

SÃO VICENTE  
SUSPENSION  
BRIDGE  
REHABILITATION  
AND CABLE  
SUBSTITUION

# LOCATION



# LOCATION



# BRIEF HISTORY

- The city of São Vicente was the first city established by the Portuguese in Brazil in 1532.
- As the city develops, it would be necessary to install a sewage collection system.

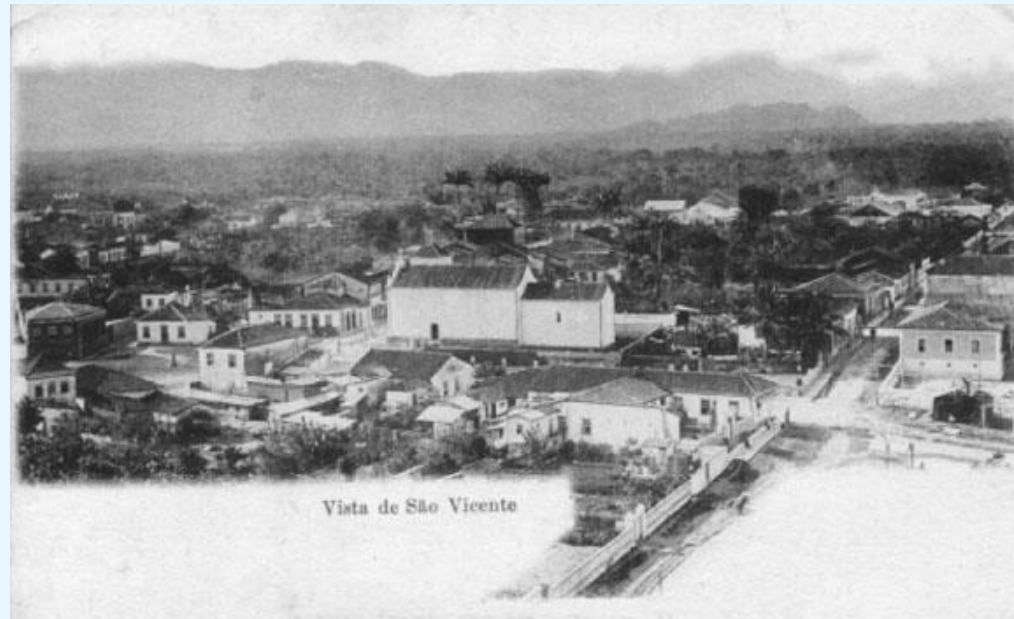
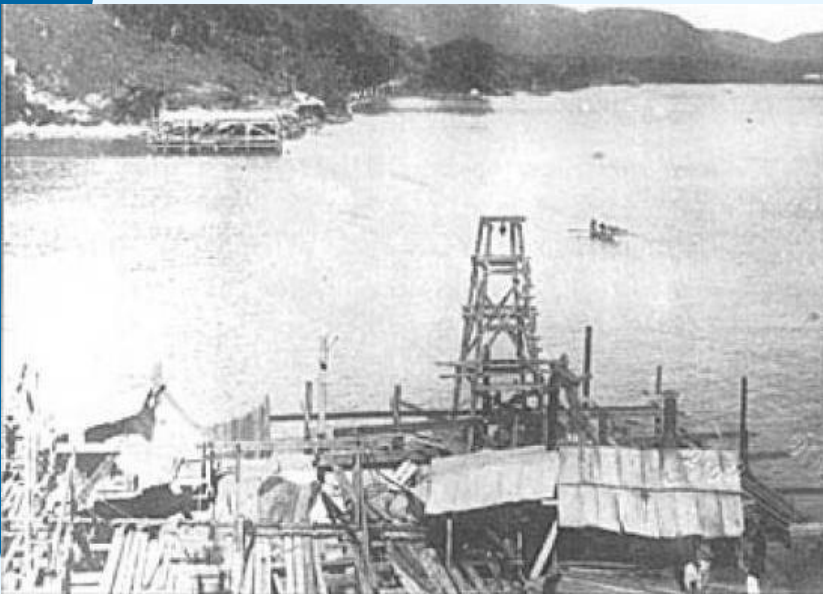


Figura 6: São Vicente por volta de 1900  
Fonte: Arquivo cedido pelo Prof. Dr. Benedito Lima de Toledo

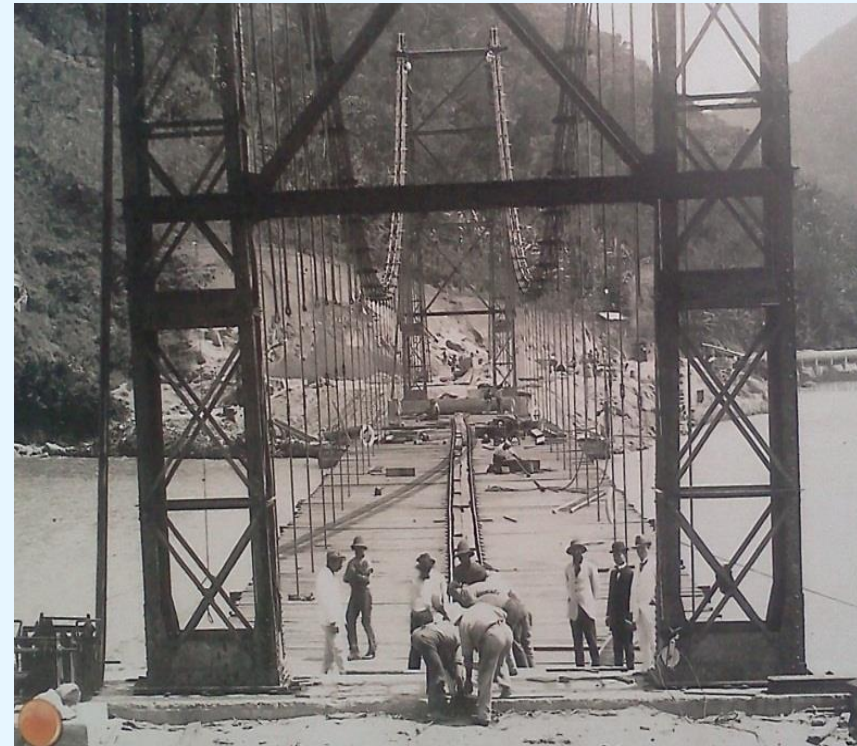
# BREVE HISTÓRIA

- The original purpose of building the bridge was to transport sewage from the Island of São Vicente and Santos to the mainland.

