2. Details of the task 2014

2.1. General information about the area covered by the contest

Figure 1 - Site map

The school should fit to its surrounding natural and cultural environment. Emphasis should be placed on feasibility, which in turn requires structurally effective and cost-efficient solutions. The schools outside space should be designed in an environmentally friendly way, including pedagogical elements such as a bio-garden, biotope, playground, etc.

2.2. Site and zoning requirements

The size of the whole development area is 10500m2. Maximum 50% of the land can be used for constructions. The maximum height allowed is ground level + one floor, with a maximum height of the construction at the top of 8m.

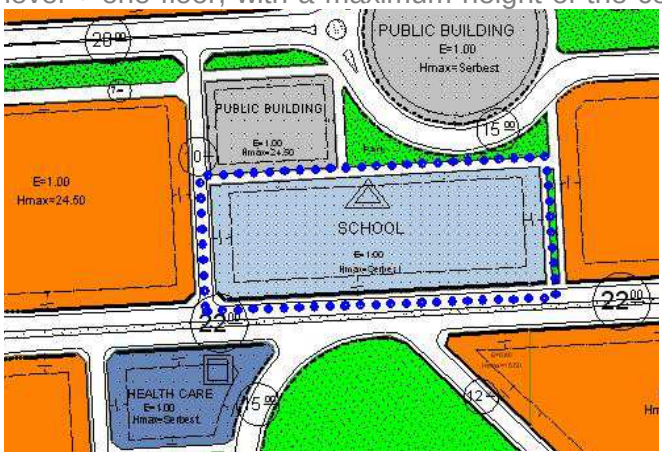

Figure 2 - Site

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2.3. Project specifics

2.3.1. School characteristics – Mandatory requirements for indoor functionalities design

As already mentioned the school should accommodate a number of 400-600 students. Each classroom should be designed with facilities for students with locomotors disabilities. The age split of the students is equally distributed with 25% from total number of students for each one of the four years of study.

Beside the classrooms the school should be fitted with facilities (laboratories) for the following activities

- music courses
- art courses
- foreign language courses

A sport hall should also be proposed in the design. The sport hall can be design as part of the existing school structure or as a separate construction. Adequate height (recommend a minimum 8m) should be taken in to account. Specific measures will be taken by the participants in order to provide a good acoustic indoor as well as a good level of light.

Separate sanitary groups will be proposed for girls and boys (recommended for each floor 16 toilets for students (8 for girls and 8 for boys), 2 toilets for disable students and 3 toilets for teachers). Also meeting rooms, rooms for teachers and storage facilities as well as any other spaces that the participants consider fit in order to have a good learning process should be taken in consideration.

The school program will start at start at 8.30 and will end at 14.20.The maximum number of courses per day is limited to six. One hour of study has 40 minutes and it is followed by a 10 minutes break except the case when is followed by the lunch break. One hour during the interval 12.30-14.30 is dedicated to lunch. Lunch time can be differentiated between classes for a better fluidity.

The school should be fitted with catering and cooking facilities (for vegetables from the garden)
The school design should allow the following schedule of courses to be held in good conditions.

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Courses	Hours /week 1st year	Hours /week 2nd year	Hours /week 3rd year	Hours /week 4th year
Turkish	10	10	8	8
Math	5	5	5	5
Science			3	3
Religion				2
Music	1	1	1	1
Art	1	1	1	1
Games and physical activities	5	5	5	5
Traffic				1
Human rights & Citizenship				2
Foreign Language		2	2	2
Social studies (introduction to science)	4	4	3	
Total	**26**	**28**	**28**	**30**

2.3.2. School characteristics – Indoor free design

Participants will decide freely the number of classrooms they will proposed based on their choice for the number students that will learn in the school, the number of students allocated to each classrooms and the layout of the classrooms in accordance with their view of the school system of the future.

Participants will also decide freely for the number and type of the offices for the school personal both teaching and administrative as well as other spaces as they see fit (ex: storage spaces).

Within the scope of the project, participants are free to propose afterschool activities and or to design any other facilities that they see fit according to their vision of the project beside those already mentioned: library, internet and communications room, multifunctional hall (for lunch, cinema, theatre etc.), others, addressed both to the school program or afterschool activities.

These facilities can be designed separately or combined in the same building as the school or in separate building depending on the individual concept as long as the criteria about maximum surface of the land that can be constructed is respected and the design is considering also the Saint-Gobain Multi Comfort criteria.

