

Typology and Design

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“The works of the past always influence us, whether or not we care to admit it, or to structure an understanding of how that influence occurs. The past is not just that which we know, it is that which we use, in a variety of ways, in the making of new work.... The typology argument today asserts that despite the diversity of our culture there are still roots of this kind which allow us to speak of the idea of a library, a museum, a city hall or a house. The continuity of these ideas of type, such as they are, and the esteemed examples which have established their identity and assured their continued cultural resonance, constitute an established line of inquiry in which new work may be effectively grounded.”

- The Harvard Architectural Review. Volume 5. Precedent and Invention. Between History and Tradition: Notes Toward a Theory of Precedent. John E. Hancock.

Introduction

Responding to the quote above, this essay investigates the role of typology in architectural design and how typologies in the project ONE LAB have been selected and modified in the design process. Following the background information of the project, the essay outlines the definition of typology based on Aldo Rossi’s interpretation. Furthermore, the essay will discuss different ways of applying typologies according to the spatial organization, scales, and use-type of architecture and the importance of typology in determining various design factors.

1. Project Information

1.1 Purpose/ goal of the project

The project challenges to transform *building 128* into an education centre, creating a collaborative platform for designers, scientists, engineers, and other experts from various fields. The total footprint of 84,000 square feet covers research labs, fabrication facilities, design studios, and exhibition rooms which all contribute to the interdisciplinary-learning environment. The name ONE LAB is given to portray the diverse, yet, unified characteristic of the site, suggesting an open, interactive space.



[Fig 1]

1.2 Location and the Surroundings

Located at the edge of Wallabout Bay between Manhattan and Brooklyn, the building 128 was once a warehouse used to manufacture vessels in the former Brooklyn Navy Yard. Over more than hundred years since 1800s, the Brooklyn Navy Yard had been used as vessel-building site, contributing to the American Revolution and The World War II.¹ The shipyard was closed in 1966², as the place lost its industrial value in the American economy. It is now designated as Brooklyn Navy Yard Industrial Park, representing the historical and cultural icon of the east coast America. Continuing its inherited meaning of the long history of the place, the project seeks to emphasize its value as the driving force of the manufacturing industry. The building is located on the North of Flushing Avenue which then divides the whole site into two different axis systems. The North-West axis directs towards the cityscape of Manhattan, and the North-South axis looks down to the Brooklyn neighborhood. The location therefore carries significance as the interconnecting link between Manhattan and Brooklyn, encompassing diverse cultures and people of the city of New York.

