

# CHILEAN MANAGEMENT SYSTEM FOR SINGULAR INFRASTRUCTURES PROJECTS:

## BIDDING PROCESS (SIP-TMS)



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# Road Department – Ministry of Public Works



The Roads Department of the Ministry of Public Works has, among others, the mission of the planning, design, construction, replacement and repair of bridges, footbridges within the road network:

Under its custody:

Basic and Community network.



# Contracts MOP



## Traditional System

- Design Contract
- Construction Contract
- Contractor build
- Payment: Stages during the contract

### Legal Codes:

- RCOP Decree MOP N° 75 year 2004
- RCTC Decree MOP
- Bidding Process
- Tender of Contractor
- Decree of Awarded

### Exception:

**Supreme Decree (President Resolution),  
where Special Basis or Contract**

# Contracts MOP



## Traditional System

### MOP qualified Recorded List

Major

Minor

Special  
List

## Emergency System

### Direct Deal

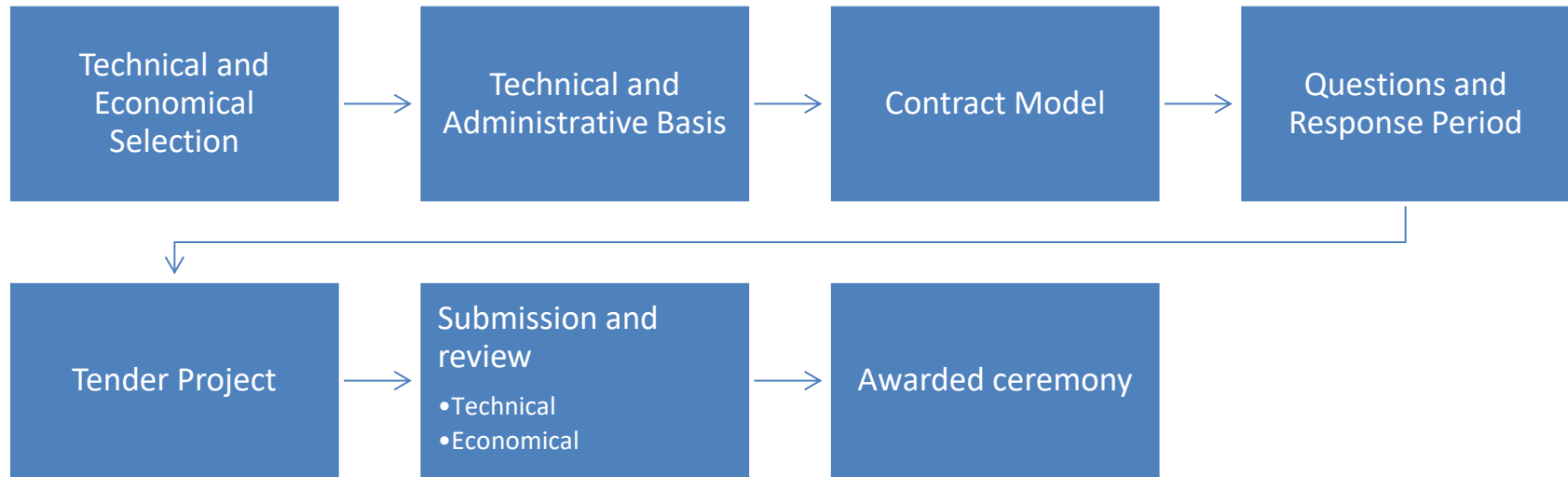
- An emergency

### Private Quote

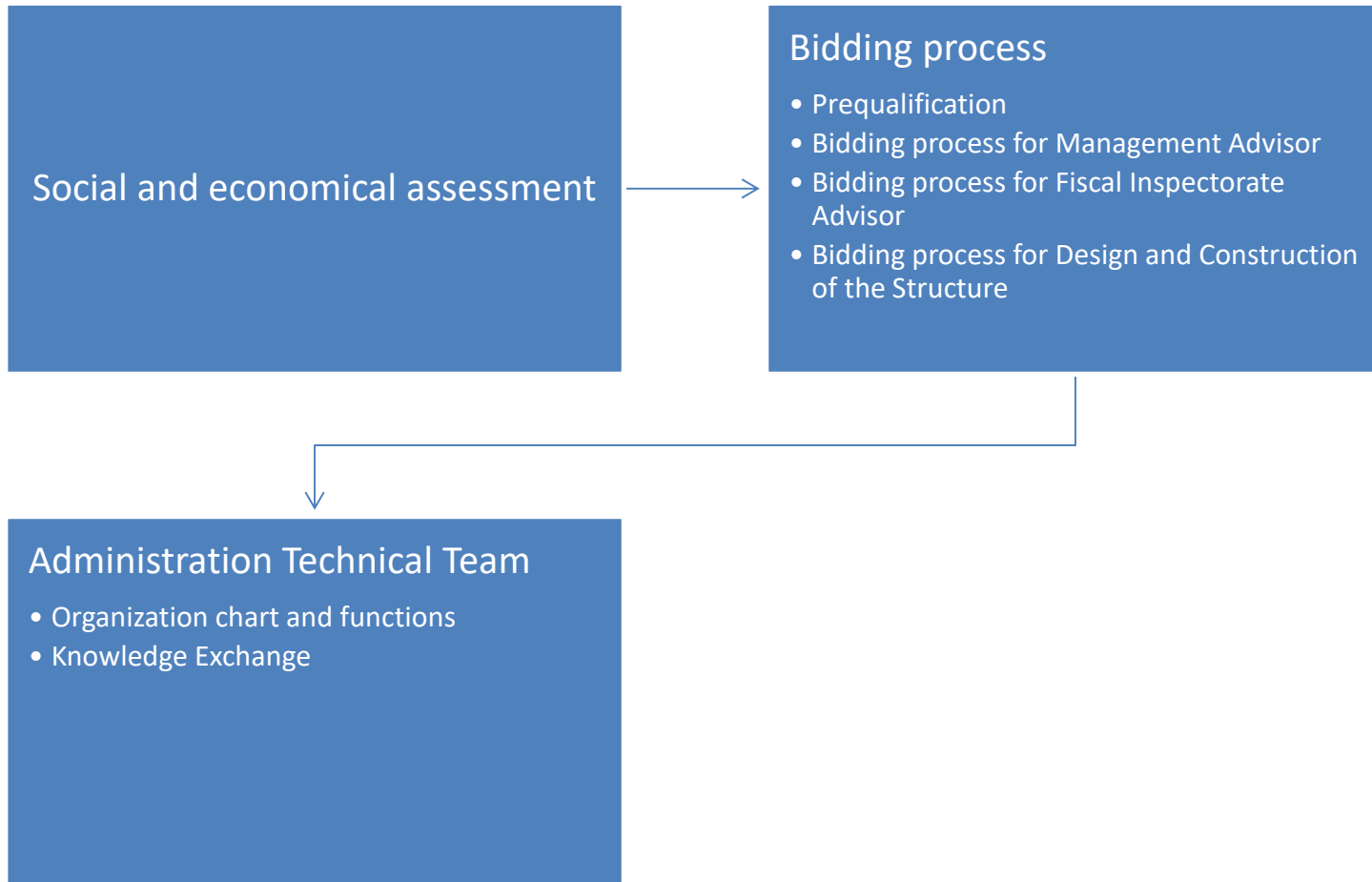
- Specialists in the requested field



# Traditional Bidding Process



# Bidding Process (SIP-TMS)



# Suspension Bridges

3

## Puente General Carrera

Región de Aysén



3

4

## Puente Ibáñez

Región de Aysén

Span 210 meters



4

# Latest Important Projects

## Bidding process of D&B

1. Chacao Bridge



