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EUROPEAN PROJECT ON FORTIFIED LANDSCAPE FACING NEW THREATS

RESILIENT FORTRESS

SUMMARY OF MONT-DAUPHIN LEARNING SESSION 3 April 2025

ERASMUS+ project

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Resilient Fortress, Erasmus+ project partners organizations.

Erasmus+ project named Resilient Fortress is designed for upskilling professionals facing the challenges of climate change and the increasing need of environmental responsibility in the context of fortified heritage.

Project partners and case studies are chosen by the geographical location of the sites and by the quality of their restoration, conservation and repair projects. The nine months project is divided into four activities: Suomenlinna Summer School (2–4.9.2024), Antibes Site Visit (2.4.2025), Mont-Dauphin Learning Session (3.4.2025) and Naarden Exchange Session (5–7.5.2025). The outcome of Resilient Fortress -project is environmentally responsible guidelines, that will motivate other professionals to gain an alert attitude towards climate change and open mind to transform old routines to green skills.

Summary of Mont-Dauphin Learning Session

Laurent Alberti, Philippe Allée, Delphine Bouet, Gaëlle Chériaux, Isabelle-Fouilloy-Jullien, Tuija Lind, Xingchen Wang

The Mont-Dauphin learning session was organized by Centre des monuments nationaux (CMN) with the presence of municipal authorities and the Mayor Cyr Piaton.

The Centre des monuments nationaux (CMN), created in 1914, is a public institution under the authority of the Ministry of Culture. Financed by the State, it preserves, manages and opens to visitors more than one hundred monuments, ranging from prehistoric times to the 20th century, nineteen of which are registered on UNESCO's World Heritage List. The stronghold of Mont-Dauphin is one of them.

Aerial view of the fortress of Mont-Dauphin. ©CMN

The session started in the evening of 2nd April with a warm welcome, sharing a supper around a large table by the fireplace at the Auberge de l'Echauguette. Two nights and a full day in Mont-Dauphin – surrounded by a stunning mountain landscape – reminded the urban residents among us of what darkness without light pollution looks like, and the luxury of silence.

The fertile plateau where Vauban chose to place his territorial defence of Alpes in the end of 17th century was called the Plateau of Thousand Winds. Vauban took advantage of the site's topography with the steep mountain walls forming a natural defence. Only the northern site required a fortified defence composed of two regular bastion fronts. According to Vauban, every inch of a stronghold had to be defended at equal degree. Besides the panoply of military architecture – arsenal, barracks, officers pavilion, powder magazine, water reservoir – Vauban wanted to create village-like living conditions in Mont-Dauphin to prevent soldiers from deserting. According to Vauban, a happy soldier is a soldier with a family. Ultimately, the village did not grow into a city as Vauban had wished. For strategic reasons, in the beginning of the 18th century, the funds were used to the development of Briançon located nearby.

The ownership of Mont-Dauphin's fortified structures was transferred from the Ministry of Defence to the Ministry of Culture and to the Centre des monuments nationaux in 1975. After the military left, less services were needed, resulting in a steep population drop. It rose later to 170 inhabitants, thanks to growing tourism.

The morning of 3rd April started with onsite presentations by Mont-Dauphin site director Isabelle Fouilloy-Jullien, by Laurent Alberti, national monument curator and state architect and by Philippe Allée, heritage engineer and work operation manager from CMN. From the Eygliers glacis we were pointed out the quarries and forests providing building material in 17th century. The glacis – used earlier as a parking – suffered some erosion, but before planning repairs, the purpose of the area should be clearly defined according to Laurent Alberti. Compared to Suomenlinna, the soil of Mont-Dauphin is resistant, but the layer of humus is thin, and the vegetation is easily damaged. In its currents state, in Mont-Dauphin the visitor security is well ensured and is not an issue in the management of the fortified landscape. Chestnut wood fences – "ganivelles" – were installed ten years ago. Weathered grey wood perfectly fits into the aesthetics of a cultural landscape.

In the ditches of the Briançon Gate, we were shown the wall restoration works programmed after building assessments in 2005 and 2014. Works are executed exclusively during summer months. Structurally the Mont-Dauphin escarpments act as retaining walls for a moraine terrace formed by a conglomerate called pudding. For this kind of structure, enemy no.1 is water. The problems in some parts of the bastion fronts stem from a lack of adequate waterproofing and drains, heavy rains, frost as well as the strong proportion of cement in mortars used in earlier reparations. Nowadays, the cement is systematically replaced by hydraulic lime.

