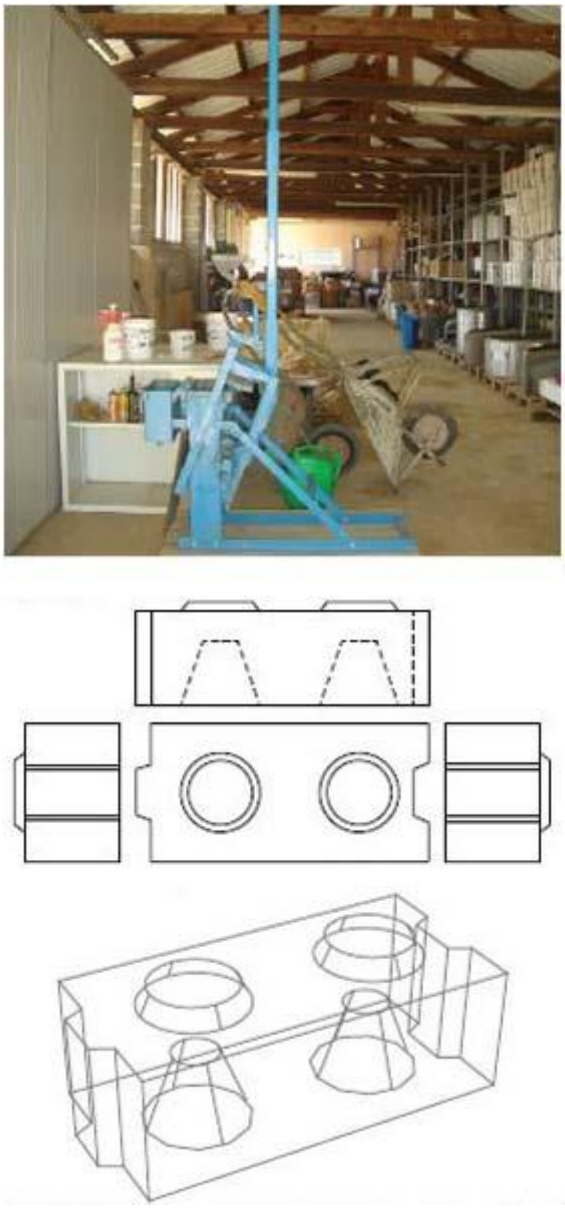
POLITECNICO DI TORINO
FIRST SCHOOL OF ARCHITECTURE
Master of Science in Architecture Construction City
Honors theses

Building with raw earth: the project of a kindergarten in Cusco
by Marinella Perri
Tutor: Simonetta Lucia Pagliolico
Co-tutors: Andrea Bocco, Christian Mariani

This thesis was born by the interest for raw earth used as construction material and by the real need to build a kindergarten for the children of Larapa, San Jerónimo, district of Cusco, Peru, by request of Augustinian Friars. The work is divided in two sections: the first is a study about raw earth and the second is the project of the building.