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2.3.3. School characteristics – Mandatory requirements for outdoor functionalities design

The minimum surface dedicated to outdoor functionalities (including access routes) is 50% of existing land. The following functionalities should be designed:

- Assembly place
- Playground
- Garden for agricultural production

2.3.4. School characteristics – Outdoor free design

The surface occupied by each of the functionalities mentioned at Point 2.3.3 as well as the layout and positioning will be decided by every participant based on their vision of the school and in accordance with the number of students.

Participants can propose any other outdoor functionality as they see fit as long as these functionalities respect the requested criteria.

2.4. Type of construction, technical parameters

The high-performance thermal, acoustic, fire protection and daylight requirements have to be considered in order to achieve the Multi-Comfort criteria. A presentation of the Multi-Comfort concept is available for download at ***www.isover-students.com.***
In the course of the competition, lectures on this subject will be held at the faculties as well as online trainings.

The Multi-Comfort criteria for the residential function are presented below.

			SCHOOL	
			Gaziantep, Turkey	
HEATING ENERGY DEMAND (kWh/m²a)			< 15 kWh/m²a	
COOLING ENERGY DEMAND (kWh/m²a)			< 15 kWh/m²a	
AIR-TIGHTNESS n50 (V/h)			0.6 V/h	
DAYLIGHTING (Daylight autonomy % during functioning hours)			60%	
			Min.	Targeted
SUMMER COMFORT (Overheating % of functioning period)			10%	5%
ACOUSTICS	Between classrooms	***Airborne*** - $D_{nT,w}$+C(dB)	≥58dB	
		Impact - $L'_{nT,w}$+CI(dB)	≤ 45dB	
	Between music laboratory and classrooms	***Airborne*** - $D_{nT,w}$+C(dB)	≥ 63dB	
		Impact - $L'_{nT,w}$+CI(dB)	≤ 40dB	
	Exterior noise	Level of noise coming from outside sources	≤ 25 dB	
SUSTAINABILITY			EPD for all SG products	

Figure 3 – Saint Gobain Multi Comfort Criteria

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Participants are expected to present in their design the main strategies they have used in order to achieve the criteria presented in “Figure 3 – Saint Gobain Multi Comfort Criteria”.

2.4.1. Construction

The construction method (load-bearing, wood, steel construction, etc.) can be chosen freely by the participants, but the integration of ISOVER, CertainTeed and/or Izocam products as parts of the construction build-up is mandatory.

ISOVER shall provide free planning assistance in the form of:

- Construction CAD details online data base: ***www.isover-construction.com***
  - First data base in the world containing more than 150 joint construction details, thermal bridge free for 4 different construction systems.
  - All these details have been certified by the Passive House Institute and using it assures thermal bridge free construction.
  - The access is free and the application provides: CAD drawings with different download options, components and products, key figures, isotherms, model and materials, air tightness concept.

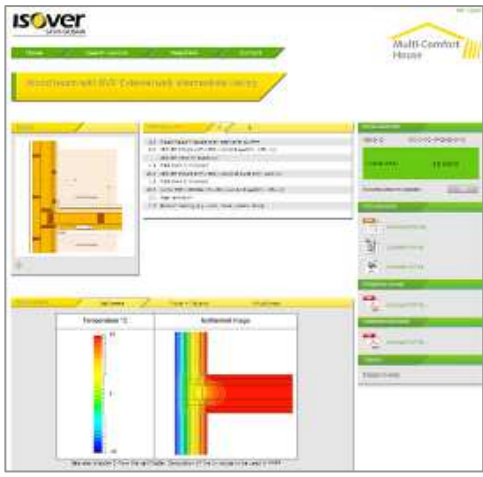

Figure 4 – ISOVER Construction details

- Air tightness website: ***www.isover-airtightness.com***
  - All relevant information about the achieving air tightness: methods, products and solutions, concept importance.

- ISOVER Designer Calculation Tool and Brochures containing literature about Multi-Comfort concept for new construction and renovation can be found at ***www.isover-construction.com***

Further Information about the local ISOVER, CertainTeed and Izocam organization can be found on the official contest website ***www.isover-students.com/content/view/137/161***

2.4.2. Thermal comfort

2.4.2.1 Technical parameters for energy efficiency

The following thermal criteria will be targeted:

- An annual heat demand <15kWh/m2.
- An annual cooling demand <15kWh/m2.

In order to achieve these values we recommended the following U values for the envelope components:

- All opaque external constructions U ≤ 0.15 W/m2K, or R > 38

(1/BTUITh-1 ft-2 0F -1) for compact building shape

- All opaque external constructions U ≤ 0.10 W/m2K, or R > 57 (1/BTUITh-1 ft-2 0F -1) for non-compact building shape
- Windows and doors U_W total ≤ 0.8 W/m2K, or R > 7 (1/BTUITh-1 ft-2 0F -1). The 'g' value should be chosen based on the solar heat gain evaluations taking in to account both cold and warm season.

