2. Details of the task

2.1. General information about the area covered by the contest

Figure 1 - Site map

Mannheim is a city with huge potential for development. Together with Heidelberg and Ludwigshafen, Mannheim forms the backbone of the Metropolregion Rhein-Neckar. The structure of the city is characterized by the inner-city, which is surrounded by the main street circle. At the south-western end adjacent to the palace of Mannheim (a copy of Versailles) the ICE railway line can be found.

The development area set for this contest contains the area directly opposite to train station. It has the highest priority in regards to the town planning as it is the connection between the neighbourhood of Lindenhof-Area and Inner-City. In 2001 a high-rise building ("Victoria Turm") was completed at the western end of this area. It emphasizes the beginning of the area stretching along the railway system. Also finished by now is the Lanz-Carrè, Glückstein-Carrè and MAFINEX building.

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There are two old operating buildings of “Deutsche Bahn” in the middle of this area: an engine hall and a former workshop building. Both buildings must be restored. The engine building is protected as a historical building. These buildings will be the new centre of the area. It`s most important to find an answer on how to connect these area with the existing Lindenhof and new build Glückstein-Carrè building ensemble.

The road planning determines the relocation of the main development road between the historic structures and the park.

2.2. Site and zoning requirements

The size of the whole development area is 6.4 hectares. The contest will focus on a selected section. This section is marked as **Area “A” and Area “B”.**

Area “A” – This area is dedicated to the residential function. A number of maximum 4 buildings with a maximum height level of ground floor + 4 floors shall be constructed in this area.
The final buildings should provide altogether a gross floor area of approximately 10.440 sq. m. As a premium-quality residential development is planned, the size of the flats shall be above-average. The estimated number of flats is estimated below 150 apartments.

Integration of new residential function is not limited to the layout presented in the “Area A, Figure 2 – Site functions”. However the overall design and the façade of the new construction should fit with the surroundings area.

This area also contains the historical buildings as well as the park. The task is to find a sustainable usage for both this spaces as well as a good link between the park area and the existing building stock of “Lindenhof” in the South-West and the two historic buildings and the new development to the North-Est.

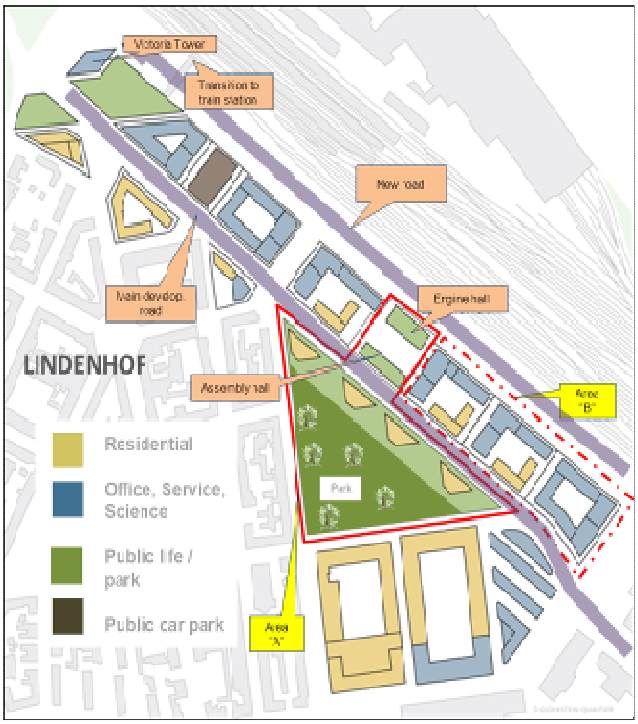

Figure 2 - Site function

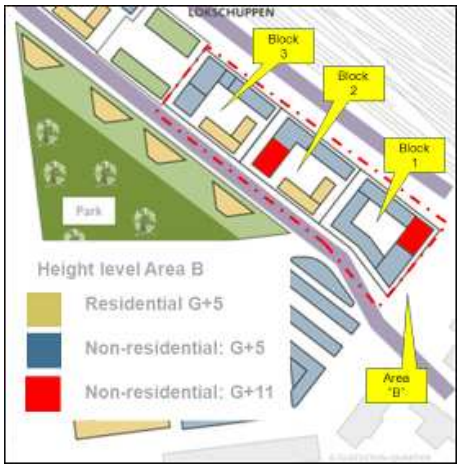

Figure 3 – Zone B height levels

Area “B” - This area is for both non-residential and residential usage. The task of the contest for this part is to create a master plan and a design for the building shapes, facades and the exterior green taken in to account office, service and science functions as well as residential function.
The height level for this area is:

- Residential: ground floor + 5 upper floors
- Non-residential: ground-floor + 5 upper floors

Formerly, there were planned 3 high-rise buildings in “Area B”.

