Proceedings of the 2nd ICAUD International Conference in Architecture and Urban Design
Epoka University, Tirana, Albania, 08-10 May 2014
Paper No. 355

Beyond the Structure; Footbridge as a Landscape Architectural Design Product

Artan Hysa[1,2]
[1]Epoka University/ Rr. Tiranë-Rinas,Km. 12, 1039 Tirana, Albania
ahysa@epoka.edu.al
[2]Istanbul Technical University/ Taşkışla Kampüsü, 34743, Beyoğlu / İstanbul / Türkiye
hysa@itu.edu.tr

ABSTRACT

Footbridge, by its name, proclaims that it is a special urban access medium for pedestrians. Unfortunately, there are less works that through research highlight this fact. Generally, pedestrian bridges are taken into account not enough differently than the `classical` bridge[1] itself. There are many scientific works focusing on the structural properties of footbridges rather than on its architectural and urban values.

This study aims to scrutinize the architectural and urban added values of the footbridge to its context and human life. It will be taken into consideration in this study as an urban furniture, a public space, a pathway, a landmark as well as a landscape feature. The goal of this research hides behind concerning with the user density rather than load bearing capacity, the urban aesthetics rather than large spans, the accessibility rather than constructability.

A selection of ten pedestrian bridges will be the raw input of this research. The selection criteria of these ten projects can be listed as follows; being built, being a recent project- due to the availability of one of the research tools of this study- [within 10 years], being of an urban context and over passing a waterway rather than a motorway. Geography has been intentionally kept wide so that to have cases from different cultures as well.

Apart from general information about the cases, this study will try to highlight the architectural and urban added values of each project to its context by various methods. Some qualitative values of an architectural and urban character of the current state of each project will be evaluated by professionals through *Likert* scale method. These people will be provided enough written and visual material about each case so that a rational evaluation process can be achieved. Another special method is used to highlight the added values of each footbridge to its neighborhood. Google earth Timeline plugin will be a crucial application to assist us on that. By contrasting and comparing two satellite images of the zone representing its state before and after the construction of the project we may read those values more clearly.

KEYWORDS: footbridge, public space, landscape structure, pedestrian access, urban rivers

[1] Classical Bridge_ is used here to literally represent the traditional bridge in structural means

1 INTRODUCTION

Footbridge or Pedestrian Bridge, as it is implied by its name, is a special urban access medium for pedestrians. Unfortunately, there are less works that through research highlight this fact. Generally, pedestrian bridges are taken into account not enough differently than the `classical` bridge[2] itself. There are many scientific works focusing on the structural properties of footbridges rather than on its architectural and urban values. It is difficult to find studies that take them as a special typology of urban public access tool. (Idelberger, 2011) (Ursula Baus, 2008) (Equality, 1981) (Schlaich, 2005)

1.1 Objectives

The basic aim of this research work is to highlight the architectural, urban and landscape values of the footbridge rather than its structural properties. Conveying a fast literature review among the academic research data, the lack of similar focuses is obvious. On the other hand, there are many studies focusing on their structural features.

The footbridge in this study is considered as an extension of the pedestrian paths of the urban life rather than as a structural marvelous object as they are. Furthermore, they are not only connections of two urbanized parts of a river- at least the examples that are included here- but as well as providing several perspectives of the city itself to their passengers[3]. They have been part of this study as important urban elements that provide to the citizens exceptional and spectacular experiences of walking over / along the interwoven dynamics of a waterway such as the river. The pedestrian bridges have been studied here as one of the rarest urban features that make urbanized man come closer to the nature.

Another goal of this study is to generate a multi criteria analysis model a trial of which have been performed during the research work and will be fully presented through this paper.

2 METHODOLOGY

2.1 Literature Review on Case Studies

In this study there are included 10 footbridges that have been shortlisted as case study. The selection criteria applied for each example can be listed as follows [main ones being in bolt];

- **Being of recent years**
- **Being built**
- **Overpassing an urbanized waterway**

- Not being similar cases
- Having different scale
- Different geographies
- Information accessibility

According to the pre-defined main selection criteria a list of more than 20 examples have been produced. Considering the other four secondary selection criteria a final list of 10 project have been prepared. The first draft list is represented in the table 1.

[2] Classical Bridge_ is used here to literally represent the traditional bridge in structural means

3 Passenger here is used in a secondary meaning. Thinking of pedestrians carried by the footbridge to cross a water or motor / way.

