

COMMITTENTE



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REGIONE AUTONOMA  
DELLA SARDEGNA



PROVINCIA  
SUD SARDEGNA



COMUNE SELEGAS



COMUNE GESICO



COMUNE MANDAS

PROGETTO

**PROGETTO DEFINITIVO PER LA REALIZZAZIONE DI UN PARCO EOLICO DENOMINATO "PLANU SERRANTIS" COMPOSTO DA 9 AEROGENERATORI DA 6,6 MW, PER UNA POTENZA COMPLESSIVA DI 59,4 MW SITO NEI COMUNI DI SELEGAS, GESICO E MANDAS (SU), CON OPERE DI CONNESSIONE NEI COMUNI DI GUASILA, VILLANOVAFRANCA, VILLAMAR, FURTEI, SANLURI (SU)**

ELABORATO

Titolo:

**ROAD SURVEY**

Tav./Doc.:

**OCV-30**

Codice elaborato:

**EOL-OCV-30**

Scala/Formato:

**A4**

0	Settembre/2023	Prima emissione	SAE	SAE	GRV WIND SARDEGNA 6 S.R.L.
REV.	DATA	DESCRIZIONE	ELABORAZIONE	VERIFICA	APPROVAZIONE



*Road Survey*  
**"Planu Serrantis"**



**ROAD SURVEY**  
**Project: "Planu Serrantis"**  
**Selegas, Gesico e Mandas (SU)**  
**9xSG170-6.6 MW HH115m**

Transport representative:

*Felice Maraglino, S.A.E. S.r.l.*

*Mirko Lafratta, S.A.E. S.r.l.*

### 1. Summary

According to Customer request it has been analyzed 9xSG170-6.6 MW HH115m configuration transport feasibility to get to "Planu Serrantis" wind farm.

Road Survey date: 23-24/05/2023

Customer Representative: Mattia MINCUZZI, GRV Wind Sardegna 6 S.r.l.

Transporter Representative: Mirko LAFRATTA, S.A.E. S.r.l.  
Felice MARAGLINO, S.A.E. S.r.l.

### 2. Specs Description

Project	"Planu Serrantis"
Country	Italy
Location	Selegas, Gesico e Mandas (SU) – Province of Sud Sardegna (SU) – Sardinia Region
Scope	Planning Stage – Transport Logistic – Feasibility Study
Turbine	9xSG170 HH115m
Transport Mode	<input checked="" type="checkbox"/> Standard <input checked="" type="checkbox"/> Transshipment <input checked="" type="checkbox"/> Blade Lifter <input checked="" type="checkbox"/> Tower <input type="checkbox"/> Nacelle
MW	-
Start From	<ul style="list-style-type: none"> <li>- Port of Cagliari (CA) – option 1</li> <li>- Port of Oristano (OR) – option 2</li> </ul>

### 3. Weight and Dimensions

#### SG5X-170 – T115.58B Specifications

UNITS	CONTENTS	WEIGHT GROSS		METERS GROSS		
		GROSS WT. EACH (Tn)	TOTAL GROSS (Tn)	LENGTH (m)	WIDTH (m)	HEIGHT (m)
9	Tower Section 1	80,055	720,495	13,284	4,700	4,700
9	Tower Section 2	78,241	704,169	18,200	4,433	4,700
9	Tower Section 3	80,502	724,518	23,800	4,427	4,433
9	Tower Section 4	68,289	614,601	27,160	4,020	4,427
9	Tower Section 5	57,174	514,566	29,970	3,380	4,020
27	SG170 BLADE	37,398	1009,746	84,022	4,355	4,053
9	NACELLE GLOBAL	80,003	720,027	15,162	4,205	3,643
9	DRIVE TRAIN	84,679	762,111	7,446	3,130	3,218
9	HUB	58,625	527,625	5,160	4,700	4,245

#### 4. Preamble

SAE has been appointed to conduct a feasibility study for a project of GRV Wind Sardegna 6 S.r.l. located near Selegas, Gesico e Mandas (SU) in Sardinia region in Italy. The study has been commissioned in order to define the feasibility to deliver wind turbine components to **"Planu Serrantis" wind farm**, that consists of 9xSG170.

The study that follows has been conducted on the basis of the packing list that GOLDWIND has provided to SAE on 30/03/2023 and the site visit was done on 23-24/05/2023 (week 21).

## **5. Table of content**

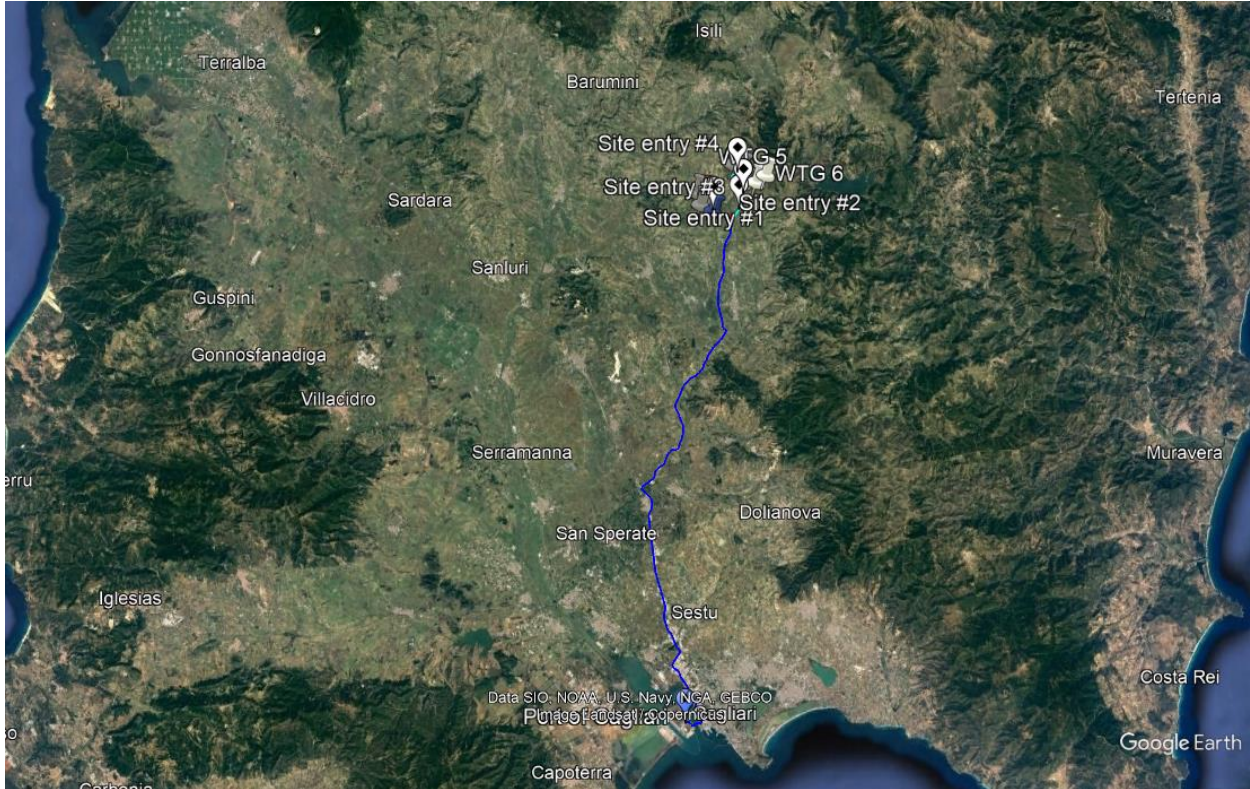
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## **6. Executive Summary**

Following the visit carried out on 23<sup>th</sup> and 24<sup>th</sup> May 2023 from loading point to site access, assumed all modifications described in this report, SAE found the possibility to do transportation of all components to "Planu Serrantis" wind farm access.

## 7. General Route Description

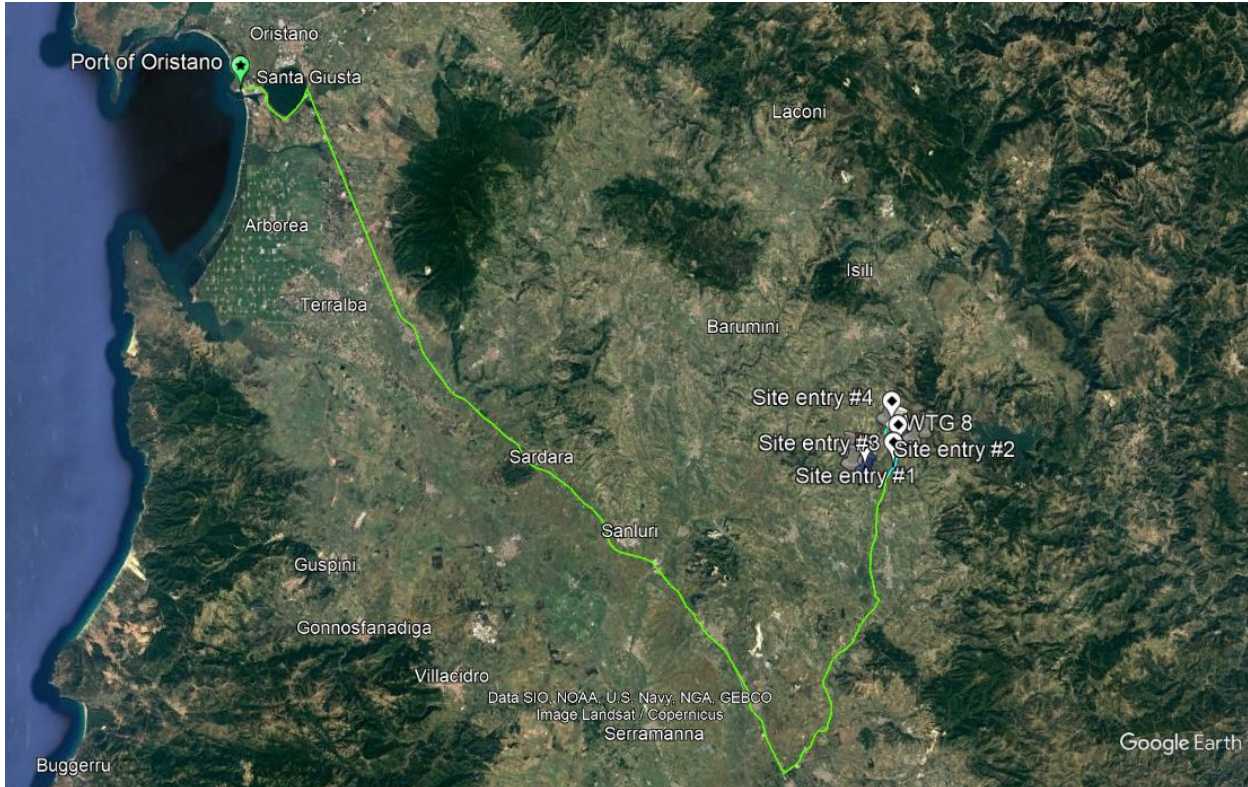
### 7.1 General route from Port of Cagliari



- **Port of Cagliari**
- **SS 195:** from Port of Oristano to SS 195 racc;
- **SS 195 racc:** from SS 195 to SS 130;
- **SS 130:** from SS 195 racc to SS 391;
- **SS 391:** from SS 130 to SS 131;
- **SS 131:** from SS 391 to SS 128;
- **SS 128:** from SS 131 to SP 5;
- **SP 5:** from SS 128 to site access;
- **SS 128:** from SS 131 to several site access.



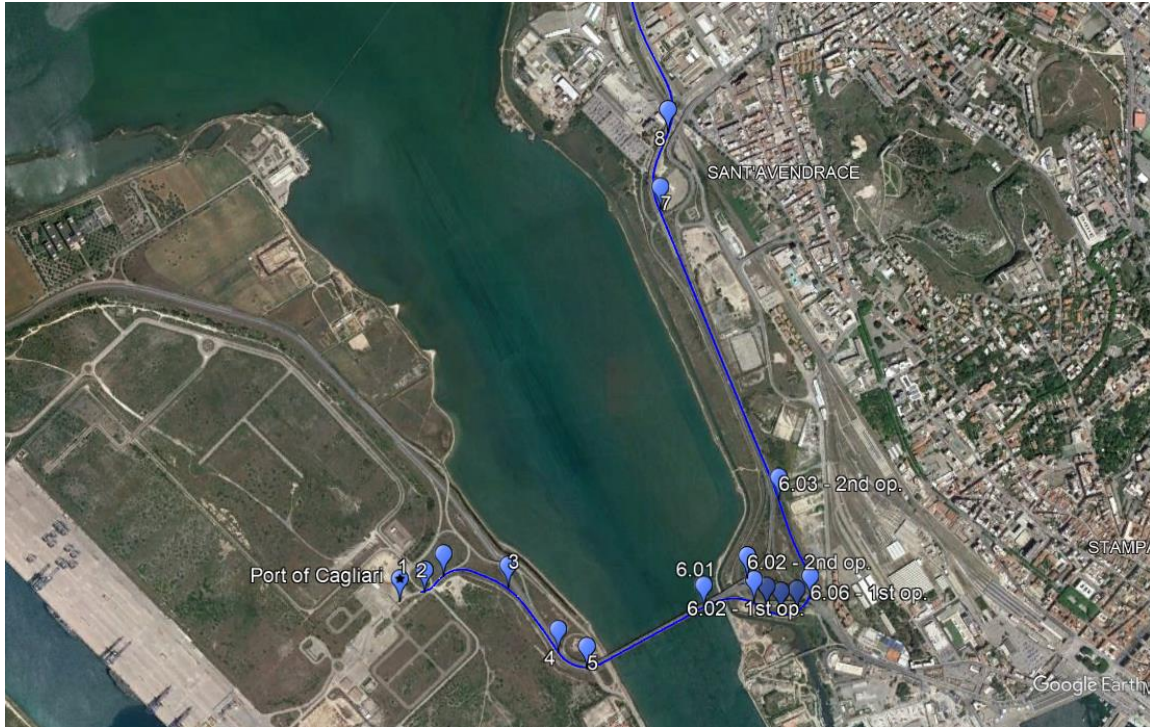
### 7.2 General route from Port of Oristano



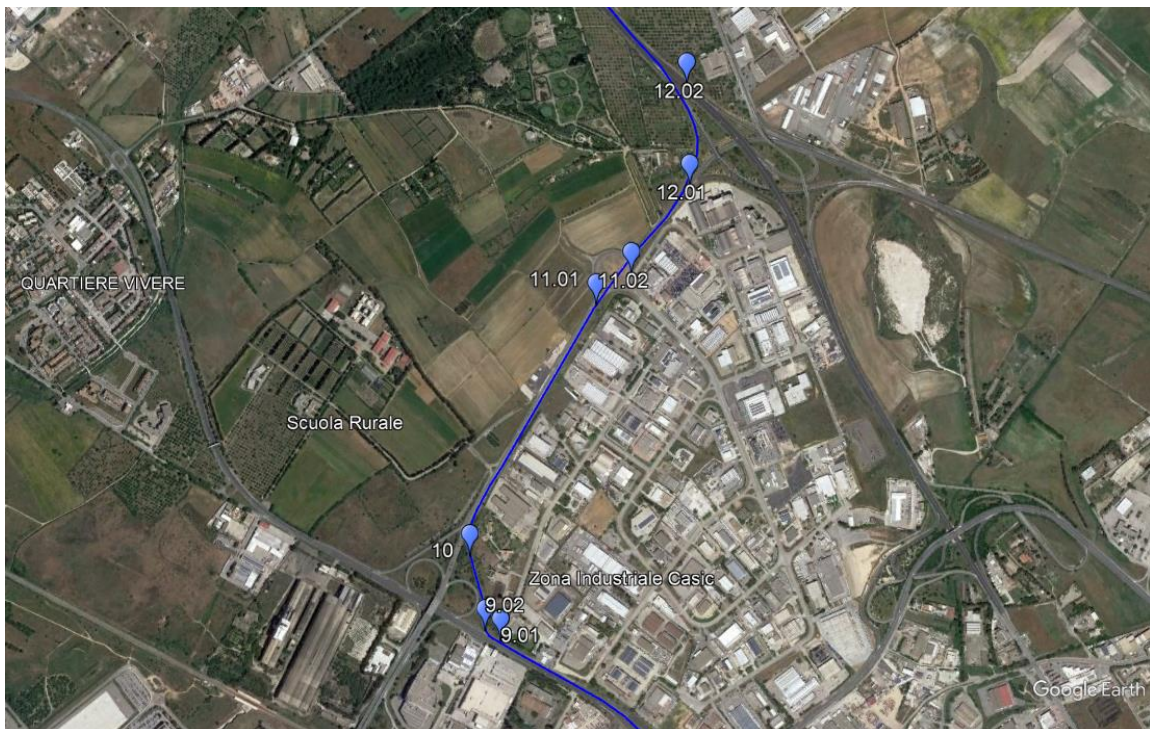
- **Port of Oristano**
- **Via Marongiu:** from Port of Oristano to SP 97;
- **SP 97:** from Via Marongiu to SP 49;
- **SP 49:** from SP 97 to SP 56;
- **SP 56:** from SP 49 to SS 131;
- **SS 131:** from SP 56 to SP 7;
- **SP 7:** from SS 131 to SS 128;
- **SS 128:** from SS 131 to SP 5;
- **SP 5:** from SS 128 to site access;
- **SS 128:** from SS 131 to several site access.

### 8. Map of observations

Map of Observations from Obs. 1 to Obs. 8 (from Port of Cagliari)



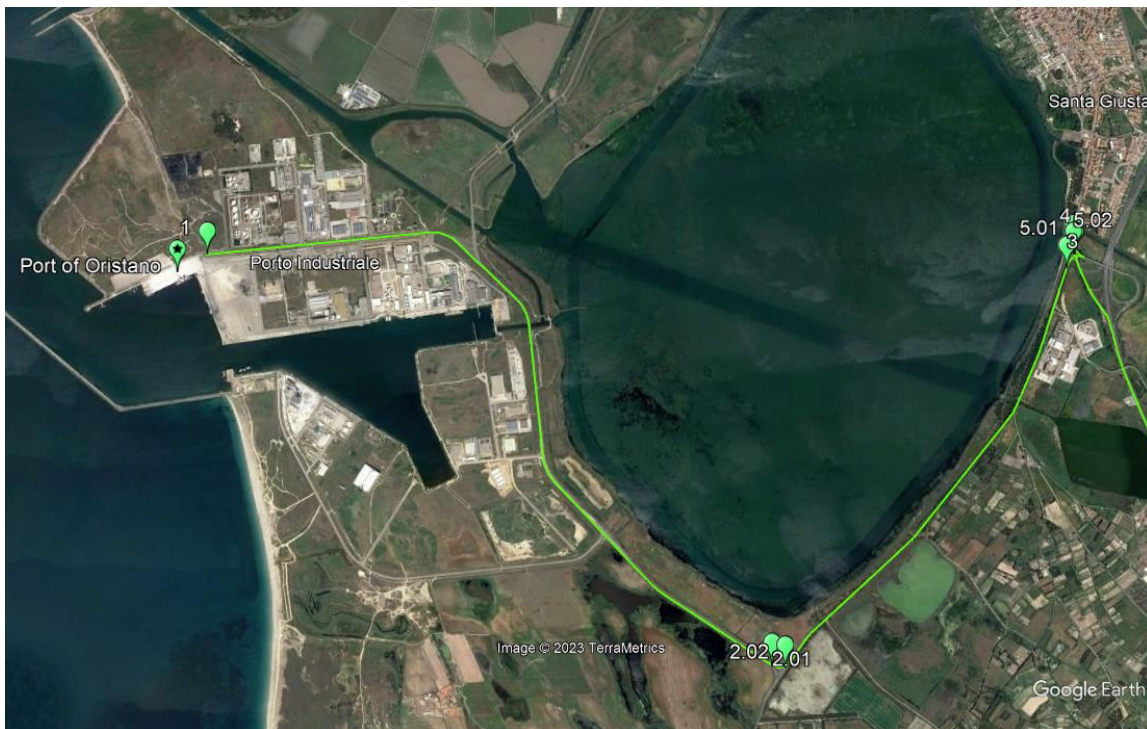
Map of Observations from Obs. 9.01 to Obs. 12.02 (from Port of Cagliari)



### Map of Observations from Obs. 13.01 to Obs. 14 (from Port of Cagliari)



### Map of Observations from Obs. 1 to Obs. 5.02 (from Port of Oristano)



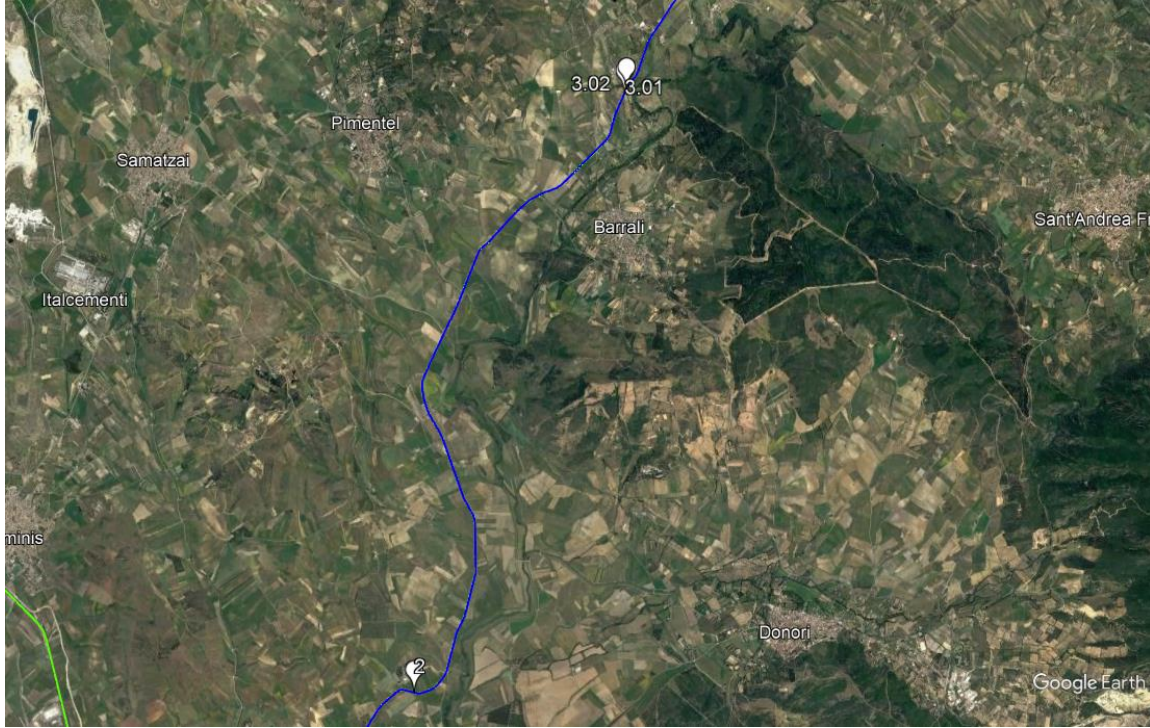
### Map of Observations from Obs. 6.01 to Obs. 8 (from Port of Oristano)



