



37<sup>TH</sup> INTERNATIONAL  
**NO - DIG**  
FLORENCE 2019

Fortezza da Basso • FLORENCE (Italy)

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

## REHABILITATION OF A 10 KM LONG ASBESTOS- CEMENT DRINKING WATER TRUNK MAIN IN SPAIN WITH FLEXIBLE RELINING TECHNOLOGY

Jorge Lamazares,  
Director Sinzatec Canalizaciones S.L.



## ASBESTOS CEMENT PIPE

- Between the 1920's and into the late 90's AC pipe was seen as the answer to low cost drinking water network construction
- Thousands of Kilometre's have been installed across the world including Spain where over 40,000 Km's are known to exist in the drinking water networks. A similar amount is considered installed in irrigation networks across the country.
- The Spanish Parliament in March 2017 research to replace all the asbestos pipe from the drinking water networks. This means a huge investment and environmental problems if only digging is selected





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## OPTIONS AVAILABLE TO REPLACE AC PIPE

- **Dig and install a new pipe leaving the old pipe buried**
  - High cost
  - Disruption
  - Environmental issue
  - Uncontrolled hazardous

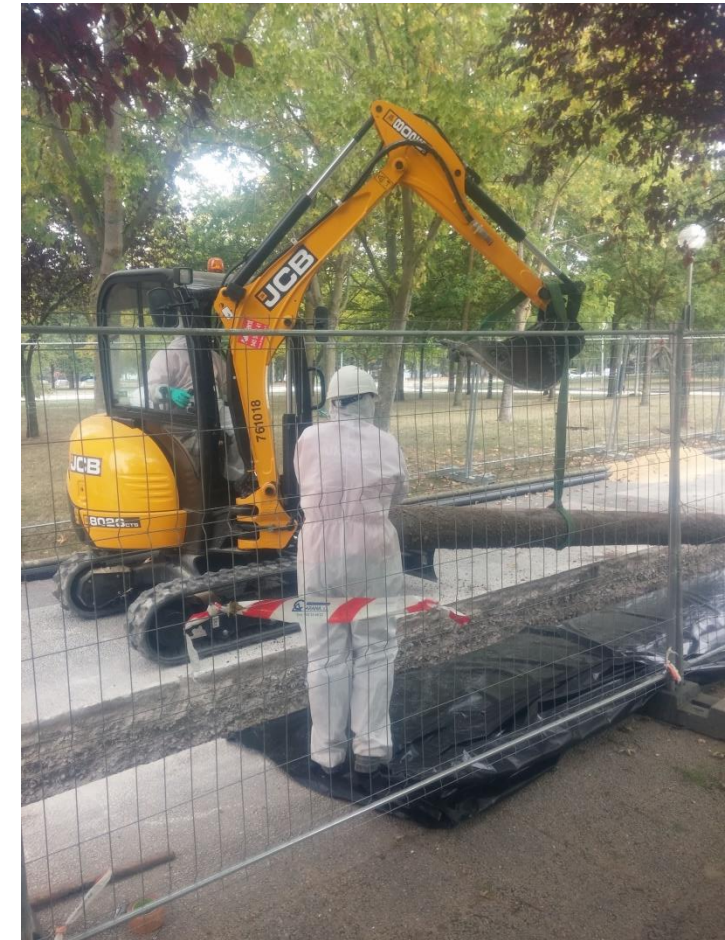
**MOST USED BUT RESIDUAL LEGACY**



## OPTIONS AVAILABLE TO REPLACE AC PIPE

- Dig and install a new pipe and left the old pipe buried
- **Dig and remove the AC pipe, installing the new pipe in the same place**
  - H&S risks during works
  - Cost
  - Disruption
  - Best environmental solution

**LEAST DESIRABLE**





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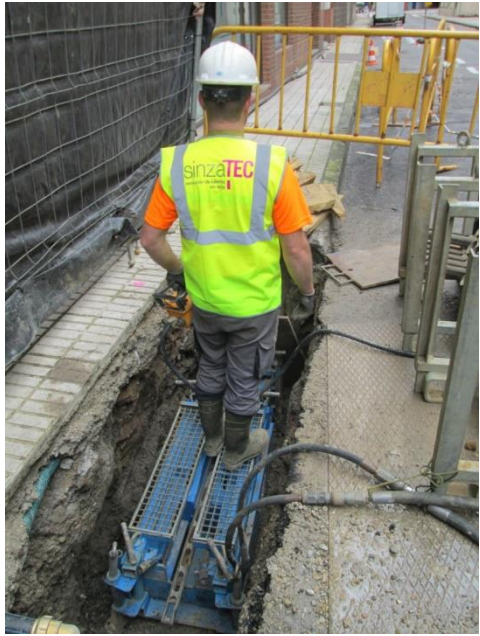