Table 1. First draft of the Footbridge case study selection

name of the project	no	page	year	budget	designer	engineer	client	state	city
Duisburg Footbridge	1	14	1999	7.5	Schlaich Bergermann	Stahlbau		Germany	Duisburg
South Quay Footbridge	2	42	1997	3	Wilkinson Eyre Architects	Jan Bobrowski	LDDC	England	London
Heinrich- Bosch Footbridge	3	69	1994	na	Hans Maourer	Mayr/ Ludescher/ Partner	City of Bamberg	Germany	Bamberg
Gustav Heinenmann Bridge	4	72	2005	na	Max Dudler	KLW Ingenieure	Senate Administration	Germany	Berlin
Baden Passarelle Bridge	5	74	2007	3.7	Leuppi & Schaffroth	Henauer Gugler AG	City of Baden	Switzerland	Baden
Schweizerhaus Footbridge	6	94	2006	na	Dr. -Ing. Dietrich Renner	Dipl. -Ing. Volker Wettmann	Water management dep.	Germany	Bad Kissingen
Luitpold Footbridge	7	92	2006	na	Dr. -Ing. Dietrich Renner	Dipl. -Ing. Volker Wettmann	Water management dep.	Germany	Bad Kissingen
Passarelle des Trois Pays	8	108	2007	na	Planning Assoc LAP	VBI, Berlin, Stuttgart	Town of Weil	Germany / France	Weil
Kaiser Bridge	9	50	2007	na	Martin Krone Engineering	SIBAU GmbH	Senate Administration / Berlin	Germany	Berlin
Rosenau Footbridge	10	20	2009	na	Dr. Schutz Ingenieure	STS Stahltechnik	EPTAGON GmbH	Germany	Kempten

name of the project	river	navigable	structural typology	str. mat	fin. Mat	accesability	1.function	2.function	length	width	span
Duisburg Footbridge	Rhine	yes	suspension-lift	steel	synthetic		linkage		73.73	3.5	73.73
South Quay Footbridge	Thames	yes	girder bridges	steel			linkage	site-viewing	90		90
Heinrich- Bosch Footbridge	Regnitz		girder bridges	steel	steel		linkage		31	3.3	31
Gustav Heinenmann Bridge	Spree	yes	girder frame	steel	wood	disabl / pedst / cycle	linkage		87.69	4	65.9
Baden Passarelle Bridge	Limmat	no	girder frame	steel	concrete	disabl / pedst / cycle	linkage	site-viewing	103	2.3	52
Schweizerhaus Footbridge	Saale	yes	girder frame	steel		disabl / pedst / cycle	linkage	site-viewing	97.5	3.25	17
Luitpold Footbridge	Saale	yes	girder frame	steel	steel	disabl / pedst / cycle	linkage	site-viewing	105	3.25	25
Passarelle des Trois Pays	Rhine	yes	Arch Bridge	steel	steel plate	disabl / pedst / cycle	linkage	site-viewing	346	7	230
Kaiser Bridge	Spree	yes	girder frame	steel	steel	disabl / pedst / cycle	linkage		140	5	92
Rosenau Footbridge	Iller	no	self-anchored suspension	steel	concrete		linkage		53.6	3.5	53.6

2.2 Documentation

2.2.1 General Information

A through research on the final ten examples were done as the next step which comprises the documentation phase. The documentation have been done in three subgroups. There have been created three documentation category for each example. Text based information have been one of the most important sources for the general information about the project. Data such as;

Name of the project
Time and Location
Design team [architect, engineers, landscape architect, etc]
Physical properties [length, span, height, width, etc]
Budget
Its history
Interesting background facts
Process [design and construction phases]

have helped to figure out the project with all its facts and background information. A sample of that general information page is shown in the figure 3.

2.2.2 Satellite Images

The second data package of each case is the satellite images. Firstly, there have been produced four satellite images using the Timeline plugin of Google Earth application.

Altitude 2000 m - year 2000's **[before the project have been built]**
Altitude 2000 m - year 2010's **[after the completion]**
Altitude 1000/ 500 m - year 2000's **[before the project have been built]**
Altitude 1000/ 500 m – year 2010's **[after the completion]**

The images of 2000 m aim to be the platform for city scale analysis. Whereas the latter two for the neighborhood scale study. On the other hand the images of before and after being built have been part of

the satellite images data pack to serve as tool for comparative study. Besides these four documents there have been used an integrated image/ map with all urban features` names and details. This image have been produced by the open source Bing Maps application. One example of the satellite images package is represented in the figure 1.

