Culture Programme

Education and Culture DG

TERRA INCOGNITA
ARCHITECTURES DE TERRE EN EUROPE

Région Provence-Alpes-Côte d'Azur

École Avignon

escola superior gallaecia

UNIVERSIDAD POLITECNICA DE VALENCIA

www.culture-terra-incognita.org

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Printed by Laffont, Avignon (France)

This project has been funded with support from the European Commission.
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Outstanding Earthen Architecture in Europe

Award 2011

The Terra [In]cognita project

Terra [In]cognita (Earthen architecture in Europe) is an European project funded within the framework of the European programme “Culture 2007-2013”, and also supported by the Provence-Alpes-Côte-d’Azur Region (France). The project is leaded by the Ecole d’Avignon, Training Centre for the Rehabilitation of the Architectural Heritage (France), and implemented in partnership with the Escola Superior Gallaecia, Vila Nova de Cerveira (Portugal), the Polytechnic University of Valencia, Institute for the Restoration of Architectural Heritage (Spain), the University of Florence, Department Technology of Architecture and Design (Italy) and the Adviser in Architecture, Urban planning and Environment (CAUE) of Vaucluse, Avignon (France).

Earthen construction and architecture is prevalent in many European countries. The thermal qualities of raw earth and the availability of materials on-site made it an attractive choice in housing construction. Although the technologies used have developed over time, this architecture remains fragile and threatened. However, research and projects are currently being undertaken to rehabilitate the image of this form of building and to highlight its significant environmental and climatic qualities.

The issues around the protection of this unique heritage and the promotion of contemporary sustainable architecture, deserve to be given a higher profile and brought to the attention of professionals, the authorities and the general public.

Outstanding Earthen Architecture in Europe

One of the main objectives of the Terra [In]cognita project is to raise public awareness of earthen architecture, its heritage and its current applications. With this aim, an «Outstanding Earthen Architecture in Europe» Award has been set up. The Award focuses on a selection of significant earthen constructions, and will certainly encourage the preservation of this heritage, and the development of contemporary earthen architecture.

Three categories of buildings are distinguished:
- Category 1: Buildings with archaeological, historical or architectural interest
- Category 2: Buildings subjects of a remarkable and relevant intervention (restoration, rehabilitation or extension)
- Category 3: Buildings constructed after 1970.

Under the Awarding Regulation, 42 buildings have been shortlisted by the Awarding Commission, which comprises the following personalities, appointed by the International Scientific Committee on Earthen Architectural Heritage (ISCEAH) of ICOMOS and the different partners: Maddalena Achenza (Italy), Mariana Correia (Portugal), Valentina Cristini (Spain), Gabriel David (France), Hubert Guillaud (France), John Hurd (United Kingdom), Pamela Jerome (United States of America), Jacob Merten (Portugal) and Yvan Saint-Jours (France).

René Guérin, representative of the Adviser in Architecture, Urban planning and Environment (CAUE) of Vaucluse, was responsible for organising and coordinating the 2011 Award.

We invite you to discover the shortlisted buildings from across Europe, which demonstrate the great richness and diversity of earthen architecture, and also, paradoxically, a shared culture in terms of construction methods.

Regulation

Subject of the Award

Article 1: The “Outstanding Earthen Architecture in Europe” Award 2011 Committee organizes a campaign with the aim to single out the earthen buildings which are among the most outstanding of the European Union, on one hand, and to disseminate their knowledge, on the other hand. The Committee is formed by Ecole d’Avignon (France), Adviser in Architecture, Urban planning and Environment (CAUE) of Vaucluse (France), Gallaecia High School (Portugal), the « Architecture and Design » Department of the University of Firenze (Italy) and the Academic Institute for Heritage restoration of the Polytechnic University of Valencia (Spain), partners of the project “Terra [In]cognita” n° 2009-0758 of the European Programme “Culture 2007-2013”.

Candidature for the Award

Article 2: The Award concerns every building (houses, construction works…) entirely or partially built with earth, protected or no protected, located in the European Union, whichever its owner: natural person, public or private legal entity.

Article 3: The application form for the Award is formed by the written agreement and the acceptance of this regulation by the owner of the building. This agreement explicitly allows use and publication free of right, by the “Outstanding Earthen Architecture in Europe” Award 2011 Committee, of every type of document (plans, pictures...) concerning the building candidate for the Award.

Article 4: In case of cancellation of the campaign for the Award by the “Outstanding Earthen Architecture in Europe” Award 2011 Committee, whatever the cause, the owners of the buildings candidates for the Award cannot claim any compensation.

Article 5: The application forms with original signature of the owners must be sent by post to CAUE of Vaucluse [2, avenue de Fontcouverte 84000 – AVIGNON (France)] before January, 31st of 2011. The description forms of the buildings candidates for the Award must be sent by e-mail to CAUE of Vaucluse [reneguerin@caue84.fr] before January, 31st of 2011 (pictures unload in a Website with large storage capacity).

Awarding

Article 6: Three categories are distinguished:
Category 1: Buildings with archaeological, historical or architectural interest;
Category 2: Buildings subjects of a remarkable and relevant intervention (restoration, rehabilitation or extension);
Category 3: Buildings constructed after 1970.

Article 7: The buildings are awarded if they obtain more than 60 points on 100, after marking from description forms by the “Outstanding Earthen Architecture in Europe” Award 2011 Commission, in accordance with the following balanced criteria:

Category 1: Buildings with archaeological, historical or architectural interest	Archaeological, historical or architectural interest	Quality of the nearby environment (landscape, urban, rural or natural space)	Use value (appropriateness of the building to the present use)	General state of the building (building work, finishing, networks…)
	40 points	**20 points**	**20 points**	**20 points**
Category 2: Buildings subjects of a remarkable and relevant intervention (restoration, rehabilitation or extension)	Relevance of the intervention (respect of the character of the building, conceptual approach…)	Archaeological, historical or architectural interest	Technical mastery of earthen building (earthen works distinctiveness, possible innovative processes…)	Use value (appropriateness of the new use to the characteristics of the building)
	40 points	**20 points**	**20 points**	**20 points**
Category 3: Buildings constructed after 1970	Architectural quality (form, materials, texture, colour, dialectic with the site…)	Technical mastery of earthen building (earthen works distinctiveness, possible innovative processes…)	Technical performances of the building (i.e.: thermal insulation, soundproofing, conformity to paraseismic rules…)	Functional performances of the building (appropriateness with use and future uses, state of the works, running and maintenance coasts…)
	40 points	**20 points**	**20 points**	**20 points**

Article 8: The “Outstanding Earthen Architecture in Europe” Award 2011 Commission is formed by members individually nominated by the partners of the project “Terra [In]cognita”, and by members of the International Scientific Committee on Earthen Architectural Heritage (ISCEAH) of ICOMOS.

Article 9: The “Outstanding Earthen Architecture in Europe” Award 2011 Commission will pronounce before March, 31st of 2011. Its decision is irrevocable.

