THESIS PROJECT: REHABILITATION OF CITY CENTER IN THE FRENCH ALPS
The nature is all we have our future is absolutely related to its condition. It is time to be conscious and responsible for our actions and impact over it. In this line of thoughts, designing is a significant act which define the vital future of our planet. No matter if we are creating an urban plan, a house or a chair we should have the same intent to compose a masterpiece in unison with the Mother Nature. The project that I choose for my Thesis reveals my understandings not only about the architecture also about the life. Its developing can shows my technical skills as graduating architect, as well responsive and rational answer to the needs nowadays. I participated to a competition for rehabilitation of city center in the heart of the French Alps.
COMPETITION CALL

Les Menuires is a charming city in Les Trois Vallées the biggest ski resort in the world. The first is built in the 60's and it was working as a first class resort. Nothing has changed in the last 50 years and the city needs a new vision. The city center is occupied by 300 meters long building call “La Croisette” host all kind of services and uses, as well accommodation. The demand is to create new public spaces, activities and to revive the city central space through architectural interventions.

ANALYSIS

1. Understanding of Alpine heritage and development

- In the 50's of the past century mass tourism started as a result of increased leisure time, disposable income and car ownership. Development of the French ski resorts does not delay/ is not delayed.
- Three phases of development of the ski resorts
  1st generation – developed around the existing villages as expanding and using the existing infrastructure
  2nd generation – started in the late 50's, designed along the current lines, even though preserving the natural habitat it is not a guiding line/ principle.
  3rd generation – in the 60's as a result of the mass market are created independent large sport centers, offering all you need – easy access, cheap accommodation, entertainment and ski to your door. Les Menuires is one of those resorts.

- Pros
  The sources of incomes are changed. The traditional work related to cottage, agriculture and forestry is decreasing. Even though, the Alpine villages are with stable population. The community it is not influenced by the urbanization due to the developing tourism.

- Cons
  Main disadvantage of the developing tourism is the bad environmental impact of the resorts. New infrastructures leads to pollution trigger the acid rain which leads to forest suffering. Ruined landscape creates erosion, deforestation and consequently risk of avalanches. Resorts produce big quantity of artificial snow in order to elongate the season, which causes noise pollution and consume huge quantity of water, more often from natural lakes which changes the ecological balance.
  The Olympic games held in Albertville in 1992 (and Les Menuires) leads to serious environmental damage – cleared trees and dynamited rocks for new sports terrains.
2. Architectural style evolution in the Alpine villages

- Chalet - traditional building techniques and materials

Chalets are first and foremost simple properties that were originally barns, attics or temporary shelters in case of bad weather. It has become a house thanks to its warm features. In the valleys and towns, stone houses prevail. On the roofs many diverse materials are used such as slates, flat tiles, flat schist tiles or gneiss. Gneiss is a rock approaching granite in composition, commonly rich in quartz, that was naturally formed at temperatures above about 550°C. Chalets have a roof protecting the front façade from the rain, snow and strong local winds. The house windows are wide and often painted in many different luminous colours. The used materials are local and natural, as well have good insulating values from cold and humidity of the soil. Walls are often made of stone, bearing elements are made of wood. Fir tree and larch are generally used. French chalets are also the result of a strong Swiss influence in the region. In this part of the Rhone Alps region, roofs are often of massive dimensions, oriented towards the sun direction. In the north of the area, chalets are foremost made of wood whilst in the south, they are mainly made of stone. A typical chalet has wooden stairs on the outside of the house to reach the first floors balcony. The latter are generally decorated and craft worked. Shutters also bear decorations as fir trees shapes, hearts, stars.