Figure 1. Satellite images page example [Simone de Beauvoir Footbridge]

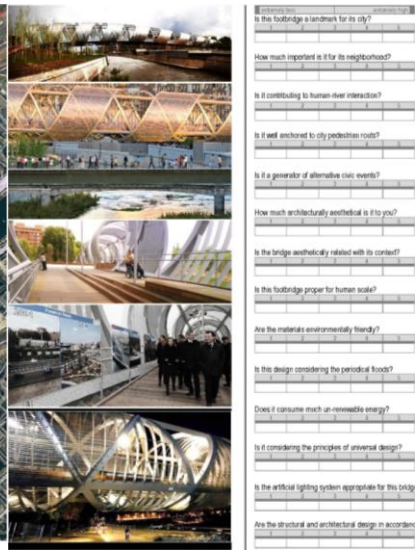


Figure 2. Delivered questionnaire and the images [Pasarela del Arganzuela]

Figure 3. General information page example [Limmat Footbridge]

2.2.3 Selected Shots

The third documented material have been a selected number of shots of each project. The primary source of these photos have been several sources on the internet. These webpages range from image stock service sites to the official webpages of the design team of the project. A seldom of them have been from books and magazines. In the end 5 to 7 images have been selected to be part of the visual information about the project. These images have been selected so that to express as much information about the project as it could. At the end catalogue of 3 pages per each project have been prepared so that to zip up a package of crucial information about the selected ten examples.

2.3 Professional Questionnaire

The next step of the process was preparing a questionnaire consisting of 14 questions sub grouped in four main titles;

Urban
Is this footbridge a landmark for its city?
How much important is it for its neighborhood?
Is it contributing to human-river interaction?
Is it well anchored to city pedestrian routs?
Is it a generator of alternative civic events?
Architectural
How much architecturally aesthetical is it to you?
Is the bridge aesthetically related with its context?
Is this footbridge proper for human scale?
Is the artificial lighting system appropriate for this bridge?

Environmental
Are the materials environmentally friendly?
Is this design considering the periodical floods?
Does it consume much un-renewable energy?
Is it considering the principles of universal design?
Structural
Are the Structural and Architectural designs in accordance?

3 DISCUSSION

During the next step, the responses have been collected and analyzed so that to draw some findings. A detailed graphical representation of these answers have been included in the appendixes part of this study. These charts have been produced by overlapping each response by a transparency value of 50 % making the graphical differentiation of each vote. By this method the differences among answers is more readable. In the appendixes part there are presented the delivered materials accompanying the questionnaire as well.

The questionnaire is of a Likert scale type and each question have been assigned a range of weight from 1-5, from the extremely low to the extremely high option. This questionnaire accompanied by the documentation catalogue of ten examples have been delivered to seven professionals with the backgrounds of architecture [three], urban design and city planning [two], and landscape architecture [two]. An example of the delivered questionnaire is shown in the figure 3. Whereas in the following table 2 it is shown the responded questionnaires of five footbridge projects.

Table 2. Responded questions for the first five projects

Besides that a numerical evaluation of the responses have been performed. In the following tables and charts have been shown the points that each project collected in total as well as correspondingly by each professional. In the table number 3 there have been listed each project in descending order with their respective ordered number of the questionnaire. In the following 8 columns there are the grading of each professional per each project. These values are graphically shown by ratio bars. Apart from that, there have been highlighted the top scores by each professional. It is not surprising here that the top ranked Castleford footbridge project consists of three professionals' top scores, that of pro 5, pro 6 and pro 2, respectively 66 out of a maximum possible of 70 points. This project have been graded by an average of 4.17 per question.

In the last two columns we have the total score per each project as well as the differences between each consecutive total score. Through the latest column we may understand the breaking point of this evaluation process. In other words the huge differences between projects being evaluated under this questionnaire. It is obvious the difference between Simone de Beauvoir and Quatro Ponte sul Canale Grande which architecturally and in urban means divide the projects into two different groups. The bottom row is the sum of the values of their own corresponding columns highlighting the highest total points by professional number 1. This has score average of 4.10 while the overall score average is 3.75 points per question.

Table 3. Evaluation of each project by each professional

project	no	pro1	pro2	pro3	pro4	pro5	pro6	pro7	pro8	total	diff
Castleford Footbridge	2	60	66	54	57	61	60	55	54	467	10
La Pasarela del Voluntariado	4	56	58	51	56	62	61	57	56	457	17
Limmat Footbridge and Promenade Lift	5	63	45	58	57	53	52	54	58	440	7
Passerelle des Trois Pays	8	61	56	55	61	50	37	57	56	433	5
Melkwegbridge Footbridge	6	57	48	48	60	62	49	54	50	428	1
Quarto Ponte sul Canal Grande	9	54	48	53	53	57	56	60	46	427	8
Simone de Beauvoir	10	61	53	51	55	52	46	47	54	419	30
Pasarela del Arganzuela	1	61	54	47	49	44	38	49	47	389	6
Kurilpa Footbridge	3	53	3	45	58	53	43	49	49	383	18
Gustav Heinemann Footbridge	7	49	44	44	44	50	40	48	46	365	
		575	505	506	550	544	482	530	516	4208	102

In the following table number 4 there is represented the evaluation process by questions. In other way this is the performance of all examples facing each question. Here the significance of each question for the shortlisted projects are to be evaluated. The structure of the table is similar to the previous one. In the first two columns there are listed in a descending order 14 questions of the questionnaire with the respective scores by eight professionals. Besides the top scores that have been highlighted the highest scored question is the question number 2, *How much important is it for its neighborhood*?, with an average of 4.19 out of 5.00 score per project.