## CCOP (PPP Contract)

2. Américo Vespucio Oriente Highway
3. Costanera Central Highway



# General background of the project



- |                           |                                                                                                |
|---------------------------|------------------------------------------------------------------------------------------------|
| <b>Project</b>            | : International bidding: Chacao Bridge Design and Construction                                 |
| <b>Type of contract</b>   | : Traditional system of public works contracts                                                 |
| <b>Bridge Typology</b>    | : Suspension bridge about 2.75 km in length<br>Large spans (more vain about 1,055 and 1,155 m) |
| <b>Location</b>           | : Los Lagos region, 1,100 km south of Santiago                                                 |
| <b>Maximum investment</b> | : USD 740 million<br>Total project)                                                            |



# Characteristics of the area of location

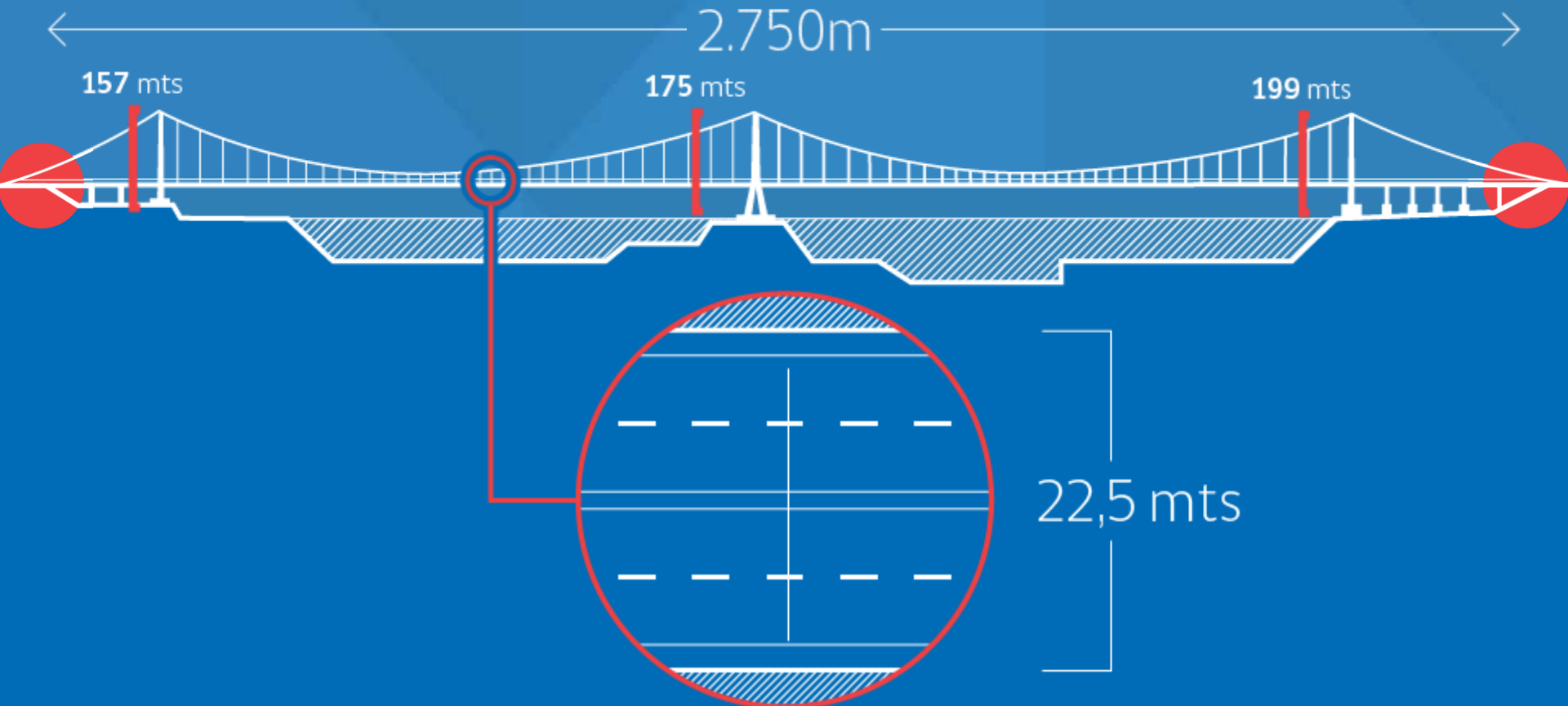


- Chiloe Island and bridge construction sector, are in a highly seismic zone
- The channel is characterized by strong winds, tides and currents
- The depth of the channel reaches a maximum of 120 m
- In the central part of the channel there is a place called Roca Remolinos, which can support the central pylon