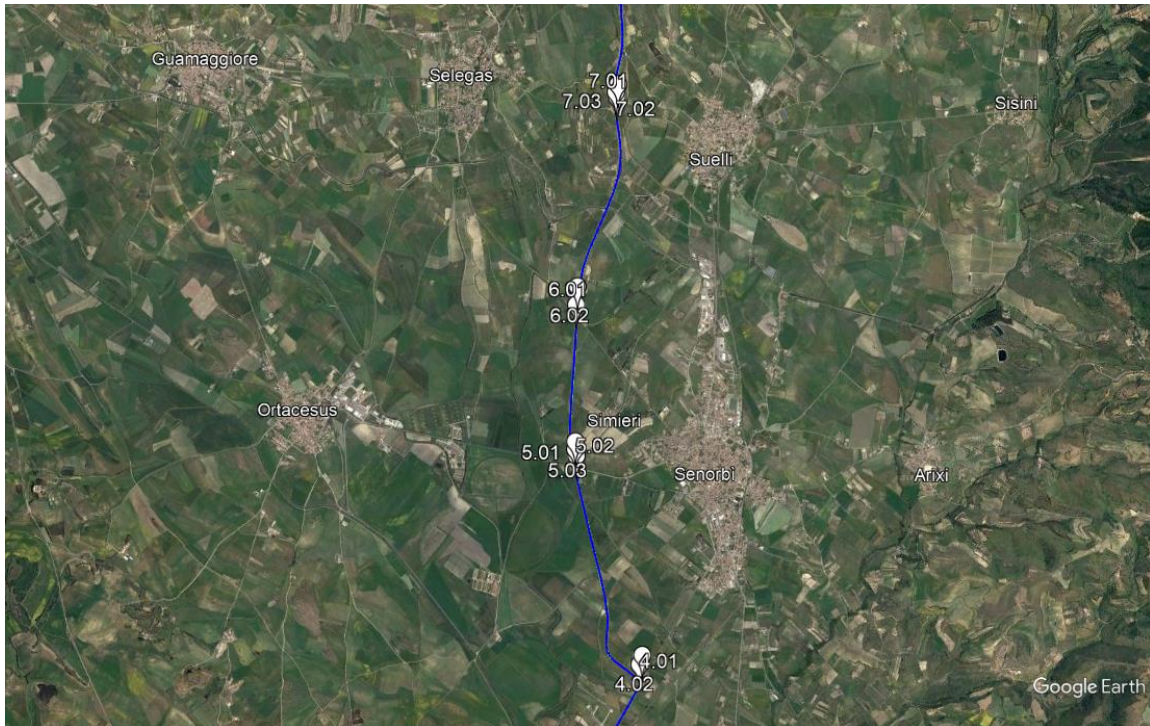
### Map of Observations from Obs. 1.01 to Obs. 1.02 (common route)



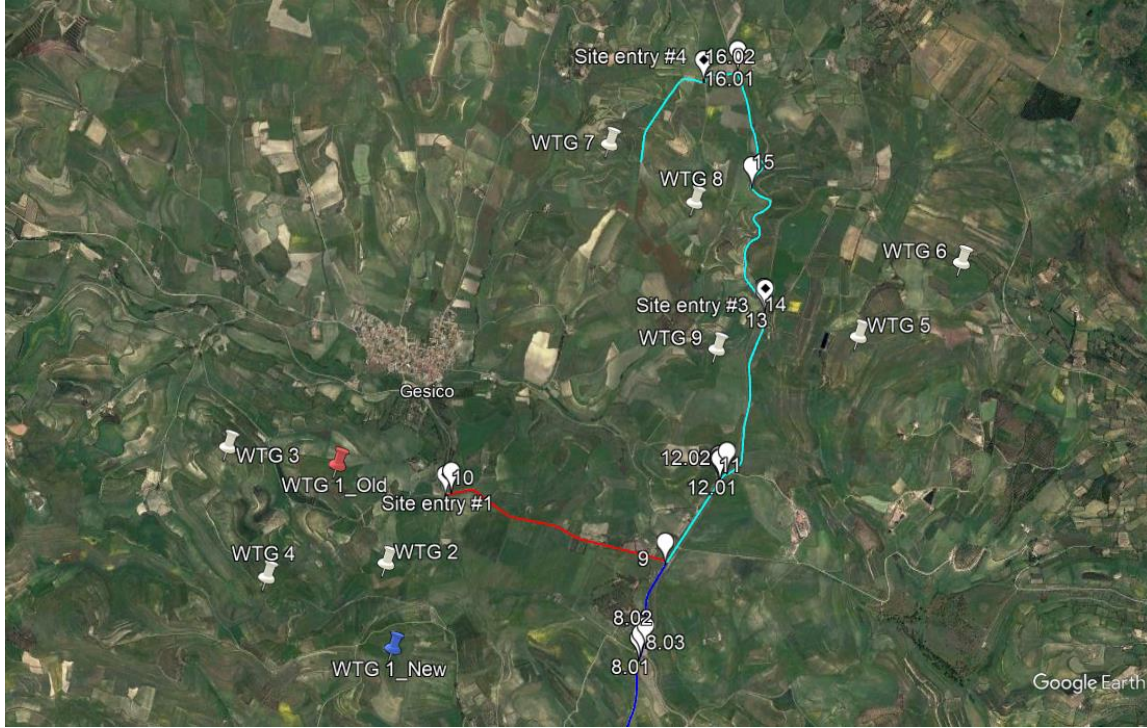
### Map of Observations from Obs. 2 to Obs. 3.02 (common route)



### Map of Observations from Obs. 4.01 to Obs. 7.03 (common route)



### Map of Observations from Obs. 8.01 to Obs. 16.02 (common route)



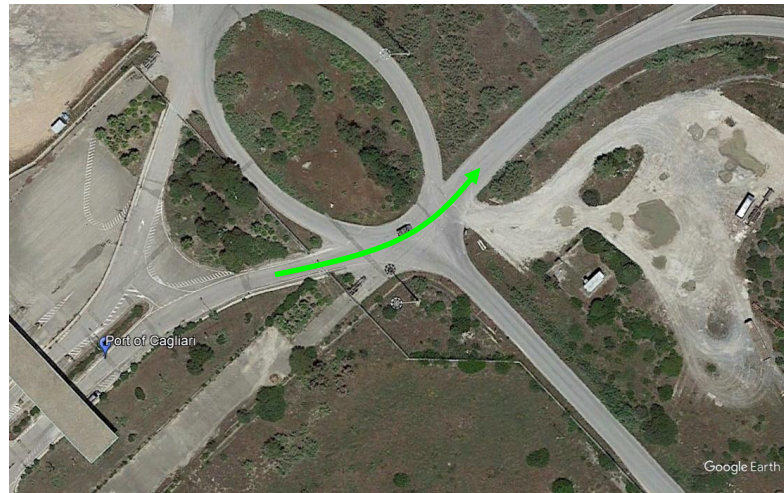
## 9. Road Modifications

### Observation 1 – route from port of Cagliari

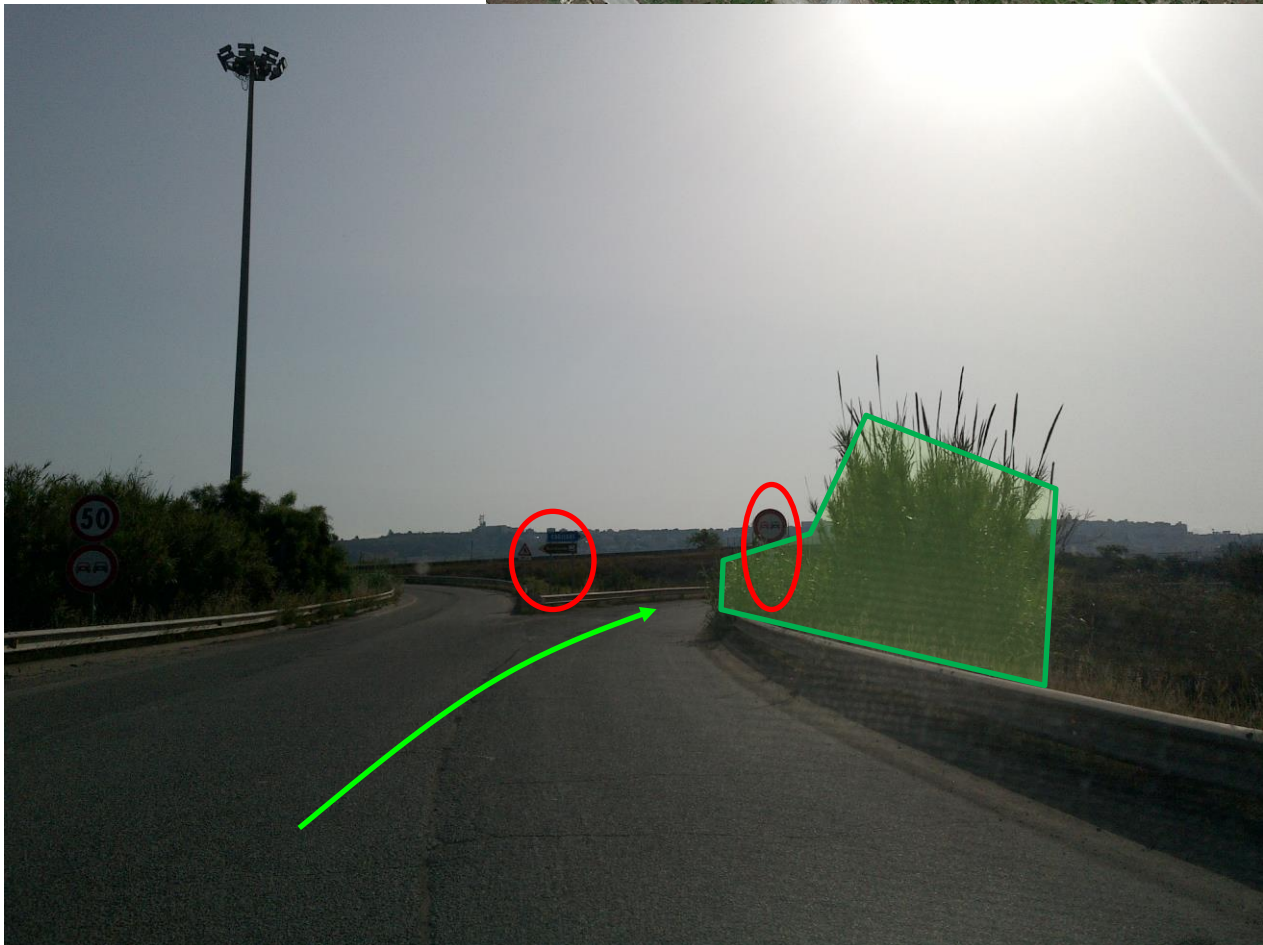
Exit from Port of Cagliari.

The gate has to be adjusted for the exit of road means.

N 39.217083° E 9.083614°

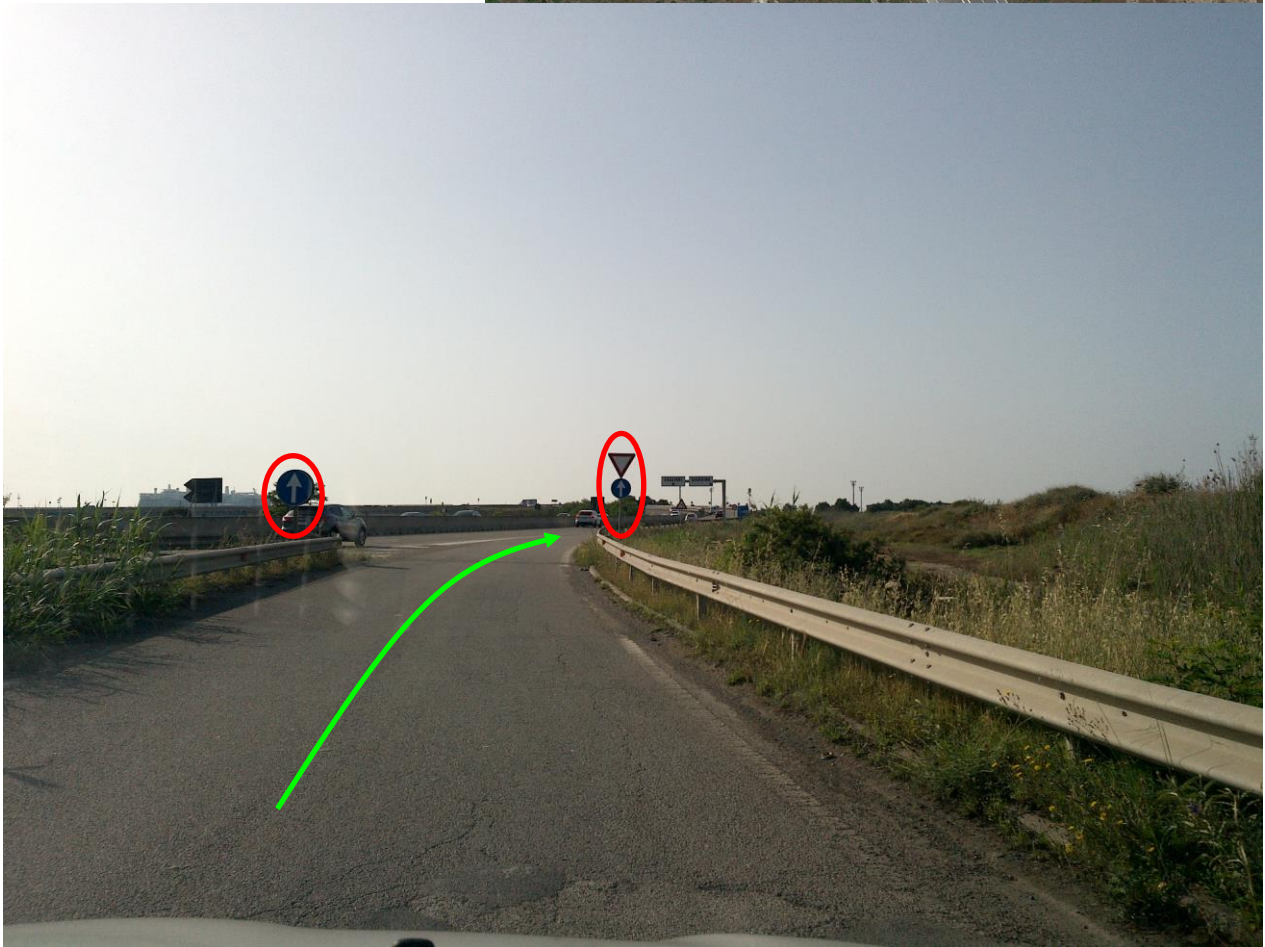


**Observation 2 – route from port of Cagliari**  
Road signs on both sides have to be removed.  
Vegetation on the right has to be cut for entire curving radius.  
N 39.217589° E 9.084358°





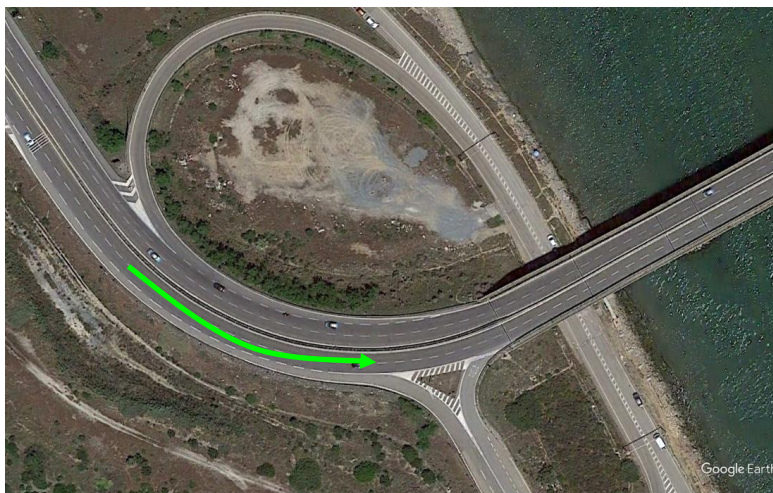
**Observation 3 – route from port of Cagliari**  
Road signs on both sides have to be removed.  
N 39.217236° E 9.086906°



**Observation 4 – route from port of Cagliari**  
Pole on the right has to be removed.  
N 39.215275° E 9.088878°



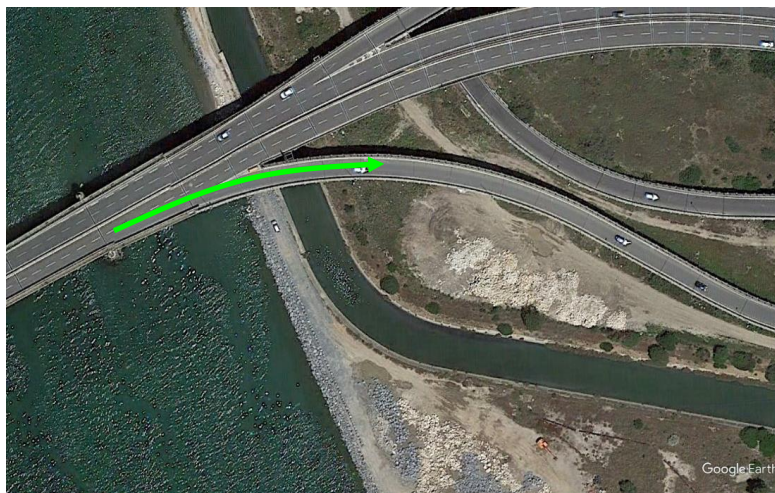
**Observation 5 – route from port of Cagliari**  
No.2 road signs on the right have to be removed.  
N 39.214747° E 9.090011°



### Observation 6.01 – route from port of Cagliari – 1<sup>st</sup> option

No.2 road signs have to be removed.

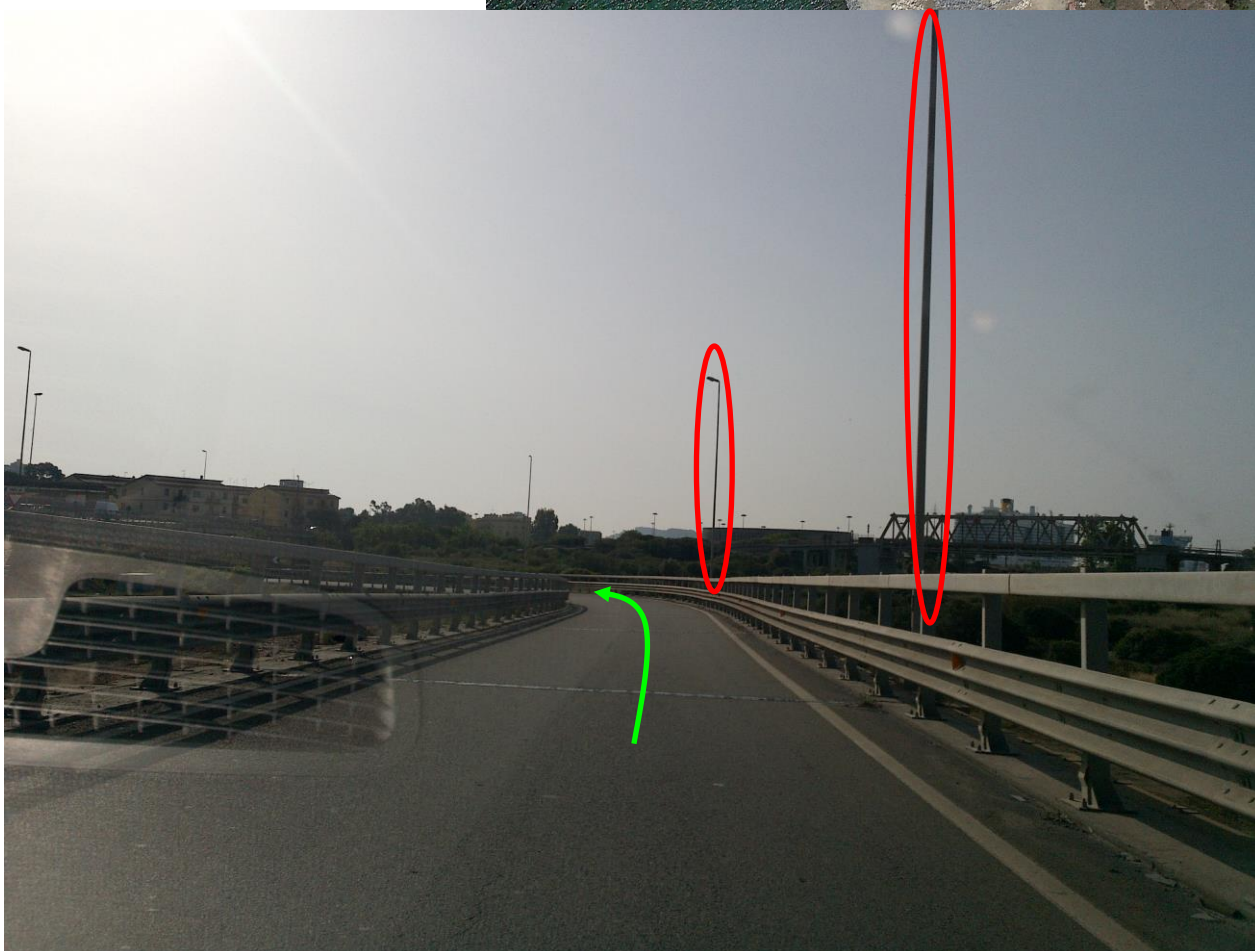
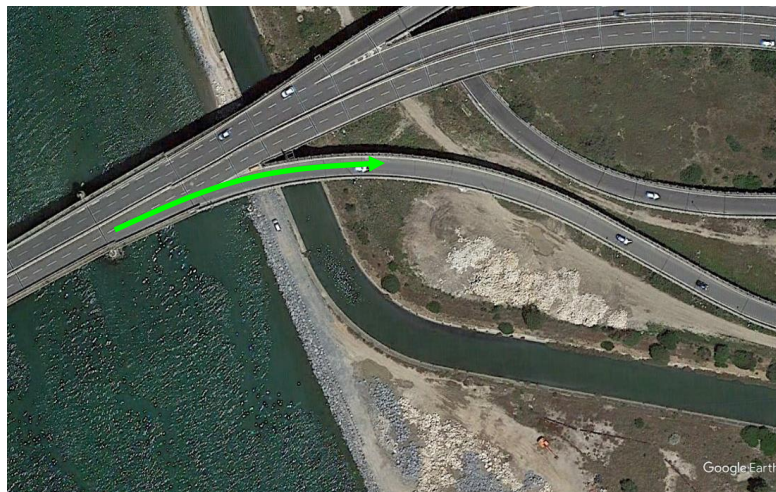
N 39.216622° E 9.094625°



### Observation 6.02 – route from port of Cagliari – 1<sup>st</sup> option

No.2 poles have to be removed.