- In the 60's

The Alpine villages built in the 60's are influenced by the modernism movement which is the trend of the time. We can notice this type of approach in central city area of Les Menuires and the buildings around it. Another reference is the ski resort Flaine famous as the modernist “masterpiece” of Breuer. The architect created a series of pre-casted concrete buildings, which are blending with the surrounding rocks and landscape topography. The village is full of sculptures of Picasso, Victor Vasarely, etc. It is the first resort totally car-free, the first snowmaking system in Europe and the first non-polluting gas-powered heating plant in the mountains. Even though, people do not like it as much, as the traditional mountain look of wooden cabins with pitched roof.

- Nowadays, bring back the traditions

Nowadays, the trend is to return the traditional style. First, in order to preserve the architectural heritage, and second because the visitors prefer more the coziness of wooden cabins, instead of a big concrete edifices.

3. Belleville valley, Les Trois Vallées

Les Trois Vallées is a ski area in Savoie, French Alps. Nowadays, it is the largest ski area in the world. The work of German consultant and writer, Christoph Schrahe, measured 600km ski runs. He measures runs directly down an imaginary line in the middle of the piste. But until 1973 it was not possible to reach the neighbor valleys. The distance between them is quite long and the connections through drag lifts and cabins make it possible to reach the whole area by ski.
4. Les Menuires

Facts

- Domain
  1850m altitude
  2688 habitants
  160km pistes/ski runs
  87 pistes
- Equipment
  27 lifts
  411 snowmaking machines/guns
- Lodging/Accommodation
  26 000 beds  1800 beds in hotels  7300 beds in tourist residence

History and architecture

Les Trois Vallées, France, is the largest ski area in the world. Situated in the Bellville valley the biggest one from the three, Les Menuires is a charming Alpine resort at altitude 1850m. It is third generation of construction. As I mentioned in the 60's as a result of the mass market are created independent large sport centers, offering all you need – easy access, cheap accommodation, entertainment and ski to your door. Les Menuires is one of those resorts.

Back to 60's the mayor of Saint Martin de Belleville gives the start of a study of tourism development in the upper part of the valley with its council. Then have been revealed a project, about the development of urban and ski area. The initial plan is to construct 100 000 beds in the valley, situated in two main resorts – Les Menuires and Val Thorens and five satellite resorts. In those years the expansion of mountain resorts is in full power, still the preservation of environment it is not a guideline. In 1967 opened the first accommodation La Croisette, also La Masse cable car and three drag lifts are already built. In 69' open first hotel and tourist office. In the 70's the valley is connected to the neighbor through the drag lift Allmands. Beginning of the construction of Val Thorens. Intense development continues up to 80's. In 1984 is voted a new development plan, considering controlled expansion and preservation of the environment. Fortunately, the accommodation is reduced to 47 000 beds, 26 000 from them in Les Menuires. Also the satellite resorts are removed from the plan.

The architecture is totally influenced by the modernist movement, the trend on this time. In the recent years there are a few new buildings in the city. They looks more like classical cabins, made from wood and stone with pitched roofs, as I mentioned (point 2) due to a few reasons the traditional Alpine vision is coming back on trend.

Environment

The process of developing ski stations has a great impact on the Alpine environment. This leads to deforestation, changes in water flows, and avalanches. There are 411 snow guns in Les Menuires, which means a lot of artificial snow. This leads to noise pollution and a use of huge quantity water. The crowd of tourists, also consume a lot water. Water resources run out and ecosystems go wrong. Moreover, it can be said that the forest in the valley are almost disappeared, due to logging for making terrain for ski runs and urban development. The Town council takes in to account the human impact and preserving the environment becomes a preoccupation. Different actions are taken in order to protect and restore the natural heritage of the Valley, as rubbish selection, tree planting, architectural and landscape improvements, grass seeding on the pistes, energy economy.
5. La Croisette

"La Croisette" is a quarter in Les Menuires and its central area, as well the first accommodation in the resort. It is called also the smile of the Alps because of its sunny slopes and the semicircular distribution in plan view of the buildings around the snow front. The snow front is a place of transition between nature and man-made. There starts the leisure ski area and finish the urban part of the resort, the most vivid and vibrant place in the village.

