



Invitation for Competition Submissions

**ISOVER Multi-Comfort House Students Contest Edition 2015**  
**Residential function in cold climate – Astana, Kazakhstan**

International, two-stage, open competition



## Acknowledgments:

Special thanks to the Department of Architecture of National Company Astana EXPO-2017 for all support during the drafting of this task.

## Content

<b>1. General information</b>	<b>3</b>
1.1. Contents of the competition	3
1.2. Who can participate	3
1.3. Awarding organization	4
1.4. Form and organization of the competition	4
1.5. Prize money	5
1.6. Time schedule	5
1.7. National jury	6
1.8. International jury	6
1.9. Transport and travel expenses	6
1.10. Legal	7
1.11. Possible collaboration	7
<b>2. Details of the task</b>	<b>8</b>
2.1. General information Astana	8
2.2. Astana climate	9
2.3 General information Astana EXPO-2017	11
2.4 General information about the task	12
2.5. Type of construction, technical parameters	15
2.6. Competition requirements	17
<b>3. Formalities for submission</b>	<b>18</b>
3.1. National stages	18
3.2. International stage	18

# 1. General information

## 1.1. Content of the competition

Under the Kyoto Protocol, more than 140 industrial nations have made a commitment to reduce their CO2 emissions drastically and agreed that the usage of energy-saving technologies it is a top priority in order to save our natural resources.

Overall, the building sector is responsible for 40% of the total energy consumption and CO2 emissions in the world demanding a new way of designing each new project and each new renovation.

As the world is becoming increasingly urban, and cities are becoming larger and more densely populated thus increasing our energy consumption as well as the CO2 emission.

Reacting to this situation, more and more local authorities from all over the world are demanding for their new development projects, designs that fulfil the highest requirements in terms of energy efficiency while providing the highest comfort possible for their inhabitants.

It is the case of Astana authorities, Kazakhstan, which have decided to investigate deeper the possibilities of developing sustainable constructions.

In this respect the city of Astana will organize in 2017 the international exhibition: Expo Astana 2017 Future Energy. The event is conceived as an extensive, integral project that addresses topic of energy from several perspectives, allowing for it to be contemplated as a determining factor in how societies and everyday life function.

Future Energy has the clear objective: exploring strategies, programmes and technologies aimed at sustainable energy development, promoting energy security and efficiency, encouraging the use of renewable energy, and guiding visitors through their essential, active role in the design and execution of a plan for energy efficient production and use.

The task for 11<sup>th</sup> International Edition of ISOVER Multi-Comfort House Students Contest developed by ISOVER in close collaboration with the Department of Architecture of National Company “Astana EXPO-2017” is the design of a residential function in Astana, Kazakhstan located in the perimeter of the post exhibition residential expansion of International Exhibition EXPO 2017.

The participants will have to create sustainable architecture in accordance with EXPO’s theme of Future Energy, integrated into the new urban space while respecting the Saint-Gobain Multi-Comfort Criteria and taking into account the extreme continental climatic conditions of Astana city and regional context



**Figure 1 – Geographical location Astana**

## 1.2. Who can participate?

Participants can be students of architecture, design and construction engineering from universities of all countries with ISOVER, CertainTeed and Izocam presence and where the local organizations mentioned before are holding this competition.

Participation is open for all students from 1<sup>st</sup> to 6<sup>th</sup> year of study as an individual or in teams of up to 3 team members.

A student cannot be part of two different teams submitting projects for the same edition of the contest. Only one project may be submitted per team.

### 1.3. Awarding organization

The awarding organizations are Saint-Gobain Insulation with the participation of national Saint-Gobain ISOVER and Izocam organizations were the national stages of the contest are hold.

**International responsible** for ISOVER Multi-Comfort House Students Contest:

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Saint-Gobain ISOVER

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**Local responsible:**

The contact details for the local Saint-Gobain ISOVER and Izocam organization can be found at:

[www.isover-students.com/content/view/91/133/](http://www.isover-students.com/content/view/91/133/)

### 1.4. Form and organization of the competition

The ISOVER Multi-Comfort House Students Contest is a 2 stage competition:

- **First stage – National Stages**
  - Takes place in each country where national Saint-Gobain ISOVER and Izocam organizations are organizing the contest.
  - The winning projects will receive an award at a presentation ceremony. The number and amount of prizes will be decided by each local organization.
- **Second stage - International Stage**
  - The International stage of the competition will be organized between 27 May and 30 May 2015. The exact location will be communicated latest end of November on [www.isover-students.com](http://www.isover-students.com).
  - The winners of the **National Stages** will be invited to this event, together with their professors.
  - A maximum number of 60 teams from all participating countries will be invited to attend the **International Stage**.
    - Each participating country will receive automatically 2 places (teams) for the International Stage
    - Depending on the total number of participating countries - the organizers reserve the rights to increase the number of invited teams per country (no more than 3 per country) if the total number of teams participating in the **International Stage** does not exceed 60.
  - The maximum number of students per team that can participate to the **International Stage** is 3 students. Depending on the local organization decision and the location of the **International Stage** a lower number of students per team might be invited to attend the **International Stage**
  - The exact number of teams as well as the exact number of students per team that will be invited to attend the **International Stage** will be communicated by the local organizations latest end of November.
  - During **International Stage** the participating projects will be displayed at the exhibition for inspection and discussion. Furthermore, the authors of the project will have the possibility to explain the concept of the project to the jury and all the participants during a five-minute presentation. All presentations will be webcasted live on <http://www.isover-students.com>
  - The presentations will be followed by the jury's deliberations and the award ceremony for the winners. The international jury will nominate the winners of the three prizes for the **International Stage**. In addition, the jury can award some special prizes for extraordinary ideas provided by the participants.



## 1.5. Prize money

Each of the two stages of the competition can assign up to three monetary prizes for the first, second and third place. Additionally, other prizes might be awarded by the local organization.

- **First stage – National Stage:**
  - Information about the amount and number of prizes for the **National Stages** will be provided by the local ISOVER and Izocam organizations.
- **Second stage – International Stage:**
  - 1<sup>st</sup> prize € 1,500
  - 2<sup>nd</sup> prize € 1,000
  - 3<sup>rd</sup> prize € 750
  - Special prizes € 500
  - Students prize € 500

For both **National Stages and International Stage** the organizer, Saint-Gobain Insulation and national Saint-Gobain ISOVER and Izocam organizations can decide to award more or less prizes than specified according to the jury evaluation of the projects.

## 1.6. Time schedule

**Distribution of invitations for competition submissions as part of an information event:**

- *September 2014*

**Registration for National Stages – See point 3.1**

- *All registrations have to be completed online at [www.isover-students.com](http://www.isover-students.com). Any participating team that fails to do so or provides incomplete or false information will be disqualified from competition.*
- *Closing date for submission for **National Stages** is 31<sup>st</sup> March 2015. Local organization can change this date to fit better with the local universities schedule.*
- *Please check this data with your local organizer.*
- *All official communications regarding the contest will be send by email to all participants registered on [www.isover-students.com](http://www.isover-students.com)*

**Online training**

- *Several online trainings will be organized, starting November 2014 until March 2015. The exact dates will be communicated thru the official newsletter of the contest to all participants that have registered on [www.isover-students.com](http://www.isover-students.com)*

**National stages and award ceremonies**

- *We recommend that the final stages **should be completed by 11<sup>th</sup> May 2015**. Local organization can change this date to better fit their local schedule. However sufficient time should be taken in to consideration by those organizations that would require visa for the participation to the final stage.*
- *Please check this data with your local responsible person*

**Submission of the material for the international stage**

- *Latest by 18<sup>th</sup> of May 2015.*

**International stage and award ceremony:**

- *The **International Stage** of the competition it will be organized between 27 May and 30 May 2015. The exact location will be communicated the end of November on <http://www.isover-students.com/>*

Further information will also be provided at the lectures held at the participating universities by the national Saint-Gobain ISOVER or Izocam companies. For more information, please contact your local Saint-Gobain ISOVER or Izocam organization who will provide you with further details.

## 1.7. National jury

The selection of the national winners will be carried out by a national jury. The composition of each national jury will be decided by the local implementing organization.

