

# DIDA RESEARCH WEEK



UNIVERSITÀ  
DEGLI STUDI  
FIRENZE



## DEEP RENOVATION OF SCHOOL BUILDINGS

Three case studies: Carrara, Vallisneri and Majorana High Schools in Lucca

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Schools and academic buildings represent 17% of the European building stocks, approximately 12% of average for not-residential energy consumption buildings in Europe. Europe's school building stock is relatively old, often dilapidated with poor energy performance standards. The European Energy Efficiency Directive (27/2012/EU) provides that, from 1 January 2014, 3% of public buildings should be refurbished every year, under energy efficiency strategies. On this same proposal, the memorandum on schools and kindergartens explicitly mentions that this type of infrastructure should be renovated with a high standard of envelope and roof insulation, installing double-glazing and replacing inefficient or obsolete heating systems. However, to achieve the objectives of the European energy standards legislation we are still too much focused on continental climatic conditions and poorly adapted to Mediterranean ones. In particular, in order to reduce the time and the cost of retrofitting actions and to answer EU energy requirements directives, it is necessary to design and develop new adaptive and precast facades. These technological solutions, in fact, guarantee to regulate the solar radiation in summer and heat losses in winter and to increase natural ventilation and daylighting inside the school buildings located in the med area. Research activity shows result of the Lucca's Public Administration collaboration focusing on the revamp project of three schools (Carrara, Vallisneri and Majorana High Schools) chosen as case studies for a responsible retrofitting strategy. In all buildings, innovative envelope systems have been integrated as a dynamic environmental filters regulates airflows, solar radiation and heat flows.

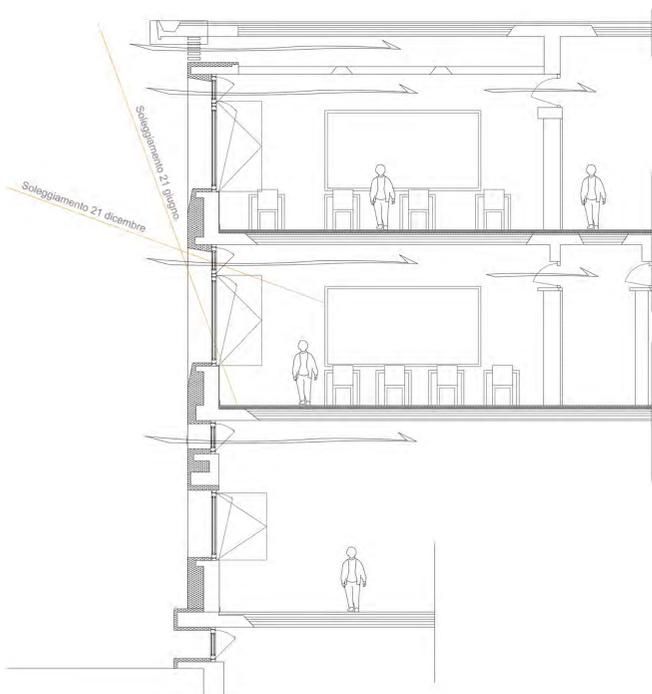
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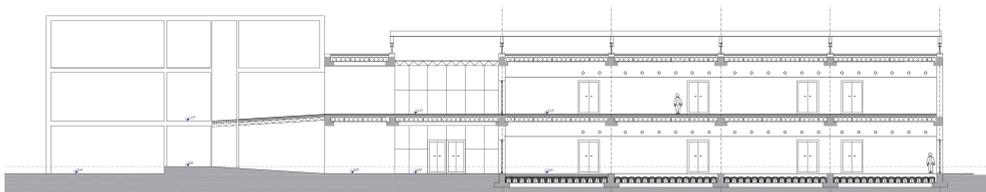
### Carrara High School Institution



### Vallisneri High School Institution



### Majorana High School Institution



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19 - 23 FEBBRAIO

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