Banyoles
Old Town
Refurbishment

by Miàs Architects
## Project Details

| Practice: | Miàs Architects |
| Designer: | Josep Miàs |
| Miàs realised this project through his practice, Miàs Architects. |
| Title: | Banyoles Old Town Refurbishment |
| Output type: | Design |
| Function: | Pedestrian public space and services infrastructure |
| Location: | Banyoles, Girona, Spain |
| Client: | Banyoles Town Council [international competition] |
| Competitors: | Hereu Espanyol, Bosch Tarrús Vives, Josep Lluís Mateo, Bosch Genové |
| Budget: | €4,000,000 for phases since 2008 |
| Area: | 18,000m² |
| Engineers: | Proisotec |
Statement about the Research Content and Process

Description

Banyoles Old Town has one of the region’s most emblematic heritage architectural and urban centres. The refurbishment modernises the public space and its systems, and builds a new sense of public landscape by uncovering the old drainage canals and reincorporating them into squares and pedestrian streets.

Questions

1. How can the identifying physical history and geology of the town be legible in the regeneration of its public spaces?

2. How to create a common material background for architectural and urban heritage by designing pedestrian-only spaces?

3. How to modernise services (plumbing, low-tension telephone, gas and drainage) effectively while respecting Banyoles’s architecture, urban morphology and natural features?

Methods

1. Urban and heritage landscape research for developing a design syntax for paving the old town.

2. Design research methods for creating a place for life that rediscovers the old town’s resources and re-envision its public spaces, e.g. by making its canals visible.

3. Integrated design and historical research towards the creation of a continuous ‘historical’ pavement, based on traces of remains, plot divisions, ruins and water canals.
4. Meeting local government heritage standards.

5. Handcrafted techniques combined with contemporary industrialised processes.

Dissemination

Featured in eight exhibitions; presented in nearly 40 international invited talks; widely reviewed, including in *On Diseño*, *Mas Context*, *Arquitectura Viva*, *Deutsche Bauzeitung*, *Tectónica*, *Pasajes de Arquitectura y Crítica*, *Built-On*, *Yapi*, *Hinge* and *Detail*.

Statement of Significance

The project won first prize in an open international architectural competition organised by Banyoles Town Council (1998). Because of the project’s overall size, regeneration of the different areas has been phased. Awards include: Finalist, 5th Urban Public Spaces European Prize (2008); Finalist, Landscape European Prize, Rosa Barba (2008); Winner, Catalonia Construction Award (2009); Finalist, FAD Awards (2010); Selected Project, Obra del Año Plataforma Arquitectura (2011); Winner, International Stone Awards (2013).
Recs have been the natural lake drainage system used for watering orchards and as a motive force for local industries, as well as an economic, social and urban backbone for the city of Banyoles.
**Introduction**

In the ninth century the monks of Sant Esteve Monastery, in the first settlement of Banyoles, built a system of drainage canals, or recs, excavated from the lacustrine travertine plate beneath the town, to provide water from Banyoles's lake and to avoid the frequent localised flooding. The recs run from the south-east bank of the lake through the old town and branch out into irrigation canals before emptying into the river Terri. The water was used for farming and pre-industrial craftworks. However, the canals were then covered until this project, which stripped away the existing pavement to expose the historical substrate of the town, uncovering the remains of buildings, tombs, objects and old canals. The aim is to render these vestiges visible within the redevelopment project, reincorporating the recs back into the streets. [fig.1–4]

**Aims and Objectives**

**Heritage**

As in every refurbishment project, a significant decision is choosing which previous era should be recovered. A deep historical and archaeological study was conducted into the town's heritage, especially its medieval old town, when most of its architecture was built and the townscape was established. The proposal tries to refloat the sunken past, to make legible the unique physical history and geology of the town. But it also makes these invisible layers compatible with the new pedestrian and low-traffic use of the streets, enabling a fluid and organic use of public space. The pavement is treated as if the stone itself were a liquid; vibrant like a cascade on the slopes, and still on the flats. Like traces of drift, trunk-benches, undulating silhouettes and random fragments of ruins are revealed. The pavement is now sculpted, even eroded, by the groundwater, in the form of canals and troughs along the direction in which the water runs. [fig.5 & 6]
Canal in Carrer del Born, running next to a façade

Photograph Adrià Goula
Children understand how the canals flow while they play with paper boats

Photograph Adrià Goula
Canal pond in the forefront of the arcaded square Plaça Major

Recovered fountain and canal pond in Plaça dels Estudis

Photograph Adrià Goula

Photograph Adrià Goula
Context

This refurbishment explores the use of the past as a material for designing a contemporary public space that is highly equipped, comfortable and flexible for modern life. Due to its unique circumstances, the project is one of the first of its kind, especially in terms of using the local material to pave and channel the water. By choosing the same stone used in Banyoles architecture, lacustrine travertine, we have revived the public space of the town as a new, meaningful, folded and cut pavement.

