

New Engineering *Progettazione & Management*

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Company's presentation:

- **services we offer**
- **our instruments**
- **a selection of our green-building projects**



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ABOUT NEW ENGINEERING

History

Mr Danilo Mora has been working as an engineer since 1977 doing many projects and consultings to public and private customers, especially in the district of Bolzano. During his long career he was designer, site engineer, project manager.

At the end of 2002, based on Mr Danilo Mora's know-how, New Engineering srl born in Bressanone (BZ) as a new engineering company. Beside Mr Danilo Mora, the new company's partners are the newly graduated engineers Mr Luca Oss Emer, Mr Riccardo Mora and Mrs Alessandra Mora.

The skills and technical support from Mr Danilo Mora were of fundamental importance during the first years of the new company, made by young and willing partners, but still beginner in the professional world.

Since the beginning New Engineering set up a workgroup in order to guarantee quality and continuity to the first customers. The workgroup has always been composed by four technicians beside the partners. Some rare collaboration with freelance technicians was also activated especially in the first years of the company. With the increasing skills of the workgroup, the new company had the necessity to operate in the neighboring district of Trento, thus in the 2004 the headquarter of the company was moved to Trento, anyway still keeping a secondary office in Bressanone (BZ).

Later a new office was opened in Bolzano, in Max Plank road no.3, as the sector of the company involved with the design of electrical and mechanical systems.

About us

Our staff is made up of dynamic and experienced young technicians that, taking advantage of the senior staff's knowledge, develop their ideas and enhance their skills working in our company. We believe in the importance of the continuous education of the staff to cope with the present and future challenges.

The keywords of our success are:

Our strengths

INNOVATION: Continuously looking for new approaches, exploring different ways to overcome everyday matters

VARIOUS SKILLS: Keeping high-level knowledge at disposal of our team, by means of education programmes tailored for each member of the staff and investments in research

EFFICIENCY: Carefully planning each work-package to successfully complete all the projects' tasks

QUALITY: Evaluating internal and external non-conformities and analyzing our customers expectations and their satisfaction

Continuous refresher courses

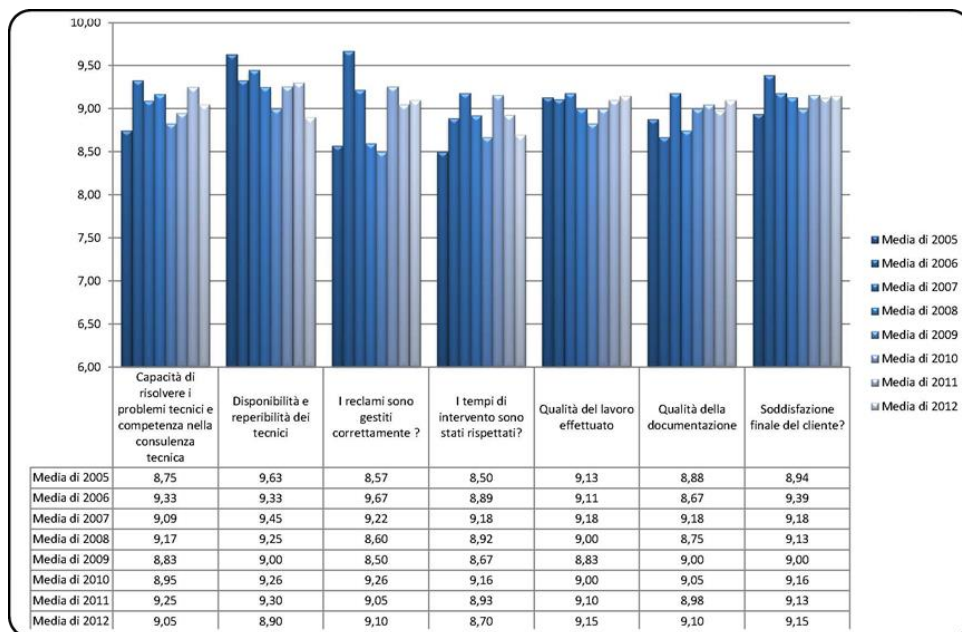
The continuous education of the whole New Engineering staff is one of the strengths of our company, thus able to follow the expectations and needs of an evolving market. Since the 2001 our staff have been continuously attending to professional courses in the following subjects:

- fire-engineering
- safety and building coordination
- administrative matters related to the public works
- energy audits
- site and construction management

Our customers say about us

- maintenance and facility management
- design
- structural analysis.

We believe in the importance of the feedbacks we receive by our customers: thanks to the analysis of our customers opinions we could offer high-quality services to all the matters proposed. The strict implementation of our quality management system (since 2005 we are an ISO 9001 accredited company) led us to the following results:



Contact

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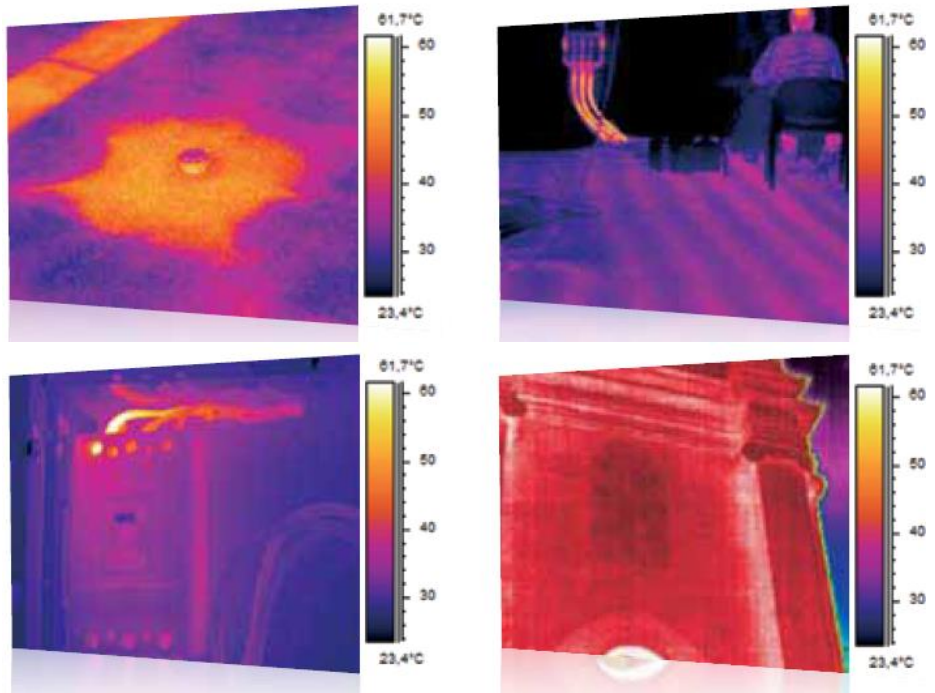
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Please visit our continuously updated web-site:
www.new-engineering.it

INSTRUMENTS



Thermographic camera



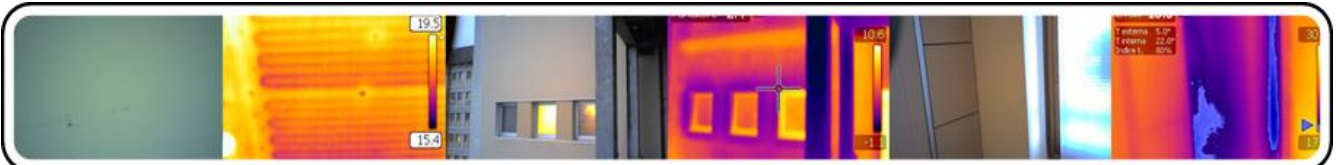
We use the **FLIR Series B400 thermographic camera** in order to provide energy audit in existing buildings and to survey circuits and power boxes and, in general, each warm component of the building.

- 320x240 pixel resolution
- 8x digital zoom
- 1.3 Megapixel camera
- <50mK NETD

By means of the thermographic camera it is possible to:

- rapidly provide energy audits of existing buildings
- highlight any problem related with the HVAC systems
- evaluate the energy performance of existing buildings
- find any moisture in the building envelope

and much more.





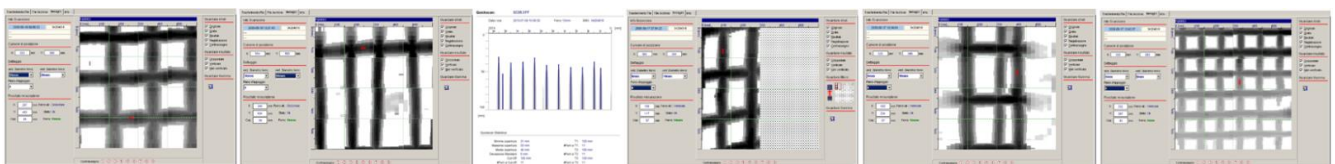
Steel reinforcement monitor

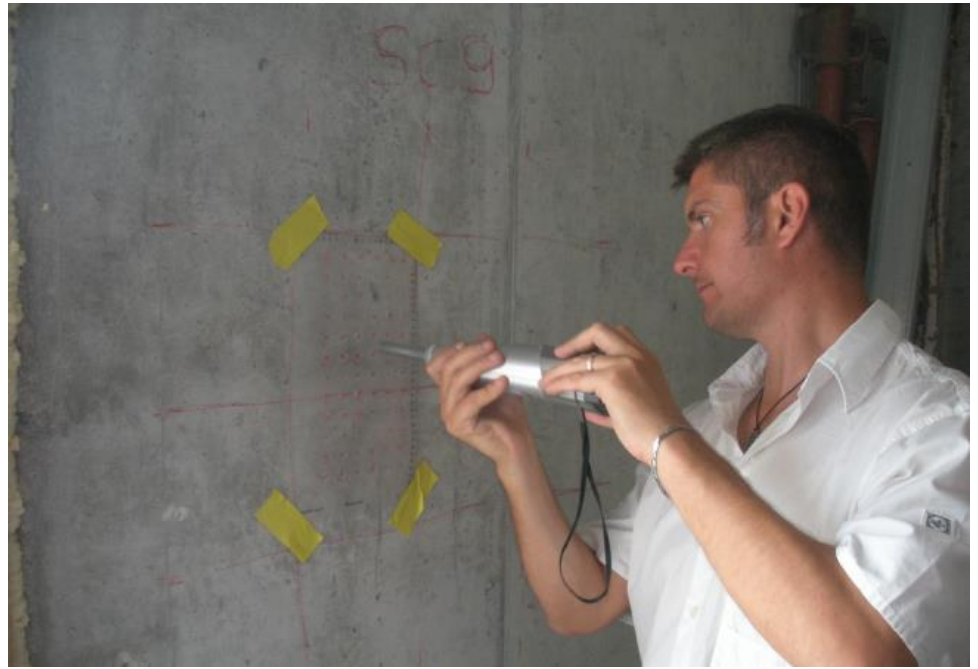
The **Hilti Ferroskan PS 200** surveys the steel reinforcement in the concrete until a 10 cm depth. We use this instrument especially to:

- provide assistance to the site engineer
- realize structural tests on constructed buildings
- verify the fire resistance of structures
- search for room inside the concrete structures where it is possible to install circuits and pipes
- verify the positioning of the puller during pull-out tests

This instrument is invaluable when it is necessary to design and realize any kind of works on existing buildings and to precisely define the steel reinforcement properties in order to perform non-linear finite element modeling aimed at the evaluation of the seismic behavior of the structures.