## OPTIONS AVAILABLE TO REPLACE AC PIPE

- Dig and install a new pipe and left the old pipe buried
- Dig and remove the AC pipe, installing the new pipe in the same place
- **Trenchless technologies**
  - Online replacement
  - CIPP
  - PE pipe and Hose Relining



# REHABILITATION OF A 10 KM LONG ASBESTOS- CEMENT DRINKING WATER TRUNK MAIN IN SPAIN WITH FLEXIBLE RELINING TECHNOLOGY



- Less cost
- Less noise
- Less disruption
- Concerns with Pipe Bursting
- Pipe relining effective and with no H&S issues
- Environmental benefits
- Pipe or fragments of AC always controlled

**MOST DESIRABLE**

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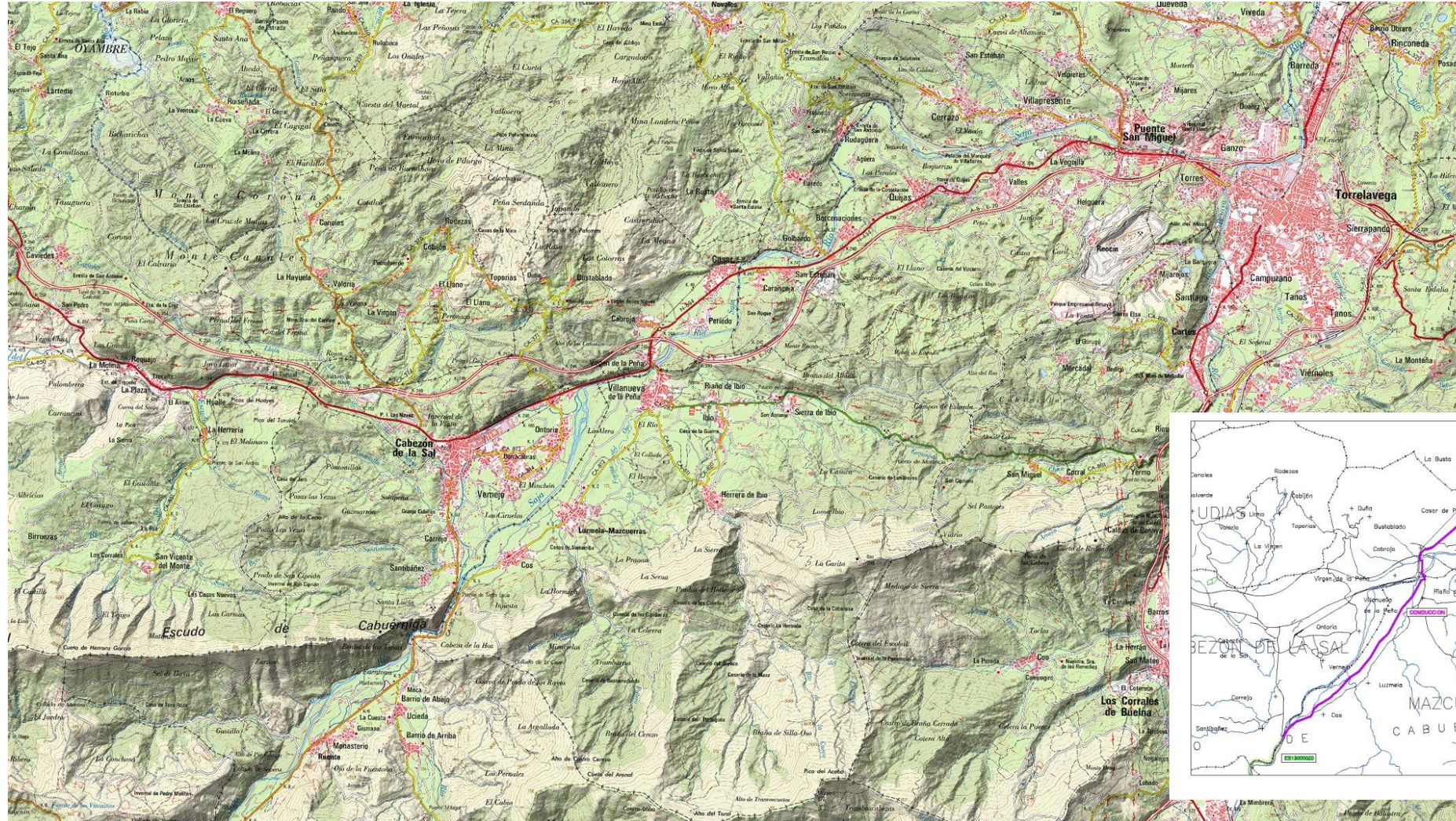
## REOCÍN PROJECT. REHABILITATION OF 10 KM OF AC DN250

