJUSTMENT WORK REQUIRED (preliminary details)



ID 24 SS7 (GPS position 40.51309, 17.41244) - ADJUSTMENT WORK REQUIRED (preliminary details)



REVERSE DRIVE CONTINUE

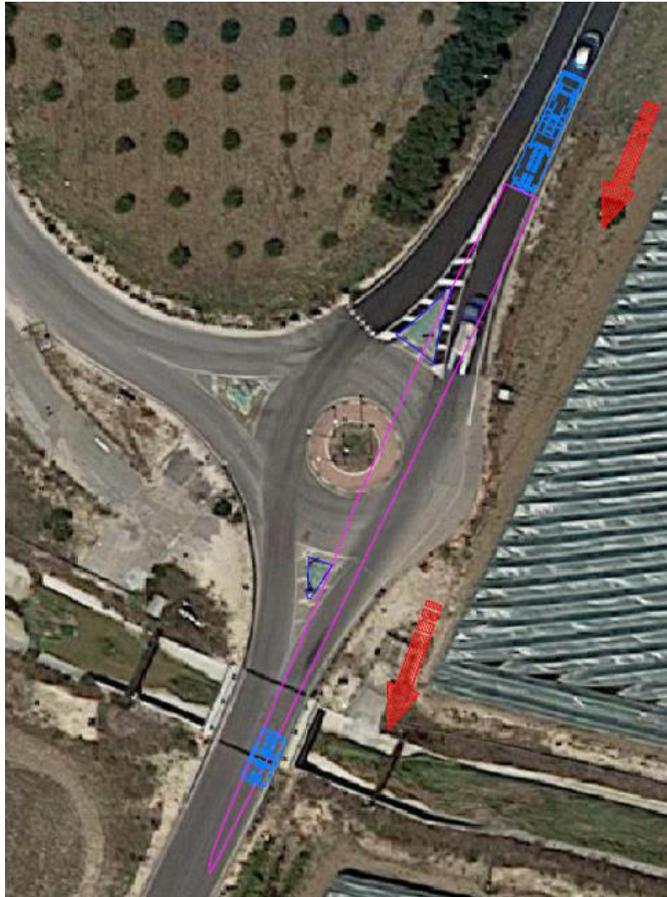
ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Roundabout to be enlarged / obstacle removal required.

Preliminary road adjustments details as per following picture.

ID 24 SS7 (GPS position 40.51309, 17.41244) - ADJUSTMENT WORK REQUIRED (preliminary details)



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ID 25 SS7 (GPS position 40.49807, 17.41195) - ADJUSTMENT WORK REQUIRED (preliminary details)



REVERSE DRIVE CONTINUE

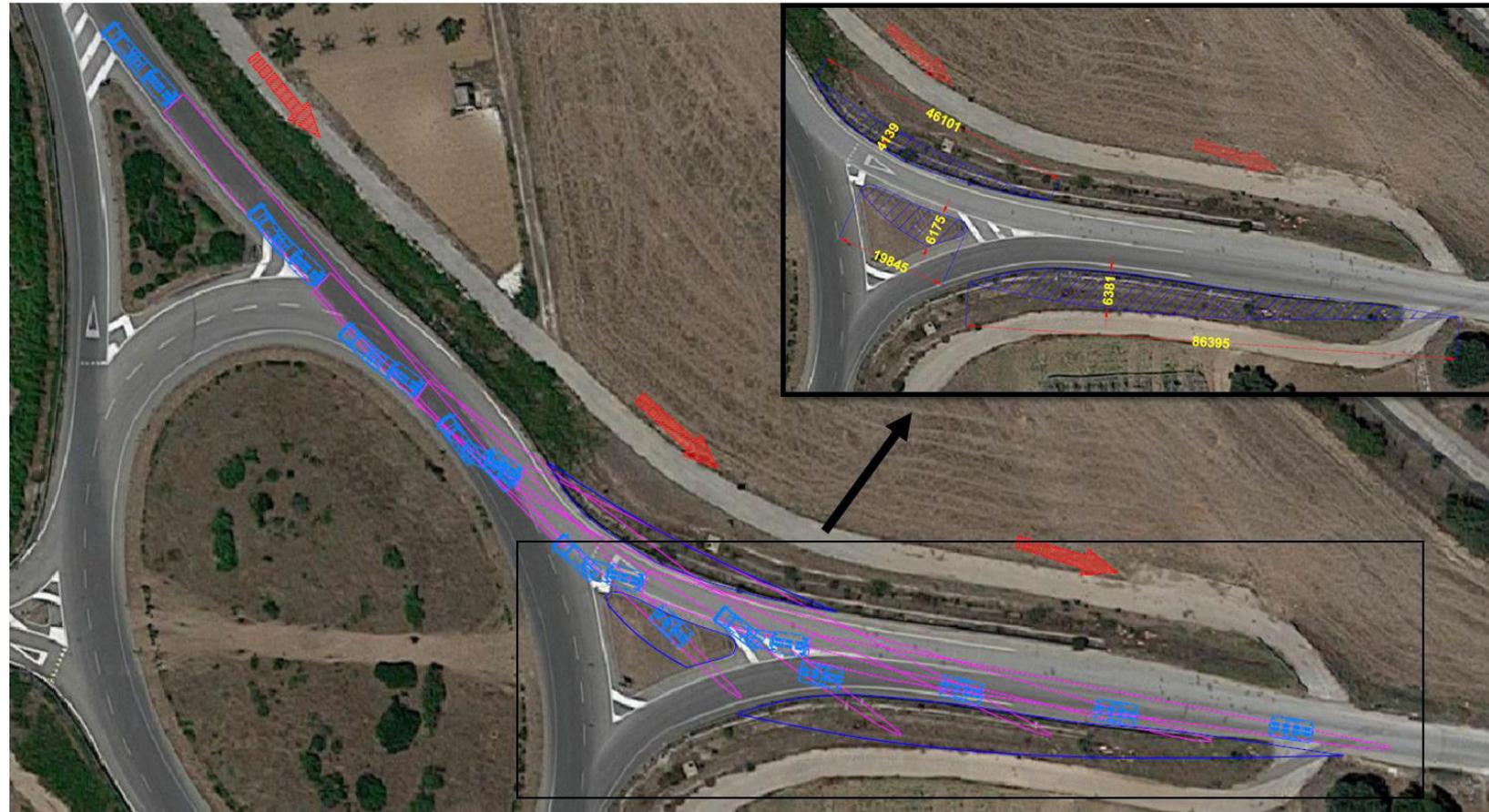
ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

External curve to be enlarged / obstacle removal required.

Preliminary road adjustments details as per following picture.

ID 25 SS7 (GPS position 40.49807, 17.41195) - ADJUSTMENT WORK REQUIRED (preliminary details)



ID 26 Strada Canale Simone (GPS position 40.49734, 17.41813) - ADJUSTMENT WORK REQUIRED (preliminary details)



REVERSE DRIVE CONTINUE

ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be enlarged / obstacle removal required.

Preliminary road adjustments details as per following picture.

ID 26 Strada Canale Simone (GPS position 40.49734, 17.41813) - ADJUSTMENT WORK REQUIRED (preliminary details)



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ID 26 Strada Canale Simone (GPS position 40.49734, 17.41813) - ADJUSTMENT WORK REQUIRED (preliminary details)



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ID 27 Strada Carosino-Grottaglie (GPS position 40.50613, 17.42323) - ADJUSTMENT WORK REQUIRED (preliminary details)