In the two-storey powder magazine – originally a freestanding ventilated building, later covered with sand – we observed well-conserved original timber structures with only minor humidity issue, which is usually a very typical problem for this category of architecture. It would be interesting to organise a technical seminar on the ventilation and waterproofing of gunpowder magazines, because most similar sites share the same problems.

Ganivelles. ©CMN

Laurent Alberti and Isabelle Fouilloy-Jullien. ©GBS

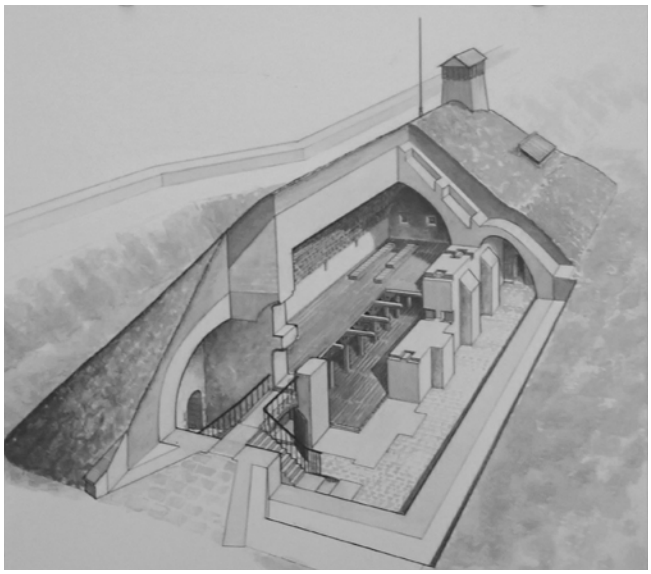
The walking tour was followed by a lecture session in Pavillon de l'Horloge filmed by Delphine Bouet, project manager for training and cultural engineering in CMN. First Isabelle Fouilloy-Jullien presented in detail Mont-Dauphin sites territorial resources in the time of Vauban, when most of the materials had to be sourced locally. The ashlar stones for escarp walls are red limestone called pink marble, and the counterscarp walls and pavements were built with pebbles stones from the riverbeds. Also, a light tufa stone was used for watchtowers and powder magazines vaulted roof. Research carried on timber structures has given knowledge on the precise origin of wood used in Mont-Dauphin as well as dendrochronological dating. A location map of four limekilns was also presented.

Laurent Alberti gave an interesting presentation on different layers of regulation on landscape and environment in France using the term regulatory inflation. Due to strong traditions in French monument protection since 19th century, the environmental approach in heritage preservation was taken into consideration quite late. Starting from the first list of the thousand classified monuments in 1840, the augmenting set of rules and regulations apply to 45 000 buildings and 280 000 objects nowadays. Interventions can only be designed and executed by authorized professionals under scientific and technical control, both before and after project. Laurent Alberti mapped the regulation layers regarding Mont- Dauphin: law on historical monuments and their perimeter, World Heritage property, World Heritage buffer zone, perimeter of listed site, perimeter of registered site, biosphere reserve, Natura 2000, natural areas of ecological, faunistic and floristic interest.

Gaëlle Chériaux, head of corporate social and environmental responsibility in the CMN showcased how the CMN is adressing the environmental crisis in their new strategy. CMN sites host a remarkable natural heritage: 83 parks and gardens located nationwide, many of which have significant environmental value. Fifteen sites are located in Natura 2000 zones, and twelve are located in Natural Areas of Ecological, Faunistic and Floristic Interest (ZNIEFF). To preserve life on its sites and beyond, the CMN is taking action to limit pressure on biodiversity through sustainable garden management, such as differentiated mowing, leaving broya on the ground and the creation of shelters (nesting boxes, ponds, etc.). However, rising temperatures, recurrent droughts, floods, forest fires and disruption to seasonal patterns related to climate change are threatening the species living on CMN sites. The decline of predators of plant-eating insects and a drastic fall in the number of pollinators are another major threat to plant biodiversity.

Given the dependency of CMN sites on biodiversity, which brings ecological and cultural benefits, the new "CMN 2030" strategy has incorporated the need to anticipate the effect of the environmental crisis on natural heritage. The "ecology of conservation" project aims to encourage limited intervention in terms of restoration approach and use of materials, to limit the effects of environmental crises on conservation and to place gardens, plants, water systems and their interconnections back at the heart of the monuments' expertise and vision.