The architect Philippe Douillet has imagined a big urban complex, following the modernist style of the epoch. Different volumes are rising smaller and bigger, they are connected on the ground floor by 300 meters long gallery in the mentioned semicircular shape. In the middle facing the snow front the structure is interrupted, open a vast corridor for skiers and pedestrians to create a connection between ski runs, through central area reaching the lower part of the resort. A sidewalk grows along the gallery, covered by wooden arcs facing the snow front. The volumes of the edifices are clean without the traditional decoration of the region. The only, coming out of the volumes are the flat roof slabs with thick insulation, serving as eaves. The complex silhouette is terraced; from the end to the center of the semicircle the roofs slightly become lower. Facades are simple and contemporary. On south they are with large glazing, as opposite to those facing north. Balconies are placed along those facing the snow front and south. The rails underline the horizontal guidelines of the design, made of wood or translucent material. The rhythm of the main lines, shades, openings, rails follow each other, as well the existing context. The desired effect is a harmony of the entire assembly. Side walls are grey; balconies are in white highlighting over the horizontal composition.

From far away the composition looks spread (metal tower have been constructed in 2000).

The access and connections are well decided for both skiers and pedestrians. Small cabin lift serve as public transport from a downer level of the city to La Croisette. Functional the gallery hosts all you need - tourist center, real estate agency, sport services, restaurants, bars, shops, supermarkets. Around the sidewalk are situated the outdoor part of cafes and restaurant, providing great view to the slopes around during summer and winter.

6. Urban regeneration

Built from a scratch in 60's and developed until the late 80's Les Menuires is purpose-built resort with strong relation between the functional and symbolic. Nothing more than a few new edifice does not happening in the last years. The planning model is outdated and the urban quality is contestable. As well the amenities are antiquated physically and moral. Nowadays, increasing attention is being paid to returning of local and landscape values, which could redefine the status of the urban space. Defining and solving the main issues – climate change/natural values, outdated planning model, architectural and urban quality; could make possible to reach the main goals – sustainable development, attracting visitors, stable local community and economy, overall creating experience value in tourism. The latter are interrelated and depend on each other.

The mountain resort tools are to promote his potential resources in order to requalify/rehabilitate the urbanity. Fragile and delicate environment.

In this project the improvement of the public spaces is a key issue, so I obtain the approach to threat the resort as a single urban place, which means it should be open to enable people to meet and interact freely with each other and the surrounding. From residual spaces between structures evolved to central spaces with specific characteristics and atmosphere. Well planned and design public spaces structure the urban territory by conveying values and meanings, on this way creating specific atmosphere gives the place character and recognizable identity.

La Croisette is the vivid city center, furthermore, it is the transition space between urban environment (accommodation, services, parkings, etc.) and leisure activities space (ski area and mountains), which makes it prime spot. From one side we have the building complex, from the other the mountain slopes, the snow front has a significant importance in the mountain resort; moreover, in this case the central area is situated there. Designing the snow front we should emphasize the vertical and horizontal links, as well in form, as in function. In vertical links can be implied between natural and man-made; and horizontal links between urban space and ski area.

7. Sustainable future

The economy in Belleville valley is based on tourism, which is related to the natural values. Currently the environment is in bad conditions, which makes the economy unstable. Another point is that the resort has high level of activities only 5 months in the year.
Architectural approach

References showing the development of mountain architecture through the time. I choose to divide the selection into two main approaches - modern and traditional. During the 60's in the boom of modernism there are built whole mountain resorts in contemporary style - concrete buildings, statues of Picasso and etc. But still when we think about cozy mountain cabin we imagine atmosphere with wood, stone and fireplace. Analysis of people preferences shows they do not like modernism approach in the mountain, instead of the traditional mountain style. As well it is noticeable the overall returning of the Alpine style.
Input data

Documents provided for the competition.
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Documents provided for the competition.
CLT constructions references - residential units

Cross laminated timber are high prefabricated elements, prefabrication can reach up to factory assembly with routed in window and door openings, preinstalled wiring and finished visible surfaces. It allows for the implementation of, not only large-sized outer and inner walls or roof and ceiling elements but also flights of stairs and balcony boards or load relieving construction components such as lintels, girders and supports. Supplemented with additional insulating layers, energy efficient and, at the same time, slim constructions are formed with cross laminated timber. Add to this an excellent sound insulation as well as an optimal room climate by means of moisture regulating walls.

