



Fortezza da Basso • FLORENCE (Italy)



37<sup>TH</sup> INTERNATIONAL  
**N** - **DIG**  
FLORENCE 2019

30<sup>th</sup> September • 2<sup>nd</sup> October 2019

## Rehabilitation of a 3000 mm water supply line under operating conditions in Buenos Aires

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University of Applied Sciences Hochschule Wismar / German Society for Trenchless Technology /

Prof. Hölterhoff Ingenieur Consulting, Berlin

## Drinking water Supply of Buenos Aires



**22.471 Km**  
**Pipe network**

**2.949 Km<sup>2</sup>**  
**Supply area**

**5.400.000**  
**m<sup>3</sup>/d**  
**Drinking water**

**10.500.000**  
**Inhabitants**



Aqua y Saneamientos Argentinos S.A.

**PROF. HÖLTERHOFF**  
**INGENIEUR CONSULTING**

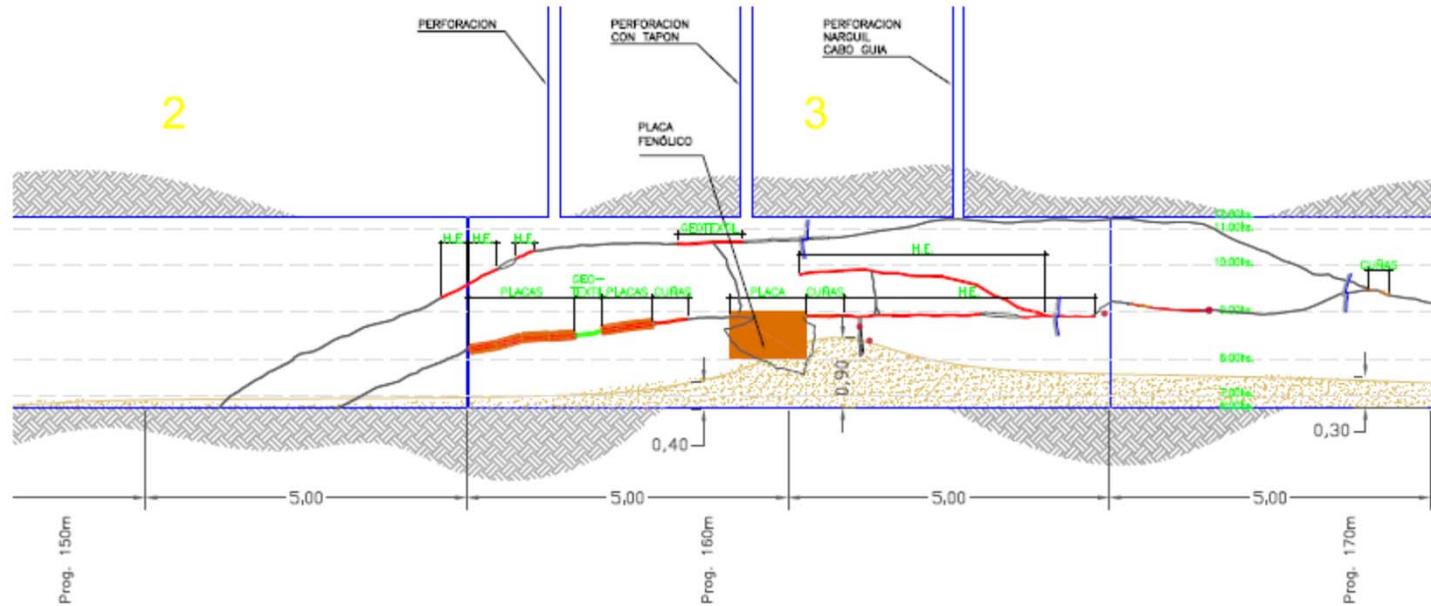


## Tendering and project planning



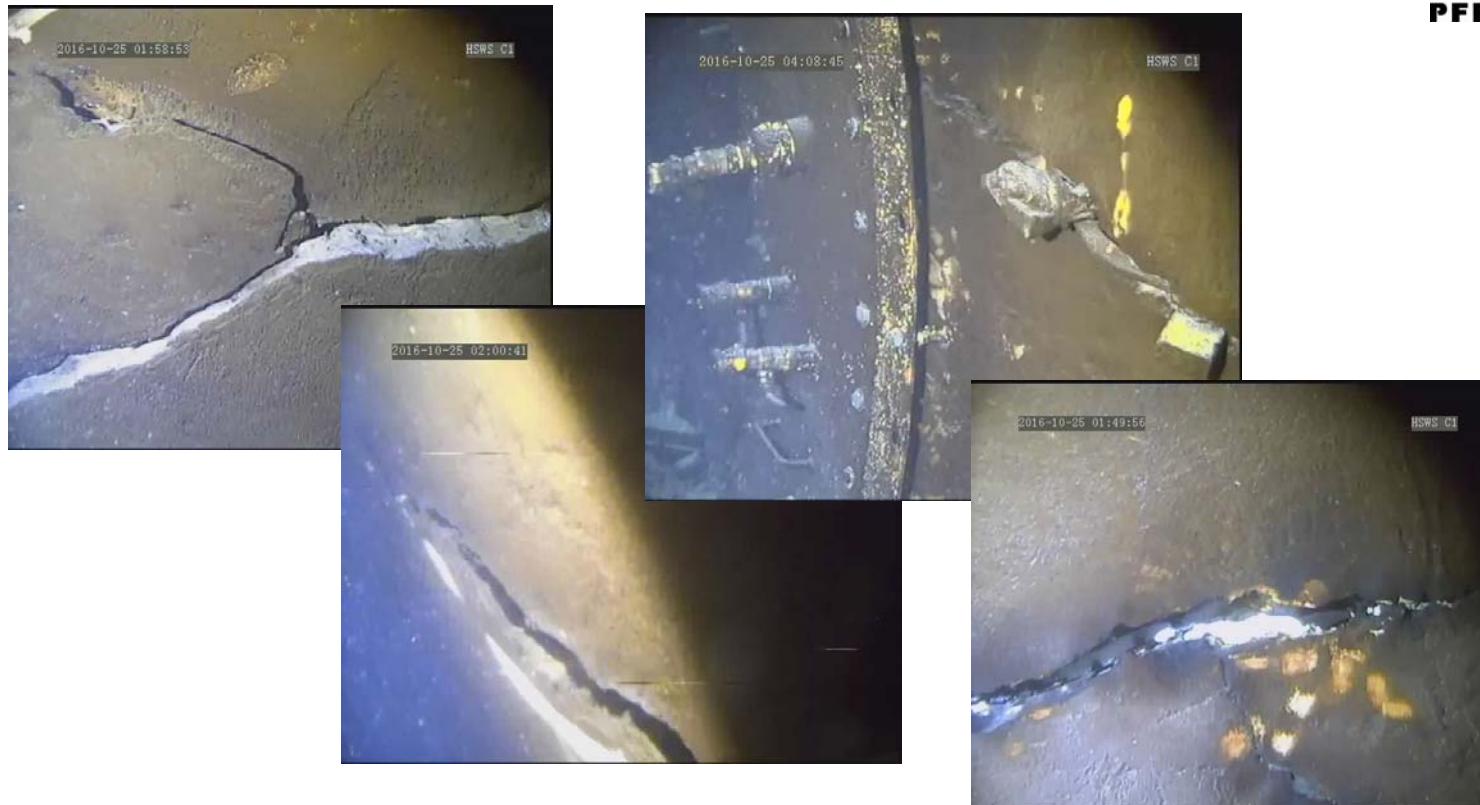
## Tendering and project planning

Cracks / shards / concrete sedimentation from earlier external rehabilitation attempt



Situation was particularly critical, so that there was a danger of collapsing!