Effects of the Award

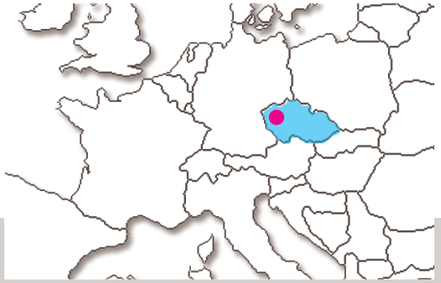
Article 10: The Award doesn’t impose any heritage protection easement of the building. However, the “Outstanding Earthen Architecture in Europe” Award 2011 Commission reserves the right to disseminate information concerning the awarded buildings, in particular the description forms, to the international organizations and authorities in charge of heritage protection (States, local authorities).

Article 11: The Award doesn’t impose any private law easement; however, the clauses of this regulation remain valid after transfer of property of an awarded building, unless in case of explicit termination by the new owner.

Article 12: The Award will be presented to the public on May, 4th of 2011 in Marseilles (France), within the framework of an international seminar on earthen architecture, jointly organized by the partners of the project “Terra [In]cognita” and ICOMOS France.

Category 1: Buildings with archaeological, historical or architectural interest

Traditional farm in Čistá (Severovýchod)



Owner: Mr Jiří Syrový
Date of building: End of the 16th century
Date of restoration: 1996 – 2009
Architect of the restoration: Mr Jiří Syrový
Address: 171 – Čistá

This protected farmstead is part of a string of such constructions along the River Loučná, formed by Benátky, Čistá and Trstěnice villages. Parts of them were proposed for protection because of the presence of remarkable vernacular buildings from early modern period. The farmstead was built with daubed earth and includes a farmhouse, a barn and stables. It was identified by an inventory survey as a farmhouse with the smoky (all-purpose) living room of late medieval tradition. The two-storey part of the house was completely rebuilt between 1672 and 1692. The north-western wall and kitchen were reconstructed in approximately 1840. The house was abandoned after 1945 and used as a storehouse for building materials. The buildings have been restored in collaboration with Litomyšl museum, giving several new functions to the farmstead: a small "in situ" museum, workshops and a secondary house.

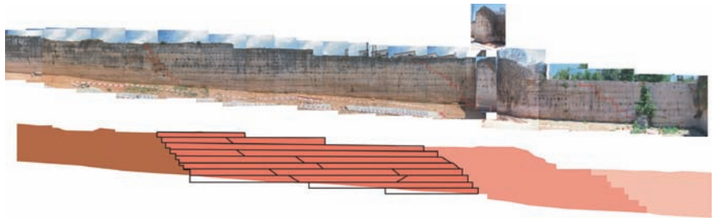
Zuzana Syrová

Jiří Škabrada

Zuzana Syrová

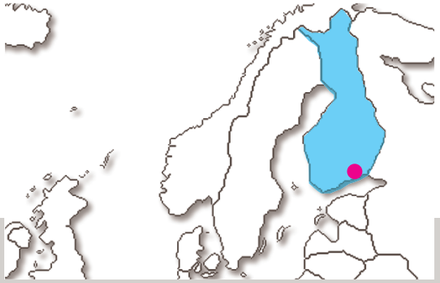
Wall of Alberzana in Granada

Owner: Junta de Andalucia
Date of building: 1333 – 1354
Date of restoration: Since 1960
Architects of the restoration: Francisco Prieto-Moreno (1960), Martin and Antonio Marcelino Orihuela (1985), D. Javier Gallego Roca (1997)
Address: Albaicín, Camino Viejo de San Antonio – Granada



Castilian raids, which reached the outskirts of the city in the late 13th century, including a raid by Alfonso X in 1281, were the reason for building defences in this suburb. The wall was commissioned by Sultan Yusuf I, at the request of his Minister Ridwan. The Wall of Alberzana has been protected since 1922, and is one of the largest monuments built with rammed mud. The temporary structures of the wall are wooden planks that make up the formwork assemblies, holding the mud in place. The formwork used measured approximately 2.50 x 0.80 metres and was formed by three or four boards. The wall covers an area with a sloping topography, and is particularly noteworthy for the significant role it has played in shaping the urban structure of the city. The most recent restoration and enhancement project, covering the wall and its surroundings, was promoted by the Albaicín-Granada Municipal Foundation and aims to recover it as a gardened public area around the monument.

The Clay house in Strömfors

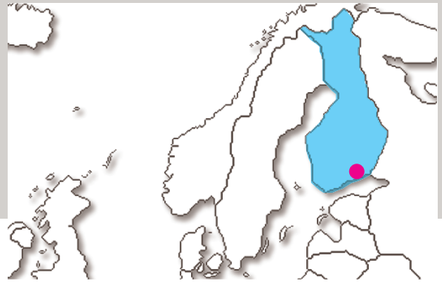


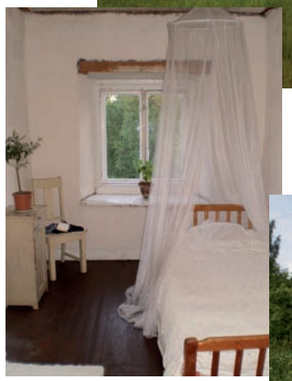
Owner: Municipality of Loviisa
Date of building: 1784
Date of restoration: 1991
Address: Puistokuja, 19 – Strömfors

The ironworks were founded in 1695 in Petjärvi village. The location was good because of the waterfall and the surrounding forest, which provided power and heat. The original ironworks were burnt down in 1711. The estate was sold in 1744 and the works were rebuilt between 1780 and 1890, and re-named “Strömfors Ironworks”. The Clay house consisted of 15 apartments for workers. It was built from a mix of clay, sand, straw and heather; its roof was made of shingle coated with tar. In the early 19th century, the building’s outer walls were treated with lime and it was used as a roadhouse. The municipality of Ruotsinpyhtää restored the building in 1991 and it is now rented out and used as hotel.

Fishing farm in Pyhtää

Owner: Mr Bo Karsten
Date of building: Around 1830s
Architect of the restoration: Teemu Kuivalainen
Address: Suluntie, 1 – Pythää





The farm was built for fishing by monks of the Caselian Monastery in Russia and is located by the rapids of River Kymijok. Nowadays the rapids are managed by locks which are unique in Finland, because they are only ones which are still operated manually. The building was constructed on a base, formed from big stones on one side because the house is on a hill, and from smaller stones on the other side. The walls were built with clay, heather branches and horse dung. The clay was daubed around a base structure of timber. At the beginning of the 20th century, a little wooden terrace was added by the "Stockfors Wood Industry" company. The farm has been recently been restored for use as a holiday home.