The following criteria will be used for awarding the prizes on national and international level:

### A. Participation criteria

- **Minimum requirements:** Projects that do not present the minimum required pieces as described in Point 2.5.1 will not be taken in to consideration

### B. Judging criteria

- **Architecture: 50%**
  - Design excellence, functional concept and regional aspects as well as the sustainability approach related to economic, ecologic and social aspects
- **Technical criteria: 20%**
  - Constructions comply with the Saint-Gobain Multi-Comfort criteria (thermal, acoustic and daylight targets) as well as fire safety strategy.
- **Construction details: 20%**
  - Quality and consistency of the proposed construction details with regards to building physics (thermal and acoustic bridges, airtightness and moisture management)
- **Products usage: 10%**
  - Correct usage and mentioning of Saint-Gobain ISOVER or Izocam products and solutions in the project

## 1.8. International jury

The international jury will consist of architects, Saint-Gobain ISOVER experts and specialists and representatives of National Company "Astana EXPO-2017". The organizer can modify the number or the composition of the jury without any other prior advice. The members of the International jury will be announced prior to the **International Stage**.

The same judging criteria like in the **National Stages** will be used in the **International Stage** for the awarding of the **1<sup>st</sup> Prize, 2<sup>nd</sup> Prize, 3<sup>rd</sup> Prize and Special Prizes**.

After the jury deliberations are finished, a feedback session will be organized, in which the members of the international jury will present for each participating project a short feedback. Due to the time limitations as well as the big number of participating teams (60 teams) this session is intended to give only a short perspective over the weaknesses and strengths of each project, as they were seen by the members of the jury.

The **Students Prize** will be awarded based on the votes received from all participating teams. Each team will receive 1(one) vote to be awarded to the team with the best project in their opinion. The team with the highest number of votes will be awarded the **Students Prize**. In case of several teams with the same number of votes the value of the prize will be split even between these teams.

## 1.9. Transport and travel expenses

- **First stage – National Stage:**
  - The risks and costs of the submission of entries to the **National Stages** shall be taken over by the participants.
- **Second stage – International Stage:**
  - The forwarding of project documentation to the final international gala shall be carried out by the respective national Saint-Gobain ISOVER or Izocam Company.
  - Furthermore, the companies shall bear the entire travel expenses, as well as the costs of accommodation and lodgings for the participants at the **International Stage**.

## **1.10. Legal**

Participants of the ISOVER Multi-Comfort House Students Contest (the 'Competition') hereby undertake that any information/data contained in their projects does not interfere with the intellectual property rights of any third party, and that they either own or have full authorization to use and disclose such information/data.

Competition participants shall retain unlimited intellectual property rights on their projects.

However, the participants to the national stage or international stage competitions, regardless of their position (students, teachers, Saint-Gobain ISOVER employees, IZOCAM employees or other attendees), hereby grant full and unrestricted authorization to Saint-Gobain Isover and Izocam (the "Organizer"), free of charge, to use and publish their projects, project presentations and all material submitted by or representing the participants, including, but not limited to, photos or videos taken of the participants at the contest and/or material provided by the participants to the Organizer for the contest, for an unlimited period of time and for all media publication used by the Organizer.

Competition participants acknowledge that the decision of the jury is final. All participants hereby accept the incontestable and definitive nature of the jury's decisions.

By participating in the competition, the participants acknowledge and accept the conditions presented here.

## **1.11. Possible collaboration between participants and the National Company "Astana EXPO-2017"**

The participants are informed that the representatives of the National Company "Astana EXPO-2017" will attend the International Stage.

National Company "Astana EXPO-2017" might be interested by some of the exposed ideas in which case separate discussions between the National Company "Astana EXPO-2017 and the authors will take place.

## 2. Details of the task

### 2.1. General information Astana

Astana has been the capital of Kazakhstan since 1997, and is the country's second largest city with a population of about 1000000. The city is located in central Kazakhstan by the Ishim River in a very flat, semi-arid steppe region. The elevation of Astana is 347 m above sea level.

The old city of Astana is located north to the river while the new city was developed south to the city. The green Nurzhol Boulevard forms the main spatial axis of the new administrative center of the city.



Figure 2 – Astana city



Figure 3 – Astana city





Figure 4 – Astana city

## 2.2. Astana climate

Astana is the second coldest capital city in the world (extreme continental climate)

- Absolute minimum temperature:  $-52$  degrees C
- Absolute maximum temperature:  $+42$  degrees C
- Design temperature of the coldest 5 days period is:  $-36$  degrees C
- The average temperature of heating period is  $-8.4$  degrees, designed duration of heating season is 216-229 days

