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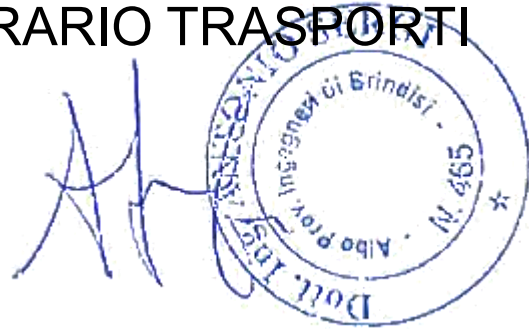
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TITLE:AVAILABLE LANGUAGE: IT

“IMPIANTO EOLICO ACQUAVIVA”

8PSY7B1_ElaboratoGrafico_25

VIABILITÀ – ITINERARIO TRASPORTI



REV.	DATE	DESCRIPTION	PREPARED	VERIFIED	APPROVED
00	16/12/2020	PRIMA EMISSIONE	V.D'AMICO	F.DE CASTRO	A. SERGI

GRE VALIDATION

COLLABORATORS	VERIFIED BY	VALIDATED BY
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PROJECT / PLANT IMPIANTO EOLICO ACQUAVIVA	GRE.EEC.D.25.IT.W.14622.00.076.00																		
	GROUP	FUNCION	TYPE	ISSUER	COUNTRY	TEC	PLANT	SYSTEM	PROGRESSIVE	REVISION									
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CLASSIFICATION	UTILIZATION SCOPE
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Savino Del Bene S.p.A.

TFS3 - Detailed Road Survey

Project Name: Acquaviva Wind Farm (SG170 HH115)

Client: ENEL Green Power

REV.	DOC #	PAGES	STATUS	AUTHOR	DATE
01	TFS3-ACQ-WFP-2020-10	35	Detailed Road Survey	Eng. Tech. Department	28/10/2020

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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 to the Acquaviva Wind Farm.

The coordinates of Acquaviva WF Enter Gates provided by Client are :

Enter Gate #1 Lat. 40.892261° Long. 16.918286°

Enter Gate #2 Lat. 40.895747° Long. 16.894358°

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

SDB recommends to do a transport trial for blades in order to confirm outcomes of this report. Be it noted that the transport trial outcomes can lead to the need of additional civil works or technical studies like topographic study.

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.

In order to approach local Authorities to receive their feedback on this report the following documents are required.

- Cargo dimensions and weight declaration signed and stamped from Client
- The full set of transportation drawings of cargo (showing dimensions, weight, CoG, supports, lifting points, lashing points, basement/footprint details, etc.)

Time required to get transportation permits is about 90 days starting from the time we receive the full set of documents to approach the local Authorities. This time excludes any specific request coming from local Authorities like make measurements/ engineering analysis of road infrastructures (e.g. bridges), etc.

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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 SG170 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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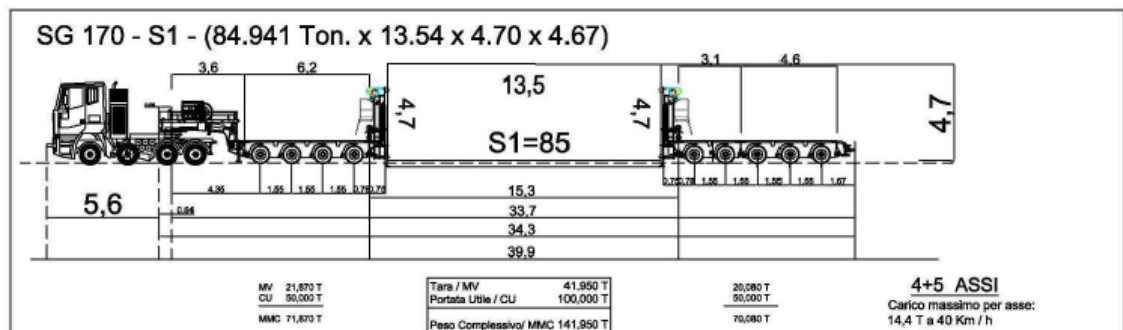
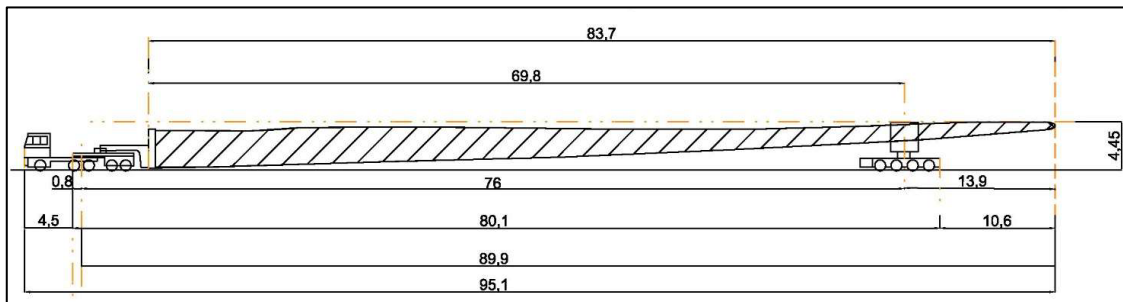
3. PRELIMINARY TRANSPORT CONFIGURATIONS

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.

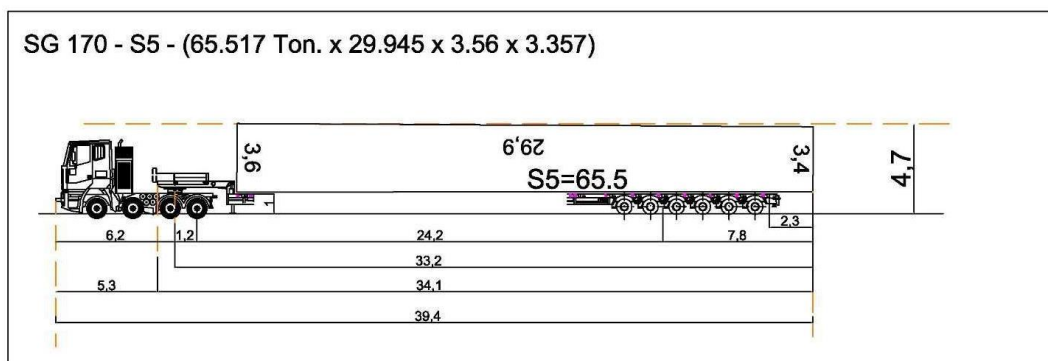
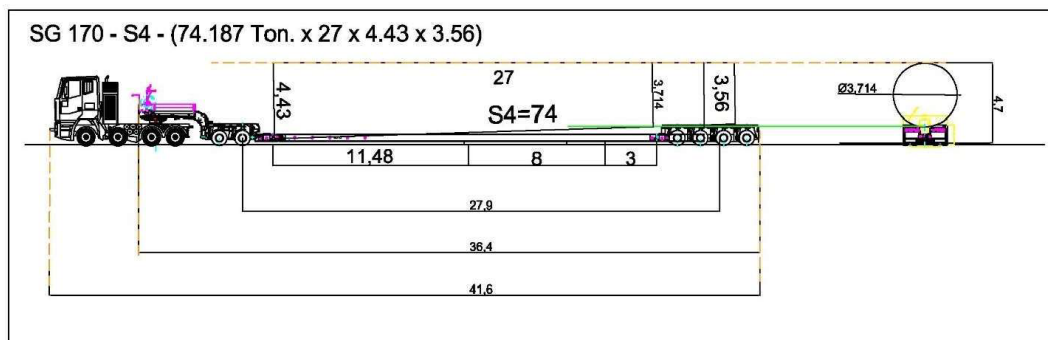
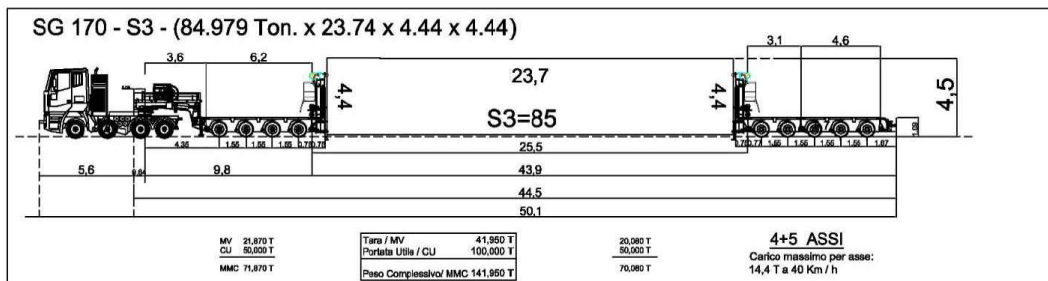
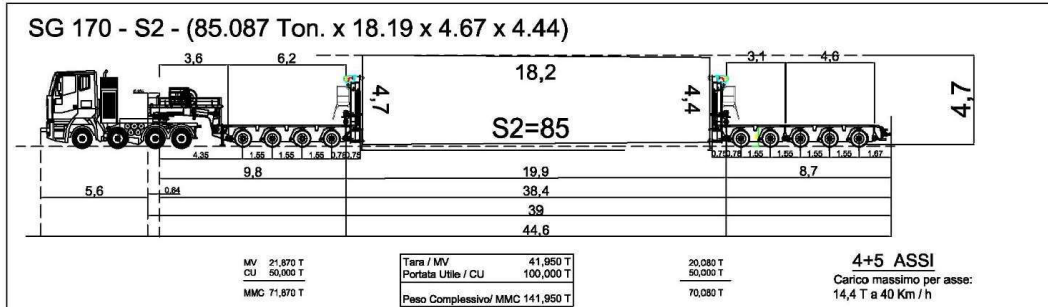