## Tendering and project planning

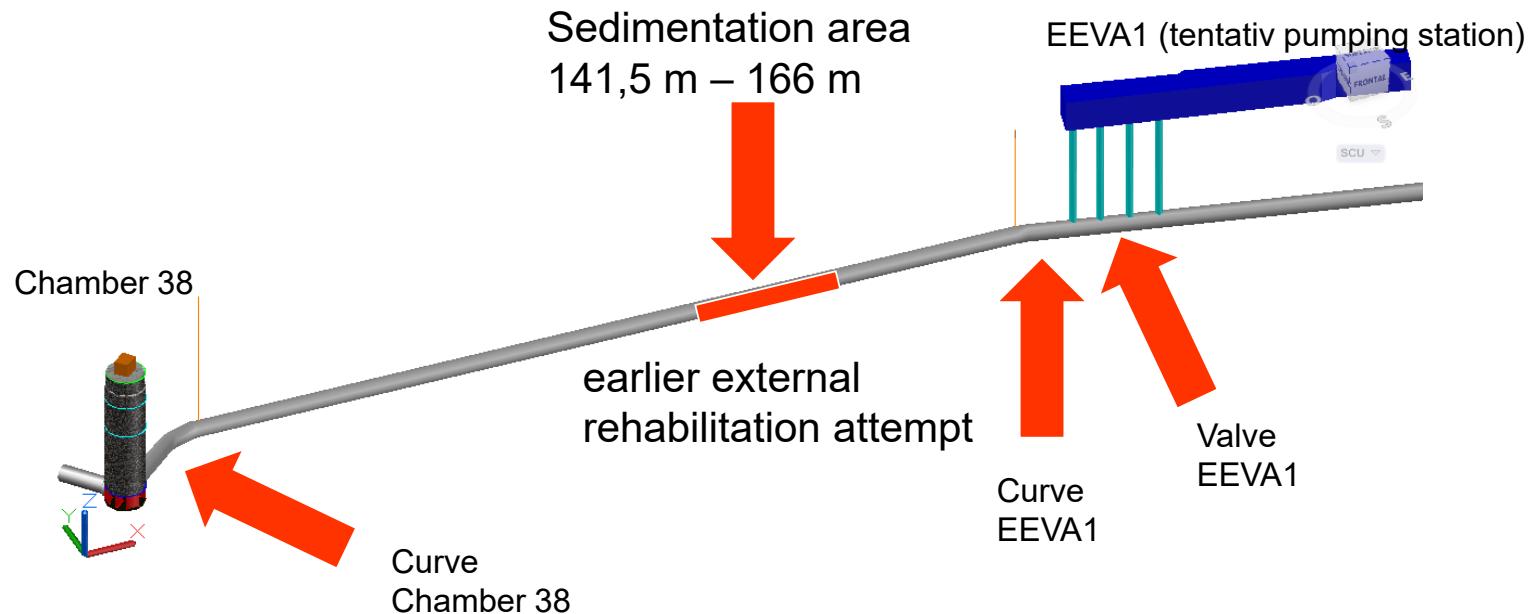


Old pipes were formed by mining as in-situ concrete pipes without steel reinforcement / groundwater infiltrating trough cracks

## Tendering and project planning

### Challenges in project planning / implementation

submit a rehabilitation concept → Ludwig Pfeiffer was awarded the contract to rehabilitate the pipeline





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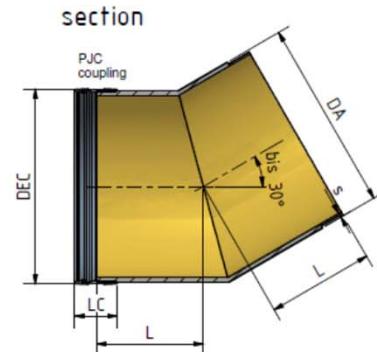
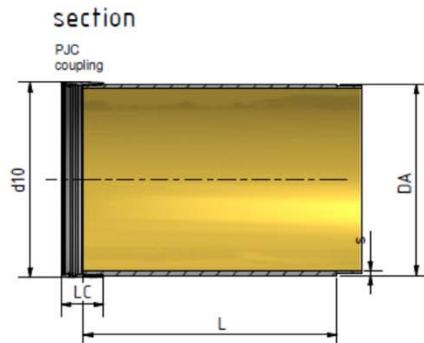
## Tendering and project planning



Chamber 38  
Villa Adelina

## Tendering and project planning

### Dimensioning / order GRP pipes



pipe DN 2550 (DA2555)					
SN (N/m <sup>2</sup> )	PN (bar)	s min (mm)	s max (mm)	s (mm)	M min (kg/m)
20000	2	68	72	69	1147

length: L = 2,92m +25/-10mm

bend DN 2550 (DA 2555)				
SN (N/m <sup>2</sup> )	PN (bar)	s (mm)	M (6°) (kg/m)	L (mm)
20000	2	69	~ 2500	1000