REVERSE DRIVE CONTINUE

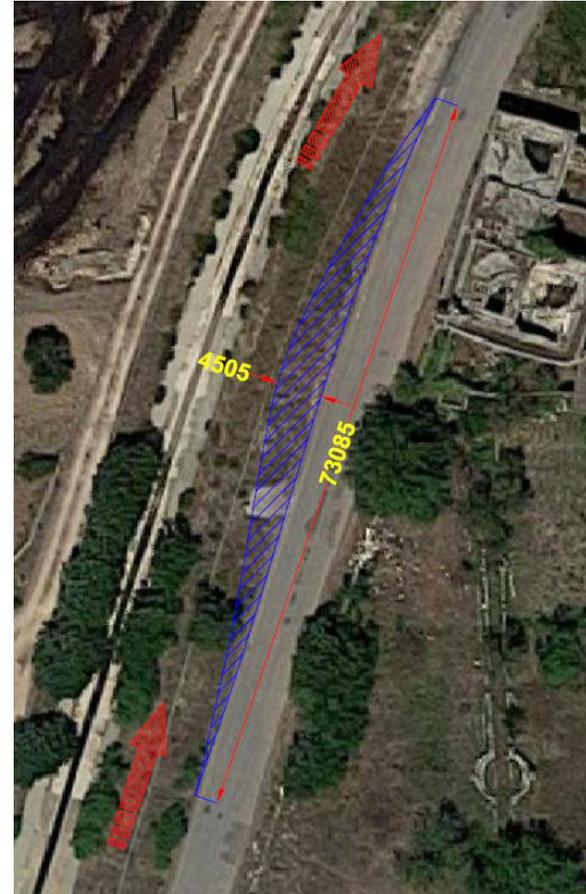
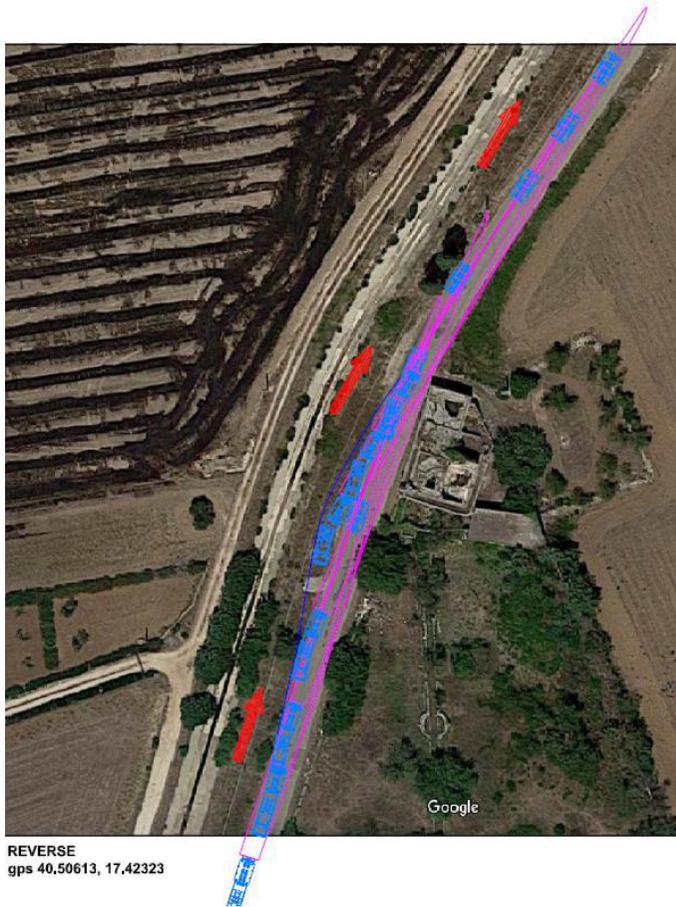
ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be enlarged / obstacle removal required.

Preliminary road adjustments details as per following picture.

ID 27 Strada Carosino-Grottaglie (GPS position 40.50613, 17.42323) - ADJUSTMENT WORK REQUIRED (preliminary details)



ID 28 Strada Carosino-Grottaglie (GPS position 40.51234, 17.42998) - ADJUSTMENT WORK REQUIRED (preliminary details)



REVERSE DRIVE CONTINUE

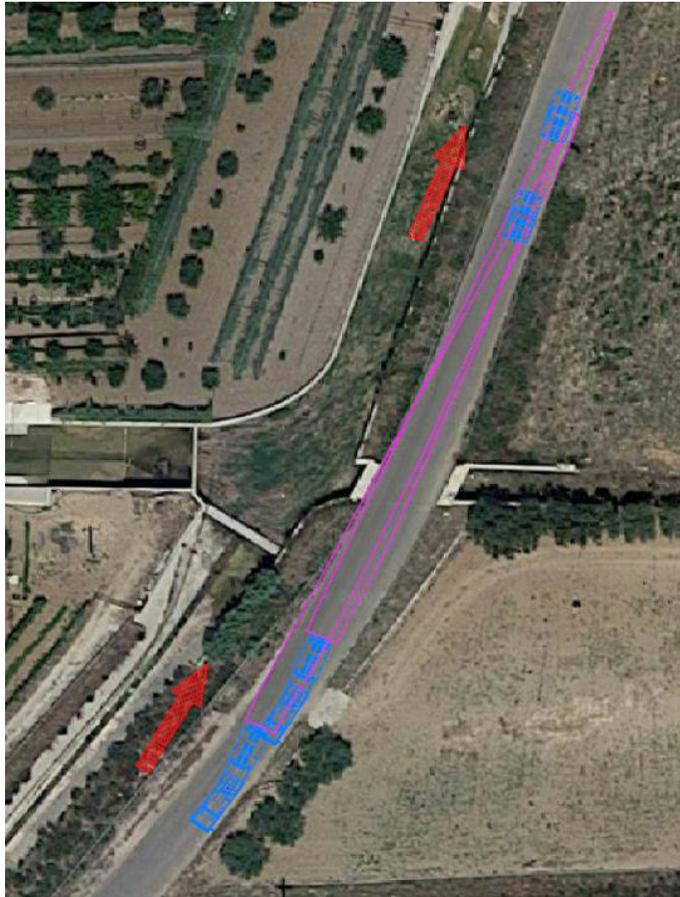
ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

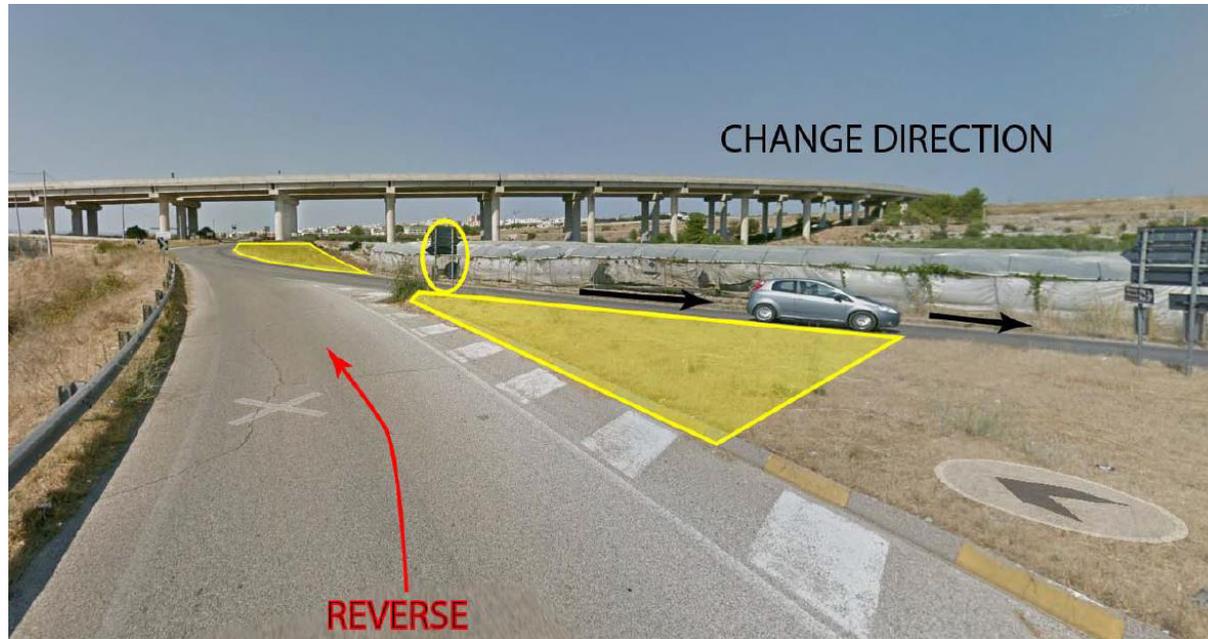
Curve to be enlarged / obstacle removal required.

Preliminary road adjustments details as per following picture.

ID 28 Strada Carosino-Grottaglie (GPS position 40.51234, 17.42998) - ADJUSTMENT WORK REQUIRED (preliminary details)



ID 29 SP 86 (GPS position 40.52095, 17.43223) - ADJUSTMENT WORK REQUIRED (preliminary details)



REVERSE DRIVE END

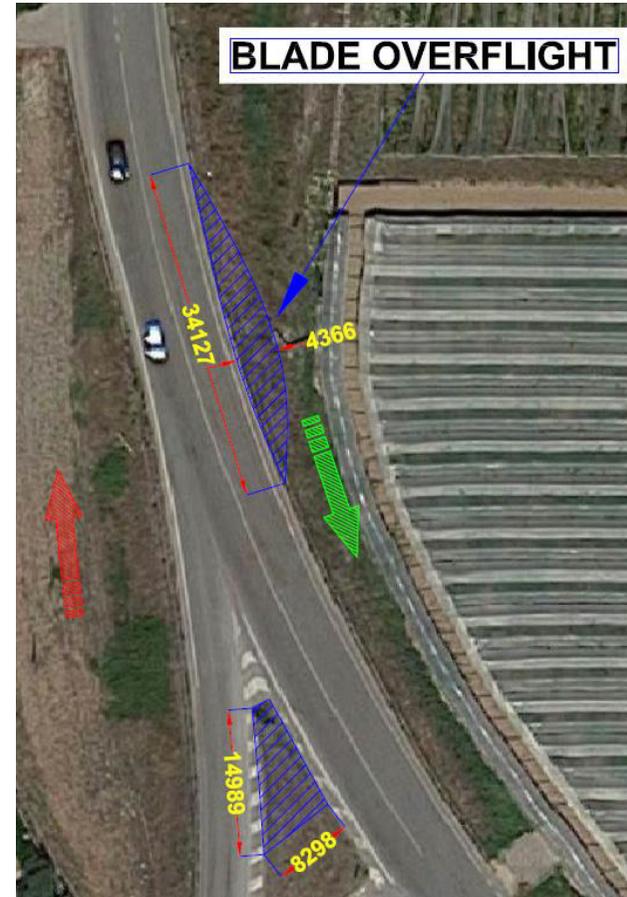
ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Intersection to be enlarged / obstacle removal required.