# Structural Scheme: Chacao Bridge

PPWS Method





## Suspension Bridges

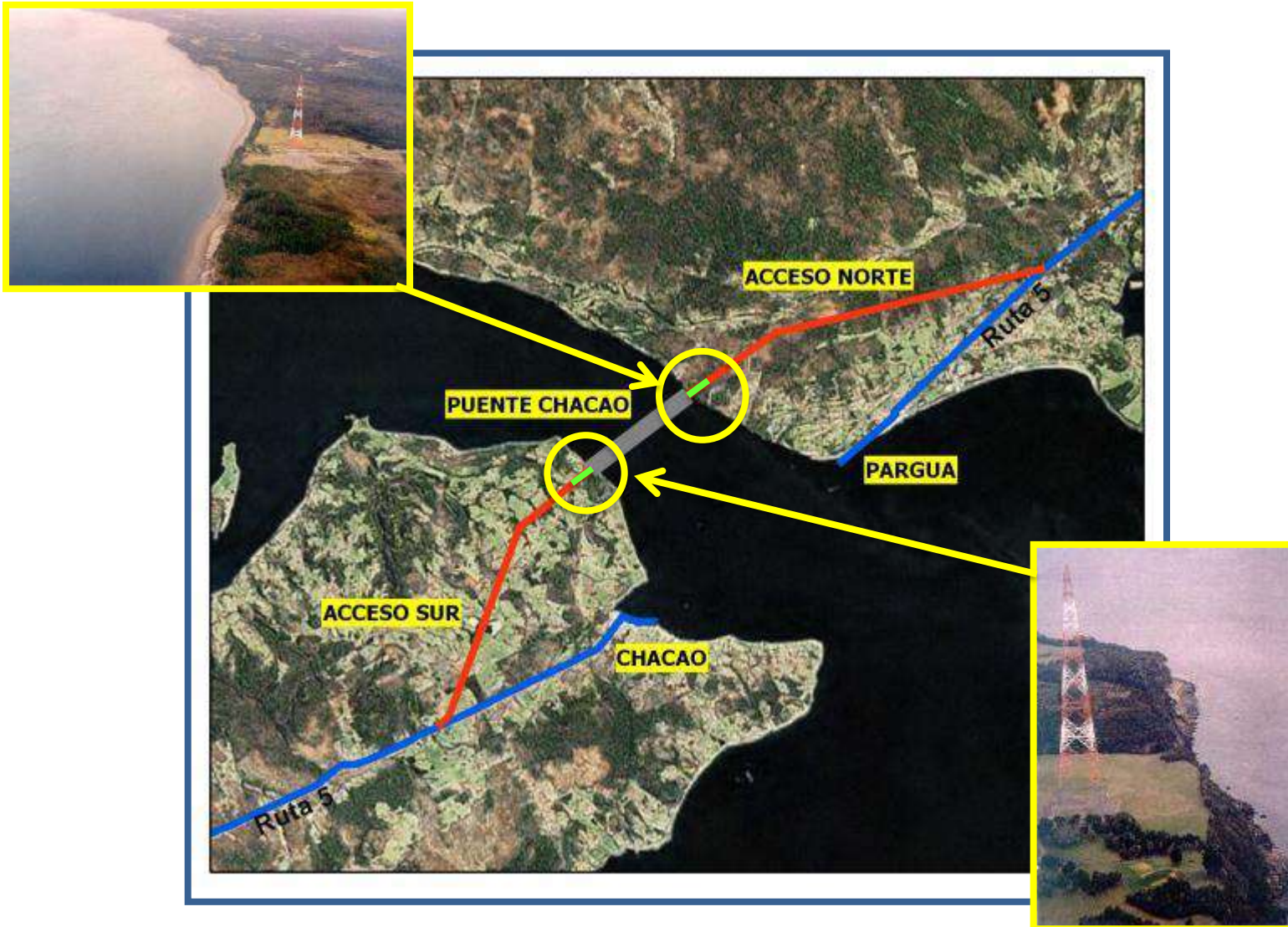
# Largest spans in service

---

|    |                   |                                  |       |      |
|----|-------------------|----------------------------------|-------|------|
| 1  | Akashi Kaikyo     | Isla Awaji – Kobe, Japón         | 1.991 | 1998 |
| 2  | Xihoumen          | Archipiélago Zhoushan, China     | 1.650 | 2009 |
| 3  | Great Belt        | Halsskov – Sprogø, Dinamarca     | 1.624 | 1998 |
| 4  | Yi Sun Sin        | Yeosu – Gwangyang, Corea del Sur | 1.545 | 2012 |
| 5  | Runyang           | Río Yangtzé, China               | 1.490 | 2005 |
| 6  | Humber            | Barton – Hull, Inglaterra        | 1.410 | 1981 |
| 7  | Jiangyin          | Río Yangtzé, China               | 1.385 | 1999 |
| 8  | Tsing Ma          | Tsing Yi – Ma Wan, Hong Kong     | 1.377 | 1997 |
| 9  | Verrazano Narrows | New York, Estados Unidos         | 1.298 | 1964 |
| 17 | Chacao            | Canal de Chacao, Chile           | 1.155 | 2020 |