Cistercian barn of Bois Bedat in Juilles (Gers)

Owner: Mr Pierre Rouméguère
Date of building: 15th century
Date of transformation: 1891
Address: Lagrange – Juilles

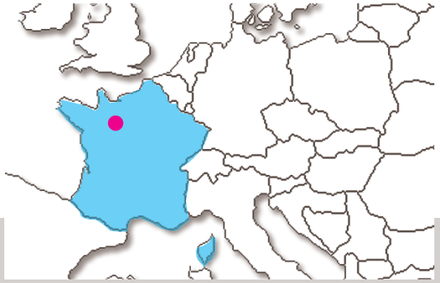
This barn was built on a base formed by an ancient Roman fort (castrum), constructed with cob walls. It was initially the property of the Abbey of Panselve in Gimont, founded by Cistercians in 1142. After the French Revolution, the Abbey of Panselve and its lands were expropriated as national public property, then the barn of Bois Bedat was sold. In 1891 the new owner converted the lower part of the barn into a home, notably by building dividing walls for the rooms with adobe bricks. The house was sold the same year to the family that has since owned the building continuously until the present day. The lower part consists of thick cob walls, with the exception of the western part, which was built with daubed earth and adobe bricks, while the corbelled upper part has a half-timbered structure with daubed earth. At present, this exceptional monument is damaged and is not protected.

Castle of Vaugirard in Champdieu (Loire)

Owner: Mrs Marie-Caroline Coyne
Date of building: Beginning of the 17th century
Address: route de Chalain-d'Uzore – Champdieu

Vaugirard Castle is located in the Forez Plain, which was formed by sediment from the Miocene era, and is famous for its clay resources, which have been used to build many rammed earth constructions over the years. The castle, which has been protected since 1970, and particularly its round tower, is an unusual example of prestigious rammed earth building. The monument was probably built in 1605 by an Adviser to the King Henri IV, and is nowadays surrounded by outstanding English style gardens that were landscaped in the 19th century. With its slate roofs topped with pinnacles, the castle is a beautiful example of French Classic style, characterized by the triangular pediments of the stone gate and main door. Inside, the reception room decorated with a fresco of the King Louis XIV Grand Carrousel is a must-see attraction.

Camp of Beugy in Sainte-Suzanne (Mayenne)



Owner: Municipality of Sainte-Suzanne
Date of building: 1083
Address: route d'Assé-le-Bérenger – Sainte-Suzanne

From 1083 to 1087, William the Conqueror, Duke of Normandy and future King of England, laid siege to the town of Sainte-Suzanne held by Hubert II de Beaumont, Viscount of Maine. After the failures of his early assaults, he ordered the construction of an earthen camp for his army. The Camp of Beugy was built on the outskirts of the town according to a quadrilateral plan, probably taking advantage of an earlier Gallo-Roman fort. It is also known as the "Camp des Anglais" (English Camp), since the King and his army were regarded by this time as English, not Norman. Outstanding remains can be seen nowadays. The important role of earth for building defences make this monument particularly interesting, and it has been protected since 1937. Archaeological excavations should improve our knowledge of the composition of the works.

Notre-Dame-de-l'Assomption Church in Verlhac-Tescou (Tarn-et-Garonne)

Owner: Municipality of Verlhac-Tescou
Date of building: 16th century (probably)
Address: La Vinouze – Verlhac-Tescou

This church is in a little hamlet located on the crest of a hill, in rural area where clay buildings of different types are frequent. A little cemetery lies adjacent to the eastern side of the nave. The walls are built with rammed earth on a foundation of stone and terracotta bricks. The western wall, topped by the bell-tower, was built with terracotta bricks in the 17th century. The sacristy and the entrance porch were built with adobe bricks.

Casa Tola and mill in San Sperate (Cagliari)

Owner: Mr Benedetto Serra
Dates of building: Mill: End of the 17th century – House: 1848
Architect of the house: Gaetano Cima
Dates of restoration: House: 1995 – Mill: 2008
Address: Via Umberto, 31-33 – San Sperate

This property, which includes an olive mill and a house, is located on the outskirts of the historic centre of San Sperate. The mill was owned by the family of Marquis Cadello; the house was built about 150 years later by Giovanni Antonio Tola, Baron of San Sperate, on land inherited from the family of Marquis Cadello by his wife Isabella Cadello Asquer. Nowadays, the place belongs to the family of the Counts of Serra. Many generations of people worked here producing olive oil and other agricultural products. The traditional stone mill was closed down in 1956 with the arrival of mechanical mills. The house was built with adobe bricks (làdiri), while timber, cane, adobe bricks and stone were used for the mill. The original design was a complex of buildings around the internal courtyard, in line with local traditions, but the side-buildings were never built. The Neoclassical style of the house combined with a humble local material such as adobe creates a particularly graceful architecture. The place hosts art exhibitions and cultural activities in collaboration with the municipality.

The mill

House in Lobbi, Alessandria

Owner: Mr Angelo Giuseppe Robboni
Date of building: Beginning of the 19th century
Address: Via Cascinali Pagella, 12, Lobbi – Alessandria

This house is located near the Tanaro River, in the Alessandria Plain, formed by sediments which have long provided abundant clay resources for building the traditional rammed earth (cascinotto) constructions. The house, built by its owner with rammed earth, has not been significantly altered. While the outer walls and the façades are in need of restoration, the wooden and tiled roof is well preserved, as is the interior which contains two floors linked by a central stone staircase.

House in San Giuliano Vecchio, Alessandria

Owner: Mrs Anna Maria Gilardenghi
Date of building: 1750
Dates of restoration: 1850, 1881 and 2010
Architect of the restoration (2010): F. Chiara Robboni
Address: Via Piacenza, 80, San Giuliano Vecchio – Alessandria

This house is located in the little village of San Giuliano Vecchio, on the road connecting Alessandria to Tortona, on the southern edge of the wide Po Valley, where clay is the most ancient and typical building material. The house was built by its owner with rammed earth (cascinotto) and its look has remained practically unchanged since the 18th century. The building has four storeys: a living area on the ground floor and first floor, the ancient barn on the second floor, and a large storage loft on the top floor. This house has also been the object of climate studies by the Polytechnic University of Turin. The most recent restoration was funded by the Piedmont Region, under the framework of the Regional Law of 16th January 2006 pertaining to the special enhancement of earthen architecture.

Rural house in Kuzma

Owner: Mr Alojz Bojnec
Date of building: Beginning of the 20th century
Architect: Jurij Fartek
Address: Trdkova, 59 – Kuzma

This house is representative of local constructions in the Pannonian Plain, which was formed during the Tertiary era. In this landscape, clay is the typical building material used in local architecture. The walls are built with rammed clay, the roof is built with timber, and decking is made by fired clay. The building system is reinforced with pieces of straw. The walls are protected with daub and whitewash. The floors are made of compressed clay, laid directly onto the ground. The ground floor was the main living area in this house, so the attic was used for storing grain. The building was restored in 1943 after a fire, but is now in poor condition and its owner lives elsewhere.

Museum of vernacular architecture and living in Martovce (Komárno)

Owner: Municipality of Martovce
Date of building: 1879
Dates of restoration: 1920s, 1963, 1975 and 2000
Address: 14 – Martovce

This house is located in the rural village of Martovce, near the junction of two rivers Nitra and Žitava, in the Danube Valley, where clay has traditionally been an important building material. It is a typical rural dwelling built by its owner, Istvan Nagy using cob building techniques. The floor plan is rectangular, with the rooms added one behind another. The roof is thatched with reeds, a plant which grows locally. The gables of the sloping roof were made of willow using the wattle and daub technique, without earth plaster. The chimney was built on the vault using the wattle and daub technique with an earth plaster finish, which has been blackened with use. The floor is made of earth, painted black, with a yellow stripe along the walls and beds; its surface was covered by a thin layer of yellow sand. The Museum of Vernacular Architecture and Living has been established here since 1975: an exhibition of old furnishings from the house and local painted furniture shows how the agricultural communities used to live.