N 39.216825° E 9.096611°

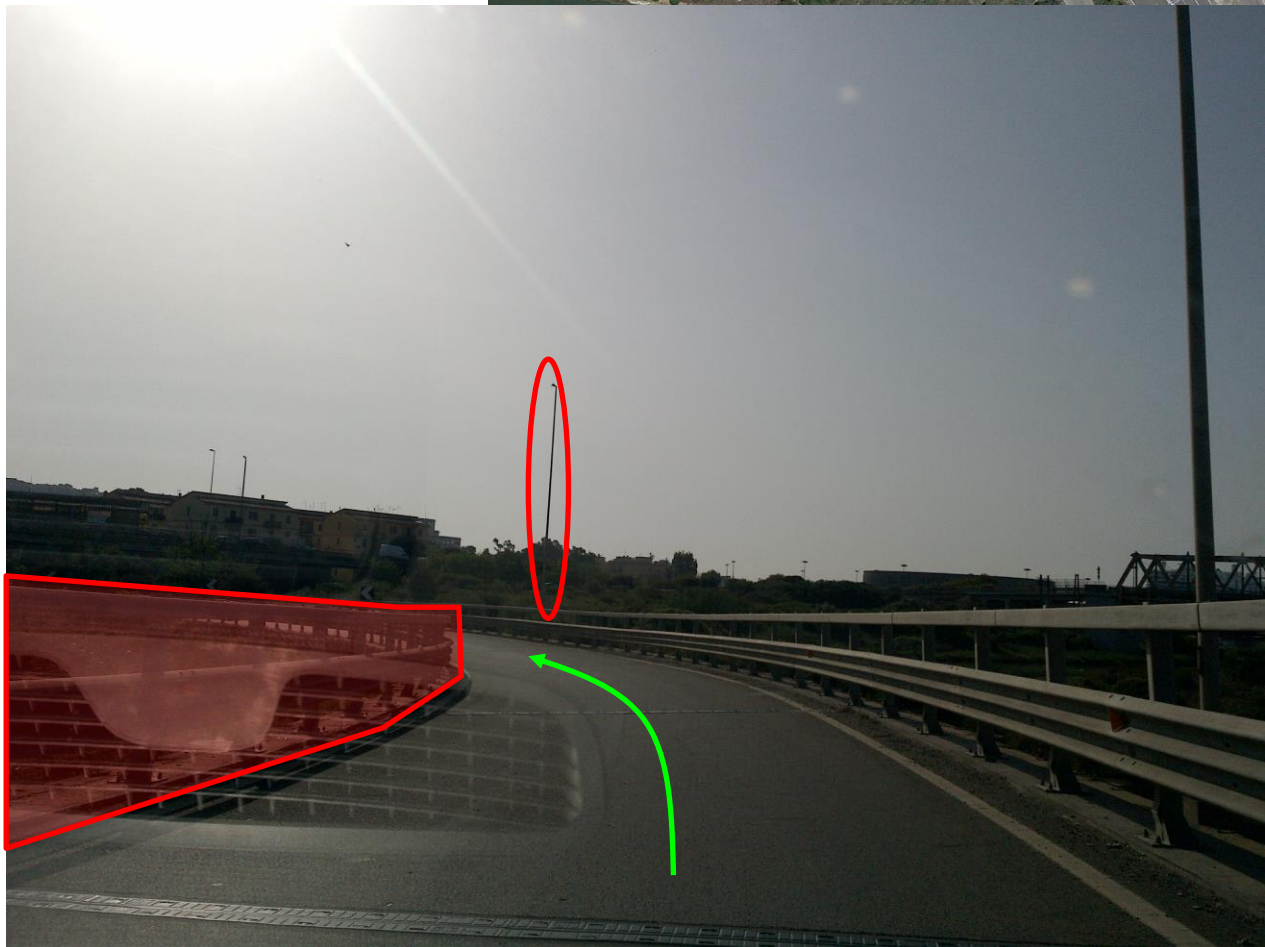


### Observation 6.03 – route from port of Cagliari – 1<sup>st</sup> option

No.1 pole has to be removed.

Guardrail on the left has to be removed for entire curving radius.

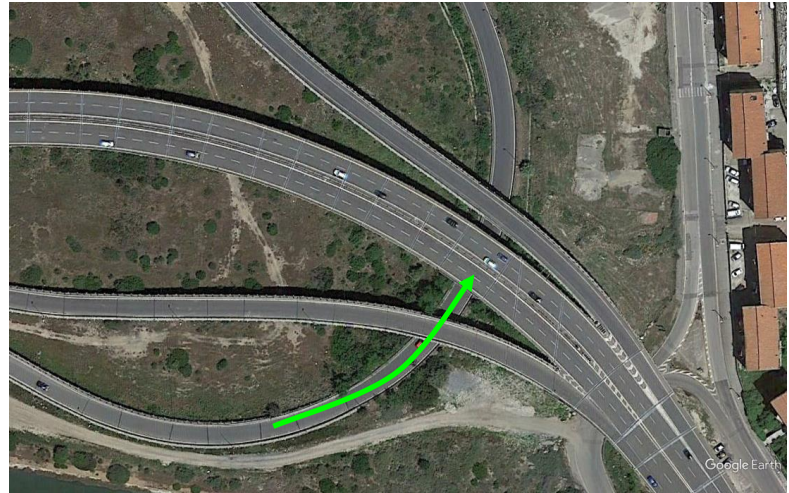
N 39.216608° E 9.097114°



### Observation 6.04 – route from port of Cagliari – 1<sup>st</sup> option

No.1 pole has to be removed.

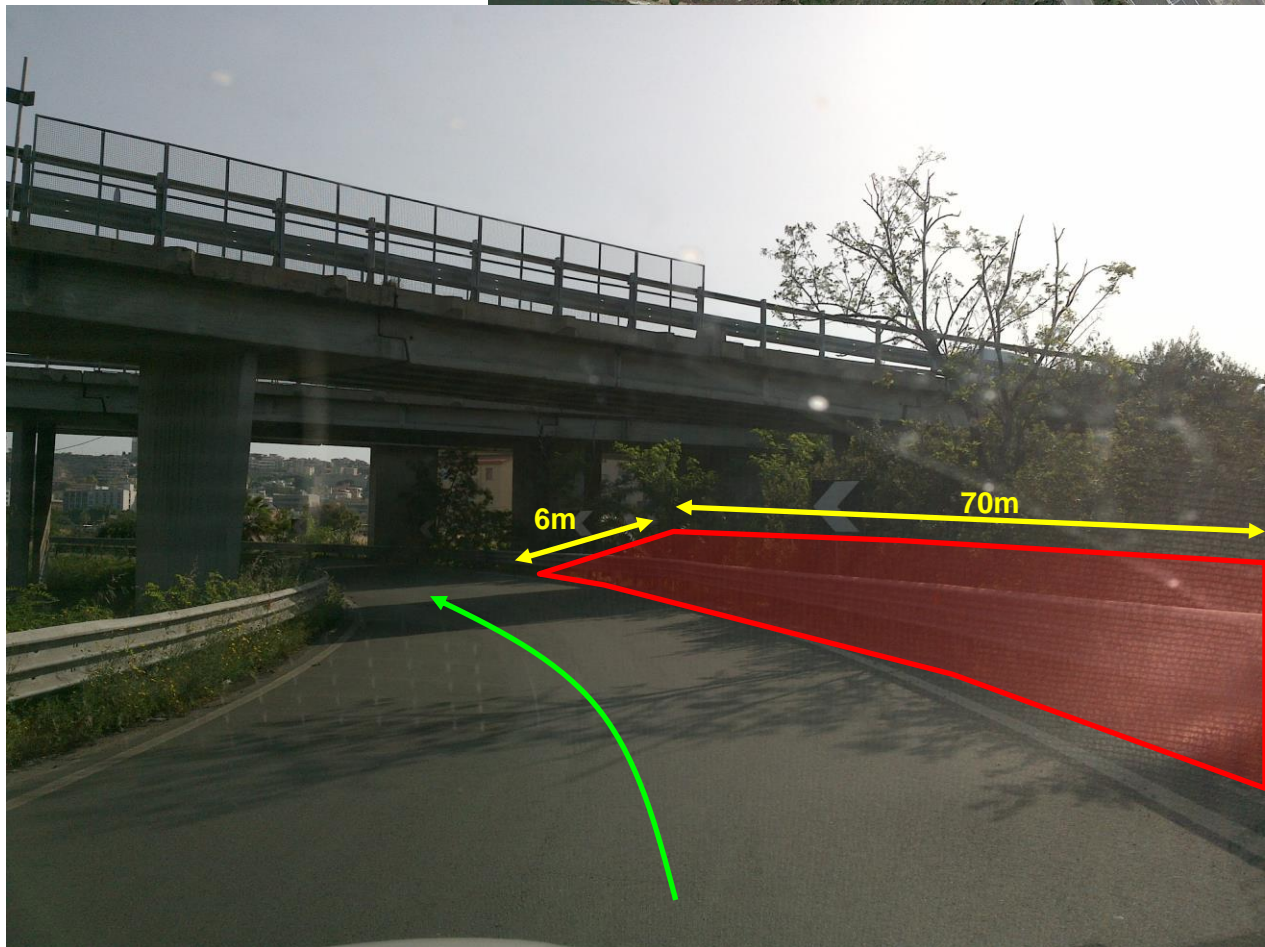
N 39.216439° E 9.097667°



### Observation 6.05 – route from port of Cagliari – 1<sup>st</sup> option

The road on the right has to be widened and made practicable for 6x70m in order to avoid pillars.

N 39.216497° E 9.098294°



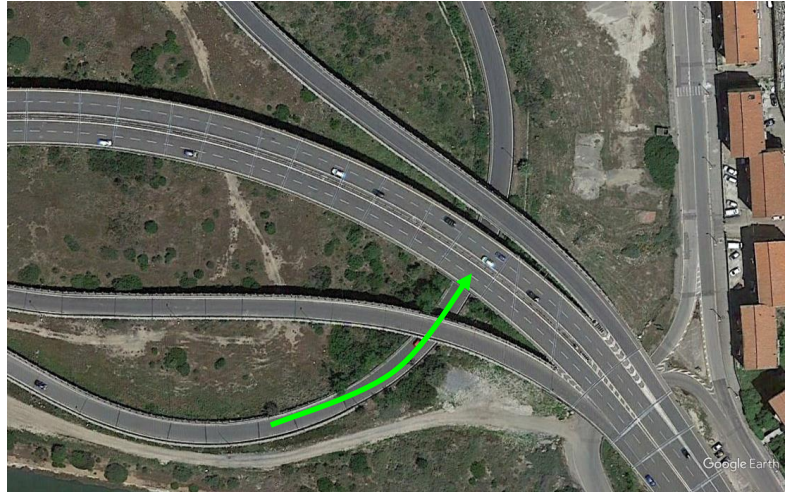


### Observation 6.06 – route from port of Cagliari – 1<sup>st</sup> option

The road on the right has to be widened and made practicable for 9x88m in order to avoid pillars.

Poles, road signs and guardrail have to be removed.

N 39.216906° E 9.098889°



### Observation 6.01 – route from port of Cagliari – 2<sup>nd</sup> option

New jersey on the left have to be removed for 40m in order to take the slip road against the traffic flow.

N 39.216622° E 9.094625°



**Observation 6.02 – route from port of Cagliari – 2<sup>nd</sup> option**  
Guardrail on the left has to be removed for entire curving radius.  
N 39.217511° E 9.096336°



### Observation 6.03 – route from port of Cagliari – 2<sup>nd</sup> option

Guardrail on the left has to be removed for 40m in order to return on correct way.

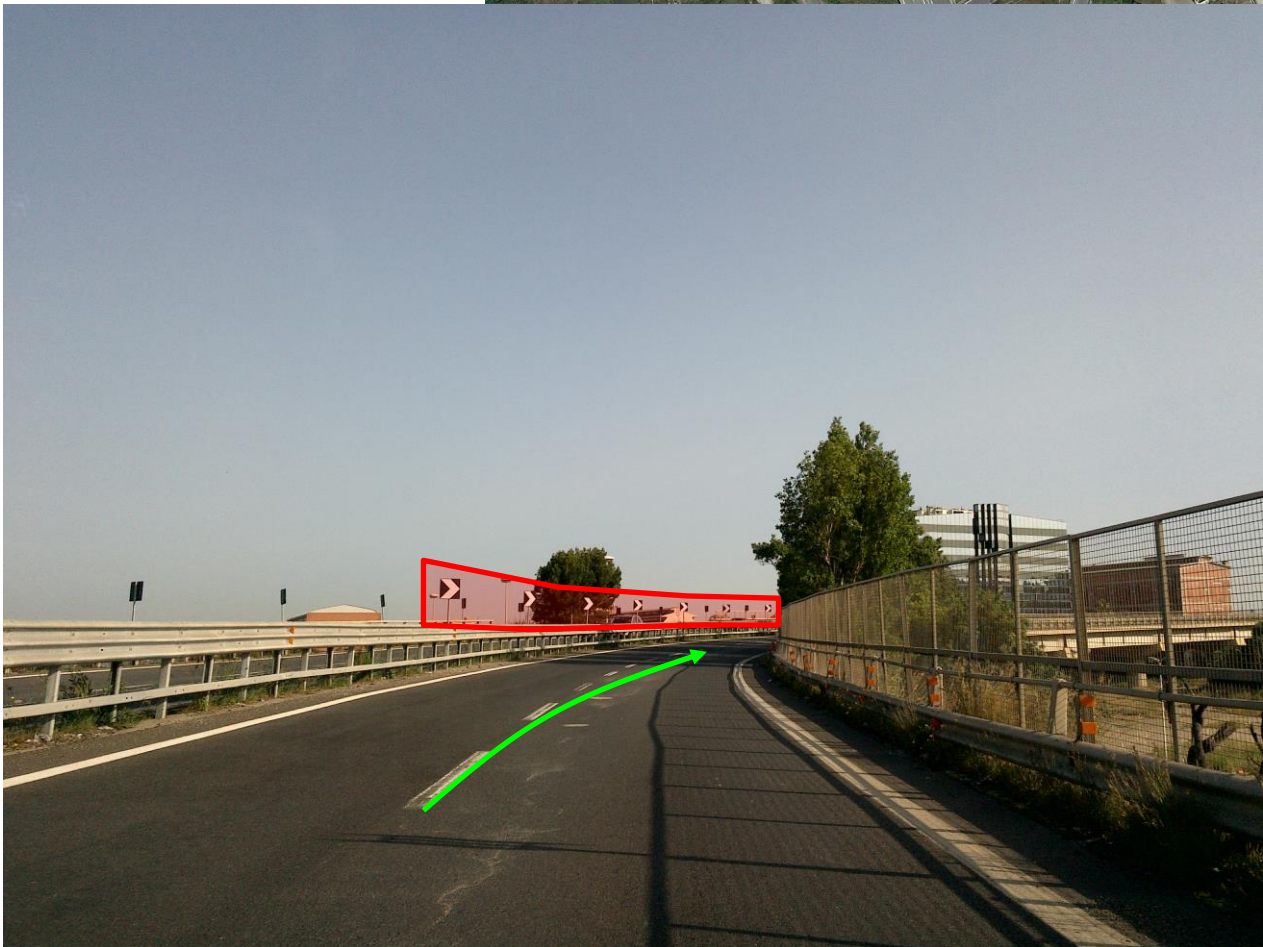
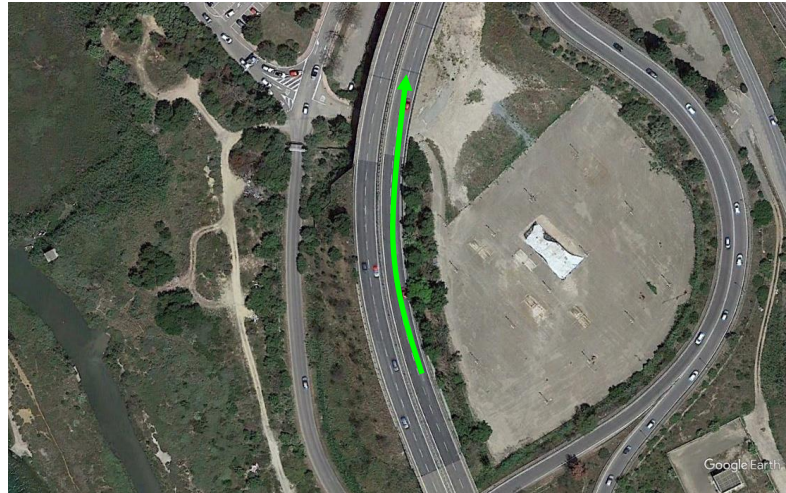
N 39.219928° E 9.097583°



### Observation 7 – route from port of Cagliari

Road signs on the left have to be removed for entire curving radius.

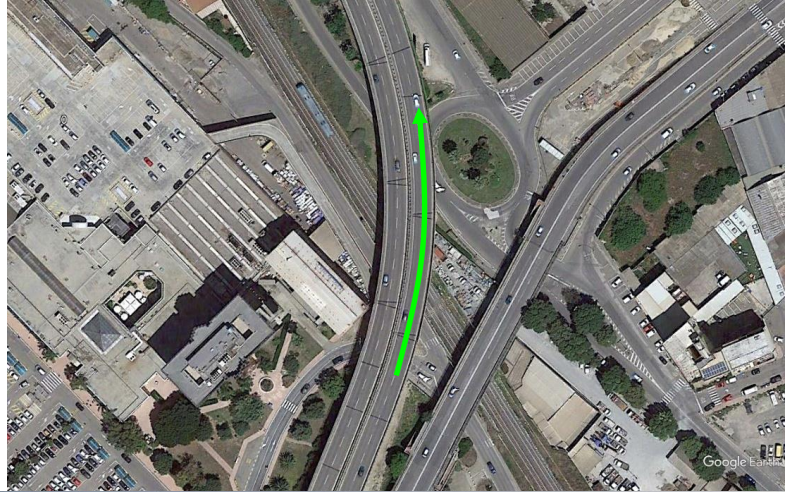
N 39.228811° E 9.092911°



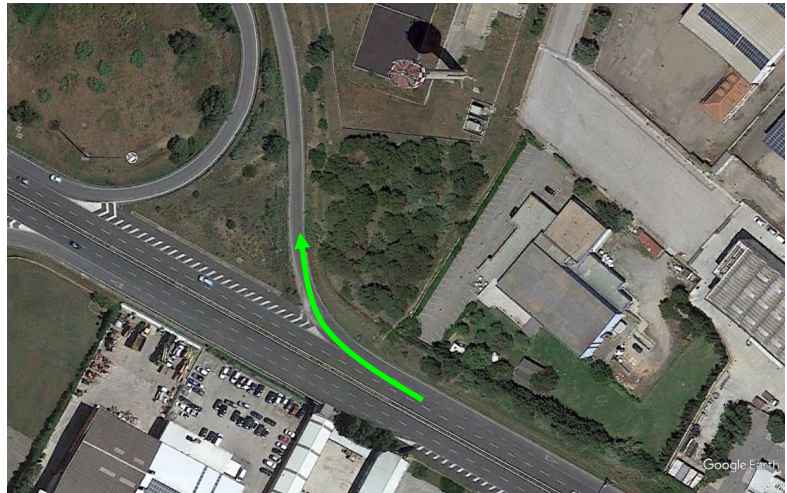
### Observation 8 – route from port of Cagliari

Road signs on the right have to be removed for entire curving radius.

N 39.231164° E 9.093208°



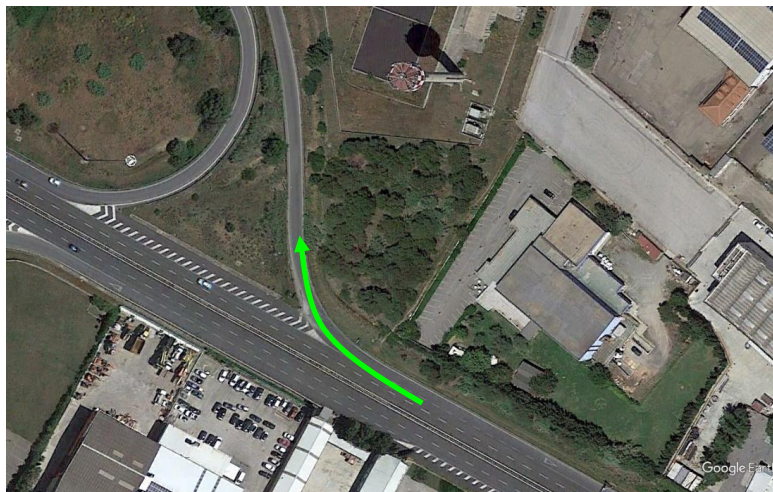
**Observation 9.01 – route from port of Cagliari**  
Guardrail on the right has to be removed for 25m.  
Road signs have to be removed.  
N 39.258742° E 9.071150°



### Observation 9.02 – route from port of Cagliari

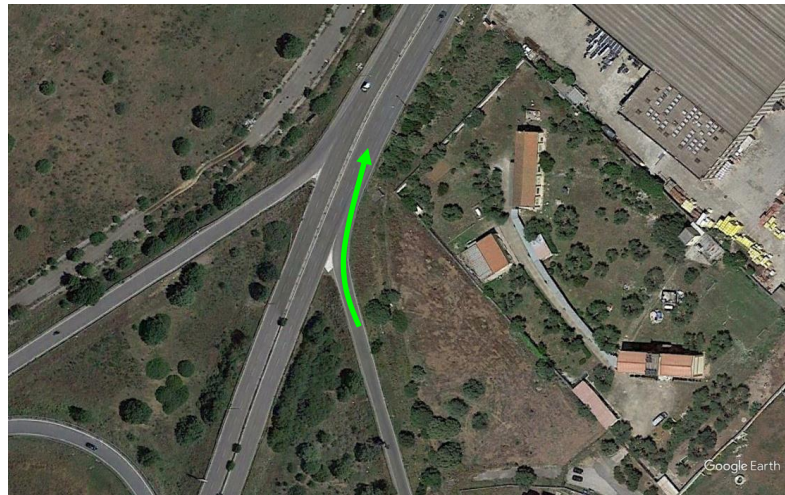
The road on the left has to be widened and made practicable for 10x100m.