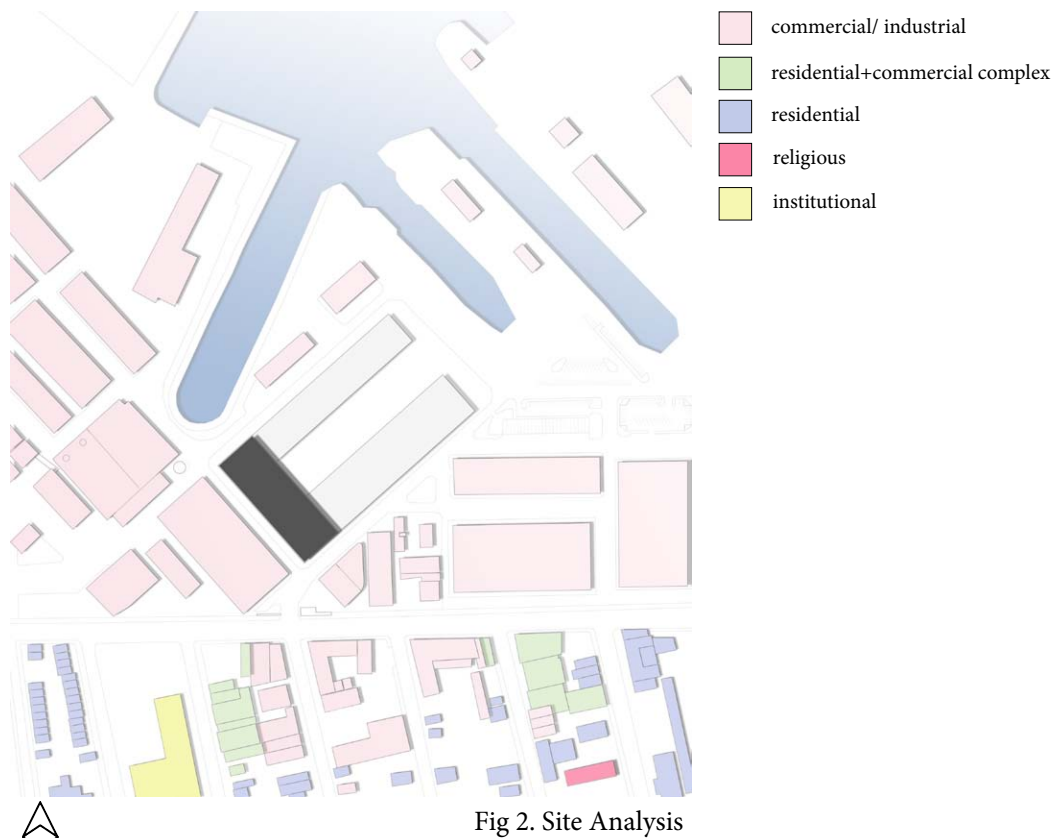


Fig 2. Site Analysis

The surrounding neighborhood is composed of various types of architecture, such as commercial, industrial, residential, multi-purpose (commercial and residential complex) to institutional buildings. The adjoining buildings are mostly warehouses, factories, manufacturing companies, and commercial buildings, situating the site in the scene of ‘environment for making’. What is being researched, produced, and made at the site is thus expected to contribute back to the community and across the whole nation.

1.3 Programs distribution

There are many different activities proposed on the site such as design, prototyping, manufacturing, experiment and making. The project is not only targeted toward graduate students who will be mainly occupying the building but also other user groups such as designers and engineers from departments of Advanced Robotics, Biotechnology, Architecture, and Industrial design, who will be collaborating with the students. Therefore, it is critical to create barrier-free environment for fast communication and network building within these different fields. Instead of dividing studio spaces into small individual units, the main scheme of the project seeks to build collaborative environment for students and designers to share ideas in open space. However, it is still important to create space that allows smooth flow of work cycle from labs (or studios) to fabricating facilities, as students test and experiment their research ideas. Hence, the programs are divided into three sectors of 'research', 'make', and 'exhibit', and each department is given a single unit that incorporates all three sectors. The fabricating shops that need to carry heavy machines are placed on the ground floor, while the research labs and design studios are arranged on the second floor. There are also exhibition areas proposed adjacent to the shops, and these are all located along the hallway on the ground floor, displaying the developed work to other students and the public circulating through the building. Such combination of exhibition-circulation is designed to naturally provoke discussions, criticisms, and many more mutual interactions among the students. The third floor is proposed as libraries and special studios, and the fourth floor is occupied with event spaces and lecture rooms.

