OBLIQUE DESIGN:
ARCHITECTURE, LANDFORM AND CYCLING

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Oblique design: Architecture, landform and cycling

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Erika Franco Gonzalez

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I would like to dedicate this thesis to my beloved Grandparents

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Abstract

The integration of cycling infrastructure into oblique forms in architecture has the potential to create a more sustainable and healthier environment by encouraging active transportation, reducing carbon emissions, and creating more friendly conditions for kids, the elderly, and people facing movement difficulties in general. However, little research has been conducted in this regard. Integrating oblique surfaces in architecture continues to be a code-related issue that buildings rarely consider in their design process, resulting in significant segregation. *Oblique Design: Architecture, landform and cycling* focuses on a design approach that prioritizes diagonal or non-perpendicular elements and can be utilized to create architecture that responds to the topography and the current need to prioritize cycling as a sustainable mobility solution. Additionally, the research examines how oblique design can contribute to creating sustainable and socially inclusive cycling infrastructure. To build an original contribution in this area of knowledge, the research analyses examples of oblique design, not the small scale of stops design and surface composition, nor the territorial scale, but the intermediate scale where the bicycle meets the architecture. To address these objectives, the research reviews a series of key precedents such as Juan Caramuel, Claude Parent, and others for later focus on constructing the Atlas of Oblique Architecture with one hundred categorized examples. The Atlas on Oblique Architecture is a comprehensive collection of information, diagrams, and case studies related to the principles and applications of Oblique Architecture. This Atlas relates and compares the architectural distribution of the selected buildings with several kinds of territorial paths. At the same time, it explores the potential of oblique angles and tilted surfaces in creating innovative and sustainable buildings and distribution systems that respond to the natural environment and enhance the human experience. Through this atlas, architects, designers, and students can better understand

the potential of Oblique Architecture in pushing the boundaries of traditional design. By presenting a range of distribution systems based on oblique design, the thesis offers insights into the potential of this design approach to shape more responsive, dynamic, and engaging urban environments for cycling. At the same time, by investigating the principles and applications of Oblique Architecture, this research contributes to developing new design strategies and techniques that can be applied in various contexts. Ultimately, this study contributes to the discourse on sustainable architecture by demonstrating the role of oblique design in shaping the relationship between architecture, landforms, and cycling.

Keywords

Sustainable mobility, Bicycle, Infrastructure, City, Theory, Oblique Architecture, Plane inclined, Cyclist Architecture, Redrawing

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Introduction

The Solomon R. Guggenheim Museum in New York is characterized by a spiral ramp that turns around the main space. This continuous space becomes the centre and distributes to all the other exhibition areas. Metaphorically, it could be defined as a crater, an empty room with ramps all around that lead to different caves and terraces. In other words, this iconic building by Frank Lloyd Wright is one of the better-known examples of Oblique Architecture.

0.1. Problem

Oblique Architecture is often inspired by the natural contours and features of the landscape, and its principles are closely linked to geography and topography. Buildings designed with oblique angles and tilted surfaces often harmonize with the surrounding terrain, creating a sense of continuity and integration with the natural environment. These strategies can create unique spatial experiences and enhance a context-related sense of place. In other words, by understanding the principles and applications of Oblique Architecture, architects can use this design approach to create structures that harmonize with the landscape. Additionally, Oblique Architecture can also be used to adapt to challenging topographical conditions, such as steep slopes, irregular shapes, or complex terrains. By embracing these conditions, Oblique Architecture can create innovative solutions that are both functional and aesthetically pleasing.

Following this line, Oblique Architecture has a strong relation with the concept of geographic architecture, understanding geographic architecture as "quelle architetture pubbliche che, mettendo in scena i fatti geografici, hanno come obiettivo quello di permettere ad una comunità di riconoscere la forma della Terra come una delle molteplici identità che fondano l'insediamento"[1] (Palma, 2016, pp. 178, 179). These architectures incorporate and represent the geographical imagery (Palma, 2016, p. 182) and represent a form of territorialization in which the spaces are redesign to considering that geographical imagery (Motta & Pizzigoni, 2006, p. 17,19).

Similarly to Oblique Architecture, geographic architecture relates the significant objects of the natural world to the things manufactured by man (Pizzigoni, 2011, p. 232). In this sense, Oblique Architecture challenges traditional notions of geometry in building design with slanted walls, sloping floors, and tilted and continuous surfaces resulting in unconventional spaces. It creates a sense of movement and dynamism that can engage and inspire the occupants of a space. Oblique Architecture can also have functional benefits, such as optimizing natural light and ventilation, reducing energy consumption, improving acoustics, and promoting accessibility. Therefore, it plays an essential role in the evolution of architecture, pushing the boundaries of what is possible and creating new possibilities for innovative design.

0.2. Hypothesis

Oblique Architecture is essential because of its ability to break free from traditional architecture's rigid and predictable patterns and because the subject has not been sufficiently studied. It still could be considered an emerging field of study that has the potential to change the way we think about some features of building design. As architects seek to create innovative structures, Oblique Architecture presents new opportunities for creativity and experimentation. By investigating the principles and applications of Oblique Architecture, researchers can contribute to developing new design strategies and techniques that can be applied in various contexts. This research can also provide insights into the benefits and challenges of Oblique Architecture, such as its suitability for different building types and its potential for creating unique spatial experiences.

Connecting all these points, Oblique Architecture represents the potential of continuous surfaces and fluid distribution systems. As mentioned, these could improve accessibility but also open the door to facing an under-researched topic: the relationship between architecture and bicycles.

The bicycle has built a significant part of our history. Currently, it can play an essential role in the future as a low-impact, economic, healthy, and inclusive transport solution. Low impact because confronted with Climate Change, the bicycle is a simple solution to reduce dangerous emissions significantly. Economical because it can be easily acquired from people of any social class, especially compared with other means like motorcycles or cars. Healthy thanks to the exercise involved in the cycling mechanism, contrasted with the sedentary culture growing nowadays. Finally, inclusive because the same surfaces that allow bicycles to transit improve the accessibility for many people with different movement difficulties, like children, the elderly, and persons in wheelchairs considerably.

Considering this and other values, it seems like the bicycle is being rediscovered. Initiatives like the intense growth of the bike-sharing scheme worldwide, the program *EuroVelo* in Europe, and the Italian Law *Disposizioni per lo sviluppo della mobilità in bicicletta e la realizzazione della rete nazionale di percorribilità ciclistica* (Legge 2, 2018) are just a sample of the formal intentions to promote this medium. In this sense, Oblique Architecture represents an opportunity to explore spaces for cycling and the modelling of the urban area on the cycling movement. As the Modern Movement designed the cities and buildings for cars, could we define the city and buildings for bicycles?

The bicycle plays a vital role in moving through the city and the routes that cross the territories, but what happens between the bike and the buildings? In other words, how is architecture considered the bicycle? Due to its operating logic, the bike requires continuous surfaces that become oblique to connect different levels. Although it may seem simple, this fact becomes an enormous difficulty for vertical construction due to the space and structural effort required by this type of surface. Perhaps this is one of the main reasons for the current poor relationship between the bicycle and the buildings, as well as the need to consider Oblique Architecture. Starting from this concern, it is essential to ask if it is possible to project and build incorporating the bicycle while positively relating to the urban environment. Can the bicycle become an element of architectural definition?

These current issues faced an ancient theme of architecture: the oblique plane as an architectonic representation of landform. Accordingly, the research aims to dig into cycling architecture to study how the necessary transition towards a new model of mobility based on the bicycle could consciously solve these issues through a renewed application in the architecture of ancestral terrestrial forms. As a starting point, this exploration will consider a harmonious relationship between architecture and bicycles and the need for Oblique Architecture to allow this relationship to be natural and fluid. In this sense, to develop this relationship between architecture, bicycles, and urban space, the study of the forms of the Earth has been essential through analogy to understand how that fluidity that naturally exists in the territory could be abstracted. Moreover, put into practice in situations and contexts that seemed different but not distant, architecture can assume this terrestrial model in distributive terms and allow movement without obstacles through inclined planes.

In short, the research plans to look through history–both antique and contemporary–to build an Oblique Architecture genealogy that would help to explore and propose the theory and projects of an improved relationship between cycling, architecture, and landform. To do it, the thesis goes from a theoretical level to a manual station, where an attempt has been made to build a manual *per exempla* of Oblique Architectures where its analysis and way of being organized become a model for constructing proposals or an operational method. In other words, this manual is expected to contribute to the architecture project since, in functional terms, it can be a tool for solving distributive problems.

0.3. Methodology

To build an original contribution in this area of knowledge, the initial proposal is to analyse bicycle-related current projects from an academic perspective considering not the small scale of stops design and surface composition, nor the territorial scale, but the intermediate scale where the bicycle meets the architecture. To address these objectives, the initially proposed work areas are the relationship between cycling, architecture, and urban settlements, the theory of the inclined plane, and an atlas of Oblique Architecture.

First is the study of contemporary scientific research and general initiatives considering the relationship between cycling, architecture, and urban settlements. This review aims to individualize the distributive, typological, and functional characteristics of bicycle architectures inside the architectural field. Although studying the relationship between settlements and bicycles, it is intended to confront opposing visions. Three studies show how the transition to the cycle space can be addressed through different approaches and in different contexts. Steven Fleming with *Velotopia* (Fleming, 2017), in the wake of the modern avant-gardes of the 1900s, imagines a new settlement form still without a specific place; Elena Cogato Lanza with *Post-Car World* (Cogato Lanza et al., 2021) and Gallego Pachón with *Madrid Cycle-Space* (Gallego Pachón, 2015) instead apply their design research to real contexts: the first builds a scenario for a vast peri-urban territory; the second designs a cycling layer over the city of Madrid.

Second, through the theory of the inclined plane, the research focuses on the study of two authors. The first is Juan Caramuel with his text *Arquitectura civil, recta y oblicua* (Caramuel Lobkowitz, 1678), where the author founds this concept through recognizing the Earth as architecture and consequently Oblique Architecture. The second is Claude Parent and Paul Virilio through the formulation of the *Fonction Oblique* (Parent & Virilio, 1996), where it is proposed that the only structure capable of conquering the habitable space in its three dimensions is the oblique line. They also silver this option to dissolve the borders between circulating and inhabiting. Therefore, in this way, architecture becomes part of the surface that allows circulation and therefore of the terrestrial soil.

Third, the Atlas (considering an atlas as an ever-incomplete document) of the Oblique Architecture (referring to the need for cycling for inclined surfaces). A recovery, analysis, categorization, and redesign of the distribution characteristics of 100 historic and contemporary buildings to abstract them from other particularities and make them comparable. The research will not consider historic buildings to study their specific relations with cycling but to point out when they act with similar logic, like when they allow animal locomotion. One of the objectives of the Atlas is that through the different forms of representation and its analysis, it is possible to summarize these distributive characteristics in a scheme that can be used in architectural projects in new or existing buildings.

In short, the research addresses the issue of Oblique Architecture and its relationship with the bicycle in three different ways. First, the analysis of the current situation. Second, the study of archaeology in the theory of architecture of the study of the inclined plane through Claude Parent and Juan Caramuel. Third, how practically through drawing and the Atlas as an organizational methodology can create an operational method for the architectural project. At the same time, the research methodology is based on four key concepts: ahistoricism, comparative method, redrawing, and representation.

Ahistoricism is a concept that has been used in various academic disciplines, including philosophy, literary studies, and cultural studies, to describe ahistorical attitude where, even understanding the importance of the historical, cultural, and social context, the focus is centered on the phenomenon of the researched object. This phenomenon could be the architecture form, the project, and its material and experimental conditions (for instance, the position argued by Giorgio G. (Grassi, 1988 in *Architettura lingua morta*).

The comparative method is a widely used research method across many academic disciplines, including anthropology, linguistics, biology, psychology, and political science. The method involves comparing two or more groups, phenomena, or variables to identify similarities and differences and draw conclusions about their underlying mechanisms, causes, or effects. Its case-based nature "demands that each case be treated as a complex entity [...] represented as configurations of conditions" (Ragin, 2014). The comparative method could be a valuable tool in architectural research for identifying patterns, principles, and meanings in the built environment and promoting a more nuanced and critical understanding of architectural history, theory, and practice. This research uses this systematic process to make the data needed to confront the proposed problem. Further, with descriptive and explicative goals, this analytic strategy is oriented to test the initial hypothesis.

Redrawing is strongly associated with the two previous points. Redrawing the study cases will extract their relevant characteristics, establish connections, and define conclusions, rules, thoughts, and questions that the figures implement. This process of highlighting and comparison should open perspectives that may not have been considered before. Drawing is used to analyse and understand the selected buildings, a way to document and study the physical characteristics and spatial relationships visually. However, as used in this research, the drawings represent the distributive scheme. Considering the Atlas's importance in this multidimensional research, the redrawing process represented a significant component of the whole process.

Representation refers to the different critical components of the visual language focused on other parts of the research. Caramuel points out the importance of the diagram in architecture.

Parent and Virilio emphasize more in the section to explain the inclined plane configuration. Whereas the Atlas focuses on axonometry to represent distributive systems, it also considers other types of representation within each file. These different means of expression are strongly related to architectural research and become critical components of the analysis process and the fuel that feeds the transversal discussion.

Directly linked to representation, this research has used the sources in their original language and in their edition princeps. Thus, they have been read in the language in which the sources were written in Spanish, English, French, Portuguese and Italian. Consequently, all translations into Spanish of texts in these languages are from the author.

Finally, the thesis is composed of three chapters and two annexes. Chapter I, *The Cycle Transition*, explains the need to change to a more sustainable mobility format where the bicycle can play a crucial role. From there, it focuses on the infrastructure, urban spaces, and buildings that actively consider the bike. Chapter II, *Inclined Plane, Two Theoretical Precedents in Architecture*, analyses the word of Caramuel, and Parent and Virilio and the most important contributors to constructing a theory to support Oblique Architecture. Chapter III, *Atlas of the Oblique Architecture, Distribution Systems*, contains one hundred projects classified and visually analysed to build new and consistent support for the development of Oblique Architecture projects. Annex I, *Experiments with the Atlas of Oblique Architecture*, recovers the processes and results of an architectural design studio course developed from the previous Atlas, representing the first example of its possible applications. To conclude, the research finished with a series of final thoughts and recommendations that resulted from this research.

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THE CYCLING TRANSITION

1.1. The context

We design and build the buildings around parking the cars inside and the bikes outside. We still think of the bike as a toy or the artefact of hippies and weird people, but "the stakes have been elevated, and we need whatever system delivers on four major fronts: public health, emissions reductions, social inclusion, and the true speed of connection" (Goodyear, 2015). The bicycle is one of humanity's most important inventions and has become a crucial part of our present and future (Figure 1.01).

> La bicicletta è solo un insieme di elementi combinati in modo eccellente dall'ingegno umano, un sistema esile e leggero di tubi e ingranaggi elementari governati da un moto ciclico, quello della ruota [...] L'equilibrio poi chiama a rapporto la capacità intrinseca all'individuo di coordinare le variazioni di posizione del proprio corpo tramite i recettori muscolari [...] Nell'abitacolo della macchina si è come chiusi in un microcosmo di suoni, odori e percezioni artificiali, viene interposta una barriera materica tra il soggetto che si sposta e tutti gli altri soggetti-oggetti circostanti. In bicicletta invece il contatto è diretto, che sia esso verbale, visivo, uditivo o sensoriale in genere, il ciclocorpo, figura che nasce e vive per il tempo in cui permane il movimento e l'accostamento tra il corpo e il mezzo, vanta un'esperienza del luogo e dello spazio del tutto nuova[2] (Caffaro, 2015, pp. 15–18).

The concept of bicycles and cycling had expanded in the last ten years before it was just a means of transport or a sports item. However, the bicycle has become an object loaded with different meanings for each society (Fattori Durán, 2009, p. 16). However, the bike is still the same. Unlike cars and so many other devices that become obsolete and outdo themselves each generation (Navarro et al., 2010, p. 206), the bicycle maintains its design, the advantages it has, and the possibilities it offers practically unchanged (Figure 1.02).

Figure 1.01. Movie poster source: Benigni, R. (1997). *La vita è bella.*

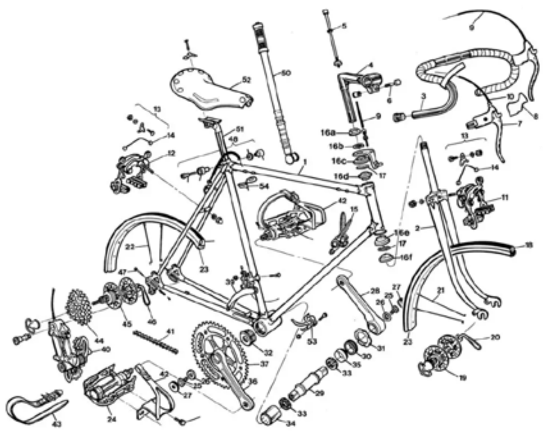

Figure 1.02. Raleigh Dealer Manual USA Catalog. (1977). *Bicycle exploded drawings and parts lists.* Source: https://www.sheldonbrown.com/retroraleighs/catalogs/1977-drawings/index.html#26

Figure 1.03. The bicycle in some cases has become a means of transportation but also a work tool. Source: https://www.pexels.com/photo/photo-of-man-riding-bicycle-3119989/

Figure 1.04. There are still several cities where all everyday transportation is by motor vehicle. Source: https://www.pexels.com/photo/cars-on-road-in-city-during-night-time-3849167/

Figure 1.05. Large constructions that aimed for quickness in transit were always the foundation of the contemporary metropolis. Source: https://www.pexels.com/photo/aerial-photo-of-buildings-and-roads-681335/

1.1.1. Political need for a cycling-driven transformation

> It's the first rule of marketing: don't start with the product, start with the customer's need. The customer seeking a drill bit, we are reminded, is really just seeking a hole. We could likewise say the person who we think wants a driverless car, doesn't want that, or even a helicopter or teleporter for that matter. They want to be somewhere else (Fleming, 2021, p. 221).

Many industries have made money by manipulating people's needs (Figure 1.03). This fact is also visible in the means of transport that have shaped many cities. It was not the planners but different industries that dictated how cities grew. For example, in 1900, London grew around the railway development, while after the Second World War, oil and car producers guided the growth of cities like Dallas and Detroit (Fleming, 2021, p. 226). Based on the car, this latest model created an excellent dispersion, and everything is so far apart that it is almost impossible to reach the destination by other means (Fleming, 2017a, p. 94). "Industry dominates traffic as soon as daily life comes to depend motorized trips" (Illich, 1974, p. 45) (Figure 1.04).

The modern city that was designed and built around the car was meant to improve accessibility, creating the infrastructure to get further and faster, but in the process made us slaves to the machine: "it gives people access to jobs, school, and markets, but only with wheels" (Goodyear, 2015). Other forms of displacement hindered the development of a city that caters above all to the car (Figure 1.05).

> In every Western country, passenger mileage on all types of conveyance increased by a factor of a hundred within fifty years of building the first railroad. When the ratio of their respective power outputs passed beyond a certain value, mechanical transformers of mineral fuels excluded people from the use of their metabolic energy and forced them to become captive consumers of conveyance (Illich, 1974, pp. 11–12).

It is not about pointing our finger at the past, thinking that we understand the causes of what happened. At that time, the car was seen as the door to the future and the solution to the problems, mainly health, that existed in dense cities. The real problem was not considering this density's positive aspects or the issues that mobility based on the car could present. Indeed, part of the reason these issues were not discussed was precisely those industry interests discussed at the beginning. Historically, private and commercial interests have been much more efficient in achieving their goals than governments. Thus, other initiatives, such as the bicycle, were forgotten since they did not have a robust industry that defended their interests: "Bicycling doesn't have a small cartel of rail or oil magnates who stand to get rich from more cycling. The only ones standing to gain are ... everyone else! [...] All we have are representative bodies: the governments that we elect" (Fleming, 2021, p. 226) (Figure 1.06).

It was not obvious a century ago, but today we understand the problems of basing mobility on the car. Popan (2019, pp. 64–66) summarises them: "pollution, road traffic deaths and injuries, energy and material consumption, climate change, health impacts, community disruptions and social inequalities". Most of them are self-explanatory, but others may be less visible such as the fact that "using a car has become more expensive, less comfortable and less necessary through the implementation of taxes and tangible restrictions associated with using a car" (Hull & Craig, 2014, pp. 371–372). In addition, with the increase in speed, the price of the infrastructure to support these movements and the space that said movement devours in the landscape also grows in a directly proportional way (Illich, 1974, p. 29) (Figure 1.07). The landscape is configured based on the car instead of being modelled based on the needs of people in a constant search to increase speed, which brought about effects on the perception of space, time and pedestrian potential (Illich, 1974, p. 18). The streets were fragmented, forcing pedestrians to stop at each traffic light, and they also became open spaces because the car did not need a roof (Fleming, 2021, p. 223) (Figure 1.08).

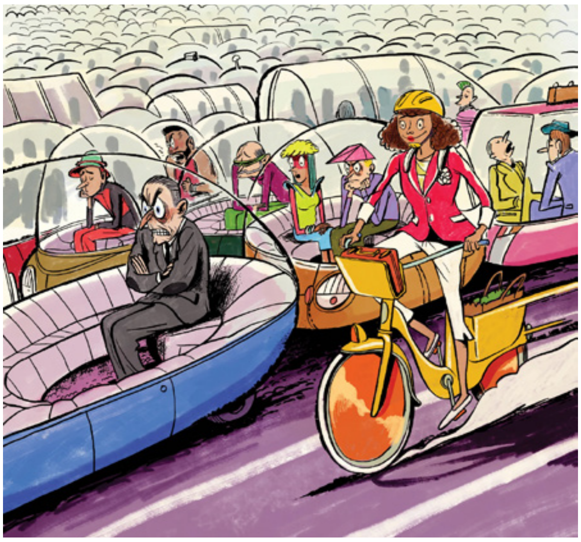

Figure 1.06. Nowadays, bicycle needs a reliable infrastructure to enable their effective growth and assist in addressing many of the issues our cities face. Source: https://www.wired.com/story/vehicle-future-bike/

Figure 1.07. The area taken up by the infrastructure required to support the usage of motorized vehicles is large, and the scenery is also significantly impacted. Source: https://www.pexels.com/photo/aerial-view-of-roads-9687802/

Figure 1.08. Commuting is fragmented for pedestrians. Source: https://pixabay.com/photos/traffic-road-pedestrian-autumn-7568718/

Figure 1.09. In some cases, using a motorized vehicle is essential. This particularity frequently widened the class divide for many households that couldn't afford a car. Source: https://pixabay.com/photos/london-stop-people-united-kingdom-3801534/

As soon as one begins to depend on the car, not just for multi-day trips but for daily commuting, the contradictions between social justice and motorized power, between effective movement and high speed, become acutely apparent (Illich, 1974, p. 15). The car that seemed like the machine of the future to set society in motion became the benefit of the few who could afford it and use it freely, considering the increase in fuel and other consumables. The inhabitants of scattered cities and typical suburbs depend on the car for any daily task that meets the most basic needs, for entertainment and even social interaction. This fact is not only suffered by families who cannot access a vehicle or use it freely but also by family members who cannot drive, such as minors and the elderly. In a family with only one car, the car is used to get to work, leaving the couple or other family members isolated in the suburbs. Many societal differences become more noticeable in the city model developed around the car (Figure 1.09). This is why the concept of sustainability goes beyond the need to respond by managing road traffic flows and their impact; it must also address, for example, the cost of mobility in terms of social exclusion, economic and social cohesion and demographic changes that will shape the structure of European cities in the future (TRT - Trasporti e Territorio, 2010, pp. 15–16).

This city model is one of many we know of, but it is the most widespread in the Western world, leaving many people disconnected. In the same way,

> Knowing that broad-based affluence and education are our best defence against a global population explosion, we are trying to bring 5 billion people out of poverty. Right now, though, that would mean introducing 5 billion more people to a car-centric model of urban development that would propel global warming. (Fleming, 2017a, p. 38)

This solution is unfeasible. We do not have a planet capable of supporting it. The rest sees cities like Rotterdam of the world as an example to follow, but "Rotterdam has as many trips by car as those other three modes put together. The planet can't cope with an extra 5 billion living like that!" (Fleming, 2017a, p. 39). It is necessary to seek solutions not based on fossil fuel consumption (Figure 1.10). Thus, the current approaches and solutions in terms of mobility for the future have as their primary objective to make it more environmentally sustainable, especially in reaching the ambitious CO2 reduction targets (Eurobarómetro, 2007). Solving these problems is even more critical if you want to maintain a good quality of life sustainably and for the mobility of people and goods to be competitive and fluid (Eurobarómetro, 2007).

The problems cars generate are far superior to their benefits (Queimaliños, 2015). It is there where the bicycle appears as a "new old thing" which has had several periods of popularity and is currently shown as a solid option to rethink displacement in cities (Vivanco, 2013, p. xx) (Figure 1.11). Cycling produces global benefits of 150 billion euros annually; more than 90 billion euros are positive external factors for the environment, public health and the mobility system (ECF European Cyclist' Federation, 2018). By comparison, a recent study by the European Commission estimates the negative externalities, i.e. the environmental, health and mobility costs, of motorized road transport at €800 billion per year (ECF European Cyclist' Federation, 2018). So, "the dual goal is to redefine the car as the source of certain societal and individual problems and to introduce the bicycle as a solution to those problems" (Vivanco, 2013, p. 124).

To face situations where the transport industry dominates social life, determining class privileges, accentuating the scarcity of time, and increasingly tying the population to an unsustainable system (Illich, 1974, p. 73), it is possible to take the bike back as "the wave of the future for car-choked, financially-strapped, obese, and sustainability-sensitive urban areas [...] a potential solution to a number of contemporary problems" (Vivanco, 2013). The bicycle improves the independence of people, allowing them to improve their health and move efficiently, avoiding traffic and the expenses associated with the car (Fleming, 2012, p. 65) (Figure 1.12).

Figure 1.10. The bicycle is a sustainable way to lessen fossil fuel usage in the face of climate change. Source: https://www.bikeradar.com/features/long-reads/cycling-environmental-impact/

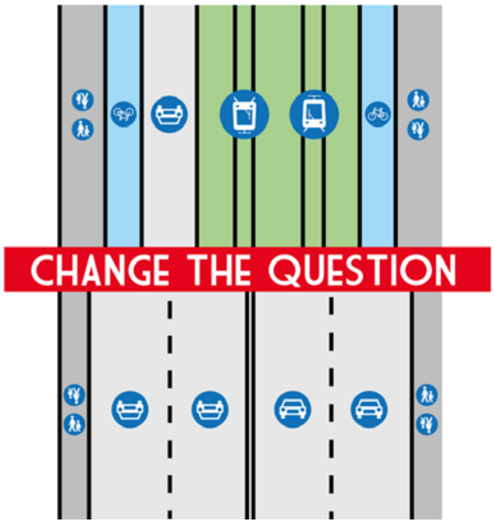

Figure 1.11. 21st century how many people can we move down the street? 20th century how many cars can we move down the street? Source: Colville-Andersen, M. (2018). *The definitive guide to global bicycle urbanism.*

Figure 1.12. One of the benefits of the bicycle in today's society, in addition to the speed and low cost of commuting, is how beneficial the constant use of the bicycle can be in terms of health. Source: https://www.flickr.com/photos/16nine/50270482352/

Figure 1.13. The idea is not to eliminate motorized vehicles since they are equally necessary for other types of travel, such as long distances. However, in dense cities full of traffic and mobility problems, prioritizing the use of bicycles can be a strategy that facilitates better development. Source: https://wanderlustcrew.com/how-to-use-velib-paris-bike-share/

Figure 1.14. Through the sustainable development objectives, the bicycle is considered a good initiative to facilitate the transformation in our cities facing the future. Source: https://www.copernicus-alliance.org/news-archive/411-basics-in-facilitating-transformation

Figure 1.15. Bicycle use significantly rose during the COVID-19 outbreak since many individuals chose to commute this way to escape crowds and blocked areas. Source: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736%2821%2901599-3/fulltext

If the point of comparison is speed, it would be necessary to consider it from a holistic point of view that considers the situation, not just compare the maximum speed that each one could reach. Bicycles shine in “dense urban areas where the distances are relatively short, and where persistent traffic congestion makes it a pain to get around by car” (Vivanco, 2013, p. 3). While motorized vehicles will continue to be necessary for long journeys, a mix of different means will be necessary (Andersen et al., 2012, p. 8). City centres and areas with increasing density are favourable territories for developing an agile and efficient environment (Figure 1.13).

> The time has come for governments to open their eyes to something no industrialist is likely to tell them: that fast machines are obstructions to a fast city. To think fast machines could make cities faster, is to misunderstand what cities are. Cities are sorting devices, built to sort, and resort, people into all manner of temporary groups (Fleming, 2021, p. 226).

Considering the congestion of urban centres, the bicycle could be considered necessary to keep people in “cities moving effectively and the economies running smoothly” (Popan, 2019, p. 95). A bet like this would bring significant controversy because it would contradict the so-called business as usual (Vivanco, 2013, p. xx). However, what would happen if the transport industry could more equitably distribute its product, a utopian system of fast and accessible transport, that is, the bicycle (Illich, 1974, p. 48). “It can be a way of redeeming the suburbs, combatting global warming and improving public health. It can also be an end in itself” (Fleming, 2017a, p. 13) (Figure 1.14).

“During lockdown, transport emissions dramatically decreased, due to limited circulation of vehicles, including motorized ones. Public transportation was most hit, with travellers avoiding using it for fear of contagion” (Federal Ministry. Republic of Austria, 2021, p. 51) (Figure 1.15). Nevertheless, the bicycle could be a sure way to face other pandemics still active today, such as hypertension and obesity. “Active transport is the most common form of physical activity” (Willems et al., 2016, p.

221), but it is not just about personal effort but about what each individual can achieve. A society that actively uses the bicycle would represent other values, such as interest in the environment and the health of the inhabitants. Bicycling is “a collective, expressive, and culturally patterned experience, in the sense that it is organized and constrained by social and political-economic processes, symbolic meanings, and actual skills, practices, and norms” (Vivanco, 2013, p. 95).

Summing up, bicycle transportation is fun, healthy, environmentally friendly, fast, and cheap, but the main advantages of bicycle transportation fall into the following categories: transportation efficiency, environmental protection, health and fitness of cyclists, economic and social effects; but it faces the following problems: lack of adequate road and parking infrastructure, poor safety for cyclists and exposure to weather conditions (TRT - Trasporti e Territorio, 2010, p. 19). Still, cycling is the fastest and most flexible mode of door-to-door travel in congested cities, plus bike racks do not use much space (TRT - Trasporti e Territorio, 2010, pp. 19–20) (Figure 1.16). More specifically, concerning the environment, the bicycle is the most efficient means of transport from an energy point of view; it does not generate any atmospheric emissions, and it makes practically no noise; that is, it would reduce ozone depletion, the greenhouse effect, photochemical smog, acid rain and noise pollution (TRT - Trasporti e Territorio, 2010, p. 20).

On the other hand, the bicycle contributes to inclusive mobility that responds to the demand for a friendlier city and a better quality of life (Alfonso Moreno, 2018, p. 2) (Figure 1.17). This would allow people who cannot afford a car, who temporarily do not have access to one, and who cannot use public transportation to get around, to move independently (TRT - Trasporti e Territorio, 2010, p. 21). Being an economical means of transport, the costs caused by the bicycle per kilometre covered are lower than those of any other means. They do not usually entail parking costs (TRT - Trasporti e Territorio, 2010, p. 21). “Active mobility helps meet everybody’s accessibility needs. It is essential in transforming unsustainable societies

Figure 1.16. A good infrastructure that generates confidence is necessary to promote bicycle use. VMX Architecten. (2001). *The Fietsflat*. Source: http://www.aviewfromthecyclepath.com/2009/02/parking-thousands-of-bicycles.html

Figure 1.17. The same surfaces capable of mobilizing bicycles also allow the movement of people with disabilities, older people, and children. It is a more inclusive type of mobility. Source: https://www.uitp.org/news/how-to-make-public-transport-accessible-and-inclusive-for-all/

Figure 1.18. To promote cycling, there must be an adequate environment with specific conditions and a good infrastructure that guarantees road safety, such as through surfaces suitable for good movement and safe parking lots. Source: https://www.justjared.com/photo-gallery/2950135/naomi-watts-family-bike-all-week-in-new-york-city-06/

Figure 1.19. The bicycle may be used for labor, carrying passengers, goods, or both. Its uses go beyond simple transportation. Source: https://www.pexels.com/photo/bicycle-for-street-vending-12179880/

and economies into liveable, prosperous and sustainable communities" (Willems et al., 2016, p. 222).

The bicycle is not defined through a single concept, "it is a heterogeneous, multidimensional, and contextual object" (Vivanco, 2013, p. 130). In this sense, for everyone, but particularly for women, children and the elderly, it is essential to ensure specific conditions that offer the proper environment to promote biking (Andersen et al., 2012, p. 50) (Figure 1.18). Precisely, turning the bicycle into the norm and not the exception will help to improve the safety of people, "a high volume of cyclists leads to a reduction in the collision risk of cyclists" (Luukkonen & Vaismaa, 2016, p. 90), because "The speed of cycling and the wearing of helmets and reflective clothing were not significant factors in relation to accident risk" (Degraeuwe, et al., 2016, p. 49). Other risks, such as exposure to pollution, could also be faced by increasing bicycles and decreasing motor vehicles because "the only thing to do to make cyclists less exposed to air pollution is to reduce air pollution" (Willems et al., 2016, p. 68).

Adding up all these factors, nowadays, the need to bet on the bicycle is evident, especially concerning the car and the pedestrian. Investing practically the same effort, a person on a bicycle would have an area 25 times larger within his reach than he has if he only walks (Bruntlett & Bruntlett, 2018, p. 165). In addition to the possibility of carrying cargo, products, and even passengers such as children, a person on a bicycle can reach their destination several times faster than walking (Figure 1.19).

It is not a discovery, but the bicycle has regained the interest of governments at different scales, especially since it can no longer ignore the climate problem and the causes that generate it. However, generally speaking, there needs to be a better network of road infrastructure for cyclists; where bike paths are poorly maintained, dirty and not wholly safe, cyclists are commonly forced to share the road with other vehicles, motor or pedestrians; at the same time, do not consider bicycles or cyclists in their design, so proper parking ends up being an exception (TRT - Trasporti e Territorio, 2010, p. 22). Thus, the cycling infrastructure requires various considerations such as "strong government support to create priority for cyclists and to provide a safe, comfortable and attractive network that integrates with a spatial policy that encourages the concentration of spatial opportunities," government policies that at least "treat cyclists on an equal footing to car users, public transport users, and walkers" and the integration "across policy delivery areas including spatial planning, transport, health and education" (Hull & Craig, 2014, pp. 384–385) (Figure 1.20).

Governments are responsible for caring for the population, and investing in policies and infrastructure that support motor transport does not point in that direction. On the contrary, "one of the solutions to the connectivity and accessibility issues that affect the city, and particularly congested city centres, is to invest in a network of cycling infrastructure" (Hull & Craig, 2014, p. 384). From the point of view of the population, a drawback to this more sustainable development is that the bicycle is often considered a low-class means of little value and much inferior to the automobile; but a cultural attitude would disappear if the bicycle were widely used (TRT - Trasporti e Territorio, 2010, p. 21).

> Accepting this change—and the fact that it will take time—will be a difficult process. In an age of instant gratification [...] Shifting people's perspectives will not be easy in places where it is still easier to hop in a car than it is to walk, bike, or take public transit even when people know it's better for them and their city. Pair this with catastrophic death and injury rates to pedestrians and cyclists caused by years of auto centric design and policy, and it is no surprise that people aren't ditching their cars for the simplicity of the bicycle (Bruntlett & Bruntlett, 2018, p. 213)

An era of the bicycle is dawning and will surely be favourable for cities. It is essential to take advantage of the opportunity to be part of this transformation and help drive it forward (Fleming, 2012, p. 44). In other words, "we want to prove that cycling is part of the solution to many of the

Figure 1.20. Even though there is a current governmental interest in promoting the use of the bicycle, it is necessary to implement policies that help prioritize the bike and planning in terms of infrastructure and architecture that facilitates use. Source: https://www.flickr.com/photos/16nine/50269638283/

Figure 1.21. Assuming its implementation is a complex undertaking that will result in improvements in many areas, cycling is one of the solutions to many issues that existing cities and their inhabitants face. Source: https://ebikes-international.com/cycling-cities-on-the-move-vancouver-ranked-by-copenhagenize-index-for-first-time/

Figure 1.22. January 12, 1972, San Francisco cyclists ask the city council for a bike lane in view of the new reforms to Market Street. Source: https://www.sfchronicle.com/oursf/article/What-a-San-Francisco-bike-protest-looked-like-in-9184846.php

world's challenges. This is a demanding ambition, but it is a challenge we gladly accept" (Neun, 2016, p. XXX) (Figure 1.21).

1.1.2. Important and current trends

Starting in the 1960s, after a general loss of the habit of using the bicycle and the great boom in the use of the car, a time came when the energy crisis, the environmental deterioration of cities and the socioeconomic and urban situation made us reconsider to the bicycle as a valuable and functional means of transport (Alfonso Moreno, 2018, p. 17) (Figure 1.22). However, the problem is that currently, the bicycle is not a central issue of interest for voters, as it was in the past in some countries of the world (Fleming, 2012, p. 8). Thus, demonstrating these benefits is a critical first step in unlocking climate action as cities need evidence and tools to build a stronger case to enable progress at scale and delivery of the required climate action (Grupo de Liderazgo Climático de Cuidades C40, 2017, p. 5).

The constant growth of the population and expansion of urban areas is an opportunity to include a bicycle. This fact has been recognized in places where the bicycle is part of the daily planning of the city, as in Utrecht (Bruntlett & Bruntlett, 2018, pp. 134–135). However, it may be even more critical in countries of the Global South where "urbanization is happening at the greatest pace, new buildings are being constructed on cleared forests and farmland", and "new buildings are big enough to be designed around ramps, instead of high-maintenance lifts" (Fleming, 2021, p. 230). In the medium term (until 2030) and long term (until 2050 and beyond), urban redevelopment and investments in new infrastructure, together with integrated urban planning, transit-oriented development and a more compact urban form that supports the use of cycling and walking can lead to the transformation of transport modes and habits and thus to the reduction of emissions from transport (IPCC, 2015, p. 82). For example, countries such as Germany, Switzerland, the Netherlands and Austria have managed to build an intricate network of multiple actors to develop cycling infrastructure jointly, mainly linked to international tourism (Benetton, 2013, pp. 95–96), demonstrating the importance of building an integrated system for the development of this type of mobility. Other exciting trends that this research has picked up are listed below:

- The use of bicycles has been increasing. In the U.S., for example, a country where the bicycle is not very popular, "the number of annual bicycle trips has more than doubled, from 1.7 billion annual trips in 1990 to 4.0 billion annual trips in 2009" (City of Los Angeles. Department of City Planning, 2013, p. 3).

- The exponential increase of "the number of bike-share programmes around the world grew from 13 to 855 between 2004 and 2014" (Popan, 2019, p. 41). A trend currently maintained where systems combine fixed stops with bicycles that can be left anywhere without the cyclist having to finish their route at any of the systems stops.

- In general, there is little research on bicycles. Engineers and planners focus on building materials and traffic-improvement technologies, but "bicycle research is itself a small and marginal area of scholarship", which is usually studied in conjunction with transport on foot (Vivanco, 2013, pp. 9–10). This fact makes it challenging to construct specific conclusions and contributions for the bicycle.

- The reasons for using the bicycle are linked more to personal interests than global ones. Studies in Denmark have shown that the health and speed benefits of cycling are the main reasons people considering choosing the bicycle as a means of transport. At the same time, consideration of the environment does not seem to play a significant role (Andersen et al., 2012, p. 57).

- "In most parts of the world, the bicycle is legally recognized as a vehicle, but its position in the vehicular hierarchy is often unclear" (Forsyth & Krizek, 2011, pp. 533–534). The bicycle is found in a grey area both in the legislation and in the built space; that is, in the legislation, it rarely has its place but is mixed with other types of mobility, and the same occurs in the public space where the bicycle seems to generally occupy spaces that do not belong to it, such as the street and the sidewalk.

• Linked to the above, “streets are no longer seen solely as infrastructure for transport, but are also part of public space” (Willems et al., 2016, p. 221). This fact allows us to go beyond the vision of flows and connections to think of the street as a place of exchange where the bicycle can play a leading role thanks to its agility to move, stop and make multiple connections.

• There has been discussion about stopping the use of the term “non-motorized transport” for commuting by bicycle and on foot because “the term non-motorized transport downgrades walking and cycling in transport policy, planning and public discourse because it defines these modes based on what they are not” (Willems et al., 2016, p. 221).

• Contrary to popular opinion in some societies, cycling can be very safe. Recent research has found that in some cities, it is safer to get around by bike than on foot, and “riding a powered two-wheeler (PTW) is associated with over four times more fatalities than riding a bicycle” (International Transport Forum, 2019, pp. 21, 25).

• It is increasingly clear that there is sufficient knowledge to support and promote the use of bicycles. However, the difference between the cities where this occurs and those that do not is a political decision (Navarro et al., 2010, p. 234). In other words, you know what to do; you must want to do it.

Some authors think that part of the current trends are a consequence of the leading role that engineers have had in the conception of mobility based on the bicycle. “Our shame as architects and urban designers is that we have sat back and allowed by-the-book engineers to design infrastructure or bikes with even less inspiration and care than they would apply when design a road” (Fleming, 2012, p. 125). These programmers believe in industrial problem-solving, but the transportation engineer cannot conceive of giving up speed and slowing down to allow optimal traffic flow in terms of time/destination (Illich, 2006, p. 50) (Figure 1.23).

On the other hand, urban designers have given priority to pedestrians. "In so doing, urban designers have focused on the overall form, scale, materials, vegetation and furnishing of the street; and on sidewalks, footpaths and off-street pedestrian paths", but "cyclists have needs from the standpoint of urban design that substantially differ from pedestrians" (Forsyth & Krizek, 2011, p. 531). In other words, "cycling has always come second to walking" (Fleming, 2012, p. 19), but a person on a bicycle can go three or four times faster than a pedestrian, consuming a fifth of the energy (Illich, 2006, p. 54).

There is a lack of funding dedicated to the subject of the bicycle, it is believed that there is not enough interest or activity around the subject, it is difficult to collect information, and in general, the bicycle is seen as a means of leisure and not of transportation (Vivanco, 2013, p. 87). For reasons like these, many of the differences mentioned above are based on the problem of the need for more information. Nevertheless, an efficient cycling mobility system could even reduce total travel times, primarily if the bicycle could be used door-to-door, including inside buildings (Fleming, 2021, p. 227) (Figure 1.24). In addition, the necessary infrastructure for the bicycle is just a tiny fraction of the cost of the infrastructure for the car.

Between factors for and against, there are several conditions to consider.

> A good cycling infrastructure, shorter travel times and enhanced safety and security are major factors in determining why so many people choose to cycle in Copenhagen. However, there are also other factors: mild winters have encouraged more people to cycle all year round, and the traffic jams caused by the roadworks in connection with the Metro construction have made it easier to travel through many parts of the city by bicycle rather than by car. General information and promotional campaigns also seem to have contributed to the positive trend although there is a certain statistical uncertainty

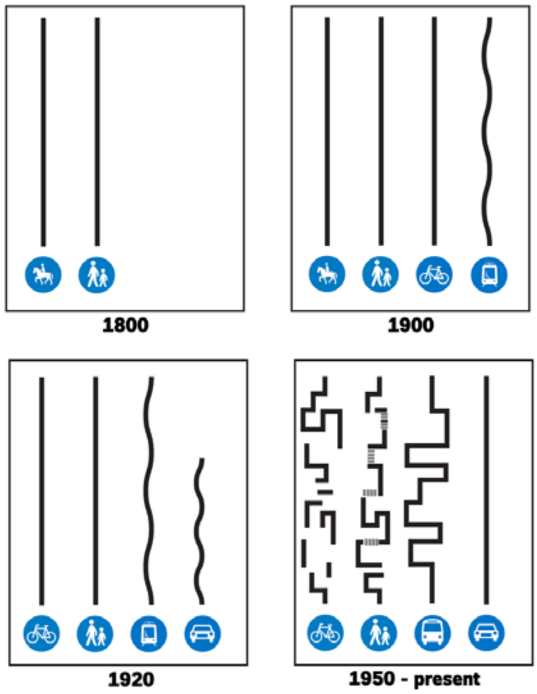

Figure 1.23. A short history of traffic engineering. Source: Colville-Andersen, M. (2018). *The definitive guide to global bicycle urbanism.*

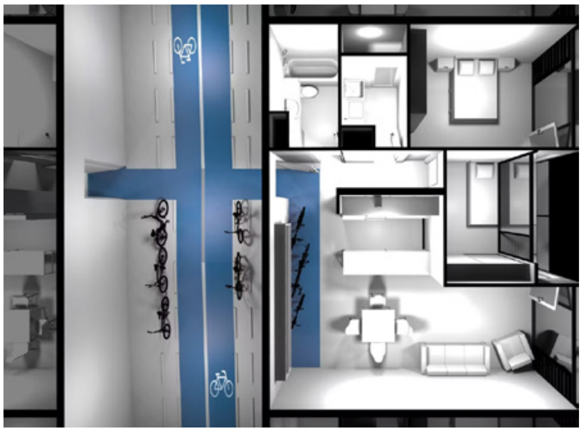

Figure 1.24. Fleming, S. (2017). *Velotopia. The production of cyclespace in our minds and our cities.*

> involved in the method of measurement (The City of Copenhagen. Technical and Environmental Administration, 2015, p. 4).
>
> National, state and local policies which influence the quality and capacity of bicycle dedicated infrastructure, the spatial design and the pricing of private car use will impact on bicycle use. Whilst the perceived costs of cycling includes monetary costs, travel time, physical energy, risk of injury, risk of theft, comfort and personal security also influence bicycle use [...] The environmental barriers to cycling across all groups included too much traffic (42.0%), too many hills (30.5%), no bike lanes or bike trails (29.0%), no safe place to cycle nearby (20.5%), badly maintained streets such as rough surfaces (16.0%), distances to places too great (12.5%) and no interesting places to which to cycle (12.0%) (ibid: 401). Continuous bike lanes / trails were the top facilitator across both active groups (74%) and inactive groups (77%). Other factors mentioned were, in order of importance, continuous bike lanes or bike trails, good lighting at night, bike racks at destinations, closer to interesting places to cycle other than parks and recreational facilities, closer to parks and recreational facilities, shower facilities at work, and more trees along streets (Hull & Craig, 2014, p. 372).

It depends on how you measure it. In general, it could be said that, with all these considerations in the balance, there are relatively few success stories of cycling in urban areas, especially in the Western world. One case usually used as a reference is the Netherlands, but there are other interesting cases. Some relevant experiences of countries that are worth learning about are discussed below.

- Holland. "By building superior places to cycle, the Dutch have also built superior places to live" (Bruntlett & Bruntlett, 2018, p. 6). The Netherlands developed a system of safer streets that put people before cars, reducing their speed, making their movement more complicated and, in turn, betting on a dense system of cycle lanes that is currently equal to a quarter of the length of the road network (Bruntlett & Bruntlett, 2018, pp. 2, 68, 211). In other words, "the Dutch don't cycle because they're morally superior to the rest of the globe [...] The Dutch cycle because their government spends an astonishing €30 ($35 USD) per person per year on bike infrastructure—fifteen times the amount invested in nearby England" (Bruntlett & Bruntlett, 2018, p. 2). Reasons like these must have a substantial weight, especially in a cold and rainy country where the weather does not help cycling, but there are other things to consider. "People in Amsterdam only use bikes because they have no place to park anything else", but the most critical factor is tradition and understanding that the Dutch have years and generations developing the use of the bicycle (Fleming, 2012, pp. 12–13).

• Singapore. The government has developed different taxes directly focused on the car, such as fuel taxes, registration fees, congestion taxes, and limited certificates adjudicated in auctions, forcing high prices (Fleming, 2012, p. 99). Other countries have similar strategies, but most focus on downtown areas where pedestrian mobility is favoured. However, the Singapore case represents a complex system that promotes other solutions; public transportation and bikes are the most common.

• Mexico. Recently, they presented the results of a program called *Ecobici*. This report presents the first results of measuring the great benefits of climate action focused on mobility by bicycle and foot in Mexico City. Among its results, it was possible to observe that an average *Ecobici* user spends from 47 to 82 minutes per week doing physical activity. The net potential benefits of the bike lanes in Mexico City are more than 65 million dollars (almost six times more than its cost). The total greenhouse gas emissions reduced thanks to the use of *Ecobici* instead of motorized means of transport, is about 1,190 tons per year, equivalent to almost 4.2 million kilometres driven by a user of an average car (Grupo de Liderazgo Climático de Cuidades C40, 2017, pp. 4–5, 13, 16).

• EEUU. "The common view in the U.S. that riding a bicycle in a city is stupid, crazy, or asking for trouble can change that same adult into a foolish maniac" (Vivanco, 2013, p. 128). However, some cities have taken vital initiatives to promote the bike. Portland is a well know example that "added 40,354 new commuters

Figure 1.25. A “Car Free Sunday” was instituted in the Netherlands during the 1970s oil crisis. Those whose attitudes demanded an automobile were able to alter as a result of this campaign. It also made it feasible for commuters to choose from various non-oil modes of transportation, such as the bicycle. Source: https://www.gizmodo.com.au/2014/12/the-dutch-rode-horses-on-their-highways-during-the-1970s-oil-crisis/

Figure 1.26. During other times when there was a lack of power, such during World War Two, Automobile Free Sundays were implemented. Source: https://www.theguardian.com/world/from-the-archive-blog/2020/nov/04/netherlands-introduces-car-free-sundays-archive-1973

between 2000 and 2013”, where “34% commuted by bicycle, 26% worked at home, 16% drove alone, 12% walked and 9% used transit” (Portland Bureau of Transportation, 2015, p. 1). On the other hand, dedicated bike zones in Manhattan have increased local retail business sales by up to 49% (Grupo de Liderazgo Climático de Cuidades C40, 2017, p. 18). While in Boston, “MassDOT recognizes that implementing separated bike lanes is a critical strategy toward achieving many statewide goals” (Massachusetts Department of Transportation, 2015, p. 3).

- Italia. The Law 2/2018, *Disposizioni per lo sviluppo della mobilità in bicicletta e la realizzazione della rete nazionale di percorribilità ciclistica establishes the Bicitalia* network of cycle paths of national interest, a system that, when fully operational, will extend over 20,000 km of cycle paths and that must feed the entire national territory, incorporating the European cycle paths of the *Eurovelo* network (Palma & Meloni, 2022, p. 10).

Some of these could become good practices that, in turn, could serve as applicable references in other parts of the world. However, “one size won’t fit all, and—like Rome—the Dutch cycling utopía wasn’t built in a day. It took over 50 years of incredibly hard work, a bit of good fortune, and some forward-thinking decisions that extended far beyond the current political cycle” (Bruntlett & Bruntlett, 2018, p. 6). Also, “infrastructure and laws privileging bicycles over cars in the Netherlands were born of unique circumstances in the early 1970s: hundreds of children killed on their bikes every year, mass demonstrations, car-free Sundays and an oil crisis” (Fleming, 2012, p. 145) (Figure 1.25).

In short, the facts exposed through this point dedicated to trends and case studies serve to contextualize some possible scenarios but consider that each place and situation must be analyzed independently. The fundamental similarities are the benefits cycling can bring to communities worldwide (Figure 1.26).

1.1.3. Transforming the city for the bicycle

At the moment, "the drivers have most of the contested public space of the city centre to drive in and park on. Risk-averse cyclists are left some shared footpaths, broken by driveways" (Fleming, 2017a, p. 163) (Figure 1.27). Nevertheless, in a bike-first scenario, bike traffic would be directed by signs, while cars would have to use maps, unlike today (Fleming, 2012, p. 30). Likewise, circulation spaces would be protected from the weather, and traffic within the city would have a tax related to the footprint occupied by the vehicle, directly linked to the consumption of the highly desirable space in urban areas (Fleming, 2012, pp. 30, 38).

> Furthermore, in a city where land is in such high demand that any square foot could be leased in five-minute increments, no one pays a cent for the rolling footprint of their car, or for the braking distance ahead of their car that is off limits to anyone else. This comes out to around 1,000 ft2 (roughly 300 m2) of unavailable space in the case of a car moving at the legal speed limit. Around SoHo, you can't rent an apartment that size for less than 8.000 a month (Fleming, 2012, p. 36).

From here, considering the city for the bicycle would represent a cheaper means to achieve more radical changes in the urban fabric. The enormous and necessary investments in the metro in cities such as Madrid, Barcelona, Valencia, Bilbao and Seville have significantly improved their citizens' quality of life and the cities' efficiency; but they have yet to improve the urban space much (Navarro et al., 2010, p. 238). On the other hand, the extension of the bicycle would have a much lower cost, and its speed and manoeuvrability require essential changes in the urban space, especially in a redistribution of space in section (Navarro et al., 2010, p. 238) (Figure 1.28).

Nowadays, riding a bicycle, we can find extreme spatial limits (barriers, islands, gates, walls, buildings and various architectural barriers) or differences (sidewalks, elevated lanes, unevenness) that delimit the spaces travelled; but both can be modified and

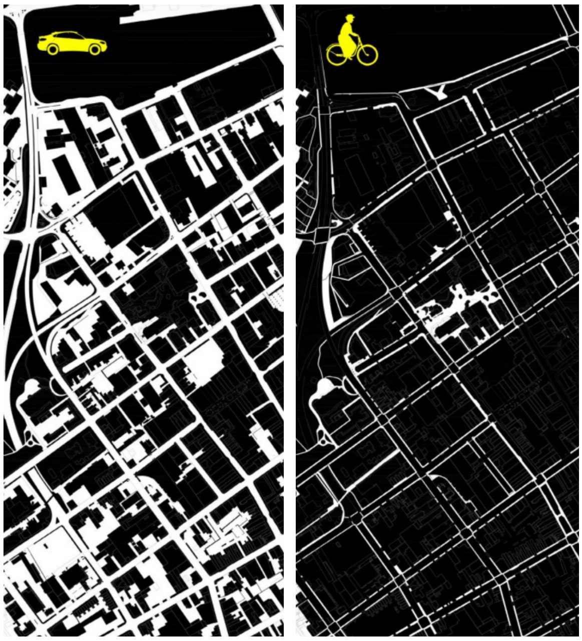

Figure 1.27. Accessible areas in the city of Launceston for one vehicle and one bicyclist. Source: Ceridwen, O., & Fleming, S. (2013). Not another bike map: Cartographic conceptions of cycle space in Launceston. University of Tasmania.

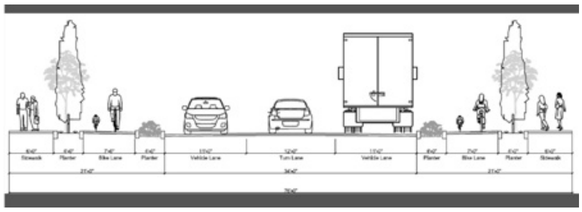

Figure 1.28. The Portland Bureau of Transportation (PBOT) cross-section. Source: https://bikeportland.org/2017/01/30/in-a-first-odot-will-use-flex-posts-in-buffer-of-outer-powell-bike-lane-215065

Figure 1.29. Dissing + Weitling. (2014). Cykelslangen. Source: https://www.climateaction.org/news/germany_is_building_worlds_biggest_bicycle_highway

Figure 1.30. Large car-moving structures and high infrastructures that, although being deemed "green spaces," appeared to have been overlooked in the process. Source: https://www.pexels.com/photo/aerial-view-of-gray-concrete-buildings-15468223/

negotiating, for example, on a sidewalk we can also go up on a bicycle, unevenness can be bridged by slowing down the movement, an obstacle can be avoided, and a door can be opened (Caffaro, 2015, p. 26). This adaptation or integration of the bicycle has been improving over time in many cities worldwide (Figure 1.29). One of the reasons why more and more people understand the possibilities of the bicycle and are willing to encourage or tolerate this integration is the advancement of telecommunications. "With the explosion of global communications, it's easier than ever to import ideas and strategies from across the globe for how to build streets that work for people" (Bruntlett & Bruntlett, 2018, p. 20). From different parts of the world, it is possible to create associations and transmit experiences that strengthen and facilitate transformation processes (Bruntlett & Bruntlett, 2018, p. 213).

However, the change in the cities should be substantial. Currently, it is typical for spaces and cities to be advertised for people, but the cars end up hidden somewhere; the vast majority of new buildings include parking, and the effort translates into adding more things without removing any (Fleming, 2017a, pp. 38–39). The same highways of the modern movement considered constructing extensive and continuous green areas that surrounded isolated towers and saw the eventual passage of elevated infrastructures (Fleming, 2012, p. 165). However, the result seems to have forgotten the green (Figure 1.30). The current situation can then take us down two paths. Collaborating in the construction of a post-industrial economy with low energy requirements and a high degree of equity or concern for the operation of machines can give new impetus to the current capital-intensive institutional development and take us beyond the last curve that leads us-separated from a hyper-industrial Armageddon (Illich, 2006, pp. 14–15). If we look for a moderately sustainable solution, we must walk or see how far we can go with the bicycle (Fleming, 2017a, p. 14).

The bicycle would be one of the instruments to forge more equitable cities. "What we really need is for the world's richest (now driving) and poorest (just walking) to meet in the middle (all cycling)" (Fleming, 2017a, p. 235). "It is unrealistic to think that walking can be the whole solution. A more holistic approach would involve cycling", especially in areas with low density and several service centres (Forsyth & Krizek, 2011, p. 531) (Figure 1.31). As noted in the previous point, this fact is especially actual in the parts of the world where equitable solutions are most needed.

> Where cities are rapidly expanding, or being built out of nothing, the opportunity exists to make cities cheaply, with no elevators or heavily engineered roads, and where the costs to individuals are equally low—bikes retail for US$50 in poor countries, about as much as motorists spend every time they refuel their cars. (Fleming, 2021, p. 234)

These new spaces would have to pay special attention to cyclists precisely because of the ease of movement that allows them to arrive faster and extend the radius of action of the inhabitants (Forsyth & Krizek, 2011, p. 531) (Figure 1.32). Even so, the efforts to transform cities to promote cycling are based on cycle paths and bicycle parking, as if these two elements were enough to promote this medium. A more radical approach is needed.

> Should there be a more radical reconceptualization of urban design given the speed, height, exposure, lighting requirements and parking needs of cyclists? Are cyclists really just using another form of vehicle similar enough to the car to make many of the auto-oriented design strategies work? Alternatively, can they be seen as essentially a faster pedestrian, using basically the same infrastructure? Or are cyclists different to both motorists and pedestrians, with needs more complicated than safety and exercise, and with implications for urban design? (Forsyth & Krizek, 2011, p. 531).

Cycle paths are necessary and are probably the centre of the transformation of cities since various studies have shown that, if these infrastructures are not available, cyclists will use the streets and sidewalks, which represents a risk for everyone and also reduces the efficiency of different media (International Transport Forum, 2019, p. 53) (Figure

Figure 1.31. Fleming, S. (2017). *Velotopia. The production of cyclespace in our minds and our cities.*

Figure 1.32. Fleming, S. (2017). *Velotopia. The production of cyclespace in our minds and our cities.*

Figure 1.33. A transformation towards sustainable mobility indispensably implies an infrastructure dedicated to cycling that offers safety in all aspects. Source: https://ciclosfera.com/a/skyway-puente-ciclista-largo-mundo-xiamen

Figure 1.34. It is perfect for separating motorized traffic from bike lanes and traffic carried by cyclists and pedestrians. Giving each form of displacement space would be the wisest course of action. Source: https://www.flickr.com/photos/16nine/16246112923/in/album-72157657144439151/

1.33). In addition, the cycle paths are a representation that the bicycle is accepted and welcomed; they are fragments of territory in which the transit of pedal vehicles is legitimate, which entails more significant serenity on the part of drivers and other users of the city who they abstractly insert them within pre-established limits (Caffaro, 2015, p. 26).

Bicycle spaces would reduce the need for new or more significant streets and avenues, "thereby making it possible to postpone or avoid costly road construction" (Andersen et al., 2012, p. 8). However, to achieve that more radical change mentioned above, it would probably be necessary to recover the prevalence of movements around the place of residence (Illich, 2006, p. 68). Likewise, it would be important not to forget the necessary interactions between pedestrians and cyclists. "Generally speaking segregating bicycle from pedestrian traffic is an excellent principle. However, this can result in an undesirable fear of contact in areas where it is acceptable (or even desirable) to allow the two transport modes to share the same area" (Andersen et al., 2012, p. 54) (Figure 1.34). It is certain that, while commuting by bicycle is facilitated, it is necessary to restrict or make motor traffic less efficient, such as reducing parking (Andersen et al., 2012, pp. 43, 55) or taxing the fuels associated with your carbon footprint. Instead of continuing the rampant construction of new streets, resources and mainly space should be directed towards the bicycle, which requires much less of both. They can serve the population more equitably-even an equal distribution of services across cities.

> But let's imagine a city where three quarters of trips are by bicycle, one quarter on foot, and cars are an oddity. Shops and cafés could be littered evenly across the whole city, just one at the base of each building. The Jane Jacobs ideal of throwing away zoning maps and encouraging a tossed-salad of functions might actually have sorne chance of succeeding (Fleming, 2012, p. 55).

To build a favourable scenario for the bicycle, several authors agree that the continuity of the system is one of the most critical factors. (Forsyth & Krizek, 2011, p. 535; Hull & Craig, 2014, p. 385; Massachusetts Department of Transportation, 2015, p. 14). The continuity of the cycle path system encourages the use of bicycles but at the same time requires that the government show a sustained interest in maintaining the infrastructure and systematically expanding and improving connections (Hull & Craig, 2014, p. 385) as is generally the case today with streets, avenues and highways (Figure 1.35).

Building continuity faces two fundamental challenges that depend on the situation. When the city is about to be built, a planning problem is faced where there are possibly more opportunities for radical approaches. When the city is already built, it is necessary to consider adaptation processes. When considering affecting a built sector, "there is a temptation to establish cycle tracks where it would be easy and cheap to do so. However cycle tracks should only be built where they are necessary, which is often where it is difficult and controversial" (Andersen et al., 2012, p. 56). In a more radical approach, you could use all the space currently dedicated to the car to create the necessary infrastructure for the bicycle and "two-thirds of that could be used for playgrounds and farming if we swapped car transport for cycling" (Goodyear, 2015). In other words, bicycles need less circulation space than cars, opening up new opportunities for cities and potentially improving their living conditions (Alfonso Moreno, 2018, p. 18) (Figure 1.36).

On the other hand, the bicycle can play a leading role easily when considering the construction of new spaces. It is possible to rethink the conditions to favour the displacement with this medium. This city would not need to invest millions of dollars in highways or massive tunnels, "the main task is taking things away, namely the cars, which since they have wheels, should not cost very much to remove!" (Fleming, 2021, p. 234). More radically, not only the external spaces could be conceived, but also the internal ones to facilitate circulation by bicycle (Fleming, 2017a, p. 13) (Figure 1.37). An approach like this would materialize in more compact settlements where the only motor vehicles would be those necessary to attend emergencies, which could move more quickly when necessary, thanks to the fact that there would be no traffic (Fleming,

Figure 1.35. Report on the development status of Eurovelo routes 2022, where more than 2,000 km of new Eurovelo routes were developed and there are more than 35,000 km of Eurovelo signals to follow in 24 countries. Source: https://www.eurovelospain.com/informe-del-estado-de-desarrollo-de-las-rutas-eurovelo/

Figure 1.36. In Latvia, a group of cyclists staged a demonstration against the overuse of automobiles. The goal was to highlight how much more room a car takes up than a bicycle. Source: https://www.atraccion360.com/ciclistas-de-letonia-buscan-venganza-contra-uso-excesivo-del-auto

Figure 1.37. Fleming, S. (2017). *Velotopia. The production of cyclespace in our minds and our cities.*

Figure 1.38. The quality of the cycling infrastructure directly influences the active use of the bicycle. Source: https://www.pexels.com/photo/two-man-and-woman-riding-bicycles-on-road-977962/

2017b). The city's shape could completely change if one thinks about the logic of movement provided by the bicycle.

> Places to ride slow, such as approaches to buildings and intersections, will ideally be slightly elevated and areas that exist to be traversed will be sunken. A piazza in cycle space would be shaped like a basin. Freestanding buildings would be located on mounds (doubly useful, as the waterways and flatlands I am proposing we develop for cyclists are often flood-prone). Streets would be U-shaped in section, naturally slowing cyclists as they veer towards the edge and bringing them back to speed as they rejoin bicycling traffic (Fleming, 2012, p. 165).

Many of these approaches are merely theoretical, but looking at the results obtained from recent experiences, interesting clues can be gleaned on how to proceed towards bicycle-friendly urban settlements. For example, "cities where bicycle traffic has increased have this in common: they have established a cohesive cycling infrastructure with a high level of cyclist service (security, passability and comfort)" (Andersen et al., 2012, p. 54) (Figure 1.38). More specifically, Hull & Craig (2014, pp. 385–386) concluded their investigation with a series of recommendations for the development of bicycle infrastructure, some of which are quoted below:

- Wide cycle lanes.
- Direct routes connecting all land uses.
- Segregation where possible, especially on trunk roads and busy centre roads. Segregation does not have to be expensive. Bollards/vegetation can offer segregation by providing a visual deterrent from driving and parking in cycle lanes.
- Clear signage. Include signage in order to join a cycle lane. No discontinuities of cycle lanes at hazardous locations (Junctions and roundabouts).
- Implement a system to bypass the danger or provide bicycle priority traffic lights for intersections.
- Using of high-quality material for cycle lanes can offer comfort and reduce maintenance.
- The visible speed barriers (night) do not make the

cyclist dismount.

- High-quality lighting on darker cycle lanes.

- Attractive settings, e.g. Greenery and place-making.

- Frequent and high-quality bicycle parking, not just at transport hubs.

- Design of end of route facilities to be discussed with businesses and employers (showers, bike storage).

- Funding needs to be forthcoming. Otherwise, good quality infrastructure cannot be implemented.

- Do not implement cycle infrastructure as an add-on. Consider when designing all transport mode networks.

Figure 1.39. Intermodality is a crucial tactic to encourage bicycle use at the territorial level. Source: https://pedalia.cc/la-intermodalidad-urbana/

This list summarizes some points that urban cycling space should consider based on recent experiences. In addition, it is common for experts to recommend promoting intermodality in order to link the bicycle to other means of transport and facilitate movement through a larger territory. Depending on whether the bicycle is compatible with these means, it is recommended to adapt buses, trains, and stations, have bicycle parking at critical stations and sites, promote portable and folding bicycles, and encourage public bicycle and public bicycle systems rent (Navarro et al., 2010, p. 235) (Figure 1.39).

One of the keys that could make the space for bicycles work in the cities that we currently have would be to occupy the spaces that nobody wants, the invisible networks.

> Most cities have redundant rail routes, high-lines and even underground spaces that architects have already been helping convert into green space with obligatory bike paths. Cities also have concrete-lined waterways waiting to be naturalized, and in the process activated with bike paths. Most cities have former industrial sites, docklands and contaminated brownfields with space for bike paths and, vitally, space for the private development that will fund all the bike paths I am proposing. Taken together, the kinds of sites mentioned provide scope for a

Figure 1.40. Piave cycle path along the river. Source: https://www.jamesmagazine.it/travel/veneto-lancia-la-ciclabile-del-piave/

> sparse lattice of Dutch urbanism–complete with new housing–in the negative space left by old Industries. It is space car-loving voters have not been contesting (Fleming, 2012, p. 8).

The reconquest of obsolete areas can turn the bicycle into the protagonist and engine of the citizen revolution through the claim of spaces that improve the lives of citizens (Queimaliños, 2015). Thus, the forgotten cracks in cities can be removed (as has been done in many cases) to configure green corridors and waterfronts that connect different city sectors and are the perfect place to promote bicycle lane networks (Figure 1.40). These cyclists include "people who ride to save time, to save money, to save losing their bike race this coming weekend, to save the planet, to save their hearts" (Fleming, 2012, p. 28) and, in any case, they find the spaces they need to mobilize through the heart of the cities. At the same time, spaces like these encourage the use of bicycles because "even though this does not mean that the construction of more cycling paths will convince more people to cycle, it does suggest that cyclists will cycle more often and faster when the infrastructure is available" (Degraeuwe, et al., 2016, p. 48).

To better understand the spaces of the bicycle, it is helpful to quote verbatim parts of some of the critical points that Hull & Craig (2014, p. 373) considered to evaluate bike lanes (a subject on which there are very few studies):

- Coherence: Continuity, logically connected destinations.
- Directness: Infrastructure provides cyclists with shortest fastest routes while taking into account all costs of travel time.
- Attractiveness: The cycle infrastructure is designed, furnished and illuminated with personal safety in mind to make cycling socially safe and attractive.
- Traffic safety: Infrastructure design ensures the traffic safety of all users.
- Comfort: The cycle infrastructure allows cycle traffic to circulate smoothly e.g. flat smooth pavement, minimum of inclines.
- Spatial integration: Cycle Infrastructure integration

into spatial context (city centre, suburbs, historic areas, modern development).

- Experience: Enjoyable? Stressful?

- Social economic value: Routes take into account user facilities and developments (commercial, office, residential and industrial).

Seen cross-sectionally, each of these concepts can be considered to study the system designed for the bicycle and synthesize many of the issues discussed at this point. Conditions such as coherence, attractiveness, spatial integration, etc., are excellent to consider when developing the city for the bicycle or transforming existing spaces (Figure 1.41).

Both new and existing cities could benefit from a gradual transformation that would facilitate the acceptance of society and the adaptation process Fleming (2012, p. 145) introduces this topic through BOD o Bicycle-Oriented Developments.

> BODs would be high density, with minimal parking. Developer infrastructure contributions from BODs, as each new one is built, would be spent upgrading bike paths with additional lanes, weather protection and every other convenience. Instead of pitting cycling against driving in a contest for prime city space, the brownfield-to-bike field model would have cyclists retreat to an alternative cycle space, which they could gradually develop with cycling as the main emphasis. The better quality of life that cycle space, in time, would provide would likely attract current non-cyclists to live and work there as well. In the meantime, it would provide a safe and fair alternative existence to those who want to orient their lives around bicycle transport (Fleming, 2012, p. 145).

The BODs would be organized through a high density of activities distributed throughout the territory with connection points to other formats of the urban fabric, through which a change of means of transport could occur. These islands intend to act as flags of change, an example of what is possible and thus facilitate its expansion. Ultimately, it would be about different ways of transforming or creating bicycle cities (Figure 1.42).

Figure 1.41. Ector Hoogstad Architecten. (2019). *Bicycle parking Stationsplein*. Source: https://cycling.today/netherlands-opens-worlds-largest-bike-parking-garage/

Figure 1.42. Cycle lane in the city of Utrecht running through the heart of the university campus. Source: https://bicycledutch.wordpress.com/2021/06/16/the-worlds-longest-rainbow-cycle-path/

Figure 1.43. If a substantial change is wanted in the type of mobility in our cities, an adequate, safe, attractive, and quality infrastructure is necessary. Source: Mulders, I. (2018). *Nigtevecht bicycle bridge*.

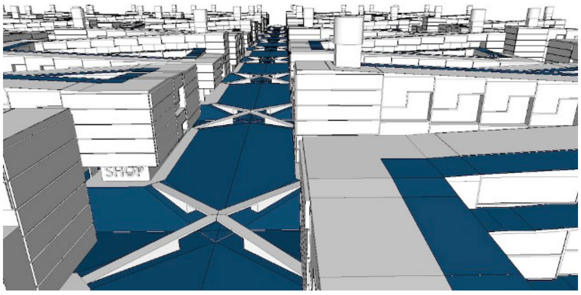

Figure 1.44. Fleming, S. (2017). *Velotopia. The production of cyclespace in our minds and our cities.*

If a substantial change is achieved somehow, “if the world shifts to cycling [...] it will be due to the efforts of environmental designers, not inventors of smartphone apps” (Fleming, 2017a, p. 38). Everything depends on the spatial condition, from bike paths to parking lots to efficient and attractive communication networks that can win followers for the bicycle revolution. The solutions to our problems can only be achieved by adapting the city (Navarro et al., 2010, p. 239) (Figure 1.43).

1.1.4. Cycling architectures: from the cycling city to the cycling space

The bicycle city would be closely linked to Flemming’s concepts as cycle space, *velotopia* and bicycletecture. *Velotopia* because it would be a city without clearly defined business centres but with offices spread throughout its length and closely linked to the homes (Fleming, 2017a, p. 156). This would be a medium-sized city where the average bicycle trip would not last more than half an hour by combining the destination’s proximity with the appropriate infrastructure for the trip (Fleming, 2017a, pp. 46–48) (Figure 1.44).

> Using something known as “disc line pickling” and this formula “d=128r/45π” it can be ascertained that the average distance (d) between any two randomly selected points on a 15-km-wide disc is 6.79 km. Assuming jobs and population densities are evenly distributed across our imaginary 15-km-wide city, 6.79-km would be the average length trip. Travelling at 15 kph, the speed one can cycle with no more effort than walking, 19 in an uninterrupted beeline, that trip would take 27 minutes and 9 seconds (Fleming, 2017a, pp. 46–48).

Thus *velotopia* would be a whole city, a part or parts of the city. Similar conditions have been defined as a cycling network “an area being within 4.8 kilometres of cycling distance to either 10 diverse uses (such as a supermarket, pharmacy, bank, health club, restaurant, child care, or civic and community facilities) or a school or employment centre, or a public transit stop or station" (HUB Cycling, 2017, p. 16) (Figure 1.45).

On the other hand, cycle space is an analogy with the airspace to demystify the city, forget the domination imposed by the car and turn the bicycle into the protagonist of the journey from the point of view of each cyclist (Fleming, 2012, p. 7). "Cycle space is the organizing system an individual cyclist projects upon his or her city, in the sense that airspace an imaginary system used to make sense of the sky" (Fleming, 2012, p. 23). Cycle space would be a changing construction depending on the city's weather conditions, but it would always be built rolling on a bicycle (Figure 1.46).

Complementarily, these spaces and experiences build and, in turn, need the bicycletecture. Bicycletecture is "the present day counterpart to carchitecture [...] propagandized for, made room for and drew inspiration from cars" and includes not only the infrastructure but the buildings (Fleming, 2012, p. 44) (Figure 1.47). If, for much of the last century, the design of buildings has revolved around favouring the movement and storage of cars, what would buildings made for the bicycle look like?

The infrastructures dedicated to this movement are an opportunity to redesign and redevelop the territory if considered in the context of the relationships established between the route and the context (Meloni, 2022, p. 16), but also for their ability to establish the necessary relationships and support displacement. However, the culture around bicycle use is equally essential to modify people's behaviour, who must also feel safe throughout the journey (Sangalli & Pinzuti, 2020, p. 5). At the same time, the most important thing for safety and, thus, the potential number of cyclists is infrastructure and planning (Luukkonen & Vaismaa, 2016, p. 90) (Figure 1.48).

The bicycle space, like the car space, is both physical and cultural. The car has had "freeways, suburbs and buildings you can drive-through and drive-into, built especially for it" (Fleming, 2017a, p. 91) and to face its main limitation, the poor

Figure 1.45. The ability to access all required services within a radius of no more than 5 kilometers by bicycle is one of the features of the cycling metropolis suggested by Steven Fleming. Source: https://archinect.com/features/article/84683423/working-out-of-the-box-steven-fleming

Figure 1.46. Dissing + Weitling Architecture. (2017). *Opened elevated cycleway*. Source: https://cycling.today/worlds-longest-elevated-bike-path-opens-in-china/

Figure 1.47. JDS Architects. (2011). *Chongming Bicycle*. Source: https://www.archdaily.com/873332/worlds-first-bicycle-architecture-biennale-to-debut-in-amsterdam?ad_medium=gallery

Figure 1.48. Foster + Partners. (2012). *SkyCycle*. Source: https://www.archdaily.com/873332/worlds-first-bicycle-architecture-biennale-to-debut-in-amsterdam?ad_medium=gallery

Figure 1.49. Benthem Crouwel Architects. (2016). *Cuyperspassage*. Source: https://www.archdaily.com/780990/cuyperspassage-benthem-crouwel-architects?ad_medium=gallery

Figure 1.50. Michel Rojkind, Callaghan Horiuchi & Marlon Blackwell Architects. (2022) *Legder*. Source: https://www.facebook.com/ledgerbentonville/

turning radius. In contrast, the problem with the bicycle is that it keeps the cyclist outdoors, which translates into a clear clue about how the city and the buildings should be for the bicycle (Fleming, 2017a, p. 92) (Figure 1.49). “Consider these examples: how walking inspired porticoes, ambulatories– virtually everything; how boating didn’t just give us passenger terminals, but Venice” (Fleming, 2017a, p. 92). As more highways encourage more cars, better cycling infrastructure will have the same results (Fleming, 2017a, p. 196). “Other measures, such as marketing, are more effective when infrastructure is of high quality and the traffic system provides the conditions for safe and competitive cycling” (Luukkonen & Vaismaa, 2016, p. 90).

Much of the platform we need to motivate people to change their behaviour and encourage cycling is architecture. As “good architecture inherently causes people to behave better, and a high value has been placed on ensuring beautiful design” (Bruntlett & Bruntlett, 2018, p. 187). Likewise, compared to cars and immense machines, the bicycle is much more agile, lighter and smaller, so the infrastructures it needs are much easier to build and designing buildings where the bicycle could enter would be much easier and cheaper (Fleming, 2017a, p. 91) (Figure 1.50). Fleming summarizes much of what has been explained so far through a syllogism:

> Major premise: we want everyone cycling! That is because cycling performs three miracles at the same time: 1) reducing door-to-door travel times in denseities (especially if the ground plane can be cleared of most cars and their traffic lights can be removed); 2) vaccinating populations against chronic disease; 3) reducing greenhouse emissions.
>
> Minor premise: new urban districts continue to be built. Whether through sprawling, thickening, back filling or building new cities from scratch, there are always new streets and private lots being made.
>
> Inference: we need to conceptualize new ways of developing cities so they encourage people to choose cycling over all other modes.
>
> Experts in other fields might see different inferences, like removing financial incentives

to drive or use public transport, or introducing laws to make drivers slow down. However, any inferences for us as designers must relate to the production of built environments. (Fleming, 2017a, p. 96)

Remembering what was explained in the previous point, bicycle space requires many things. Two essential conditions are connectivity and multimodality, as well as "the level of service of the bicycle network" (Nogal & Jiménez, 2020). Precisely the use of the bicycle is strengthened when it allows door-to-door movement; for that, a system of spaces and buildings is necessary (Figure 1.51). A system that works well translates into "low-stress routes" that require dedicated spaces for bicycles that: "Provide recognizable facilities; Provide direct and convenient connections that minimize detours; Connect at a local scale for access, and a regional scale for mobility; Integrate into the larger multimodal transportation network; Provide seamless transitions between different facility types" (Massachusetts Department of Transportation, 2015, p. 10). These recommendations emphasize the link of the bicycle with other means of transport, which translates into the emphasis and the need to attend to the nodes, which end up being spaces and buildings where the transition occurs.

A series of amenities also become vital pieces of the system. Cycling amenities are "characteristics or features that encourage cycling or that make the building easier, or more pleasant to use by people who ride bikes" (HUB Cycling, 2017, p. 5) as "bike shelters, bike pumps, bike wash stations, vending machines selling bike tools, spare tubes, lights and other basic parts, footrests and railings at intersections and parking solutions" (Popan, 2019, p. 28) (Figure 1.52). These specific elements must be integrated into the "existing and proposed transportation network (i.e. bicycles routes, trails, paths, transit stops, streets, etc.)" to create a "bike-friendly city" (City of Los Angeles. Department of City Planning, 2013, p. 19). Even so, despite their importance, the architectural forms, the distribution methods, the scales and the levels of complexity of these punctiform components

Figure 1.51. Ector Hoogstad Architecten. (2019). Bicycle parking Stationsplein. Source: https://cycling.today/netherlands-opens-worlds-largest-bike-parking-garage/

Figure 1.52. Parking spaces and bike lanes are insufficient to ensure the smooth operation of a bicycle network; other amenities like shelters, washrooms, and repair shops are also required, in addition to the provision of components for simple fixes. Source: https://newatlas.com/bike-fixtation-self-service-bike-repair-kiosk-launched/19136/

Figure 1.53. Even so, in cities where the public space is organized for reasonable bicycle use, buildings are still designed without considering at least a safe parking for bikes. Source: https://www.meyer-hayoz.com/en/project/v-locker/

of the cycle path systems cited by the Law still represent themes of design experimentation and do not refer to consolidated typologies (Vedi: Franco Gonzalez, 2022, p. 166).

It is very likely that when talking about these topics, the reference images have to do only with outdoor spaces. Bike lanes stretch through the city parallel to the streets. Nevertheless, this should be different; *velotopia*, cycle space, and bicycletecture should build an image that starts inside the house and ends inside the office, the supermarket, or the school. Bicycle networks are not only the city; they are only completed if they include architecture (Vivanco, 2013, p. 95). This point begins by taking up and recomposing these concepts and starting from the idea of the city developed in the previous point. One of the reasons why it is difficult to imagine such a complete journey is due to the lack of references or previous experiences, but "How many buildings try to capture the essence of two-wheeled human-powered movement? The velodrome? BIG's Danish Pavilion at the Shanghai Expo in 2010? There really aren't many" (Fleming, 2017a, p. 92). Even in the cases where the public space is organized for the operation of the bicycle, it seems that the buildings do not find reasons to do so (Popan, 2019, p. 11) but, to encourage people to use the bicycle, equipped places to leave the bicycle safely and dedicated policies for those who use it every day are needed (Bikenomist, 2021, p. 3) (Figure 1.53).

"How can the scale of buildings and streets reflect cycling dimensions and views, particularly in dedicated paths?" (Forsyth & Krizek, 2011, p. 546). Maybe spaces like velodromes and BMX tracks can be a reference,

> but none of those environments have produced architecture. No one has thought about what kinds of built environments (or cyclescapes) would evolve if everyone in the city were dipping into basins and seeing the world as a blur, leaning through corners and thus seeing buildings around them all arching over, and slowing as they ascended onto higher planes where they would once more see things in detail. Never before has a whole built environment been conceived

> through the eyes of a cycle-born population, using a ground plane sculpted first to meet their needs, not those of pedestrians or users of cars (Fleming, 2012, p. 167).

It is not about complicated spaces that require various manoeuvres; the bicycle makes sense as long as it is considered efficient, at least when it is focused as a means of transport (Fleming, 2017a, p. 42). The building configuration should naturalize getting the bike and leaving where the street is or coming back, leaving it and taking it to the final space of permanence. It is precisely in this programmatic organization that one of the keys to the architecture of the bicycle lies (Figure 1.54). Following the example of Denmark and the Netherlands, cycling must lead directly to the final destination "without sacrificing comfort or convenience" (Bruntlett & Bruntlett, 2018, p. 69). To achieve this, the house should change the car garage to a bicycle garage (Fleming, 2017a, p. 171; Popan, 2019, p. 10). As well as, the automatic gate allows the cart to be unloaded directly in the kitchen, "renegades among us know that bike trips needn't stop at bike rack. We can ride all the way to the room we are heading to" (Fleming, 2017a, p. 45). This is how the need to think about the interior of buildings arises around bicycle motion (Fleming, 2017a, p. 48; Forsyth & Krizek, 2011, p. 547) thanks also to the fact that "bikes are safe enough and clean enough to be ridden indoors" (Fleming, 2017a, p. 92). In addition, the cyclist can reach any destination of his choice at a moderate distance without locking himself inside a motorized vehicle (Illich, 2006, p. 58).

The architecture of the bicycle requires changing elevators and stairs for ramps (Fleming, 2012, p. 68), but it is also necessary to consider a continuous programmatic organization. In this sense, certain types of buildings, such as shopping centres, would not require too many changes since they even have wide circulation spaces (Fleming, 2017a, pp. 163–164). However, other cases, such as residential buildings, could require more profound changes. Perhaps a clear example of this type of building is the hotel for cyclists (Figure 1.55). Mostly linked to the tourist theme, hotels for cyclists exceed 2,700

Figure 1.54. The bicycle architecture must have a configuration that allows continuity in movement, leaving and entering the building without getting off the seat if desired. Source: Studio RHE. (1026). *Alphabeta Building*.

Figure 1.55. Philip Modest Schambelan & Anton Fromm. (2009 - 2010). *Mountain bike hotel, Hiding in Triangles*. Source: https://www.evolo.us/mountain-bike-hotel-proposed-for-cliffs-above-lake-garda/

Figure 1.56. The Velostations are a style of architecture that encourages bicycle riding while simultaneously supporting intermodality. Source: https://www.aargauerzeitung.ch/aargau/baden-270-zusaetzliche-veloparkplaetze-beim-bahnhof-ld.2161972

Figure 1.57. The Velostations must be evident, reachable, shut, and safe. These traits provide the biker assurance that operating the bicycle and finding parking won't be an issue. Source: https://www.archilovers.com/projects/167680/nuova-velostazione-di-cesano-maderno.html

in Copenhagen (The City of Copenhagen. Technical and Environmental Administration, 2015, p. 19). They are common in rural areas of several European countries. Even so, although bike-friendly, the architecture is not usually different from any other hotel, only providing spaces for bicycle parking and spaces to repair them.

Another building closely related to the bicycle is the velostation. Velostations are a standard format in Europe conceived as closed buildings for bicycle parking that offer protection against inclement weather and theft or acts of vandalism but generally offer complementary bicycle repair and rental services (Kauffmann et al., 2013, pp. 5–6). The velostation usually arises in response to many badly parked bicycles or thefts and daily vandalism (Sangalli & Pinzuti, 2020, p. 32) (Figure 1.56). These are usually located in central areas and are visible. In densely urbanized areas, they are usually part of a building, while in less dense areas, they are usually isolated (Kauffmann et al., 2013, p. 43). In places where they are available, velostations improve the supply of bicycle parking, promote ecological mobility, improve safety and reinforce modal interchange.

Precisely, just as in the relationship between cars and buildings, when thinking about the architecture of the bicycle, parking plays a fundamental role, especially in places defined as traffic attractors such as train stations, hospitals, schools, etc. (Sangalli & Pinzuti, 2020, p. 22). “So far, good bicycle parking has been given far too little attention in urban planning” (Celis & Bølling-Ladegaard, 2008, p. 4), without understanding that this must function as a connecting link between cycling and the final destination (Celis & Bølling-Ladegaard, 2008, p. 10). Among other things, parking must be easily accessible and visible and “enhance the local environment” (Andersen et al., 2012, p. 120) (Figure 1.57).

In any case, the increasing use of bicycles makes it advisable to start thinking about off-surface parking, providing spaces in public and private parking lots, inside buildings or even inside houses, which is beginning to be included in urban regulations (Navarro et al., 2010, p. 241) (Figure 1.58). An example where bicycle parking begins to play an important role is in Canada.

> The Canada Green Building Council and US Green Building Council's Leadership in Energy and Environmental Design (LEED) standard has been a widely adopted certification program across North America.
>
> For commercial or institutional projects the latest version (v4) of LEED requires that the following is provided:
>
> - short-term bicycle storage (Class B) for at least 2.5 percent of all peak visitors.
> - long-term bicycle storage (Class A) for at least five percent of all regular building occupants.
>
> at least one on-site shower with a changing facility for the first 100 regular building occupants and one additional shower for every additional 150 regular building occupants.31
>
> For residential projects LEED v4 requires that the following is provided:
>
> - short-term bicycle storage (Class B) for at least 2.5 percent of all peak visitors (no fewer than four storage spaces per building).
> - long-term bicycle storage (Class A) for at least 30 percent of all regular building occupants (HUB Cycling, 2017, p. 16).

Likewise, the regulations require that these parking lots be located on the ground floor, which sometimes represents a conflict for the designers with all the other activities on that level (HUB Cycling, 2017, p. 43) (Figure 1.59). For reasons like these, architects always look "interesting best practices and how projects have made that work" (HUB Cycling, 2017, p. 46). This opens up a fascinating field of research on the subject. Similar situations are occurring in other places, although the regulations do not have the same level of development or requirement. For example, in the city of Los Angeles, "Typical long-term bicycle parking locations include Parking lockers or cages inside a building on the ground floor or primary building entrance level; Designated area on the ground floor of the parking garage; Designated space within owner's work or living space (City of Los Angeles. Department of City Planning, 2013, p. 12). Considering the parking inside the building

Figure 1.58. Ector Hoogstad Architecten. (2019). *Bicycle parking Stationsplein*. Source: https://www.facebook.com/photo?fbid=3200879383337102&set=pcb.3200879550003752

Figure 1.59. Bicycle parking spots are increasingly being included into municipal laws in both public and private structures. Sometimes it is necessary for them to be on the ground floor or to be accessible. Source: https://ao.aargautourismus.ch/de/punkt/e-bike-ladestation/velostation/58990875/

Figure 1.60. wUrck. (2018). *Strawinskylaan bicycle parking*. Source: https://archello.com/project/strawinskylaan-bicycle-parking

Figure 1.61. One of the advantages of the bicycle is that, in some cases, it is not a transport for a single person; some use trailers to transport passengers or children. Source: https://curbsidecycle.com/blogs/blog/9-reasons-we-love-nihola

is closely related to the time invested in the trip because, although a small parking lot is acceptable for long journeys such as those associated with tourism, daily trips require efficiency and thus, parking as close as possible to the final destination (Sangalli & Pinzuti, 2020, p. 24).