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °C (°F)	3.4 (38.1)	4.8 (40.6)	22.1 (71.8)	29.7 (85.5)	35.7 (96.3)	40.1 (104.2)	41.6 (106.9)	38.7 (101.7)	36.2 (97.2)	26.7 (80.1)	18.5 (65.3)	4.5 (40.1)	41.6 (106.9)
Average high °C (°F)	-9.9 (14.2)	-9.2 (15.4)	-2.5 (27.5)	10.9 (51.6)	20.2 (68.4)	25.8 (78.4)	26.8 (80.2)	25.2 (77.4)	18.8 (65.8)	10.0 (50)	-1.4 (29.5)	-8.0 (17.6)	8.9 (48)
Daily mean °C (°F)	-14.2 (6.4)	-14.1 (6.6)	-7.1 (19.2)	5.2 (41.4)	13.9 (57)	19.5 (67.1)	20.8 (69.4)	18.8 (65.8)	12.3 (54.1)	4.6 (40.3)	-5.4 (22.3)	-12.1 (10.2)	3.5 (38.3)
Average low °C (°F)	-18.3 (-0.9)	-18.5 (-1.3)	-11.5 (11.3)	0.2 (32.4)	7.9 (46.2)	13.2 (55.8)	15.0 (59)	12.8 (55)	6.6 (43.9)	0.2 (32.4)	-8.3 (16)	-16.1 (3)	-1.5 (29.3)
Record low °C (°F)	-51.6 (-60.9)	-48.9 (-56)	-38.0 (-36.4)	-27.7 (-17.9)	-10.8 (12.6)	-1.5 (29.3)	2.3 (36.1)	-2.2 (28)	-8.2 (17.2)	-25.3 (-13.5)	-39.2 (-38.6)	-43.5 (-46.3)	-51.6 (-60.9)
Precipitation mm (inches)	16 (0.63)	15 (0.59)	18 (0.71)	20 (0.79)	35 (1.38)	37 (1.46)	50 (1.97)	29 (1.14)	22 (0.87)	27 (1.06)	27 (1.06)	22 (0.87)	318 (12.52)
Avg. precipitation days (≥ 1.0 mm)	5.3	4.3	3.2	4.7	6.3	6.1	6.8	5.6	4.4	7.3	6.0	5.3	65.1
Mean monthly sunshine hours	102.3	146.9	192.2	237.0	300.7	336.0	334.8	294.5	231.0	136.4	99.0	93.0	2,503.8

The strongest winds are blowing during winter months. The number of windy days per year is about 280-300 days.

