

Preliminary architectural design for library building in Berovo

The proposal for the library starts with a compact city urban pattern for development of the city of Berovo. The compact city is one of the preferred urban patterns and tendencies in the urban debate in Europe in regard to conservation of space, energy, time and material resources and enablement of and access to public services. In the urban pattern an accent is put on the pedestrian and bicycle path which are the fastest transportation means for distances between 0 and 4500m by the book *Green Vitruvius* [1] and also preferred transport means for saving of material resources and energy.

The entire site is divided on urban blocks of mixed use by new streets (Library n Streets) in respect to every existing parcel. The new library is placed loosely in a park block in the urban pattern with façade parallel to the river bank, the park that continues to the hospital parcel to the north. The public entrance of the library is placed on the side of the river bank which is the main pedestrian and bicycle path in the urban pattern. On the opposite side of the library a "logistics square" is placed with parking, loading platform and staff entrance.

The library and the other mixed use buildings in the urban pattern are designed in a way that they don't block the movement of the air and the north and north-west winds that blow along the Bregalnica River.

In the existing situation the new library is part of a larger park where the "logistics square" is connected with Library 1 Street with the Zadarska Street.

The library

The organization of the areas of the library has been divided in regard to the mobility and the needs of the stakeholders, the public (1xxx area numbers in the floor plans), the staff (2xxx) and the media (3xxx).

The public library

The public library includes all the public areas of the library. The total number of displayed media in the public areas is 40900 books, CDs, or DVDs or 68% of the total number of media which is 60100. (In the calculations the 35/50cm bookshelf with height of 180cm and 7 shelves could exhibit 100 various media, while 35/50cm bookshelf with height of 90cm and 4 shelves could exhibit 50)

The public library begins with the entrance which includes wardrobe and information center about the activities in the library and here the borrowed media can be returned to the library. The public entrance is connected to the network of pedestrian and bicycle paths with ramps and stairs, enabling cleared access to the library. It includes only one elevator, for both public and staff use, is planned due to the size of the library. A security lock is planned in the elevator where the underground floor can be locked out from the public by a key or card.

From the public entrance the users can head toward left to the children library, which is separated section for the adult library and placed on the ground floor, to the right to the café and the exhibition area and up through the stairs to the adult library.

The café and the exhibition area are placed together because they complement their function, the café can have more visitors and the visitors in the exhibition area will have possibility to have refreshments.

The children library

The children library is consisted of entrance room with 1 employed and 3 rooms, the "story reading room" (1602), the "Lego reading room" (1603) and the "theater room" (1604). The motifs for design of the rooms in the children library were flexibility, change and playfulness. Therefore "Lego" principle has been used. The "Lego" principle means that the furniture in the rooms is movable and it could be arranged by the children by their imagination. The "theater room" can have variety of functions with the mobile furniture. It could be transformed into reading room, classroom, room for theater performances or room video projections of children movies and cartoons, documentaries etc. Also the seats and the shelves in the "story reading room" could be moved to accommodate individual or group readings. The "theater room" can welcome 30 children for a theater performance or video presentation, and 15 children as readers. The media capacity of the "theater room" is 1800 books, CDs and DVDs. The "story reading room" can accommodate 3 individual story readings and has media capacity of 3300 books. The Lego reading room has media capacity of 2600 books while 700 books are placed in the entrance room making in total 8400 displayed media capacity of the children library.

The children library has 1 standard and 1 toilet for handicap persons designed by Adaptive Access [2] standards.

The adult library

The adult library is organized on 3 floors, 2 floors and 1 gallery and in 3 halls. From the public entrance up through the stairs the users reach the first floor and the main hall of the library which includes the information desk about the content of the library, the periodicals section with 17 reading armchairs and IT center with 6 computers. The main hall is connected with the other two halls and the civics section of the library. The civics section has capacity of 3600 books and includes books and maps from social sciences like sociology, economy, laws, psychology, history etc. The fiction and philosophy section is placed in the "wisdom and fantasy hall". It is consisted of 8000 novellas, dramas, poetry, philosophy, religion, literature science etc. The "wisdom and fantasy hall" is a study intensive area with 12 reading desks. The smaller hall on the first floor is the "foreign languages hall" where the books of various languages are exhibited. It has capacity of 7200 books, CDs and DVDs of various topics and 10 reading desks.

The nature and technology section with capacity of 4800 books is placed between the galleries of the both halls on the second floor. It includes media from natural sciences, for example medicine, technology etc.

The third floor is dedicated to the local culture and the arts sections. The local culture section includes 4900 media capacity library with special ethnological music, dances and folk costumes collection from the Malesevija region. There is a music room in the local culture section where the interior is designed in traditional style of architecture where it will be possible to play traditional musical instruments and listen to traditional folk music. The arts section includes media from painting, sculpture, architecture, photography, music, film, etc.

The terrace (cardak, чардак in Macedonian)

The third floor also has opened-closed terrace, a cardak. The cardak is mark in traditional Macedonian architecture which is used flexible. It is open in summer and closed in winter. In summer it serves as shade from the hellish sun, while in winter it's a shelter from the icy winter effecting the environment of the rooms which are placed next or under the terrace, it cools them in summer and doesn't let them cool easily in winter. In the traditional Macedonian architecture the cardak has completely wooden structure, while the rest of the walls are built out of stone, mud bricks or wood and mortar composites. A same principle inherited from the traditional Macedonian architecture has been used for the library where the cardak is made out of wood while for the other walls different composites are used to make most energy efficient walls in means of energy conservation which will lower the operation costs of the building.

The terrace (cardak, чардак) of the library is open space that can be used for almost any community activity like community meetings and workshops, exhibitions, recitals, video projections etc. or as extension of the café with an outlook to the city. It could be used partly as well, for example part café, part community workshop, part exhibition area.

The adult library has 2 standard and 2 toilet for handicap persons designed by Adaptive Access [2] standards on the first floor and in the gallery.

Mobile library

A very important part of the proposal is the mobile library with 1 hour stand in every settlement in the municipality, with this extending the "classical library" service in the entire municipality. The mobile libraries are widely used in the Nordic countries and in United Kingdom with great effect on the local culture and boost of inhabitants morale. In Finland currently cruise around 190 mobile libraries, while there is no mobile library in Macedonia yet. There is no library bus manufacturer in Macedonia, so in the proposal for the mobile library is included link to the famous library bus entrepreneur in Finland Kiitokori [3]. The approximate costs of a library bus in Kiitokori are around 100.000€ for the chassis plus around 150.000€ for the body of the library bus.