Purpose:

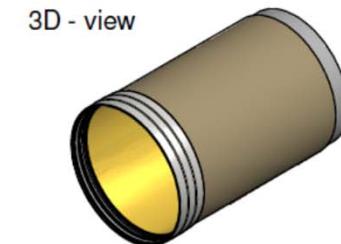
HOBAS pipe as sewer pipe and pressure pipe  
drinking water according certificate N 000472

Resin quality:

Polyester resin min. type 1130 acc. DIN 16946-2

Pipe connection:

PJC coupling (stainless steel 1.4571) with EPDM-gasket



## Development of rehabilitation technology

Test and diver training site Ludwig Pfeiffer Kassel





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## Development of rehabilitation technology

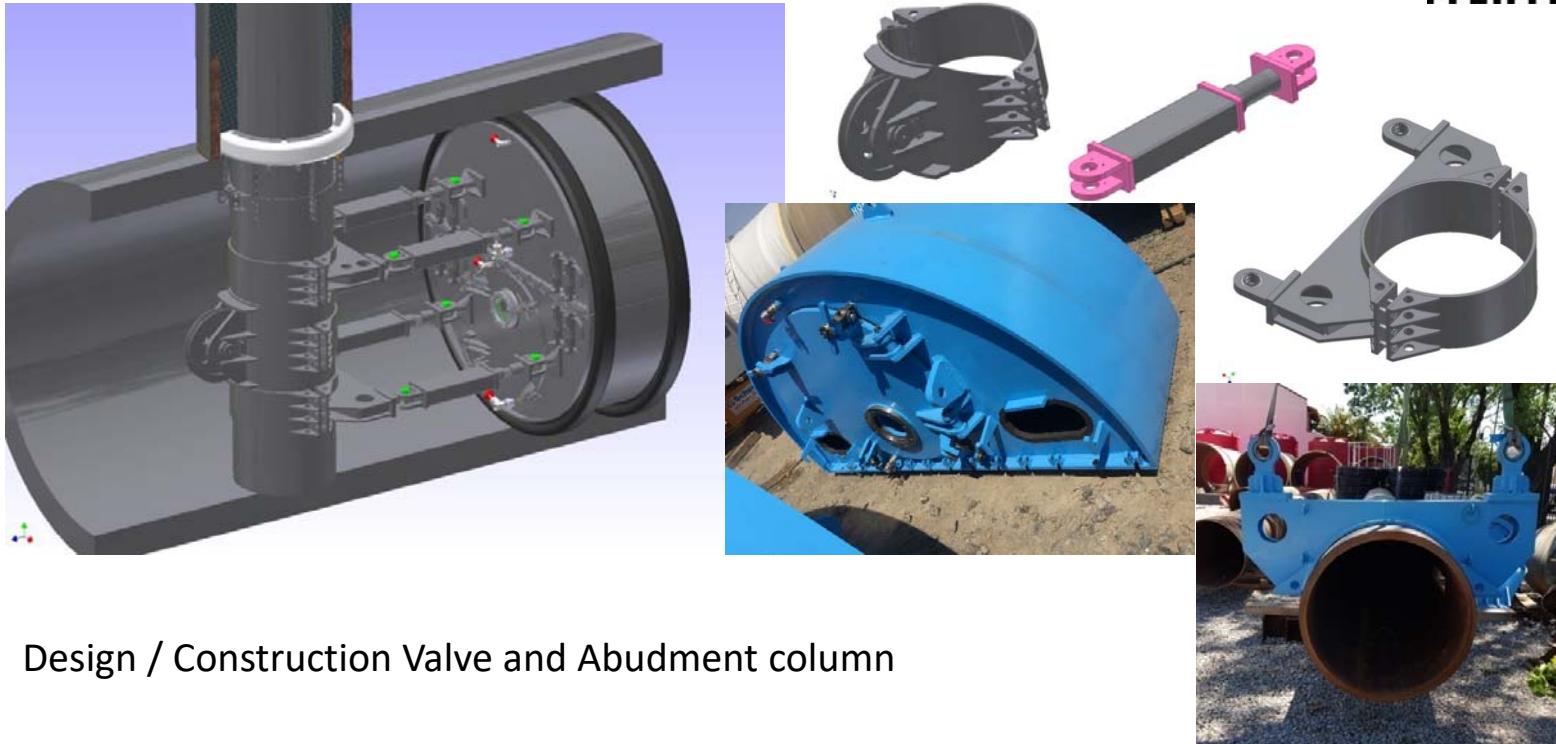
Test site Ludwig Pfeiffer Kassel / GRP Pipe with coupling device