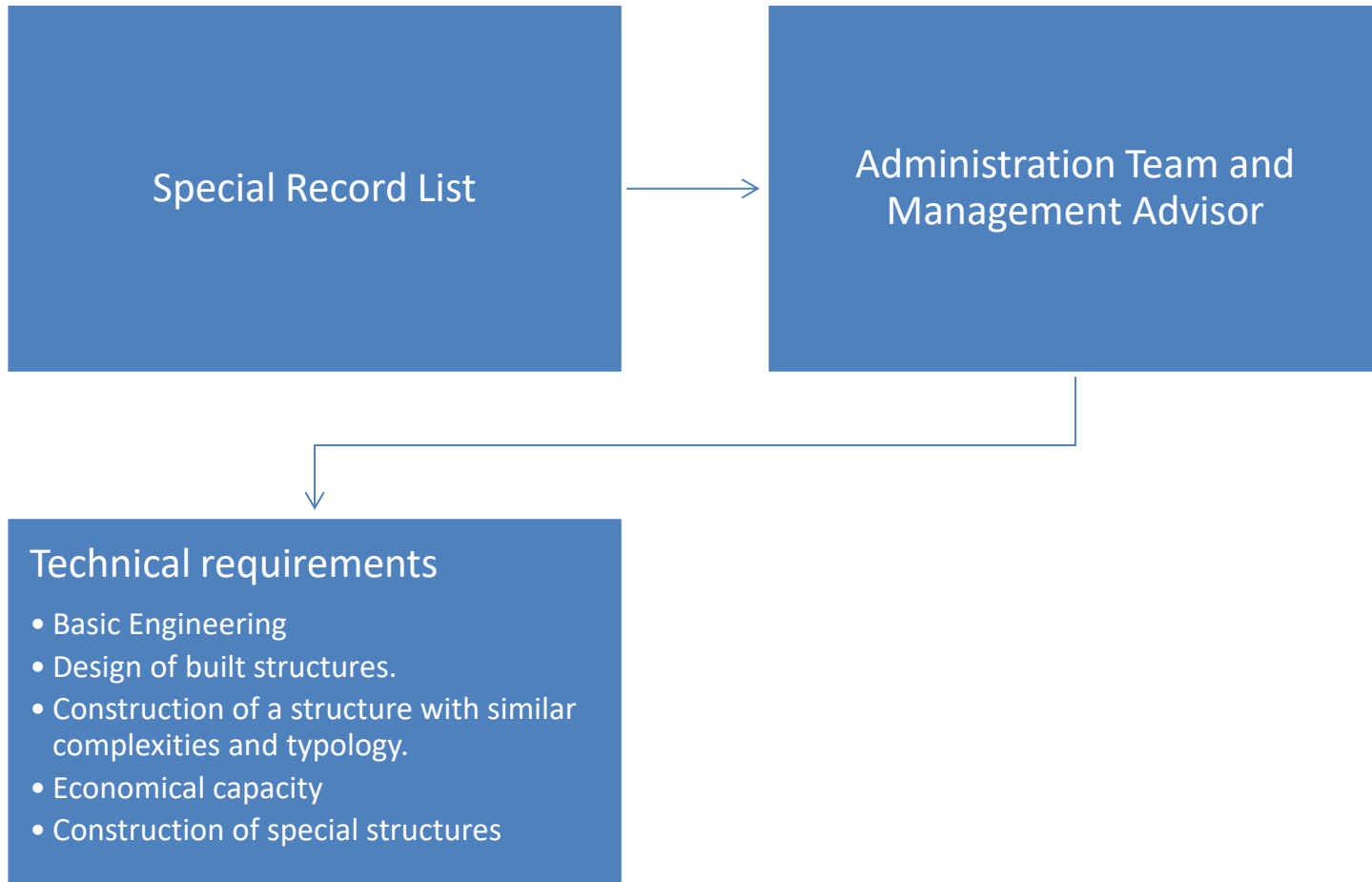


# Location and Access Bridge



# Bidding Process (SIP-TMS)

## Prequalification





# REQUISITOS

para la precalificación

## INGENIERÍA Y DISEÑO

de al menos un puente colgante de vano mayor, igual o superior a 600m, puesto en servicio desde el año 1985 en adelante.

## ESTUDIOS DE ING. BÁSICA

geológicos, geotécnicos, de vientos e hidráulica marina.

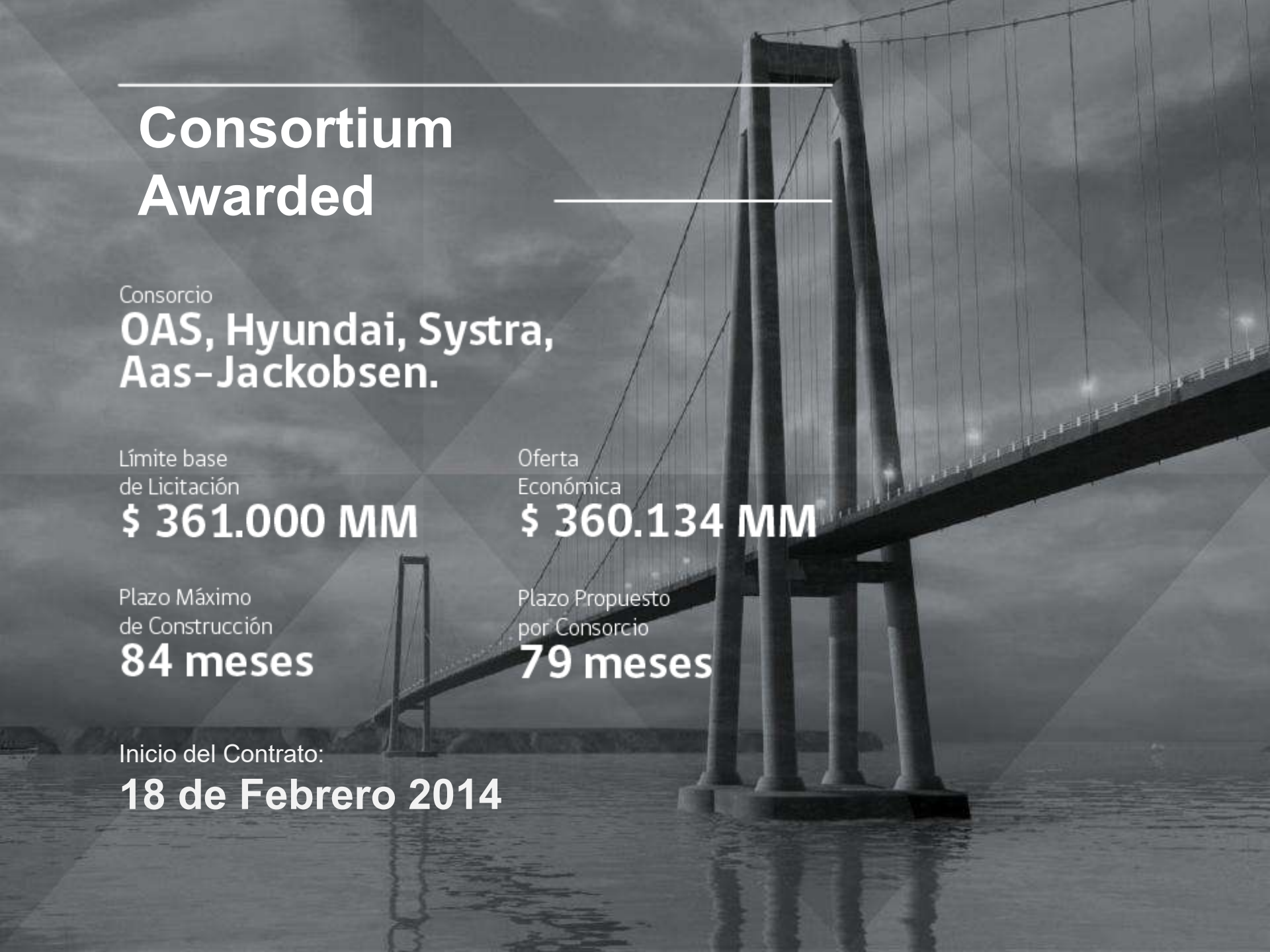
## CONSTRUCCIÓN

## FUNDACIONES BAJO EL AGUA

off shore, marinas o fluviales, en profundidades superiores a los 20m realizadas desde el año 1985 y hasta el 31 de Julio de 2012.