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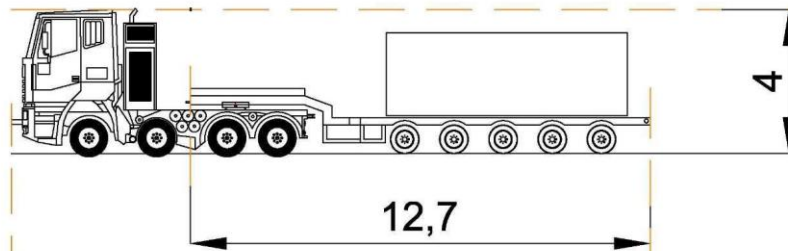
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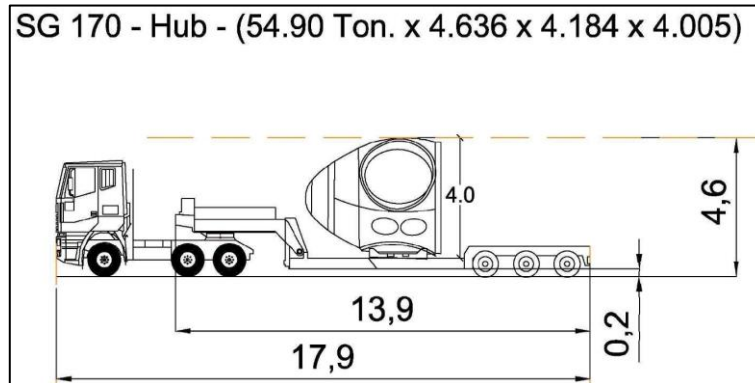
SG 170 - Nacelle - (98.00 Ton. x 14.614 x 4.72 x 3.405)



SG 170 - Drive Train - (76.30 Ton. x 6.680 x 320 x 2.30)



SG 170 - Hub - (54.90 Ton. x 4.636 x 4.184 x 4.005)



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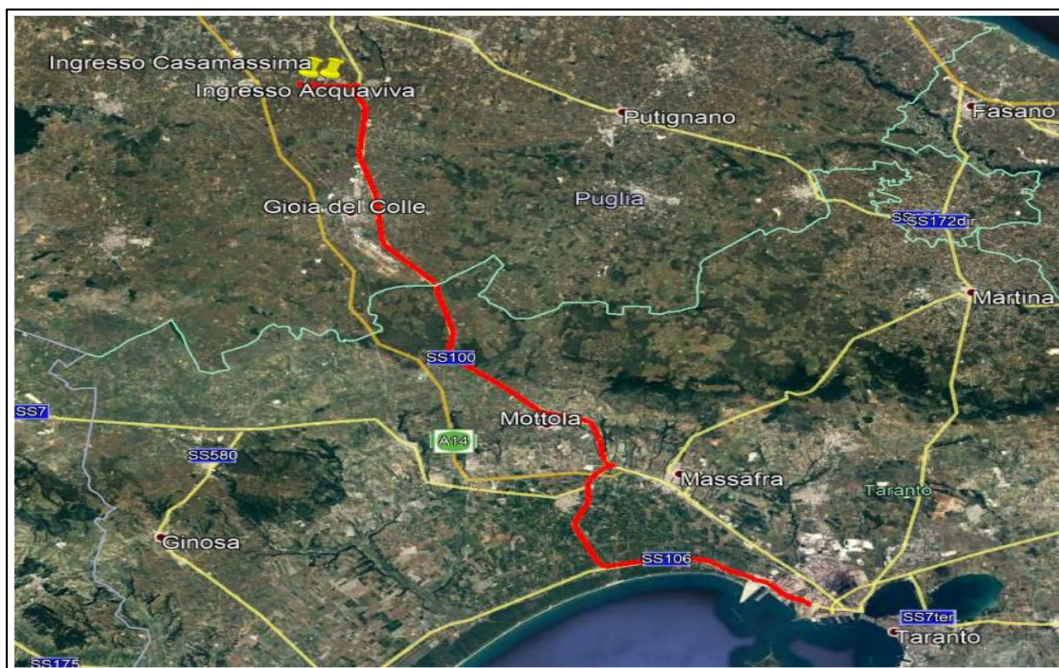
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4. ROAD ITINERARY DESCRIPTION

SDB has considered the items with the most critical dimensions in order to evaluate the routing from Taranto port to Acquaviva WF.

SDB has visited and evaluated the following route.



Total Routing from Taranto port to Acquaviva Wind Farm (abt. 70 km):

- Taranto port
- SS106;
- SS106 dir;
- SS 7;
- SS 100;
- Sp 125;

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IMPORTANT REMARKS ON ROUTING

The routing has been evaluated according with preliminary technical information provided by Client as per Ch.2 and according with the most severe convoy provided in Ch.3 (ie blade and tower sections).

Be it noted that in order to deliver cargo in the scope of work to Acquaviva WF the following actions/adjustment works are required. SDB has evaluated these adjustment work high severe and highly recommends to check the real feasibility asking a feedback to the local Roads Authorities (ie by TFS4).

- At overpass #30 on SS100 it's required to scarify the paved road of at least 30-35cm in order to allow the transit of the convoy (see Ch.5 ID#10)
- At the exit from SS100 to SP125 it's required an hard road adjustment (see Ch.5 ID#11/11bis)






SDB reminds that in order to proceed with an TFS4 needs of a statement from Client of dimensions/weights of main items (ie blades and tower sections) and technical drawings showing CoG (Centre of Gravity), saddle position, lifting points, lashing points, and all relevant data required for transportation purposes.