It can be easily estimated that the shortlisted projects are much successful in relation with their neighboring urban areas than other aspects questioned through the questions. The least scored question was question number 5, *Is it a generator of other public events?*, scoring an average of 3.16. The total average of the questions score is the same with overall average of 3.75 per project. What is interesting here is the case of question number 14, *Are the structural and architectural design in accordance?*, which is ranked as the second only with one point difference from the first out of 400 points in total. This is exceptional since it shows the strong relation of structural and architectural design of the footbridge. Not to be neglected is the background of each participant of the questionnaire.

Table 4. Evaluation of each question by each professional

question	no	pro1	pro2	pro3	pro4	pro5	pro6	pro7	pro8	total	diff
How much important is it for its neighborhood?	2	48	32	41	48	42	34	42	48	335	1
Are the structural and architectural design in accordance?	14	43	43	39	43	44	37	42	43	334	5
Is it well anchored to city pedestrian routs?	4	46	32	37	45	45	38	42	44	329	2
Is this footbridge proper for human scale?	8	46	39	37	42	45	41	39	38	327	8
Is it considering the principles of universal design?	12	44	41	40	39	43	39	35	38	319	1
Is this footbridge a landmark for its city?	1	36	35	41	41	40	39	43	43	318	14
Is this design considering the periodical floods?	10	48	47	32	33	38	34	36	36	304	4
How much architecturally aesthetical is it to you?	6	39	41	37	41	39	30	38	35	300	9
Is the bridge aesthetically related with its context?	7	36	38	35	34	40	34	38	36	291	3
Is the artificial lighting system appropriate for this bridge?	13	39	33	34	37	40	33	37	35	288	12
Does it consume much un-renewable energy?	11	39	39	36	33	32	32	31	34	276	6
Is it contributing to human-river interaction?	3	40	2	34	37	2	37	41	32	270	6
Are the materials environmentally friendly?	9	38	37	33	39	36	2	31	2	264	11
Is it a generator of alternative civic events?	5	33	2	30	38	34	31	35	2	253	
		575	505	506	550	544	482	530	516	4208	82

In the following charts there is presented the descending graph of the overall values of each table. In the first one there are the shown the point per question option whereas in the second one the point per project case.

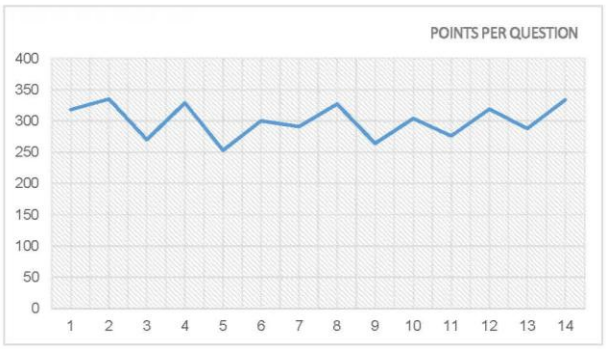


Figure 4. Points per question chart

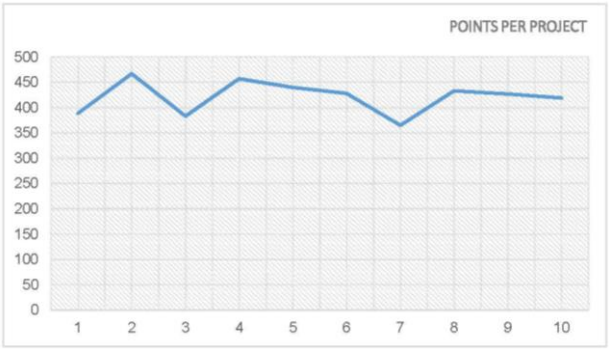


Figure 5. Points per project chart

4 CONCLUSION

As a conclusion it can be highlighted that the footbridges can be studied in architectural, urban and landscape means as well. Even though their structural properties haven't been the focal point of this study one of the questions asking the accordance among architectural and structural values of each example was ranked as the second highest point.

At the end of these study it can be claimed that there is possible to numerically evaluate some architectural and landscape projects such as pedestrian bridges.

An important missing part of the numerical analysis of the study is the table showing the points per question that each project have been evaluated. By that we would draw some important facts on evaluating these projects under special properties that have been highlighted by each question of the questionnaire.