## Development of rehabilitation technology Test site Ludwig Pfeiffer Kassel



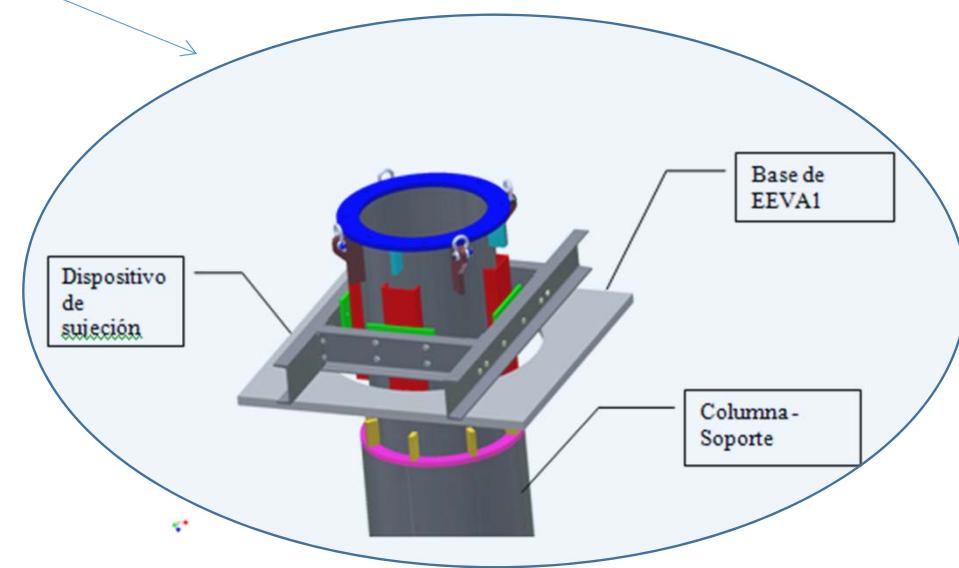
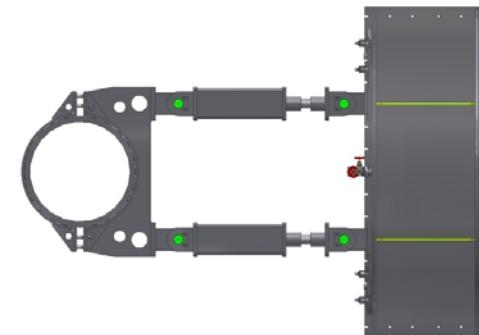
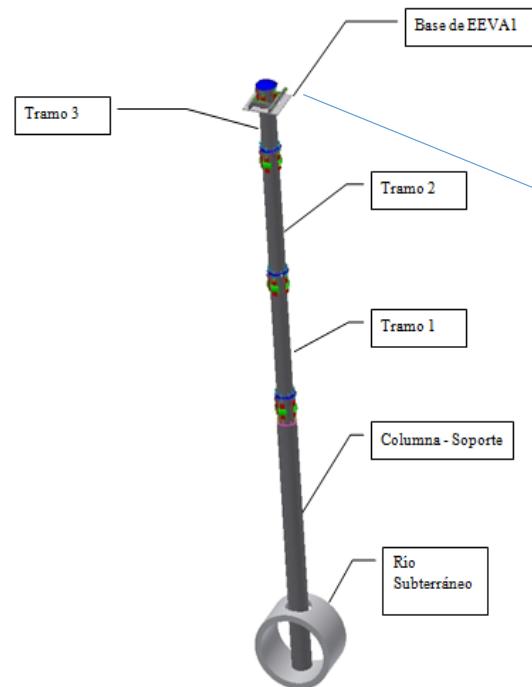
## Development of rehabilitation technology