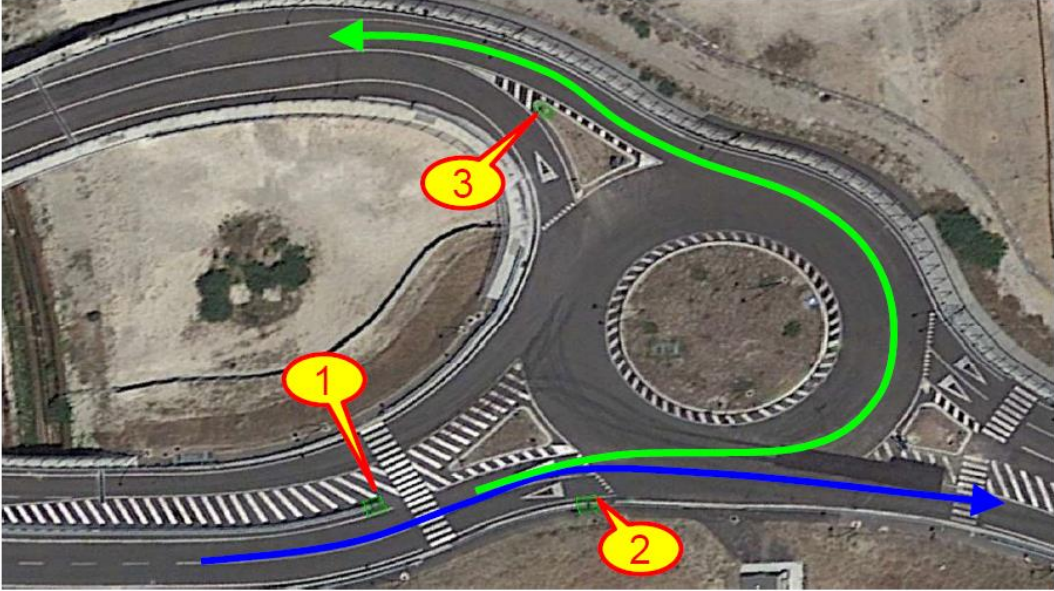
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5. ROUTE CRITICAL POINTS / ADJUSTMENT WORKS

LEGEND					
	Blades riving forward		Tower, Nacelle, Hub, D.Train. driving forward		Driving revers
	Area to be arranged obstacle free				
	Area to be arranged suitable for trailer transit				

ID	01	GPS Coordinate :	40°30'13.38"N. - 17°10'15.68"E
Road :	Polisettoriale Berth Road		
Place :	Taranto		
Road adjustments / Remarks :	<ol style="list-style-type: none"> 1. Traffic signs to be removed to allow the transit of Blades 2. Traffic signs to be removed to allow the transit of Blades 3. Traffic signs to be removed to allow the transit of Tower Sections, Nacelle, Hub, Drive Train 		
			

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ID 01

GPS Coordinate : 40°30'13.38"N. - 17°10'15.68"E

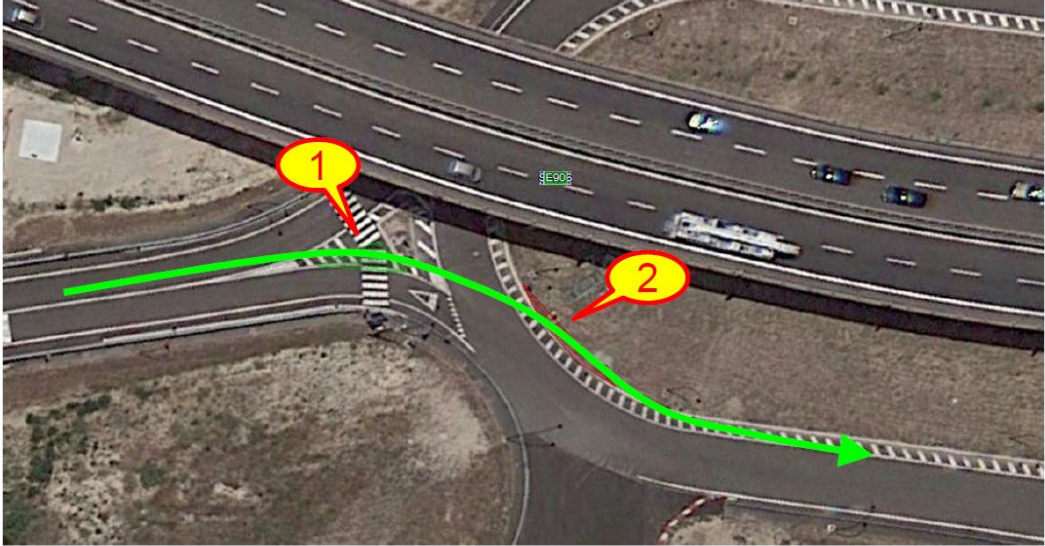


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ID	02	GPS Coordinate :	40°30'23.85"N - 17°10'4.41"E
Road :	Polisettoriale Berth Road / SS106		
Place :	Taranto		
Road adjustments / Remarks :	To allow the transit of Tower Sections, Nacelle, Hub, Drive Train 1. Traffic signs to be removed 2. Road needs to be enlarged 15-16m long / 1,5m wide, and traffic signs to be removed		
			

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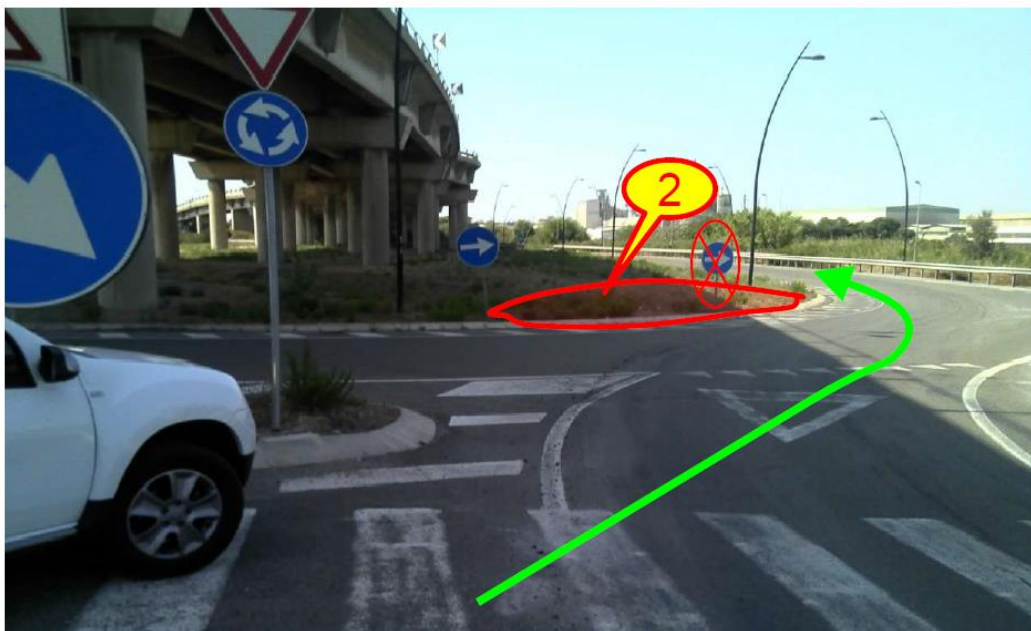
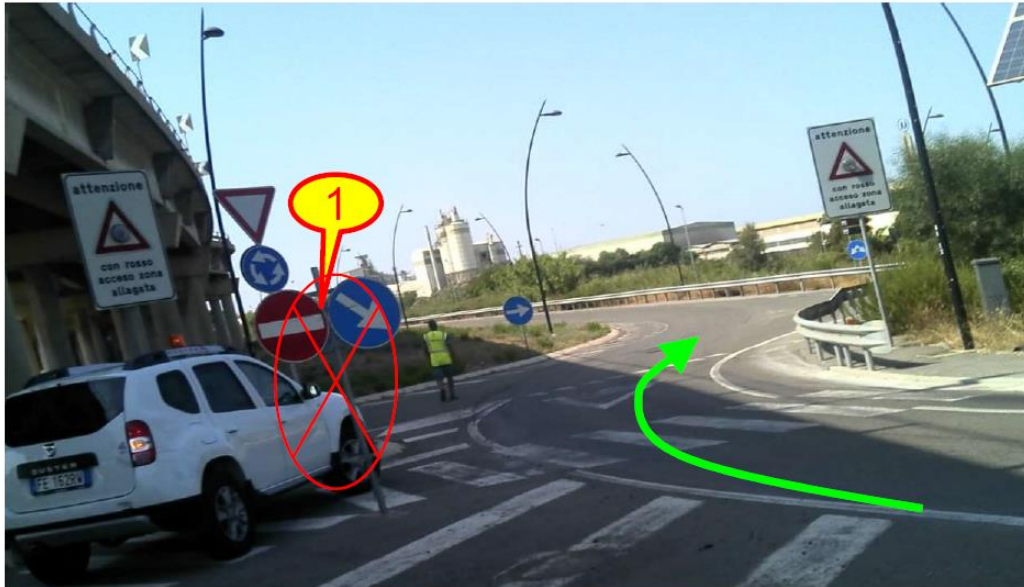