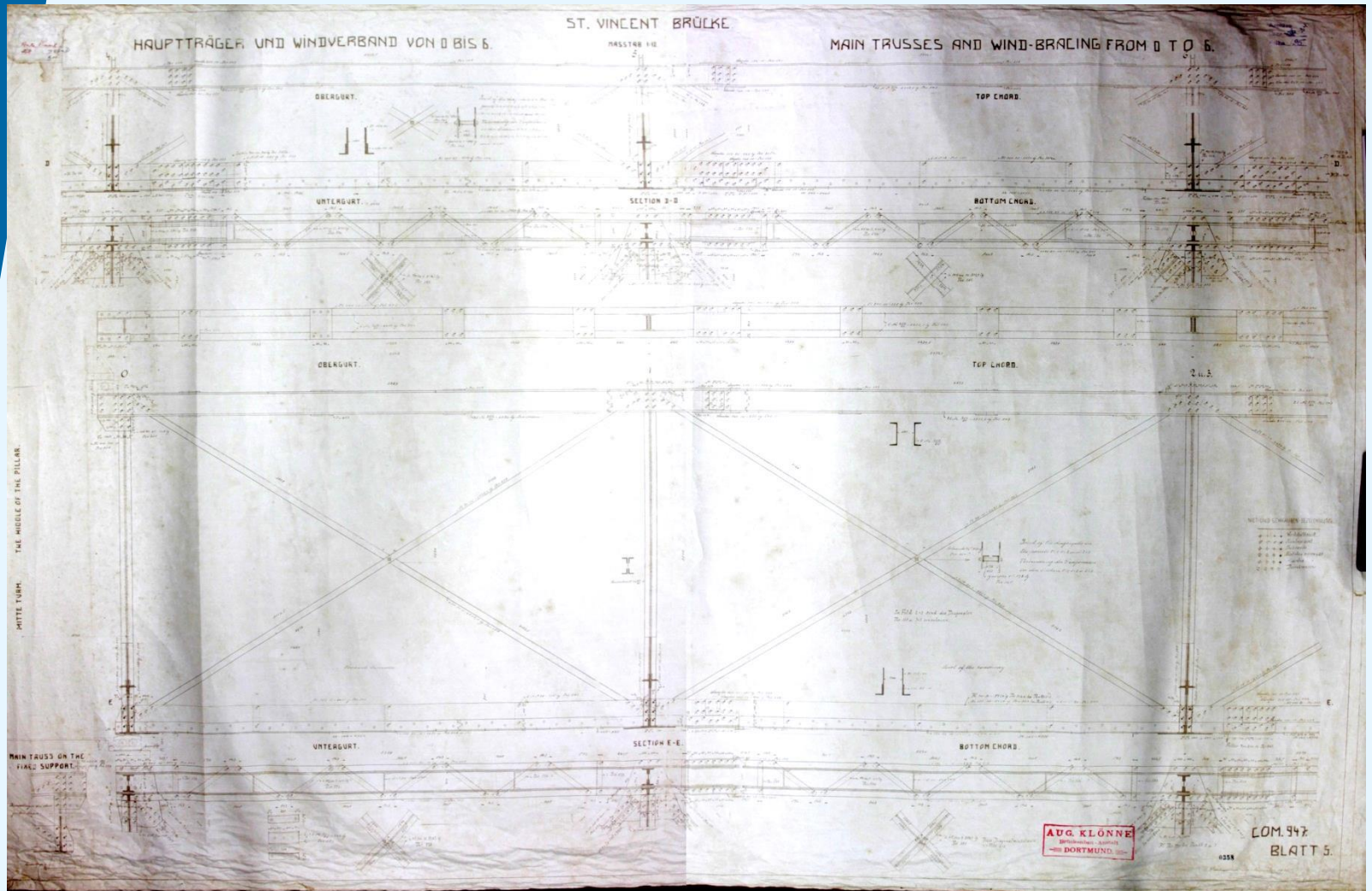


# BREVE HISTÓRIA

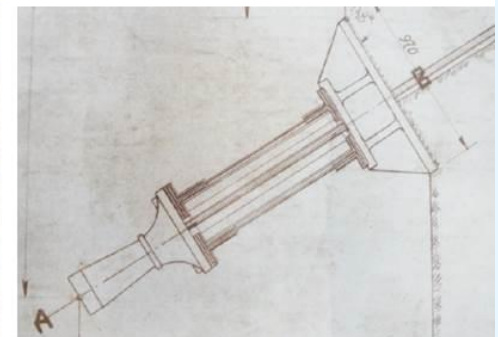
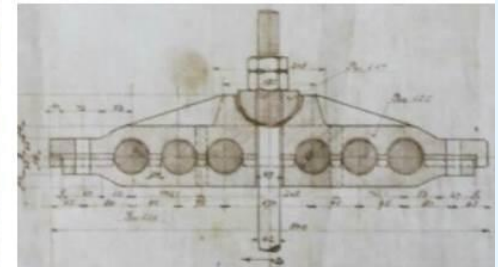
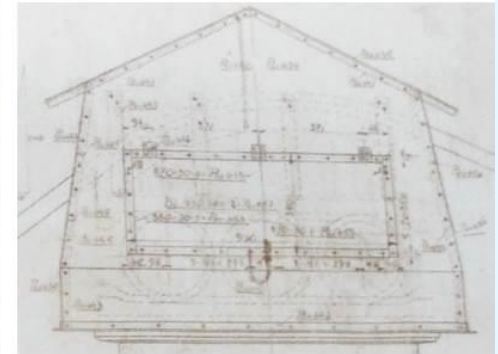
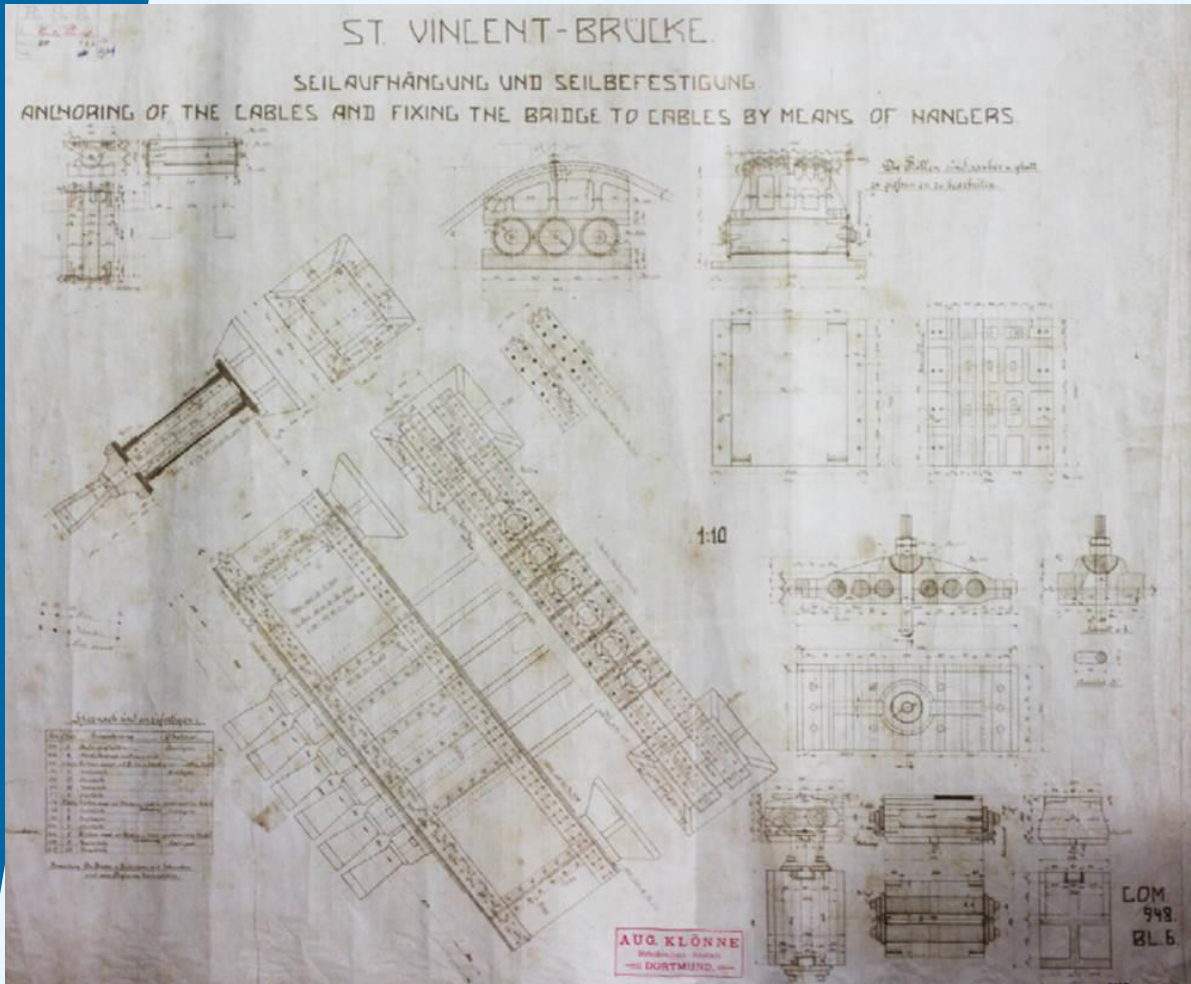
- The bridge was designed and manufactured by August Klöne in Dortmund, Germany
- The construction of the bridge took place from 1911 to 1914



# BREVE HISTÓRIA



# BREVE HISTÓRIA





# BREVE HISTÓRIA



# BREVE HISTÓRIA

- Inauguration – May/1914



- Listed as a historical heritage site in 1982.