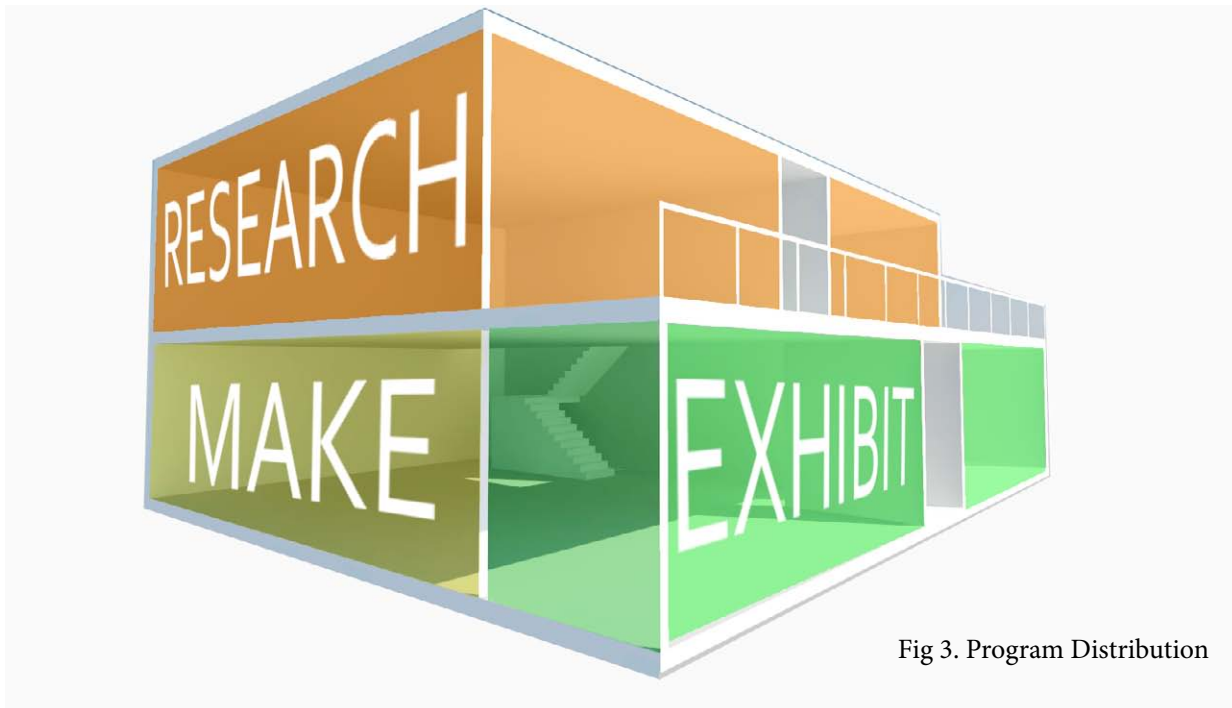
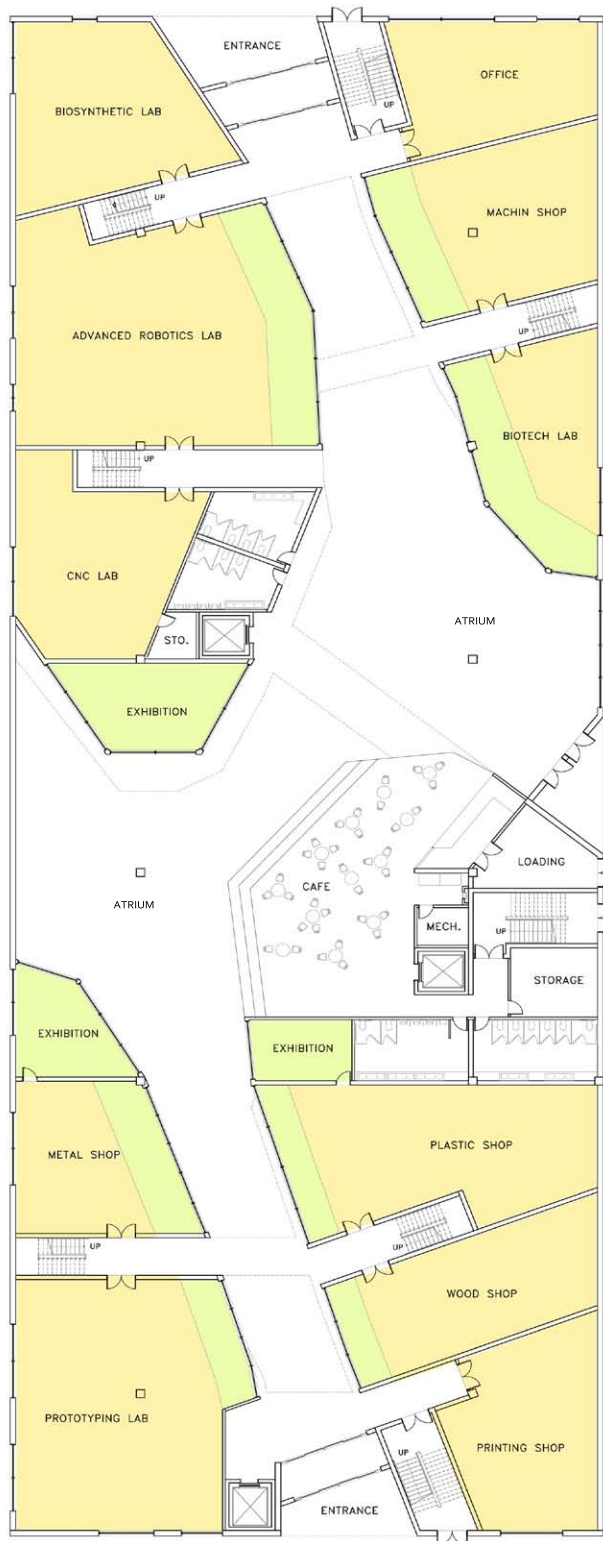


Fig 3. Program Distribution



1:500

Fig 4. Ground Floor Plan

1.4 Design challenges

The major challenge of the project was to transform the existing structure and incorporating new programs, while maintaining the overall form. Any changes or new forms had to be created within the given perimeter. The concept therefore restores some of the existing structural members, yet, inserting completely new concept into the form.

The very first factor to consider in the design was to somehow maintain the view of the expansive volume of the structure. Since the place carries the long history as a vessel manufacturer, it was critical to leave the trace of its cultural heritage and to interpret such message through architectural form. Hence, the whole circulation area on from the South-East entrance to the North-West entrance was designed as the full 20m-high open, vertical space. This contacted long and narrow hallway space becomes expanded, as one enters the atrium space where the view to the neighborhood and the courtyard is allowed. The atrium space receives the most sunlight and is also the most public space where cafes and large exhibition rooms are located.