Even if the detailed analysis of the in-situ collected data is performed by the New Engineering staff at office, it is possible to gain important information related to the position and dimensions of the steel reinforcement directly in-situ, a few minutes after the execution of the survey.





Sclerometer

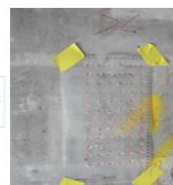
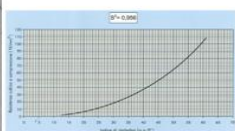


The **ECTHA 1000 sclerometer** allow to evaluate the resistance of concrete parts. The combined use of this instrument with the Hilti Ferrosan steel reinforcement monitor allow to evaluate the resistance of concrete far enough from the reinforcement.

We generally use the sclerometer in order to:

- assist the site engineer
- realize structural tests on constructed buildings

To perform more precise measures, it is important to remove the surface layer of the concrete by means of an abrasive element given with the instrument. All the in-situ collected data are analyzed and statistically interpolated in order to obtain a very precise information related to the resistance of the concrete element.





Pull-out jack



We use the hydraulic jack **ENERPAC RCH-202**, in combination with the suited pressure gauge and some Fisher mechanical anchors in order to perform pull-out tests.

The pull-out tests are often required to:

- assist the site engineer
- perform structural tests on constructed buildings
- analyze the seismic behavior of buildings.

These instruments are combined with the steel reinforcement monitor to avoid the risk of realizing pull-out tests where the steel reinforcement collaborate to enhance the concrete resistance. The in-situ collected data are analyzed by means of the Meneghetti's theory in order to evaluate the compression resistance of the concrete.





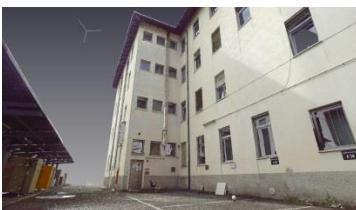
3D Laser Scanner



We use the innovative **3-dimensional laser scanner Focus 3d** to perform surveys. It could scan points in the range of 0.6 - 120 m (distance of points from the instrument) with a productivity of 976.000 points per second. The Focus 3d laser scanner has an integrated 70 megapixels camera and thus provides color and photorealistic 3 dimensional scans.

We use the Focus 3d in order to:

- realize surveys as input data for architectural, structural and plants design
- assist the site engineer
- perform on-site work accounting
- monitor slope stability during excavations
- verify and monitor strains
- realize as-builts.





GNSS HIPER PRO receiver



GNSS GR-3 receiver



Our “traditional” instruments for surveying are absolutely innovative. This is the reason why we written in quotation marks the word traditional: in fact they are state-of-the-art surveying instruments but they are traditional if compared to the 3d laser scanner. Our GNSS receivers can be linked to three different constellations (GPS, GLONASS and GALILEO). Here the peculiarities of our receivers:

TOPCON HIPER PRO:

- GNSS GPS+GLONAS receiver
- 40 channels
- integrated antenna
- output in RTK,RTCM2,RTCM3
- integrated Bluetooth
- integrated Radio UHF 380-470MHz
- link to the permanent regional/national networks

TOPCON GR-3:

- GNSS GPS+GLONAS+GALILEO receiver
- 70 channels
- integrated antenna
- output in RTK,RTCM2,RTCM3
- integrated wireless Bluetooth
- integrated modem GSM/GPRS
- integrated Radio UHF Tx/Rx
- link to the permanent regional/national networks

More than 10 years at your service





GPT-3005 LN theodolite

Theodolite with laser pointing 1200 m far. It is thus suitable also to survey points in difficult and extreme conditions.

The theodolite is endowed with a bi-axial compensator that minimizes errors.

Here follow the specs of the theodolite:

TOPCON GPT-3005 LN:

- direct reading 1200 m far
- class 1 laser
- internal storage memory
- bi-axial compensator



Topcon FC-236

Windows mobile controller for the GPS receiver. It is endowed with an integrated GPS communication channel thus it could be used as a receiver.

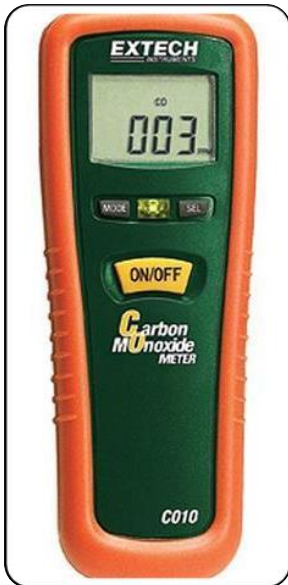
It is robust, water and dust proof (protection level IP67) and it resists to falls, moisture and works well in the range -30°C – 60°C.

The main specs of the Topcon FC-236 are:

TOPCON FC-236:

- integrated GPS
- Bluetooth 2.0 and WLAN function
- 3 Megapixels integrated camera
- Windows Mobile 6.1 Professional
- CPU at 806 MHz
- Display touch-screen 3,5" VGA
- GSM/UMTS





Extech C010

Carbon monoxide meter: Extech C010

- Operating moisture range – 0-99% relative humidity
- Measuring range – from 0 to 1000PPM (parts per million)
- Measure sensitivity - 1PPM
- Accuracy - 5% o + /-10PPM

Using this instrument we:

- measure the indoor CO concentration (in factories, commercial buildings and residential houses)
- verify the sealing of chimneys and the safety of stoves



Extech M0297

Hygrometer with integrated IR thermometer and Bluetooth: Extech M0297

- vapor pressure from 0 to 20.0 kPa
- dew point from -30°C to 100°C
- humidity ratio from 0 to 160 g/kg
- productivity: 2 measures per second

Using this instrument we:

- measure indoor temperature and relative humidity
- measure the moisture in materials, without damaging their surface

We generally use this hygrometer/thermometer in combination with the thermographic camera, thus we can provide precise energy audits of existing buildings.





Leica disto D5

Instrument to measure distances, angles, areas and related quantities. Measures range from 0.05 to 200 m with a $\pm 1,0$ mm mm accuracy.

Main specs of Leica DISTO D5:

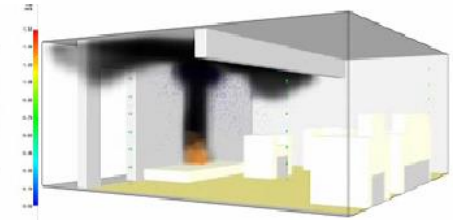
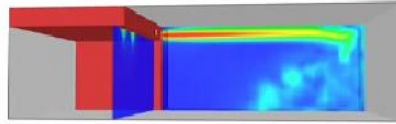
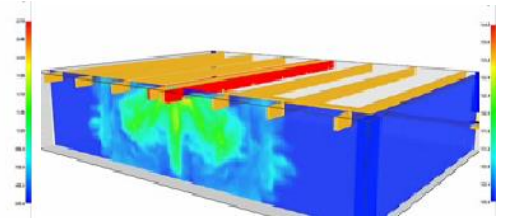
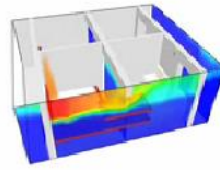
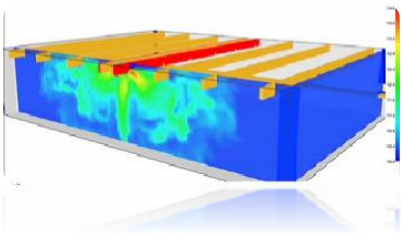
- measures range from 0,005 to 200m
- digital viewfinder with 4x zoom and color high-definition display
- inclinometer
- functions to measure inclination and areas



Nikon D200

Reflex digital camera – 10.1 Megapixels

MAIN SERVICES

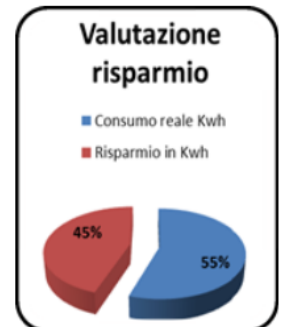
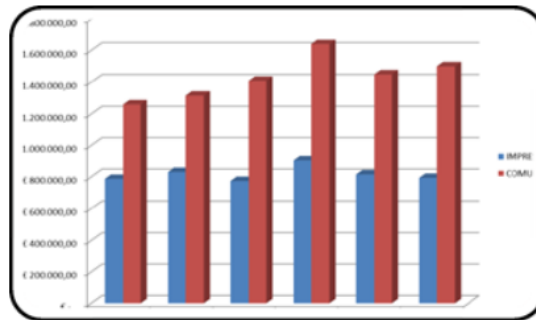


Numerical analysis - CFD and Fire Engineering

We offer specific skills in order to numerically simulate complex problems such as those related to fire in buildings, fluid dynamics, heat transfer and, in general, problems related with the sustainable building design. Thus we implement concepts from fire-engineering, computational fluid-dynamics.

To this aim we implement the most precise numerical codes, such as FDS (Fire Dynamic Simulator) and Smokeview. For example, these are some numerical analyses we carried out:

- mechanical ventilation regulation with accurate numerical analysis of the fresh airflow inlet in order to guarantee the thermal comfort of the users
- design of the fire systems simulating the fire inside a room and check of the influence of ceiling's different shapes on the smoke diffusion
- numerical simulation of the fire in a college. Check of the indoor smoke diffusion and of the sprinkler system efficiency
- numerical simulation of the air flow inside a gym and check of the thermal comfort at the playground level and at the spectators' seats level

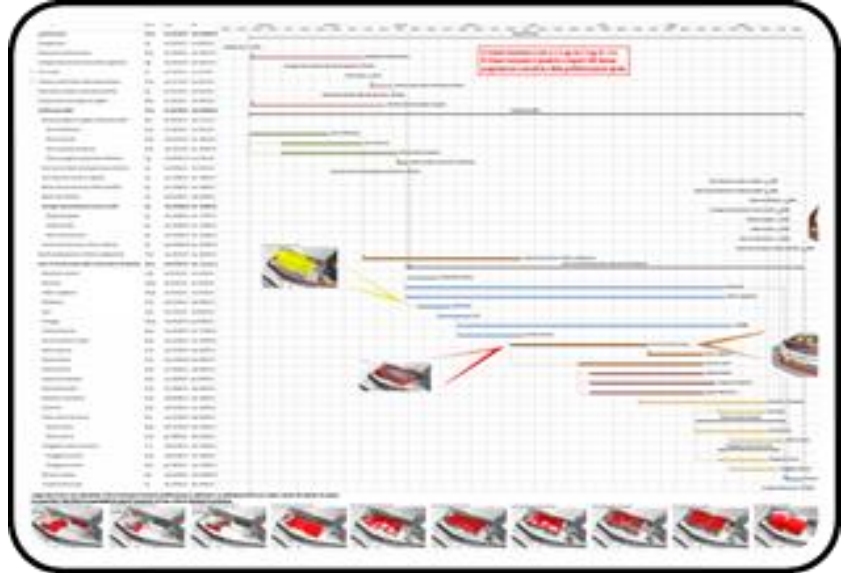


Energy Management Facility Management

We could be Energy Manager for public administrations, supporting public managers in delivering invitation to tenders related to the heating supply and management of heating systems in public-owned buildings. In general, our activities related to the whole system building-HVAC systems are summarized as follows:

- deep analysis of the system building-HVAC system
- evaluation of the energy performance of the building
- search of specific problems in the envelope or in the HVAC systems
- flattening of the macro-specific problems, in order to highlight micro-specific problems
- preparation of specific plans to enhance and optimize the system building-H systems

We could also be Facility Managers, with particular care to the energetic matters of the facilities, but also with attention to the other fields and services. Our strength is the definition of the required maintenance to assure the conservation of the building and to meet the in force regulations requirements.