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ID 02

GPS Coordinate : 40°30'23.85"N - 17°10'4.41"E





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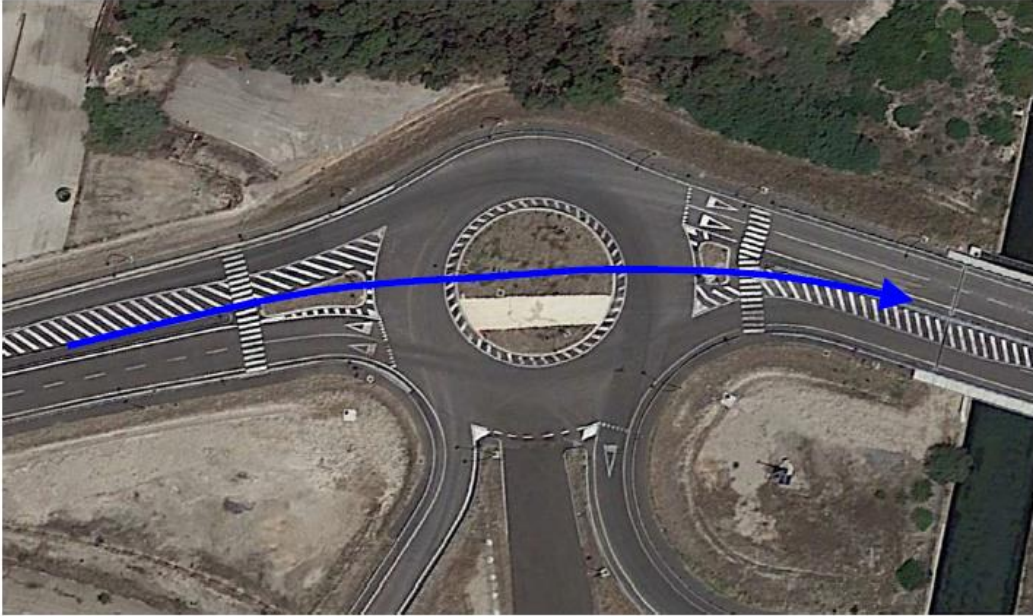
ID	03	GPS Coordinate :	40°30'38.20"N - 17° 9'28.95"E
Road :	Polisettoriale Berth Road / SS106		
Place :	Taranto		
Road adjustments / Remarks :	To allow the transit of Tower Sections, Nacelle, Hub, Drive Train obstacles to be removed		
			
			

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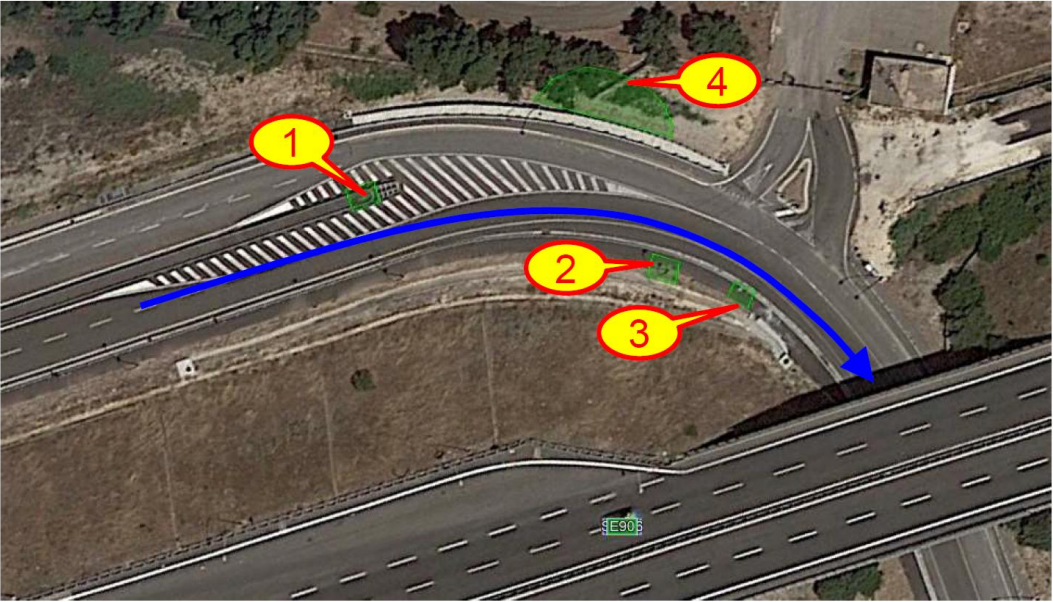
ID	04	GPS Coordinate :	40°29'50.86"N - 17°10'43.33"E
Road :	Polisettoriale Berth Road / SS106		
Place :	Taranto		
Road adjustments / Remarks :	To allow the transit of Blades roundabout to enlarged.		
			