Hutterite Chapel in Veľké Leváre (Malacky)

Owner: Municipality of Veľké Leváre
Date of building: 1760
Date of restoration: 1990
Address: Habánsky dvor, 69 – Veľké Leváre

Some Anabaptists, who were gradually expelled from Switzerland moved and settled in southern Slovakia, where they were given land in 1588, because the local aristocrats appreciated their exquisite craftsmanship. The Hutterites built their yard in 1592 and it became the home of their self sufficient community. Nowadays, it is the largest and best-preserved yard of the Hutterite culture in Europe. The building is made of rammed earth; sometimes adobe bricks were used and fired bricks were used around the doors and windows. The walls are plastered with earth plaster and used to be lime-washed. The whole chapel is built on stone and fired brick foundations. The gable wall is built on two vaulted external walls. The ceiling is made with wooden beams and timber planks, and the partitions on the ground floor are a mixture of rammed earth and fired bricks. The gable was originally made with wattle and daub, as were the partitions in the attics. The monument has been protected since 1981: the chapel is used for religious services, while exhibitions are sometimes hosted on the attic level.

Museum of Hutterite crafts (Izra's House) in Veľké Leváre (Malacky)

Owner: Municipality of Veľké Leváre
Date of building: Beginning of the 17th century
Date of restoration: 1970
Address: Habánsky dvor, 78 – Veľké Leváre

Izra's House is located in the Hutterite Yard, which was established in 1588. After the Hutterite Chapel, Izra's House is one of the biggest buildings in the yard: it housed several families and a workshop. After the house opposite was slowly demolished by weathering in 1985, the empty space was converted into a quiet pedestrian square in 2010, and is now occasionally used for festivals. Like the other Hutterite houses, Izra's House has a big roof, in the late Gothic style from Southern Germany. The building is an rectangular house made of adobe brick walls built on stone foundations. Izra's House has three floors; the attic floor was divided into small rooms by wattle and daub partitions, which form part of the roof structure. The thick earth walls are plastered with earth plaster and lime-washed. The Museum of Hutterite Crafts was founded by the municipality in 1970; some exhibition items were donated to the museum by Izra's family.

Category 2: Buildings subjects of a remarkable and relevant intervention

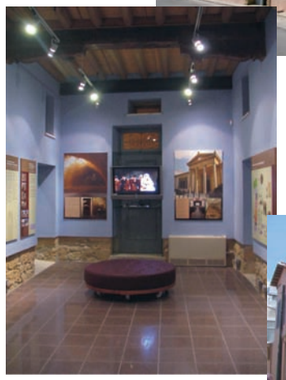
Bendida House in Narechenski Bani (Asenovgrad)

Owner: Mrs Varvara Valtchanova
Date of building: 1880s
Date of restoration: 2009
Address: Rahovitza, Kosovo – Narechenski Bani

This two-story farmhouse and its adjoining barns are located in Rahovitza hamlet, in the Rhodope Mountains. Bendida House has the typical features of traditional mountain houses, with its integration into the sloping ground, and distinct entrances to each floor. The ground floor walls, as well as some first floor walls, are made of stonemasonry with horizontal wooden reinforcement beams. The other first floor walls and the internal walls are made of daubed earth. The roofing is formed of flagstones on a heavy four-slope timber frame. The ground floor was used as a sheep fold, heating the inhabited first floor above. The first floor comprises a large corridor that used to have an open ceiling to the roof and four small rooms with wooden ceilings insulated with earth and straw. Bendida Farm had been abandoned for around twenty years when its present owner bought it in 2000. The objective was to transform this private house into a modern dwelling with contemporary levels of comfort, without altering its character. The restoration work was carried out between 2004 and 2009 with local materials shaped by hand tools, by Rhodopean craftsmen and around 80 volunteers from all over Europe, in yearly summer workshops.

Museums of the Pancyprian Gymnasium in Nicosia

Owner: Hellenic School board of Nicosia
Date of building: Beginning of the 20th century
Date of restoration: 2006
Architect of the restoration: Antonia Theodosiou
Address: Agios Ioannis / Theseos – Nicosia



The Museums of the Pancyprian Gymnasium consist of a complex of five Venetian and Neoclassic styles houses, which were unified after restoration in 2006. A sixth house will be incorporated in the near future. These houses were abandoned around 1980, and as a result a substantial part had collapsed, due to many years of neglect. In 2000, the State decided to restore and convert them into museums. The adobe brick walls were conserved and filled with mud whenever it was feasible; new adobe bricks walls with traditional lime coatings were constructed in place of the collapsed parts, and timber-framed tiled roofs were built. The adobe bricks were produced on site with a mixture of earth, straw and water. The roofing has been constructed on a paraseismic wooden frame, built on the walls, on top of the adobe bricks. The museums house major exhibitions concerning history of the Pancyprian Gymnasium, which was the first high school in the medieval city of Nicosia. The establishment of the museums has contributed significantly to the regeneration of the old city, not only due to the restoration work, but also the creation of cultural and educational spaces.

House built on Hellenistic tombs in Nicosia

Owners: Mr Achilleas Kentonis and Mrs Maria Papaharalampous
Date of building: End of the 19th century
Date of restoration: 1995
Architects of the restoration: Antonia Theodosiou, Naso Chrysochou (building permit)
Address: Agioi Omologites, 91B – Nicosia

This house is located in the vicinity of a necropolis, dating back to the Hellenistic era (310-30 BC). The walls were restored using the original material, adobe bricks, produced on site from a mixture of earth, straw and water. Four looted tombs were discovered during the restoration work. The tombs are carved into the rocks, forming steps and burial chambers. They were conserved, while systems of monitoring humidity and ventilation were installed. During the European Cultural Month in 1995, the owners of the house organized cultural events in the tombs, which were broadcast worldwide by electronic means; for at least one month, the tombs had been exposed to air for the first time 3000 years. The restoration was awarded the Europa Nostra diploma in 1997. In addition, this project represented Cyprus at the Biennale of Art and Architecture in Turin (Italy) in 1997.

Traditional house in Pera Orinis

Owner: Mr Vasilis Vasiloudis
Date of building: Beginning of the 19th century
Date of restoration: 2006
Architect of the restoration: Antonia Theodosiou
Address: Theodoulou Andreadi, 10 – Pera Orinis

This house has been listed since 1982, and is considered to be an exceptional and representative sample of traditional urban architecture. The foundations were constructed with river cobblestone and little lime stones, while the upper parts of the ground floor and first floor walls were built with plastered adobe bricks. The adobe produced on site consists of a mixture of earth, straw, little stones and water. A double wall system was built, with the mud-bricks being laid with the application of straw-based earth mortar; a coating of lime plaster was used for the inside surfaces of the adobe walls, and coatings of mud and straw were used for the external rendering. The arches were constructed with a calcareous limestone (pouropetra). The concept of the conservation plan was to adjust the modern lifestyle to the characteristics of the building and minimize the interventions needed in order to assure the functionality of the house. As a result, the interior and exterior spaces were kept the same, since there were no alterations regarding the plan and morphology of the building.