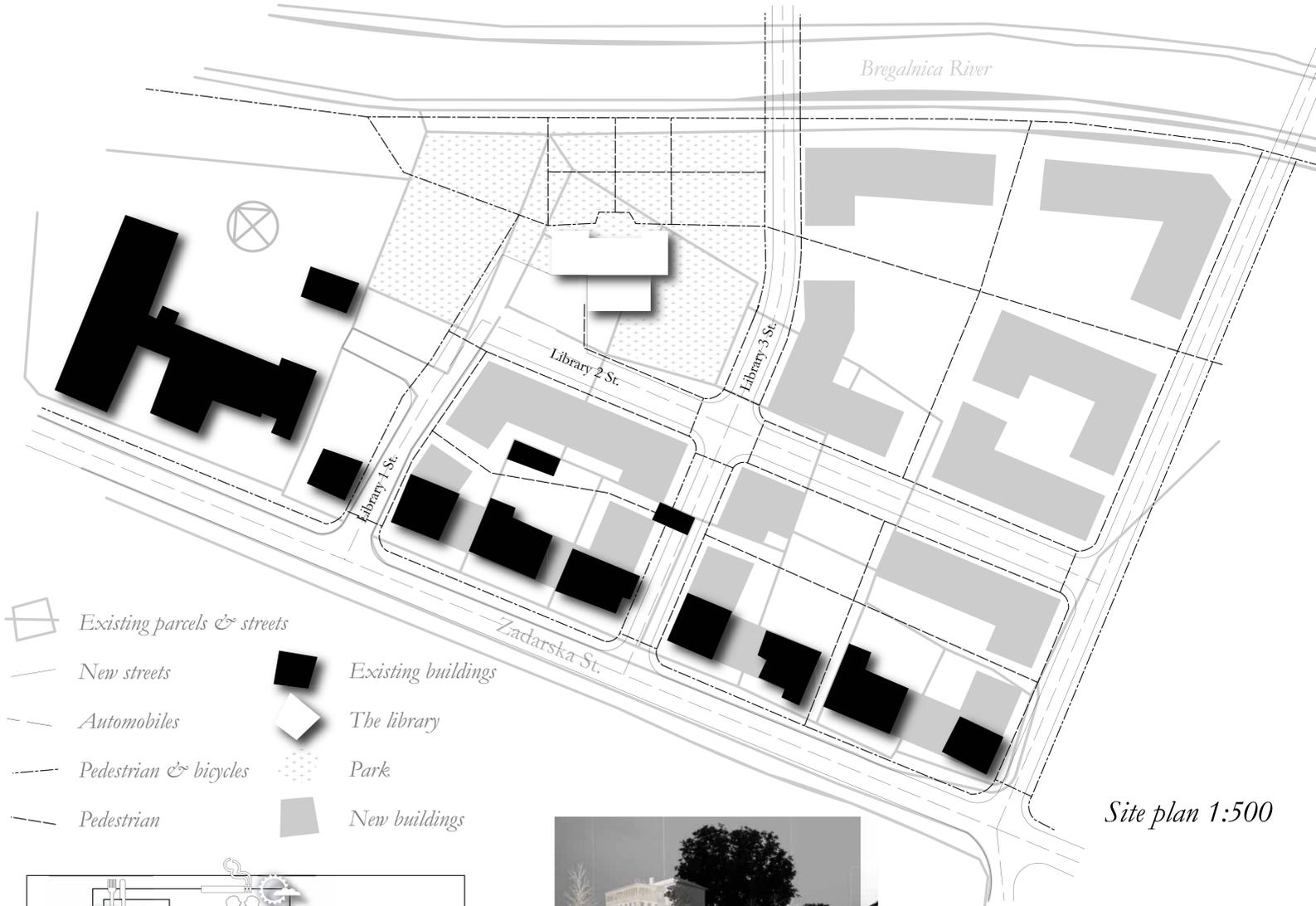
The staff areas

The accent on the staff areas in the library is design toward comfortability. The entrance for the staff is connected to the pedestrian paths with ramps and stairs, enabling cleared access and there are two important staff areas, on the top floor and in the basement floor. The top floor staff area is connected to the library management offices and includes break area and kitchen where the employed can take a break with coffee, tea or have lunch or snack, or just lie or seat on a sofa for a while.

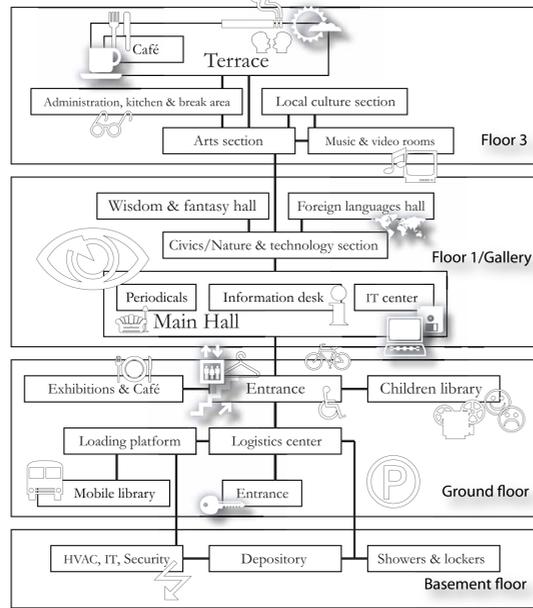
The second staff area is in the basement floor where 2 showers and a toilet are placed with 2 locker rooms. There the library employees can keep their private belongings, have shower and relax.

Media management

The unblocked media flows are important for the efficiency and the number of staff in the library. The media management includes borrowing and handling of returned media, receiving new media, repairing the broken or damaged and depositing media and supplying the mobile library.



Site plan 1:500



3D model Photo 017



3D model Photo 009



3D model Photo 002



Organization scheme

The media could be borrowed on every staff desk. They are placed near the vertical communications, while the borrowing machines are placed on the first floor on the exit to the public entrance. The media can be returned only on the info desk in the main entrance or in the separate sections. The returned media from the info desk are transferred to the logistics center. The core of the media management is the logistics center. It is consisted of office (3102) and workshop/storage (3101). The logistics center is the place where the media are sorted out and put in pushing carts and send to the different sections. The logistics center is also connected with a loading platform from where new media and periodical arrive and from where the mobile library is supplied with media. The repairing the broken or damaged media is also done in the logistics center.

Part of the media are place in a depository in the basement floor which has capacity of 19200 books and it has possibility to enlarge the capacity by 8000 books if there is no need of the storage for heating material.

Security and IT

The technical room for security and IT of the library is placed in the basement floor with video control and network server equipment. A system of cameras should be placed in the whole library and a book barcode identification machines on the public entrance to prevent stealing of the media. A system of staff security cards for the staff and locks should be use to limit the public access to the basement and the staff areas.