## CAPITAL DE TRABAJO

acreditado superior a USD 200 millones



# Consortium Awarded

Consortio

**OAS, Hyundai, Systra,  
Aas-Jackobsen.**

Límite base  
de Licitación

**\$ 361.000 MM**

Oferta  
Económica

**\$ 360.134 MM**

Plazo Máximo  
de Construcción

**84 meses**

Plazo Propuesto  
por Consorcio

**79 meses**

Inicio del Contrato:

**18 de Febrero 2014**

# Bidding Process (SIP-TMS) Management Advisor

Background analysis

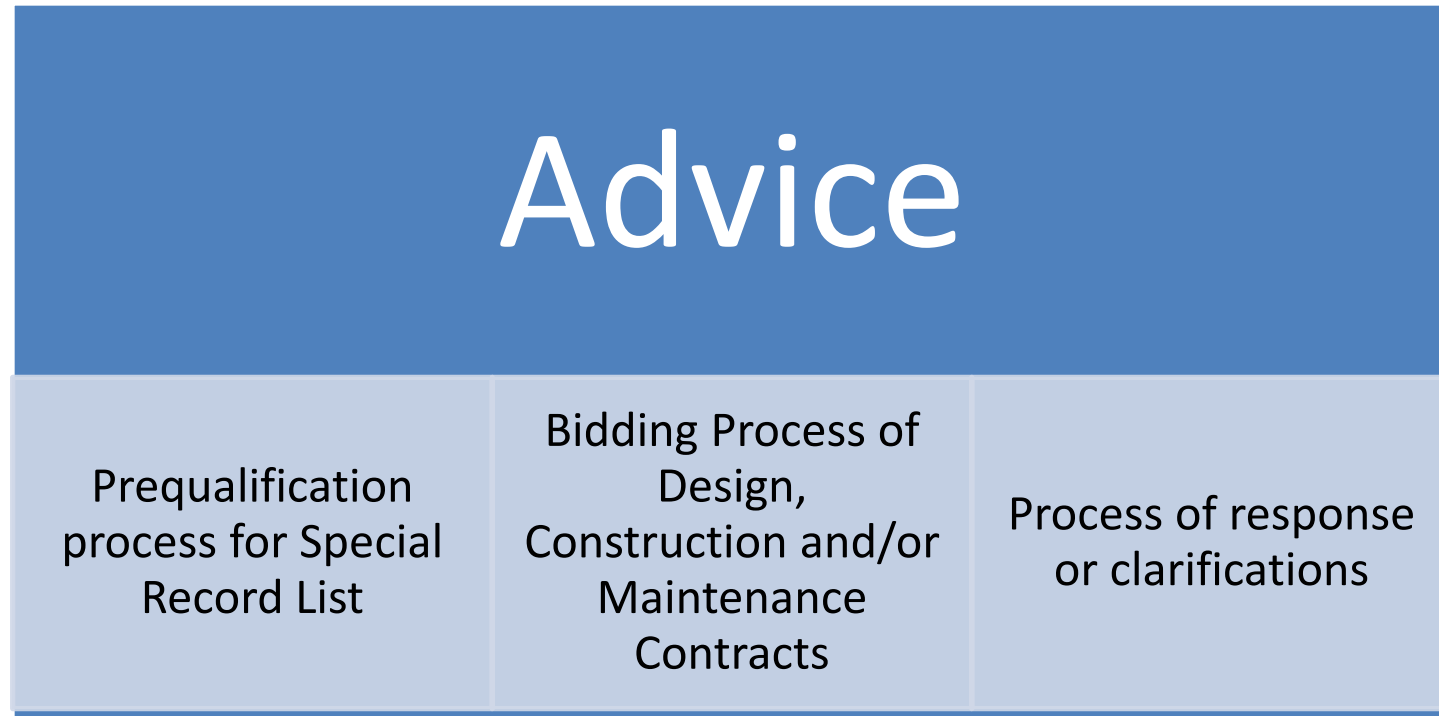


Digital and Physical File



BIM





**Study and analyze the background**  
**Develop a critical analysis of the Technical Basis**



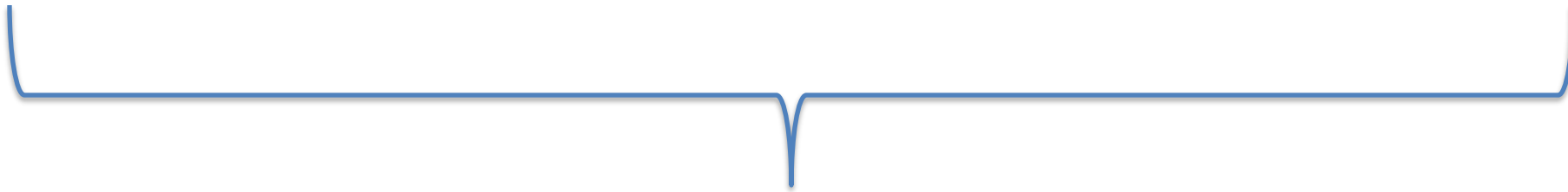
# Bidding Process (SIP-TMS) Management Advisor



Elaboration of Final Basis  
and Check List for Tenders

Assessment of the  
Proposal Projects

Advisory during award  
process



**Coordination Meetings**  
**Technical Meetings**



# Bidding Process (SIP-TMS) Management Advisor



Advisory Team



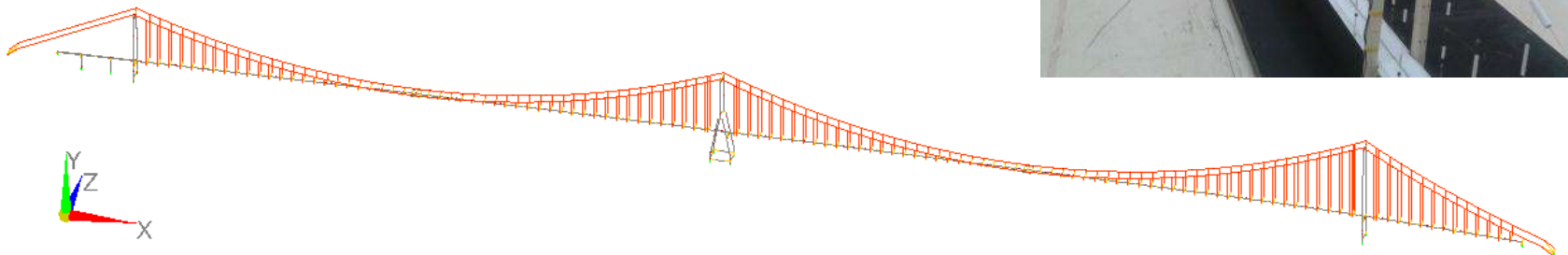
Permanent staff



Support staff



Administration Team



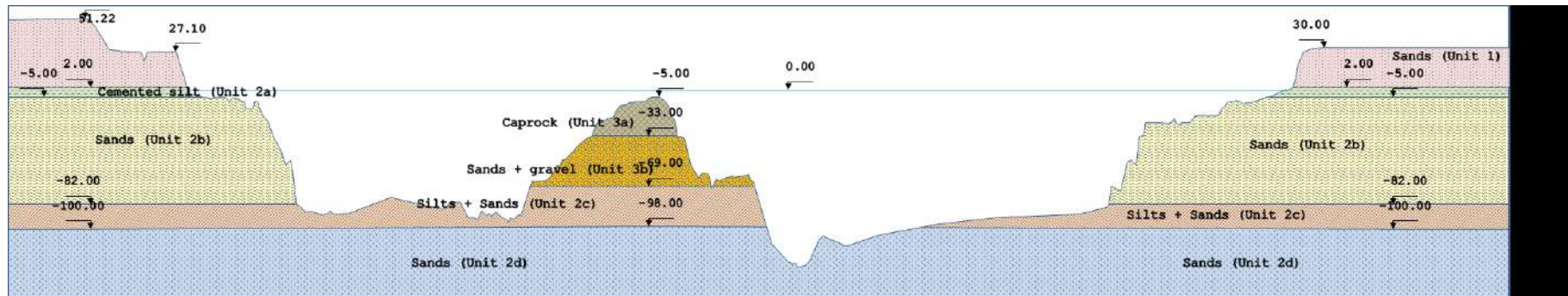
# Basic Engineering: Current and reference

