

GRASPINNO

Transnational model, strategies and decision support for innovative clusters and business networks towards green growth, focusing on green e-procurement in EE/RES for energy refurbishment of public buildings.

Deliverable: 3.9.1

Report on the Pilot of :

Refurbishment with Energetic and Seismic Adjustments of the Angelo Codello Elementary School of the Municipality of Valdobbiadene - Veneto Region - Italy

*Prepared by Municipality of Valdobbiadene-Department of Public works-,
with the contribution of Veneto Region and Unioncamere Veneto*

Date: 18/12/2017

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1. INTRODUCTION

This document deals with the work of REFURBISHMENT WITH IMPROVEMENT OF ENERGY PERFORMANCE AND SEISMIC ADJUSTMENT OF THE "PADRE ANGELO CODELLO" ELEMENTARY SCHOOL IN THE LOCATION OF S. PIETRO DI BARBOZZA, to be carried out on behalf of the MUNICIPALITY OF VALDOBBIADENE, Veneto Region, Italy.

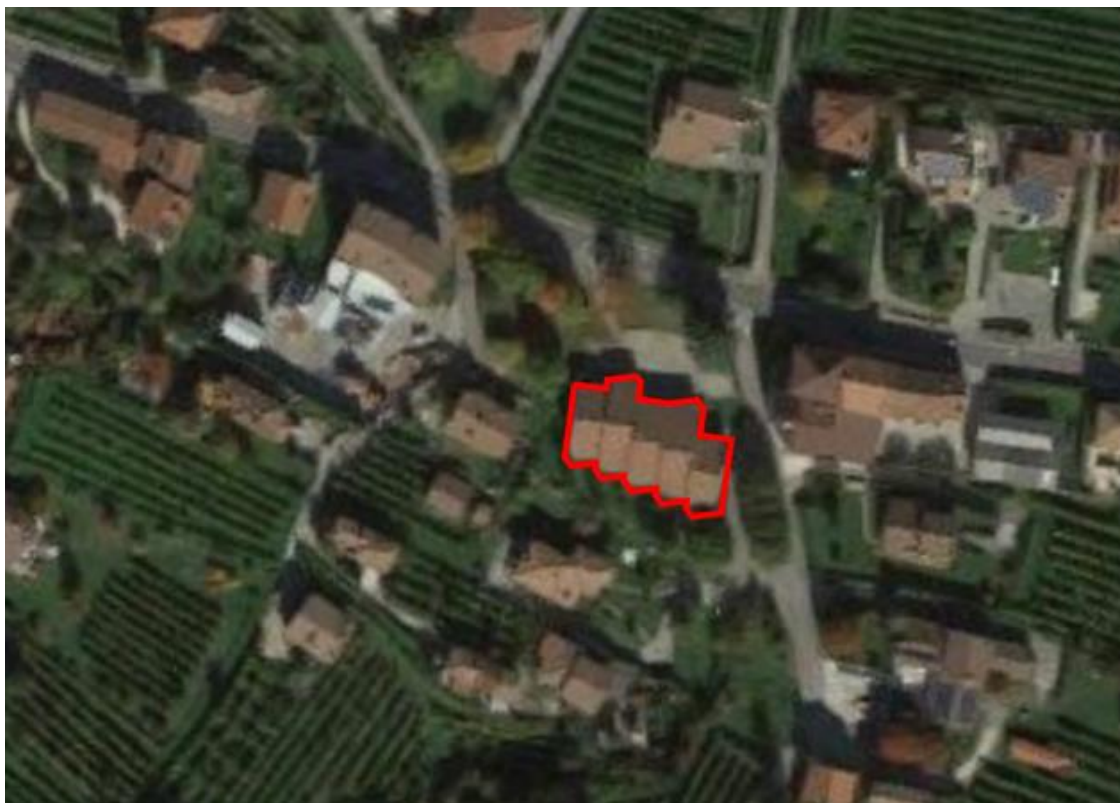
The building represents a volume consisting of two main floors, one of which is completely above ground, and a basement. The roof is made by two pitches, characterized by an impracticable attic. From an architectural point of view, the building is made up of five modules, that are placed against each other, with staggered floors, joined together to form a single body. The internal width of each module is constant and equal to 7 meters (corresponding to the light of the floors), while in length elements of 18.8 meters alternate with elements of 14.8 meters.