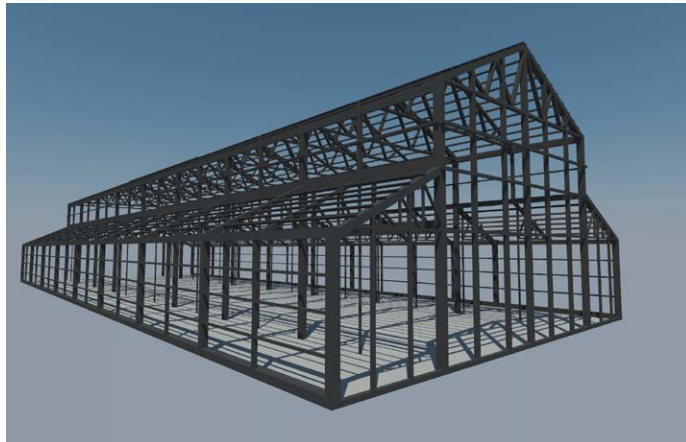


Fig 5. Existing Structure

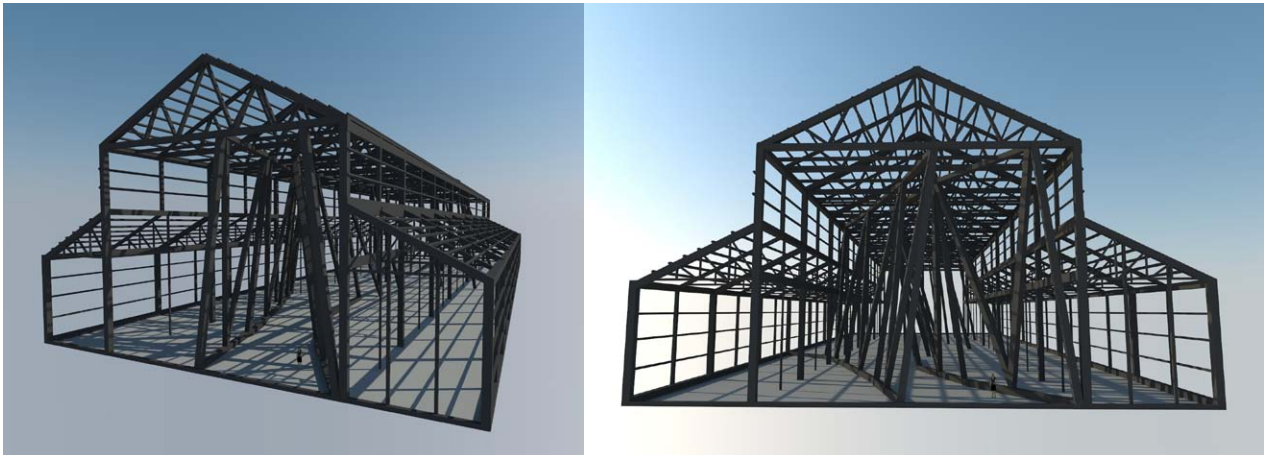


Fig 6. Restored Structure (new structural members added)

The concept suggests a gesture of ‘carving’ through the mass on the vertical and horizontal axis of the building. This divides the overall volume into four separate parts and creates hallways in between them for circulation. The concept is implemented to compartmentalize such expansive volume into more accessible and specified space. As a result, a number of bridges are placed on the upper floors to connect from each volume to the other, creating a landscape of network of bridges. Anywhere that is ‘carved’ allows natural light from the outside, and this idea is applied on the elevations of the building as well. The façade is carved out in long, vertical strips to allow light to enter the interior.