5 ACKNOWLEDGEMENTS

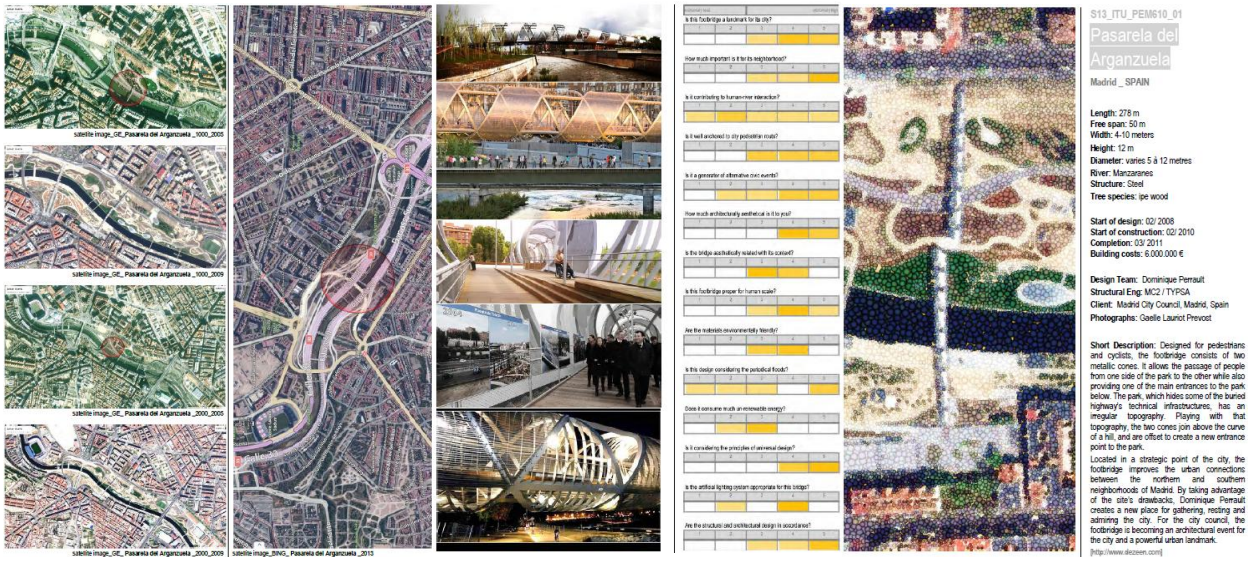
This study is a revised product of my research work for the fulfillment of graduate course Pem610, taken from the Landscape Architecture department at Istanbul Technical University. In this context, I have to thank the course lecturer Selim Velioğlu. At the same time, I am grateful to other professors Ayçim Türer Başkaya and Meltem Erdem, at ITU Pem for their support during the process. Furthermore, I have to thank my colleagues[4] in the Department of Architecture at Epoka University for participating as the professionals team to respond the questionnaire. The last but not the least appreciation goes for my institution- Epoka University- and my family, for supporting by understanding my periodical trips to Istanbul as part of my PhD education.

6 APPENDIXES

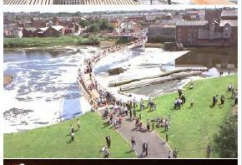
Delivered Textual and visual materials to each Professional

List of Ten shortlisted Footbridge Projects

1. Pasarela del Arganzuela
2. Castleford Footbridge
3. Kurilpa Footbridge
4. La Pasarela del Voluntariado
5. Limmat Footbridge and Promenade Lift
6. Melkwegbridge Footbridge
7. Gustav Heinemann Footbridge
8. Passerelle des Trois Pays
9. Quarto Ponte sul Canal Grande
10. Simone de Beauvoir



[4] Adelina Greca, Desantila Rrumbullaku Hysa, Edmond Manahasa, Egin Zeka, Odeta Durmishi Manahasa, Ilir Nase, Ina Osmani, Jurtin Hajro, Sokol Dervishi, Valbona Koçi.



S13_ITU_PEM610_02

Castleford Footbridge

Castleford_ UK

Length: 130 m
Free span: 65.90 m
Width: 4.00 meters
River: Aire
Structure: Steel

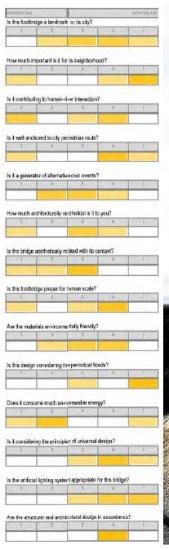
Location: Castleford, River Aire, Yorkshire WF10, UK
Surface area: Bridge Surface: 524m2,
Total timber weight: 37 tones
Decking: All deck boards laid end to end = 8km
Stainless steel deck fixings: total of 7000

Start of design: 2003
Start of construction: 06/2004
Completion: 2005
Building costs: 5.6 million €

Design Team: McDowell+Benedetti
Structural Engineers: Alan Baxter
Client: Wakefield Council, Yorkshire Forward and English Partnerships
Address: Castleford / West Yorkshire, England

Short Description_ The £4.8 million bridge has been funded by Wakefield Council, Yorkshire Forward and English Partnerships. It creates a safer more pleasant pedestrian route than the 200 year-old Victorian road bridge further downstream. The new bridge will unite the north and south of Castleford's riverside community connecting Aire Street to Mill Lane.

