



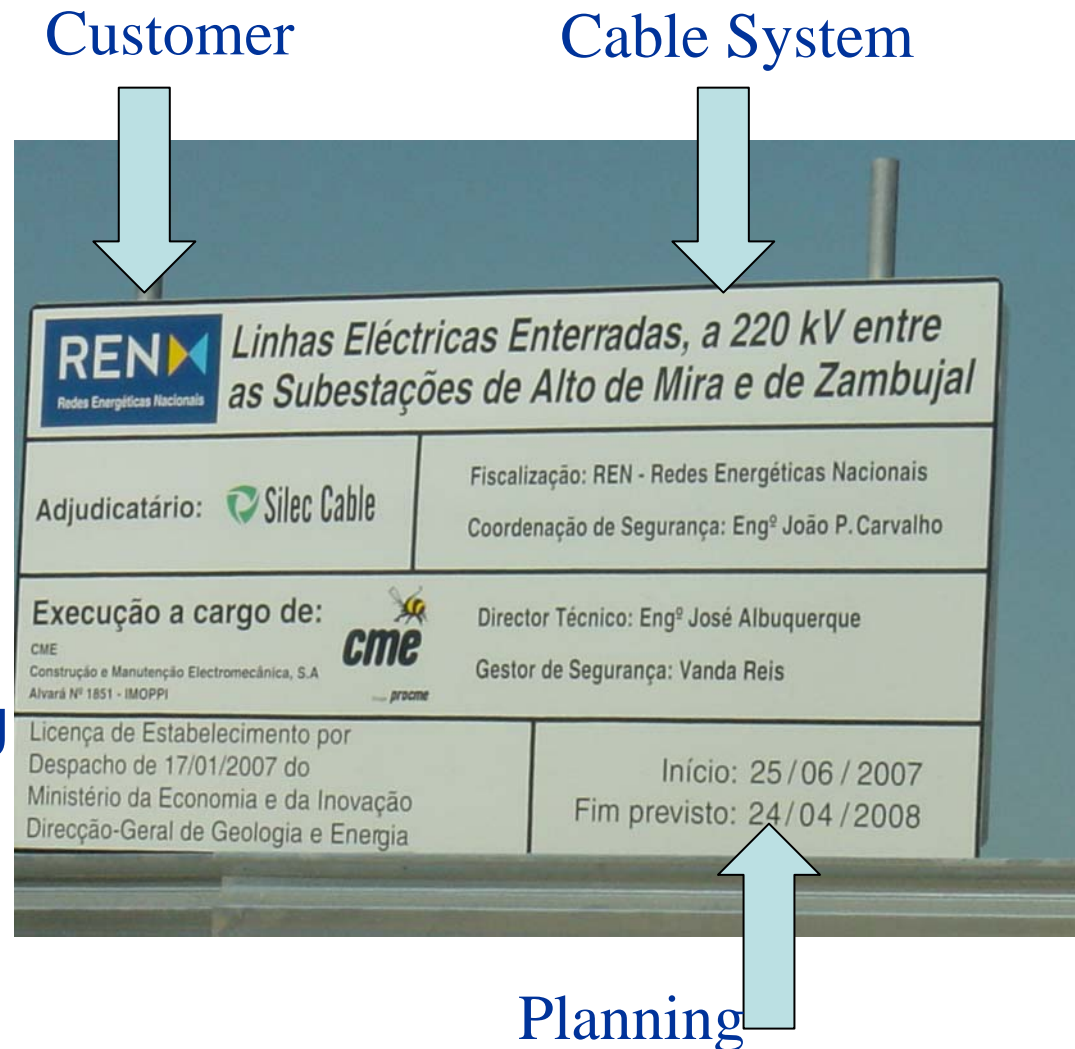
# Large 220 kV Cable System in LISBOA (Portugal)

Pierre Argaut



# Scope of Supply

- Turn Key project :  
2\*11km Circuits in //
- 67.8 km of 1600 mm<sup>2</sup> copper 220kV
- 126 « one piece premolded joint »
  - 42 with shield break
  - 18 with grounding
  - 66 without grounding
  - link boxes
- 6 outdoor terminations with composite insulators (6 existing)



# Technical data

- Standard: NF C 33-253
- Voltage: 127/220/(245)kV
- B.I.L: 1050 kVp
- Short-Circuit rating: 50 kA/0.5s
- Transmission capacity: 410 MW
- Air temperature: 40°C
- Soil temperature: 20°C

# Laying conditions

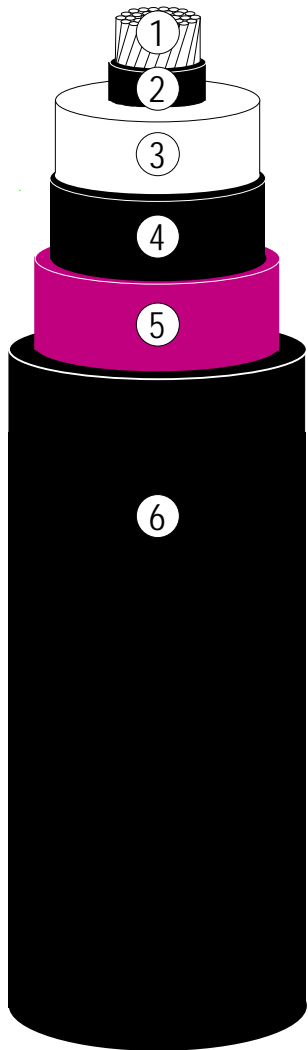
- ↪ Air temperature : 40 °C
- ↪ Ground temperature : 20 °C
- ↪ Ground thermal resistivity: 100°C.cm/W
- ↪ Concrete thermal resistivity: 90°C.cm/W
- ↪ Sand thermal resistivity: 200°C.cm/W