# CHARACTERISTICS

- MAIN SPAN: 180,00m – 590ft
- WIDTH: 6,40m – 20ft



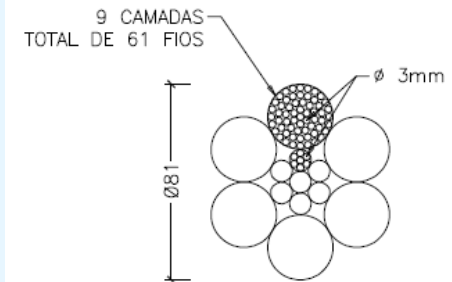
# CHARACTERISTICS

- Lateral trusses with a height of 3,70m – 12ft, divided in 30 modules of 6,00m – 20ft



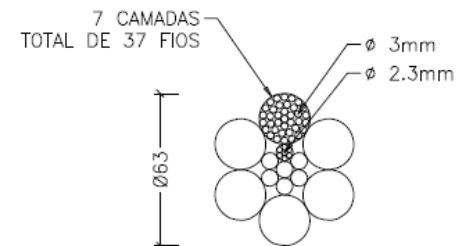
# CHARACTERISTICS

- Support system formed by 8 cables in each side of the deck



**CABO DE Ø 81mm**

ESCALA 1: 2.5  
(NOTA: MEDIDAS EM mm.)



**CABO DE Ø 63mm**

ESCALA 1: 2.5  
(NOTA: MEDIDAS EM mm.)

# CHARACTERISTICS

- The support system is connected to the towers by saddles
- Towers were built on metal trusses and covered in concrete to protect against corrosion

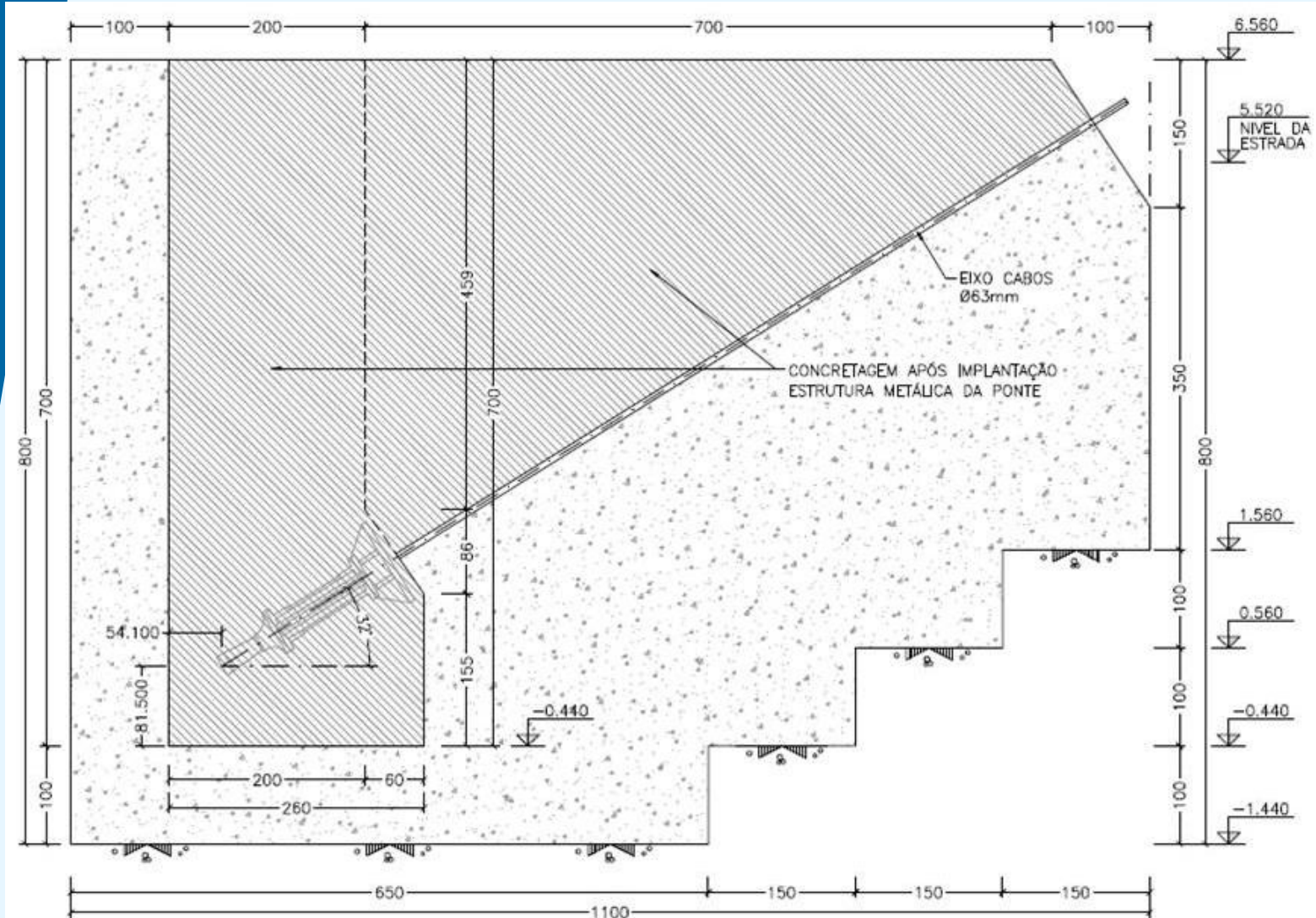


# CHARACTERISTICS

- The support system is anchored to massive anchor blocks at the back of the towers.



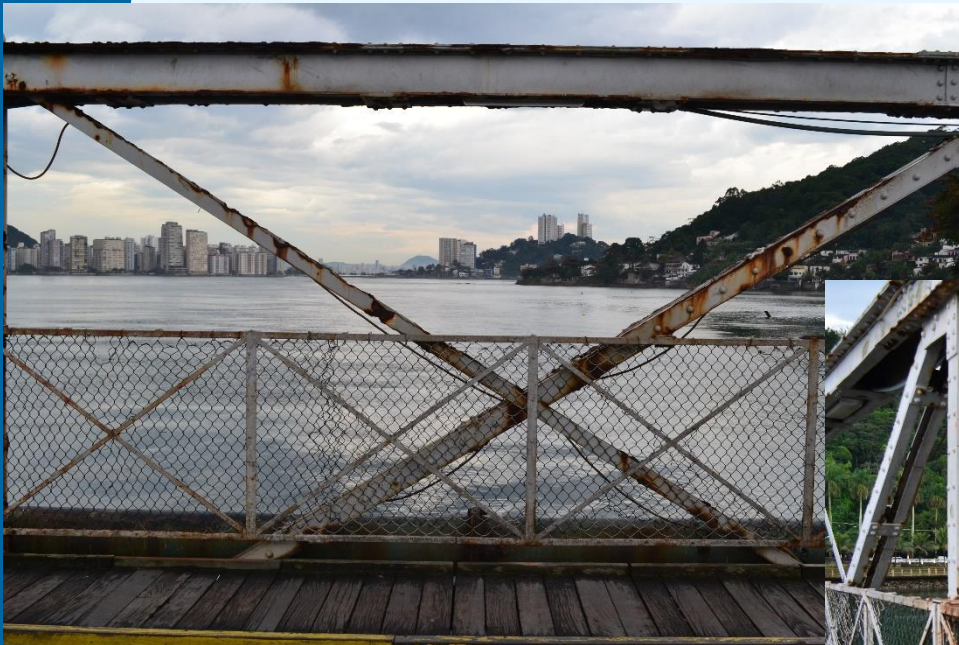
# CHARACTERISTICS





# BRIDGE CONDINTION IN 2012

- Corrosion in steel elements



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# BRIDGE CONDINTION IN 2012

- Damaged and corroded support cables



# BRIDGE CONDINTION IN 2012

- Damaged and corroded support cables



# BRIDGE CONDINTION IN 2012

- Cracks on towers





# BRIDGE CONDINTION IN 2012

- Cracks in anchor blocks



# CONDIÇÕES DA PONTE EM 2012

- Trincas em blocos de ancoragem



# CONCEPT – CABLE SUBSTITUTION

- Maintenance of the original position - provisional system lateral to the existing one