## Topography and Geodesy



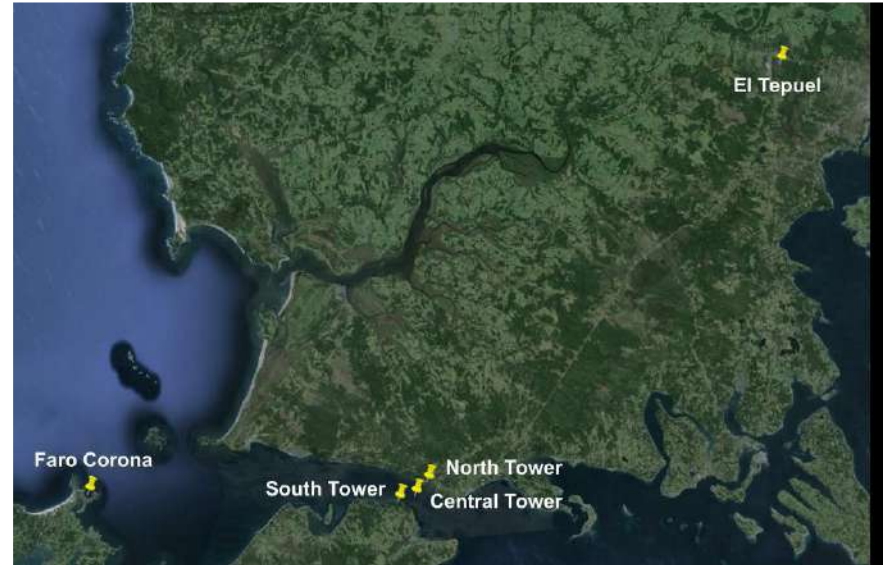
# Basic Engineering: Current and reference

## Geology and Geotechnic



# Basic Engineering: Current and reference

## Wind measurements



# Basic Engineering: Current and reference

Seismic  
studies



# Basic Engineering: Current and reference

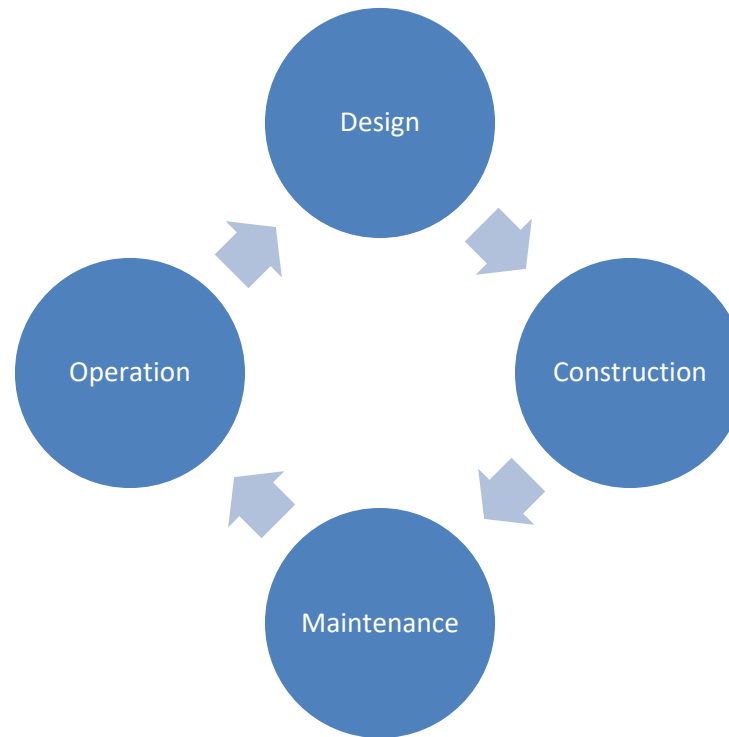


Maritime  
studies



# Bidding Process (SIP-TMS)

## Technical Visit



# Technical Visits



**Maintenance Cables (New Carquinez)**



**Hanger (New Carquinez)**



# Technical Visits



(Tacoma Narrows 2007 - 1950)



(Golden Gate)



(Mackinac)



# Technical Visits



Hedges, lifts  
(Mackinac)



# Technical Visits



**Piers  
(SAS)**



**Cranes  
(SAS)**



**Trucks  
(SAS)**



**Cranes  
(SAS)**



# Technical Visits

- Mackinac - Museum



# Technical Visits

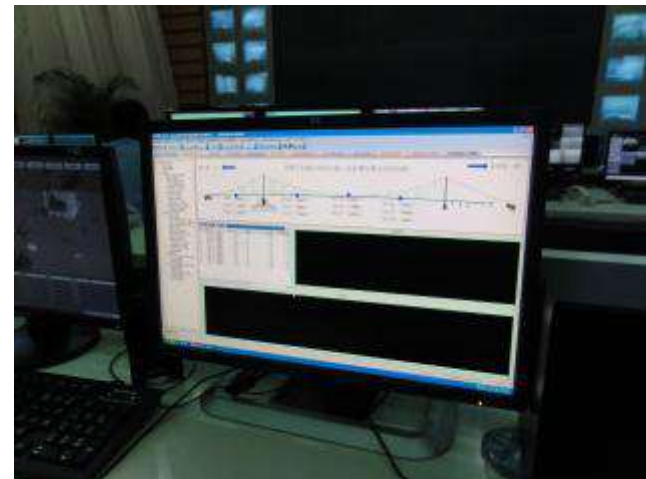
- Golden Gate



# Technical Visits

Xihoumen Bridge

BMS Buildings



# Bidding Process (SIP-TMS)

## Final Report



General review of the Tender Project

Complementary opinion of the Project from professionals and experts

Integrity review of the structure (bridge, tunnel, port, among others)