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ID	05	GPS Coordinate :	40°29'45.23"N - 17°10'52.36"E
Road :	Polisettoriale Berth Road / SS106		
Place :	Taranto		
Road adjustments / Remarks :	To allow the transit of Blades 1. Traffic signs to be removed 2. Light pole #3125 to be removed 3. Obstacle to be removed 4. Tree trimming required		
			

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ID 05

GPS Coordinate : 40°29'45.23"N - 17°10'52.36"E



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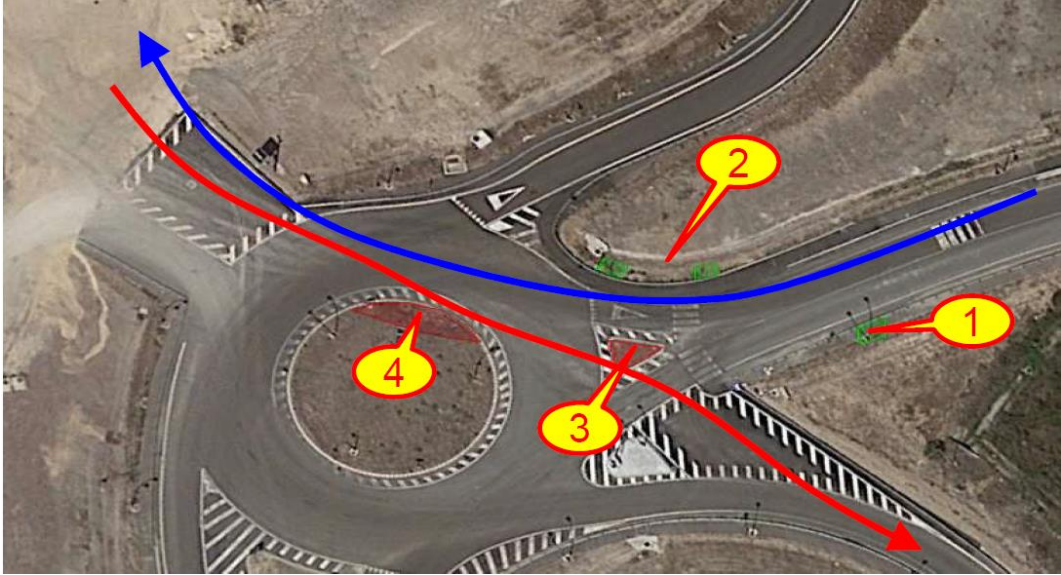
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ID	06	GPS Coordinate :	40°29'40.60"N - 17°10'50.16"E
Road :	Polisettoriale Berth Road / SS106		
Place :	Taranto		
Road adjustments / Remarks :	<p>Maneuver required : Blades enter inside roundabout and move inside the unpaved area located in the middle driving forward. Then, driving reverse upto the SS106 ramp and proceed on SS106 to Taranto</p> <ol style="list-style-type: none">1. Traffic signs and light pole #3220 to be removed2. Traffic signs to be removed3. Road to be enlarged4. Roundabout to be enlarged		



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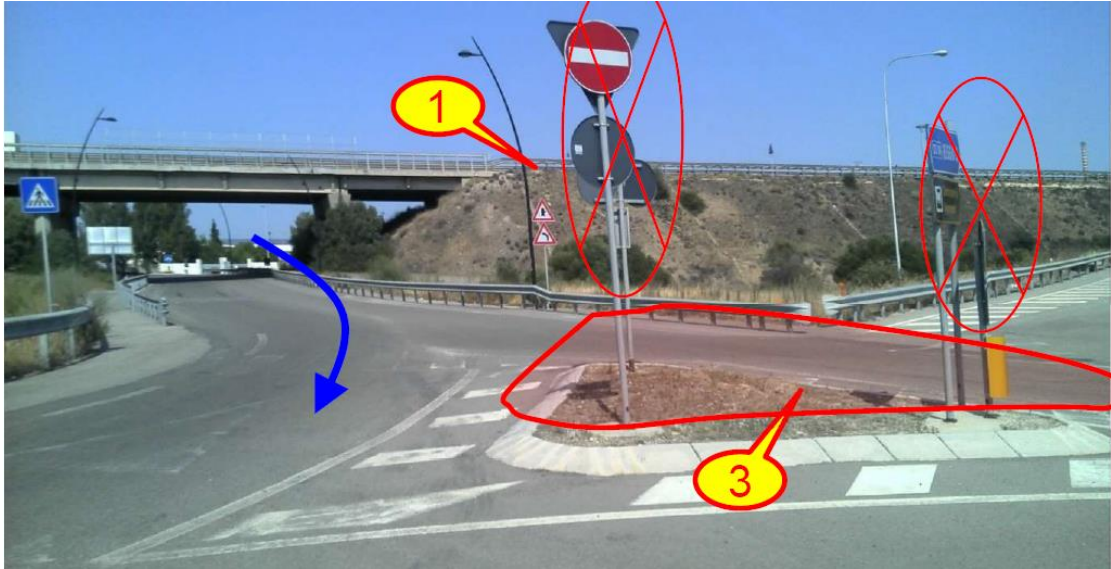


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ID 06

GPS Coordinate : 40°29'40.60"N - 17°10'50.16"E



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ID 06

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ID	07	GPS Coordinate :	40°29'33.53"N - 17°11'16.33"E
Road :	SS 106		
Place :	Taranto		
Road adjustments / Remarks :	Maneuver required : Blades proceed driving reverse on SS106 to Taranto upto the end of the guardrails and here start driving forward to Reggio Calabria		
			
			

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ID	08	GPS Coordinate :	40°31'44.03"N - 17° 3'24.35"E
Road :	SS 106		
Place :	Palagiano		
Road adjustments / Remarks :	Routing Blades : at km 476+500 of SS106 take exit to Palagiano. Traffic sign to be removed.		
			
			

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ID	09	GPS Coordinate :	40°36'5.52"N - 17° 4'28.29"E
Road :	SS 106 / SS100		
Place :	Palagiano		
Road adjustments / Remarks :	To allow the transit of Blades 1. Tree trimming required 2. Tree trimming required 3. Tree trimming and obstacle removal required 4. Tree trimming required 5. Tree trimming and obstacle removal required		
			
			

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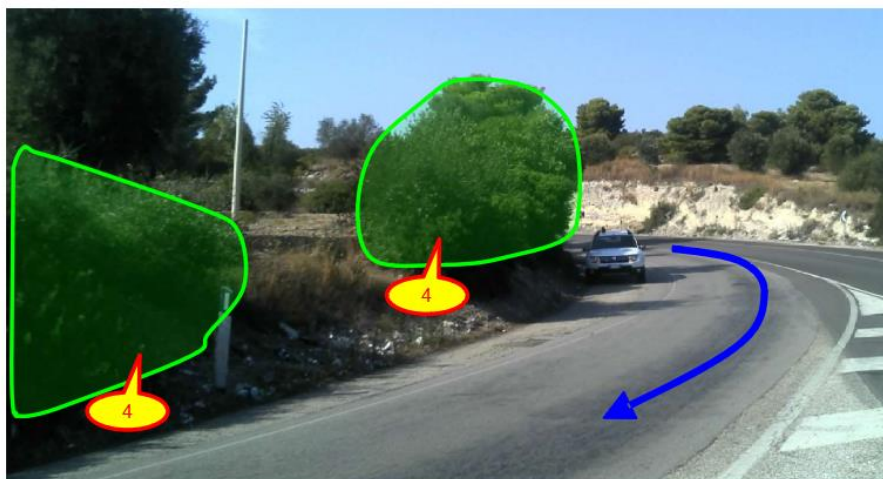
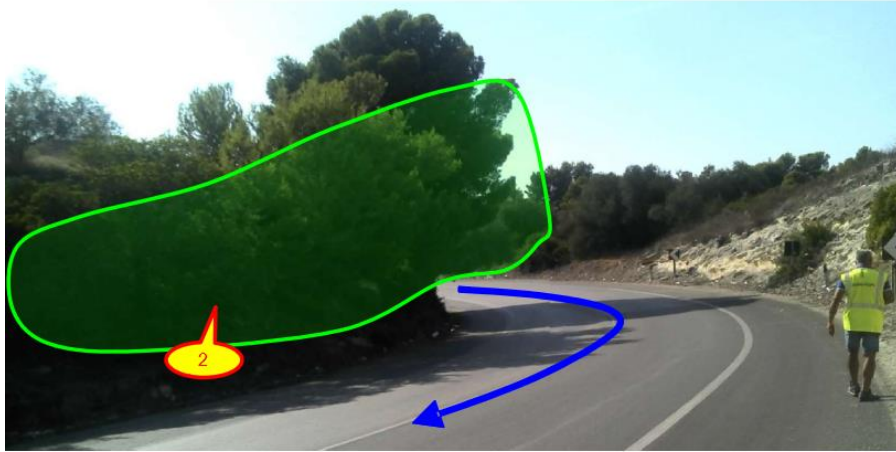