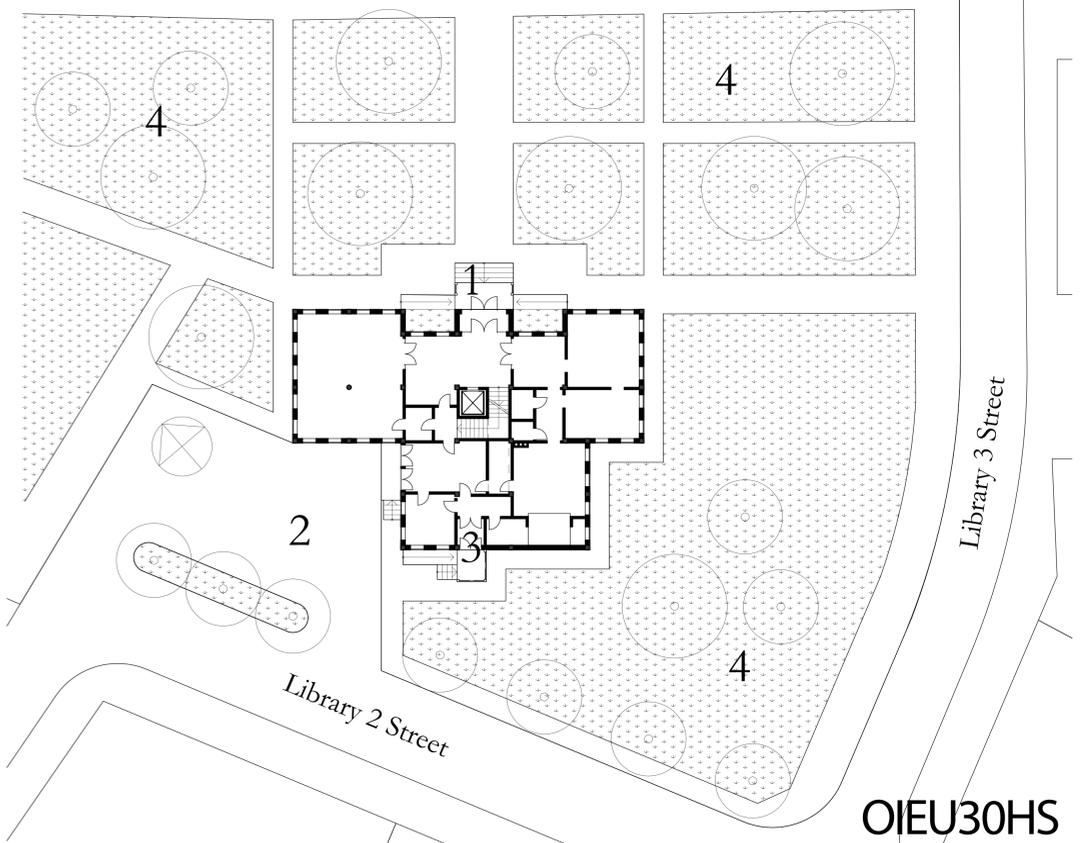
Every staff desk should have computer and bar code reader and all computers should be networked. A system of barcode member cards should be used. Software for library management should be installed with option for online search and reservation of books. The online search and reservation of books is planned to be part of the web page for the library, as subdomain to the main Berovo web page. For example <http://www.biblioteka.berovo.gov.mk/>

Energy

The energy requirements for the building could be seen wider then the design of the library. In a compact city urban pattern the heating could be supplied by an efficient district heating. Unfortunately there is no district heating today and a combination of electricity and biomass has been recommended as temporary solution, until more efficient district heating plant is built. The biomass burning fuel is recommended in regard of the abundance of forests in the surroundings and the wood industry that will develop in the future on the present resources. The technical rooms for the heating include boiler room and wood pellets storage. When a district heating plant would be built, the wood storage could be transformed into book depository adding additional 8000 media to depository space. A shades for the windows are recommended for the summer period.

1. Public entrance
2. Logistics square
3. Staff entrance
4. Park

Parterre 1:200



End note

In total net area of the library is 732.8m² with terrace of 82.5m². The basement floor has additional 240.3m². The coefficients are $k_i=0.24$ while $p_i=0.89$. (The p_i and k_i are urban coefficients in Macedonia. The coefficient p_i is percent of the area under the building divided with the area of the parcel, while the second coefficient k_i is the quotient of the net area of all floors and the area of the parcel.)

The preliminary design focuses on several questions, accessibility and service of the library, or how the inhabitants can access the library, both on city and municipal scale, the genius loci, the pervading spirit of the place or how the library could be accepted by the inhabitants as building and as civic service and how it fits the local culture and heritage, and on the possibility of flexible use of different areas of the library.

In the end almost everything has been seen both from a development perspective of a city toward preferred sustainable urban pattern, the compact city and compared to 0 alternative, or how the library will fit in the city if the city flows are intensified, the built environment is more compacted and the population rises and how the library fits now when the city is loosely built and with current flows and population.

References

- [1] *A Green Vitruvius: Principles and Practice of Sustainable Architectural Design*. (1999). London: James & James
- [2] <http://www.adaptiveaccess.com/>
- [3] <http://www.kiitokori.fi/>