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According to the current state of planning only two high-rise buildings will be building: Block 1 and Block 2 as indicated in the right picture. The height of these two buildings is: ground floor + 11 upper floors
In Area B altogether approx. 14 % of the surface should be constructed for the residential function. The residential use should be located as follows

- Ca. 23 % residential use in Block 2
- Ca. 23 % residential use in Block 3.

More information about **Area "A"** and **Area "B"** can be found in the file **"Plan zoning 2013.pdf".**

The contest requests only the development of "Area A" and "Area B". Details and calculation are requested only for one building with residential function in "Area A" (see "2.5. Competition requirements"). This building should achieve Multi-Comfort House criteria.
However all buildings (in 'Area A' and 'Area B') should achieve the building physics performance of a Multi-Comfort House (including the two historical building after renovation.)

Beside constructional, the social and economic aspects also have to be considered and respected and the buildings designed should give a new impulse to the existing urban area.
The architecture of the neighbourhood has to fit in the surrounding of the site. Urban space solutions for the immediate surroundings of the site will be proposed.
The overall scope of the task is to get actively involved in giving shape to future development of living in European cities.

2.3. Specifics of the context

The two historical buildings can be found in Area A. One is a former engine shed and the other one is an assembly hall.

These two buildings shall be maintained. They form "the middle" of the whole facility and shall host amenities contribute to enlivening the Glückstein-Carrè.

Between the historical buildings and the existing Lindenhof development there can be found the park that forms the connection between the two grown structures. This should be covered partly on its North-East part with the residential function that will be developed (see "Figure 2 - Site function").

The proposed architectural solution has to correspond both with the existing constructions of Lindenhof and the new development that can be found at the Lanz-Carrè and Glückstein-Carrè.

Furthermore a connection between the new and existing buildings should be built.

Figure 4 – Engine hall

Figure 5 – Assembly hall (front) and engine hall

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The basic structure for the development of “Area B” is given in the “Area B Figure 2 – Site functions” as well as in “Figure 3 – Zone B height levels”. Here an appealing architecture in coordination with the external area is desirable. The architecture shall harmonize with the adjacent properties of the Glückstein-Carrè and the MAFINEX technological centre. It is recommended that the final layout of the buildings footprint matches the layout presented in “Area B Figure 2 – Site functions” and “Figure 3 – Zone B height levels”.

Figure 7 – MAFINEX technology centre

Figure 6 – Assembly hall (right) and engine hall (left)

Figure 8 – Lanz Carrè building

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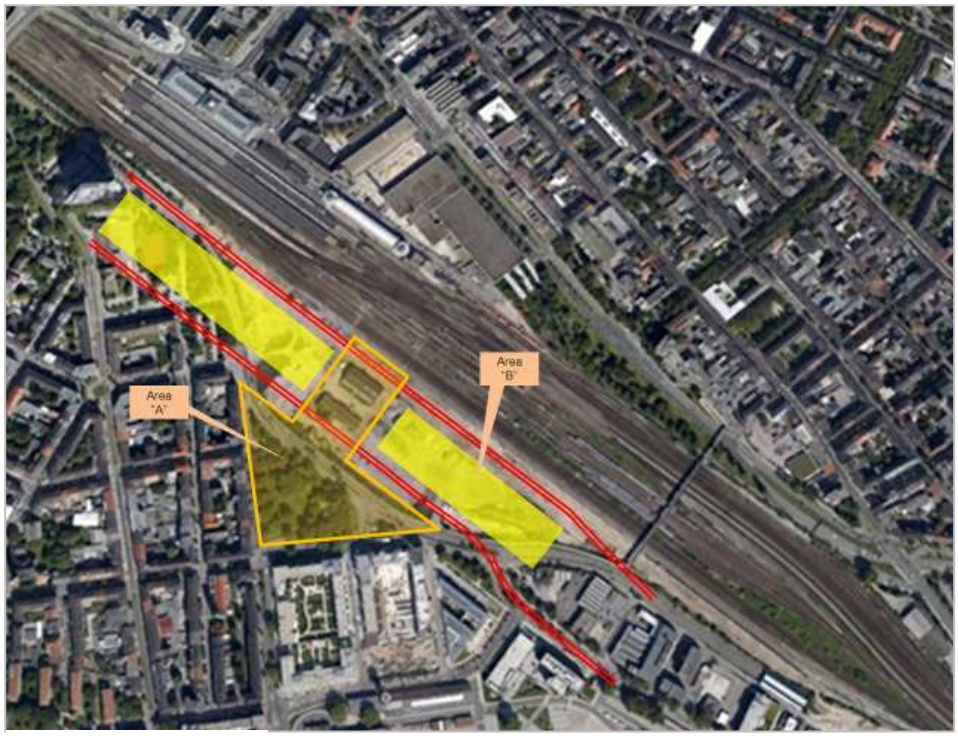