The building has 7 classrooms, as well as a multipurpose area and four toilet blocks, closets, laboratories and a teachers-room.

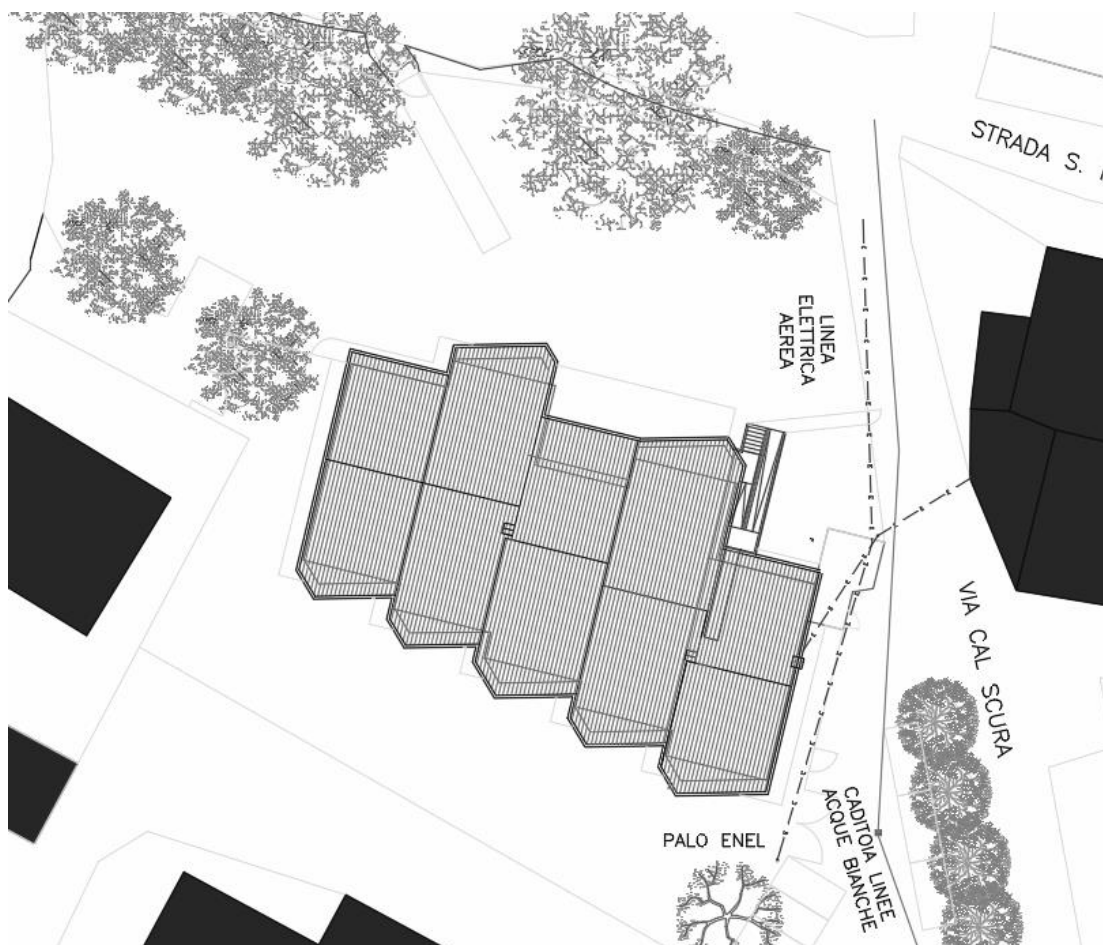
The structure of the building is in masonry, with two heads walls of a thickness of 25 cm. In addition to the masonry characteristic, the building, against the ground in the North side, is made in reinforced concrete with a thickness of 25 cm. The inter-floor slabs and the roof are in masonry.