Preliminary road adjustments details as per following picture.

ID 29 SP 86 (GPS position 40.52095, 17.43223) - ADJUSTMENT WORK REQUIRED (preliminary details)



ID 30 SP 86 (GPS position 40.51531, 17.44034) - ADJUSTMENT WORK REQUIRED (preliminary details)



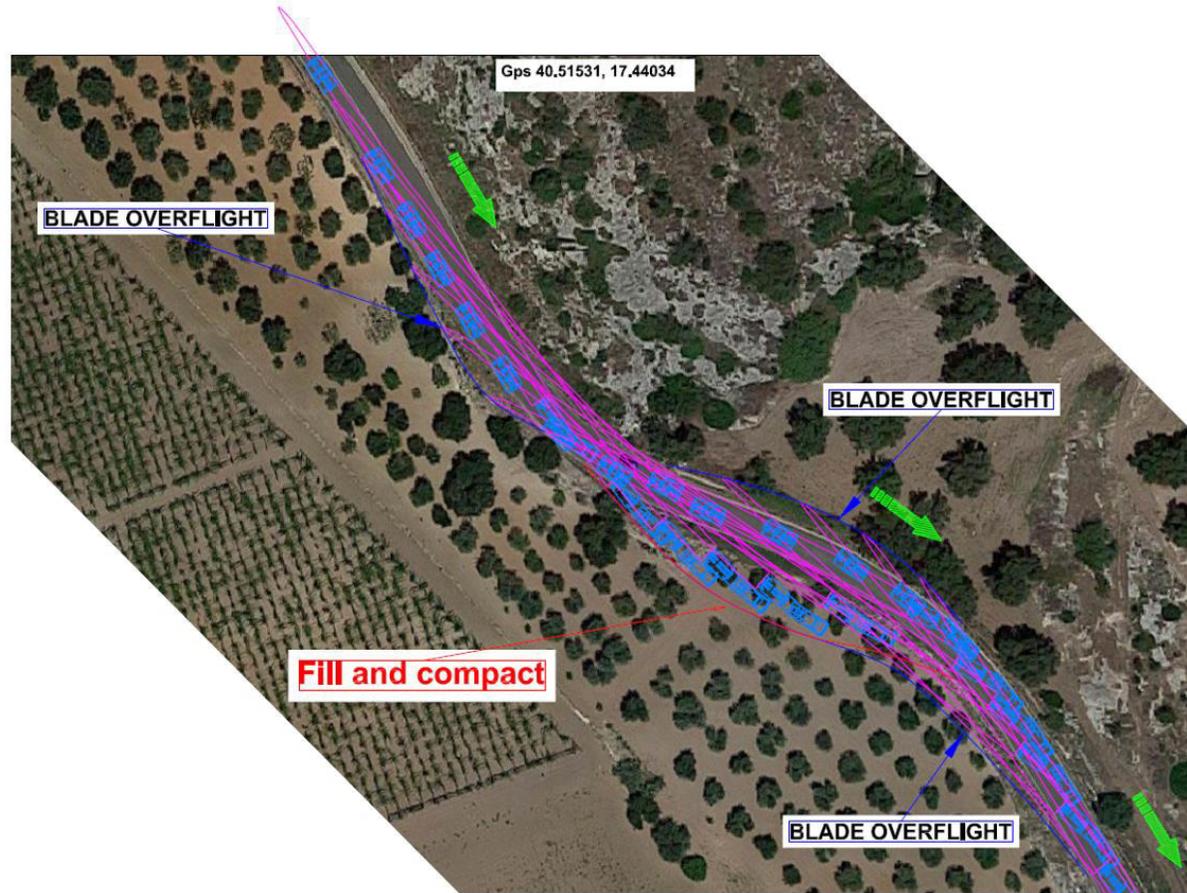
ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Road to be enlarged / obstacle removal and tree trimming required.

Preliminary road adjustments details as per following picture.

ID 30 SP 86 (GPS position 40.51531, 17.44034) - ADJUSTMENT WORK REQUIRED (preliminary details)



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ID 30 SP 86 (GPS position 40.51531, 17.44034) - ADJUSTMENT WORK REQUIRED (preliminary details)

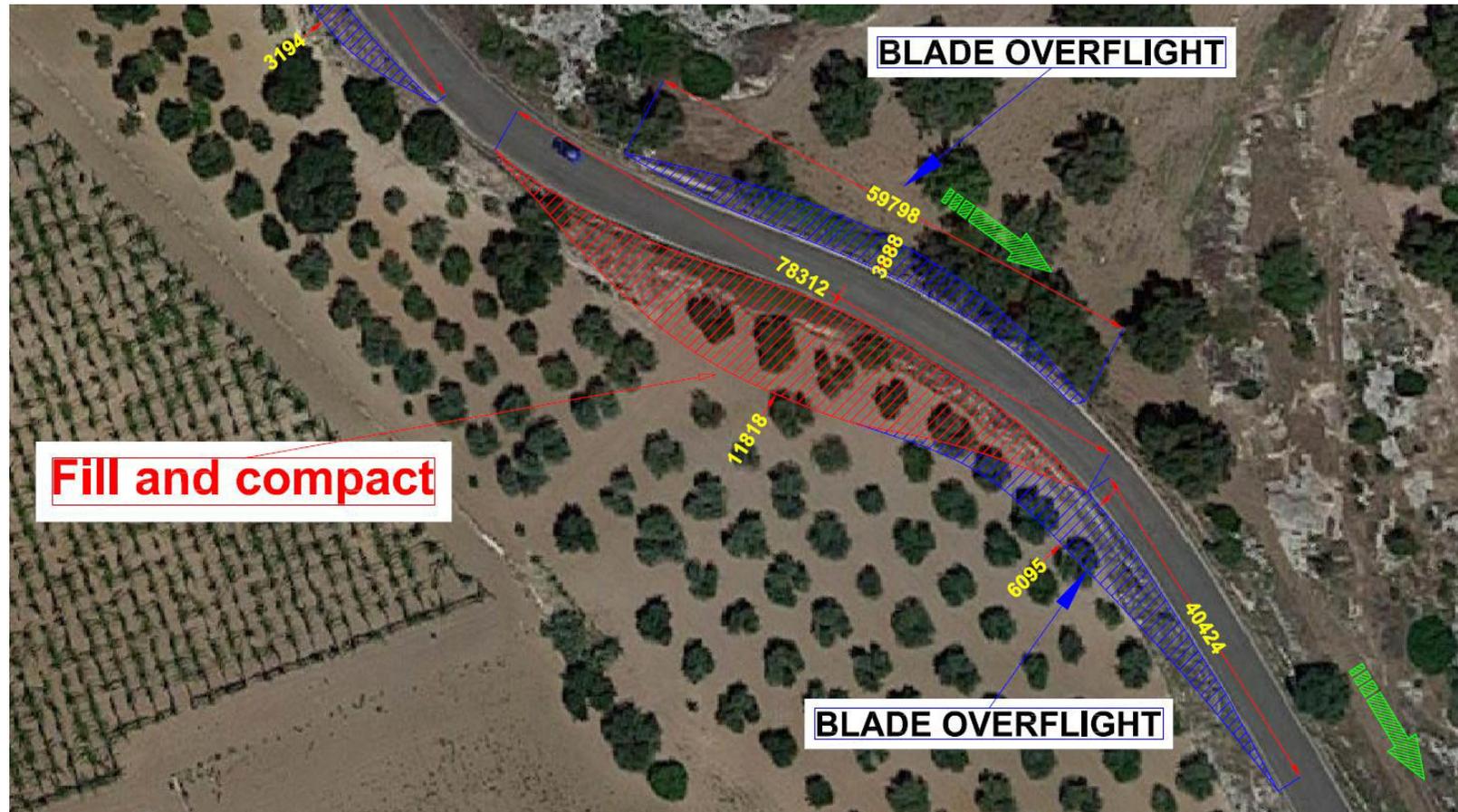


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ID 30 SP 86 (GPS position 40.51531, 17.44034) - ADJUSTMENT WORK REQUIRED (preliminary details)