**N 39.259000° E 9.070653°**





**Observation 10 – route from port of Cagliari**  
Guardrail on the right has to be removed for 70m.  
Remove all air obstacles for 6m in depth.  
N 39.260892° E 9.070158°

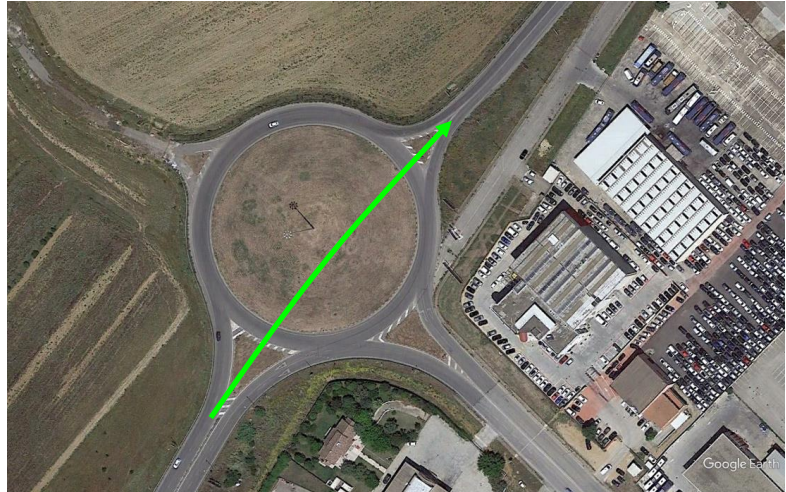


### Observation 11.01 – route from port of Cagliari

Half traffic island has to be widened and made practicable.

By-pass of 9m width on roundabout has to be created according to Customer Guidelines.

N 39.267206° E 9.074264°



**Observation 11.02 – route from port of Cagliari**  
Traffic island has to be widened and made practicable.  
**N 39.267983° E 9.075400°**



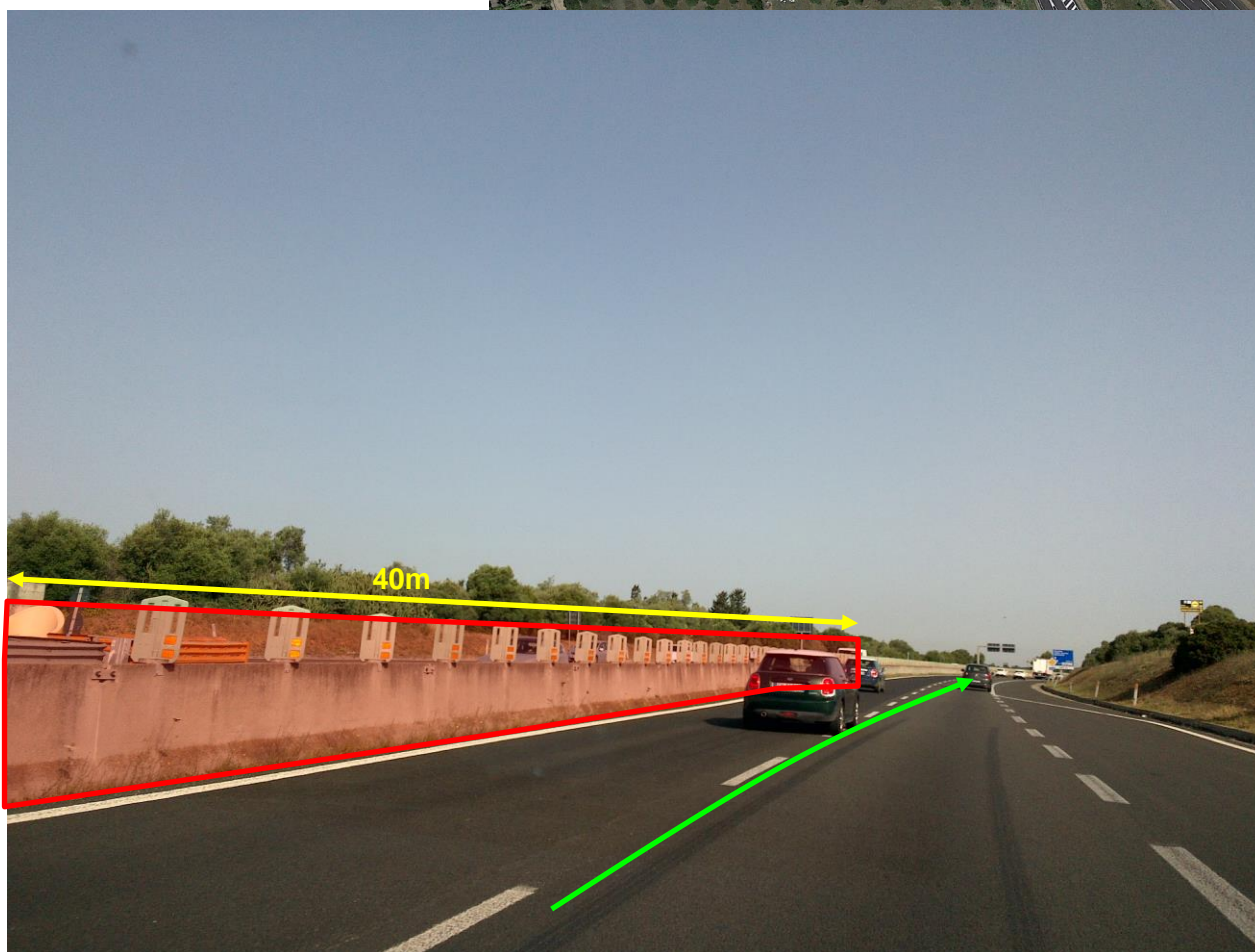
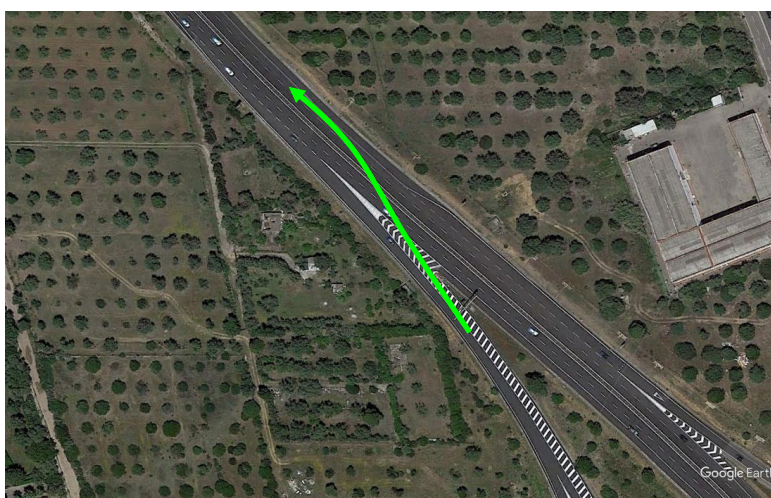
**Observation 12.01 – route from port of Cagliari**  
Take the slip road on the left against the traffic flow.  
**N 39.270197° E 9.077286°**



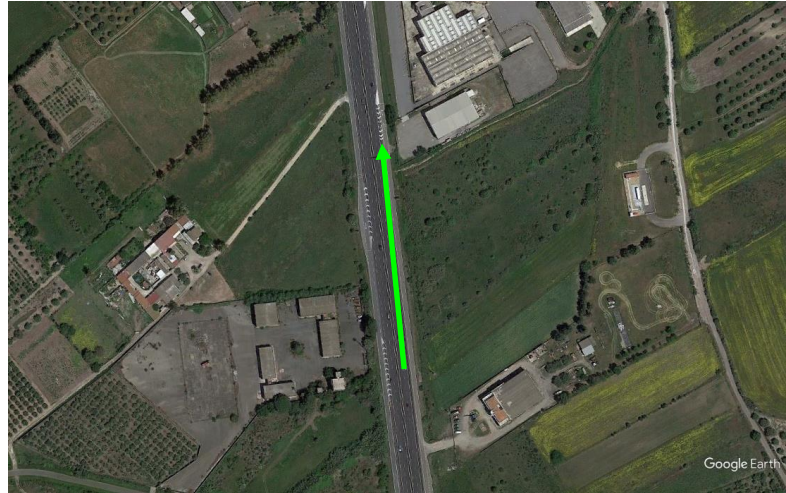
### Observation 12.02 – route from port of Cagliari

Concrete guardrail on the left has to be removed for 40m in order to return on correct way.

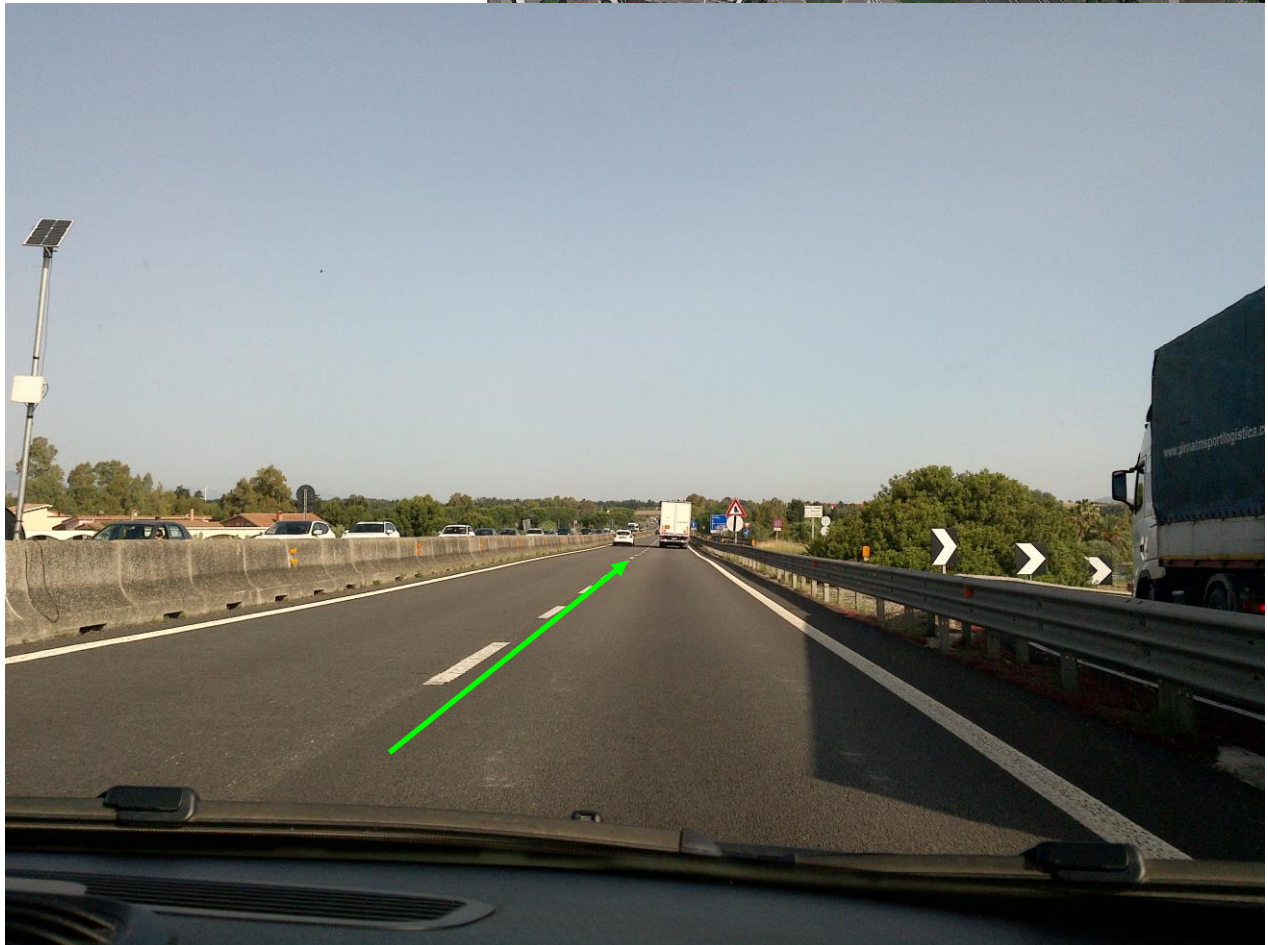
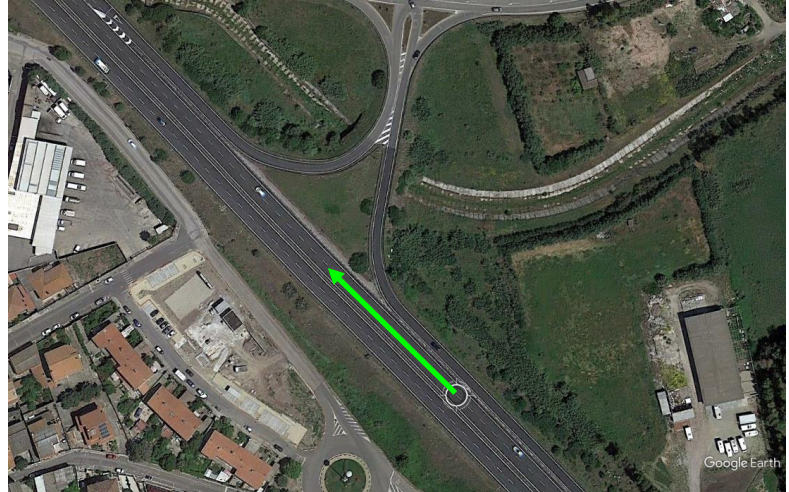
N 39.272733° E 9.077192°



**Observation 13.01 – route from port of Cagliari**  
Work in progress in this point.  
**N 39.368328° E 9.047756°**



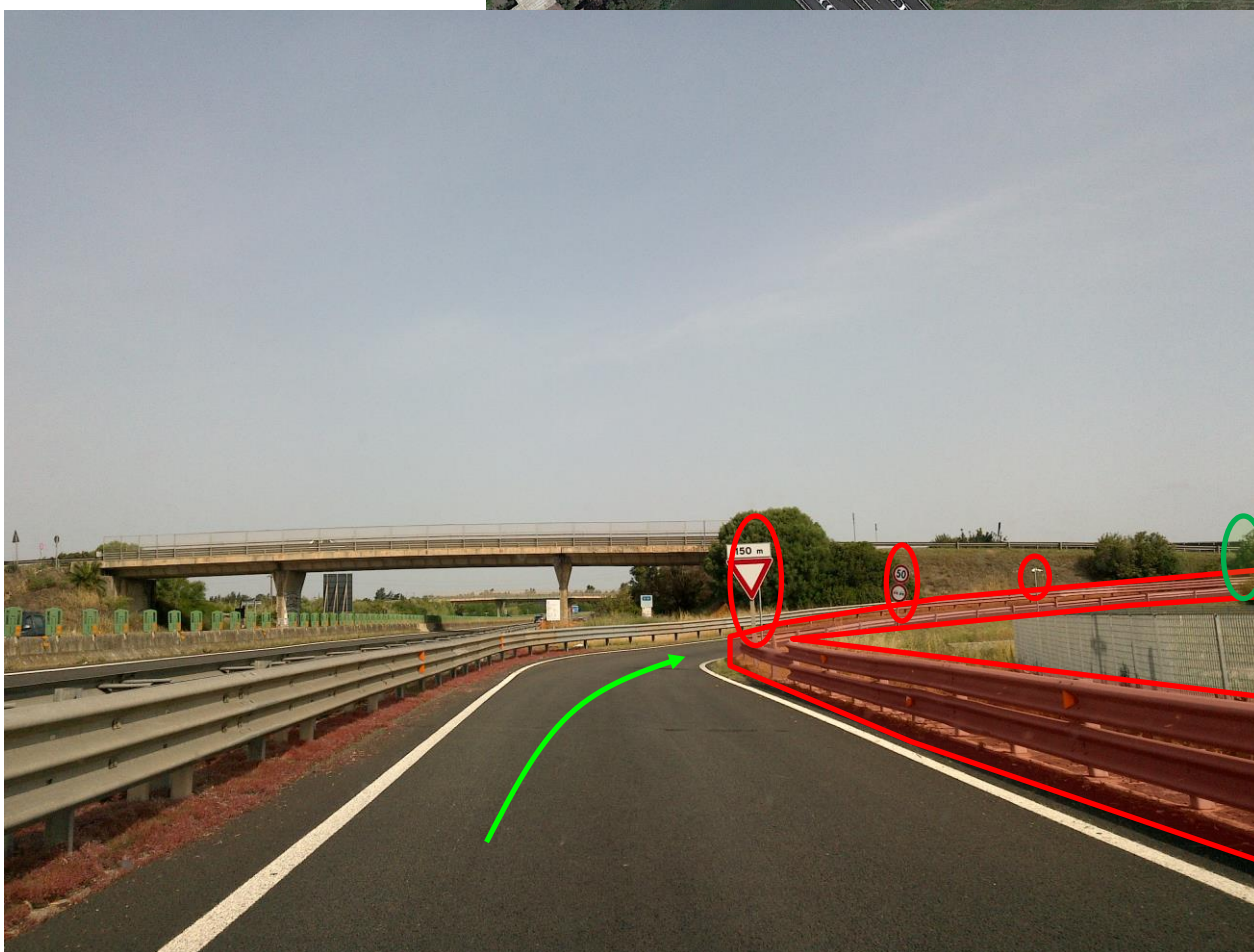
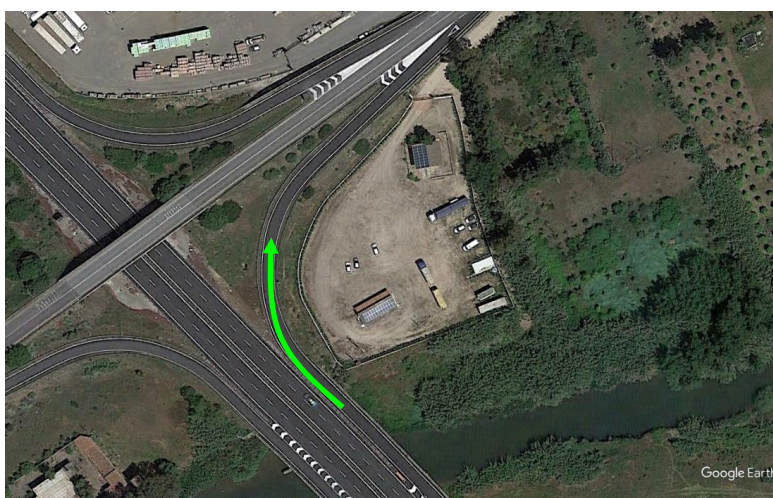
**Observation 13.02 – route from port of Cagliari**  
End of road works.  
**N 39.389303° E 9.047156°**



### Observation 14 – route from port of Cagliari

Guardrail, road signs and vegetation on the right have to be removed for entire curving radius.

N 39.395089° E 9.039758°

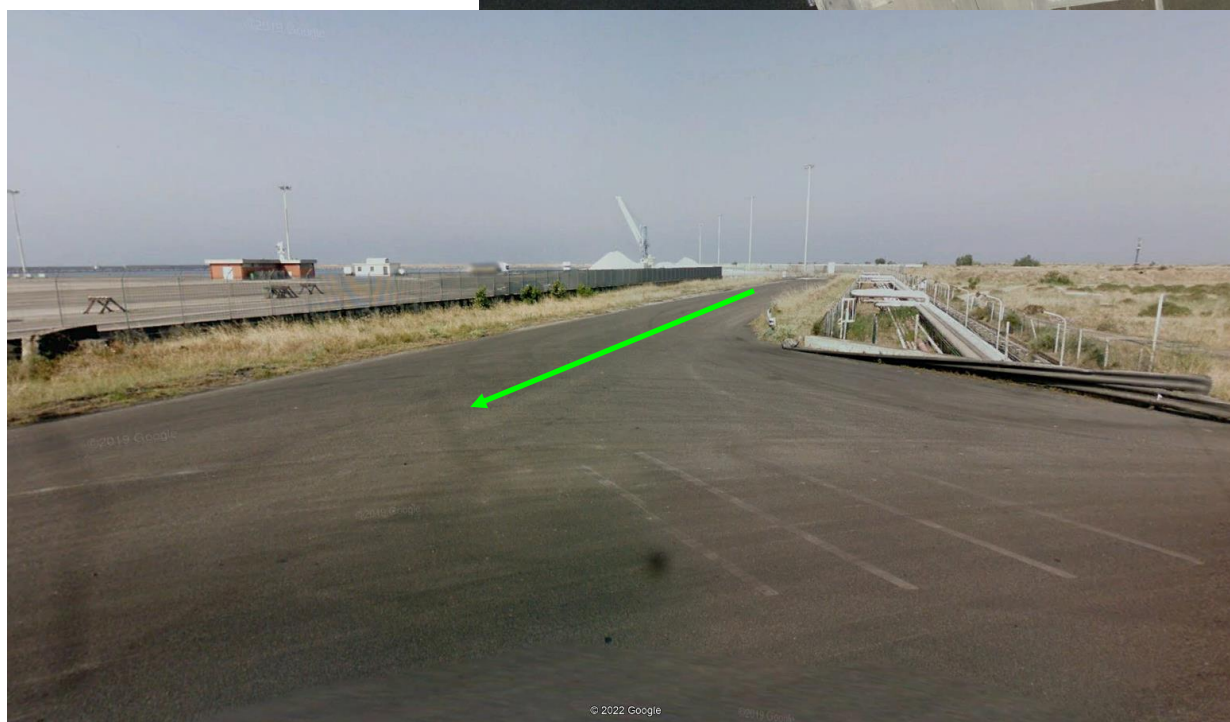




### Observation 1 – route from port of Oristano

Exit from Port of Oristano.