Where car and bike racks are a must, developers often try to trade fewer for more bike racks to save costs, especially when these spaces require excavation (HUB Cycling, 2017, pp. 36, 40) (Figure 1.60). In any case, when it is possible to promote appropriate parking for bicycles within a system that works, more cyclists are gained, car traffic is reduced, people exercise, environmental impact is reduced, the accessibility of spaces is improved, and all those benefits of the bicycle are promoted from architecture (Celis & Bølling-Ladegaard, 2008, p. 8).

Considering available space may sound complicated; ramps, parking lots, and everything requires space. However, an exciting possibility is that of sharing. They shared parking lots between several offices or businesses and ramps shared by several buildings. Actions like these allow more ample and comfortable spaces to ensure good circulation. More comfortable spaces are essential for other trends in bicycle mobility, such as cargo bikes. "The 'cargo bike revolution' was initially driven by the desire to make cities more efficient (Figure 1.61). Radical changes in the distribution of goods were needed at a time when the digital economy and e-commerce were booming" (Popan, 2019, p. 13). Also, "in recent years the use of cargo bikes and cycle trailers to carry children or goods has become increasingly widespread" (Andersen et al., 2012, p. 8).

The shared format in the bicycle world is familiar. "Despite the many advantages of cycling, some aspects hinder the transition from less sustainable transport modes. It requires acquiring a bike and having it available when needed. To overcome these issues, bike-sharing schemes (BSS) were created (Nogal & Jiménez, 2020). In particular, recent years have seen a huge increase in bike-sharing systems, and spatial organization plays an important role here. “Good station placement can attract riders, serve as a permanent promotion for the system itself, create value for sponsors, contribute to larger road safety designs, and add activity to the pedestrian realm” (NACTO National Association of City Transportation Officials, n.d., p. 9) (Figure 1.62). The European Parliament has also identified the promotion of shared formats as an interesting strategy and, in those same recommendations, it lists other important points that have been pointed out up to now as “Build separate and safer cycle tracks” y “Create spacious secure and sheltered bicycle parking facilities near public transport stops” (TRT - Trasporti e Territorio, 2010).

Bike buildings need to put bikes before cars, which includes designing circulation spaces to accommodate bike movement and ensuring cyclists are protected from the weather whenever possible (Fleming, 2012, p. 155). In addition, architecture should accommodate the bicycle and the ideal of cycling (Figure 1.63).

> Washington’s Bikestation was not built to serve a demand, like a station in the Netherlands. It was built to create a demand. Its function is mostly symbolic. It was built to raise the profile of cycling in a sprawling car city, where it is assumed cyclists must share road space with drivers. Architectural symbols of power are conferred upon cyclists by proxy, hopefully so that drivers show them respect. By Outch standards the Washington Bikestation was hideously expensive, costing 3 million dollars while providing storage for less than 100 bicycles. However, the District of Columbia Department of Transportation, in funding this building, banked en converting more than 100 Washington drivers to cycling. Three million dollars was the cost of an architectural sign to the whole city that the district sanctions cycling. Authorities in Washington seem to have taken the view–though they may not have used the same terms–that expanding the empire of cycling in the USA requires more than simply an expansion of bicycle paths and the raising of public awareness. For the Romans, new roads and show-crucifixions were not enough either. Rome had to replicate its principal buildings throughout

Figure 1.62. The shared format is an excellent strategy to promote the use of bicycles. It is possible that it is not only available but also very close to you when you need it. Source: https://commons.wikimedia.org/wiki/File:Bikemi_duomo_Milan.jpg

Figure 1.63. The bicycle architecture must prioritize distribution systems based on cyclist movement to be safe, easily accessible, and primarily accessible. Source: https://www.archdaily.com/806102/12-inspiring-architectural-projects-for-bicycles?ad_medium=gallery

Figure 1.64. Grupo Aranea. (2011 - 2013). Twisted valley. Source: https://www.archdaily.com/806102/12-inspiring-architectural-projects-for-bicycles?ad_medium=gallery

Figure 1.65. Annie Scheel. (2010). *BIKE, Parking lot transformed into Urban cycling oasis*. Source: https://inhabitat.com/philadelphia-parking-lot-transformed-into-cycling-oasis/

> the occupied colonies before Rome's subjects believed it was in charge (Fleming, 2012, p. 89).

Thus, architecture has a vital role in constructing the bicycle culture-architecture. Just as the cities where highways dominate show their interest in the car and their hunger for fuel, so there are cities where public spaces dominate, and the experience abroad is necessary; likewise, the city where the infrastructure and buildings begin to talk about the bicycle will represent the interest to change (Figure 1.64).

Infrastructure and buildings may be the flags, but they must have the appropriate policies. In Denmark, cyclists of all ages are supported with trikes for those who no longer have the balance they had a few years ago or electric bikes for those who lack strength; while supermarkets provide carports and repair stations, and Libraries rent cargo bikes (The City of Copenhagen. Technical and Environmental Administration, 2015) (Figure 1.65). On the other hand, in Austria, recommendations such as: "Consider cycling during spatial planning and incorporate it into building regulations;" "Spatial planning should facilitate short trips suitable for cycling by ensuring an adequate land-use mix;" "Cycling-friendly building regulations should set detailed requirements (including secure bicycle parking, chargers, positioning of entrances, wide doors, oversized elevators, changing rooms, lockers and repair stands)" (Federal Ministry. Republic of Austria, 2021, pp. 40–50). Politics, space and culture affect each other and should complement each other.

Until now, a wide variety of conditions have been discussed to start thinking about the bicycle city, which includes bicycle buildings. It is necessary to advance one step at a time to reach this goal because today, it is pretty far from reality, but "but it all be gins with that first ride" (Fleming, 2012, p. 152). Considering the complexity and variety of situations, experimentation and adaptation will be necessary. In this sense, "the formulaic approaches of engineers can be discarded in favour of the creative ones that architects use. No two stretches of cycle space need ever be exactly the same" (Fleming, 2012, p. 154). These ideas will have to consider significant changes. Not even in Copenhagen, a city used as a world reference, where a large part of the public space is dedicated to bicycles, you can enter the buildings with a bicycle (Fleming, 2017a, pp. 48–49) (Figure 1.66).

We architects will have to think about how the bicycle spaces will be. Architects are not like engineers. Generally speaking, while engineers are trained to solve problems, architects are trained to look beyond. Faced with terrible climatic problems and prevailing inequality, the bicycle is shown as an essential contribution to facing these problems, but it will require spaces to function efficiently (Figure 1.67). The architecture of the bicycle must represent the same qualities that the bicycle has "health and wellbeing, stoic resilience, frugality, concern for the planet, refined design, fearlessness, fairness" (Fleming, 2012, pp. 87–89). So what else do we need to know before we start acting? (Fleming, 2017a, p. 14). It is not about making bridges for bicycles because the cars can flow freely underneath (Fleming, 2017a, p. 197). It is necessary to change priorities and strive to understand what it means to cycle and the cyclist's needs (Palma & Meloni, 2022, p. 10). Precisely, "research on cyclists' perceptions and experiences is an important area for future work" (Forsyth & Krizek, 2011, p. 533).

Architects complain that they are pawns of politics, but they forget that the last great vision of the metropolis was promoted by architects fascinated by cars (Queimaliños, 2015). This idea changed the world in just a few decades. These are radical positions, but perhaps a radical position is precisely what we need considering how big and serious the problem is (Goodyear, 2015). The change will indeed require significant changes in legislation, as experiences in Canada have shown (HUB Cycling, 2017, p. 54). However, only architects will be able to think of buildings for bicycles "just as stables had to once be invented for horses, or as stations were invented for trains, new building types appeared in the 1920s for cars. We are thinking, to start with, of a purely utilitarian need" (Fleming, 2012, p. 45). "We are not just considering the space between buildings and how architects can make them bike

Figure 1.66. A paradigm shift is needed in the bicycle-architecture relationship since access to bicycles is prohibited even in bike-friendly cities, and there is no safe space to leave them. Source: https://www.compliancesigns.com/pd/osha-notice-no-bicycles-allowed-in-building-sign-with-symbol-one-9533

Figure 1.67. Michel Rojkind, Callaghan Horiuchi & Marlon Blackwell Architects. (2022) *Legder*. Source: https://www.armoneyandpolitics.com/first-bikeable-building-bentonville/

Figure 1.68. BIG Architects. (2010). Denmark pavilion, Shanghai Expo. Source: https://www.archdaily.com/57922/denmark-pavilion-shanghai-expo-2010-big?ad_medium=gallery

friendly. We are thinking of buildings themselves and what architects can do to make them natural generators and receptors of bike trips" (Fleming, 2017a, p. 174) (Figure 1.68).

To understand how these principles can materialize in built space, three examples are briefly commented on below: *Post-Car World* by Elena Cogato Lanza, *Velotopia* by Steven Fleming and *Madrid Cycle-Space* by Luis Gallego Pachón.

Elena Cogato Lanza, Farzaneh Bahrami, Simon Berger, and Luca Pattaroni (Cogato Lanza et al., 2021) developed research between Lausanne and Geneva to envision a future with virtually no motor vehicles, the Post-Car era. The analysis of the territory's densities, configurations, urban policies and historical transformation leads the authors to propose evaluating the old, non-hierarchical networks. This proposal confronts the modern highway systems favouring uneven development in a region with fewer vehicles per inhabitant. The research shows that a move away from self-mobility would allow the development of a sustainable public transport system. It recognizes the potential of configuring compact centres favouring walking and cycling (Figure 1.69).

As also seen throughout this chapter, Steven Fleming (Fleming, 2017a) studies and optimize buildings designed for the bicycle. These elongated buildings stretch for hundreds of meters, but the diagonal predominates instead of the horizontal predominating. After doubling the surface, the ramp becomes the backbone of the raised buildings that rise out of the ground. This distribution space allows even to enter the apartments with a bicycle, turning the corridor into a broader space that allows different circulation speeds (Figure 1.70).

Luis Gallego Pachón (Gallego Pachón, 2015) analyses the current Madrid and designs a multi-scale plan to connect the city through the use of bicycles. At the urban scale, it analyses the topography, slopes and routes to formulate the networks and nodes through a hierarchical system that defines primary and secondary routes and nodes. At the building scale, this proposal defines a series of structures organized typologically to define the different types of nodes, circulation channels and parking lots. In the scale of detail, the author defines the support structures, spaces' dimensions and the elements' materiality. Finally, all these elements are applied to the conditions of the streets of Madrid, and the proposed typology will adapt to various situations (Figure 1.71).

These three cases show how different approaches and contexts can address the transition to the cycle space. Fleming, in the wake of the modern avant-gardes of the 1900s, imagines a new settlement form, *Velotopia*, still without a specific place; Cogato Lanza and Gallego Pachón instead apply their design research to real contexts: the first builds a scenario for a vast peri-urban territory; the second designs a cycling layer over the city of Madrid.

Beyond the differences among the aspects that these researchers have in common, one question emerges if we look at them from the point of view of architecture. In the distribution systems that allow the cycle space to function, the architectural device of the inclined plane plays an important role. Regardless of the design scales and contexts of application, bicycles can only travel vertically through the architecture, moving along oblique surfaces. The vertical distribution must occur on inclined planes, whether it crosses a territory or the bicycle travels through a building or an altimetrically connoted part of the city. This element - which replaces the stairs - not only requires an adequate architectural and technical response each time concerning slopes, measurements, radii of curvature, etc., thus becoming a dominant component for the architectural definition of cycle buildings, but, as I will try to argue in the following chapters, relates the cyclo-architectures with those terrestrial forms that are described by the territorial routes.

The construction of the cycling city requires to superimposed an imaginary of earthly forms and figures that cross the entire history of architecture.

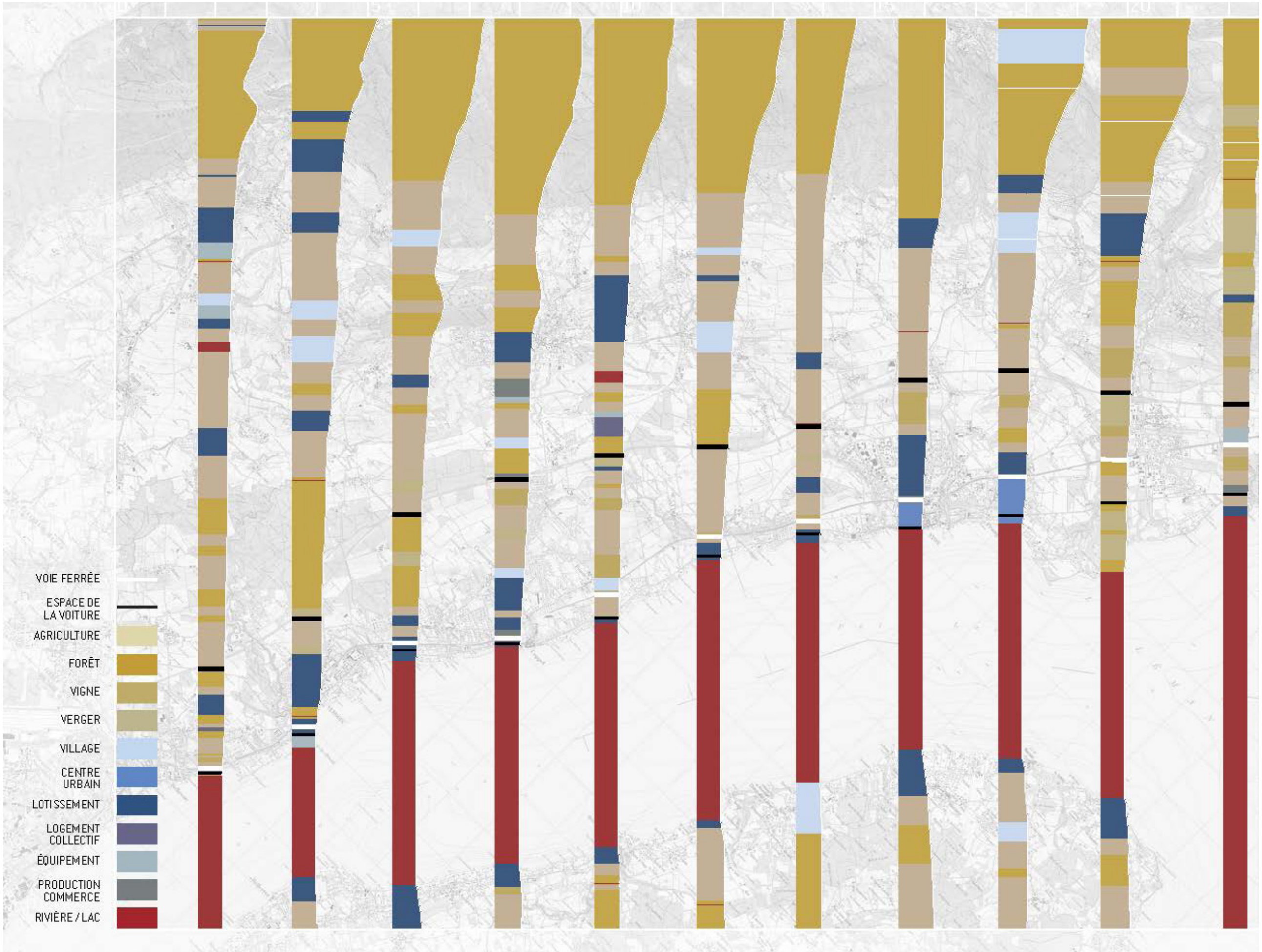

Figure 1.69. Cogato Lanza, E., Bahrami, F., Berger, S., & Pattaroni, L. (2021). Post-car world: Futurs de la ville-territoire. In *Post-car world futurs de la ville-territoire*. MetisPresses.

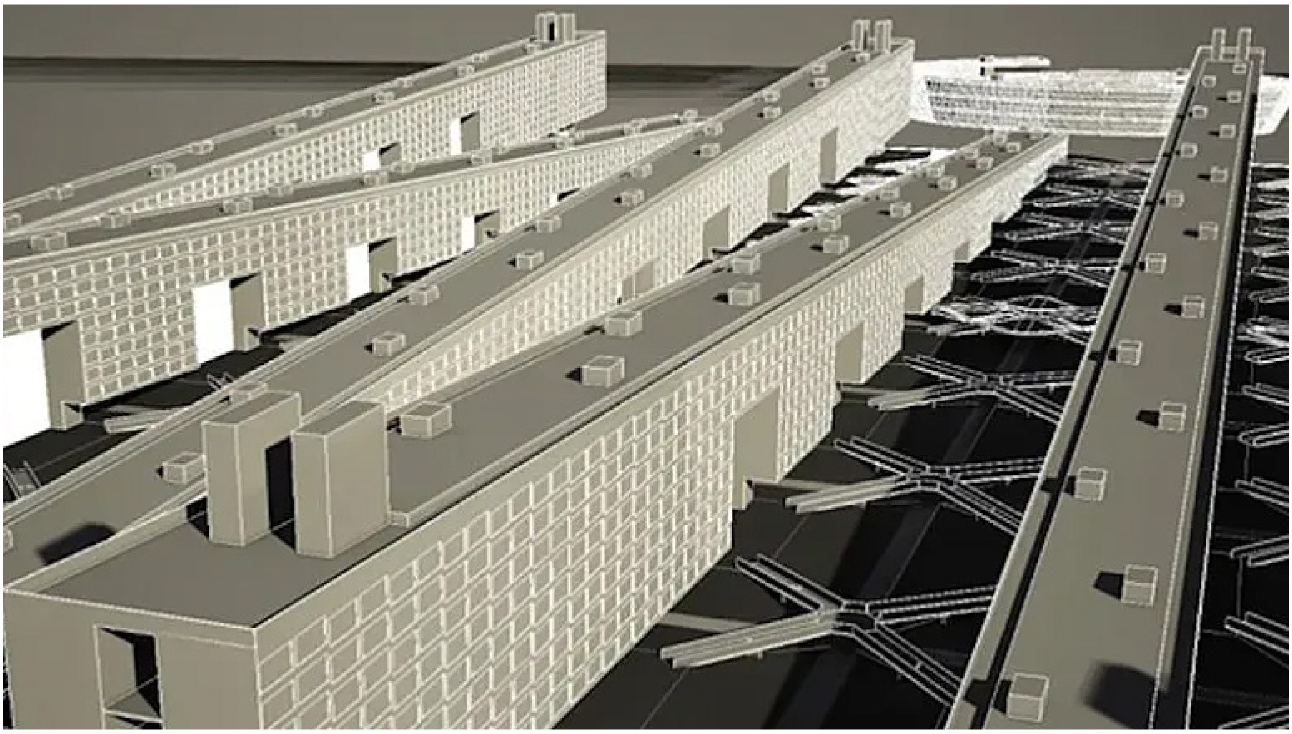

Figure 1.70. Fleming, S. (2017). *Velotopia. The production of cyclespace in our minds and our cities*. nai010 publishers.

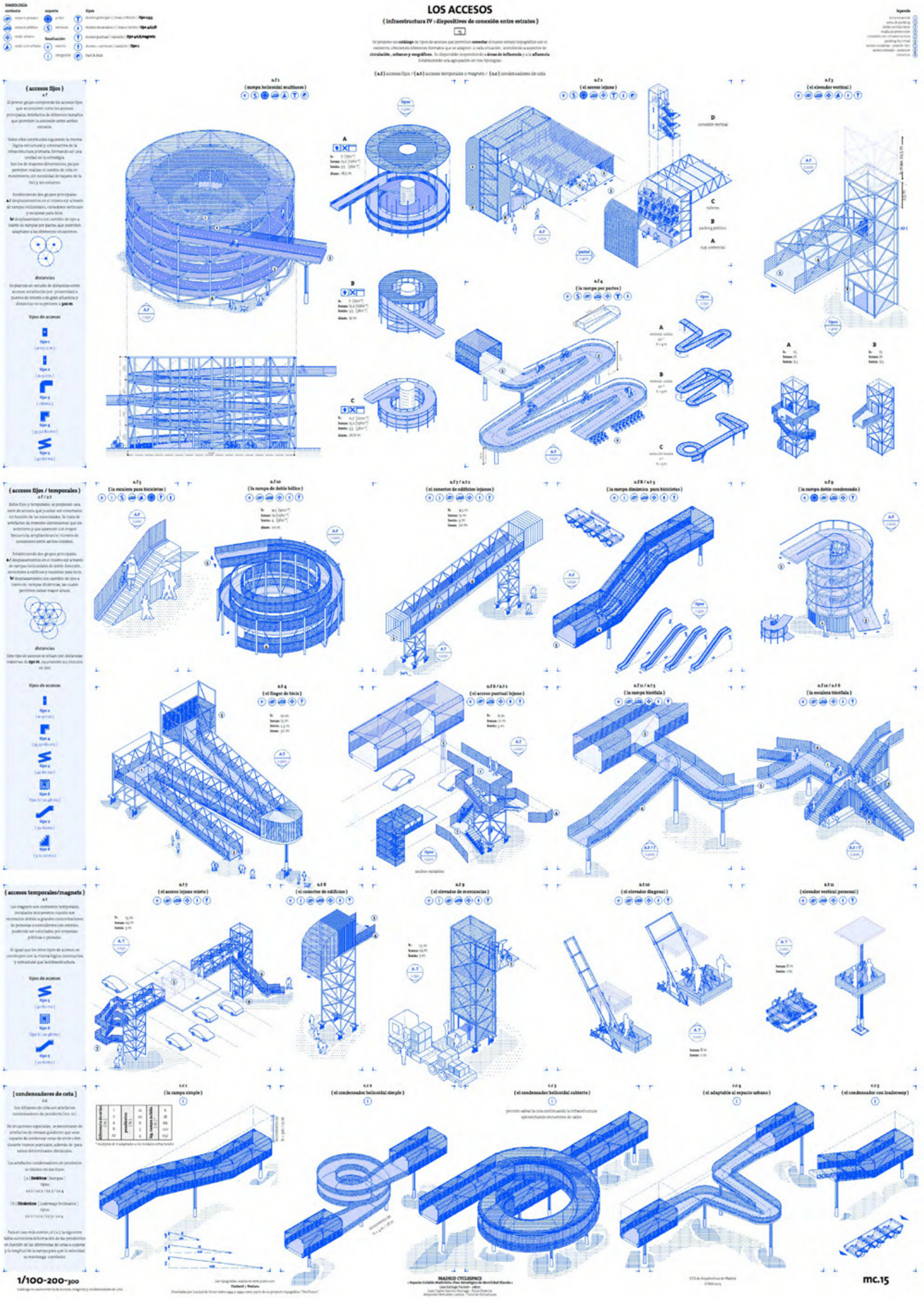

Figure 1.71. Gallego Pachón, L. (2015). *Madrid Cycle-space. Espacio ciclable madrileño: Plan estratégico de movilidad blanda* [PhD Thesis]. Universidad Politecnica de Madrid.

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INCLINED PLANE: TWO THEORETICAL PRECEDENTS IN ARCHITECTURE

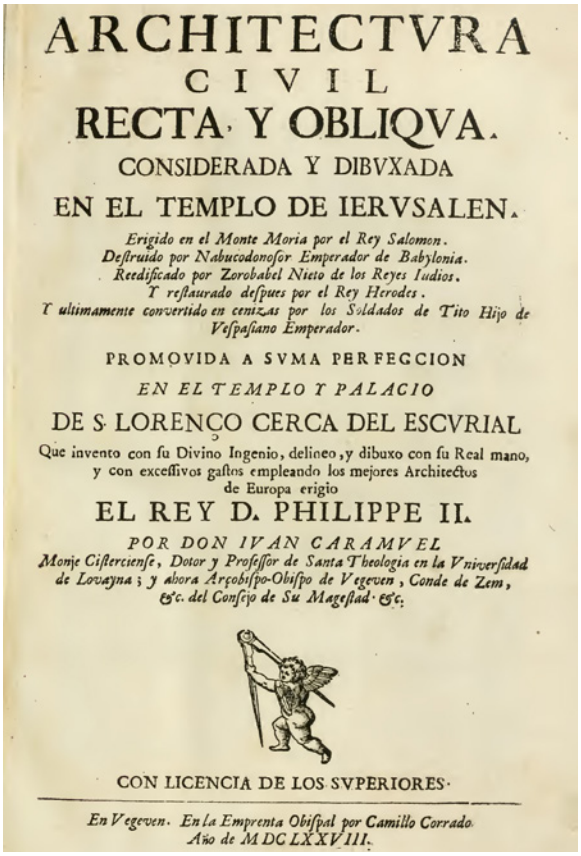
CHAPTER II

2.1. Juan Caramuel and the *Architectura civil recta y obliqua*

Juan Caramuel, son of Lorenzo Caramuel, a native of Bohemia and artilleryman in the service of the Spanish crown and Catalina, a nobleman from Flanders, was born in Madrid on May 23, 1606, and died in a town in northern Italy Vigevano in 1682 with the title of bishop of the catholic church (Borselli & Pagliardini, 2012, p. 9; Esteve Secall, 2005, p. 74).

Since he was a child, he showed great interest in learning a diversity of subjects, among which languages and mathematics stand out (Iurilli, 2014, p. 81). Caramuel even studied exotic languages such as Chinese, became known as an outstanding polygraph, and explored the possibilities of creating a universal language (Escalante Rubio, 2015, p. 34), while his outstanding studies on mathematics even led him to publish an astronomical table when he was barely ten years old (Esteve Secall, 2005, p. 74). In other words, in addition to Cistercian Bishop, Caramuel was a cosmopolitan scientist, a powerful personality who marked the seventeenth century for his dedication and knowledge on a wide variety of subjects (Iurilli, 2014, pp. 16–17).

These interests in multiple fields of knowledge led him to hold discussions with many of the most important figures of the time, who became interested in his work as a result of the important texts that he published (Escalante Rubio, 2015, p. 34; Navarro Morales, 2018, p. 163). These documents include seventy publications and a couple of hundred manuscripts (Navarro Morales, 2018, p. 163). Thanks to this production, today he is not only recognized as a scholar for his handling of various areas of knowledge, but he has also become a central object of study based on the advances that he materialized through his publications (Escalante Rubio, 2015, p. 34)..



ARCHITECTVRA
CIVIL
RECTA Y OBLIQVA.
CONSIDERADA Y DIBVXADA
EN EL TEMPLO DE IERVSALEN.

Erigido en el Monte Moria por el Rey Salomon.
Destruido por Nabucodonosor Emperador de Babylonia.
Reedificado por Zorobabel Nieto de los Reyes Iudios.
Y restaurado despues por el Rey Herodes.
Y ultimamente convertido en cenizas por los Soldados de Tito Hijo de Vespasiano Emperador.

PROMOVIDA A SVMA PERFECCION
EN EL TEMPLO Y PALACIO
DE S. LORENÇO CERCA DEL ESCVRIAL
Que invento con su Divino Ingenio, delineo, y dibuxo con su Real mano, y con excessivos gastos empleando los mejores Architectos de Europa erigio
EL REY D. PHILIPPE II.

POR DON IVAN CARAMVEL
Monje Cisterciense, Dotor y Professor de Santa Theologia en la Vniversidad de Lovayna; y ahora Arçobispo-Obispo de Vegeven, Conde de Zem, &c. del Consejo de Su Magestad &c.

CON LICENCIA DE LOS SVPERIORES.

En Vegeven. En la Emprenta Obispal por Camillo Corrado. Año de MDCLXXVIII.

Figure 2.01. Cover page source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

Figure 2.02. First page source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

Another subject in which he showed a particular interest was in both civil and military architecture where he recognized himself as a theoretician and a practitioner and criticized his colleagues for their lack of scientific perception (Escalante Rubio, 2015, p. 6; Gil Saura, 2014, p. 1). His interest and studies on the subject led him to publish his treatise *Architectura Civil Recta y Obliqua* (Figure 2.01). This was his only work on the subject and it was published in Spanish in 1678 and then in Latin in 1681 (Navarro Morales, 2018, p. 163). But *Architectura Civil Recta y Obliqua* is not only the result of Caramuel's thoughts during his old age, this publication is a compilation of notes that he developed through his travels and that, according to the author himself, date back to 1624: "Empeçe a escribir y delinear esta ideas alla en España, siendo mozo, año de 1624, con occasion de una hermosa capilla, que en nuestro Monasterio se erigia: y ahora me hallo harto viejo, y siempre las voy perficionando"[3] (Caramuel Lobkowitz, 1678, vol. II, Tratado VI, p. 2) (Figure 2.02).

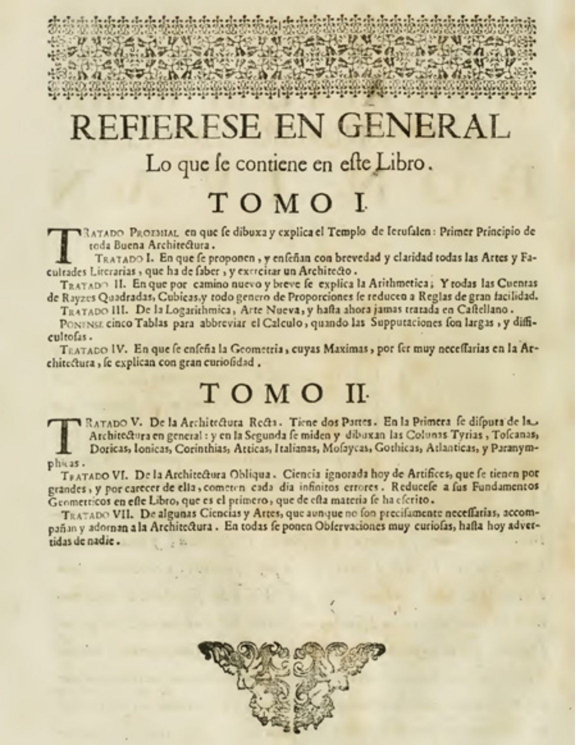
Although some of the contents of this work were included in previous publications, the treatise concentrates also all unpublished information product of more than 50 years of reflections on the subject (Pena Buján, 2007, pp. 15–72). Through his travels through Italy, Germany, the Netherlands, Caramuel builds a cultural identity that he seeks to concentrate and transmit to the architects of his country through his treatise (Iurilli, 2014, p. 71). In other words, Caramuel's experience mixes a large number of styles and ideas learned through his encounter with great personalities of the moment (Escalante Rubio, 2015, pp. 34–35) and the experience of different forms of architecture.

Especially until 1950, *Architectura Civil Recta y Obliqua* was one of the few examples of interest in the architecture of the time that did not come from a historian or foreign scholar, one of the reasons why it became an important reference (Escalante Rubio, 2015, pp. 34–35). The treatise is formulated by means of an encyclopaedic structure that seeks to review all the issues that the author considers necessary for the architect through a multidisciplinary position that demonstrates the complexity of the culture of the moment, that is, it cannot be understood as a practical manual (Iurilli, 2014, p. 17). In the same sense, the texts generally do not develop the indicated topics in a clear and concrete way, but the ideas must be completed with parts of different volumes (Pena Buján, 2007, p. 74).

In this publication, Caramuel reflects on the art of building as a classical tradition and manages to compose one of the most complex and interesting documents of the seventeenth century (Pena Buján, 2007, p. 15). One of the particularities of the text is that it is understood as one of the first recognitions of the importance of history in the education of the architect, which is why it tries to articulate a history of architecture that includes its manifestations at different times and places and present it in an orderly way (Navarro Morales, 2018, p. 163). This interest in presenting a well-organized document is evident and can be recognized from its table of contents where the grouping of topics is explained in three volumes, two of text and one of explanatory illustrations. The first two volumes are presented as follows (Caramuel Lobkowitz, 1678 Table of contents):

TOMO I

- **TRATADO PROEMIAL** en que se dibuxa y explica el Templo de Ierusalen: Primer Principio de toda Buena Architectura.
- **TRATADO I**. En que se proponen, y enseñan con brevedad y claridad todas las Artes y Facultades Literarias, que ha de saber, y ejercitar un Architecto.
- **TRATADO II**. En que por camino nuevo y breve se explica la Arithmetica; y todas las Cuentas de Rayzes Quadradas, Cubicas, y todo genero de Proporciones se reducen a Reglas de gran facilidad.
- **TRATADO III**. De la Logarithmica, Arte Nueva, y hasta ahora jamas tratada en Castellano. Ponenses cinco Tablas para abbreviar el Calculo, quando las Supputaciones son largas, y dificultosas.



REFIERESE EN GENERAL

Lo que ſe contiene en eſte Libro.

TOMO I.

TRATADO PROEMIAL en que ſe dibuxa y explica el Templo de Ieruſalen: Primer Principio de toda Buena Architectura.

TRATADO I. En que ſe proponen, y enſeñan con brevedad y claridad todas las Artes y Facultades Literarias, que ha de ſaber, y exercitar un Architecto.

TRATADO II. En que por camino nuevo y breve ſe explica la Arithmetica; Y todas las Cuentas de Rayzes Quadradas, Cubicas, y todo genero de Proporciones ſe reducen a Reglas de gran facilidad.

TRATADO III. De la Logarithmica, Arte Nueva, y haſta ahora jamas tratada en Caſtellano.

PONENSE cinco Tablas para abbreviar el Calculo, quando las Supputaciones ſon largas, y difficultoſas.

TRATADO IV. En que ſe enſeña la Geometria, cuyas Maximas, por ſer muy neceſſarias en la Architectura, ſe explican con gran curioſidad.

TOMO II.

TRATADO V. De la Architectura Recta. Tiene dos Partes. En la Primera ſe diſputa de la Architectura en general: y en la Segunda ſe miden y dibuxan las Colunas Tyrias, Toſcanas, Doricas, Ionicas, Corinthias, Atticas, Italianas, Moſaycas, Gothicas, Atlanticas, y Paranymphicas.

TRATADO VI. De la Architectura Obliqua. Ciencia ignorada hoy de Artifices, que ſe tienen por grandes, y por carecer de ella, cometen cada dia infinitos errores. Reduceſe a ſus Fundamentos Geometricos en eſte Libro, que es el primero, que de eſta materia ſe ha eſcrito.

TRATADO VII. De algunas Ciencias y Artes, que aunque no ſon preciſamente neceſſarias, accompañan y adornan a la Architectura. En todas ſe ponen Obſervaciones muy curioſas, haſta hoy advertidas de nadie.

Figure 2.03. Table of Contents source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

Figure 2.04. "Parte IV" cover page source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

- **TRATADO IV**. En que se enseña la Geometria, cuyas Maximas, por ser muy necesarias en la Architectura, se explican con gran curiosidad.

TOMO II

- **TRATADO V**. De la Architectura Recta. Tiene dos Partes. En la Primera se disputa de la Architectura en general; y en la Segunda se miden y dibuxan las Colunas Tyrias, Toscanas, Doricas, Ionicas, Corinthias, Atticas, Italianas, Mosaycas, Gothicas, Atlanticas y Paranymphicas

- **TRATADO VI**. De la Architectura Obliqua. Ciencia ignorada hoy de Artifices que se tienen por grandes, y por carecer de ella, cometen cada dia infinitos errores. Reduse a sus Fundamentos Geometricos en este Libro, que es el primero, que de esta materia se ha escrito.

- **TRATADO VII**. De algunas Ciencias y Artes, que aunque no son precisamente necesarias, accompañan y adornan a la Architectura. En todas se ponen Observaciones muy curiosas, hasta hoy advertidas de nadie[4] (Figure 2.03).

The first volume begins with an introduction in which the temple of Solomon is described and continues with the knowledge that every architect must have. These areas of knowledge are literary and mathematical. History is found in literature, but also spelling, calligraphy, steganography or the art of writing in encrypted codes, grammar, poetics, fables and paradoxes. In mathematics he defines arithmetic, logarithmic and geometric. Although arguably not a particularly innovative perspective, it is presented with strict and systematic rigor (Iurilli, 2014, p. 94). It could be understood that the introductory character extends to the entire first volume.

The second volume focuses directly on architecture and the definition of Straight and Oblique Architecture (Figure 2.04). On the one hand, the definition of Straight Architecture presents the forms of various architectural orders through the analysis of various ancient monuments. On the other hand, Oblique Architecture becomes the true distinct feature of the work, which, according to the author, arises in response to the need to synthesize the scientific spirit of its modern culture to make it the engine of the new architecture. Even so, this topic is not built from the mathematical rigor declared by the author, but this fact does not detract from the innovation that the concept represents (Iurilli, 2014, pp. 95–96). Later in the same volume, the author explains practical architecture through various examples and then points out some of the difficulties that the architect of the time had to face, proposing a series of resolutions.

The third volume presents a large selection of images hand-engraved of great quality and complexity, true works of art (Figure 2.05). According to the author himself, these images were engraved and collected during four decades of his life: "En hazerlas esculpir y gravar he gastado mas de quarenta años; porque desde el de M.DC.XXXV he ido empleando excelentes Artifices"[5] (Caramuel Lobkowitz, 1678, vol. I, Tratado III, Dedicatoria). It is also important to note that the images are closely linked to Caramuel's texts and serve to visualize many of his approaches and detailed descriptions (Figure 2.06).

Nowadays, *Architectura Civil Recta y Obliqua* continues to be an important document in the history of architecture that shows a mature reflection on the complexity of the architect's work. The same author faces the complexity of the discipline by defining it as "Arte de edificar" while understanding it as "Ciencia Practica" that is best demonstrated with examples (Caramuel Lobkowitz, 1678, vol. I, Tratado I, Articulo I, pp. 10 & Articulo IV, 30) (Figure 2.07).

This fact is represented in the way in which Caramuel feels obliged to introduce the reader to a series of previous knowledge before beginning to speak specifically about architecture (Figure 2.08). From there, Caramuel presents straight architecture as a historical reflection and framework to define what will be his most important contribution, Oblique Architecture.

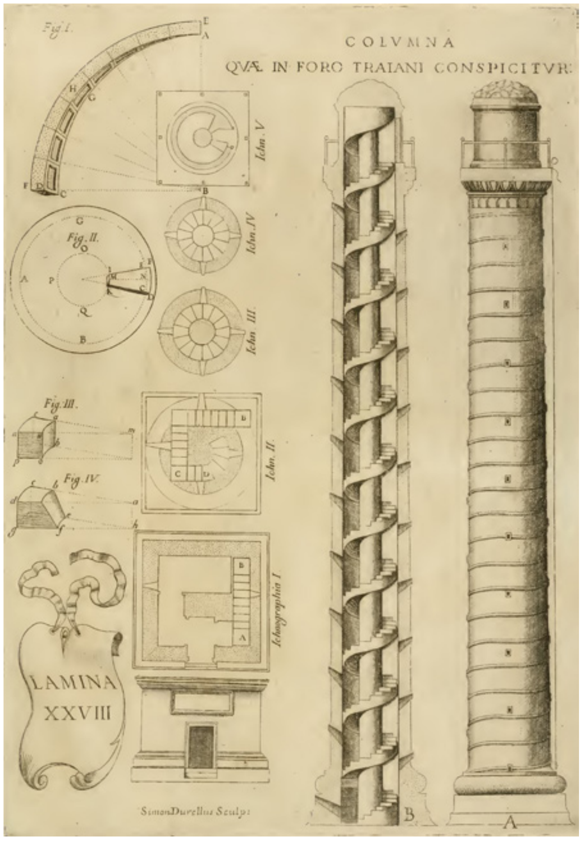


Figure 2.05. "Lamina XXVIII" source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

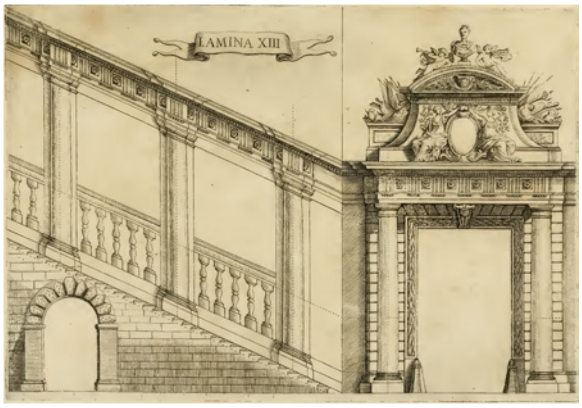


Figure 2.06. "Lamina XIII" source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

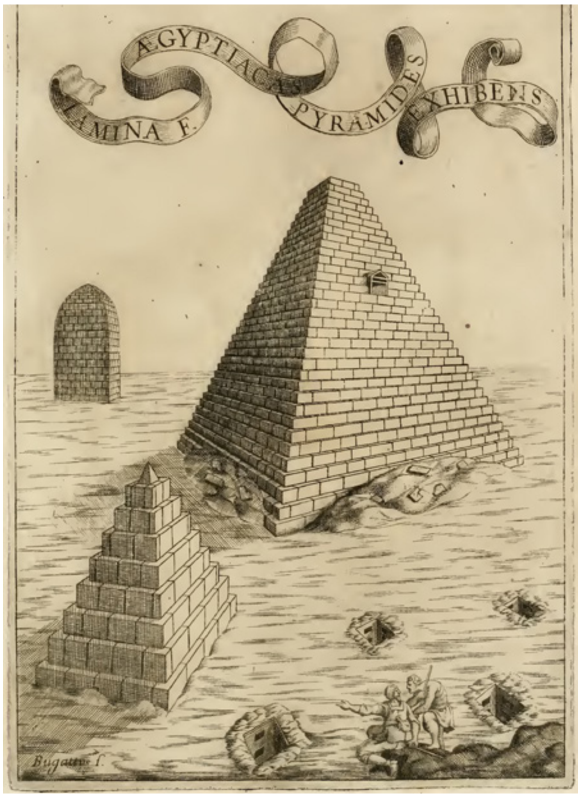


Figure 2.07. "Lamina F" source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

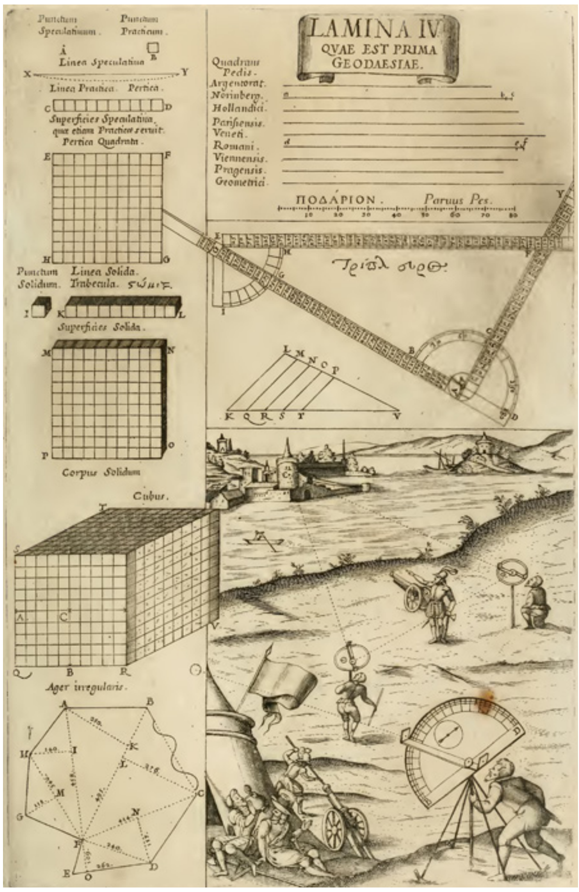


Figure 2.08. "Lamina IV" source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

2.1.1. Oblique Architecture foundation

Caramuel not only founds Oblique Architecture as that architecture that derives from the relationship with the shape of the Earth, but also founds the idea that the Earth itself is an architecture, precisely oblique. Obliquity is therefore identified as the idea that allows us to consider the Earth and geographic elements as an architecture. Caramuel explains that Architecture can be Straight or Oblique. Straight Architecture is based on right angles:

> Trata la RECTA de edificios, con que sus suelos son al Horizonte parallelos, se hazen ad libellum, y tienen por Perpendiculares, las lineas que cayeron a plomo. Sobre estos Planos erige Muros rectos, y haze Salones, Camaras y Galerias[6] (Caramuel Lobkowitz, 1678, vol. II, Tratado V, Parte II, p. 30).

The vertical line associated with the divine, while the horizontal is closely linked with the human (a conception that can be seen in many cultures). On this perspective, "Caramuel develops his theory of Oblique Architecture based on this ontological distinction, and architecture becomes as a mediator between the vertical and the horizontal dimensions, between the divine and the human realms" (Navarro Morales, 2012, p. 125). In Caramuel words, the Oblique Architecture: "Occupase la OBLIQUA, donde el suelo se inclina (como lo haze en todas las Escaleras [...]) en los Pasadisos y Puertas, que corren en viage, en los Templos Redondos, o de figur Elliptica, en las Coronas que se ponen sobre las Ventanas"[7] (Caramuel Lobkowitz, 1678, vol. II, Tratado V, Parte II, p. 30) (Figure 2.09).

Studying the treatise it is evident that Oblique Architecture must rely heavily on mathematics, particularly on geometry, in order to be designed and built (Escalante Rubio, 2015, p. 9) (Figure 2.10). In part, this is the reason why Caramuel must include these themes in the first volume of the document and then materialize them through many of the illustrations that make up the third volume. Likewise, it is important to understand that Caramuel's Oblique Architecture does not focus only on the relationship between object and observer, but that he considers all spatial configurations that are not dominated by the right angle, such as inclined planes and curved facades (Iurilli, 2014, pp. 16–17) (Figure 2.11).

“La Architectura es Arte de edificar: dividola en Recta y Obliqua. Y digo, que esta Division la hago Yo; porque aunque ha havido muchos, que con acierto han tratado de aquella, de esta hasta ahora no ha escrito ni tratado ninguno”[8] (Caramuel Lobkowitz, 1678, p. 13). In other words, Caramuel understand that Oblique Architecture had existed, but no one explained it before him. In the same way, it is largely understood that, as a result of the Caramuel treaty, oblique solutions gained recognition from the architectural world (Esteve Secall, 2005, p. 76). Precisely as a result of the unprecedented nature of the concept, it is that the author sees himself in the obligation to present and explain Straight Architecture because the Oblique was born from there, in his own words: “Mi intento principal [...] fue escribir de la Architectura Qbliqua, de la qual no ha salido Libro, que yo sepa: pero como todas sus medidas han de nacer de la Recta, me vi obligado a explicarla tambien con la curiosidad que pude y supe”[9] (Caramuel Lobkowitz, 1678, pt. Orden de los Tratados)

Another important aspect to consider is not that only God created the world –that is, the shape of the Earth, but that the world is already considered by Juan Caramuel as architecture. In other words, God is understood as an architect, but the most relevant fact for this research is that the world is regarded as the first Oblique Architecture (Figure 2.12).

> El primer Architecto, que en el Cielo y la Tierra hecho lineas Obliquas, fue Dios [...] Mando en la Tierra, que obliquamente se engriesen y erigiesen los montes: y obliquamente corriesen los rios y arroyos por sus valles[10] (Caramuel Lobkowitz, 1678, vol. II, Tratado VI, Articulo II, p. 3).

In this line, God made the rivers, the mountains and the valleys, the orbits, the poles, so –seen in this way– Oblique Architecture has existed since creation. In this way, by giving God the role of

Figure 2.09. G. Maria Cassini, Riproduzione interpolata dell’altare di Sant’Alessio, fine XVIII sec. Incisione, Roma, Istituto Nazionale per la Grafica.

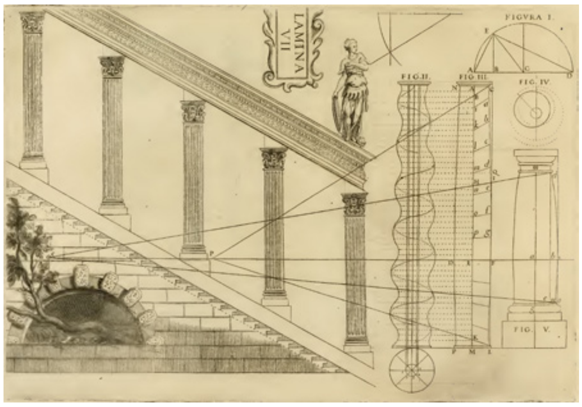


Figure 2.10. “Lamina VII” source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

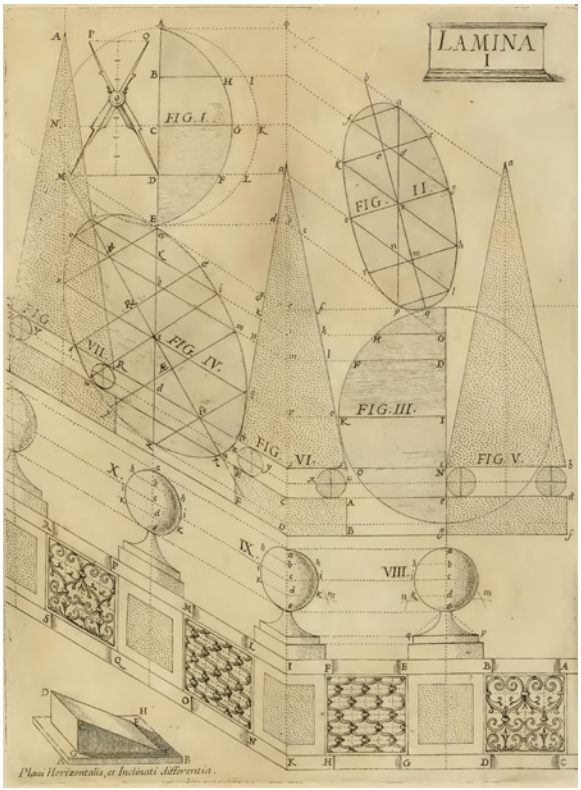


Figure 2.11. "Lamina I" source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

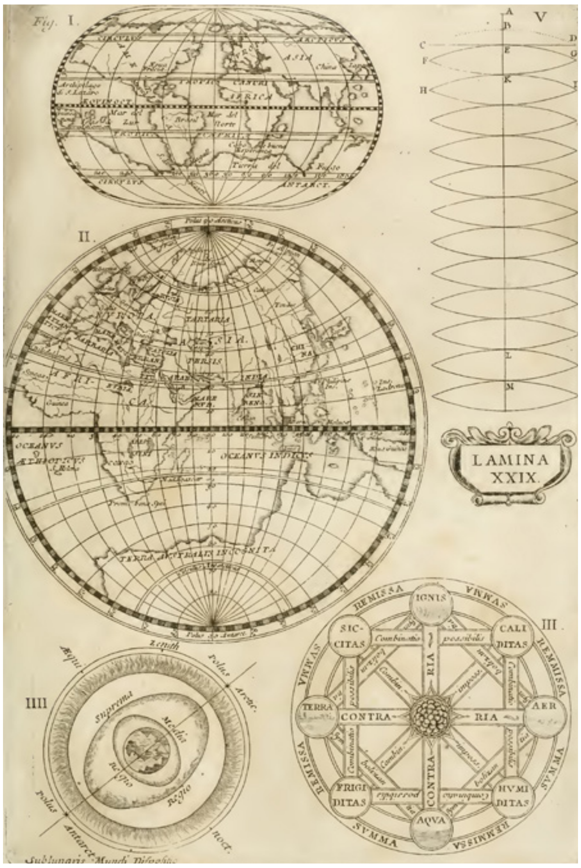


Figure 2.12. "Lamina XXIX" source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

the first architect who built obliquely, Caramuel legitimizes Oblique Architecture [...] Therefore, by stating that God had created the world obliquely, Caramuel also elevates the oblique above the straight" (Navarro Morales, 2012, p. 174). Oblique Architecture becomes a celebration of the world as it is (Navarro Morales, 2012, p. 217).

In addition to the above, Caramuel defines Oblique Architecture as the oldest, but at the same time Straight Architecture is necessary to understand and explain it, at least from the geographical, temporal and cultural context from which he writes the work. In Caramuel's words, Oblique Architecture "se origina y procede de la Comun, que en sus Libros nos enseña Vitruvio"[11] referring to Straith Architecture as the common one (Caramuel Lobkowitz, 1678, vol. III, Part. IV, Cover). This kind of contradiction characterizes and also enriches the author's reflection through a dialectical discourse where each of these two versions mutually enrich each other.

Although Caramuel points out that Oblique Architecture is the most common, in the first page of that chapter the author explains: "muchas cosas he visto bien labradas, y en ellas las Leyes de la Architectura Obliqua bien executadas; he visto tambien Reales Edificios muchos yerros; porque como no hay ningun libro, que trate de Architectura Obliqua, y son de ordinario Albañiles"[12] (Caramuel Lobkowitz, 1678, vol. II, Tratado VI, p. 1). In short, "La inclinacion, por ser mas ordinaria, es mas conocida, y menos bien executada"[13] (Caramuel Lobkowitz, 1678, vol. II, Tratado VI, Articulo 4, p. 6). Following the same line, Caramuel also points out that all architects must learn Oblique Architecture because there are many tilted floors to which they must adapt, more specifically: "Hanla de conocer forzosamente los que obran edificios de Architectura Recta, porque ellos hay muchos suelos, que se inclinan"[14] (Caramuel Lobkowitz, 1678, pt. Orden de los Tratados, p. 37) (Figure 2.13). Through this perspective from which he studied classic architecture, Caramuel's vision became one of the most subtle and at the same time controversial episodes in the long evolution of the language of the classical orders from its original conception, where capitals, cornices, architraves found a broad discursive development in his treatise (Bérchez, 2018, p. 191) (Figure 2.14).

To teach Oblique Architecture Caramuel starts from the Vitruvian principles *firmitas, utilitas* and *venustas*. In the same way he dedicates the first chapters of the treatise to mathematics, the second volume explains the architectural orders from a classical point of view. From there, the author explains how to design oblique elements starting from straight elements, that is, the geometric manipulation will be what allows to achieve this transformation, but "oblique elements are thus slanted but not deformed, have to be comparable in beauty to the works of Straight Architecture" (Navarro Morales, 2012, p. 173). In this transformation process, the horizontal lines must adapt to the terrain and thus become oblique following the terrain trends, but the vertical lines must remain vertical (Navarro Morales, 2012, p. 213) In short, Caramuel seeks an adaptation of the architectural principles to the particularities of the place (Figure 2.15). Recognizing the originality of its proposal and valuing its importance, Caramuel gives Oblique Architecture the rank of new art:

> Hoy nace una Arte Nueva; (Otava entre las Liberales, Decima entre las Musas) de la qual nadie ha escrito en el mundo. LA ARCHITECTVRA OBLIQVA, digo: porque a ella se ordena, quanto de la Architectura Recta, quanto de el Templo de Ierusalen, quanto de la Aritmetica, Geometria, Logarithmica, Pictoria, Estatuaria, Perspectiva, y otras diversas Ciencias en este Libro se disputa[15] (Caramuel Lobkowitz, 1678, pt. Dedicatoria).

But what is more important and pertinent for this work is that Oblique Architecture highlights the importance of adapting clearly defined designs from the Greeks –which today could have similarities with standardized systems– to the needs of each place (Figure 2.16). Even so, as scholars of his treatise have pointed out, Caramuel, recognizing the importance of these Vitruvian origins, points out that any transgression "could not be a matter of mere whim, but had to arise from the need to adapt to the irregularities of a particular site" (Navarro Morales, 2012, pp. 168–169).

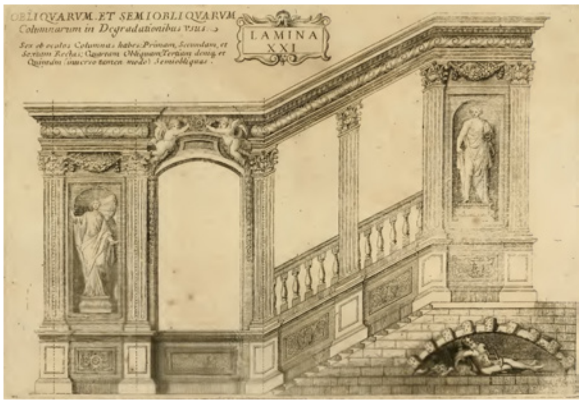


Figure 2.13. "Lamina XXI" source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

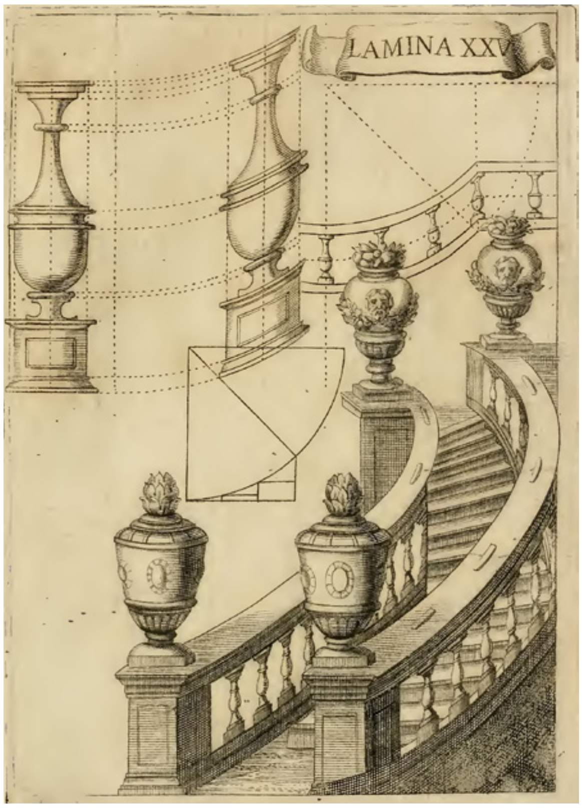


Figure 2.14. "Lamina XXV" source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

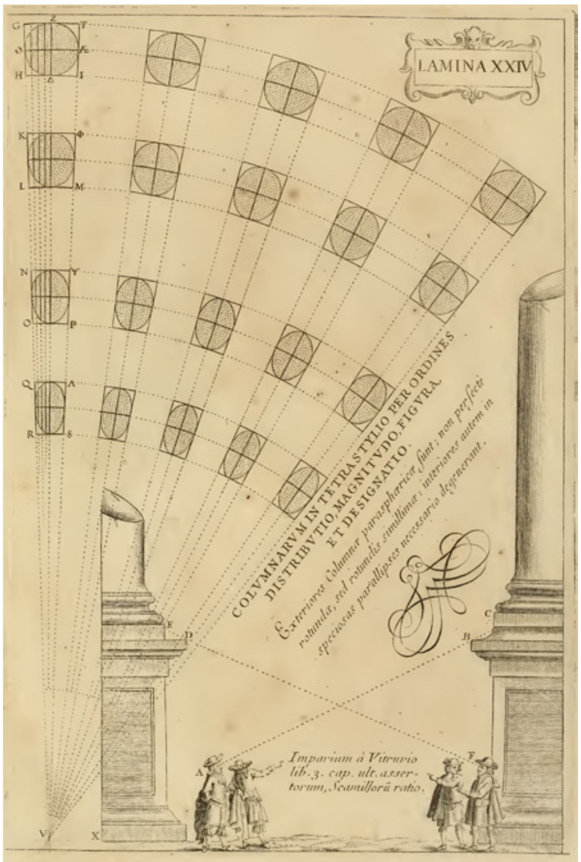


Figure 2.15. “Lamina XXIV” source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

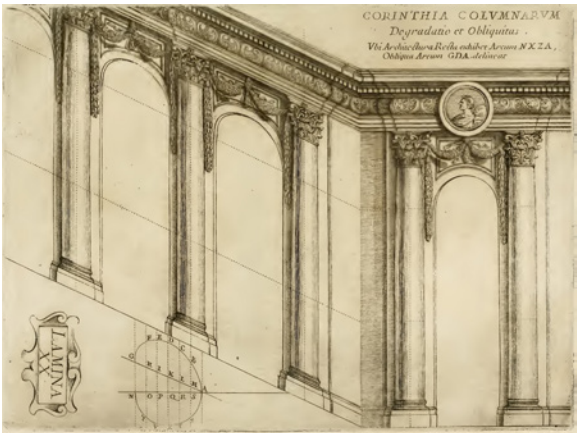


Figure 2.16. “Lamina XX” source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

In short, Oblique Architecture seeks to celebrate the slope of the terrain rather than flatten it and presents ways of adapting the classical orders of architecture to these irregularities: “No solamente en las montañas, sino tambien en las Ciudades hay sus valles y cuestas, y en ellas se edifican Palacios [...] Y porque no todos saben edificar en lugares declives, es menester poner esta advertencia”[16] (Caramuel Lobkowitz, 1678, vol. II, Tratado VI, Articulo X, p. 16). Although the author uses God to support this theory and denote its importance, it is a revolutionary position that aligns with the positions that architecture currently follows.

For Caramuel, therefore, it is not just a question of understanding how architecture can adapt and deform according to the obliquity of the Earth, but, reciprocally, how the Earth itself, through architecture, can finally be described. The movement is in two directions, there is a situation of undecidability. In this sense, the description that architecture can make of the Earth can only be diagrammatic. Obliquity holds the two terms together in general on a theoretical level, but only the diagram makes the relationship operational.

2.1.2. The Diagram

In the first chapters of his treatise, Caramuel explains thanknowing other disciplines is necessary to design Oblique Architecture. He divides these disciplines into those that must be learned before architecture, that is, literature and mathematics, and those that can complement his training such as painting, sculpture, music and astronomy (Caramuel Lobkowitz, 1678, vol. II, Tratado VII, pp. 40–41) (Figure 2.17). But what is more interesting is that the author points out that all these disciplines have something in common, the διαγραμματα which is translated as the diagram. In other words, it is understood that the action and reflection of working on sketches (in all its possible levels of complexity) through different means of representation is a need shared by all these disciplines. To define this concept, Caramuel goes through different disciplines:

> De la pintura. ΔΙΆΓΡΑΜΜΑ es un vocablo Griego, que el solo significa, quanto hazen estas Facultades y Ciencias, que con la gala de sus especulaciones adornan a la Architectura. Ellas son l'Arte Pictoria, la Estatuaria, la Perspectiva, la Musica, y la Astronomia; y que los Diagrammas sean los Objetos de todas estas Ciencias, se prueba manifiestamente. Porque las primeras lineas que tira sobre un lienço un Pintor, son διαγράμματα: y tambien lo son los Modelos, que haze en pequeño un Architecto, o Estatuario, paraque sin gastos se vea la forma y figura, que ha de tener despues el Palacio, que se manda edificar; o el Colosso, que se pretende hazer. Y este mismo nombre tienen las lineas occultas, que tira en una Tabla de Perspectivo, para cubrirlas despues de diversas colores. Bernardo Baldo, Abbad de Guastalla, en el Vocabulario Vitruviano. Est itaque Diagramma, cujusque rei per lineas expressa figura, imago-ve. Nos (Itali) voce pene Latina Disegni, e Figure lineationes istas dicimus. Y explica bien aquella voz; porque Διάγραμμα dice el Griego ΄απὸ τω διαγραφειν que es pintar, describir, dibuxar, delinear. Que las planas, en que con Notas escriben sus Melodias los Musicos, sean tambien Διάγpamma cosnta de lo que se lee en Vitruvio[17] (Caramuel Lobkowitz, 1678, vol. II, Tratado VII, p. 40).

In a few words, the Spanish includes as Diagrams the construction and composition on canvas, about the drawings made by astronomers and musicians to get closer to his ideas, but also about the drawings and even the models that sculptors and architects must make to develop their work (Figure 2.18).

Through the treatise, it is possible to understand the importance that Caramuel gives to graphic representation with the effort dedicated to the inclusion of a volume with images and also with the intention of using them as tools for learning, at the same time complementing the text and vice versa. According to authors such as Fernández-Santos, precisely the images guaranteed Caramuel's future, perhaps because some of his concepts are more to be seen than to be read (Fernández-Santos Ortiz-Iribas, 2014, p. 350).

Caramuel not only theorized about architecture through words, but also through images. Much

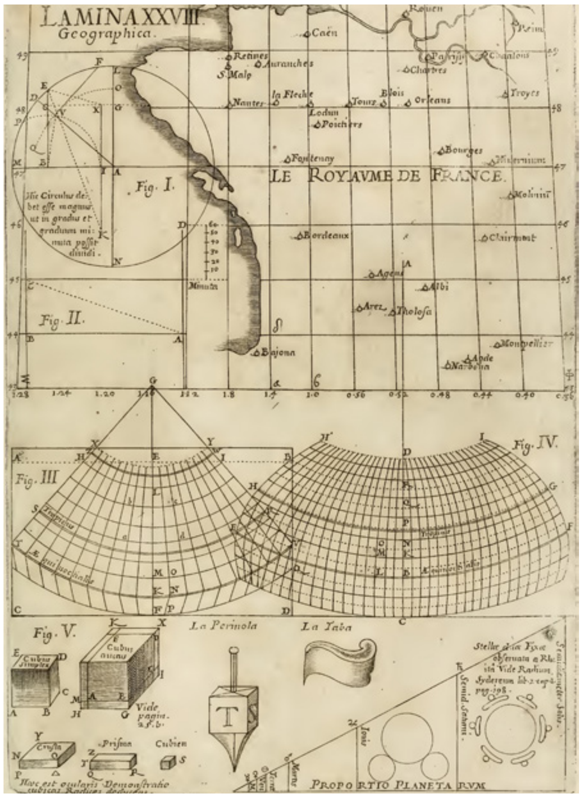


Figure 2.17. "Lamina XXVIII" source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

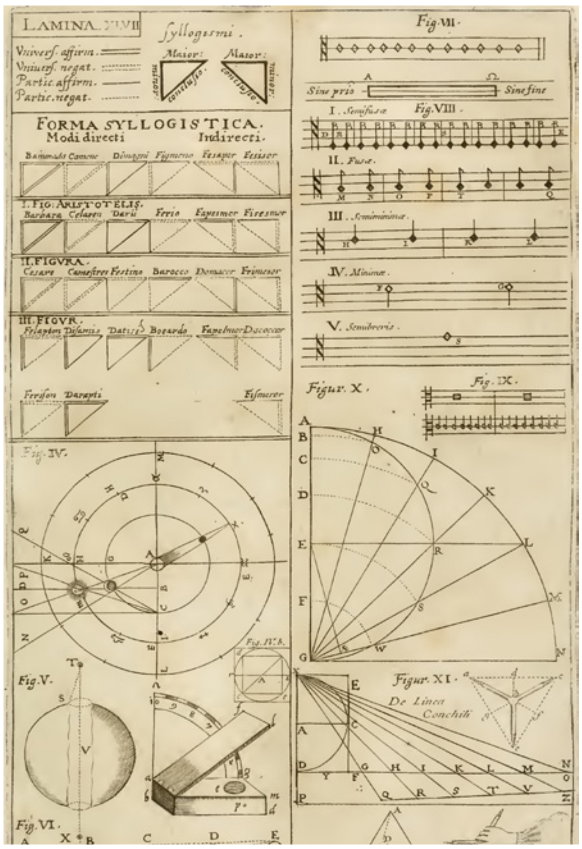


Figure 2.18. "Lamina XLVI" source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

Figure 2.19. "Lamina XXIV" source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

of his effort was devoted to systematizing and drawing with exquisite precision what was built and drawn in France and Spain for at least one hundred and fifty years (Calvo López, 2001, p. 44). But the importance that Caramuel gives to diagrams is not only educational, it also considers them a necessary means to build architecture: "Solo dire, que el Architecto ha de saber dibuxar, porque nunca se edificara bien un Palacio, si en una plana no se delineare bien primero"[18] (Caramuel Lobkowitz, 1678, vol. II, Tratado VII, p. 41). According to Navarro Morales, "Caramuel understands drawing as one of the aspects that differentiates the work of the architect from that of the mason." (Navarro Morales, 2012, pp. 173–174). Through this distinction, it is understood that the architect must be responsible for the architecture project and the elaboration of enough information so that another person can build it faithfully. This way of working reinforces the need for the architect to become a representation professional (Figure 2.19).

Within the dissertation on images, it is important to draw attention to the differentiation that Caramuel makes between portraits and symbols. Portraits are defined as faithful representation of objects, while symbols explain some quality or virtue of the thing represented:

> Heregias ha havido y hay hoy en el Mundo, ha habido y hay hoy en el mundo, muy desatinadas, pero en mi opinion ninguna mas desencaminada, que la condena las Imagenes. Hay dos generos dellas, unas, que son Retratos, otras Symbolos. Las primeras nos representan al vivo una cosa, como ella es: las segundas son Hieroglyphicos, que nos explican alguna cualidad o virtud de la cosa representada[19] (Caramuel Lobkowitz, 1678, pt. Tratado Proemial, p.37).

To clarify this, the author specifies that no portrait of God can exist, but it is possible to represent attributes in the form of symbols. For example, "para representar un Seraphin, o un Cherubin, pintamos una cabeça con dos alas; no poque queramos persuadir, que hay tal criatura en el Mundo corporeo, sino explicar sus propiedades"[20] (Caramuel Lobkowitz, 1678, pt. Tratado Proemial, p. 38). This differentiation has a direct parallel with the drawings that are used to represent a real space, an existing object, as well as many of those that Caramuel includes in his treatise, with respect to those that are used to represent ideas and organize thoughts. This differentiation is still relevant today (Figure 2.20).

When he approaches the subject of representation in a transversal way, Caramuel underlines the importance of experimentation in order to avoid justifying the results obtained in art (painting, sculpture, architecture, etc.) with tradition only (Escalante Rubio, 2015, pp. 1–2). This thought becomes one more factor to consider in Caramuel's revolutionary and contemporary stance, where the treaty begins to play a fundamental role in different aspects of the development of the disciplines it considers. Representation is understood as a space for exploration where ideas can be tested, a space that is surely necessary to face the diversity and complexity of the oblique.

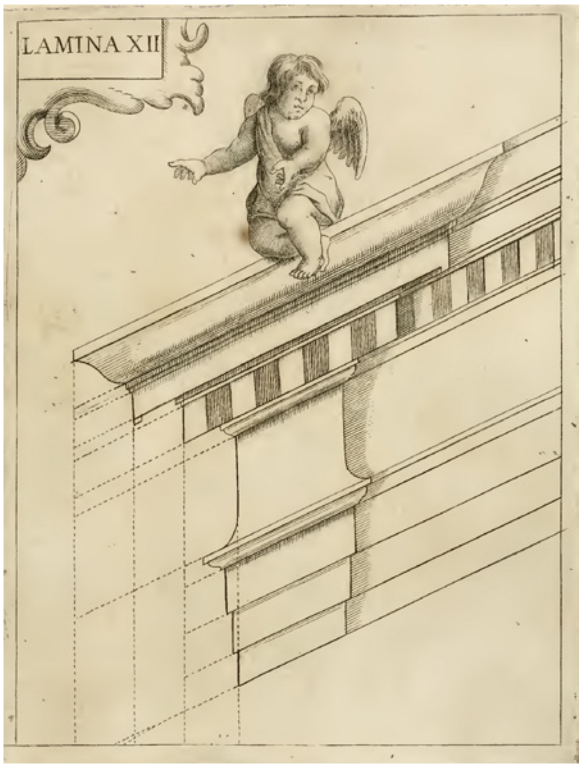


Figure 2.20. "Lamina XII" source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

This position where Caramuel combines a deep mathematical study with refined graphic representation results in ingenious solutions to be able to adjust or adapt rigid principles of Vitruvian architecture to the irregular reality of the world in which it is situated (Esteve Secall, 2005, p. 76). "Oblique Architecture is the alternative Caramuel offers to the architect to build in a world where uncertainties abound" (Navarro Morales, 2012, p. 164). The representation becomes a path to reach Oblique Architecture, and at the same time Oblique Architecture becomes a bridge to successfully reach the diversity of the natural space (Escalante Rubio, 2015, p. 29) (Figure 2.21).

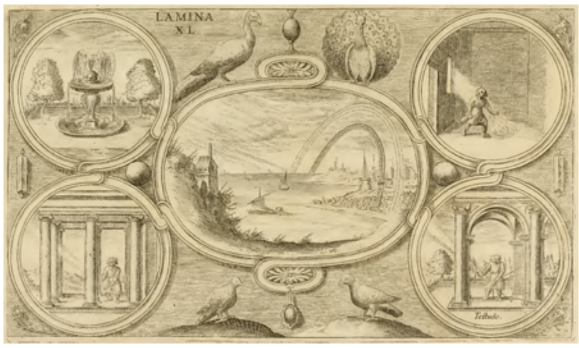


Figure 2.21. "Lamina XL" source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

Following this same line of thought, it could be said that not in vain does the Spanish explain that the ancient inhabitants of the Earth needed houses and in order to build them they had to develop architecture and cosmography: "Para vivir en Tierra necessitaron los antiguos de Casas, y de lugar donde erigirlas: de donde nacieron dos differentes Ciencias, Architectura, y Cosmographia. Aquella se emplea en fabricar Viviendas: Esta en delinear y describir los Territorios, y Provincias en que las Habitaciones se colocan"[21] (Caramuel

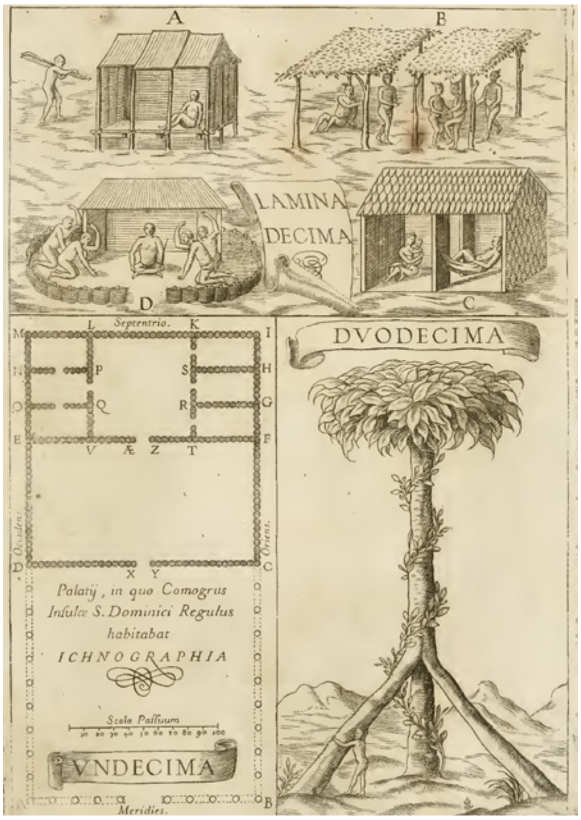


Figure 2.22. "Lamina DECIMA. VNDECIMA. DVODECIMA" source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

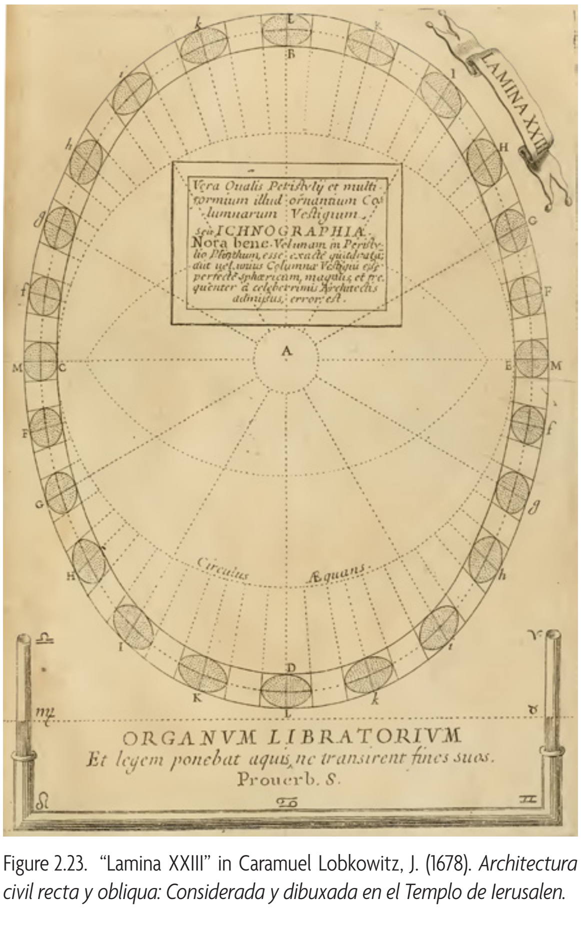


Figure 2.23. "Lamina XXIII" in Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

Lobkowitz, 1678, pt. Discurso Matematico, p. 5). The architecture helped them to make those houses and the cosmography served to study and understand the territory where they would place them. In this way, Caramuel focuses on and underlines the importance of considering the territory, the context, using representation to achieve this architecture that is closer to God, Oblique Architecture (Figure 2.22).

In short, for Caramuel representation through the diagram is a space for experimentation where ideas are put to the test, but, at the same time, it becomes a tool for analysing and understanding existing works and ideas (Figure 2.23). In other words, Caramuel understands the diagram as a design tool and therefore as a way of interpreting the forms of the Earth; the Earth understood as architecture. His diagrammatic logic enables him to view Solomon's temple as a built, oblique diagram of the shape of the Earth.

2.1.3. The Temple of Solomon

Following Caramuel's thought means understanding Oblique Architecture like the art where arithmetic, geometry, painting, sculpture and other disciplines are combined, having its first appearance in the Temple of Solomon or Temple in Jerusalem (Caramuel Lobkowitz, 1678, p. 11). The basis of this reasoning is of a theological order, in which he understands that God –as the first architect, in addition to building nature with straight and oblique lines, also guides the hand of Hiram Abif to build a divine temple and that is why he dedicates the first part of his treatise to this building (Iurilli, 2014, p. 89). From there, through an argumentative as well as poetic formulation, Caramuel defines the foundations of Oblique Architecture relying on the reconstruction of the temple (Borselli & Pagliardini, 2012, p. 9). For Caramuel the Temple of Solomon is the first Oblique Architecture and as such it summarizes and architecturally represents the forms of the Earth (Figure 2.24).

Figure 2.24. "Lamina A" source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

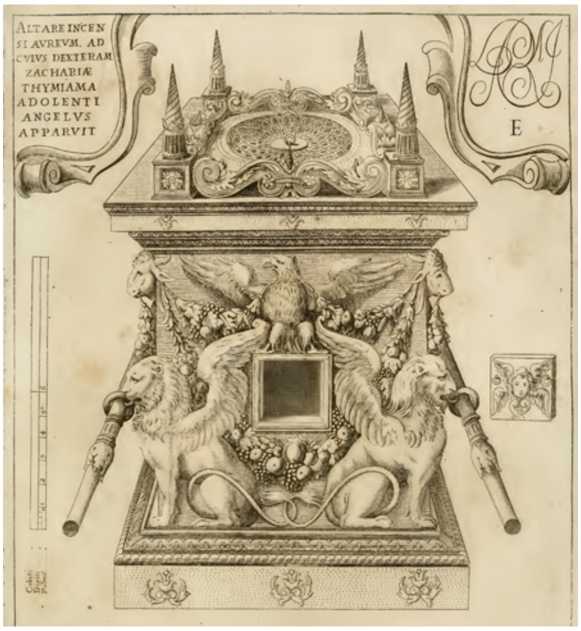


Figure 2.25. “Lamina E” source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

Converting God into the first architect not only constitutes a basis for the social legitimation of the profession, but also turns the temple into a tool to learn from its divine essence (Pena Buján, 2007, p. 75). The Temple in Jerusalem, becomes the paradigm of good architecture and source from which the architect must extract the principles he needs to guide his practice (Navarro Morales, 2018, p. 165). Among the architectural elements that Caramuel points out are the windows in which “Hiran, Ingeniero mayor, [...] empleo todo su ingenio; haziendo cuanto pudo y supo, paraque su obra fuesse un Milagro del Mundo”[22] (Caramuel Lobkowitz, 1678, vol. II, Tratado VI, Articulo II, p. 4), the pillars that were well carved and adjusted to look like a continuous stone although there were many, and the portals that were four to correspond with the four parts of the world (Caramuel Lobkowitz, 1678, pt. Tratado Proemial, Articulo IV, pp. 24–25). But other aspects of rebuilding the obliquity of the Temple in Jerusalem are more important and pertinent to this research, such as the consideration of the context, the territory, the construction of the walls and stairs (Figure 2.25).

The explanation of the temple does not keep it as an immaculate object floating on a neutral surface, on the contrary, to understand the building, Caramuel points out the geographical conditions that surround it such as the valleys, the desert and the Kidron stream (Caramuel Lobkowitz, 1678, pp. 23–24). Likewise, the space that the author dedicates to the temple in his treatise is not exclusively governed by geometrical-architectural reflections on Oblique Architecture, but rather dedicates a large part of his reflection to the modelling of the terrain where the temple sits, where the stereotomy plays a fundamental role (Iurilli, 2014, p. 89).

The basement, in this case the mountain, and the way it was treated to house the temple were Caramuel’s concerns. The Spanish dedicates a large part of his reflections to explain how a wall was built, a majestic work to model, accompany and support the mountain, at the same time it allowed to prepare the surface where the temple would be built:

> Las cumbres de los montes son de ordinario agudas y inclinados los lados, y assi Salomon paraque los lados del Monte Moria cayessen a plomo, y todo arriba fuesse llano, huvo de levantar desde los valles gruessos muros, y llenar los vacios de desvaratada piedra o tierra[23] (Caramuel Lobkowitz, 1678, pt. Tratado Proemial, p. 24).

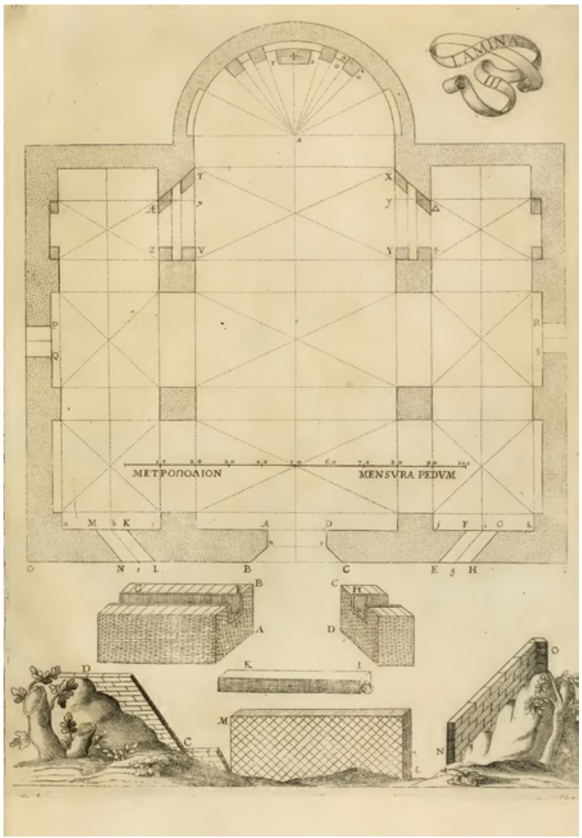


Figure 2.26. "Lamina III" source: Caramuel Lobkowitz, J. (1678). *Architectura civil recta y obliqua: Considerada y dibuxada en el Templo de Ierusalen.*

This wall represented a tool used to model the mountain that included arches and stirrups to support the weight, important changes were also made to the land to house the temple and make it part of this place. Along the same lines, where the wall was not the predominant object, modelling the terrain was equally important depending on the stairs that would connect the Temple with the city and suburbs (Caramuel Lobkowitz, 1678, pt. Tratado Proemial, p. 24) (Figure 2.26).

Oblique Architecture has an extremely important diagrammatic value in Caramuel's description and is defined through the detailed design of the temple's windows to which Caramuel dedicates much of his explanation and on which various scholars have paid attention, but, at the same time, as the geographical architecture that shapes the terrain and serves as a bridge to link human intervention with the natural world.

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2.2. Claude Parent and Paul Virilio in the *Fonction Oblique*

In 1966, Claude Parent (1923-2016) and Paul Virilio (1932-2018) founded the French group *Architecture Principe* (which occasionally included the participation of the painter Michel Carrada and the sculptor Morice Lipsi) (Moreno Moreno & Rojo, 2019, p. 106) "with the aim of investigating a new kind of architectural and urban order" (Parent & Virilio, 1996i, p. 5) for the rebirth of an architecture that they considered to be in existential crisis (Moreno Moreno, 2020, p. 26). Moreover, they wanted to create a space where to replace contemplation with experimentation (Parent & Virilio, 1996i, p. 5) (Figure 2.27).

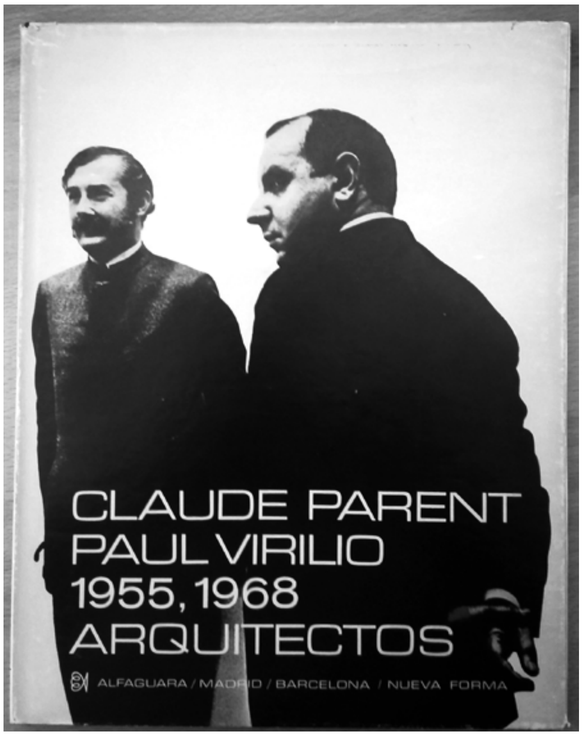

Figure 2.27. Cover page source: Fullaondo, Juan Daniel (Ed.): *Claude Parent y Paul Virilio, 1955-1968, arquitectos*, Madrid: Alfaguara, 1968.

Architecture Principe was established as a multidisciplinary group with a revolutionary vision that reflected on the role of the architectural discipline in the incipient mass society, shared the faith in the possibilities that technological advances meant to improve life and saw architecture as a tool capable of to transform society (Pérez Moreno, 2014, p. 86). In the words of Parent (1992, p. 48):

> En réalité, l'action de la revue Architecture Principe fut double. Elle s'efforça bien d'établir les principes essentiels qui permettraient de créer des circonstances favorables à l'architecture, mais elle révéla surtout les propositions de base de la fonction oblique; elle dénonça certes la crise urbaine, mais en mettant l'accent sur le défaut de l'urbanisme vertical et de l'urbanisme horizontal au profit de l'avènement de l'ordre oblique. Elle dénonça la crise de société, la pénurie des matières premières dès 1966, mais en soutenant que l'économie de gaspillage de l'espace devait céder le pas en architecture à la meilleure utilisation du sol par l'emploi des plans inclinés. Il s'agissait donc bien de la confrontation permanente de la fonction oblique et de la réalité quotidienne.[24]

Figure 2.28. Cover pages source: Parent, C., & Virilio, P. (1996). *Architecture Principe 1966 et 1996* (R. Edwards, Ed.). Les Éditions de L'imprimeur.

In addition to the research group, *Architecture Principe* became a publication, a manifesto that, however, intended to be a simple body of architectural theory (Parent & Virilio, 1996a, p. 12) (Figure 2.28), but it was not a unique case. The decade of the sixties was characterized by the proliferation of groups of architects who, for the most part, published together with urban planners, sociologists, philosophers or artists (Pérez Moreno, 2014, p. 77). Many of those were architecture magazines distinguished for being, in addition to their media showcase, incubators of debates around new ways of understanding the architectural discipline such as the English Archigram, the Japanese Shinkenchiku and the French Internationale Situationniste, Utopie and *Architeture Principe* (Colomina et al., 2010). In general, the interest of these new groups focused on questioning the role of the architect in society, while seeking professional development in which architecture moved away from being a solution to a specific problem in an established place and with a fixed program (Pérez Moreno, 2014, p. 77).

The name of the group, *Architecture Principe*, is an unequivocal demonstration of the intense discipline and rigor contained in the oblique proposal (Fullaondo Buigas de Dalmau, 2011, pp. 61–62). Parent and Virilio affirmed that the proposal seeks principles to oppose unbridled fantasy, hence the term *Architecture Principe* instead of Architecture Oblique (Ragon, 1982, p. 164). Even so, Virilio also affirmed that the Architecture Príncipe group predates his meeting with Parent and he chose that name because architecture is a principle of organization (Ragon, 1982, p. 164). "However, the most important work of the group [...] is the development of the theory known as THE FUNCTION OF THE OBLIQUE" and to elaborate the theory, it was absolutely essential to have a publication, a manifesto, Hence *Architecture Principe* (Parent & Virilio, 1996i, p. 12).

Spatial precision, constructive rigor and the conscious treatment of architecture as a sculptural piece were other differentiating features of *Architecture Principe* that sought to investigate plasticity, where space and form cannot be separated from built reality (Pérez Moreno, 2014, p. 87). But with the *Architecture Principe manifesto*, the group questioned not only the forms, the construction materials, but also the techniques of the body, rejecting the postural scheme of the classical era, the static balance of human movements (Parent & Virilio, 1996a, p. 7) (Figure 2.29). Both authors defended this approach from a multidisciplinary perspective that sought effective collaboration between architects, painters and sculptors to achieve, through the plastic arts, a harmonious development of human activities (Pérez Moreno, 2014, p. 83).