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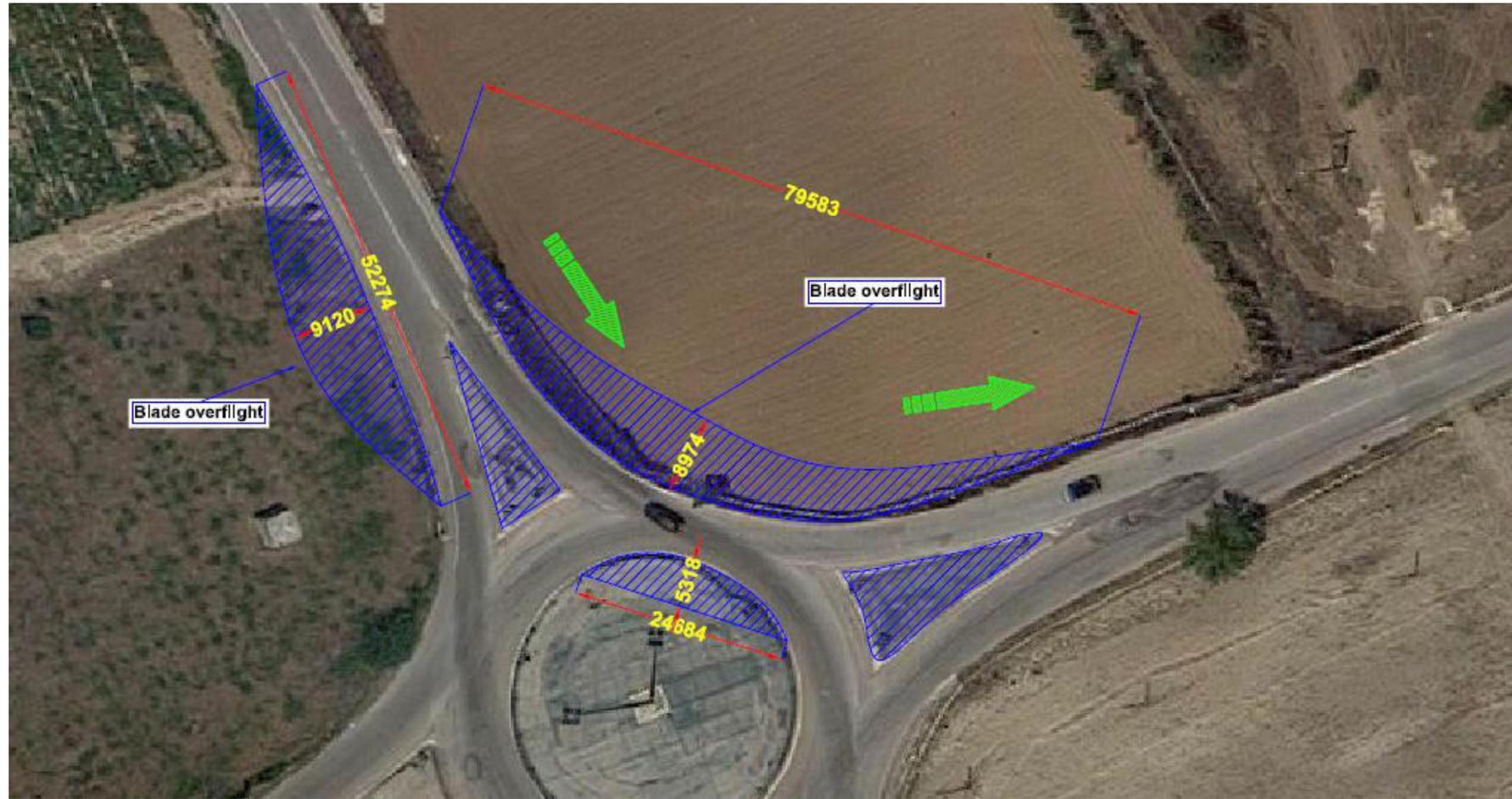
ID 31	<p>SP 86- SS 603 (GPS position 40.48615, 17.46148) - ADJUSTMENT WORK REQUIRED (preliminary details)</p> 	<p>ADJUSTMENT REQUIRED</p> <p>The highlighted area shall be suitable for transit : levelled ground and obstacle free.</p> <p>Roundabout to be enlarged / obstacle removal required.</p> <p>Preliminary road adjustments details as per following picture.</p>
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ID 31 SP 86- SS 603 (GPS position 40.48615, 17.46148) - ADJUSTMENT WORK REQUIRED (preliminary details)



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ID 31 SP 86- SS 603 (GPS position 40.48615, 17.46148) - ADJUSTMENT WORK REQUIRED (preliminary details)



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ID 32 SP 603 – SP 55 (GPS position 40.51729, 17.56072) - ADJUSTMENT WORK REQUIRED (preliminary details)



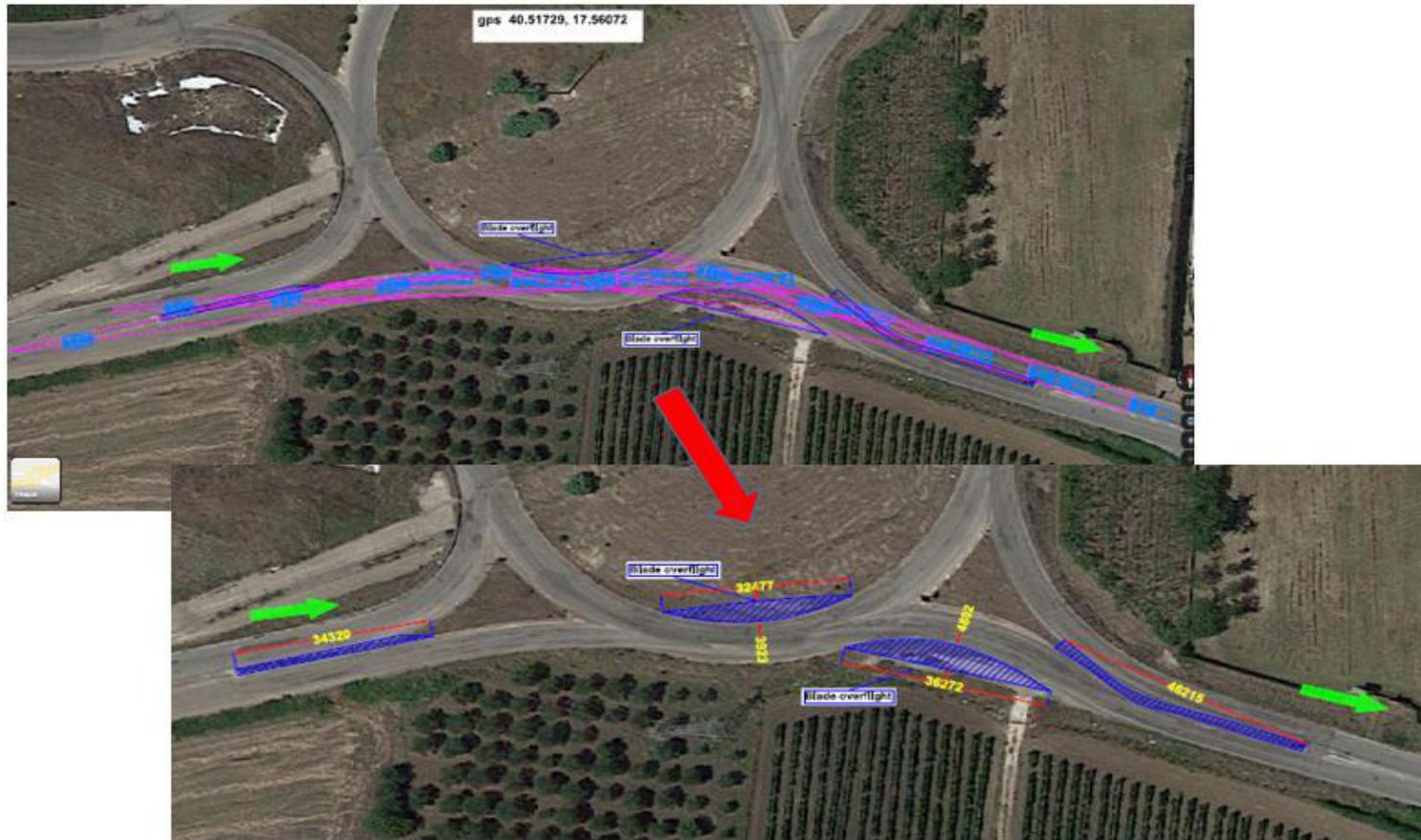
ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Obstacle removal required in order to make the highlighted area suitable for transit

Preliminary road adjustments details as per following picture.