Banyoles, like many European towns or cities, is the result of historical layering. Different moments of its evolution can be imagined in a tiny detail. Our contextual research has considered material and immaterial heritage: buildings, objects, works of art, but also volumes, voids and abstract structures. Our proposal aims to refloat this heritage that had ‘sunk’ underground to redefine the surface of a new social space. The project focuses the attention in two main ideas.

a. Latent history of water

In order to reinterpret the remains of the past and meet new needs, we used techniques to preserve the material heritage and protect it for other generations.

The old town of Banyoles had completely lost the main features that defined it: water canals, orchards, materials, walkable streets, etc. It had been invaded by cars, and it had forgotten its lacustrine identity. Previously, the water canals irrigated kitchen gardens, and provided water for domestic use and public laundries. They also powered machinery in the town’s textile and agricultural industries. Once these industries had died out, the network of canals was relegated to a sewer system, where clean rain-and lake-water mixed with dirty water.

Banyoles Council has protected the old town’s heritage through a special urban plan, but it is only this project that has retrieved the originality of the canals as a specifically Catalan technology. Their original industrial role is changed into a public landscape, referencing this unique geological and historical context.

Water is also part of Banyoles’s everyday experience and heritage. Water canals, together with the lake, have defined the town in all its shapes and uses. This irrigation system was the town’s first infrastructure and often corresponds with still-existing boundaries between plots of land. Above all, the proposal highlights the recorded heritage as well as latent historical aspects that time has hidden, phenomenological qualities such as sound and change of material that reappear through the folding or shape of the pavement, and through the water flow itself.

The project reconnects the town to Banyoles Lake, an outstanding feature of the area, karstic in origin, and the largest local natural lake of the Iberian Peninsula (2,150m long, surface area 111.7hm²). It has recently been declared as PEIN (Special Plan for Natural Interest Spaces) by the Catalan Government, and is part of the 2000 Natura Net and Wet Areas Ramsar List. [fig. 7–12]
Banyoles Old Town refurbishment
Banyoles was established on a limestone plate (a result of centuries of lacustrine material sedimentation), surrounded by aquiferous wellsprings and former volcanic areas.
The map shows the relationship between Banyoles Lake, the old town and the modern city of Banyoles. The surface which occupies the old town corresponds to the walled area of the medieval city. The demographic growth is graphically clear: from 172 inhabitants in the 16th century (blocks marked in black) to 18,700 inhabitants in 2010 (blocks marked in grey).
Plaça Major is the central arcaded square where the regular local market is held. Photograph Adrià Goula

Both buildings and voids are part of the heritage, as well as patterns and plantations. Like many market squares in Catalonia, Plaça Major’s pavement was made of granite gravel; the project’s aim was to respect that value. Photograph Adrià Goula

Entrance of Carrer Abeuradors to Plaça Major. Most of the buildings are catalogued and protected, representing a unified historic urban fabric. Photograph Adrià Goula
b. Pedestrianisation

Before the project began, the old town of Banyoles was full of cars, leaving little room for pedestrians, and causing physical and air/particle pollution damage to the porous travertine buildings. In addition, parked cars occupied public spaces which should have been for people and public activities. [fig.13–15]

Questions

How can the identifying physical history and geology of the town be legible in the regeneration of its public spaces?

An important research question was how to establish a design syntax for paving the old town. A simple global strategy had to be invented in order to pave the whole old town despite all its particularities. Two main items defined this research: the heritage patterns and the geometric possibilities of the stone. Both gave clues to how the stone had to be placed in terms of size and layout.

How can one create a common material background for architectural and urban heritage by designing pedestrian-only public spaces?

One of the questions was how to design a place for pedestrian life that rediscovers the old town’s resources and re-envisions its public spaces. Because of the existence of numerous uncatalogued archaeological sites throughout the old town, the project had to be based on strict procedures to achieve the local government standards for excavation and documentation, as well as realise a complete refurbishment of the remains.

How can one modernise services and facilities (plumbing, low-tension telephone and gas networks, and the drainage system) effectively while respecting Banyoles’s architecture, urban morphology and natural features?