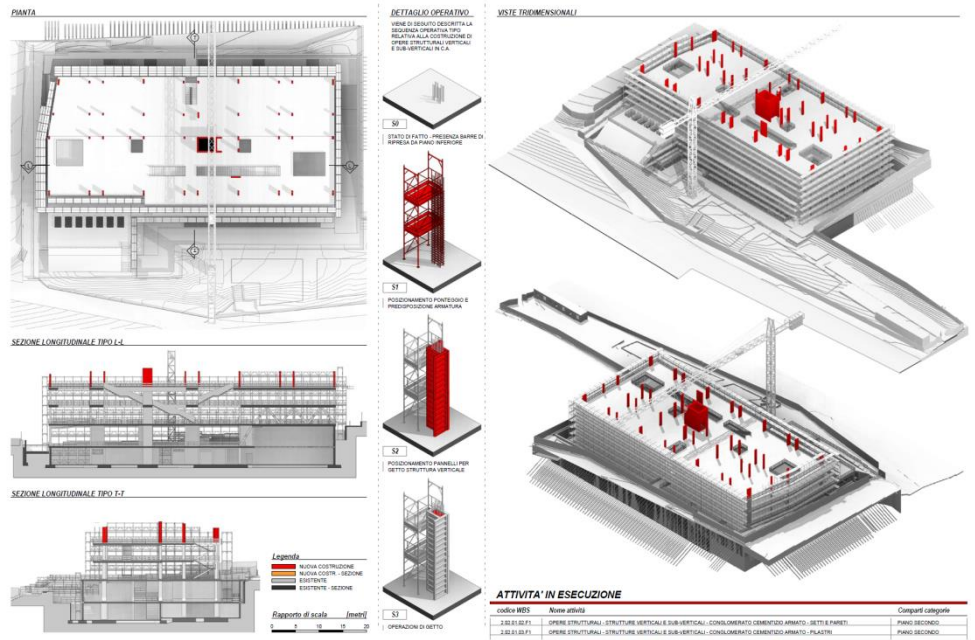
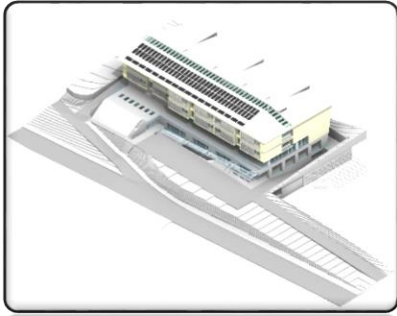


Project Management

We offer project management support, assisting our customers in the coordination of all the professionals, construction companies, building components suppliers, final users of the works.

In the project management activities our strength and distinguishing peculiarity is our ability to implement 4D models, i.e. three-dimensional virtual models where we take into account also the phasing of the construction process and the advancements of the construction works. We implement these innovative techniques actually in all the services we provide, such as:

- integrated design where our staff coordinate the specialized professionals in order to provide a design as a whole, where all the designed work's components are reciprocally suitable
- site and construction management where we provide a continuous on-site presence that assures an effective management of the construction activities
- project control where we constantly monitor the advancement and the quality of the works, in order to assure that the final work is compliant with the expected quality and costs and realized on time.



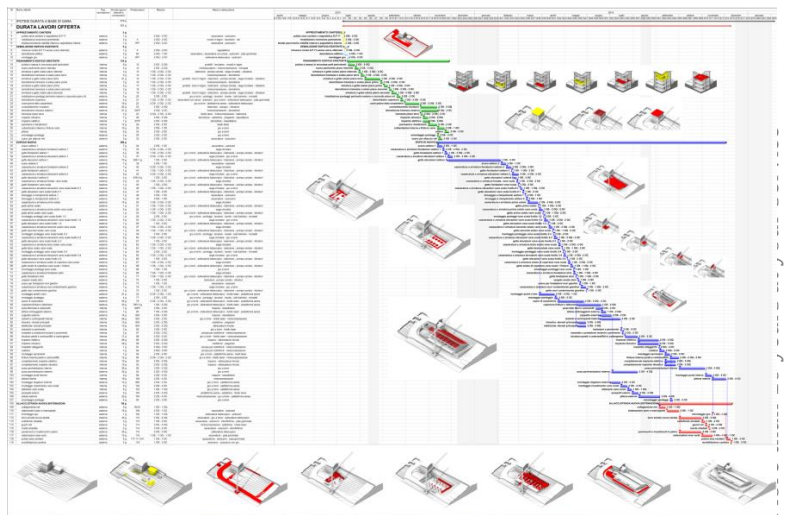
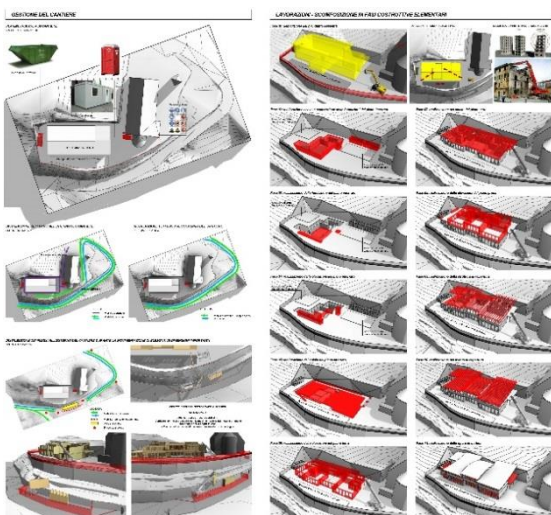
4D design

We develop full 4D designs, thus giving our customers the tools required to control the advancements of the project and the cash-flow related, starting from the very beginning of the construction phase.

The 4-dimensional design consists of provide 3-dimensional virtual models of the works to be constructed, associating to each component of the work also properties related to the time of construction, i.e. when the particular component will be constructed and how long its construction will last.

The construction of the 3-dimensional virtual model leads to the correct and immediate integration between the specialized designs (architectural, structural, mechanical and electrical) and allows, from the very beginning of the design process, to highlight possible interferences between the various parts of the design. With the 3-dimensional models, the customers are able to virtually explore the works before their construction. Taking into account the construction phasing we deeply analyze the construction process, verifying its technical feasibility, optimizing the site management and coordinating the construction activities, with benefits both on time and on costs of the construction.

We also develop traditional 2-d designs, applying our know-how both in the design of buildings and infrastructures.





Site and construction management

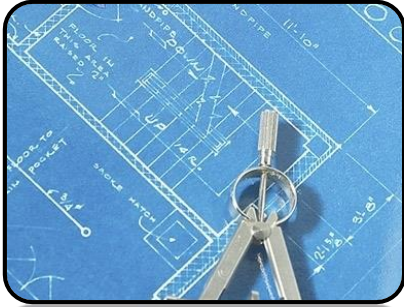
Thanks to the skills we developed in many engineering sectors (design of schools and hospitals, residential and commercial buildings, road and railways, HVAC and electrical systems for buildings and various infrastructures, management of civil and industrial demolitions) our staff is able to manage the construction site from its beginning until the end of the construction phase and the tests on the structures, including the construction accounting.

We carry out the site management activities also with innovative instruments, such as the 3d laser scanner, thus providing a continuous monitoring of the quality of works and assuring the balance between work advancements and cash-flow for the benefit of the customer.

The main phases of the site and construction management are:

- preliminary verification of the design and its technical feasibility
- verification of the administrative qualifications of the constructor
- qualification of material and technical solutions proposed by the constructor
- management of works and of the cash-flow
- works accounting
- assistance during the final tests on works

We implement a web platform to facilitate teamworking and share projects' data with our partners and the customers. It can be accessed with all the main internet browsers.



Works accounting

We provide accounting of works during the construction of public works, attending the in force Italian regulations (D.Lgs.163/2006 and DPR 207/10).

We implement also innovative instruments in order to effectively monitor the in-site advancement of works. For example with the 3d laser scanner we could precisely evaluate the volume of excavations in a construction site comparing the 3-dimensional scans taken before and after the excavations.

To provide preliminary accounting of works, i.e. the evaluation of the costs of the work during the design phase, we implement a software system that links the costs with the 3-dimensional model of the designed works, in order to minimize possible accounting errors.



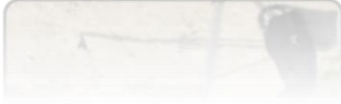
High precision surveys

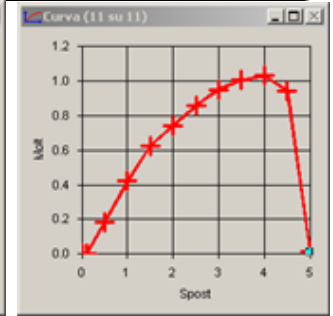
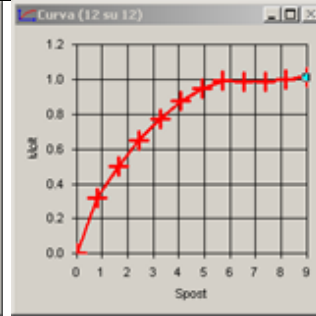
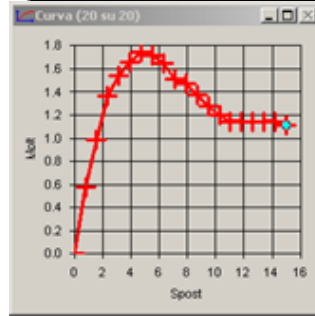
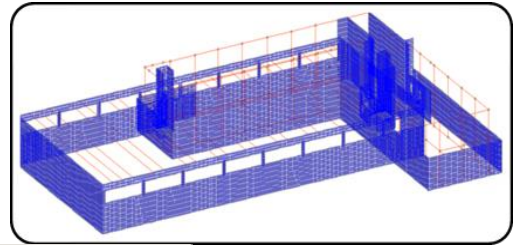
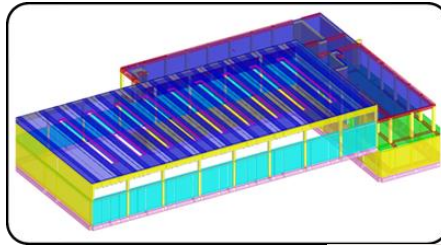


We implement high precision survey instruments both traditional and innovative. We provide surveys to meet every needs:

- on site surveys
- detailed surveys
- surveys and operations on the land register
- precise positioning of structures and infrastructures
- verification and monitoring of work advancements

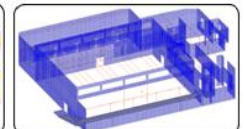
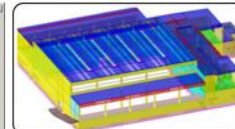
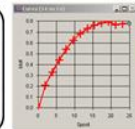
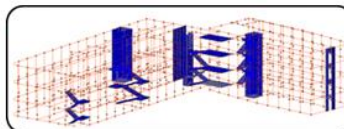
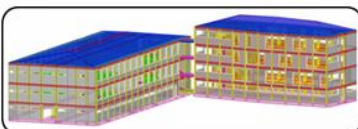
We also provide Digital Terrain Models of the surveyed sites.