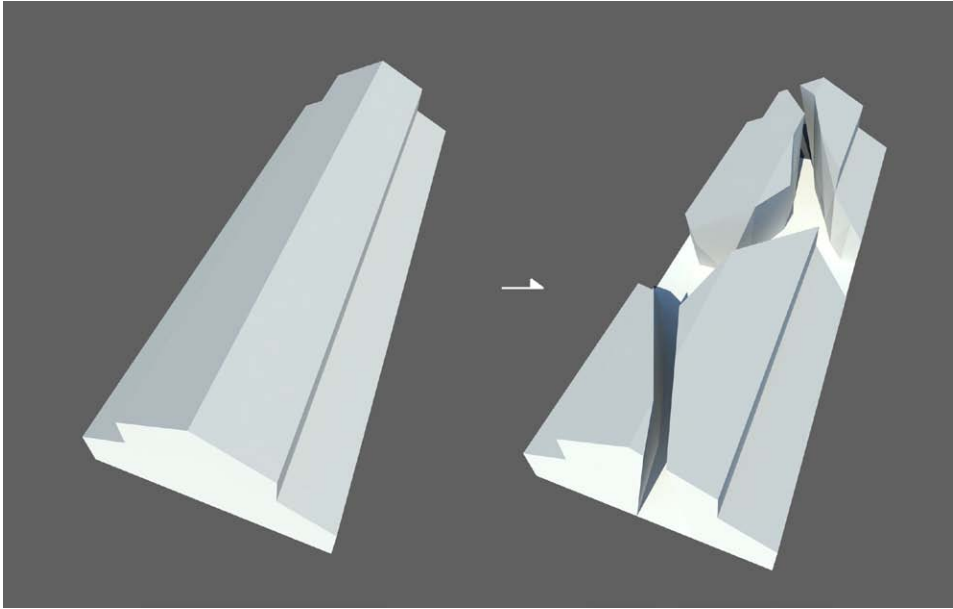


Fig 7. Concept

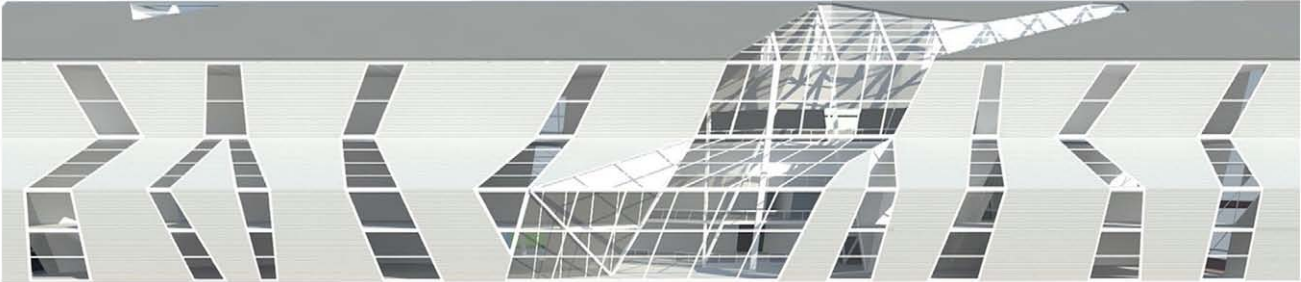


Fig 8. South Elevation

2.1 Definition of Typology

*“Type is thus a constant and manifests itself with a character of necessity... it reacts dialectically with technique, function, and style, as well as with both the collective character and the individual moment of the architectural artifact.”*³

- Aldo Rossi

Typology in dictionary definition, is “a classification according to general type”⁴. The word is composed of the Greek word *typos* and *logia*, the former meaning “a blow, dent, impression, mark, effect of a blow”⁵. In architecture, the word has been referred to a particular set of characteristics of a building, and it helps identifying and categorizing buildings into different groups of forms. For example, we easily identify a house by its architectural form - a peak on the roof and a rectangular boxy shape - have been commonly known as the general type of house design. Typology is certainly not a rule that must be followed in architectural design, since not all houses are designed in such way. However, the types have been created and used widely for certain reasons. This typology of house has been used presumably since the Ancient time because the post and lintel structure was proposed as the first principle of building houses for structural purposes; the peak of the roof supports the rest of the structure from exterior weight factors such as rain and snow, distributing the load equally onto the columns that are supporting the whole house. For another instance, apartment housings are generally designed as a row of residential units around the central core, since this kind of planning is one of the optimal ways of organizing the space: all units to having access to the outside view and the sunlight while the less frequently used hallways and the vertical circulation is located in the inside. A typology therefore identifies the function of the space and its most suitable structural composition.

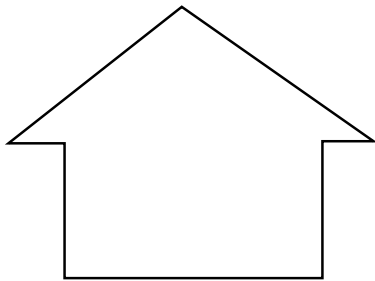


Fig 9. Typical house typology



Fig 10. Laugier's primitive hut

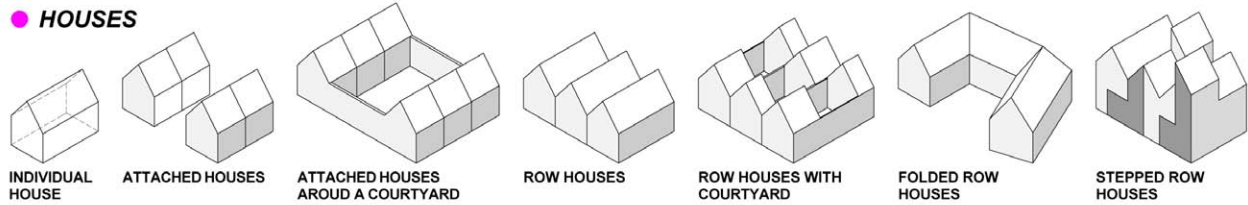


Fig 11. House typologies

There are many ways that these types can vary. Like in the Fig.11, a house or a group of houses can be designed in different forms, insofar as the type works properly within the urban context, the lifestyle of the users, or even the specific climates or weather conditions of the site. Beyond these few examples there could be many other types, such as detached houses, low rise apartments, and townhouses, however not all types are used considered as a typical form.