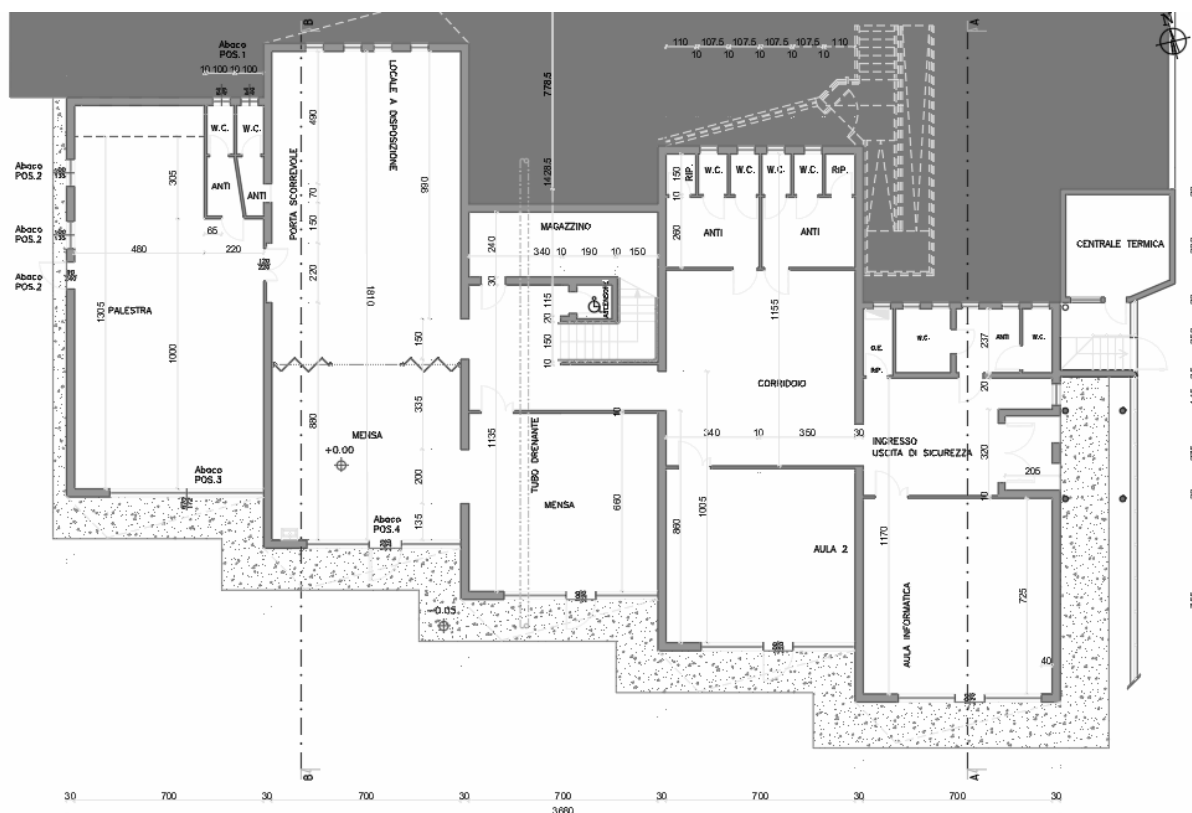
School building front view



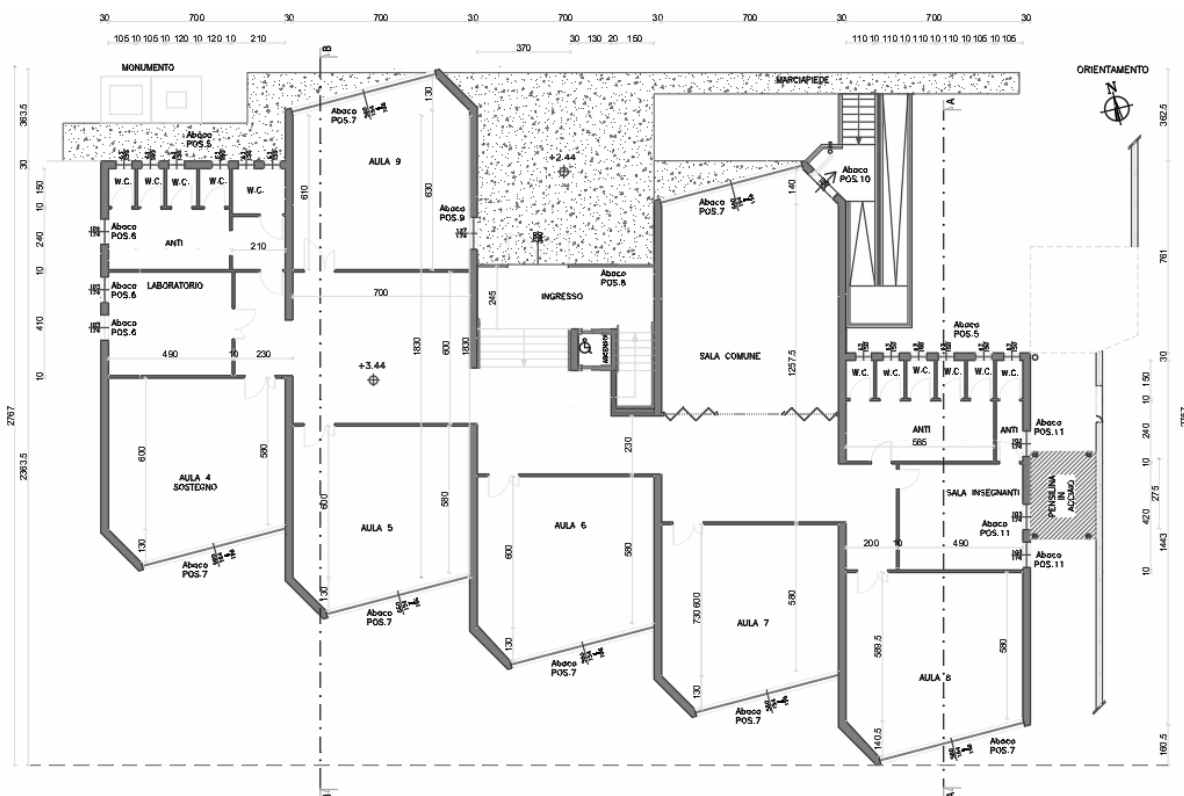
Aerial view



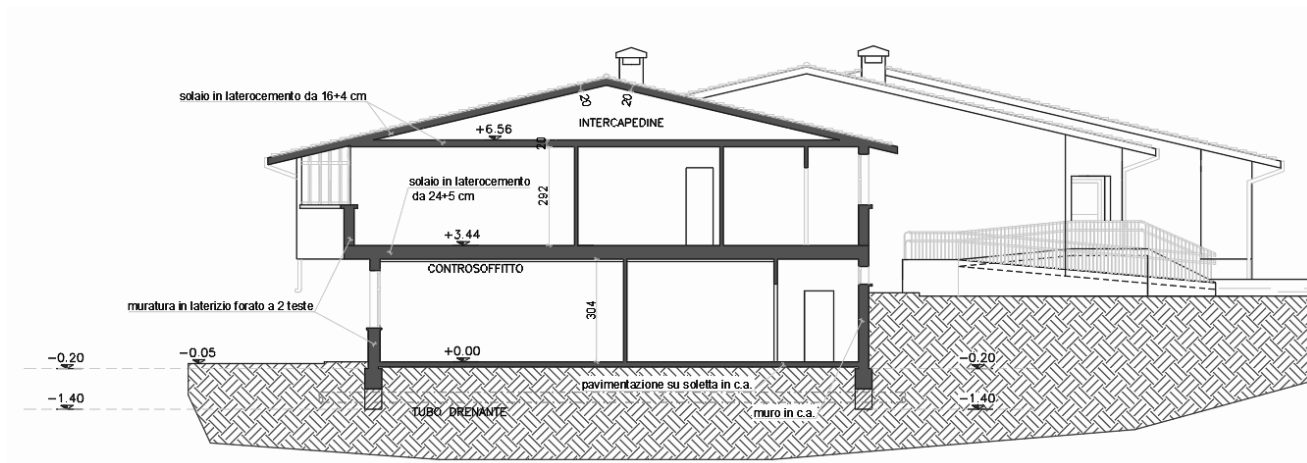
Planimetry of the school building



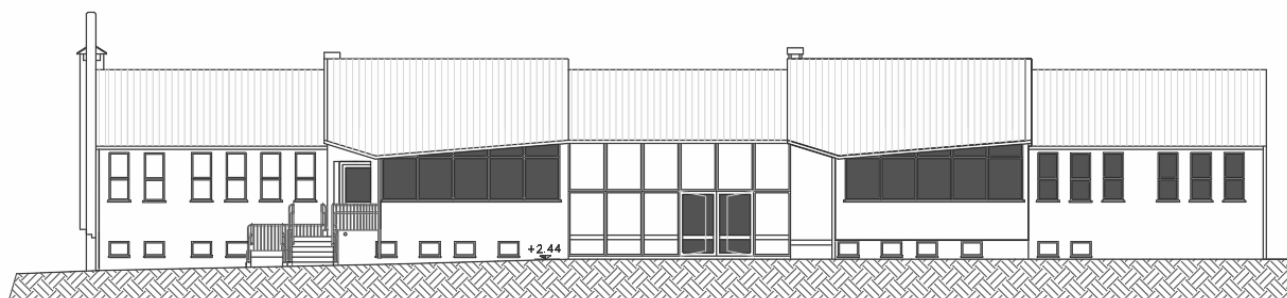
Basement floor plan



in-plan projection of the ground floor



Altimetric section



North side building elevation



South side building elevation

2. PILOT SITES INITIAL CONDITION

2.1 Audits of pilot sites

The primary result of the project is a satisfactory seismic adaptation of the building to current regulations and the simultaneous improvement of its energy performance, with methods that respect the minimum environmental requirements of products and materials used. As regards the energy performance of the school building, from an initial assessment of the state of the building, carried out keeping in mind the UNI 16247 part 1-2 and UNI CEI TR 11428 procedures, an estimated annual non-renewable energy consumption per unit of surface was calculated. The resulting number is located at the bottom of the energy scale of characterization of buildings (Class E). A second expected result is the acquisition of knowledge and skills to apply GPP procedures and tools in a systematic manner in other future renovations of public buildings, within a transnational competence network.

The following table contains the description of the main objectives of thermal improvement, which is to be achieved with the project, with reference also to the types of new materials to be used.