One of the most challenging questions was how to make heritage and contemporary life compatible. Banyoles’s past had to be uncovered literally and prepared to coexist with new services and networks (such as a new drainage system, plumbing and low-tension networks) that had to be built to meet current necessities. [fig.16 & 17]
The whole plan for the old town has transformed the experience of the city, returning its pedestrian use and accessibility. Photograph Adrià Goula

The pavement is an extension of the built environment, made of the same limestone that is naturally produced by the lake’s sediments and used for building the city. Photograph Adrià Goula

All the service networks were updated and integrated in the pavement layout. Photograph Adrià Goula

Canals have shaped the city by delimiting spaces, influencing urban patterns and enabling economic activities. Photograph Adrià Goula
Pavement pattern in Carrer Major, with troughs for collecting rainwater and service outlet boxes integrated in the layout

Photograph Adrià Goula
Aerial view of Carrer Abeuradors pavement and canals
Photograph Adrià Goula
Archaeological research

Banyoles Town Council did not possess very accurate previous information: i.e. precise digital cartography, detailed archaeological records, or the exact positioning of canals under its pavements. The design challenge was to include all this concealed information in the new pavement syntax without making mistakes. For these reasons, we were obliged to maintain a continuous and constant presence at the site, readapting construction strategies and solutions together with the craftsmen and builders. In fact, many decisions had to be taken on site through easy-to-follow guidelines.

In Banyoles, any kind of excavation has to be followed by an archaeological mapping which builds a database with all the gathered information. Subsequently, the autonomous government Generalitat de Catalunya passes judgement on what steps should be followed, i.e. whether remains should stay or be taken to the museum. In our case, these archaeological findings helped us define departing points for ideas and design.

The Council knew that some archaeological remains existed as they had written registers of historical facts. However, until our project, when the entire pavement was changed, it had not been possible to study, catalogue and give value to the underground heritage of Banyoles. For example, the necropolis around Santa Maria dels Turers has recently been uncovered and studied, as well as Roman and medieval archaeological sites underneath Plaça Major.

Political consensus

One of the main difficulties has been to maintain consistent political interest in this project through to completion. Thirteen years have passed since the project began and during this time there have been three different political parties in Banyoles Council. Throughout, there has been a general economic, social and civic consensus to carry out the project because of its unique heritage value. However, each party wanted to correct the former Council’s work, resulting in a continuous political struggle. Apart from this, there were technical problems which emerged due to the layered nature of the ground of the old town since every excavation revealed new information which required the project to be redefined.
Existing urban furniture, such as this stone fountain in Plaça de la Font, were refurbished and recovered. Photograph Adrià Goula

New details were added in order to give back the original meaning of the old urban furniture. Photographs Adrià Goula
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In some areas, archaeological remains have been discovered. In Plaça del Teatre, the pavement layout is designed following the wall lines of a demolished theatre that existed previously.
Photograph Adrià Goula

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Inhabitants and visitors rediscover Banyoles’s origins in the new image of the old town.
Photograph Adrià Goula
Banyoles is a central point in a large region, and a reference for nearby towns and for tourism. Because of the town’s strategic location, the cost was covered by different institutions:

— Banyoles Council, 25%
— Girona Area Deputation, 15%
— Generalitat de Catalunya (autonomic government), Built Environment Department (and European Funds for Regional Development), 50%
— Neighbours’ special contributions, 10%.

[fig. 18–22]

Methods

Urban landscape research for developing a design syntax for paving the old town from its heritage patterns/geometries and qualities of the stone.

On a masterplan level the work has been done in phases, each one with its basic and executive projects, with its budget studies, constructive solutions, historical approximations, and water and lighting engineering. Precision was needed for the stonework for every square as well as for the general patterns and criteria which would be usable as a syntax for designing other areas in the old town. Each phase is the continuation of the previous and all the water and service networks are connected and considered as a whole. Four phases have been completed: Plaça de la Font (2008–2009); Plaça dels Estudis (2009); Plaça del Teatre (2010); Carrer de l’Església and Carrer del Forn (2011–2012). Currently, Plaça de Santa Maria – Carrer de l’Església are underway, due to be completed by December 2013. A further 10 streets/squares are also planned.

Design research methods for creating a place for life that rediscovers the old town’s resources and re-envisions its public spaces, e.g. by making its canals visible.