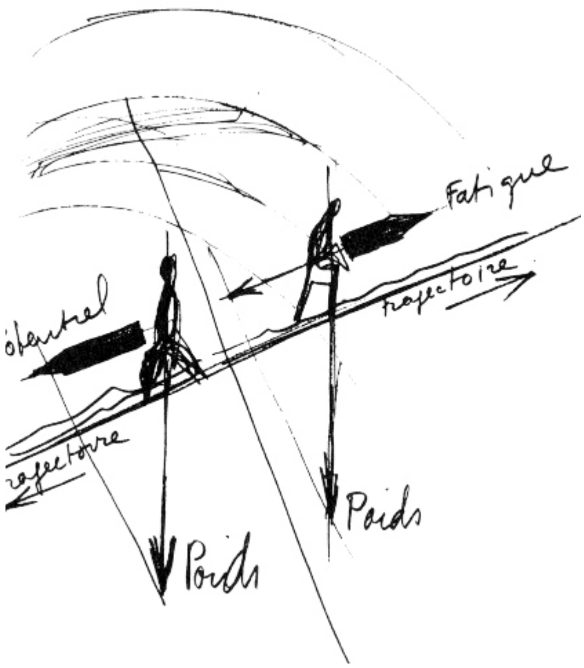

Figure 2.29. The group in the Architecture Principe manifesto questioned body mechanics, rejecting conventional postural alignment and the static harmony of human motion. Source: Parent, C., & Virilio, P. (1996). *Architecture Principe 1966 et 1996* (R. Edwards, Ed.). Les Éditions de L'imprimeur.

Along this same line, it is important to understand that the nature of the theory developed by *Architecture Principe* is two-headed, strangely bringing together two very different great personalities, two independent professional paths, two vocations and talents, both brilliant, but in many ways two almost antagonistic profiles that converge, for an instant, in a single line: the oblique (Fullaondo Buigas de Dalmau, 2011, p. 17). Although this relationship was brief, even after the separation, both Parent and Virilio have pointed out several times that everything they published in the manifesto was the work and merit of both, mutually acknowledging the importance of each other.

On one side, despite his relatively little built work, Claude Parent was one of the most influential French architects of the 20th century, covering the entire time span between Le Corbusier and Jean Nouvel, being an apprentice in the former's workshop and a collaborator of the latter at the beginning of his career (Cabodevilla-Artieda, 2016, p. 24). Already in his forty-nine years, Parent was one of the most important European architects (Schein, 1973, p. 636) and, although he was described as a utopian, supermodernist or brutalist architect, his work can hardly be easily labeled (Cabodevilla-Artieda, 2016, p. 25). Having consolidated his professional career, in addition to continuing with a growing public and editorial activity from the most diverse platforms, Parent establishes a close collaboration with the French administration in the planning of large territorial infrastructures, from nuclear power

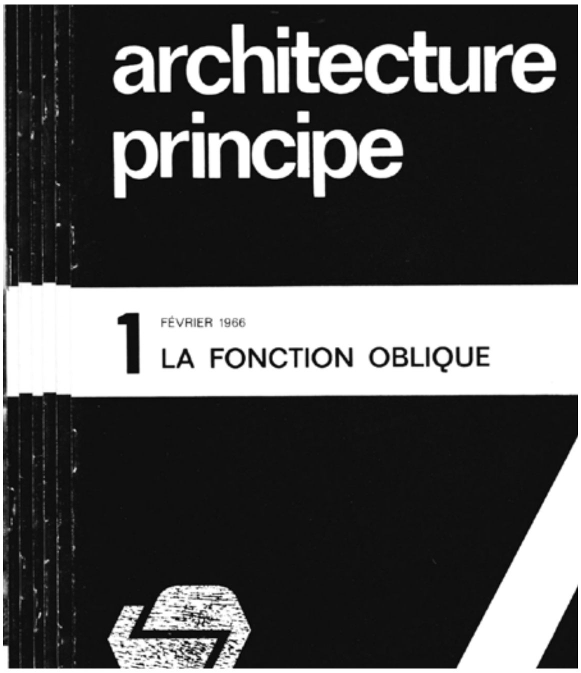

Figure 2.30. Cover page source: Parent, C., & Virilio, P. (1996). La Fonction Oblique. In C. Parent & P. Virilio, *Architecture Principe 1966 et 1996*. Les Éditions de L'imprimeur.

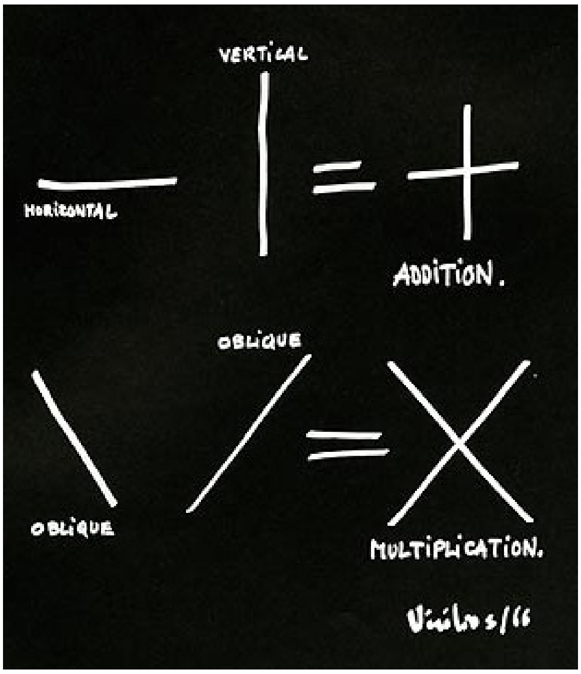

Figure 2.31. Paul Virilio created a diagram illustrating how adding the vertical and horizontal components only produced an addition. In contrast, the number of choices increased with the oblique line. Source: Parent, C., & Virilio, P. (1996). *Architecture Principe 1966 et 1996* (R. Edwards, Ed.). Les Éditions de L'imprimeur

plants to railway stations (Fullaondo Buigas de Dalmau, 2011, p. 12) that provide great diversity to his career. On the other side, by the end of the last Century, "self-proffeced 'urbanist', political thinker and 'critic of the art of technology', Paul Virilio was one of the most significant and stimulating French cultural theorists" (Armitage, 1999, p. 1). Without architectural or artistic contamination, Virilio is based on the understanding that he studies the evolution of society, the progress of science and the symptoms of exhaustion of urban fabrics (Fullaondo Buigas de Dalmau, 2011, p. 71).

The *Fonction Oblique* was not only the most important contribution of *Architecture Principe* (Parent & Virilio, 1996i, p. 12), but could even be considered the most important contribution of Parent and Virilio (Figure 2.30). "But what exactly was 'the function of the oblique'? For the *Architecture Principe* group, it was a new means of appropriating space, very much inspired by a Gestalt psychology of form, which, promoted continuous, fluid movement and forced the body to adapt to instability" (Parent & Virilio, 1996i, p. 5) (Figure 2.31). In their research, the authors determine that the architectural form had not undergone any substantial modification throughout history and based on that observation they propose the hypothesis of tilting the support plane to overcome the limitations of the previous organizations that put the architecture to the test (Fullaondo Buigas de Dalmau, 2011, pp. 168–169). Although they had already been considering the possibility of a topological or at least non-orthogonal architecture (Parent & Virilio, 1996i, p. 11), it was not until the creation of the *Architecture Principe* group that these ideas materialized.

Initially they raised the need to live on inclined planes based on the idea of building imbalance after discovering the few studies that existed on the subject (Figure 2.32):

> Tout a commencé, comme je le disais, avec l'idée de bâtir du déséquilibre. Donc avec l'idée de l'utilisation privilégiée du plan incliné. Il faut dire qu'au début je pensais à un plan ou à un truc comme ça. Mais Virilio était rentré dans un bunker

qui avait été basculé et il avait été très frappé de l'impression que cela avait produit sur lui: il avait été littéralement pris de vertige ... Donc là on retrouve un peu Hoffmann au fond! [Rires] Voilà, il s'est dit: «Il se passe quelque chose!» Parce que les bunkers on les voit toujours de l'extérieur, il en avait lui-même filmé des milliers. Mais en général ils étaient bétonnés et on ne pouvait pas rentrer dedans. Un jour cependant il est entré dans l'un d'eux qui était ouvert, on ne sait trop pourquoi. Et il se retrouve tout à coup sur un plan incliné, parce que la construction avait été basculée par le sable. Et il ressent quelque chose proche d'un vertige. Du coup on était allé voir un psychiatre assez célèbre, qui travaillait dans une sorte d'institut psychiatrique à l'extérieur de Paris avec un beau jardin et qui était très à la mode à ce moment-là.

Mais je reviens à Virilio. Donc avec lui, et suite à son expérience dans le bunker, on était venu voir ce psychiatre pour analyser et approfondir cette histoire de vertige. Et on s'est aperçu d'une chose étonnante, qui était qu'à ce moment-là - on devait être en 1964 -, il n'existait pratiquement aucune étude sur le sujet. Tout ce qu'on obtenait comme information était que, en gros, c'était un problème très complexe et que l'on savait fort peu de chose sur le vertige! On ne savait quasiment rien sur le comment et le pourquoi. À qui cela arrivait, à qui cela n'arrivait pas? Pourquoi il y avait des gens qui pouvaient marcher sur un mur de dix mètres de haut sur trente centimètres de large sans sourciller et d'autres qui se cassaient la gueule à partir d'un mètre de haut? Le vertige a donc, je crois, été un point de départ de tout ça. Et à un moment donné aux cours de nos parlottes avec Virilio qui duraient des heures et des heures, nous sommes mis à dessiner notre plan incliné de l'église[25] (Parent & Ultrich Obrist, 2012, pp. 106–112).

Parent and Virilio contemplated with envy the enormous advances that were produced in many other areas of knowledge: hydraulic theories, ballistics, sociology, etc.; so his oblique theorem sought to build a specifically architectural response to that same scenario, assuming its same principles of reference: dynamism, fluidity, mutability, controlled imbalance, etc. (Fullaondo Buigas de Dalmau, 2011, p. 115) (Figure 2.33). But unlike other proposals such as that of the Archigram group,

Figure 2.32. Exhibition Poster source: *Cadre de vie, Claude Parent: L'Architecture Oblique*, Maison de la Culture d'Amiens, November 197 - February 1973.

Figure 2.33. By adopting the same concepts of reference—dynamism, fluidity, mutability, controlled imbalance, etc.—Parent and Virilio, with the theorem, aimed to create a distinctively architectural solution to that identical circumstance. Source: Parent, C. (1970). *Vivre à l'oblique*. L'Aventure Urbaine.

Figure 2.34. The illustrations created by Parent were a crucial component of this approach. Using this medium, an ongoing tangle of oblique spaces is portrayed, a fluid and dynamic process of regeneration with limitless implications. Source: Parent, C. (1970). *Vivre à l'oblique*. L'Aventure Urbaine.

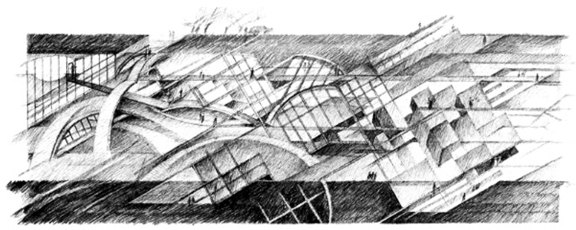

Figure 2.35. His incredible drawings display the lyrical vision of someone who wishes to challenge how the city and its region are conceived via architecture. Source: Parent, C. (2010). *Demain, la terre...* Manuella Editions.

which were partial suggestions of the future, Claude Parent and Virilio's approach was complete, closed and authoritarian, one of the reasons why it was not initially well received (Fullaondo Buigas de Dalmau, 2011, p. 51). Among some of the most important statements that help to understand the revolutionary spirit of this proposal are:

> L'oblique provoque et permet la révision du savoir. L'oblique est révolutionnaire dans la mesure où elle permet de tout remettre en question, de tout envisager, en repartant de zéro. L'oblique libère l'architecte englué, piégé dans un credo qu'il n'ose pas contester alors qu'au fond de lui-même il le sait caduc (Parent, 1992, p. 97).
>
> Vivre à l'oblique, c'est entretenir son corps dans la pratique quotidienne de son existence, sans même le vouloir, spontanément. Vivre à l'oblique, c'est avoir la possibilité de refuser la canalisation. Vivre à l'oblique, c'est retrouver la vacuité de l'espace habitable. Vivre à l'oblique, c'est chasser définitivement le meuble de l'habitation, c'est rajeunir dans la mesure où l'héritage mobilier, le poids du passé et des habitudes sont récusés par l'architecture du lieu. Vivre à l'oblique, c'est retrouver l'esprit d'aventure et de conquête. Vivre à oblique, c'est être libre[26] (Parent, 1992, p. 107).

Before the approach of *Architecture Principe*, the ramp responded only to specific needs and Frank Lloyd Wright's Guggenheim Museum was just an exception (Parent & Virilio, 1996a, p. 10). Even so, they based much of their work on the study of past civilizations and existing projects (Moreno Moreno, 2020, pp. 29–30). According to its authors, the result is that this proposal can be studied from theory through research aimed at constantly specifying and refining its terms and gradually deciphering its intervention in all areas of human life, or through continuous experiments that allow to measure and evaluate the results, as well as to associate it with other disciplines (Parent, 1992, pp. 45–47).

An important part of the study and experimentation of this theory were the drawings of Parent. Through this medium, a continuous interweaving of oblique spaces is represented, a dynamic and fluid process of renewal with infinite ramifications (Cattant, 2013, pp. 95–96) (Figure 2.34). His extraordinary drawings show the poetic vision of one who wants to disrupt the conception of the territory and the city through architecture (Nicoletti, 2003, pp. 6–7) (Figure 2.35). The representation of this theory builds an adventure space that must be imagined (Parent, 1970, p. 39). The drawing strategy collaborated in organizing the spaces, obviating the exterior envelopes, showing the intention of establishing strong a relationship between the urban space, linear and infinite, with the domestic space (Moreno Moreno, 2020, p. 34) (Figure 2.36). This relationship is not develop in a vacuum, but is generated from the existing conditions and from the confrontation of the horizontal-vertical binomial (Nicoletti, 2003, p. 49).

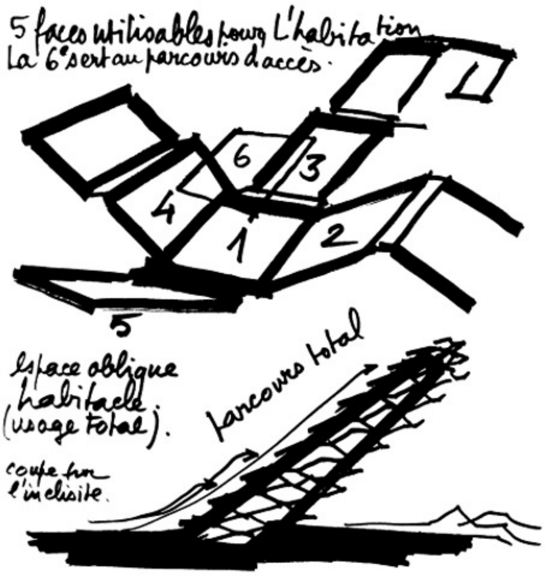

Figure 2.36. The drawing method helped organize the spaces by eliminating the facades and demonstrating the goal to forge a strong connection between the linear, endless environment and the home space. Source: Parent, C. (1970). *Vivre à l'oblique*. L'Aventure Urbaine.

Precisely this confrontation with the dominant orthogonal logic becomes the starting point and a large part of the fuel of the *Architecture Principe* group. Its authors considered the need for an architecture that motivated action instead of a neutral and passive space (Parent & Virilio, 1996a), which also allows man to take possession of the space through formulas of delimitation that did not mean segregation (Fullaondo Buigas de Dalmau, 2011, p. 27) (Figure 2.37). These postulates will have two important lines, on the one hand, confronting the logic of mobility based on the automobile that was expanding rapidly in those same years and, on the other, recognizing the need to face sedentary life, also understanding it as a problem (Parent & Virilio, 1996a). The ramp to improve accessibility, replace motors and combat obesity, concepts that are increasingly important and pertinent. Thus, the *Fonction Oblique* emerges as a criticism of a large part of the Modern Movement–which would coincide with the crisis of the sixties–especially "to the zoning carried out on the expansion of the cities after the second world war that, according to their critical analyses, turned out to be defective from a sociological, spatial and material point of view" (Moreno Moreno, 2020, p. 26; Moreno Moreno & Rojo, 2019, p. 105). But, if the postulates of Parent and Virilio are analyzed, it is possible to understand that they would agree with the Modern Movement in that architecture could become the engine of social change.

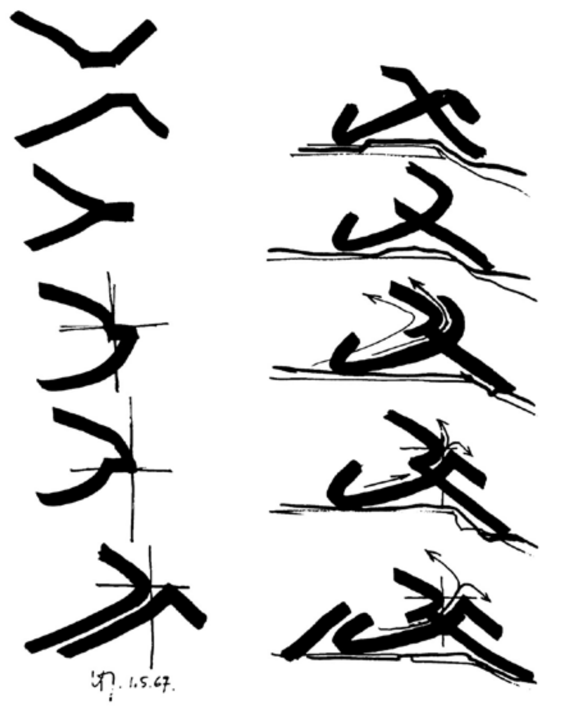

Figure 2.37. The study of diagrammatic sections is crucial to understanding oblique theory. The writers took into account the necessity for an architecture that encouraged activity while also enabling man to use the space through delimitation formulae that did not imply segregation. Source: Parent, C., & Virilio, P. (1996). *Architecture Principe 1966 et 1996* (R. Edwards, Ed.). Les Éditions de L'imprimeur.

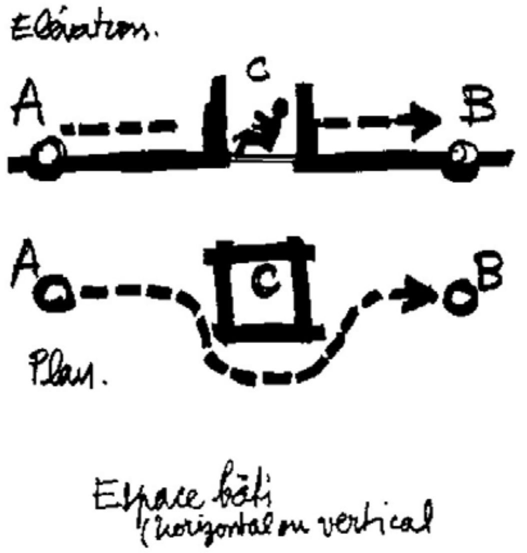

Figure 2.38. Parent and Virilio wanted to emphasize the disconnect between architecture and landform. The construction of an enclosure suggests the presence of a barrier that restricts mobility across a previously open area. Source: Parent, C. (1970). *Vivre à l'oblique*. L'Aventure Urbaine.

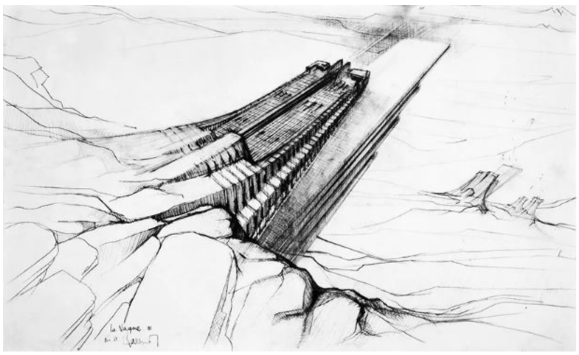

Figure 2.39. There was great interest in the shape of the Earth and its relationship with architecture. This could be seen expressed in many of the drawings presented by the Architecture Principe group. Source: Parent, C., & Virilio, P. (1996). *Architecture Principe 1966 et 1996* (R. Edwards, Ed.). Les Éditions de L'imprimeur.

Although it is true that today the loss of the balanced man-territory relationship is more evident due in part to new technological advances and the primacy of economic development in human settlements (Flores, 2012, p. 7), Parent and Virilio discussed this trend mostly pointing at the disconnection between architecture and the ground that modern architecture sought. "From this historical perspective, which included ancient civilizations, they thought that the technological and constructive evolution had concentrated only on the invention and improvement of light span (intercolumn-distant) and the resistance of the covering systems like arches, vaults and domes" obviating the ground floor (Moreno Moreno & Rojo, 2019, p. 107). According to the authors, unlike a cave or a grotto, the creation of an enclosure implies an obstacle that prevents movement through what was previously a fluid space (Parent, 1970, pp. 7–11) (Figure 2.38). So, altering the ground plane represented a surely controversial risk (Moreno Moreno & Rojo, 2019, p. 107). But although at the beginning of the 20th century the horizontal planes were completely straight, orderly and neutral, and were separated from each other in perfect parallelism (Delgado Barrocal, 2016, p. 111), the enormous interest around the ground plane by the end of the same century demonstrates the distrust that already existed in the classical relationships between the building and the ground (Irala, 2014, p. 8) (Figure 2.39). In the same sense, although the anticipatory ideas of the *Architecture Principe* group were initially rejected (Parent & Virilio, 1996i, p. 55), over the years a few issues of a magazine without a budget would slowly make their way until claiming its meritorious place in history.

2.2.1. The *Fonction Oblique* and the form of the Earth

"RECONSTITUER c'est recréer le SUR-SOL CONTINU de la Terre qui nous nourrira de nouveau et qui assurera notre survie"[27] (Parent, 2010). So important is the oblique approach within the thought of its authors. The link with the Earth becomes a fundamental theme. A close link, which considers different dimensions, focuses on a geographical, topographical theme, where the idea of Earth is fundamentally manifested through the shape of the ground. In other words, it is proposed to redefine it as a geographic operating system, which changes the determined and neutral surface, for another complex and changing one, a three-dimensional, dense space, which ends up becoming a natural-artificial geography (Delgado Barrocal, 2016, p. 42) (Figure 2.40).

From this point of view, the ground loses its absolute character, it goes from being a separation platform to becoming the threshold of relationship between "deux états naturels particuliers"[28] (Parent & Virilio, 1996c). These states are understood by other authors as a culture-nature contrast that serves as a space for relationship and exchange through an active process of dialogue (Fernández, 2015, p. 42). Seen this way, the modification of the shape of the Earth will bring with it a "MODIFICATION CONSTANTE DE L'ESPACE, donc une LECTURE CHANGEANTE DU LIEU"[29] (Parent, 1970, p. 33). The floor plan of architecture tilts, undulates and folds, to obtain its ideal configuration, exploring the complex universe of possibilities that appears from this new system of geometric references (Fullaondo Buigas de Dalmau, 2011, p. 184) (Figure 2.41). In this way, it is revealed "un lieu à habiter cela s'écoute, se regarde, se touche, cela s'investit et s'enlève à l'assaut comme une ancienne place forte"[30] (Parent, 1970, p. 47).

The concept and evolution of the ground has gone from being separate, independent and flat, as in the Parthenon where the plinth simulates a flat artificial layer that raises the building symbolically separating it from the ground level or natural terrain, to an architecture that depends on the ground, with which it is related by establishing a formal dependency that seeks to achieve stability (Delgado Barrocal, 2016, pp. 127–128) (Figure 2.42). This contemporary vision was reflected in the book "Groundscapes. The reunion with the ground in contemporary architecture" edited by llka and Andreas Ruby. In this text there is a certain apparent confusion between two meanings of the term ground (ground as a natural environment on

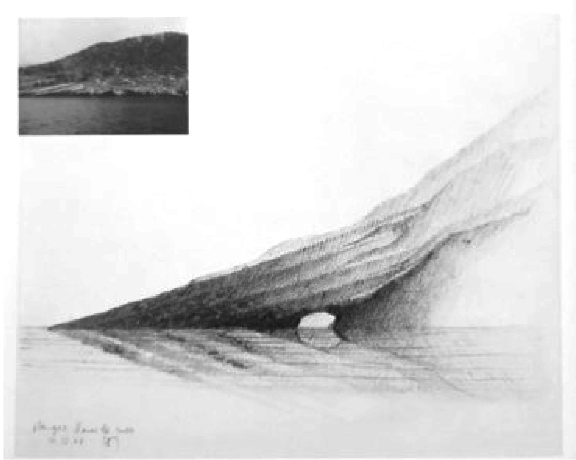

Figure 2.40. The link with the land is a fundamental issue that considers the different dimensions. The land manifests itself through the shape of the ground to give way to architecture. Source: Parent, C. (1992). *Entrelacs de l'oblique*. Centre d'études et de prévisions.

Figure 2.41. The earth transforms into architecture, a place for interaction and communication. Architecture adjusts to the environment to find the best arrangement from a new world of geometric possibilities that go beyond the vertical and horizontal. Source: Parent, C. (1971). *Les ponts urbains*.

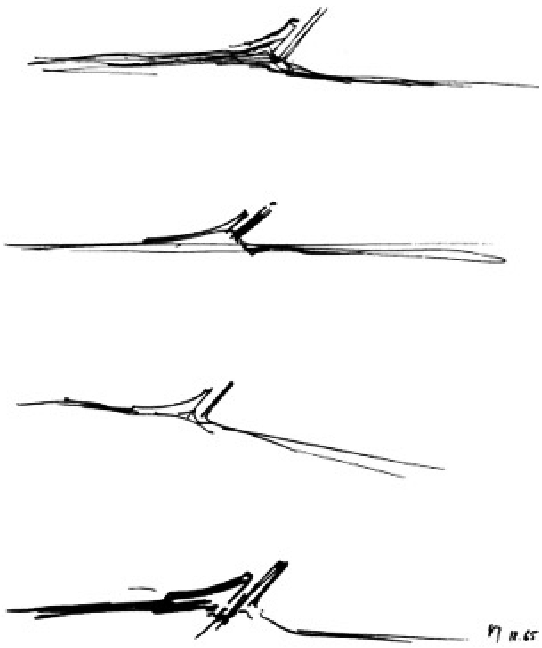

Figure 2.42. The idea of the ground has evolved from being distinct, autonomous, and flat to being tied to architecture via the establishment of a formal reliance that aims to produce stability. Source: Parent, C. (1992). *Entrelacs de l'oblique*. Centre d'études et de prévisions.

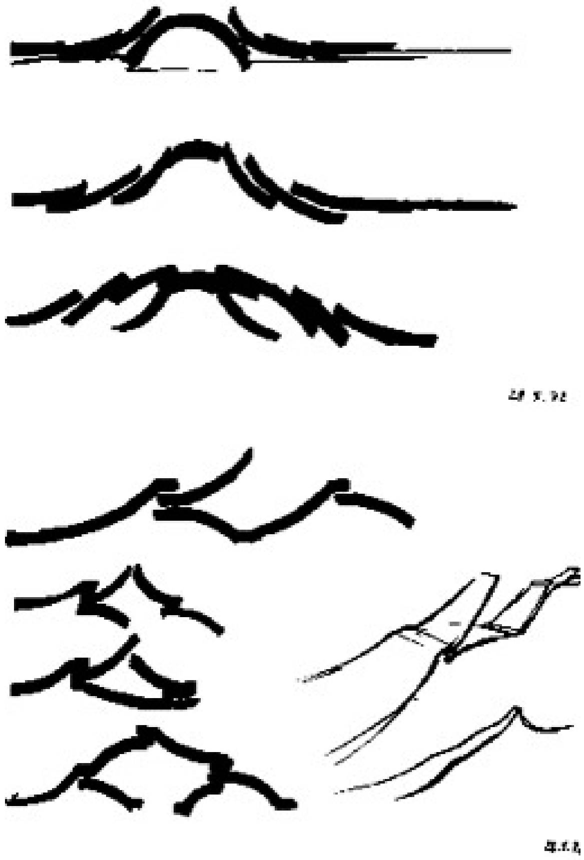

Figure 2.43. The ground serves as a catalyst for the interaction of architecture with nature and allows for the configuration of fluidity. Understanding the link between these two dualities of architecture and landform requires a thorough understanding of the section drawing. Source: Parent, C. (1992). *Entrelacs de l'oblique*. Centre d'études et de prévisions.

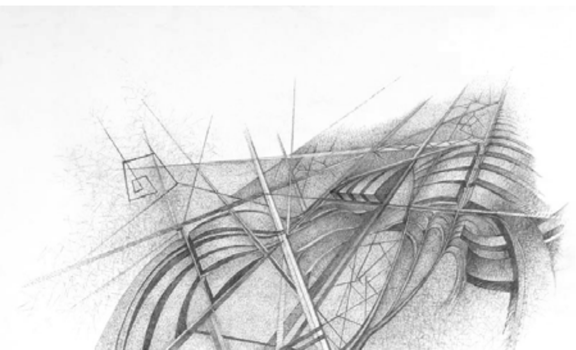

Figure 2.44. Following the physical characteristics of the land while also creating the necessary circumstances to make this relationship a reality is the relationship between the shape of the terrain and architecture. The ability to transfer traits is built and assimilated through reciprocal relationships. Source: Parent, C. (2010). *Demain, la terre...* Manuella Editions.

which architecture is implanted and ground as an artificial support surface for activity created by architecture itself), but this interchangeability of the two concepts, Far from being equivocal, it is intentional and is aimed at drawing an idea of land and architecture, as a general landscape of human activity, which is currently very common (Fullaondo Buigas de Dalmau, 2011, p. 181).

The floor becomes a catalyst for the relationship between architecture and nature, which makes it possible to study strategies and define ways to configure the required continuity (Fernández, 2015, p. 76), because the floor is, above all, the proper means of architecture to spatialize its content (Parent & Virilio, 1996h). In this way, in addition to the morphologies and formation logics that are used for constructions, it is possible to develop and implement analogous efforts for the definition of the territory and its valuation in terms of order, but also of occupation and modeling of spaces (Flores, 2012, p. 7). To facilitate this process, it is necessary to treat the ground as a "spatial object" which could be achieved by defining a finite surface entity with which to work (Ruby & Ruby, 2006, p. 71). This process would facilitate the approximation to a phenomenon as extensive and complex as the shape of the Earth, while it serves to represent it as an attainable object that can be worked with the available instruments (Figure 2.43).

Establishing a close relationship with the ground means following the conditions it proposes and at the same time proposing new conditions that allow new realities to materialize. In this encounter it is possible that the historical-social phenomena that cross the ground are redefined while spaces are transformed into places and vice versa, the shape of the Earth defines us and is defined (Carballeda, 2015, pp. 2–3). The architecture interprets the context at the same time that the context informs the architecture within the construction of a geography of proximity (Sánchez Fernández, 2019, p. 10). This relationship can not only build "with" nature, but "like" nature to transfer its qualities to the new built spaces, an attempt of domestication and extension of the existing land. From Nicoletti's interpretation (2003, p. 49) (Figure 2.44):

> L'architettura del «mondo Inclisite» ha i suoi modelli negli eventi dinamici e nelle tracce pietrificate del movimento che modellano la nostra percezione del pianeta: le rocce che precipitano nel mare, le onde delle mareggiate, le stratificazioni geologiche convulsamente ondulate da cataclismi tellurici. La «fonction oblique» è la riconquista della complessità implicita nella natura umana, impone viste mai adagiate sulla banalità dell'ortogonale, sconfiggendo la costruzione limitativa dell'orizzonte.[31]

While nature offers us a multitude of models, shores, mountains, plains; man materializes jetties, dams, terrace crops, velodromes, auditoriums, which represent inspiration and analogy (Fullaondo Buigas de Dalmau, 2011, p. 30; Zevi, 1972b, p. 10) and that are constituted in forms of interaction that mutually nurture both realities or even bring them closer to the point of making them part of the same space. "L'analogie au relief naturel est intéressante à analyser car on peut assimiler les différents regroupements d'inclisites sous des figures géométriques diverses (vagues, turbosites, conques, croisées) à des COLLINES ARTIFICIELLES"[32] (Parent, 1970, p. 57). This is the form of nature taken up by the oblique vision because the oblique is natural, it exists permanently in nature, unlike the horizontal or the vertical, which are only technical conquests of the human spirit (Parent, 1992, p. 20) (Figure 2.45).

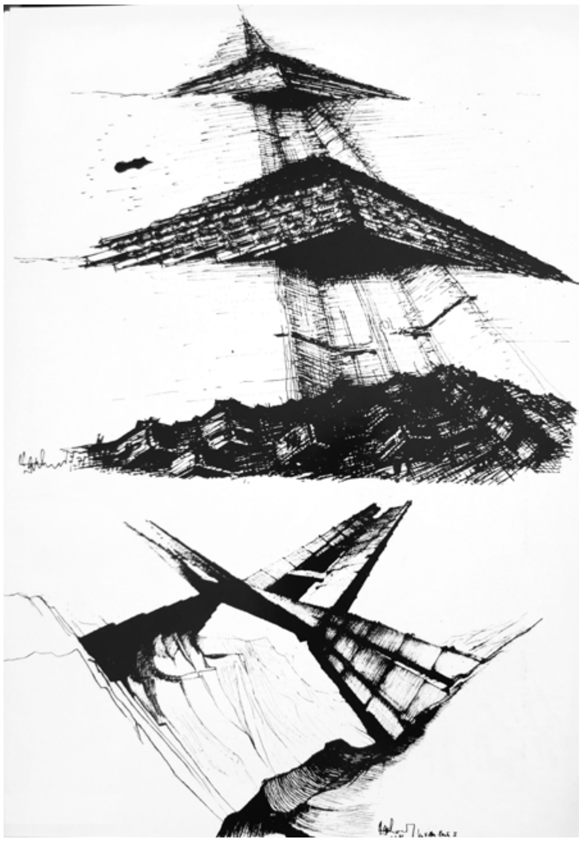

Figure 2.45. Due to the fact that what is natural is oblique and always existing in nature, nature adopts an oblique view through similarity with various geometric objects like waves, thorns, and shells. Source: Parent, C. (1971). *Les ponts urbains*.

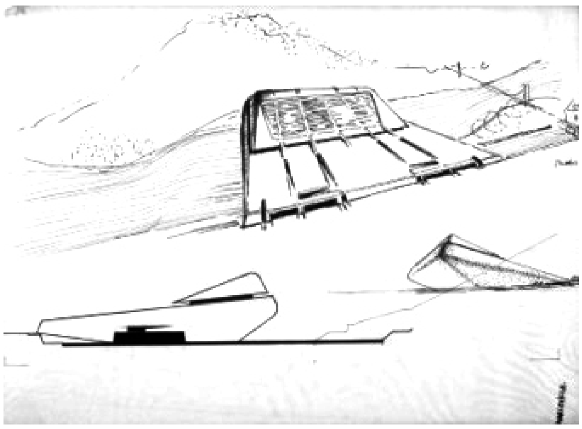

Figure 2.46. The architecture serves as a platform for dialogue and mediation about the place. This viewpoint contends that the project should be planned according to that landscape, respecting its geometry, recommending the continuity of routes and formal arrangement, and seeking a unique language that can be read by following the curvature of the Earth. Source: Parent, C., & Virilio, P. (1966-1967). *Palais des expositions*.

The classical view (where form is conceived as an object or figure based on a static, stable and rigid composition) and the modern view (which introduces the concept of time and controlled position, equally literal and deterministic) evolve towards a theoretical approach in which form is the result of a changing, open process that is willing to evolve (Delgado Barrocal, 2016, p. 30). Architecture then becomes a platform for interaction and mediation in and with space (Rosas, 2007, p. 10). Within this perspective, for the project to follow the shape of the Earth, it is necessary to design it based on that landscape, respect its geometry, propose the continuity of routes and formal configuration, seeking an intrinsic language

Figure 2.47. Modifying the ground plane makes it possible to conceptualize space as a road or route because it produces flows and trajectories that alter how the world is seen. The alteration of the ground required to propose the oblique function would aim to dissolve or dematerialize the surfaces. Source: Parent, C. (2010). *Demain, la terre...* Manuella Editions.

that can be interpreted (Sánchez Fernández, 2019) (Figure 2.46).

"Devant les besoins, face aux contraintes, contre l'impossible, l'architecture doit: [...] Dominer le site, devenir l'équivalence des reliefs naturels, changer de dimensions. Devenir relief artificiel, paysage" (Parent & Virilio, 1996d). This effort makes the architect also a surveyor, an archaeologist who tries to discover and interpret the information embedded in the ground (Tudela Rodríguez, 2018, p. 14). The architect is then in charge of a stratified design process that allows him to gradually understand the complexities of the configuration proposed by nature to produce a response in accordance with it. This intellectual exercise requires being able to imagine and propose structures, forms of land and space, focused on the design of cultural and natural spaces that recognize the land and the relationships that can be created between existing and imagined scenarios[33] (Flores, 2012, p. 7).

The manipulation of the ground plane allows space to be understood as a route or path, since this strategy creates flows and trajectories that cause changing perceptions of the environment (Fernández, 2015, p. 79). So, architecture is not served by the straight line, it needs to be discovered gradually, it does not appear instantly, it shows the access, but the turns and sinuosities protect it through interrupted views that deny its immediate understanding (Nicoletti, 2003, p. 84). In this way, proposing the oblique space means concentrating a large part of the efforts on the manipulation of the ground, which in turn would seek the dissolution, dematerialization or camouflage of the rest of its constitutive surfaces (Fullaondo Buigas de Dalmau, 2013, p. 17). Actions in this direction would bring the project closer to the original oblique approaches: "Nous voulons HISSER L'HABITATION A LA DIMENSION DU SITE éventuellement à une dimension supérieure (domination du lieu) en même temps que nous assimilons la prise de possession du site naturel préexistant à celle d'un ouvrage d'art"[34] (Parent, 1970, p. 57). An approach that ends up tilting, digging, folding and operating on the ground in order to reformulate the existing fluidity (Pedio, 1973, p. 686) (Figure 2.47).

The oblique approach must be inserted into the relief, anchored to the ground and make it the protagonist. The building does not look like a piece of furniture placed on a surface, but rather like inlays made in a material (Ruby & Ruby, 2006, p. 20). Thus, “l’architecture n’est pas Intégrée au site. Elle existe en soi et établit avec le paysage un rapport de nature qualitative et dimensionnelle”[35] (Parent & Virilio, 1996d). The ground is an artificial plane but it is understood as a conditioned natural ground that connects the landscape and the architecture, making the landscape expand, broadening its meaning (Fernández, 2015, p. 42). The floor becomes a source of creation–which connects with reality and with history, from which architecture establishes such a close link (Flores, 2012, p. 11) (Figure 2.48). In Cattant’s words (2013, pp. 44–45):

> Ses dessins inscrivent la ville dans un paysage qui déborde du cadre urbain. Si ceux réalisés aux débuts de la «fonction oblique» établissent une confrontation entre une architecture à grande échelle et une étendue naturelle, les dessins des dix dernières années marquent une évolution qui trouble la distinction entre architecture et paysage. Le dualisme du mouvement moderne qui opposait le construit au naturel est mis en crise par Claude Parent qui opère une hybridation entre les deux. Il ne s’agit pas d’ajouter un élément construit à un site existant: l’architecture «ne doit pas procéder par accumulation, juxtaposition, addition» écrivait-il dès 1966. Les processus imaginés par l’architecte creusent, s’incrustent ou s’agrippent aux reliefs existants, entre émergence et enfouissement; pénétration, incision et envahissement se substituent aux processus classiques d’intégration ou d’insertion de l’architecture dans un site: il faut «refuser l’artifice de l’intégration. Fallacieuse prétention de continuité formelle entre l’architecture et la nature». Pou décrire la fonction oblique, Claude Parent a souvent utilisé la métaphore du lierre; cette image est riche d’enseignement car elle montre qu’il ne recherche pas une équivalence entre une architecture-lierre et un environnement-support, mais plutôt une métamorphose, un métissage où artificiel

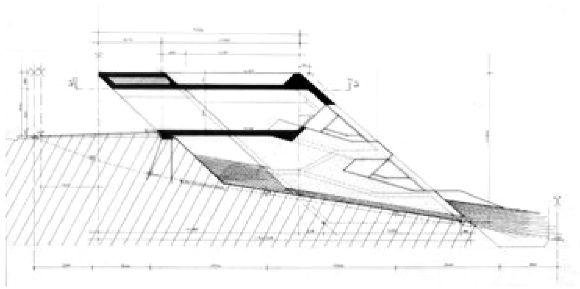

Figure 2.48. The Oblique Architecture is incorporated into the relief, secured to the surface, and makes it the protagonist. The building does not look like the furniture placed on a surface but rather like inlays made of a material. Source: Parent, C., & Virilio, P. (1967-1970). *Maison Mariotti*.

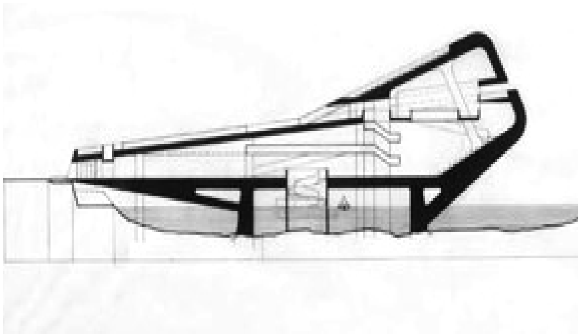

Figure 2.49. Architecture is not an added object, the ground is part of it, it builds and materializes it. For Parent and Virilio, this relationship is fundamentally studied in section. Source: Parent, C., & Virilio, P. (1966-1967). *Palais des expositions*.

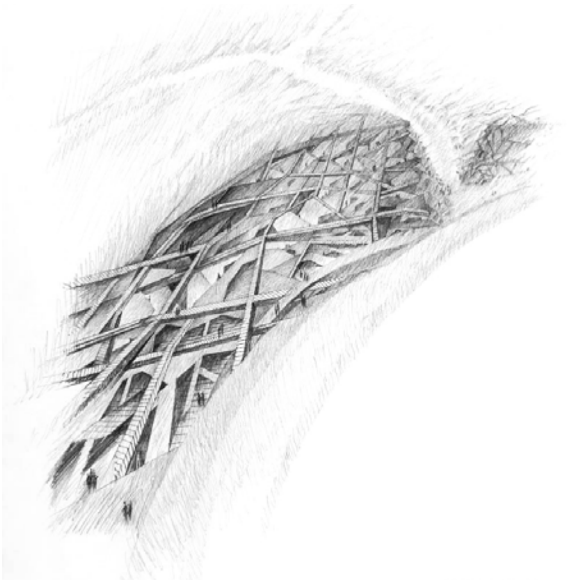

Figure 2.50. Architecture is a new floor that links to the area and is on the ground and with the ground, forming a dialectical interaction between nature and culture, it is a geographical architecture. Source: Parent, C. (2010). *Demain, la terre*... Manuella Editions.

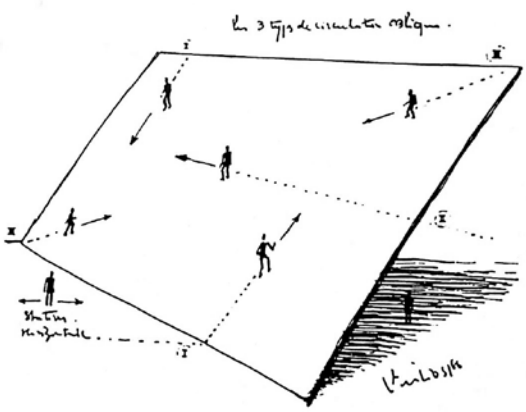

Figure 2.51. The oblique organization offers countless possibilities that allow freedom of movement. This change in displacement materialized through different slopes varying between 5º and 30º to allow fluid transitions. Source: Parent, C., & Virilio, P. (1996). *Architecture Principe 1966 et 1996* (R. Edwards, Ed.). Les Éditions de L'imprimeur.

> et naturel se fondent. Dans les dessins de la série *Open limit*, des structures qui semblent accueillir des hommes forment un paysage à grande échelle. Elles ont une géométrie à la fois répétitive et aléatoire, et bien qu'elles semblent à première vue artificielles, elles empruntent aux reliefs et aux plissements de l'écorce terrestre leurs mouvements.[36]

To explain this relationship, Parent uses the French word "surrection," what does it mean "the architecture seems no longer to be rooted in the ground, but rather to be erupting out of it -almost as if the ground itself was lifting up to make the form" (Scalbert & Mostafavi, 1996, p. 49). The ground "is a consubstantial part of architecture, is part of it, constitutes it and also materializes it" (Rosas, 2007, p. 10). Architecture is also a new ground, on the ground and with the ground that connects to the place to constitute a dialectical relationship between nature and culture (Fernández, 2015, p. 24). But this relationship does not become a simple addition, the sum of a new element, because by forming a new relationship between land and architecture, the new whole is more than the sum of its parts (Pedio, 1973, p. 691) (Figure 2.49).

Following this line of thought, in architecture the floor has gone from being the plinth on which to support the architecture only containing secondary functions such as warehouses and parking lots, (Ruby & Ruby, 2006, p. 10) to become the hub of operations and relationships. Throughout the second half of the 20th century, infrastructures have become the undisputed protagonists of the landscape, while projects have adapted strategies to generate new relationships and continuity of spaces (Irala, 2014, p. 1). These efforts end up creating new constructed reliefs, artificial reliefs with the dimension of hills and mountains, with the dimension of the landscape (Parent, 1970, pag. 67–68). More recently, architecture has come to understand the ground as an operating system without a determined frame that presents a diagonal structure instead of a structure determined by gravity (Foreign Office Architects, 1998, p. 41). Instead of resting on the ground, the architecture is injected into the ground and lifts its surface to result in a "geological dislocation in the landscape" that becomes part of the context (Ruby & Ruby, 2006, p. 99). A geological structure is composed that finishes integrating the proposed layers with the existing ones: "lands in lands" (Delgado Barrocal, 2016, p. 120) (Figure 2.50).

Briefly, Fullaondo Buigas de Dalmau (2013, p. 12) explains that of all the elements of architecture, the one that has been least explored and has remained practically unchanged is the floor. Therefore, it can be foreseen that the manipulation of the ground generates the alternatives that allow the architecture to evolve towards the resolution of the problems it faces.

2.2.2. *Fonction Oblique* features

For Parent and Virilio, before considering the oblique, architecture was dominated by horizontal and vertical approaches that limited the possibilities of movement and, above all, the relationship between spaces. As each historical period has its own spatial system whose geometry represents its social organization, a paradigm shift was necessary that materialized through slopes and varied between five and thirty degrees to allow fluid transitions (Reventós Viñas, 2018, p. 5). While the vertical organization offers only three possibilities ("1 - Hausser, 2 - Allonger, 3 - Décaler"), the oblique has innumerable combinations and allows such freedom of movement that it is possible to free oneself from all limitations (Parent & Virilio, 1996c). Likewise, the oblique would make "the qualities of the architecture were to be perceive in a sensitive, sensual manner, as people became free to move beyond conventional spatial situations" (Parent & Virilio, 1996i, p. 5) (Figure 2.51).

The oblique was proposed as a dynamic, free, unlimited, unstable architecture (sensitive to the force of gravity due to the slope), interactive (favoring visual relationships and links of continuity), which manipulates the forgotten ground plane (merging figure-ground or closure-continuity) (Delgado Barrocal, 2016, p. 114) (Figure 2.52). Precisely the imbalance and instability formed

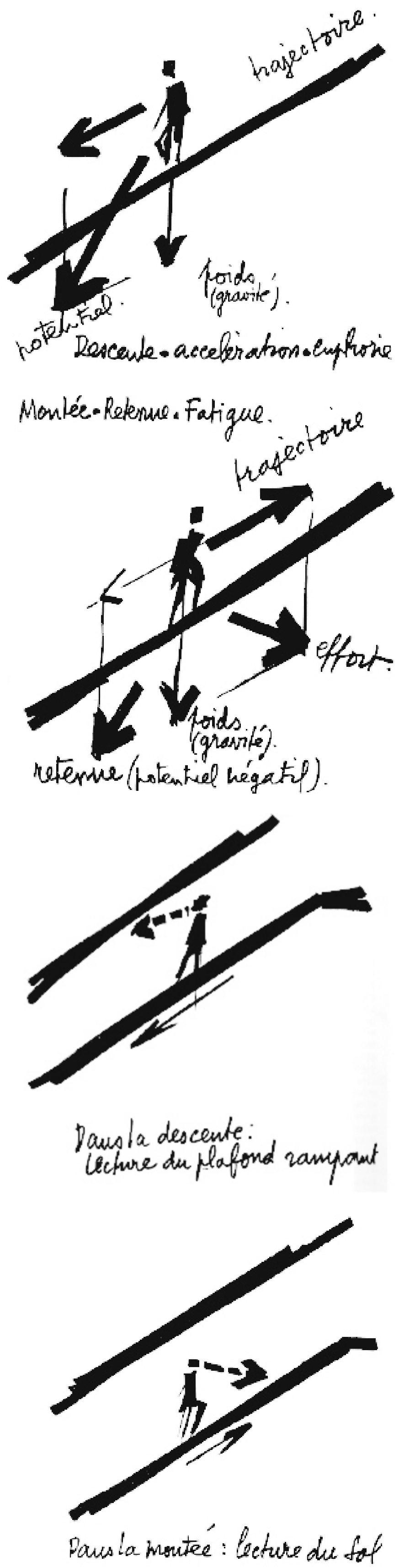

Figure 2.52. Oblique Architecture is a dynamic, unrestricted, unpredictable, interactive architecture that values continuity ties and visual relationships. Source: Parent, C. (1970). *Vivre à l'oblique*. L'Aventure Urbaine.

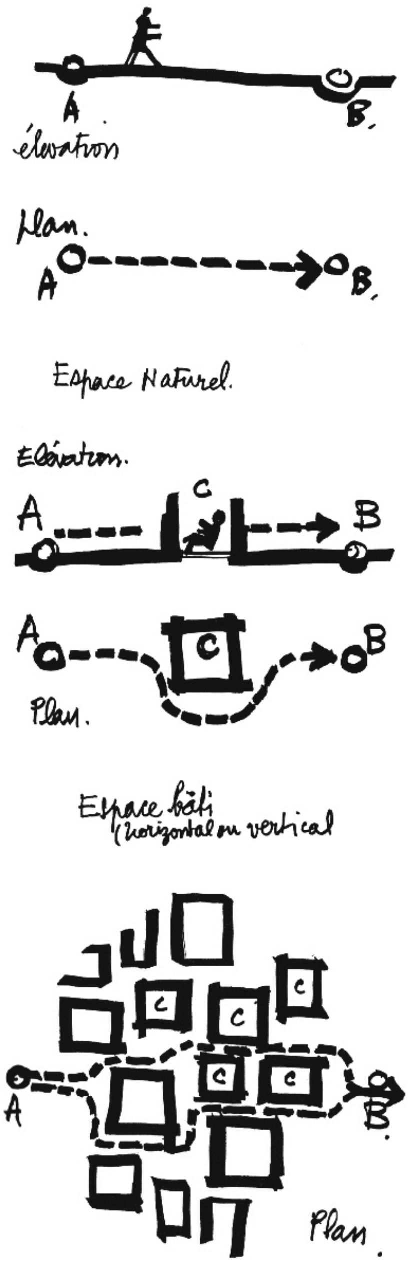

Figure 2.53. Parent and Virilio consider that Oblique Architecture is based on the close relationship between experience and movement. For this reason, space changes assume the main characteristic of continuity and fluidity. Source: Parent, C. (1970). *Vivre à l'oblique*. L'Aventure Urbaine.

part of its origins with the intention of "using the earth's gravity as a motor for movement inspired a very Galilean utilization of the INCLINED PLANE" (Virilio, 1996a, p. 12). In other words, "it was a new means of appropriating space, very much inspired by a Gestalt psychology of form, which, promoted continuous, fluid movement and forced the body to adapt to instability" (Lucan, 1996, p. 5). These approaches considered architecture as the result of the redefinition of architectural space, which in turn became a starting point for experimentation (Pérez Moreno, 2014, p. 86); It's not about small changes:

> Ce n'est pas une petite rampe par-ci, par-là, mettant par un audacieux coup de chance deux plans horizontaux en communication, qui constitue une architecture oblique, ce n'est pas le fait d'incliner les façades d'un immeuble qui permet de dire que cette construction répond à la théorie de la fonction oblique. Pour qu'il y ait architecture oblique au niveau où l'entend la théorie, il faut que les espaces internes eux-mêmes soient déterminés par des plans inclinés. C'est la structure intérieure (comme extérieure) qui doit être en pente. Il s'agit bien d'un basculement total de l'espace, d'une modification complète du support[37] (Parent, 1992, p. 75).

These changes in space revolve around the notion of movement "because in the end that's what the oblique is. It's when you put architecture in motion that it produces slopes" (Abu ElDahab & Benjamin, 2020, p. 15). This change in the ground means deliberately upsetting the inhabitant, bringing him out of his lethargy to make him react and actively and consciously participate in the architecture (Cattant & Mahdalickova, 2013, p. 13) (Figure 2.53). The individual ceases to be just an observer of architecture to become a consubstantial part of the dynamic experience that it materializes (Pérez Moreno, 2014, p. 81). In the words of the authors, "we wanted above all to create an "ordinary place" where experimentation replaces contemplation, where the architecture is experienced through movement and the quality of that movement" (Parent & Virilio, 1996i, p. 5). The oblique approach seeks to bring the human habitat to the era of the dynamics of moving bodies (Virilio, 1996b, p.

8) through a close relationship with architecture (Figure 2.54).

For this thesis, it is essential to point out that the three features attributed by Parent to Oblique Architecture are strictly related to the sensations we feel while traveling through a mountainous landscape. These are (Parent & Virilio, 1996i, p. 70):

> ACTIVATION | The exercise of choice with regard to a place according to the potential of gravity, with the chosen direction either supplying or consuming energy.
>
> VERTIGO | The condition induced by the loss of the traditional reference-system of the vertical and horizontal
>
> CONTINUUM | A growing awareness of belonging to a continuous, permanently unfolding architectural environment.

Activation

Linked to the above, Oblique Architecture is the architecture of the effort that awakens man (Parent, 1970, p. 47) with the purpose "to encourage a constant awareness of gravity, bringing the body into a tactile relationship with the building" and perceiving it "in a sensitive, sensual manner" (Lucan, 1996, p. 5). In this way, the *Fonction Oblique* seeks to take man out of his comfort zone to stimulate an indispensable dynamism (Nicoletti, 2003, p. 32), in other words:

> [...] l'homme dans son lieu de vie, pour survivre, doit être mis en action, DYNAMISÉ, concerné par le cadre [...] Le lieu ne doit pas, selon e qu'on lui demande en ce moment, laisser cet homme en tranquillité, mais au contraire doit lui poser de questions, lui tendre des problèmes à résoudre, lui jeter des incitations, provoquer des impulsions, le faire vivre, le forcer au dialogue, le projeter dans l'inconfort psychologique[38] (Parent, 1970, pp. 45–47).

To raise these questions, an important effort must be promoted. Movement on continuous surfaces requires a certain commitment on the part of the person who walks them:

Figure 2.54. These Parent schemes that try to explain in section the fluidity of what was sought with the oblique function also express the direct relationship between architecture and the shape of the land. How architecture reads and reconstructs the place where it rests. Source: Parent, C. (1970). *Vivre à l'oblique*. L'Aventure Urbaine.

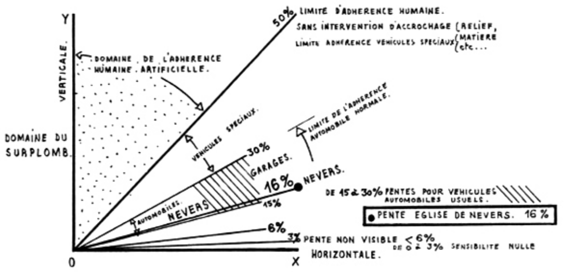

Figure 2.55. New comfort standards are proposed that give the individual freedom of movement related to physical and emotional possibilities. The function oblique proposes areas that encourage motor activity and increase accessibility. Source: Parent, C., & Virilio, P. (1996). *Architecture Principe 1966 et 1996* (R. Edwards, Ed.). Les Éditions de L'imprimeur.

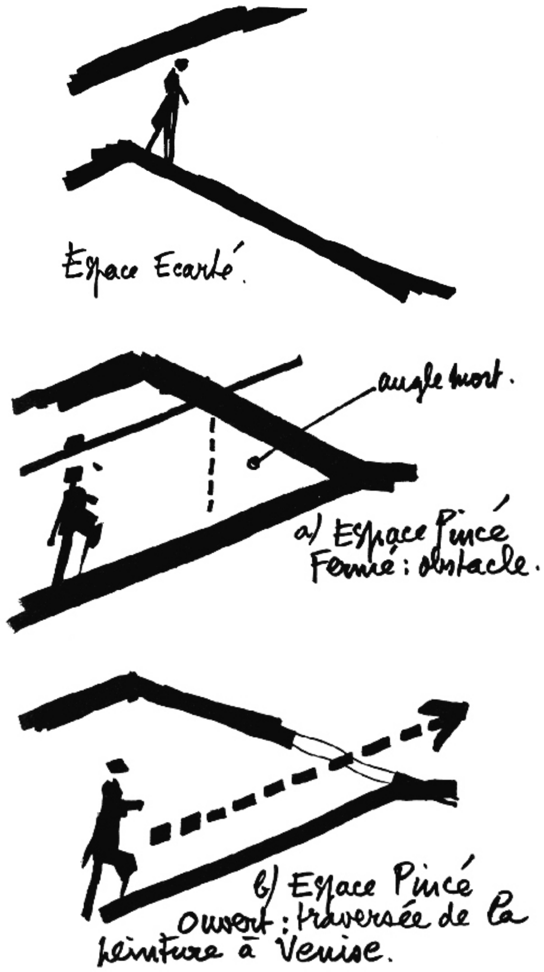

Figure 2.56. For Parent and Virilio, moving across incline planes is a process of free displacement-based discovery. The authors claim that this adjustment will enable people's advancement in its growth and create a dynamic interaction with the surrounding environment and architecture. Source: Parent, C. (1970). *Vivre à l'oblique*. L'Aventure Urbaine.

> Le corps intervient par une sensibilisation plus intense à la notion de gravité. Le poids de l'homme est ressenti, est exprimé, sur une pente même en station immobile, car il faut mécaniquement réaliser un effort musculaire pour conserver dans ce cas son équilibre. Cette prise de conscience du corps même dans l'immobilité, prend une acuité bien plus grande dans le déplacement sur les rampes. Le poids devient un moteur interne. Descendre une pente déclenche une accélération, une utilisation du poids du corps dans le sens d'une perte d'équilibre constamment contrôlée; monter une rampe correspond à une retenue, à un ralentissement du parcours. Les sensations d'euphorie (descente) et d'effort (montée) sont automatiquement associées au choix de ce parcours. Autrement dit, ni la station immobile, ni le mouvement ne sont neutres dans le cadre de la structure oblique (alors qu'ils le sont sur le plan horizontal). Il y a échange énergétique permanent entre le corps de l'homme et son support[39] (Parent, 1970, p. 31).

At the same time that it seeks to break the classic comfort zone that is characterized by resting on horizontal surfaces, the *Fonction Oblique* proposes new comfort standards that inhibit rest in an unstable environment (Moreno Moreno, 2020, p. 44). But this effort is not the same for everyone, it is flexible and adaptable depending on the circumstances. In Parent's words: "la liberté du parcours sur la rampe habitable permet à l'homme de doser son effort, de l'adapter à son humeur ou à ses possibilités du moment [...] L'oblique entretient le corps humain et s'adapte à chaque cas particulier"[40] (Parent, 1992, p. 28). Seen in this way, the activation approach is closely linked to a contemporary issue: sedentary lifestyle. The *Fonction Oblique* aims to design spaces that promote exercise while improving accessibility. If you are facing a stairway and a ramp, surely the ramp will be considered a much more accessible space (Figure 2.55).

Oblique Architecture proposes action, seeking to provoke a reaction on the part of the inhabitant (Parent, 1970, p. 47). The effort required to achieve this reaction will depend on the conditions of the oblique space, but this relationship will always revolve around the tactile, a physical link with matter where the visual is no longer the center:

> La deuxième incidence physiologique précise est celle de la TACTILITÉ. La pente est en effet directement sensible pendant le parcours au niveau des pieds, par l'intermédiaire du phénomène de l'adhérence. Le pied, facteur essentiel du polygone de sustentation transmet des informations directes, non codées, sur les incidences de pente, les difficultés du parcours, les pertes d'adhérence, etc. Le visuel n'est plus l'élément informateur préférentiel. Nous sommes libérés en tant qu'homme de cette hiérarchie néfaste et nocive de l'information, qui à travers la prédominance du visuel occultait notre jugement, le codait à tel point que notre réflexion était toujours dominée par les différentes idéologies relatives à la perception de l'espace vécu[41] (Parent, 1970, p. 35).

Continuing with the words of Parent and Virilio, traction on a ramp restores freedom to the individual through a discovery process that is more significant on low slope surfaces, when the presence of the ramp is not noticed (Parent, 1970, p. 33). But there is also an important variety. The *Fonction Oblique* constantly poses a new challenge, a new possibility, a new unknown that will allow people to continue advancing in their development (Fullaondo Buigas de Dalmau, 2011, p. 38) In a few words, activation is the characteristic that seeks to liberate man from a supposed inertial state in order to motivate a dynamic relationship with architecture and the spaces that surround him (Figure 2.56).

Vertigo

The idea of vertigo was also handled from other associated terms, for example: "'The function of the oblique' had its origins in the concepts of disequilibrium and motive instability" (Virilio, 1996a, p. 12). These terms are closely linked to the previous characteristic of activation and in some way can be considered a consequence of it. The alteration of the forms to produce the oblique planes is a challenge for those who go through them with the idea of making the relationship

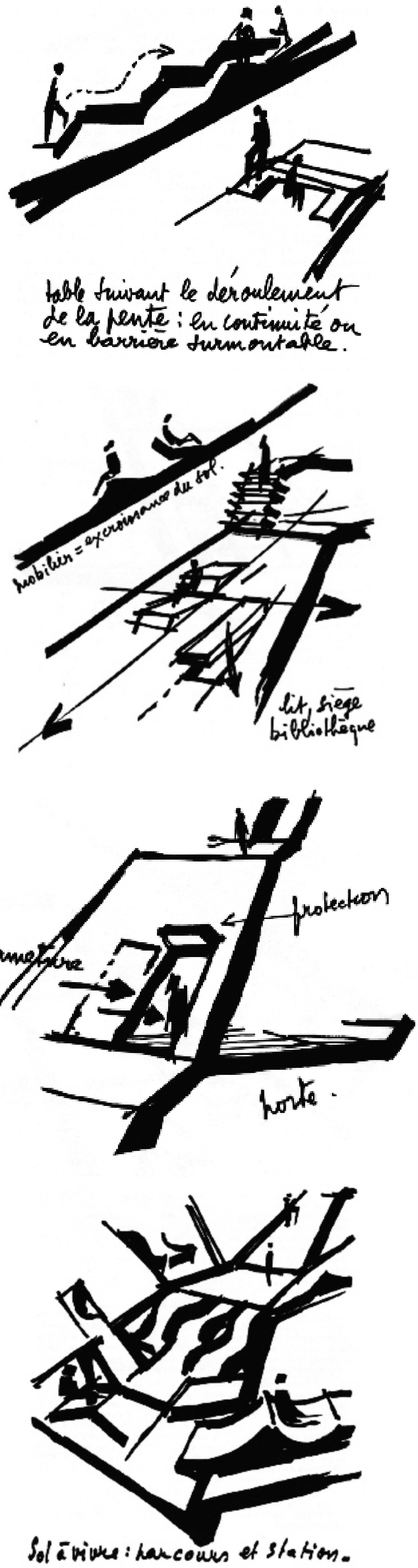

Figure 2.57. Oblique Architecture aims to challenge the movement of individuals, but one of its main objectives is to increase the relationship between person - architecture - landform. Source: Parent, C. (1970). *Vivre à l'oblique*. L'Aventure Urbaine.

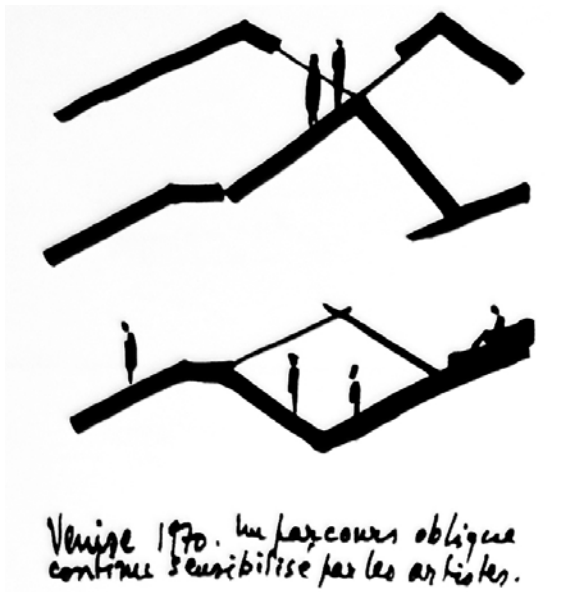

Figure 2.58. Parent and Virilio propose an oblique habitable space, even so this inclined plane is static but a changing sensation of movement is built. Source: Parent, C. (1970). *Vivre à l'oblique*. L'Aventure Urbaine.

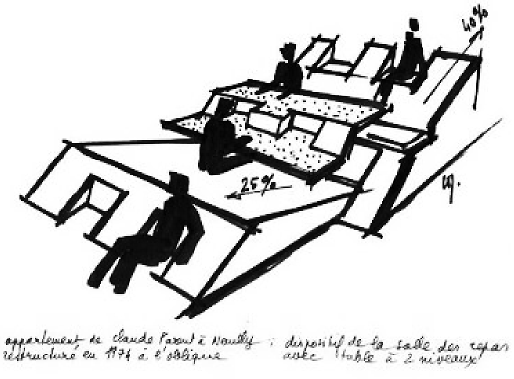

Figure 2.59. Oblique Architecture is not only the consideration of the inclined plane; the Architecture Principe group also proposed a sensory experience through these surfaces, seeking a multisensory experience. Source: Parent, C., & Virilio, P. (1996). Architecture Principe 1966 et 1996 (R. Edwards, Ed.). Les Éditions de L'imprimeur.

between the person and the architecture more intense (Figure 2.57):

> La fonction oblique [...] stabilise ses formes. Elle répond cependant à ce désir de l'homme de modifier constamment la façon dont il appréhende l'espace. La pratique, l'usage de la 3º dimension (verticale) dans le parcours, engendre, sans toucher au volume, la modification de l'espace. Le volume reste fixe, mais l'homme en se déplaçant change lui-même sa façon de ressentir le lieu[42] (Parent, 1970, p. 35).

In this way, although in strict terms the space is static, a sensation of movement is built, a changing situation that motivates that sensation of vertigo or instability. From there, the authors coined the concept of "unstable equilibrium:" "vous avez un appel de la gravité vers le vide, vous avez une fatigue quand vous montez, bref votre corps est en équilibre instable"[43] (Parent & Ultrich Obrist, 2012, pp. 38–39). This concept will appear in various publications and somehow seeks to summarize the intrinsic dynamism of the *Fonction Oblique* (Figure 2.58).

When considered together, imbalance becomes the engine that drives people to become part of the oblique space. "The limbs of the individual became MOTIVE. And the in habitant effectively became LOCOMOTIVE, propelled by the (relative) disequilibrium created by the gravity of planet Earth, the habitat of our species" (Virilio, 1996a, p. 13). Just as it was explained before, the *Fonction Oblique* seeks to include the sense of touch through friction and a close relationship with surfaces, so this imbalance is also linked to hearing. This multiplication of the senses will be understood as a multi-sensorial perception experienced by the citizen when walking through those oblique spaces, a way of perceiving the alteration of the landscape proposed by the architect and, at the same time, doing his work as a more present creator (Pérez Moreno, 2014, p. 79) (Figure 2.59).

The unstable balance generates the sensation of vertigo and reveals the conditions of the architecture that builds the space. The condition of neutrality is broken through the introduction of vectors of fatigue (rise) and euphoria (descent) that will deal with inertia (Parent & Virilio, 1996e). In other words, the *Fonction Oblique* places its center on the ground plane in order to move from the neutrality of the horizontal plan to a suggestive plan of unstable equilibrium through the manipulation of the surface that opens up infinite possibilities (Fernández, 2015, p. 189) (Figure 2.60).

Figure 2.60. Highly inspired by the architectural ideas of his brother, Nicole Parent proposes a method of oblique gymnastics; this helps movement with less effort, better breathing, and more excellent stretching. The oblique floor favors action; it is a terrain to work, a gymnastics to live. Source: Pedio, R. (1973). La fonction oblique: Progetti. *L'Architettura: Cronache e Storia*, 10(208), 682–694.

Continuum

Parent and Virilio understood the horizontal-vertical approach as a formula that imposed significant barriers, especially through walls and compartmentalized spaces. From there, the *Fonction Oblique* raises the need to generate new formulas of living and circulating that, instead of channeling roads, elevators and corridors in a repressive way, serves to find the happiness of movement (Zevi, 1972b, p. 10). The oblique surface favors accessibility and ensures that the building is not a barrier because, although it recognizes its individuality, it raises the vision of community (Scalbert & Mostafavi, 1996, p. 52) (Figure 2.61).

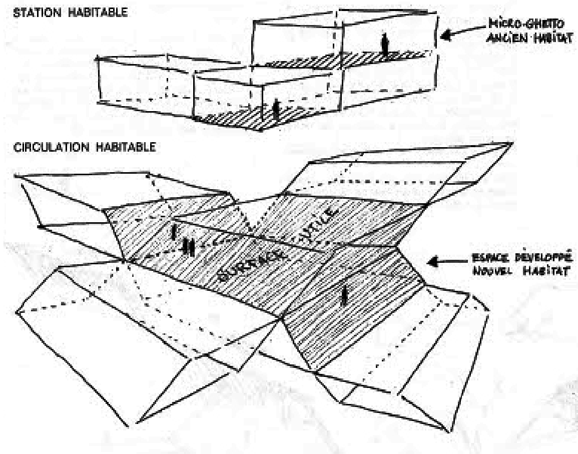

Figure 2.61. For Parent and Virilio, the horizontal approach was a barrier through compartmentalized spaces. The oblique function is used to suggest a new formula for dwelling and moving around; all surfaces are navigable, and the slanted plane encourages accessibility. Source: Parent, C., & Virilio, P. (1996a). *Architecture Principe 1966 et 1996* (R. Edwards, Ed.). Les Éditions de L'imprimeur.

One of the key points to achieve this fluidity is the idea of the passable enclosure that serves to oppose the binomials of exterior-interior or inhabit-circular (Irala, 2014, p. 3; Moreno Moreno, 2020, p. 44). Private space and public space are intertwined dissolving the discontinuity (Fullaondo Buigas de Dalmau, 2011, p. 86) (Figure 2.62) or in Parent's words:

> En fonction oblique n'existe plus la distinction intérieur/ extérieur. Cette notion cède le pas à celle d'espace du dessus et d'espace du dessous. Ce sont les rampes qui établissent une frontière entre les lieux, mais, contrairement à la structure orthogonale qui exige de percer la frontière pour faire communiquer les espaces, les rampes par leur débordement latéral les mettent en communication naturellement[44] (Parent, 1992, p. 111).

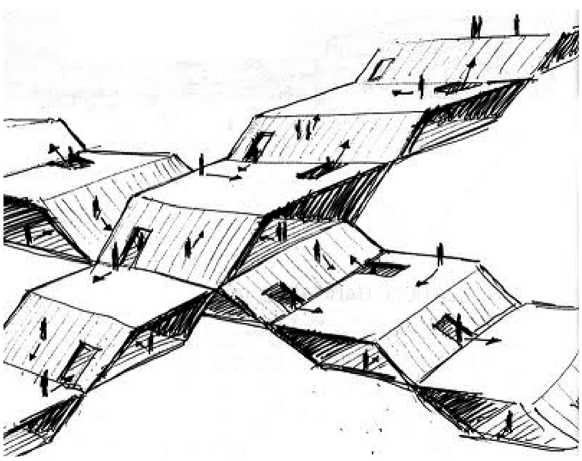

Figure 2.62. Fluidity is achieved by utilizing the concept of the walking enclosure. Spaces that are public and private merge together and eliminate boundaries. Source: Parent, C., & Virilio, P. (1996). *Architecture Principe 1966 et 1996* (R. Edwards, Ed.). Les Éditions de L'imprimeur.

A fluidity defined by the inclination of the straight lines thought in section, which provide visual

Figure 2.63. The fluidity is characterized by the inclination of the straight lines studied in the section, which offers visual continuity, freedom of movement, and unbroken perception movement, and unbroken perception. Source: Parent, C., & Virilio, P. (1996). *Architecture Principe 1966 et 1996* (R. Edwards, Ed.). Les Éditions de L'imprimeur.

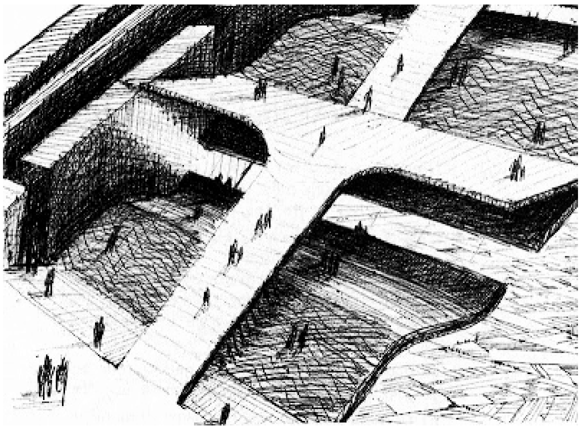

Figure 2.64. The theory proposed by Parent and Virilio mainly suggests continuity, an architecture that supports the movement. Source: Parent, C., & Virilio, P. (1996). *Architecture Principe 1966 et 1996* (R. Edwards, Ed.). Les Éditions de L'imprimeur.

continuity, freedom of movement, uninterrupted perception (Sánchez Fernández, 2019, p. 11) Certainly the ascending or descending slope does not include any obstacle, it does not accept any limit, therefore, the oblique demands a continuous movement, a displacement that tends to infinity (Parent, 2013, p. 146). There is no segregation, neutral spaces and elevators are eliminated to superimpose a continuity of uninterrupted moments that motivate fluidity (Parent & Virilio, 1996d). Thus, "l'oblique est la seule structure qui PERMET L'ÉLÉVATION dans la continuité du parcours"[45] (Parent, 1970, p. 33) (Figure 2.63).

The *Fonction Oblique* is continuity because it allows compartmentalization without opposing displacement (Parent & Virilio, 1996c). The inclined plans emerge from the ground to produce dynamism, sliding a perceptive movement rather than a connective one. (Sánchez Fernández, 2019, p. 11). In other words, the *Fonction Oblique* represents the colonization of the three dimensions spatially, psychologically and physically (Fullaondo Buigas de Dalmau, 2011, p. 86). Architecture becomes a support for movement, movement is freed from the restriction of tracking precision and ends up reinventing a mobility system that is always continuous (Parent & Virilio, 1996c, 1996b) (Figure 2.64).

In addition to these three central characteristics, the *Fonction Oblique* is defined by another series of conditions. For example, the *Fonction Oblique* has the ability to be landscape and city, floor and ceiling, all at the same time (Schein, 1973, p. 636), so it is fundamentally pedestrian in nature (Fullaondo Buigas de Dalmau, 2011, p. 33). The authors also argue that the *Fonction Oblique* is focused on a functional interest, not a decorative matter (Parent, 1970, p. 39).

The *Fonction Oblique* would also represent a qualitative change thanks to the increase in the useful surface (Fullaondo Buigas de Dalmau, 2011, p. 34). With the same amount of construction material, the land is better used, improving the proportion and profitability between the contained volume and the surface of the perimeter enclosure necessary to delimit it (Fullaondo Buigas de Dalmau, 2011, p. 34). In this way, the *Fonction Oblique* creates a complex, intricate three-dimensional thickness to allow for a habitat made up of interlocking spaces (Nicoletti, 2003, p. 8) (Figure 2.65).

In short, the *Fonction Oblique* revolves around an enormous potential for activation and flexibility. The latter also referred to as freedom by Parent, who in a recent interview noted (Figure 2.66):

> With the oblique you can do all this stuff, you can run around, it's a little nutty. It's amazing to be free from constraints. When you have inclines in your dwelling you can enjoy yourself. You can sit and lie on the surface of it, or slide down, etc. Because you feel the weight of your body. On an incline the weight of your body is you friend, an ally. Here, with slopes, you've got a friend for life. The oblique has a very practical dimension to it. Once you can apply such a radical change to such a simple notion, you can quickly see how this could challenge so many rules that seem unchallengeable. That's what attracts me. The fact that the oblique expands possibilities (Abu ElDahab & Benjamin, 2020, p. 100).

Figure 2.65. The oblique function creates a complex three-dimensional architecture made up of interlocking spaces. It represents a change not only due to the use of the inclined plane but also due to the increase in the proper surface since it makes efficient use of the ground and the enclosures. Source: Parent, C. (1993). *Les échelles de l'espace*.

2.2.3. Inhabiting Oblique Architecture

Of all the conditions that characterize the *Fonction Oblique*, one of the most relevant for this work is that the oblique space was not raised by Parent and Virilio only as a connecting space, but rather they developed the idea of the oblique space as a habitable space (Figure 2.67):

> Nous sommes donc obligés d'abandonner la logique élémentaire de la partition spatiale pour entrer dans le domaine d l'hypothèse car la fonction oblique suppose une hypothèse de départ: dans leur nouvel âge urbain, les hommes VIVRONT SUR DES PLANS INCLINÉS[46] (Parent, 1970, p. 25).

This new way of living would serve to connect people with "a dynamic age of the body in movement" while moving away from the classic idea of the

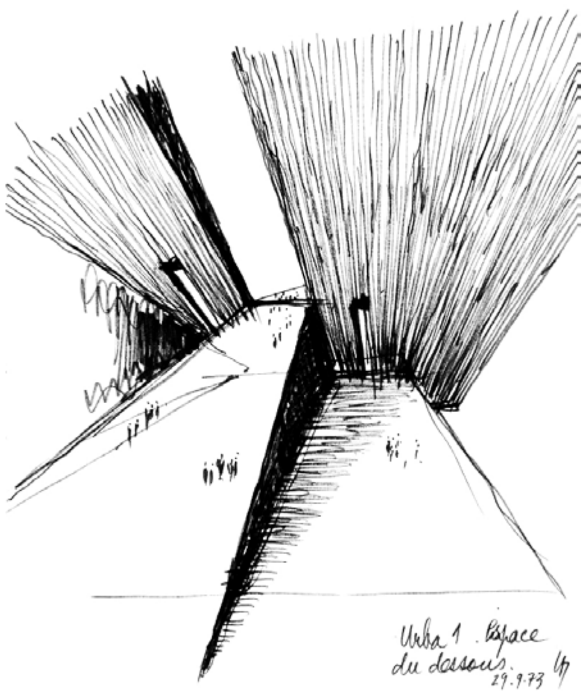

Figure 2.66. The Fonction Oblique revolves around a tremendous amount of activation and flexibility potential. Source: Parent, C., & Virilio, P. (1973). *La surface du dessous*.

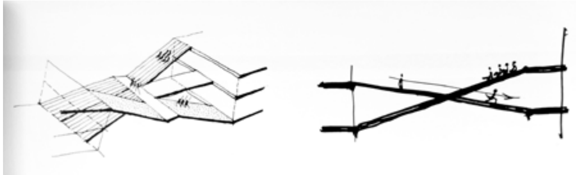

Figure 2.67. The utilization of the inclined plane as a place for connection and fluidity and the development of the notion that these surfaces are livable are two features of the oblique function that Parent and Virilio suggest. Source: Zevi, B. (1972). Encuentro con Claude Parent. *Nueva Forma*, 78/79, 8–17.

body as a static element (Virilio, 1996a, p. 13). The integration of the circular and the dwelling raises the need for a walkable enclosure that facilitates understanding and navigation in space (Irala, 2014, p. 3). Thus, the idea of inhabitable circulation materializes physically through the constructed slopes and sensorially through the experience of traveling through those inclined planes; oblique space results in a complete environment (Pérez Moreno, 2014, p. 81). Starting from the possibility of activation that was previously mentioned, the *Fonction Oblique* makes movement an intrinsic part of the experience, using inclined planes to make the most of the energy of gravity (Lucan, 1996, p. 8).

Previously, the optimal and direct trajectory between two points was cut by the private spaces, leaving the movement as something that happens in the interstitial spaces between different obstacles (Fullaondo Buigas de Dalmau, 2011, p. 28). La "CIRCULATION" est née. Elle est DISSOCIÉE de "l'habitation"[47] (Parent, 1970, p. 11). The drastic separation means that the static and dynamic spaces have been conceived as two antagonistic entities (Fullaondo Buigas de Dalmau, 2011, p. 28). Hence, the habitable circulation of the *Fonction Oblique* raises the need to change the vertical, inaccessible enclosures, for inclined and continuous spaces (Virilio, 1996a, p. 12). Some of these spaces are defined by these authors as:

> Les espaces PLONGEANTS parcourus en descendant offrent la lecture de la pente supérieure, les espaces ASCENDANTS donnent la lecture du sol support, LES ESPACES PINCÉS, c'est-à-dire les espaces à dièdre aigu refermé, ou LES ESPACES ÉCARTÉS à plans inclinés inversés dans le sens de l'ouverture sont des supports structurels nouveaux, tremplins d'une action artistique à imaginer[48] (Parent, 1970, p. 39).

In this way, the orthogonal planes become diagonal with the function of delimiting spaces, but also of allowing circulation, all in a single element that of habitable circulation where a large part of the movement occurs on the exterior surfaces (Fullaondo Buigas de Dalmau, 2011, p. 33). The planes arising from the ground generate continuity, they are active surfaces that dissolve the object-ground binomial and turn the building into a habitable and inhabited topography both in its morphology and in its conception (Delgado Barrocal, 2016, p. 114). This habitable topography is a hybrid configuration that manifests itself both inside and outside through artificial relief. The manipulation of geography allows the ground to host activities, which leads to understanding the landscape as an operating system with an apparent elasticity that allows it to adapt (Delgado Barrocal, 2016, pp. 120–121) (Figure 2.68).

All surfaces become living space. While the classical approach requires that most of the faces of the volume be vertical and serve as enclosures, in the oblique space it is possible to inhabit all the faces, increasing the area, the dimensions of the houses and buildings (Parent, 1972, p. 51; Virilio, 1996b, p. 8). "Il devient excroissance de la rampe. C'èst le sol qui en se soulevant, en se redressant, en se creusant, en se modelant constitue les plans horizontaux nécessaires à la vie: LE SOL A VIVRE"[49] (Parent, 1970, p. 43). The parts that make up the space are no longer individual elements that can be removed or replaced by others, they are integral parts of the whole (Parent, 1972, p. 70). It could even be said that the parts cannot be recognized in their individuality and any change would mean a profound alteration of the whole (Figure 2.69).

The integral way in which the *Fonction Oblique* configures the space includes the definition of the interior, as it forms the floor of the private areas (Fullaondo Buigas de Dalmau, 2011, pp. 33–34), but the definition of the oblique space also directs and orients the furniture (Parent, 1970, p. 43). In the words of the authors: "L'ameublement y sera étroitement incorporé et participera à ce rôle d'exaltation de la dynamique humaine en devenant le moyen de diversification du sol, par ses volumes, ses matières et ses couleurs"[50] (Parent & Virilio, 1996b). The equipment necessary for life takes advantage of the active ground, the "sol-à-vivre" of Oblique Architecture to insert itself and create a scenario where it can fulfill all the required functions (Virilio, 1996b, p. 8) (Figure 2.70).

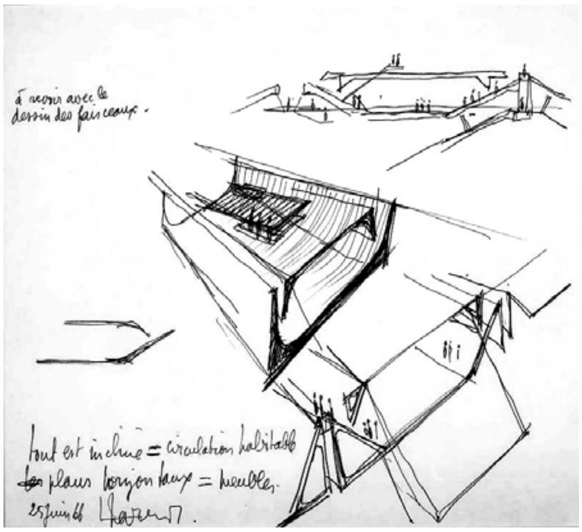

Figure 2.68. Circulation becomes a habitable element where most movements occur on the exterior surfaces. The manipulation of the geography allows the ground to contain a functional program; the relief is then an internally and externally habitable container. Source: Parent, C., & Virilio, P. (1996) *Tout est incliné = circulation habitable, plans horizontaux = meublés.*

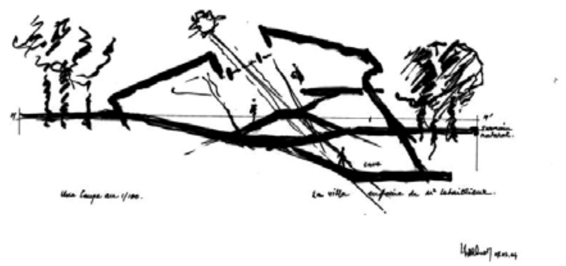

Figure 2.69. Oblique Architecture states that all surfaces are helpful; it is possible to inhabit or circulate all the faces that make up this architecture, thus increasing the surface compared to the horizontal model. Source: Parent, C., & Virilio, P. (1994-2004). *Maison Letaillieur*.

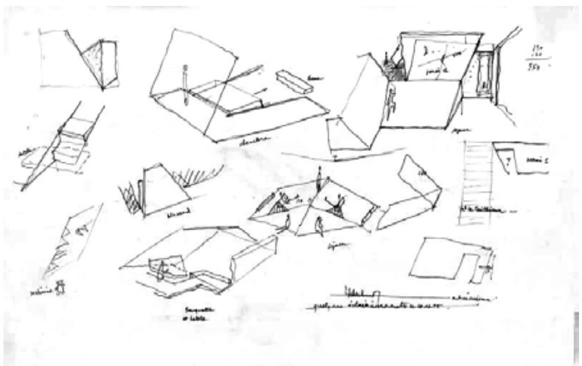

Figure 2.70. Parent and Virilio also propose that the furniture in private spaces be designed in conjunction with the architecture to make the most of the qualities of the oblique system. Source: Parent, C., & Virilio, P. (1994-2004). *Maison Letaillieur*.

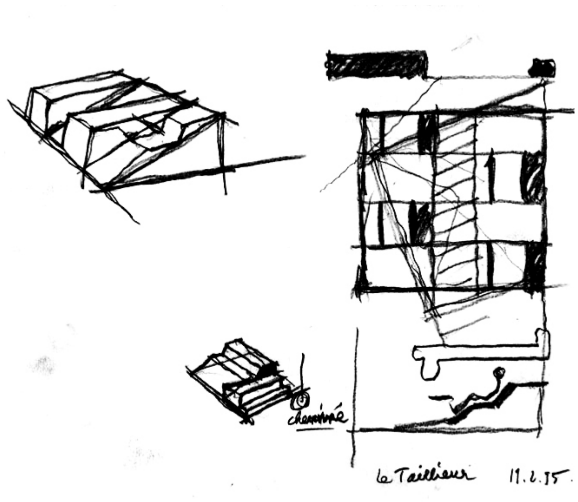

Figure 2.71. The possibility of having different angles facilitates the proposal of furniture with different positions for the inhabitant. Multifunctional and adaptable furniture that was closely linked to the inclined plane. Source: Parent, C., & Virilio, P. (1994-2004). *Maison Letaillieur*.

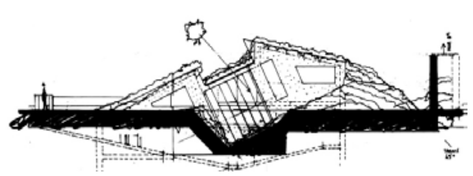

Figure 2.72. Oblique Architecture is a habitable space that intertwines room with circulation. Somehow it contains public and private spaces but maintains its essence by having them functionally separated. Source: Parent, C., & Virilio, P. (1994-2004). *Maison Letaillieur*.