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ID 09

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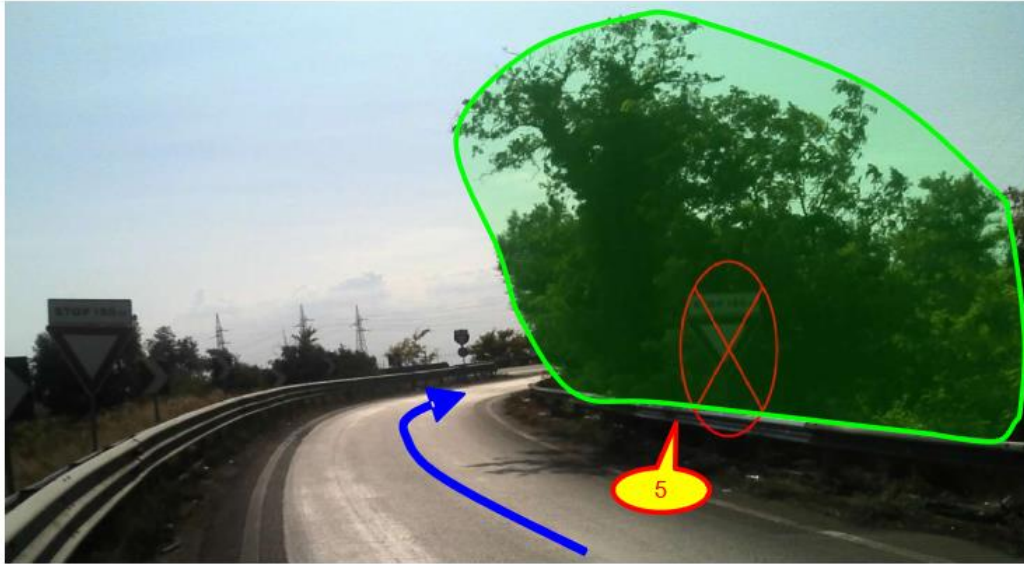


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ID 09

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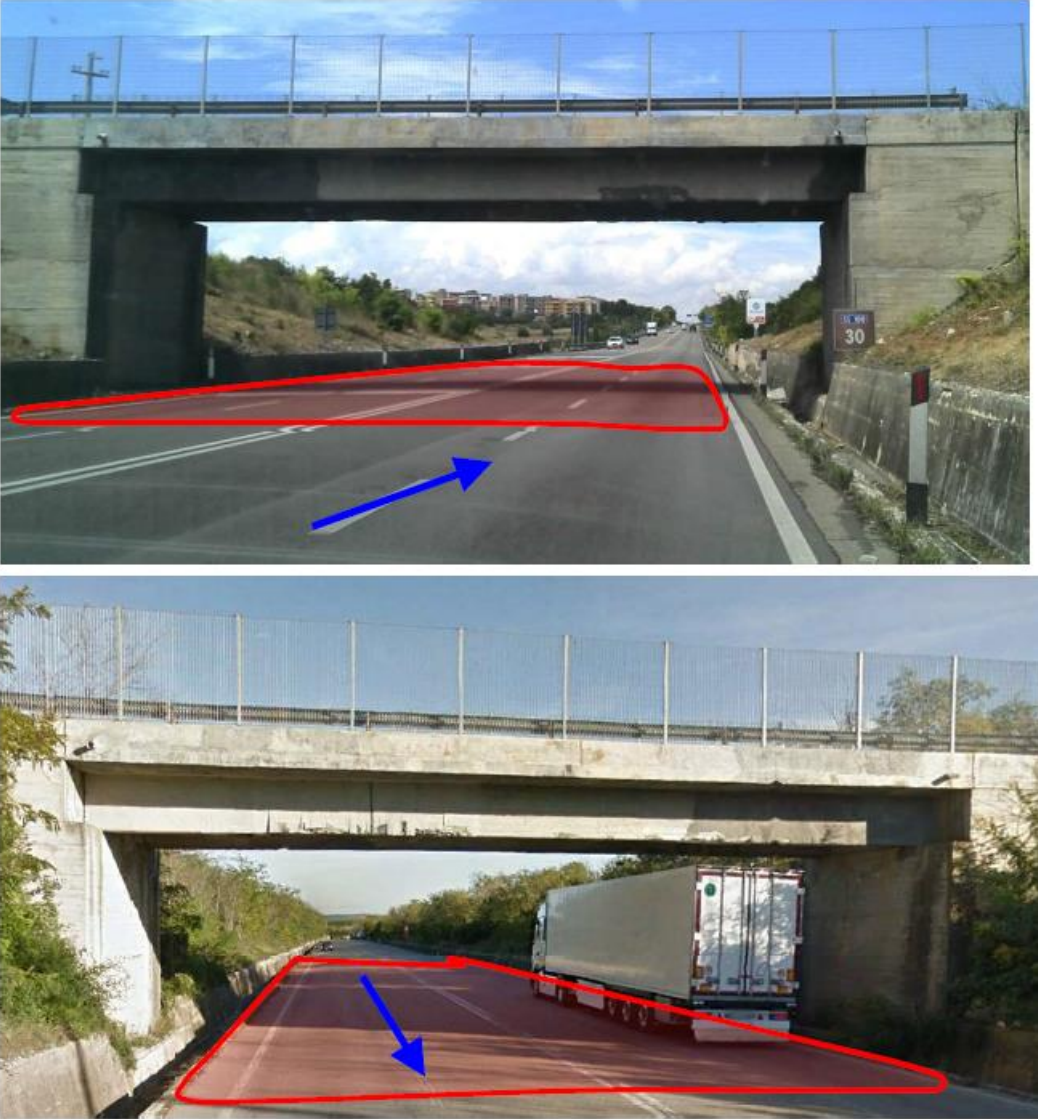