The research and design process involved:

a. Water systems separation: Complete separation of water systems into clean-rainwater canals and sewage system, which previously, were mixed. [fig. 23–28]

b. Recovering the original sections: Restoration of the best-conserved sections of the canals, as in Carrer Abeuradors.

c. Sculpting water and the local stone: The main materials of the project are those related to water. Water itself is the matrix material, running from the lake all along the town in canals. Travertine,
24 & 25
Plaça Major

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Plaça Teatre
Axonometric construction details.
A. Canal areas

A1. Local limestone pavement piece, 7cm thick
A2. Mortar layer, 5cm thick
A3. Reinforced concrete support with electro-welded steel mesh for road traffic areas
A4. Lean concrete layer, 10cm thick
A5. Natural compacted ground
A6. Waterproofing asphalt sheet over mortar regulation layer
A7. Special pieces forming the bed of the canal, 5cm thick
A8. Special pieces for the canal border
A9. Façade wall of the existing buildings
A10. Slab covering the thickness of the canal located in building’s entrance doors
A11. Overflow tube
A12. Underground canals and rainwater evacuation networks: high-density polyethylene pipeline over concrete bed, covered by compacted graded aggregate
A13. Sewage system network: high-density polyethylene pipeline over concrete bed, covered by compacted graded aggregate
A14. Water supply network: high-density polyethylene pipeline, with half of the pipe covered by sand over a concrete bed, covered by another half pipe of superior protection and filled with compacted graded aggregate
A15. Low voltage network: PVC pipeline, copper cable with PVC isolation coating and superior marking strips
B. Drainage systems

B1. Local limestone pavement piece, 7cm thick
B2. Mortar layer, 5cm thick
B3. Concrete support for walkable areas, 10cm thick
B4. Lean concrete layer
B5. Natural compacted ground
B6. Special pieces for the rainwater drain, 10cm thick
B7. Steel plates welded and anchored with chemical bolts, forming the support for the drain border pieces
B8. Concrete prefabricated gutter
B9. Steel plates to protect the edge of limestone pieces in tree pits, 1cm thick
B10. Layer formed by vegetal earth for the tree pits
B11. Layer formed by the mixture of granite gravel, quarried gravel and organic matter
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Views of the canal and pond at Plaça del Teatre
Photographs Adrià Goula
formed in the waters of the lake as well, is the base material for covering, folding and opening the pavement. It is easy to cut and to transport stone quarried in the outskirts of Banyoles, where larger prehistoric lakes left deposits of travertine.

By using travertine, the project gets completely camouflaged in the context of treating the road as the third façade of the town. Travertine is used in façades and monuments, resulting in a complete continuity between façades and pavements. Pieces of urban furniture, such as benches, have been designed especially for this project as wooden trunks which have been drifted metaphorically by the ‘liquid’ pavement. [fig. 29–31]

**Integrated design and historical research towards the creation of a continuous ‘historical’ pavement. The main design tools are based on traces of remains, plot divisions, ruins and water canals.**

The main design tools were based in historical research. Traces of remains, plot division, ruins and water canals were the leading design agendas in the project. This new pavement included different aspects related to conservation and design. The contact of façades with the soil was restored and several systems of protection were used to avoid damage caused by humidity or capillarity. Research included investigating how to manufacture and control a wide range of pieces, considering specific mechanical and material properties, resistance to erosion and water, prefabrication and cost.

**Meeting local government heritage standards.**

Departing from the available scarce information given by the Council, the deconstruction process of the existing pavement helped to reveal, catalogue and map precisely what was found. After that, and following government standards, objects were taken to the museum and ruins were protected and covered again. This new cartography was used to design the patterns of the pavement.

Physically there were just a few elements that had to be restored; the project focuses on public spaces which were formerly made of tar and concrete. However, some urban furniture and other elements needed restoration because they were going to play a part in the project: a stone fountain in Plaça de la Font; iron fountains in Plaça dels Estudis and Plaça del Teatre; stone arches of the original canal in Carrer Abeuradors, near Plaça Major; and big medieval pieces of travertine which were later reused for paving Plaça Major. Each one of these elements was cleaned with non-abrasive techniques and protected against erosion. When mortar was damaged it was refilled with a similar one, and broken travertine pieces were repaired [fig. 32–34]
The pavement is designed to drive and collect both rainwater and the water from the fountains.

View of Plaça dels Estudis. Urban furniture helps to solve level differences, such as the entrance of the Darder Museum.

Photograph Adrià Goula
By using the same material, the pavement turns out to be the third façade of the public space, making the void legible as a volume.

Photograph Adrià Goula

Views of Plaça del Teatre and Plaça de la Font, where the variety of the pavement pattern and shape can be noticed

Photographs Adrià Goula
Handcrafted techniques combined with industrialised processes.