Figure 2.73. An exciting aspect of the theory proposed by Parent and Virilio is that it was possible to transfer these reflections to different scales: one architectural, one intermediate, and one urban. Source: Parent, C. (1960) *Les Villes cônes.*

The furniture represented another of the points of interest of the *Fonction Oblique*. This exploration considered ergonomics as a central theme, taking advantage of the various angles to propose different positions to the inhabitant, but also the tables, the shelves, everything sought to be part of the *Fonction Oblique* (Moreno Moreno, 2020, p. 44). This research suggests that the entire world of interior and furniture design has also been limited to date by the dictatorship of the horizontal plane as the only possible support, which opens up a wide range of possibilities, for example: architecture once again assumes the responsibility that had been abandoned in the hands of decoration, the space regains a leading role that may be accompanied by accessory elements, the initial configuration of the space must be resounding and precise, architecture will not wait for other disciplines to take control or overlap, new types of specific furniture will appear, the multifunctionality and adaptability of these elements–now strongly associated with their inclined plane, will replace the multiplication of useless objects superimposed on architecture (Fullaondo Buigas de Dalmau, 2011, p. 35) (Figure 2.71).

Ultimately, the inclined plane is a habitable space that incorporates both habitation and circulation. Although this proposal could be considered contradictory, it is nothing more than going back to the origins of architecture, prior to the spatial separation imposed by the modern vision, to motivate fluidity (Parent & Virilio, 1996i, pp. 67, 70) (Figure 2.72).

2.2.4. Forms of oblique aggregation

Parent and Virilio proposed the *Fonction Oblique* to work at multiple scales. In reality, most of the reflections seem to refer to intermediate scales, of housing groups that acquire an urban scale (Fullaondo Buigas de Dalmau, 2011, p. 32). Cities that serve as a framework for a variety of relationships, activities, but above all an intense fluidity (Parent & Virilio, 1996i, p. 68) that even intended to respond to the constant migratory movement of the population (Parent, 1970, p. 59). When observing Parent's drawings it is possible to recognize visionary cities organized through this third (oblique) urban order, but it is also observed that the *Fonction Oblique* is supported by a self-referential logic that expands even on a planetary scale (Nicoletti, 2003, p. 49) (Figure 2.73).

When viewed crosswise, the *Fonction Oblique* passes through all the scales. It is presented as an idea, an abstract vision on which to discuss, from which walls, hills, and various entities that relate the ground and the sky, the water and the ground are imagined (Parent, 1970, p. 59). Then, the *Fonction Oblique* recognizes habitats where man can be move from one to another, starting from the individual act to consider collective behavior (Parent, 1970, p. 67). This configuration comes to be understood as a structure capable of multiplying itself over vast extensions of land, even regions, accompanying the existing infrastructure networks (Parent & Virilio, 1996c). From there, Parent proposes to reach that global scale that was previously mentioned (Figure 2.74):

> Exigez qu'on prenne en considération ce fameux tissu intermédiaire, cette couche qui, à elle seule, fabrique la richesse du monde. Votez pour une architecture continue qui ne sera plus un agglomérat de constructions qui enferment mais pour une texture, une nappe qui entretiendra avec le sol de la terre une proximité permanente par d'immenses ponts urbains. Inventez des établissements humains qui reprendront le thème de la vie à l'air libre. La science vous en donne les moyens. Il suffit de réclamer et avant tout de refuser ce que les pouvoirs vous contraignent à réaliser. Il s'agit d'inventer des rapports plus simples, plus directs avec la nature, le sol, il s'agit de reprendre la maîtrise de l'eau qui nous menace à court terme. Unis dans un immense projet qui deviendra vite planétaire, vous reprendrez votre place de générateurs de sites, vous travaillerez ensemble à la modification de notre terre[51] (Parent, 2009, p. 52).

Parent, far from conceiving architecture from a solely social dimension, imagined buildings and infrastructures on a monumental scale that traced, by themselves, a new urban landscape (Moreno

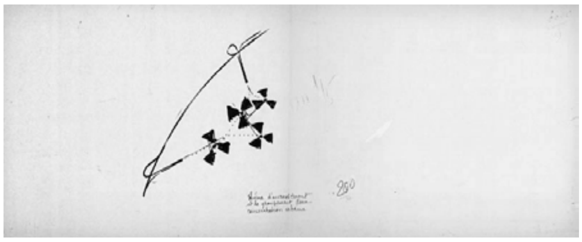

Figure 2.74. The oblique function is a structure capable of multiplying and adapting to different territories. Source: Parent, C. (1960) *Les Villes cônes*.

Moreno, 2020, p. 26). Parent and Virilio defined this approach as "topotonique," an urban model that unfolds and unfolds over time (Parent & Virilio, 1996c), because obliquity is the need for freedom, dynamism and unlimited landscapes, it is the rebellion against stillness and the restrictions of the mind that are forced by the mechanisms and procedural rites of society (Nicoletti, 2003, p. 23). This position understands urban space as a palimpsest crust that accumulates changing and simultaneous experiences, instead of a determined and stable form (Fernández, 2015, p. 216). Oblique Architecture is conceived as a kind of organism that colonizes the world as we know it (Figure 2.75):

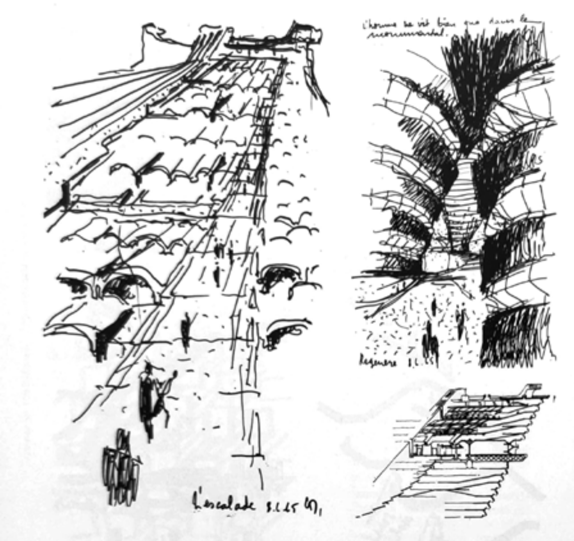

Figure 2.75. The oblique theory on an urban scale is infrastructure capable of multiplying over time, building an unlimited urban landscape. Source: Parent, C. (1992). *Entrelacs de l'oblique*. Centre d'études et de prévisions.

> L'oblique s'est déjà glissée sous les arches. La tour Eiffel est assiégée et, par le pont de Puteaux, Neuilly est attaqué. D'est en ouest, la jonction s'est faite à la porte Maillot, tout autour du palais des Congrès qui étouffe à son tour après vous avoir tant étouffé. Puis, d'un seul élan, l'oblique s'écoule dans le périphérique; comme un fleuve géant de béton, elle avance, lançant à chaque sortie ses branches vers le r 5eme arrondissement ou vers le quartier Italie, rebroussant chemin dans les entrées vers la porte d'Orléans ou vers Saint-Ouen. Mais elle préfère les tours. Sur ces ineptes structures verticales, elle s'enroule comme le lierre sur le poteau de la véranda. Tout lui est support, tout lui est point d'appui pour bondir, pour enjamber, pour réunir, pour contredire cent ans d'un urbanisme imbécile et criminel. Mais l'oblique bientôt est repue. Son béton a comblé toutes les blessures de la ville; plus de périphérigue, plus de souterrains, plus de parkings. Elle a enserré les automobiles dans sa maille. Celles qui ont pu s'échapper à temps errent de ville en ville pour chercher, vainement, de nouvelles plaies où se nourrir. Mais l'oblique est partout. Alors, elles s'arrêtent, faute de but, en rase campagne. Et bientôt, abandonnées, définitivement arretees, elles servent de jeu aux enfants, de perchoir aux oiseaux, d'abri pour les cultivateurs ou pour les promeneurs. Le lierre s'y installe. Et ce sont autant de gros bouquets au sein desquels brille encore quelquefois l'éclair de l'acier inoxydable. Pas pour longtemps... L'oblique repue s'est assoupie dans les rues. Elle a prêté son dos, son espace du dessus aux pas paisibles des piétons, aux pas lents de ses habitants. Elle

est enfin la ville, la ville de la rencontre et de la communication[52] (Parent, 1992, p. 11).

Instead of following the tabula rasa idea shared by so many architects of their time, Parent and Virilio change the ground so that a new city arises obliquely from the existing one (Ruby & Ruby, 2006, p. 16). This oblique city is a space where the morphology of nature becomes habitable, where the inhabitants communicate through the intertwining of the obliques (Parent, 1992, p. 22) and which is made up of two zones: the "SUR-FACE," a walkable and continuous zone where the relationship between neighbors, common activities, social mixing and community life are favored in spaces that ensure natural lighting and ventilation; and the "SOUS-FACE," is the lower face that, suspended in the void, ensures the intimacy of private spaces (Parent, 1970, p. 47).

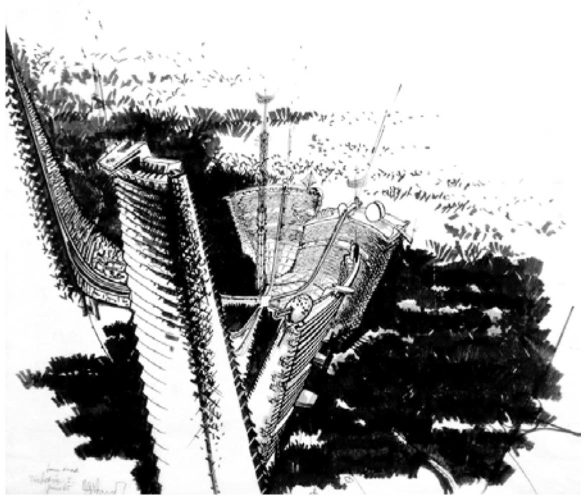

Figure 2.76. Parent and Virilio, through this theory, propose the construction of new oblique cities where the shape of the land becomes architecture and habitable. A town that favors movement thanks to its continuous figures. Source: Parent, C., & Virilio, P. (1996). *Architecture Principe 1966 et 1996* (R. Edwards, Ed.). Les Éditions de L'imprimeur.

In some way, the typical zoning of the time is proposed, but in section, some uses above and others below (Fullaondo Buigas de Dalmau, 2011, p. 92). With the upper level of inclined planes designed for the meeting, it seeks to promote sociability and increase the surface of enjoyment (Zevi, 1972b, p. 10). The city extends like a blanket over the entire building, generating a new public space (Fullaondo Buigas de Dalmau, 2011, p. 86). Everything is habitable circulation, everything is part of the same urban structure: the ramp represents the roof of the city, the roof of the building, the inhabited floor of the house or dwelling (Parent, 1992, p. 30) (Figure 2.76).

On the other hand, the *Fonction Oblique* allows the city to contract, to develop a denser system that expands the useful interior space (Parent, 1972, p. 63). Cities that require greater volume, but less footprint that manifest as "reliefs constructs to the dimension des natural sites"[53] (Parent, 1970, p. 57). This proposal demonstrates a critical stance towards the existing urban form such as the compartmentalization of common spaces, the extension of the urban footprint and the reduction of living spaces. It also recognizes the need to promote a different alternative (Figure 2.77). According to Parent, the concentric city must

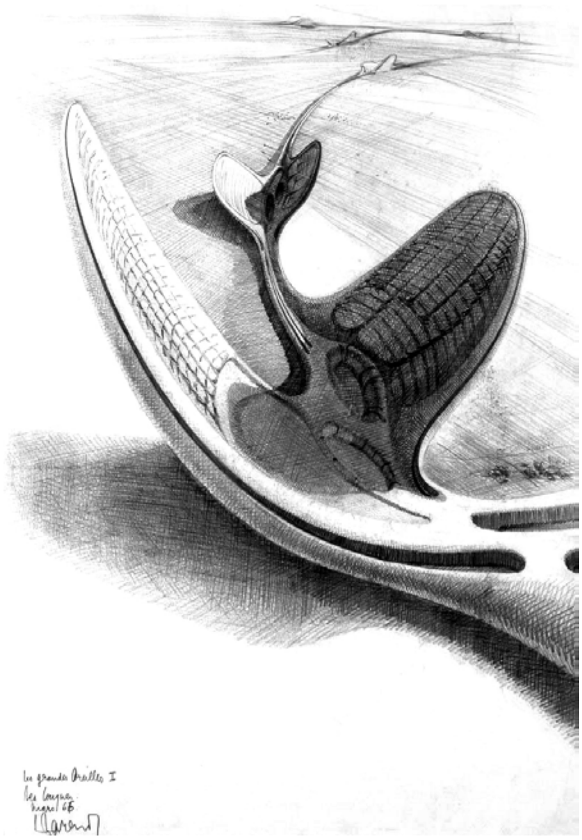

Figure 2.77. These structures are designed to build a dense city that multiplies usable area, requiring a larger volume but leaving a smaller footprint. Build a geographic architecture with the dimensions of the landform. Source: Parent, C., & Virilio, P. (1966). *Les grandes oreilles I / Les conques*.

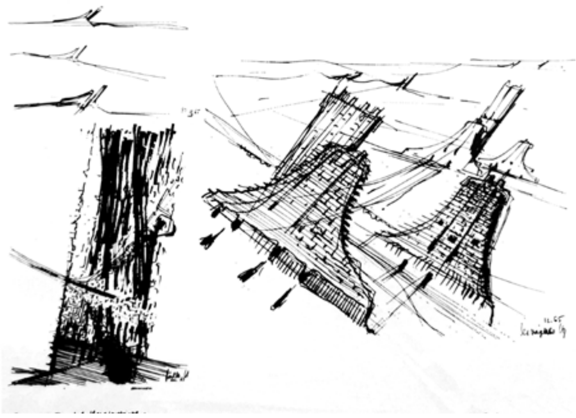

Figure 2.78. In addition to encroaching on the existing land, these city models may dominate the area by mimicking its topography through architecture, adhering to waterways, respecting the surrounding vegetation, and preserving unevenness by using an inclined plane. Source: Pedio, R. (1973). La fonction oblique: Progetti. *L'Architettura: Cronache e Storia*, 10(208), 682–694.

be replaced by a city made up of organic networks that follow the same strategy as the watercourses that, accompanied by vegetation, run over the land, irrigating and connecting the territories (Parent, 2010). The metaphorical approach to the natural landscape will also generate architectures "turbines, nautas, vagues, cratères, sites de dérivation" that will serve as shelters for people[54] (Parent & Virilio, 1996f). These alterations are intended to be inserted into the existing relief, but at the same time create an intervention that is capable of imposing itself and dominating the site (Parent, 1970, p. 57) (Figure 2.78).

Another important difference that this city model has compared to the trends that prevailed at that time, is that it does not give importance to the car. The new oblique spaces are conceived as purely pedestrian structures where a slower, more human speed predominates, favoring exchange, sociability and constant integration among its inhabitants through the recovery of public space (Fullaondo Buigas de Dalmau, 2011, p. 33). The vehicle exists only to move between different urban centers, to move goods or attend emergencies:

> Il faut répéter que ces parcours sur l'oblique sont à l'échelle de l'habitat et surtout à l'échelle de la ville, puisque les habitations sont distribuées non plus par les ascenseurs mais par la pente extérieure de l'immeuble (ou de la ville), puisque les façades sont parcourables, puisque la marche se fait continuellement, pour les activités quotidiennes de l'homme, sur les pentes et contrepentes. L'entretien du corps est donc permanent et naturel. Il fait partie automatiquement du mode de vie. Il est très important de visualiser le déroulement du quotidien dans la vie à l'oblique. Cette ville étant très concentrée est une ville pour piétons. Les véhicules n'y jouent que le rôle de transport de malades ou de livraison de marchandises[55] (Parent, 1992, p. 29).

Since the invention of the *Fonction Oblique* theory, the urban and territorial dimension of architecture has been the central object of study (Cattant, 2013, p. 44). The versatility of the model is applied at all scales of human habitation until it is capable of building complete urban settlements.

Likewise, these spaces are imagined centered on people, with the interest of fostering relationships and the cohesion of society.

2.2.5. Distributive systems and oblique projects

Parent and Virilio consider that traditional vertical organization and circulation are a problem. In addition to requiring a constant return to the ground floor in order to connect with other buildings, preventing direct relationships due to its monolithic condition, this format promotes fragmentation and isolation (Parent, 1970, p. 51) (Figure 2.79):

> Les espaces distribués eux-mêmes sont cloisonnés et isolés, conçus de telle sorte qu'ils n'ont comme liaison avec l'extérieur qu'une surface vitrée en balcon sur le vide; on se rend compte de l'isolement que la structure verticale secrète, en même temps que du gaspillage qu'elle entérine: chaque espace habité ne donne comme surface utilisable que le plancher c'est-à-dire une seule des six faces qui lui sont nécessaires pour le constituer. Ces micro ghettos empilés sous forme de silos à homme, stockent ceux-ci comme des marchandises, mais ne les font ni habiter, ni vivre[56] (Parent, 1970, p. 51).

On this same point, the authors recognize the elevator as a dark and asocial hose that works through an electronic collection system that is illogical, and also ends up becoming grotesque when used to connect differences on a single floor (Parent, 1970, p. 51). This fact is added to a society surrounded by mechanical means of transport, instead of solving the problems of displacement through bridges, ramps, circuits, interchanges, etc., that is, through an architectural response (Parent, 1972, p. 22) (Figure 2.80).

The oblique abandons the static condition to make way for a dynamic idea of change and constant controlled variation that ends up activating all the spaces of architecture (Fullaondo Buigas de Dalmau, 2011, p. 86). Thus, the *Fonction Oblique* is

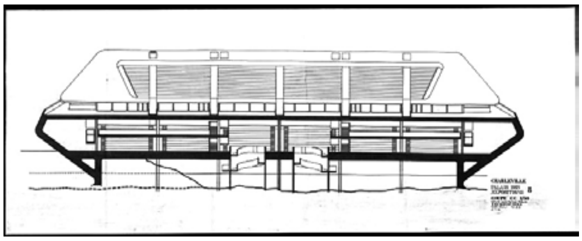

Figure 2.79. One of the problems of the vertical order that Parent and Virilio want to avoid is that the buildings, due to their vertical development, do not have direct relations between them; there is no fluidity, and the isolation increases. Source: Parent, C., & Virilio, P. (1966-1967). *Palais des expositions*.

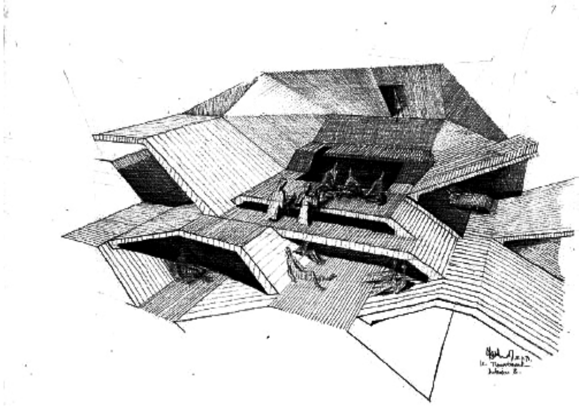

Figure 2.80. The design on which the oblique function is built allows displacement issues to be resolved without mechanical conveyance. Moving in an Oblique Architecture is a concept that directly connects to the inclined plane. Source: Parent, C., & Virilio, P. (1965-1967). *La fonction oblique*.

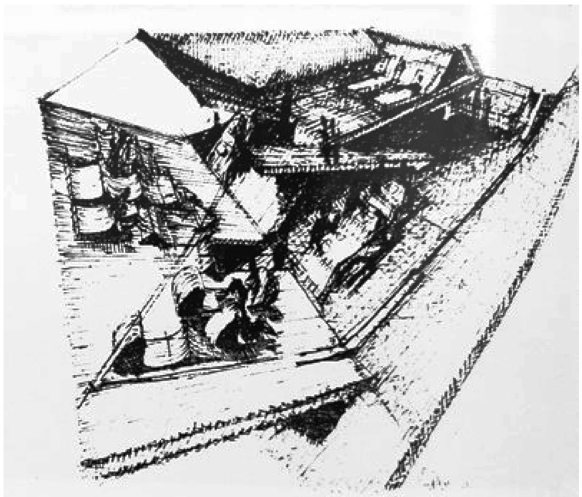

Figure 2.81. Oblique Architecture is a constantly controlled variation of space. This dynamic space seeks to generate different sensations and experiences, where representation has been essential to transmit the authors' ideas. Source: Pedio, R. (1973). La fonction oblique: Progetti. *L'Architettura: Cronache e Storia*, 10(208), 682–694.

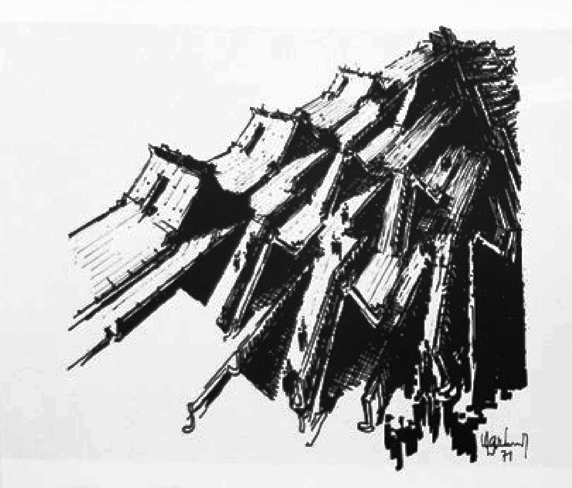

Figure 2.82. The oblique planes allow a natural distribution through the space; the movement is fluid without obstacles. There is freedom of movement mixed with sensory and spatial experimentation. Source: Parent, C. (1992). *Entrelacs de l'oblique*. Centre d'études et de prévisions.

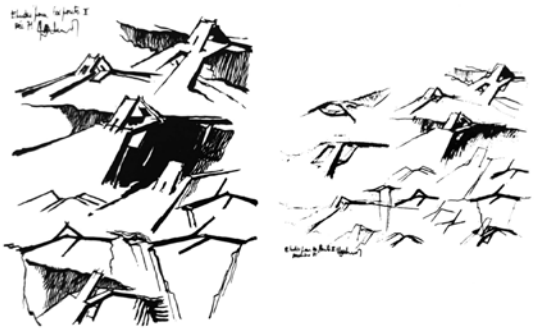

Figure 2.83. The organization of the spaces of the Oblique Architecture allows both the enclosures and the coverings of the buildings to be passable, one of the essential aspects of the theory. Source: Parent, C. (1992). *Entrelacs de l'oblique*. Centre d'études et de prévisions.

considered as a central element for the organization of space (Figure 2.81):

> When the human mind organizes a body of thought, it does so almost inevitably in terms of spatial imagery. This will have become evident from what I said about programs for buildings, and I can think of no more appropriate point with which to complete the argument of this book. The design of a building is the spatial organization of thoughts about its functions. Conversely, any organization of thoughts assumes the form of an architectural structure (Arnheim, 1977, p. 272).

The *Fonction Oblique* formulates this structure through a fluid movement that leads without being oppressive (Parent, 1970, p. 68). The organization and distribution of the spaces is achieved through a layout that feels natural to those who walk through it. Freedom, difference and effort recover the value of planes and spaces hitherto underused or too specialized, which in turn minimizes interior compartmentalization in favor of the free choice of routes and multiplication of ways of using space (Fullaondo Buigas de Dalmau, 2011, p. 86). These considerations take place within a framework that considers circulation as a fact in itself, to which oblique displacement is understood as a practical solution that also combines intense spatial and sensory experimentation (Moreno Moreno, 2020, p. 43). The architecture, the underlying system of spatial references that organizes the building, is the exclusive protagonist of the proposal (Fullaondo Buigas de Dalmau, 2011, p. 86) (Figure 2.82).

The Oblique Architecture approach honestly manifests the volume from the inside and the outside, exposing its spatial and organizational structure, without displaying secondary and technological elements from other disciplines to give it its unique character (Fullaondo Buigas de Dalmau, 2011, p. 86). Likewise, this organization of spaces allows the establishment of distribution routes outside the buildings, which allows walking outdoors or indoors on its entire surface through a route that is left to the choice of man (Parent, 1970, pp. 47–51). In this way, the formation of space configures a passable enclosure that is a fundamental and necessary part of Oblique Architecture (Parent, 1970, pp. 23–25) (Figure 2.83).

To get to this point, it has been necessary to go through a significant transformation. From a classical perspective, architecture has carried images and texts on the vertical surfaces of its facades, later, with the conquest of airspace by skyscrapers and airplanes, the roof became a possible bearer of signs, but after the architect's vision moved away from the roof, extending to the horizontal ground surfaces that frame the building (Ruby & Ruby, 2006, p. 181). However, the function of the floor is not so much to be seen as to create space, so lines, points and surfaces also become elements of essential programmatic value (Ruby & Ruby, 2006, p. 181) (Figure 2.84).

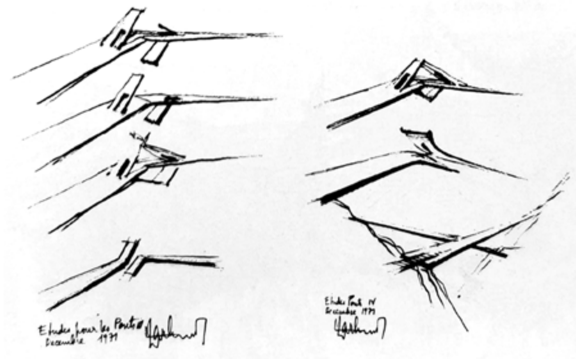

Figure 2.84. The function of the roof for Parent and Virilio had an essential and programmatic value within Oblique Architecture. It was a space for connection, movement, and social gathering. Source: Pedio, R. (1973). La fonction oblique: Progetti. *L'Architettura: Cronache e Storia*, 10(208), 682–694.

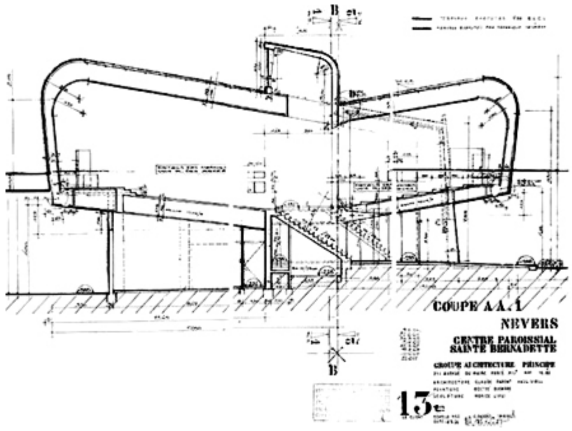

Figure 2.85. As it is created and constructed at the same time as Parent and Virilio establish their idea of the Fonction Oblique, it is one of the most significant initiatives of the team. Source: Parent, C., & Virilio, P. (1963-1966). *Eglise Sainte-Bernadette-du-Banlay*.

To recognize these and other topics that have been analyzed, it is important to review some key elements of the authors' projects, as well as others related to oblique theory. One of the most important examples is the Church of *Sainte-Bernadette*. Between 1963 and 1966, this project begins with the meeting of Parent and Virilio and ends coinciding with the public presentation of the oblique theory in the magazine; so the work is developed simultaneously with the process of formulating the theory to which the authors were giving shape (Fullaondo Buigas de Dalmau, 2013, p. 14). In the words of the authors, "The church of Sainte-Bernadette was our first venture into the function of the oblique. Curiously, its construction preceded the development of our experimental theories in *Architecture Principe* magazine" (Parent & Virilio, 1996i, p. 19) (Figure 2.85).

The architectural scheme of the church is represented by two planes inclined backwards (Parent & Virilio, 1996g), where concrete is used as the only construction material, not only fulfilling structural functions, but also becoming floors, ceilings, cladding, and even furniture (Fullaondo Buigas de Dalmau, 2013, p. 13). Its final appearance connects it directly with the bunkers photographed by Virilio that became an important inspiration for the formulation of the theory. The role of the *Fonction Oblique* is emphasized by

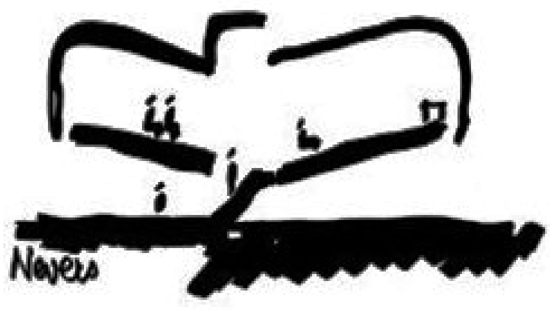

Figure 2.86. The church of Sainte Bernadette, despite being the first project carried out by the group, does not meet all the objectives set by the oblique theory, fluidity, and the absence of a passable roof, some of these. But it may have been a time for experimentation while the theory was still forming. Source: Parent, C., & Virilio, P. (1963-1966). *Eglise Sainte-Bernadette-du-Banlay*.

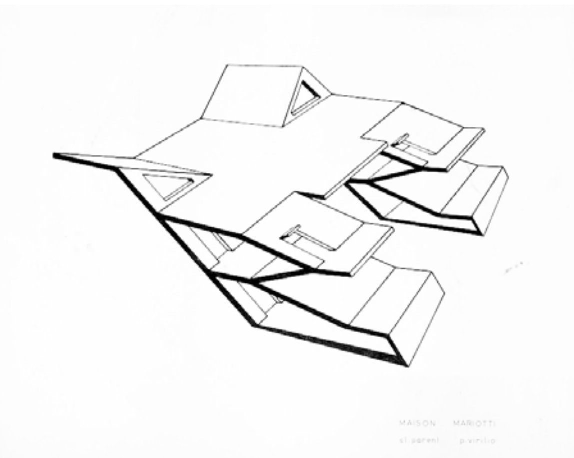

Figure 2.87. Few were the projects built by the group, many remained just ideas, and it is these projects that became the first explorations of what Oblique Architecture could be. Source: Parent, C., & Virilio, P. (1967-1970). *Maison Mariotti*.

the absence of right angles between the walls, developing a continuous surface even between elements arranged at ninety degrees. Although the authors pointed out that this first experimentation represented a rejection of aesthetic exploration, they also emphasized the way movement is perceived and the quality of that movement (Parent & Virilio, 1996g). Even so, the analysis of the result may lead to some inconsistencies, for example (Figure 2.86):

> This floor arrangement, where the stairs was such a protagonist leads to questions of functionality such as those posed, but it also forces the critical questioning as to whether by including the stairs, the spatial idea of continuity as set out in the theory of "La Fonction Oblique" was exemplified with the project. Or if on the contrary, it would have been better to connect the levels with a ramp of an assumable slope, making an ascending "promenade" towards the room; and the place for leaving this ramp could have been located in a more discreet area to one side in order to free the center of the room for direct traffic flow to the altar or to increase the pew area (Moreno Moreno & Rojo, 2019, pp. 111–112).

Perhaps the different points of view on the built work fundamentally serve to understand its experimental character at a time when the oblique theory was still in formation. A similar situation can be observed with the *Maison Soultrait* (1956-1958) and the *Maison Druch* (1963-1965) that Parent built before the creation of the group. These projects would become the first explorations of the oblique condition, where the rotation of a part of the project transmitted a certain instability that would become the seed for the later *Maison Mariotti* (Moreno Moreno, 2020, p. 28). The images of the model of the *Maison Druch* illustrated not only a way of living obliquely but also essential architectural questions such as the relationship of the complex with the terrain, the plasticity of the piece and the entrances of light (Pérez Moreno, 2014, p. 84) (Figure 2.87).

For its part, *Maison Mariotti* is considered by its authors to be the first oblique house that also expressed the principle of habitable circulation

(Parent & Virilio, 1996i, p. 38). "The houses literally reproduced, on a reduced scale, the outline of the urban incision originating from the *Architecture Principe* interpretation of the city made by imitating terrestrial geomorphology" (Moreno Moreno, 2020, pp. 31–32). The different interior spaces of the house are analyzed one by one to determine which ones inevitably require a horizontal floor, while the rest slope gently to allow the complete path of the vertical dimension of the house and thus minimize interior divisions making let it be the space itself and the movement that define the different rooms with a diffuse perimeter (Fullaondo Buigas de Dalmau, 2011, p. 97).

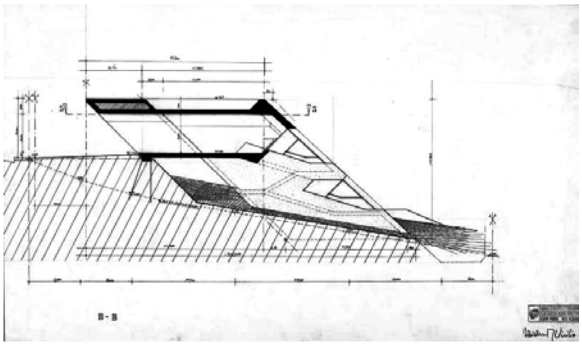

Figure 2.88. The Maison Mariotti expressed the fundamental principle of the oblique theory, which was habitable circulation. The study in the section was essential to understand the interior spaces that inevitably had to have a horizontal plane. Source: Parent, C., & Virilio, P. (1967-1970). *Maison Mariotti*.

Both sides of the oblique configuration are specialized in the different activities and uses of the house, on the one hand, superimposed and decorative furniture is eliminated and replaced by the minimum number of equipment integrated into the structure of the house itself, on the other, sharp spaces that are difficult to access are activated and used to locate accesses and storage areas (Fullaondo Buigas de Dalmau, 2011, p. 97). "The micro-ghetto of the traditional habitat is transformed into a freely accessible interior landscape by the mobilizing function of the oblique, which removes all impediments to movement - the fixed partitions and the random clutter of furniture" (Parent & Virilio, 1996i, p. 38) (Figure 2.88). In his analysis, Moreno Moreno (2020, pp. 32–35) explains:

> The initial sketches of the project predicted dynamism through diagonal lines that, representing the sections, would free the house from gravity and therefore from the stable relationship between earth and sky or floor and ceiling. The development of the project was complicated by avoiding, at all phases, the appearance of horizontal surfaces (floors and ceilings) and vertical surfaces (walls). The inclusion of stairs and vertical dividing walls was deliberately avoided, to avoid spoiling the continuum of long routes from the immediate topography to the interior of the house. The slope of the land continued that of the façade, which was converted into an inclined surface that accessed the roof. This fusion of the envelopes–

> floor and ceiling–unified the concepts of habitation and movement, breaking the interior-exterior duality. The facing was transformed into a circulation route, establishing an architectural promenade that extended the interior landscape beyond the limits of the house.

Figure 2.89. Maison Mariotti is one of Parent and Virilio's projects that was never built but is possibly one of the most closely related to the Fonction Oblique. Source: Parent, C., & Virilio, P. (1967-1970). *Maison Mariotti*.

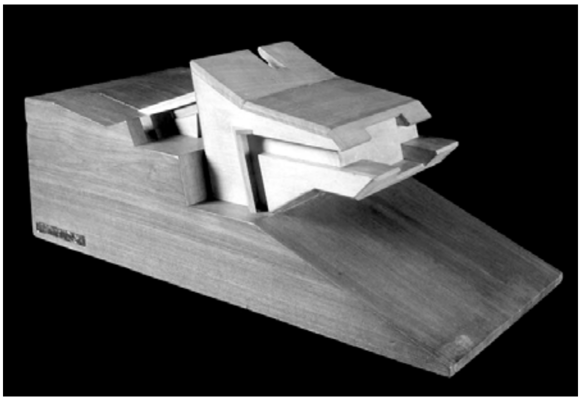

Figure 2.90. Many of Parent and Virilio's projects that best express their oblique theory were houses. Source: Parent, C., & Virilio, P. (1969-1970). *Maison Toueg*.

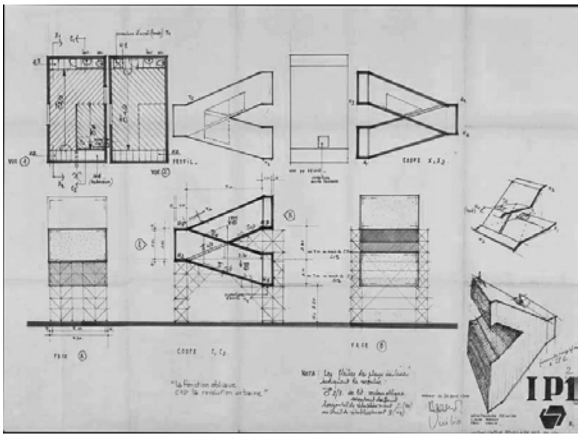

Figure 2.91. The Instabilisateur Pendulaire nº1 was the last project that Parent and Virilio prepared together. They planned to put into practice what it meant to live on an oblique surface and determine what the best angles for the different spaces were, but their separation as a group prevented the experiment from taking place. Source Parent, C., & Virilio, P. (1968). *IP 1 - Instabilisateur pendulaire*.

In a nutshell, *Maison Mariotti* is one of the most interesting examples of the *Fonction Oblique*. Many of the features developed in this theory seek to be put into practice. Another project that seeks to put these ideas into practice is the *Charleville Cultural Center* (1966-1967). This large volume, slightly inclined over the Meuse river, seems to be born from the ground with the plane of the roof to generate two different environments: the upper one becomes an urban square with stands where you can enjoy shows, while the lower one collects the program and the continuous habitable circulation that is born from the inner dock, thus prolonging the movement of navigation on the river (Irala, 2014, p. 4). "The overall from of the Charleville project is in no way 'figurative'. It is not nautical, despite its setting, nor aerodynamic, despite its profile. Rather, it is carved out of the capacity of the interior" (Parent & Virilio, 1996i, p. 35). Likewise, the formalization of the cultural center was based on the possibilities of full use of the inclined planes to extend the complex program in different planes folded on themselves, an operation that meant creating continuity between the interior space and the exterior space, giving this last an urban condition (Pérez Moreno, 2014, p. 82) (Figure 2.89).

Other interesting explorations were the *Maison Woog* (1969-1970) and the *Maison Toueg* (1969-1970). For the *Maison Woog* Parent and Virilio "proposed three options that evolved from a more traditional configuration to a harmonious Oblique Function design" (Moreno Moreno, 2020, pp. 36–39) (Figure 2.90):

> In the first version, two large horizontal surfaces were articulated through a vertical and central figure —ziggurat— inside which helical ramps were deployed for viewing the art collection. Its exterior adopted the morphology of the ziggurat [...] In the second version of the house, the ziggurat was abandoned as it attached to

> an oblique profile support, a cantilevered raised body that housed the main bedroom with the required views [...] The last version of the house was the most faithful to the principles of the Oblique Function, rejecting volume as disruptive, and returning to the idea of continuity and a more unitary whole. The development on one side of two continuous 8% ramps ensured the view from the exhibition gallery, offering an affinity with other inclined parts of the house that merged with the immediate landscape (Moreno Moreno, 2020, p. 39).

For its part, the *Maison Toueg* was also located on a hill and its shape followed the natural slope of the land, while two opposing ramps connected the main interior spaces that were naturally illuminated through a large oblique glass.

In 1968, parallel to these two projects and shortly before the dissolution of the group, Parent and Virilio had prepared a life-size *Fonction Oblique* experiment in Nanterre that they defined as “the Instabilisateur Pendulaire n°1” (Virilio, 1996b, p. 13). This experiment consisted of living several weeks on oblique supports to try to test questions of balance and habitability in order to choose the best angles of the different habitable spaces (Virilio, 1996b, p. 13). Its decontextualized condition and its elevation from the ground made the project have the character of a scientific experiment where “psychologists, sociologists and doctors verified any harmful or gratifying effects” (Moreno Moreno, 2020, pp. 35–36). However, May 68 protests in France prevented the advancement of this experience. In Virilio’s words “L’Histoire en décida autrement”[57] (Virilio, 1996b, p. 13). “The play of the two reverse ramps anticipated the espace pincé created for the Pavilion of the Venice Biennale (1970); a gap opening in the upper plane of the convergence of two planes at an acute angle that avoided dead spaces” (Moreno Moreno, 2020, pp. 40–41) (Figure 2.91).

The violent rupture between Claude Parent and Paul Virilio in 1968 is the end of the *Architecture Principe* group, a fact in which the *Fonction Oblique*–still in an embryonic phase–suddenly lost both of its parents (Fullaondo Buigas de Dalmau,

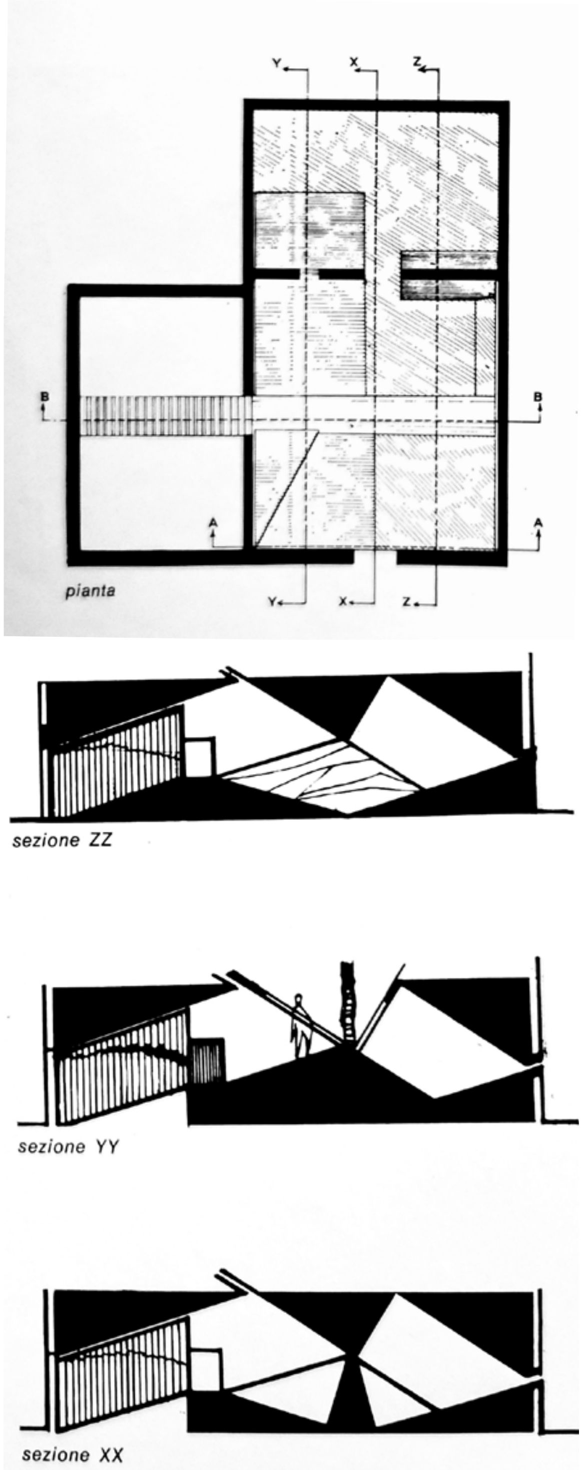

Figure 2.92. The separation of the Architecture Principe group halted the construction of a theory that was beginning to be built. Many unrealized experiments and projects remained to be developed and built, such as the Venice Biennale Pavilion, which was finally designed and produced solely by Parent. It was considered a last failed attempt at what may have been Oblique Architecture at the time. Source: Parent, C. (1996). *French Pavilion at the Venice Biennale of Architecture*.

2011, p. 173). The French pavilion for the 35th Venice Biennale in 1970 had already been commissioned from the group and was expected to become the debut of the new oblique order before the entire international architectural scene, but Virilio resigned from participating in the project and Parent built a kind of burial chamber for a theory that had been orphaned almost before it was born (Fullaondo Buigas de Dalmau, 2011, p. 173). It would take several decades for the *Fonction Oblique* to finally have meaningful consequences, but when the time arrived they completely changed the way of doing and thinking about architecture (Figure 2.92). Considering the surfaces of distribution in architecture as landforms, Oblique Architecture represents nowadays an essential precedent in order to study how to design settlements and buildings based on bicycle circulation.

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ATLAS OF THE OBLIQUE ARCHITECTURE: DISTRIBUTION SYSTEMS AND LANDFORMS

CHAPTER

3.1. The Construction of the Atlas

3.1.1. The Atlas

In Greek, the word Atlas comprises an *-a* particle and the root *-tlâ*, which means “carrying.” In Greek mythology, Atlas was the Titan of astronomy and navigation, a giant half-man and half-god. He became the leader of the war between the Titans and the Olympian gods to control the skies. His name describes the punishment to which he was sentenced. Upon losing the battle against Zeus, Atlas was punished by eternally holding the pillars where the sky rests on his shoulders, the so-called celestial vault (Figure 3.01). Thanks to this task to which Atlas was sentenced, he was known as a wise man, a connoisseur of the universe who instructed humanity in the art of astronomy, a tool used by sailors in navigation and by farmers to measure the seasons.

The geographer and cartographer Gérard Kremer–known as Mercator–spent the second half of his life producing maps in a format suitable for binding his 1595 book. As a graphic symbol, the cover of this map book contained an engraving depicting the giant Atlas holding up the sky (Figure 3.02). Mercator used it to commemorate the Titan Atlas, whom he considered the first great geographer. This is one of the earliest occurrences of the word atlas in a book of maps. On the other hand, Antonio Lafreri–printer and engraver–is also considered one of the first to assemble a set of maps bound in a volume with a cover and a title referring to the Titan. Also, on one of its covers, the titan Atlas was shown holding the world; since then, the use of the term atlas to name these cartographic collections became common (Figure 3.03). In this way, by a kind of synecdoche or antonomasia, the collections of maps edited and published together in a book or collection are known as atlases.

Figure 3.01. From Greek mythology Hercules helping Atlas to hold up the world. Source: https://pixabay.com/es/vectors/h%C3%A9rcules-atlas-mundo-griego-6224008/

Figure 3.02. Cover page source: Mercator, G. (1512-1594) *Atlas sive Cosmographicae meditationes de fabrica mvndi et fabricati figvra. Source:* https://www.loc.gov/resource/rbc0001.2003rosen0730/?sp=5&r=-0.147,-0.008,1.276,0.792,0

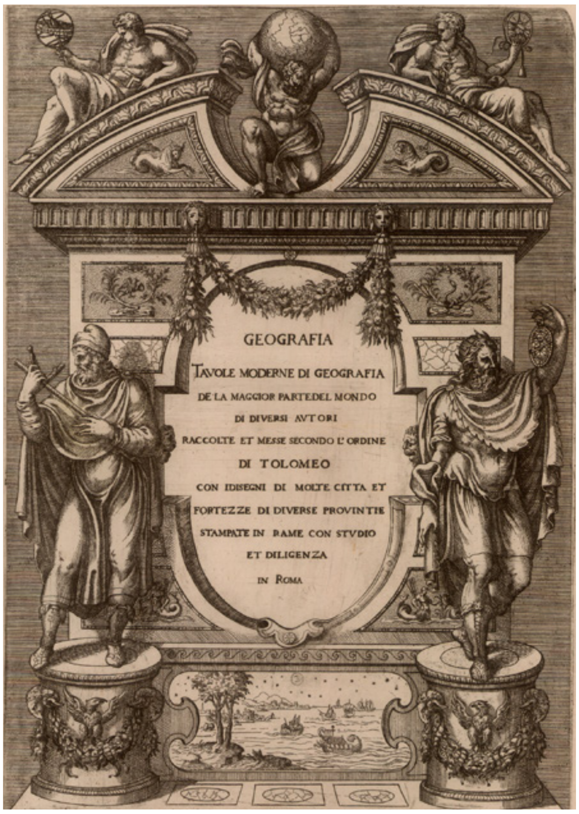

Figure 3.03. Cover page source: Lafreri, A. (1550-1572). *Geografia. Tavole Moderne di Geografia de la maggior parte del mondo di diversi avtori raccolte et messe secondo l'ordine di Tolomeo con i disegni di molte città et fortezze di diverse provintie stampate in rame con stvdio et diligenza in Roma. Source:* https://www.realbiblioteca.es/index.php/es/node/282#&gid=2&pid=1

LETTERA

DI

RAFFAELLO D'URBINO

A

PAPA LEONE X.

DI NUOVO POSTA IN LUCE

DAL CAVALIERE

PIETRO ERCOLE VISCONTI

COMMISSARIO DELLE ANTICHITA' ROMANE, PRESIDENTE ONORARIO DEL MUSEO CAPITOLINO, CONSIGLIERE NELLA COMMISSIONE GENERALE CONSULTIVA PER LE ANTICHITA' E BELLE ARTI PRESSO IL CAMERLENGATO DI S. R. C., DEPUTATO NELLA SEZIONE DIRETTRICE DEI PUBBLICI LAVORI DI BENEFICENZA, SOCIO ORDINARIO E SEGRETARIO PERPETUO DELLA PONTIFICIA ACCADEMIA ROMANA DI ARCHEOLOGIA, ACCADEMICO D'ONORE DELL'INSIGNE E PONTIFICIA ACCADEMIA DI S. LUCA, CORRISPONDENTE DELLA R. ACCADEMIA ERCOLANESE E DELLA PONTANIANA, DELLA PONTIFICIA ACCADEMIA DI BELLE ARTI IN BOLOGNA, DELL'I. R. SOCIETA' ANIMATRICE DELLE ARTI DI PIETROBURGO.

ROMA

Tipografia delle Scienze Via Rosa Num. 10.

1840.

Figure 3.04. Cover page source: Raphael, 1483-1520. (1840). *Lettera di Raffaello d'Urbino a papa Leone X : di nuovo posta in luce. Source:* https://it.wikisource.org/wiki/Pagina:Raffaello_-_Lettera_a_Leone_X,_1840.djvu/5

For a long time, man has made graphic projections of the universe in what is now known as maps. When cartography began to develop massively from knowledge in the Renaissance era, many scientists, astronomers, cartographers, and navigators had to categorize and unify all this knowledge according to their interests and needs. The atlas emerges to concentrate all the necessary cartographic information.

The Atlas is a book that combines a collection of maps edited for publication in a book or collection. They are characterized by the varied images showing the relationship in their different representation methods. The atlas allows showing a variety of tools to systematize information without a specific structure and with any approach. Its goal is to manage, extract, compare, explore, and restructure essential information creatively, flexibly, and systematically.

It would be equally important to mention how the *Lettera a Leone X* written by Raffaello Sanzio D'Urbino in 1519 (Raphael, 1840) with the collaboration of Baldassarre Castiglione (Figure 3.04) is a document that brings together a collection of drawings of the buildings of Imperial Rome made by the painter. Raffaello projects a general Atlantean on *Roma Antica* and the importance of its conservation.

The first part of the letter exposes the reasons, principles, and ideas that gave rise to this work. The second part is dedicated to technical aspects, where the instrument with which the surveys were carried out is described, a compass that served to measure and orient the buildings on the plan. The rigor with which, through this method of study and representation, an attempt to restore the parts that had been damaged or destroyed in order to be able to act on their recovery is evident.

Another important aspect of this manuscript is its classification as a study method. In the Atlas, Raffaello classifies Roman buildings, dividing them into those built in the imperial age, rough times, and modern.

The letter proposes a census of existing monuments through drawing. The erection of these buildings followed precise and meticulous rules, their location was specified, plans, sections, and facades were represented. The letter is a brief scientific treatise on the architectural study and its graphic representation.

Sebastian Serlio's treatise on architecture began in 1537 (Serlio, 1978) (Figure 3.05). Published individually, book by the book was the first architectural manual emphasizing architecture's practical rather than theoretical aspects. This treatise was one of the first to catalog the five orders of architecture. The so-called *I sette libri dell'architettura* was one of the first series in the form of a manual that incorporated a series of models to copy through plans and elevations. This treatise was a set of illustrations linked by commentaries.

Serlio intended his architectural treatises to be instructive for the intellect and a working tool for the artisans of the moment. The importance of Serlio's treatise lay in the fact that the illustrations conveyed the essence of the message, unlike many architecture books of the time in which the text was essential. He pioneered high-quality drawings as an essential complement to the text, his significant contribution being a practical treatise on architecture (Figure 3.06).

Serlio's treatise proposes different morphological typologies explained through a temple's analysis. The document describes the parts that make up the building, its measurements, the distribution, and, in some cases, details of the materiality, descriptions of relevant parts, or specific project explanations of the work.

The structure in which Serlio's *per exempla* treatise is presented is repeated identically throughout all the books. This begins by analyzing a typology with a descriptive text of the generalities of the represented building. Then, he contrasts the plant's design with what was previously written. To this description are added representations such as the cut, the views, or details that provide more information always related to the text (Figure 3.07).

Figure 3.05. Cover page source: Serlio, S. (1540). Il terzo libro di Sebastiano Serlio Bolognese, nel quale si figurano, e descriuono le antiquita di Roma e le altre che sono in Italia, e fuori d'Italia. *Source:* https://archive.org/details/ldpd_12223131_000/mode/2up

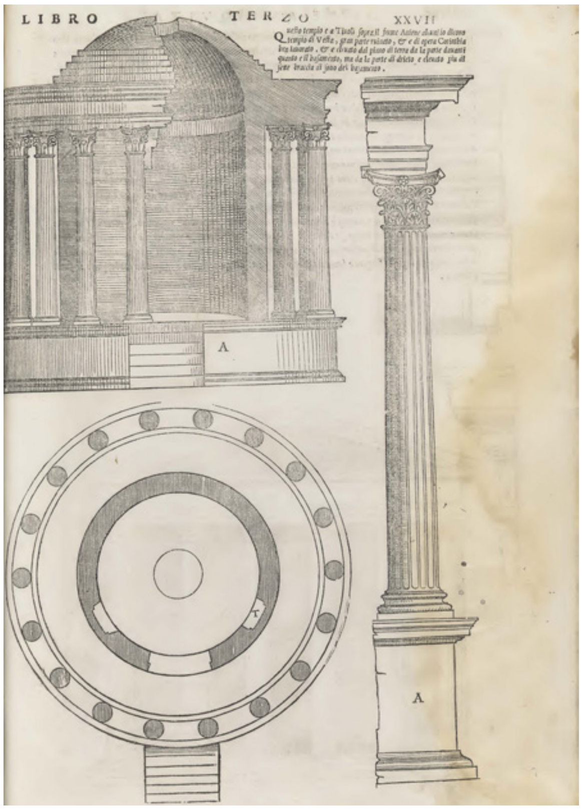

Figure 3.06. Page XXVII source: Serlio, S. (1540). Il terzo libro di Sebastiano Serlio Bolognese, nel quale si figurano, e descriuono le antiquita di Roma e le altre che sono in Italia, e fuori d'Italia. *Source:* https://archive.org/details/ldpd_12223131_000/mode/2up

Figure 3.07. Chapter. LXXII Page 186 - 187 source: Serlio, S. (1575). *Il settimo libro di Sebastiano Serlio Bolognese, nel qual si tratta di molti accidenti che possono occorrer'all architetto in diuersi luoghi*. *Source:* https://archive.org/details/ldpd_12467423_000/page/n203/mode/2up?view=theater

Figure 3.08. Crater *Nabiyotum*, Kenia. Source: https://www.orangesmile.com/extreme/es/crateres-espectaculares/nabiyotum.htm

This thesis has used atlas as a collection and classification tool. Different architectural projects have been collected and ordered according to their forms of distribution. Each project has a file and a brief explanatory text describing each example's general characteristics. Likewise, each case has graphic elaborations through redrawing and diagrams as a methodological instrument to isolate repeatable elements, which offer the reader an approximation of what a manual for cycling architecture could be.

In this thesis, we can then define what an Atlantean of architecture means as a methodical structure for collecting and classifying cases that intend to serve the architectural project's development actively. The *Atlas of the Oblique Architecture: distribution systems and landforms* is a tentative manual, a compendium of solutions related to distributional problems in buildings that hope to serve as practical information.

3.1.2. Oblique Architectures and landforms

The atlas investigates the analogy between architectures whose distribution systems are based on the role of ramps and the types of roads that cross mountains. In this way, the atlas shows the relationship between Oblique Architecture and landforms, as well as the types of roads associated with the forms of the mountain on which they develop. The categories represent an analogy between mountain routes and routes in architecture. The element distribution allows us to relate the terrestrial form with the form of architecture. Therefore, the structure of the atlas is based on different types of roads that are related to the shape of the Earth:

- Crater routes follow a circular distribution where the distributed spaces are outside the empty interior (Figure 3.08).
- Mountain routes follow a circular distribution where the distributed spaces are inside (Figure 3.09).

- Mountain pass routes that go from one point to another by going up and down, mostly crossing a high point (Figure 3.10).
- Mountain ridge continuous routes that centrally divide distributed spaces or routes that reach a single space (Figure 3.11).
- Mountainside lateral route through a sloped surface tend to be next to distributed spaces (Figure 3.12).

The formal conditions of the Earth have evidenced its architectural characteristics (Motta & Pizzigoni, 2006, p. 13) (Figure 3.13). On the other hand, architecture becomes essential when the natural elements that geography deals with are described as architectures, influencing the design and construction of buildings (Motta & Pizzigoni, 2006, p. 11). As Motta and Pizzigoni explain, between the geography of the Earth and the artificiality of architectural constructions, it is necessary to build a theory that is capable of explaining architecture as a construction of the territory, rediscovering its relationship with nature. (2006, p. 19)

> La risposta che noi diamo riguarda la necessità di riconoscere come l'architettura, che ha perso la sua connotazione urbana, possa essere uno strumento non solo di descrizione ma anche operativo e progettuale nei confronti degli elementi naturali con cui essa entra in relazione, in modo che all'architettura della città si possa sostituire un'architettura dei fiumi, delle acque, delle montagne, un'architettura delle isole o delle coste; in sostanza una architettura della Terra[58] (Motta & Pizzigoni, 2006, p. 19)

These are the architectural keys to our relationship with nature, architecture through a simple and immediate relationship with said nature. Thus it is essential to speak of Earth Architecture (Motta & Pizzigoni, 2006, p. 19). The nature of the rivers, the physics of the sea, the origin and structure of the mountains, the formation of the plains, and the presence of fire in the interior of the Earth begin to be the object of an architectural study as if the works and Architects' buildings could not ignore that great work that is the Earth (Motta & Pizzigoni, 2006, p. 23) (Figure 3.14).

Figure 3.09. Mountain *North Yungas Road*, Bolivia. Source: https://trans-americas.com/death-road-bolivia-drive/

Figure 3.10. Mountain pass *The Neveg*, Israel. Source: https://unsplash.com/es/fotos/ZtpjQdYgCFQ

Figure 3.11. Mountain ridge *Roys Peak*, New Zealand. Source: https://www.freepik.com/free-photo/panoramic-view-roys-peak-new-zealand-with-mountains-distance-light-cloudscape_10303101.htm#from_view=detail_alsolike

Figure 3.12. Mountainside *Serra da Leba Pass*, Angola. Source: https://www.adventurebikerider.com/worlds-best-mountain-passes/

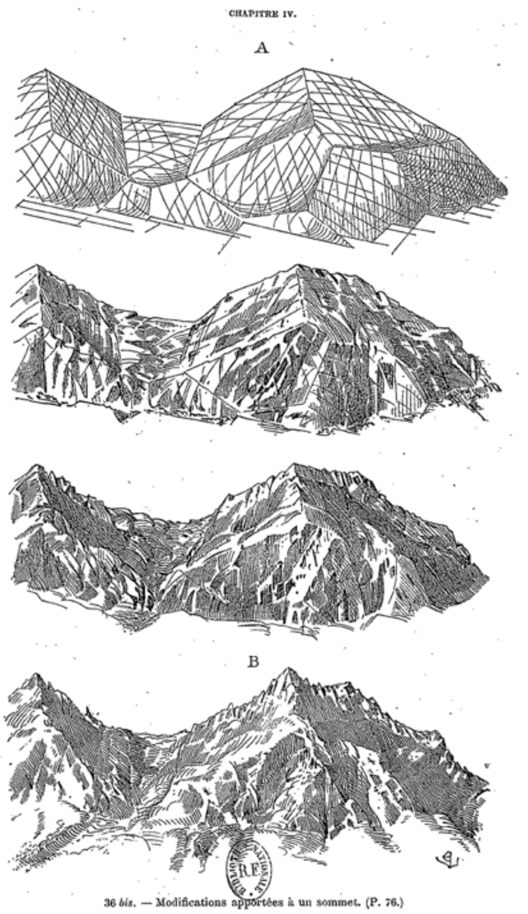

Figure 3.13. Viollet-Le-Duc, E. *Le Massif du Mont Blanc. Etude sur sa constitution géodésique et géologique, sur ses transformations et sur l'état ancien et moderne de ses glaciers*, Paris, Libraire Polytechnique, J. Baudry Editeur, 1876.

Figure 3.14. Scolari, M. (1987). *L'ultima città conosciuta*, acquarello.

> L'archetipo fissa il rapporto tra architettura e natura, nel senso che in esso il dato naturale si trasforma in fatto costruito. Questo succede sia di fronte ai singoli elementi, l'aria, l'acqua, la terra e il fuoco, e che vengono visti e rappresentati sotto la specie dell'architettura, sia nei punti che segnano il passaggio da un elemento all'altro, dall'acqua alla terra, o tra terre diverse, ma anche dalla terra al fuoco, dal fuoco all'aria. Si delineano così gli archetipi della terra emersa o della piramide, il basamento e il recinto, l'arca e il tempio, la torre e lo scavo, il camino, la ciminiera e la diga, la porta di mare, il ponte[59] (Motta & Pizzigoni, 2006, pp. 19–20)

The foundations of a theory of architecture that overcomes the need to refer exclusively to the urban construction typical of the tradition of Western civilization must also be defined through a positive and open relationship with the phenomena of nature, geography, and the physical structure of the territory (Motta & Pizzigoni, 2006, p. 23).

> L'ipotesi di queste ricerche è che si possa costruire e dar corpo a una tradizione di studi i quali, poiché hanno considerato l'architettura come un riferimento e un modello di grande efficacia nella descrizione della Terra, delle sue diverse regioni, dei suoi diversi ambienti o elementi geografici, l'hanno anche così ampiamente coinvolta nella rappresentazione dei luoghi volta per volta analizzati, nell'elaborazione di immagini e nella costruzione di figure che queste sono entrate a far parte del patrimonio dei materiali propri dell'architettura, sono diventate parte della sua tradizione figurativa [...][60] (Motta & Pizzigoni, 2006, pp. 23–24)

At that time, the examples shown in the Atlas define the classification of distribution systems that favor commuting and connections by bicycle. The use that this atlas gives to distributive systems can be understood in this reflection by Frampton on the work of Le Corbusier.

> Il Vestibolo e l'atrio d'ingresso sono vere "macchine" di classificazione; tutte le numerose categorie di utilizzatori, pur vedendosi reciprocamente, seguono itinerari precisi che li portano automaticamente alla loro destinazione.

> Questi “percorsi” (che comprendono piani inclinati) sono in un certo senso come “passi di montagna”[61] (Frampton, 1986, pp. 27–28).

This phrase by Le Corbusier has been fundamental since the atlas of this thesis is built from a classification based on the analogy between land shape and architecture, the paths along the shape of the land, and the paths in architecture. Distribution schemes allow us to build this analogy. There are two types of classification: Territorial form has to do with the architecture that rests on the ground and reproduces that form; Architectural form has to do with architecture that recreates the shape of the Earth inside. The classification of Territorial form (Figure 3.15, 3.16, 3.17) is the foundational classification where the bases are built on understanding how this analogy between the form of the Earth and the form of architecture is possible in architecture.

> Qu’y faire ? Nous sommes nés au sein de la nature [...] Nous nous dressons contre elle, pour échapper à son étreinte, essayant de l’endiguer, t entant de la dominer. Si elle est l’univers, depuis toujours nous avons voulu aussi créer notre univers. Et nous le défendons : c’est notre labeur quotidien. Pourtant nous sommes les fils de la terre, et nous l’avons appelée la terre-mère [...] La géométrie qui est le seul langage que nous sachions parler, nous l’avons puisée dans la nature car tout n’est chaos qu’au dehors; tout est ordre au dedans, un ordre implacable[62] (Le Corbusier, 1928, p. 12)

This analogy promotes richness and originality in the elaboration of figures that make this and other possible studies a contribution of great importance in architectural design.

3.1.3. Analysis and design

Drawing and redrawing have played a fundamental role in the development of this atlas as an indispensable instrument to organize the main ideas and analyze the selected cases. Some of its results constitute a primary diagram where the main conditions of each project are regulated and

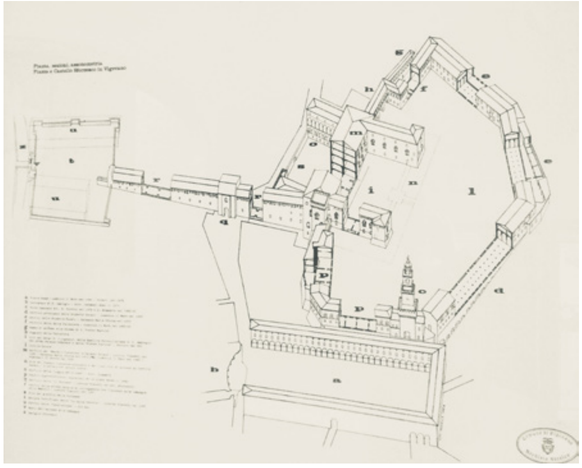

Figure 3.15. Territorial form, architectures that rest on the ground and reproduce that shape. In this example, the earth feature is a Mountain Pass. Visconti, L. (1347). *Strada coperta di Vigevano*. Source: http://www.visitvigevano.it/mappa-del-castello/

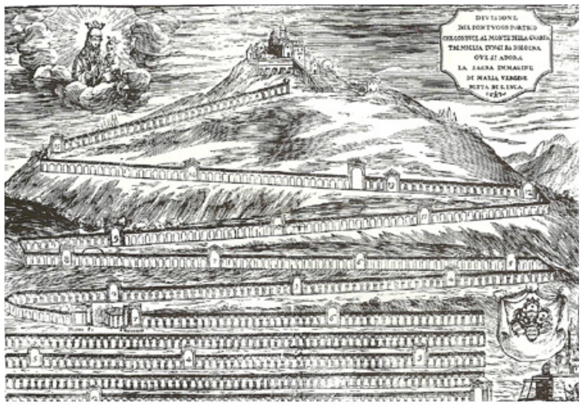

Figure 3.16. Territorial form, architectures that rest on the ground and reproduce that shape. In this example, the earth feature is a Mountain Ridge. Dotti, C. (1674). *Portico di San Luca*. Source: https://www.originebologna.com/beata-vergine-di-san-luca/il-portico/il-portico-la-storia/

Figure 3.17. Territorial form, architectures that rest on the ground and reproduce that shape. In this example, the earth feature is a Mountainside. Bernascone, G. (1604). Sacro Monte di Varese. Source: https://www.laprovinciadivarese.it/stories/varese-citta/il-magico-sacro-monte-di-stendhal_1191195_11/

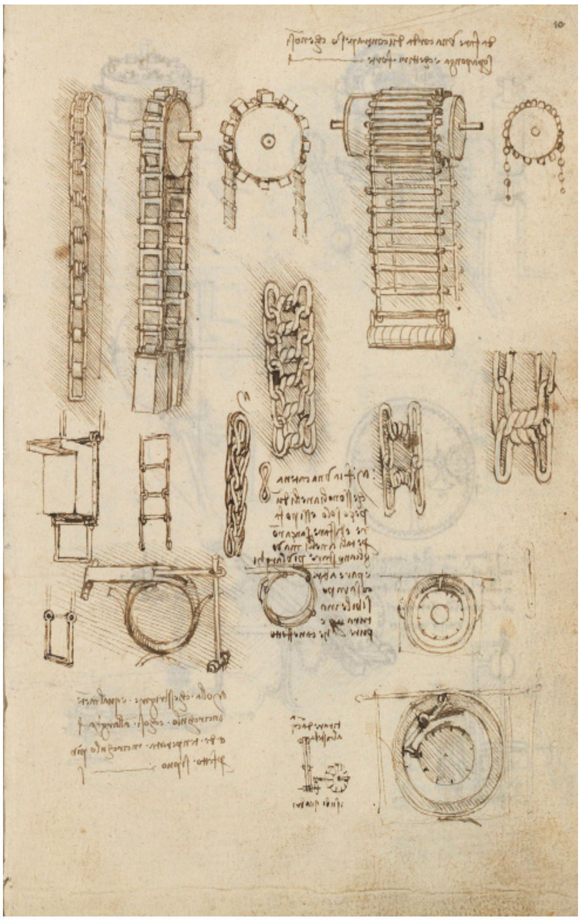

Figure 3.18. Da Vinci, L. *Drawings of different types of transmission chains*. Source: https://www.leonardodavinci.website/bicicleta/

understood. At the same time, the distributive scheme helps to visualize graphically and simply the result of all the analysis done by redrawing (Figure 3.18).

The drawing as a methodology in this thesis has served to visualize the distributive aspects of the analyzed cases to later apply them to architectural projects where it is desired to prioritize a type of distribution by the active mobility systems. Through representation, atlas aims to highlight the relevant aspects of each architecture and its interrelationship between the distribution systems and the distributed spaces. A case study analysis through the drawing seeks to distinguish and select the essential aspects where the result is a scheme that wants to communicate a central idea.

Redrawing manages to put different projects, not only in form but also in function and construction time, on the same plane through common representation standards that make them comparable. This process has been essential to contrast differences, difficulties, and problems recognized in each case.

> Cuando dibujamos hacemos marcas en una superficie para representar gráficamente lo que vemos ante nosotros o imaginamos en la mente. El dibujo es un medio natural de expresión que crea un mundo de imágenes independiente, pero paralelo, que habla con la visión. El acto de dibujar no puede separarse de la visión ni de la reflexión sobre aquello que se representa. Resulta imposible dibujar un objeto o una escena a menos que la tengamos delante como modelo o que sea lo suficientemente conocida como para recrearla a partir del recuerdo o de la imaginación. Así pues, la destreza en el dibujo debe conllevar un conocimiento de aquello que nos esforzamos en representar gráficamente[63] (Ching D.K., 2012, p. 3)

Drawing is a practical tool to formulate and approach design problems and visualize and communicate project ideas. It is expected that the product of the analysis of each case study will always be an interpretation of the object of study rather than an exact reproduction. The instrumental nature of the redrawing methodology has allowed its use as an element of recognition under a specific gaze. The approach to each case study has been a reconstruction of the work.

To illustrate the analogy between the shape of the land and the shapes of architecture, this Atlas aims to show how, based on this similarity, the case studies are compiled and classified to facilitate the analysis of their distributive systems through schematic representation so that these representations yield results that can be extrapolated and reused in other contexts, such as the architecture project.

> [...] ogni rappresentazione si colloca sempre al punto di incontro tra due catene o gruppi di figure: quelle che rappresentano l'oggetto e quelle che appartengono al tema e alla tecnica di rappresentazione. L'analisi ha sempre un doppio gesto, da una parte costruisce la figura che rappresenta l'oggetto, dall'altra trova le figure che stavano prima dell'oggetto e in cui si inserisce anche quella elaborata dall'analisi. Si delinea così una catena o una famiglia di rimandi e di somiglianze in cui l'oggetto si trova collocato senza tuttavia essere il punto di partenza. Esso non appare più così necessario come quando era ritenuto essere ciò che dà origine alla rappresentazione[64] (Motta & Pizzigoni, 2011, p. 120)

The analysis of the projects is not a historical analysis; it does not investigate architecture based on history or its temporal development; that is to say, it is not situated within a succession in which the events are ordered linearly to be explained from what it was to what it has become, the analysis does not even attempt to explain why the reasons behind the works (Motta, 1997a, p. 329). Instead, the study seeks to find relationships or connections that allow studying the specific objectives described above that do not have to do with a historical analysis but with the project. Here tradition is not a reason for an explanation, but rather the thing itself to be interpreted, because put into play together with what is investigated, it also becomes an object of understanding (Motta, 1997a, p. 329).

The analysis does not conclude, it does not end, it does not give definitive answers, but it keeps open the possibility of asking questions, it keeps open the wealth of possible meanings, it does not close itself in a single sense of things (Motta, 1997a, p. 330). As Motta correctly states, the purpose of the analysis does not lie in its end, in the sense that at the end, it is not necessary to have definitively understood a house, a room, or an element, but rather, on the contrary, it is essential that there remains the possibility of ask other questions, to promote other analyses. The freedom to ask new questions must be supported by an analysis that can contradict itself because it can change the rules of the game and the nature of the analysis-project relationship as two different terms, with different skills, methods and, purposes, but also a specific relationship of dependency and instrumentality (Motta, 1997a, p. 330).

> Non si analizza per conoscere l'oggetto, ma per produrre figure utili. Dunque, l'analisi non è necessariamente uno strumento di conoscenza dell'opera. Si analizza per costruire immagini che spesso non hanno nemmeno attinenza con l'insieme della cosa analizzata. L'analisi procede nel ritagliare, staccare, separare figure il cui obiettivo è di riuscire a imporsi come figure autonome[65] (Motta, 2011, p. 279)

The analysis is developed mainly through operations such as redrawing and schematizing the examples to find a more inclusive solution for the distributive systems in the architecture project. The analysis becomes a type of project; it works on things, not to explain them but to enrich them. The analysis in this case, while proceeding through the representation of what already exists, is entirely part of the project activities: relying on sometimes unique and very different techniques depending on the problems or objectives, it highlights figures whom they are as if hidden inside the body of the city or of the buildings, hidden inside their external appearance. These are figures without whom the project work cannot even begin (Motta, 2011, p. 271)

> L'analisi formale ha infatti come suo strumento fondamentale e irrinunciabile il disegno. Essa non si costituisce come un punto di vista esterno

> all'architettura e nemmeno come sguardo neutro; in sostanza essa non spiega nemmeno il suo oggetto, ma lo disegna e lo ridisegna guardandolo da diversi punti di vista e sezionandolo in vari modi. Un'analisi formale è perciò di fatto già dentro l'architettura e soprattutto dentro le sue tecniche, dentro il disegno e la rappresentazione, dunque dentro gli stessi strumenti che sono messi in campo dal progetto[66] (Motta & Pizzigoni, 2011, pp. 117–118).

The files are intended to be a catalog of examples where, thanks to the classification, a distributive typology can be described, extracting characteristics of each project through schematization. At the same time, it seeks to maintain the general characteristics with which it is possible to build this Atlantean distribution system. On the other hand, the different distributive typologies aim to describe and, in turn, define and classify the different selected examples.

The term type, from the Greek *typos*, appears at the end of the fifteenth century and is linked to topography, printed signs, imprints, mold, or matrices. At the same time, it also designates typography, not the object or figure to be imitated, but the medium, the instrument of its reproducibility (Cabassi, 1997, p. 74). As Cabassi explains, in the 18th century, the term type was specified as a concept that expresses the essence of a set of objects or people and reaches architecture as a reflection of the development of sciences based on the inductive method.

> [...] il tipo è legato all'idea della classificazione, è l'elemento a partire dal quale si descrive la specie e che, nello stesso tempo, ne enuncia le caratteristiche. Il tipo serve una costruzione astratta, è capace di render conto, con estrema economia, di una totalità. La tipologia cancella quindi i caratteri particolari dell'oggetto per conservare solamente i caratteri generali sui quali fondare la tassonomia. Attraverso riduzioni successive, essa supera la semplice classificazione per proporre, in una visione universalista, una articolazione completa del campo di studio[67] (Cabassi, 1997, p. 74).

Thus, the typological viewpoints to the systematization of knowledge through classification, where the categories identified by the typology serve to guide interpretations (Cabassi, 1997, p. 78). The classification of these case studies aims to set standards and establish an order to which the types of distribution respond.

This Atlas is an ensemble operation that will still need to be finished. On the one hand, the Atlas–considered something without an end–is the beginning of a manual to which more files and ideas can be added infinitely. On the other hand, the Atlas makes it clear that the reference is not only architecture but the ways of understanding the terrestrial form as architecture.

3.1.4. How does the Atlas work?

One of the first activities to create this Atlas was the investigation and selection of different architectural projects. The search pointed to projects and buildings where the ramp was a vital part of the circulation system, sometimes even essential in distribution. This characteristic allowed us to collect a bank of Oblique Architectures from different places, functions, and times.

Thus, the Atlas of the Oblique Architecture on distributive systems contains 100 architectures divided into five categories: Crater, Mountain, Mountain pass, Mountain ridge, and Mountainside. For each Project, the plants have been redrawn in two dimensions using the existing material. These plants are drawn from an analysis that aims to select and extract the essential elements to build later a three-dimensional model where the distribution system is highlighted. Each project is built and analyzed through a three-dimensional model to better understand the distribution system instead of using sections or views.

Another important aspect to highlight is the type of ramp in each category mentioned above. In the macro-categories, it is possible to identify the type of ramp. For example, *Crater* distribution has an internal spiral ramp that distributes to the surrounding spaces while keeping the interior empty. *Mountain* distribution has an external spiral ramp distributing inwards. *Mountain pass* distribution has an opposed double ramp that starts from a low point, reaches a high level in the building, and goes back down on the opposite side. *Mountain ridge* distribution is characterized by a straight ramp that organizes the building laterally or centrally. Finally, the examples categorized as *Mountainside* are characterized by having a hairpin ben ramp usually found laterally connecting to the building or fulfilling some other strategic role in the layout.

The types of distribution were defined based on the classification present in the text of *Ponti abitati e ciclovie* (Palma, 2019, pp. 3–11). In this research three types of configuration are distinguished: **Continuous** distribution defines the ramps that distribute the spaces continuously. **Punctual** distribution defines the ramps that connect directly with one or more spaces. **Diffuse** distribution defines the ramps that connect with spaces sporadically during their route.

The profile cards for each project have two pages. The first page shows the type of general distribution, the category data, and the represented architecture data. This also has a brief explanatory text intended to be the key to reading and a general understanding of the building and its distribution system. This first page also has part of the original graphic material of each project with which the redrawing was made. The second page concentrates on the result of this redrawing and analysis. It shows an axonometry of each project that shows the type of distribution system and its relationship between served and service spaces. The result of all the analysis of each project becomes effective from constructing a distributive scheme that aims to be replicable in other projects. This scheme seeks to abstract from the particularities of each case study and always produce with the same elements the relationships extracted from each project.

In some cases, there was enough material to produce said diagrams, but in other cases, the drawing was born from analyzing photographs, views, or other resources. The drawings of each project maintain the actual proportions of the building. They are intended to extract important architectural features for the construction of the axonometry, but in no case are they a detailed survey of each project. It is a representation that highlights the distributive aspect as an essential element of the drawing.

> La parzialità della rappresentazione consente l'allontanamento dall'architettura di riferimento e quindi non comporta giudizi di valore su di essa o la necessità di assumerla interamente come modello. L'architettura di riferimento deve semplicemente essere considerata quale fonte per la ricerca e la costruzione di materiali e figure utili per il progetto[68] (Motta & Pizzigoni, 2011, p. 184)

Each representation that is part of the project files serves to adjust the architectures to the same system to study and compare their distributive characteristics. In addition, this axonometry resulting from redrawing and analysis creates a typology of the projects that show some common cases and new solutions. The fundamental objective of this effort is to create a catalog of Oblique Architectures and a project manual.

> Con la rappresentazione dell'architettura di riferimento inizia un meccanismo di continui invii del tutto simili a quelli che si verificano nell'analisi. L'immagine ottenuta ha senso solo se ne richiama un'altra. Il progetto è il meccanismo per cui, problema per problema, si producono delle catene di immagini ognuna delle quali si concluderà solo con le figure dl progetto[69] (Motta & Pizzigoni, 2011, p. 126)

The atlas profile cards are considered the result of the observation, description, and representation of the different selected projects, where a fundamental aspect of achieving its operability in the future is that all the files have a scheme that generalizes the distributive solution so that this can be replicated in other architecture projects.

> In questa ricerca il tema della rappresentazione ha un ruolo fondamentale; in esso si ritrovano [...] gli aspetti della ripetizione e della differenza che consideriamo essenziali per interpretare l'architettura quando si ha come intendimento la sempre più precisa definizione di una cultura del progetto e delle tecniche che in esso vengono messe in atto per guidare l'immaginazione[70] (Motta, 1997b, p. 5).

The fundamental tools for the development of this compilation are the text, the drawing, the outline, and the legend. Below, each tool is briefly explained as a way of introducing and supporting the reading process.

- The text. Although it is true that the atlas prioritizes graphic representation, the text is a fundamental reading key to express in a few lines certain essential aspects, such as the steps that were considered and the vital characteristics to observe in each case study. The introduction that accompanies each sheet establishes a relationship between text and image to allow a better understanding of the project and its analysis.

- The drawing. The drawing has been one of the instruments used to record or represent reality, but also as a tool that synthesizes a series of comprehension, analysis, and comparison processes. These processes generate new analogies that can be used as design solutions. The drawing and graphic work innervate and organizes the entire representation space and its actual structure (Ravagnati, 1997, p. 100). Drawing as a method of representation arises from the attention given not only to the project and its different components but also to pay special attention to the systems that allow the external and internal circulation of the building. It also represents and emphasizes how these elements traverse or allow circulation in each case study.

- The scheme. The scheme belongs to the topological space and is built from simple geometric figures. This graphic representation does not have its scale, but it does have a close relationship with the project. The distributive schemes shown on the cards allow you to communicate their meaning quickly. As Palma

(2003, p. 88) explains, another vital aspect of the scheme is the scale changes, its iconic and formal load, and its immediacy where representation and design tend to coincide in the exact figure. By simplifying the figures and abstracting from the accidents of the topographical space, the scheme assumes all the rules of architectural composition: axiality, symmetries, use of simple geometric figures, the proportion between the elements, etc. (Palma, 2003, p. 88).

- The legend. The legend as an organized list that shows all the elements present, is a summary that effectively shows the elements that make up and organize the drawing. In addition, the legend subjects the different elements to graphical normalization. It encodes a system of valuable notes to reconcile elements of different entities, such as unique architectures, fragments, pieces, etc. (Dutto, 2016, pp. 52, 53).

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3.1.5. Organization for the Atlas of the Oblique Architecture

ATLAS

Analysis and classification of case studies based on their distributive systems.

ATLAS OF THE OBLIQUE ARCHITECTURE: DISTRIBUTION SYSTEMS AND LANDFORMS

RESEARCH FIELDS

Categorization by Earth shapes and how architecture replicates that form.

TERRITORIAL FORM

ARCHITECTURAL FORM

EARTH FEATURES

Categorization by mountain-related concepts.

Crater

Mountain

Mountain pass

Mountain ridge

Mountainside

DISTRIBUTION FEATURES

Categorization by ramp type.

DISTRIBUTION TYPES

The ways in which the ramp distributes the served spaces within the building.

LEGEND

It refers to the composition or characteristics of the individual elements present in the models of each case study.