Pilot Objectives	The aim of the intervention on the Elementary School is to make a seismic adaptation of the structure to bring the risk level of the building within the values foreseen by the seismic classification of the area and at the same time to make improvements to the thermal performance of the building through the replacement of part of the fixtures, the roof thermal insulation and the realization of appropriate measures in the plastering of the walls subject to chaining and cording. From the point of view of energy performance of the building, the KPI (Key Performance Indicator), taken into consideration, is the total annual thermal dispersion of the building per square meter, used in Italian and European legislation to define the energy classes with reference to the certification of the energy performance of buildings. The goal is to reach the energy class C, which corresponds to a total annual energy consumption to heat the building per surface unit, between 116 and 145 kWh / m² * year. Within this general objective the pilot intends to verify the application of the regional provisions in terms of minimum environmental criteria (CAM) for products and renovation works of public buildings, taking into consideration the tools developed by the GRASPINNO project, of which the Veneto Region is a partner, together with Unioncamere del Veneto.
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EE/RES category	Energy efficiency
EE/RES subcategory	Improvement of the thermal performance of the building envelope, with particular reference to non-opaque parts (glazing)
product type	Insulating glass, double insulation consisting of: 4 + 4 stratified glass external sheet with interposed PVB layer (0.76); 16 mm chamber; inner plate: 4 + 4 laminated glass with interposed PVB layer (0.76).
product characteristics green	The overall thermal transmittance of the new frames must not exceed 1,30W / sq.m. * K. Materials and installation systems in accordance with the CAM (Minimum Environmental Criteria) for the external window frames.
Green system characteristics evaluation of products and	Energy performance values and characteristics of the materials below the minimum thresholds set by the applicable CAMs are not accepted. A specific score will weigh the values above threshold, both related to the mandatory and to the rewarding ones.
EE/RES subcategory	Improvement of the thermal performance of the building envelope
product type	replacement of fixtures
product characteristics green	The whole thermal transmittance of the wall must not exceed 0.23 W/sm*K
Green system characteristics evaluation of products and	Energy performance values and characteristics of the materials below the minimum thresholds set by the applicable CAMs are not accepted. A specific score will weigh the values above threshold, both related to the mandatory and to the rewarding ones.
EE/RES subcategory	Improvement of the thermal performance of the building, with particular reference to the horizontal opaque parts
product type	Creation of insulation layer at the attic floor
product characteristics green	The overall thermal transmittance of the roof wall must not exceed 0.20W / m²K.
Green system characteristics evaluation of	Energy performance values and characteristics of the materials below the minimum thresholds set by the