ID 32 SP 603 - SP 55 (GPS position 40.51729, 17.56072) - ADJUSTMENT WORK REQUIRED (preliminary details)



ID 33 SP 55 (GPS position 40.51335, 17.58148) - ADJUSTMENT WORK REQUIRED (preliminary details)



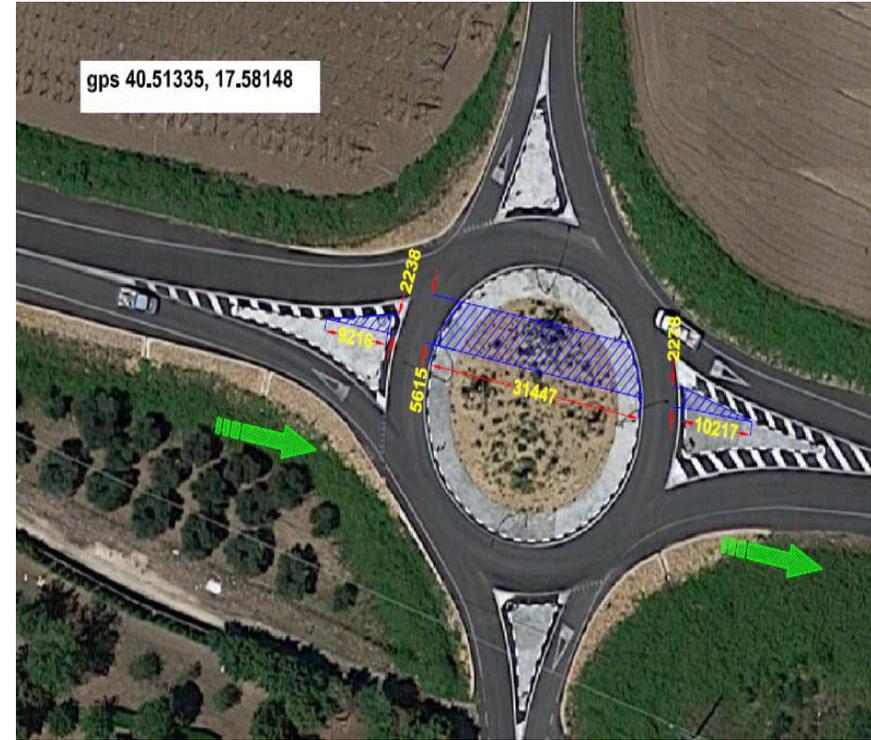
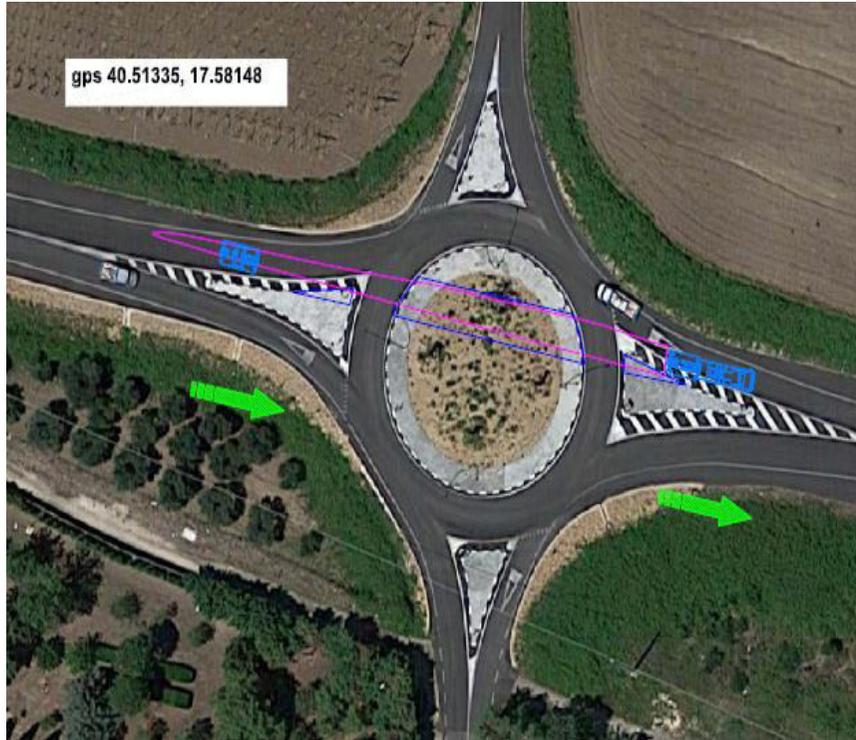
ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Roundabout to be enlarged / obstacle removal required.

Preliminary road adjustments details as per following picture.

ID 33 SP 55 (GPS position 40.51335, 17.58148) - ADJUSTMENT WORK REQUIRED (preliminary details)



ID 34 SP 55 (GPS position 40.51261, 17.58862)- ADJUSTMENT WORK REQUIRED (preliminary details)



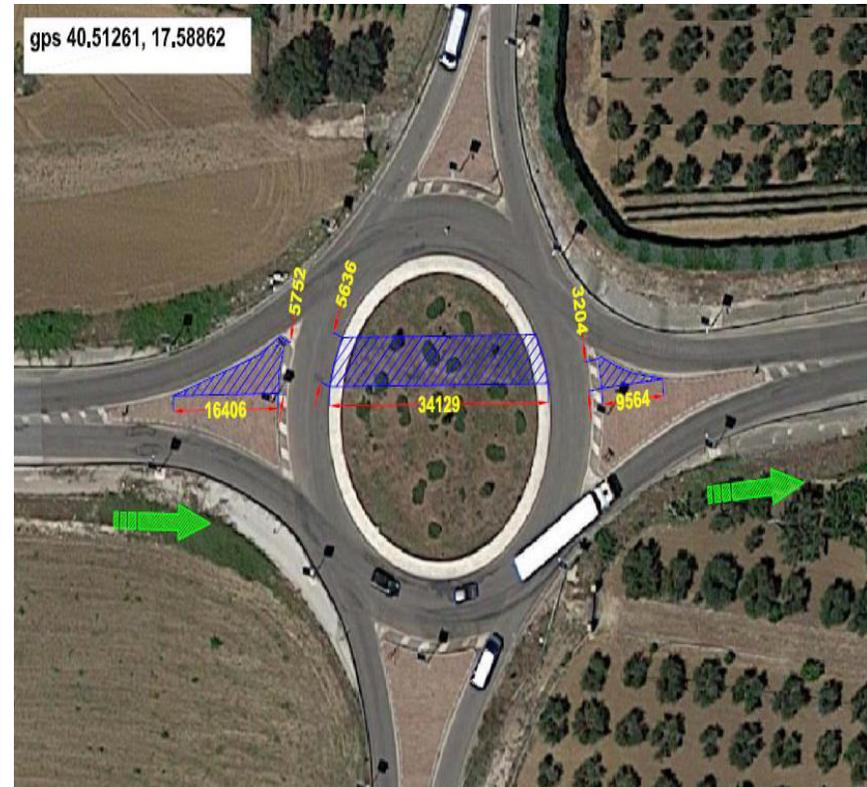
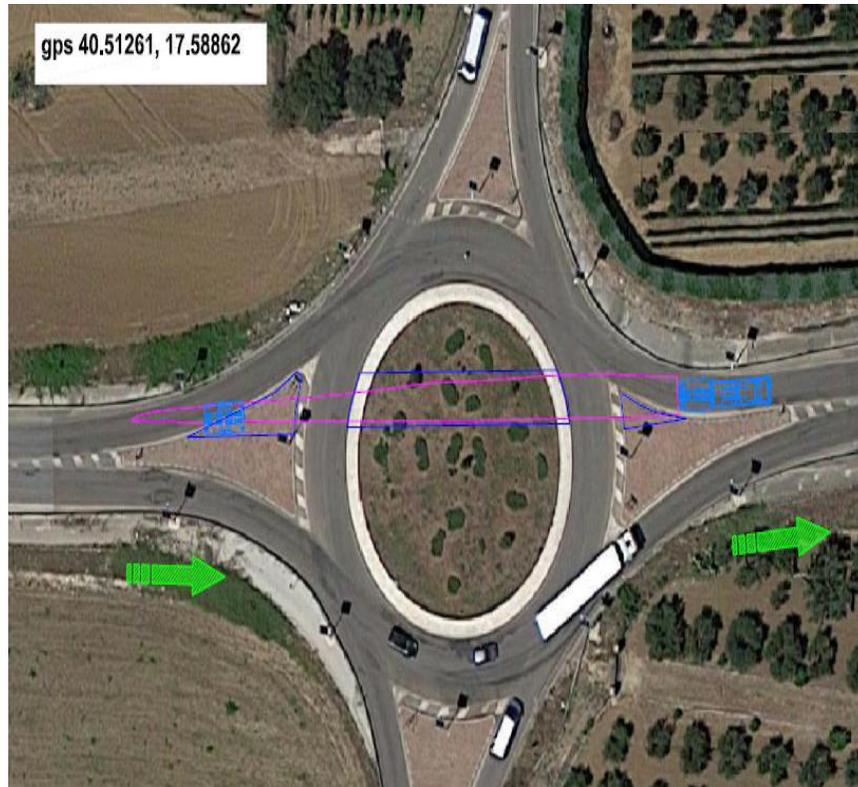
ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Roundabout to be enlarged / obstacle removal required.

