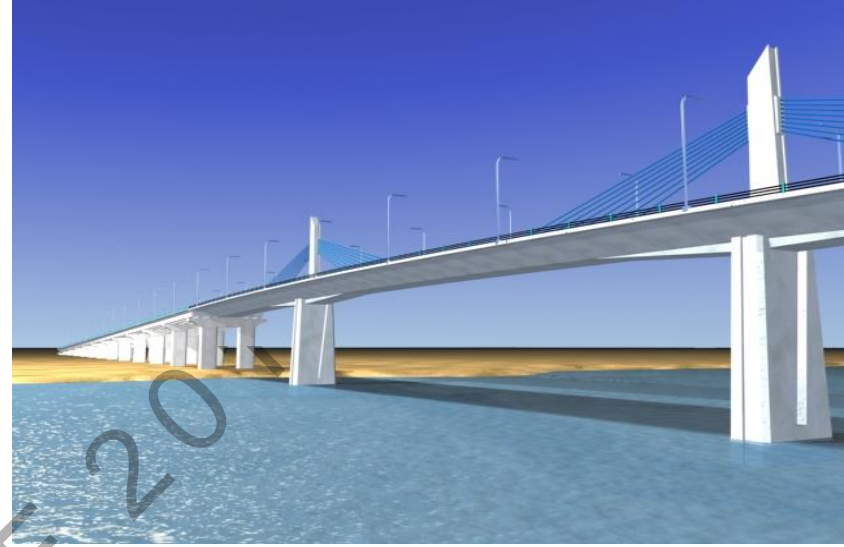




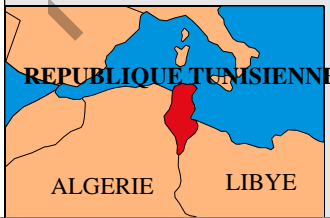
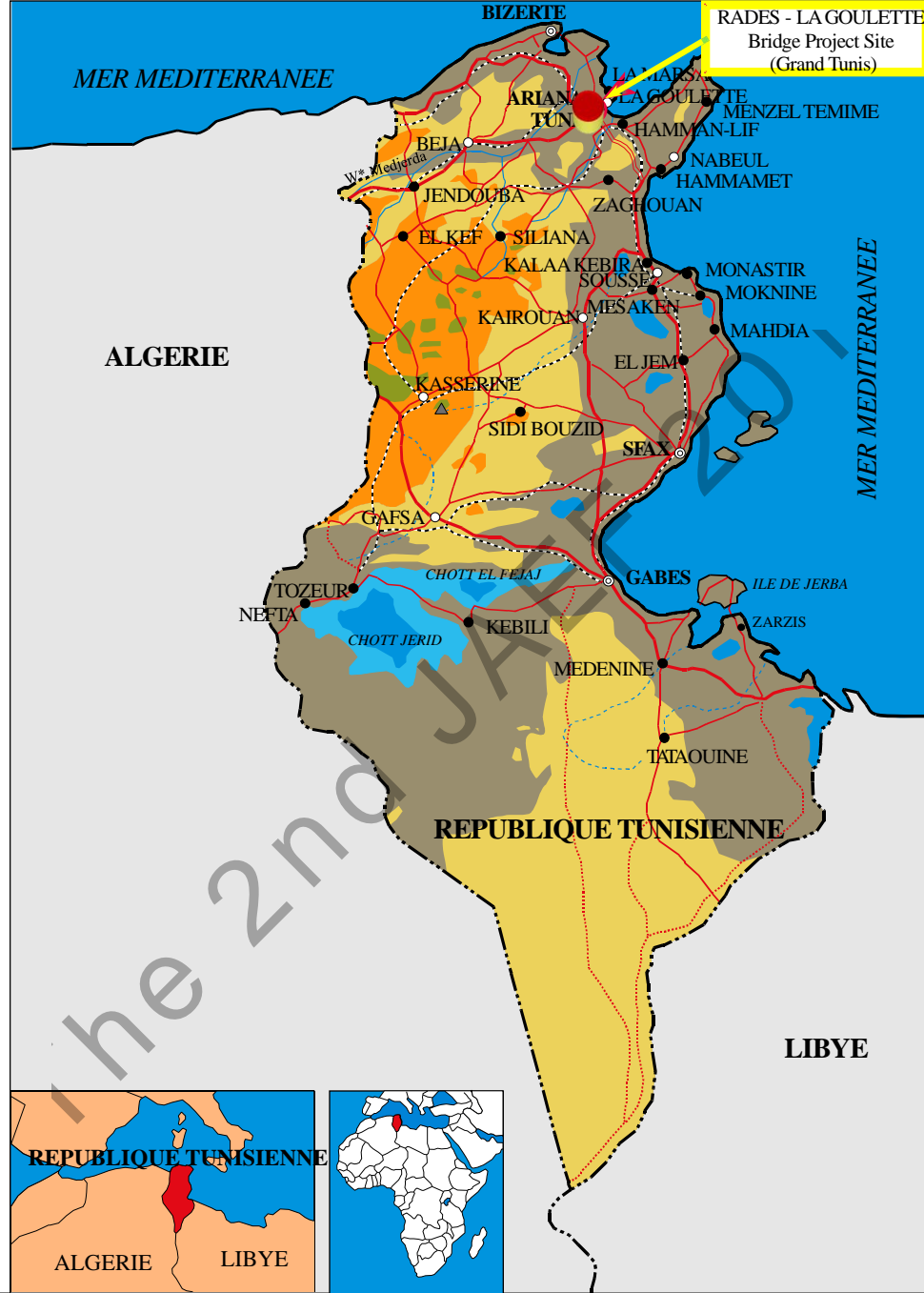
REPUBLIC OF TUNISIA

MINISTRY OF EQUIPEMENT, HOUSING AND  
LAND DEVELOPMENT

DEPARTMENT OF ROADS AND BRIGES



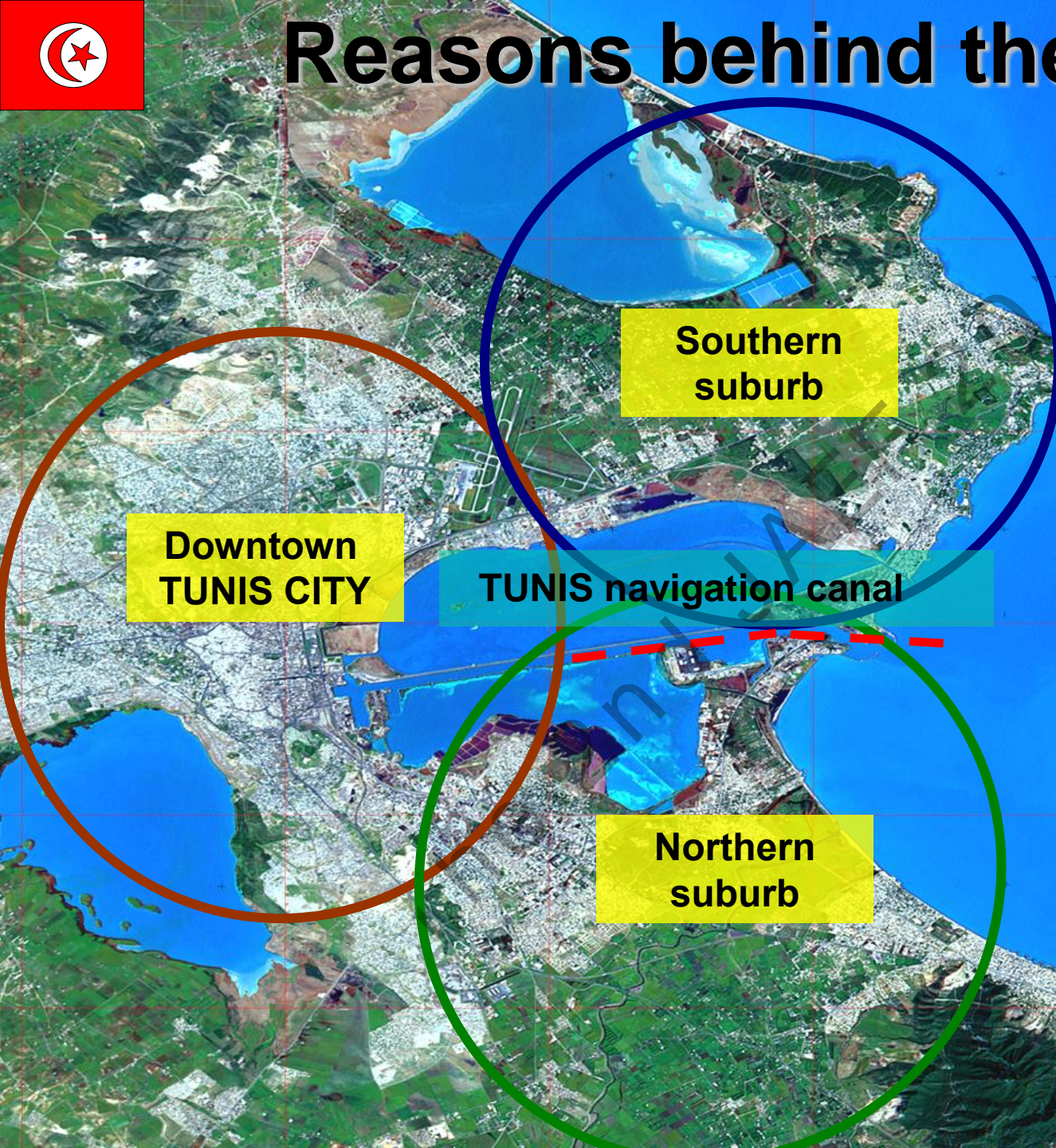
# PROJECT OF RADES – La GOULETTE BRIGE



**TUNISIA'S GENERAL MAP**



# Reasons behind the project



The southern and northern suburbs :

- Considered as the continuity of the capital and are overlooking the mediterranean sea