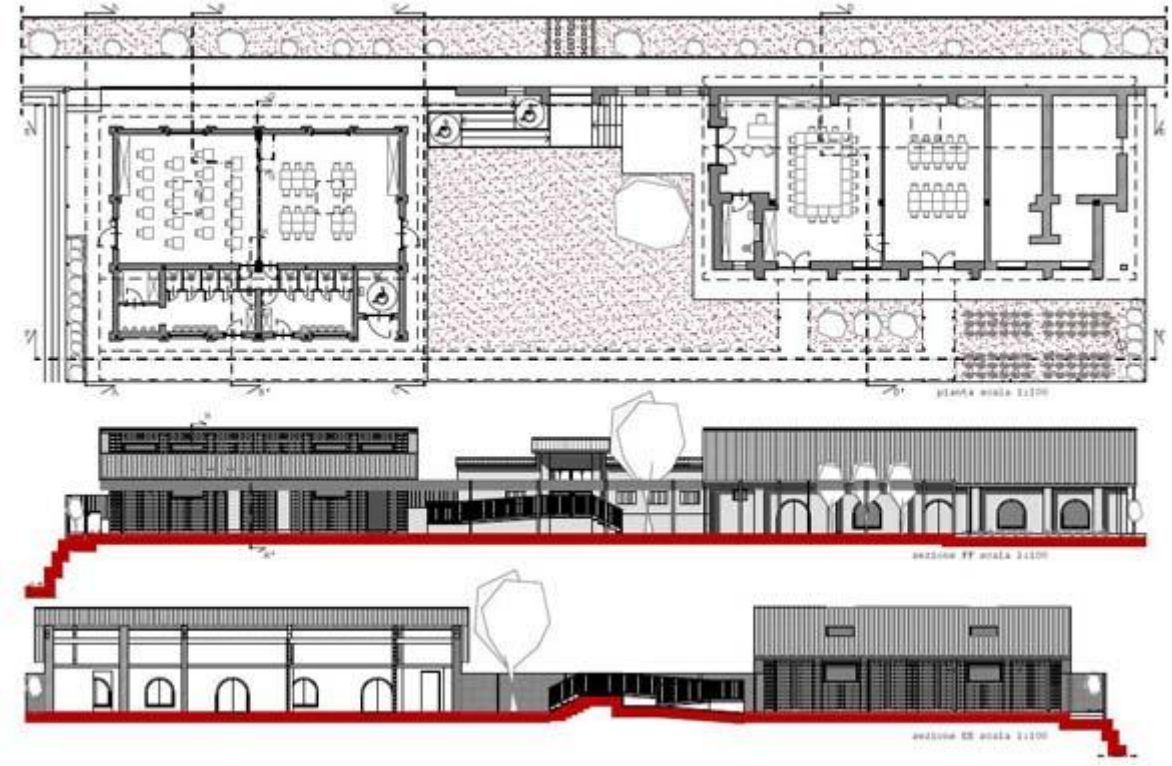
In the first section there is the study about raw earth and its building techniques: from the most traditional, like *torchis* or *adobes*, to the newest, like the stabilized compressed earth blocks. On this last one it was performed a study about block and presses types available in commerce, to find the best machine for the Peruvian building site. The block chosen was the *Blocco Mattone*, on which it was possible to try a direct experience of self-construction of some little prototypes at the *Laboratorio di Sperimentazione Materiali Poveri e Autocostruzione* in *Villaggio Globale* of *SERMIG* at *Cascine Nuove di Cumiana* and at the *Laboratorio Tecnologico di Autocostruzione* (*LATEC* of *CISDA*) of Politecnico di Torino.