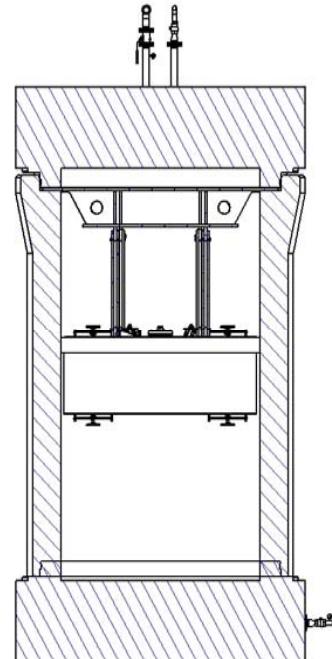
Design / Construction Valve and Abudment column

## Development of rehabilitation technology

### Construction abudment column

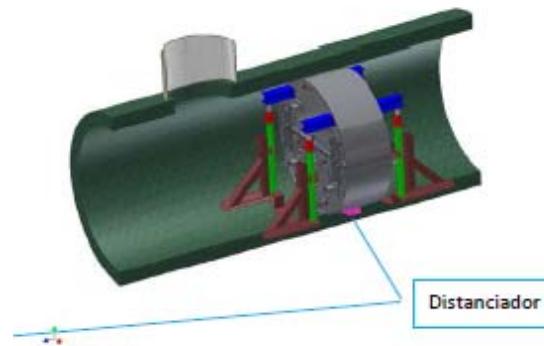
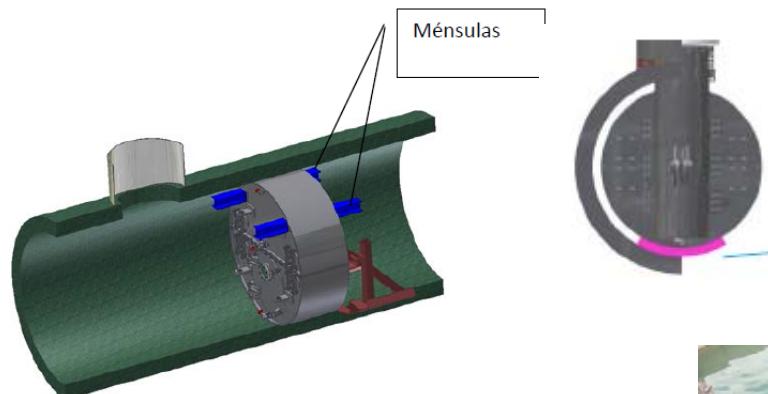


## Development of rehabilitation technology



Test seal and valve

## Development of rehabilitation technology



## Implementation of the rehabilitation



## Implementation of the rehabilitation





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## Implementation of the rehabilitation

Floating valve part



## Implementation of the rehabilitation Diver control center



## Implementation of the rehabilitation



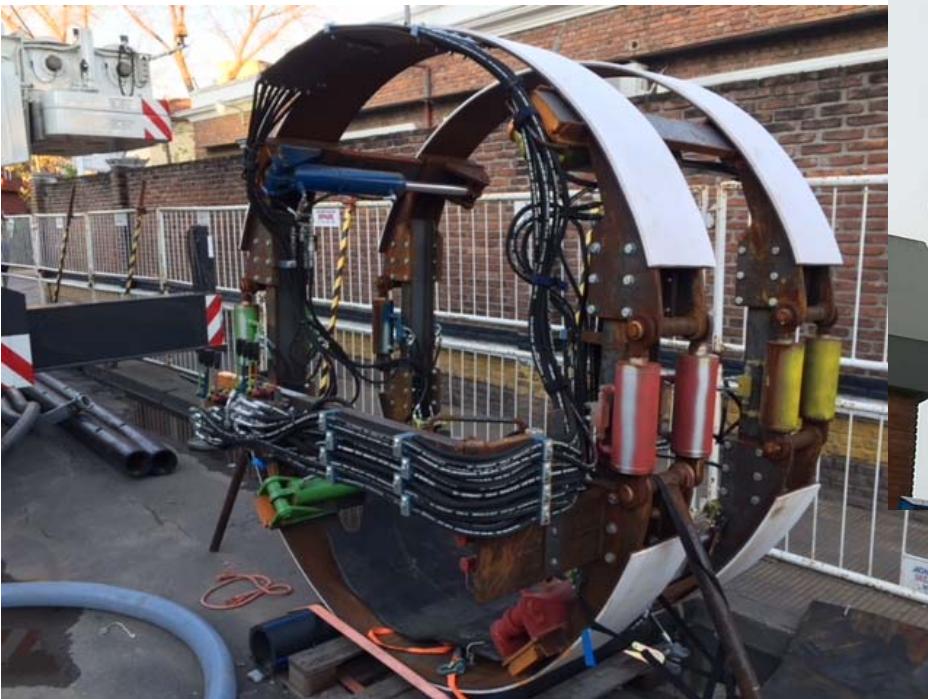
Expansion of concrete sedimentation by diamond saws an hydraulic splitter