- Two important complementary economic and industrial pôles

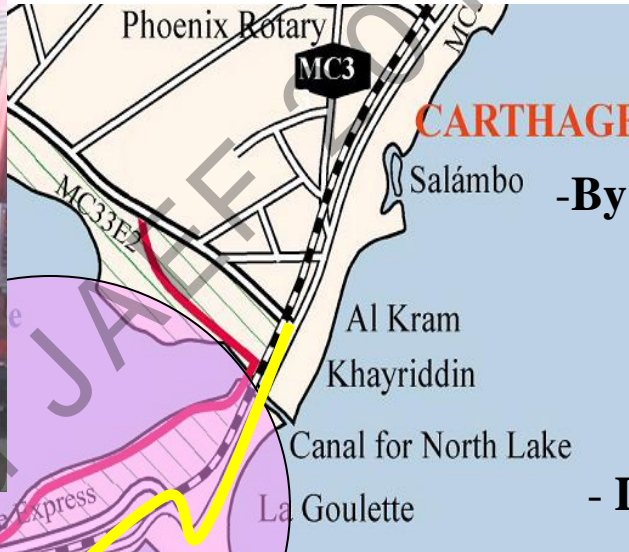
Separated by the Tunis navigation canal



# Reasons behind the project



Before the project, The link between the two poles was assured



-By crossing the city

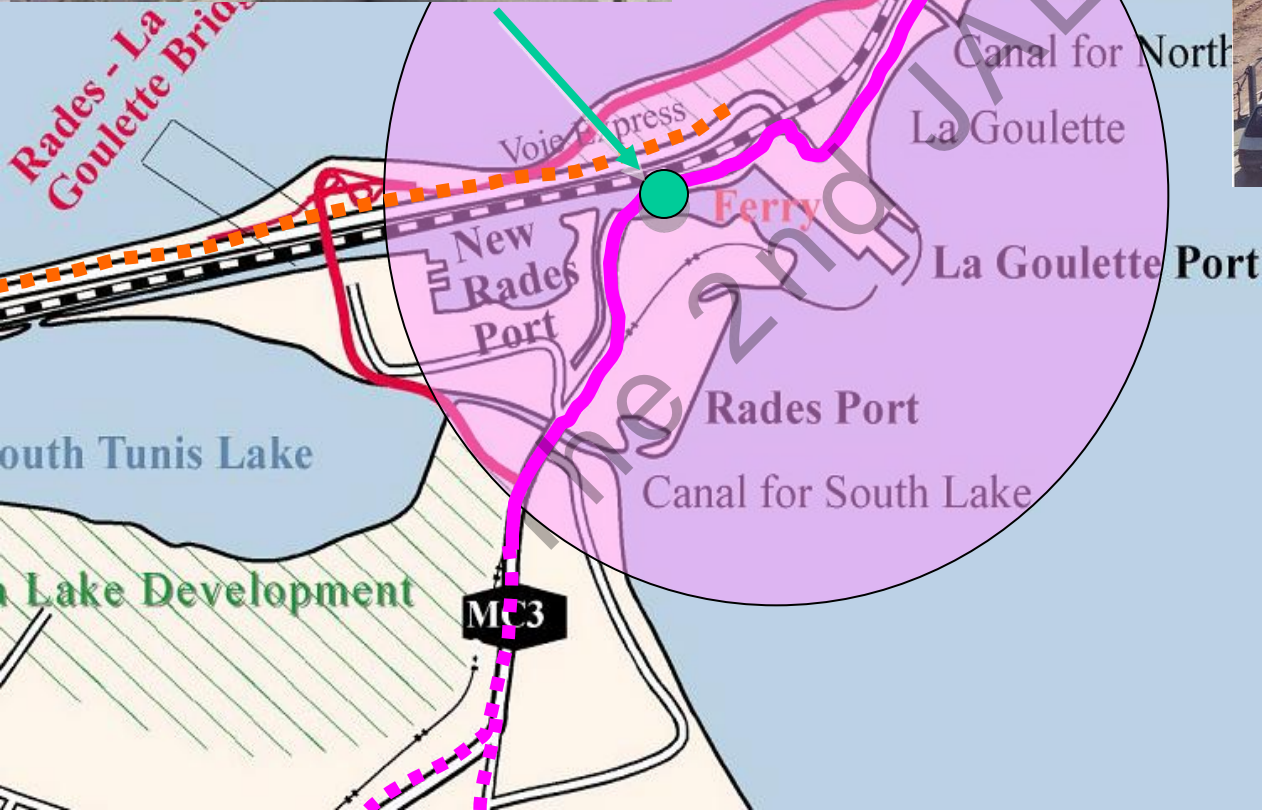
- Directly via ferries





# Reasons behind the project

Handicaps of the ferries



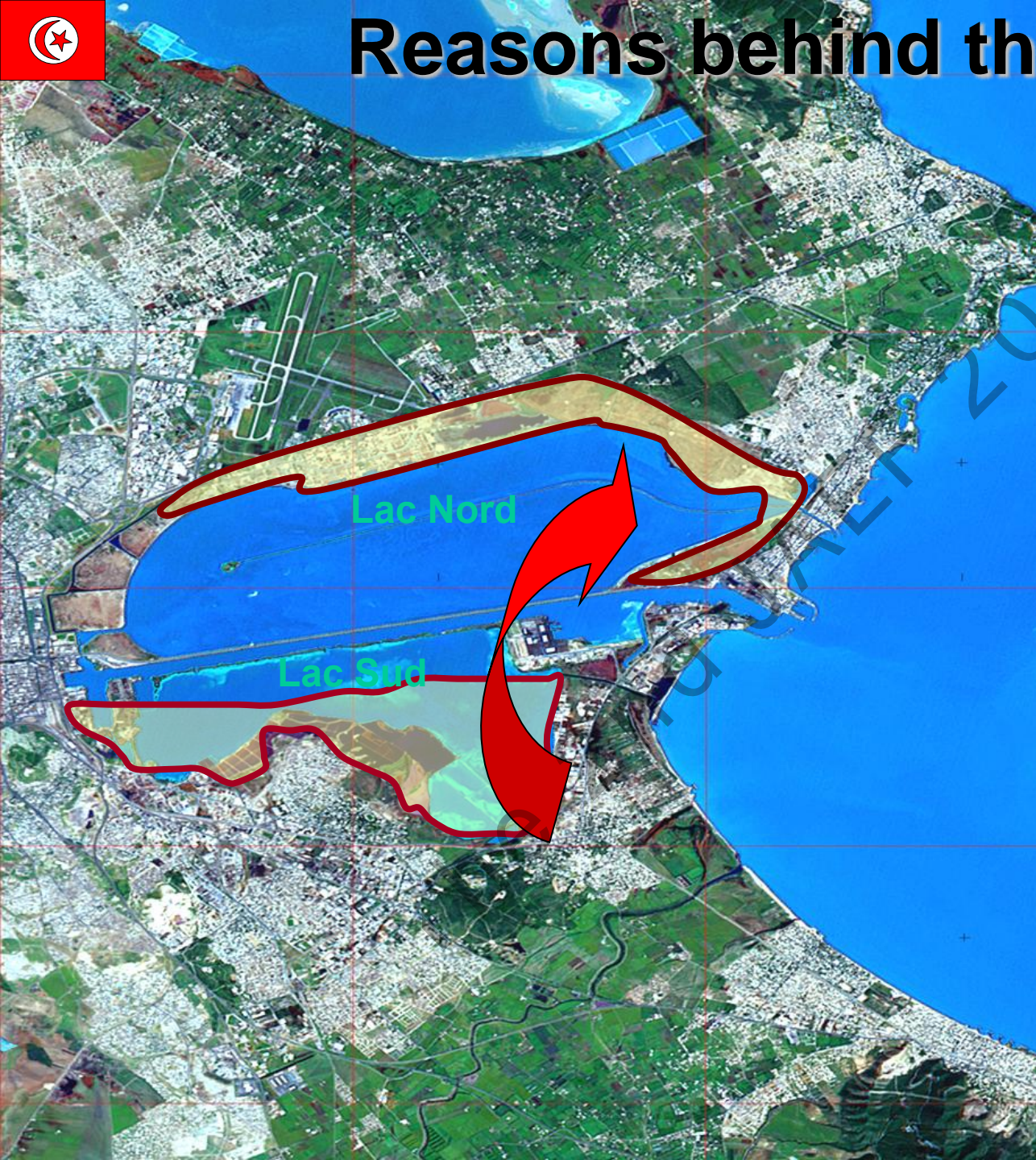
- Limited capacity
- Limitation of weight < 3.5 T
- Depend on weather conditions and sea traffic



# Reasons behind the project

Spectacular development due to the presence of urban and social areas in both suburbs

**A direct link between the two suburbs became urgent**



# RADES – LA GOULETTE BRIDGE PROJECT

## GENERAL DATA

### Consistency:

- Construction of 2000 linear meters of Bridges including a 260- meter extradossed stay cable bridge.
- Construction of 12.6 km of 2x2 lanes urban express ways.

### Objectives:

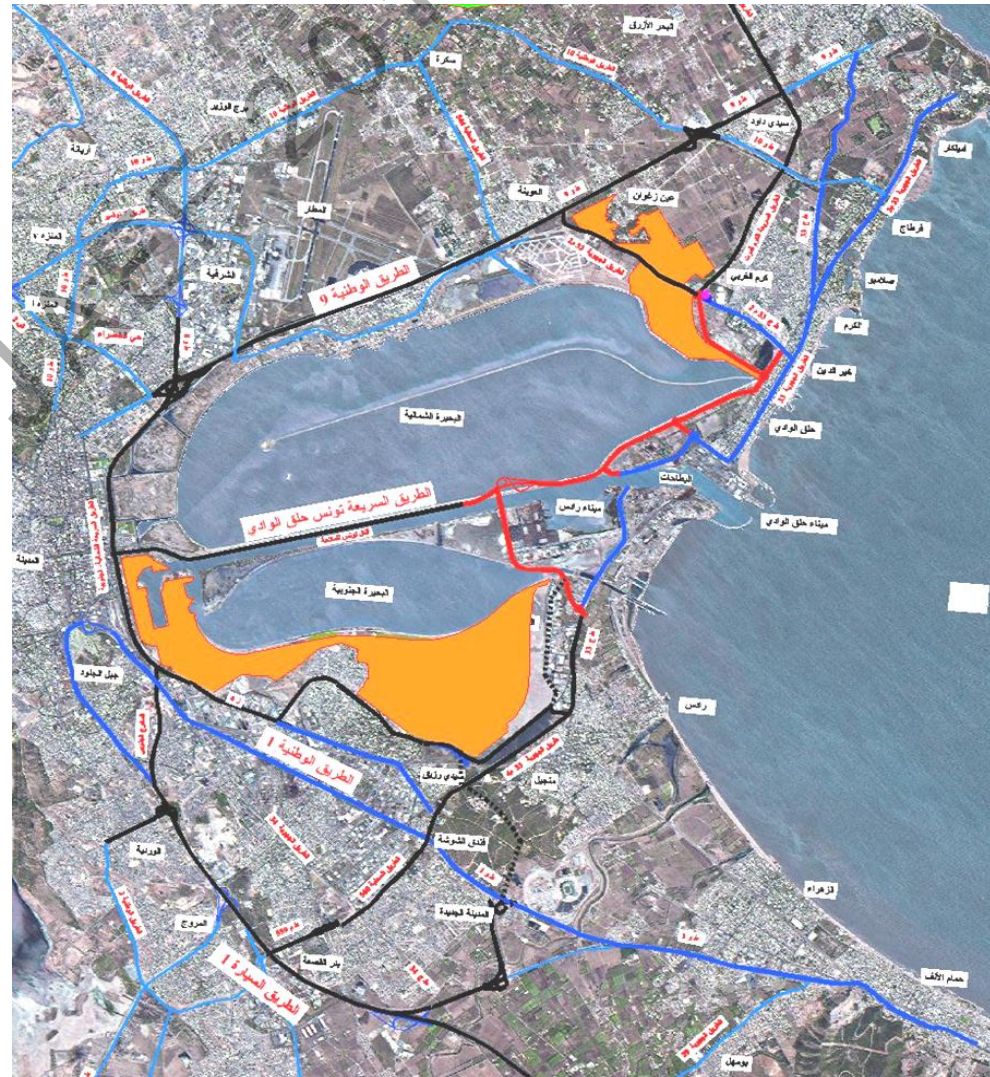
- Creation of a permanent direct fast link between the northern and southern suburbs. →
- Completion of the express bypass link for the northern suburbs near Le Kram and La Goulette. →
- Reduction of traffic on the southern access roads to the capital and the crossing of Le Kram and la Goulette →
- Creation of a link between Rades-la Goulette ports and the structuring road network →

**Cost:** 141 MDT

**Funding:** Tunisian  
Japanese

JBIC loan:8.4m JPY  
March 30th, 1999  
Project : TS-P18

**Execution:** September, 2004 - March, 2009



## INTERVENANTS AND PROJECT COMPONENTS

### OWNER :

- **TUNISIAN Ministry of equipment , housing and land development.**
- **Department of roads and bridges**