Hrabinovo farmstead in Kaňovice (Střední Morava)

Owner: Municipality of Kaňovice
Date of building: End of the 18th century
Date of restoration: 2009
Architect of the restoration: Edita Vlčková
Address: Farmstead n°19 – Kaňovice

The vernacular buildings and the historic structure of Kaňovice are typical of the Luhačovické Zálesí area, where old settlement meets the hilly countryside that was colonised later. The original building techniques of this area were corner-timbering and rammed earth, both replaced since the end of the 18th century by adobe bricks. The Hrabinovo farmstead consists of a dwelling-house, stables, a small cellar and a two-storey granary. The farmhouse and granary were constructed at the end of the 18th century, while the stables were rebuilt during the 19th century. All the buildings are built with adobe bricks. The timber ceiling is covered with a protective earthen layer. The walls are covered with earthen plaster and white-washed with lime. The painted blue band (podrovnávka), characteristic of Slovácko region, forms a border at the base of the walls. The municipality of Kaňovice bought Hrabinovo farmstead in 2005, with the aim of organising local events, notably linked with folk traditions, and to create an open-air museum to present traditional interiors, tools and equipment.

Traditional farmstead in Lysovice (Jihovýchod)

Owner: Mrs Edita Vlčková
Date of building: Middle of the 18th century
Dates of restoration: 1953, 1964 and 2008
Architect of the restoration: Edita Vlčková
Address: Farmstead n°33 – Lysovice

Lysovice is part of the "Germanic Insula" of 8 villages founded during the 13th and 14th centuries, the period of German colonisation. The settlers adopted traditional local building forms and technologies and thanks to their conservative temperament several ancient features survived here: houses with porches (žudr); wooden chambers in the loft for grain storage, covered with protective earthen coatings (lepenec); hand-decorated plastic earthen surfaces (murl). The most ancient part of the farmstead is the farmhouse, which had a thatched roof until a fire in 1951. Thanks to the protective earthen layers on the upper side of ceilings, only the plastering and the roof required partial reconstruction after the fire. In 1953 only the porch was thatched, and the plastic earthen surface was replaced by lime rendering. In 1969, part of the stables and coach house were demolished and a new relatively small house constructed in their place. The present owner bought the farmstead in 2000. After repairing the damaged structures, the plastic earthen surface and the earthen coatings were restored, the stables were partially rebuilt and the house was roofed with cane. At present, this private farmstead is also used as a place for workshops and training courses, notably earthen building courses.

Bofilla Tower in Bétera (Valencia)

Owner: Municipality of Bétera
Date of building: Second half of the 12th century
Date of restoration: 2010
Architects of the restoration: Fernando Vegas, Camilla Mileto (Universidad Politécnica de Valencia)
Address: Plot 055 – 074b – Bétera

Although this Muslim watchtower is isolated, it belongs to a network of watchtowers across the region. Over the centuries the tower was transformed, with a barbican added, not for military reasons, it may have been used as a store. The original building has a narrow upper entrance, protected by a ladder. The body of the tower is divided by a set of ceilings (destroyed) and a terrace with a sentry walk for patrols. One of the incredible aspects of the monument is the variability and the richness of the building techniques: different types of formwork, wooden boards and details were used in the construction of this reinforced rammed earth building. Before its restoration, structural and material problems had damaged the image and safety of the tower. The main goals of the work were to preserve the strata of History that were visible in the building, and at the same time to guarantee its preservation. Based on this idea, the restoration project involved the following steps: preservation of the surfaces, reinforcement of detached parts, control of cleaning and jointing, maintenance of the building volume, filling any cracks, constructing new wooden ceilings and new door; respecting the "aura" and "genius loci" of the material, and ensuring accessibility and safety.

Nougarède farm in La Salvetat-Belmontet (Tarn-et-Garonne)

Owner: Mr Serge Teruel
Date of building: Beginning of the 19th century
Date of restoration: 2010
Address: Nougarède – La Salvetat-Belmontet

This farm is located in a hilly landscape formed by a mosaic of little fields, meadows and woods, which characterize this rural region, where since the Roman period, clay has traditionally been used for building: rammed earth, adobe, terracotta bricks and tiles. The Nougarède farm was originally one of the six farms (metairies) of the Castle of Belmontet. The house was probably extended on its eastern side in 1911, judging by an inscription on the staircase. The walls are built with rammed earth and alternated layers of adobe and terracotta bricks. The farm was abandoned for many decades until 2008, when the new owner restored it. The walls of rammed earth were refilled, and rendered with mud-and-flax and mud-and-lime plasters.

Departmental Museum of Bresse in Saint-Cyr-sur-Menthon (Ain)

Owner: Department of Ain
Dates of building: From 1490 to the 19th century
Date of restoration: 1995
Architects of the restoration: François Voinchet (preliminary study), Eric Pallot
Address: Domaine des Planons, La Mulatière – Saint-Cyr-sur-Menthon

The Museum of Bresse is established in the Planons Estate, in a wide area of remarkable traditional bocage farmland. The Planons farmstead was built and altered over the course of many centuries. It is one of the first farms to have been listed and protected as a Historic Monument, from as early as 1938. The farmstead includes five buildings whose architecture has the traditional characteristics of the Southern Bresse area. The house presents a main façade on the eastern side, galleries under arcades, an oak framework with wattle and daub on terracotta bricks (carrons) foundations. The stables, the pig house and the hen house are built with rammed earth on stones or terracotta bricks foundation. The Planons Estate was used for agriculture until 1984, and was lived on until 1992, when the Department of Ain started restoration work with the aim of establishing a museum focusing on the relationship between people, nature, territory and food. The daubed and rammed earth walls were perfectly conserved and restored under the supervision of the government agency for Historic Monuments. In addition to the cultural centre, there is a modern building, integrated in the surrounding landscape, which hosts the reception and an exhibition hall.

Pascale Court

Jorge Alves

River Cottage in Kilmallock (Limerick)

Owners: Mrs Anne-Marie Carroll and Mr Ger Egan
Date of building: Beginning of the 19th century
Date of rebuilding: 2009
Architect of the rebuilding: Cáit ní Cheallacháin
Address: "River Cottage", Ballincaroona, Jamestown, Effin – Kilmallock

After the fire

This cottage was constructed from locally available materials, mud and thatch. Unfortunately, the thatched roof burnt in 2001. At the time of the fire, it was thought that only the north end was constructed of mud; as the work progressed it became clear that the entire main house was built of mud, with only the south end constructed of stone. Then a similar house was discovered, which was also constructed of mud and which had its fireplace still intact. From the outside it looked as if it were built of concrete and had a corrugated iron roof: it was used as a model for rebuilding the wattle and daub hood. In comparison to the original cottage, the only additional elements were a window in the north gable on ground floor in the kitchen, a door on the eastern side, which had been converted into a window. This rebuilding elicited a widespread interest, with many people learning afresh about this ancient form of construction, which had implications for other mud houses in the region.