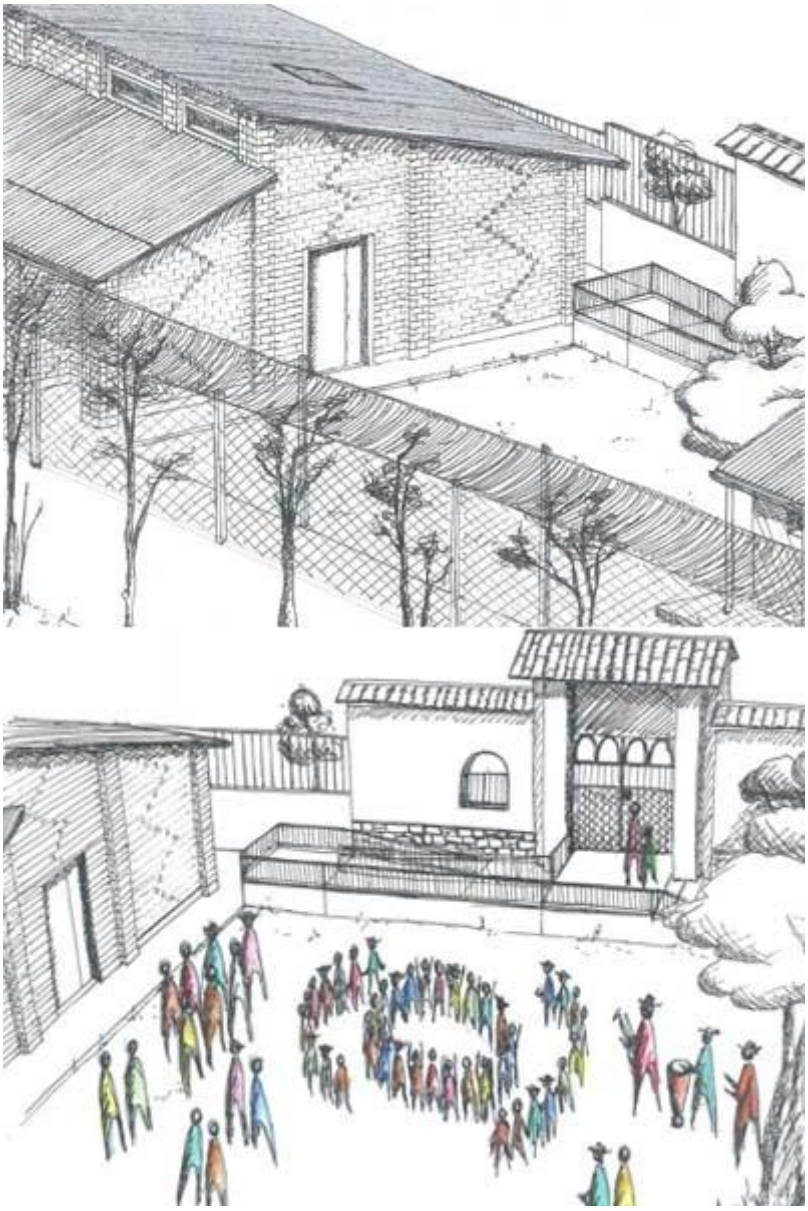
Press for ceb *Mattone* at *Laboratorio di Cumiana* and drawing of the block

In the second section, after the presentation of some significant study cases in the world of school buildings which use raw earth or that for some other aspects are taken like examples for the work, it was described the design, from the geographic and historic context, to regulative constraints and to design choices. Thanks to the collaboration with a local architect, Christian Mariani, it was possible do the remote project. The study of the area takes place looking photos and thanks to the finding of *Plan Urbano del Distrito de San Jerónimo* sent by Arch. Mariani, while the simple field tests on the zone soil were made by other people in their theses. The lot borders on west and south with a school recently realized and on east with a general surgery, that are buildings included into Augustinian Friars unit.

One of the most important principles on which the work is based has been the creation of an external open space as extended as possible, like a square for children and all the people of Larapa. The project plans the construction of a new building and the restoration and the change of use of another already existent in the site. In the new building, once found the right distribution of the spaces, it had drawn rooms on the block module, focus to deal realisation in the easiest way. The configuration of the building is box-like and symmetrical. Educational space has been thought to be as flexible as possible: the two classrooms are divided by a sliding wooden wall, completely movable on track. Classrooms are illuminated by a skylight placed on the northern pitch of the roof, made by polycarbonate corrugated. The roof has been designed as lightweight as possible, like in the existent building, to pay attention to the seismical behaviour: there are some wooden trusses, with a covering in corrugated sheets produced from bituminous recycled cellulose fibres and with a ceiling made by reed matting and plaster hanging to the secondary beams.



Plan and longitudinal sections of the kindergarten



Perspective sketches of the kindergarten and of the garden with the entrance

All the materials, the products used and the selected techniques have been chosen for the availability in the area or the previous knowledge of the local workers. The perspective of a concrete realization, applied in a smaller way during the workshop, has brought problems which were unreal in the project, but really true on the building site, that has been resolved with extemporary solutions that sometimes have totally changed the original ideas.

For further information, e-mail:
Marinella Perri: marinella.perri@gmail.com