### CONSULTANT :

**Tunisian and Japanese Joint venture :**  
**NIPPON KOEI / PCI / SCET / STUDI**

### TECHNICAL CONTROL :

**Tunisian and French joint venture:**  
**VERITAS FRANCE / VERITAS TUNISIE**

### COMPAGNIES:

**LOT 1 : Main brige :** an extradossed stay cable bridge (L=260 m)

**LOT 2 : The south link** near Rades between the road RR33 and the main bridge(L=2.6 Kms)

**LOT 3 : The interchange** allowing the exchange between the main bridge and the Tunis- La Goulette express way.

**LOT 4 : The north extension** between the Tunis- la Goulette express way and the RR33E2

**LOT 5 : Lightening**

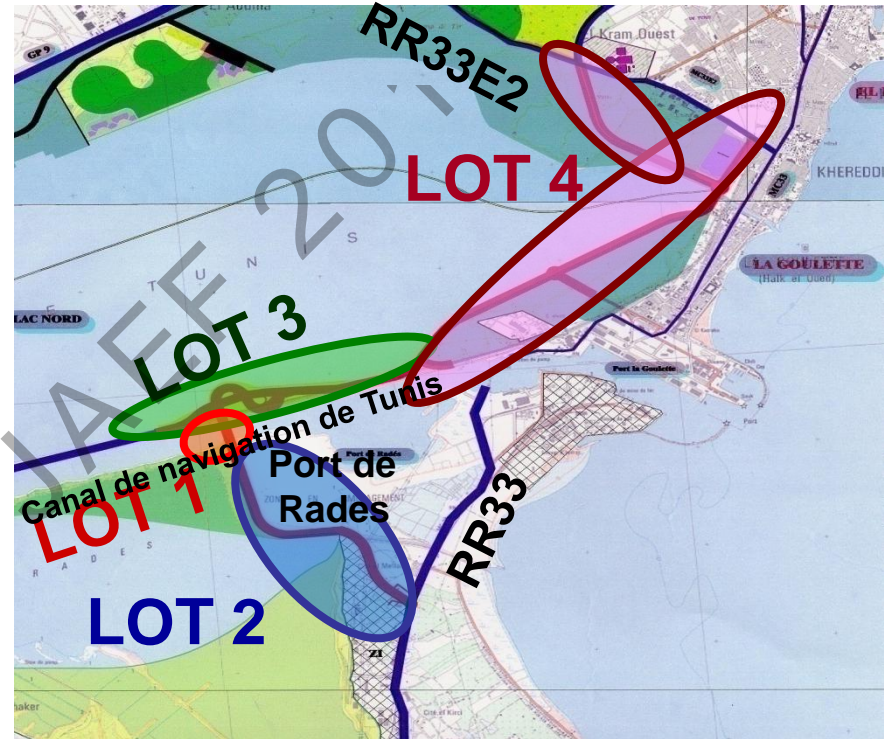
**: JAPANESE contrator : TAISEI CORPORATION** « TAISEI »

**: JAPANESE AND EGYTIAN joint venture :**  
« KAJIMA-SUMITOMO-ARABCO » [KAJIMA ARABCO](#)

**: JAPANESE contrator : TAISEI CORPORATION** « TAISEI »

**: TUNISIAN contrator : « SOMATRA-GET »** « SOMATRA GET »

**: TUNISIAN contrator : « SENELEC »**

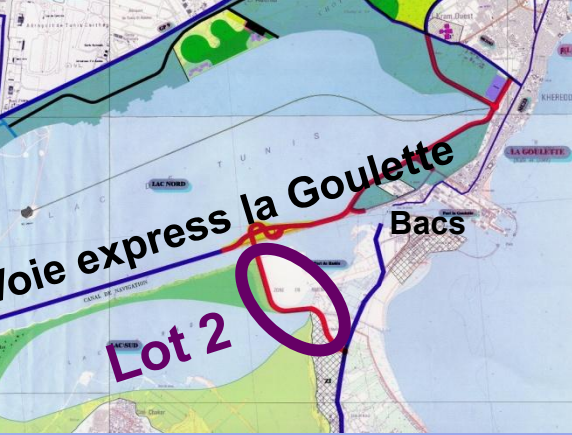




# MAIN CHALLENGES

- Construction of a new generation of stay Cable Bridge of 260m length by successive corbelled construction method.
- Execution of drilled piles of 2m of diameter and 75m of depth
- The sand filling of 20Ha of the north lake over very soft clay and in a sensitive and specific ecosystem.
- The treatment of the settlement of the soil by drains and weight consolidation method.
- The execution of beaten prefabricated piles.