2.4.2.2 Technical parameters for protection against overheating

Several studies have shown the link between the room temperature and the mental activities in the schools. When the inside temperature reaches 30°C the performance of the students drops to 80% of the performance measured at 22°C.

In order to provide a good learning environment the proposed target for the summer comfort is that the overheating above 25°C or +77°F (measured as % from the total period when an activity is taking part in the classrooms) is below 10%.

In order to achieve these values students can design both passive measures (ex: sun louvers, usage of light colour for the exterior surfaces) and active measures (ventilation system with heat recovery bypass for the summer, active cooling measures)

2.4.3. Acoustic comfort - Technical parameters

Most of the existing classrooms have long reverberation time and the high background noise. Due to these facts the students learn less (ex: 50% of the teachers' explanations are not being heard by the students, *Seibein 1998, 600 classrooms in Florida*) and the teachers are taking more days of sick and suffer voice and throat problems.

In order to avoid there problems the following acoustic criteria should be targeted:

Subjects	Classrooms
Maximum level of noise coming from outside	25dB
Airborne sound insulation between classrooms DnT,w + C	≥58 dB
Impact sound insulation between classrooms L'nT,w + Cl	≤45 dB
Reverberation time	0.5s

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As the estimated level of outside noise in the neighbouring of the school is Leq=65-70dB we recommend the usage of opaque constructions with Rw > 50-55dB as well as windows solutions with an Rw > 40dB. In case of a high % of glazing surfaces on the exterior walls facing noise sources supplementary noise protection methods might be needed.

The participants are advices to analyse also the level of noise generated by the technical equipment (such as HVAC) and if necessary to propose solutions to reduce it (sound insulated HVAC ducts, sound absorbers installed on the ducts).

In order to achieve a good acoustic of the classrooms and the recommended values for reverberation time period students are recommended to use acoustic treatments for the interior of the classrooms: acoustic ceiling or acoustic treatments for the walls. Architectural acoustic measures such as unparalleled walls or a height limited to 2.5m- 3m for the classrooms can also help in achieving the desired acoustic comfort.

2.4.3. Indoor Air Quality

The CO2 concentration has a direct effect of the human decision making performance. The typical outdoor concentrations are around 380 ppm and the ASHRAE recommendations for indoor CO2 levels are not to exceed the outdoor concentration by more than 600 ppm. However there are numerous examples of schools were the indoor CO2 level reaches more than 2500 ppm.
A study by *Department of Energy from Lawrence Berkeley National Laboratory* show that in comparison with a CO2 level of 1000ppm a level of 2500ppm generate large reduction of the performances, the most dramatic declines (in which subjects were rated as “dysfunctional,”) being ‘initiative taking’ and ‘strategically thinking’
In order provide the best conditions for the study process the participants are expected to achieve a concentration of CO2 of maximum 1000ppm inside the classrooms. To achieve this concentration of CO2 the participants should provide a level of the ventilation rate of 30-35mc per hour per person.

2.4.6. Fire safety

All bearing internal and external walls have to achieve at least REI 60 according to EN standards,
The roof and ceilings have to achieve at least REI 60 according to EN standards,
All non-bearing internal walls between different functions (depending on the function) have to achieve at least EI 60 according to EN standards.

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2.4.7 Natural daylight

A good level of natural light is mandatory for a good learning process. According to the *CEC study from 1999* a good level of natural light generates higher level of concentration and better short-term memory recall, increasing the student's performances in standardized test by 20%.

In order to have a good level of daylight the proposed target for the present project is to achieve during the functioning hours natural daylight autonomy of 60%. This means during the teaching hours at least 60% of the time the illumination level has 300lux.

In order to achieve these levels for Gaziantep location under standard conditions it is recommended to use for the classrooms a window to floor ratio of at least 8%.

2.5. Competition requirements

2.5.1. Minimum requirements (mandatory)

The following minimum requirements for descriptions and plans must be considered. Participants are advised to choose appropriate scales for all drawings based on the poster sizes outlined in section 3.1 and 3.2 and the participant's individual design ideas and directions to allow appropriate detail and clarity to be reviewed by the judges.

Master plan

- Experience of learning in the school including the deployment of indoor/ outdoor facilities and connections with the neighbourhood.