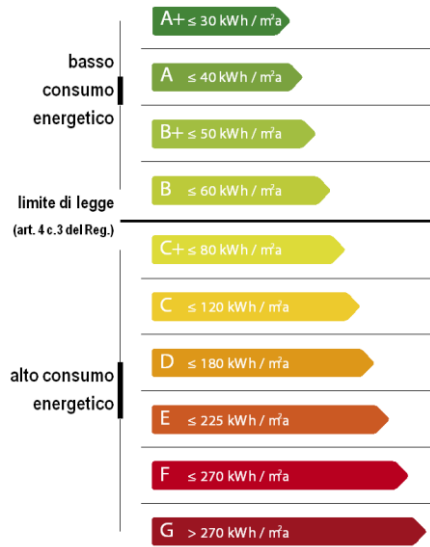




Seismic analysis

We provide seismic analysis on buildings after collecting many data on the existing buildings, as stated in the current regulations. The data are collected both directly on site, by means of measures and observations, and obtained by existing filed documents. The objective is to obtain all the properties of the materials that constitute the building, of the steel reinforcement in the concrete components and the main structural details. Then we build a 3-dimensional finite element model of the structures that is used to numerically evaluate the seismic behavior of the building. After the analysis of the results it is possible to identify the operations required by the building in order to enhance its seismic behavior.





Energy audit

We provide energy audit both on existing buildings and on new buildings and renovated ones. We realize the certificates that indicates the energy performance of the building, in accordance with the current Italian regulations.

ARCA qualification

We provide support for customers that want to qualify their wooden buildings in accordance with the ARCA rating system. ARCA is the acronym for “Architettura Comfort Ambiente” (architecture comfort environment), it refers to the rating system for wooden buildings studied in Trentino, the land of wooden buildings in the northern Italy.

Casaclima qualification

Some of our technicians are CasaClima accredited professionals. CasaClima is the public authority that, in the Provincia Autonoma di Bolzano manage the accreditation of buildings in relation to their energy performance. Our technicians support the customer during the whole construction process and starting from the design phase.

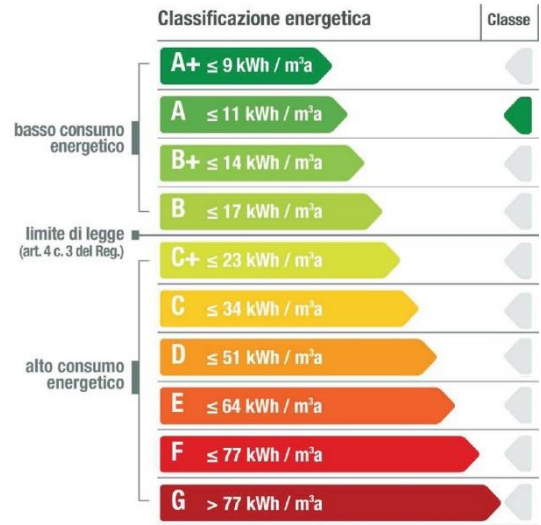
GREEN-BUILDING PROJECTS

GYM OF ELEMENTARY SCHOOL SEGANTINI

COMUNE DI ARCO - PROVINCIA AUTONOMA TRENTO

Short info

- Description** : Adaptation and expansion of the gym of the elementary school Segantini in Arco
- Customer** : Servizio Opere Pubbliche – Comune di Arco
ref. Arch. Bianca Maria Simonetti
- Where** : Arco – Comune di Arco (TN) - Italy
- Service** : Design
- Cost** : 2.771.892,50 €
- When** : 2012 - 2013



Description

The design of the new gym adjacent to the elementary school “Segantini” in Arco is related to the demolition of the existing gym and the construction of a new bigger one. The new gym will guarantee first-level energy performance and structural stability in case of earthquake.



Materials and Technical solutions

The new gym will be constituted by reinforced concrete walls and a wooden roof supported by laminated beams. The building envelope will be adequately isolated by means of the installation of insulating materials such as rock wool and polystyrene.



Wooden beams as support for the wooden roof of the gym



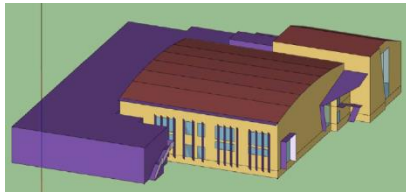
Plants will shadow the southern face of the gym

In proximity of the southern face of the new gym some metal gratings will be installed where climbing deciduous plants will grow in order to shadow all the new gym face and its big windows. The plants will then be in their full vegetative-state during summer, offering maximum protection both from the incident solar radiation (thus maintaining adequate indoor comfort even without conditioning) and from the sunlight that could glare the athletes inside the gym. It is important to highlight that the deciduous plants will be without any leaf during winter, thus allowing the sunbeams to contribute in the heating of the indoor space.

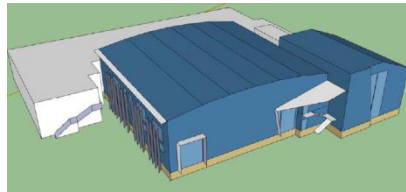
Numerical analysis

DYNAMIC ENERGY MODELLING

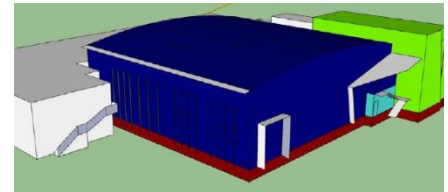
The energy efficiency of the new gym was evaluated by means of an energy dynamic simulation, i.e. a simulation that takes into account the variability with time of all the involved parameters. By means of this simulation is possible to precisely evaluate the energetic behavior of the building and of the HVAC systems.



3D model of the gym



Assumed boundary conditions



Thermal zones considered in the analysis

The dynamic analysis of the energetic performance of the new gym was evaluated by means of EnergyPlus, the software produced by the US Department of Energy. The analysis allowed, in the design phase:

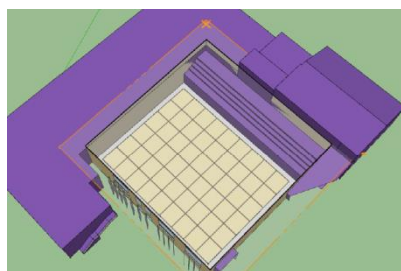
- to optimize the energy consumption of the new gym
- to deeply analyze the behavior of the building and of the HVAC system as a unique system

NATURAL AND ARTIFICIAL ILLUMINATION

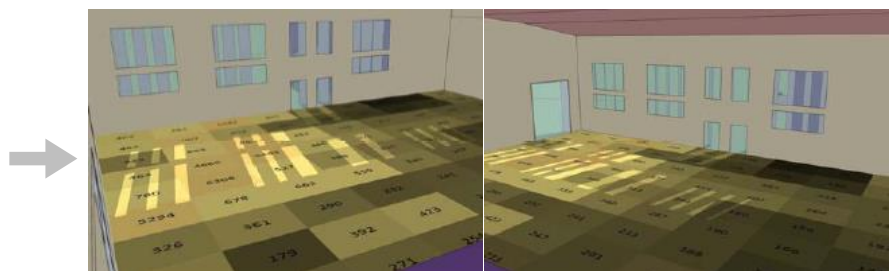
An innovative and accurate analysis was also carried out in order to forecast the indoor illumination of the gym due to daylight and to prevent glaring phenomena to the athletes inside the gym.

The numeric code EnergyPlus provided values of the natural illuminance [lux] on the floor of the gym and of the glaring index evaluated for athletes positioned in different parts of the gym. Thanks to these values it is possible to pre-define controllers of the lights (such as dimming-switches) and of the shadowing devices on the windows.

ILLUMINANCE

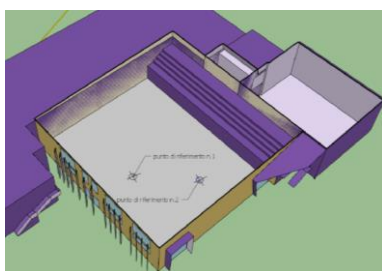


Illuminance Map on the floor of the gym

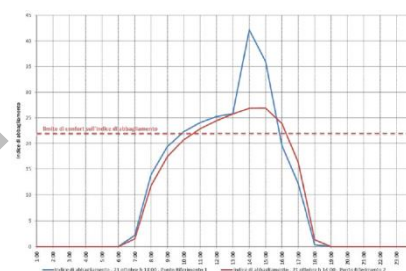


A couple of views of the results: the numeric values are related to the forecasted indoor lux

GLARING INDEX



Positions of the reference points



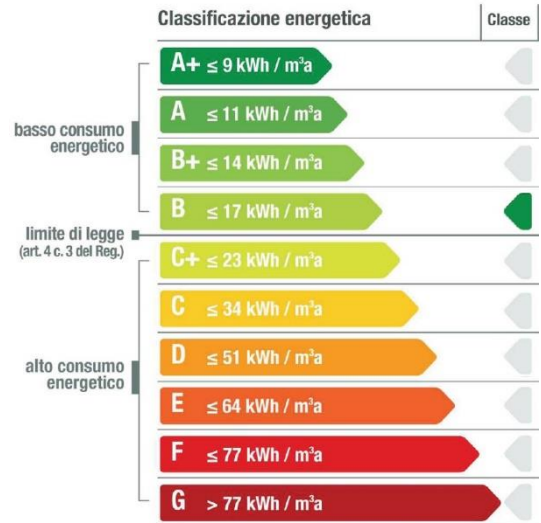
Numeric values of the glaring index – for one day on the left and for a full year on the right (the red dotted horizontal line refers to the upper limit of comfort conditions)

NEW SCHOOL OF NORIGLIO

COMUNE DI ROVERETO - PROVINCIA AUTONOMA TRENTO

Short info

- Description** : New school of Noriglio and adjacent public room
Customer : Servizio Lavori Pubblici – Comune di Rovereto
 ref. Ing. Paolo Piccinni
Where : Noriglio – Comune di Rovereto
Service : Site and construction management - Health and safety construction management - Design (variant)
Cost : 5.280.834,74 €
When : 2009 - 2012



Description

The new school of Noriglio was built following the bio-architecture principles, implementing natural materials and innovative technologies in order to minimize the energy consumption of the school all over its life-cycle (thus minimizing the energy consumption for heating, ventilation and air-conditioning and the energy required to produce the construction materials and to demolish them at the end of the life of the building).