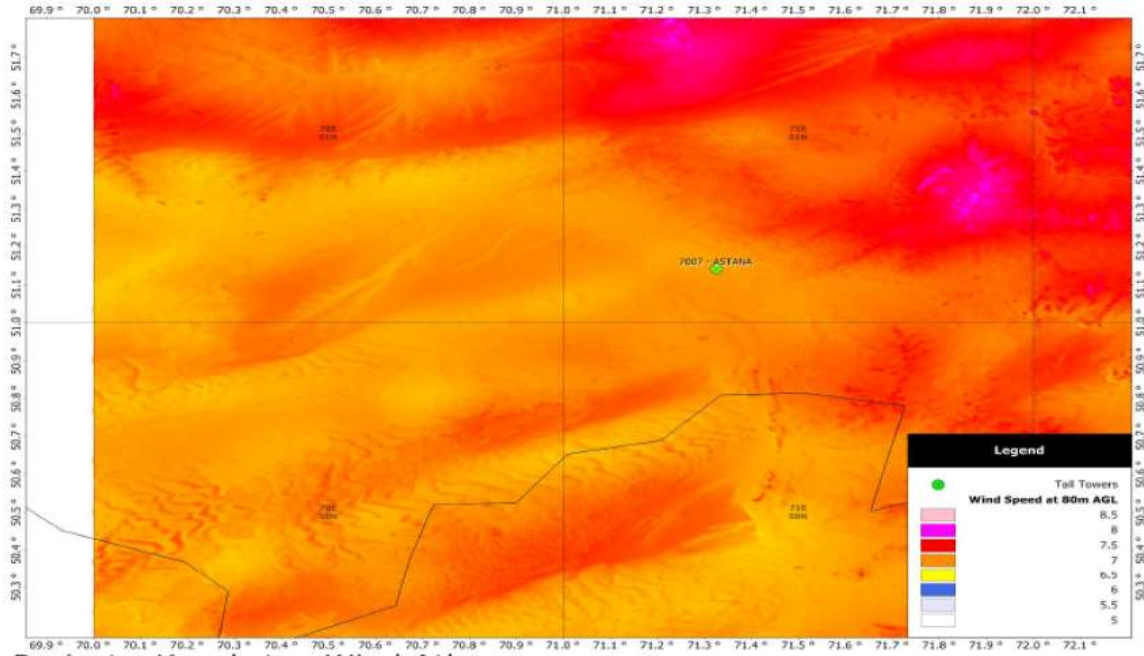


Figure 5 – Wind speed in Astana

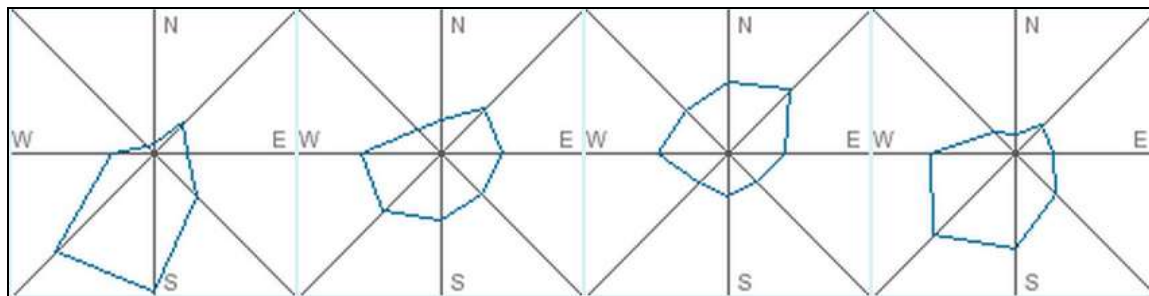


Figure 6 – Astana wind rose

### 2.3. General information Astana EXPO-2017



Astana EXPO-2017 site is located between the new city center (4 km away) and airport in the close proximity of the Nazarbayev University.



**Figure 7 – Expo location**

The overall building area of the EXPO complex is 173.4 ha and the overall building area of the EXPO Site is 25 ha. The main features of the expo can be seen below. A more complete document can be found on [www.isover-students.com](http://www.isover-students.com) in **Documentation for Submissions 2015**



**Figure 8 – Expo functions**

The zoning of the Expo Complex has in 3 main areas: Expo area, Residential area for Expo and Post expo residential area expansion.



Figure 9 – Expo main areas

## 2.4 General information about the task

The students are required to develop a vision for a residential function located in the perimeter of the post exhibition residential expansion of International Exhibition EXPO 2017. The site where the task is situated is the one indicated in red the figure below.



Figure 10 – Task site

## Site and zoning requirements

The size of the proposed area for the development is 3.1 hectares. A number of residential buildings to be



constructed in this area are 10-12 buildings. The height level is 6 – 8 stories. The final buildings should provide altogether a gross floor area of approximately 31000 sq. m above the ground (the density of housing is to be approx.10000 m<sup>2</sup>/ha) and a total number of 320-350 apartments. Total gross area must include basement car parking with the ratio of one parking space per unit.

The participants can decide to arrange the parking in a semi recessed lower level with the ground level being raised approximately 1.5 meters above grade.



Figure 11 – Task site

### Flats requirements

Bedrooms in the residential units should be large enough to accommodate two persons each and living areas should be adequately sized to accommodate families based on the ratio of total living floor space is more than 18 m<sup>2</sup> per person. The choice for the number of rooms per apartment is up to the participants. The recommendation is to focus mainly on 2 and 3 room apartments. Floor-to-floor dimensions will be 3.3 meters for residential floors.

### Outdoor amenities

As minimum should include following:

- Play area suitable for children
- Neighborhood plaza. The open space requirement can either be in the form of a yard, a courtyard, or integrated into the building, or some combination of those strategies
- Garden-natural area of the neighborhood scale integrating both natural landscape and hard surfaces.
- Bicycle parking with bike sharing station integration
- Guest parking lots on grade
- Special features: waste collection points

### Other functionalities,

In order to develop their own vision of the area the participants can to propose other residential amenities including community-friendly commercial spaces that could work for Astana climate conditions



### Adjacent territories:

- South: Buffer Park conceived as natural landscapes that serve as a screen from the surrounding highways. These parks will be a key component of the city wide sustainable strategies integrating storm water management systems and extensive solar panel array for energy generation.
- North: Covered Street is a mixed use facility including retail, office, health club, cinema, art gallery and parking facilities. The structure links the BRT station at the west end and EXPO site (25 hectares) at the east end. The design of the Covered Street is currently under development. Maximum building height is 30 m.
- West: Post EXPO Residential expansion with the height of 6 to 8 stories. Participants can propose the same principle of housing configuration as for the Contest task area.
- East: 3-story high school for 1200 students. The location of the school is currently undefined and this area can be transformed to the residential quarter (6 to 8 stories) during Post Expo master plan development.