The streamlined timber deck bridge is designed as a generous public space as well as a route, with the structure rising through the deck to create four 20 metre curving benches to sit and enjoy the panoramic views.



S13_ITU_PEM610_03

Kurilpa Footbridge

Brisbane_ AUSTRALIA

Project: Kurilpa Footbridge

Length: 470 m
Free span: 350m
Width: 6.50 meters
River: Brisbane
Structure: Steel

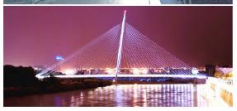
Start of construction: 12/ 2007
Completion: 09/ 2009
Building costs: 49 million €

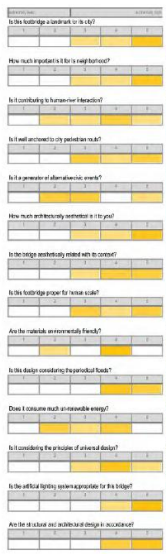
Design Team: Cox Rayner Architects, Michael Rayner, Antony Scott Pegum, Hang Ling, Casey Vallance, Philip Cox, TristramCarfrae Jan Ainsworth, Tom James
Structural Engineers: Arup
Client: Baden City Building Department, Ennetbaden Town Planning Department
Photographs: Christopher Frederick Jones, Roger D'Souza
Address: Tank Street, Brisbane, Queensland 4000 Australia

Short Description: Measuring 470 metres long and 6.5 metres wide, the Kurilpa Bridge has several viewing decks and a full length canopy, both of which are supported by a secondary tensegrity structure.

Speaking in the Queensland Parliament, the Premier Anna Bligh said, "With 1500 people moving into South-East Queensland every week, the demand for improved pedestrian and cycle pathways is growing. I am happy that we can meet this practical demand in such an eye pleasing way. The design is a world-first and an exciting new landmark for our State.

[http://www.worldarchitecturenews.com]





S13_ITU_PEM610_04

La Pasarela del Voluntariado

Zaragoza_ SPAIN

Length: 277 m
Free span: 230 m
Width: 4.50 m
Height: 77.75 m
Foot angle: 29.5 degree
Structure: Steel

Start of construction: 06/2004
Completion: 2008
Building costs: 6.216.048 €

Project: Pedestrian bridge Quatro Ponte
Planning: Javier Manterola
Client: Municipality di Zaragoza, Expo Zaragoza 2008

Short Description: Infrastructure slender, modern, beautiful, visually permeable and technologically advanced, are some of the praise that awakens a project that at night is enhanced by the brightness of his suspenders, which excites Arnisen Javier Manterola, author of more than 200 bridges, busy now in the early gigantic new bridge that will cross the Bay of Cadiz, the tallest in Europe with 69 meters and 3.15 miles long.

"The de Zaragoza is a large project, a footbridge over a river such as the Ebro huge, major, with a range of braces, but at the time it was getting light and airy structure, but with a curtain clothes space "declared Javier Manterola yesterday recovering from surgery slightly.

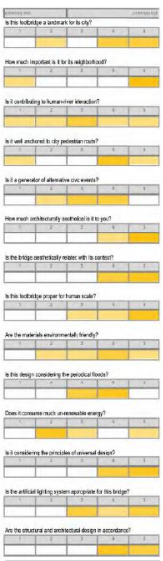
[http://www.diariodenavarra.es]









S13_ITU_PEM610_05

Limmat Footbridge and Promenade Lift

Baden_ SWITZERLAND

Length: 80 m
Free span: 80 m
Width: 4 meters
River: Limmat
Structure: Steel

Start of construction: 06/2004
Completion: 2007
Building costs: 4.000.000 €

Design Team: Leuppi & Schafroth Architekten
Structural Engineers: Henauer Gugler AG
Artist: Beat Zoderer
Client: Baden City Building Department, Ennetbaden Town Planning Department
Photographs: Roger Frei
Address: Ennetbaden, Switzerland

Short Description: The Limmat River winds around the town of Baden and forms a valley that naturally separates it from the neighboring village of Ennetbaden. This geological feature impedes the connection between the two towns. As such, a direct access for pedestrians and bicyclists has been needed for decades.

Situated on the same location where a cable ferry over the river once existed, a steel structure bridges the approximately 30 meter high and 80 meter long distance between the two points. This new linear path – perceivable as a walk-through sculpture – is composed of a horizontal bridge, a vertical elevator tower and a horizontal walkway.