Figure 9 – Sit view

As can be seen from the bird´s eye view the area will be connected to the Lindenhof through the territorial development and complemented by it. The main streets have to be relocated. The traffic on those streets is high; therefore noise pollution has to be handled. A large degree of noise is also produced by the track system of the railway station nearby. Further information on the noise can be found in the contest documents.

The urban development approach is to build a building complex, with mainly non-residential to the noisy surrounding and residential usage to the more silent court yard, along the main development axis and parallel to the railway system. So single construction fields are created which are covered by surrounding building blocks.

The north-western part of the area is under development at the moment. This is bordered by the “new middle” with its two historical buildings. Here the public life of the quarter shall take place.

Keeping the existing buildings, an alternative usage including their surroundings, shall be implemented for these two constructions. Participants will consider also an energetic refurbishment (to the level of MCH as already mentioned) but the detailed description of this treatment are not mandatory. The external area shall emphasize the public usage and provide the connection to the park on the south.

The residential construction envisaged for the Hanns-Luck Stone Park has to respond to the demand of the spatial connection between the green area and the historical structures. The development has to be in context with the newly built buildings Lanz-Carrè, Glückstein-Carrè and MAFINEX technological centre.

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Proposals are expected for "urban villas". They can be designed up to a building height of ground floor + 4 floors. Most important will be to keep an open view between the existing Lindenhof and the historical buildings. Proposals should also be made for the design of the walkways across the green/park to strengthen the relationship between all existing buildings.

The surrounding block construction with commercial usage is continued at the south end of the territory. Suitable facade architecture, energetic optimization and a cooperating external area (on master plan level only) shall be designed.

The whole area will be connected to the district heating pipe. There is no need for the design of a separate heat supply.

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

			HOUSING	
			Cold & Moderate	Hot
HEATING ENERGY DEMAND (kWh/m²a)			New < 15 ; Renovation < 25 (1) or future next local regulation level	
COOLING ENERGY DEMAND (kWh/m²a)			New < 15 ; Renovation < 25 or future next local regulation level	
AIR-TIGHTNESS n50 (V/h)			0.6	1.0
DAYLIGHTING (Daylight autonomy %)			60% (3)	
			Min.	Targeted
SUMMER COMFORT (overheating % of season)			10% (2)	5% (2)
ACOUSTICS	Between dwellings	*Airborne* - DnT,w+C(dB)	≥58dB	≥ 63dB
		Impact - L'nT,w+CI(dB)	≤ 45dB	≤ 40dB
	Between rooms of one dwelling	*Airborne* - DnT,w+C(dB)	≥ 45dB (4)	≥ 48dB (4)
		Impact - L'nT,w+CI(dB)	≤ 50dB	≤ 45dB
	From exterior noise	Rural & Urban – L_{den}	25 dB	20 dB

Figure 10 – Saint Gobain Multi Comfort Criteria

Participants are expected to undertake calculations on a residential building to prove this achieve Saint Gobain Multi Comfort criteria of:

- annual heat demand < 15kWh/m2
- annual cooling demand < 15kWh/m2
- the other criteria presented in “Figure 10 – Saint Gobain Multi Comfort Criteria”

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Calculations will be done using ISOVER Designer (version 2 or version 3). The tool is available for download at ***www.isover-construction.com*** Calculation can also be done by using PHPP (Passive House Planning Package)

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 strongly recommended.