Preliminary road adjustments details as per following picture.

ID 34 SP 55 (GPS position 40.51261, 17.58862)- ADJUSTMENT WORK REQUIRED (preliminary details)



ID 35 SP 55 – SP 56 (GPS position 40.51575, 17.61248) - ADJUSTMENT WORK REQUIRED (preliminary details)



ADJUSTMENT REQUIRED

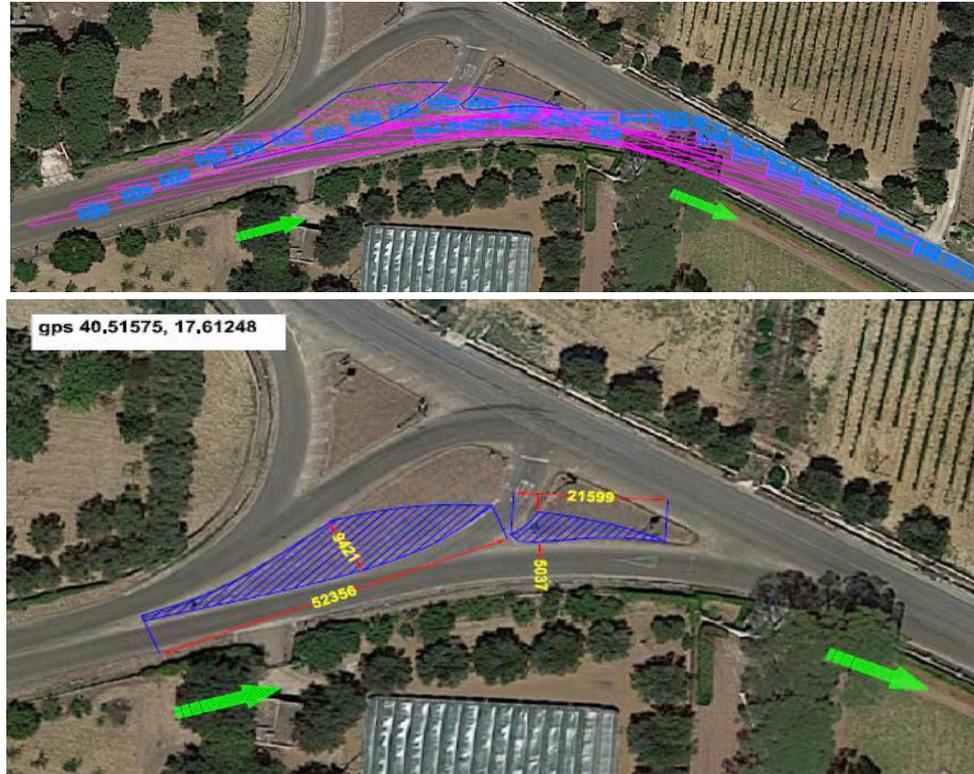
This area has been evaluated suitable to discharge the blade from the convoy and re-load onto blade lifter.

Road to be enlarged / obstacle removal required.

Preliminary road adjustments details as per following picture.

ID 35

SP 55 - SP 56 (GPS position 40.51575, 17.61248)



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ID 36

SP 51 (GPS position 40.50539, 17.63015) - ADJUSTMENT WORK REQUIRED (preliminary details)



ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be enlarged / obstacle removal required.

Preliminary road adjustments details as per following picture.

ID 36

SP 51 (GPS position 40.50539, 17.63015) - ADJUSTMENT WORK REQUIRED (preliminary details)



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ID 37

SP 51 (GPS position 40.49021, 17.64313) - ADJUSTMENT WORK REQUIRED (preliminary details)



ADJUSTMENT REQUIRED

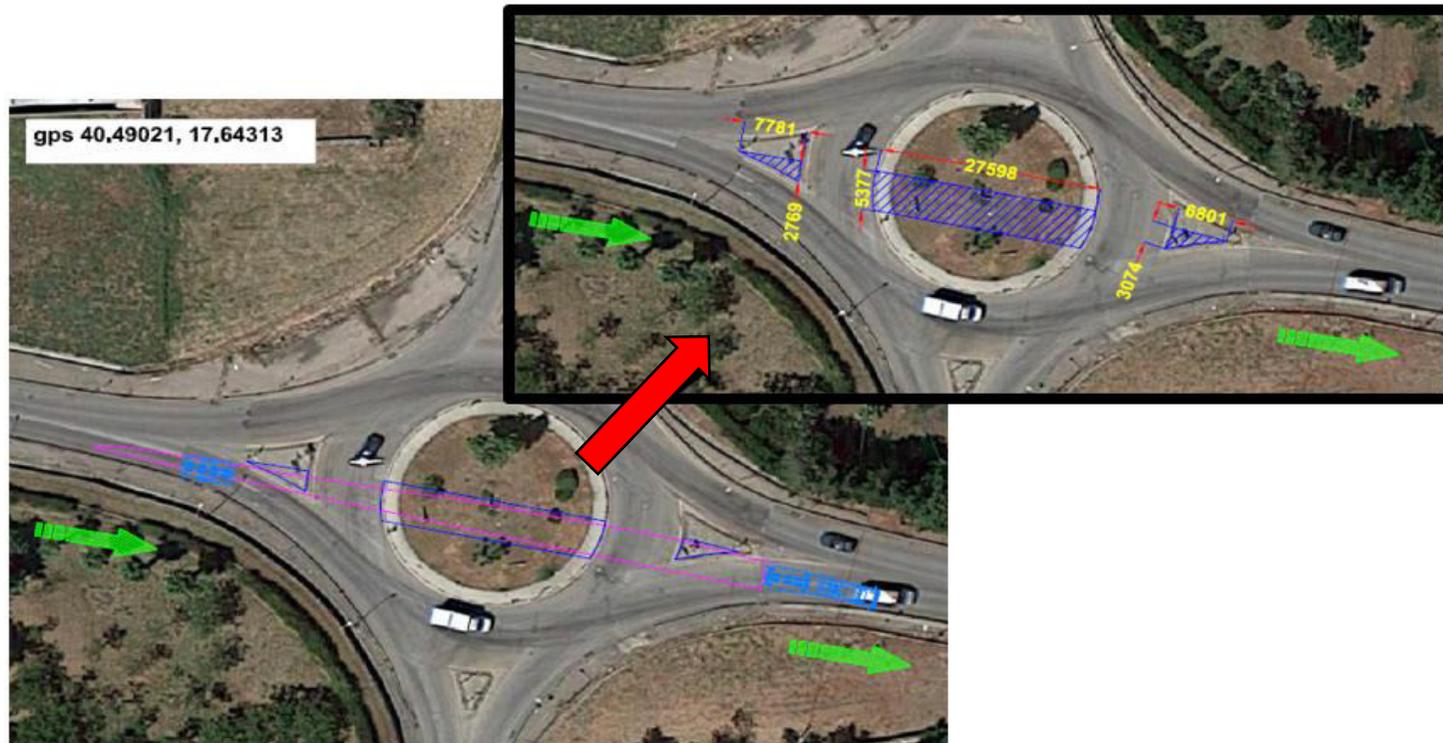
The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be enlarged / obstacle removal required.

Preliminary road adjustments details as per following picture.

ID 37

SP 51 (GPS position 40.49021, 17.64313)



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ID 38 SP 51 (GPS position 40.49782, 17.4155) - ADJUSTMENT WORK REQUIRED (preliminary details)



ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be enlarged / obstacle removal required.

Preliminary road adjustments details as per following picture.

ID 38 SP 51 (GPS position 40.49782, 17.4155) - ADJUSTMENT WORK REQUIRED (preliminary details)



ID 39 SP 51 (GPS position 40.49454, 17.7624) - ADJUSTMENT WORK REQUIRED (preliminary details)