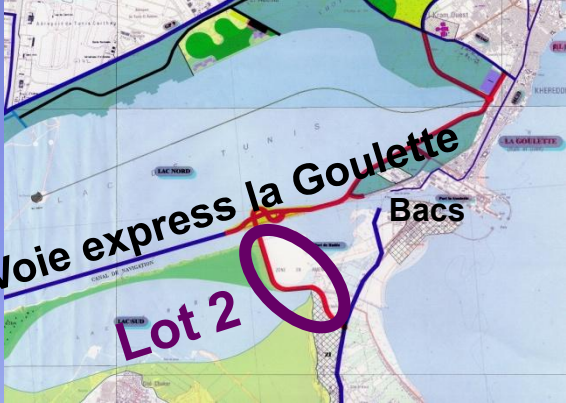




Avancement Lot 2

# Exécution des semelles

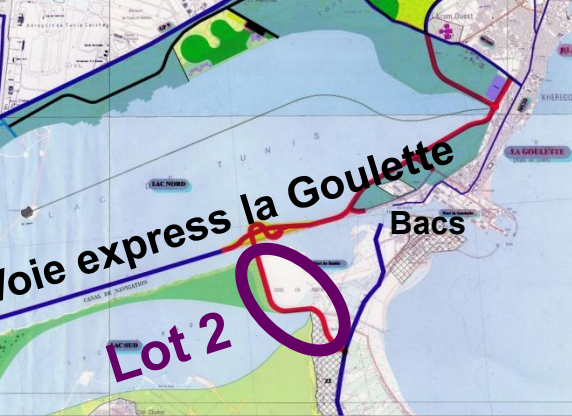




# Avancement Lot 2

## Préfabrication des poutres





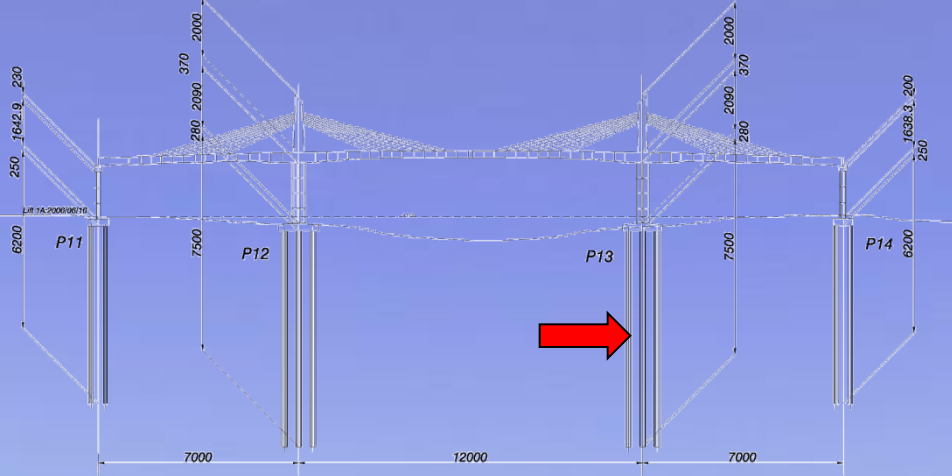
## Avancement Lot 2

# Lancement des poutres



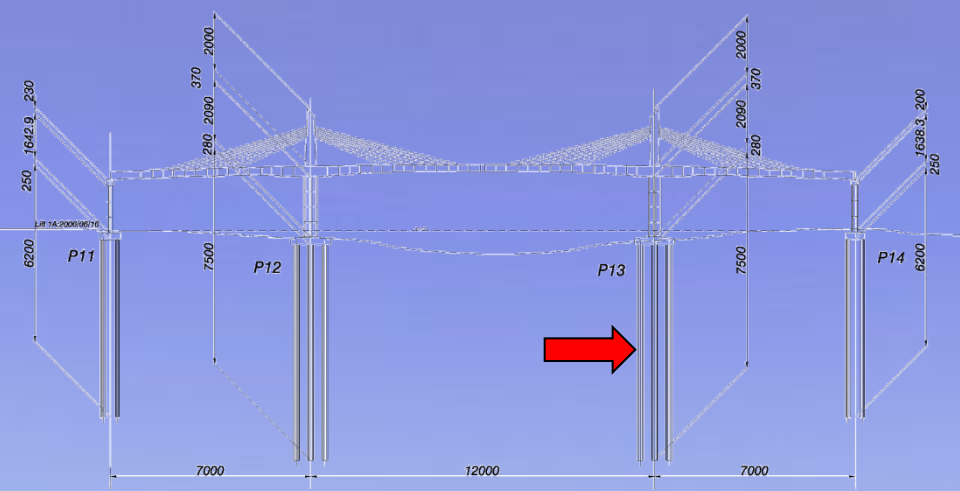
# Avancement Lot 1

# PIEUX



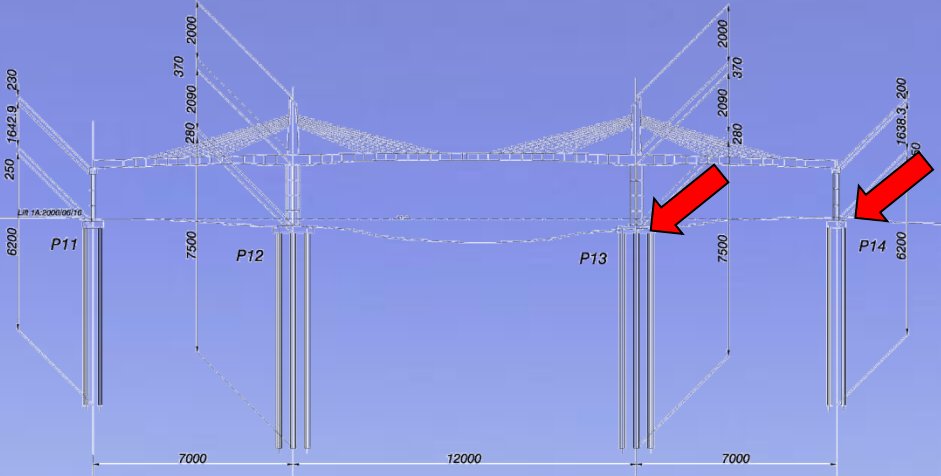
# Avancement Lot 1

## PIEUX



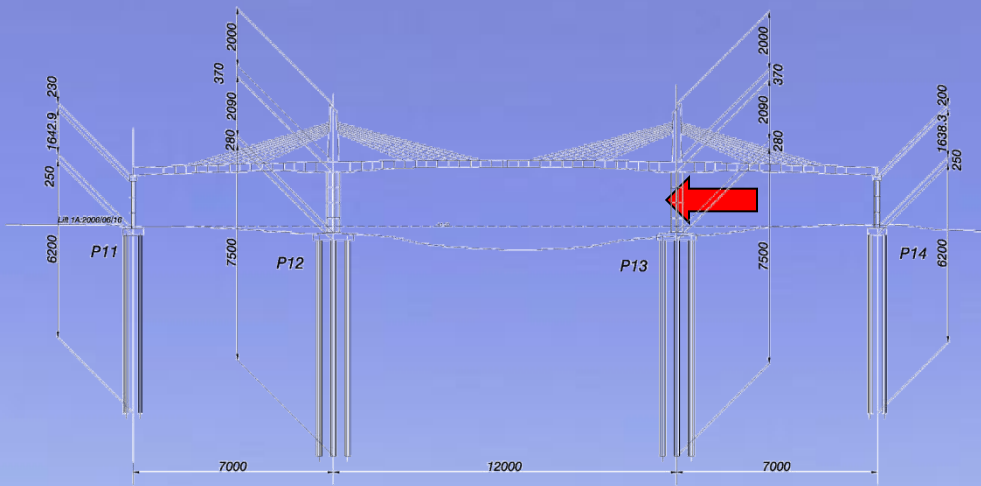
# Avancement Lot 1

## SEMELLES



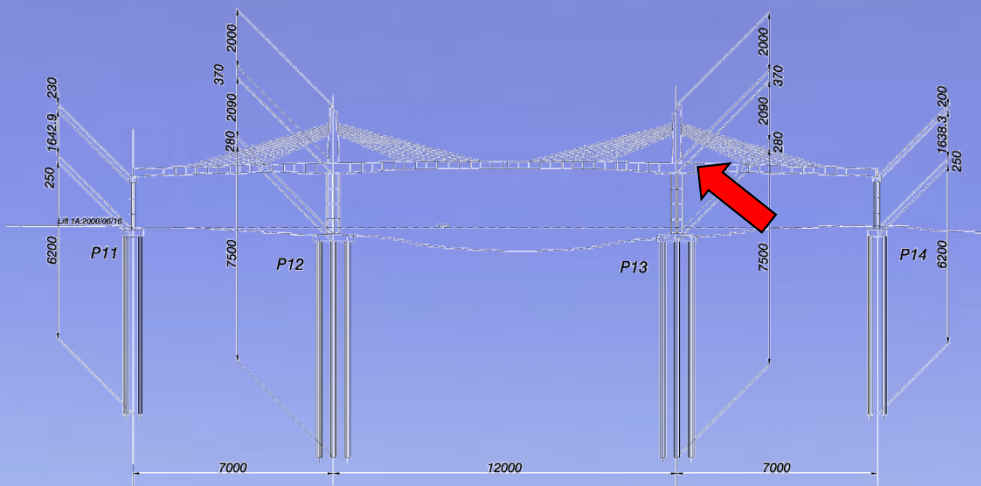


# Avancement Lot 1 PILES



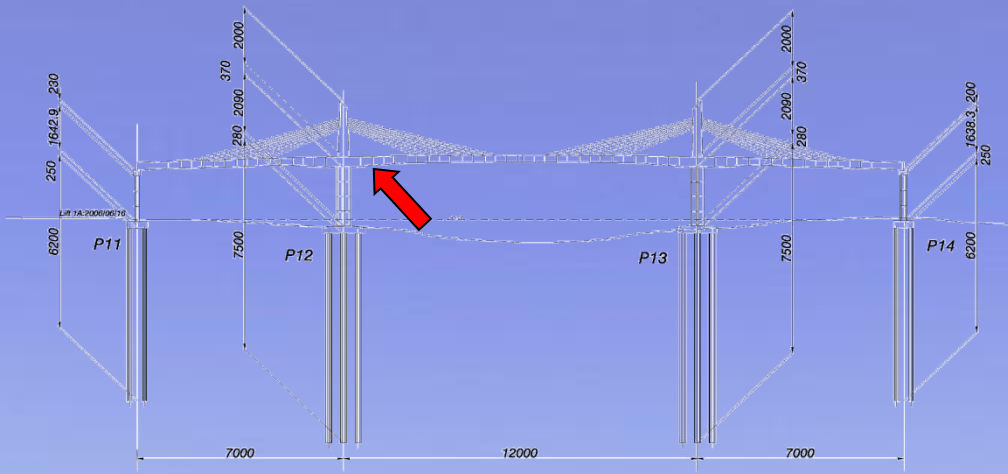
# Avancement Lot 1

## VOUSSOIRS

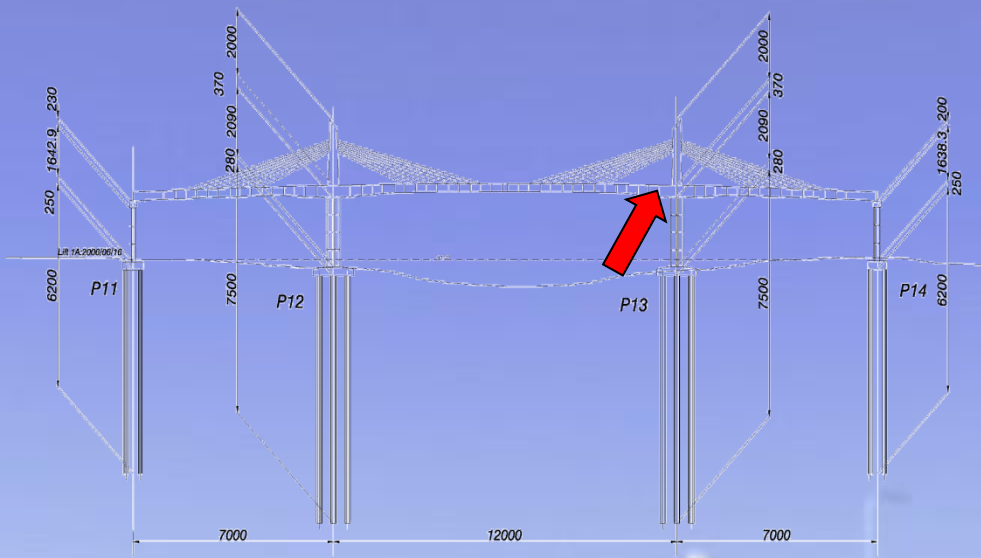


# Avancement Lot 1

## VOUSSOIRS



# EQUIPAGE MOBILE



# Avancement Lot 1

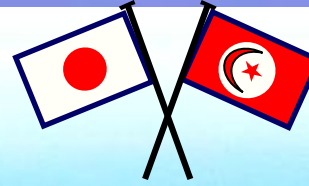
## Phasage d'exécution du tablier



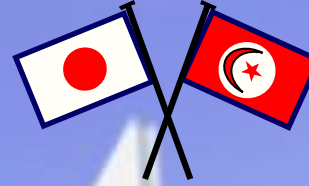


The 2nd JAIF 201

Rades-La Goulette Bridge LOCATION  
before construction

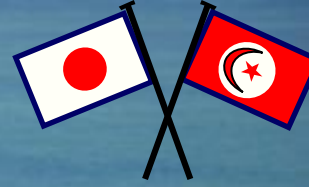


Embankment stage



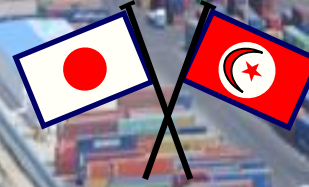
Pier construction stage





The 2nd JAFEE 201

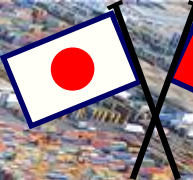
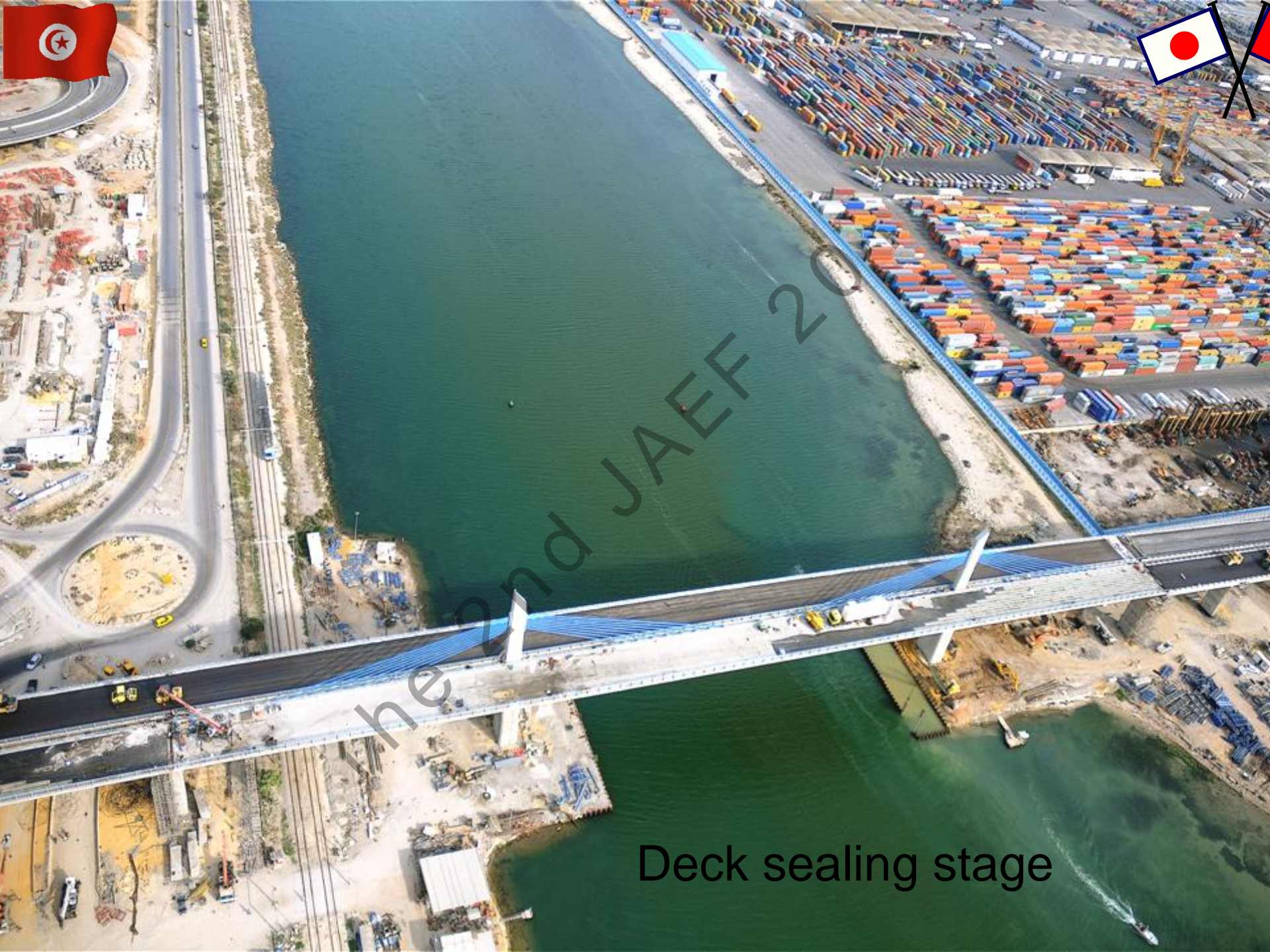
Deck construction stage