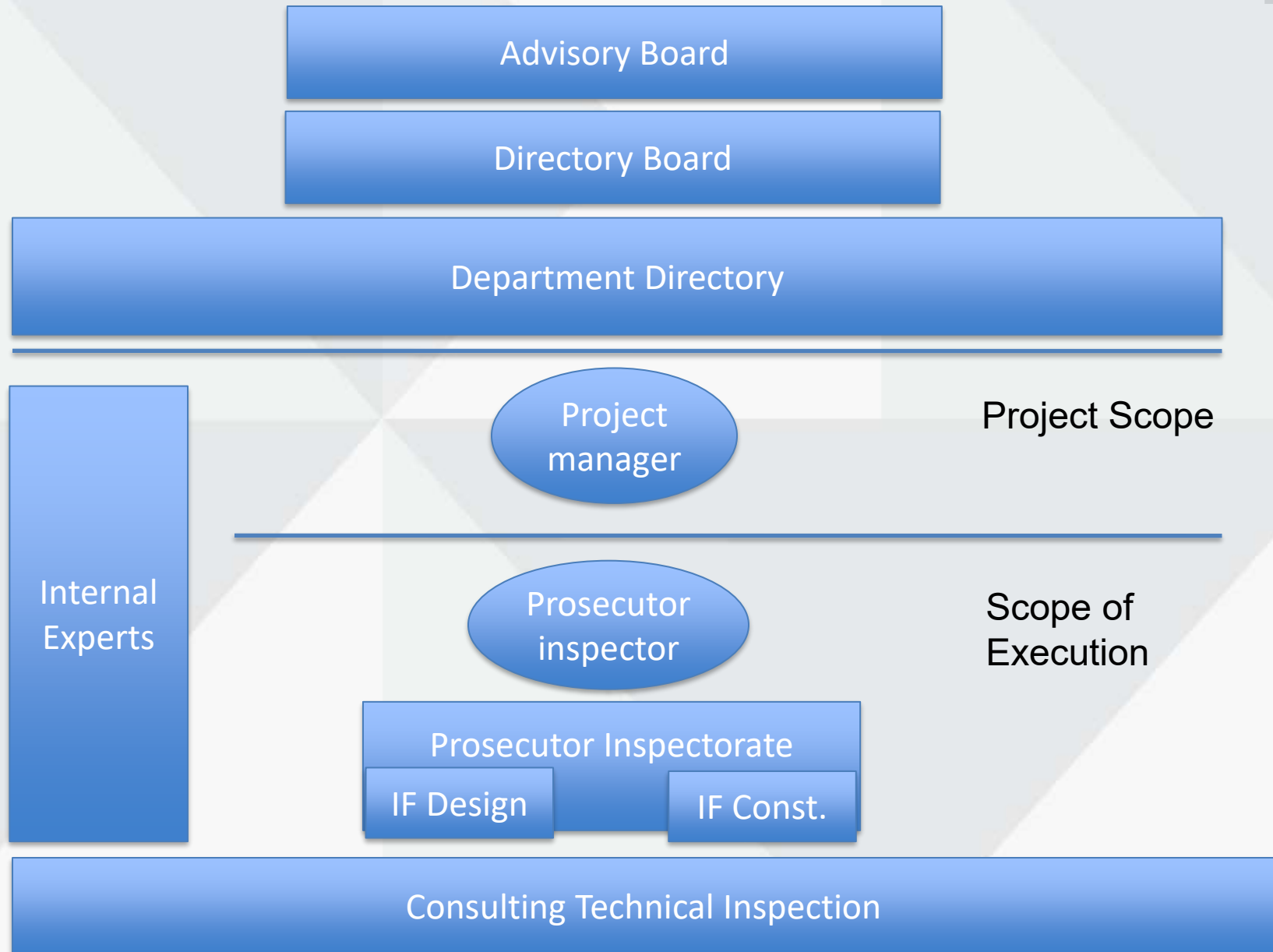
Report of suitability of the Project.



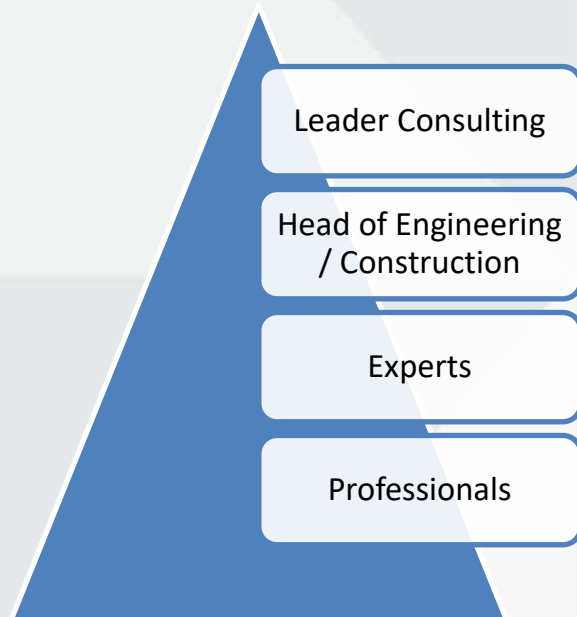
The background of the slide is a photograph of a large suspension bridge at night. The bridge's tall, dark pylons and the network of cables are silhouetted against a dark, cloudy sky. The bridge deck extends from the right side of the frame towards the left. In the foreground, the calm water of a body of water reflects the bridge's structure. A large, semi-transparent red rectangle is positioned on the left side of the image, containing the text 'INSPECTION TEAM'. This rectangle is composed of several overlapping triangles, creating a geometric pattern.

# **INSPECTION TEAM**

# Structure of Owner



# LEVELS OF INTERRELATION BETWEEN CLIENT AND CONTRACTOR



Consulting Technical Inspection



Prosecutor Inspectorate



Contractor

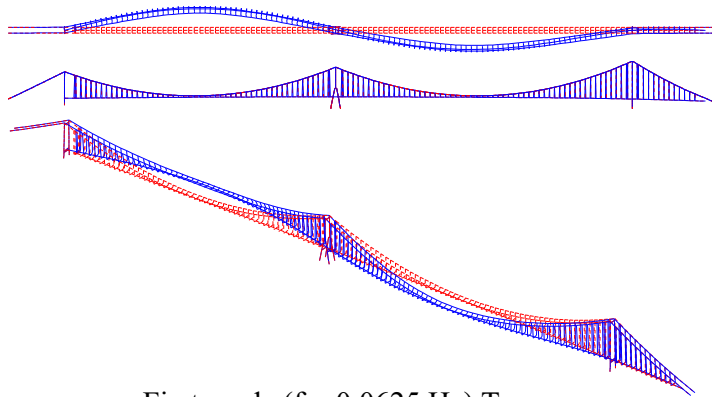
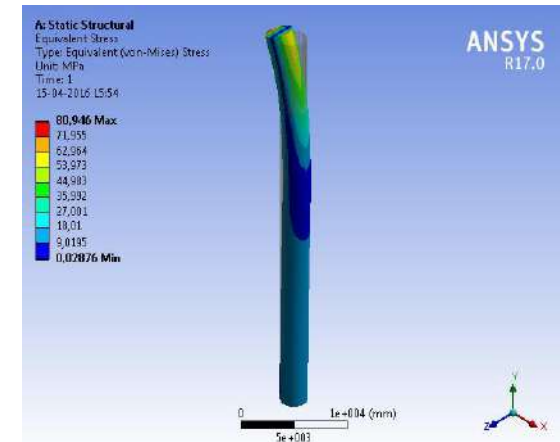
# Bidding Process (SIP-TMS)