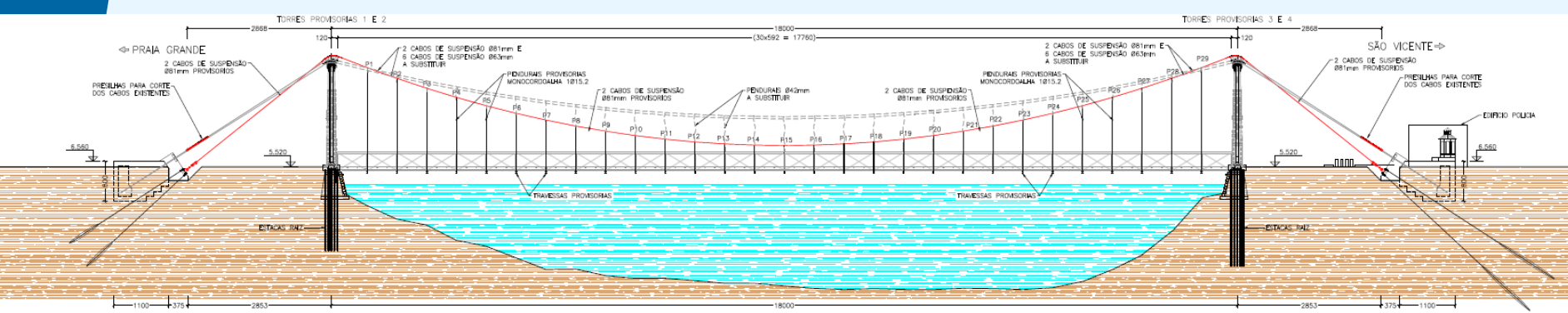
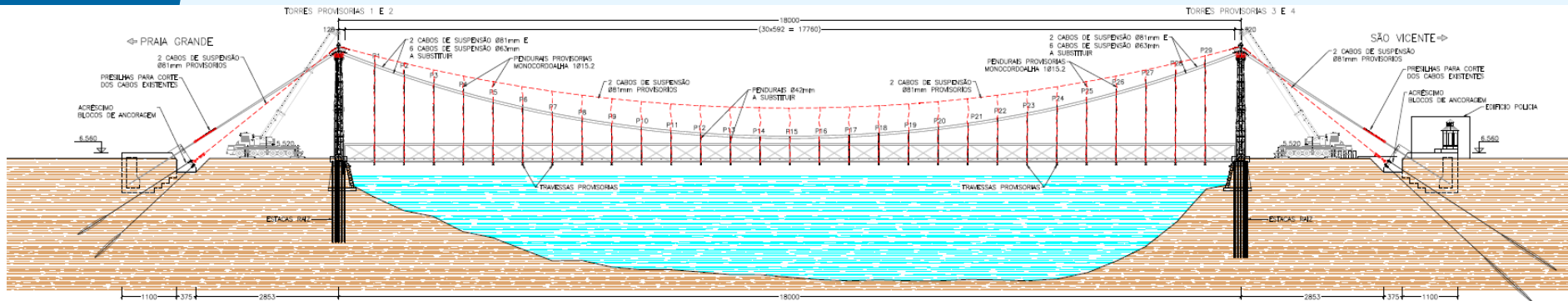