The 2nd JAIF 201

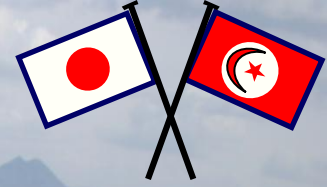
Deck cantilever construction stage



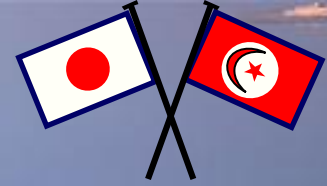


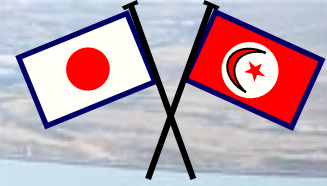
The 2nd JAEFF 20

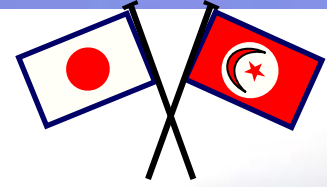
Deck sealing stage



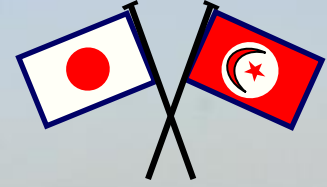
the2ndstage





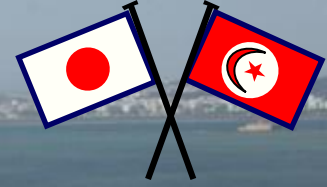


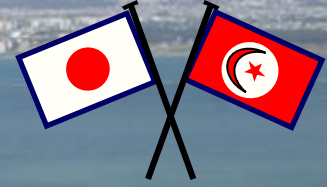
The 2nd JAEFF 201



The 2nd JAFH 201

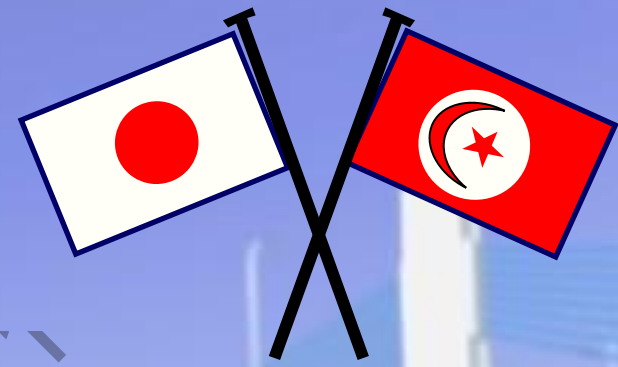






# CONCLUSION

- In March 2009, President **Zine El Abidine Ben Ali** inaugurated Rades- La Goulette Bridge. With the opening of the bridge,
- The project is a landmark of success in the cooperation between **TUNISIA AND JAPAN**
- The project became a milestone for Tunisia infrastructure
- More mega projects are expected in Tunisia so more jointwork and cooperation with Japan are most welcome



50th Anniversary  
Japan-Tunisia  
Cooperation postage stamp



**REPUBLIQUE TUNISIENNE**  
**Ministère de l'Équipement, de l'Habitat**  
**Et de l'Aménagement du Territoire**  
**Direction Générale des Ponts et Chaussées**



**Thank you for  
your attention**



# PROJECT OBJECTIVES

- 1) Creating a **continuous, fast and direct** link between the two suburbs over the tunis navigation canal

• **Direct**



• **Fast**

- **For all types of vehicules**

• **Non stop**

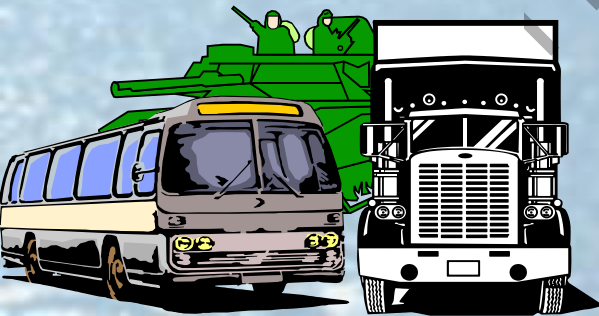
Speed 80Km/h

from 40 to 60Kms/h  
for the interchange

Non moving  
bridge

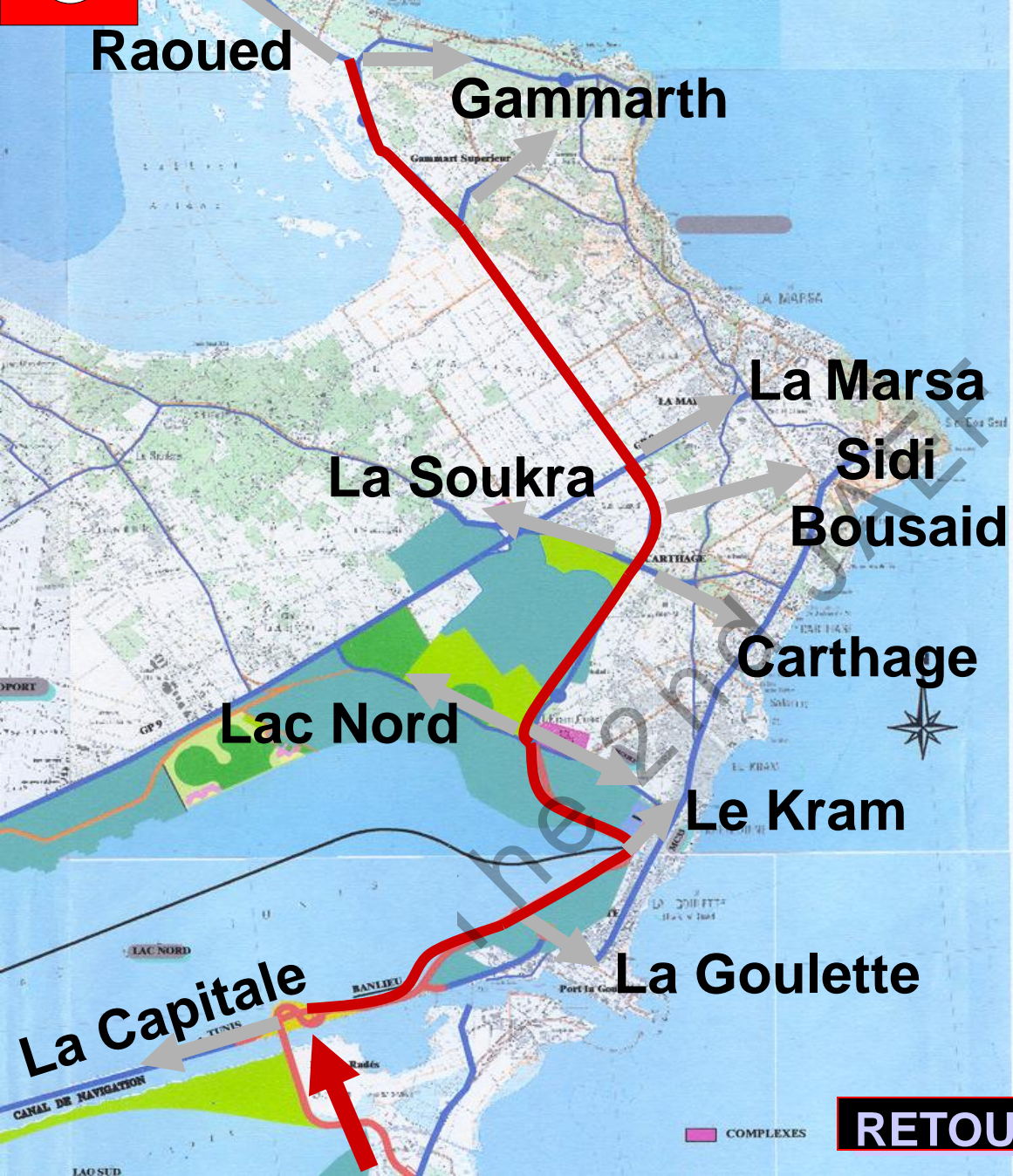
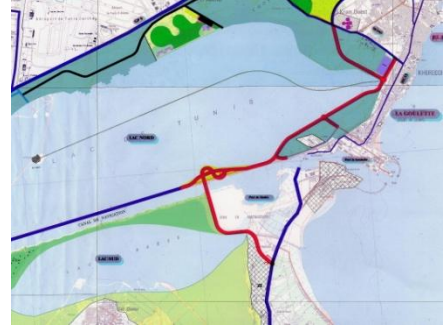


• **Back**





# PROJECT OBJECTIVES

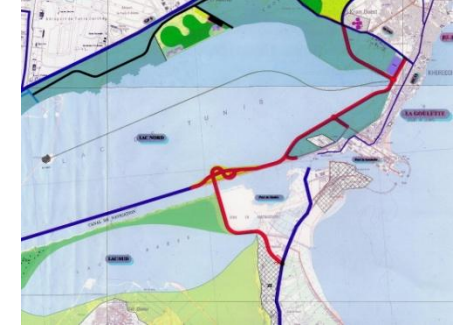
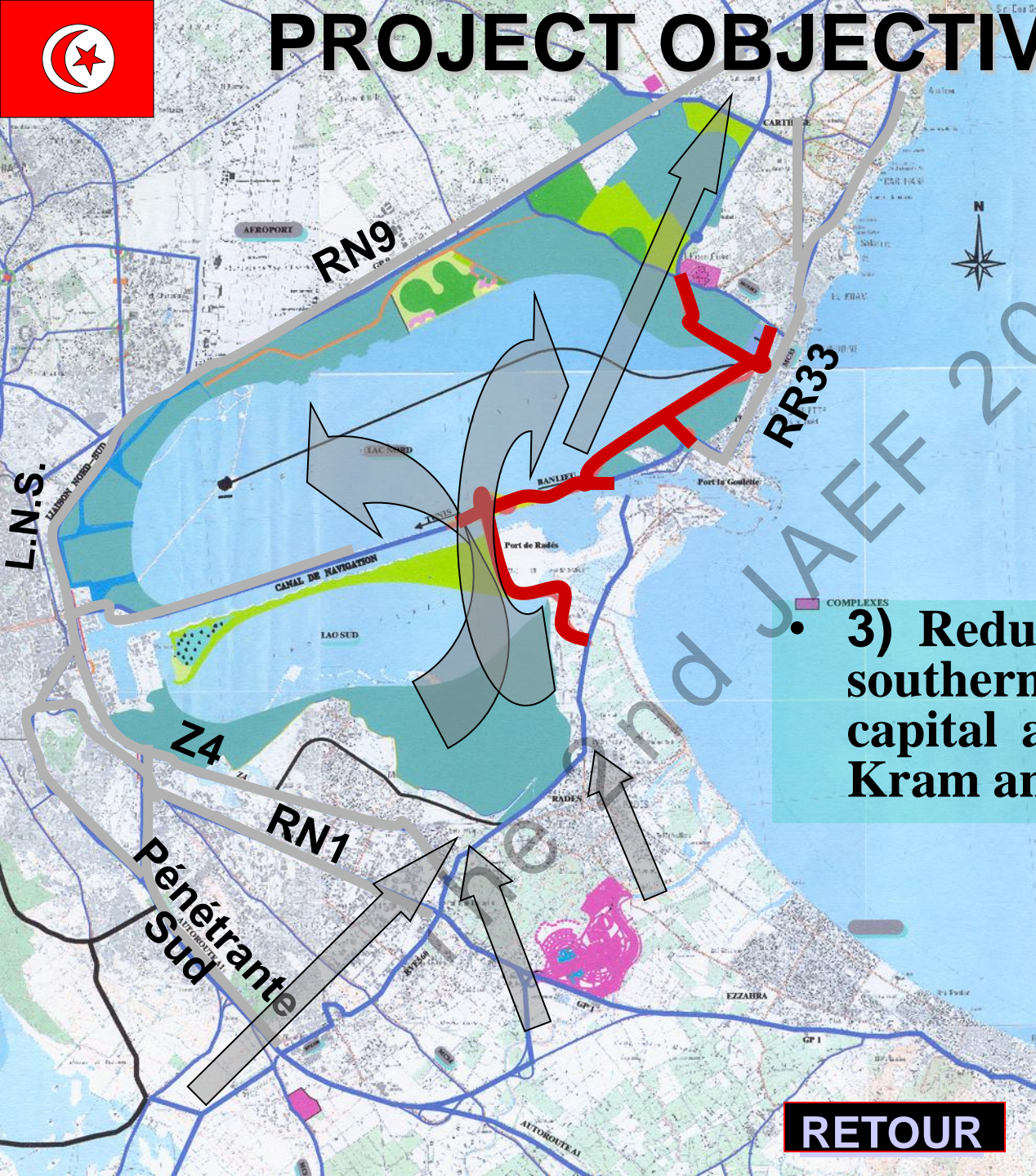


- 2) Completion of the express bypass link for the northern suburbs near Le Kram and La Goulette..