The main access routes are presented below:

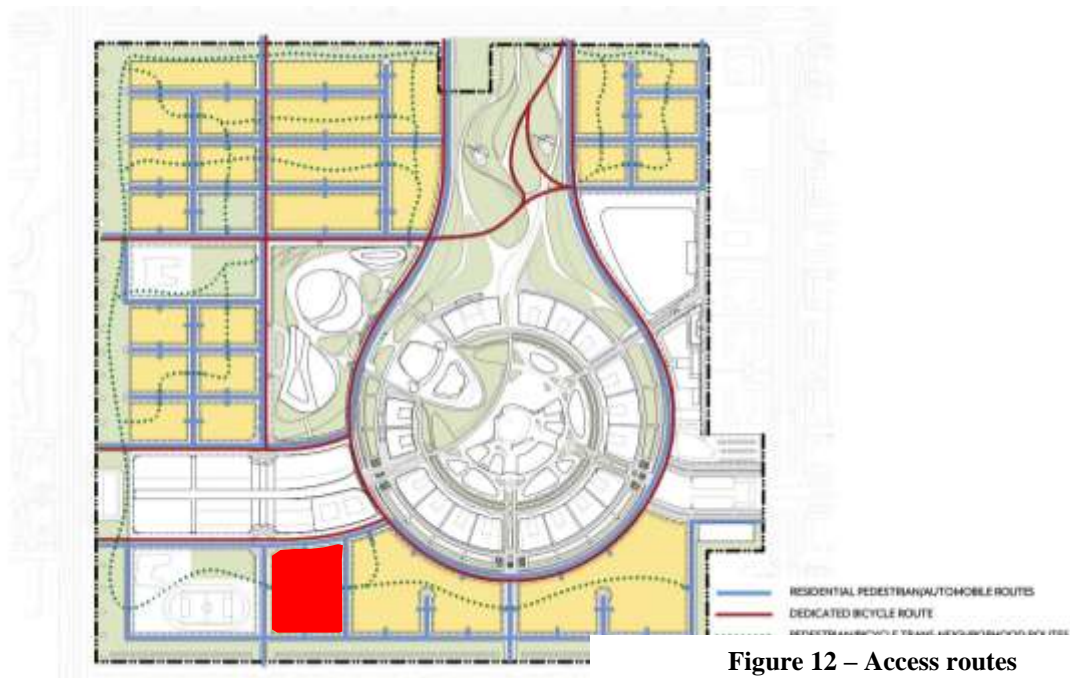


Figure 12 – Access routes

The contest requests only the development of the area market in red. All buildings from this area should achieve the building physics performance of a Multi-Comfort House as they are presented in the page 15.

Details and calculation are requested only for one building with residential function in this area.

The architecture of the neighborhood has to fit in the surrounding of the site. The overall scope of the task is to answer to the question: **What is “sustainable housing” in Astana extreme climate conditions.**

## 2.5. 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](http://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. Due to the extreme climatic conditions of Astana in the case of the Heating Energy Demand the target value is 30 kWh/m<sup>2</sup> year.

			HOUSING	
			Astana, Kazakhstan	
HEATING ENERGY DEMAND (kWh/m <sup>2</sup> a)			30 kWh/m <sup>2</sup> a	
COOLING ENERGY DEMAND (kWh/m <sup>2</sup> a)			15 kWh/m <sup>2</sup> a	
AIR-TIGHTNESS n50 (V/h)			0.6 V/h	
DAYLIGHTING (Daylight autonomy %)			60%	
			Min.	Targeted
SUMMER COMFORT (overheating % of season (year))			10%	5%
ACOUSTICS	Between dwellings	Airborne - D <sub>nT,w</sub> +C(dB)	≥ 58dB	≥ 63dB
		Impact - L <sub>nT,w</sub> +Ci(dB)	≤ 45dB	≤ 40dB
	Between rooms of one dwelling	Airborne - D <sub>nT,w</sub> +C(dB)	≥ 45dB	≥ 48dB
		Impact - L <sub>nT,w</sub> +Ci(dB)	≤ 50dB	≤ 45dB
From exterior noise		Rural & Urban - L <sub>den</sub>	25 dB	20 dB
SUSTAINABILITY				

Figure 13 – Saint Gobain Multi-Comfort Criteria

Participants are expected to present in their design the main strategies they have used in order to achieve the criteria presented in “Figure 13 – Saint-Gobain Multi-Comfort Criteria”.