Single Family House — by Superpart, Dold and Hasenauer Architects

House in Sistrans, Austria — by media+ architecture
CLT constructions references

North Vancouver City Hall — by Michel Greer architects

Renovation of the building includes two-story 1021 m² from the total built up area 3530m². Two main key points in the project are - creating new atrium along which is organized the rest of the space and an impressive cantilever with length 14m above the main entrance defines the plaza in front the building. Construction is from glulam columns and LSL panels between them. The roof is from four layers LSL arranged crosswise, which creates custom CLT construction. The floor construction is made from glulam beams, covered with plywood (which transfers the lateral loads) and concrete topping.

Muritzeum — by Wingårdhs Arkitektkontor, Göteborg

Nature museum, info centre and Germany's largest fresh water aquarium: the "House of the 1000 lakes" in Waren on the Müritz enjoys considerable popularity with visitors. The approx. 60 degree inclined exterior walls consist of load bearing, cut to a trapezium shape, cross laminated timber elements with visible surfaces of sanded three-layer larch slabs. On the outside the facade is completed by wood boards, which were carbonised on one side to protect the wood prior to assembly.
CLT construction methods

WALL-CONCRETE CONNECTION

01 WALL-CONCRETE CONNECTION

1.1 WITHOUT ADDITIONAL SILL PLATE

WALL-WALL CONNECTION, ROOF-WALL CONNECTION

03 WALL-WALL CONNECTION, ROOF-WALL CONNECTION

3.1 CONNECTIONS OF WALLS AT AN ANGLE TOWARDS EACH OTHER

3.3 EAVES DESIGN WITHOUT CANOPY (INDEPENDENT OF PANEL BEARING DIRECTION)

WALL-WALL CONNECTION, CEILING-WALL CONNECTION

02 WALL-WALL CONNECTION, CEILING-WALL CONNECTION

2.1 EXTERIOR WALL - INTERIOR WALL - CEILINGS

ROOF-ROOF CONNECTION

04 ROOF-ROOF CONNECTION

4.1 RIDGE DESIGN, IF MAIN BEARING DIRECTION IS PARALLEL TO RIDGE

4.2 RIDGE DESIGN, IF MAIN BEARING DIRECTION IS NORMAL TO RIDGE
1.1 Snowfront reinvent

- New central space
- Smooth transition from nature to non-nature
- Smooth transition from winter to summer

1.2 Skyline rehab

Goals:
- Blending with the surrounding landscape
- Traditional style
- New usable area/view points

Tools:
- Picketed walls
- Camp

Existing leisure fields become guidelines for the new landscape design

playground/arena/ice rink
summer/winter
1.3 Accommodation and pergola

- Mass-timber (new accommodation)
- Concrete bench mark (existing building)

Shelter and roof concept
- Fut frame + big windows

plan view

- Shapes start from equilateral triangles and transform according to the situation
- Canopy above the restaurant outdoor area

Building +
- 1 terrace
ANALYSIS LA CROISETTE

Functional diagram
- Accommodation
- Cultural space
- Services
- Sport
- Cable car/Lift station

Ground floor
- Existing ground floor with commercial and services spaces.
- Vertical communication and access to the accommodation in blue.
1. Reinvent the open central space / new snowfront

Current situation
- Outdated planning model
- Undefined public space
- Lack of continuous landscape design

Design goals
- Emphasize La Croisette as gathering space during summer and winter
- Creating continuous landscape blending with the surroundings
- New snowfront allows smooth transition between nature and man made