- Cantabrian Regional Government investment
- Water supply to a population of 15,000 hab
- Old pipe 50years old
- The pipe runs through sensitive areas like touristic villages and labour lands close to the Saja river.
- The pipe transport water from the Treatment Plant to the main reservoir
- Operating pressure 6-9 bar





# REHABILITATION OF A 10 KM LONG ASBESTOS- CEMENT DRINKING WATER TRUNK MAIN IN SPAIN WITH FLEXIBLE RELINING TECHNOLOGY





## REOCÍN PROJECT. REHABILITATION OF 10 KM OF AC DN250

- First alternative **Dig and relay** new DI pipe DN250
- Investment cost 3,3 MM €
- COST OF PERMITS 0,6 MM €  
-----
- TOTAL COST 3,9 MM€
- Permits: 590 private land.
- Estimated consruction time 12 months





## REOCÍN PROJECT. REHABILITATION OF 10 KM OF AC DN250

- Option with Trenchless. Best option **PRIMUS LINE**
- Investment cost 2,2 MM €
- COST OF PERMITS 6,500 €  
-----
- TOTAL COST 2,2 MM€
- Permits: 25 private land.
- Estimated consruction time 4 months





## REOCÍN PROJECT. REHABILITATION OF 10 KM OF AC DN250

	DIG AND RELAY	PRIMUS LINE	
• Investment cost	3,3 MM €	2,2 MM €	
• COST OF PERMITS	0,6 MM €	6,500 €	
	-----	-----	
• TOTAL COST	3,9 MM €	2,2 MM€	<b>44% SAVINGS !!</b>
• Permits:	590 landowners	25 private land.	
• Estimated consTruction time	12 months	4 months	



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WATER TRUNK MAIN IN SPAIN WITH FLEXIBLE RELINING TECHNOLOGY



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PRIMUS LINE



## REOCÍN PROJECT. REHABILITATION OF 10 KM OF AC DN250

- Old AC (40 years) pipe DN250 and PVC DN200
- 10.500 m drinking water
- 6-9 Bar operating pressure
- 60 connectors DN250 and 4 DN200
- December 2016-April 2017
- Customer: Gobierno de Cantabria/Dragados
- Leaking pipe
- Renovation with Primus Line DN250 PN15
- Curves and bends
- 19 installation stages, de 200 a 800 m





# REHABILITATION OF A 10 KM LONG ASBESTOS- CEMENT DRINKING WATER TRUNK MAIN IN SPAIN WITH FLEXIBLE RELINING TECHNOLOGY

Nº TRAMO	PK		PRIMUS LINE	
			ø200	ø250
1	0+000,000	0+160,500		160,50
2	0+246,300	0+517,400		271,10
2*	0+517,400	1+425,000		907,60
3	1+425,000	2+092,135		667,14
4	2+092,135	2+281,050		188,92
5	2+281,050	3+140,636		859,92
6	3+140,636	3+750,000		609,40
7	3+750,000	4+497,717		747,75
8	4+497,717	5+308,362		810,72
9	5+896,027	6+151,929		255,92
10	6+759,475	7+402,185		642,73
11	7+767,662	8+426,099		658,71
12	8+426,099	8+921,582	495,79	
13	8+921,582	9+285,010		364,37
14	9+285,010	9+931,055		650,26
15	9+931,055	10+431,596		500,64
16	10+619,457	11+341,475		722,23
17	11+341,475	11+646,621		311,52
18	11+646,621	12+125,274		479,32
	SUMA...		495,79	9.808,76





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- WHY THE CUSTOMER OPTED FOR PRIMUS LINE?
- Standard pipe renovation project usually done with open trench
- Already tested Primus Line in two small jobs
- Avoiding occupation of private lands.
- Global reduction in time and cost.
- Better hydraulic behaviour
- Ideal conditions for PL. Installations longer than 300 m with no connections and medium pressure pipe
- CHALLENGES OF THE PROJECT
- Maintaining water service during works.
- Working in AC pipe in long lengths with soft curves
- Existing bends not previously detected. Problems during installation; H&S issues with Asbestos.