“The word ‘type’ represents not so much the image of a thing to be copied or perfectly imitated as the idea of an element that must itself serve as a rule for the model... The model, understood in terms of the practical execution of art, is an object that must be repeated such as it is; type, on the contrary, is an object according to which one can conceive works that do not resemble on another at all. Everything is precise and given in the model; everything is more or less vague in the type.”⁶

- Quatremère de Quincy

The above quote by Quatremère de Quincy clearly distinguishes a *typology* from the concept of a *model*. It points out that a type cannot be copied from one building to another since it is not a specified set of physical properties with fixed dimensions and shapes. Instead, it is just a generalized category to be applied and modified with adjustments and to suit authentic site conditions of architecture and other design factors.

2.2 Typologies of the project in various aspects

Form

The typology of the project will be analyzed from three aspects: spatial organization, scale, and user-type. Following the analysis of these three kinds of typologies, the proposed building will then be compared with precedent projects of the similar typologies that have influenced the design process.

The given form of the building is a modified version of a simple linear block type. It is a long and narrow block with the main arcade with a peaked roof and two lower wings on its longitudinal flanks. Adopting the linear axis of the building, the main circulation follows the north-west axis of the site, while allowing access to fabricating shops and other amenities on both sides of the hallway.

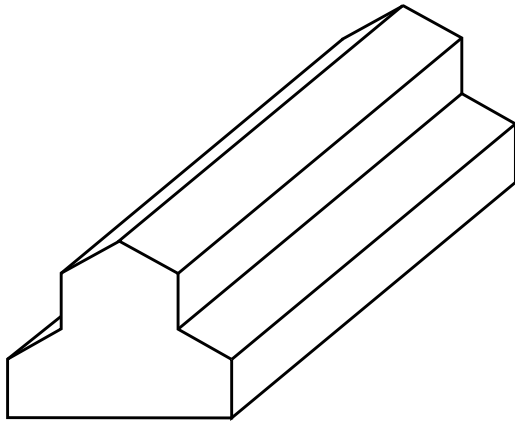


Fig 12. Typology of ONE LAB



Fig 13. Circulation of ONE LAB

Scale

The overall dimensions of the building 128 is 106m in length, 39m in width, and 22.8m in height. The building covers the footprint of 84,000 square feet. There are four floors in total; the first two floors take the full width of the site while the third and fourth floors are in mezzanine structure. This type of scale usually belongs to industrial, commercial, or institutional building categories.

Program/ Use type

Once an industrial building, it is now designed as an institution for a post-secondary education facility. The main users are graduate students of ONE LAB, educators, and other designers and engineers who will be collaborating with the students. Although the primary programs of the project are the research labs and fabricating facilities, the design also focuses on exhibition program considered as museum space; thus the overall design is a hybrid of two different kinds of use-type typologies: educational institution and cultural center.

Considering all these factors, the project building can be defined as a mid-rise institutional building in a linear block type.

2.3 Typologies in precedent projects

There were three architectural projects considered as precedents due to their similarities in various aspects of typologies. Through looking at the examples of forms, scales, and use-types of these buildings, it was possible to clarify the typology of ONE LAB during the design process.

Kiasma Museum of Contemporary Art

Helsinki, Finland

Footprint: 130,000 sq. ft. ⁷

Form Typology: conjoined linear blocks

Use-type: cultural building – museum



Fig 14. Kiasma Museum

Kiasma museum was selected as a precedent project, since its form typology was quite similar to building 128. It is a conjoined form of two long, narrow blocks. The main feature of the museum is the two-storey high hallway (or atrium) space which is at the centre of the plan. It divides programs into two sections on

its sides, thus becoming the main access point to all individualized exhibition rooms and amenities. This circulation zone is what connects the two linear blocks where the exhibition spaces are arranged; thus, the hallway is treated in transparency with the natural lighting entering the space from the expansive skylights on the roof.