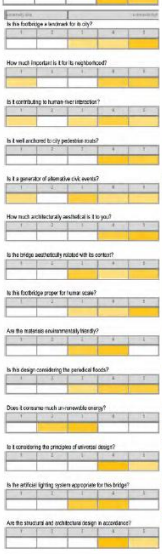
Red-brown in color – varying in shade depending on the light – this steel artifact complements its surroundings. At night, the indirectly illuminated structure glows in the landscape. [http://www.archdaily.com]









S13_ITU_PEM610_06

Melkwegbridge Footbridge

Purmerend _ NETHERLAND

Length: 100 m
Free span: 66 m
Width: 4 meters
Height: 12 m
River: Noordholland Canal
Structure: Steel

Start of design: 09/2007
Start of construction: 05/2011
Completion: 10/ 2012
Building costs: 6.000.000 €

Design Team: NEXT Architects and Rietveld Landscape
Structural Engineers: Ingenieurs Bureau Amsterdam (IBA),
Client: Municipality of Purmerend
Photographs: Jeroen Musch

Short Description: The most striking part of the bridge, designed by NEXT architects, is a massive arch which reaches the height of 12m above water level and offers an incredible view over the city. The high lookout is an attraction in itself and lets pedestrians fully experience the relation between the new and historic center of Purmerend.

Bicycles and remainder traffic can cross the bridge using the 100m long bicycle deck makes a pendulum over the water so the slope can be limited to a minimum.

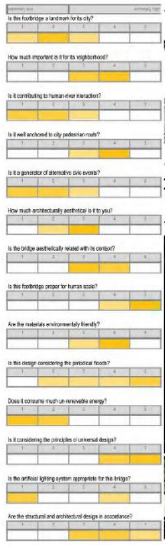
Because pedestrian traffic was separated from cyclists, the direct line between the Melkweg and city centre could remain. Furthermore the 49m arch remains the fastest possible way to cross the water. The pedestrian bridge weighs 85 tons, consists of 130 steps and is supported by a steel arch. [http://www.dezeen.com]









S13_ITU_PEM610_07

Gustav Heinemann Footbridge

Berlin_ GERMANY

Project: Gustav Heinemann Footbridge

Length: 87.69 m
Free span: 65.90 m
Width: 4.00 meters

River: Spree

Structure: Steel

Start of construction: 06/2004
Completion: 2005
Building costs: €

Design Team: Max Dudler
Structural Engineers: KLW Ingenieure

Client: Senate Administration

Address: Berlin Central Station, Germany

Short Description: A footpath only a few hundred meters long leads from the intersection of high speed traffic intercity, regional and city trains at Berlin Central Station to the government quarter in the bend of the Spree. Pedestrians and cyclists can cross the river over a (9.03 + 65.90 + 12.76)m = 87.69 m footbridge with an effective width of 4.00 meters between the balustrades. The bridge was opened on 30 June 2005 and is known as the 'Gustav Heinemann Bridge'.
The pedestrian deck consists of the transverse girders, two outer HEB 200 sections and three inner HEA100 sections as longitudinal girders. The deck is covered and additionally stiffened with cross- laid oak planking.
(Idelberger, 2011)

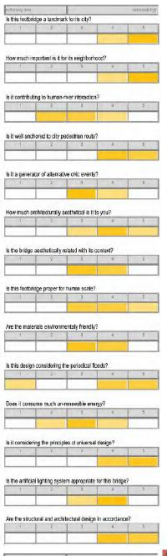
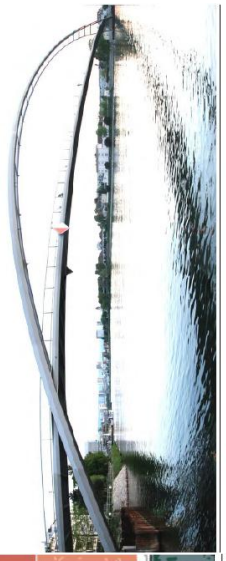












S13_ITU_PEM610_08

Passerelle des Trois Pays

Basle_GERMANY- FRANCE

Length: 248 m
Free span: 238 m
Width: 5.5 m
Hight: 24.75 m
Material:

- 1012 tons of steel
- 1798 m 3 of concrete
- 805 m of cables 30/ 60 mm diameter

River: Rhein
Structure: Steel, Concrete
Start of construction: 2006
Completion: 2007
Building costs: 9 million €

Design Team: Dietmar Feichtinger

Structural Engineers: LAP

Client: E. Union, Land Baden-Württemberg

Address: **Basle**, Huningue, France / Weil-am-Rhein, Germany; Basel), Switzerland

General Description: The construction of a bridge not only has a physical meaning of liaison between territorial and urban areas, but also a symbolic value: reference element within a city and a landscape, the bridge carries the technological ambitions that represent a specific historical period.