- Spiral internal ramp
  - Continuous distribution
  - Punctual distribution
  - Diffuse distribution
- Spiral external ramp
  - Continuous distribution
  - Punctual distribution
  - Diffuse distribution
- Opposed double ramp
  - Continuous distribution
  - Punctual distribution
  - Diffuse distribution
- Straight ramp
  - Continuous distribution
  - Punctual distribution
  - Diffuse distribution
- Hairpin bend ramp
  - Continuous distribution
  - Punctual distribution
  - Diffuse distribution

LEGEND:

- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~

— *non-present*

ATLAS OF THE OBLIQUE ARCHITECTURE:
DISTRIBUTION SYSTEMS AND LANDFORMS

RESEARCH FIELDS

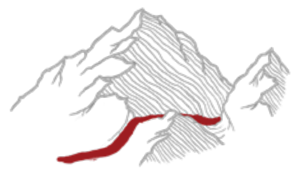
ARCHITECTURAL FORM

EARTH FEATURES

Crater

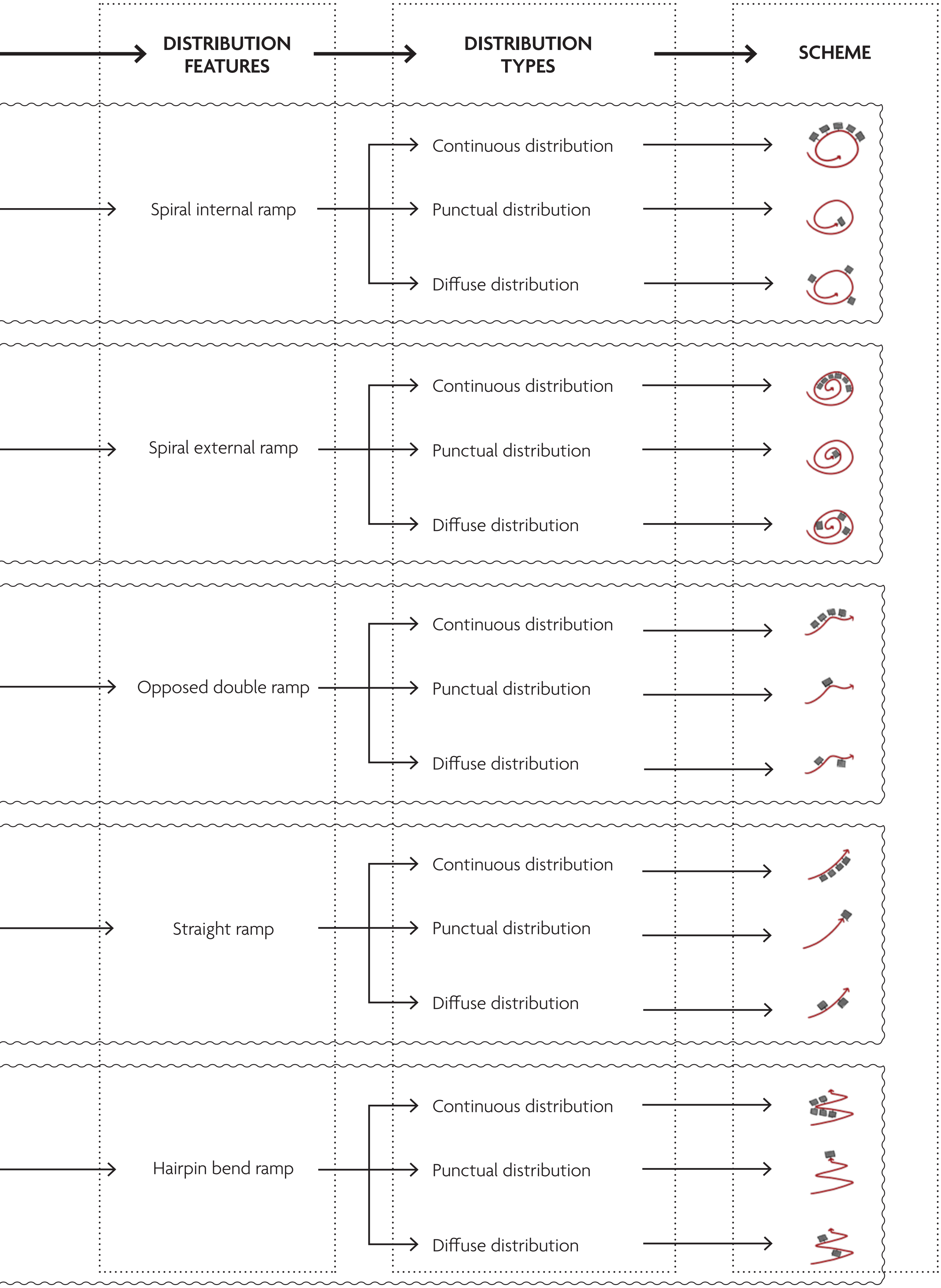
Mountain

Mountain pass

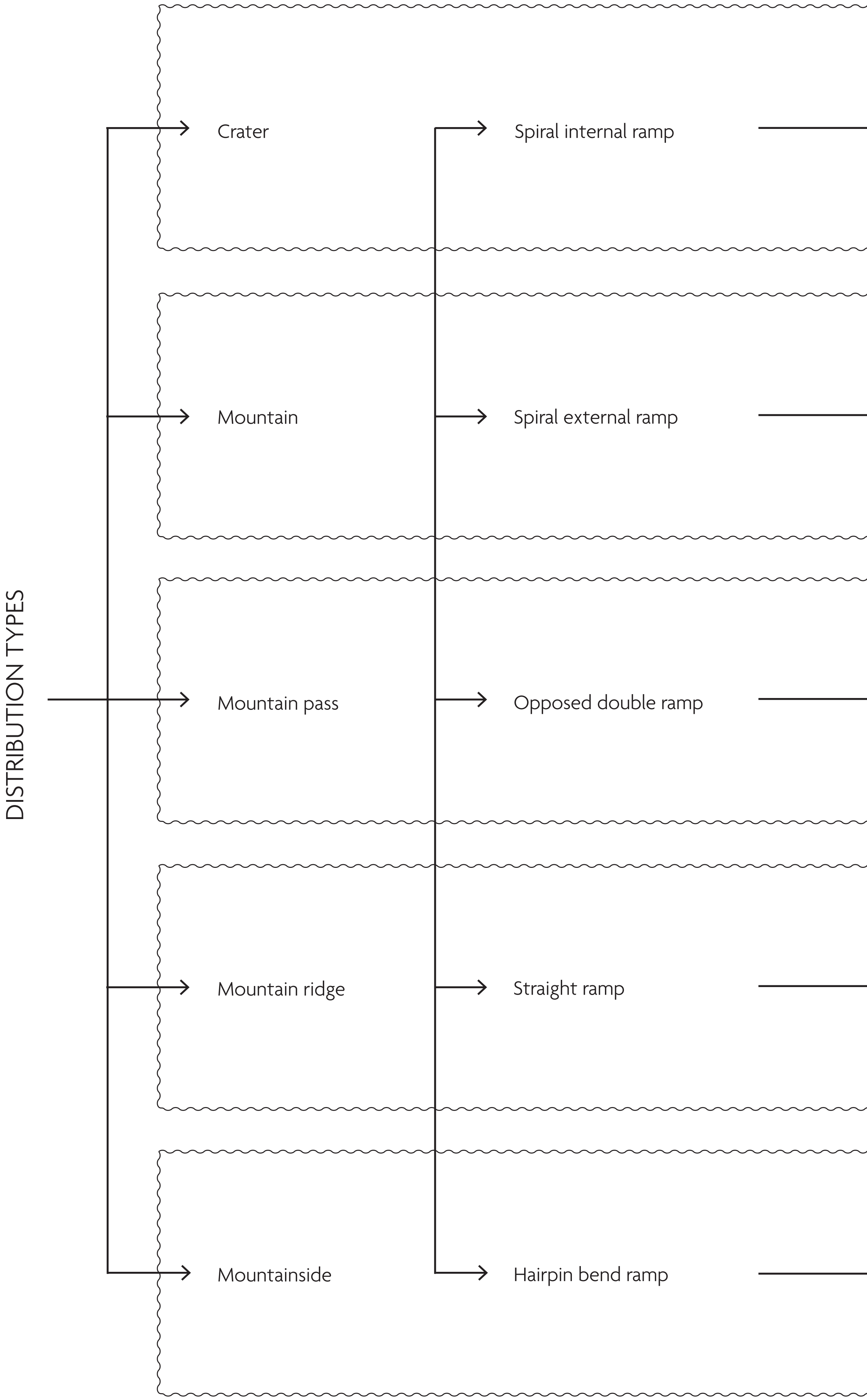


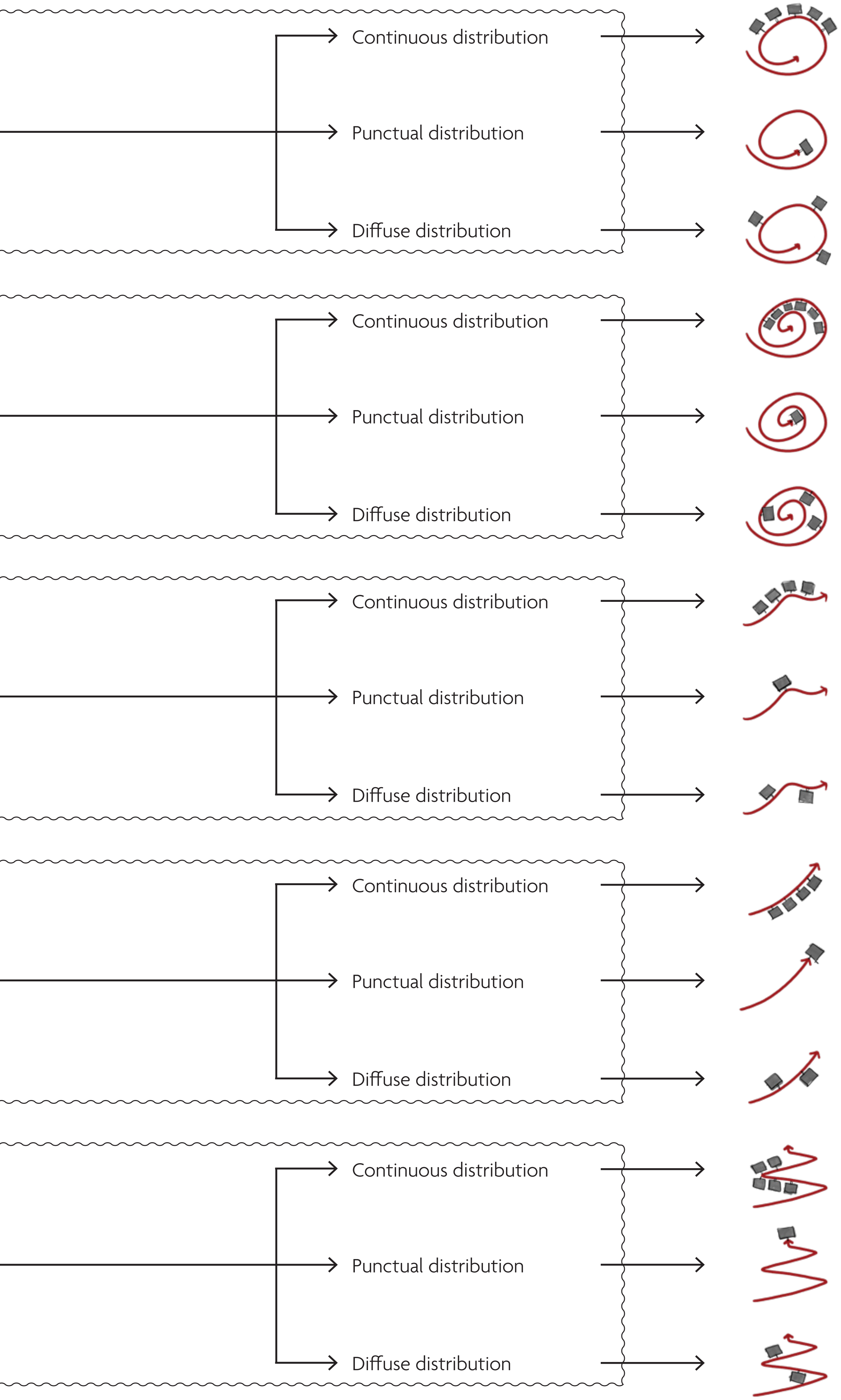
Mountain ridge

Mountainside


DISTRIBUTION FEATURES
DISTRIBUTION TYPES
SCHEME
Spiral internal ramp
Continuous distribution
Punctual distribution
Diffuse distribution
Spiral external ramp
Continuous distribution
Punctual distribution
Diffuse distribution
Opposed double ramp
Continuous distribution
Punctual distribution
Diffuse distribution
Straight ramp
Continuous distribution
Punctual distribution
Diffuse distribution
Hairpin bend ramp
Continuous distribution
Punctual distribution
Diffuse distribution

3.1.7. Types of distribution: Crater | Mountain | Mountain pass | Mountain ridge | Mountainside





Continuous distribution
Punctual distribution
Diffuse distribution
Continuous distribution
Punctual distribution
Diffuse distribution
Continuous distribution
Punctual distribution
Diffuse distribution
Continuous distribution
Punctual distribution
Diffuse distribution
Continuous distribution
Punctual distribution
Diffuse distribution

3.1.8. LIST OF 100 PROFILE CARDS

ARCHITECTURAL FORM

CRATER

SPIRAL INTERNAL RAMP

CR_01 Vittorio Bonadé Bottino, *Colonia Fiat Torre Balilla*. Sauze d'Oulx, Italy (1937).

CR_02 Gmp Architects, *Hanoi Museum*. Hoàn Kiem, Vietnam (2010).

CR_03 *Chand Baori stepwell*. Rajasthan, India (VII - IX century).

CR_04 Antonio da Sangallo il Giovane, Pozzo di San Patrizio. Orvieto, Italy (1527 – 1537).

CR_05 Frak Llyod Wright, *MOMA - Guggenheim Museum*. New York, United States (1943).

CR_06 GSMM Architetti, *88 Aires Mateus School of music*. Bressasone, Italy (2013).

CR_07 Bernard Tschumi architects, *Alésia Museum and archeological*. Burgundy, France (2012).

CR_08 BIG Architects, *Danish Pavilion*. Shangai, China (2013).

CR_09 VTN Architects, *Farming Kindergarden*. Biên Hòa, Vietnam (2013).

CR_10 DeA architects, *F4 Parking*. Saint-Louis, France (2017).

CR_11 GaP Grudzinski & Posay Architects, *Parking Building*. Grenoble, France (2015).

CR_12 OBRA Architects, *Spiral Housing*. Hamburg, Germany (2015).

CR_13 Pier Luigi Nervi, *Progetto del palazzo dell'acqua e della luce*. Rome, Italy (1939 – 1040).

CR_14 Studio MRDO & Studio LAM, *Crossing Parallels (First prize winner)*. Korean Demilitarized Zone, Korea (2017).

CR_15 WSP Architects, *Exhibition Center Offices*. Zhengzhou, China (2017).

CR_16 Gerkan Marg & Partners, *Multi-Storey Parking Rotunda*. Hamburg, Germany (1990).

CR_17 3Gatti Architecture Studio, *Automobile Museum*. Nanjing, China (2009).

CR_18 RE+D, *Guardería Capire*. Zapopan, Mexico (2019).

CR_19 NL Architects, *Strijp S*. Eindhoven, Holland (2007).

CR_20 Grupo Uno en Uno, HO Building. Villa Urquiza, Argentina (2018).

3.1.8. LIST OF 100 PROFILE CARDS

ARCHITECTURAL FORM

MOUNTAIN

SPIRAL EXTERNAL RAMP

MT_01 *Castel Sant'Elmo*. Naples, Italy (XIV – XVII century).

MT_02 P. Neuberger, D. Bornhorst, J. Romero, *El Helicoide*. Caracas, Venezuela (1956).

MT_03 *Giralda*. Seville, Spain (XI century).

MT_04 KWK Promes, *Broken House*. Katowice, Poland (2002).

MT_05 MRDV, *Central Library Brabant*. Brabant, Netherlands (2000).

MT_06 Bernhardt + Partner Architekten, *Advanced Training Centre*. Heidelberg, Germany (2010).

MT_07 Demetriano, Mausoleo di Adriano - *Castel Sant'Angelo*. Rome, Italy (135 - 139 AD).

MT_08 Penda architects + Chris Precht and Dayong Sun, *A thousand yards – botanical pavilion*. Beijing, China (2019).

MT_09 Adjaye Associates, Mass Extinction Memorial Observatory. Isle of Portland, England (2013).

MT_10 Konstantin Stepanovich Melnikov, Spiral Parking. Paris, France (1925).

MT_11 Spectacle: Bureau for Architecture and Urbanism, *Water Whirl (Runner Up)*. Korean Demilitarized Zone, Korea (2017).

MT_12 BIG Architects, *Danish Villa for a Car Collector*. Aalborg, Denmark (2015).

MT_13 Oscar Niemeyer, *Museu Nacional da Republica*. Brasilia, Brazil (2006).

MT_14 Jiakun Architects, *West Village*. Chengdu, China (2015).

MT_15 *Tower of Babel*. Babylon, Iraq (2000 and 500 BC).

MT_16 Rem Koolhaas – OMA, *Two Libraries*. Paris, France (1992).

MT_17 Rudy Ricciotti, *MUCEUM*. Marseille, France (2002).

MT_18 Frank Lloyd Wright, *Gordon Strong Automobile Planetarium*. Maryland, United States (1925).

MT_19 Frank Lloyd Wright, *David and Gladys Wright House*. Arizona, United States (1950).

MT_20 BIG Architects, *Musée Atelier Audemars Piguet*. Le Chenit, Switzerland (2018).

3.1.8. LIST OF 100 PROFILE CARDS

ARCHITECTURAL FORM

MOUNTAIN PASS

OPPOSED DOUBLE RAMP

MP_01 Le Corbusier, *Carpenter Center*. Cambridge, United States (1961).

MP_02 Giacomo Mattè-Trucco, *Stabilimento FIAT Lingotto*. Turin, Italy (1915-1930).

MP_03 Konstantin Stepanovich Melnikov, *Dormitorio Bloque*. Russia (1929).

MP_04 HHF Architects, *Transform Existing Parking structure*. Basel, Switzerland (2014).

MP_05 Oscar Niemeyer, *The Oscar Niemeyer Museum*. Curitiba, Brazil (2002).

MP_06 3andwich Design - He Wei Studio, *Service station of the Ecological Corridor*. Dali, China (2021).

MP_07 NL Architects, *Bicycle Club*. Sanya, China (2012).

MP_08 Giovanni da Ferrara, *Ponte Coperto*. Pavia, Italy (1351).

MP_09 Antonio da Ponte, *Ponte di Rialto*. Venezia, Italy (1588-1591).

MP_10 BIG Architects, *MÉCA - Maison de l'Économie Créative*. Bordeaux, France (2019).

MP_11 Javier Galindo, *The Packard Belt (Second prize winner)*. Detroit, United States (2014).

MP_12 BIG + Silvio d'Ascia Architecture, *Pont de Bondy Metro Station*. Paris, France (2016).

MP_13 8x8 Design Studio Co, *CG Villa (Calatagan Gym Villa)*. Calatagan, Philippines (2021).

MP_14 Public City Architecture, *Manitoboggan Slide*. Winnipeg, Canada (2018).

MP_15 AWP Office for Territorial Reconfiguration, *Musée des insectes*. Poissy, France (2016).

MP_16 Kaminsky Arkitektur, *KKA Designs Electric Vehicle Charging Stations*. Sweden (2013).

MP_17 Skidmore Owings & Merrill, *Macy's Queens Plaza*. New York, United States (1965).

MP_18 JHK Architecten, *Parking "de Cope"*. Utrecht, Netherlands (2008).

MP_19 PRODUCTORA, *Pavilion for the Culture Fair*. Ciudad de Mexico, Mexico (2014).

MP_20 Reiulf Ramstad Arkitekter *Selvika*. Havøysund, Norway (2012).

3.1.8. LIST OF 100 PROFILE CARDS

ARCHITECTURAL FORM

MOUNTAIN RIDGE

STRAIGHT RAMP

MR_01 *Mortuary Temple of Hatshepsut*. Plain of Deir el-Bahari, Egypt (15th century BC).

MR_02 David Chipperfield, *Museum of Natural History*. Huzhou, China (2018).

MR_03 *Santuario della Fortuna Primigenia*, Preneste. Italy (end of the 2nd century BC).

MR_04 *Chiesa Monumentale di San Gaudenzio*. Baceno, Italy (10th century).

MR_05 NEXT Architects, *Nudo de la suerte*. Changsha Shi, China (2016).

MR_06 Oscar Niemeyer, *Palácio do Planalto*. São Paulo, Brazil (1960).

MR_07 Steven Fleming, *Slab Block*. Velotopia (2017).

MR_08 Rem Koolhaas – OMA, *Educatorium*. Utrecht, Netherlands (1992-1995).

MR_09 *Temple of Etemenanki*. Babylon, Iraq (9th century BCE).

MR_10 J. Mayer H., *Season Escape*. Ascona, Switzerland (2000).

MR_11 Claude Parent, Paul Virilio, *Sainte Bernadette de Banlay*. Nevers, France (1963).

MR_12 Claude Parent, Paul Virilio, *Palais des expositions*. Charleville, France (1966-1967).

MR_13 *Temple of Solomon*. Jerusalem, Israel (957 BC).

MR_14 João Diniz Arquitetura, *Chapel in Lagoa Santa*. Lagoa Santa, Brazil (2018).

MR_15 Stu/D/O Architects, *Radial House*. MU SI, Thailand (2020).

MR_16 Alberto Campo Baeza, *Between Cathedrals*. Cadiz, Spain (2009).

MR_17 Simone Gobbo, *Bivacco F.lli Fanton*. Belluno, Italy (2015).

MR_18 Hidalgo Hartmann, *Bianna House*. Olot, Spain (2006).

MR_19 G. Barone, *Padiglione II - Mercato Ittico*. Torino, Italy (1836).

MR_20 Le Corbusier, Palais de Congrès. Strasbourg, France (1962).

3.1.8. LIST OF 100 PROFILE CARDS

ARCHITECTURAL FORM

MOUNTAINSIDE

HAIRPIN BEND RAMP

MS_01 Claude Parent, *Supermarché Carrefour*. Sens-Maillot, France (1970).

MS_02 BIG Architects, *Hotel Zig-Zag Ski*. Vallée de Joux, Switzerland (2018).

MS_03 Konstantin Stepanovich Melnikov, *Parking on a Bridge*. Paris, France (1925).

MS_04 Various Architects, *Bicycle Hotel*. Lillestrom, Norway (2016).

MS_05 JAAM Sociedad de Arquitectura, *Parking Building*. Leioa, Spain (2013).

MS_06 Riesco + Rivera Arquitectos, *Noguera House*. Las Condes, Chile (2011).

MS_07 Andramartin, *Vida Bekasi Marketing Office*. Bantargebang, Indonesia (2014).

MS_08 Atelier d'Architecture Bruno Erpicum & Partners, *Can Mana*. Balearic Islands, Spain (2008).

MS_09 Birk-Heilmeyer + Frenzel Architekten, *Parking Garage*. Coesfield, Germany (2007).

MS_10 Mareines Arquitectura + Patalano Arquitectura, *Casa Pinhão*. Campos de Jordão, Brazil (2016).

MS_11 LSM Architects, *Ed Roberts Campus*. Berkeley, United States (2011).

MS_12 QLAB, *Wulai Parking Structure*. New Taipei City, Taiwan (2012).

MS_13 Oscar Niemeyer, *Museo de Arte Contemporáneo*. Niterói, Brazil (1996).

MS_14 Claude Parent, Paul Virilio, *Maison Mariotti*. Saint-Germain-en-Laye, France (1967-1970).

MS_15 NL Architects, *Nike Arena*. Hilversum, Holland (2007).

MS_16 Tengbom, *The Bicycle Garage*. Kungsängen, Sweden (2019).

MS_17 Experimental Branch of Architecture, *Cultural - Sport Complex For Disabled*. Tehran, Iran (2011).

MS_18 Modern Office of Design and Architecture, *GROW Housing*. Calgary, Canada (2021).

MS_19 NL Architects, *Parkhouse / Carstadt*. Amsterdam, Holland (1994-1995).

MS_20 Enric Miralles & Carme Pinós, *Cementerio de la Igualada*. Barcelona, Spain (1994).

CRATER

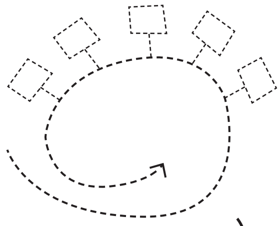
SPIRAL INTERNAL RAMP

CR-01

Features of the Earth

Features of the distribution

Category Code - Project number



Type of distribution

ORIGINAL DESIGNS

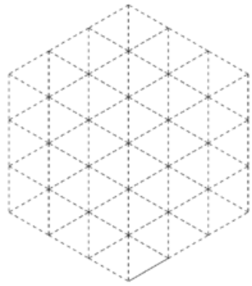
ORIGINAL DESIGNS

BUILDING DESIGNS - FACADE OR SECTION
redrawn by the author

Short text about the distribution system

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequt in culpa qui officia deserunt mollit anim id est laborum. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt Lorem ipsum dolor sit amet, consectetur adipiscing elit,

Distribution Scheme



BUILDING DESIGNS - AXONOMETRY
redrawn by the author

Data about the project

Legend of schemes

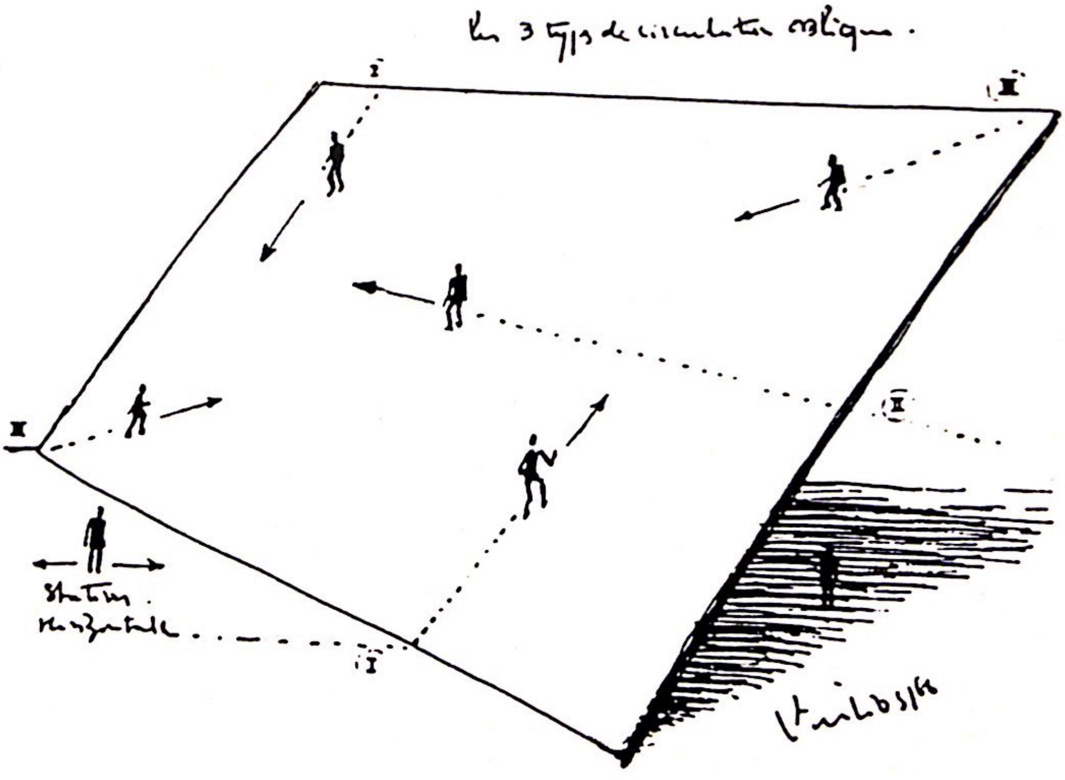
ARCHITECT: XXXXXXXXXXXXXXXXX
NAME: XXXXXXXX
DATE: XXXX
LOCATION: XXXXXXXXXXX
PROGRAM: XXXXX

LEGEND:

- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- ~~INTERNAL STAIRS~~
- ~~EXTERNAL STAIRS~~
- — *non-present*

3.2. ATLAS OF THE OBLIQUE ARCHITECTURE:

DISTRIBUTION SYSTEMS AND LANDFORMS


Les 3 types de circulation oblique.
Station horizontale

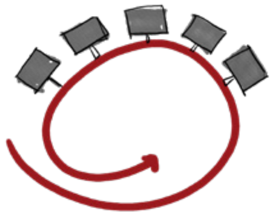
ARCHITECTURAL FORM

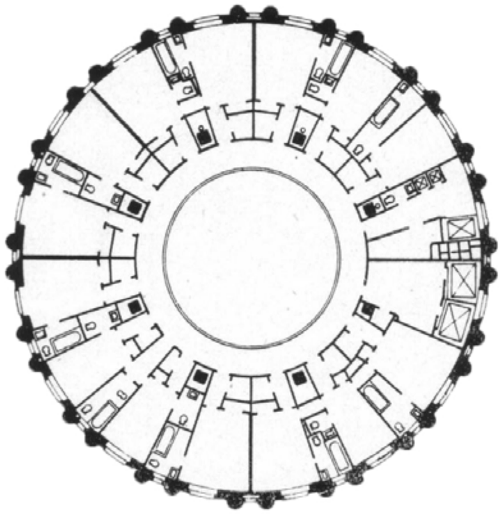
3.2.1. CRATER SPIRAL INTERNAL RAMP

CRATER

SPIRAL INTERNAL RAMP

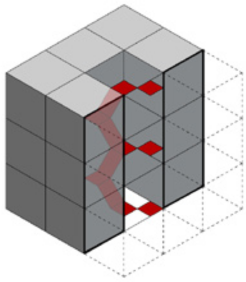
CR-01

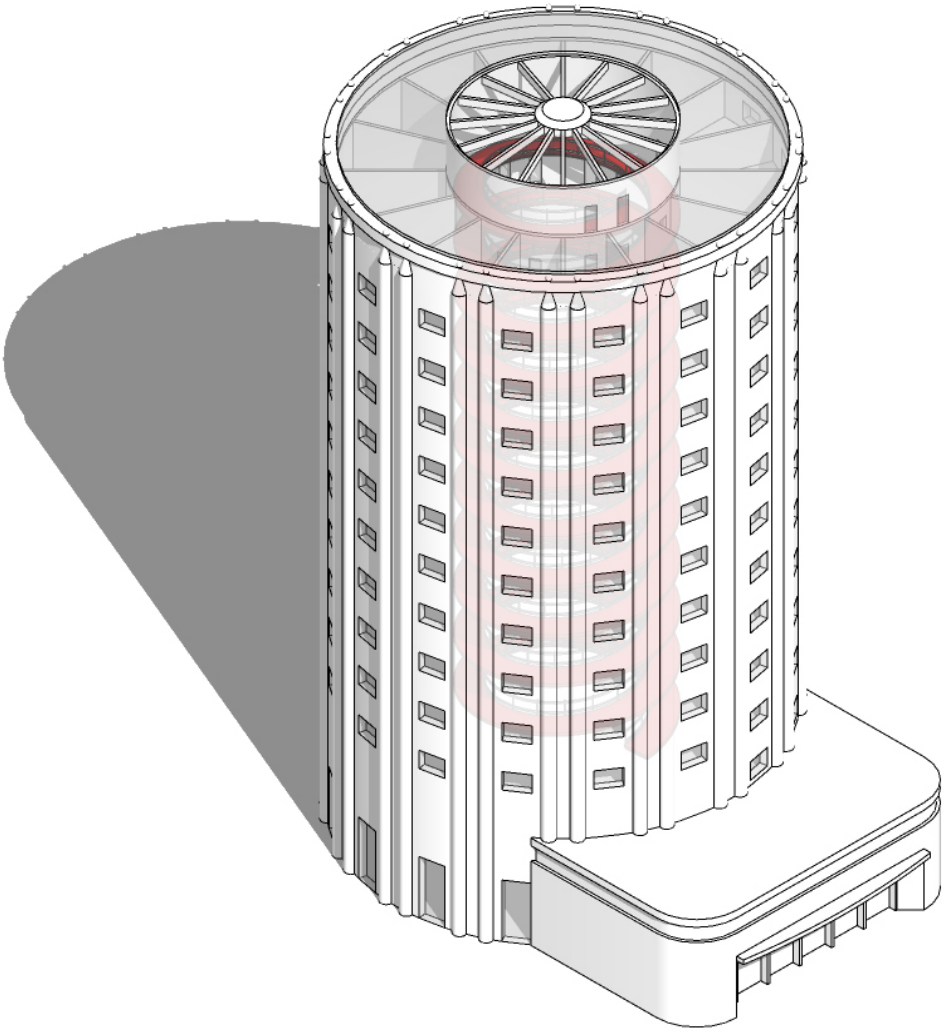




The Colonia Fiat Torre Balilla is an exciting example of a building that utilises a unique distribution system. The building was initially designed as a summer camp for the children of Fiat employees, and it features a ramp that winds up from the ground floor to the upper levels. This ramp is an essential element of the building's design, as it serves as the main circulation path for visitors and connects all of the different spaces within the building. The ramp also serves as a central gathering space, with various rooms and activity areas branching off from it on each floor. The type of distribution is continuous since the spaces are on the outside along the ramp.

Distribution Scheme





ARCHITECT:	Vittorio Bonadé Bottino
NAME:	Colonia Fiat Torre Balilla
DATE:	1937
LOCATION:	Sauze d'Olux, Italy
PROGRAM:	Hotel

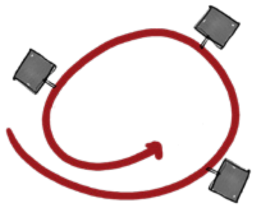
LEGEND:

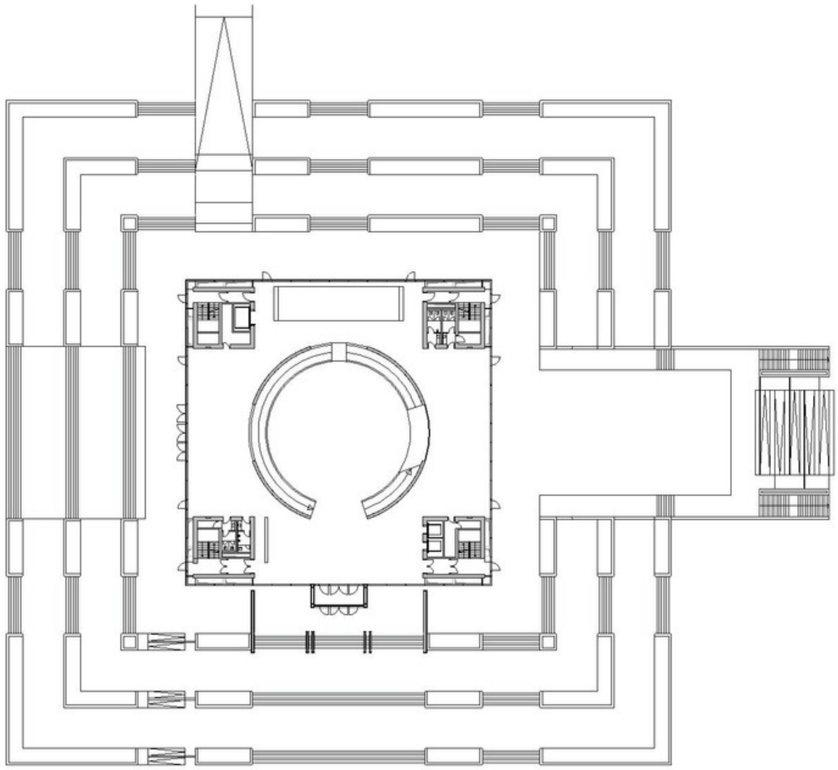
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

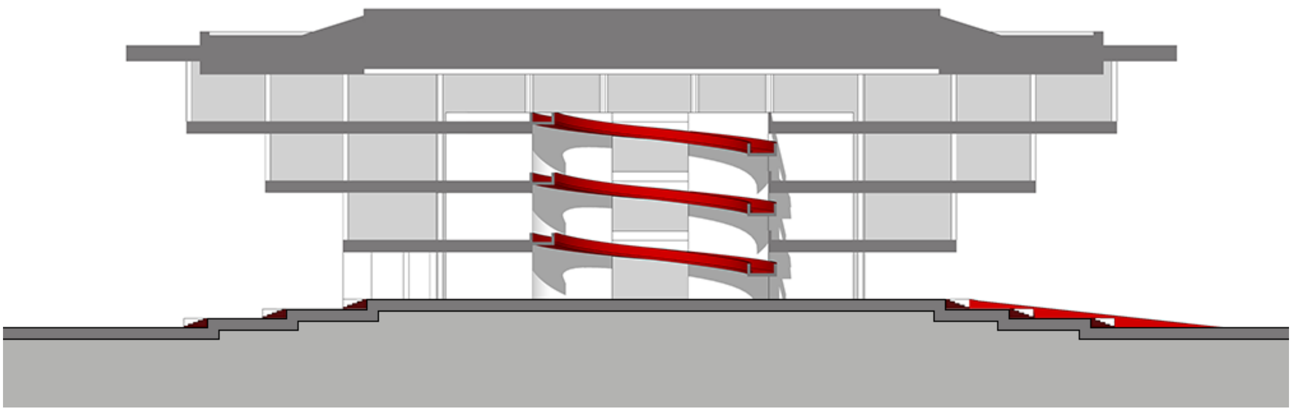
CRATER

SPIRAL INTERNAL RAMP

CR-02

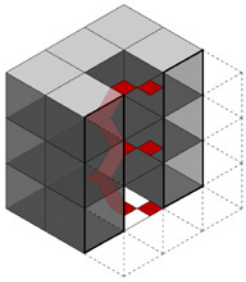


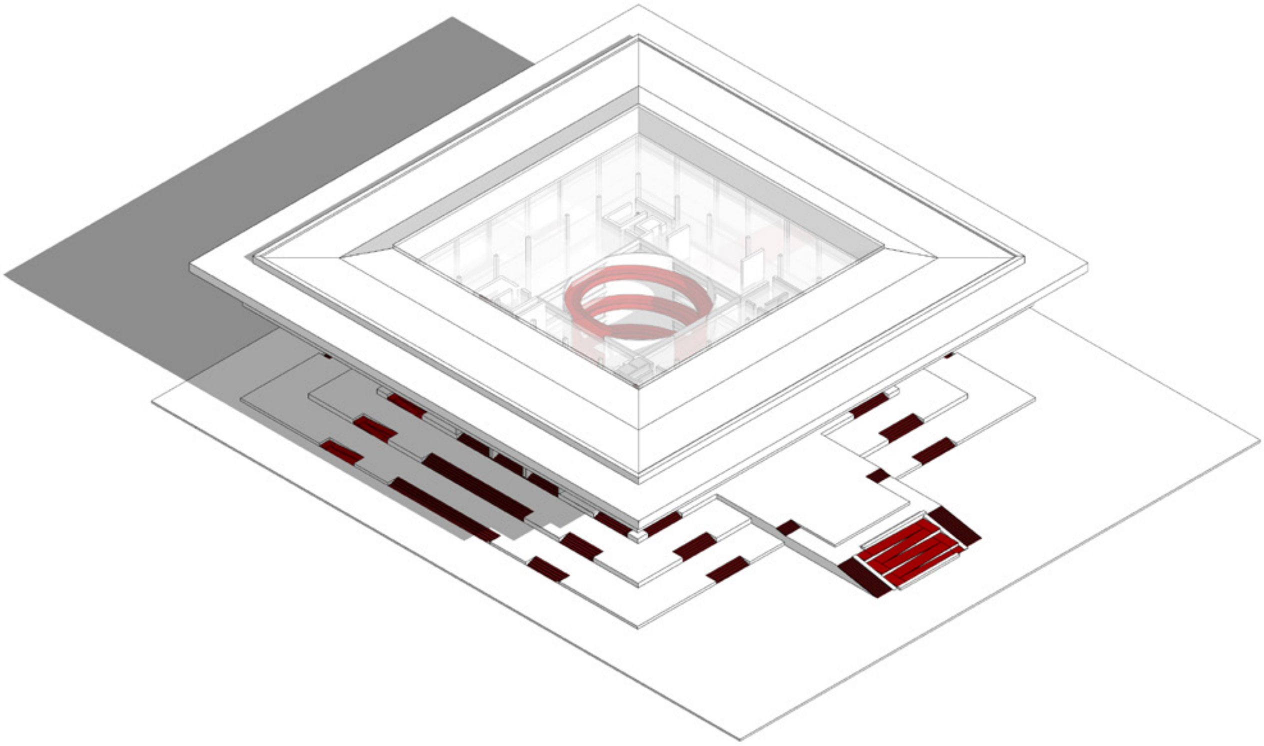




The Hanoi Museum is an impressive example of a building that utilises a unique distribution system. The building's main entrance leads visitors through a central atrium dominated by a massive spiral ramp. This ramp is a significant building feature, allowing visitors to circulate easily between the different floors and exhibits. It is also a visually stunning element, with curved walls and a spiralling form that creates a sense of movement and dynamism. The ramp serves as the main circulation path for visitors, with exhibit spaces branching off from it on each level. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.

Distribution Scheme





ARCHITECT:	GMP Architects
NAME:	Hanoi Museum
DATE:	2010
LOCATION:	Hanói, Vietnam
PROGRAM:	Museum

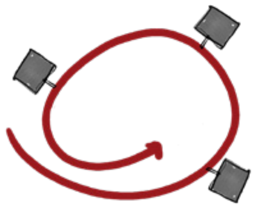
LEGEND:

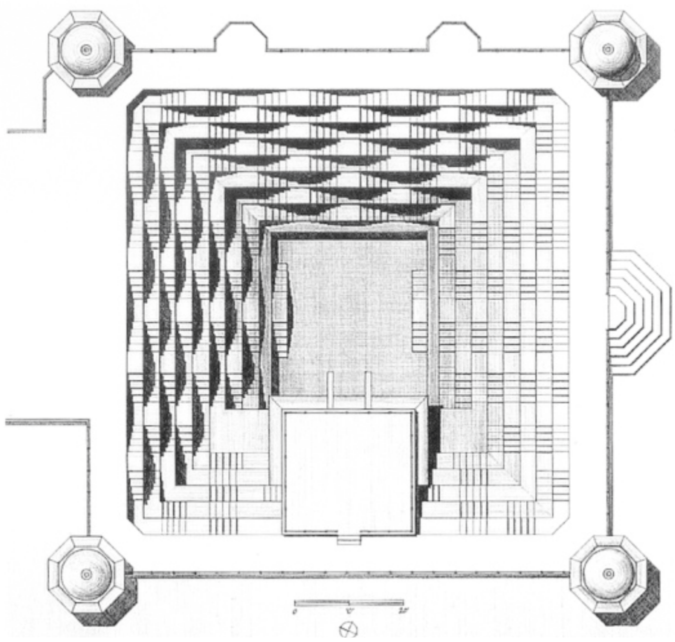
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- EXTERNAL STAIRS
- — *non-present*

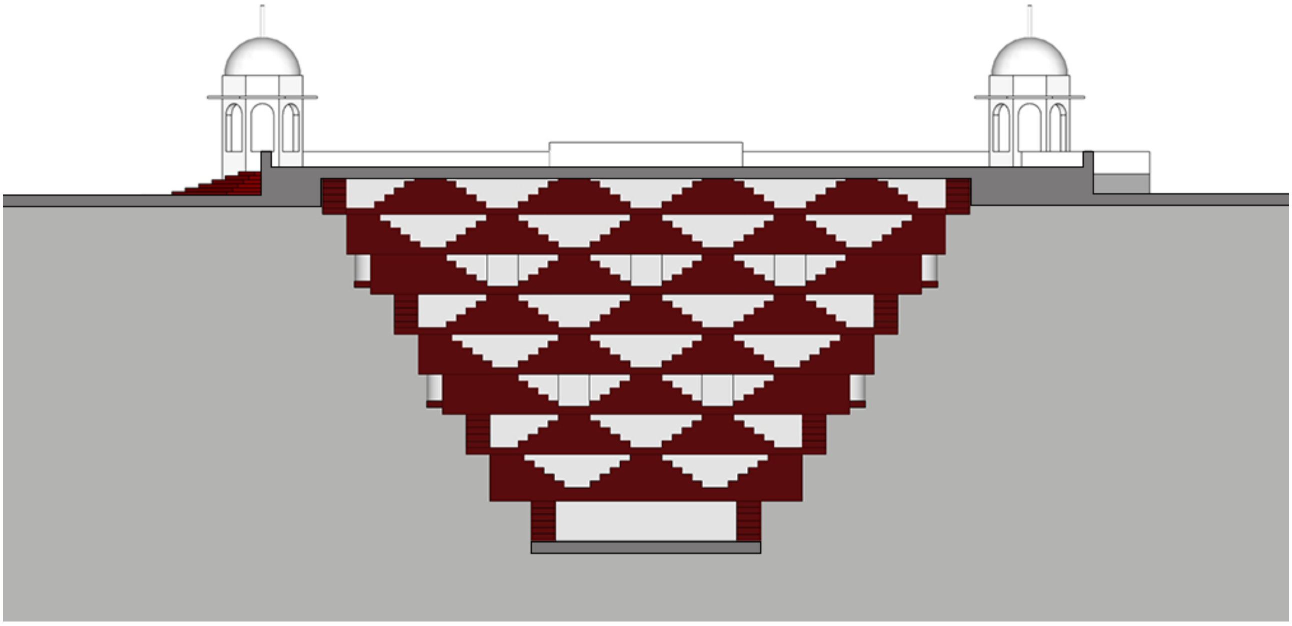
CRATER

SPIRAL INTERNAL RAMP

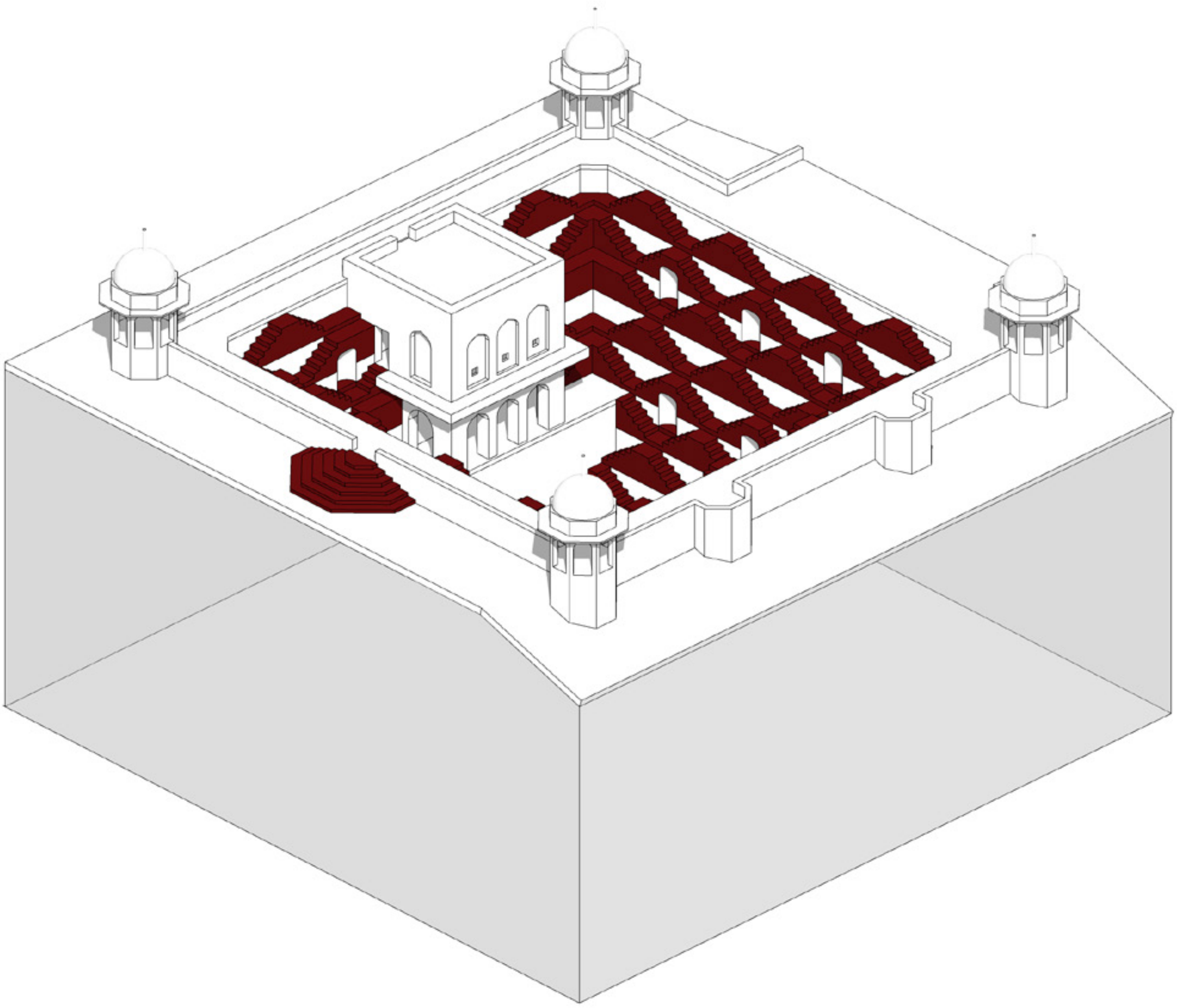
CR-03







The Chand Baori stepwell is a square-shaped structure with symmetrical steps leading down to a deep pool of water. The distribution system of the stepwell is centred around the water source, with the steps serving as a way for people to access the water at different depths. The steps of the Chand Baori stepwell are a remarkable feature. Overall, the stepwell is a testament to the ingenuity and creativity of ancient Indian architects, inspiring visitors from around the world today. The type of distribution is diffuse since the spaces distributed by the stairs are in different areas.



ARCHITECT:	-
NAME:	Chand Baori stepwell
DATE:	VII - IX Century
LOCATION:	Rajasthan, India
PROGRAM:	Temple

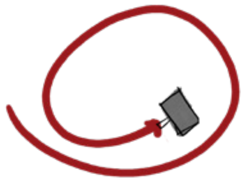
LEGEND:

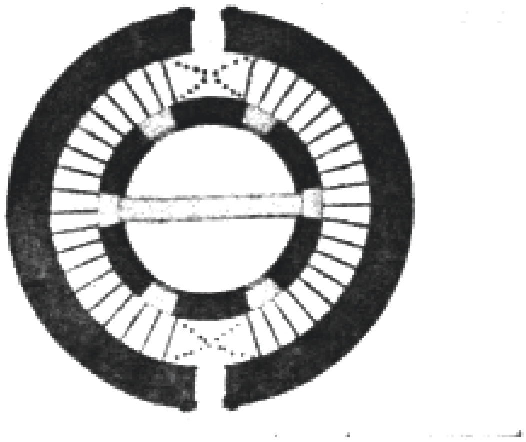
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- ~~EXTERNAL RAMPS~~
- ~~INTERNAL STAIRS~~
- EXTERNAL STAIRS
- — *non-present*

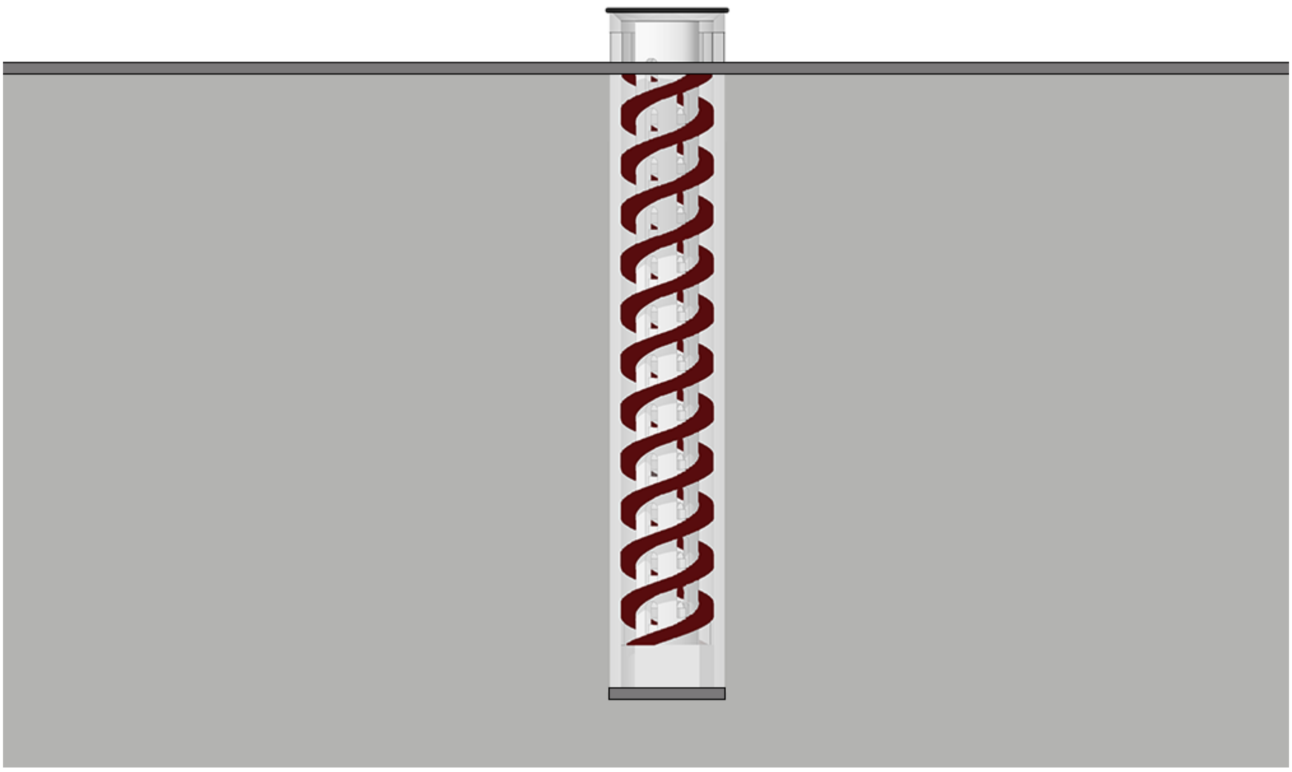
CRATER

SPIRAL INTERNAL RAMP

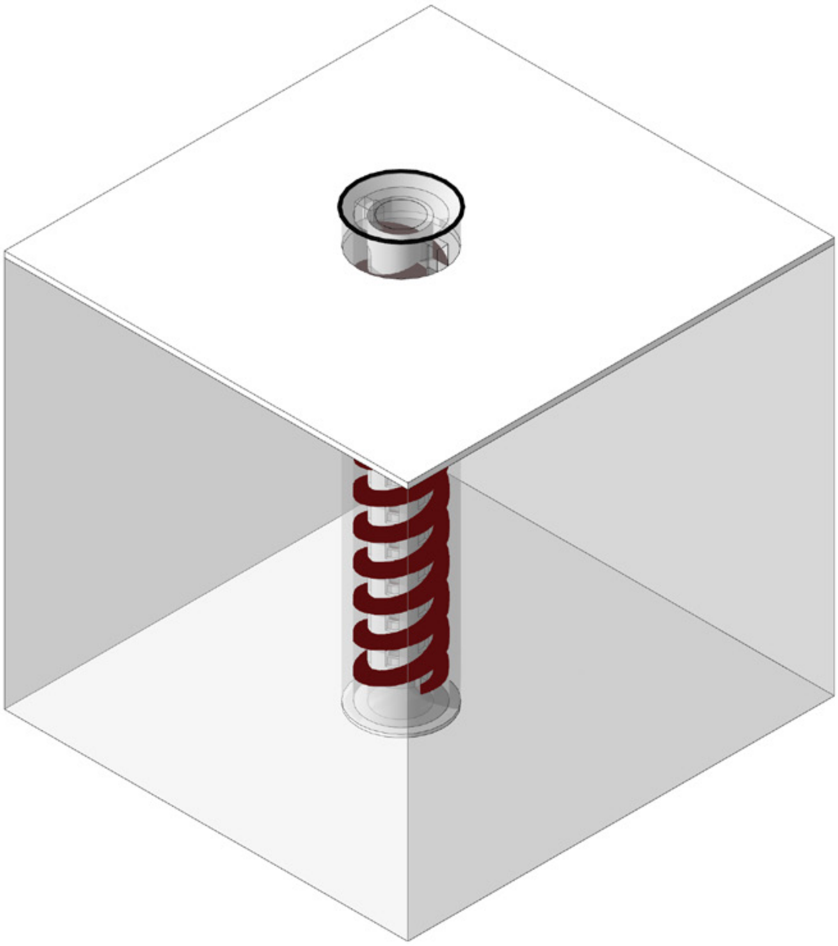
CR-04







The Pozzo di San Patrizio is a cylindrical structure with two spiral staircases that wind down to a central water source. The two staircases were designed to allow people and animals to move up and down the well without crossing paths, making it a highly efficient and functional space. The staircases are an impressive architectural feat; the steps are wide and gently sloping, providing a comfortable and easy way to move through the space. The type of distribution is punctual since the stairs lead directly to the space to be distributed.



ARCHITECT:	Antonio da Sangallo il Giovane
NAME:	Pozzo di San Patrizio
DATE:	1527 - 1537
LOCATION:	Orvieto, Italy
PROGRAM:	Waterhole

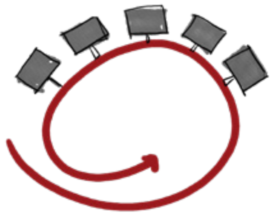
LEGEND:

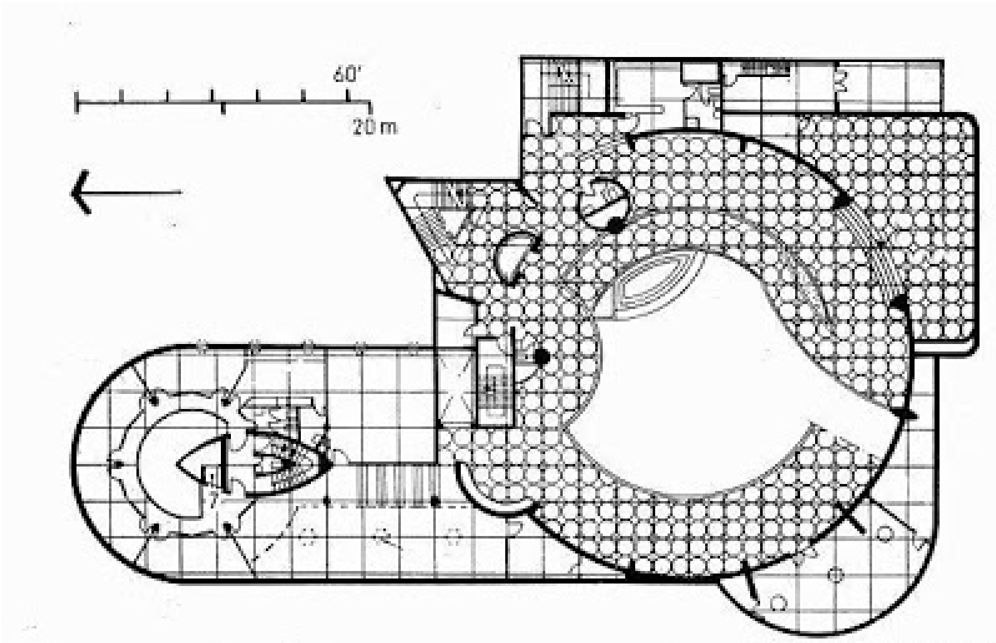
- ~~SERVED SPACES~~
- ~~INTERNAL RAMPS~~
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

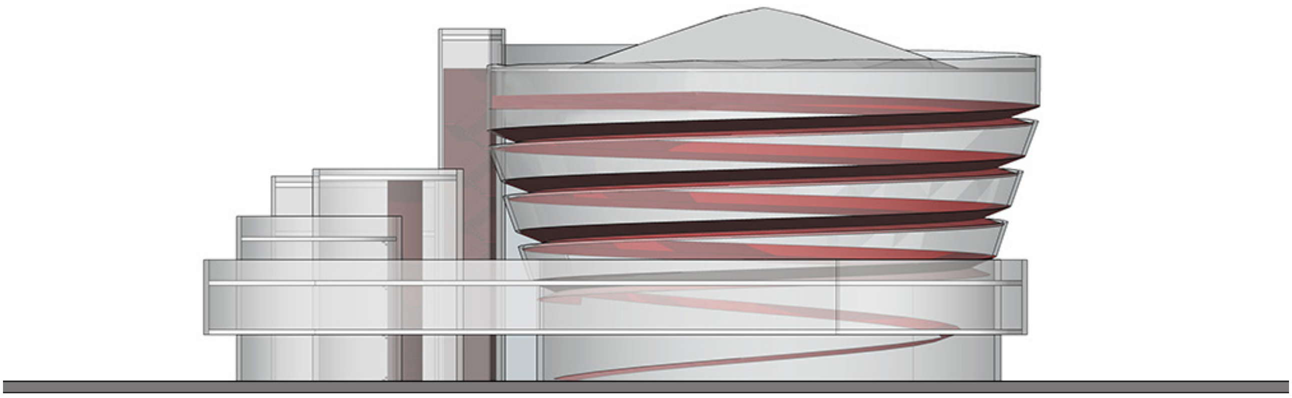
CRATER

SPIRAL INTERNAL RAMP

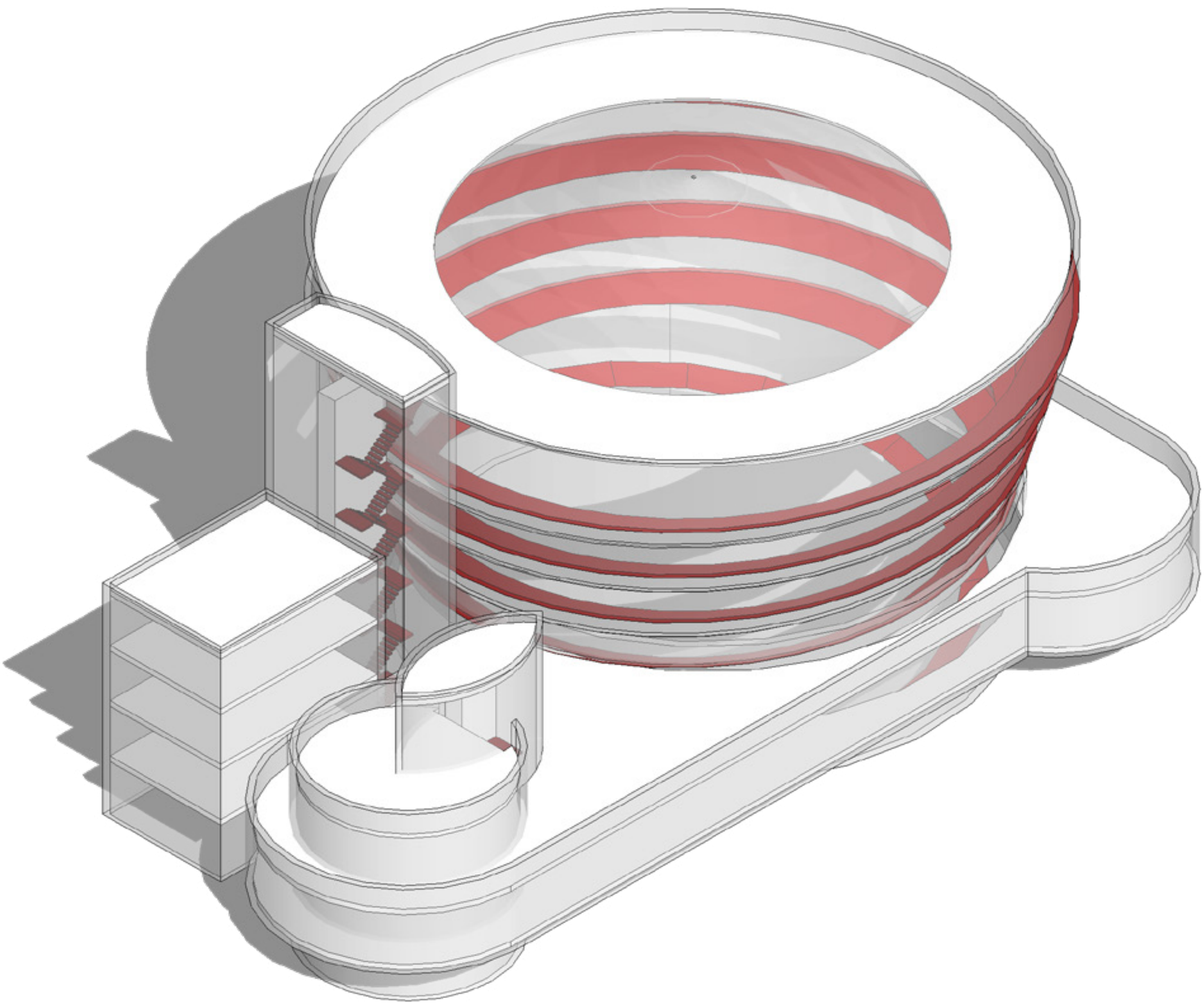
CR-05







The Guggenheim Museum's unique distribution system is centred around a spiralling ramp that winds up through the centre of the building. The ramp serves as the main circulation path for visitors, allowing them to access the museum's galleries and exhibits seamlessly and intuitively. The ramp is an essential element of the building's design, with a wide width and a gentle slope that encourages visitors to move through the space at their own pace. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



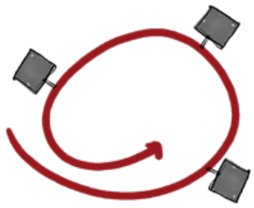
ARCHITECT: Frank Lloyd Wright
NAME: MOMA - Guggenheim Museum
DATE: 1943
LOCATION: New York, United States
PROGRAM: Museum

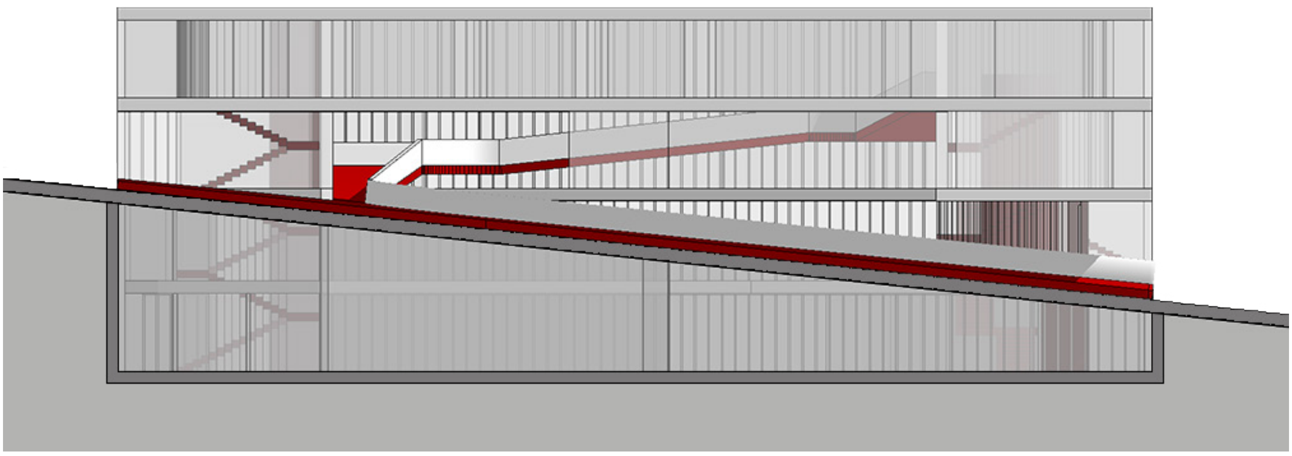
LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

CRATER

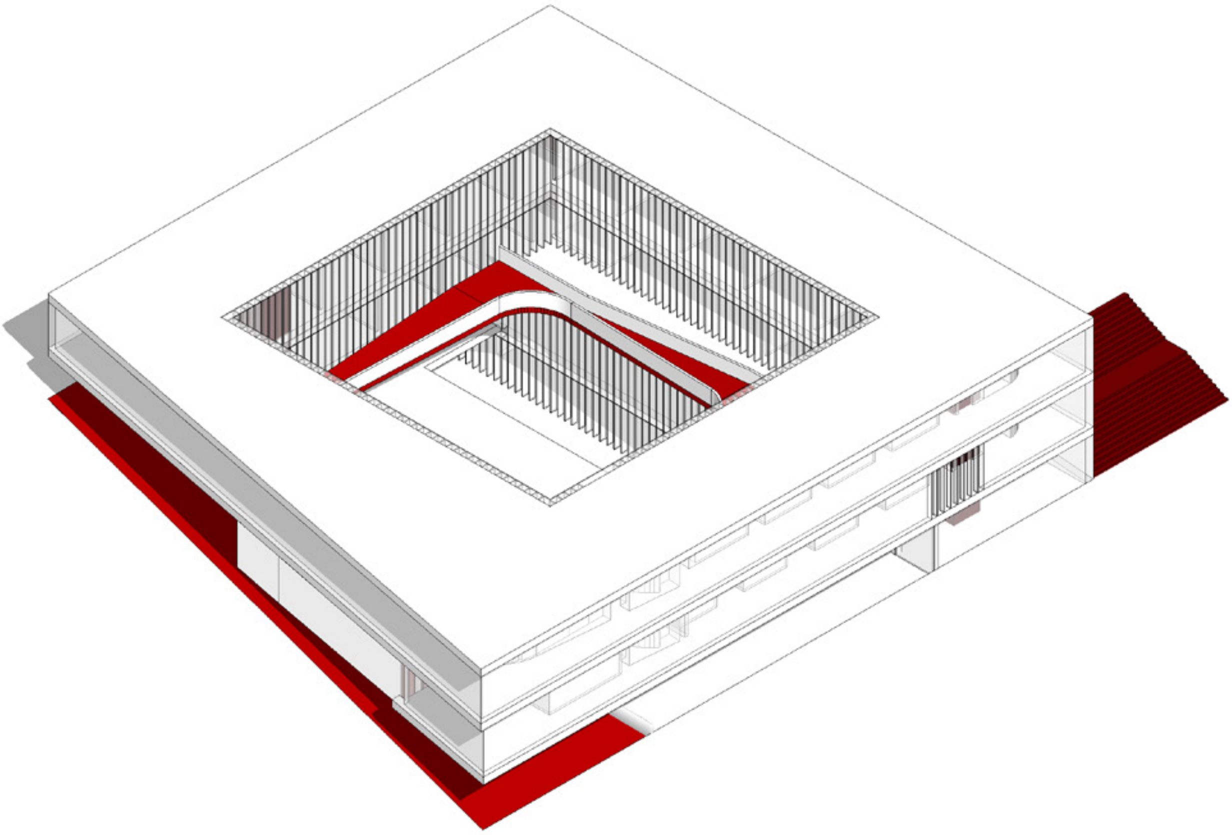
SPIRAL INTERNAL RAMP

CR-06





The 88 Aires Mateus School of Music features a unique distribution system that creates a fluid and intuitive visitor experience. The building's main circulation path is a ramp that winds through the space, connecting the different levels and programmatic areas. The ramp is a carefully designed element with a width and slope that encourages visitors to move through the space comfortably and efficiently. The ramp also serves as a focal point for the building, with a striking, monolithic form that contrasts with the surrounding architecture. The type of distribution is diffuse since the spaces to be distributed are not found serially but sporadically.



ARCHITECT:	GSMM Architetti
NAME:	88 Aires Mateus School of music
DATE:	2013
LOCATION:	Bressasone, Italy
PROGRAM:	School

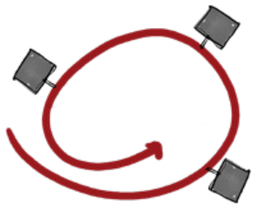
LEGEND:

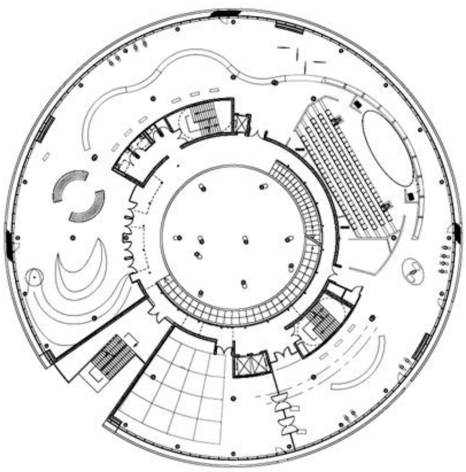
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- EXTERNAL STAIRS
- — *non-present*

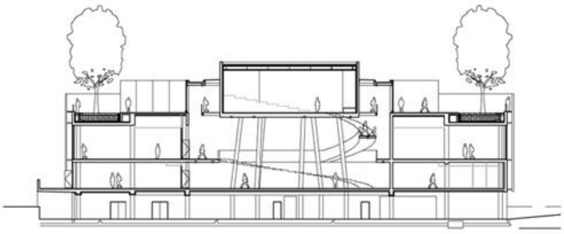
CRATER

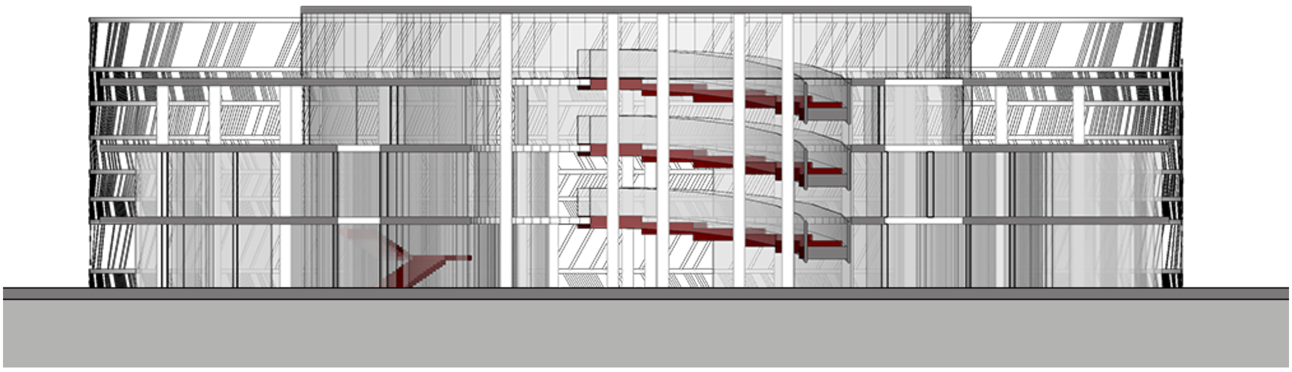
SPIRAL INTERNAL RAMP

CR-07

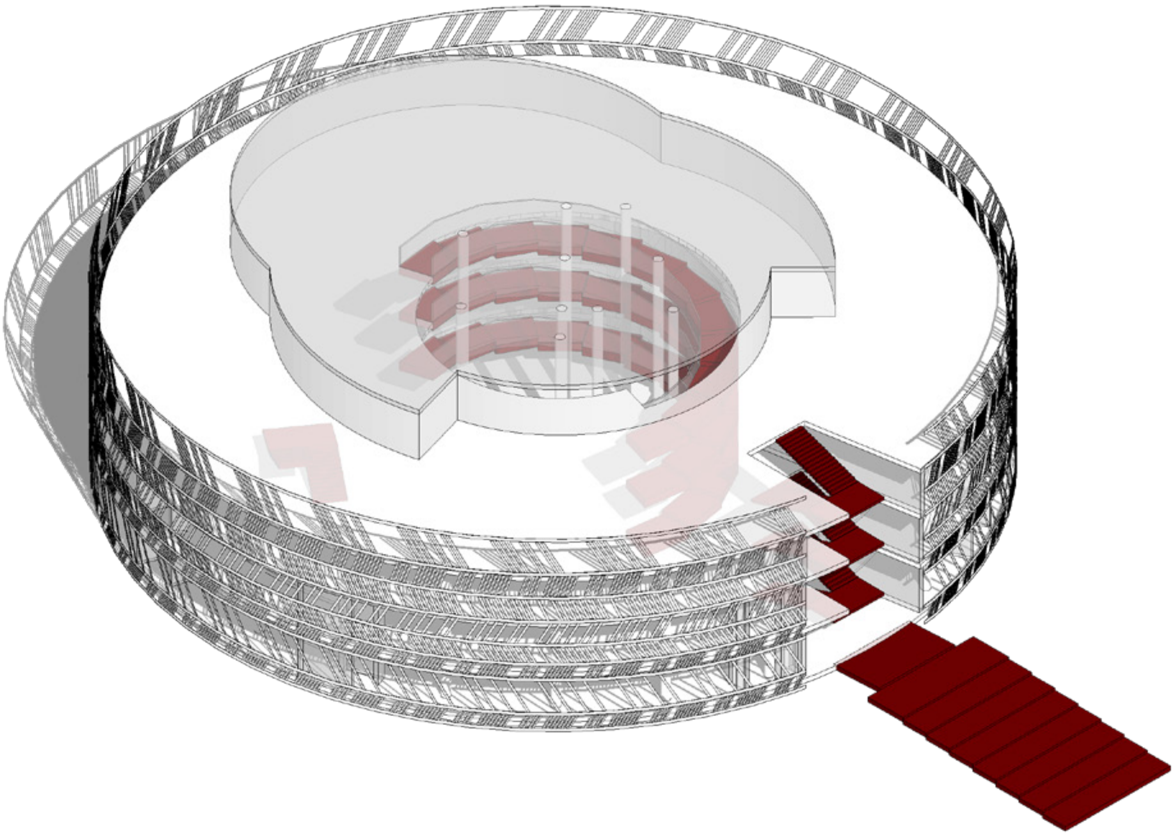








The Alésia Museum and Archaeological Park's distribution system seamlessly integrates the museum's exhibitions with the surrounding landscape. The building is situated atop a hill overlooking the site of the famous battle of Alésia, and its design is centred around a spiralling ramp that leads visitors down to the archaeological park below. The ramp also allows for a fluid distribution of people throughout the space, with multiple points of access and egress that ensure a comfortable and efficient circulation path. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



ARCHITECT: Bernard Tschumi architects
NAME: Alésia Museum and archeological
DATE: 2012
LOCATION: Burgundy, France
PROGRAM: Museum

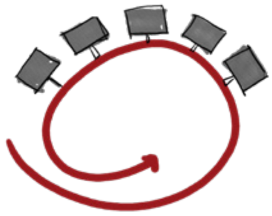
LEGEND:

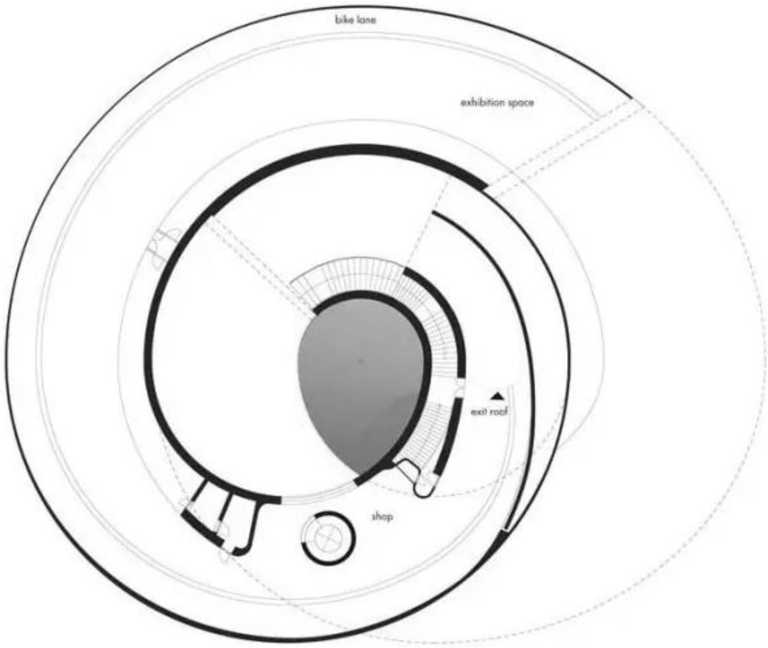
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- EXTERNAL STAIRS
- — *non-present*

CRATER

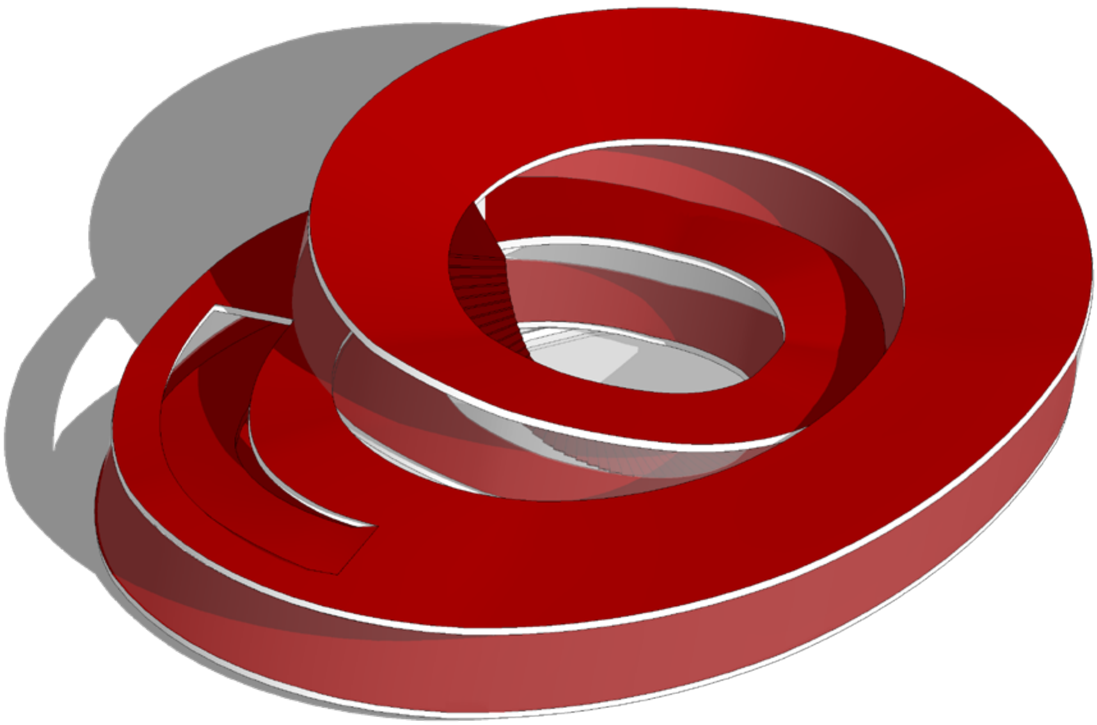
SPIRAL INTERNAL RAMP

CR-08





The Danish Pavilion features a unique distribution system that creates a dynamic and engaging experience for visitors. The building is centred around a spiralling ramp that winds up through the space, connecting the different levels and programmatic areas. The ramp is an essential element of the building's design, with a width and slope that encourages visitors to move through the space at their own pace. The ramp also serves as a focal point for the building, with a striking, curving form that creates a sense of movement and energy. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT:	BIG Architects
NAME:	Danish Pavilion
DATE:	2013
LOCATION:	Shangai, China
PROGRAM:	Pavilion

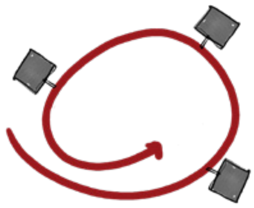
LEGEND:

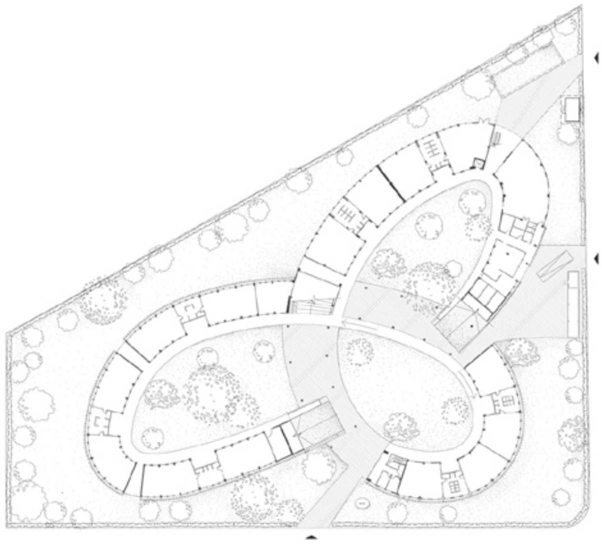
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

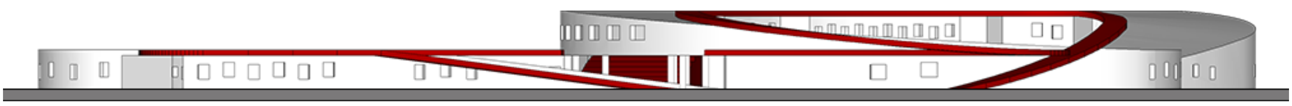
CRATER

SPIRAL INTERNAL RAMP

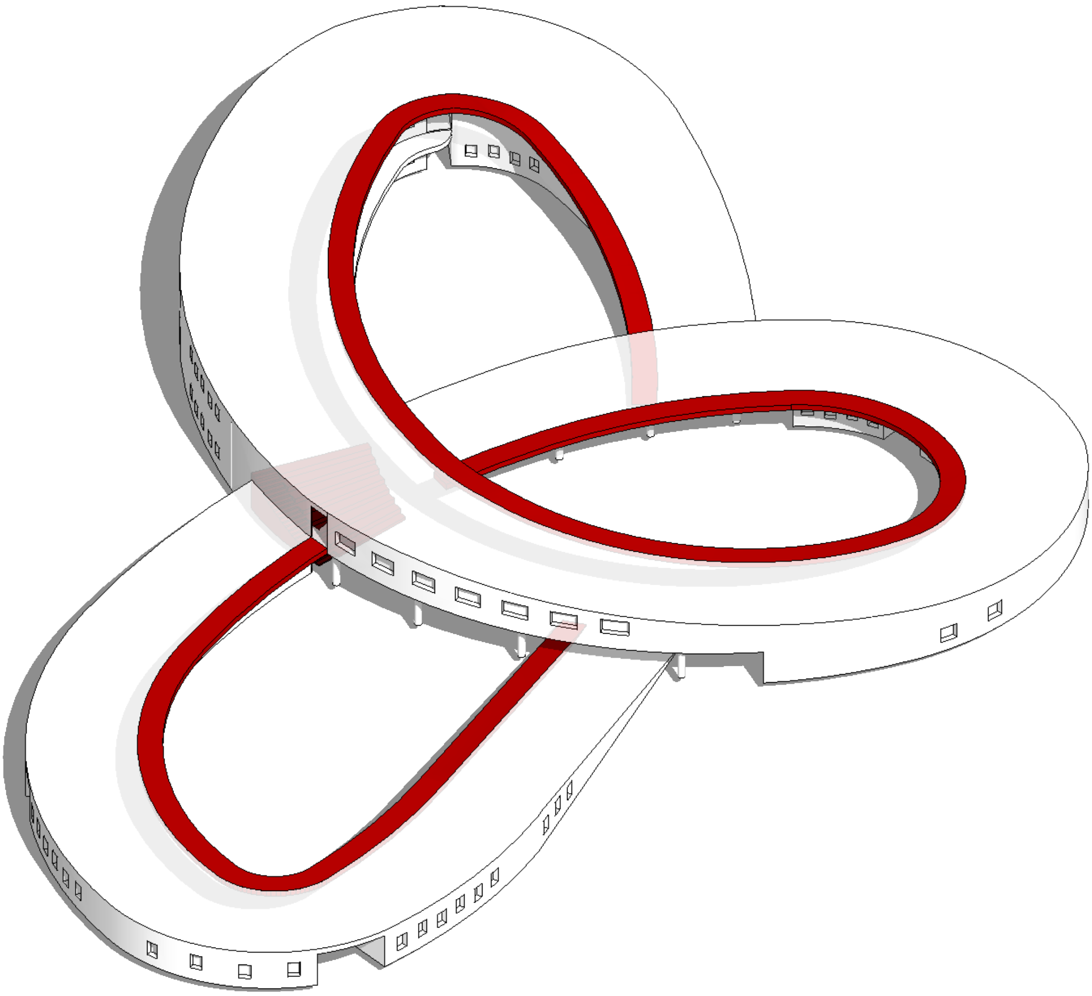
CR-09







The Farming Kindergarten's distribution system creates a playful and engaging experience for young children. The building is organised around a central courtyard and features a series of ramps and stairs that connect the different levels of the space. The ramps of kindergarten are designed with the needs of young children in mind, with a gentle slope and wide surface that allows them to move through the space quickly. The ramps also serve as a space for play and exploration, with different textures and materials. The type of distribution is diffuse since the spaces to be distributed are not found serially but sporadically.



ARCHITECT:	VTN Architects
NAME:	Farming Kindergarden
DATE:	2013
LOCATION:	Biền Hòa, Vietnam
PROGRAM:	School

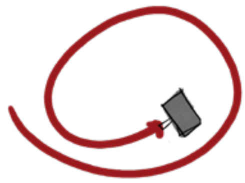
LEGEND:

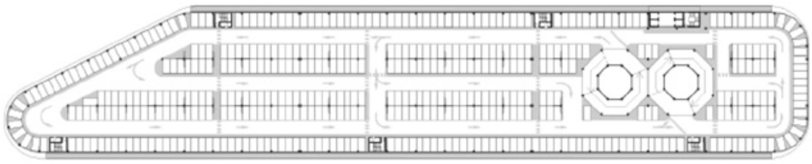
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

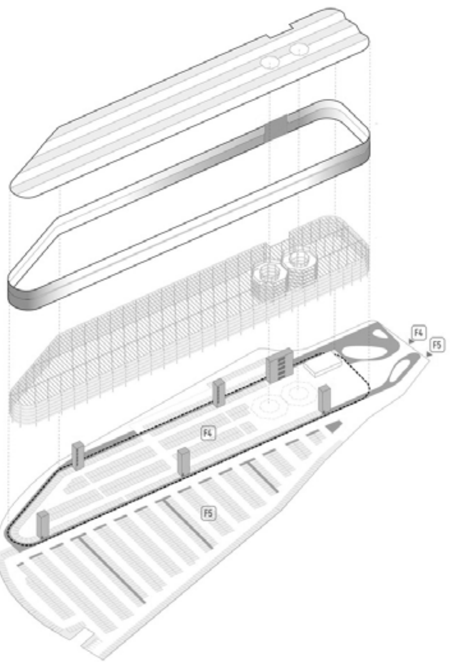
CRATER

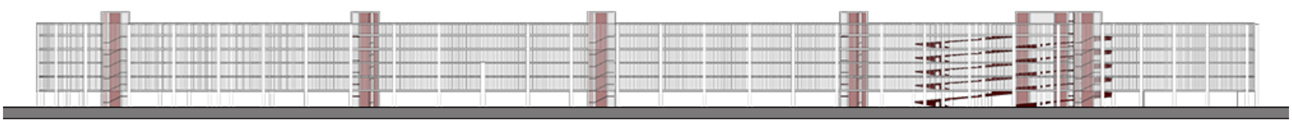
SPIRAL INTERNAL RAMP

CR-10

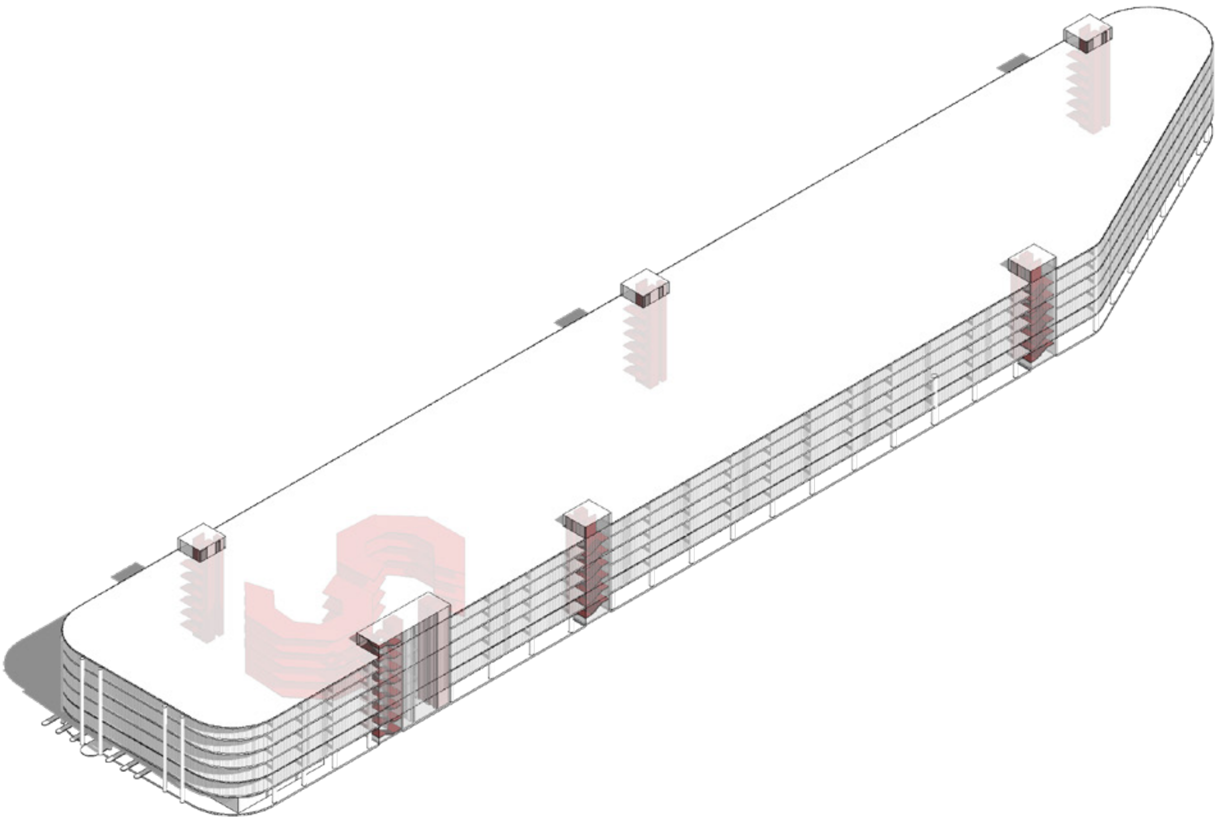








The F4 Parking features a highly functional distribution system that allows for efficient movement and Parking of vehicles. The building is organised around a central ramp that winds up through the space, connecting the different levels and parking areas. The ramp is an essential element of the building's design, with a width and slope allowing for cars' safe and easy movement throughout the space. The ramp also serves as a space for ventilation and natural light. The type of distribution is punctual since the ramp distributes the different levels of the building punctually.