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 11 – 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. Technical parameters for thermal insulation

The main scope is to achieve:

- An annual heat demand <15kWh/m2.
- An annual cooling demand <15kWh/m2.
  The recommended U values for the envelope components are:
- 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 UW 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.

2.4.3. Technical parameters for sound insulation

Depending on the future function of the building parts the sound protection concept has to be considered. The airborne and impact sound insulation of the residential function have to take in consideration the acoustic criteria. The following acoustic criteria are targeted for the residential function.

From exterior noise (houses):

- Maximum level of noise inside the apartments Lden 20dB.
  Between dwellings (houses):
- Airborne sound insulation between dwellings DnT,w ≥63 dB
- Impact sound insulation between dwellings: LnT,w ≤ 40 dB
  Inside dwellings (inside the house)
- Airborne sound insulation between the rooms in the dwelling (without the doors) DnT,w ≥48 dB
- Impact sound insulation in the dwelling: LnT,w ≤ 45 dB

In practice, sufficient sound insulation for windows and doors, as well as for sanitary installation and ventilation systems should be considered for residential and non-residential usage.

2.4.4. Other technical parameters

Protection against overheating in summer
Sufficient sun protection needs to be planned to reduce summer overheating. The ratio of transparent to opaque components also needs to be taken in account.
Furthermore the frequency of overheating of more than +25℃ or +77℉ indoor temperature must be less than 5%.

Fire protection
All bearing internal and external walls have to achieve at least REI 60 according to ISO standards,
The roof and ceilings have to achieve at least REI 60 according to ISO standards,
All non-bearing internal walls between different functions (depending on the function) have to achieve at least REI 30 according to ISO standards.

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Natural daylight
Natural daylight autonomy should be achieved for at least 60%, on a yearly basis for living spaces.

2.5. Competition requirements

2.5.1. Minimum requirements (obligatory)

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.

A. Master plan

- Plan proposal indicating the proposed functions and connection with existing surrounding in Zone A and Zone B
- Experience of living in the analysed zones (Zone A and Zone B)
- Visualisation of the connection on NE- SW axe between existing residential area, new residential and preserved historical buildings.

B. Residential function

The following information should be presented at least for one residential building in zone A

- Typical floor plan(s)
- Cross-section(s)
- Views, perspectives and/or photographs of physical models
- Construction details:
  - Horizontal facade cross-section (suggested scale 1:50)
  - Vertical facade cross-section (suggested scale 1:50)
  - Roof, external wall and ground floor interface details (suggested scale 1:20 / 1:10)
  - Other details as see fit by the participants
- ISOVER Designer calculations
  - Calculation overview
  - Calculation can be done using ISOVER Designer version 2 or version 3 or calculation software PHPP
- Any additional information considered necessary by the participants

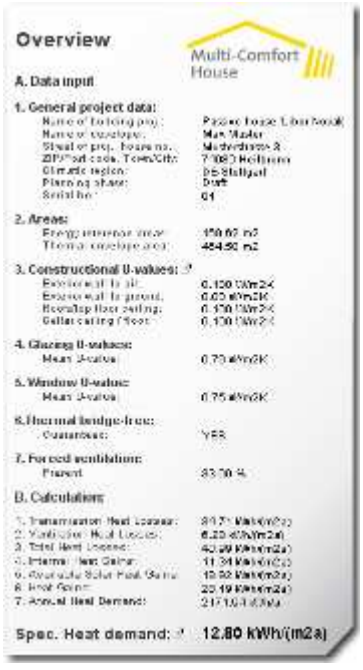

Figure 12 – Overview Designer 2

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C. Descriptions

Participants are advised to furnish the necessary text / diagrams on the submitted posters to allow judges to suitably understand the scheme.

This may include;
Functional solution

- Design concept
- Description of construction
- U-values
- Energy supply and overall sustainable concept

Participants may include additional calculation, drawings or information about the usage of energy, renewable sources, ecology or others points) to better explain their scheme.

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 70 x100 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 2013. 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 8 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 exposure of projects during the international stage.

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

- A Power Point Presentation file
  - Version 2010 or lower, extension PPT. 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 1515 MB
  - All presentations bigger than that will be cut to required dimension.

- In case the presentation contains external animated files, the format of this files has to be supported by Microsoft Power Point version 2010

This file(s) 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, colour 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 2013”.

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