Borgocapo House in Casalincontrada (Chieti)

Owners: Mr Gianfranco Conti and Mrs Stefania Giardinelli
Date of building: 1920s
Date of restoration: 2009
Address: Via Maiella, 151 – Casalincontrada

Borgocapo House is home to a laboratory for the dissemination of constructive techniques in raw earth. Borgocapo House is one of 800 constructions identified in a survey by the Abruzzo Region, built with a monolithic structure using the traditional "massone" technique. Between 2004 and 2009, Borgocapo House was converted into a temporary residence for the laboratory activities. The house and its extension were restored and other new modules and loggia were added: a framework of wood was built into the raw earth walls on a brick and stone plinth. Several raw earth techniques have been tested in this place: adobe, cob and straw bales.

Panta Rei Training Centre in Passignano sul Trasimeno (Perugia)

Owner: Cooperativa di sperimentazione per lo sviluppo sostenibile Centro Panta Rei
Date of building: 1982
Date of rehabilitation: 2001
Architects of the restoration: Atelier ambulant d'architecture, Rainer Toshikazu Winter
Engineer: Alvaro Scarpini, geometer
Address: Le Pierle – Passignano sul Trasimeno

Panta Rei is an educational training centre for renewable energies and sustainable materials founded in 2001 by reconverting a complex of three agricultural buildings that had been built during the 1980s. The rehabilitation project was based on a sustainable approach, taking into account the correct disposal of problematic existing materials on site, and using the natural resources that were locally available (energy, water, materials and landscape) as starting point for the restoration work. Local materials were chosen in dialogue with the cooperative as future owner of the Panta Rei eco-centre, focusing especially on raw earth as economic, zero-km and healthy material, ideal for the didactical self-building experiment that was planned using simple low-tech methods. The overall thermal performance is around 50kW/m^2/year, the thermal conductivity (λ) is between 0.13 to 0.39 W/mK. The steel frame structure is combined with an anti-seismic ring beam installed during the rehabilitation.

Four traditional houses in Macerata

Owner: Municipality of Macerata
Date of building: Middle of the 19th century
Date of restoration: 2006
Architect of the restoration: Anna Paola Conti
Address: Ficana – Macerata

These earthen buildings are located in Ficana district, composed of about fifty small two-storey buildings, arranged in parallel clusters. The houses are built with earth, known locally as "atterrati". The building technique is cob (massone), but adobe bricks are also used. Although these buildings were originally built by the land owners, they often show particular attention to aesthetic issues, as shown by analysis of the facades, which are always balanced and symmetrical. One of the houses collapsed in the 1980s and was rebuilt during the general restoration work carried out by the municipality of Macerata. The work was complicated because various problems were dealt with and appropriate solutions needed to be found for every "atterrato" so as to respect the logic of the buildings. Cob was used for small repairs and adobe masonry was applied where major rebuilding was required. This restoration was an exception because current laws do not allow the use of raw earth in seismic zones. One of the four houses is going to be turned into a museum.

Ex-voto dated August 23th 1891, given to the Church on the occasion of the successful extinguishing of a fire

St Jadwiga Bastion and Water Fort in Nysa (Opolskie)

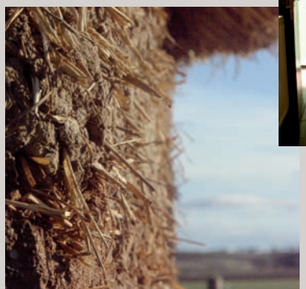
Owner: Municipality of Nysa
Date of building: From 1594 to the end of the 19th century
Date of restoration: 2008
Engineer of the restoration: Miroslaw Bartocha
Address: St Jadwiga Bastion: 19 Plastowska ul. – Nysa / Water Fort: 2 Powstańców Śląskich ul. – Nysa

Nysa Fortress is considered to be one of the strongest and most advanced forts built in Europe in the 17th century. Originally built using only earthen construction techniques, St Jadwiga Bastion is one of the ten bastions surrounding Nysa after the Thirty Year's War. After being taken over by the Prussians, a bunker was added in the years 1771-1774. Plaster, pilasters and architectural details differentiate this bastion greatly from other fortresses. The Water Fort, built in a rush in 1741 as a triangular structure, was frequently rebuilt. In 1807, during the Battle of Nysa, fierce combats took place at this fort. Currently, around 60% of the fortifications are preserved. Besides the stones and terracotta bricks used for walls facing, a large quantity of earth was used to build the fortress. The municipality carried out the restoration work on these parts of this monument, with the aim of enhancing the tourist appeal and cultural life of the city.

Old Schoolhouse in Logie (Angus, Scotland)

Owner: The National Trust for Scotland
Date of building: End of the18th century or Begin of the 19th century
Date of restoration: 2008
Architect of the restoration (Conservation Report): Arc Architects (Tom Morton)
Address: Craigo – Logie

The Logie Schoolhouse was built at the end of the 18th century, according to the Old Statistical Account of 1791, or in the early 19th century, as mentioned in the Statistical Account of 1834-45. The Schoolhouse was then used by the Free Church, and the United Free Church, from 1929 until the 1980s. The building represents a rare and remarkably complete example of clay as a vernacular building material. The clay is mixed with straw and moulded into the shape of the building with locally produced handmade bricks, and finished with lime render. The walls had been partially re-faced externally in bricks and stone, and partially internally with laths and plaster. The Logie Schoolhouse was completely restored by the National Trust for Scotland following local collapse of some walls: the original clay was recycled and new material dug from the field next door. Compatible materials such as recycled newspaper and hemp fibre were used as insulation, which keeps the building warm whilst allowing it to breathe.



Category 3: Buildings constructed after 1970

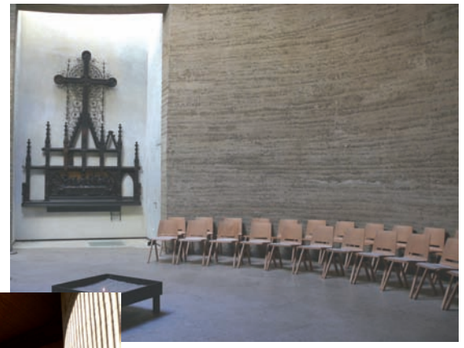
Wangeliner Garden's House in Buchberg (Mecklenburg - Vorpommern)

Owner: Verein zur Förderung ökologisch-ökonomisch angemessener Lebensverhältnisse westlich des Plauer Sees e.V. (FAL e.V.)
Date of building: 2001
Architects: Günter zur Nieden
Address: Nachtkoppelweg, Wangelin – Buchberg

This building provides rooms for seminars, café, a staff room, a garden shop for regional products and activities linked to the Wangeliner Garden, which presents more than 900 different herbs and plants to the public. The design concept corresponds to the garden elements (earth and plants), with heavy rammed earth interior walls surrounded by a shell of lightweight construction. Earth is used as a building material in different building shells: exterior and interior rammed earth walls, clay plasters on exterior walls and ceilings, rammed earthen floors covered with tiles in the glasshouse and a clay stove providing additional heat. The rammed earth walls show differently earth-coloured earth lenses and layers. The mix for the rammed earth was processed in a nearby brickyard. The exterior walls are a lightweight timber construction, insulated with cellulose, with interior clay plasters and covered with timber boards outside. The clay oven is sculptured in a geometric form resembling the seed pod of a plant seed. The building is designed to use passive solar energy. An active solar water heating system has additionally been installed and the roof of the glass house is covered with semi-transparent solar panels. The thermal conductivity (λ) is 0.15 W/mK for the roof, 0.25 W/mK for the floor and 0.20 W/mK for the external walls.