**A - Cable in trefoil formation in buried throughs filled with sand ( thermal resistivity of sand 200 °C.cm/W)**

**B - Cable in Flat formation in PVC ducts (diam 200 mm) embedded in concrete banks (thermal resistivity of concrete 90 °C.cm/W )**

**C - Cable in trefoil formation in PVC ducts (diam 200 mm) embedded in concrete banks (thermal resistivity of concrete 90 °C.cm/W )**

# Cable Construction



Indicative external diameter : 121.5 mm

Indicative weight : 37. kg/m

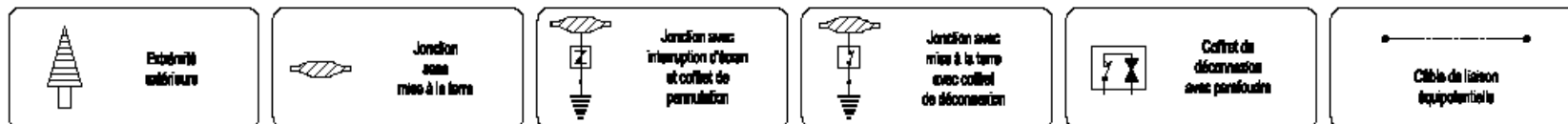
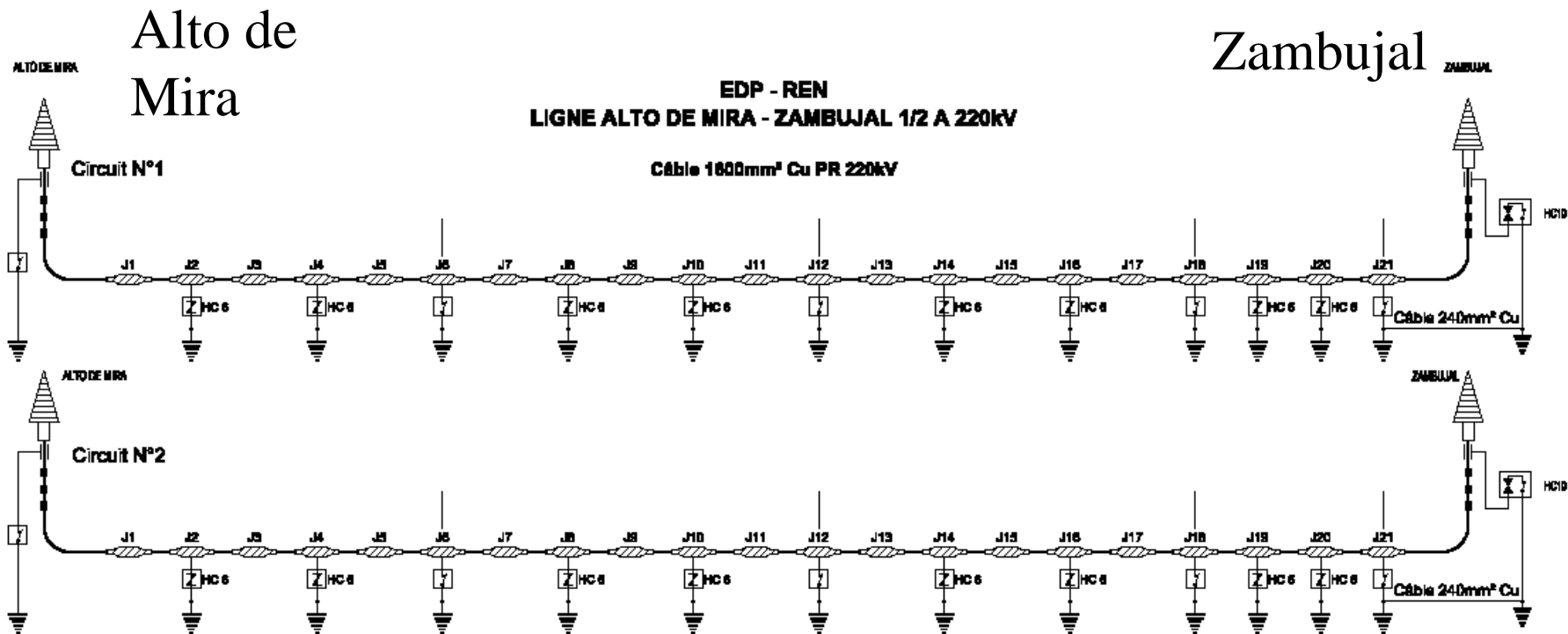
Minimum bending radius

- permanent 2.2 m

- during installation 2.5 m

- **1 – segmental conductor**
  - Cross-section : 1600 mm<sup>2</sup>
  - Material : copper
  - Indicative diameter : 50.9 mm
- **2 - Inner semi-conductive layer**
  - Indicative thickness : 1.6 mm
- **3 - XLPE Insulation**
  - Minimum average thickness : 23 mm\*
- **4 - Smooth outer semi-conductive layer**
  - Indicative thickness : 1.5 mm
- **5 – Lead sheath**
  - Minimum average thickness : 3.8 mm
- **6 - Smooth LDPE outer sheath with semi conducting layer**
  - Minimum average thickness : 4 mm \*

## SCHEMA DE MISE A LA TERRE



Ref : 18XP1185P1C - Ls 100607

# Cable route (examples)



Fall ICC 2007, TNL

SCOTTSDALE, November 6th, 2007

# Status

- Cables and accessories at the manufacturing stage
- Permitting/Civil works slightly delayed.
- Accessories installation not yet started.
- Update and more pictures for next meetings.

Thank you for your attention!

Questions?