## Implementation of the rehabilitation

Installation of Liner Plates DA 2,88 m

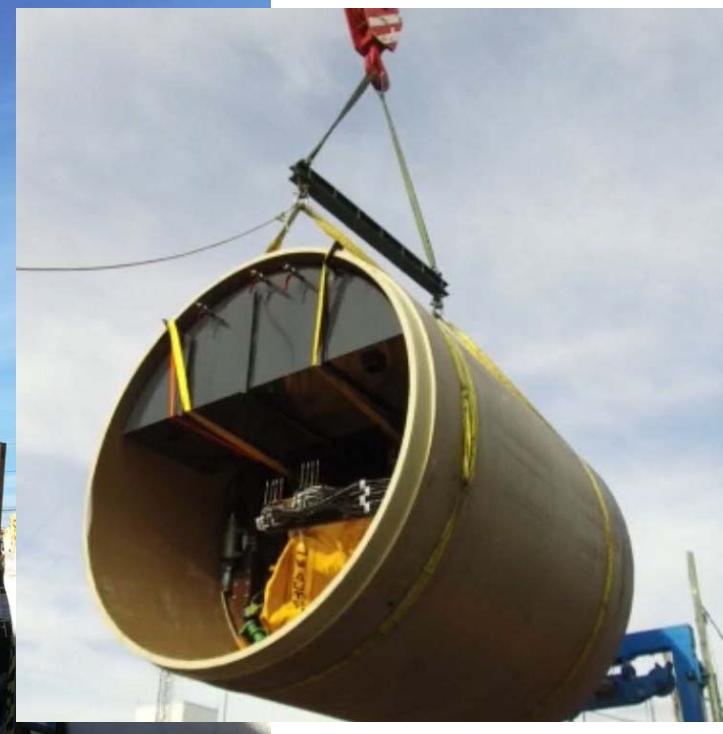
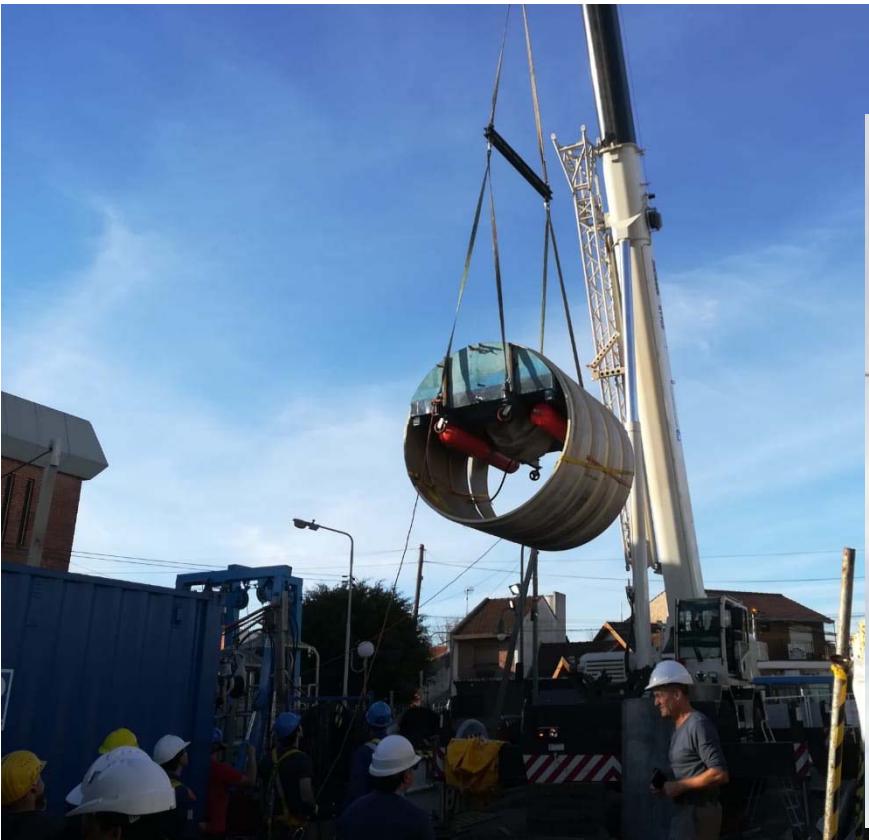