# CONCEPT – CABLE SUBSTITUTION

- Temporary anchorage next to the existing anchorage



# LOAD TRANSFER



# LOAD TRANSFER



# LOAD TRANSFER

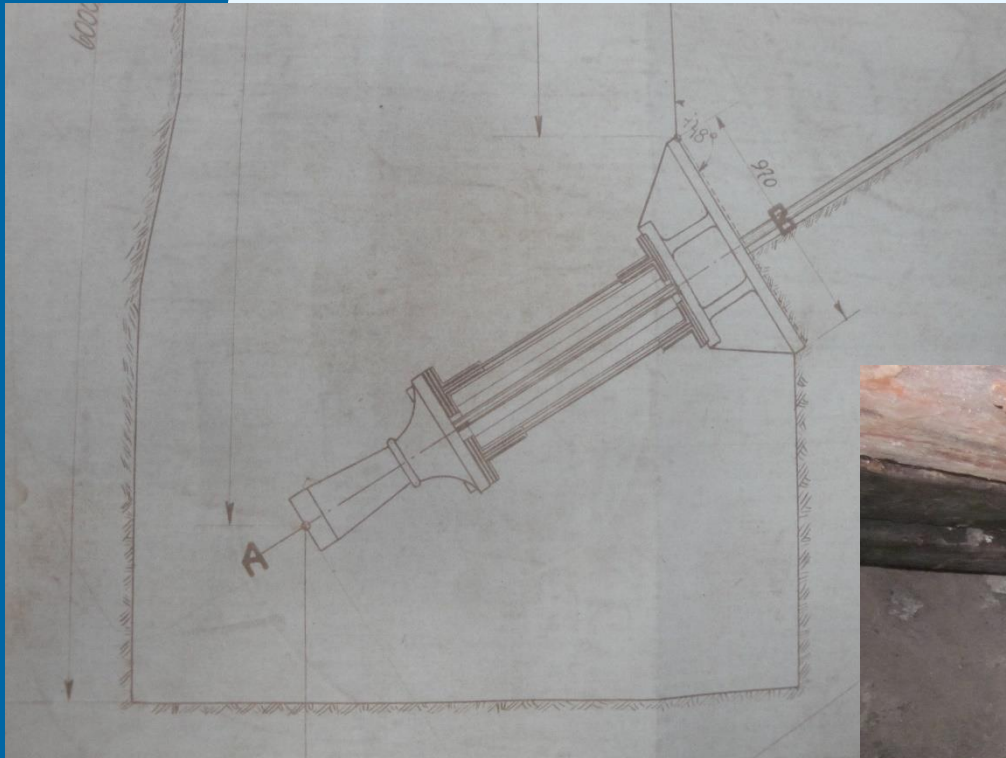


# REINFORCE OF THE ANCHOR BLOCK

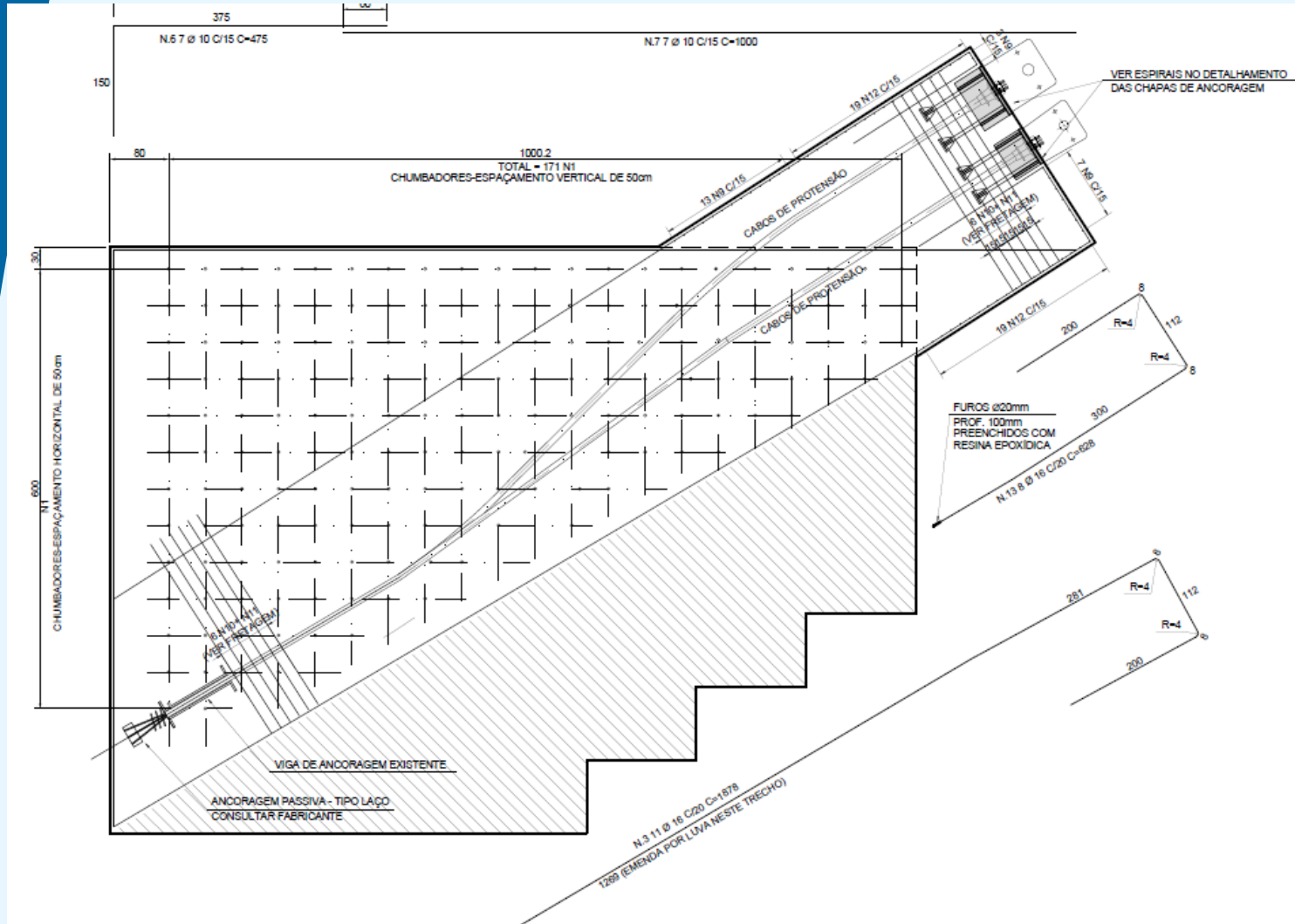




# REINFORCE OF THE ANCHOR BLOCK



# BLOCO DE ANCORAGEM DEFINITIVO



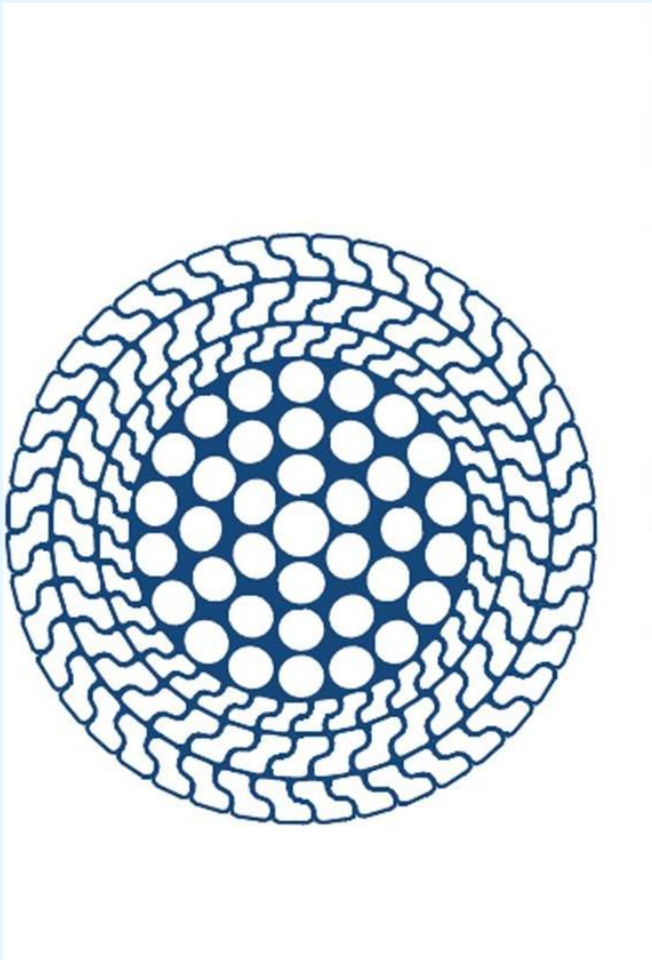
# REINFORCE OF THE ANCHOR BLOCK



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# THE NEW SUPPORT SYSTEM



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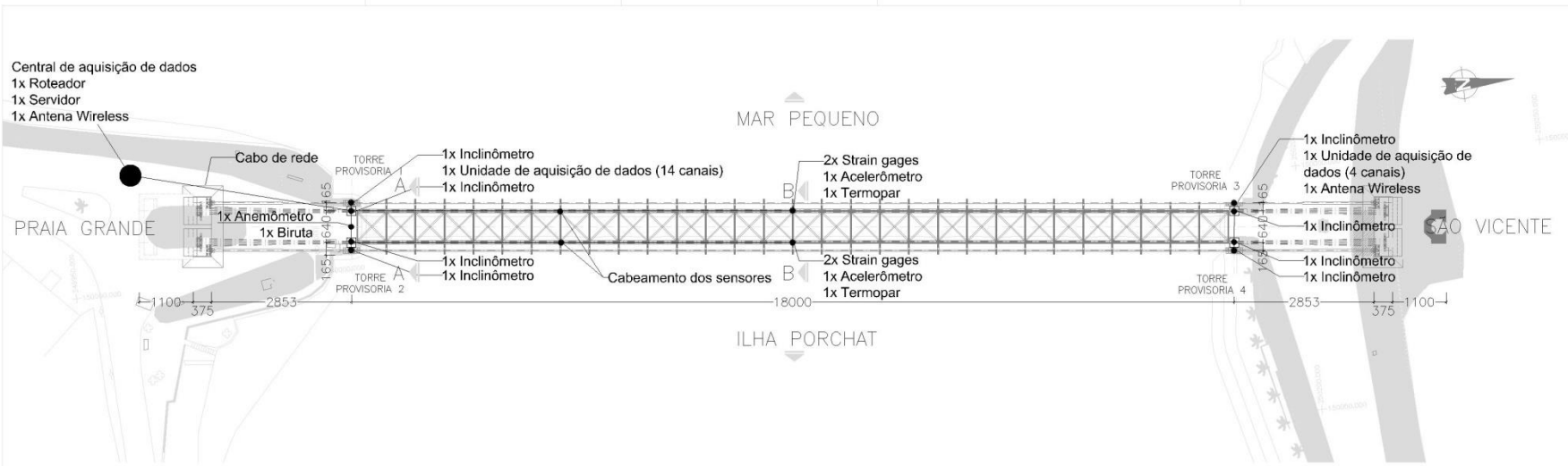