Bregalnica

Library 3 Street

Library 2 Street

OIEU30HS

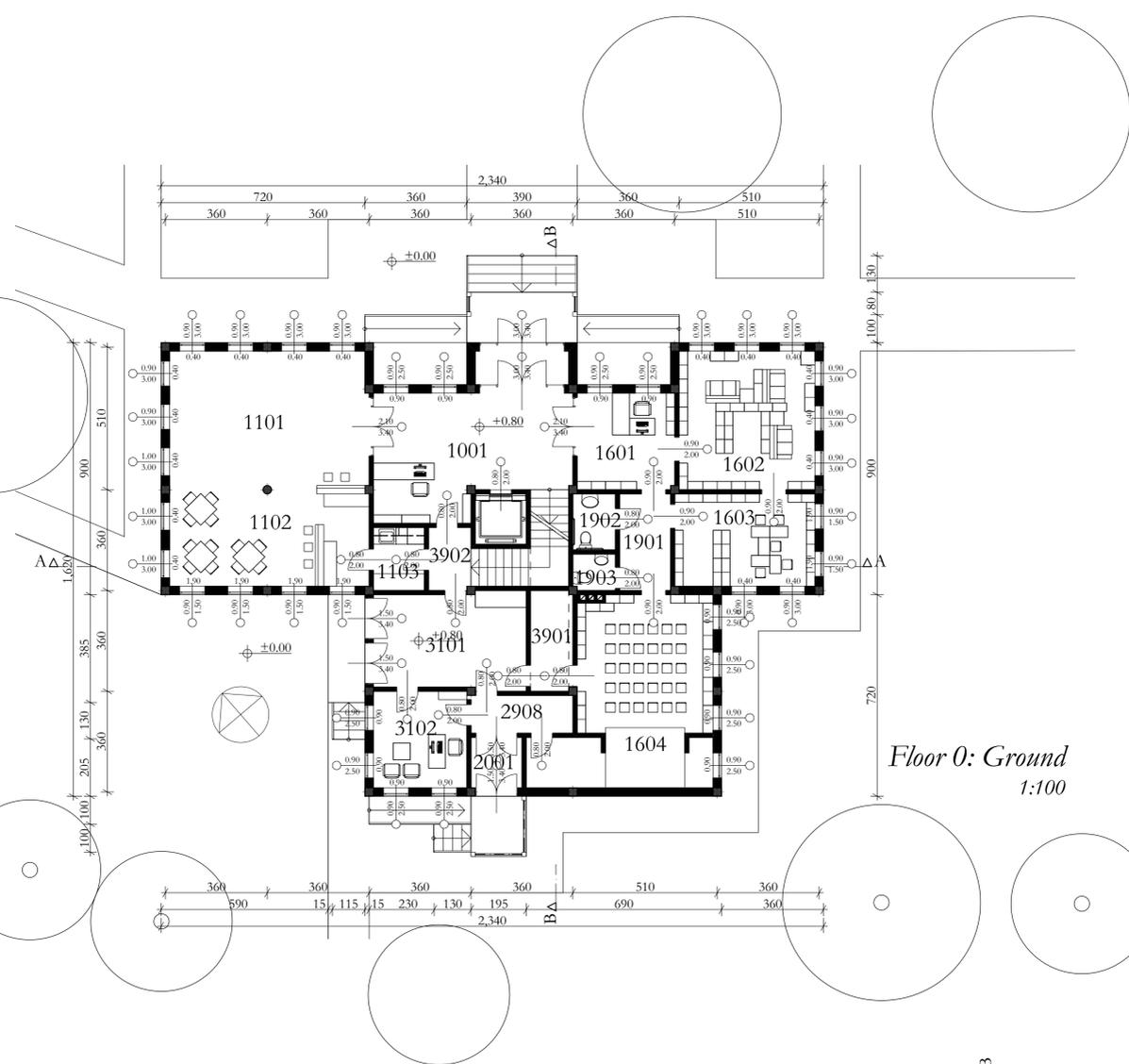
Floor	No	Description	Height	Area	Σ
-1	Staff 2202	HVAC equipment	2.50	12.38	
-1	Staff 2203	HVAC storage and workshop	2.50	53.19	
-1	Staff 2204	Security & IT equipment	2.50	15.54	
-1	Staff 2301	Lockers	2.50	5.55	
-1	Staff 2302	Lockers	2.50	6.27	
-1	Staff 2902	Communications	2.50	6.21	
-1	Staff 2903	Communications	2.50	5.50	
-1	Staff 2903	Toilet	2.50	2.00	
-1	Staff 2904	Shower	2.50	1.35	
-1	Staff 2905	Shower	2.50	1.35	
-1	Staff 2906	Storage	2.50	2.43	
-1	Staff 2907	Communications	2.50	3.77	
-1	Media 3001	Depository	2.50	34.15	
-1	Media 3002	Depository	2.50	37.21	
-1	Media 3003	Depository	2.50	23.76	
-1	Media 3201	Workshop	2.50	29.62	240.28

Floor	No	Description	Height	Area	Σ
0	Staff 2001	Entrance	2.50	3.24	
0	Staff 2908	Communications	2.50	4.86	
0	Media 3101	Logistics center	2.50	18.36	
0	Media 3102	Logistics center	2.50	11.39	
0	Media 3901	Storage	2.50	5.35	
0	Media 3902	Communications	2.50	3.35	
0	Public 1001	Entrance & wardrobe	3.50	28.37	
0	Public 1101	Exhibitions	3.50	34.76	
0	Public 1102	Café	3.50	24.41	
0	Public 1103	Café	5.20	4.05	
0	Public 1601	Children library	3.50	12.03	
0	Public 1602	Children library	3.50	23.76	
0	Public 1603	Children library	3.50	16.33	
0	Public 1604	Children library	3.50	35.59	
0	Public 1901	Communications	2.50	6.71	
0	Public 1902	Toilet	2.50	3.00	
0	Public 1903	Toilet	2.50	1.93	237.49

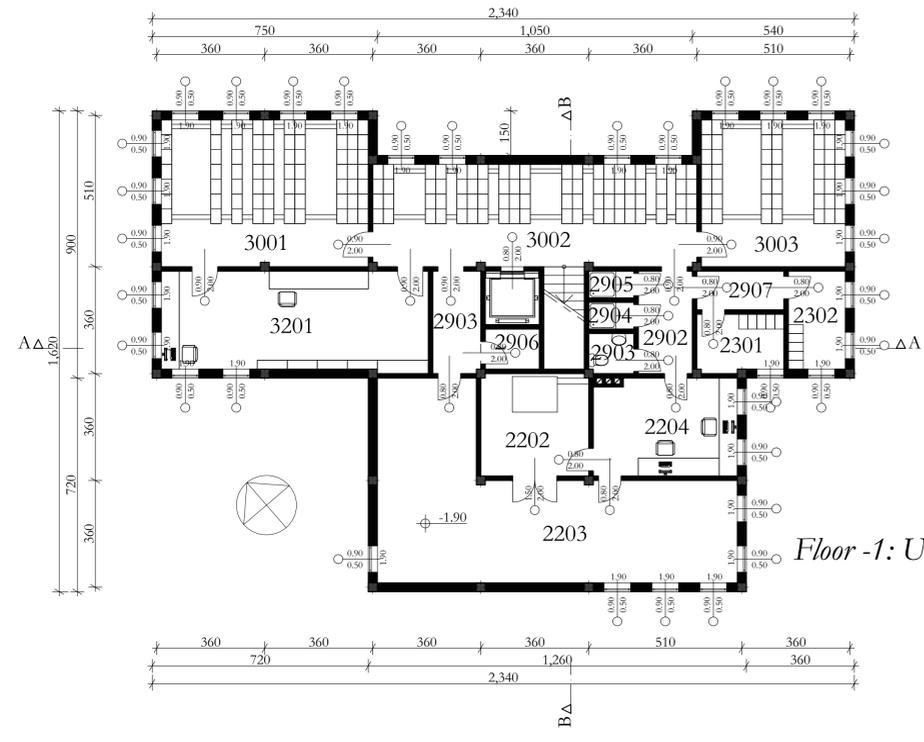
1	Media 3001	Storage	2.50	2.43	
1	Public 1002	Information desk	5.20	12.94	
1	Public 1003	Borrowing machines	5.20	2.31	
1	Public 1201	Periodicals	2.50	12.87	
1	Public 1203	Periodicals	5.20	17.29	
1	Public 1204	Periodicals	5.20	30.02	
1	Public 1301	IT center and library search	5.20	16.56	
1	Public 1301	Wisdom & fantasy hall	5.20	32.10	
1	Public 1302	Wisdom & fantasy hall	2.50	23.48	
1	Public 1303	Civics section	2.50	36.63	
1	Public 1304	Foreign languages hall	5.20	23.04	
1	Public 1305	Foreign languages hall	2.50	17.28	
1	Public 1904	Toilet	2.50	3.00	
1	Public 1905	Toilet	2.50	1.93	
1	Public 1906	Communications	2.50	6.71	238.59