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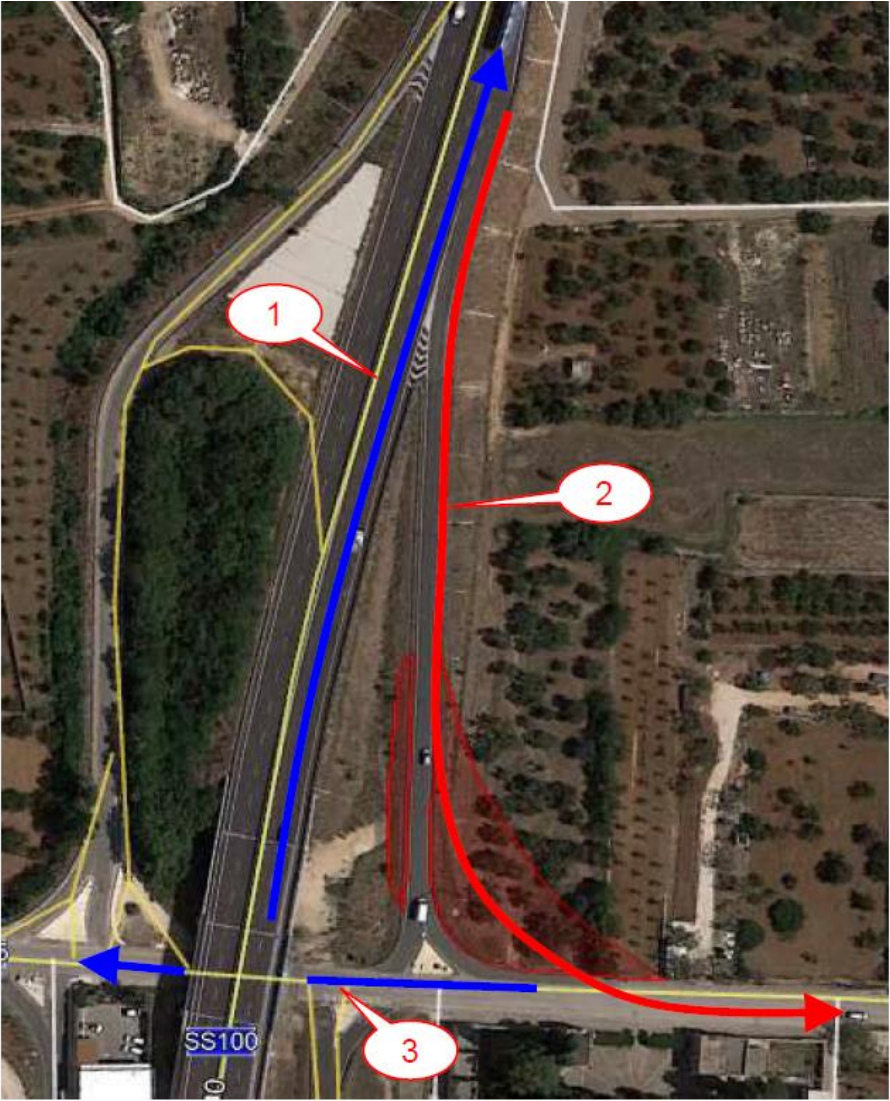
ID	10	GPS Coordinate :	40°38'13.65"N - 17° 3'13.77"E
Road :	SS100		
Place :	Mottola		
Road adjustments / Remarks :	To allow the transit of Blades the road needs to be scarify of 30-35cm.		
			

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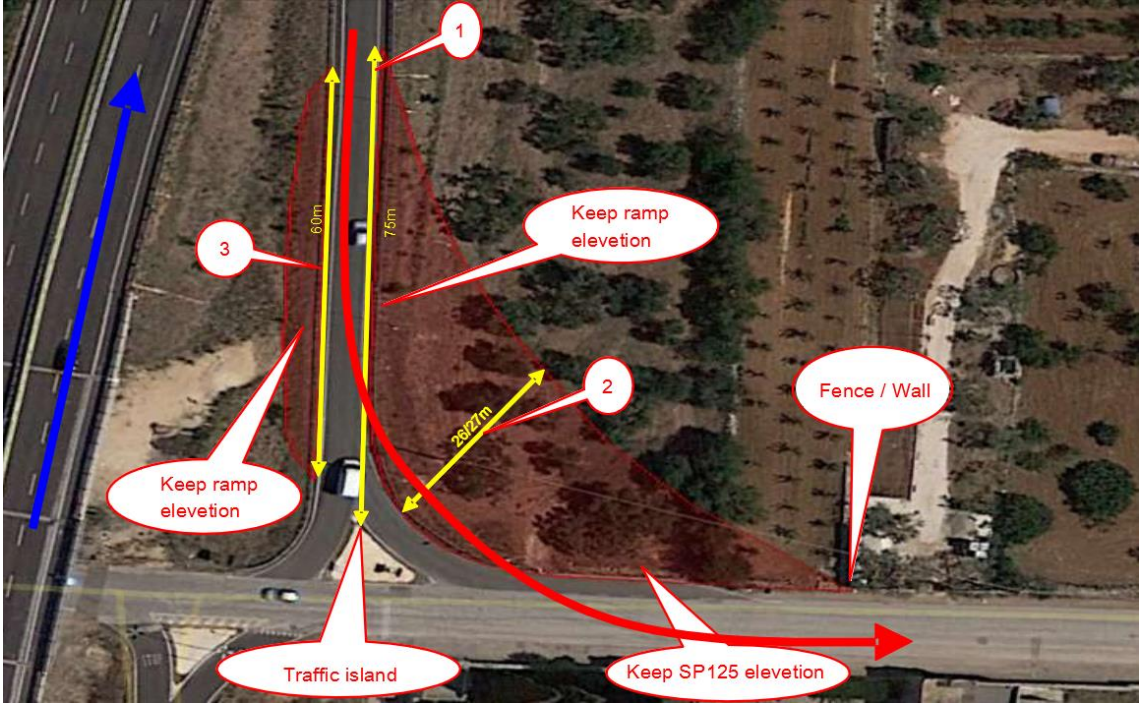
ID	11	GPS Coordinate :	40°53'20.21"N - 16°56'23.67"E
Road :	SS100 / SP125		
Place :	Sammichele di Bari		
Road adjustments / Remarks :	<p>In order to enter in SP125 Blades must drive reverse and in wrong direction the entrance ramp to Bari.</p> <ol style="list-style-type: none">1. Driving forward2. Driving reverse and in wrong way3. Driving forward to Acquaviva WF Entrance Gate		
			

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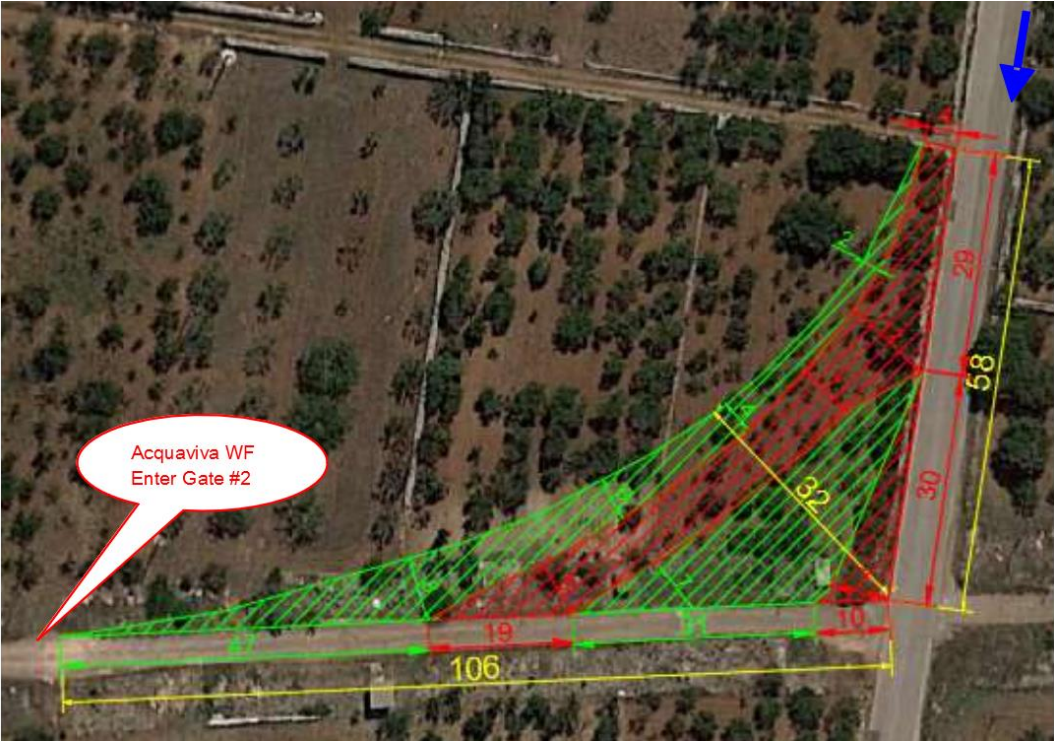
ID	11 bis	GPS Coordinate :	40°53'20.21"N - 16°56'23.67"E
Road :	SS100 / SP125		
Place :	Sammichele di Bari		
Road adjustments / Remarks :	<p>In order to enter in SP125 driving reverse it's required to enlarge the ramp SP125/SS100 to Bari. The area of intervention is</p> <ol style="list-style-type: none">1. from the traffic island to the ramp there are 75 meters2. 26-27 meters depth inner side3. 60 meters external side, guard rails to be removed and 4 meters in depth to be arranged for trailer transit. <p>Everything included in the red area shown below to be removed : 3 light poles, 1 Enel cement pole, 1 Enel wooden pole, 6-7 olive trees. The enlargement works must be designed fitting the elevation of the SS100 to the elevation of SP125.</p> <p>A topographical survey must be carried out to confirm the simulation and confirm the enlargement works required.</p>		
			