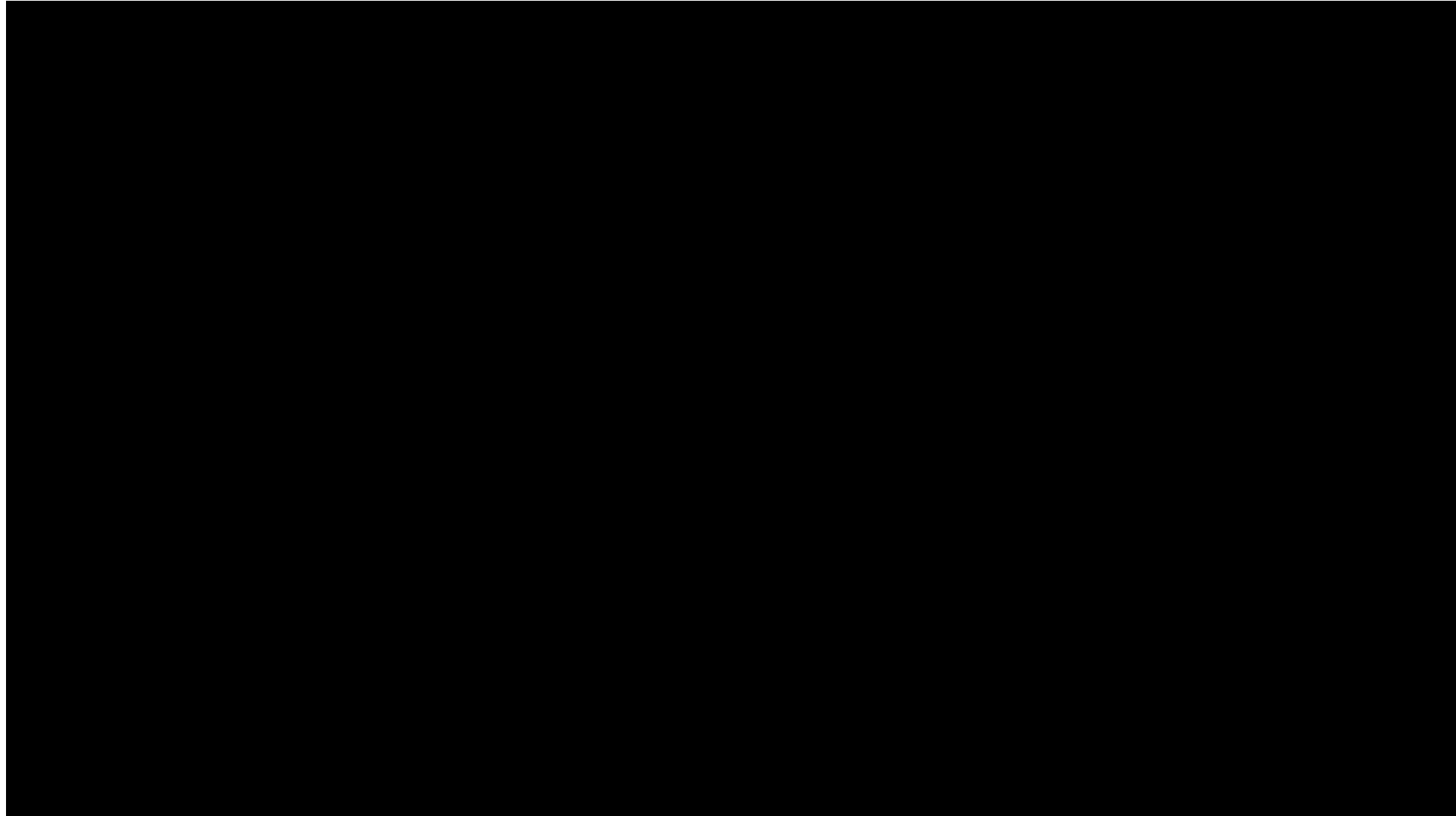
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¡Muchas gracias por su atención!

**sinzaTEC**  
renovación de tuberías  
sin zanja

**Jorge Lamazares**  
Director Sinzatec Canalizaciones  
[jlamazares@sinzatec.es](mailto:jlamazares@sinzatec.es)  
**+34-942 585704**