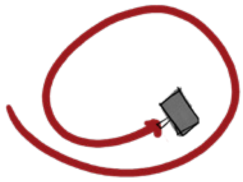
ARCHITECT: DeA architectes
NAME: F4 Parking
DATE: 2017
LOCATION: Saint-Louis, France
PROGRAM: Parking

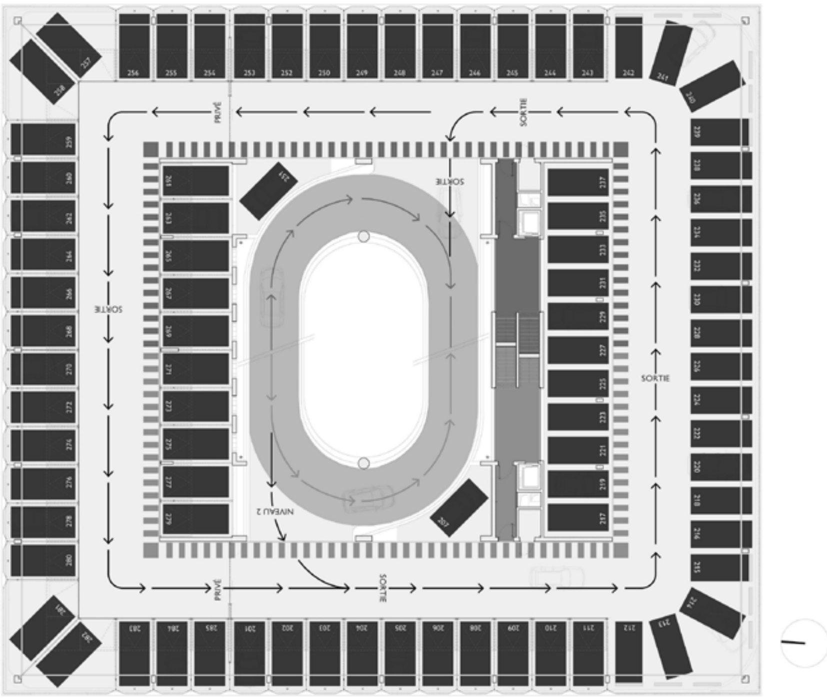
LEGEND:
~~SERVED SPACES~~
INTERNAL RAMPS
~~EXTERNAL RAMPS~~
INTERNAL STAIRS
~~EXTERNAL STAIRS~~
— *non-present*

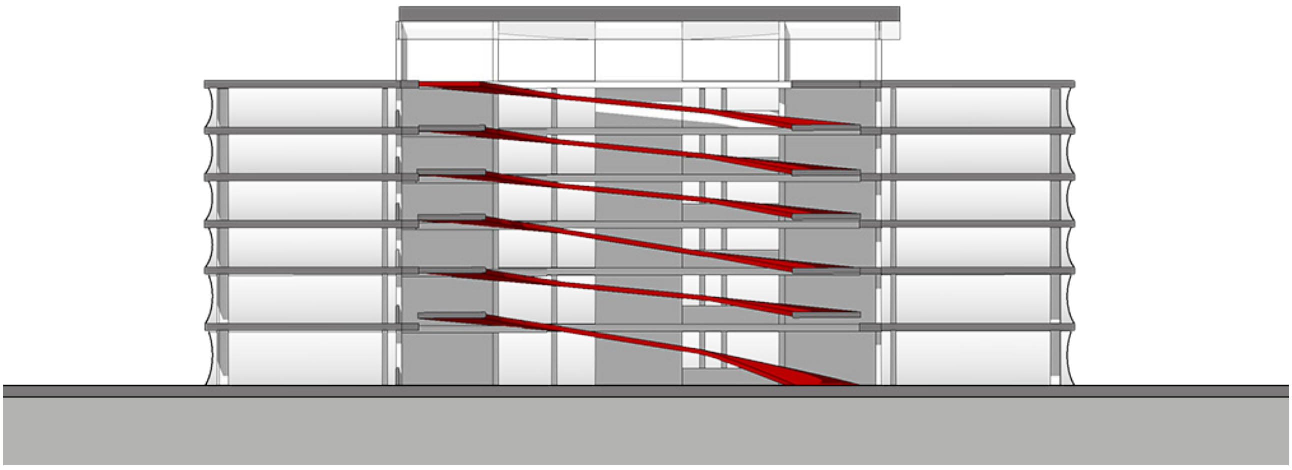
CRATER

SPIRAL INTERNAL RAMP

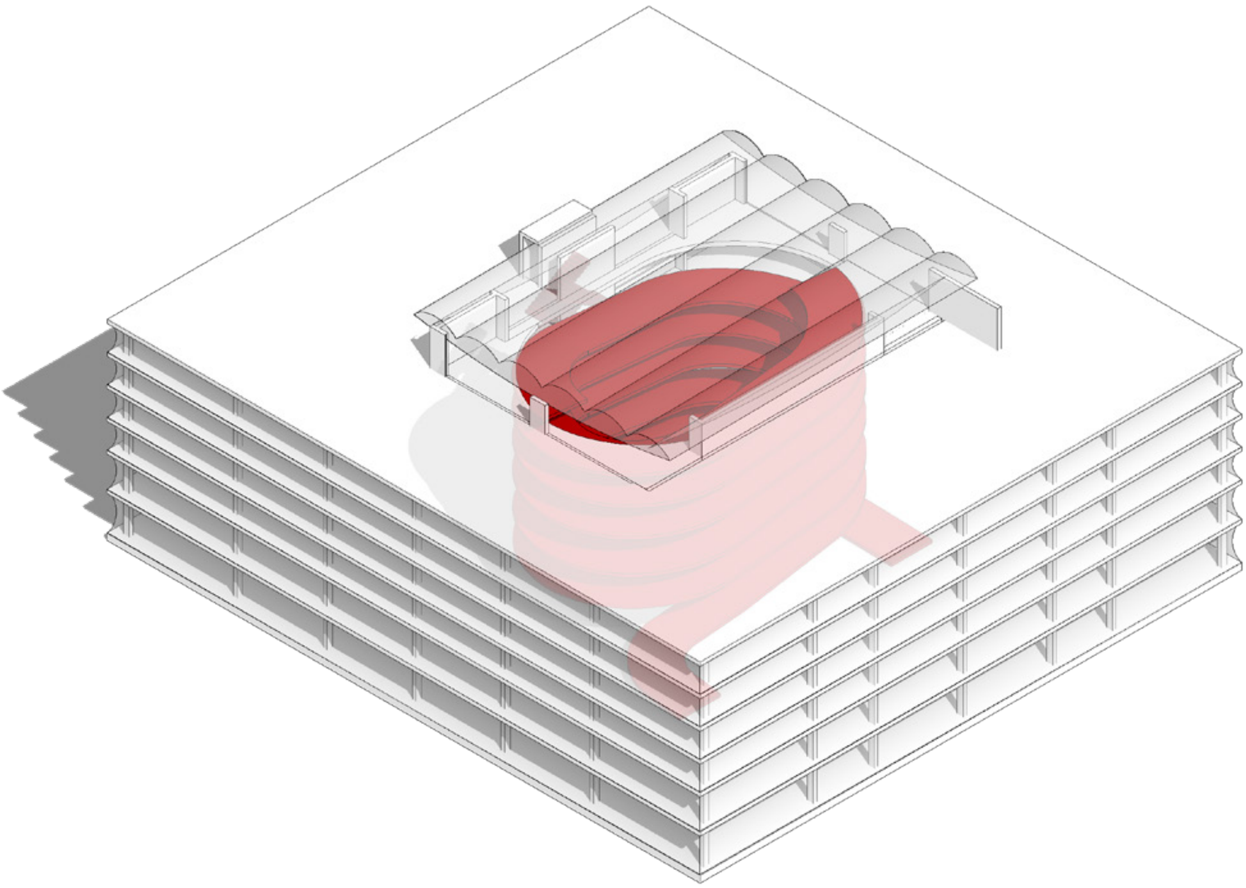
CR-11







The Parking Building features a distribution system that creates movement and flows within the space. The building is organised around a central ramp that winds up through the room, connecting the different levels and parking areas. The ramp is an essential element of the building's design, with a sweeping form that creates a sense of motion and dynamism. The ramp is also designed with the needs of drivers in mind, with a gentle slope and wide surface that allows for safe and easy movement of vehicles throughout the space. The type of distribution is punctual since the ramp distributes the different levels of the building punctually.



ARCHITECT:	GaP Grudzinski & Posay Architects
NAME:	Parking Building (Grenoble)
DATE:	2015
LOCATION:	Grenoble, France
PROGRAM:	Parking

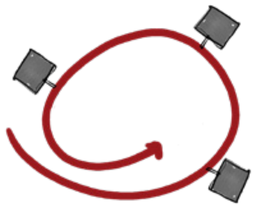
LEGEND:

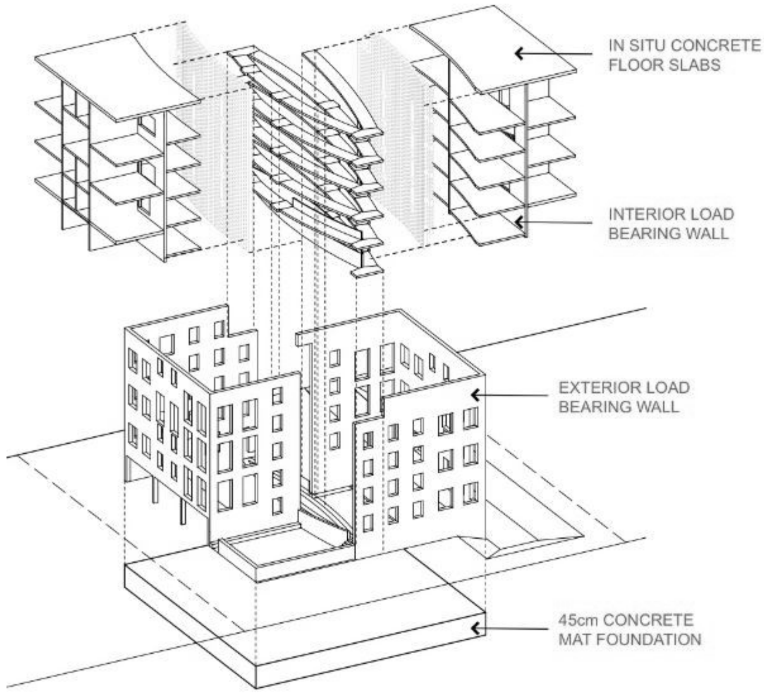
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

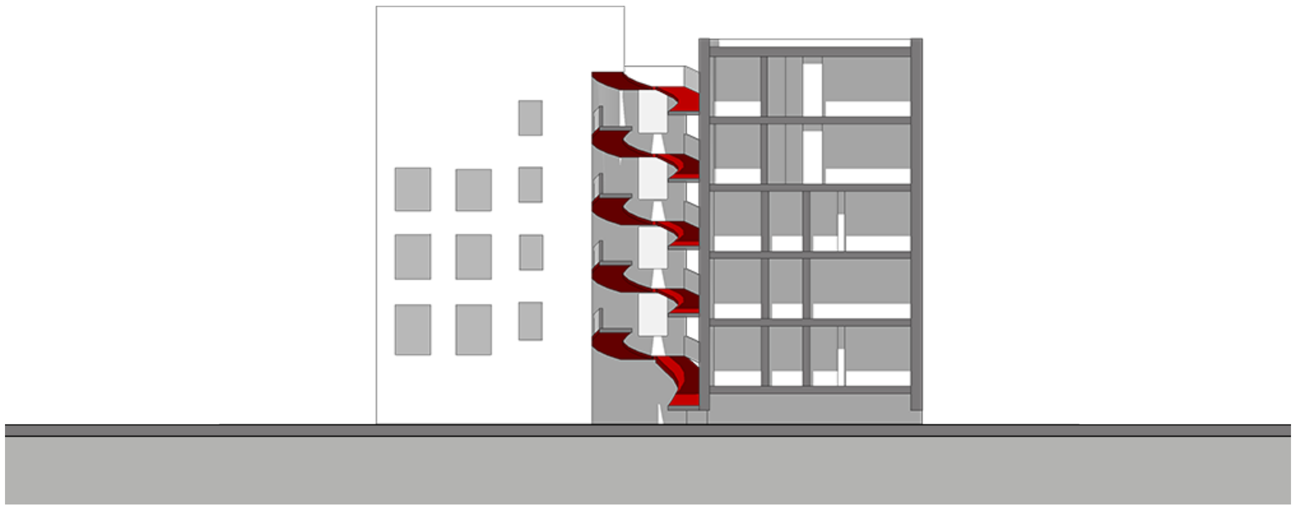
CRATER

SPIRAL INTERNAL RAMP

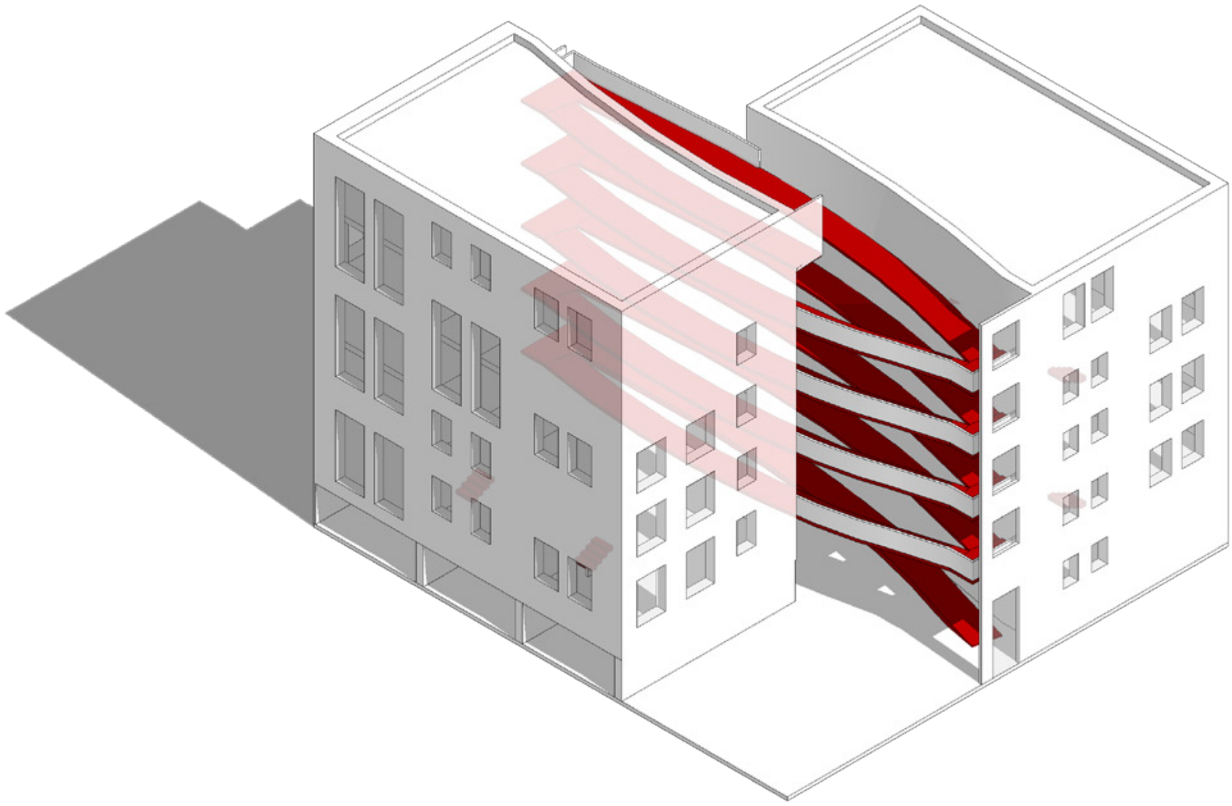
CR-12







The Spiral Housing features a distribution system that creates a sense of movement and flows within the space. The building is organised around a central spiral ramp that winds up through the area, connecting the different levels and residential units. The ramp also serves as a communal space, encouraging social interaction and creating a sense of community within the building. Overall, the distribution system creates a dynamic and engaging space for residents. The type of distribution is diffuse since the spaces to be distributed are not found serially but sporadically.



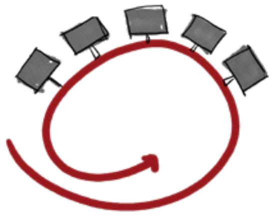
ARCHITECT: OBRA Architects
NAME: Spiral Housing
DATE: 2015
LOCATION: Hamburg, Germany
PROGRAM: House

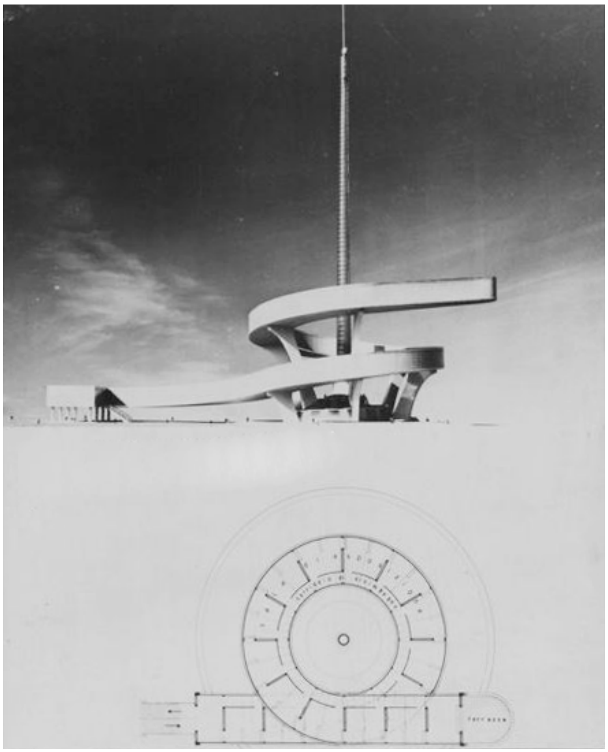
LEGEND:
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

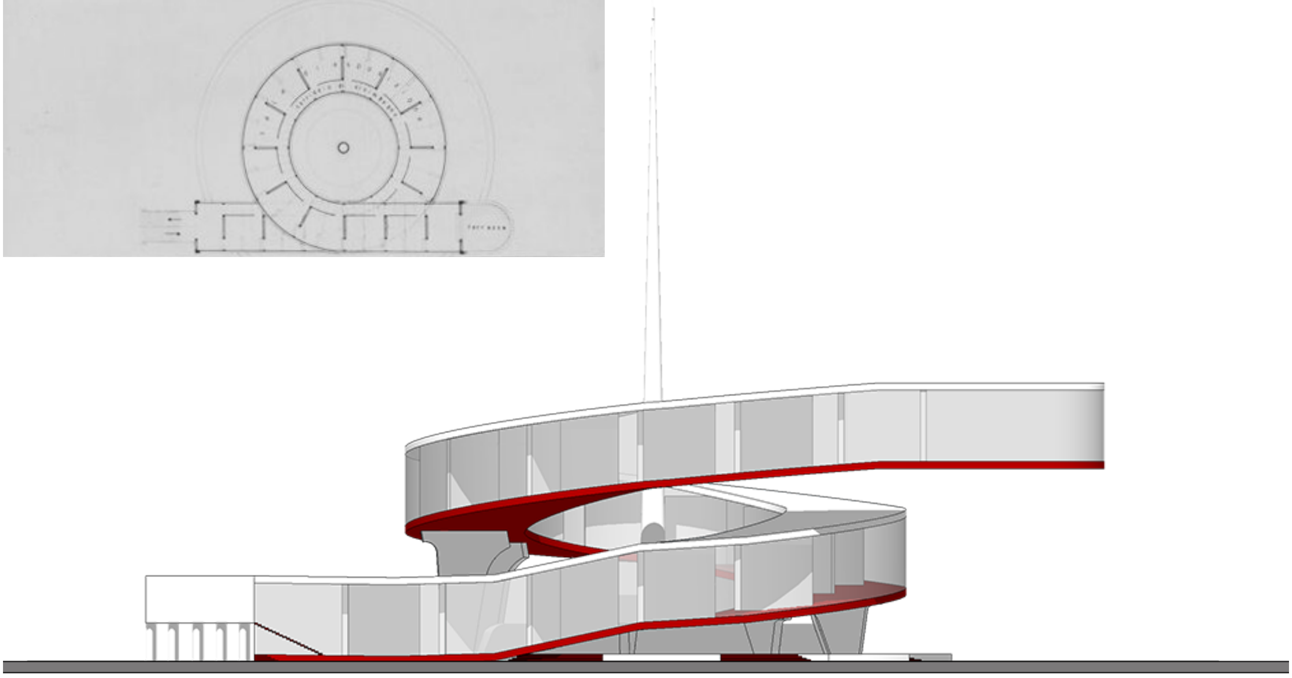
CRATER

SPIRAL INTERNAL RAMP

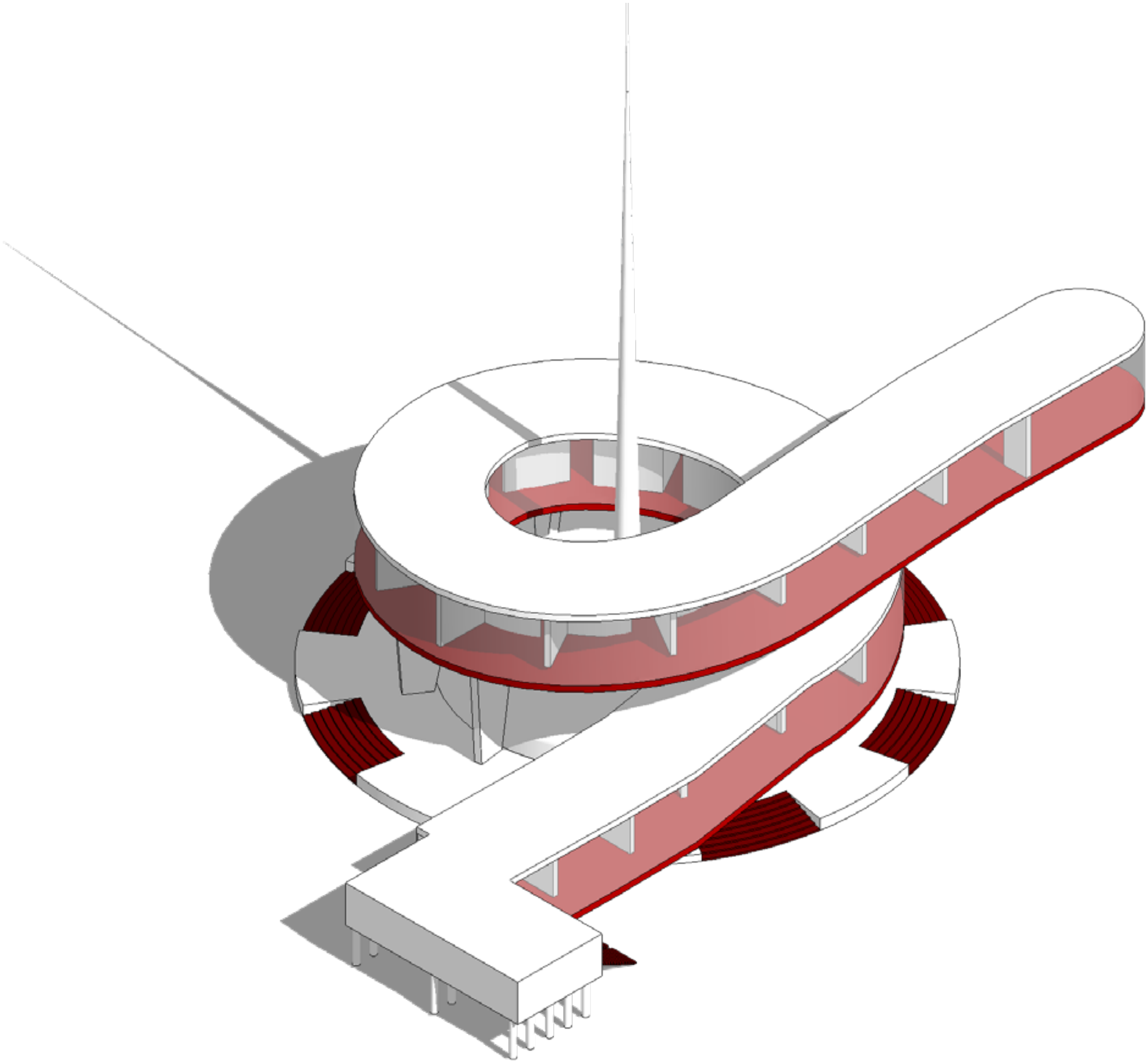
CR-13







The Progetto del Palazzo dell'Acqua e della Luce is organised around a central ramp that connects the different levels and spaces within the structure, providing easy access for people and equipment. The ramp is an essential element of the building's design, with a graceful and sweeping form that creates a sense of movement and flow. The ramp also serves as a focal point of the building, highlighting the importance of water and light in the structure's design. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT: Pier Luigi Nervi

NAME: Progetto del palazzo dell'acqua e della luce

DATE: 1939 - 1040

LOCATION: Rome, Italy

PROGRAM: Pavilion

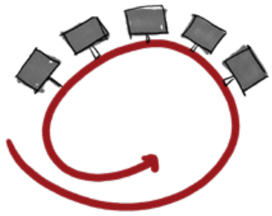
LEGEND:

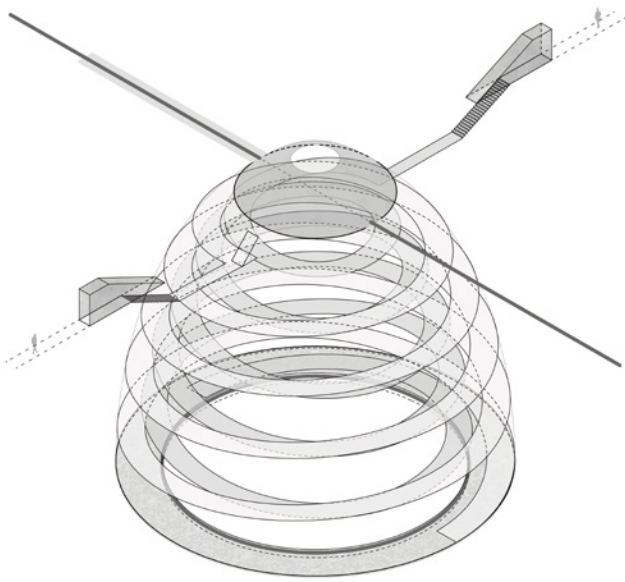
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- ~~INTERNAL STAIRS~~
- EXTERNAL STAIRS
- — *non-present*

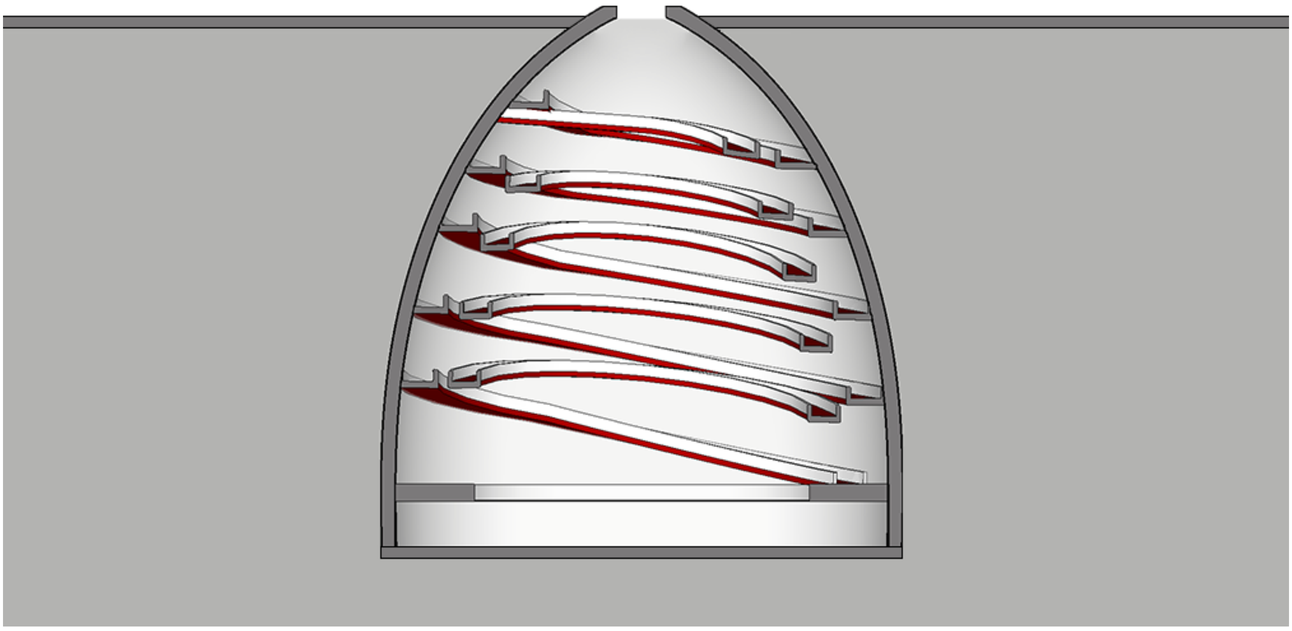
CRATER

SPIRAL INTERNAL RAMP

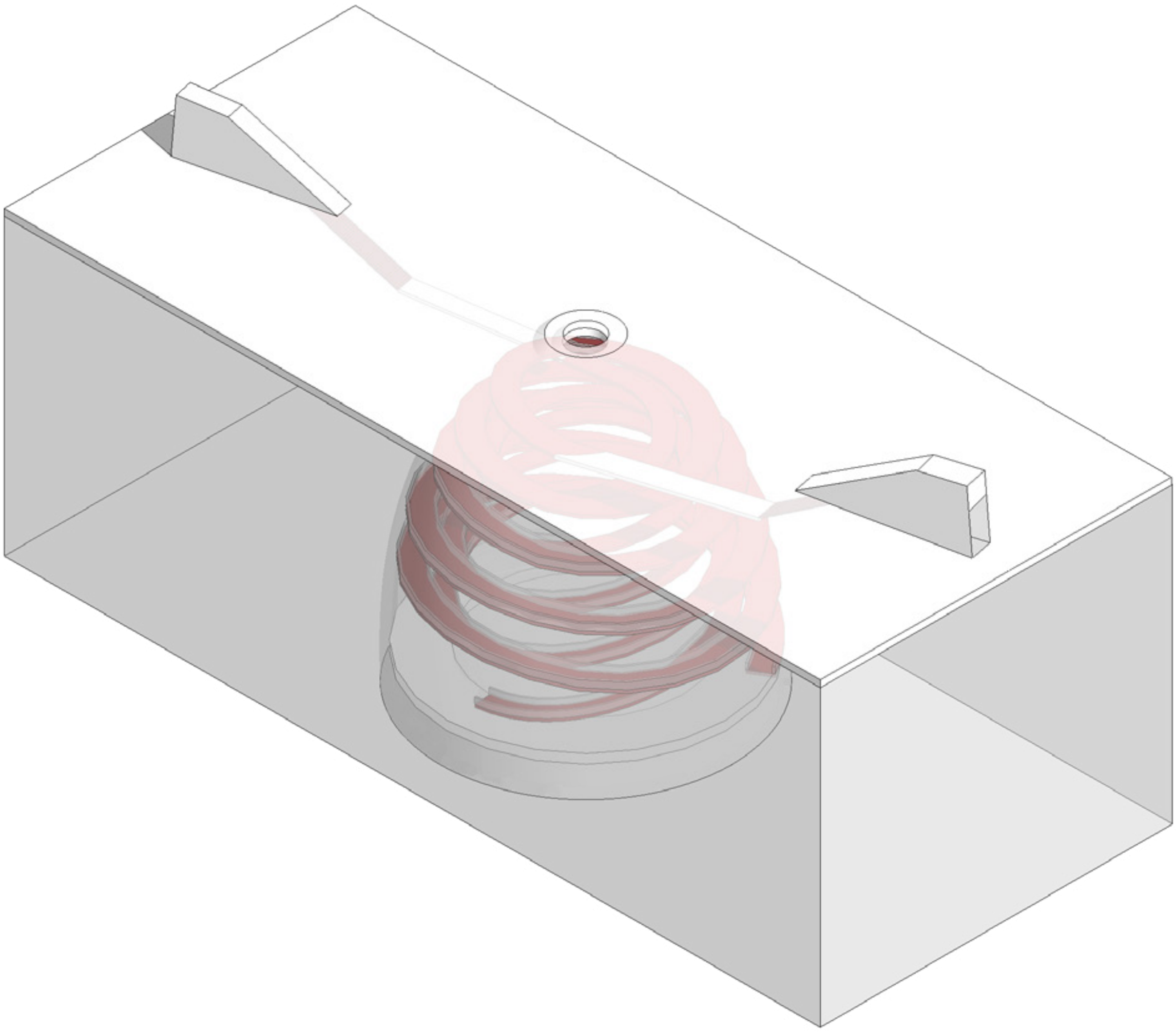
CR-14







Crossing Parallels is an innovative proposal for a cultural centre; the distribution system of the building is centred around a busy ramp that provides a seamless transition between the interior and exterior spaces. The ramp also serves as a gathering space, providing visitors with a different experience. The distribution system demonstrates the architects' ability to create spaces that are not only functional but also imbued with a deeper meaning and purpose. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



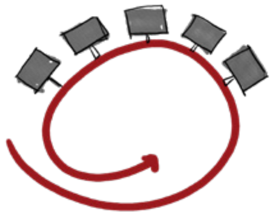
ARCHITECT:	Studio MRDO & Studio LAM
NAME:	Crossing Parallels (First prize winner)
DATE:	2017
LOCATION:	Korean Demilitarized Zone, Korea
PROGRAM:	Underground BathHouse

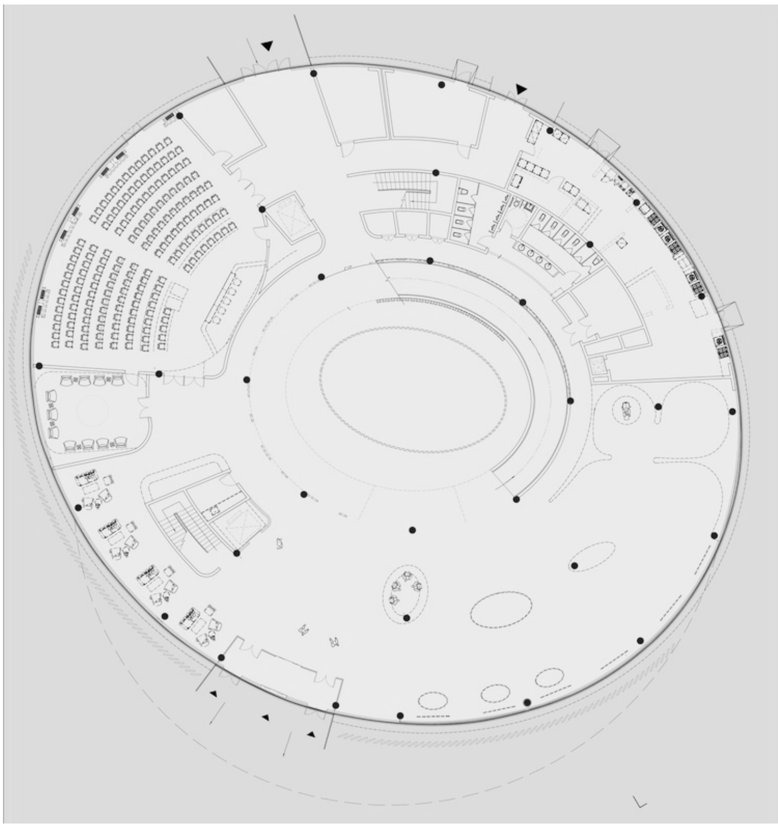
LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

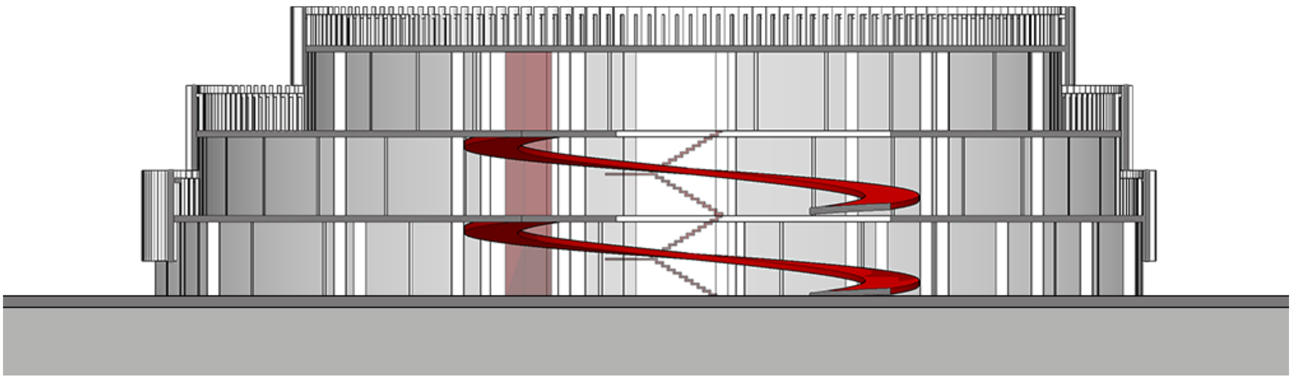
CRATER

SPIRAL INTERNAL RAMP

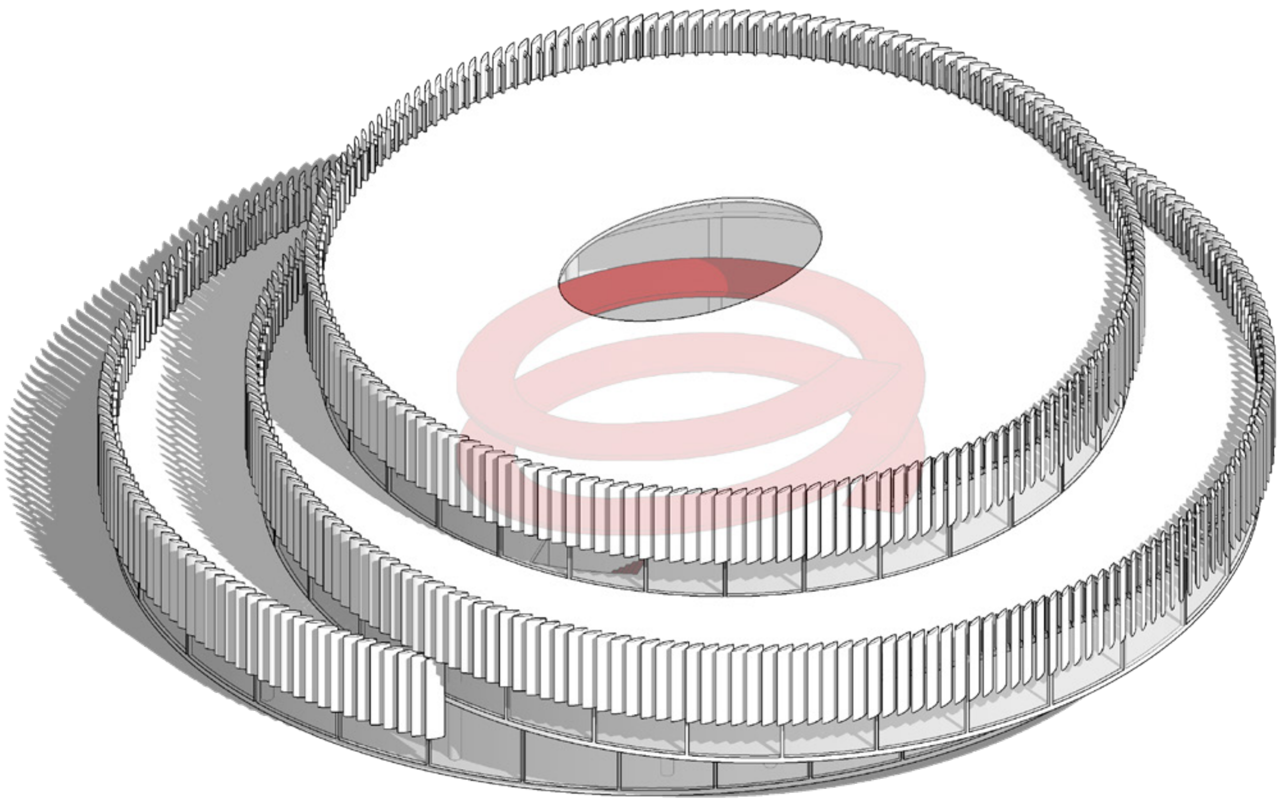
CR-15







The Exhibition Center Offices features a distribution system allowing efficient movement of people and resources throughout the building. The ramp serves as the central element of the distribution system, providing a continuous flow of movement between the different floors. The distribution allows space flexibility with multiple offices, meeting rooms, and common area options. In general, the design of the building, thanks to the particular distribution system, allows them to be functional, pleasant spaces and adaptable to different uses. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



ARCHITECT: WSP Architects
NAME: Exhibition Center Offices
DATE: 2017
LOCATION: Zhengzhou, China
PROGRAM: Science Education Center

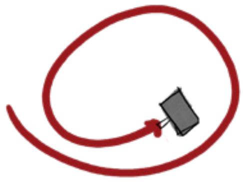
LEGEND:

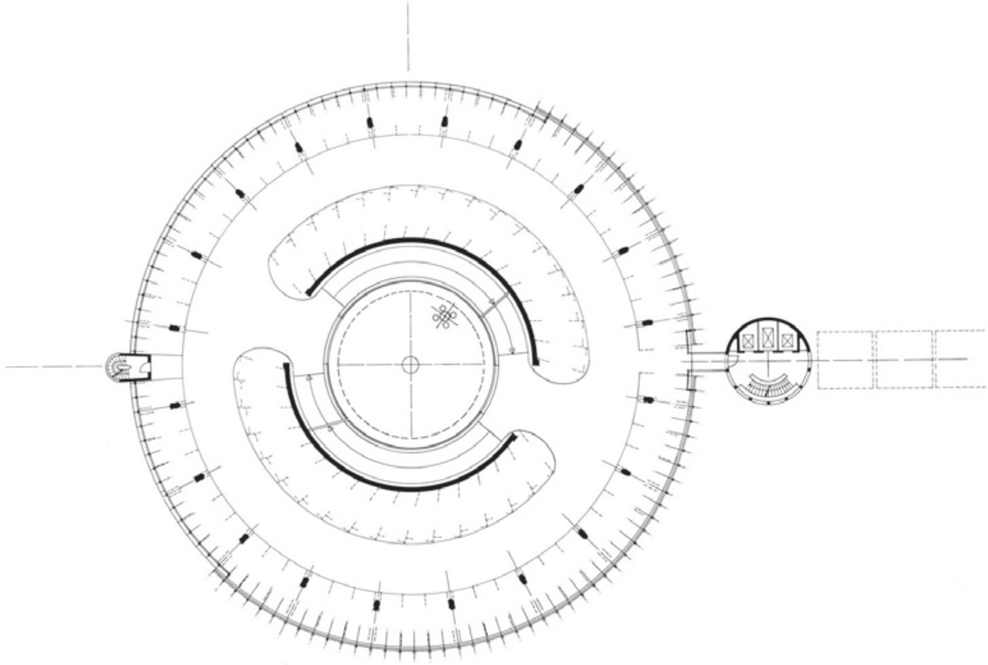
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

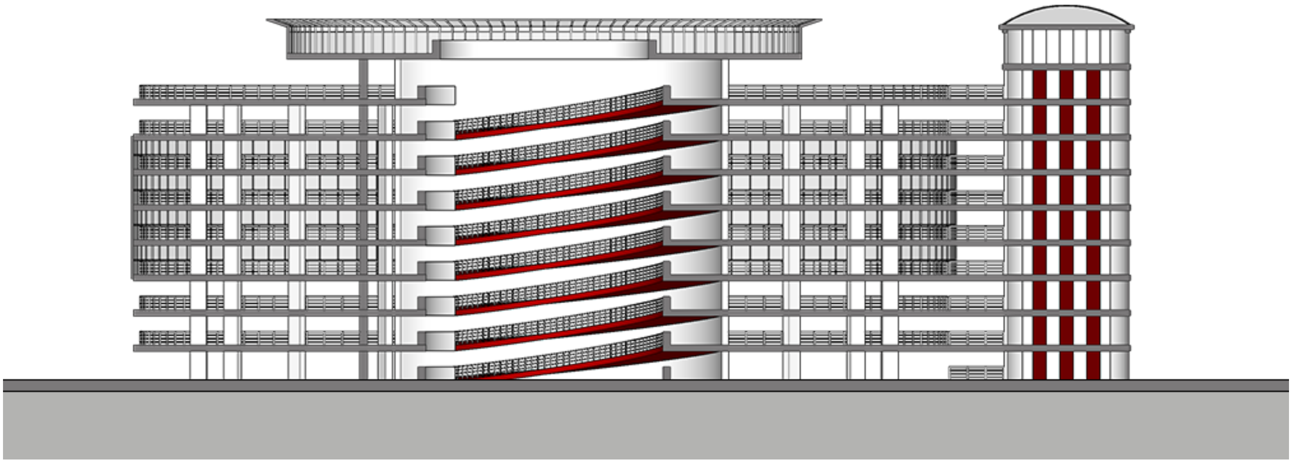
CRATER

SPIRAL INTERNAL RAMP

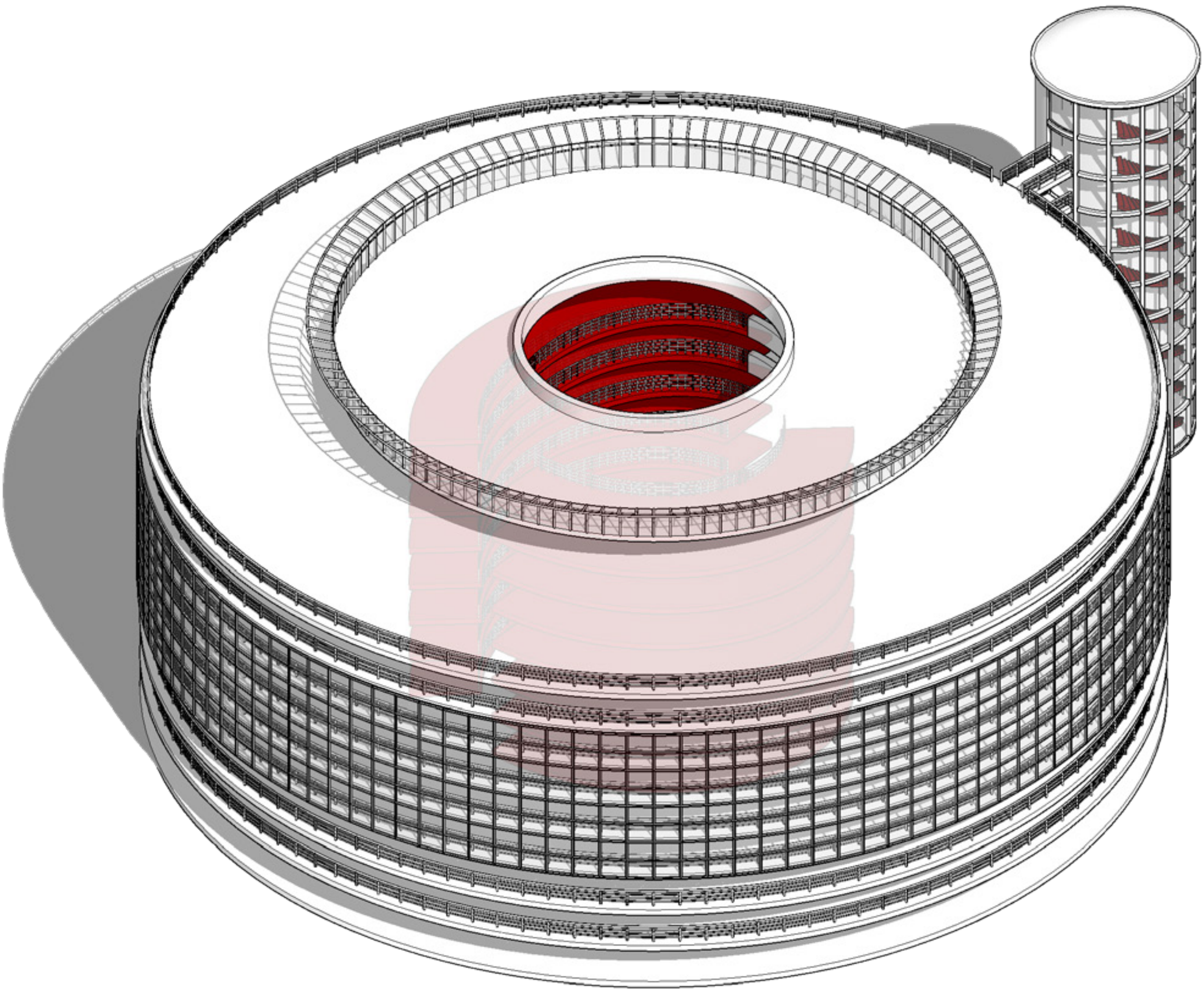
CR-16







The Multi-Storey Parking Rotunda features a distribution system that maximises parking efficiency. The building's circular design allows for a continuous traffic flow, with ramps spiralling upwards to the different parking levels. The ramps are illuminated with natural light, creating a bright. The distribution system can create functional and appealing spaces that optimise efficiency and user experience. The type of distribution is punctual since the ramp distributes the different levels of the building punctually.



ARCHITECT: Gerkan Marg & Partners
NAME: Multi-Storey Parking Rotunda
DATE: 1990
LOCATION: Hamburg, Germany
PROGRAM: Parking

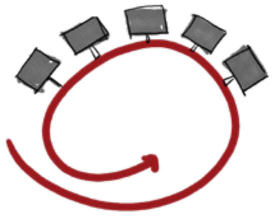
LEGEND:

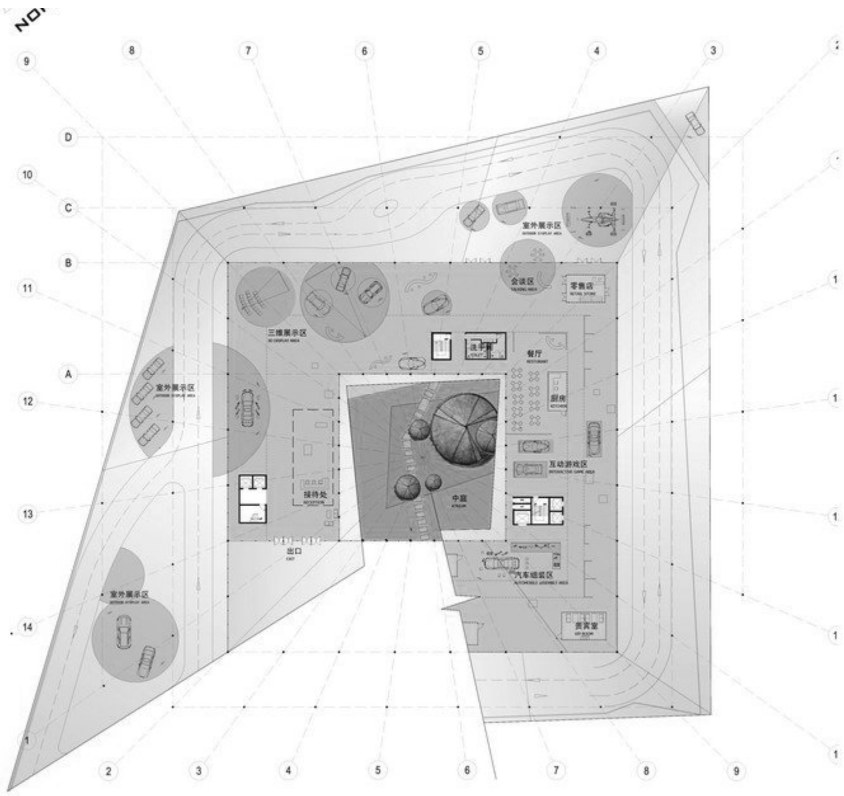
- ~~SERVED SPACES~~
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

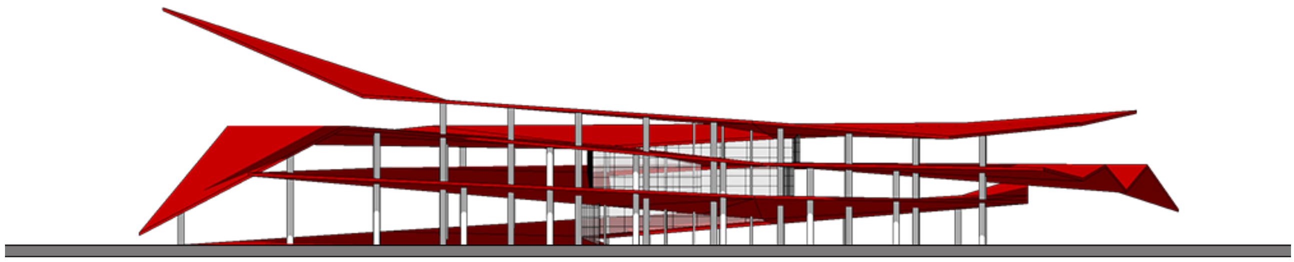
CRATER

SPIRAL INTERNAL RAMP

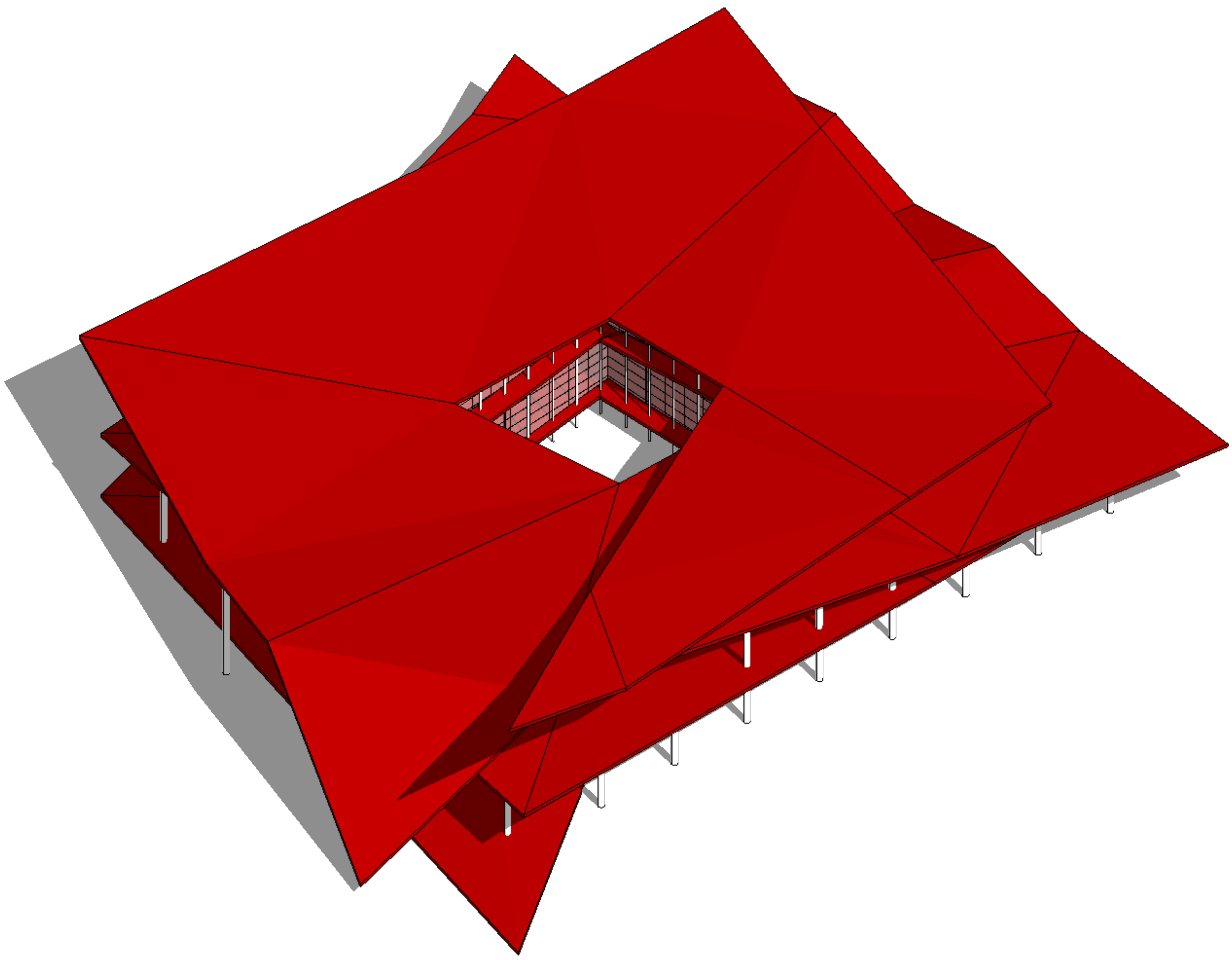
CR-17







The Automobile Museum's distribution system showcases the cars as if they were in a three-dimensional landscape. The building's main feature is its spiralling ramp, which winds upwards from the ground floor to the top level. The ramp serves as the primary circulation system and takes visitors through the museum, allowing them to view the cars from different angles and perspectives. The ramp is also lit by natural light, which changes depending on the time of day, enhancing the experience for visitors. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT: 3Gatti Architecture Studio
NAME: Automobile Museum
DATE: 2009
LOCATION: Nanjing, China
PROGRAM: Museum

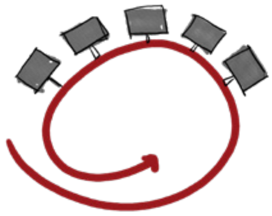
LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- ~~INTERNAL STAIRS~~
- ~~EXTERNAL STAIRS~~

— *non-present*

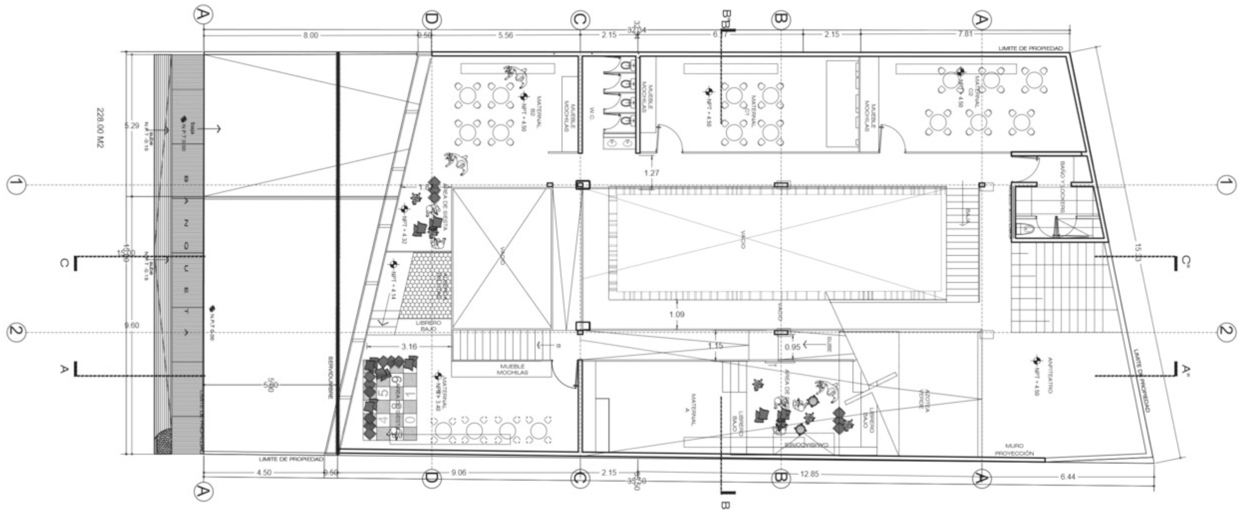
CRATER

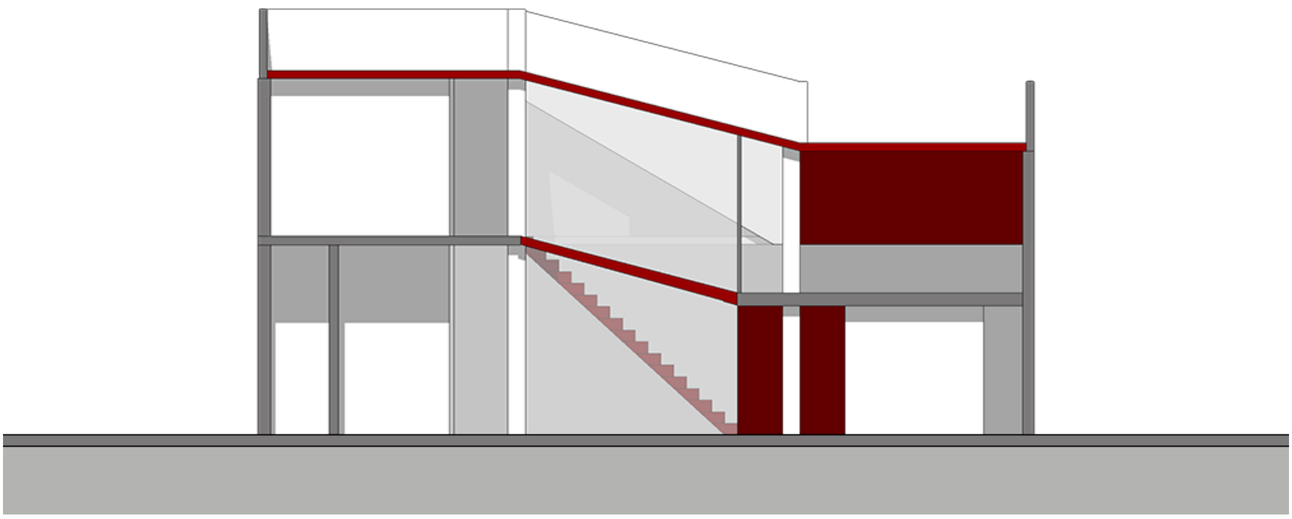
SPIRAL INTERNAL RAMP

CR-18

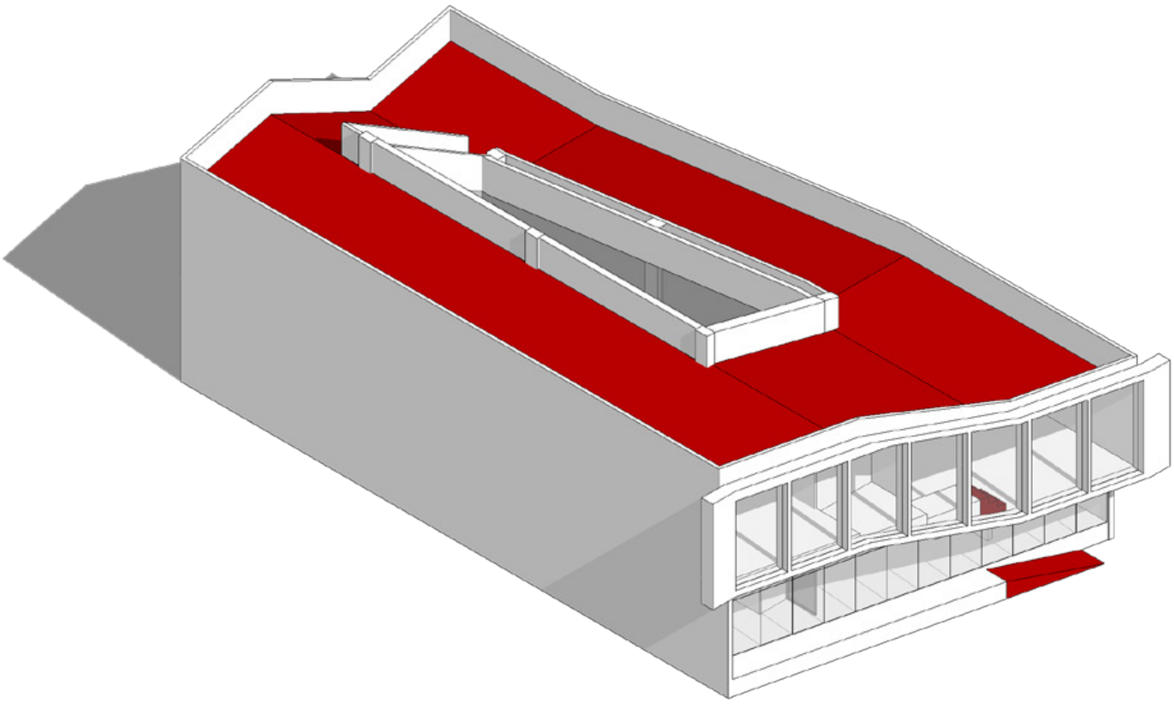


PLANTA ALTA





The Guardería Capire features a unique ramp system that provides accessibility to the different levels of the building while also serving as an animated feature for the children. The ramp leads to a rooftop playground, which is an open-air classroom. The building's distribution system prioritises natural light and ventilation, creating a comfortable and healthy learning environment. The ramp system is a functional element of the building and adds to the playful character. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



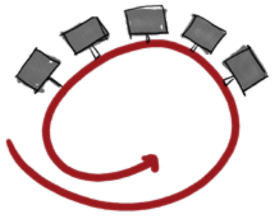
ARCHITECT: RE+D
NAME: Guardería Capire
DATE: 2019
LOCATION: Zapopan, Mexico
PROGRAM: School

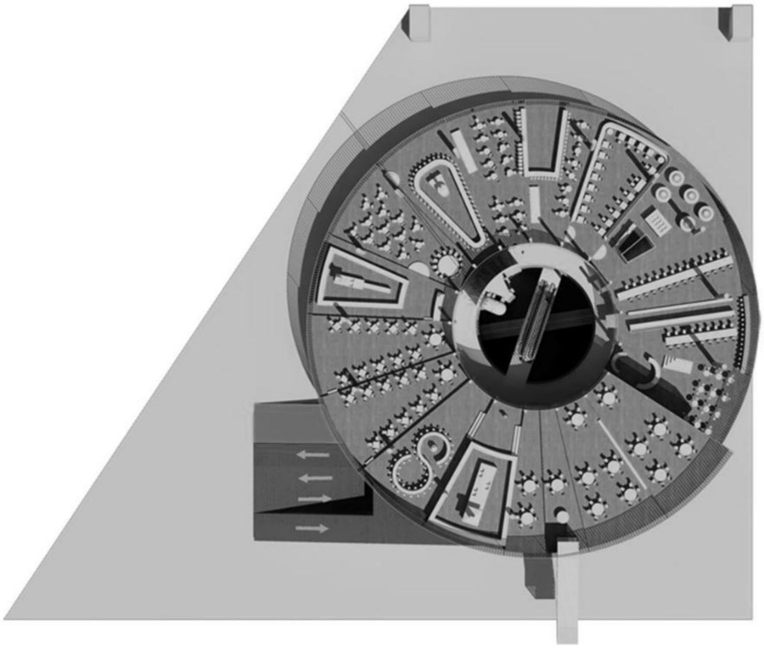
LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

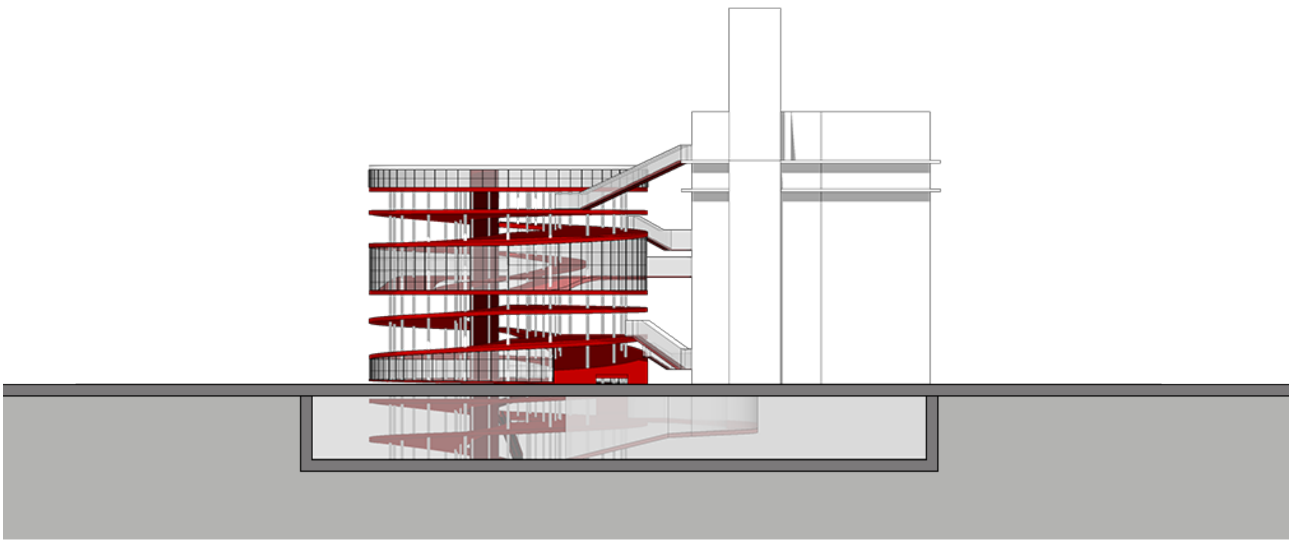
CRATER

SPIRAL INTERNAL RAMP

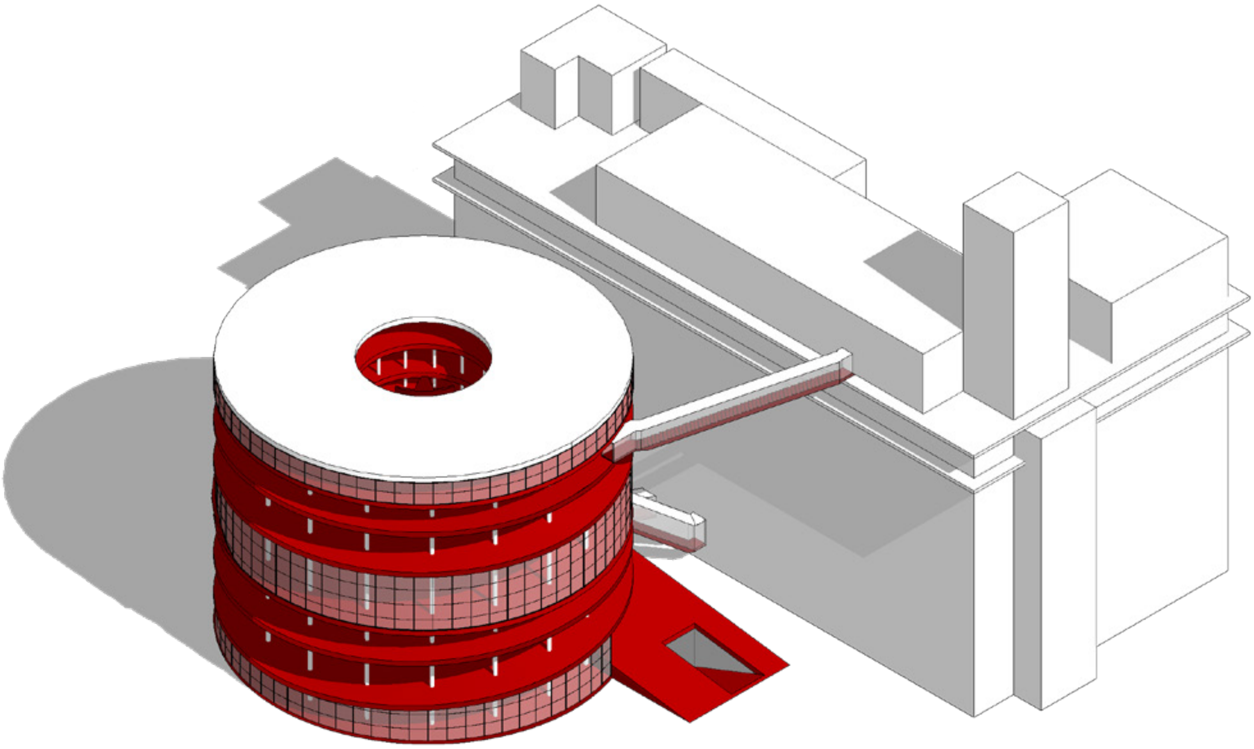
CR-19







The Strijp S is a shopping centre with a large ramp connecting all levels from the ground floor to the upper levels. This ramp is the main circulation route, allowing visitors to move seamlessly between the building's functions. The ramp also acts as a public space, with seating areas and views of the surrounding area, encouraging interaction and socialisation. Different programmatic functions are mixed in the building; on some levels, it is possible to connect with the building next door that complements the functional program. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT: NL Architects
NAME: Strijp S
DATE: 2007
LOCATION: Eindhoven, Holland
PROGRAM: Shopping Center

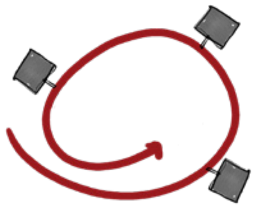
LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~

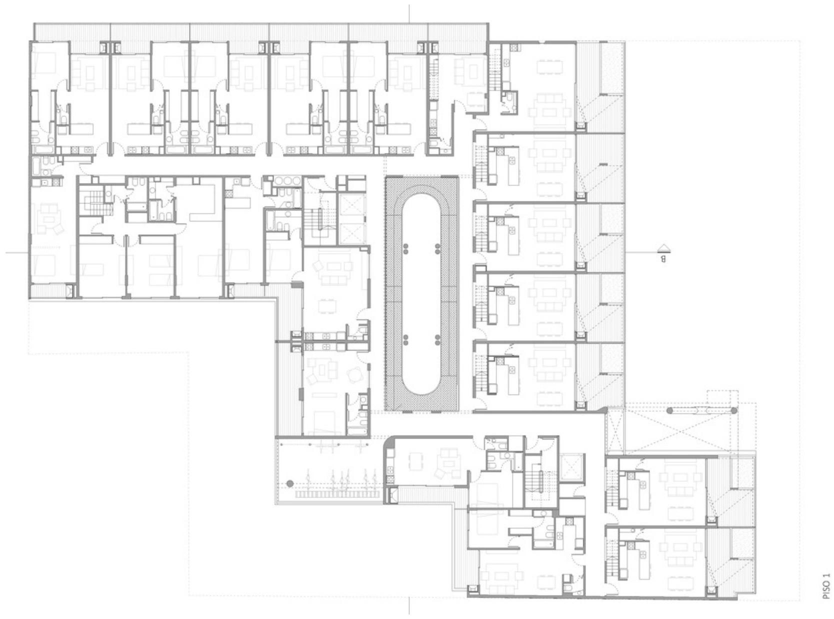
— *non-present*

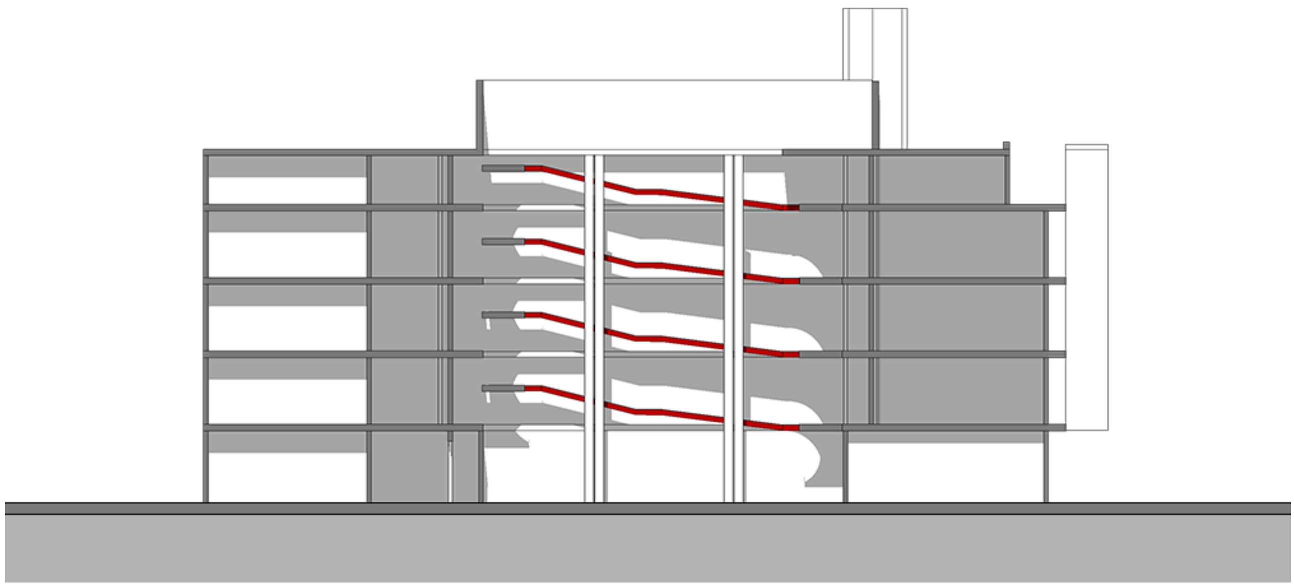
CRATER

SPIRAL INTERNAL RAMP

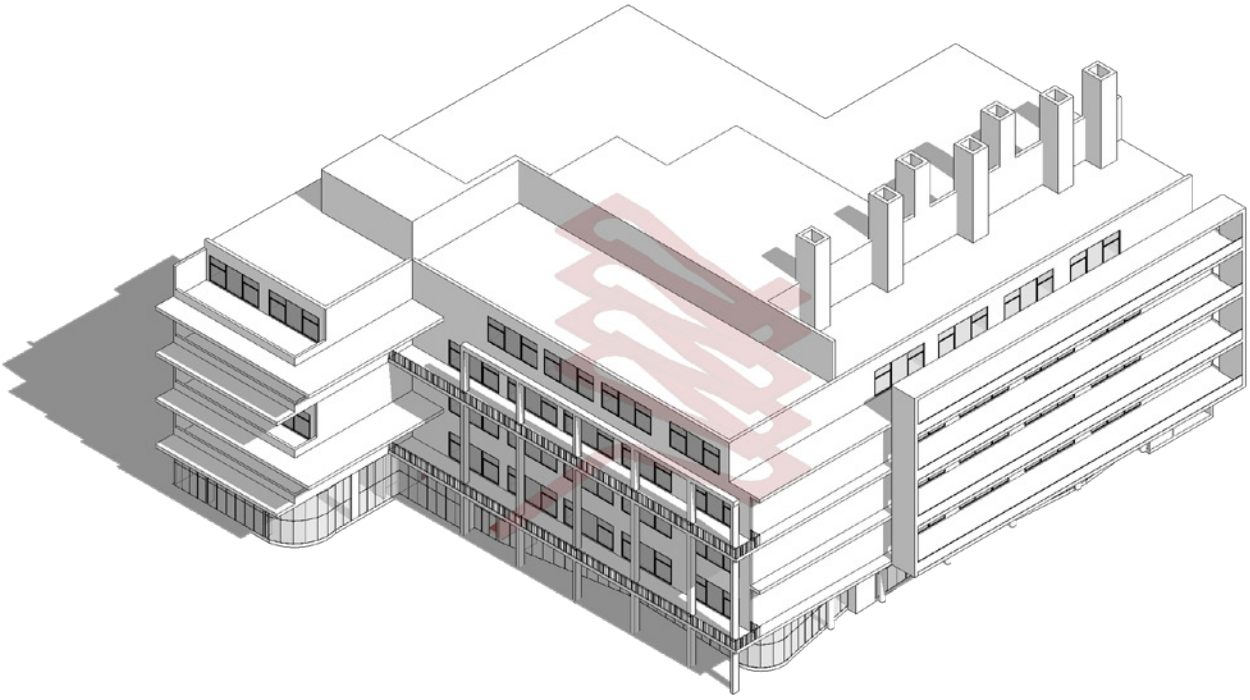
CR-20







The HO Building features a distribution system organised around a central courtyard that serves as a space for interaction and connection. The interior spaces are distributed around this central core, allowing natural light to penetrate deep into the building. The ramp in the building is an important feature that connects the various building floors and provides a sense of fluidity and movement. The ramp also serves as an alternative to the staircase, allowing for easy movement of people with disabilities and by bike. The type of distribution is diffuse since the spaces to be distributed are not found serially but sporadically.



ARCHITECT:	Grupo Uno en Uno
NAME:	HO Building
DATE:	2018
LOCATION:	Villa Urquiza, Argentina
PROGRAM:	Residential Building

LEGEND:

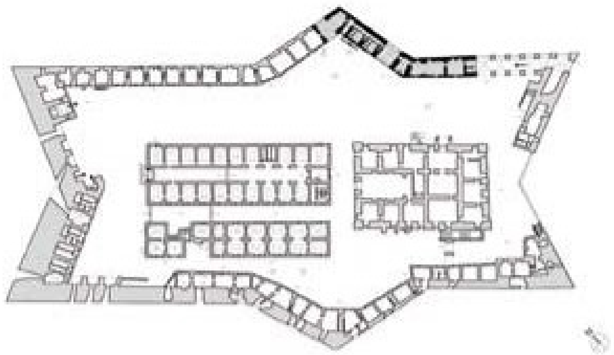
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

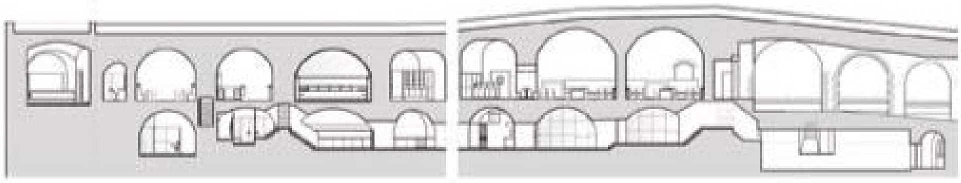
ARCHITECTURAL FORM

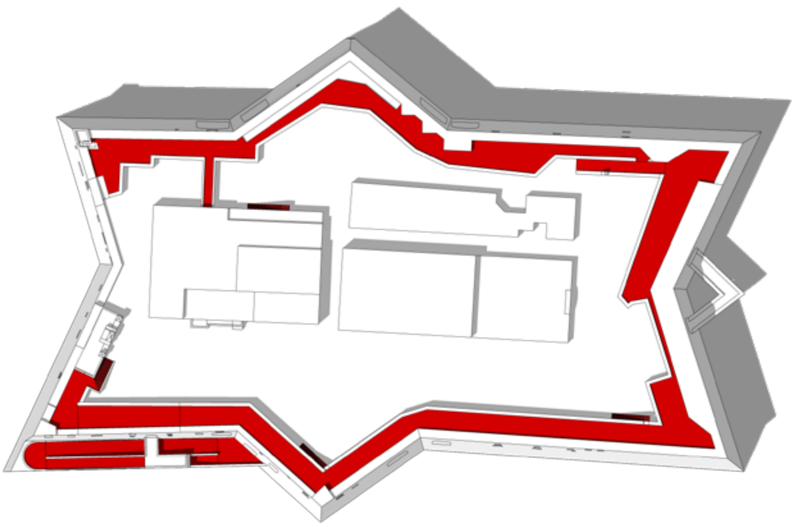
3.2.2. **MOUNTAIN SPIRAL EXTERNAL RAMP**

MOUNTAIN
EXTERNAL INTERNAL RAMP

MT-01

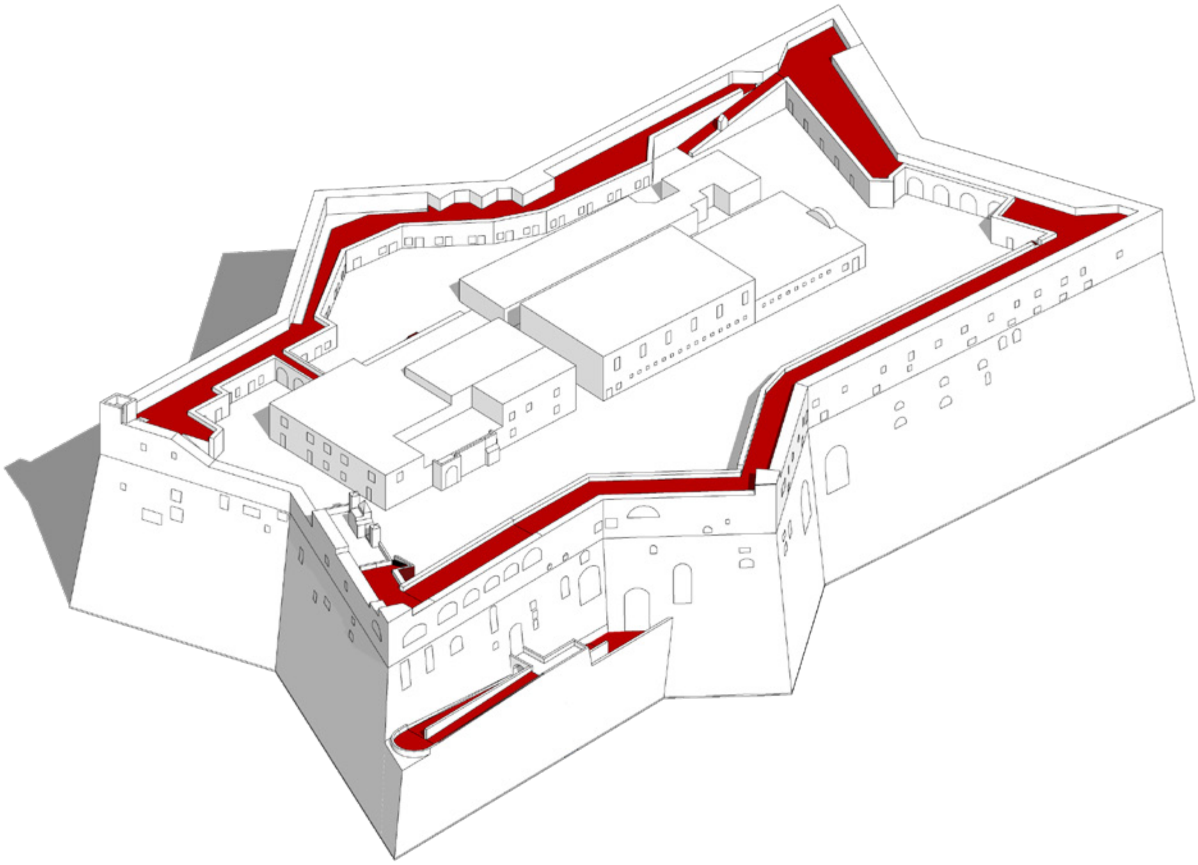






Castel Sant'Elmo has a unique and complex distribution system; the ramp, in particular, is a significant feature of the castle, as it winds up the hillside and provides access to the various levels of the fortress. The ramp is also a vital feature of the castle's defensive design, allowing soldiers, horses, and supplies to be easily moved to different levels of the fortress in times of conflict. The type of distribution is diffuse since the spaces to be distributed are not found serially but sporadically.