## Implementation of the rehabilitation Installation of the Coupling device



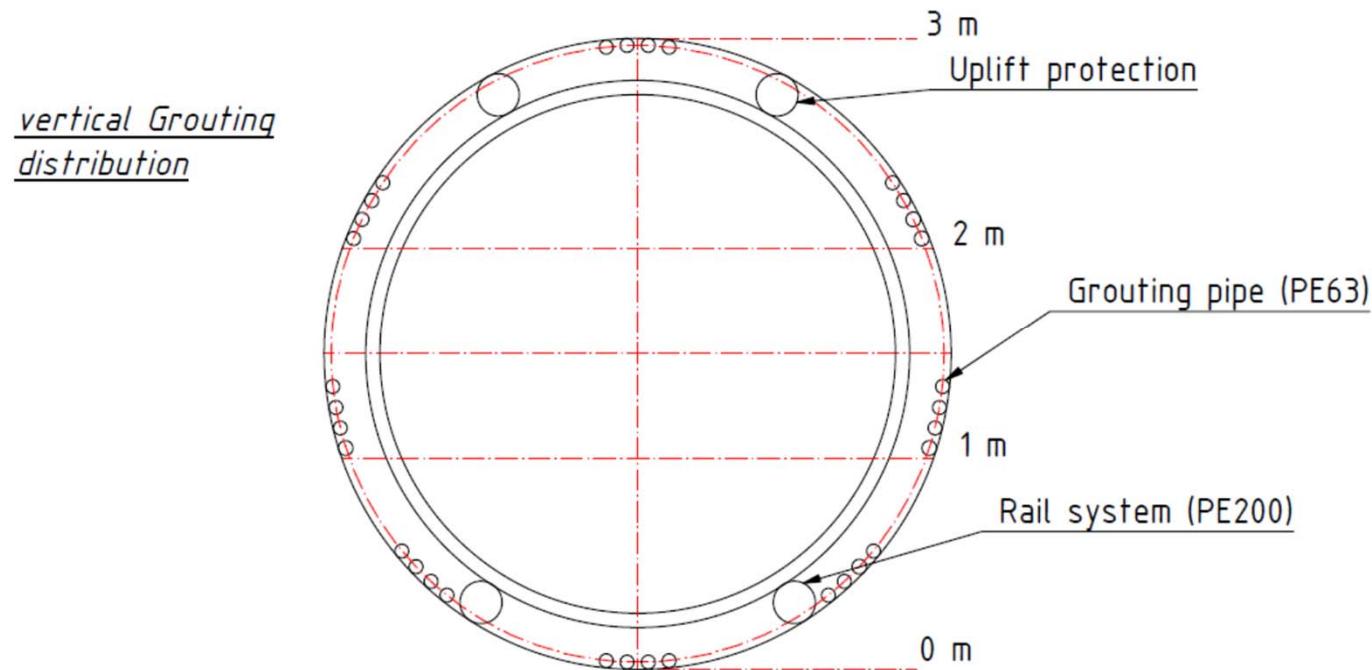
## Implementation of the rehabilitation

Installation of GRP jacking pressure pipe



## Implementation of the rehabilitation

Rio Subterraneo grouting the annular space





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# Questions?

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