characteristics and products	applicable CAMs are not accepted. A specific score will weigh the values above threshold, both related to the mandatory and to the rewarding ones.
EE/RES subcategory	Improvement of the energy performance of the heat generator.
product type	Replacement of the existing Standard old Heat Generator with a Condensing new Heat Generator
product characteristics green	The generator, with a thermal power higher than 35 kWt, will have an effective efficiency $\geq 93 + 2 * \log P_n$.
Green system evaluation of characteristics and products	Energy performance values and characteristics of the materials below the minimum thresholds set by the applicable CAMs are not accepted. A specific score will weigh the values above threshold, both related to the mandatory and to the rewarding ones.
EE/RES subcategory	Improvement of the energy performance of the lighting system.
product type	Replacement of fluorescent lighting system with LED lighting.
product characteristics green	LED luminaires will have luminous efficiency of at least 110 Lumen / W. With an estimated energy saving of 50% of the installed electrical power.
Green system evaluation of characteristics and products	Energy performance values and characteristics of the materials below the minimum thresholds set by the applicable CAMs are not accepted. A specific score will weigh the values above threshold, both related to the mandatory and to the rewarding ones.
Estimated budget	The budget for the entire project is € 696,000.00, of which € 547,500.00 for works that will be based on public auction

Below are some photos of the actual state of the windows to be replaced and other details on which to intervene to improve the energy performance of the building.

The currently installed windows and doors have an estimated overall thermal transmittance of $2.80 \text{ W / m}^2\text{K}$.

FOTO 1



FOTO 2



2.2 Identifications of KPIs

From the point of view of energy performance, the KPI (Key Performance Indicator) is taken into account, the annual consumption per square meter of non-renewable energy, necessary to heat the building as a whole. This indicator is used in Italian and European legislation to define the energy classes in the energy certification of buildings. $KPI = [KWh / mq * year]$.

2.3 KPIs implementation

To be evaluated at the end of the building refurbishment

3. TENDERS

3.1 Preparation using the Egpp platform

For the preparation of the call for tender there has been a fruitful collaboration with Unioncamere del Veneto, partner of the Graspino project, which has started to transfer to the municipal administration what has been developed in terms of tools and EGPP platform.

3.2 Publication of the real tender

The call for tenders was prepared in accordance with the laws in force:

- LEGISLATIVE DECREE 18 April 2016, n. 50 - Implementation of the directives 2014/23 / UE, 2014/24 / UE and 2014/25 / UE on the awarding of concession contracts, on public procurement and on the tender procedures of the supplying bodies in the water sectors, of the energy, transport and postal services, as well as for the reorganization of the current legislation on public contracts relating to works, services and supplies. (16G00062) (GU General Series n.91 of 19-04-2016 - Ordinary Supplement No. 10)
- The corrective decree to the code of public contracts (Legislative Decree No. 56/2017)

To participate in the call for tenders 20 companies were invited, with a negotiated procedure through an unofficial bid. The determination by the Manager (RUP - sole responsible for the procedure) of public works in the municipality of Valdobbiadene took place on 15-11-2017

3.3 Tenders evaluation system

The evaluation of the responses to the announcement can be found in the minutes of the municipality of Valdobbiadene on 12-12-2017

3.4 Results of the tenders

The assignment of the works took place through the contracting authority of the Feltrina Mountain Union in the presence of the RUP on 12-12-2017. The company CO.FA.M srl of Rome-Italy has been awarded the contract

4. INSTALLATION OF SUPPLIED PRODUCT/SERVICES

Work will start at the beginning of 2018 and will be completed in September 2018.

5. CONCLUSION

To be completed at the end of the project