High room of the powder magazine. ©CMN



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Resilience is therefore an ongoing area of reflection for the Centre des monuments nationaux, with new experiments and solutions to be implemented to keep fulfilling the mission of preserving heritage for future generations.

As an example of the creation of shelters for biodiversity and adaptation to harsh conditions, Philippe Allée presented the restoration of ramparts on If Island in front of Marseille. Famous for its prison thanks to Alexandre Dumas, the If Castle and its ramparts date from 16th century. When the fortress was demilitarised and opened to the public in 1890, the maintenance of the ramparts came to an end. The walls were originally rendered, but the action of sea strongly eroded the renderings and mortar between the irregular small stones.

The site is difficult to access with challenging working conditions, especially as regards building scaffoldings and in addition, the island is home to several protected plants, two species of reptiles and a yellow-legged gull that should be protected during any restauration work on the ramparts.

The CMN used hydraulic lime mortar for both rendering and filling the gaps between stones, but during the works, the experts already noticed that the active salt crystallisation was weakening the mortar. This finding resulted in adding Prompt (a natural cement from Grenoble region with fast hardening) to the mortar with different mixes (10% Prompt / NHL3,5– 20% Prompt / NHL 5).

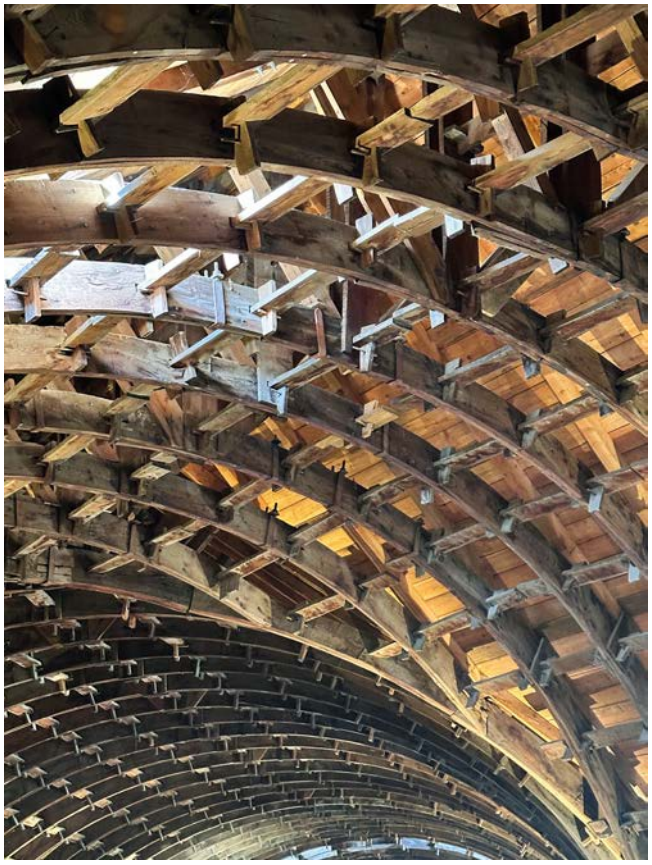
In the case of If Castles hyper-saline environment it seems that traditional mortars are not a long-term solution. Either there should be a continuous maintenance of the ramparts, which is economically and environmentally unsustainable, or the CNM should use a modern ready mixed cavity-mortar. If this kind of mortar resisted, it could be considered as a sacrificial layer.

The Ronchambeau Barracks. ©CMN

In the afternoon, site visits focused on rainwater management (rain and melting snow) and reuse of Rochambeau barracks. Two sources from the time of Vauban at a 2 km distance from Mont-Dauphin are still in use. Aqueduct brought water to fountains, washhouse, water reserves and a pond. Also, there was a possibility to inundate the gunpowder magazine in case of necessity.

The half meter wide gutter in the main street of Mont-Dauphin gives a cue, but seeing pictures of water running over the ramparts like Niagara Falls was a surprise for the group, especially with the beautiful weather. There are no irrigation on the site, as there is no need. However, better management of spring water is in place when there are restrictions on use, particularly in the only fountain managed by the CMN (in Rochambeau). Together with municipality the CMN is planning new ways of managing rainwater in the village.