The school is constituted by three separated blocks that contain the nursery school, the elementary school, the gym and all the required services. All the blocks share the same heating plant.



Materials and Technical solutions

BLOCKS OF THE SCHOOLS

WOODEN INTERNAL AND EXTERNAL WALLS

The walls of the school blocks are constituted by wooden elements and adequate insulating materials. The external walls are covered with colored plasterboards that realize a ventilated double facade.

The roof is made with wooden elements and beams and the insulation is constituted by wooden-fibers.

The windows are made with low-emitting glazing that offers first-class acoustic and insulating performance.

A gas-proof membrane was installed beneath the blocks in order to prevent the diffusion of the radon in the indoor environment.

The HVAC system is based on a high-performance boiler that feed the radiant panels installed in the floor of the school.



GYM AND SERVICES BLOCKS

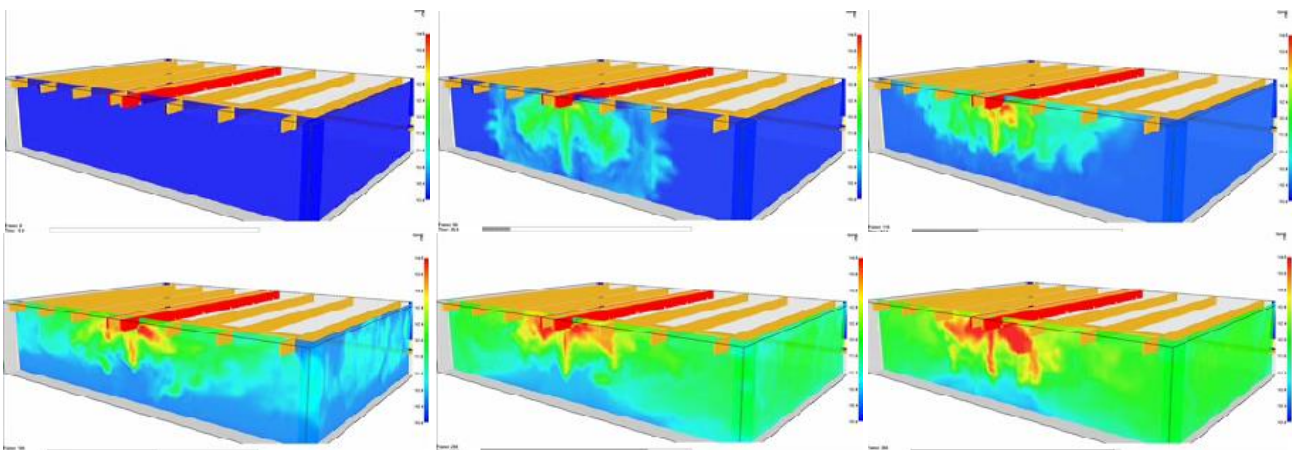
The gym and services blocks are supported by a reinforced concrete structure with masonries and wooden panels. Some tanks were also installed in order to collect the water from the rain for its use for irrigation purposes. All the taps and flushes are specific low-water consumption products.



Numerical analysis

COMPUTATIONAL FLUID-DYNAMICS MODELING

In order to precisely evaluate the indoor comfort of the athletes and of the spectators in the gym we carried out a CFD analysis of the air-flow inside the gym. The three-dimensional results are briefly exposed in the following pictures: they shows the forecasted temperature in the indoor of the gym, when the HVAC system starts. In particular they shows that in a few minutes after starting, the warm mass of air diffuses all over the indoor environment.

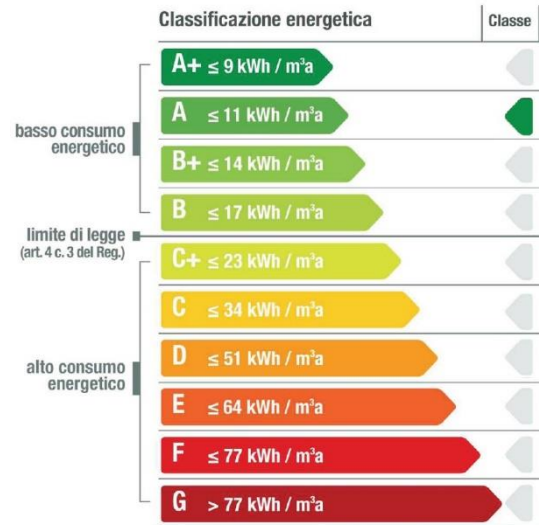


THE MECCATRONICA CENTER

TRENTINO SVILUPPO S.p.A. - PROVINCIA AUTONOMA TRENTO

Short info

- Description** : The Meccatronica Center
- Customer** : Trentino Sviluppo S.p.A. - ref. Eng. Michele Ferrari
- Where** : Polo Tecnologico - Trentino Sviluppo S.p.A. - via Zeni 8 - Rovereto 38068 (TN)
- Service** : Site and construction management
- Cost** : 16.779.122,75 €
- When** : 2012 – in progress



Description

The new “Polo della Meccatronica” will become the center of mechatronic sciences in Trentino, providing future room companies and firms involved both in the research and in the production of mechatronic components and elements and, eventually, for specialization schools and branch of the university of Trento.

The new building will then be huge (approx 4500 square meters per floor – three floors) with two semi-buried lower floors made in reinforced concrete and a upper floor completely made in wood.



Materials and Technical solutions

Building envelope

The lower floors will be dedicated to the production of mechatronic components and it is being built with reinforced pre-cast concrete walls and floors made with post-stressed slabs made in reinforced concrete. The pre-cast concrete walls provide an insulation layer.



The wooden-upper floor is being built with wooden panels built with the XLAM technology (laminated panels, glued together alternatively crossing the wood fibers).



The new building will be adequately inserted in the landscape thanks to the vegetation that will be planted all over the new structures. Part of the roofs will be green-roofs and climbing deciduous plants will cover the stairways providing shadowing in the summer.

Water management

All the rain will be collected and used for the building's water needs (toilets flushing and plants irrigation) after the filtration and settling into specific tanks.

Materials

A relevant percentage of the materials used in the construction derives from local primary resources, thus minimizing the transportation and all the related pollution. All the rubbish is being accurately differentiated and separated, in order to perform a comprehensive selective waste collection during construction.

Energy and atmosphere

In order to prevent pollution to the atmosphere and CO2 emissions, the building generates parts of the electricity it requires by means of photovoltaic cells installed on the roof and the conditioning equipments contains only refrigerant fluids with null Ozone Depletion Potential.

Indoor environment quality

The new building will be healthy and comfortable for its occupants, implementing materials that don't generate Volatile Organic Compounds. The lights in the shared spaces of the building will be managed by means of dimmer switches and presence-sensors.

Rating systems qualifications

The peculiarities of the new building that will house the new "Polo della Meccatronica" will lead to the prestigious qualifications of the LEED (**LEED platinum**) and ARCA (**ARCA silver**) rating systems:

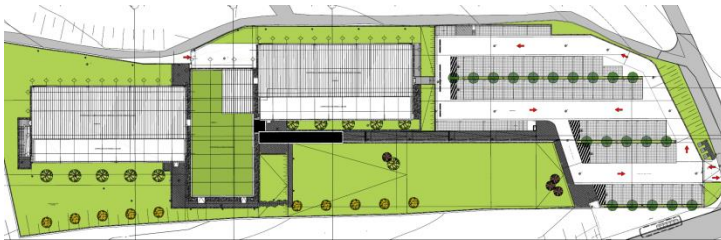


NEW "S.BORROMEO" COLLEGE IN L'AQUILA

COMUNE DE L'AQUILA - REGIONE ABRUZZO

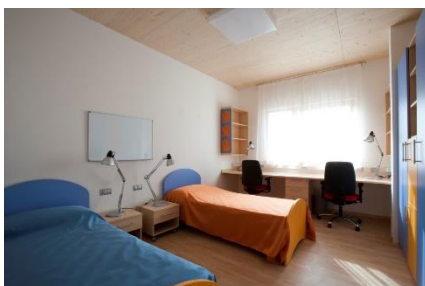
Short info

- Description** : New college in L'Aquila
- Customer** : Infrastrutture Lombarde - Regione Lombardia
- Where** : L'Aquila Loc. Coppito (AQ)
- Service** : Design
- Cost** : 5.709.731,00 €
- When** : 2009



Description

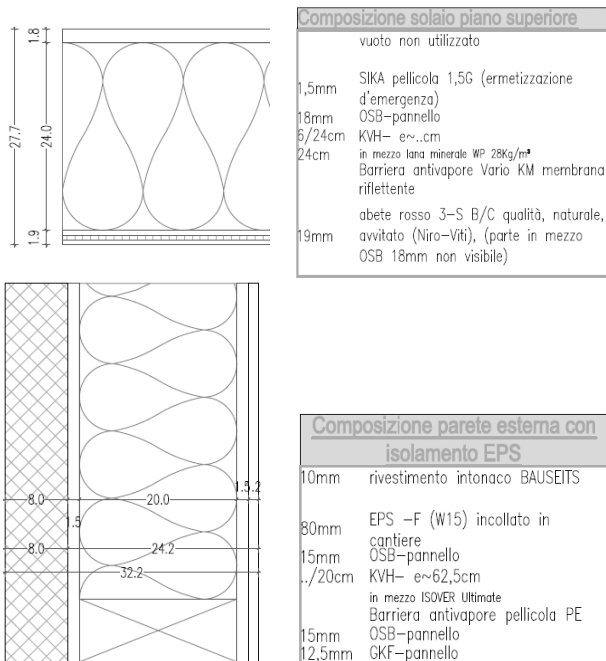
The new "S. Borromeo" college in L'Aquila was built immediately after the catastrophic earthquake that affected the mid Italy in the 2009 and that had its seismic origin in the city of L'Aquila. The main objective of the new college was to give room to the students attending the famous university of the city, in the shortest time. Thus the construction made massive use of prefabricated building components made in wood. All the building's structures and the building envelope were made in wood because this material guarantee a peculiar elastic resistance to seismic events and first-class indoor comfort thanks to insulating and breathing properties.



