

## Recent researches for footbridges

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### Abstract

1. Walkway on Eyzies bridge, Dordogne, FRANCE
2. Footbridge at Blagnac, Haute Garonne, FRANCE
3. Preuilly Footbridge at Auxerre, Yonne, FRANCE
4. Footbridge over the river Cher at Tours, Indre et Loire, FRANCE
5. Footbridge over the river Sarre at Sarreguemines, Moselle, FRANCE
6. Footbridge over the river Ill at Wantzenau, Bas Rhin, FRANCE
7. Footbridge over the river Meurthe and Moselle at Nancy, Meurthe et Moselle, FRANCE

Common elements for these footbridges :

#### **A - Structure**

1. Exposed structure, mostly metallic
2. Utilization of existing industrial products or prefabrications
3. Moderated height of structures
4. Deck in concrete or in hard wood (with wind braces)
5. Fast and easy accomplishment, (variability of realization delay - from 9 to 18 months)
6. Imperceptible vibration problems, presence of a sensible "lightness" on the footbridge over the Cher

Eyzies bridge	2 beams Glued-Laminated Wood	Length $\approx$ 80.00m	<b>Widening</b>
Footbridge at Blagnac	2 beams IPN with wooden arc	Span $\approx$ 36.00m	Bowstring
Preuilly Footbridge at Auxerre	3 beams Glued-Laminated Wood	Span $\approx$ 35.00m	Portal bridge
Footbridge over the river Cher at Tours	2 beams IPN	Span $\approx$ 235.00m	suspended
Footbridge over the river Sarre at Sarreguemines	2 beams IPN	Span $\approx$ 90.00m	suspended
Footbridge over the river Ill at Wantzenau	2 beams IPN	Span $\approx$ 28.5+12+28.5 = 69 m	Three spans
Footbridge over the river Meurthe and Moselle at Nancy	2 beams IPN	Span $\approx$ 110 + 115 = 225.00m	Cable stayed

#### **B - Implantation**

1. Respectful urbanism, no important modification of the approaches – historical surroundings, ancient monument sites,...
  - ☐ Eyzies bridge
  - ☐ Footbridge over the river Sarre at Sarreguemines
  - ☐ Preuilly Footbridge at Auxerre
2. An "original" plan for each project, according to the site
3. View-points (Footbridge over the river Meurthe and Moselle at Nancy), belvederes (Footbridge over the river Cher at Tours, Footbridge over the river Ill at Wantzenau), widenings (Footbridge over the river Sarre at Sarreguemines), roofings (Footbridge at Blagnac)
4. Abutment and approaches treatment :
  - ☐ ¼ of circle - Eyzies bridge
  - ☐ place (view-point) - Footbridge at Blagnac
  - ☐ staircase - Preuilly Footbridge at Auxerre
  - ☐ access ramp and promenade - Footbridge over the river Cher at Tours and Footbridge over the river Sarre at Sarreguemines
  - ☐ footpaths and pedestrian and cyclist circuit - Footbridge over the river Ill at Wantzenau

- ❑ existing pedestrian traffic with an access to the island - Footbridge over the river Mechelle and Meurthe at Nancy

#### **C - Security**

1. Over dimensioned handrail super-structure (20 to 30%)
2. Anti side-slip and anti-glide structure surfaces
3. Accessibility of all the footbridges to physically handicap persons
4. Study over vertigo
5. Intended inside inclination of super-structures
6. Pleasant handrails widely dimensioned
7. Integrated lighting and ground marks

#### **D - A particularly profile each time**

#### **longitudinal movement**

Walkway on Eyzies bridge	corrugated
Footbridge at Blagnac	covered
Preuilly Footbridge at Auxerre	flat
Footbridge over the river Cher at Tours	arch
Footbridge over the river Sarre at Sarreguemines	slope 2.5%
Footbridge over the river Ill at Wantzenau	slope
Footbridge over the river Mechelle and Meurthe at Nancy	slope

#### **E – Costs of works (tax free)**

$$L \times l = S$$

Walkway on Eyzies bridge	80 m x 2.5 m = 200 m <sup>2</sup>	6 MF/1 M€
Footbridge at Blagnac	36 m x 4.40 m = 158.40 m <sup>2</sup>	4 MF/0.6 M€
Preuilly Footbridge at Auxerre	35 m x 4.10 m = 143.50 m <sup>2</sup>	3.5 MF/0.5 M€
Footbridge over the river Cher at Tours	235 m x 3 m = 705 m <sup>2</sup>	12MF/2M€
Footbridge over the river Sarre at Sarreguemines	90 m x 3.5 m = 315 m <sup>2</sup>	8.5MF/1.3M€
Footbridge over the river Ill at Wantzenau	69 m x 4 m = 276 m <sup>2</sup>	3.5 MF/0.5 M€
Footbridge over the river Mechelle and Meurthe at Nancy	230 m x 3 m = 690 m <sup>2</sup>	14MF/2.1M€

#### **F - Conception**

These footbridges have been studied and designed by the same architect with the following Technical Study Offices :

Walkway on Eyzies bridge - CETE from BORDEAUX

Footbridge at Blagnac – DDE HAUTE GARONNE

Preuilly Footbridge at Auxerre – J. M. I.

Footbridge over the river Cher at Tours – J. M. I.

Footbridge over the river Sarre at Sarreguemines – THALES and M. VIRLOGEUX Consultant

Footbridge over the river Ill at Wantzenau - EEG SIMECSOL

Footbridge over the river Mechelle and Meurthe at Nancy - FREYSSINET

#### **G - Conclusion**

These examples of footbridges achieved in France between 1998 and 2002, give us an idea of current researches :

- ❑ Freely planned bridges and long profiles
- ❑ Fast achieved implement
- ❑ Increased structure complexity
- ❑ Use of different assembled materials
- ❑ Limited and controlled costs
- ❑ "Smooth" insertion in very complex sites an historical surroundings

#### **Satisfied public**