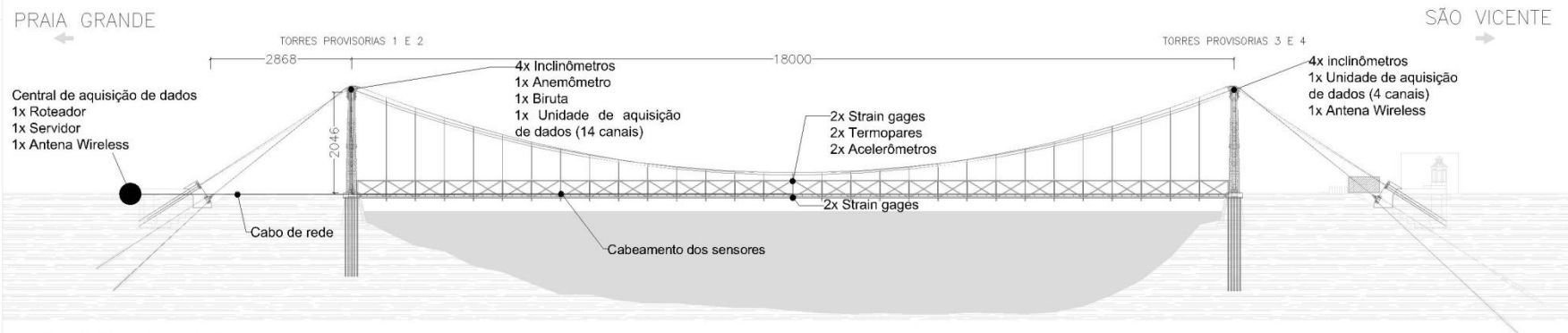
# TRANSFERÊNCIA DE CARGA SISTEMA DEFINITIVO



# MONITORING SYSTEM

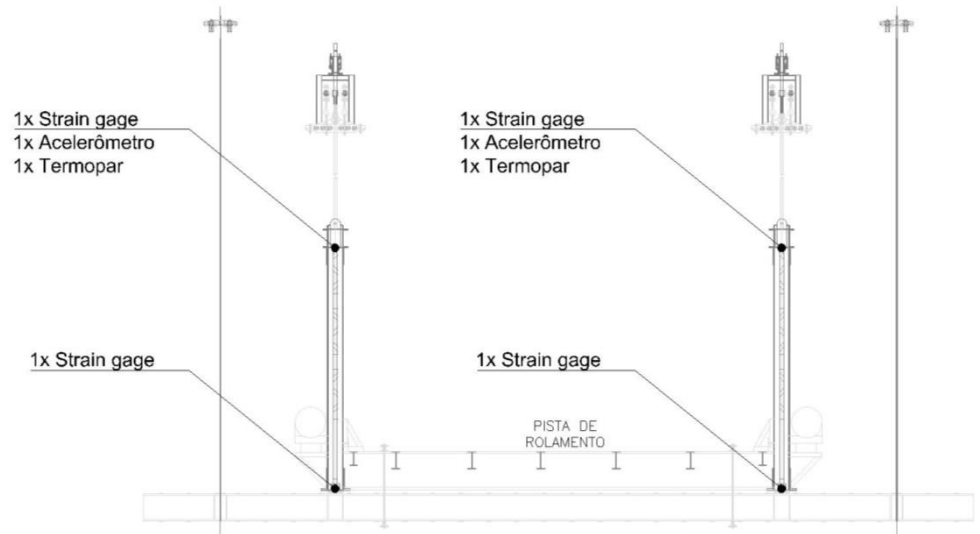
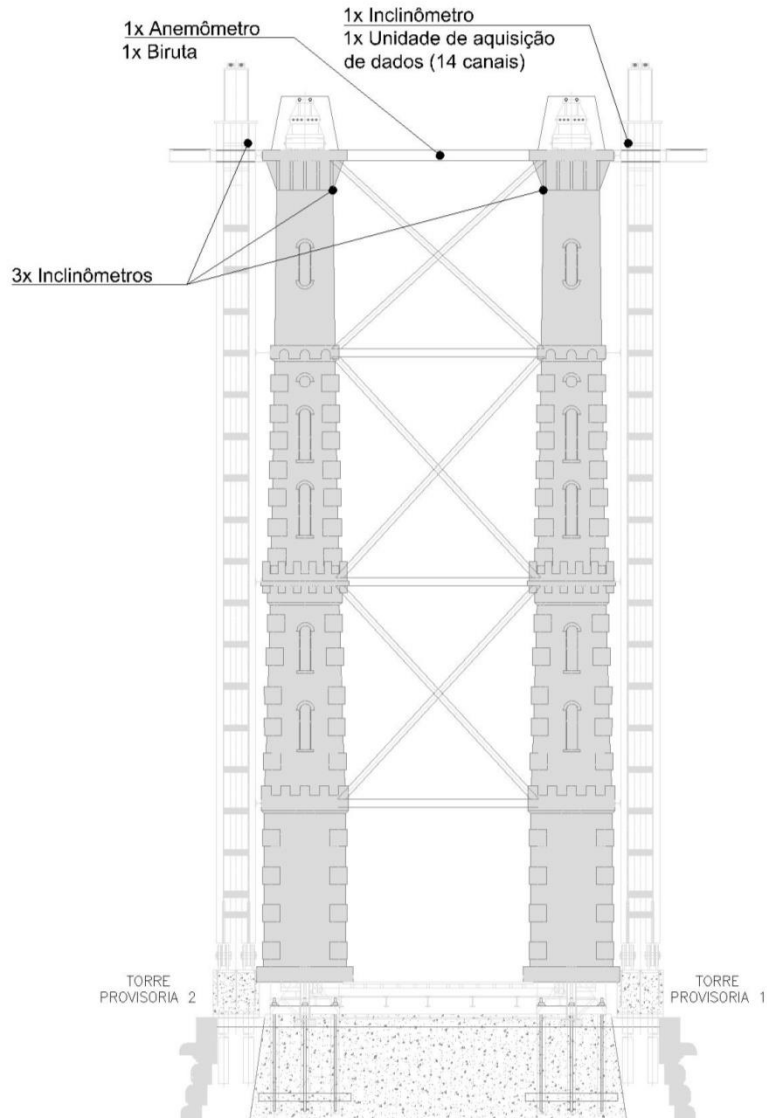