School function

- All floor plans *(suggested scale 1:100)*
- Sections
  - *Longitudinal section (suggested scale 1:50)*
  - *Cross section (suggested scale 1:50)*
- Construction details:
  - *Roof, external wall, partition walls, windows, ground and intermediary floors details (suggested scale 1:20 / 1:10)*
    - *Attention should be accorded to thermal/acoustic bridges as well as to airtightness and moisture protection*
  - *Other details as see fit by the participants*
- Views, perspectives and/or photographs of physical models

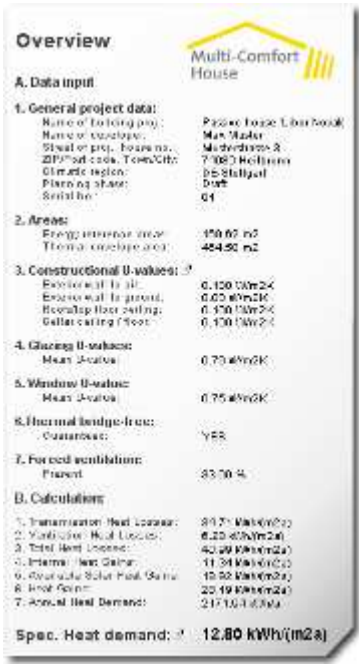

Figure 5 ISOVER Designer v.2

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Calculations

- **Annual heat demand**
  - *Calculation can be done using Designer v.2, Designer v.3 or calculation software PHPP.*
  - *Participants will insert a calculation overview in the project*

Falling to provide the requested information above will lead to the disqualification of the project from the competition.

2.5.2. Description of the Design Concept

Beside the minimum requirements the participants are expected to provide sufficient information to allow the jury members to analyse:

- **Design concept and functional solution**
- **Strategy to achieve thermal comfort**
  - Example: construction U values, airtightness concept, HVAC system, passive/active shading measures, cooling, etc.
- **Strategy to achieve acoustic comfort**
  - Example: Constructions Rw and Ln,w values, classrooms acoustics, main measures for sound protection, etc.
- **Strategy to achieve indoor air quality**
  - Example: Proposed type of ventilation (mechanical and/or manual), ventilation blueprint, proposed solutions, etc.
- **Fire safety strategy**
  - Example: Evacuation path, separation, material fire reaction, etc.
- **Natural daylight strategy**
- **Energy supply and overall sustainable concept**

In order to explain the requirements mentioned above the participants can present: text, diagrams, calculations, drawings or information as they seem feat.

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3. Formalities for submission

The following formalities have to be fulfilled for the participation in the national stage and international stage of the ISOVER Multi Comfort House Students Contest 2013

3.1. Formalities for submission - National Stages

The participants can register online at: **www.isover-students.com**. All participants registered will receive the official communications via the official online newsletter. Any participating team that fails to register or provides incomplete or false information will be disqualified from competition
The exact way in which the projects will be submitted to the national stage as well as the final local stage schedule will be decided by the respective local organizations. The recommendation is to allow a maximum number of 3 posters in 84 x120 cm format.
The contact details for the local ISOVER, CertainTeed and Izocam organization can be found at ***www.isover-students.com/content/view/91/133/***

3.2. Formalities for submission - International Stage

The formalities for the international stage shall be finalized by latest 12th May 2014. Each of the participant teams shall submit a CD to the ISOVER contact person in their country containing the following information:

1. ***Project in electronic format with the following characteristics:***
    - PDF file version 9 or lower
    - Resolution 300 dpi
    - Dimensions of the poster 180cm x 80cm (height 180cm, width 80 cm).

Maximum number of posters that can be submitted for each team is 1 (one). The poster of each project will contain the following data:

- Team country (e.g. Austria)
- University (e.g. University of Ljubljana)
- Name of the drafter (or all names in the case of a team submission)
- National stage prize (e.g. 1st Prize)

This data will be used by the local ISOVER organization to print and prepare a roll-up display for each team for exhibition of projects during the international stage.

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2. An electronic presentation of the project. The file will have the following characteristics:

- A single Power Point Presentation file
  - Extension PPT or (PPTX). Other file types will not be accepted.
- The file name should be: Country X_Y Prize, Name1_Name2_Name 3.
  - Example: Serbia, 2nd Prize, Ilian Dragutinovici_Igor Pancic
- Maximum dimension of the file, not archived, has to be less than 20 MB.
  - All presentations bigger will be cut to required dimension.

This file will be used during the international stage for the official presentation of the project in front of the jury.

3. Individual pictures of each member of the team in tiff format, scheme CMYK, resolution 300 dpi.

4. Three tiff files containing pictures or details of the project in 300 dpi resolution:

- First picture: buildings preview (usually 3D model)
- Second picture: architectural plans (graphics, sections, drawings, models others.)
- Third picture: insulations (ideas, drawings etc.)

This data will be used for the edition of the book "ISOVER Multi-Comfort House Students Competition - Best of the Projects 2014".

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