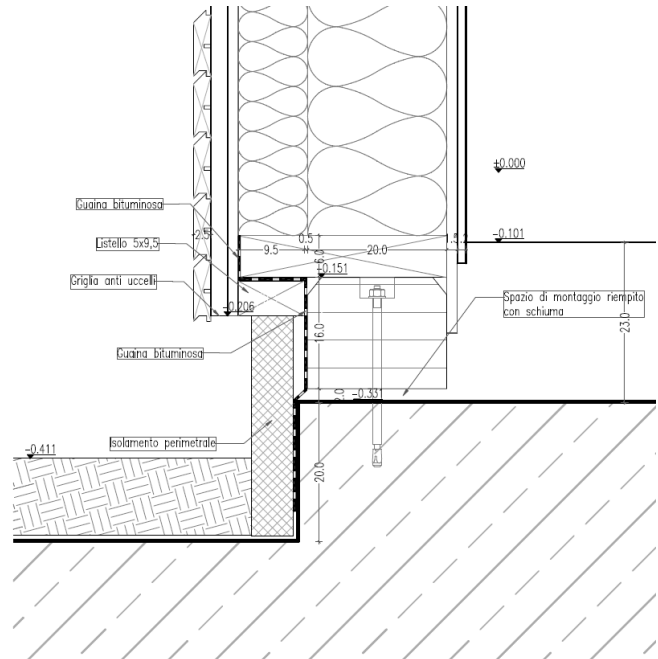
Materials and Technical solutions

The new college is made with three separated blocks each one built over seismic base isolation systems. A reinforced concrete grid of beams leans over the base isolators and over that the wooden buildings are sustained. The structural parts of the building are made with wood-frame, except for the structure of the elevator shaft that are made with XLAM (laminated panels, glued together alternatively crossing the wood fibers).

The building thus offers an incredible seismic resistance and, in the meanwhile, optimal insulation properties, thanks to the insulating layers coupled with the wooden structures and to the very accurate elimination of all the possible thermal bridges by means of the deep study of all the building's nodes. High-level energetic performances of the building are also guaranteed by the solar collectors that contribute in the production of the required hot water.



Cross section of the floor slabs and load-bearing walls



Accurate study of the base-node of the building



NEW HOSPICE FOR PALLIATIVE ASSISTANCE

PATRIMONIO DEL TRENTO S.p.A. – PROVINCIA DI TRENTO

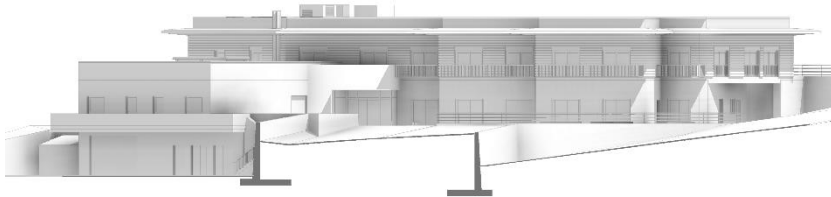
Short info

- Description** : New Hospice for Palliative Assistance
Customer : Patrimonio del Trentino S.p.A.
Where : loc. Man Malpensada – Trento – Comune di Trento (TN)
Service : Support of the Constructor in the technical proposal (call for tender)
Competitor : INCO Srl – ATZWANGER SpA
Cost : 4.876.477,93 €
When : 2013

Proposed qualification

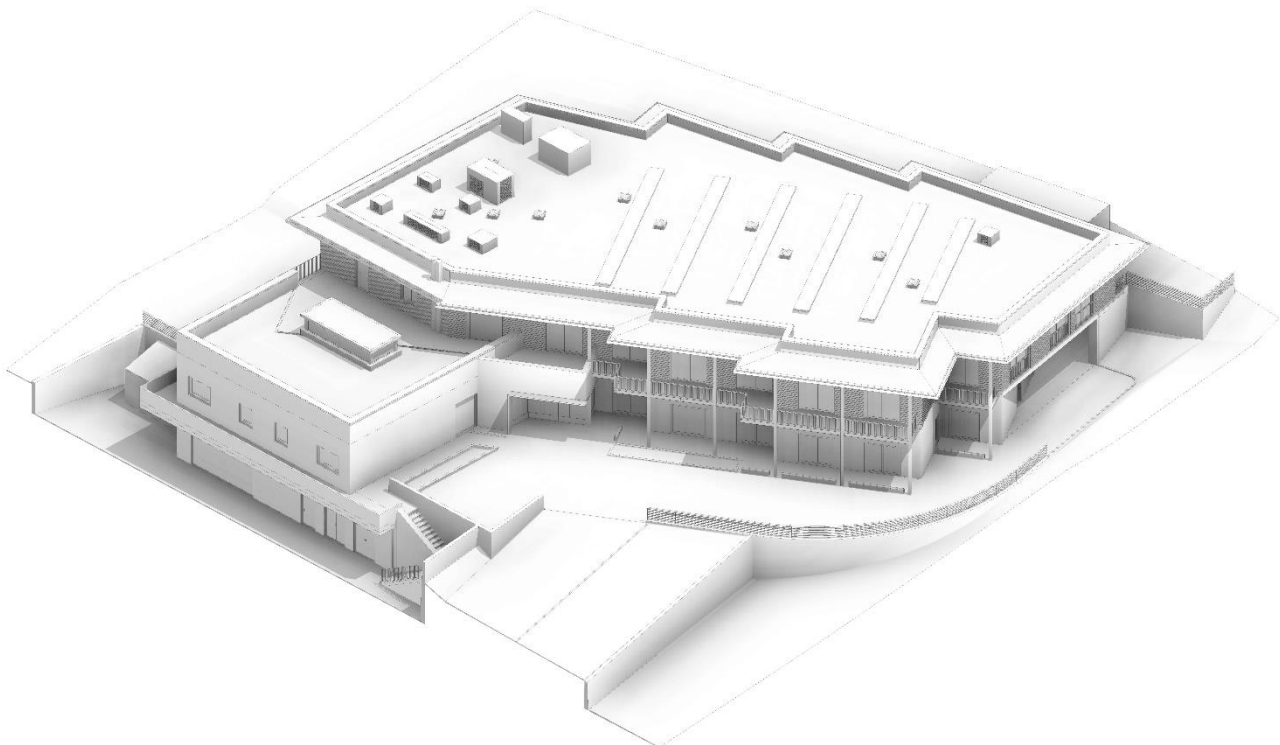
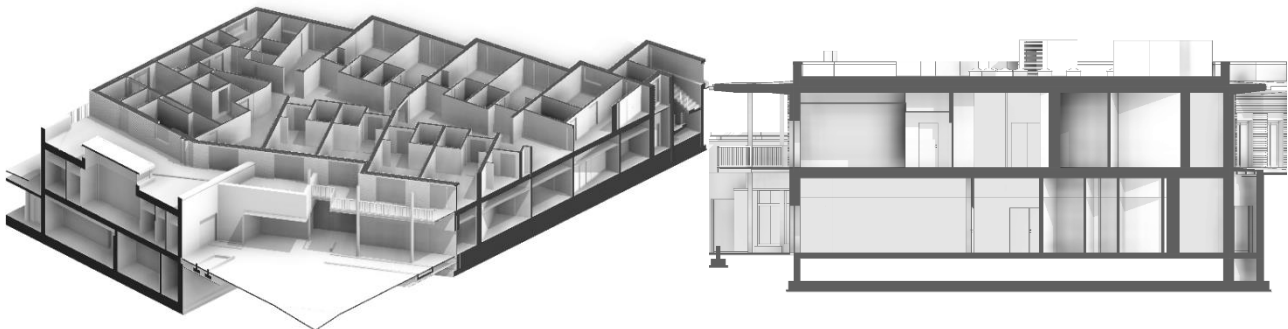


Leadership in Energy and Environmental Design



Description

We supported the Constructor in the formulation of the technical proposal, optimizing the design choices in terms of sustainability and costs. The design that we optimized was related to the construction of a new hospice with three floors, for a total of 10 new rooms for old patients.



Materials and Technical solutions

Building envelope

The building envelope offer first-class insulating properties: the walls are all insulated by means of polystyrene and a layer of air. The windows are made low-emitting insulated glazing constituted with three glass panes. The roof and part of the big terrace are covered respectively with ballast and plants (green-roof) in order to minimize the solar radiation entering the building during summer.

Water managemnet

The consumption of water is minimized thanks to a storage tank for the rainwater (used for irrigation purposes) and the installation of low-consumption taps and toilets flushes. In order to reach the new building it will be necessary to build a new road thus increasing the water-proof surfaces. Thus, to minimize the amount of water drained in the sewage system during storms, we designed a complete system infiltrating-wells.

Energy and atmosphere

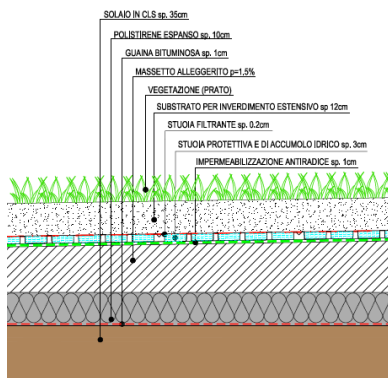
In order to prevent pollution to the atmosphere and CO₂ emissions, the building generates parts of the electricity it requires by means of photovoltaic cells installed on the roof and the conditioning equipments contains only refrigerant fluids with null Ozone Depletion Potential.

Materials

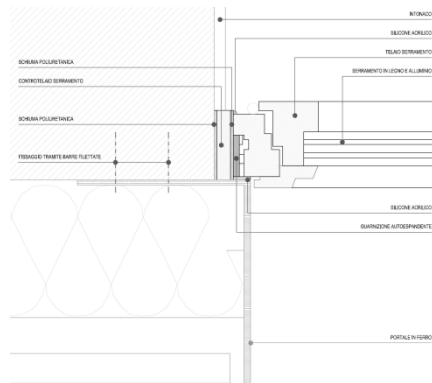
A relevant percentage of the materials used in the construction derives from local primary resources, thus minimizing the transportation and all the related pollution. All the rubbish is being accurately differentiated and separated, in order to perform a comprehensive selective waste collection during construction.

Indoor environment quality

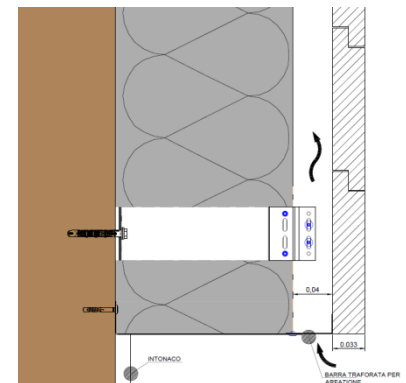
The new building will be healthy and comfortable for its occupants, implementing materials that don't generate Volatile Organic Compounds. The lights in the shared spaces of the building will be managed by means of dimmer switches and presence-sensors.



Cross section of the green-roof



The wall-window node analysis



Cross section of the ventilated facade

Proposed qualifications

Thanks to the optimization of the design choices the building, if constructed with the peculiarities we analyze during the proposal, will be able to obtain the qualification **LEED gold**, thus increasing the design level (LEED silver).