2. Skyline rehabilitation

Architectural approach analysis
- Built in the 60’s, influenced by the modernism movement
- 3rd generation resort; ski to your door
- Analysis of ppl preferences shows they do not like modernism approach in the mountain, instead of the traditional mountain style

- New buildings in the city in traditional Alpine style
- Overall returning of traditional mountain architecture

Design process
- Existing outline
- + tradition
- + inspiration
- + nature

Design goals
- New volumes provides additional accommodation
- Envelope for existing edifices gives good thermal values and sustainability
- New skyline blending with the surroundings
- Preserving the Alpine heritage through traditional style

3. Alpine center

Guidelines
- Continuation of the urban space
- New gathering point dedicated to the mountain culture
- Experience the building as the surrounding landscape
1. REINVENT THE OPEN CENTRAL SPACE / NEW SNOWFRONT

Nature is all we have our future is absolutely related to its condition. It is time to be conscious and responsible for our actions and impact over it. Especially in the mountain we should have the intent to compose a masterpiece in union with the Mother Nature. The project is situated in the world largest ski area I visited Les Menuires during the winter and as a skier and tourist really love it. The site is diverse naturally and all the comforts that visitor needs are already created. Though this project I try to improve the existing values and to find the lacks.

The project setting is really delicate which drives the design to very tender approach. La Croisette is the city center and snow front of Les Menuires which makes it a crucial zone. The rehabilitation has two steps. The first one is to reinvent the snow front by continuous landscape design, transiting smooth and gently between nature and man made. The guidelines follow the existing layout, creating noscuous gathering point and letting the public place to be read as one open space.

The second stage of the design has the aim to reorganize La Croisette skyline. Creating a new vision linking traditional and modern approach. The new volumes will more accommodation without constructing a new building and new envelope to the existing buildings gives near thermal values and energy efficiency.
LA CROISSETE
2. SKYLINE
REHABILITATIONS

ELEVATIONS

LEGEND
Exciting materials
Site photos
New materials
New elements
Demolished elements

North-East Elevation - old situation
1:250

North-East Elevation - new proposal
1:250
NEW ACCOMMODATION

DETAIL 1
Cross laminated timber:
Connection CLT floor panel to concrete wall
1. Laminated veneer lumber mullion
2. Pine wood sill
3. Timber post
4. plywood flooring 30mm (interior)
5. Insulation 70mm
6. Cross laminated timber panel (5 layers x 40mm)
7. Screws
8. Metal bracket
9. Anchor bolts
10. Wooden pine deck 20mm
11. T wood stud support
12. Flexible membrane
13. Insulation 70mm
14. plywood panals 30mm (exterior)
15. Cavity for installations
16. Hang ceiling plywood panels 20mm (interior)

DETAIL 2
Cross laminated timber:
Connections wall to floor panel
1. Cross laminated timber panel (5 layers x 40mm)
2. plywood flooring 30mm (interior)
2.1 Bead
3. Insulation 70mm
4. Anchor bolts x2
5. Hidden metal plate
6. Screws x2
7. Plasterboard 20mm

NB: visible c/t panel surface inside the appartmnet as wall and ceiling finish
ALPINE CENTER

1. Concept

1.1 Select the terrain

1.2 Choose the spot

2. View

- Next to the city center, linking the existing design to the new one
1. Explore the shape


marrow view

occupy too much of the street front
1.4 Connection with the context

1.5 Vision of the edifice
1.3 Functional scheme/programme

1. Lobby
2. Reception/Welcome desk
3. Souvenir shop
4. Coffee/Brizka
5. Administration
6. Climbing facilities
7. Gallery
- History of Alpinism
- History of ski & snowboard
- Man and the mountain
8. Tribune