### 2.5.1. 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](http://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 14 – ISOVER Construction details

- Air tightness website: [www.isover-airtightness.com](http://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](http://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](http://www.isover-students.com/content/view/137/161)

## 2.5.2. Thermal comfort

### 2.5.2.1 Technical parameters for energy efficiency

The following thermal criteria will be targeted:

- An annual heat demand <30kWh/m<sup>2</sup>.
- An annual cooling demand <15kWh/m<sup>2</sup>.

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

- All opaque external constructions  $U \leq 0.15$  W/m<sup>2</sup>K for compact building shape
- All opaque external constructions  $U \leq 0.10$  W/m<sup>2</sup>K for non-compact building shape
- Windows and doors  $U_w$  total  $\leq 0.8$  W/m<sup>2</sup>K. The 'g' value should be chosen based on the solar heat gain evaluations taking in to account both cold and warm season.

The above mentioned values do not guarantee the achievement of the criteria. The participants have to run the MCH Designer for their projects to have a clear image of the results.

### 2.5.2.2 Technical parameters for protection against overheating

In order to provide a good environment the proposed target for the summer comfort is that the overheating (temperatures above 25°C) measured as % from the total period 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).

## 2.5.3. Acoustic comfort - Technical parameters

Noise is extremely damaging to human health. Providing a good environment from acoustic point of view is crucial for the human wellbeing. Sleep deprivation, as a result of high levels of noise, has adverse effects on human.

The sound sources that bother annoy or disturb the most in residential functions are: road traffic and neighbours.

The participants are advised 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).

## 2.5.4. Indoor Air Quality

In order to provide the best conditions for the inhabitant's low levels of CO<sub>2</sub> concentrations (maximum 1000ppm) inside the apartments should be achieved. To reach this concentration of CO<sub>2</sub> the participants should provide a level of the ventilation rate of 30mc per hour per person.

## 2.5.5. 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.

## 2.5.6 Natural daylight

A good level of natural light is mandatory for a good quality of life. There for in the rooms where different activities are taking place during the day (ex: kitchen) a natural daylight autonomy of 60% should be achieved. In order to achieve these levels for Astana location under standard conditions it is recommended to use a window to floor ratio of 15%.

## 2.6. Competition requirements

### 2.6.1. 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 living in the analysed zones

### Residential function

- 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

### Calculations

- Will be performed for only one building
- **Annual heat demand**
  - *Calculation will be done using Designer v.3.5*
  - *Participants will insert a calculation overview in the project*



Overview Palette	
B. QUARTY	
F. Shading	
G. HVAC	
H. Heat Demand Calculations	
Transmission Heat Losses:	17847,12
Ventilation Heat Losses:	2006,11
Total Heat Losses:	19853,23
Internal Heat Gains:	4297,60
Available Solar Heat Gains:	13949,97
Total Heat Gains:	18247,57
Annual Heat Demand:	2911,77
Specific Annual Heat Demand:	9,48
I. Overheating Calculations	
Exterior Thermal Transmittance:	137,91
Ground Thermal Transmittance:	31,52
Exterior Ventilation Transmittance:	43,47
Ground Ventilation Transmittance:	0,00
Solar Aperture:	72,37
Frequency of Overheating:	42,58

Figure 15 – ISOVER Designer v.3.5 overview

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

### 2.6.2. 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  $R_w$  and  $L_{n,w}$  values, 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.

## 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 2015.

### 3.1. Formalities for submission - National Stages

The participants can register online at: [www.isover-students.com](http://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 and Izocam organization can be found at [www.isover-students.com/content/view/91/133/](http://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 18<sup>th</sup> May 2015. Each of the participant teams shall submit to the ISOVER contact person in their country 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.

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

- A single file - Power Point Presentation
  - 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 2015".