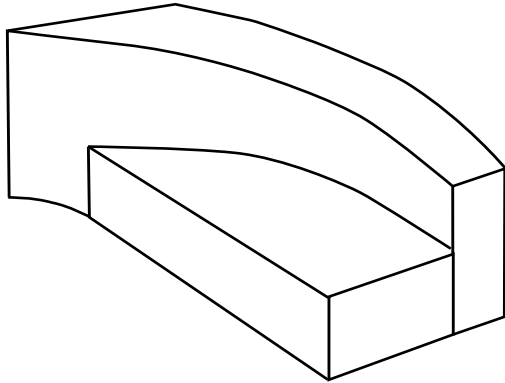


Fig 15. Kiasma Museum - Typology



Fig 16. Kiasma Museum - Floor Plans



Fig 17. Kiasma Museum - Atrium

Dia beacon

New York, U.S.A.

Footprint: 240,000 sq. ft. ⁸

Form Typology: A block type [image]

Use-type: cultural building - museum



Fig 18. Dia: Beacon

A former box printing factory⁹, this building was renovated into an exhibition space. Similar to ONE LAB, the building was transformed from an industrial-purpose architecture to a new cultural building. The existing structure such as saw-tooth skylights and monitors¹⁰ were kept and restored, and the originally contiguous buildings were merged and re-rendered as a big, open space to contain the art collections. The design intervention was interesting enough to be an inspiration, since the newly inserted program blends into the old pre-existing structure. As a result, the new architecture carries more cultural values beyond its simple function, as its historical narrative resonates through the old material of the building.

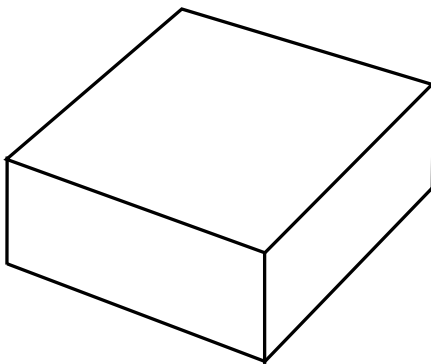


Fig 19. Dia: Beacon - Typology



Fig 20. Dia: Beacon - Interior

Jewish Museum

Berlin, Germany

Footprint: 167,000 sq. ft. ¹¹

Form Typology: A linear block in zigzag format

Use-type: cultural building – museum



Fig 21. Jewish Museum

This building was referenced for its unique façade typology. The thin slits of windows and the diagonally-running zinc-plated façade¹² inspired the elevations of the ONE LAB design. In Libeskind's design, these slits are often interpreted as wounds reminiscent of the Holocaust; however for ONE LAB, the windows are no more in slits, rather, widened and enlarged to bring in the view of the surroundings and the natural lighting, as well as to exhibit what is being produced inside the institution to the outside. Also, the zinc material was borrowed for its high reflectivity of the material surface which will make the façade to have more distinct feature in the midst of dull and grey industrial site. Hence, the cultural interpretation of the façade carries completely different meaning to that of Jewish Museum.

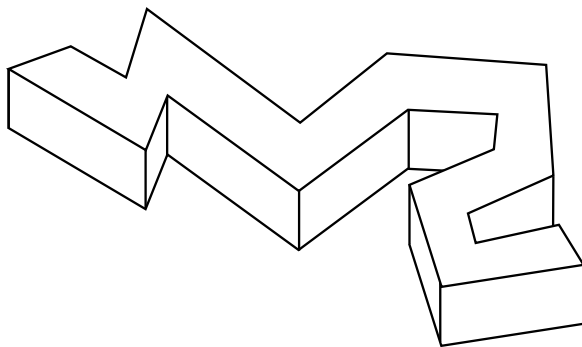


Fig 22. Jewish Museum - Typology



Fig 23. Jewish Museum - Façade

2.4 Importance of Typology

The typologies of the form, use-type, and the façade in other projects were applied, but it had created a completely new architectural design. Each typology could not be implemented to its full extent, since they had to be modified according to ONE LAB's site condition, cultural context, functions, and other design objectives. This again proves Quincy's quote and Aldo Rossi's argument that a typology is not a fixed model but a generalized constant that is to be recontextualized in each distinctive characteristics of architecture. Therefore, a typology does not always have to be applied in design, as long as the architecture serves its purpose while providing adequate living conditions for its users. Even if a house does not follow a typical house form of a peaked roof and a rectangular shape, it still can be a house that fully functions as a residential building.

