URBAN MOBILITY SOLUTIONS:
ROPEWAY AND INCLINED LIFTS
Summary

- Company Presentation
- Technical background
  - Ropeways
  - Inclined Lifts
- Urban Installations
  - Funicular in oPorto
  - Funicular in Viseu
  - Funicular in Covilhã
  - Inclined Lifts in Covilhã
  - Mechanical escalators
EFACEC Elevadores, SA

- Founded in the years 50.
- Production and mounting of lifts.
- Average number of produced lifts per year above 1000 units.

LIFTECH, SA

- Founded at year 2002 corresponding to a spin out process of Lift System Department of EFACEC.
Areas of activity

- Development and production of Lift Controllers
- Complete lifts (supplied to installing companies)
- Accessibility systems - home lifts, platform lifts, chair lifts, etc.
- Special projects: funiculars and other ropeway systems, inclined lifts, etc.
• Definition:
Cableway installations designed to carry persons
Used on inclined slopes
Can admit both horizontal and vertical curves on the profile
Installations with high capacity transport

• Legal framework
European directive for ropeways 2000/9/EC

• Types of installations
Funiculars
Aerial ropeways
Main features
• 1 or to cabins pulled by a steel cable, on a rail based track
• Suitable for short or large distance installations
• Suitable for profiles with horizontal curves
• Suitable for profiles with vertical curves – variable inclination
• Range from low capacity transport systems (100 persons per hour) to high capacity systems (> 1000 persons per hour)
Technological background

Ropeways - Funiculars
Technological background

Ropeways - Funiculars
Main features

• Typically two or more cabins suspended on cables
  • In a jig-back movement – 2 cabins
  • Continuous movement (gondolas) – a few dozens of cabins
• Suitable for short or large distance installations
• Only suitable for linear paths, without curves
• Short use of ground space
• Range from low capacity transport systems (200 persons per hour) to high capacity systems (> 1000 persons per hour)
Technological back ground

Ropeways - Aerial
Technological back ground

Ropeways - Aerial
• Definition:
Consists of a cabin, similar to lift, but moving on an inclined profile, along a linear profile
Its operation mode is equal to normal lifts, using call push buttons

• Legal framework
European directive for lifts
Main features

• Similar to normal lifts, using same type of components
• Used on inclined slopes >15° to the horizontal
• Typically used for linear profiles and short distances
• Installations with lower capacity transport
• Suitable for outdoor installations
• Cheaper installations when compared to ropeways
Technological back ground

Inclined Lifts
Urban Installations
Funicular in Viseu

- Level difference: 35.8 m
- Track length: 390 m
- Number of carriages: 2
- Capacity of each carriage: 50 passengers
- Nominal speed: 2.0 m/s
- Transportation capacity: 500 passengers/hour in each direction
- Sharing track with cars and pedestrians
Urban Installations
Funicular in oPorto

- Level difference: 61.2 m
- Track length: 280 m
- Number of carriages: 2
- Capacity of each carriage: 25 passengers
- Nominal speed: 5.0 m/s
- Transportation capacity: 515 passengers/hour in each direction
- Automatic levelling system to deal with variation on the profile
Urban Installations

Funicular in oPorto
Urban Installations
Funicular in Covilhã

- Level difference: 72 m
- Track length: 200 m
- Number of carriages: 1
- Capacity of the carriage: 15 passengers
- Nominal speed: 2,0 m/s
- Transportation capacity: 200 passengers/hour in each direction
- Dealing with a track with several horizontal curves
- Automatic installation, without operator
Urban Installations

Funicular in Covilhã
Urban Installations

Funicular in Covilhã
Urban Installations

Funicular in Covilhã
Urban Installations

Inclined lift in Covilhã I

- Level difference: 30 m
- Track length: 65 m
- Capacity: 850 Kg / 11 passengers
- Nominal speed: 1,0 m/s
- Number of stops: 2
Urban Installations

Inclined lift in Covilhã I
Urban Installations

Inclined lift in Covilhã II

- Level difference: 20 m
- Track length: 40 m
- Capacity: 850 Kg / 11 passengers
- Nominal speed: 1.0 m/s
- Number of stops: 2
Urban Installations

Inclined lift in Covilhã II
Urban Installations
Mechanical Escalators - Access to Castle in Montemor-o-Velho

- Set of 3 independent mechanical escalators
- Level difference - total: 33m
- Nominal speed: 0.5 m/s
- Connection between lower part of the city and a Castle, in full integration in the old part of the city
Urban Installations
Mechanical Escalators - Access to Castle in Montemor-o-Velho
Special projects
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