2	Public 1306	Foreign languages hall	2.50	17.28	
2	Public 1307	Nature & technology section	2.50	49.50	
2	Public 1308	Wisdom & fantasy hall	2.50	23.39	
2	Public 1907	Communications	2.50	6.71	
2	Public 1908	Toilet	2.50	3.00	
2	Public 1909	Toilet	2.50	1.93	101.81

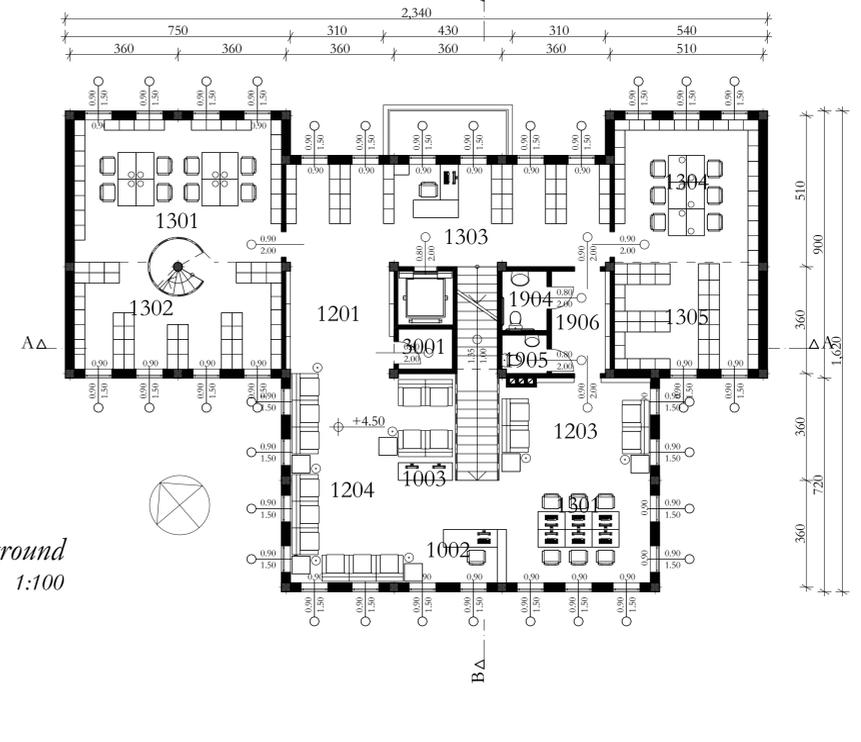
3	Staff 2101	Office	2.50	23.76	
3	Staff 2102	Office	2.50	11.38	
3	Staff 2909	Kitchen & break area	2.50	23.04	
3	Staff 2910	Wardrobe	2.50	2.47	
3	Staff 2911	Toilet	2.50	2.25	
3	Public 1309	Arts section	2.50	37.09	
3	Public 1310	Music & video room	2.50	10.89	
3	Public 1311	Local culture music room	2.50	10.89	
3	Public 1312	Local culture section	2.50	33.12	154.89
3	Public 1004	Terrace	2.50	82.5	732.78