**RETOUR**



# PROJECT OBJECTIVES



- 3) Reduction of traffic on the southern access roads to the capital and the crossing of Le Kram and la Goulette

**RETOUR**

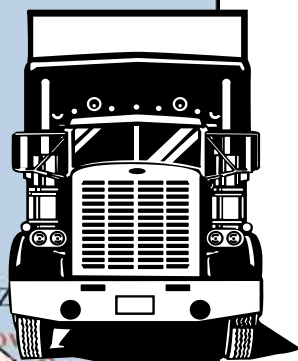




# PROJECT OBJECTIVES

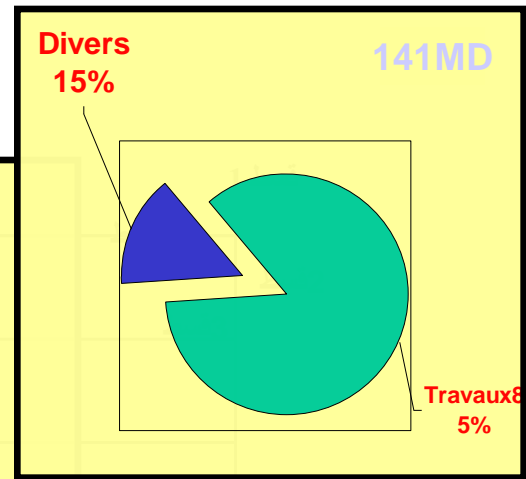
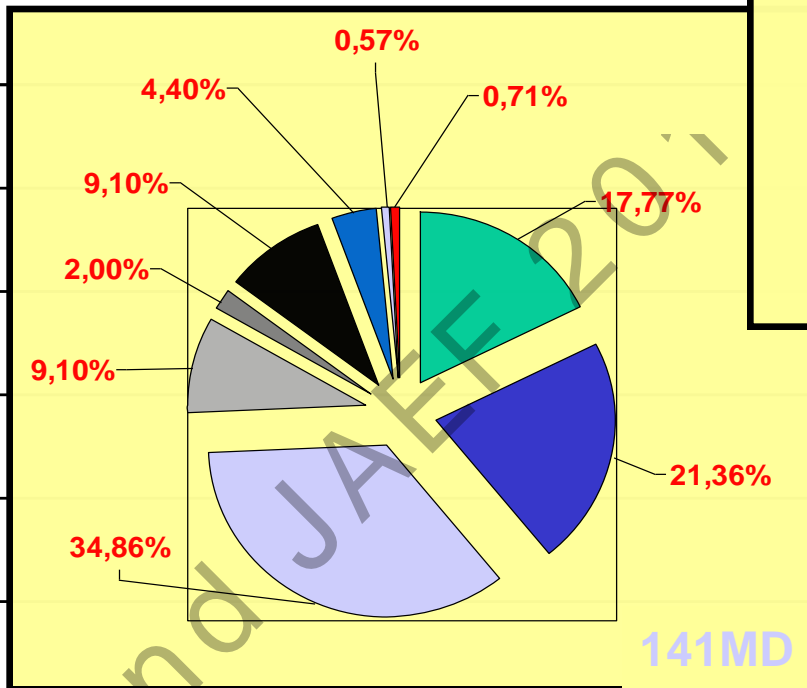
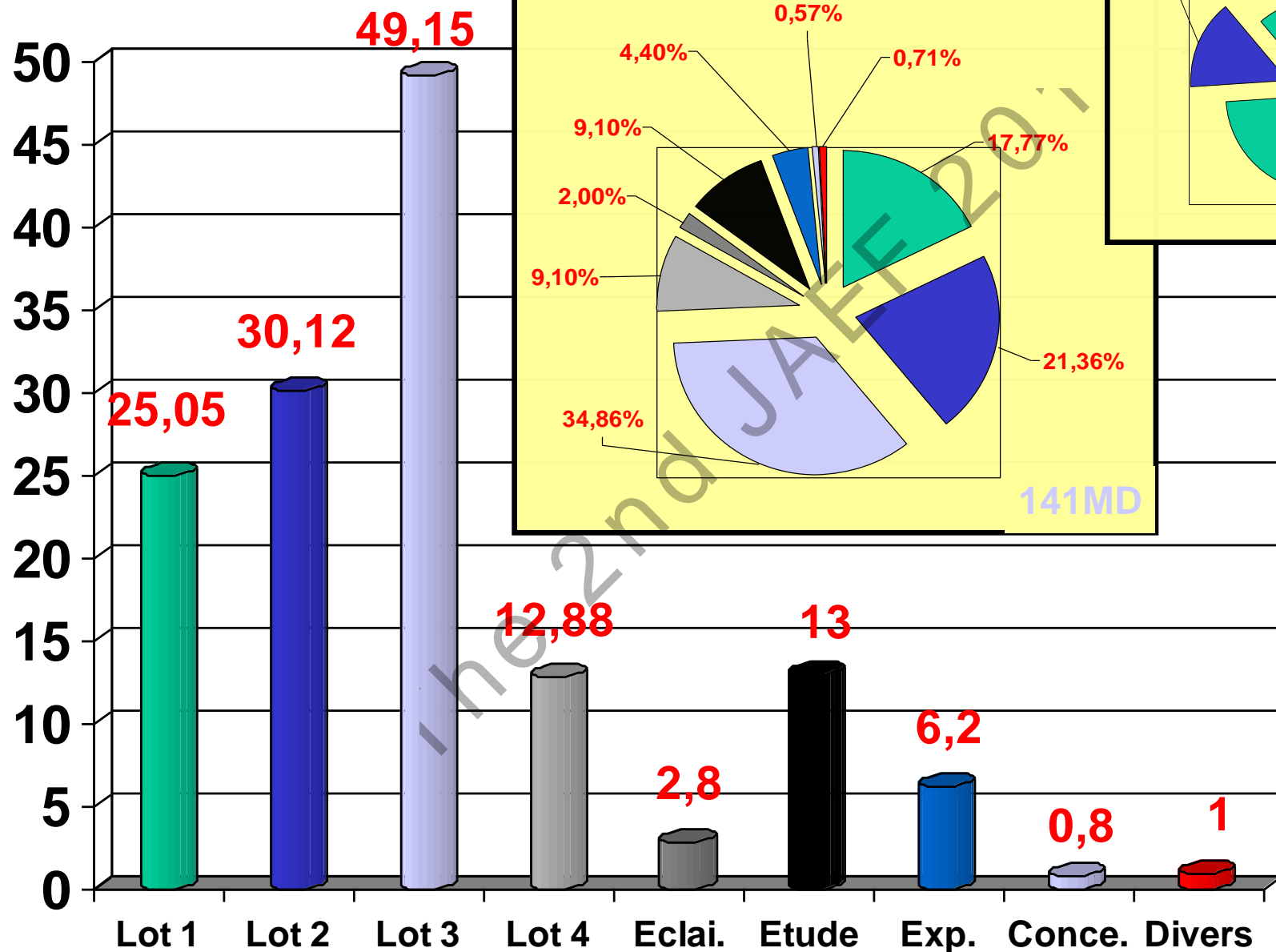


4) Creation of a link between Rades-la Goulette ports and the structuring road network