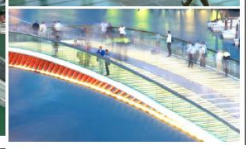
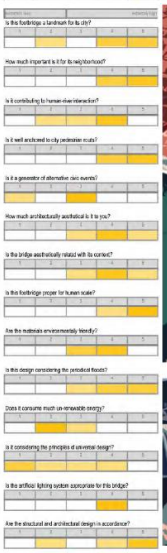
A rainbow stretched asymmetrical cut transmits all the power and elegance Technical bridge which is supported by a vertical arc comprising two pipes in a hexagon shape, and on its south side, rests a thinner arc that opens the visual axis from the ground level. Supports the ground, designed to not obscure the view of the river, the slope of the ramps that it adapts to the topography, and the discretion of metal mesh elements parapets join in the drawing that depicts a building that blends with the landscape and becomes part. It is both a symbol, a sign and witness of the contemporary project. [Elena Cardani, Arca]









S13_ITU_PEM610_09

Quarto Ponte sul Canal Grande

Venice _ ITALY

Length: 94 m
Free span: 81 m
Width: 5.5- 9 m
Height: 3 -9 m
Arch radius: 180 m
Structure: Steel

Start of planning: 06/1999
Start of construction: 06/2003
Completion: 09/2009
Building costs: 21 000 000 € incl. VAT

Planning: Santiago CALATRAVA

Client: Municipality di Venice

General Description: The project is sited at a strategic point, connecting the railway station (at the north end of the bridge) with the Piazzale Roma (the City's arrival point by car or bus) on the south. The bridge will therefore be important both functionally and symbolically, giving visitors their first impressions of Venice and providing a panoramic view of the Grand Canal.

Care has been taken to integrate the bridge with the quays on either side. The steps and ramps are designed to add vitality to both sides of the canal, while the abutments (which are crescent-shaped) leave pedestrians with free access to the quays. The areas at either end act as extensions of the bridge, creating new celebratory spaces for Venice. On the south side, the design also provides a new passage between the Piazzale Roma and the mooring platforms for the ACTV water transport.

The steps and deck of the bridge are made of alternating sections of tempered security glass and natural Istria stone, picking up the design of the pavement on many of the existing bridges in Venice. The parapet is entirely glass, with a bronze handrail comprising its upper edge.

[www.catola.com/public/allegati_eventi]

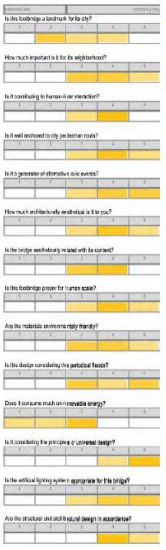












S13_ITU_PEM610_10

Simone de Beauvoir

Paris _ FRANCE

Length: 304 m
Free span: 194 m
Width: 6 to 12 meters
Structure: Steel
River: Seine

Competition: 09/1998, winner
Start of planning: 06/1999
Start of construction: 06/2004
Completion: 07/2006
Building costs: 21 000 000 € incl. VAT

Project: Pedestrian bridge Simone de Beauvoir

Planning: Feichtinger Architectes - contract leader _ Architect Dipl.-Ing. Dietmar Feichtinger

Client: Mairie de Paris, Dir. de la Voirie

Address: Paris 12th and 13th arrondissements

General description: The pedestrian bridge with a length of 304 m links the new districts of Paris - Bercy and Tolbiac - and at the same time the new national French library with the Park Tolbiac.

The new footbridge maintains the coherence of this unusually open Parisian space by reaching across the river in a single, continuous span, without intermediate supports.

Three pathes succeed along the arch and the bow. The middle alongside the bow reveals the view of Notre Dame and historic Paris. The rope guides near to the riverside. The overlay of the two force lines matches with the path-network.

Rope and bow produce a tense in the central section of the bridge. It offers a unique space over the water, to be intended as tribune for events on the water

The lower level of the lens forms a plaza 12 m wide and 65 m long which, enlivened by kiosks, cafes and other temporary installations, persuades the pedestrian to pause mid-route. The central deck, forming the upper part of the lens, protects these activities. The lens anchors the bridge visually in the landscape, giving rise to a unique public space.

[www.archimagazine.com]

7 BIBLIOGRAPHY

Equality, C. f. (1981). *Footbridges in the Countryside: Design and Construction.* Commission for Racial Equality.

Idelberger, K. (2011). *The World of Footbridges: From the Utilitarian to the Spectacular.* Berlin: Wilhelm Ernst & Sohn.

Ursula Baus, M. S. (2008). *Footbridges; Construction Design History.* Berlin: Birkhäuser Verlag.