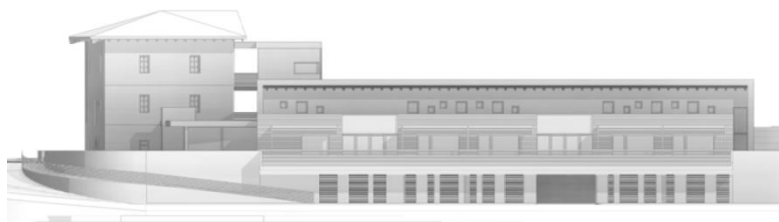
NURSERY SCHOOL OF CIVEZZANO

COMUNE DI CIVEZZANO – PROVINCIA DI TRENTO

Short info

- Description** : New Nursery School of Civezzano
Customer : Comune di Civezzano
Where : Loc. Maso Zandonà – Comune di Civezzano (TN)
Service : Support of the Constructor in the technical proposal (call for tender)
Competitor : INCO Srl
Cost : 2.042.492,14 €
When : 2013

Proposed qualifications



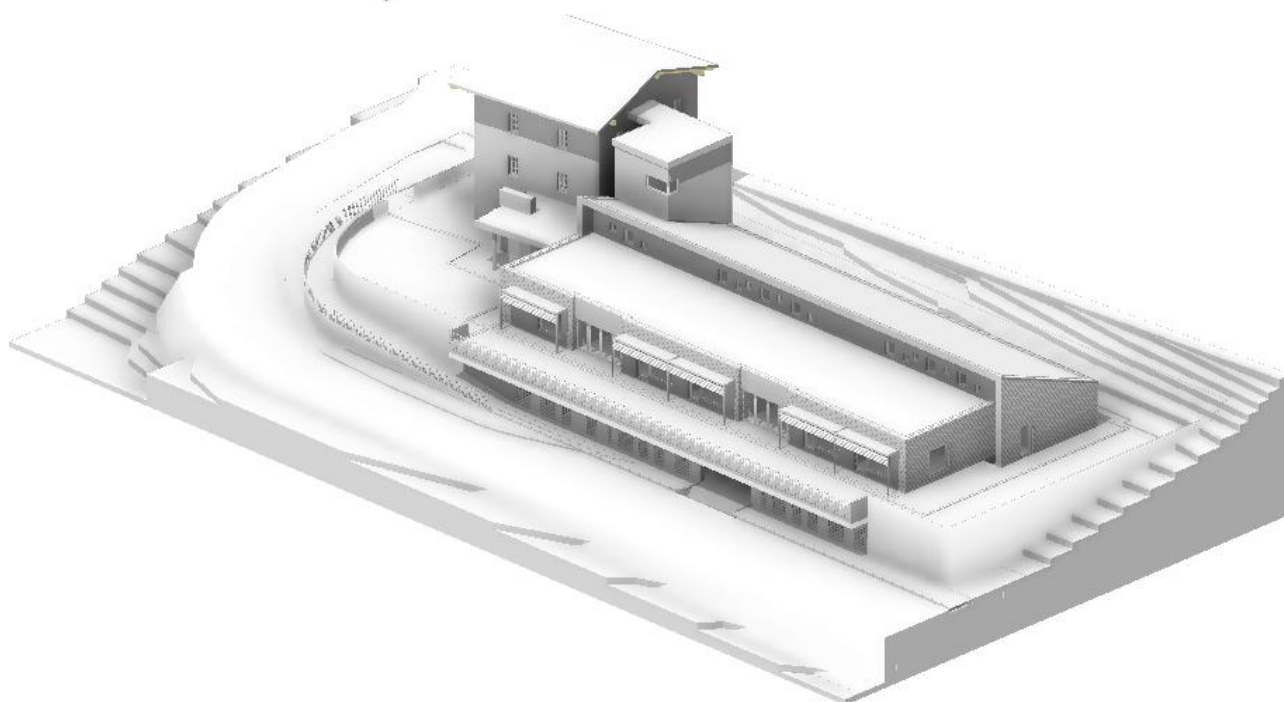
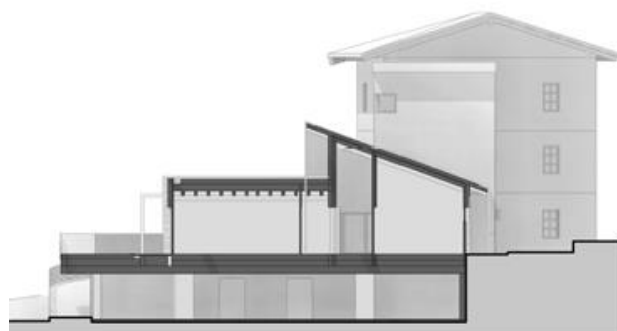
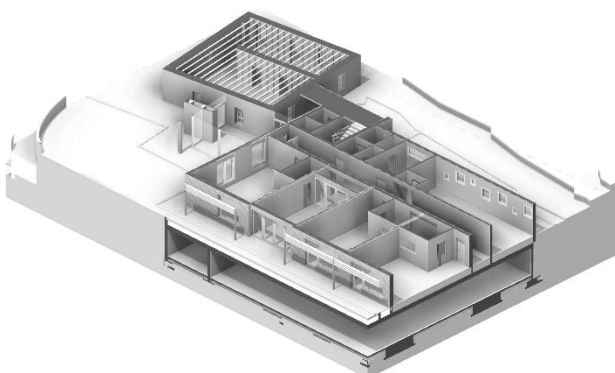
ARchitettura
Comfort Ambiente



Passive House Institute

Description

We supported the Constructor in the formulation of the technical proposal, optimizing the design choices in terms of sustainability and costs. The design we optimized is related to the renovation of the four-floors existing building (that will be dedicated to the school services) and to the construction of the new two-floors school.



Materials and Technical solutions

The first semi-buried floor of the new building will be built in reinforced concrete and the second floor will be constructed with XLAM panels and a wooden roof.

Technical specifications

All the walls are insulated with a wide insulating layer (200 mm) and all the building's nodes are free of air infiltrations thanks to gaskets and adhesive tape. The windows frames offer good insulating performance (they are made in wood). A massive use of renewable energies will be achieved (more than 60% of the energy required for the production of hot water and more than 20% of energy required for climatization derive from exploitation of renewable resources).

Constructive accuracies

All the building features were deeply analyzed in order to guarantee its optimal functionality and maintenance. Avoiding thus moisture in the wooden structures, both by means of an effective drainage of the rainwater and the wide separation (at least 20 cm) between the ground-level and the wooden structures.

The cold water pipes used for the conditioning are super-insulated in order to prevent condensation and dripping, the electric wires are covered with plastic non-toxic materials in case of burning. Shadowing devices are installed on the windows and the roof is a green-roof.

Sustainability

A relevant percentage of the materials used in the construction derives from local primary resources, thus minimizing the transportation and all the related pollution. In particular the wood used for the XLAM panes and the windows frames derives from certified local forests.

The new building will be healthy and comfortable for its occupants, implementing materials that don't generate Volatile Organic Compounds.

Proposed qualifications

ARchitettura Comfort Ambiente

Thanks to the detailed analysis and optimization of the design choices the building could obtain the highest level of the ARCA qualification (**ARCA Platinum**).



PASSIVE HOUSE

The new building will be a low-consumption building compliant with the **PASSIVE HOUSE** regulations.

NEW ART SCHOOL “G.SORAPERRA” IN POZZA DI FASSA

COMUNE DI POZZA DI FASSA – PROVINCIA DI TRENTO

Short info

- Description** : New Art School “G.Soraperra” in Pozza di Fassa
Customer : Comune di Pozza di Fassa
Where : Pozza di Fassa – Comune di Pozza di Fassa (TN)
Service : Support of the Constructor in the technical proposal (call for tender)
Competitor : INCO Srl – ZANETTI Srl
Cost : 13.352.141,83€
When : 2013

Proposed qualification

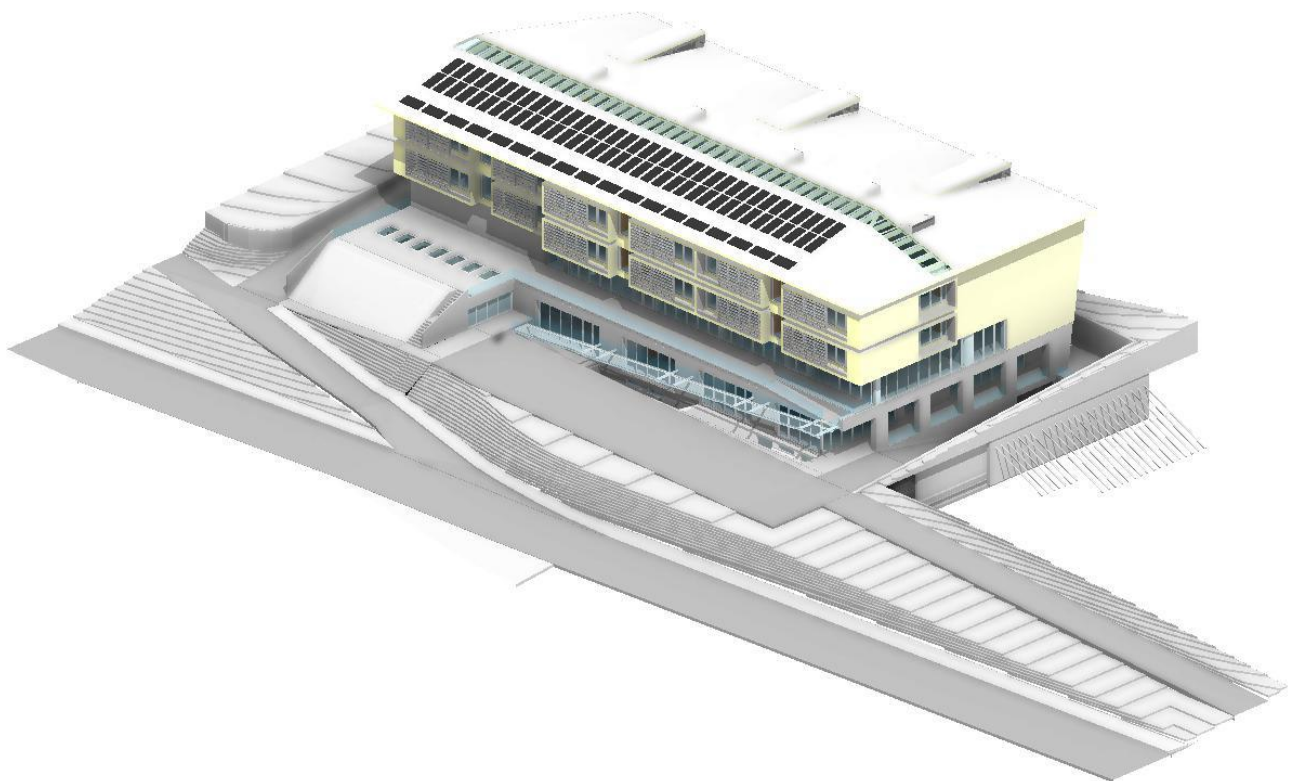
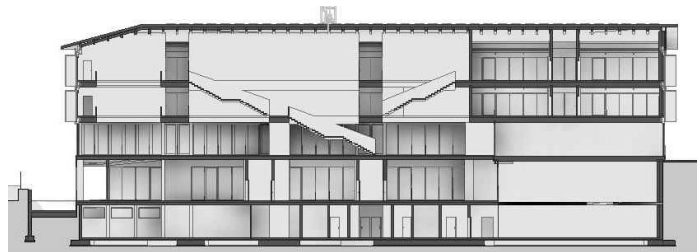
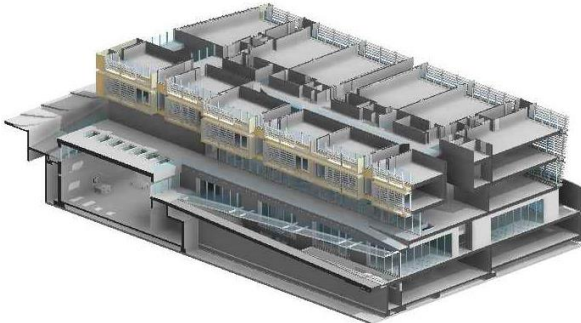


Leadership in Energy and Environmental Design



Description

We supported the Constructor in the formulation of the technical proposal, optimizing the design choices in terms of sustainability and costs. The design we optimized is related to the full demolition of the existing school and to the reconstruction of a new, five-floors building (of which one is under the ground-level and one is semi-buried).