**RETOUR**

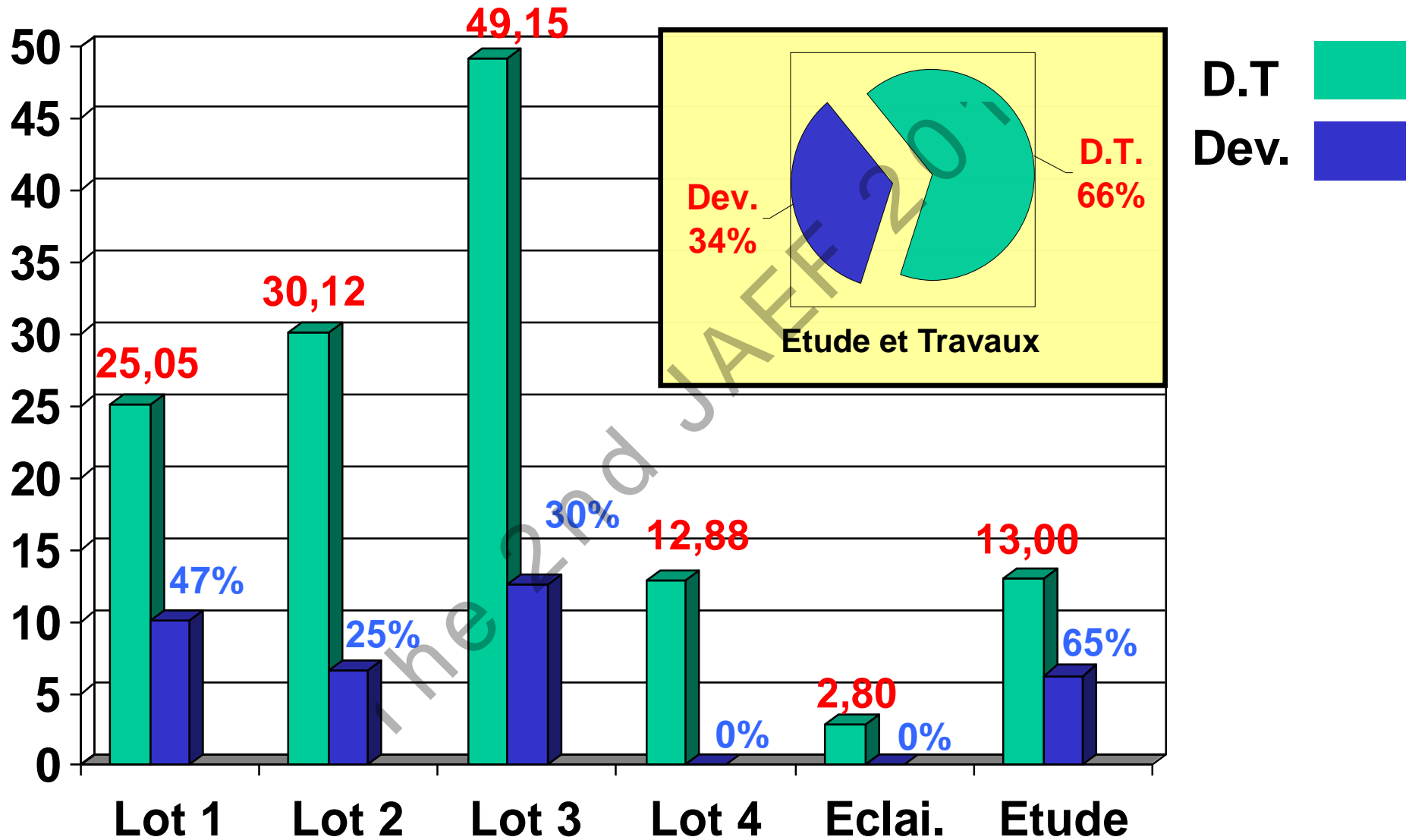
# ○ Répartition du Coût du Projet



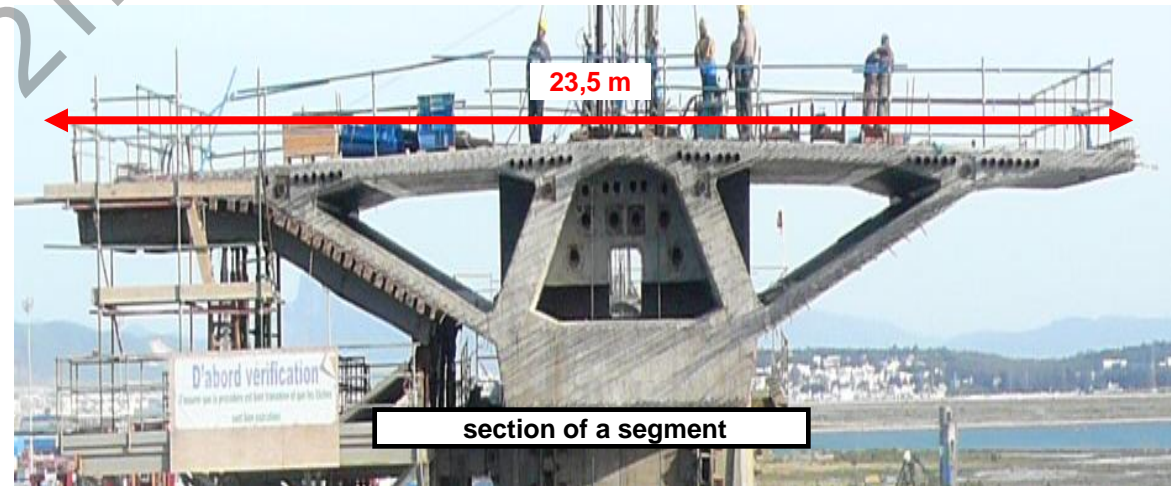
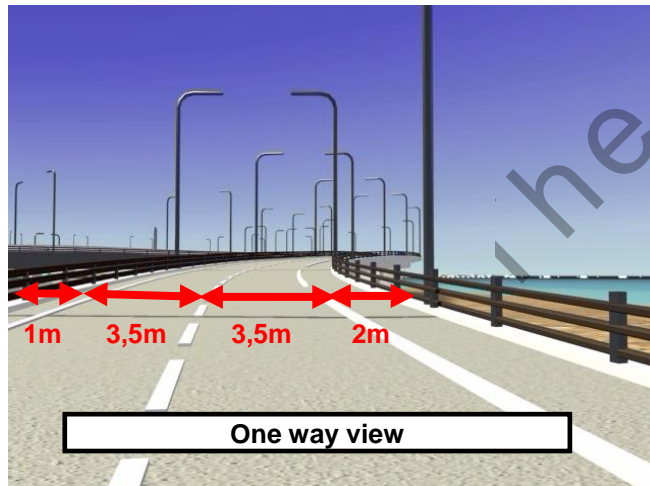
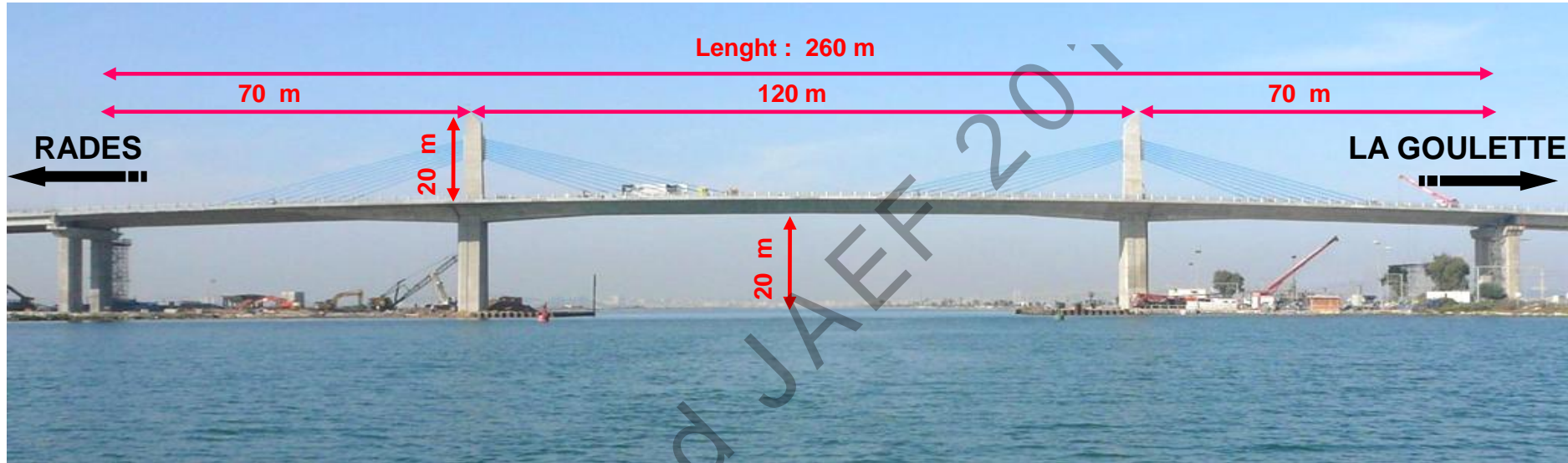
- Lot 1
- Lot 2
- Lot 3
- Lot 4
- Eclai.
- Etude
- Exp.
- Conce.
- Divers

**RETOUR**

# Répartition de la Devise



MAIN BRIDGE



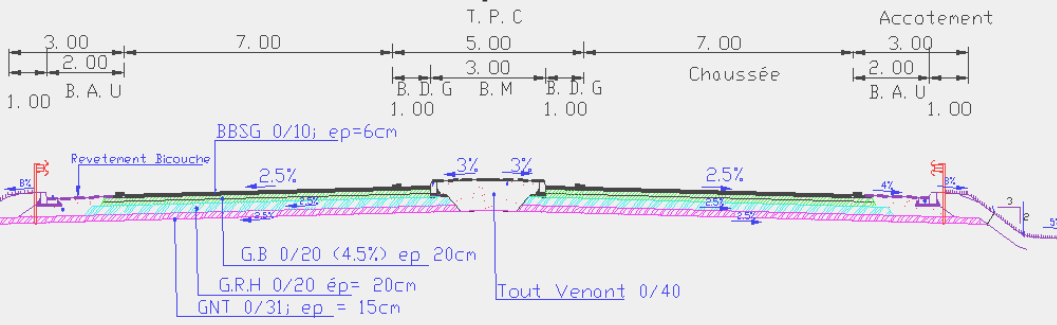
# Avancement Lot 1

## Phasage d'exécution du tablier

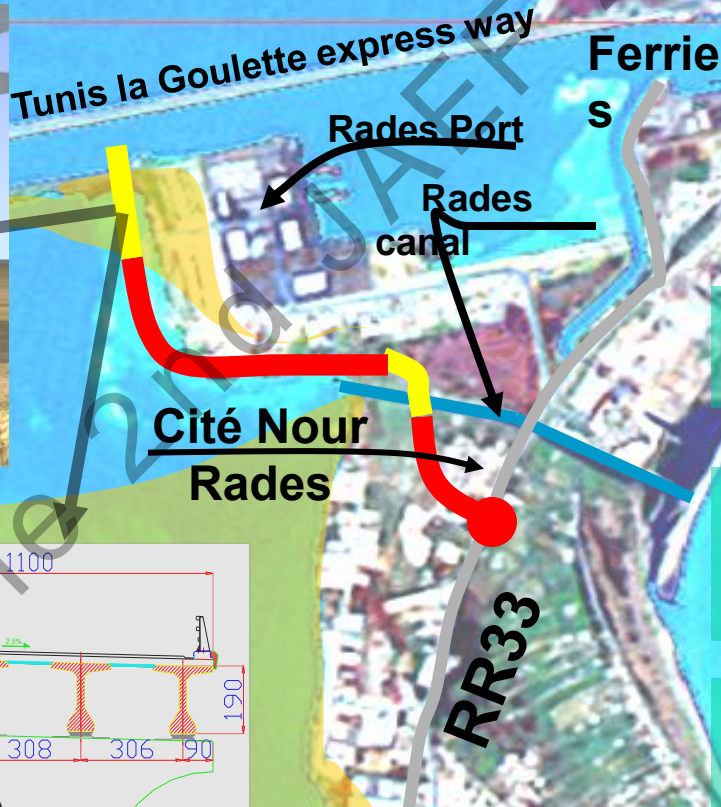




# Cross profile

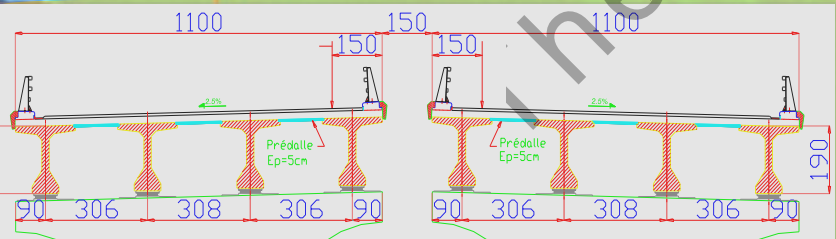


# LOT 2: THE SOUTHERN LINK



This lot includes the following :

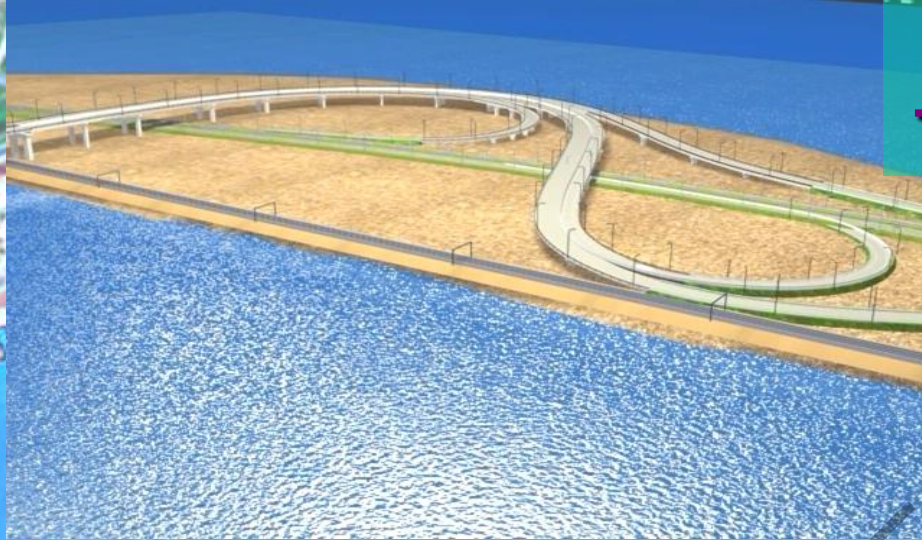
- 1) The construction of 2 km 2x2 lane express-ways
- 2) The construction of a 180 m length bridge over the Rades channel
- 3) The construction of a 400m length bridge for the southern approach