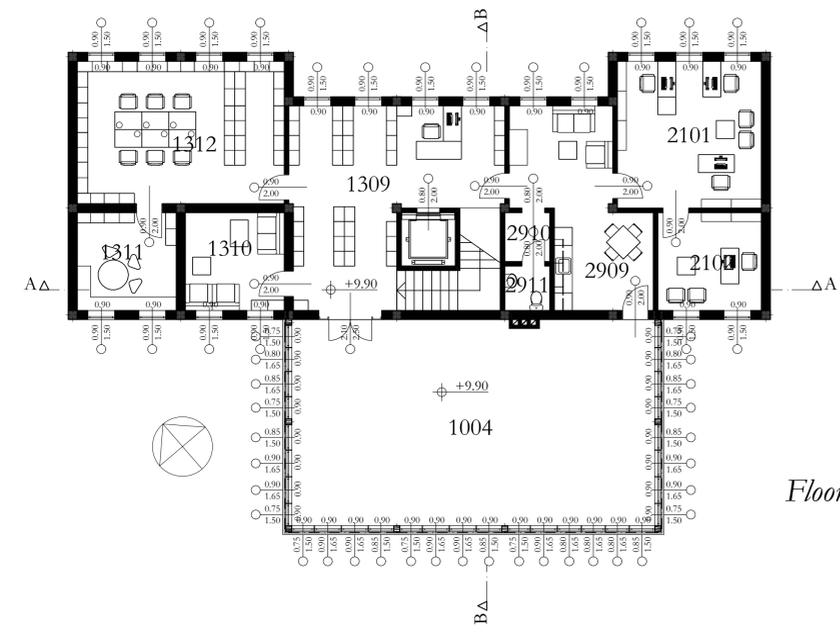
Floor 0: Ground
1:100



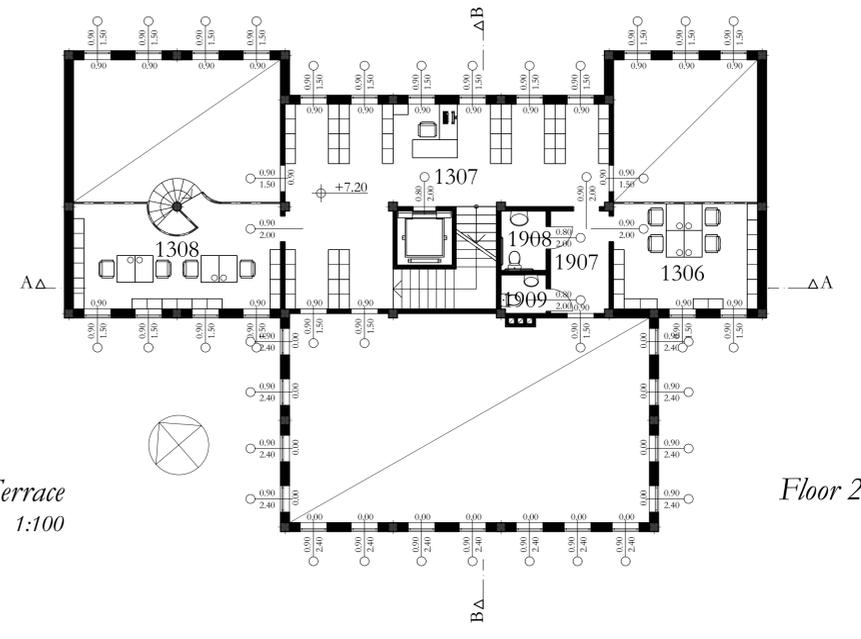
Floor -1: Underground
1:100



Floor 1
1:100



Floor 3: Terrace
1:100



Floor 2: Gallery
1:100



South-West Façade
1:100



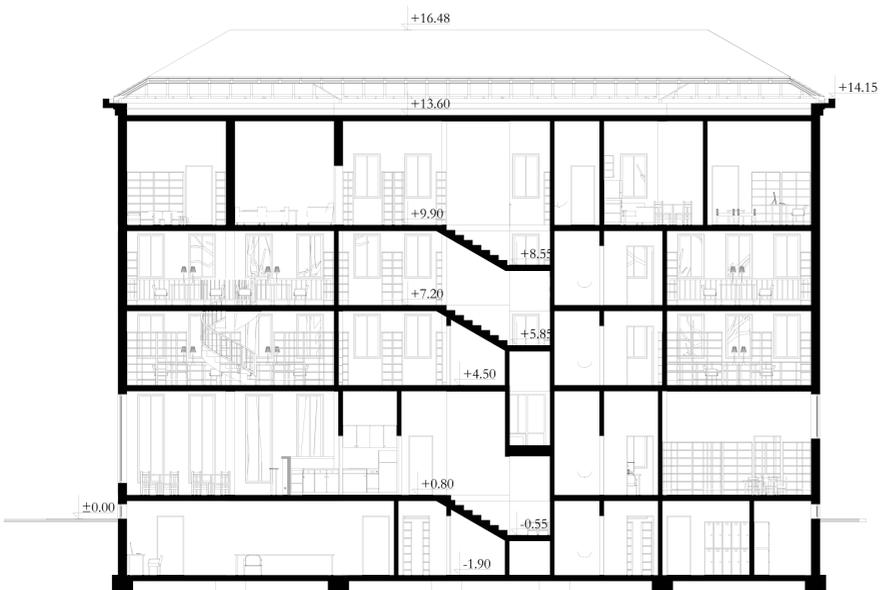
North-West Façade
1:100



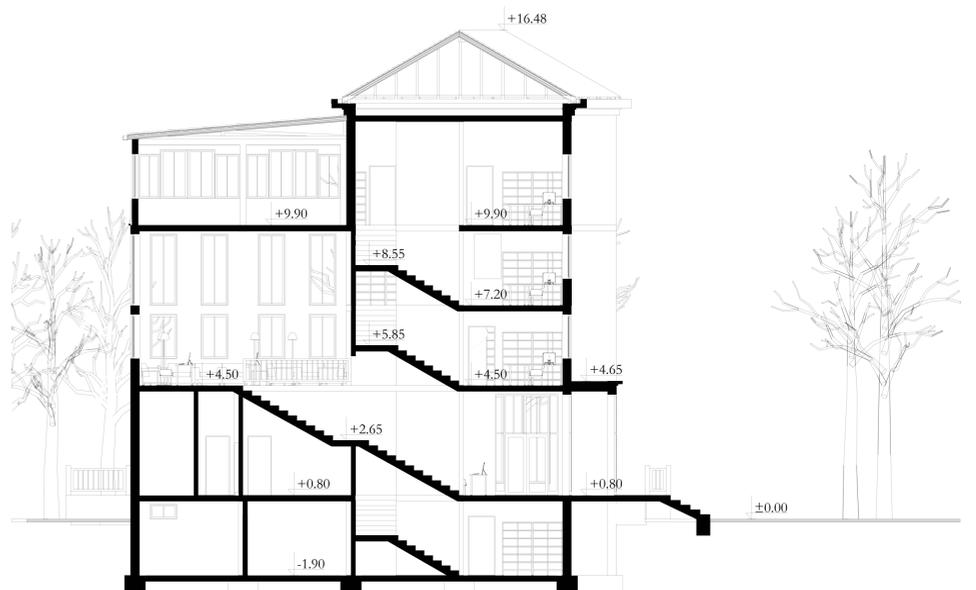
South-East Façade
1:100



North-East Façade
1:100



Section A-A
1:100

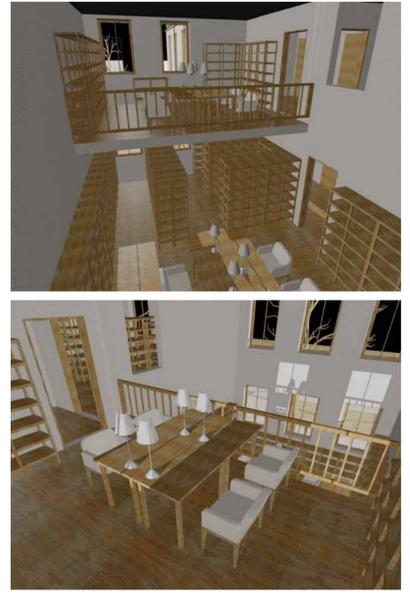


Section B-B
1:100

*Detail A: Floor 1
Wisdom & fantasy ball
1:50*

*3D model
Wisdom & fantasy ball*

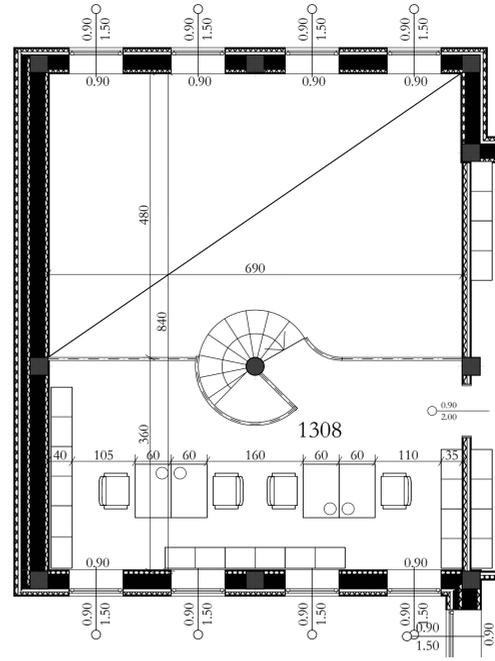
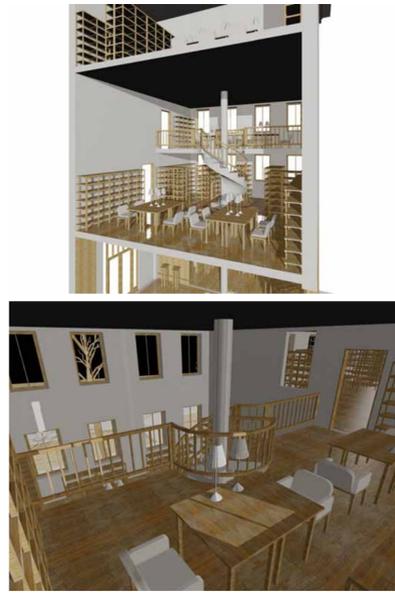
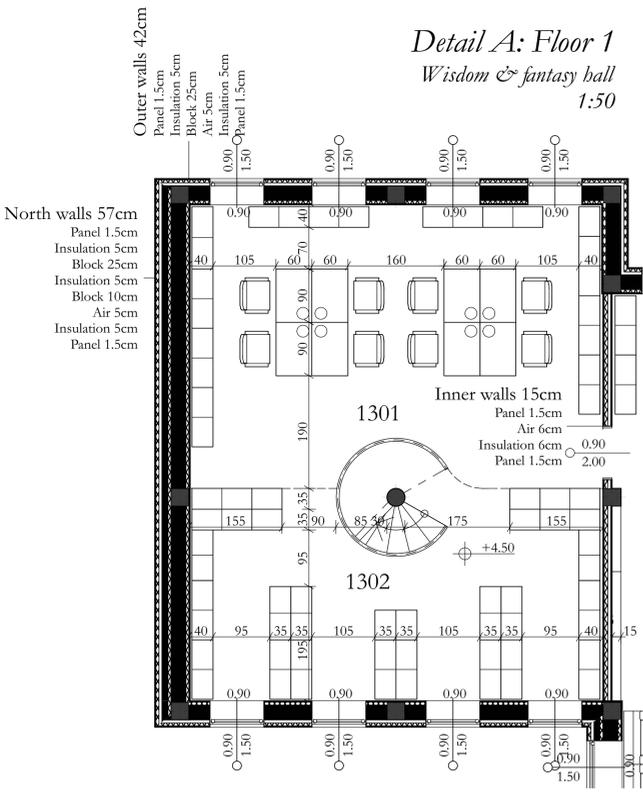
*Detail A: Gallery
Wisdom & fantasy ball
1:50*



*3D model
Foreign languages hall*



*3D model
Main hall*



The structural system and the building materials

There are two alternatives for the structural system, steel and wood alternative of steel columns and wood, steel and insulation composite walls and slabs and reinforced concrete alternative of reinforced columns and beamless slabs with wood and insulation or ceramic blocks and insulation composite walls.

While the steel and wood alternative is more sustainable from material resources and recycling point of view the reinforced concrete alternative is more socially accepted today by the public. A public debate for acceptance of a wood and steel library is recommended as an addition in the consequent design phases. Amos Rappaport [4], a famous American researcher in folk architecture in the world and the relation between culture and architecture, in his book *House Form and Culture* argued that even though there is wide accessibility of building technologies and materials the people accept the ones that fit their ideal world.