N 39.868183° E 8.551178°



### Observation 2.01 – route from port of Oristano

Make a by-pass through the traffic island according to Goldwind Guidelines.

N 39.847030° E 8.588989°



### Observation 2.02 – route from port of Oristano

End of by-pass.

Vegetation on the left side has to be cut.

Road signs on traffic island have to be removed.

N 39.846886° E 8.589869°



### Observation 3 – route from port of Oristano

Vegetation has to be cut over 2.5m height until crossway.

N 39.867458° E 8.608742°



### Observation 4 – route from port of Oristano

Traffic island has to be made accessible.

Road signs have to be removed.

N 39.868172° E 8.609194°



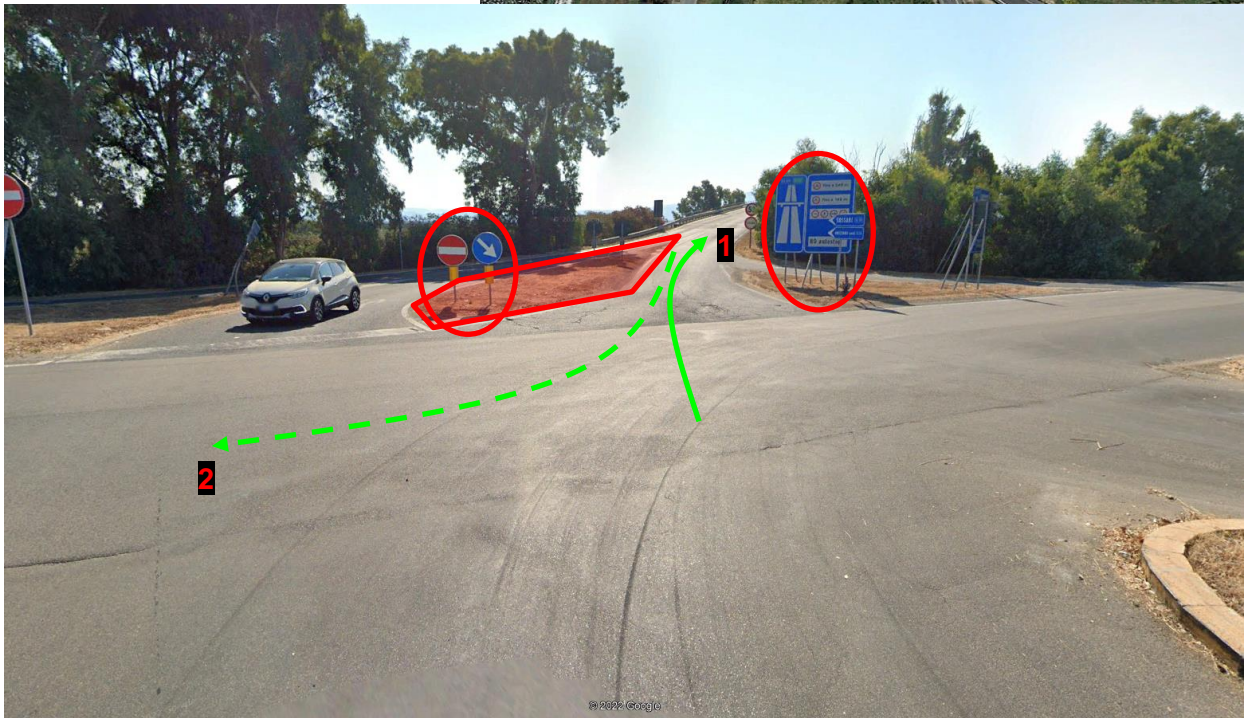
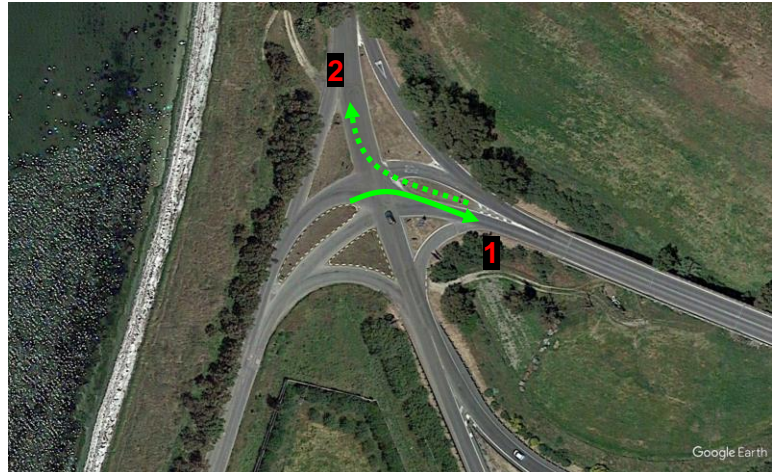
## "Planu Serrantis"

### Observation 5.01 – route from port of Oristano

Traffic island has to be made accessible, removing also all road signs on it, in order to make the maneuver as shown in the picture.

Road signs have to be removed.

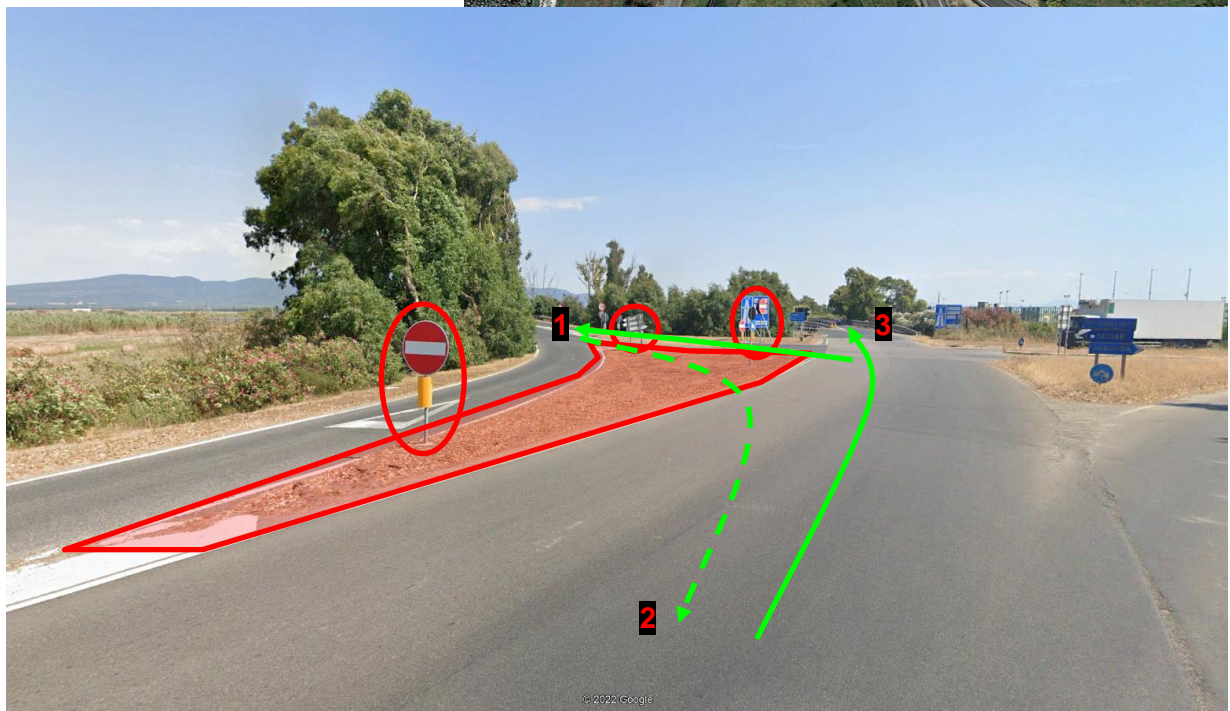
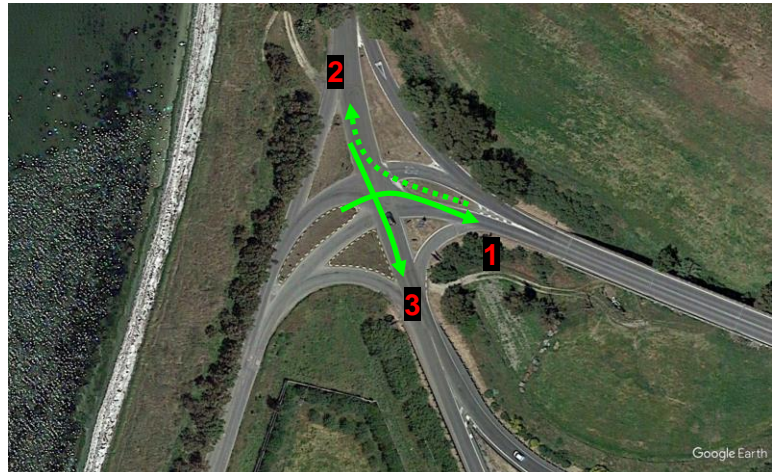
N 39.868161° E 8.609297°



### Observation 5.02 – route from port of Oristano

Traffic island has to be made accessible, removing also all road signs on it, in order to make the maneuver as shown in the picture.

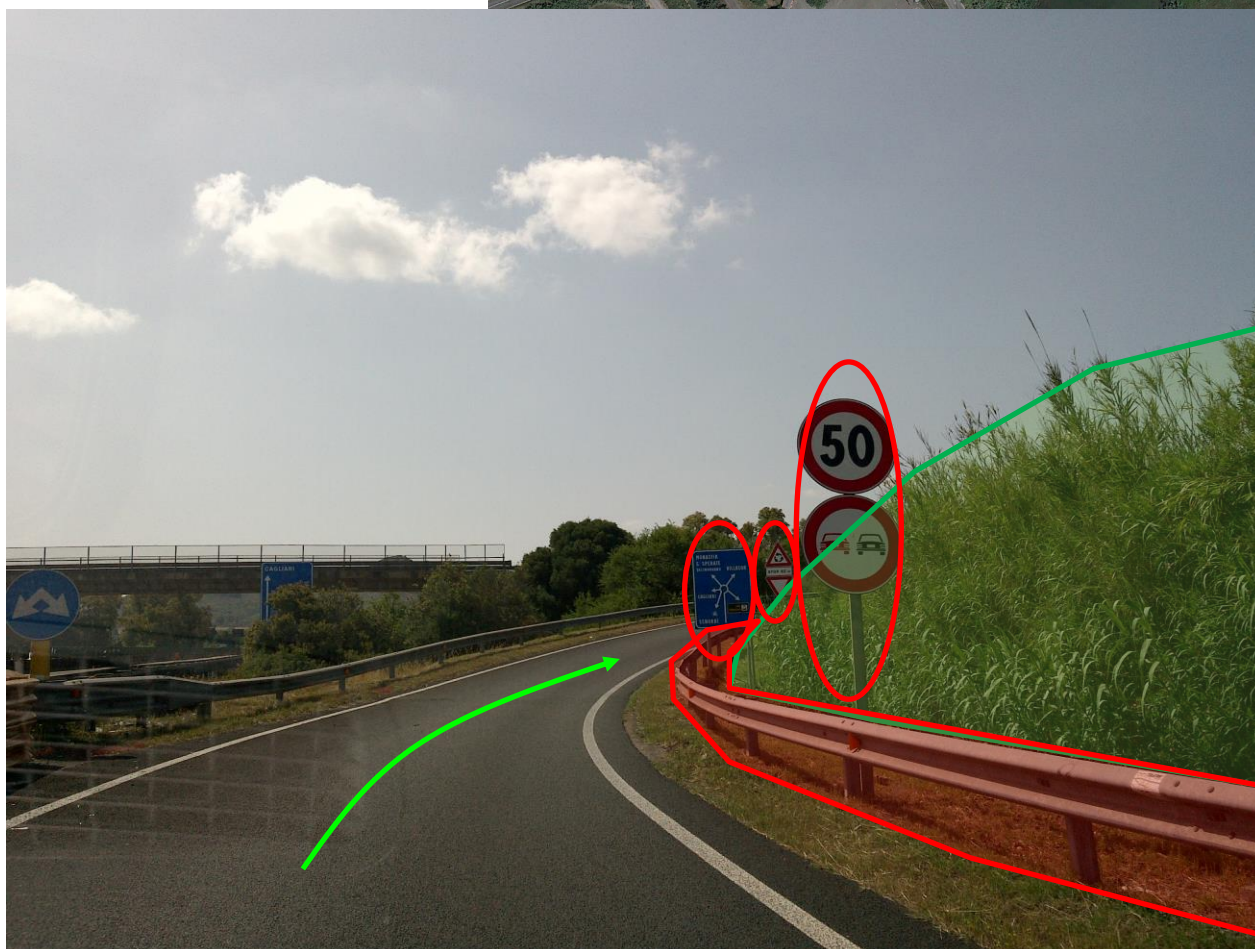
N 39.868561° E 8.609167°



### Observation 6.01 – route from port of Oristano

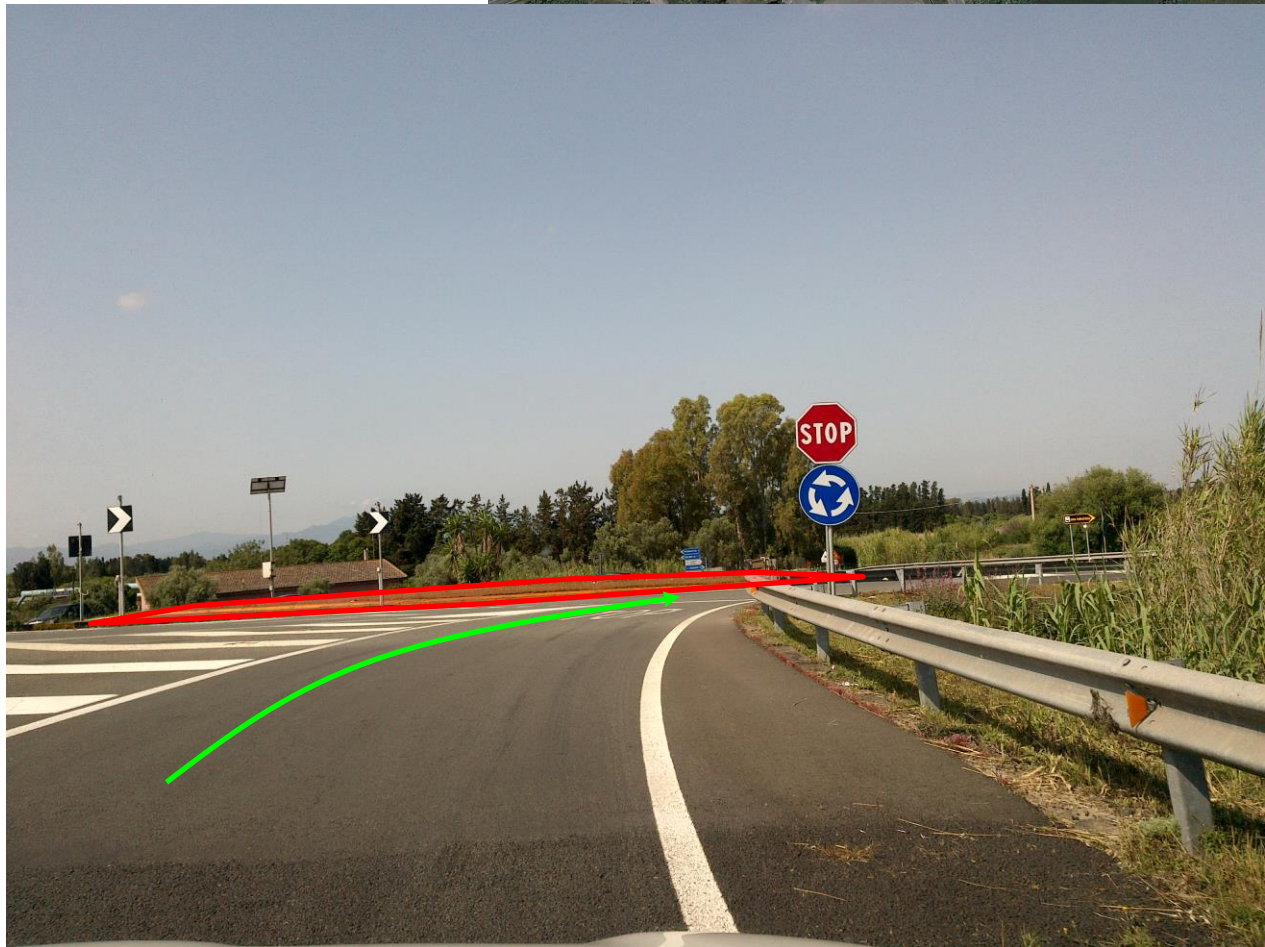
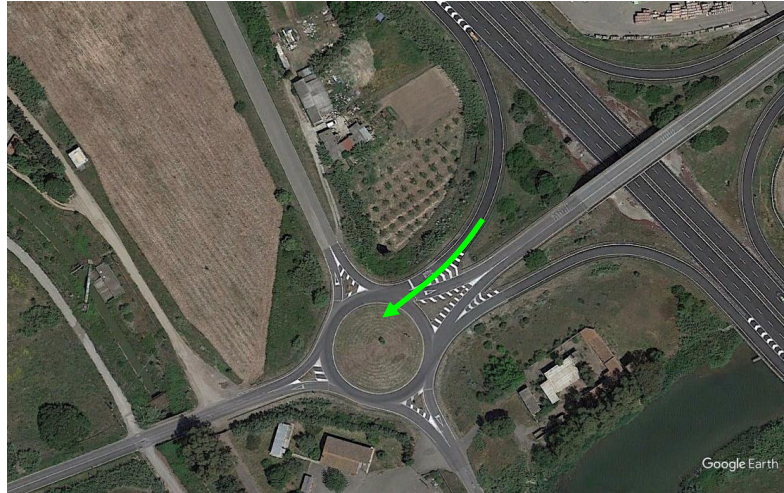
Guardrail, road signs and vegetation on the right have to be removed for entire curving radius.

N 39.396322° E 9.037853°

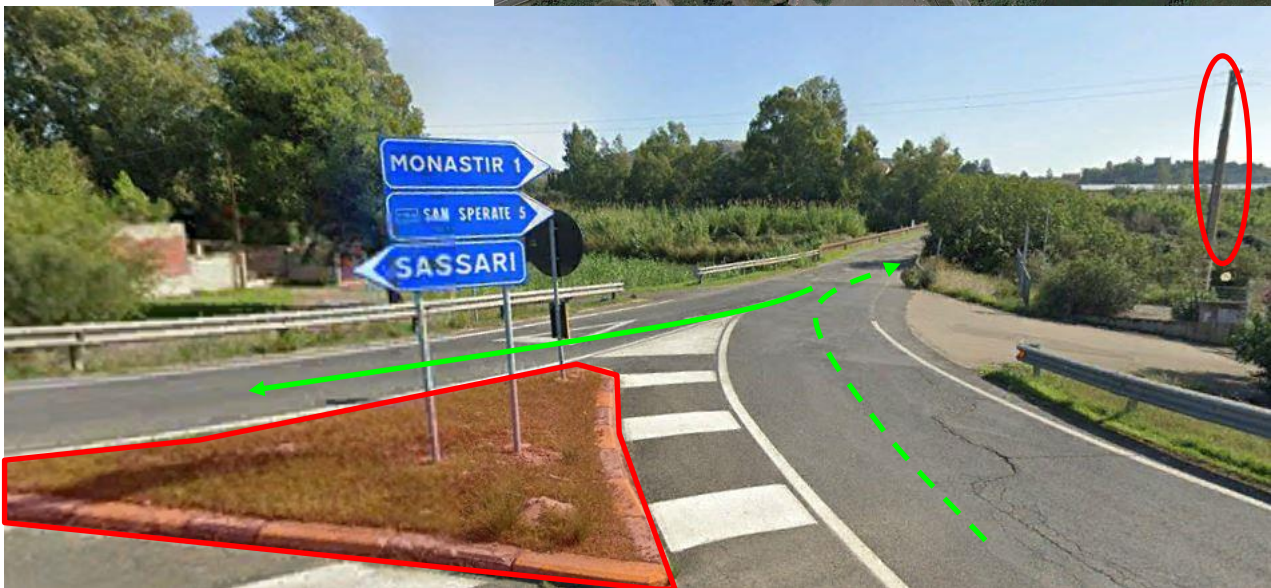
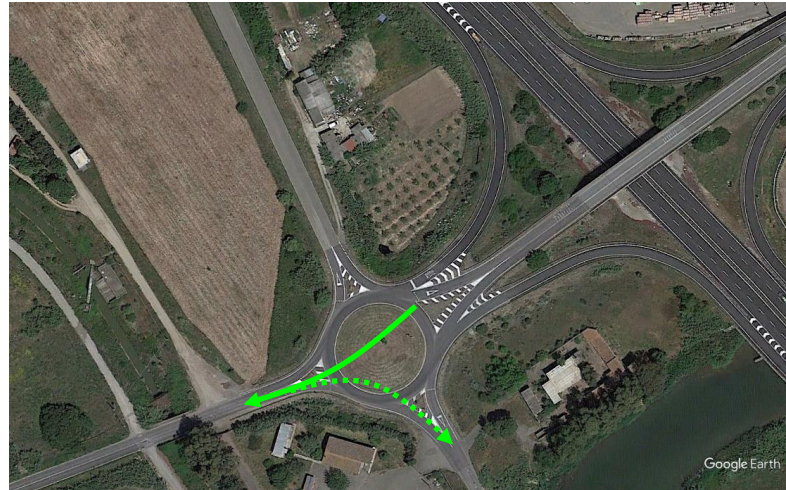




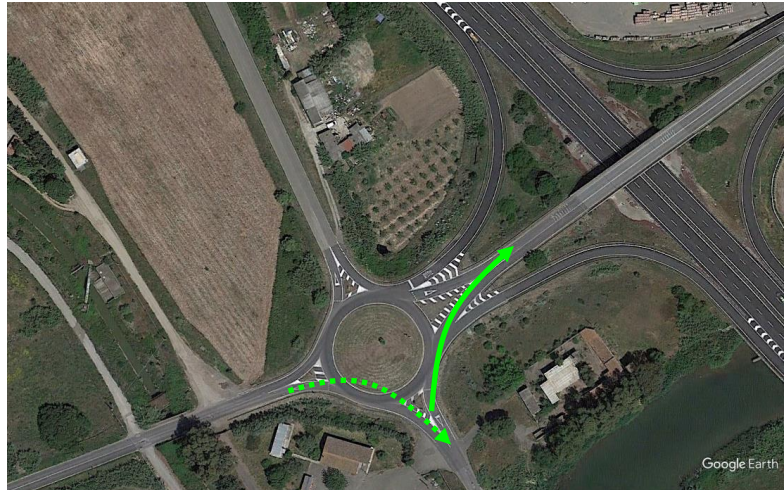
**Observation 6.02 – route from port of Oristano**  
Roundabout has to be made practicable.  
**N 39.395442° E 9.038089°**



**Observation 7.01 – route from port of Oristano**  
Traffic island has to be made practicable.  
Pole on the right has to be removed.  
N 39.394858° E 9.037706°



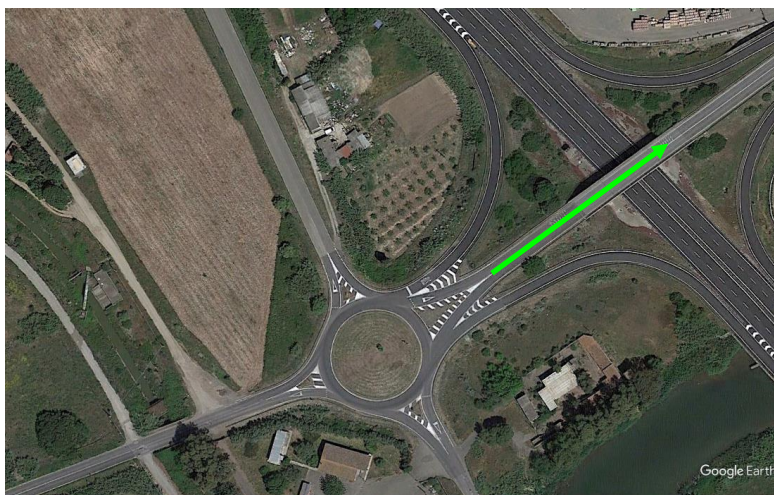
**Observation 7.02 – route from port of Oristano**  
Guardrail has to be removed for 40m.  
Traffic island and road signs have to be removed.  
N 39.394858° E 9.037706°



### Observation 8 – route from port of Oristano

The maximum bearing capacity of the bridge has to be checked.