Chapel of Reconciliation in Berlin

Owner: Evangelische Versöhnungsgemeinde
Date of building: 2000
Architects: Rudolf Reitermann, Peter Sassenroth
Address: Bernauer Straße 4 (Einmündung Hussitenstraße) – Berlin-Mitte



The old Reconciliation Church was blown up by GDR border troops in 1985. The church had already been inaccessible since the Berlin Wall was built in 1961, because it was located right on the so-called death strip. The fall of the wall in 1989 forced the reconciliation parish to re-determine its position. The answer was the «Chapel of Reconciliation», a modern rammed loam construction on the foundations of the old reconciliation church that had been destroyed. The altar and the bells had been preserved from the old church and found a new home here. This chapel is the first sacred building to be built from load-bearing earth in Germany. Rammed earth construction was chosen as building technique for the 7.2 m load-bearing interior wall. However, because the building technique was not well-known, a so-called special-case construction permit was needed, requiring detailed analysis of the material during manufacture and installation as well as careful supervision of the building process. Various trial mixtures were tested for their compressive, tensile and shear strength. A mixture with similar material characteristics to concrete was selected: it is a conglomerate of clay and stony aggregates of different grain sizes to which a small amount of flax fibres was added. The relationship between the shear, tensile, bending and compressive strength of the clay tested are similar to those of concrete. The rammed earth required for building was mixed homogeneously and the compressive strength of this mixture was tested again.

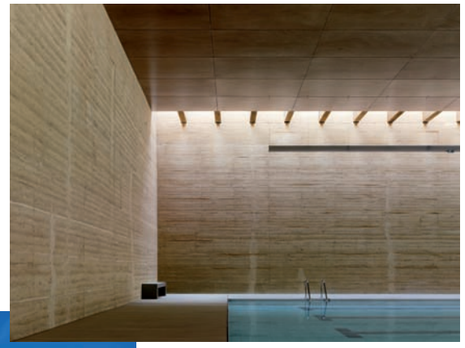
Group of individual houses in Amayuelas de Abajo (Palencia)

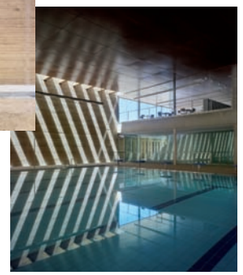
Owner: Entramado Sociedad Cooperativa
Date of building: 2001
Architects: María Jesús González Díaz, Jorge Silva Uribarri, Farncisco Valbuena García
Address: 10 Casa Ecológicas – Amayuelas de Abajo

Amayuelas is a little abandoned town, in which ecologists have created a sustainable community. Ten private houses were built for them, recovering a totally lost building tradition involving the construction of dwellings with rammed earth walls, adobe bricks and wood. The houses were designed and shaped to blend into the landscape, with the addition of new technologies such as thermal and photovoltaic energy and the use of low environmental impact materials; another aim was to revitalise an economically depressed area. The buildings are owned by a mutual association; despite the fact that the use of adobe bricks as the basic building material raised problems (lack of skilled craftsmen, little industrial-scale production, material not specified in current standards...), the decision was made to use it primarily because of its excellent thermal qualities and because it is part of an age-old tradition.

Indoor swimming pool of Toro (Zamora)

Owner: Municipality of Toro
Date of building: 2010
Architects: Vier Architects
(Antonio Raya, Cristóbal Crespo, Santiago Sánchez, Enrique Antelo)
Address: Calle Bustamente – Toro





This building tries to incorporate a new piece in the city, with the aim of playing a representative role as a public building, fitting into the town with dignity and becoming part of its architectural legacy. The swimming pool does not stand in a prominent position, but is inspired by the history and traditions of its environment, in using materials from the local area and in the expressive use of volume in the facility. The special design feature of the pool is the role that the use of rammed earth plays in the construction and image of the building. Through the definition of bearing walls and exterior cladding to be built in rammed earth, the pool is conceived as a space that is closed to the outside, focusing attention on the texture, form and composition of the walls, enhancing the expressiveness of the building's image in the urban environment where it is located. The thermal resistance (R) is 0.793 m^2K/W, the thermal conductivity (λ) is 0.756 W/mK, and the acoustic damping of aerial noise (R) is 69.21 dBA.

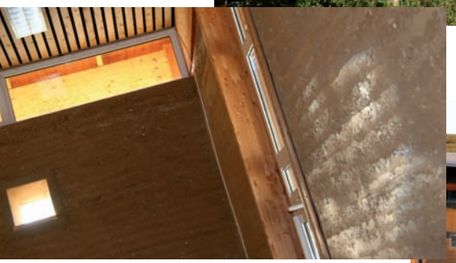
Group of social houses "Le Village" in Cavaillon (Vaucluse)

Owner: Municipality of Cavaillon
Date of building: 1998-2009
Designer: Jamal Boudchiche
Address: Mas de la Baronne – Cavaillon

The "Village" in Cavaillon is a non-profit association which helps persons with social difficulties (unemployed people etc.), giving them a job and accommodation in little individual houses of 25 m^2 floor area. The group of 11 houses was built by the residents themselves with compressed earth blocks. This material was easy to produce from local clay, and was therefore very cheap. The compressed earth blocks were used for main and side walls, and for the vaults of 4 houses. Following this first building experience, with the aim of achieving greater financial independence by increasing its economic resources, the "Village" association decided to produce compressed earth blocks and to sell them to general public.

Leisure Centre in Ramatuelle (Var)

Owner: Municipality of Ramatuelle
Date of building: 2005
Architect: Ann Guillec
Address: Bonne-Terrasse – Ramatuelle

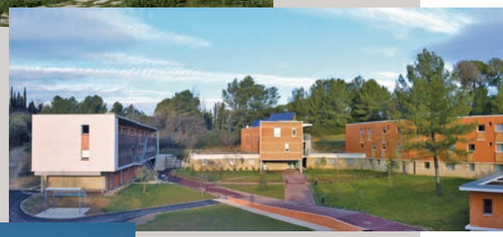


The Leisure Centre is located near the Mediterranean Sea, on the famous Saint-Tropez peninsula. For this children's facility, the municipality of Ramatuelle has chosen a sustainable, temperate, healthy and environmental friendly building. The building is made up of wooden boxes corresponding to different spaces: activity rooms, library, dining hall, kitchen and sick bay. These spaces are gathered around a large earthen box containing a multi-purpose hall. Under the green roof, the walls are built with rammed earth of various colours, which sometimes includes gravel or cut reeds, as a reference to the nearby reed beds, with the aim of achieving good hygrometric performance, and high-quality thermal insulation and soundproofing. Heating is provided by a local renewable energy resource: the wood comes from the surrounding forest.