Distribution Scheme



ARCHITECT: -

NAME: Castel Sant'Elmo

DATE: XIV – XVII century

LOCATION: Naples, Italy

PROGRAM: Castle

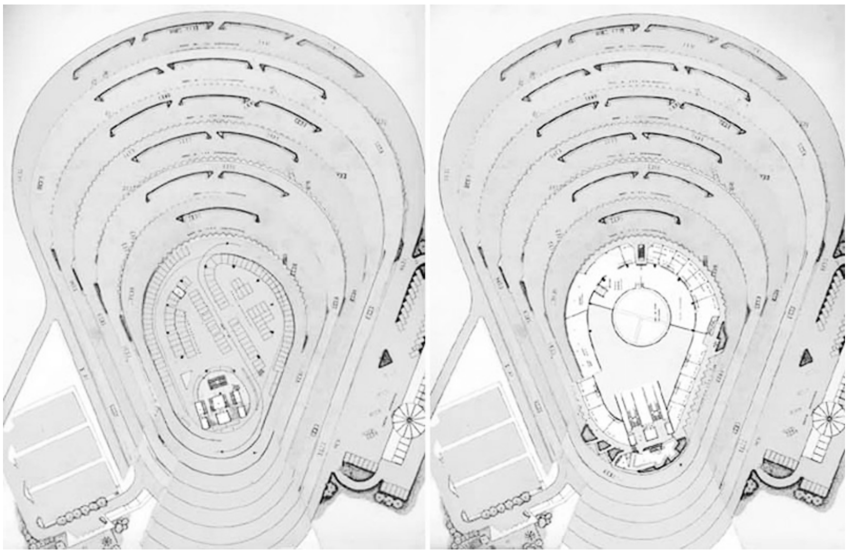
LEGEND:

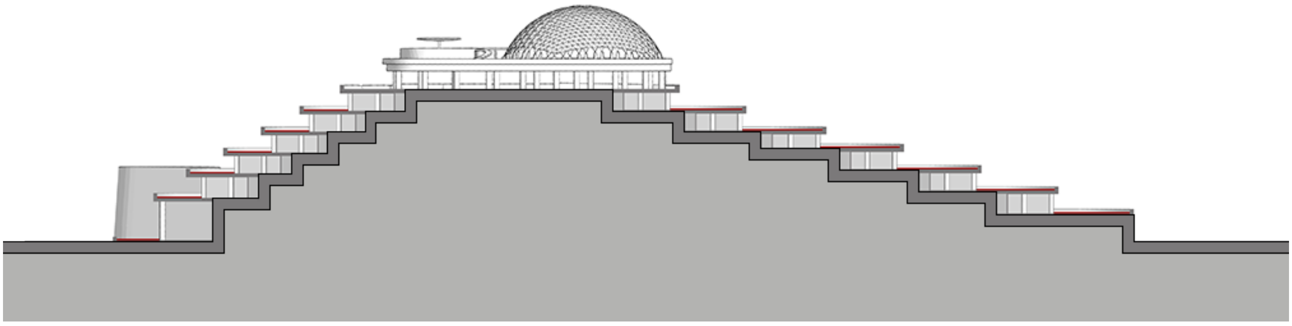
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAIN

EXTERNAL INTERNAL RAMP

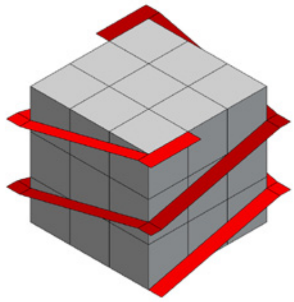
MT-02

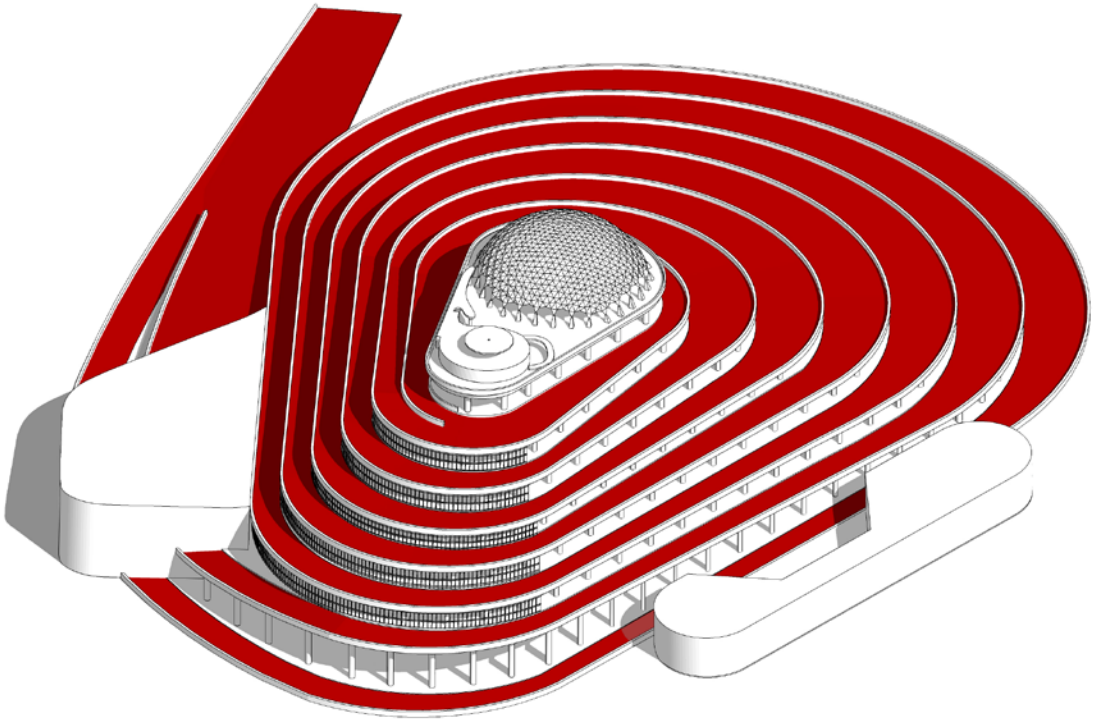




El Helicoide is a spiralled, concrete building. It was designed to be a drive-in mall but was never finished and later converted into a government jail. The building's distribution system consists of a spiralled ramp that winds up the building's exterior at all levels. The ramp's unique design allows easy access to stores without elevators or stairs. The ramp has a gentle incline and wide width, providing ample space for cars to move comfortably through the area, including parking spaces along the route. The type of distribution is continuous since the ramps throughout their route distribute the spaces.

Distribution Scheme





ARCHITECT:	P. Neuberger, D. Bornhorst, J. Romero
NAME:	El Helicoide
DATE:	1956
LOCATION:	Caracas, Venezuela
PROGRAM:	Mall

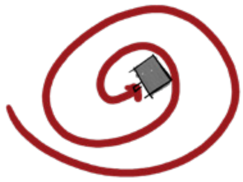
LEGEND:

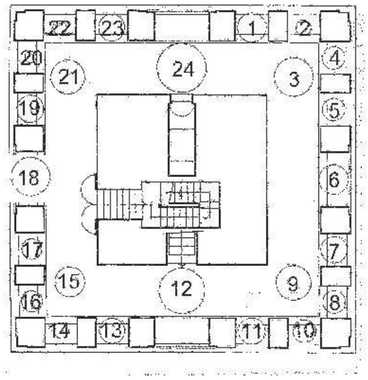
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

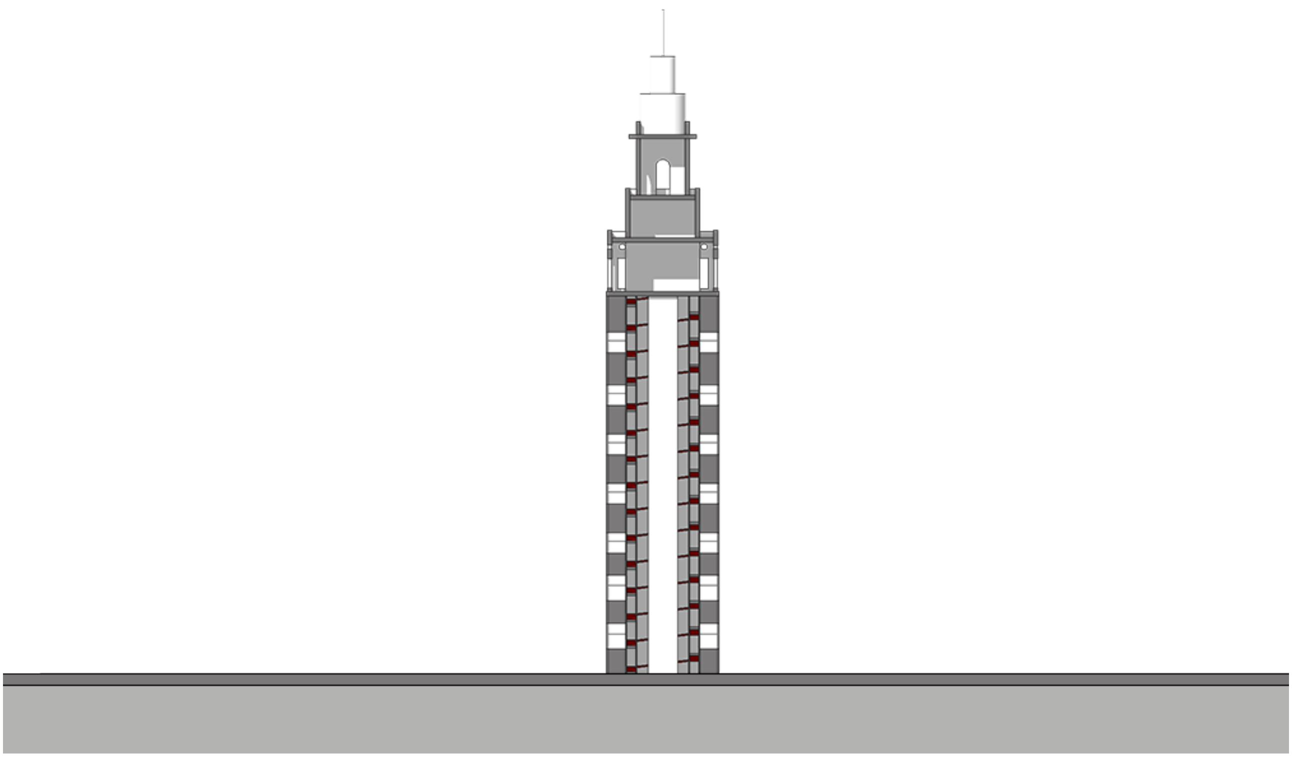
MOUNTAIN

EXTERNAL INTERNAL RAMP

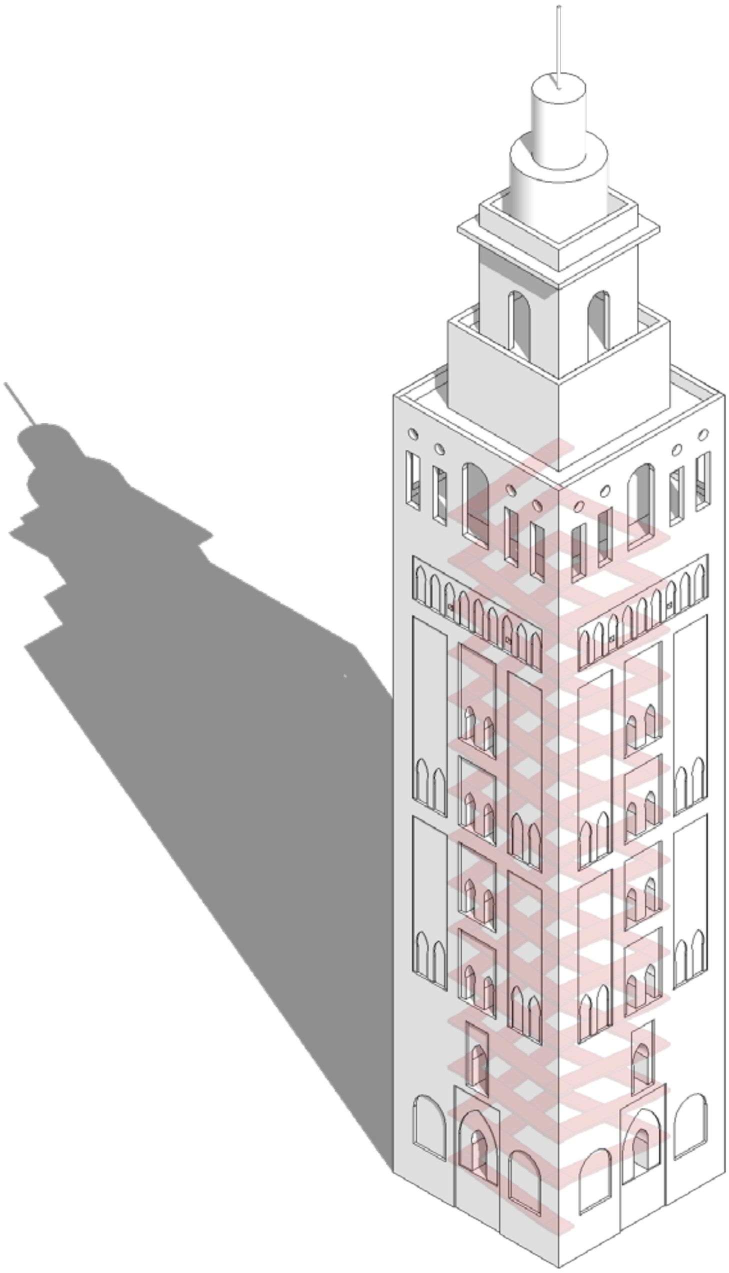
MT-03







The distribution system of the Giralda consists of ramps instead of stairs, which were designed to allow the Muslim muezzin to ride his horse to the top for the call to prayer. The ramps, which have a slight incline, make it easier for people to climb to the top of the tower. The type of distribution is punctual since the stairs lead directly to the space to be distributed.



ARCHITECT:	-
NAME:	Giralda
DATE:	XI century
LOCATION:	Seville, Spain
PROGRAM:	Bell Tower

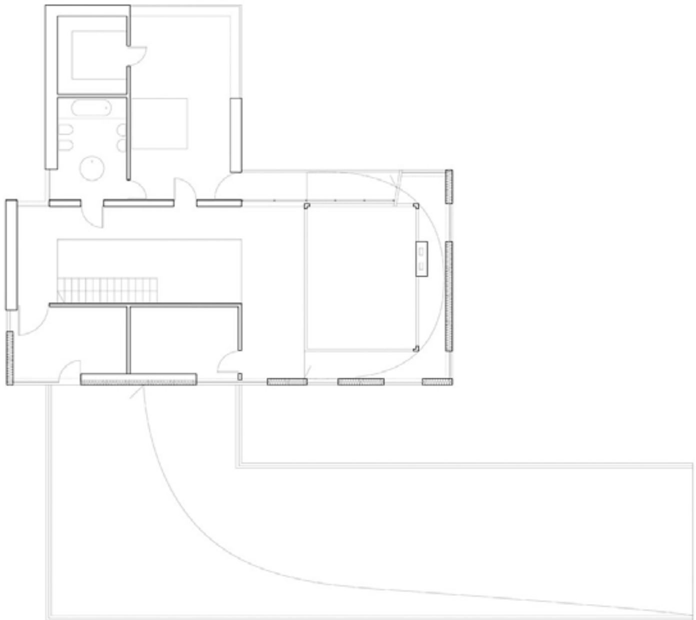
LEGEND:

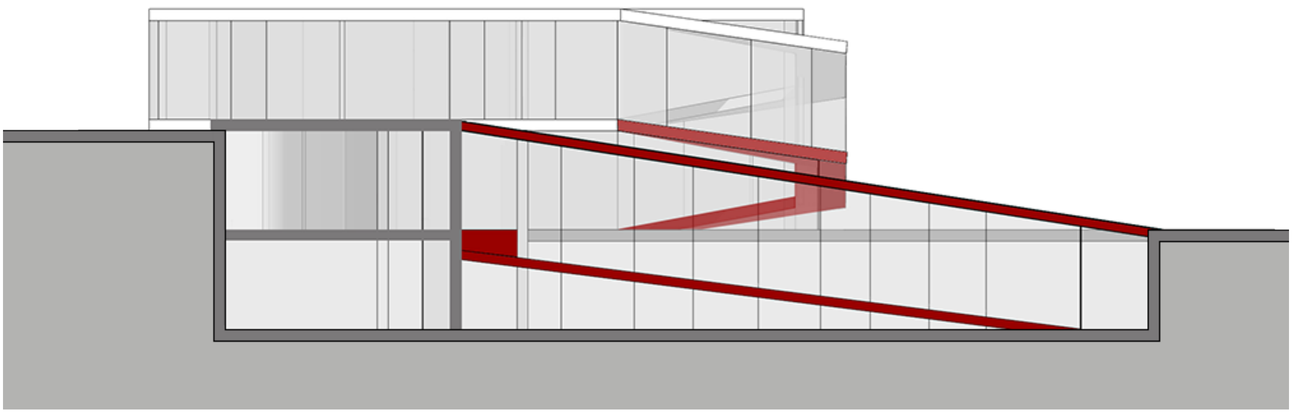
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAIN

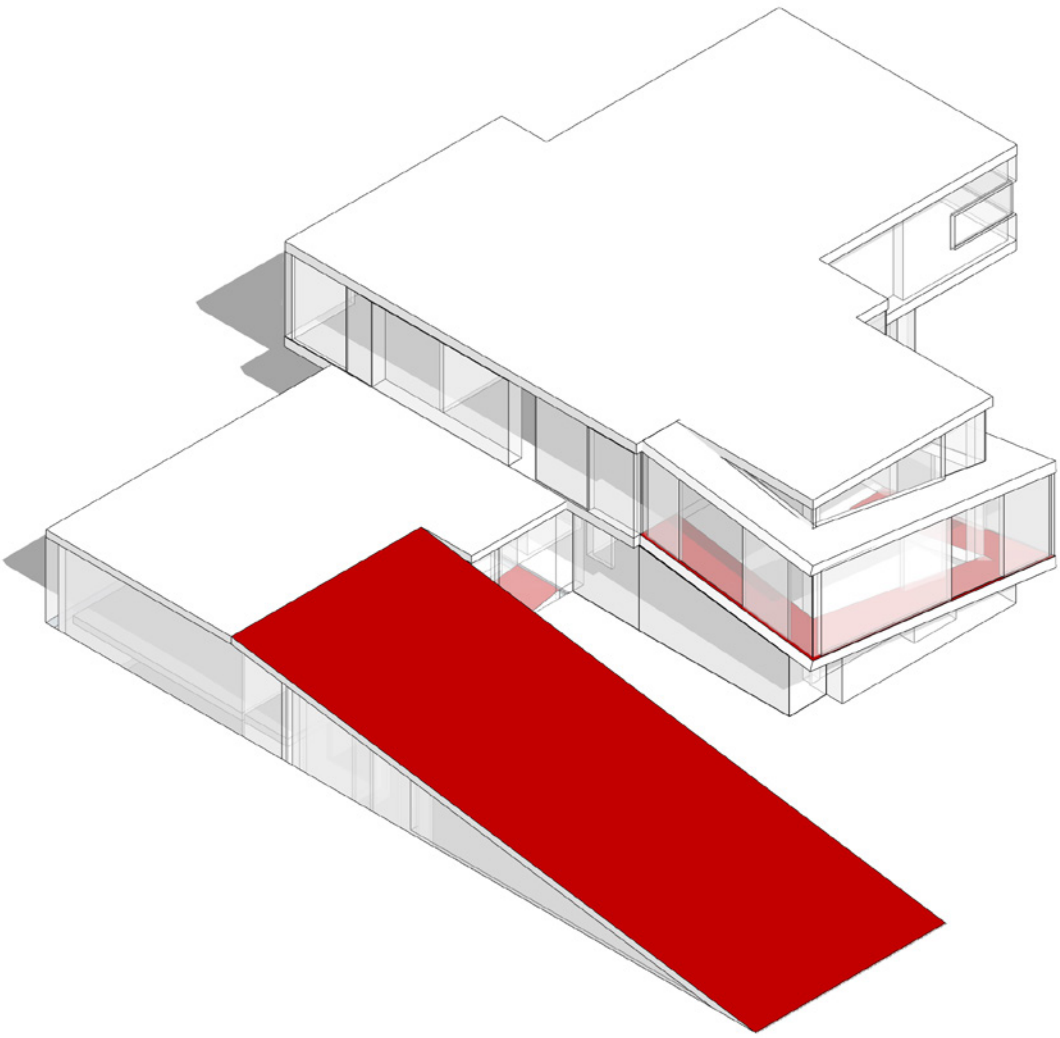
EXTERNAL INTERNAL RAMP

MT-04





The Broken House distribution system works in a way that creates a sense of separation between the living areas and the surrounding landscape. People are distributed in the building through ramps and stairs, creating an immersive experience as they move through the space. The ramp is an essential characteristic of the building, as it connects different levels of the house and creates a fluid sense of movement. The type of distribution is diffuse since the spaces to be distributed are not found serially but sporadically.



ARCHITECT: KWK Promes
NAME: Broken House
DATE: 2002
LOCATION: Katowice, Poland
PROGRAM: House

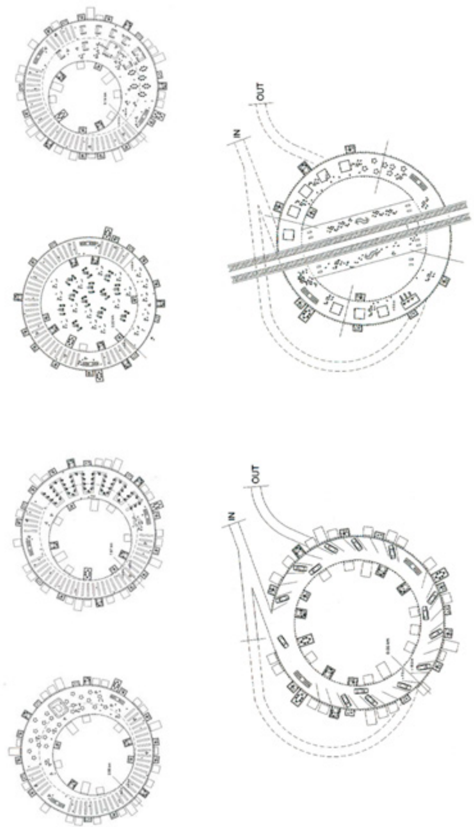
LEGEND:

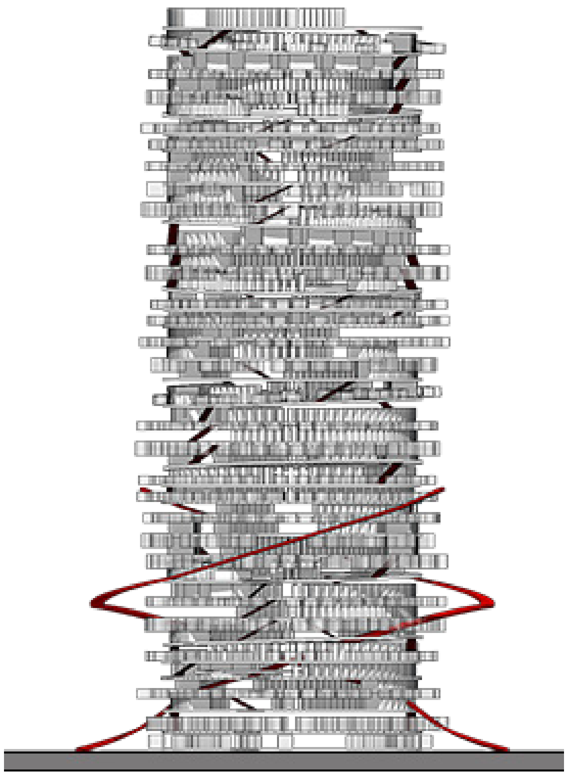
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAIN

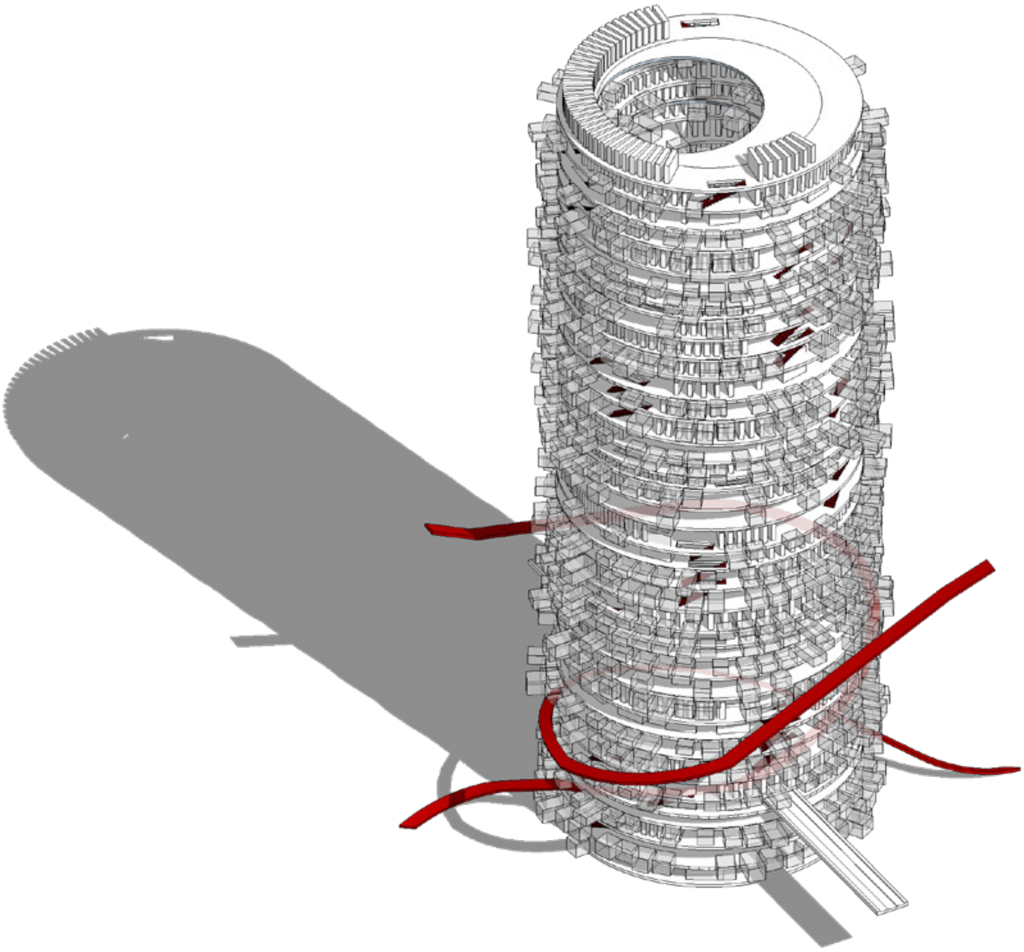
EXTERNAL INTERNAL RAMP

MT-05





The Central Library Brabant features an innovative distribution system. Visitors can explore the library through a ramp that spirals around a central atrium, leading them to different levels and sections of the building. The ramp is essential to the library's design, creating a dynamic and visually striking space while providing a functional circulation system. The type of distribution is diffuse since the spaces to be distributed are not found serially but sporadically.



ARCHITECT:	MRDV
NAME:	Central Library Brabant
DATE:	2000
LOCATION:	Brabant, Netherlands
PROGRAM:	Library

LEGEND:

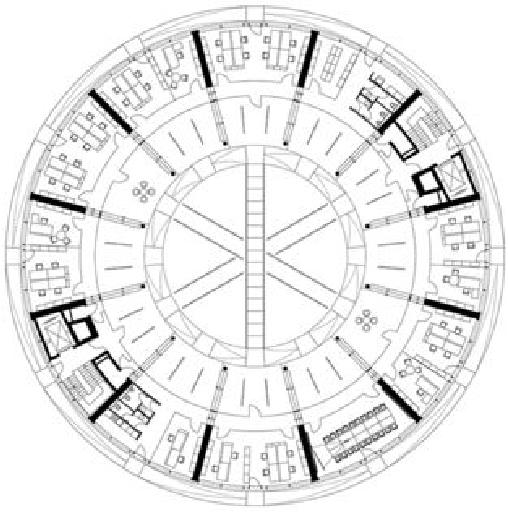
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~

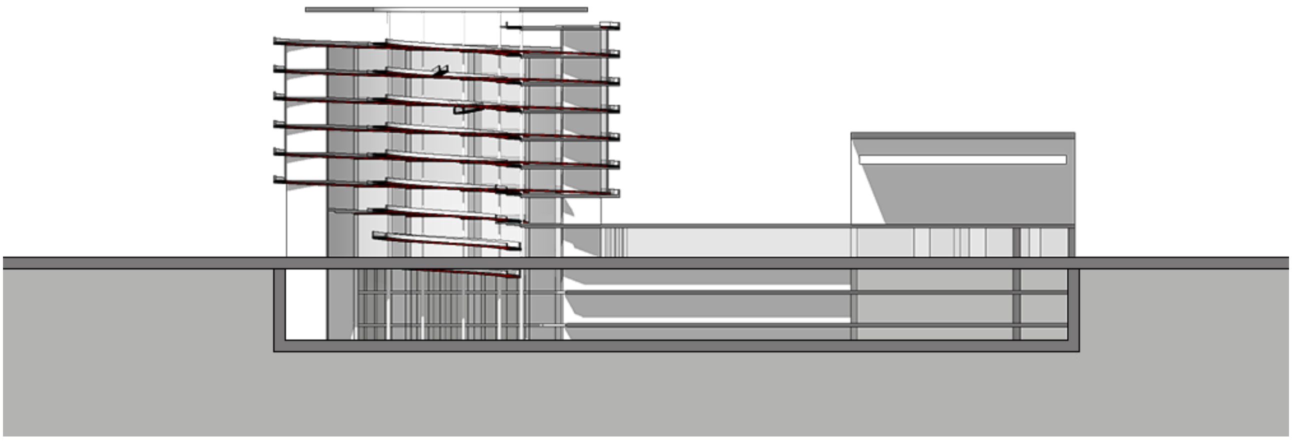
— *non-present*

MOUNTAIN

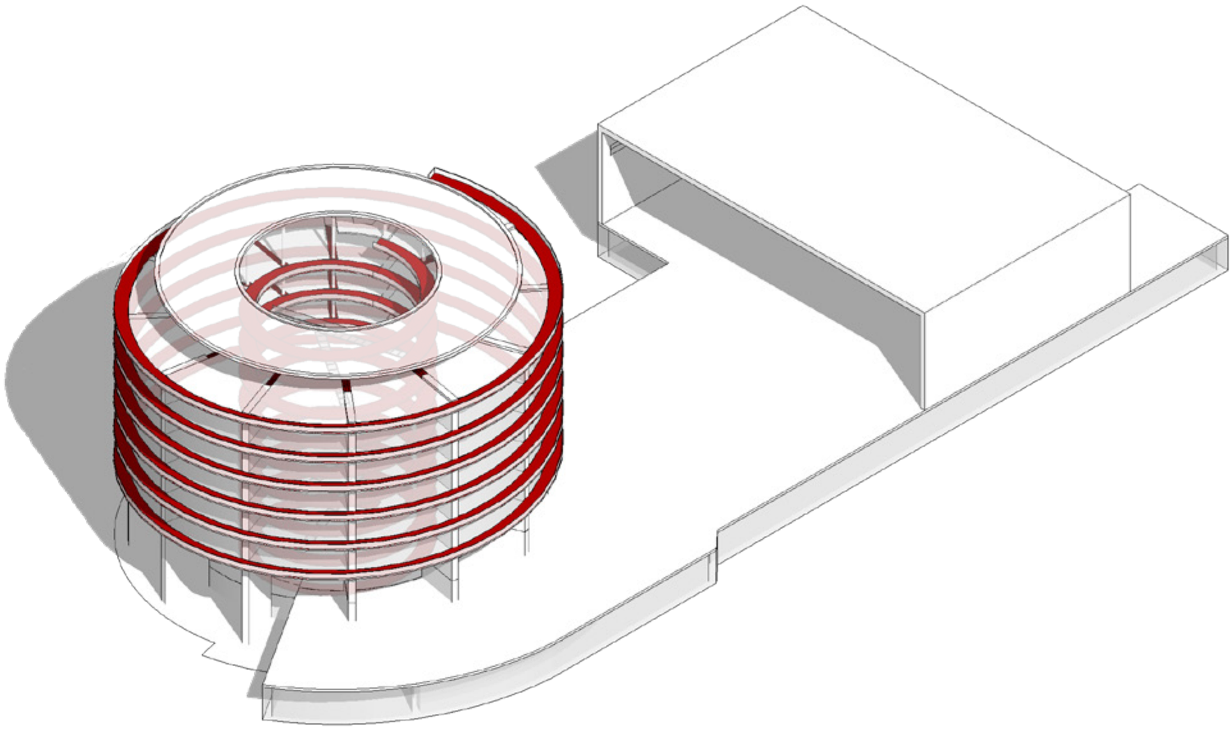
EXTERNAL INTERNAL RAMP

MT-06





The Advanced Training Center has a unique distribution system. The building has two ramps that connect all levels, one of them is internal for visitors, and the other is external for workers. The ramp wraps around the atrium and connects all floors, providing an alternate circulation path for visitors and increasing the building's fluidity and openness. The distribution allows space flexibility with multiple offices, meeting rooms, and common area options. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT:	Bernhardt + Partner Architekten
NAME:	Advanced Training Centre
DATE:	2010
LOCATION:	Heidelberg, Germany
PROGRAM:	University

LEGEND:

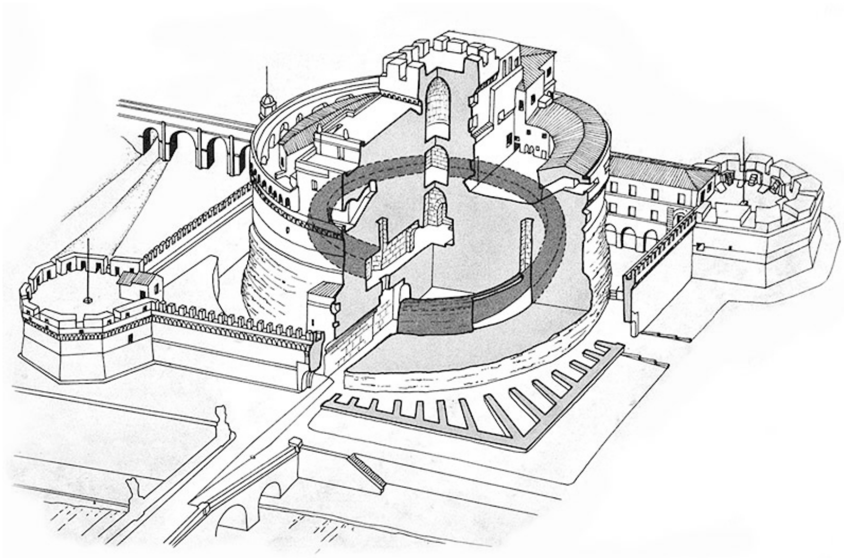
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~

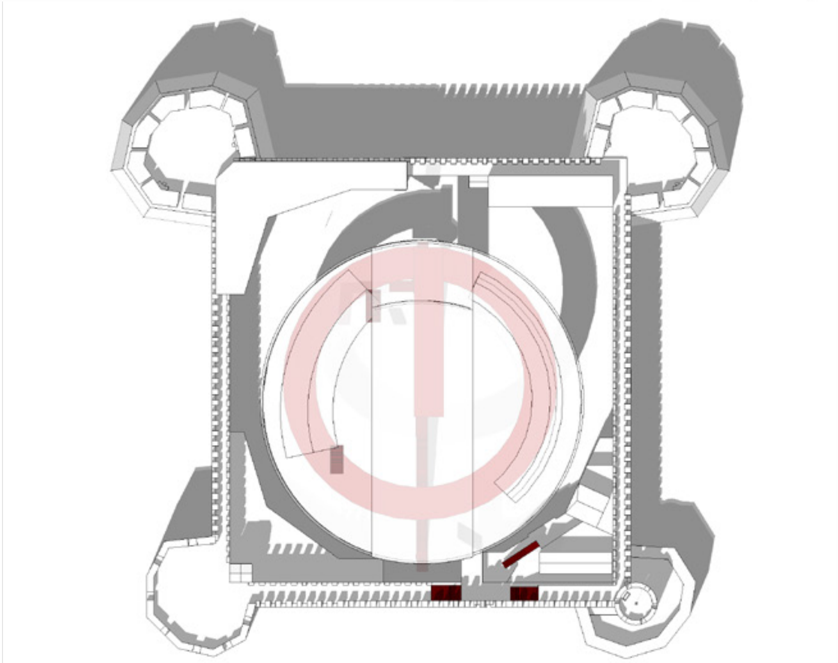
— *non-present*

MOUNTAIN

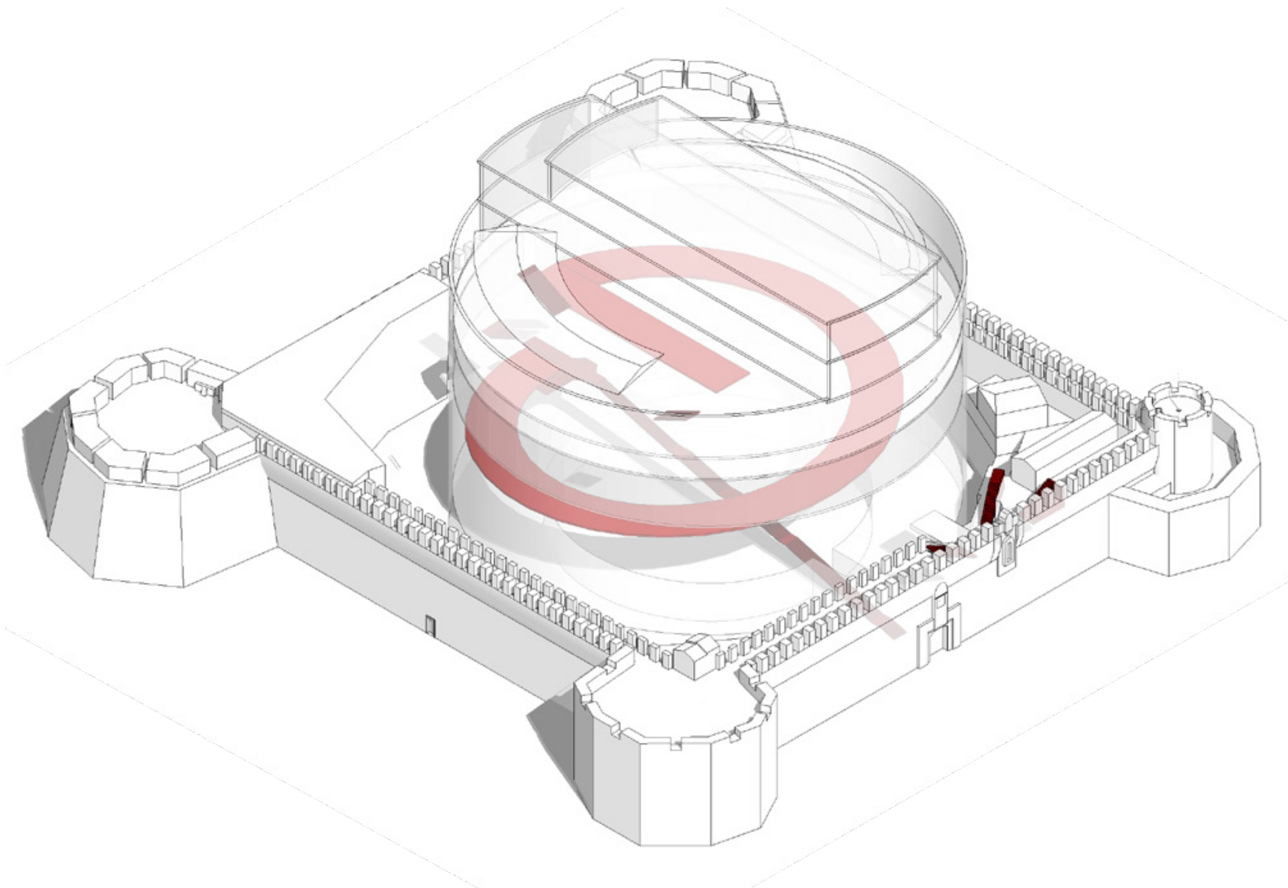
EXTERNAL INTERNAL RAMP

MT-07





Castel Sant'Angelo is a fortress whose distribution system comprises a central cylindrical tower surrounded by four corner towers and connected by two massive walls. The ramp, which winds up through the central cylindrical tower, is a unique feature of the castle. It was added during the Renaissance and allowed for the transportation and movement of weapons, artillery, and animals to the top of the court. Today, the ramp is used by visitors to access the top of the castle and enjoy panoramic views of the city. The type of distribution is diffuse since the spaces to be distributed are not found serially but sporadically.



ARCHITECT:	Demetriano
NAME:	Mausoleo di Adriano- Castel Sant'Angelo
DATE:	135 - 139 AD
LOCATION:	Rome, Italy
PROGRAM:	Funeral Mausoleum - Fortress

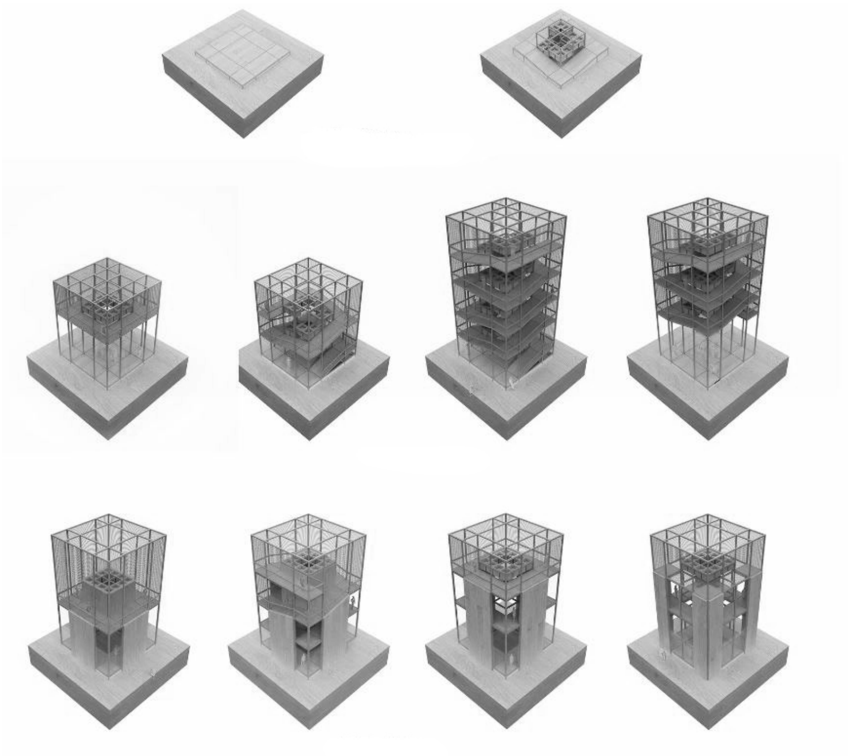
LEGEND:

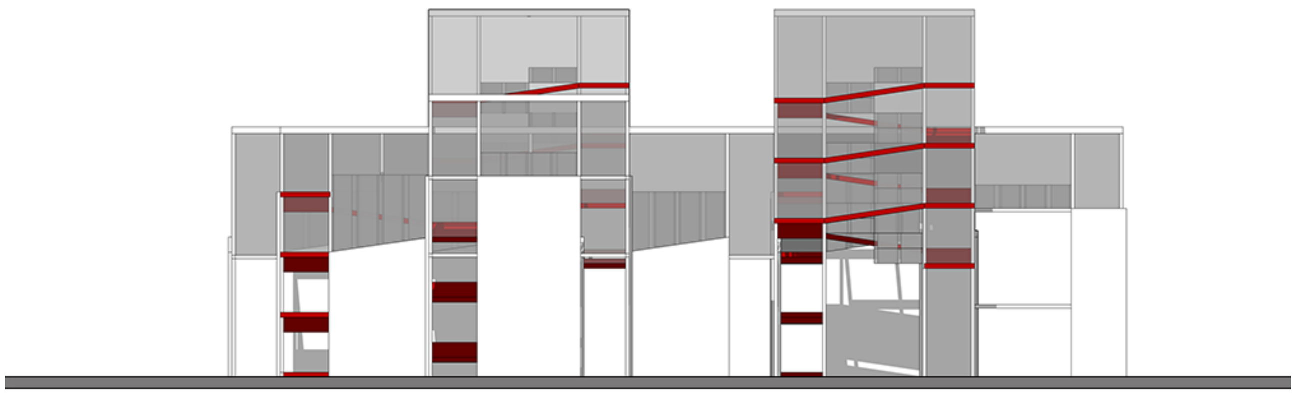
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- EXTERNAL STAIRS
- — *non-present*

MOUNTAIN

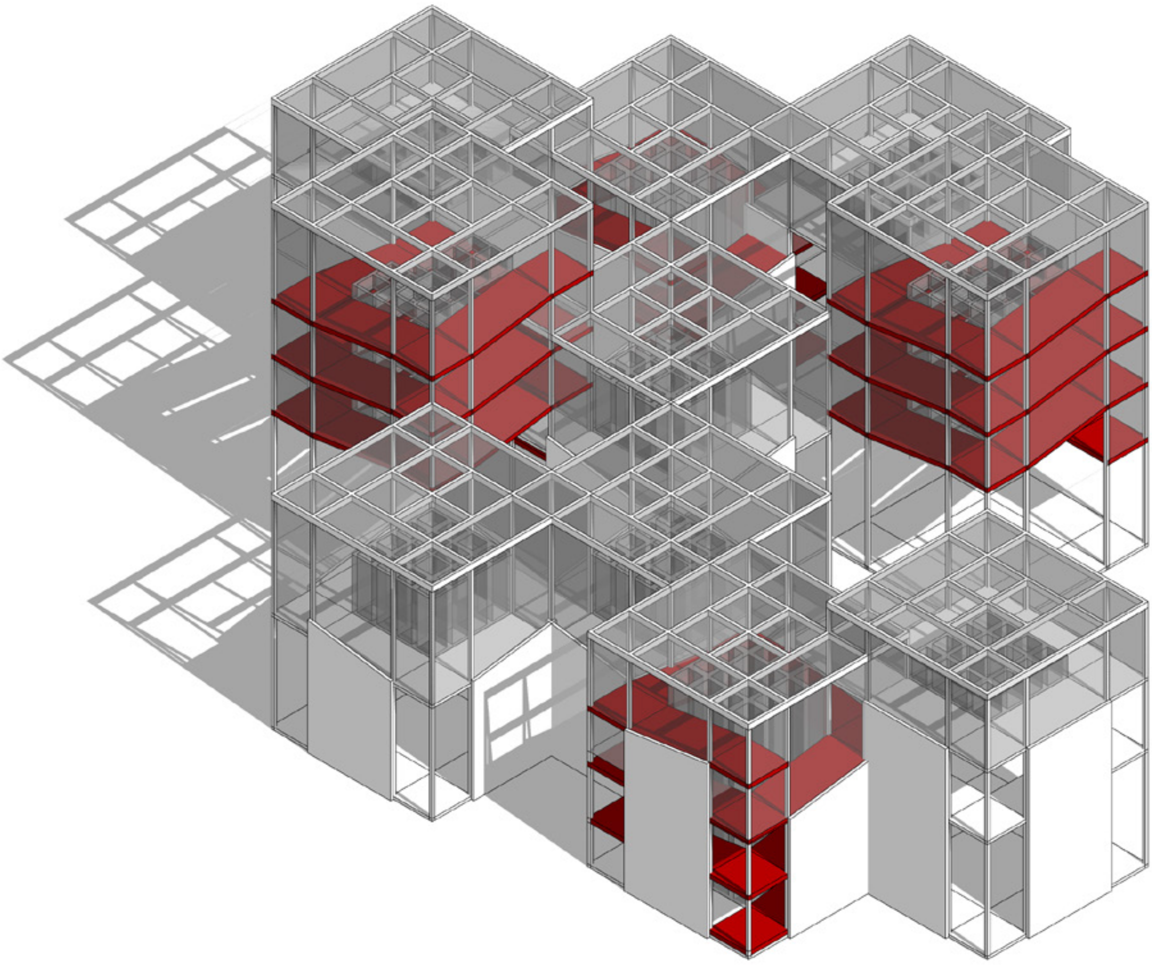
EXTERNAL INTERNAL RAMP

MT-08





The A Thousand Yards botanical pavilion is a unique structure resembling a winding greenery maze. The pavilion is divided into five courtyards, each representing a different habitat and ecosystem. The courtyards are connected by a continuous ramp that spirals upwards, creating an immersive experience for visitors walking through the lush greenery. The ramp also serves as an essential feature of the building, acting as a natural ventilation system that draws cool air up from the ground and into the pavilion. The type of distribution is diffuse since the spaces to be distributed are not found serially but sporadically.



ARCHITECT:	Penda architects + Chris Precht and Dayong Sun
NAME:	A thousand yards – botanical pavilion
DATE:	2019
LOCATION:	Beijing, China
PROGRAM:	Pavilion

LEGEND:

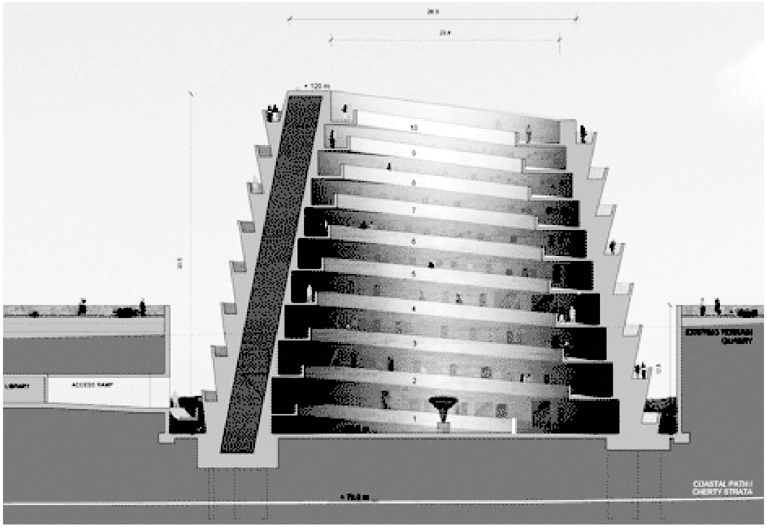
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- ~~INTERNAL STAIRS~~
- ~~EXTERNAL STAIRS~~

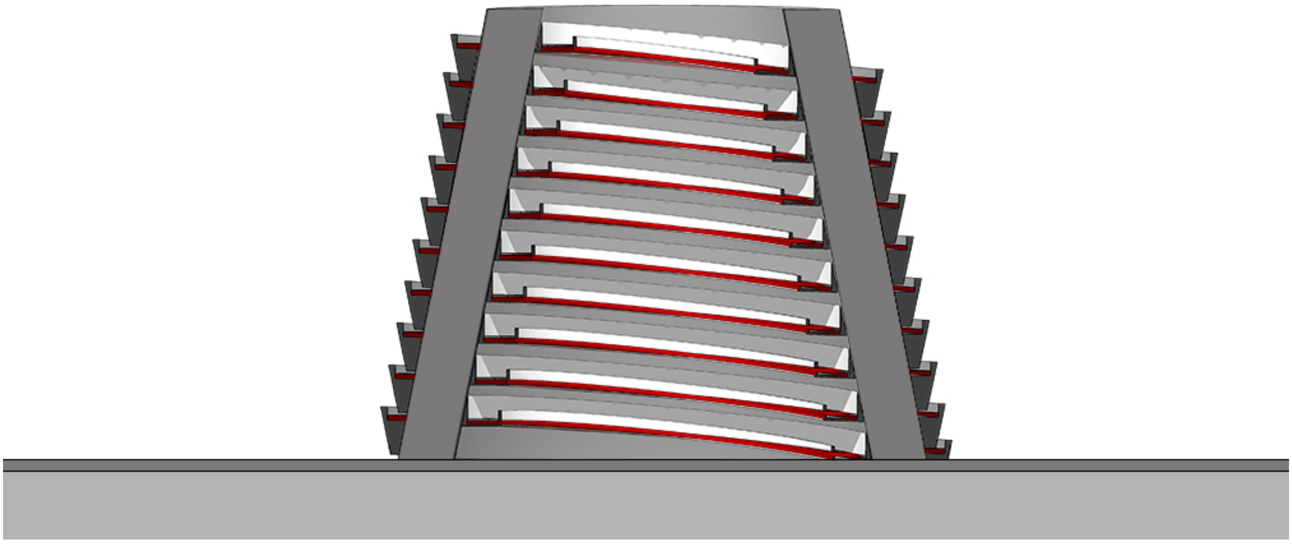
— *non-present*

MOUNTAIN

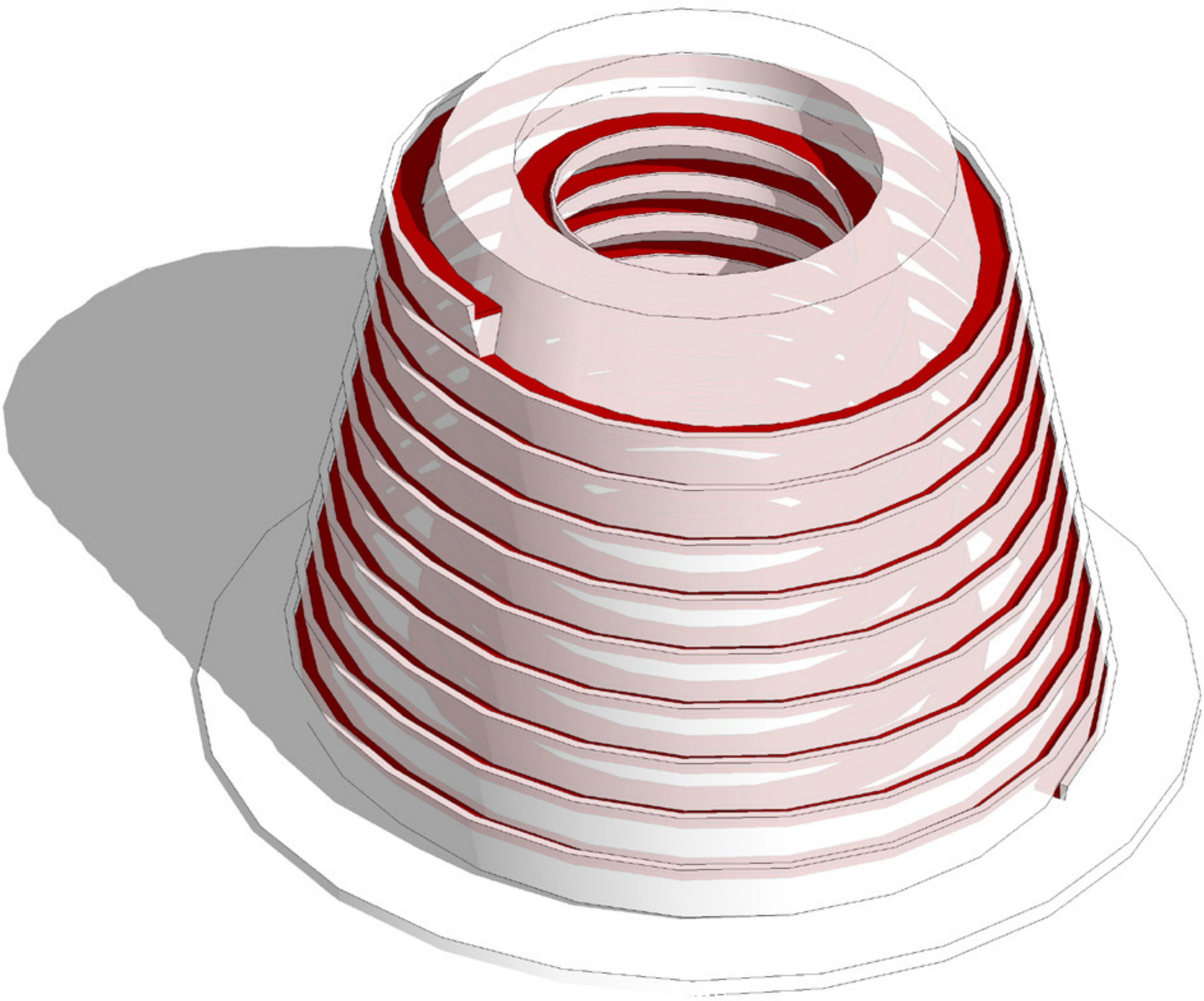
EXTERNAL INTERNAL RAMP

MT-09





The Mass Extinction Memorial Observatory's unique in that follows the geological strata of the site, and its distribution system is organised vertically through a spiralling ramp that leads visitors up through various exhibition spaces culminating in a rooftop observation deck. The building has two ramps: an interior that allows fluidity through the exhibition spaces and an exterior one that also offers a relationship with the exterior. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT:	Adjaye Associates
NAME:	Mass Extinction Memorial Osservatory
DATE:	2013
LOCATION:	Isle of Portland, England
PROGRAM:	Observatory and Education Centre

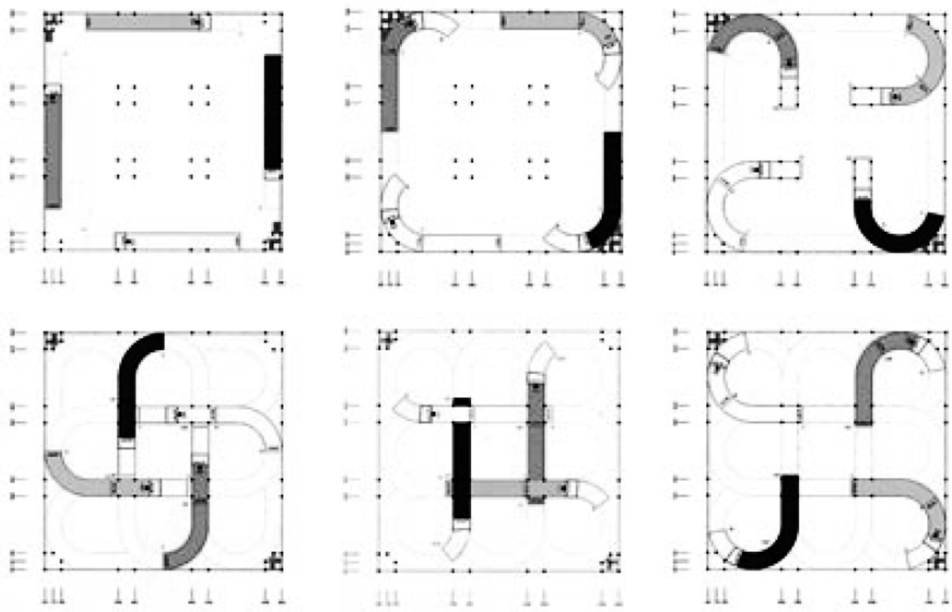
LEGEND:

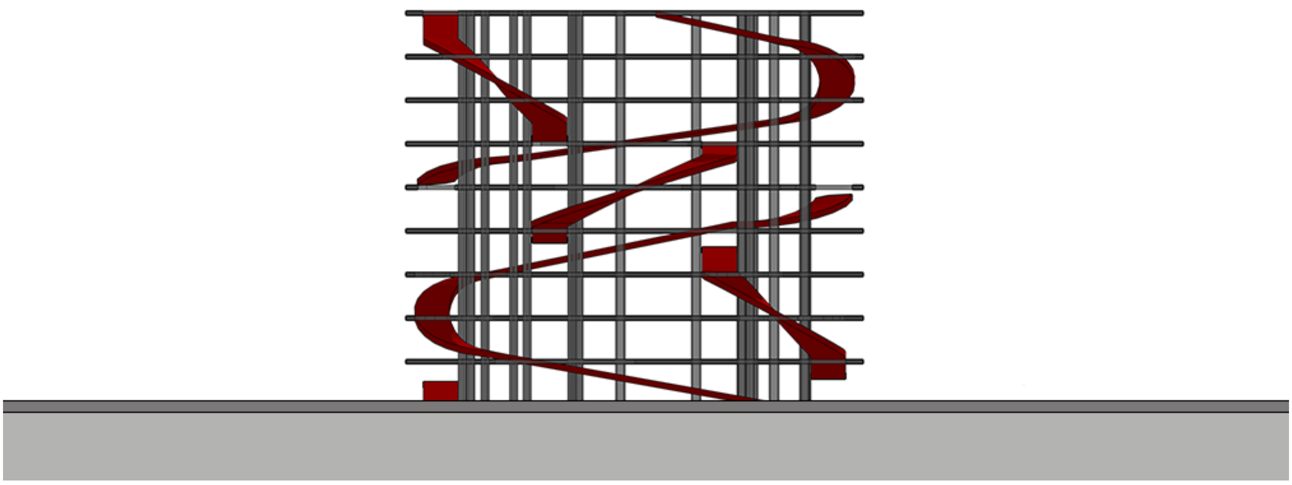
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- ~~INTERNAL STAIRS~~
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAIN

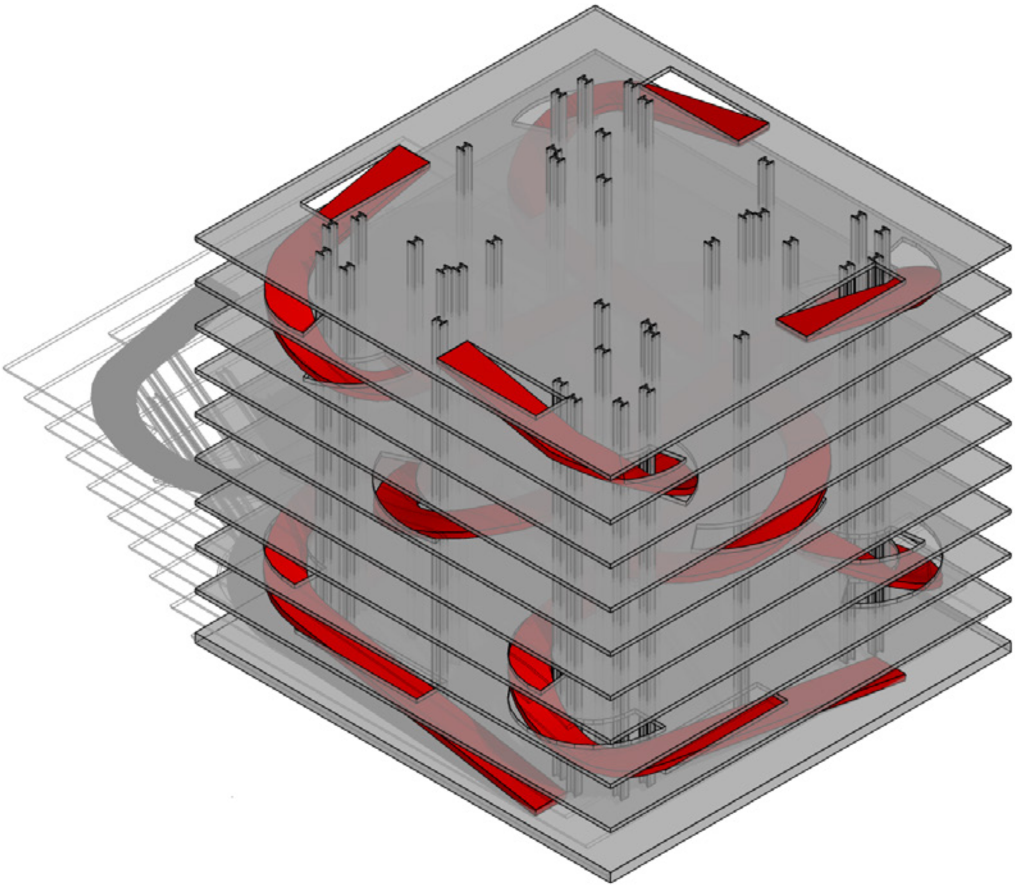
EXTERNAL INTERNAL RAMP

MT-10





The Spiral Parking has a distribution system with a spiralling ramp allowing cars to be parked on multiple levels. The ramp system maximises space and eases congestion, with vehicles entering and exiting from separate points. The main characteristic of this building is that the ramps are intertwined, it has two exits and two entrances, and they are also differentiated and are located at opposite ends. This differentiation allows the tour of the building to be always continuous. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



ARCHITECT:	Konstantin Stepanovich Melnikov
NAME:	Spiral Parking
DATE:	1925
LOCATION:	Paris, France
PROGRAM:	Parking

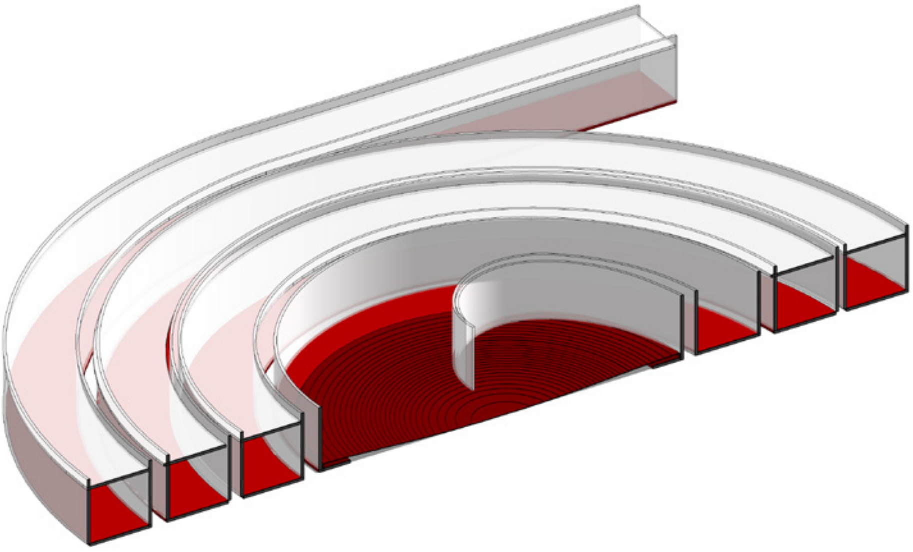
LEGEND:

- ~~SERVED SPACES~~
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- ~~INTERNAL STAIRS~~
- ~~EXTERNAL STAIRS~~
- — *non-present*

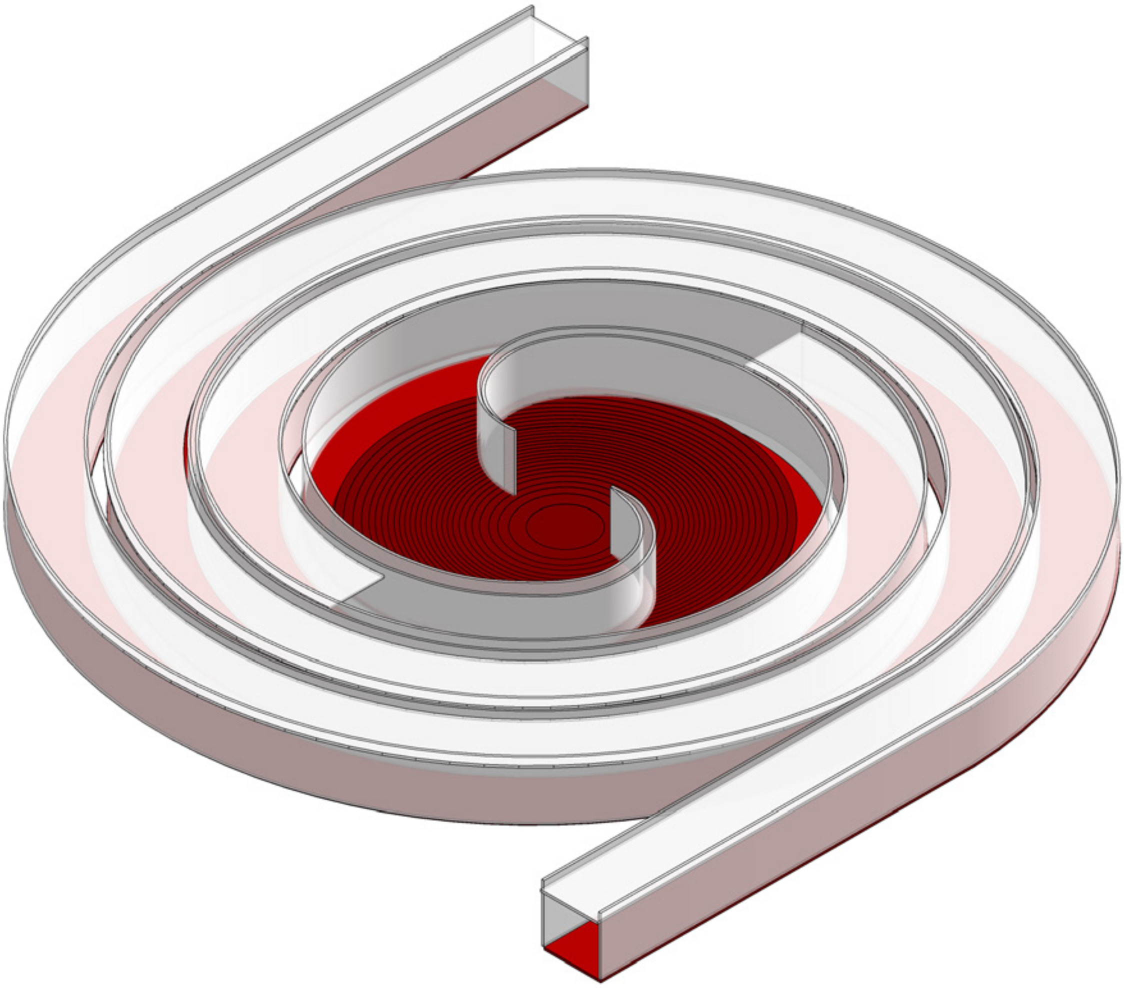
MOUNTAIN

EXTERNAL INTERNAL RAMP

MT-11



The Water Whirl structure was designed to gather and reflect on the relationship between humans and nature, emphasising water. It has an access ramp that is intertwined with the exit ramp, there is no contact between them along its route, but they are in the central space. The ramp is a central design feature, winding around a water feature. In addition, this distributive configuration allows activities to develop along the way with a continuous flow in flexible spaces and without interruptions. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT: Spectacle: Bureau for Architecture and Urbanism
NAME: Water Whirl (Runner Up)
DATE: 2017
LOCATION: Korean Demilitarized Zone, Korea
PROGRAM: Underground BathHouse

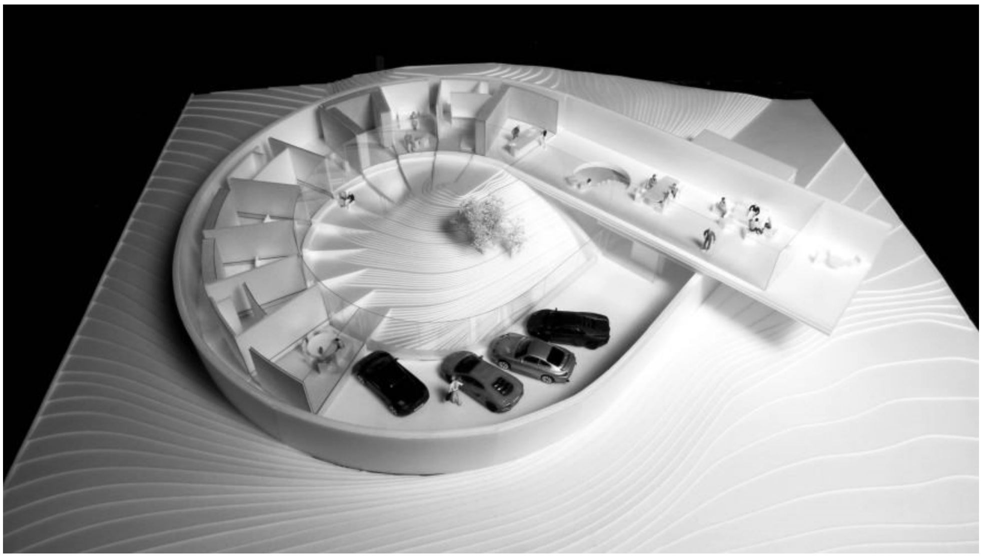
LEGEND:

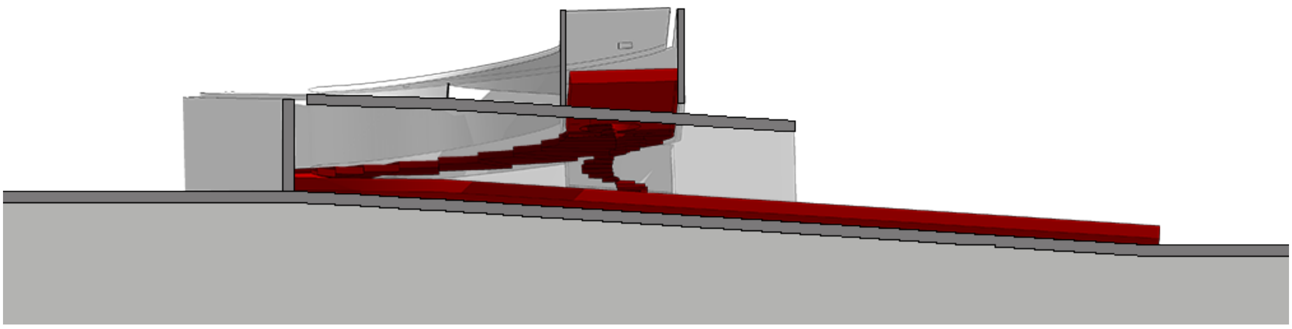
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- ~~INTERNAL STAIRS~~
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAIN

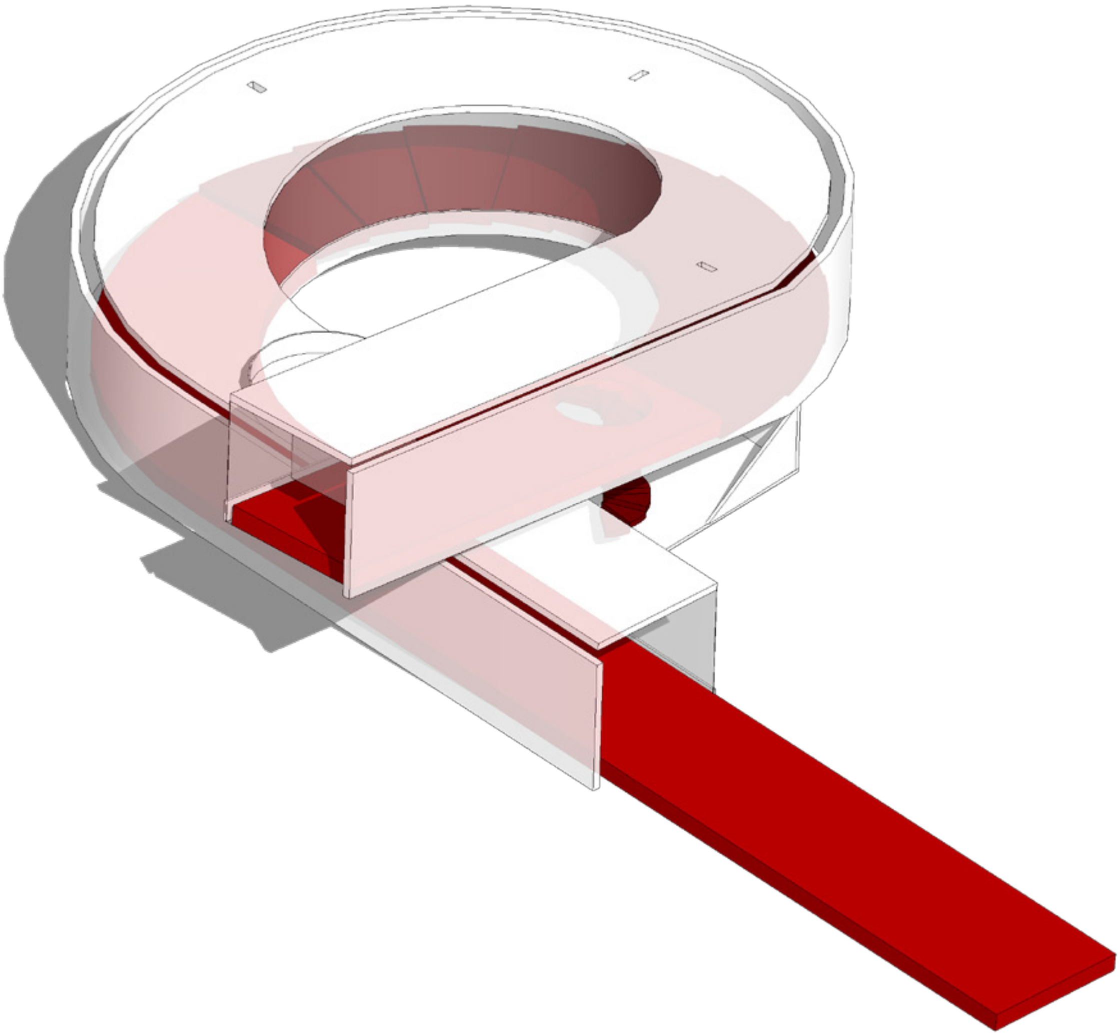
EXTERNAL INTERNAL RAMP

MT-12





The Danish Villa for a Car Collector has a unique distribution system that works around the central car ramp. The ramp takes up the centre of the house, allowing cars to be displayed on multiple levels and creating an interactive experience for car enthusiasts. The villa is organised around the ramp, with living spaces on the upper floors and car storage and maintenance spaces on the lower levels. The ramp also serves as the main circulation path for people, with living rooms arranged around it like a spiral. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT: BIG Architects

NAME: Danish Villa for a Car Collector

DATE: 2015

LOCATION: Aalborg, Denmark

PROGRAM: House

LEGEND:

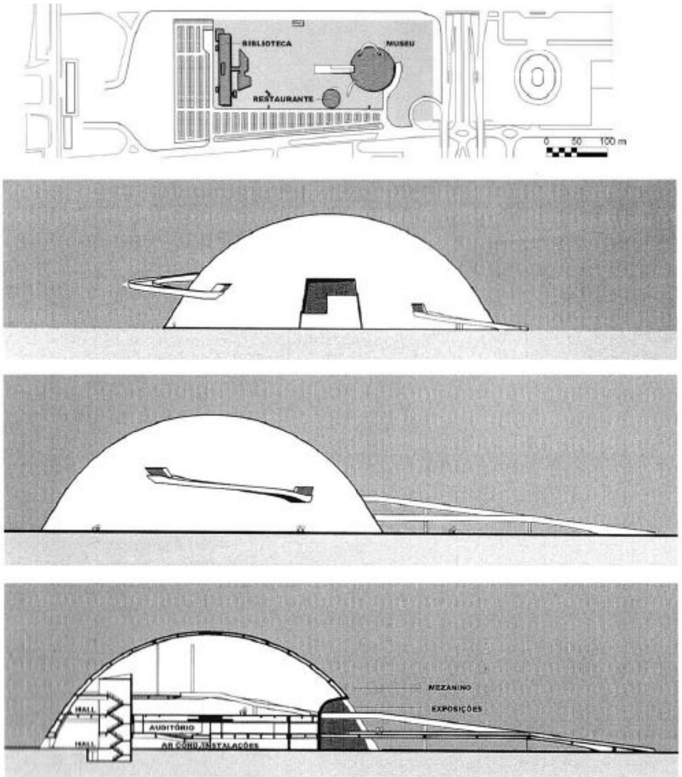
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~

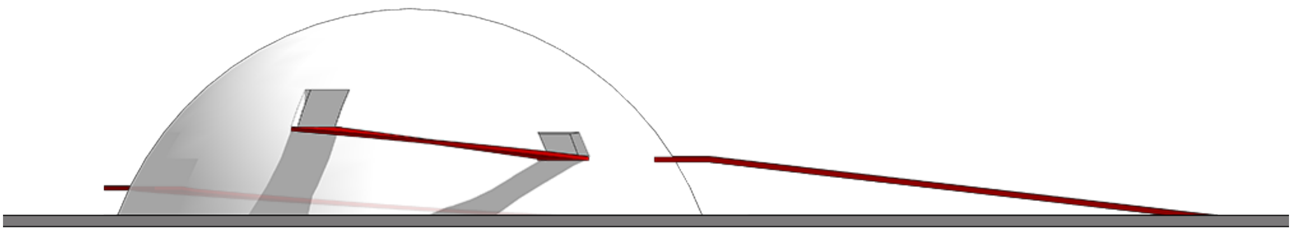
— *non-present*

MOUNTAIN

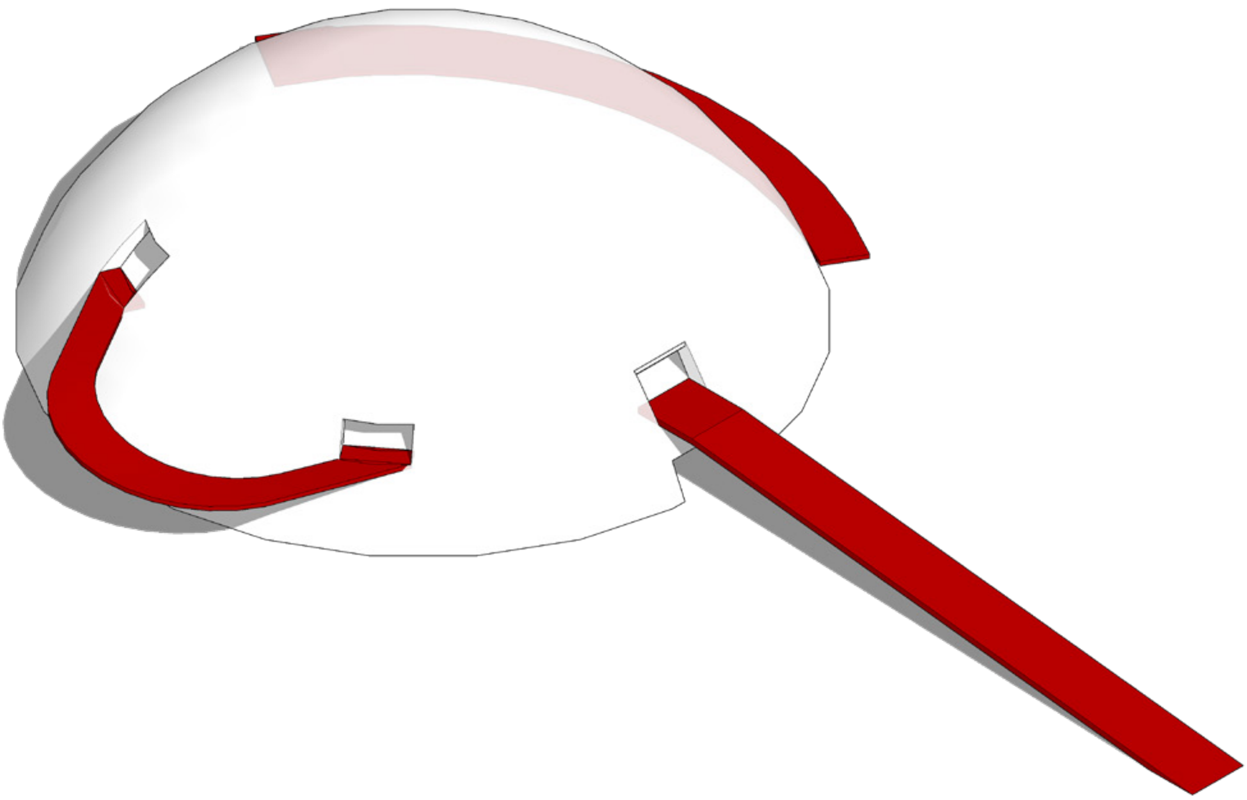
EXTERNAL INTERNAL RAMP

MT-13





The Museu Nacional da Republica has a unique distribution system where visitors enter the museum through a grand ramp that leads them to the exhibition spaces. The ramp's gradual slope and curvature encourage visitors to engage with the building's exterior and enjoy the surrounding landscape. Inside the museum, visitors can explore the galleries on different levels connected by ramps and walkways that offer an exciting visual experience. The ramp's design and curvature allow visitors to connect with the surrounding environment. The type of distribution is diffuse since the spaces to be distributed are not found serially but sporadically.



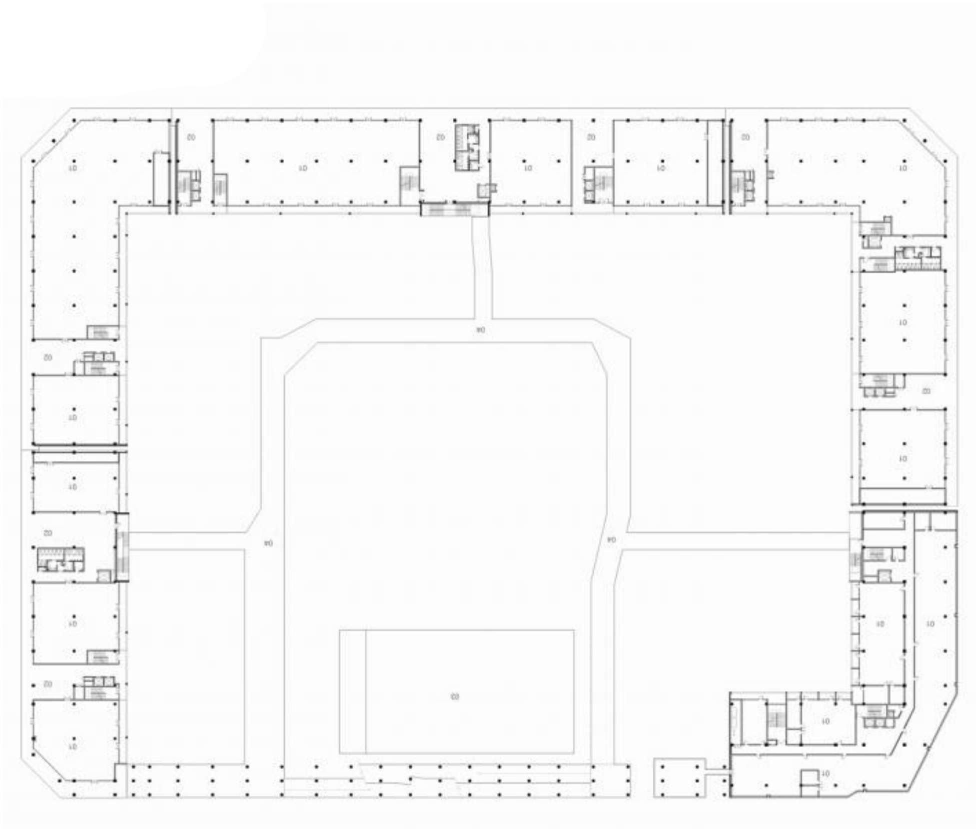
ARCHITECT: Oscar Niemeyer
NAME: Museu Nacional da Republica
DATE: 2006
LOCATION: Brasilia, Brazil
PROGRAM: Museum

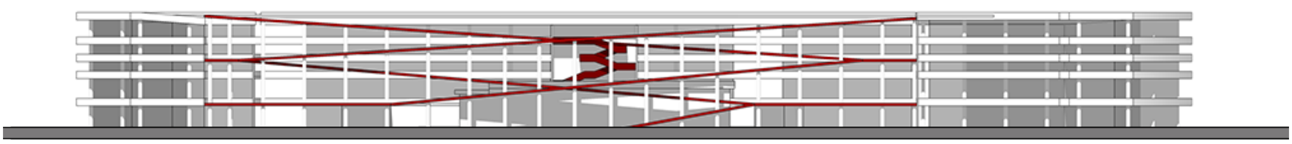
LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAIN

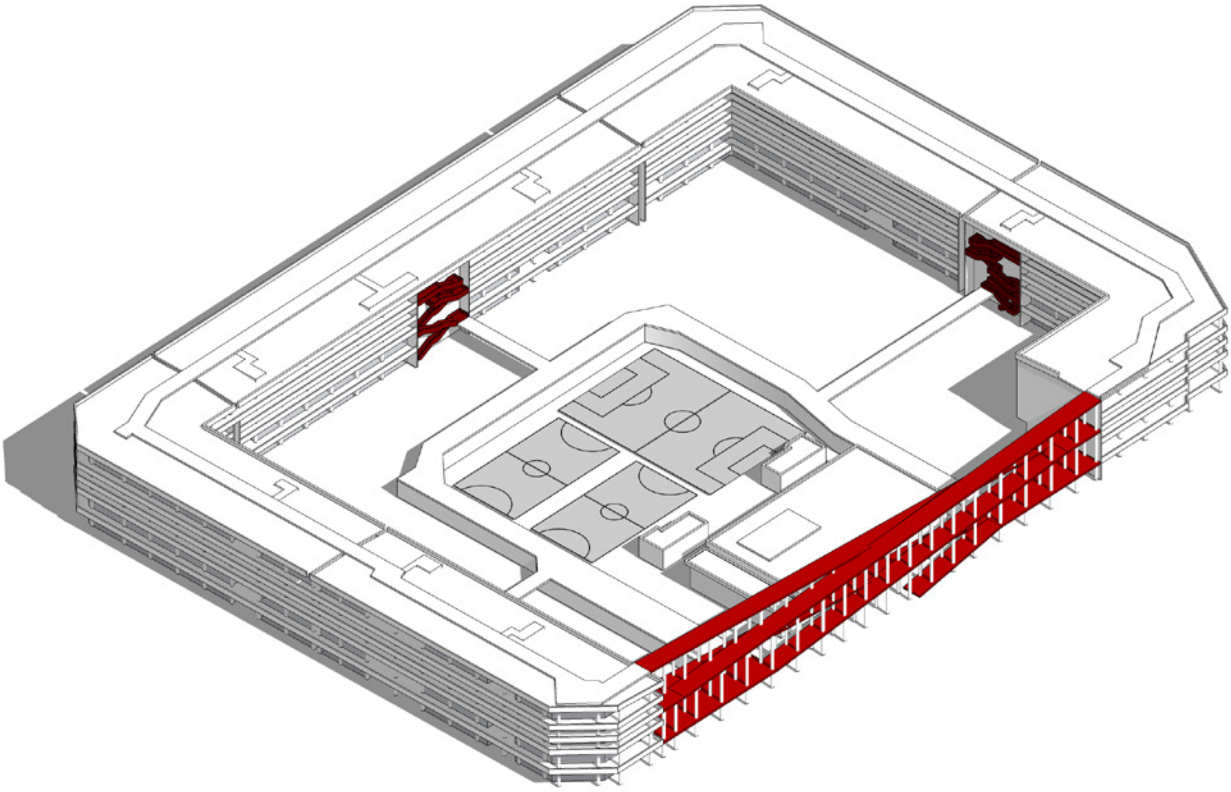
EXTERNAL INTERNAL RAMP

MT-14





The West Village is a modern mixed-use complex featuring an intricate distribution system. The building is organised around a central courtyard, with a series of ramps leading up to the different levels of the building. These ramps make it easy to get around and provide a sense of dynamism and movement throughout the space. They are also used for sporting purposes. People are distributed throughout the building via the ramps and stairs, offering unique vantage points to view the courtyard and surrounding cityscape. The type of distribution is diffuse since the spaces to be distributed are not found serially but sporadically.