**N 39.395442° E 9.038431°**

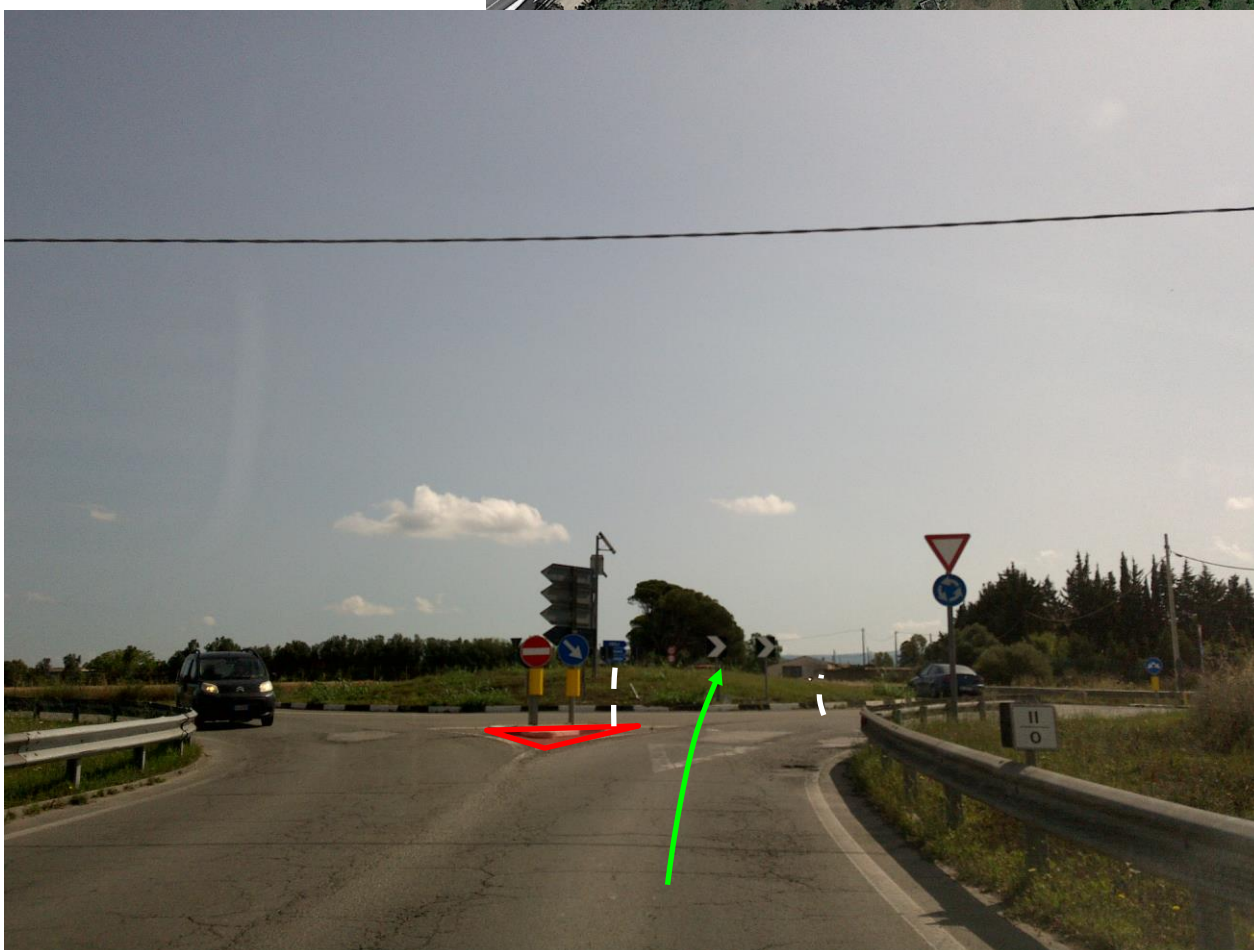


### Observation 1.01 – common route

Traffic island has to be removed.

By-pass on the roundabout has to be created according to Customer Guidelines.

N 39.396664° E 9.040578°



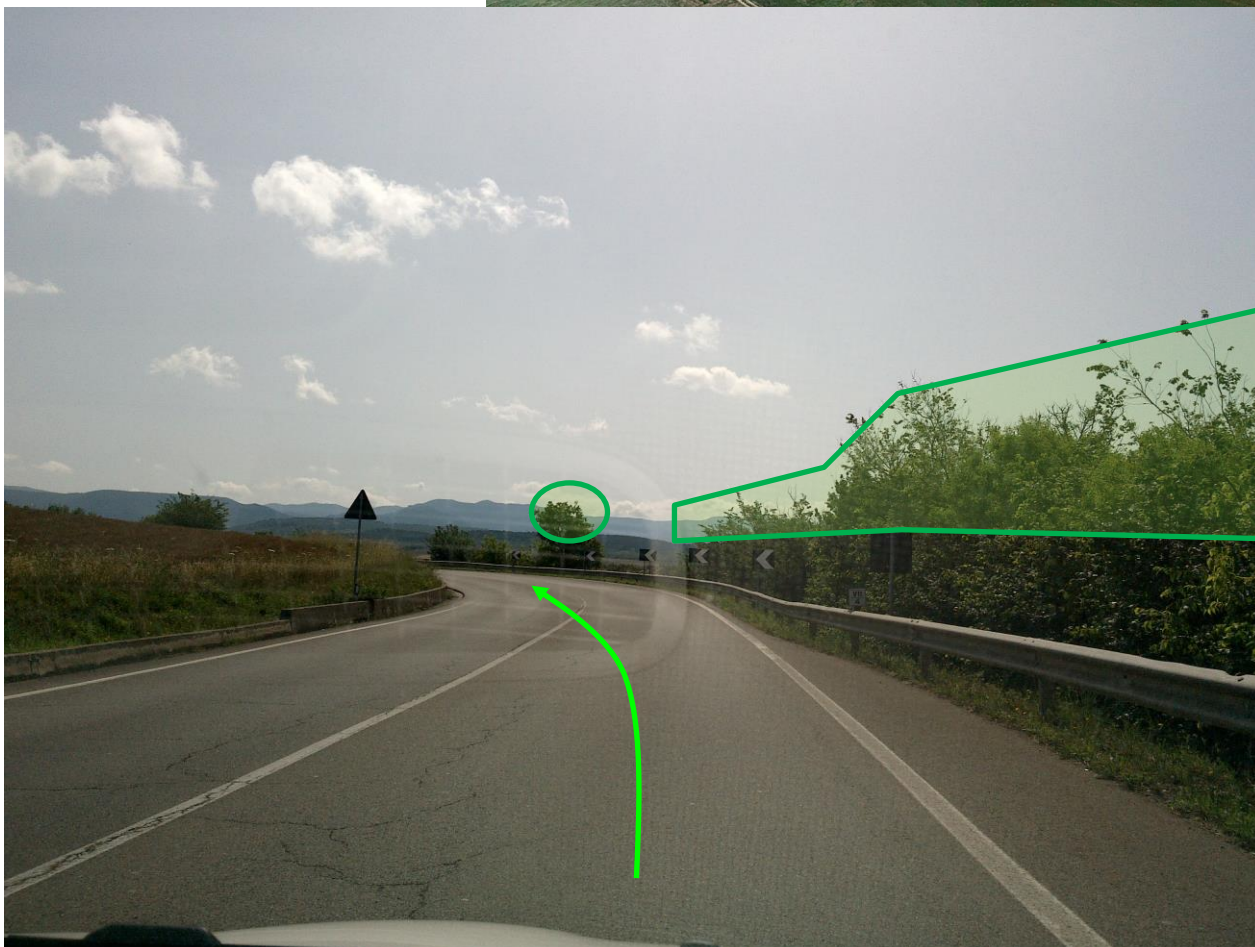
**Observation 1.02 – common route**  
Traffic island has to be removed.  
N 39.396894° E 9.041214°



### Observation 2 – common route

Higher part of the vegetation on the right has to be cut.

N 39.424619° E 9.071797°

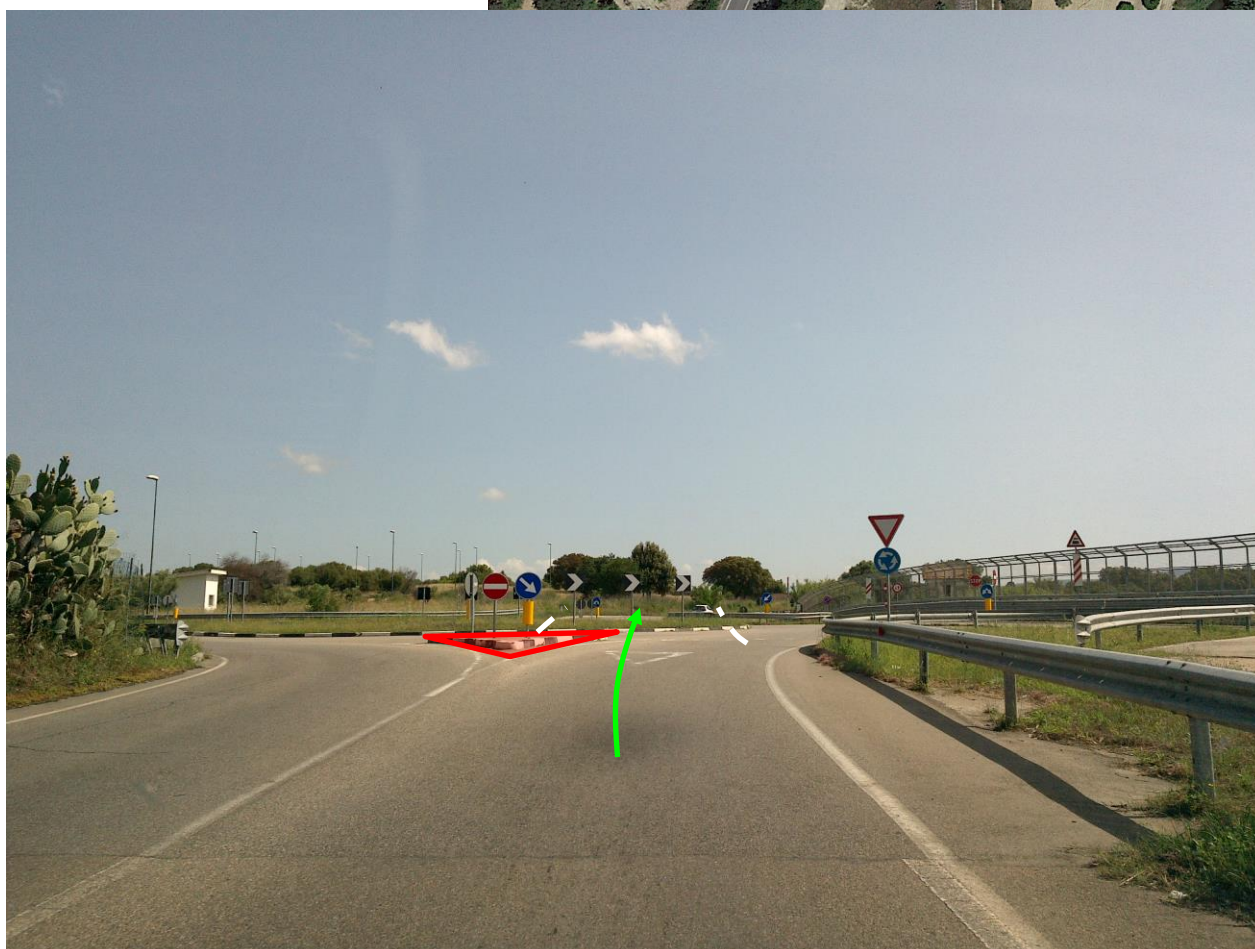
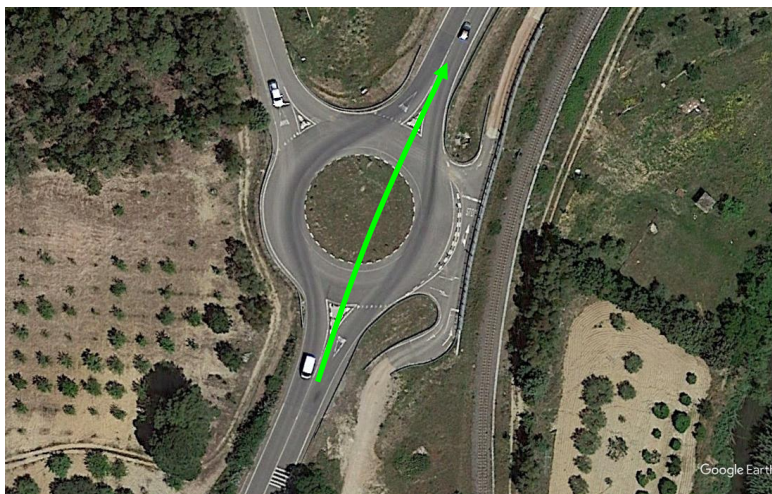


### Observation 3.01 – common route

Traffic island has to be removed.

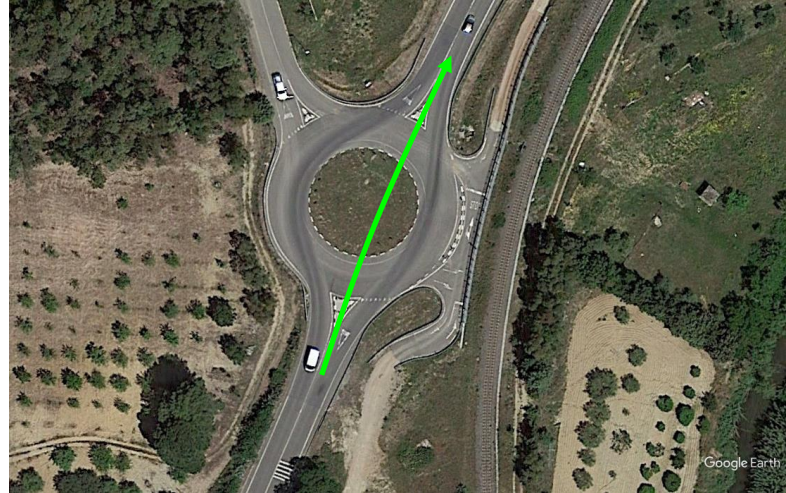
By-pass on the roundabout has to be created according to Customer Guidelines.

N 39.490944° E 9.101989°





**Observation 3.02 – common route**  
Traffic island has to be removed.  
N 39.491344° E 9.102269°

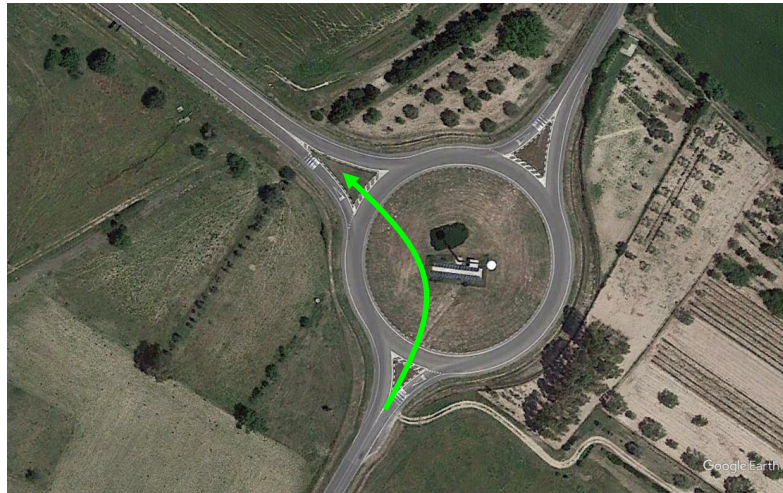


**Observation 4.01 – common route**

Traffic island has to be removed.

Roundabout has to be widened and made practicable for 15x50m to turn on left.

N 39.514867° E 9.123050°

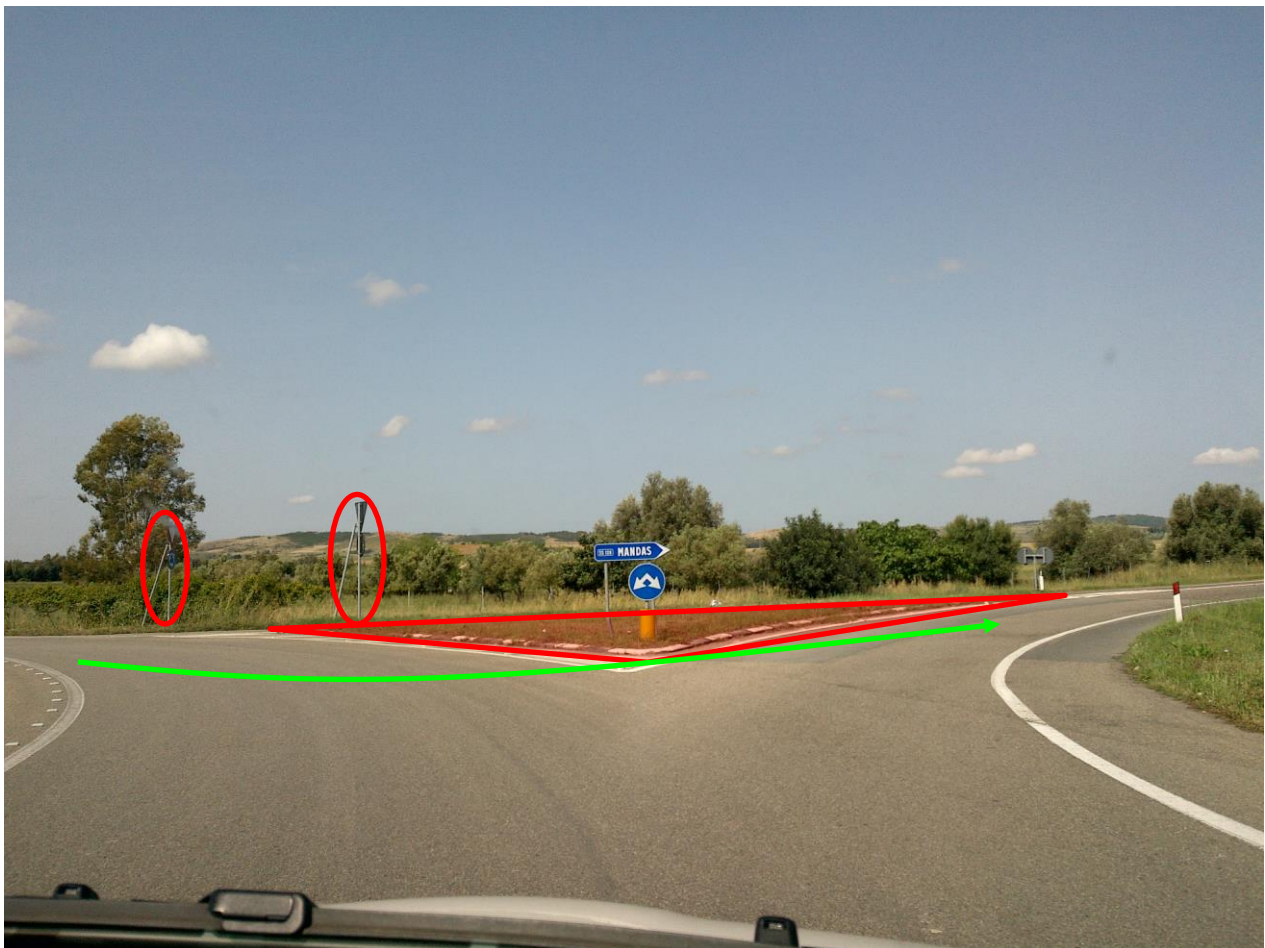
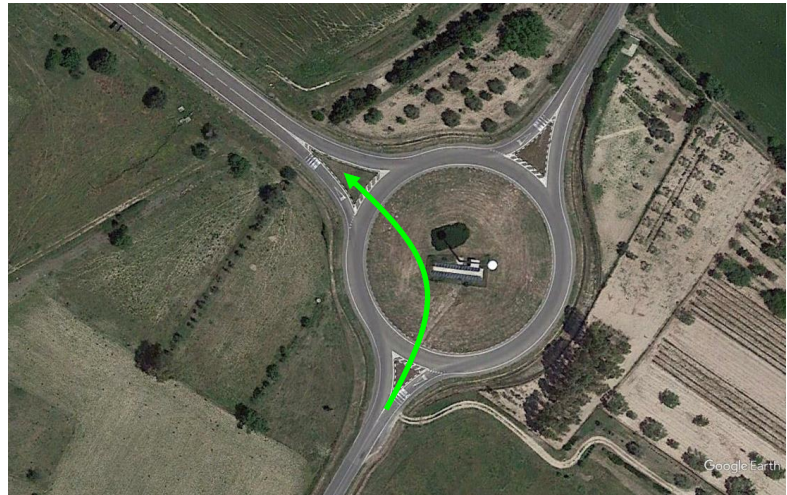