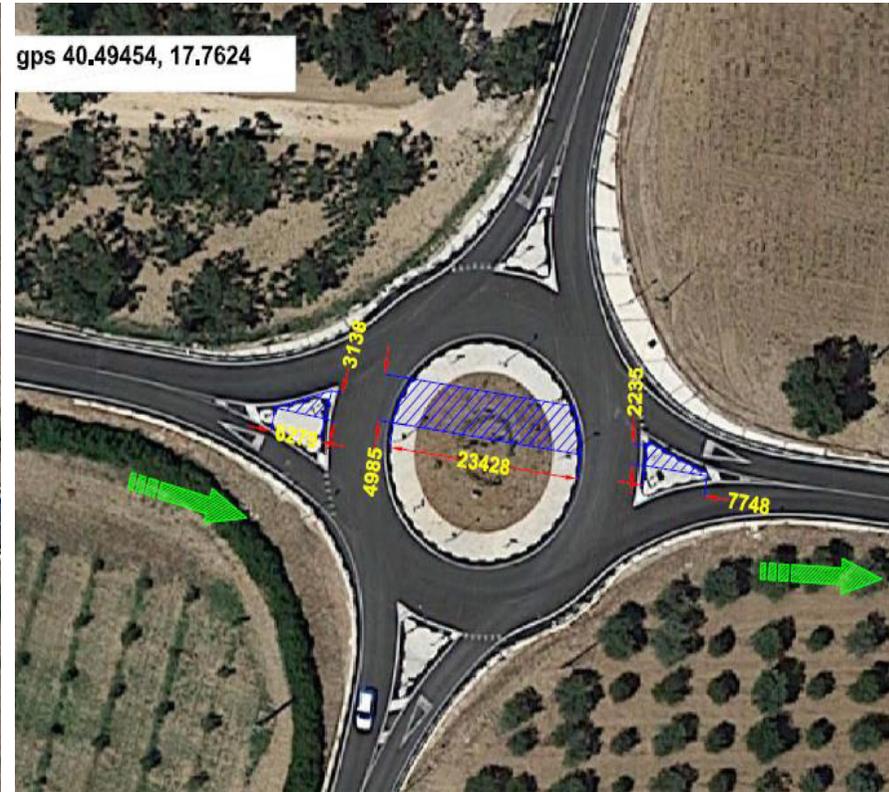
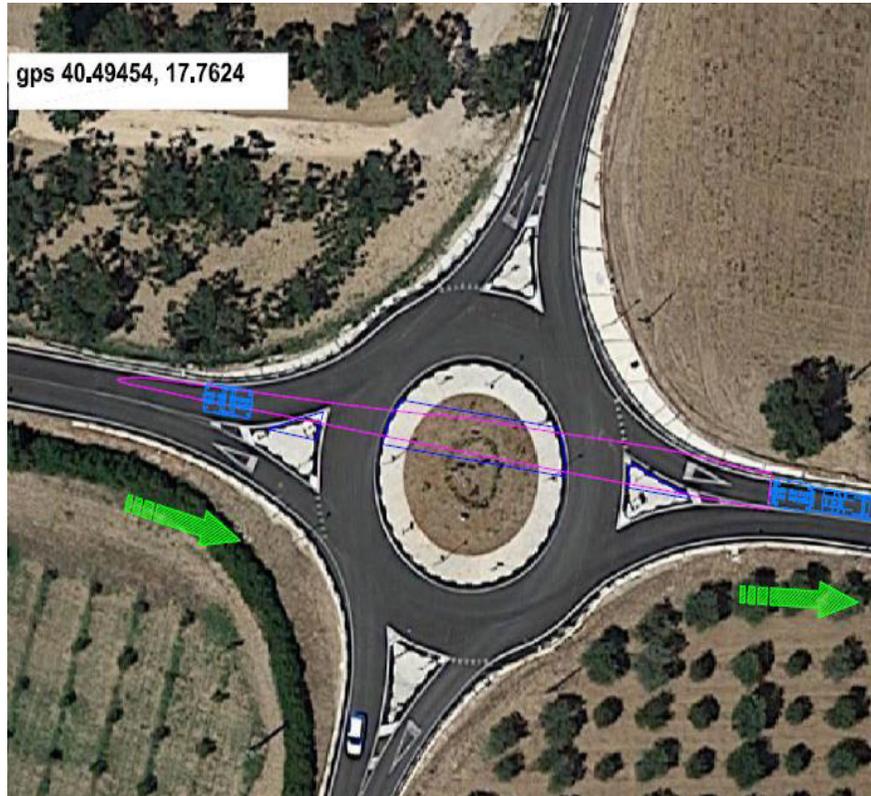
ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be enlarged / obstacle removal required.

Preliminary road adjustments details as per following picture.

ID 39 SP 51 (GPS position 40.49454, 17.7624) - ADJUSTMENT WORK REQUIRED (preliminary details)



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ID 40 SP 51 - (GPS position 40.48571, 17.83406) - ADJUSTMENT WORK REQUIRED (preliminary details)



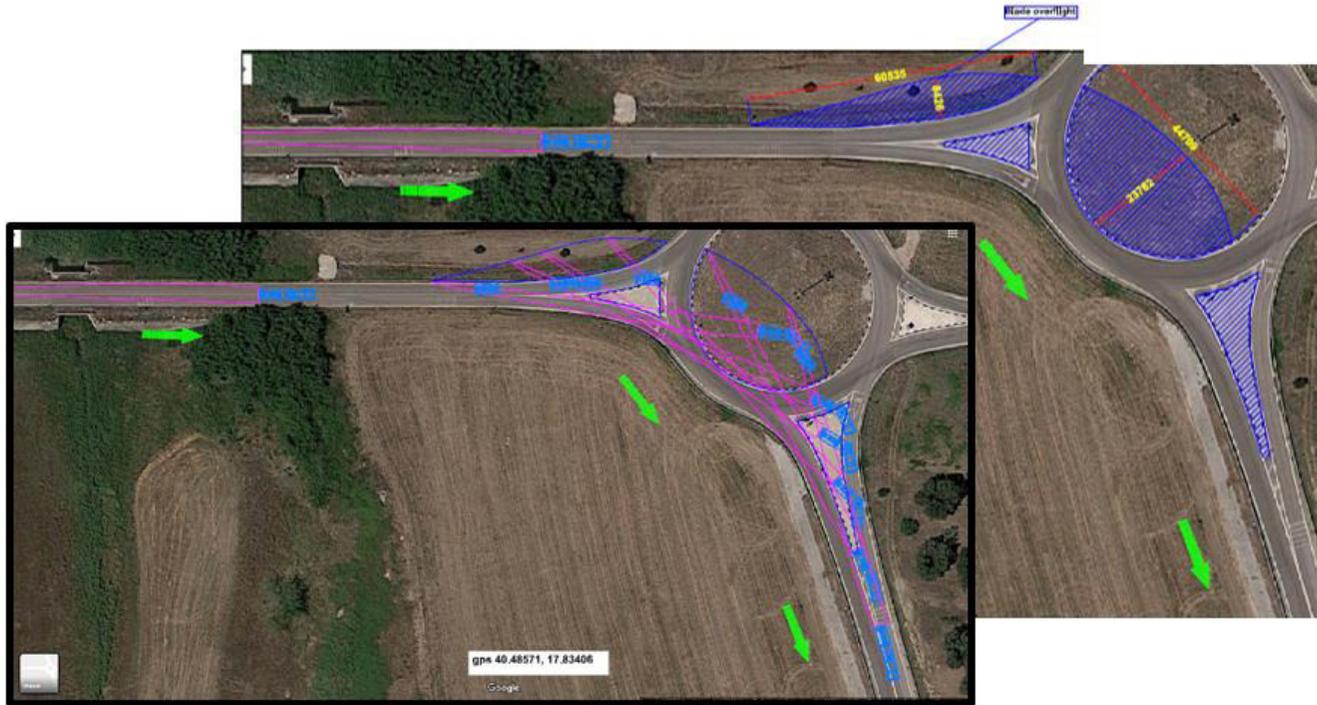
ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be enlarged and compacted.

Preliminary road adjustments details as per following picture.

ID 40 SP 51 - (GPS position 40.48571, 17.83406) - ADJUSTMENT WORK REQUIRED (preliminary details)



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ID 41 SP74 - (GPS position 40.44073, 17.84048) - ADJUSTMENT WORK REQUIRED (preliminary details)



ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be enlarged and compacted.

Preliminary road adjustments details as per following picture.

ID 41 SP74 - (GPS position 40.44073, 17.84048) - ADJUSTMENT WORK REQUIRED (preliminary details)



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ID 42 (GPS position 40.43744, 17.81307) - ADJUSTMENT WORK REQUIRED (preliminary details)



ADJUSTMENT REQUIRED

The highlighted area shall be suitable for transit : levelled ground and obstacle free.

Curve to be enlarged and compacted.

Preliminary road adjustments details as per following picture.