Experience the building as the real mountain scape.
ALPINE CENTER
1. CONCEPT

1.6 Functional scheme/programme

1. Lobby
2. Reception/Welcome desk
3. Souvenir shop
4. Coffee/Bar
5. Administration
6. Climbing facilities
7. Gallery
   - History of Alpinism
   - History of ski & snowboard
   - Man and the mountain
8. Tribune

experience the building as the real mountain scape
FLOOR PLAN
-2 Storey - Bearing construction
LA CROISSETTE
3. ALPINE CENTER

ELEVATIONS

The facade's appearance follows the main concept to represent the nature, through the use of local materials. Vertical elements are designed from wood, unlike the horizontal made of concrete, steel, and stone. As well the idea is to be perceived subconsciously as mountain terrain - the rocky trails and high conifers.
**DETAIL 1.**

scale 1:20

wall
1. cross laminated panel 10.5 cm (3 layers x 3.5mm)
2. insulation 8 cm
3. moisture resistant membrane
4. horizontal wood stud 8 cm
5. charred wood siding 3 cm

slab
6. concrete footing 5cm
7. insulation 10 cm
8. vapour barrier
9. reinforced concrete slab 25 cm

foundation wall
11. protective membrane
12. concrete foundation wall
13. concrete footing
14. drainage gravel

**DETAIL 2.**

connection wall to roof

scale 1:20

wall/roof
1. cross laminated panel 10.5 cm
2. moisture resistant membrane
3. insulation 8 cm
4. horizontal wood stud 8 cm
5. charred wood siding 3 cm
15. metal plate
16. screws x 2

NB: typical cutting of CLT panels for eaves design without canopy

**DETAIL 3.**

roof panels connection

scale 1:20

roof
1. cross laminated panel 10.5 cm
2. insulation 8 cm
3. moisture resistant membrane
4. wood stud 8 cm
5. charred wood siding 3 cm
15. metal plate
16. screws

NB: typical CLT cutting for roof connection, when the bearing direction is normal to ridge

**DETAIL 4.**

scale 1:20

slab
17. stone slabs 2cm
18. adjustable pedestal

cantilever slab
6. concrete flooring 5cm
7. insulation 10 cm
8. vapour barrier
9. reinforced concrete slab 25 cm

supporting structure
19. steel columns @ 50cm, 3mm wall thickness
rc concrete fill
longitudinal reinforcement @ 8mm x 6 bars

**DETAIL 5.**

connection wall to slab

scale 1:20

wall
1. cross laminated panel 10.5 cm
2. moisture resistant membrane
3. insulation 8 cm
4. horizontal wood stud 8 cm
5. charred wood siding 3 cm
23. metal cap

cantilever slab
6. concrete flooring 5cm
7. insulation 10 cm
8. vapour barrier
9. reinforced concrete slab 25 cm

connectors (hidden connection)
21. metal plate
22. anchor bolt x 2
16. screw x 2

enclosure
air cavity (serves as insulation)
20. plywood panels 3 cm
Bibliography

History
http://en.st-martin-belleval.com/winter/ski-resort/history
http://www.les3vallees.com/en/history/history.123/
http://www.skiexcel.com/3-valleys-history.html les trois vallees
http://www.skiblanc.co.uk/history-of-the-three-valleys.htm #tv
https://christopheriedel.wordpress.com/2015/02/13/des-menuires-se-patinant/
http://www1.american.edu/led/france.htm - pollution and damages from the tourism in the French Alps
https://rga.revues.org/1813 - French resort urban planning strategy

References
http://www.dezeen.com/2016/03/06/flaine-ski-resort-marcel-breuer-brutalist-alastair-philip-wiper-photography-essay/ - modernism alpine city in France
http://www.evolus.us/architecture/ski-resort-in-lapland-big/
http://www.azuremagazine.com/article/ski-inn-italy-piancavallo/
http://www.dezeen.com/2015/06/30/herzog-de-meuron-mountain-top-restaurant-cable-car-station-wood-switzerland/ - restaurant, cable car station
http://www.designboom.com/architecture/big-architects-koutalaki-ski-village/
http://www.big.dk/#projects-ski