There is a technological "concrete" myth in Macedonian culture in the last 50 years of the wood as ephemeral, short living, and easily flammable building material compared to stone or earth based building materials which are regarded as durable, bound and firm and are preferred more, like concrete, bricks, gypsum, mortar etc. and seldom wooden buildings are built. For the preliminary phase of the design it is important myth especially when public buildings are in question. Building a wooden library could be understood as building a short living and ephemeral building in respect to the myth. The "concrete" myth completely replaced the traditional Macedonian architecture which was made out of wood and abandoned as a style and practice more than 50 years ago. But even before seldom the public building where made out of wood.

The details

The displayed details are drawn conceptually to fit both the alternatives.

Several composite walls are recommended from energy efficiency viewpoint. The north wall in the traditional Macedonian architecture had double depth than the other walls, preventing the cooling of the building to the north side. In respect to that the north walls have additional layer of insulation. The roof is insulated to prevent the cooling of the building. It is also designed by the practices in the traditional Macedonian architecture.

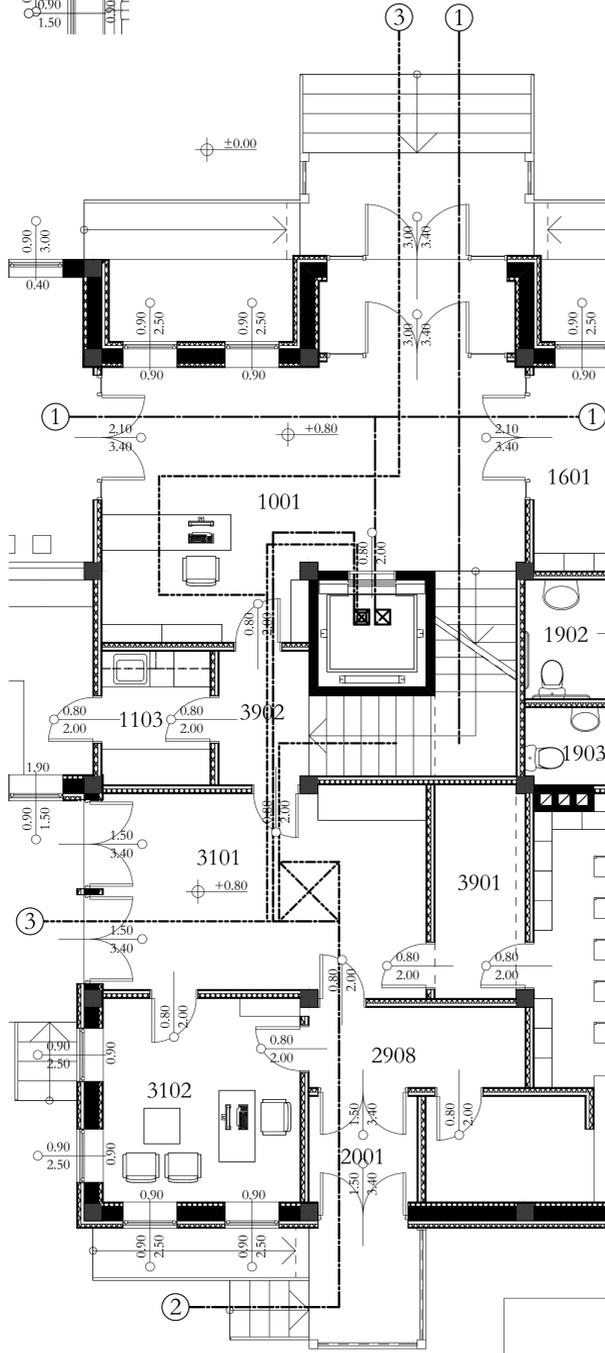
The inner walls of the music rooms are the exception of the rest of the inner walls because they are additionally sound proved.