## Dissemination and Exchange Of Knowledge

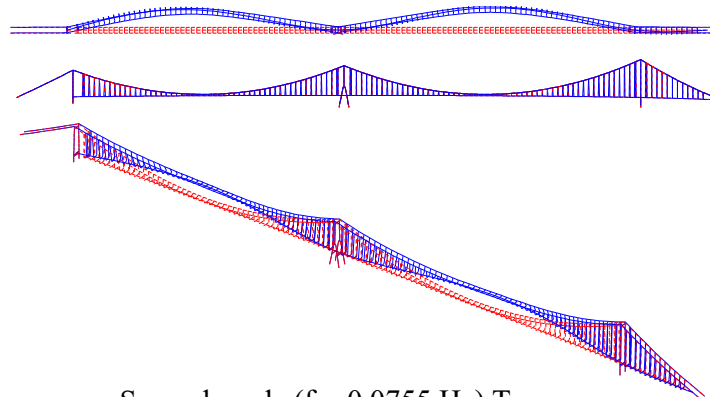
- Agreements MOP – Universities

Dynamic Behavior

Piles study

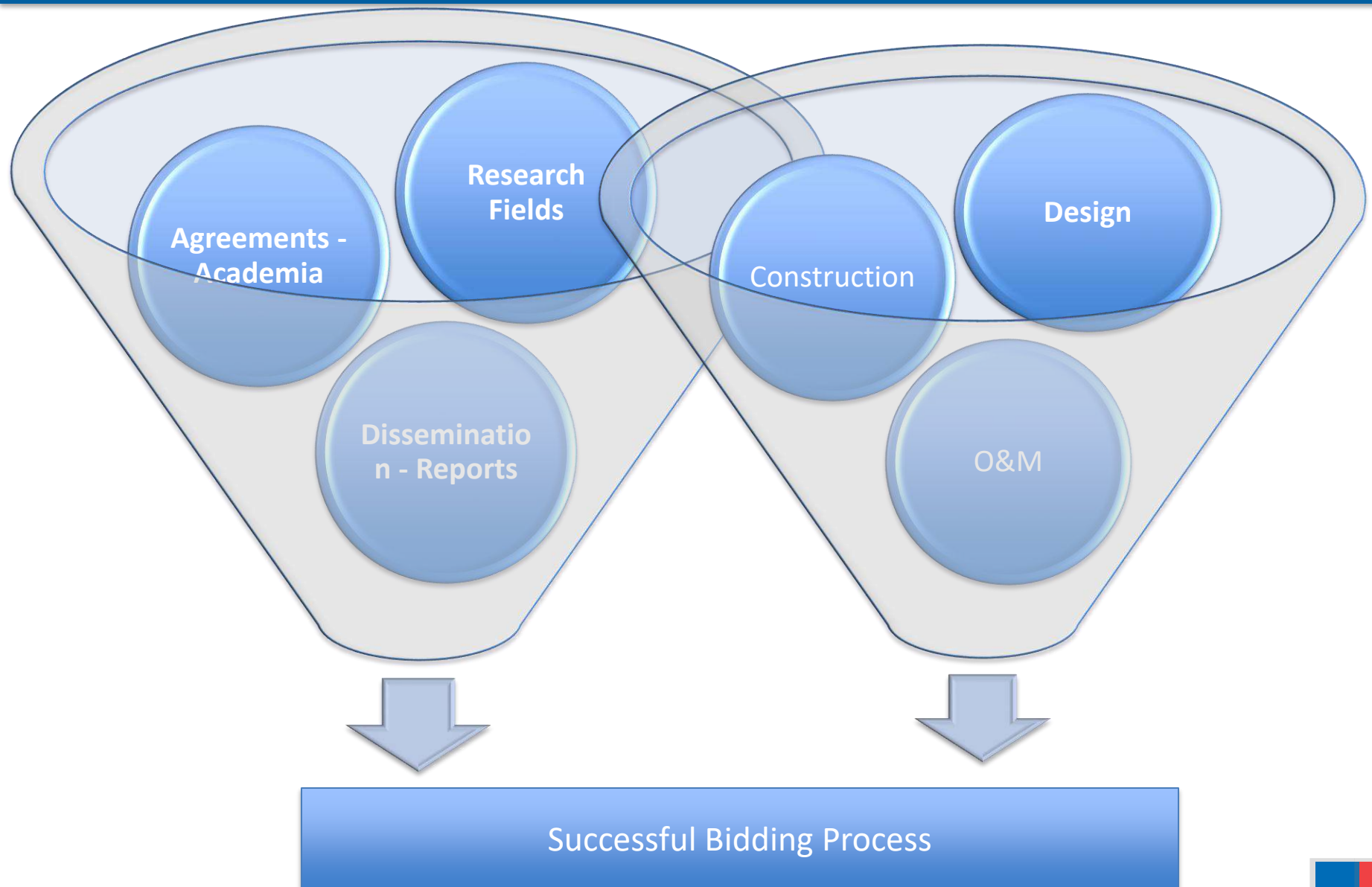


First mode ( $f = 0.0625$  Hz) Transverse



Second mode ( $f = 0.0755$  Hz) Transverse

# Final Comments



# Final Comments

The Chilean Administration has implemented a new methodology of management for nontraditional structures, following SIP-TMS method presented in this paper. The first application of this method was the Chacao Bridge Project.

To use the traditional codes as a framework of the nontraditional structures.

A new code or normative has to be developed for this kind of projects.

Support of the technical teams and the authorities.

The Administration has to prepare a background of the project with special focus on:

- Administrative issues,
- Conceptual design and basic engineering

An advisor team has to be hired with national and international experience.

Exchange knowledge and dissemination are the two main concepts that have to be promoted in this project.



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