In addition to 2D and 3D drawings (plans and sections) that describe the project with precision, special wooden models of particular pieces were made to be used as a reference during construction by the builders. These models were communication documents between stonemasons and the office. [fig. 38]

The rectangular pieces of the pavement were cut industrially into different sizes and proportions, whereas all the border pieces of the canals and special shaped pieces were sculpted manually on site by specialised local craftsmen. Due to a higher resistance standard (borders), a harder variety of stone was used. [fig. 35–37]

After the archaeological documentation was finished, service networks were installed (fresh water, rainwater, wastewater, gas, low/medium voltage, telephone and fibre-optic networks) in designed excavated areas and connected to individual building nets. Canals were then built with a twin scheme, capable of driving extra water through an auxiliary underground canal. Once every net was tested and protected, a horizontally stable pre-layer was laid to create a plane surface, leaving the canals uncovered. Special pieces were then placed, building the bed and the borders of the canals, and finally, industrialised pieces were laid. Many pieces of urban furniture such as fountains were also made on site, using wooden moulds and standards to precisely measure sizes and shapes as stone requires exact joints. [fig. 39]
Dissemination

The project has been exhibited in several exhibitions throughout Europe, including:


*Wonderland, Platform for European Architecture* (2011-2009): Vienna; Brno, Czech Republic; Barcelona; Florence; Terni, Italy; Steinhaus, Austria.


*In Favour of Public Space: European Prize for Urban Public Space* (2008): Belgrade, Serbia; Novi Sad, Serbia; Bucharest, Romania; Leuven, Belgium.

The project has been presented in nearly 40 lectures all over the world, including in:

Montevideo, Uruguay (2008); Zaragoza, Spain (2008); Alghero, Italy (2008/2011); Las Palmas de Gran Canaria, Spain (2010); Toulouse (2010); Valencia (2010); Chihuahua, Mexico (2011); London (2011); Catania, Italy (2011); Barcelona (2011/2012); Lisbon (2012); Port Vendres, France (2012), Kiev, Ukraine (2012); and São Paulo (2012).

It has been reviewed in articles, books and magazines, including: *On diseño, Mas Context, Arquitectura Viva, Deutsche Bauzeitung, Tectónica, Pasajes de Arquitectura y Crítica, Built-On, Yapi, Hinge and Detail.*
Related publications by the researcher

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Bloom
by Alisa Andrasek
and José Sanchez

House of Flags
by AY Architects

Montpellier Community Nursery
by AY Architects

Design for London
by Peter Bishop

2EmmaToc / Writtle Calling
by Matthew Butcher
and Melissa Appleton

River Douglas Bridge
by DKFS Architects

Open Cinema
by Colin Fournier
and Marysia Lewandowska

The ActiveHouse
by Stephen Gage

Déjà vu
by Penelope Haralambidou

Urban Collage
by Christine Hawley

Hakka Cultural Park
by Christine Hawley,
Abigail Ashton, Andrew
Porter and Moyang Yang

House Refurbishment in Carmena
by Izaskun Chinchilla
Architects

Refurbishment of Garcimuñoz Castle
by Izaskun Chinchilla
Architects

Gorchakov's Wish
by Kreider + O'Leary

Video Shakkei
by Kreider + O'Leary

Megaframe
by Dirk Krolikowski
(Rogers Stirk Harbour + Partners)

Seasons Through the Looking Glass
by C.J. Lim

Agropolis
by mam

Alga(e)zebo
by mam

Chong Qing Nan Lu Towers
by mam

ProtoRobotic FOAMing
by mam, Grymsdyke Farm
and REX|LAB

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by Miàs Architects

Torre Baró Apartment Building
by Miàs Architects

Alzheimer’s Respite Centre
by Níall McLaughlin Architects

Bishop Edward King Chapel
by Níall McLaughlin Architects

Block N15 Façade, Olympic Village
by Níall McLaughlin Architects

Regeneration of Birzeit Historic Centre
by Palestine Regeneration Team

PerFORM
by Protoarchitecture Lab

55/02
by sixteen*(makers)

Envirographic and Techno Natures
by Smout Allen

Hydrological Infrastructures
by Smout Allen

Lunar Wood
by Smout Allen

Universal Tea Machine
by Smout Allen

British Exploratory
Land Archive
by Smout Allen
and Geoff Manaugh

101 Spinning Wardrobe
by Storp Weber Architects

Blind Spot House
by Storp Weber Architects

Green Belt Movement
Teaching and Learning Pavilion
by Patrick Weber

Modulating Light and Views
by Patrick Weber