### Observation 4.02 – common route

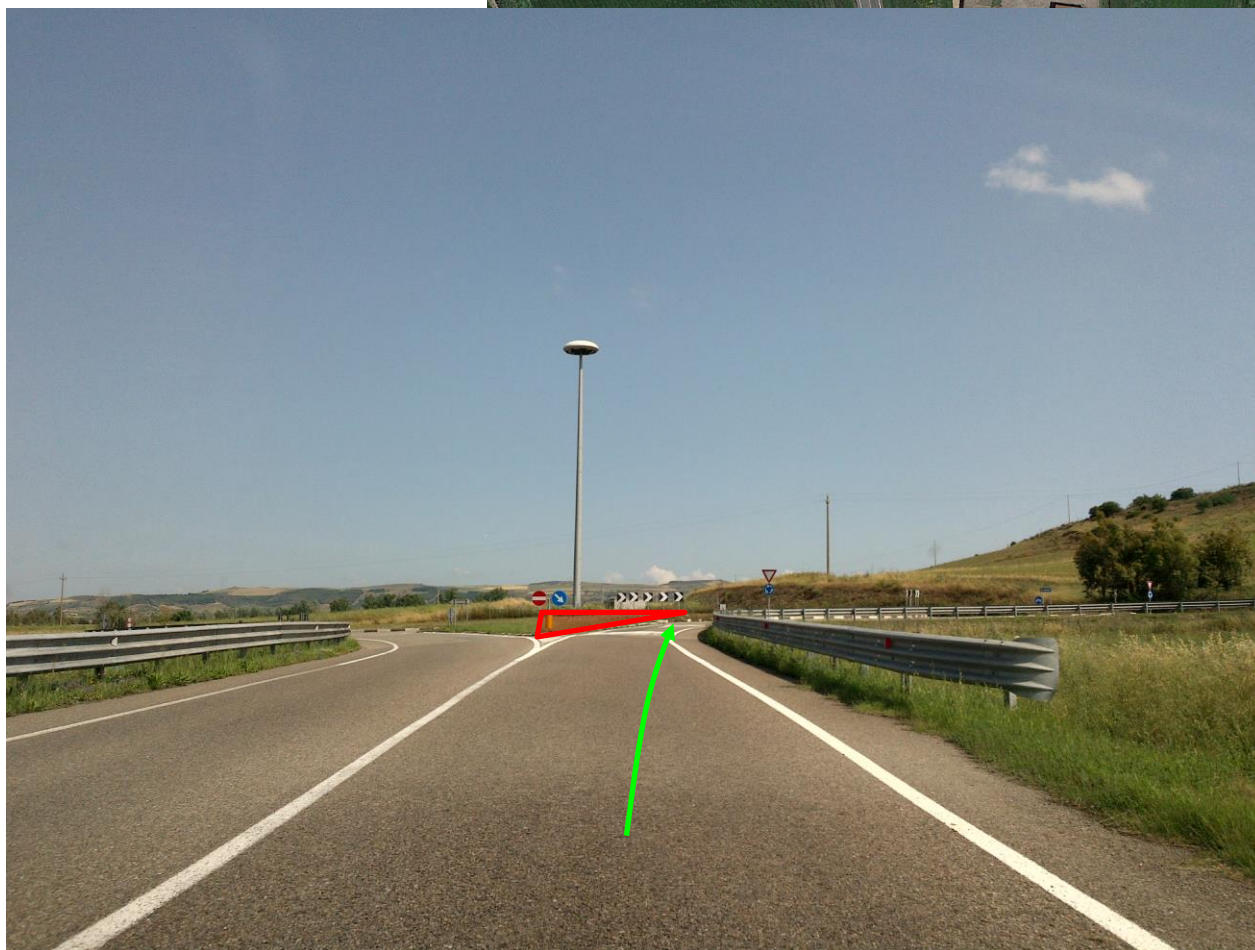
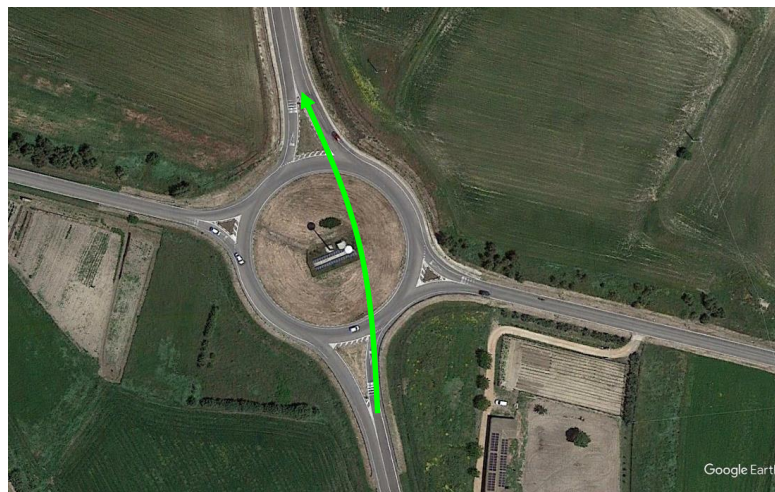
Traffic island has to be removed.

Road signs on the left have to be removed.

N 39.515694° E 9.123367°



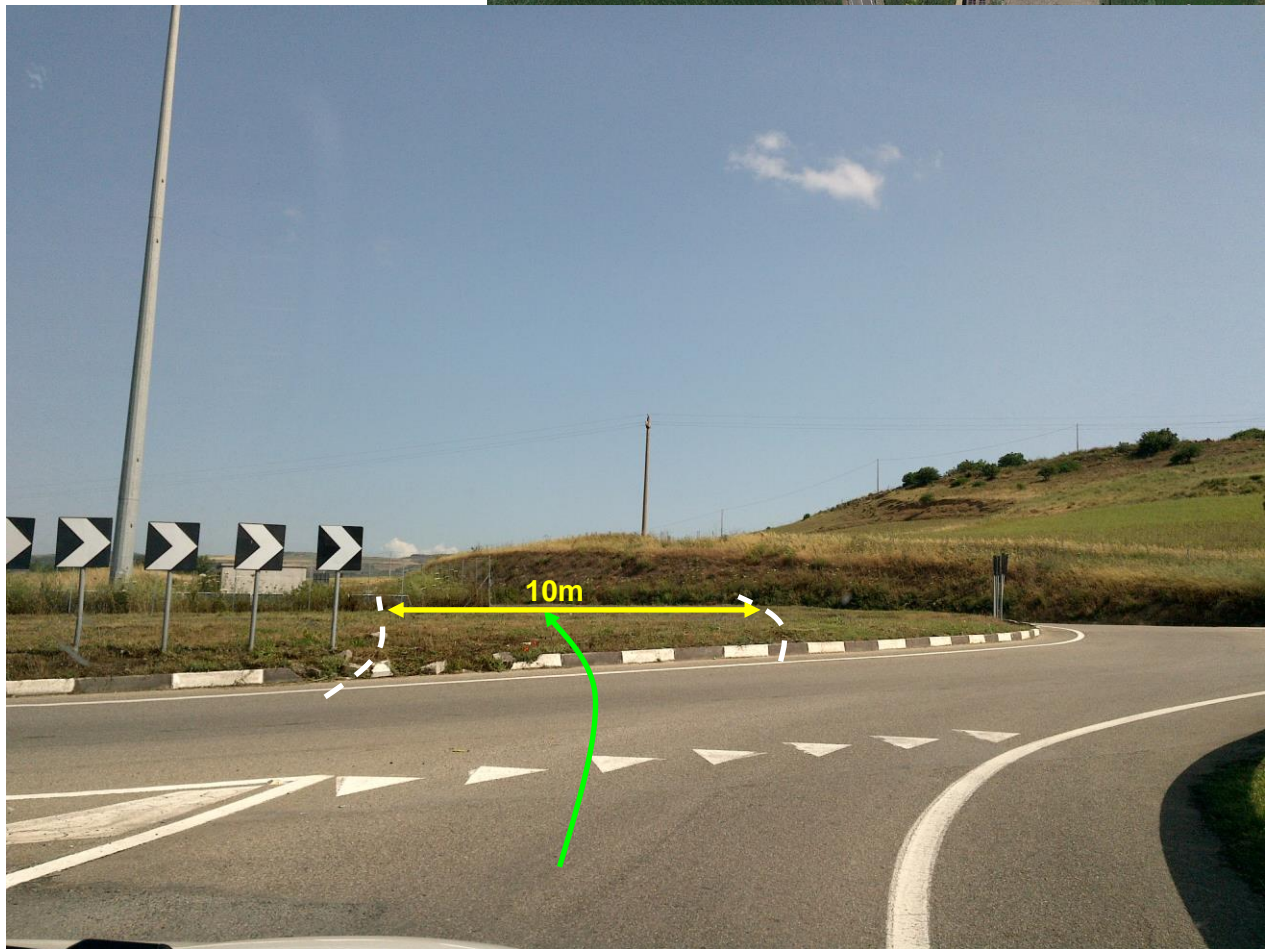
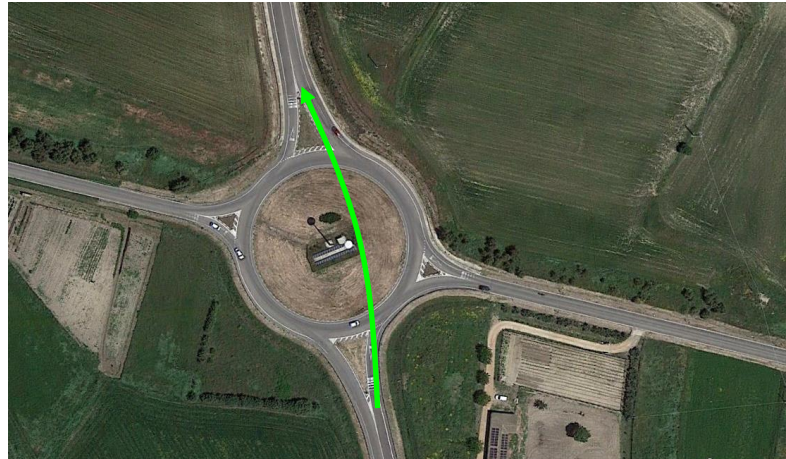
**Observation 5.01 – common route**  
Half traffic island has to be removed.  
**N 39.533153° E 9.115917°**



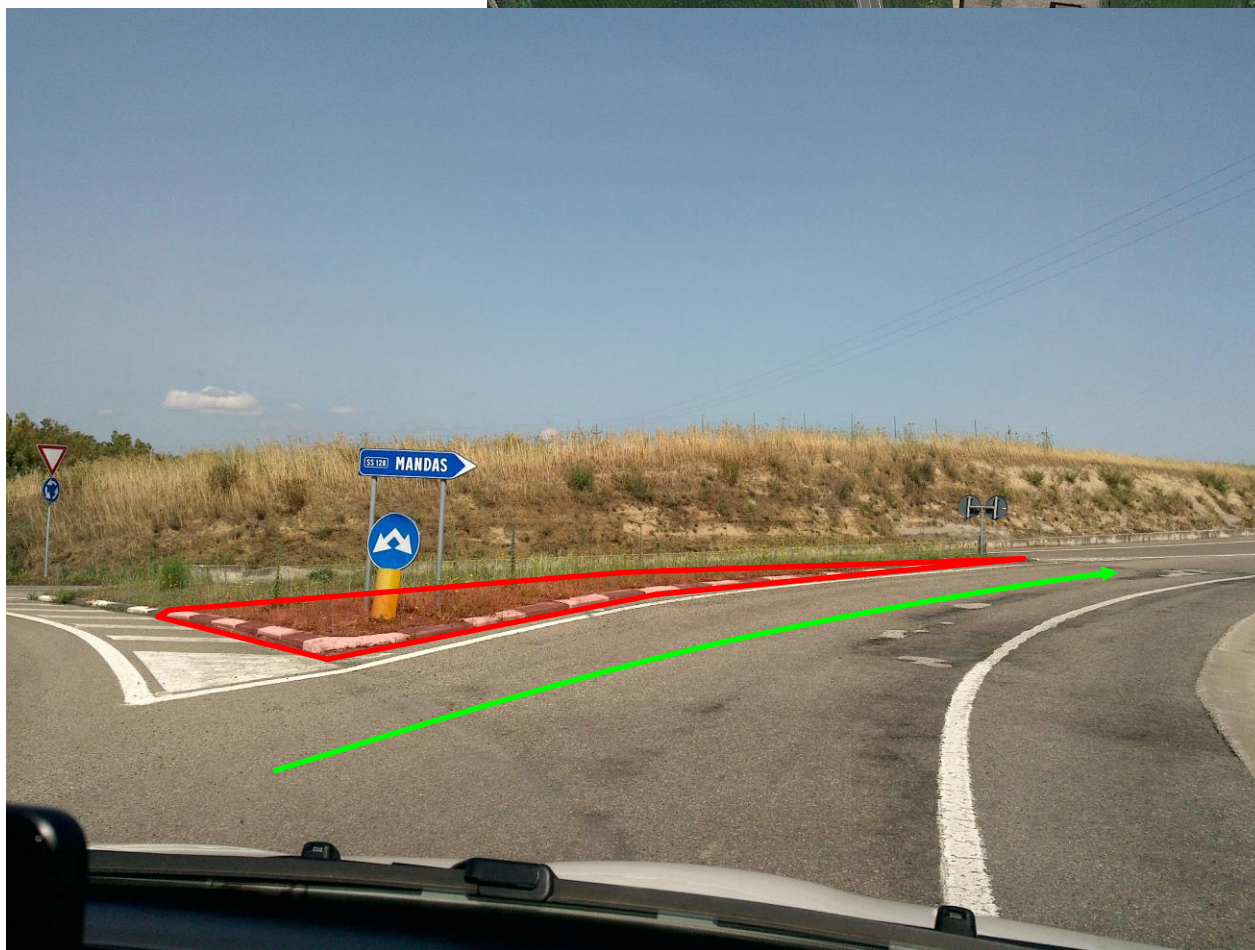
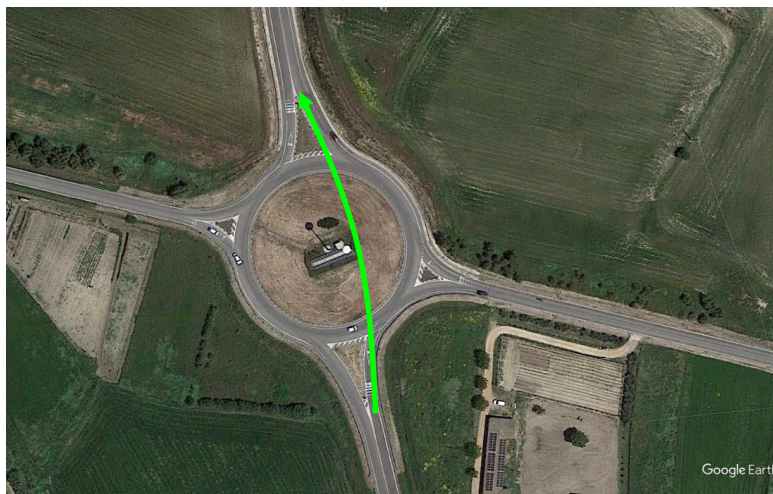
### Observation 5.02 – common route

By-pass of 10m on the right of the roundabout has to be created according to Customer Guidelines.

N 39.533739° E 9.115761°



**Observation 5.03 – common route**  
Half traffic island has to be removed.  
N 39.534403° E 9.115783°

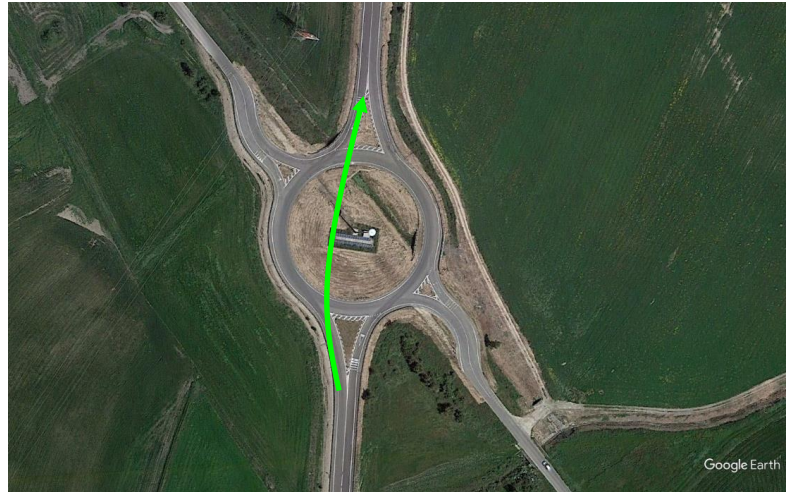


### Observation 6.01 – common route

Traffic island has to be removed.

Take the roundabout against the traffic flow.

N 39.546356° E 9.115872°



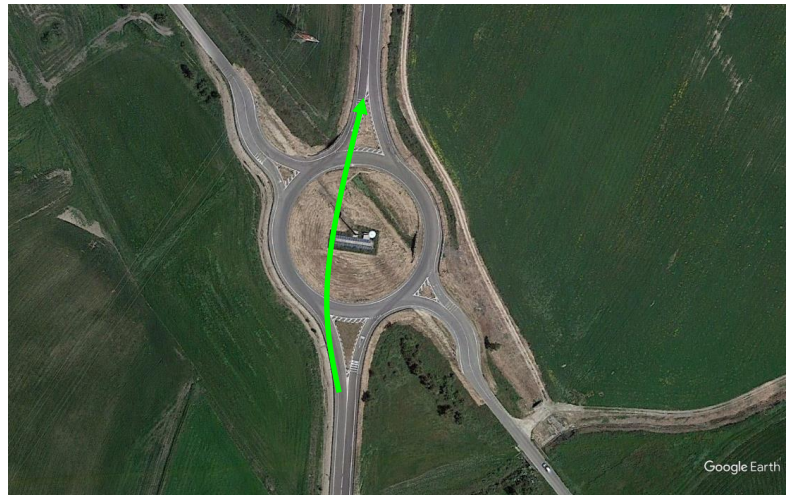
### Observation 6.02 – common route

Traffic island has to be removed.

Roundabout has to be widened and made practicable for 15x58m.

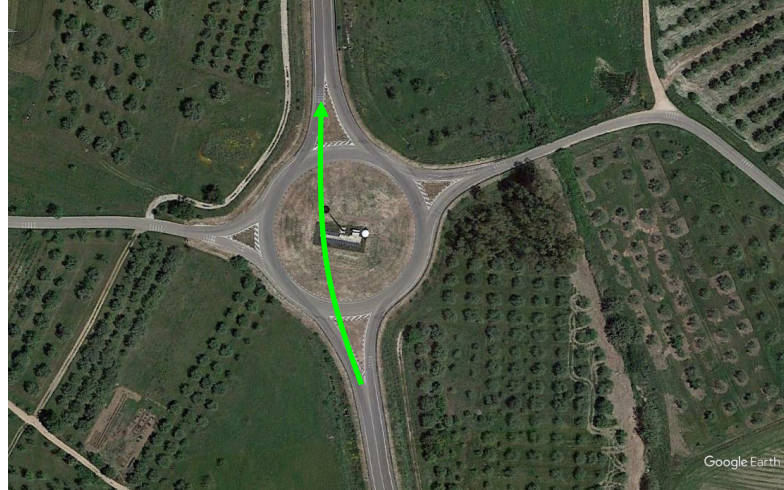
Guardrail on the left has to be removed for 27m.

N 39.547958° E 9.116028°





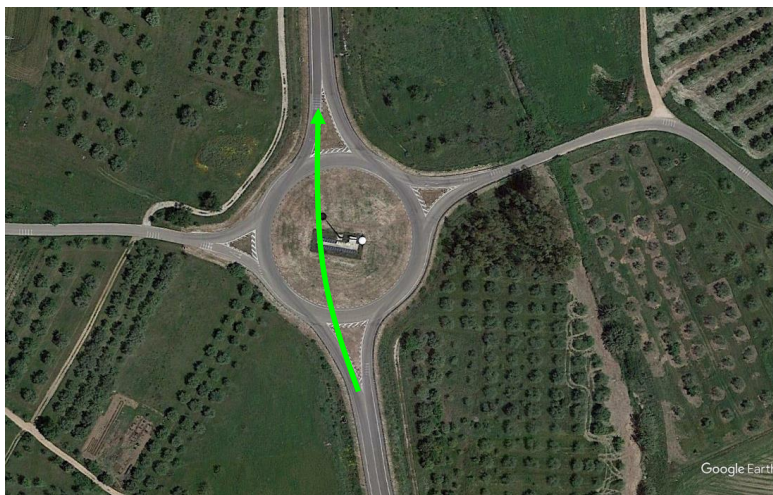
**Observation 7.01 – common route**  
Traffic island has to be removed.  
N 39.564406° E 9.120425°



### Observation 7.02 – common route

Half roundabout on the left on the pole has to be widened and made practicable.