However, all these typologies need to be constantly studied because they significantly affect the way architects design. Typologies often speak for itself. For example, a slanted or peaked roof indicates that the site is located somewhere in the area where it snows or rains because the slope of the roof is critical to push down the exterior load from the top of the building in order to stabilize the whole structure of the house. A closed block type of building indicates that it is intended for the users to interact and build communal environment in the semi-public space that is created within the block. A stepped block type alludes to the building code concerning the spatial and lighting in relation to the surrounding buildings. Therefore, a typology is not something to be randomly adopted and applied. Architects need to consider the climate, history, culture and other site conditions of the building prior to selecting a typology of the new building's form, materials and plan configurations. Typologies can also be used outside the field of architecture and urban planning. For example, in the real-estate field, categorizing buildings according to their user-types and scales makes it more efficient to manage the vast amount of information in their business database. This indicates that architectural typologies have significant social and political values as well.

3.1 Reading Typology

Movement. Circulation

Typologies affect the way we experience architectural space. For example, a long and narrow block typology suggests a linear circulation throughout the building. On the other hand, a zigzag plan configuration proposes much slower circulation as one is interrupted by buffer zones created in between the programs. Libeskind's Jewish Museum in the typical form of a zigzag plan which offers longer time of circulation around the building. The length of the corridor is much longer than the limited width of the site; therefore, the spatial organization gives more effective way of circulating around the building, extending the time to walk around the exhibition collections. The plan adequately suits the purpose of the program.

In addition, our bodies can be a great tool to survey architectural typologies in terms of scale and orientation. In reference to the location and scale of our own bodies, we can approximately grasp the dimensions of the space and the directions of the programs arranged in the space. Even if the use type of the building is not known, it is still possible to distinguish a small residential building to a large industrial building. Our bodies are the walking measuring tool that is essential for reading and understanding the architectural space. Thus, we identify and experience a typology of an architectural building in a sequence of images that are interpreted based on our physical interactions with the space.

3.2 Design Process

For architects, individual experience of architectural spaces affect the way they design. From selecting a typology to laying out a plan, architects initiate the design process by recollecting certain images from their past experience that become inspiration or reference to the project. What they experienced affect their designs, whether the memories are consciously retrieved or not, they mysteriously become integrated into the creative process. There are two types of ingredients that make up design ideas: memories based on bodily interaction with space, and memories based on sensory experience of the space.

*“The body is our general medium for having a world.”*¹³

- Maurice Merleau-Ponty

As we move through architectural space, we estimate dimensions, scales and orientations of each moment through our bodies which operate as a reference point. Merleau-Ponty’s quote suggests that the body is a vehicle through which we perceive the world, thus an “embodied consciousness”. Architectural experience is, therefore, partially or entirely a subjective matter, hence, the same place can also be remembered in different narratives from individual to individual. Architectural space is learned through our physical senses, and the absorbed visual, auditory, and tactile information of the space constructs a final image of the place. From walking through hallway to touching texture of wall, our individual perception and physical experience identify the form, materials, structure, and scale of the architecture. Memories of these experience are often easily recalled upon remembering; however, most of the time we tend to forget every detail of architectural experience; consequently, some memories become stored in the unconscious. Also, the familiar spaces such as the cityscape we experience everyday eventually become less significant to us, thus gradually embodied in our consciousness. These kinds of memories that have become a part of the unconscious cannot be retrieved at will; however, they still influence and contribute to the way we understand the world, further to our creative design process. In total, every image of our architectural experience subliminally merge and assemble with other thoughts, gradually constructing and designing a new kind of form.

3.3 Applying Typology

In the case of designing ONE LAB, my personal experiences of many different places influenced the decision-making. It is difficult to sort and classify which part of the design was referenced from which building typology. It is only clear that I considered Dia Beacon and Jewish Museum as two major precedent project because I have, in the past, visited these two places in person and thought that some of their similarities to ONE LAB project could enhance the design process. Consequently, these two projects became a practical, yet, inspirational examples. It was interesting to note that in Dia Beacon, the pre-existing structure was merged with the new program; and in Jewish Museum, the distinct façade typology seemed ideal for the ‘carving-through-the-mass’ concept of ONE LAB project. Otherwise, the rest of the decision making process seem to be influenced by some other images of architectural space I have experienced in the past memories which are now stored in the unconscious.

Conclusion

It is interesting to see how a design process works, since for the most of the part we are not consciously aware of where ideas come from or exactly based on which information we make decisions. Thus, choosing an ideal typology for a building and modifying according to factual site conditions and other design factors all depend on our own personal experience and preferences. Because what we experience becomes stored in our body and consciousness – as if becoming part of ourselves –we, as architects, need to expose ourselves to many different kinds of architectural space. By travelling to many places and having architectural experience in diverse cultures, climate conditions, and geographical sites, we can eventually offer ourselves much broader spectrum of design ideas - a giant database filled with many examples, knowledge, and inspiration.

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