The other part of the visit – before getting back to the lecture hall – was the immense 18th century Rochambeau barracks building site and the Little Bighorn exhibition by artist Ousmane Sow. Rochambeau barracks is composed of five sections lined up following the edge of the plateau, each having tree-storeys of vaulted rooms, a basement and an attic. The attic with pebble stone pavement served for horses. In the early 19th century, it was covered by an impressive 250-meters long roof structure in Philibert Delorme-style. Famous architect from the 16th century, Delorme invented a light vaulted roof structure, built with relatively small beams needing no pillars. The restoration of the roof structure and slate covering is financed by the Ministry of Culture and will cost 3,6 M €. The quality exhibition of massive sculptures, in itself a reason to visit Mont-Dauphin, is installed in the attic accessible without stairs from un upper terrace.



Philibert Delorme-style roof structure. ©GBS

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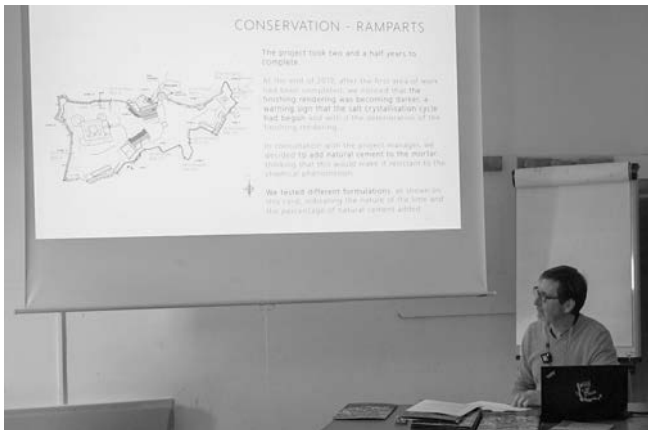
After the visit, heritage architect Corrado de Giuli Morghen from La Fabrica, commissioned to establish a master plan for Rochambeau barracks, presented his work. The master plan consists of studying all the possibilities of reuse, taking into account the regulations on accessibility. Since access to most of the barrack's sections is via stairs, these areas cannot have a public use. Corrado de Giuli Morghen showed various scenarios of reuse with the perspective of having as many independent uses as possible.

At the end of the day director Camille Thomas and project manager Alba Zamarbide from the Vauban's major sites network (World Heritage), mentioned the finished work on renewing the buffer zones of Vauban's World Heritage Sites, and their future actions. With some similarities to Resilient Fortress projects background, Camille Thomas and Alba Zamarbide together with EFFORTS and its secretary general Rafaël Deroo, are launching a match making webinar (30 June 2025) about cooperation on climate-smart management of fortified sites.

Gaëlle Chériaux. ©GBS



Philippe Allée. ©GBS

Corrado de Giuli Morghen. ©GBS

Camille Thomas and Alba Zamarbide. ©GBS

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List of participants at Mont-Dauphin Learning session the 3 April 2025

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Philippe Allée / Centre des monuments nationaux (FR)
Pauline Boinet / Centre des monuments nationaux (FR)
Delphine Bouet / Centre des monuments nationaux (FR)
Pauline Boniface / Port Vauban, Antibes (FR)
Ger Copier / Stichting Monumentenbezit (NL)
Gaëlle Chériaux / Centre des monuments nationaux (FR)
Rafaël Deroo / European Federation of Fortified Sites (EU)
Myriam Deschamps / Master 2 Sustainable Territorial Management (FR)
Corrado de Giuli Morghen / La Fabrica (FR)
Isabelle Fouilloy-Jullien / Centre des monuments nationaux (FR)
Tiina Koskenniemi / Governing Body of Suomenlinna (FI)
Tuija Lind / Governing Body of Suomenlinna (FI)
Petri Lyytikäinen / Governing Body of Suomenlinna (FI)
Federica Marulo / University of Groningen (NL)
Miia Perkkiö / Governing Body of Suomenlinna (FI)
Cyr Piaton / Mont Dauphin municipality (FR)
Camille Thomas / Association of Vauban's major sites (FR)
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Alba Zamarbide / Association of Vauban's major sites (FR)

Mont-Dauphin Learning Session participants.

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Mont-Dauphin Learning Session

CENTRE DES MONUMENTS NATIONAUX

Resilient Fortress Project Partners

THE GOVERNING BODY OF SUOMENLINNA

Stichting Monumentenbezit

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