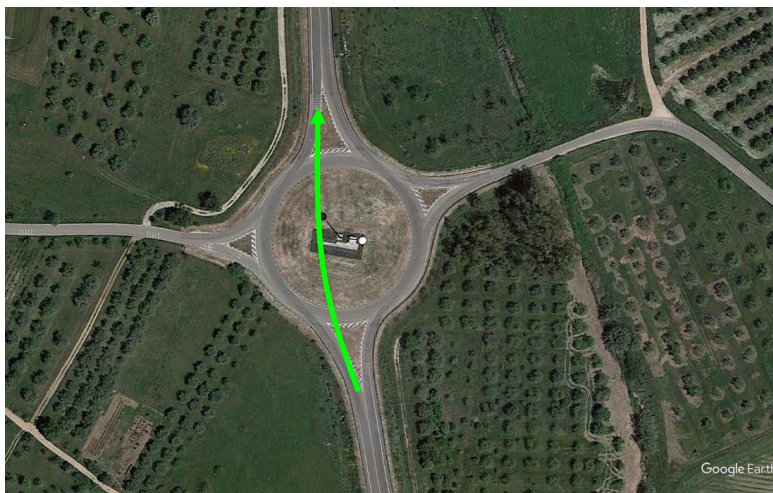
**N 39.564797° E 9.120342°**



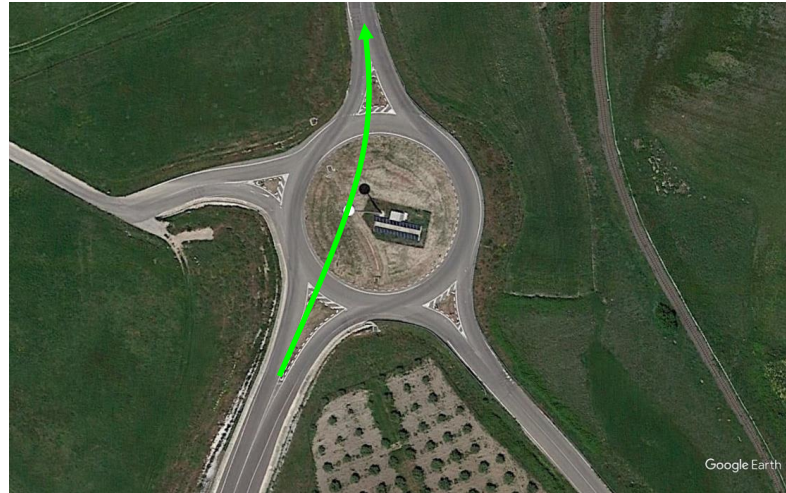
### Observation 7.03 – common route

Traffic island has to be removed.

N 39.565456° E 9.120583°



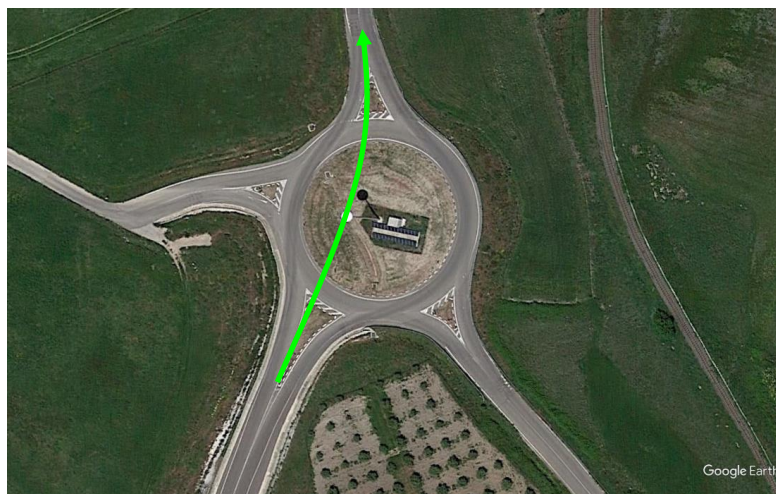
**Observation 8.01 – common route**  
Traffic island has to be removed.  
N 39.593933° E 9.128058°



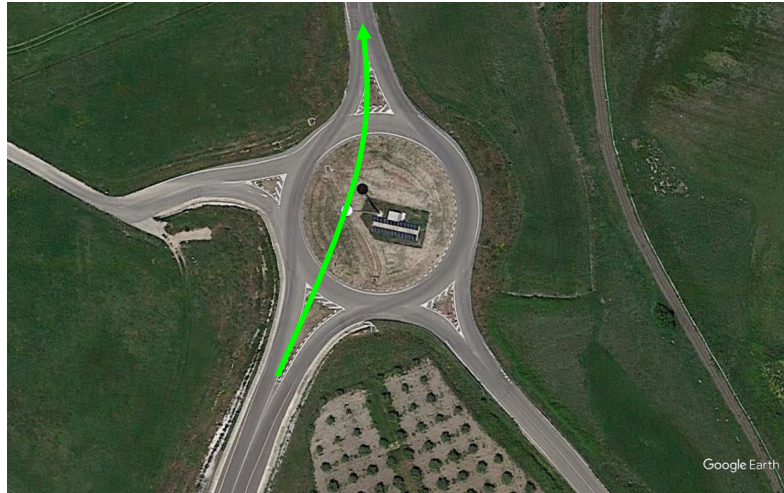
### Observation 8.02 – common route

Half roundabout on the left on the pole has to be widened and made practicable.

N 39.594258° E 9.128242°



**Observation 8.03 – common route**  
Traffic island has to be removed.  
N 39.594839° E 9.128717°



### Observation 9 – common route

Turn on left to reach WTGs 1-2-3-4.

Proceed straight to reach WTGs 5-6-7-8-9.

No.2 traffic island have to be removed.

**FROM THIS OBS. HAS TO BE CONSIDERED ALL COMPONENTS TRANSSHIPPED ON BLADE LIFTER AND MODULA TRAILERS.**

**N 39.600853° E 9.130525°**

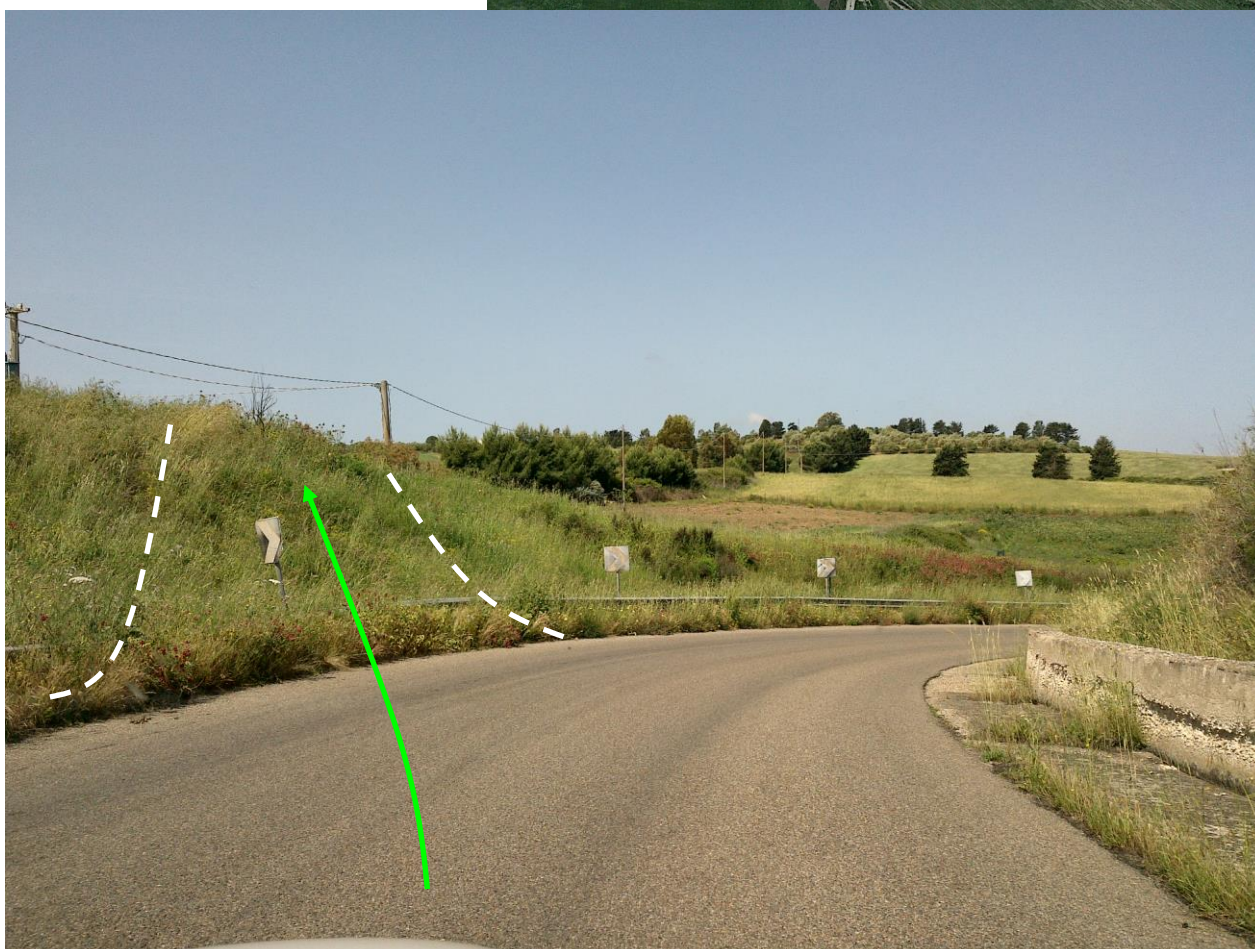
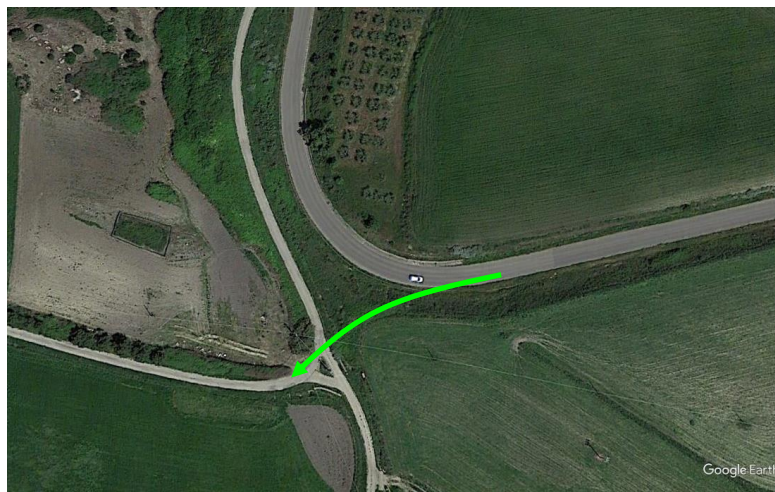


### Observation 10 – common route

Site access for WTGs 1-2-3-4.

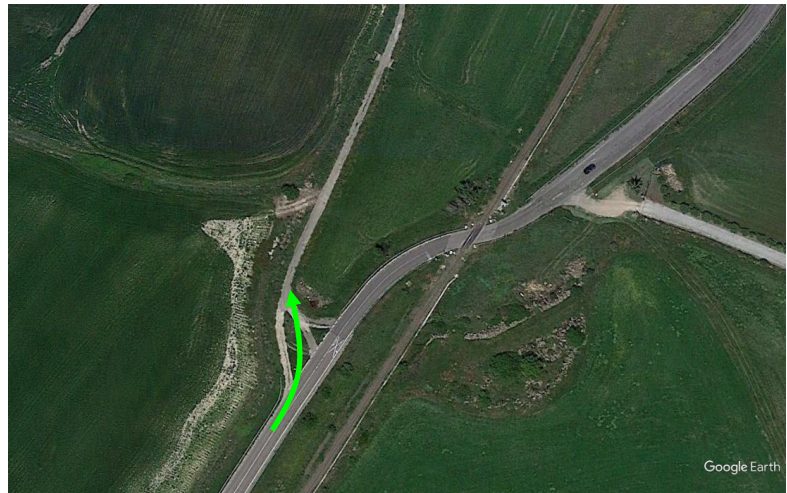
By-pass to reach WTGs has to be created according to Customer Guidelines.

**N 39.605914° E 9.110589°**





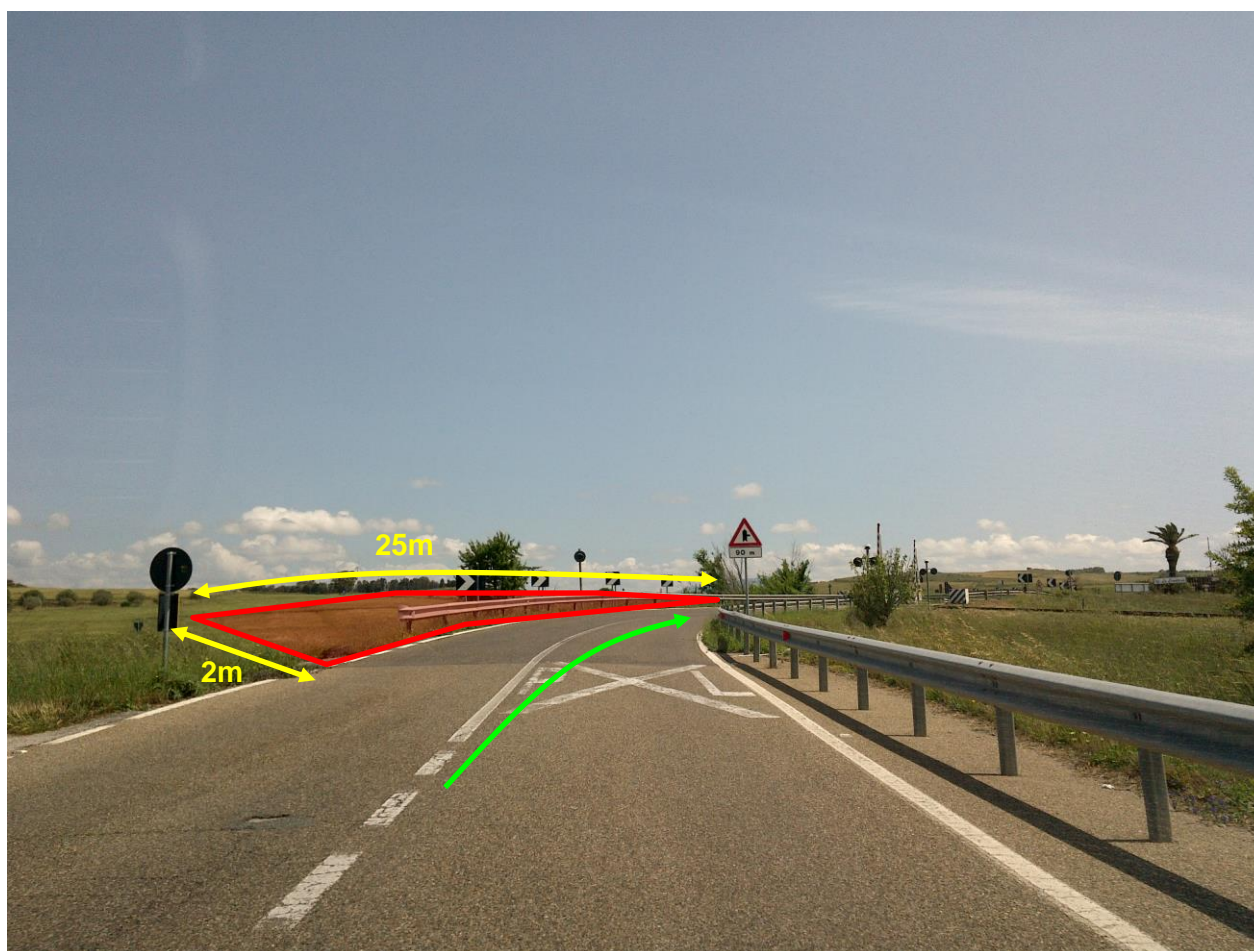
**Observation 11 – common route**  
Site access for WTG 9.  
The road has to be created.  
N 39.606839° E 9.135508°



### Observation 12.01 – common route

The road on the left has to be widened and made practicable for 2x25m before rail crossing.

N 39.606833° E 9.135611°



### Observation 12.02 – common route

The road on the right has to be widened and made practicable for 2x25m after rail crossing.

N 39.607367° E 9.136267°



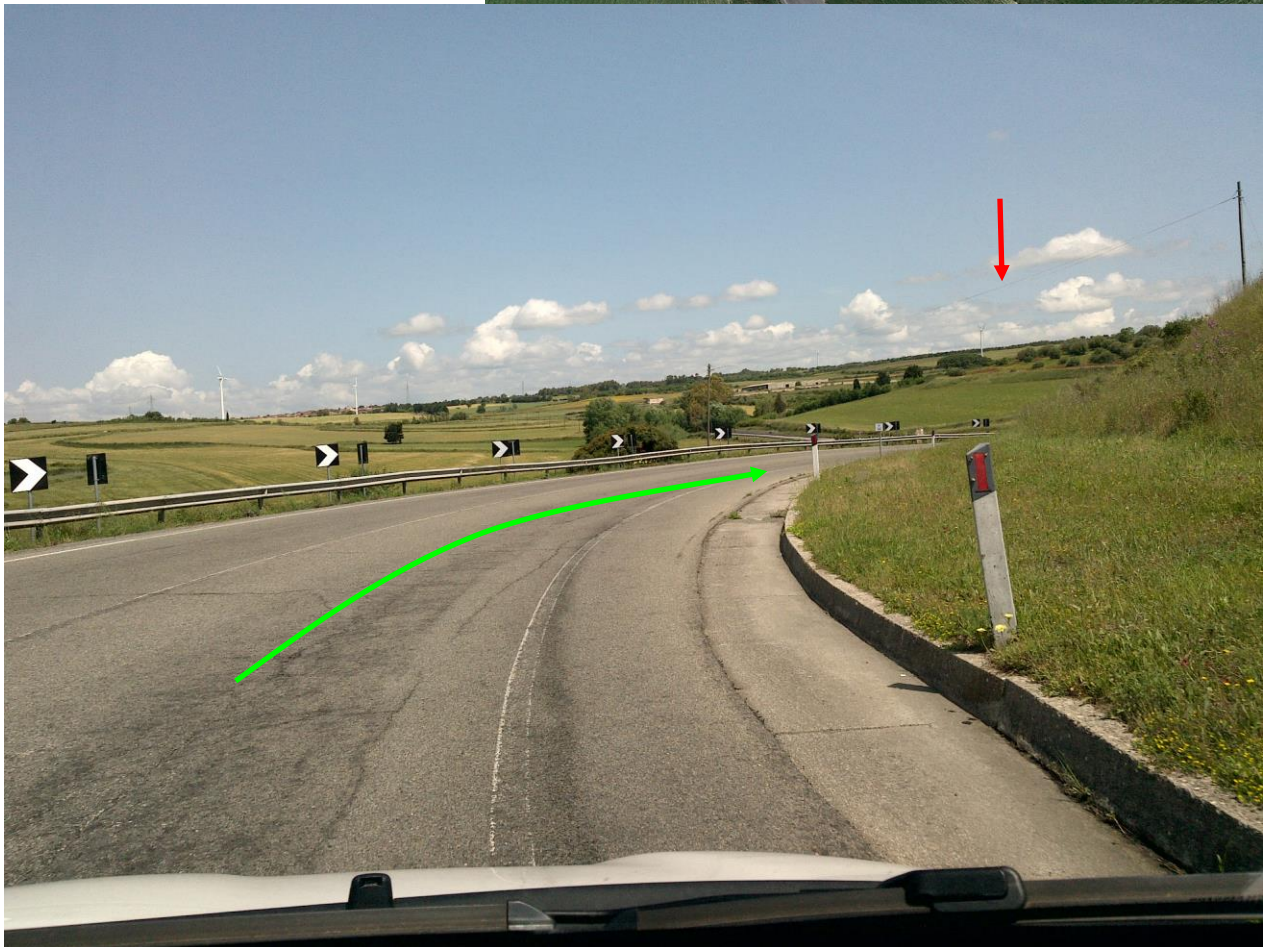
**Observation 13 – common route**  
Site access on the right for WTGs 5-6.  
N 39.618817° E 9.139672°



**Observation 14 – common route**  
Rail crossing.  
N 39.619078° E 9.139642°



**Observation 15 – common route**  
No.1 cable has to be buried.  
**N 39.627828° E 9.138569°**



### Observation 16.01 – common route

Site access for WTGs 7-8.

By-pass has to be created according to Customer Guidelines.

**N 39.636097° E 9.137222°**



### Observation 16.02 – common route

Site access for WTGs 7-8.

End of by-pass.

N 39.635333° E 9.134100°





## **10. Final Considerations**

This feasibility study of transport was carried out to transport 9xSG170 HH115m.

The proposed road does not consider the weight limitations and/or examination of the bridges' weight capacity along the route.

The enclosed transport requirements and related observations are based on the existing road infrastructures, combined with the overall extent of the wind farm, without any indications regarding the site road, its arrangement, and access to each installation pad.

The site road to reach the platforms has to be built according to SAE equipment specifications. An inspection is needed before the kickoff of the project in order to evaluate the civil works.

The entire site road has to be ensured with at least 6m clearance, free from any obstacles on either side of the road and must be levelled, compacted, cleared from all branches jutting out on the carriageway. We would like to advise you to have, during the first transport, an authorized staff with a forklift that can do this operation.

Along the route, it will be necessary to keep flat each height difference (vertical radius must be defined according to Guidelines of the wind turbines manufacturer).

All cables overpassing the entire transport route must be secured at a minimum of 5.5 m of height.

In order to prove the route feasibility and the delivery of all components to each platform, a further inspection and a test run should be performed by SAE before the transportation commencement. We suggest that on the first transport our Carrier will be supported by Client team in case of needs.