Materials and Technical solutions

Water management

The irrigation of the plants surrounding the new school is made with rainwater collected in a store tank.

Energy and atmosphere

The building guarantees a very low energy consumption for heating and cooling, thanks to the optimal insulation of the building envelope. Moreover, the low amount of energy required, is partially generated exploiting renewable sources (the building is in fact provided with solar collectors that produce both hot water and electricity).

Materials and resources

A relevant percentage of the materials used in the construction derives from local primary resources, thus minimizing the transportation and all the related pollution. All the rubbish is being accurately differentiated and separated, in order to perform a comprehensive selective waste collection during construction.

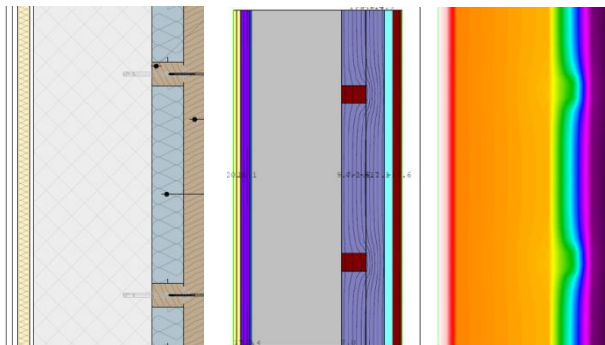
Indoor environment quality

The new building will be healthy and comfortable for its occupants, implementing materials that don't generate Volatile Organic Compounds. The lights will be managed by a supervising system that can be controlled from a single point.

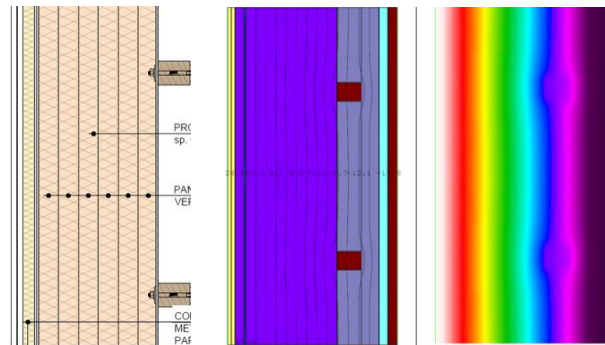
Numerical analysis

In order to guarantee first-class insulating performance of the building envelope, the external walls were analyzed by means a 2-dimensional finite element model. Thus it was possible to optimize the performance of the walls, by choosing the most adequate materials and their optimal configuration.

2-DIMENSIONAL ANALYSIS OF THE TEMPERATURE INSIDE THE EXTERNAL REINFORCED CONCRETE LOAD-BEARING WALL, WITH DOUBLE FACADE



2-DIMENSIONAL ANALYSIS OF THE TEMPERATURE INSIDE THE EXTERNAL NON-LOAD-BEARING WALL, WITH DOUBLE FACADE



Proposed qualifications

Thanks to the optimization of the design choices the building, if constructed with the peculiarities we analyze during the proposal, will be able to obtain the qualification **LEED platinum**, thus increasing the design level (LEED gold).

INFANT SCHOOL OF MOLVENO

PARROCCHIA DI SAN CARLO BORROMEO IN MOLVENO – PROVINCIA DI TRENTO

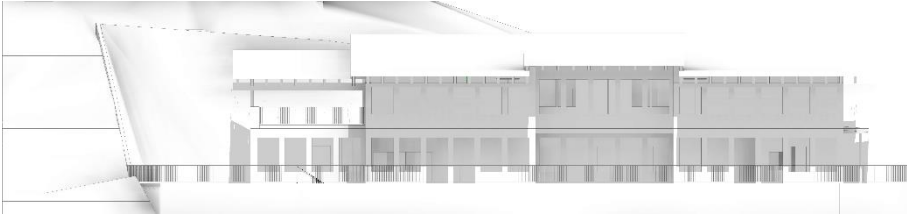
Short info

- Description** : New Infant School of Molveno
- Customer** : Parrocchia di San Carlo Borromeo in Molveno
- Where** : Molveno – Comune di Molveno (TN)
- Service** : Support of the Constructor in the technical proposal (call for tender)
- Competitor** : LEGNO PIU' CASE Spa
- Cost** : 2.042.492,14 €
- When** : 2012

Proposed qualification

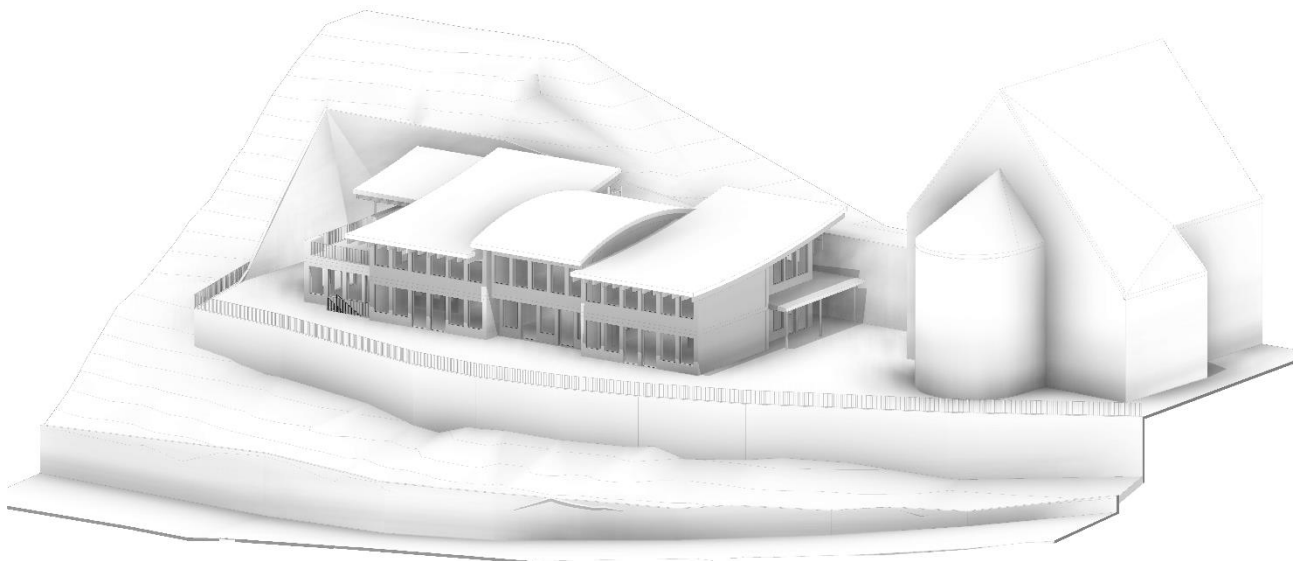
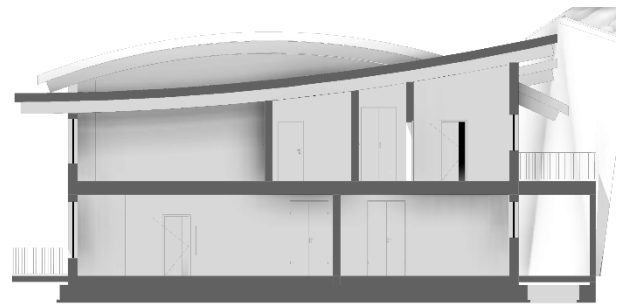
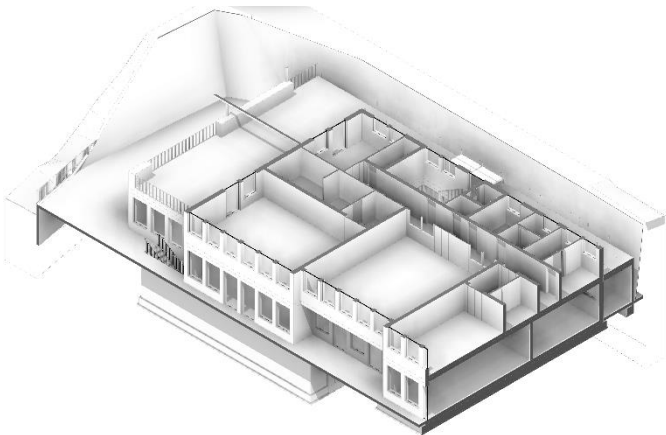


ARchitettura Comfort Ambiente



Description

We supported the Constructor in the formulation of the technical proposal, optimizing the design choices in terms of sustainability and costs. The design we optimized is related to the construction of the new infant school of Molveno, that will give room to 50 schoolchildren. The new building will have two floors, the first one dedicated to the school, the kitchen and other services, the second one dedicated to all the other activities.



Materials and Technical solutions

The new building's walls will be made with 5 layers XLAM wooden panes, while the floor slabs will be constructed with 7 layers XLAM panes. The roof will also be made in wood.

Building envelope

All the external walls will be endowed with at least 140 mm of insulation layer. The air infiltration will be minimized by means of adhesive tape and specific gaskets installed in the building's nodes.

Constructive accuracies

All the building features were deeply analyzed in order to guarantee its optimal functionality and maintenance. Avoiding thus moisture in the wooden structures, both by means of an effective drainage of the rainwater and the wide separation (at least 20 cm) between the ground-level and the wooden structures.

The cold water pipes used for the conditioning are super-insulated in order to prevent condensation and dripping.

Sustainability

A relevant percentage of the materials used in the construction derives from local primary resources, thus minimizing the transportation and all the related pollution. In particular the wood used for the XLAM panes and the windows frames derives from certified local forests.

The new building will be healthy and comfortable for its occupants, implementing materials that don't generate Volatile Organic Compounds.

Proposed qualifications

ARchitettura Comfort Ambiente

Thanks to the detailed analysis and optimization of the design choices the building could obtain the gold-level of the ARCA qualification (**ARCA Gold**).