ID 43 (GPS position 40.43737, 17.8114)- TRANSHIPMENT AREA

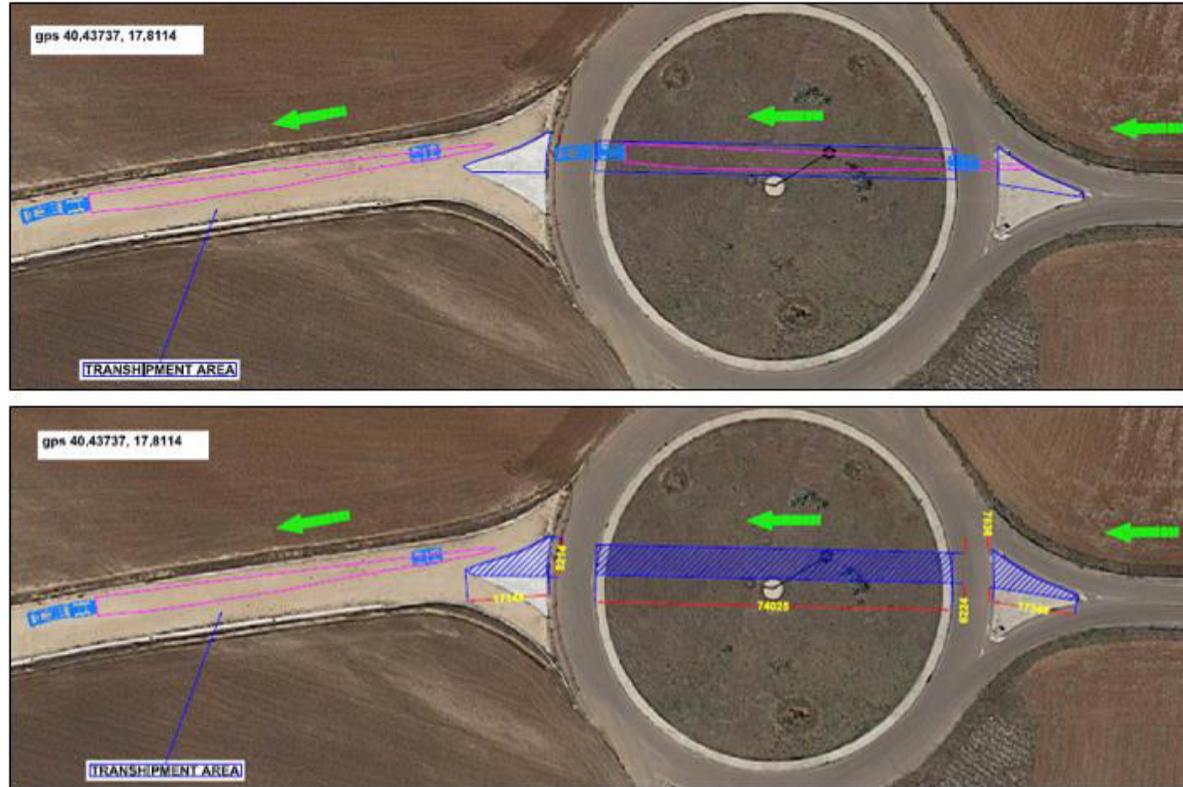


This area has been evaluated suitable to discharge the blade from the convoy and re-load onto blade lifter.

From this point to the enter Site Gate the blades to be transported by blade-lifter only.

For road adjustment required see what indicated previously for the rest of main items coming from Brindisi port.

ID 43 (GPS position 40.43737, 17.8114)- TRANSHIPMENT AREA



6. PRELIMINARY RISK ASSESSMENT

Client's Risk Assessment Table filled on TFS3 outcomes basis follows.

Risk Description	Brief Summary Description	Kind of Risk	Level of Risk	Impact Severity without actions	Actions Required / Recommendations
Port of Arrival	<p><u>Taranto Port (Industrial Port) :</u> Max draft 12 m From berth the Exit Gate can be reached driving straight, the manoeuvrings shall be discussed with local Port Authorities due to over-length dimensions of blades (83.72 m). In case other berths should be used, the manoeuvrings to exit need to be evaluated consulting local ports Authorities.</p> <p>For further information on ports see TFS2 Study.</p>	C S	LOW	HIGH	Vessel to be instructed to call berth. Direct delivery is recommended. In case final lot composition consists of more than one blade, direct delivery to be checked consulting both Ports Authorities and local Roads Authorities. In case via Place of Rest of blades is required this operations to be planned timely approaching local port Authorities.
	<p><u>Brindisi port :</u> Max draft 11 m. From berth the Exit Gate can be reached driving straight, the manoeuvrings shall be discussed with local Port Authorities due to over-length dimensions of tower section 5 (29.95 m). In case other berths should be used, the manoeuvrings to exit need to be evaluated consulting local ports Authorities.</p> <p>For further information on ports see TFS2 Study.</p>	PR C S	LOW	HIGH	Vessel to be instructed to call berth. Direct delivery is recommended. In case final lot composition consists of more than one tower, direct delivery to be checked consulting both Ports Authorities and local Roads Authorities. In case via Place of Rest of towers is required this operations to be planned timely approaching local port Authorities.

Risk Description	Brief Summary Description	Kind of Risk	Level of Risk	Impact Severity without actions	Actions Required / Recommendations
Bridges	On the routings there are some elevated roads (19) to overcross.	PR C S	MEDIUM	HIGH	It is recommended to consult timely the local Road Authorities with an official permit application in order to receive their feedback on feasibility. (*)
Underpasses	On the routings there are several bridges (14) undercross.	PR C S	MEDIUM	HIGH	It is recommended to consult timely the local Road Authorities with an official permit application in order to receive their feedback on feasibility. (*)
Improvement works	On the roads several improvement works like road enlargement will be required.	C S	MEDIUM	HIGH	It is recommended to consult timely the local Road Authorities with an official permit application in order to receive their feedback on feasibility. (*)
Improvement works on Gravel Roads	On the roads several improvement works on gravel roads like road enlargement, road compaction and vegetable removal will be required.	C S	MEDIUM	HIGH	It is recommended to arrange gravels roads in order to allow the transit of over-size/over-weight convoys in the scope of work. In this case civil works required will need of both local Authorities approval and private Owners (if any). (*)
Obstacle removal	On the roads several civil works to remove obstacles will be required.	C S	MEDIUM	HIGH	It is recommended to consult timely the local Road Authorities with an official permit application in order to receive their feedback on feasibility. (*)

Risk Description	Brief Summary Description	Kind of Risk	Level of Risk	Impact Severity without actions	Actions Required / Recommendations
Wires	MV/LV cables along the route.	C S	LOW	MEDIUM	Electrical and telephone cables along this part of itinerary to be buried to allow the blade lifter transit. It is recommended to consult timely the local Electricity Transmission Operator / local Electricity Authorities with an official request in order to receive their feedback on feasibility. (*)
Tree trimming	On the roads tree trimming could be required from hard manoeuvrings.	PR C S	MEDIUM	HIGH	It is recommended to consult timely the local Environmental Authorities in order to receive their feedback on feasibility for tree trimming. (*)
Access to Site	According with information provided by Client, SDB has considered as Final Delivery Place the two Entrance Coordinates: <ul style="list-style-type: none"> Entry 1: 40.39594, 17.82156 Entry 2: 40.36986, 17.80779 	PR C S	LOW	MEDIUM	Access to Site needs of civil works mentioned in this TFS3 Study. Internal roads has not evaluated by this TFS3 Study since not in its scope of work. Internal roads to be arranged by Client in order to reach the erection place.
Special equipment	The blade lifter is required in order to reach both Entrance Gate. The use of blade lifter is subject to check of COG position of blades and final dwg drawings of blades providing full technical details.	PR C S	HIGH	CRITICAL	It is recommended to provide timely complete set of technical drawings in order to check/confirm technical solution proposed. It is recommended to consult timely the local Road Authorities with an official permit application in order to receive their feedback on feasibility. (*)

(*) To approach local Authorities for their feedback on the routing proposed the full set of transportation drawings of cargo (showing dimensions, weight, CoG, supports, lifting points, lashing points, basement/footprint details, etc.) is required.



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7. CONCLUSIONS

SDB has evaluated the road transport of main items of Salice - Veglie Wind Farm project. SDB found out that due to the out-of-gauge dimensions two different routing shall be used. Notably, Towers, Nacelle, Drive Train, Hub shall be shipped via Brindisi port due to over-height dimensions, while blades via Taranto port due to over-length dimension.

Moreover, for the blade transports SDB has evaluated to use both the dolly configuration and the blade lifter configuration. The blade lifter will be used for the last part of the route. SDB has identified a suitable Transshipment Area (GPS position 40.43737, 17.8114) near the Salice - Veglie WF Enters Gate where it could be feasible shift from the dolly configuration to the blade lifter configuration (off-loading/re-loading operations will be required).

In order to execute the transports road enlargement and obstacle removals shall be required. This notable for the blades transport which need of more invasive road adjustments (as described above). Obstacles to be removed consisting generally of islands, traffic islands, signs, wires. Also tree trimming is required in order to get the necessary clearance for the overflight area of the blades. All road adjustments listed in this document shall be approved by local Authorities.

As far as the bridge over-crossing is considered, bridges along the routing were found out in good sound conditions at time of this survey. Anyhow, for our experience, the road owners will required engineering studies for the over-weight items in the scope of work.

Due to road adjustments and the engineering studies may be required, SDB suggest to plan with an adequate notice the road transports and submit to Authorities an application for road permits in order to get their preliminary response as soon as possible. Be it reminded in order to submit an application to local Authorities a full-detailed transportation drawings of all main items shall be provided by Client.

Driving on gravel roads is required in order to reach both Entrance Gates from the Transshipment Area. This is required for all main items evaluated on this TFS3. Be it reminded that in order to transit on these roads above mentioned improvement works are required. In this case civil works required will need of both local Authorities approval and private Owners (if any).

Prepared by Eng. Tech. Department