PLANTA

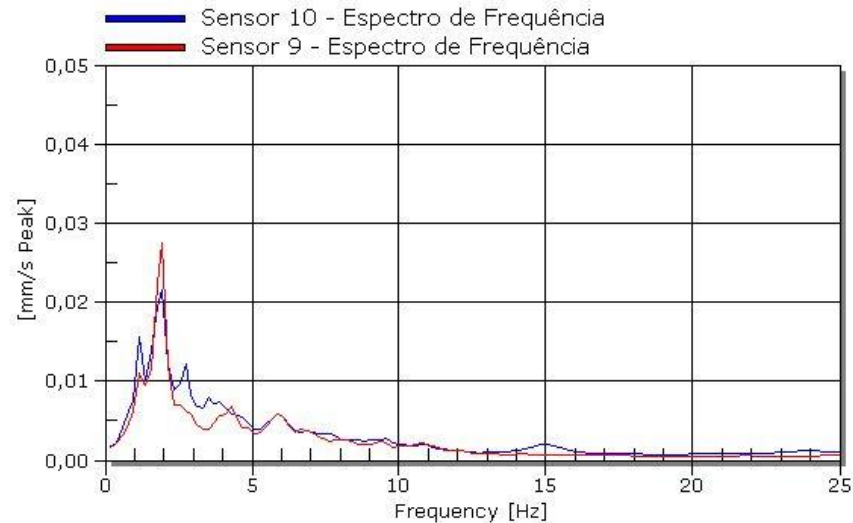
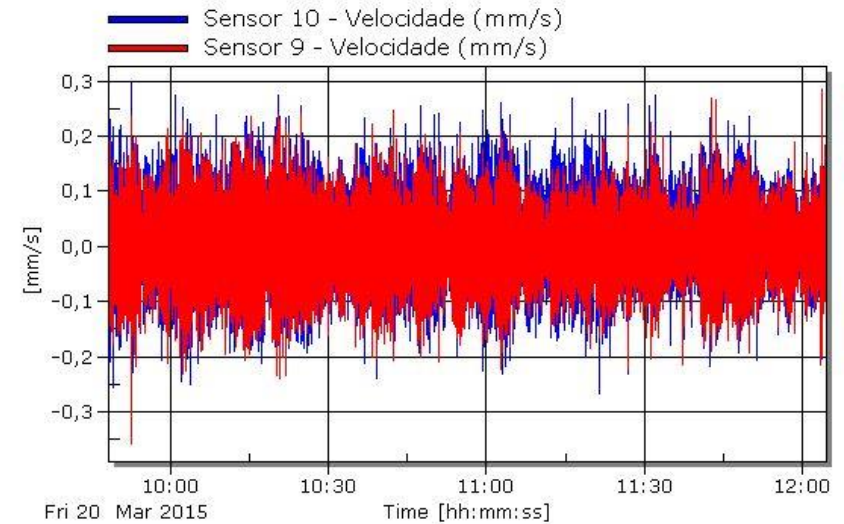
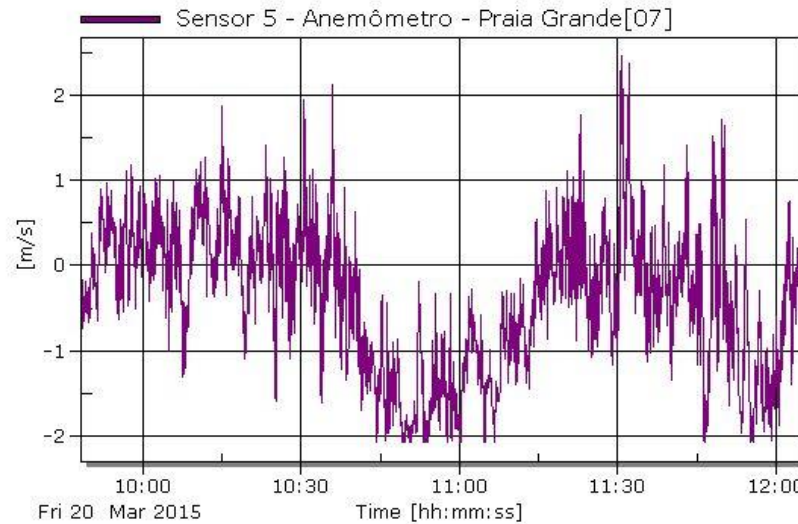


VISTA MAR PEQUENO

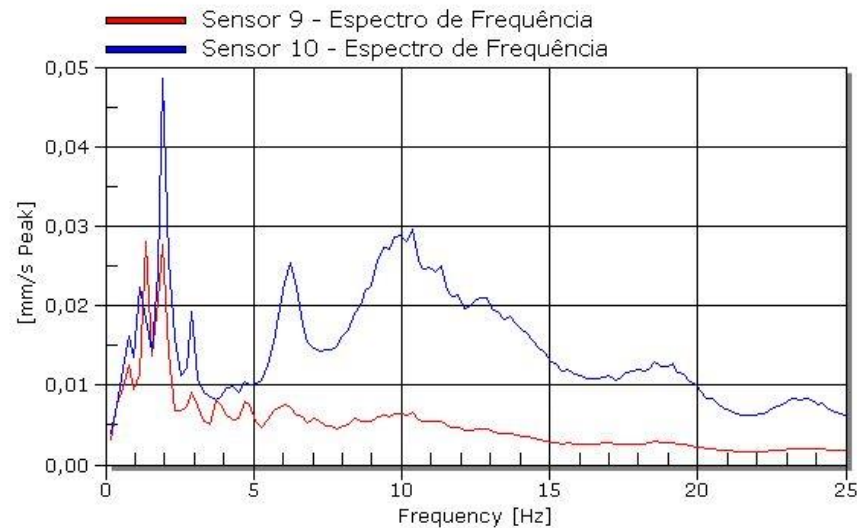
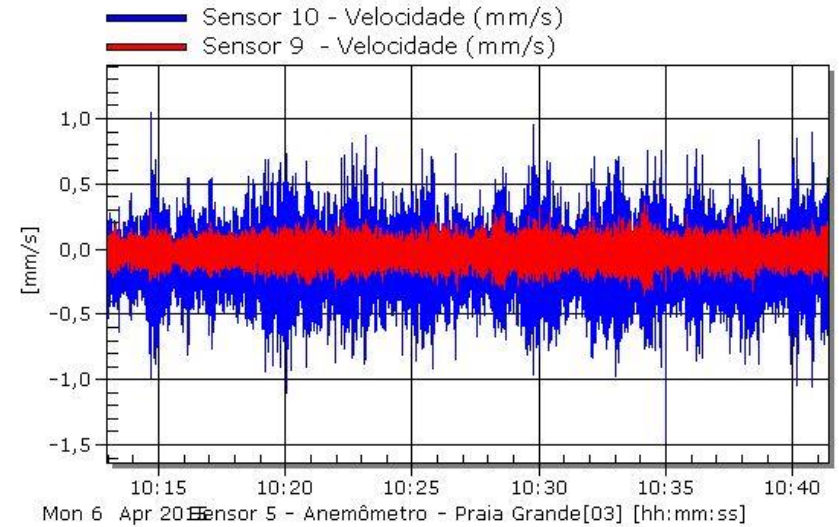
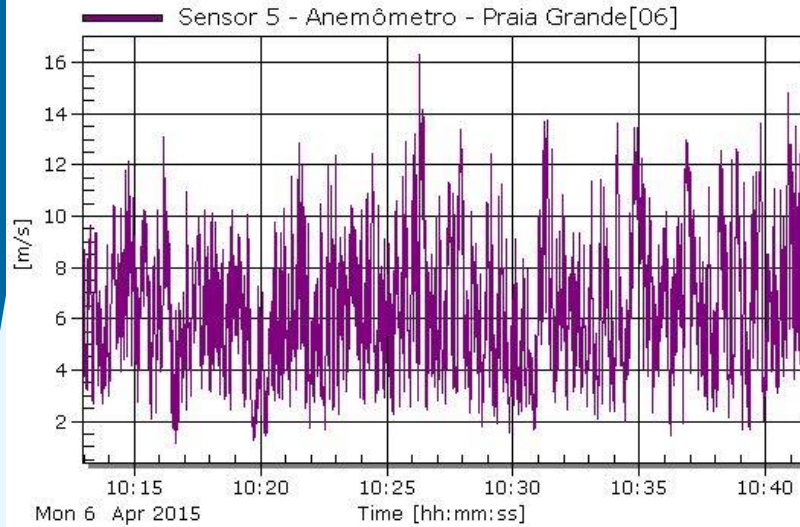
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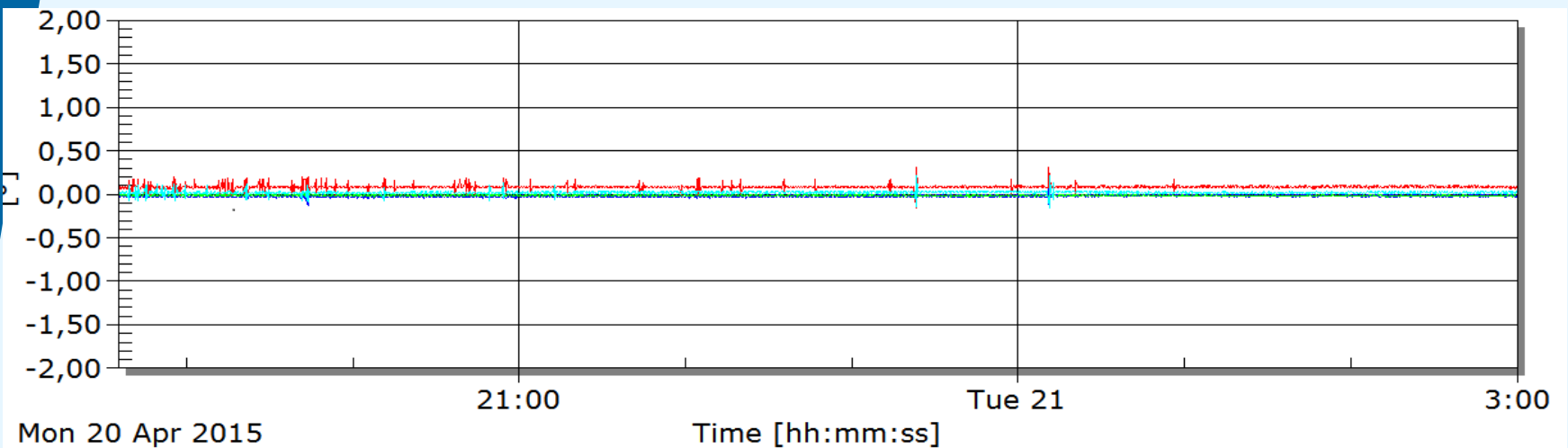
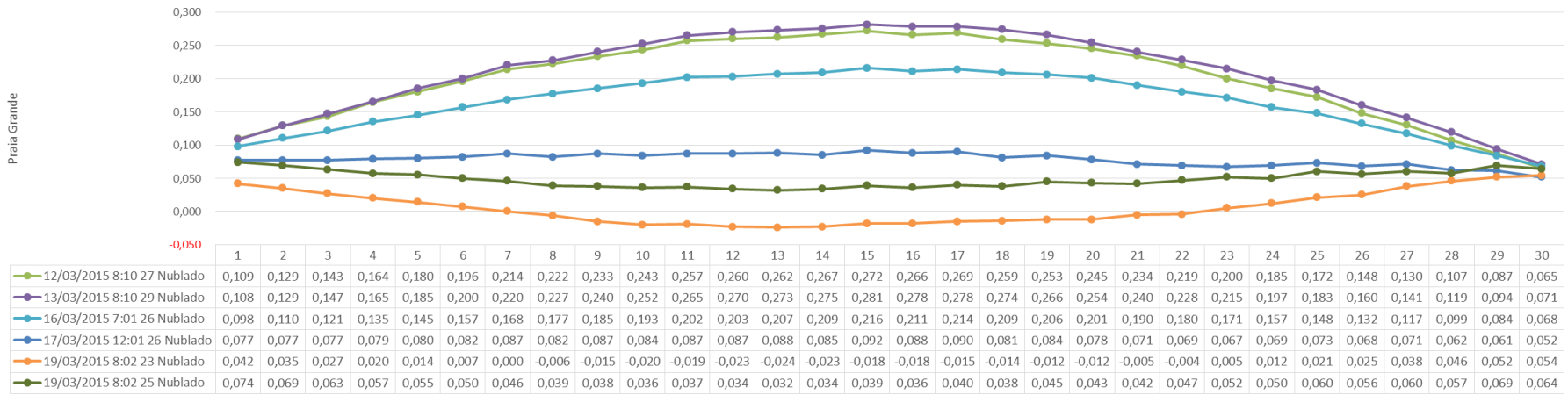