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ID	12	GPS Coordinate :	40°53'30.60"N - 16°55'5.93"E
Road :	SP125		
Place :	Acquaviva WF Entrance Gate #2		
Road adjustments / Remarks :	<p>In order to enter Acquaviva Gate #2 it's required to enlarge the curve. The red area must filled and compacted to allow the trailer transit, while the green area to be obstacle free.</p> <p>A topographical survey must be carried out to confirm the simulation and confirm the enlargement works required.</p>		
			

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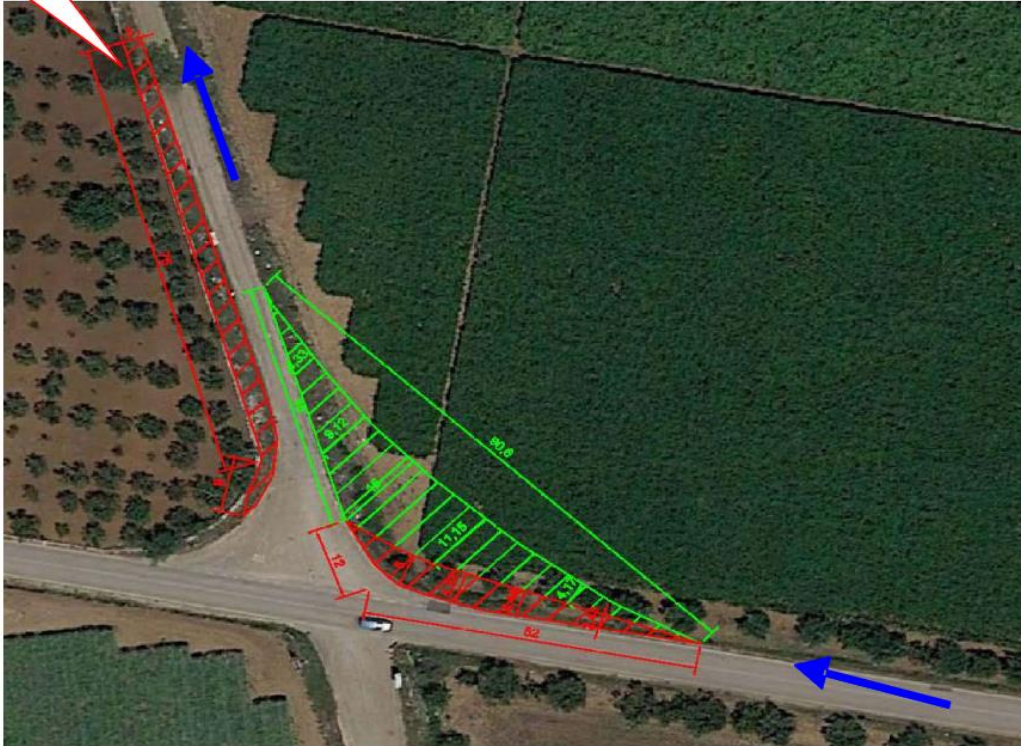


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ID	13	GPS Coordinate :	40°53'44.69"N 16°53'39.69"E
Road :	SP125		
Place :	Acquaviva WF Entrance Gate #1		
Road adjustments / Remarks :	<p>In order to enter Acquaviva Gate #1 it's required to enlarge the curve. The red area must filled and compacted to allow the trailer transit, while the green area to be obstacle free.</p> <p>A topographical survey must be carried out to confirm the simulation and confirm the enlargement works required.</p>		

Acquaviva WF
Enter Gate #1



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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>Taranto Port (Industrial Port): 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>	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 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.
Bridges	On the routings there are some structures 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	<p>On the routings there are several bridges to undercross with a total height 5m. To cross under Mottola overpass it's required to scarify the road of 30-35 cm.</p>	PR C S	HIGH	CRITICAL	It is recommended to consult the local Road Authorities with an official permit application in order to receive their feedback on feasibility. (*) SDB recommends to evaluate to reduce the height of blades.

Risk Description	Brief Summary Description	Kind of Risk	Level of Risk	Impact Severity without actions	Actions Required / Recommendations
Improvement works	On the roads several improvement works like road enlargement will be required. High severe improvement works required between SS100/SP125.	PR C S	HIGH	CRITICAL	It is recommended to consult the local Road Authorities with an official permit application in order to receive their feedback on feasibility. (*) SDB recommends to evaluate to reduce the length of blades.
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. (*)
Wires	MV/LV cables along the route.	C S	LOW	LOW	
Tree trimming	On the roads tree trimming could be required from hard manoeuvrings. Olive tree to be removed this needs of permits from local Environmental Authorities.	PR C S	HIGH	CRITICAL	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 Coordinates Enter #1 : 40°53'44.69"N - 16°53'39.69"E Coordinates Enter #2 : 40°53'30.60"N - 16°55'5.93"E	NA	NA	NA	Internal roads not in the scope of this TFS3 Study.

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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Risk Description	Brief Summary Description	Kind of Risk	Level of Risk	Impact Severity without actions	Actions Required / Recommendations
Special equipment	For the transport of main units SDB intends to use hydraulic trailers.	C S	LOW	LOW	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 Acquaviva Wind Farm project. In order to execute the transports road enlargement and obstacle removals shall be required.

Notably for blades, at overpass #30 on SS100 it's required to scarify the paved road of at least 30-35cm in order to allow the transit of the convoy (see Ch.5 ID#10), and at the exit from SS100 to SP125 it's required to enlarge the ramp (see Ch.5 ID#11/11bis). Both road adjustments required are high severe. Obstacles to be removed consisting generally of islands, traffic islands, signs, wires. Some road adjustments will need of a topographic study in order to design the civil works and confirm the transport feasibility. Also tree trimming/removal is required in order to get the necessary clearance for the overflight area of the blades and/or in order to allow the convoy transit (see Ch.5 ID11bis). Remind that in order to cut/remove olive trees the permit from local Environmental Authorities is required.

All road adjustments listed in this document must be approved by local Authorities. It's recommended to get an official feedback by local Authorities by TSF4.

The use of lands which according to this report may require improvement works in order to allow the convoy passage is subject to landowners approval. In order to check this SDB needs to know the actual time of shipment and official power of attorney from Client.

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 suggests 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. Again, for this project SDB recommends to approach the local Authorities by TSF4.

This report to be updated/confirmed at time of shipment.

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IMPORTANT : the outcomes of the TFS3 Study are subject to approval from local Road Authorities and check/verification final drawings of main items showing all relevant information for transportation purposes (CoG, saddle/support position, lashing points, lifting points, etc.).

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