The details also display the interior solutions in regard to use and flexibility. The "wisdom & fantasy hall" (detail A) is used as reading zone and therefore it is silent zone. It is non flexible area serving one use. The "theater room" in the children library (detail C) is flexible area. It changes its function in regard of the needs and preferences of the public. It can be transformed into small theater, classroom or into "Lego reading room".

The detail B shows the flows and paths of the media, staff and public and the link from the entrances to the main hall and the logistics center.

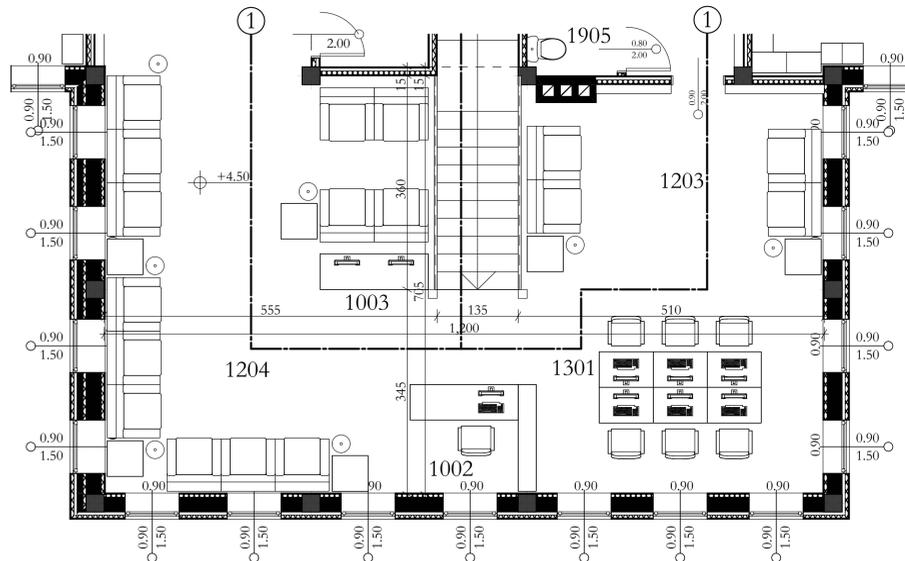
References

[4] Amos Rappaport. (1969). *House Form and Culture*. Englewood Cliffs: Prentice-Hall



*Detail B: Floor 0
Entrances & main hall
1:50*

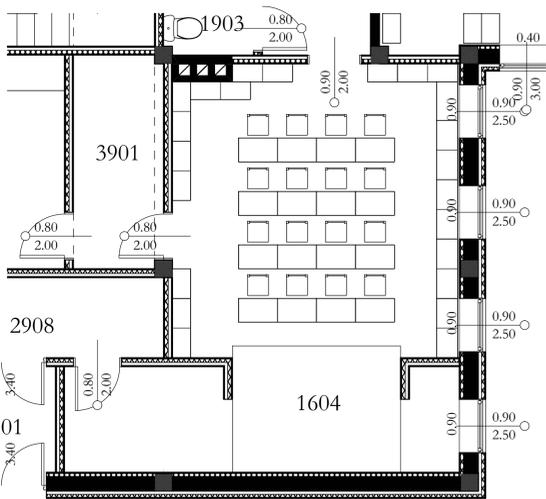
- ① — Public
- ② — Staff
- ③ — Media



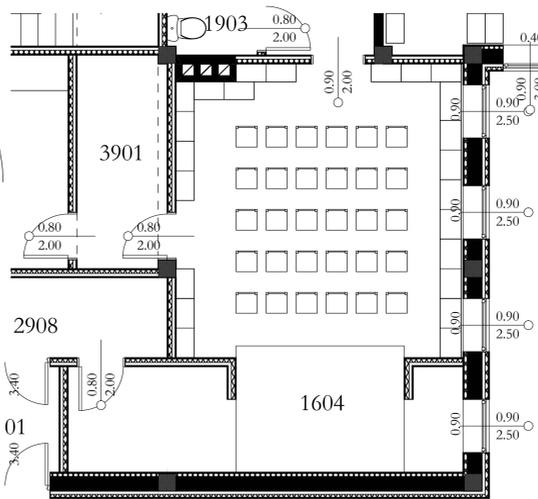
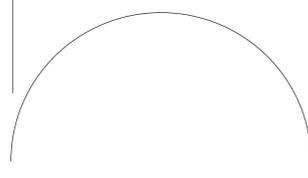
*Detail B: Floor 1
Entrances & Main Hall
1:50*



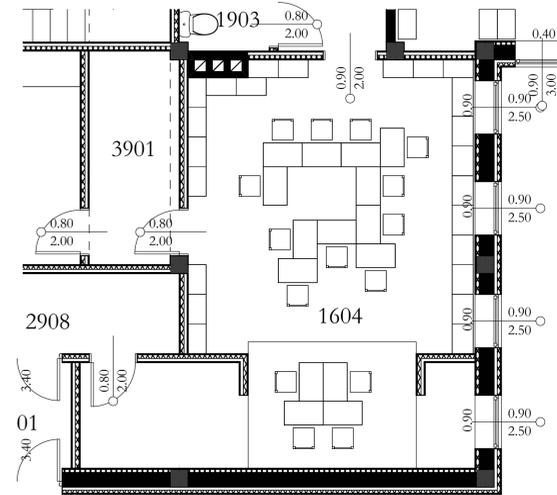
*3D model
Public entrance*



*Detail C: Floor 0
The theater room as classroom
1:50*



*Detail C: Floor 0
The theater room for theater performances
1:50*



*Detail C: Floor 0
The theater room as Lego reading room
1:50*