# MONITORING SYSTEM



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Delta de Evolução Ilha Porchat

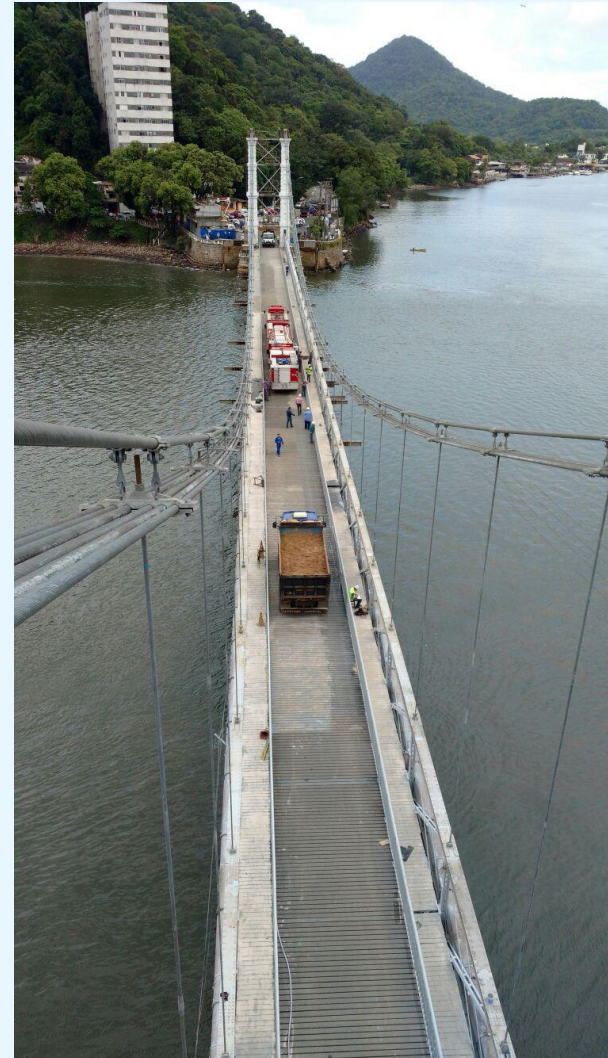
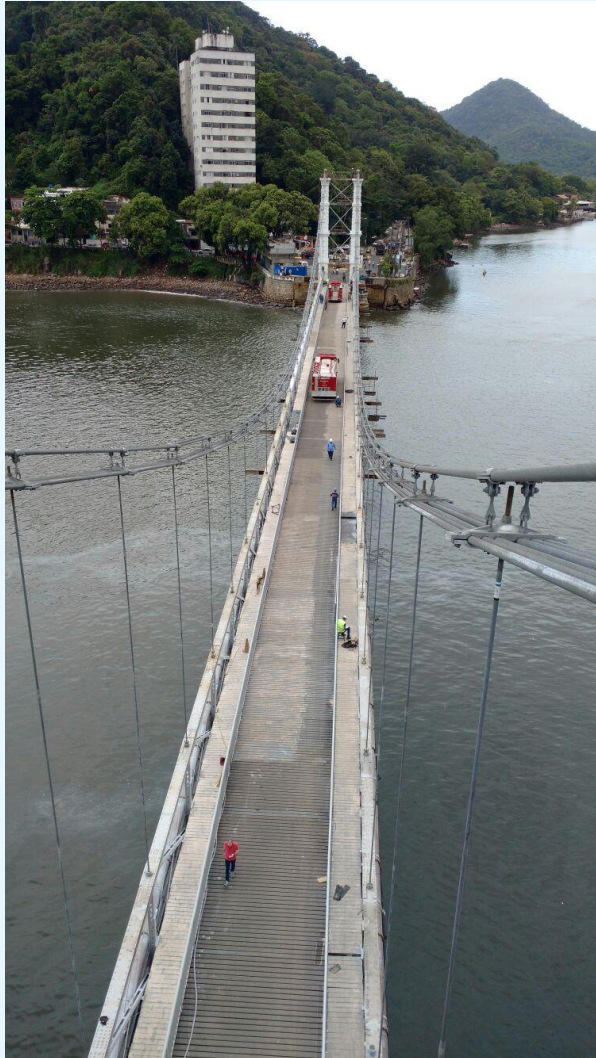


## JOB NUMBERS

Estrutura metálica	445 T
Substituição de rebites	15 mil
Cabos de sustentação	120 T
Concreto	785 m <sup>3</sup>
Ferragem	62 T



# LOAD TEST



# LOAD TEST



# REOPENING



# REOPENING



# REOPENING



# REOPENING



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