Student House in Montpellier (Hérault)

Owner: Institut Agronomique Méditerranéen de Montpellier (IAMM)
Date of building: 2007-2008
Architects: Studio Portal-Thomas-Teissier
(Nathalie Portal, Jean-Pierre Thomas, Richard Teissier)
Address: 3191, route de Mende – Montpellier

This Student House is located on the edge of a wooded park, in the Campus of the Mediterranean Agronomic Institute of Montpellier, which is part of the Agropolis scientific hub. This facility houses around 200 students from many Mediterranean countries in 82 studio flats, 8 of which are accessible for people with disabilities. The three residential buildings and the cafeteria were built according to the following principles: sustainable development, landscape integration and Mediterranean identity. Under a green roof, the walls are built with stone from "Pont du Gard" on the ground floor, and terracotta bricks and rammed earth for the upper floors, for high thermal performance both in winter and summer. The passageways are generally outside in order to limit the built volume requiring heating and air-conditioning, and for a better link between flats and nature. The overall thermal performance is around 60 kWh/m²/year.



Local products exhibition building in Serrenti (Medio Campidano)

Owner: Municipality of Serrenti
Date of building: 2007
Engineers: Pierpaolo Portoghese, Nicola Curreli, Valeria Saiu
Address: Via Nazionale 182 – Serrenti

Serrenti is located in Campidano Valley, characterised by traditional constructions using adobe bricks. The exhibition building is a big structure designed by the Municipality of Serrenti to be a space for the presentation of typical local agricultural products. The structure is built with traditional technologies and materials that are typical of the area: trachyte from the local quarries for the stonemasonry, adobe bricks and Sardinian tiles. The complex, consisting of several buildings, follows the typical pattern of court-houses in the Campidano Valley: a central courtyard overlooked by arcades running all along the front of the house. The first building has four rooms: its opens onto the wide central entrance through an archway of local stone blocks. The second building consists of a single large hall. In the main room, adobe was used exclusively for the partitions, while the bearing framework is made of double-laminated wood pillars, connected to the reinforced concrete foundation and to the beams supporting the wooden rods that span the entire structure.

Experimental house in Paslek (Warminsko-Mazurskie)

Owner: Politechnika Warszawska, Widział Architektury
Date of building: 2008
Architects: Teresa Kelm, Jerzy Gorski, Marek Kollataj
Address: Parku Ekologicznym – Paslek

This house stands in the Ecological Park of the City of Paslek. The project was designed by architects from the Faculty of Architecture of Technical University of Warsaw. The design was preceded by laboratory tests and investigations, which focused on the physical and mechanical properties of the compressed earth blocks. Their properties are similar to raw earth compacted in a scaffold framework. The purpose of the building project was to demonstrate the construction methods used with raw earth technology and create an opportunity for carrying out observations and research during the process. The building is energy efficient with the passive solar system used. The direct gain of solar heat is provided by a greenhouse the south side of the building. The research will focus on thermal capacity, interior conditions (humidity, radiation) and the possibility of heat storage by the solid earthen walls. The thermal resistance (R) is 2.99 m^2 K/W, the thermal conductivity (λ) is 0.87 W/mK for rammed earth, 0.04 W/mK for cellulose insulation, and 0.35 W/mK for adobe (internal layer).

Monitoring Centre for Treatment station of residual waters in Évora (Alentejo)

Owner: Águas do Centro Alentejo, S.A.
Date of building: 2010
Architect: João Alberto Correia
Address: Zona Industrial Almeirim Sul – Évora

The Monitoring Centre is a functional complement of the complex sanitary infrastructure of Évora. The simplicity of the rammed earth exterior walls, following the local tradition, were built as autonomous vertical planes combined with a metal toping roof solution, which confers a volumetric monolithic language to the building. The orthogonal shape and the plainness of the exterior walls, together with the material roughness aim to bring awareness to the local construction know-how - austere and pragmatic with an important contribution related with temperature performance on the hot and dry region of Alentejo. The application of a silicone spray protective layer on the external surfaces provides a water-resistant coating without compromise the material breathing. This reveals the true aspect of the rammed earth, taking advantage of its natural plastic characteristics.

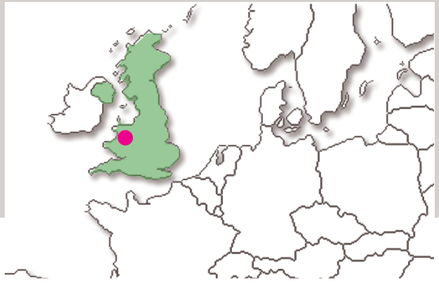
Experimental house in Hrubý Šúr (Senec)

Owner: Mrs Zuzana Kierulfová
Date of building: 2010
Architects: Gernot Minke (author), Bjorn Kierulf (detailing)
Address: Hrubý Šúr 15

This building presents a straw bale dome with 8 vaults, covered by a green roof, so it looks like a small hill. The floor of the house is 30 cm under the ground, for the sake of covering it with earth and to be as low as possible. It is probably the first construction in which straw bales were cut from two sides to create an exact shape for the dome and vaults, which are themselves load bearing and bear the load of vegetation roof too. Extremely well compacted straw bales are placed one on top of another and secured in position with wooden poles. All the construction details were designed to low energy standards with some elements of Passivhaus design, such as triple windows with airtight fittings and no frames, to lower costs, but also eliminating any cold bridges. After finishing, the building will be used by the architectural studio Createrra and by the NGO ArTUR, which will exhibit the results of the workshops and organise seminars to promote ecological building methods. The thermal resistance (R) is between 7 and 12 m^2 K/W, the thermal conductivity (λ) is 0.054 W/mK for 36 cm straw, and 0.054 W/mK for places insulated with additional foam glass (30-50 cm).

Centre for Alternative Technology in Machynlleth (Powys, Wales)

Owner: Centre for Alternative Technology (Charity) Ltd
Date of building: 2010
Architects: Pat Borer, David Lea
Address: Centre for Alternative Technology – Llwyngwern, Machynlleth



The Wales Institute for Sustainable Education (WISE) building provides the setting for courses in tertiary education and conferences on environmental subjects. The WISE was constructed of materials with low embodied energy: glulam timber frame, hemcrete walls, rammed earth, lime renders, slate, cork, home-grown timber flooring and finishes of natural paints and stains. It is very well insulated and airtight, with heat recovery to some areas. All the spaces are arranged around courtyards and terraces so that every room enjoys daylight, natural ventilation and a fine view out over this beautiful site. The centrepiece of the building is an astonishingly beautiful, iconic, circular 200 seat rammed earth lecture theatre around which the rest of the building is grouped. With walls of 7.2 metres, they are one of the highest rammed earth walls in the United Kingdom. The thermal resistance (R) is 0.47 m^2 K/W, the thermal conductivity (λ) is approximately 1.70 W/mK, the acoustic damping of aerial noise (R) is approximately 60 dB, and the compressive strength is 2.3 N/mm^2.