Cross profile of the southern approach bridge

**RETOUR**

# LOT 3: THE INTERCHANGE

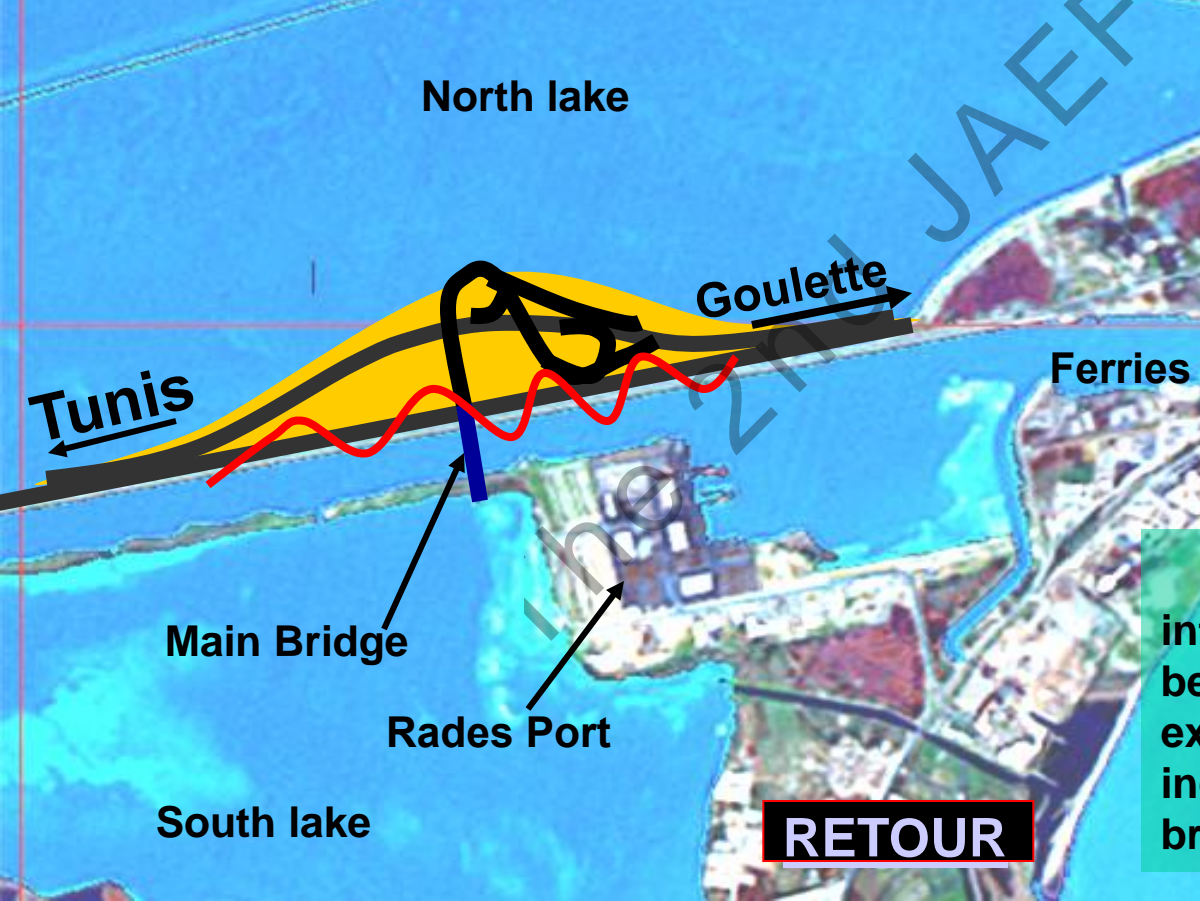


This lot includes the following:

1) Sand filling of 25 Ha of the lake's northern part

2) The deviation of the Tunis la Goulette road over a 2.4 km distance

3) The construction of an interchange allowing exchanges between the main bridge and the express way Tunis - la Goulette including a 720 m long box girder bridge for the northern approach



North lake

Goulette

Tunis

Ferries

Main Bridge

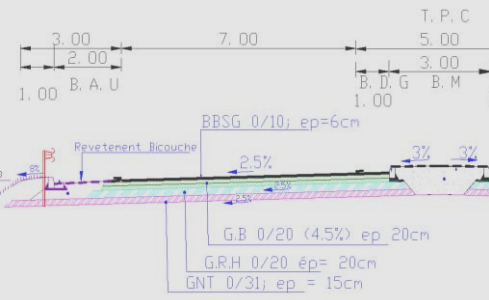
Rades Port

South lake

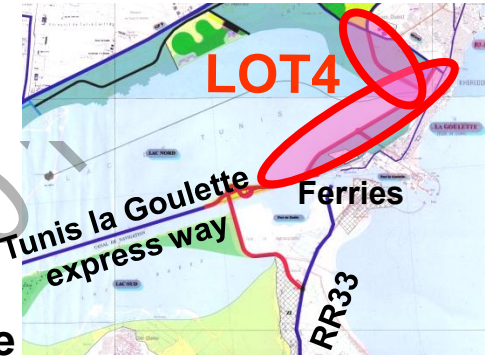
**RETOUR**



Road cross section



# LOT 4 : THE NORTHERN LINK

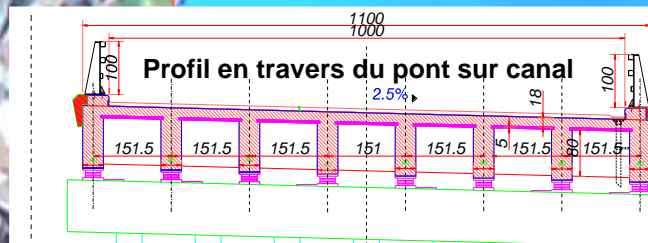


This lot includes the following:

1) The construction of a 5.5 km long 2x2 lanes express way

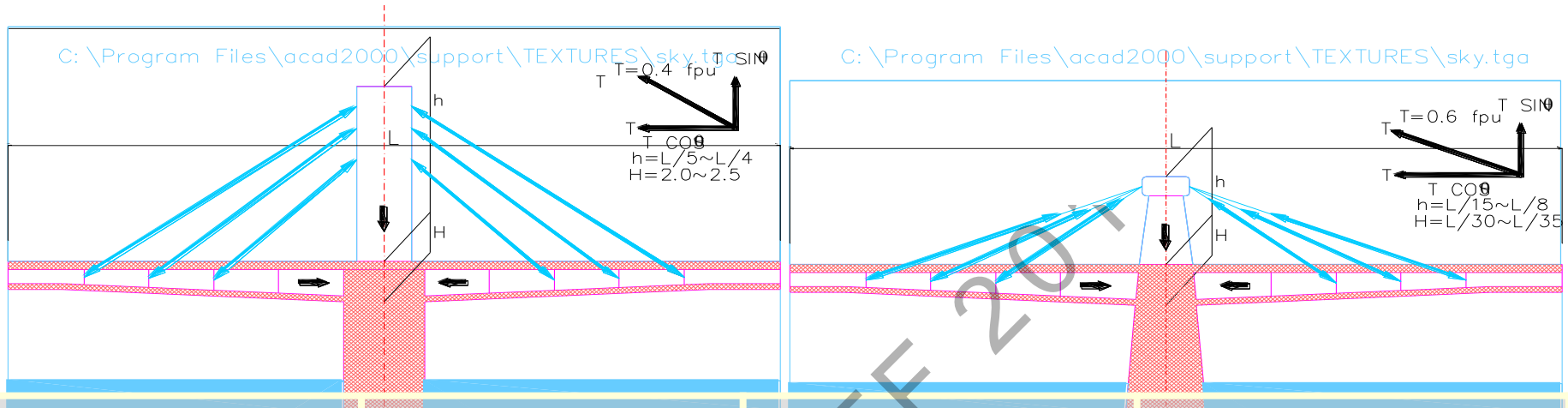
2) The construction of a 14.5 m long bridge over the STEG channel

3) The construction of a 58 m long bridge over the Khair-Eddine channel



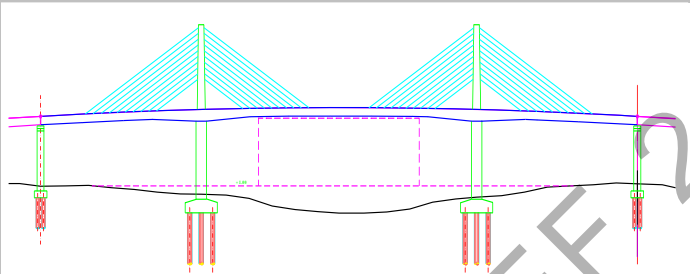
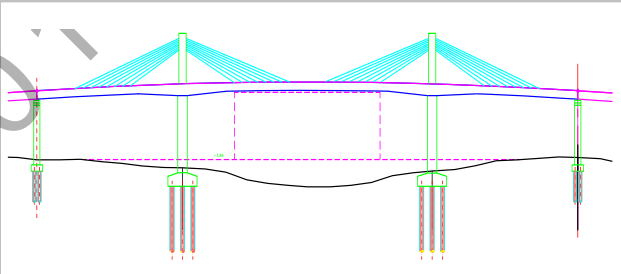
**RETOUR**

# La Difference entre pont extra-dossé et un pont à hauban



	Caisson BP Encorbellement	Pont Extradossé	Pont à Haubans
Hauteur du Tablier (h/L)	Support: 1/18 Mi-travée: 1/40	Support: 1/35 Mi-travée: 1/55	1/120 à 1/200
Hauteur des Pylones (H/L)	0	1/15 à 1/8	1/5 à 1/4
Charge verticale reprise par le câblage	< 20 %	≈ 30 %	> 60 %
Taux de travail des Câbles	80 % fprg	60 % fprg	40 % fprg
Portées économiques	50 – 200 m	100 – 250 m	> 150 m

# La Difference entre pont extra-dossé et un pont à hauban

DESCRIPTION	ETUDE DE FAISABILITE PONT A HAUBAN	ETUDE D ETAILLEE PONT EXTRA DOSSE
(1) Géometrie du pont		
Aspects esthétiques	<p>-apparence plus fine due à la hauteur réduite des poutres</p> <p>-Vue plus symbolique due à la hauteur des pylones</p>	<p>-apparence plus fine due à la hauteur basse des pylones</p> <p>-Vue symbolique due à la réduction des cables et pylones</p>
Rapport du coût de construction	1.26	1.00
Delai de construction de la travée principale uniquement	24 mois	20 mois
Aspect de maintenance	Plus de travaux de maintenance dus à la longueur élevée des cables	Moins de travaux de maintenance et coût dus à la simplicité de la structure réduite
Evaluation globale	Moyen	Excellent

# LES DIFFERENTES METHODES

## DES METHODES ANALOGUES AUX PONTS EN CAISSON BETON PRECONTRAIT

- PAR POUSSAGE
- AVEC POUTRE DE LANCEMENT
- PAR ENCORBELLEMENT SYMETRIQUE