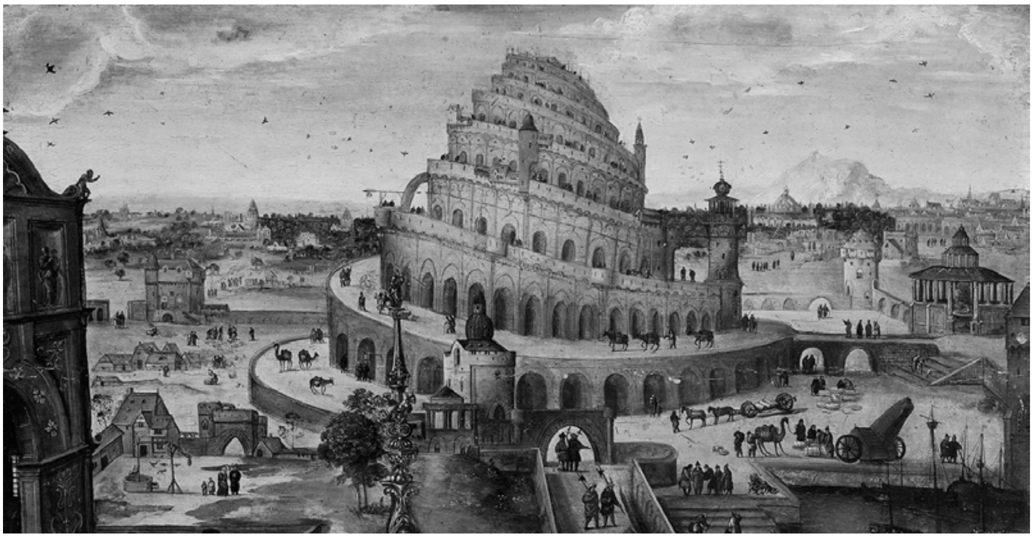
ARCHITECT: Jiakun Architects
NAME: West Village
DATE: 2015
LOCATION: Chengdu, China
PROGRAM: Residential Building

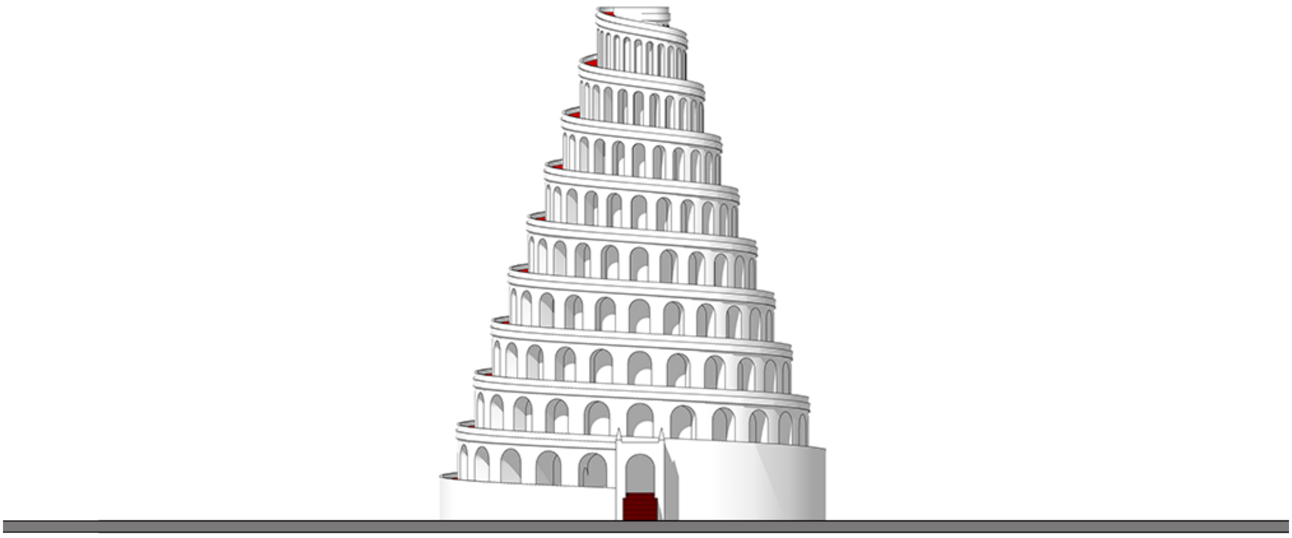
LEGEND:
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAIN

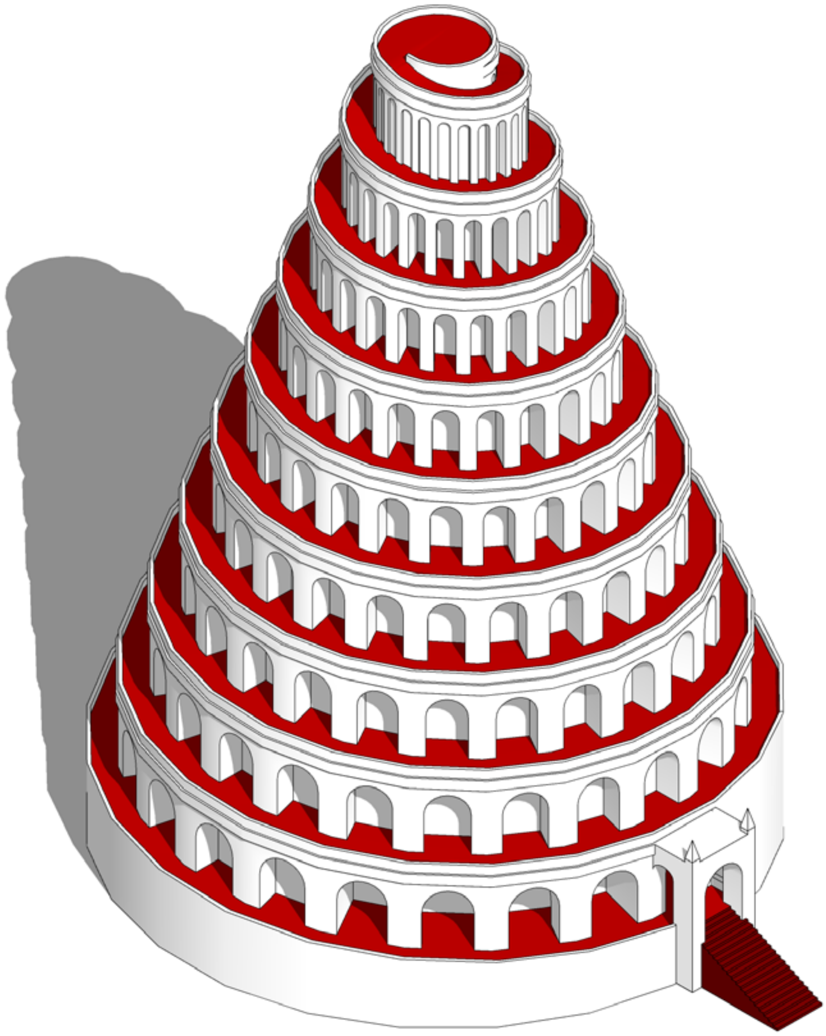
EXTERNAL INTERNAL RAMP

MT-15





The archetyope of Tower of Babel features a distribution system based on a spiralling ramp that ascended to the top, allowing people to move quickly and down the building. The ramp was an essential characteristic of the tower, as it allowed people to move between levels and facilitated the transport of goods and materials. In addition, throughout the development of the ramp, there are different niches with different programmatic possibilities. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT:	-
NAME:	Tower of Babel
DATE:	2000 and 500 BC
LOCATION:	Babylon, Iraq
PROGRAM:	Tower

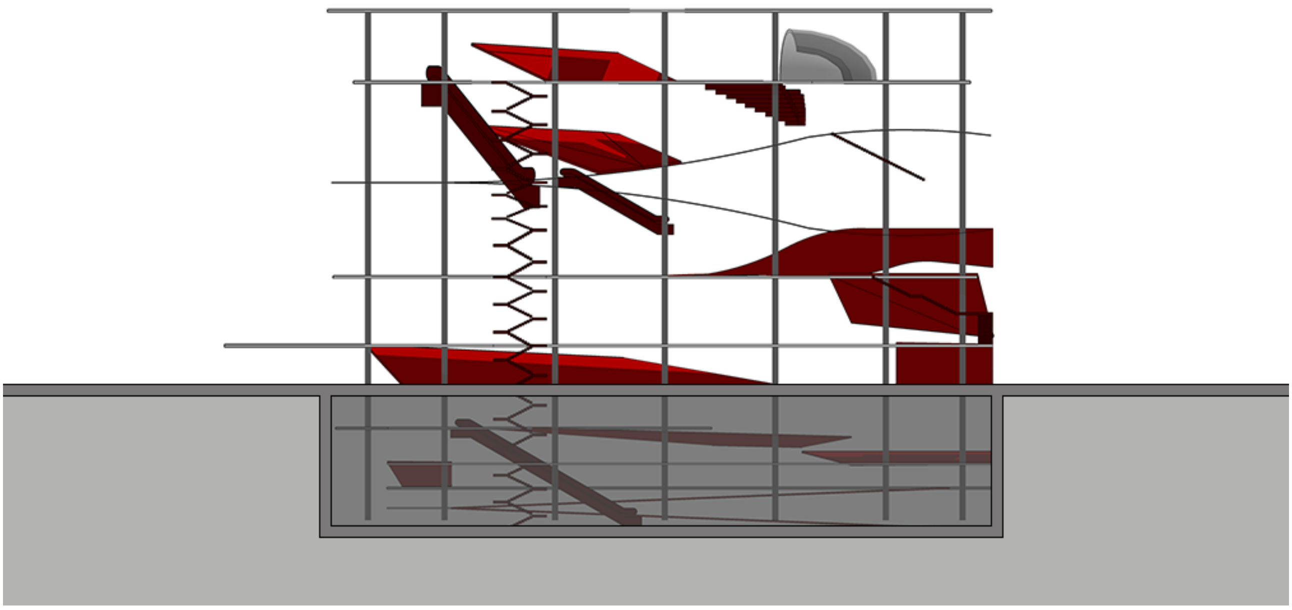
LEGEND:

- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- ~~INTERNAL STAIRS~~
- EXTERNAL STAIRS
- — *non-present*

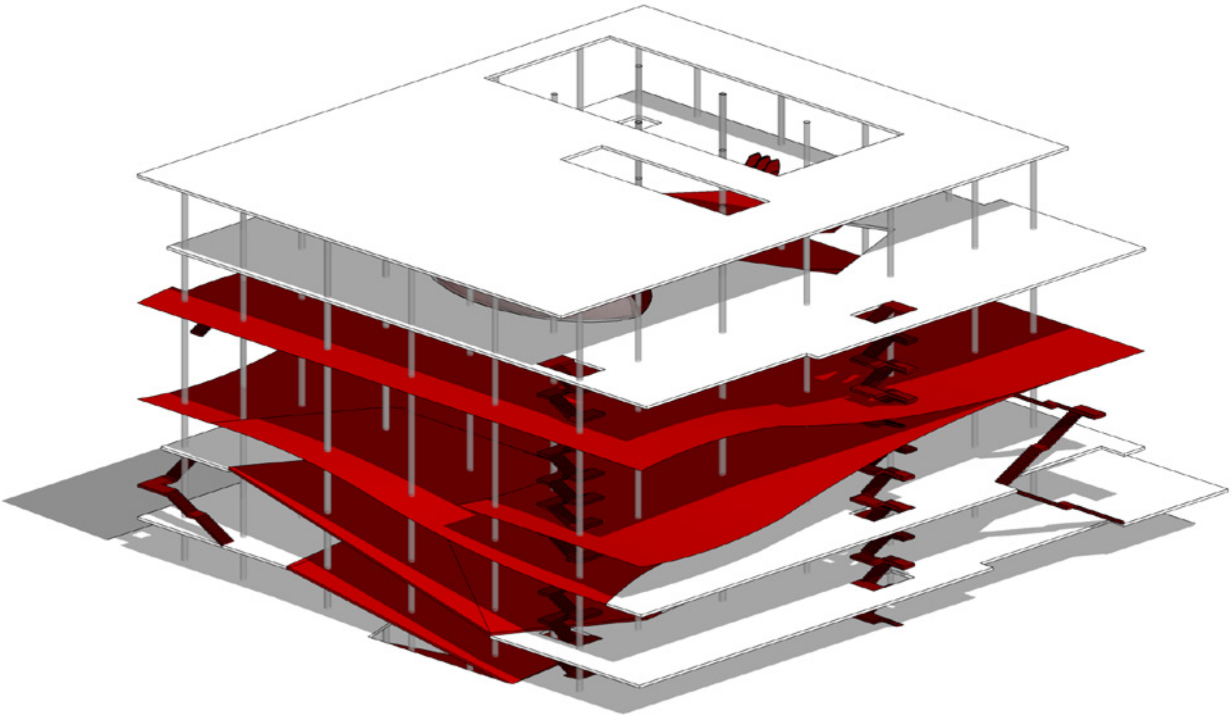
MOUNTAIN

EXTERNAL INTERNAL RAMP

MT-16



The two libraries feature a distribution system where books are stored underground, while above-ground spaces are reserved for reading and socialising. The ramp is the library level that is manipulated to connect, forming a single route that crosses the entire building. The ramp is designed to be an active and dynamic space, encouraging movement and exploration inside the building; the ramp also serves as a gathering place, reading room, and common areas. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT:	Rem Koolhaas – OMA
NAME:	Two Libraries
DATE:	1992
LOCATION:	Paris, France
PROGRAM:	Library

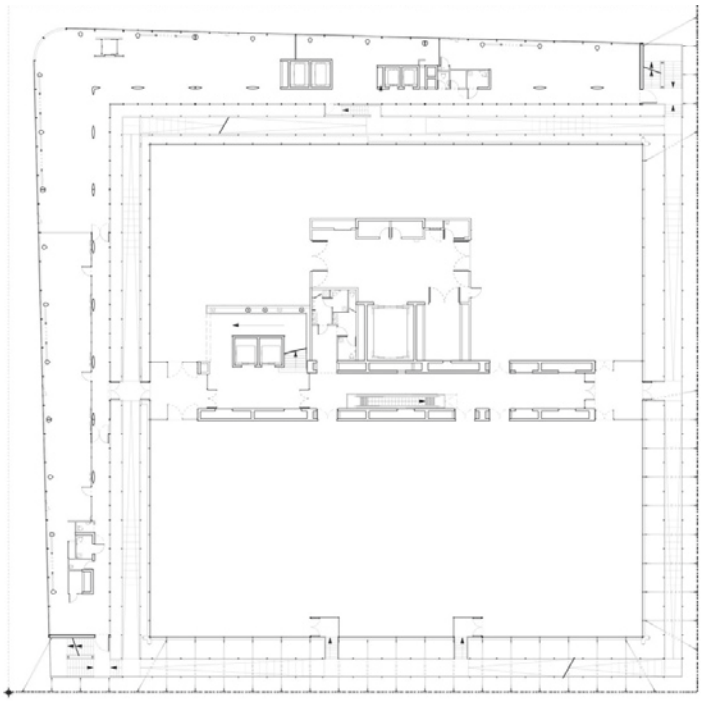
LEGEND:

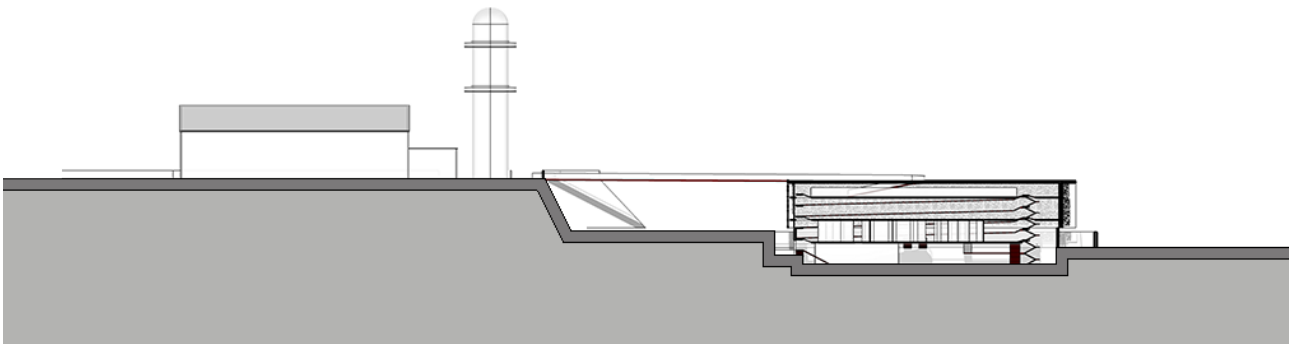
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- EXTERNAL STAIRS
- — *non-present*

MOUNTAIN

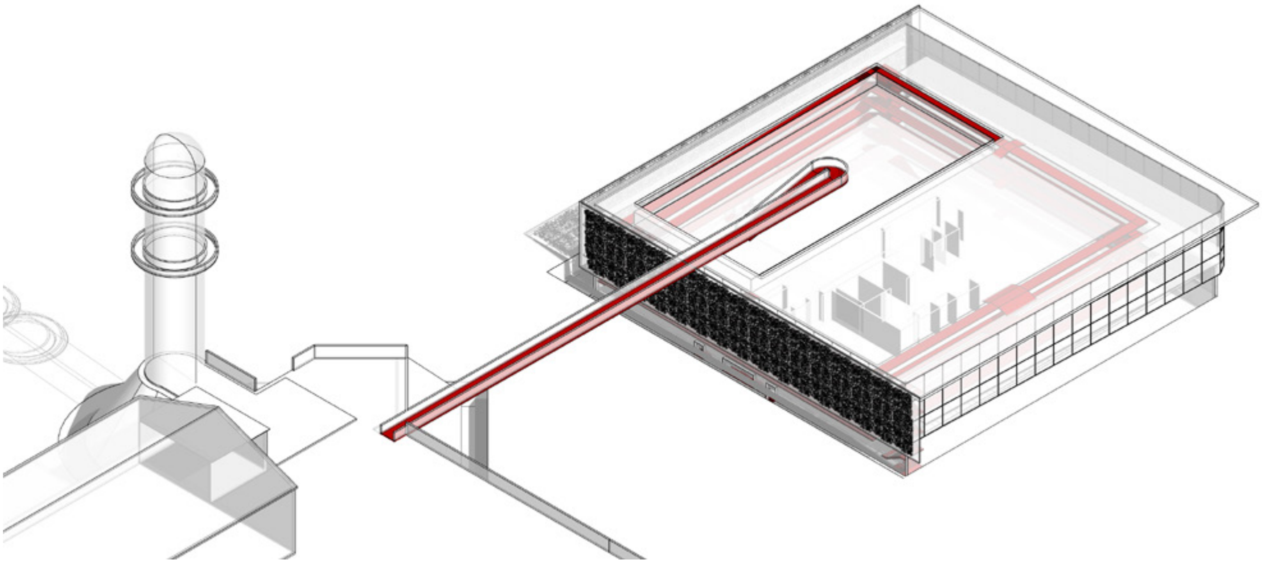
EXTERNAL INTERNAL RAMP

MT-17





The MUSEUM features a distribution system that seamlessly guides visitors through the various exhibitions and spaces. People are distributed in the building through ramps connecting the different levels. The essential characteristic of the ramp is that it provides a continuous journey through the museum, allowing visitors to experience the various exhibitions cohesively and uninterruptedly. The ramp through the façade offers an exciting relationship with the exterior. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



ARCHITECT: Rudy Ricciotti
NAME: MUCEUM
DATE: 2002
LOCATION: Marseille, France
PROGRAM: Museum

LEGEND:

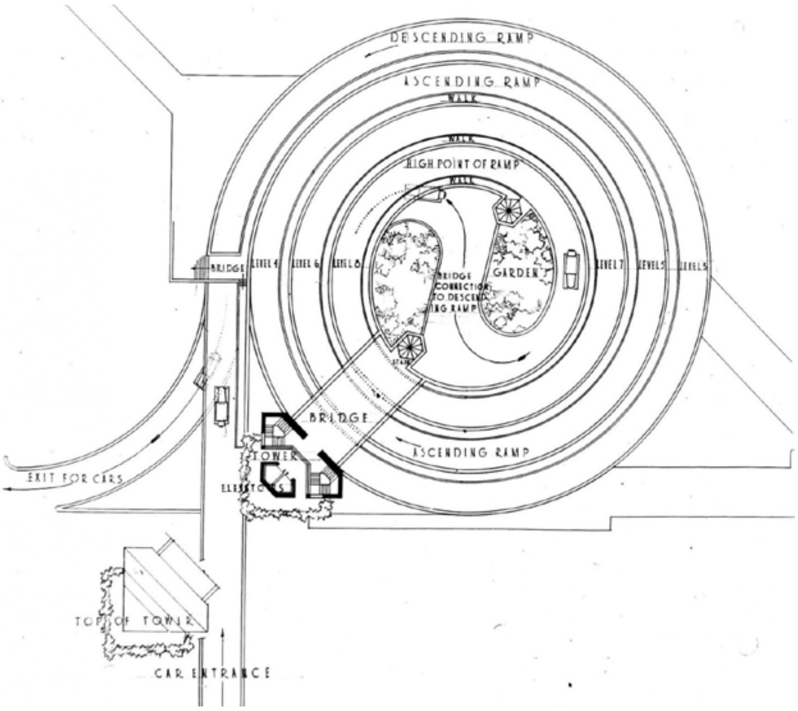
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~

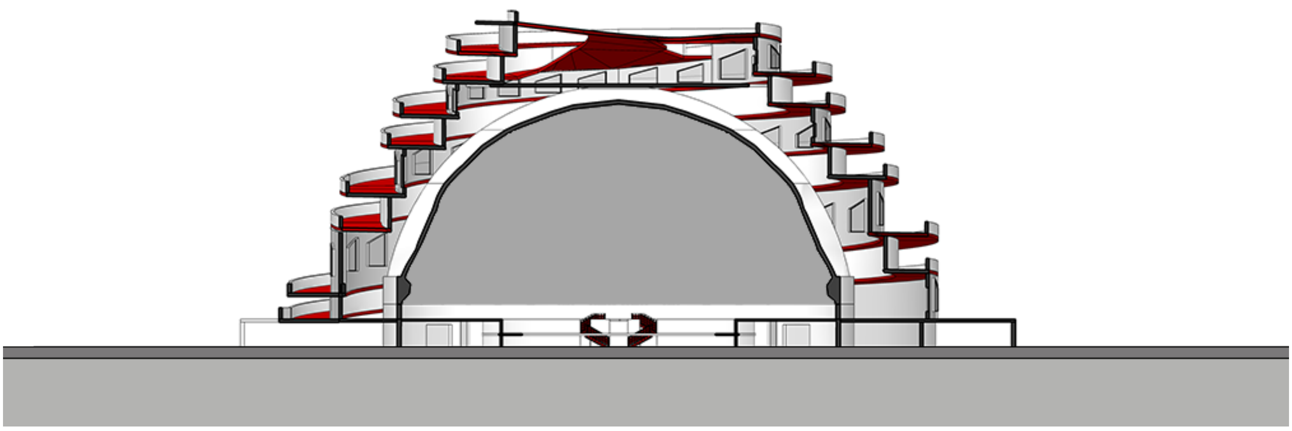
— *non-present*

MOUNTAIN

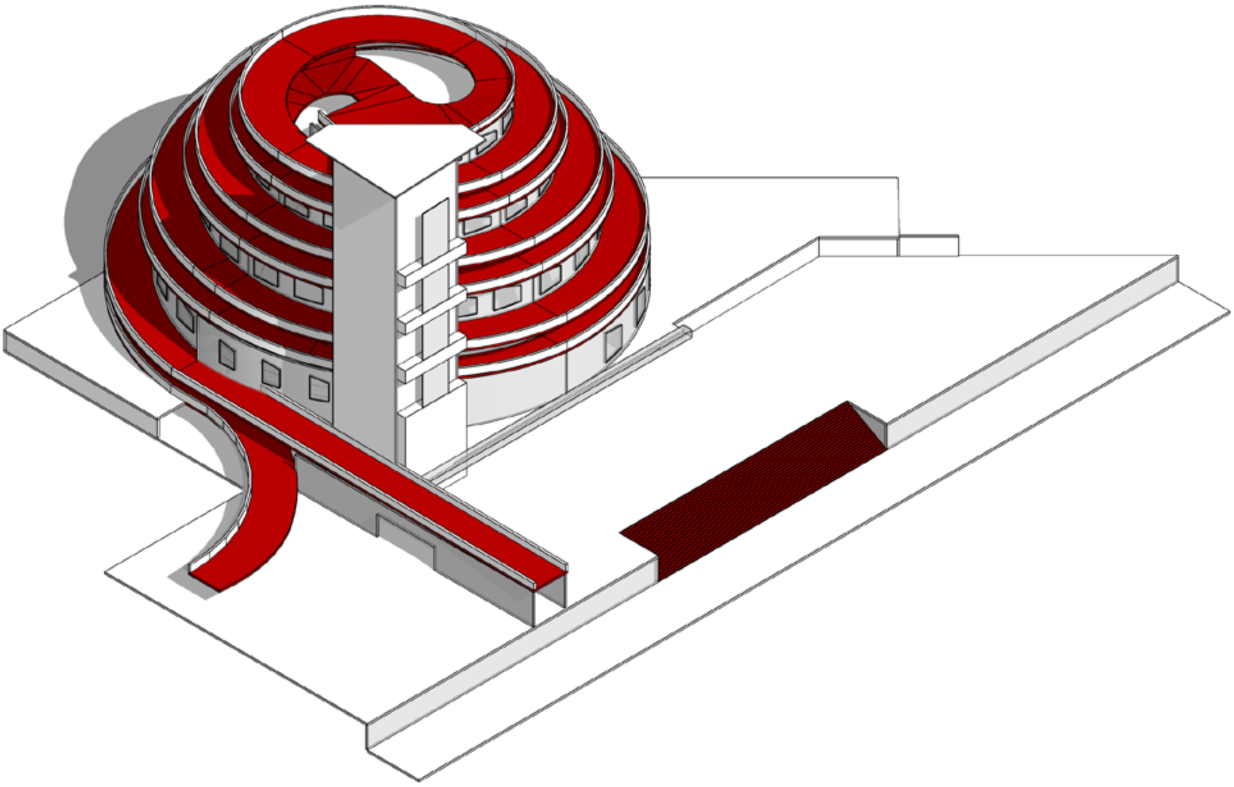
EXTERNAL INTERNAL RAMP

MT-18





The Gordon Strong Automobile Objective and Planetarium was intended to be an automobile showroom, garage, and planetarium, all under one roof. The distribution system of the building is characterised by a central ramp that allows cars to be driven up to the upper level of the building. People are distributed in the building through a series of ramps and staircases. The ramp is an essential feature of the building, both functionally and aesthetically, as it allows for a striking visual element that is an integral part of the design. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT: Frank Lloyd Wright

NAME: Gordon Strong Automobile Planetarium

DATE: 1925

LOCATION: Maryland, United States

PROGRAM: Museum and Planetarium

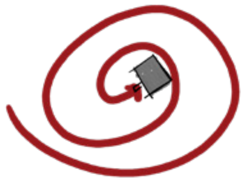
LEGEND:

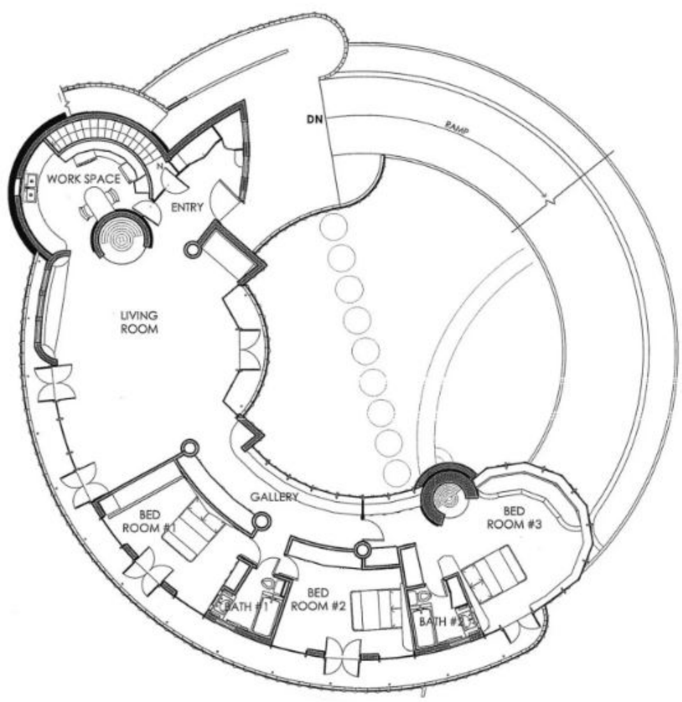
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

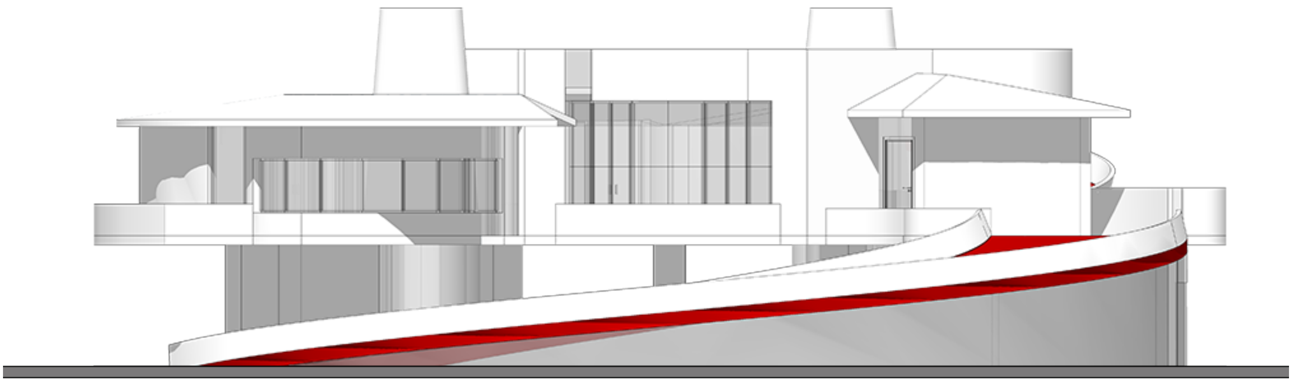
MOUNTAIN

EXTERNAL INTERNAL RAMP

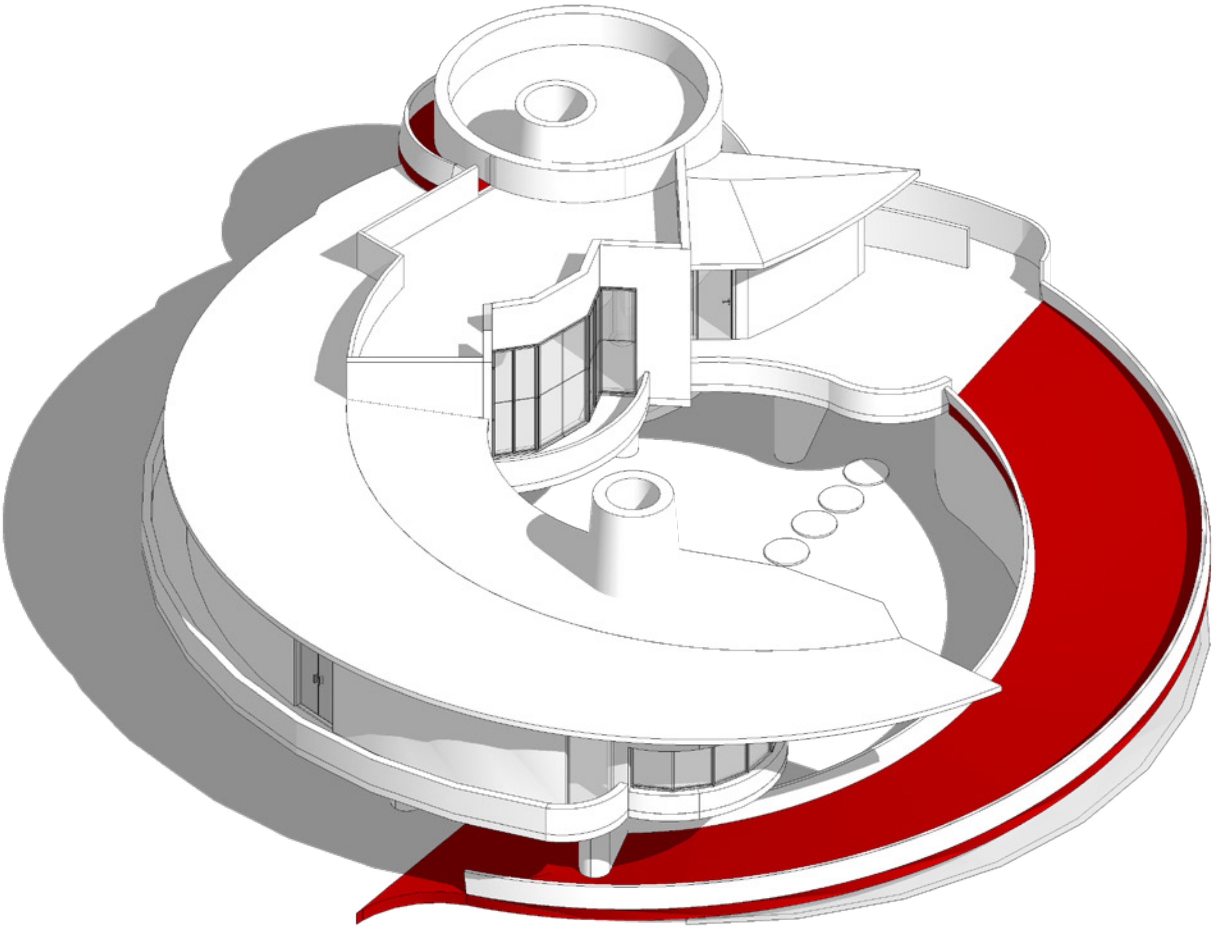
MT-19







The David and Gladys Wright House features a unique circular plan and ramp that connects the different levels of the house. The ramp serves as the central circulation spine of the house, providing a smooth transition between the living spaces and offering impressive views of the surrounding landscape. The house is organised around a central courtyard, and the ramp closes this space, bringing natural light and ventilation to the heart of the house. The type of distribution is punctual since the stairs lead directly to the space to be distributed.



ARCHITECT:	Frank Lloyd Wright
NAME:	David and Gladys Wright House
DATE:	1950
LOCATION:	Arizona, United States
PROGRAM:	House

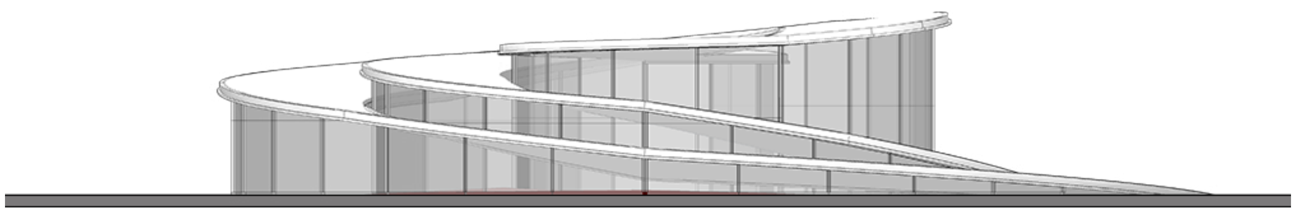
LEGEND:

- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

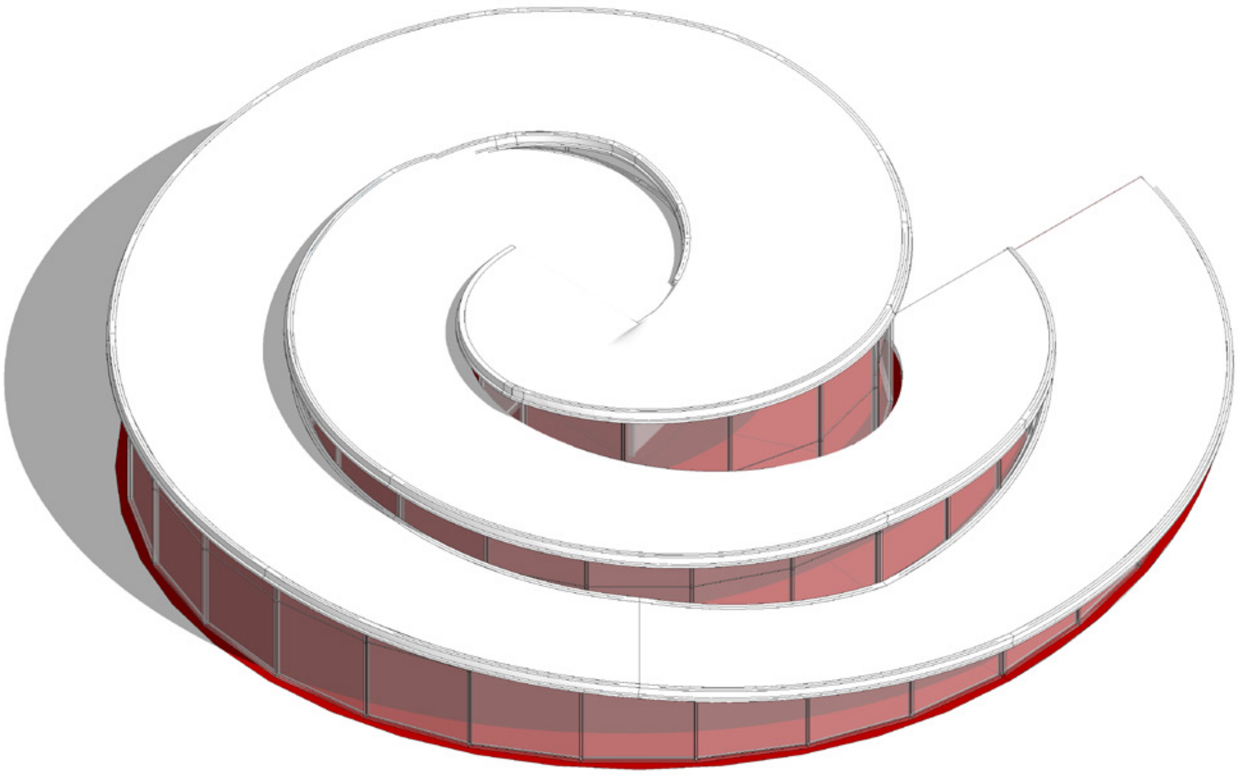
MOUNTAIN

EXTERNAL INTERNAL RAMP

MT-20



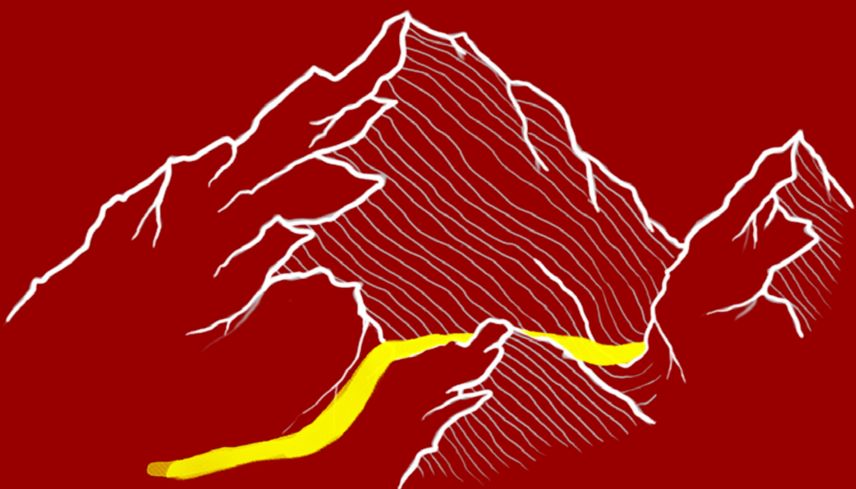
The Musée Atelier Audemars Piguet distribution system is carefully designed to showcase the watchmaking process. A ramp leads through a series of interconnected spaces culminating in a large open workshop at the heart of the building. The ramp is a prominent feature, dividing the entry and exit paths through a spiral that coincides with the building's central atrium and offers a panoramic view of the workshop and museum exhibits. The ramp's design emphasises the building's circular form while creating an engaging experience for visitors. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT: BIG Architects
NAME: Musée Atelier Audemars Piguet
DATE: 2018
LOCATION: Le Chenit, Switzerland
PROGRAM: Museum

LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- ~~INTERNAL STAIRS~~
- ~~EXTERNAL STAIRS~~
- — *non-present*

ARCHITECTURAL FORM

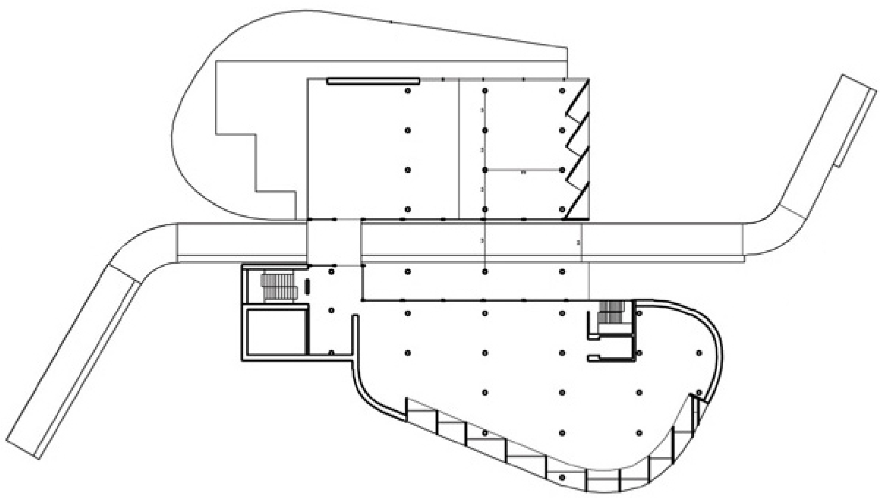


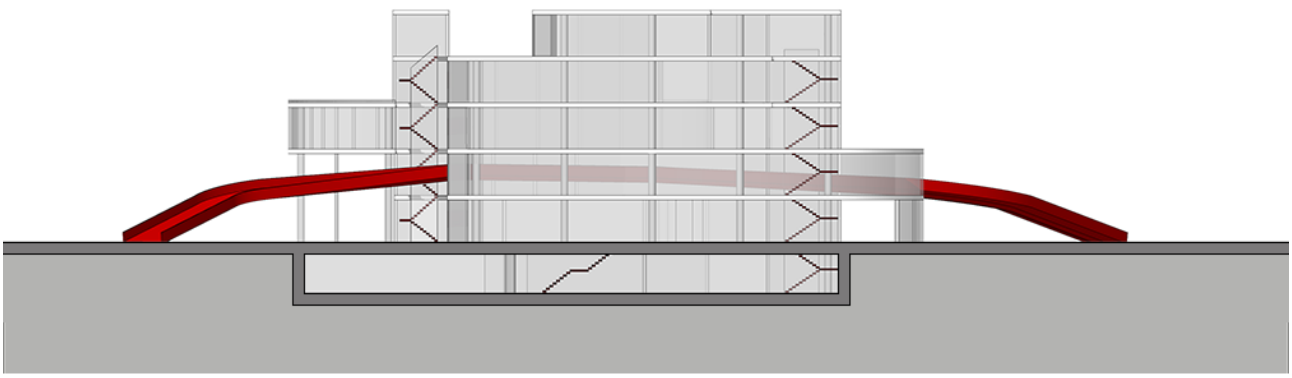
3.2.3. MOUNTAIN PASS OPPOSED DOUBLE RAMP

MOUNTAIN PASS

OPOSSED DOUBLE RAMP

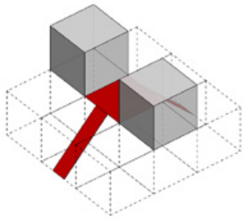
MP-01

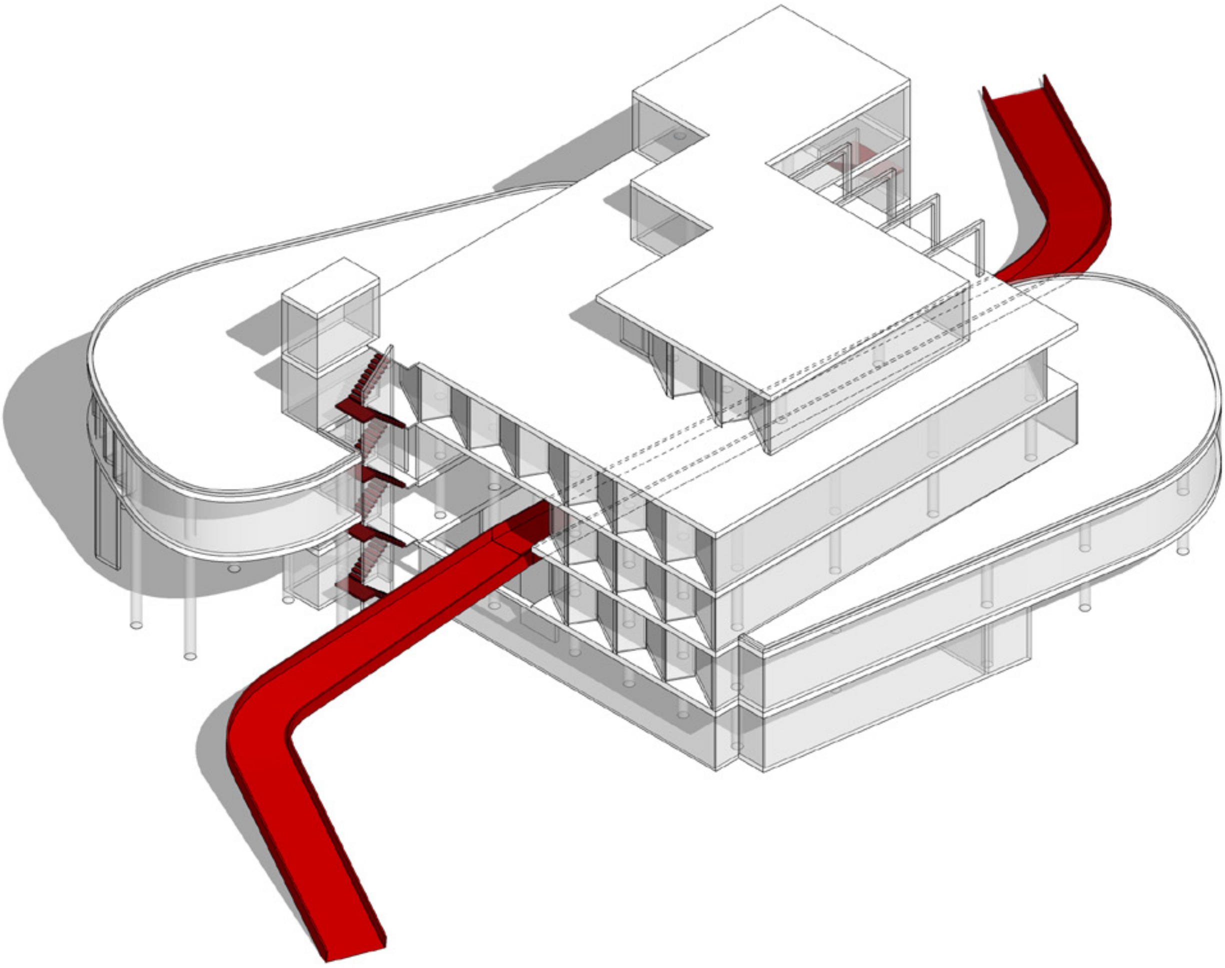




The Carpenter Center for the Visual Arts has a distribution system based on a vertical circulation axis consisting of an elevator and a curved ramp up to the upper levels. The ramp is a defining feature of the building and allows for uninterrupted access and exit of visitors. The exciting thing about this ramp is that it goes up to a high point of the building, from which it distributes the spaces through a lobby, and this same ramp continues its descent. The access and exit are at opposite points. The type of distribution is punctual since the stairs lead directly to the space to be distributed.

Distribution Scheme





ARCHITECT:	Le Corbusier
NAME:	Carpenter Center
DATE:	1961
LOCATION:	Cambridge, United States
PROGRAM:	University

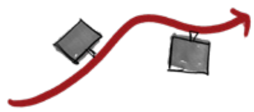
LEGEND:

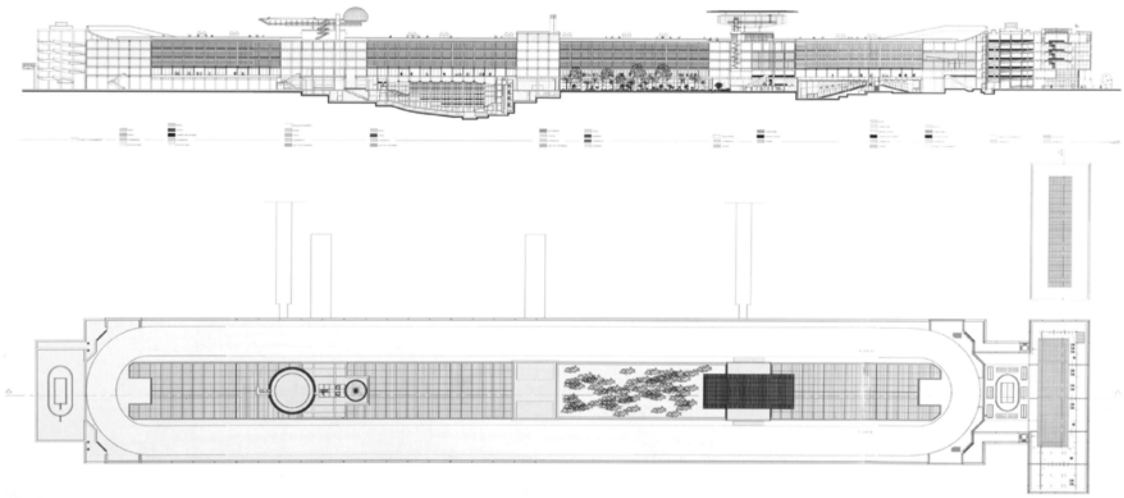
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

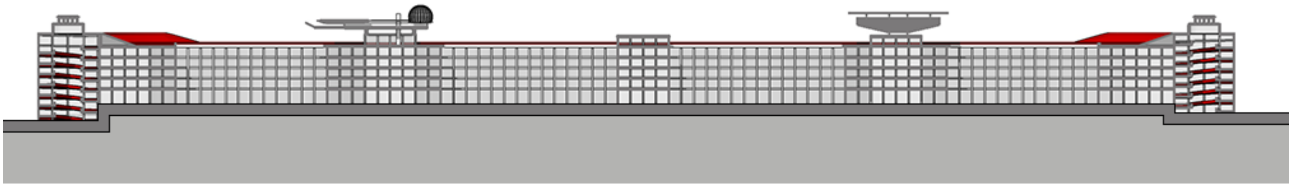
MOUNTAIN PASS

OPOSSED DOUBLE RAMP

MP-02

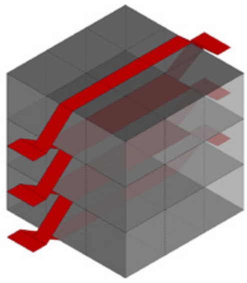


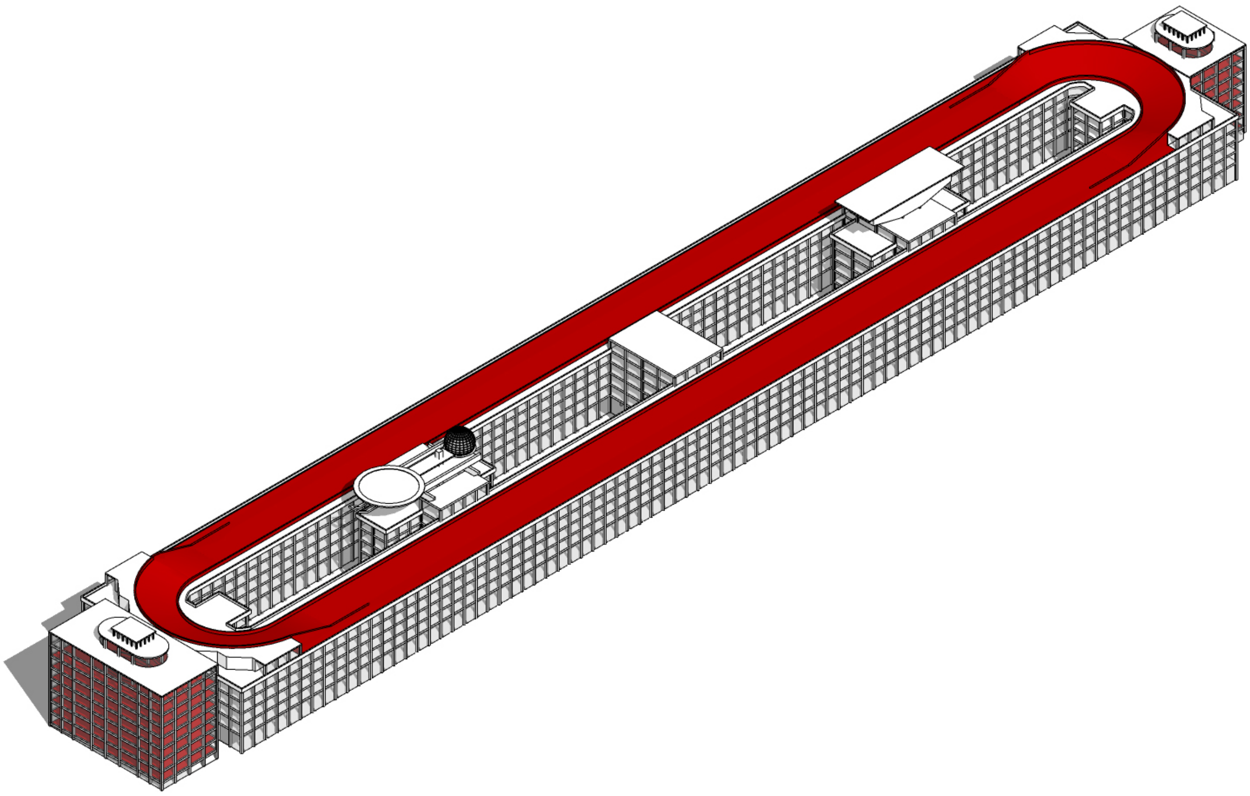




The Stabilimento FIAT Lingotto has a distribution system organised around one ramp module at each end, which allows for the smooth flow of cars, materials, and people throughout the factory. The factory's unique feature is the rooftop test track, which was used to test the newly produced vehicles. This test track was accessed by a spiral ramp at one end of the building. The ramp's design also enabled the delivery of raw materials to the upper floors, making the factory's production process more efficient. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.

Distribution Scheme





ARCHITECT: Giacomo Mattè-Trucco
NAME: Stabilimento FIAT Lingotto
DATE: 1915-1930
LOCATION: Turin, Italy
PROGRAM: Factory

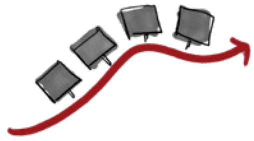
LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~

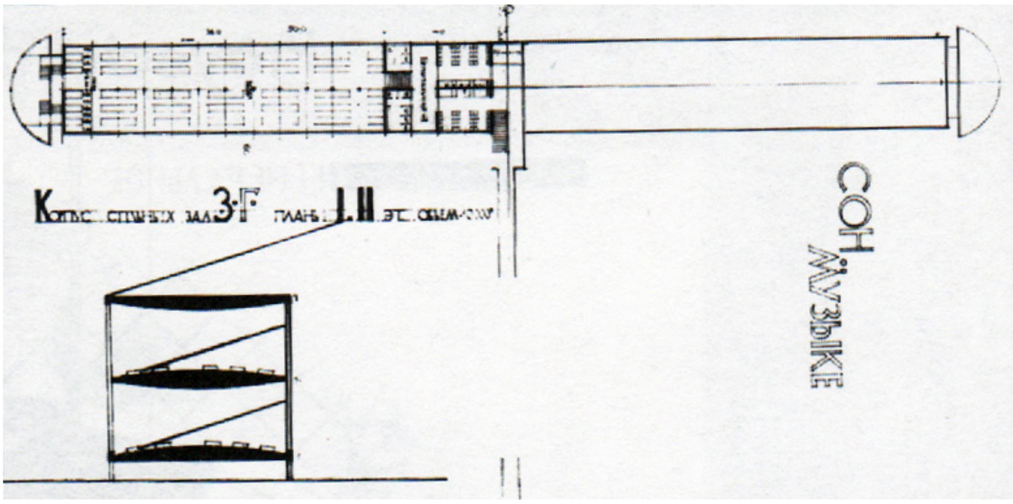
— *non-present*

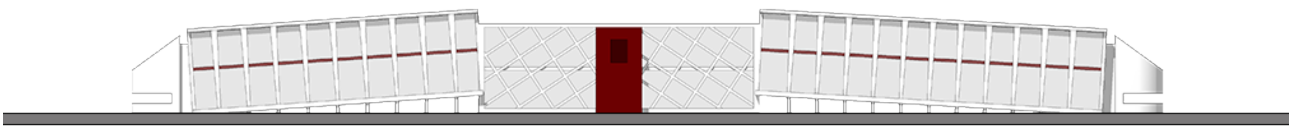
MOUNTAIN PASS

OPOSSED DOUBLE RAMP

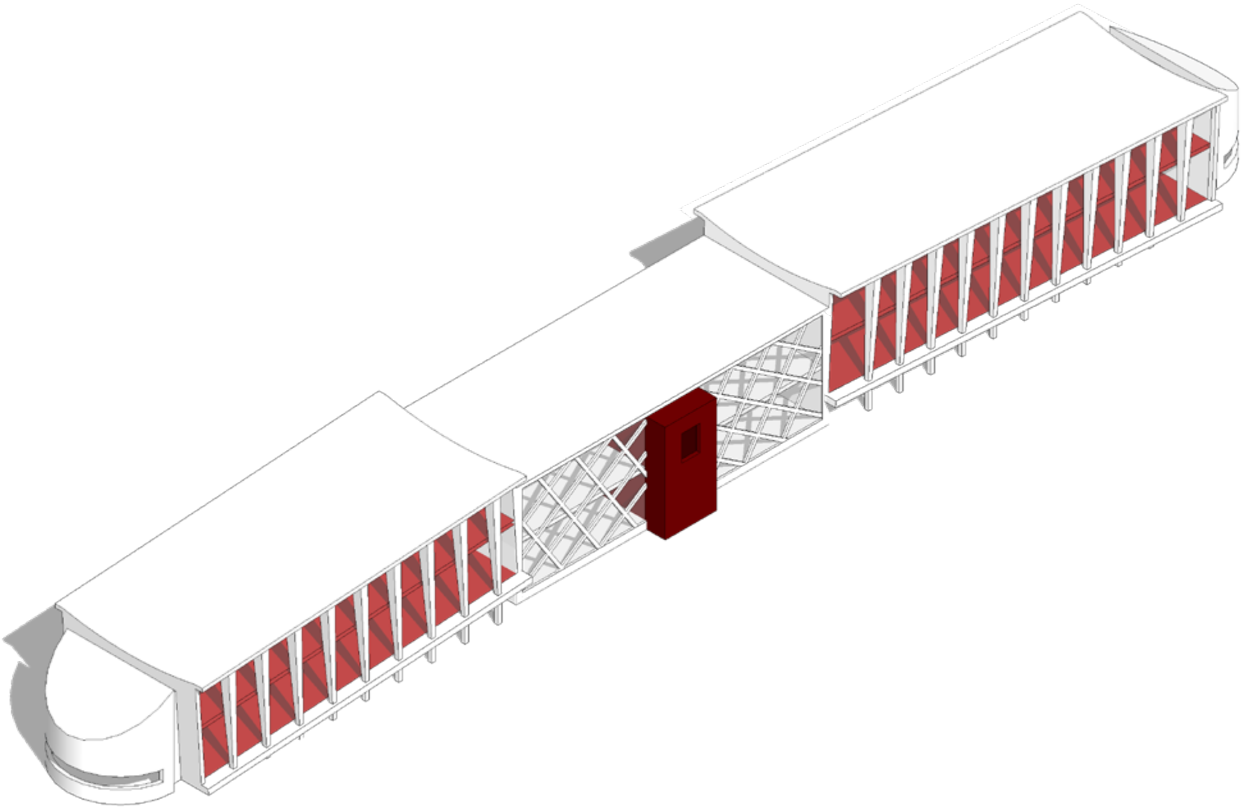
MP-03







The Dormitorio Bloque features a unique distribution system where individual rooms are arranged along the ramp that leads to the upper floors. The ramp was designed to optimise the circulation of people and goods throughout the building, allowing for efficient movement and easy access to all rooms. The ramp also serves as a communal space where students can socialise and interact with each other. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



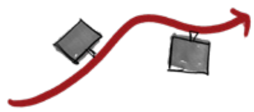
ARCHITECT: Konstantin Stepanovich Melnikov
NAME: Dormitorio Bloque
DATE: 1929
LOCATION: Russia
PROGRAM: Residential Building

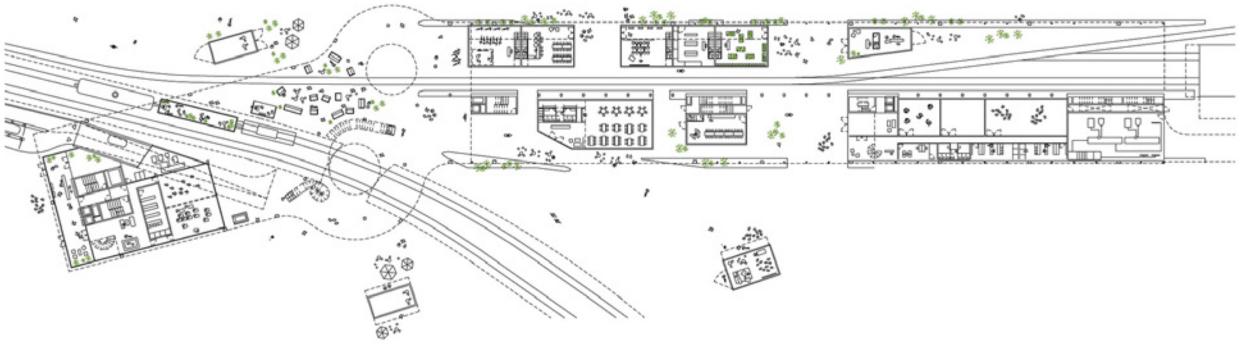
LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

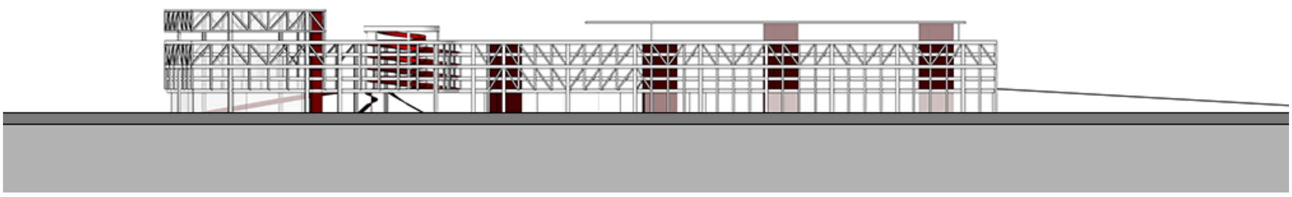
MOUNTAIN PASS

OPOSSED DOUBLE RAMP

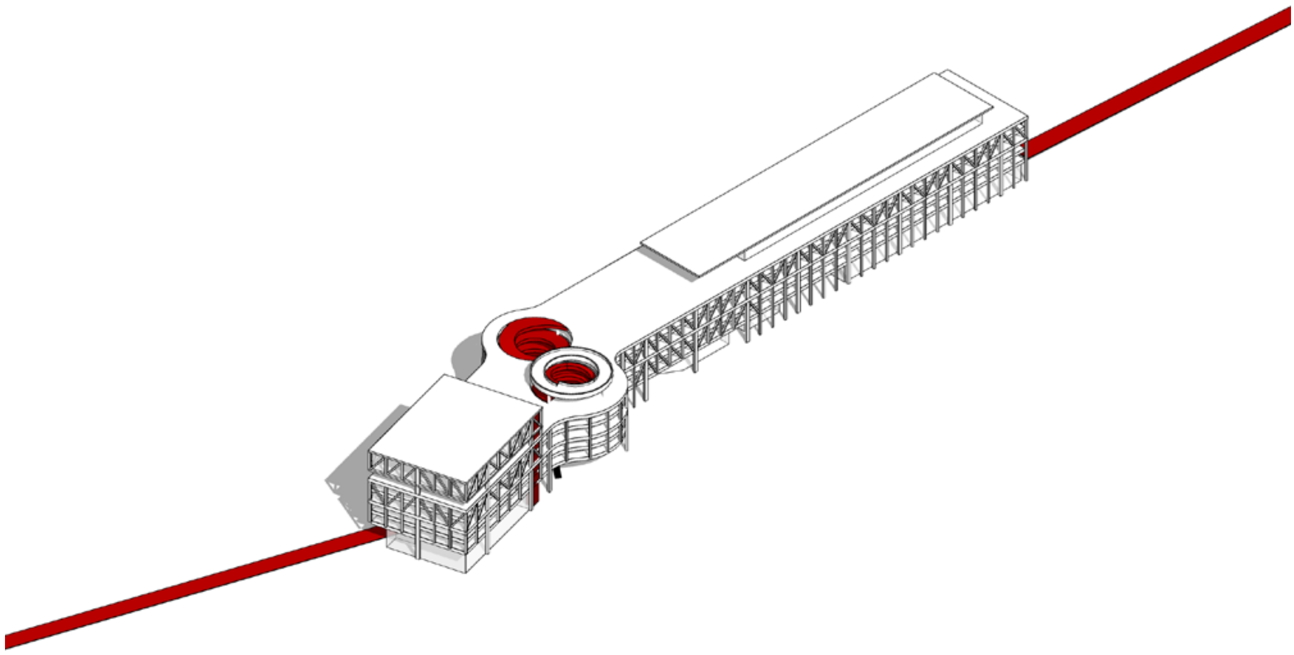
MP-04







The Transform existing parking structure is a multi-functional space by inserting a new spiral ramp. The ramp serves as the central element of the design and connects different levels of the building while providing a new circulation system. People are distributed through the building using the ramp as the primary circulation means. The design emphasises creating a transformative space by rethinking existing infrastructure and providing new spatial experiences. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



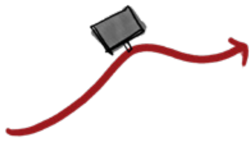
ARCHITECT: HHF Architects
NAME: Transform Existing Parking structure
DATE: 2014
LOCATION: Basel, Switzerland
PROGRAM: Parking

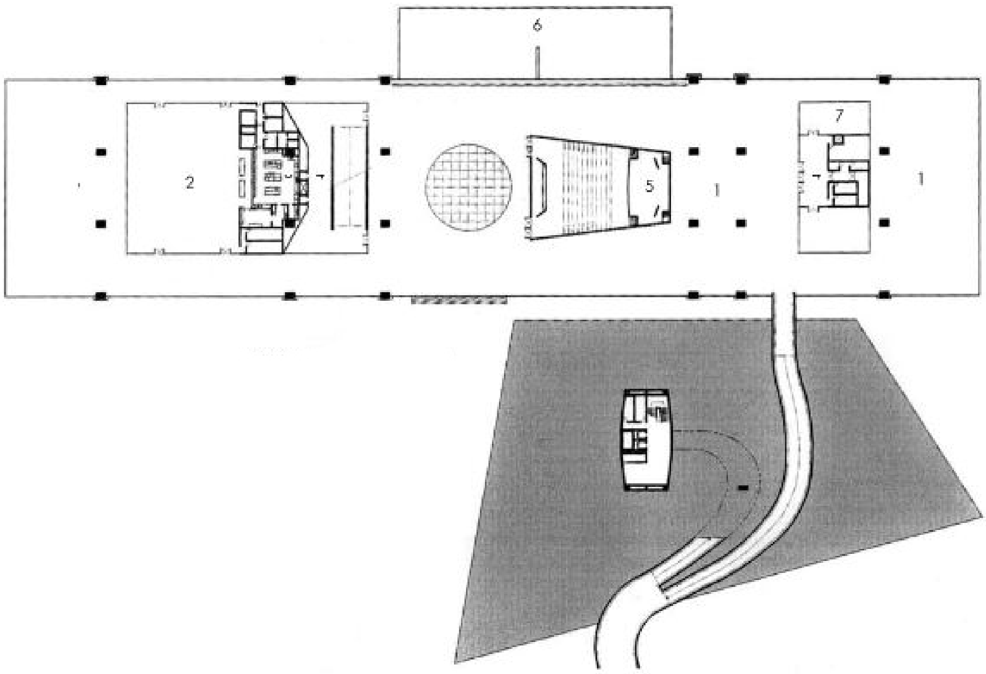
LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

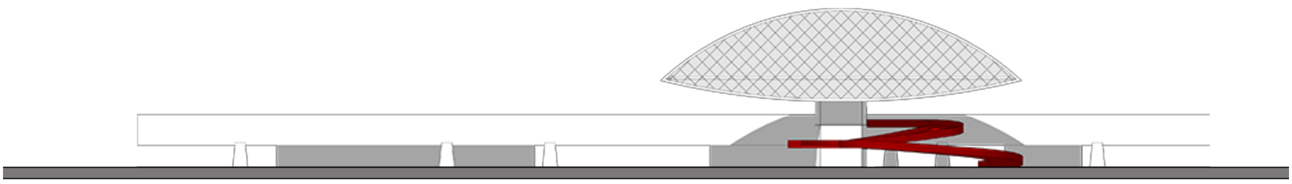
MOUNTAIN PASS

OPOSSED DOUBLE RAMP

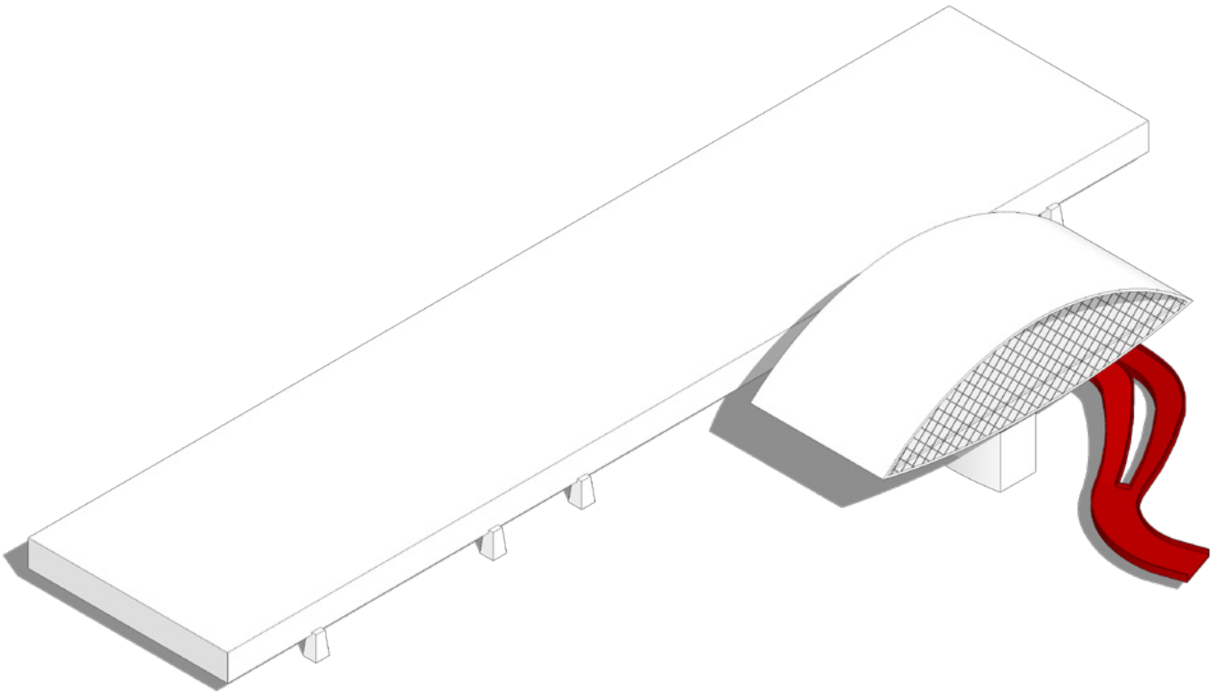
MP-05







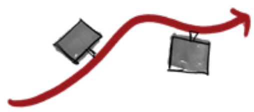
The Oscar Niemeyer Museum's distribution system works through a central axis that organises the various exhibition spaces and galleries. Visitors are distributed throughout the museum through ramps that lead to different sites. The ramp is a crucial feature of the museum's design and allows for a continuous flow of movement through the different spaces, creating a dynamic and immersive experience. The type of distribution is punctual since the stairs lead directly to the space to be distributed.



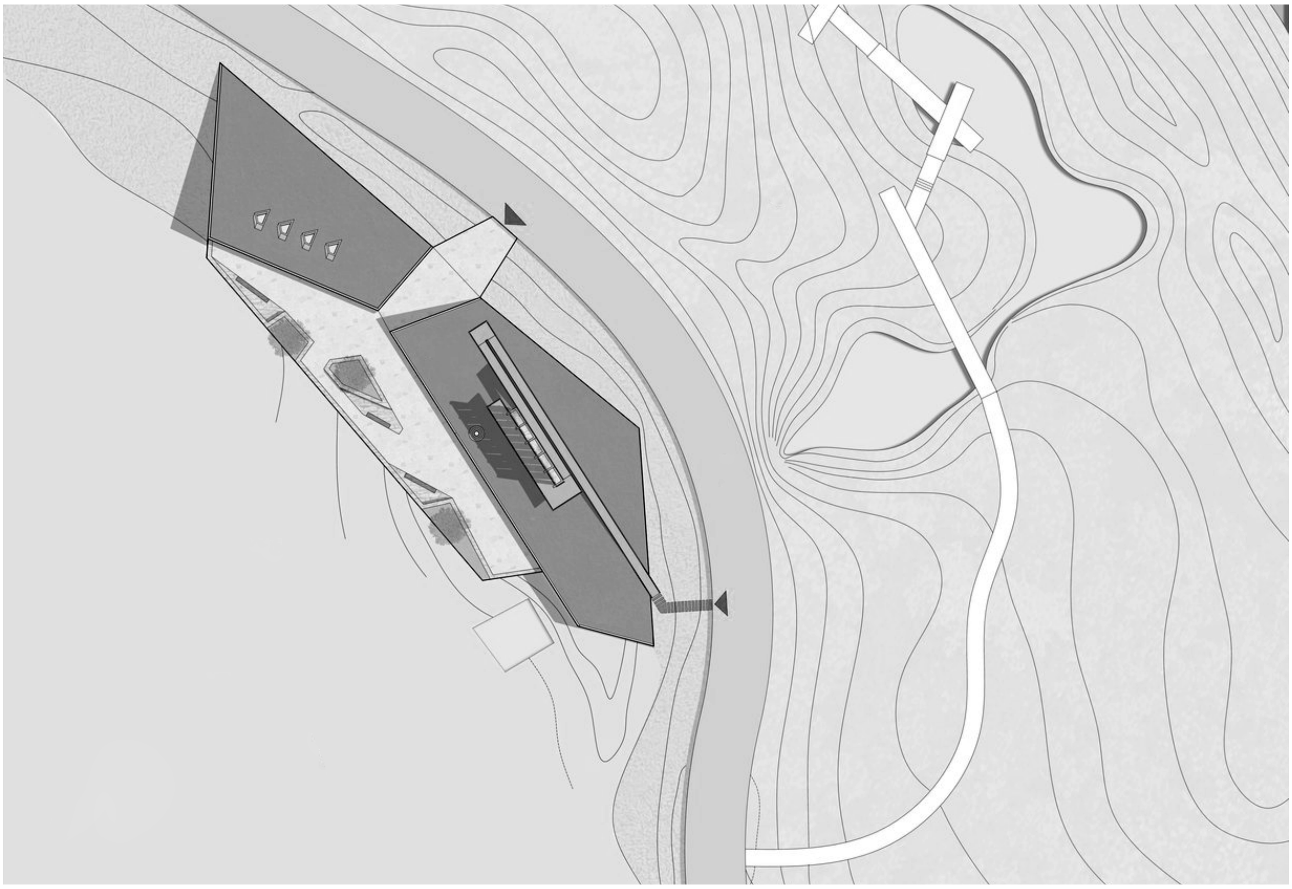
ARCHITECT: Oscar Niemeyer
NAME: The Oscar Niemeyer Museum
DATE: 2002
LOCATION: Curitiba, Brazil
PROGRAM: Museum

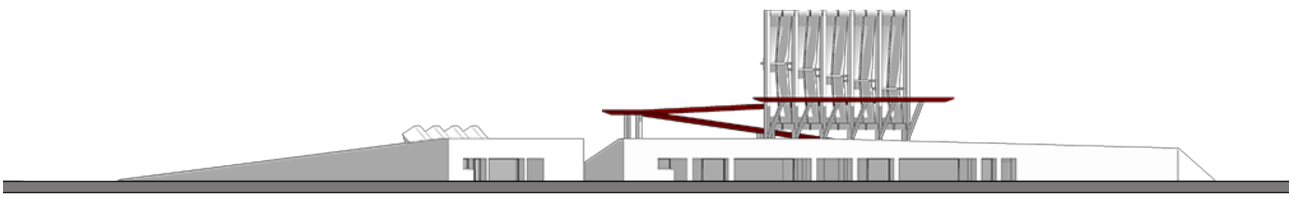
LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAIN PASS
OPOSSED DOUBLE RAMP

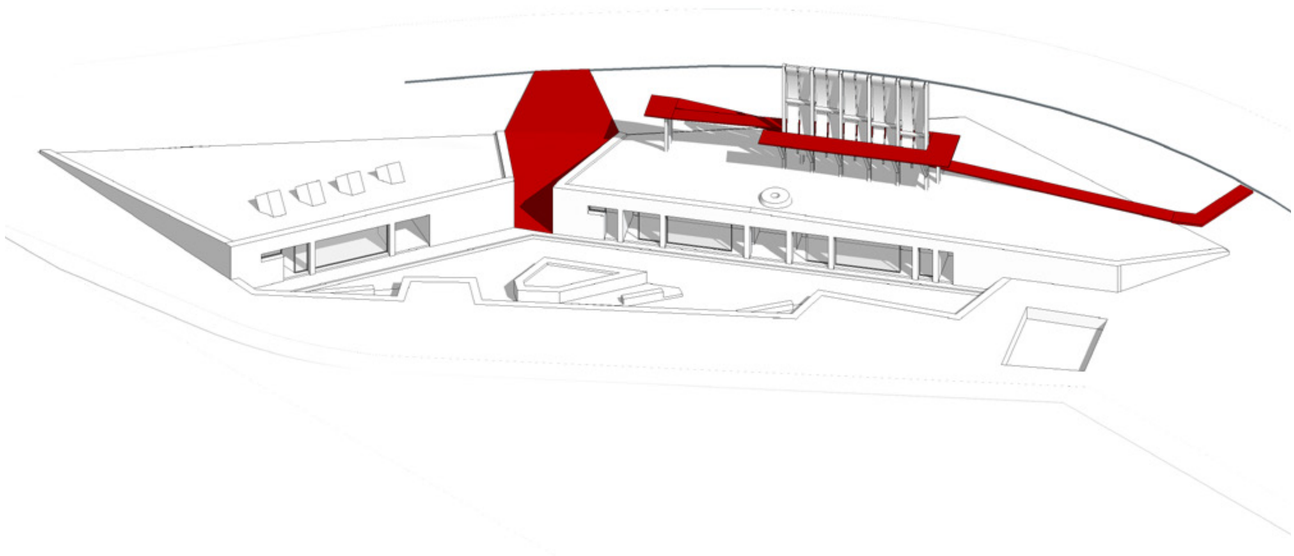


MP-06





The Service Station of the Ecological Corridor has a distribution system that maximises natural light and ventilation and is seamlessly integrated into the surrounding landscape. The people have distributed in the building in a way fluidity. The ramp of the building is an important feature, as it not only distributes but also offers the possibility of other programmatic functions, such as providing panoramic views of the surrounding mountains and lake. The type of distribution is diffuse since the spaces to be distributed are not found serially but sporadically.



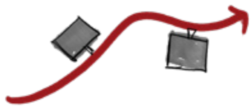
ARCHITECT: 3andwich Design, He Wei Studio
NAME: Service station of the Ecological Corridor
DATE: 2021
LOCATION: Dali, China
PROGRAM: Station

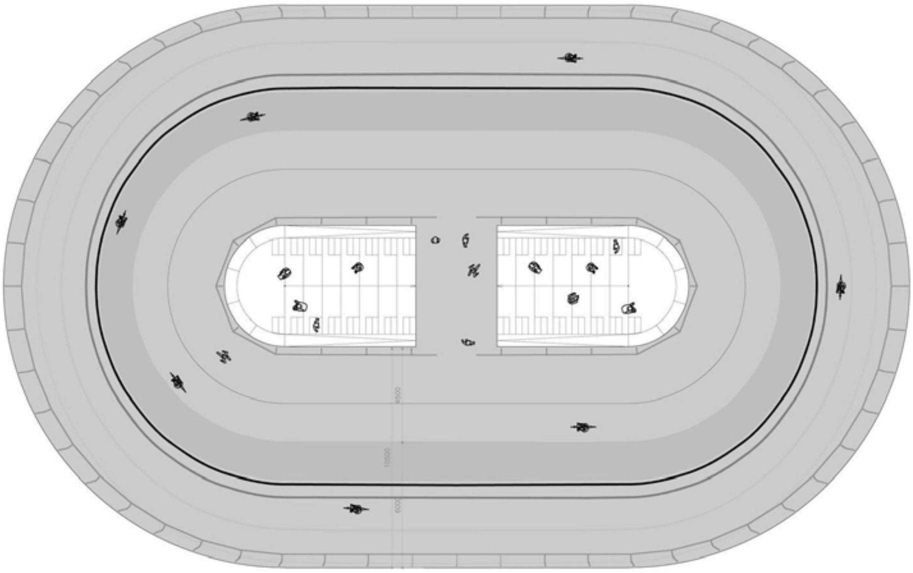
LEGEND:
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- ~~INTERNAL STAIRS~~
- ~~EXTERNAL STAIRS~~
- — *non-present*

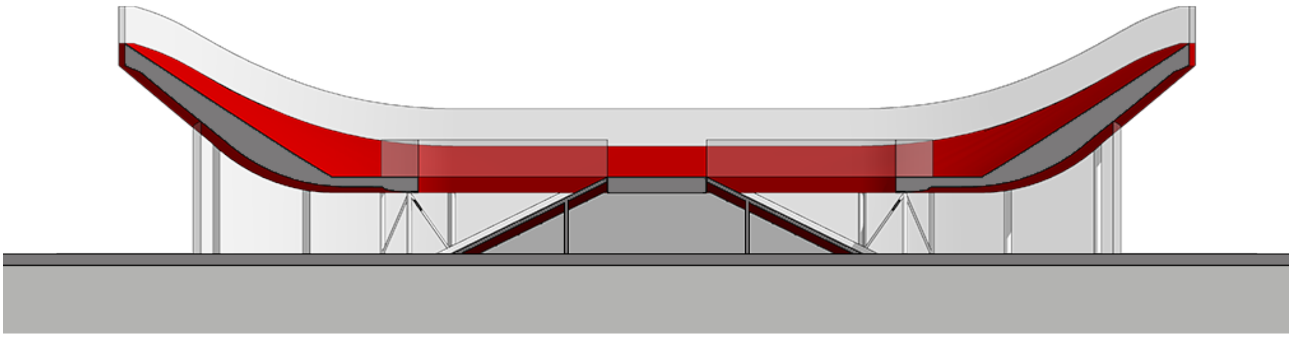
MOUNTAIN PASS

OPOSSED DOUBLE RAMP

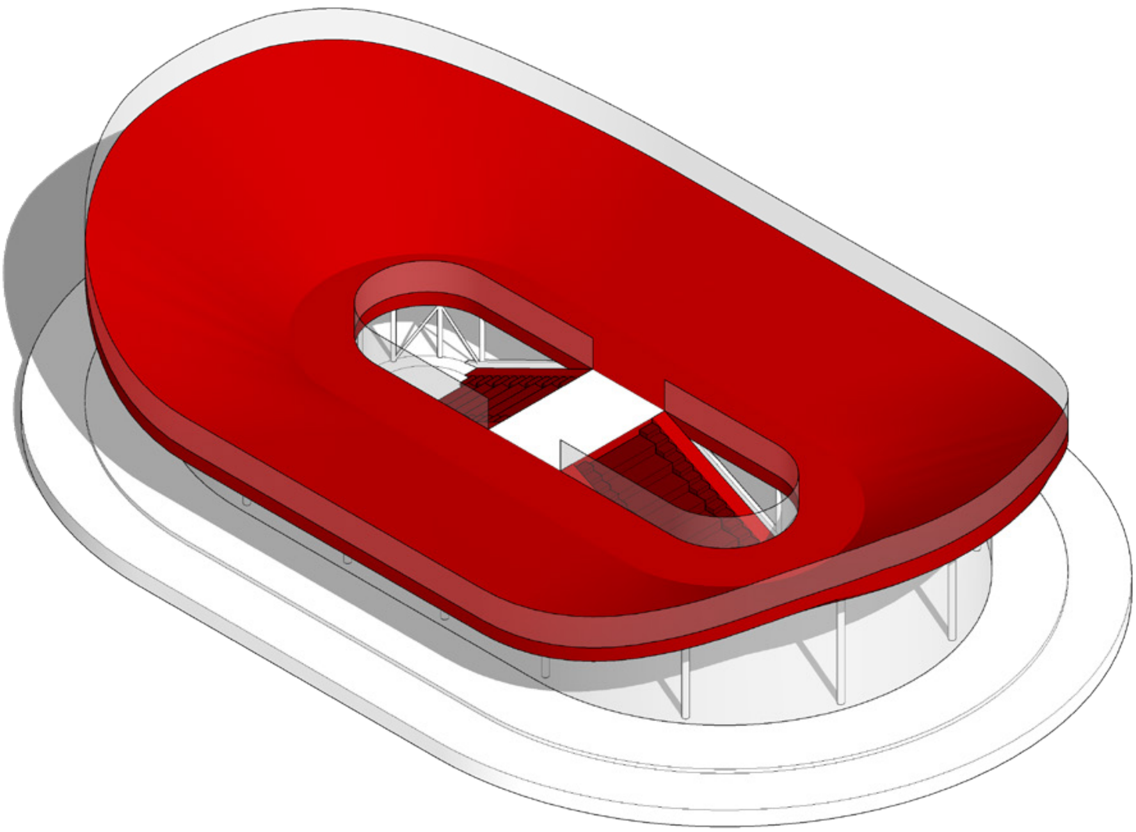
MP-07







The Bicycle Club is a circular building designed to store, maintain, and try bicycles. The distribution system in the building is simple but effective, with a central ramp that takes cyclists to the upper floors where bikes can be parked or tested. The ramp also doubles as a public path, giving visitors a unique view of the surrounding area. People are distributed throughout the building depending on its purpose, with the service and storage areas on the ground floors and the common areas on the upper floor. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



ARCHITECT: NL Architects
NAME: Bicycle Club
DATE: 2012
LOCATION: Sanya, China
PROGRAM: Pavilion

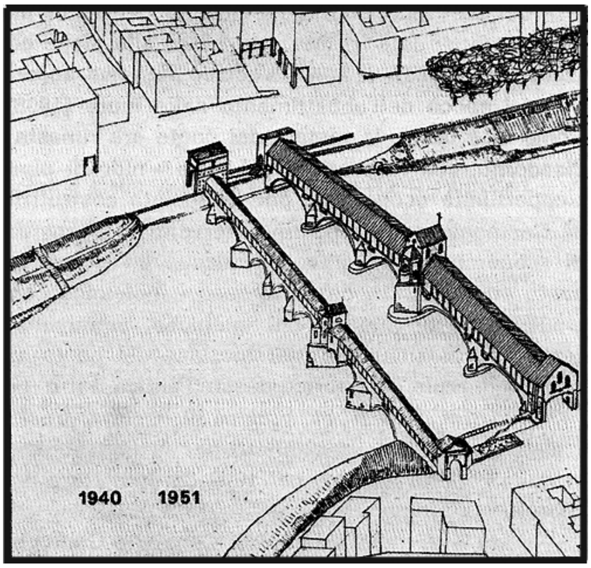
LEGEND:

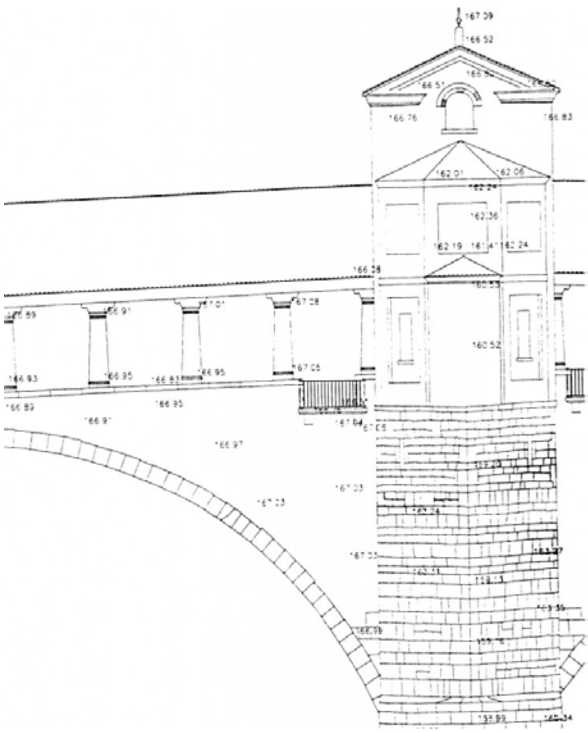
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

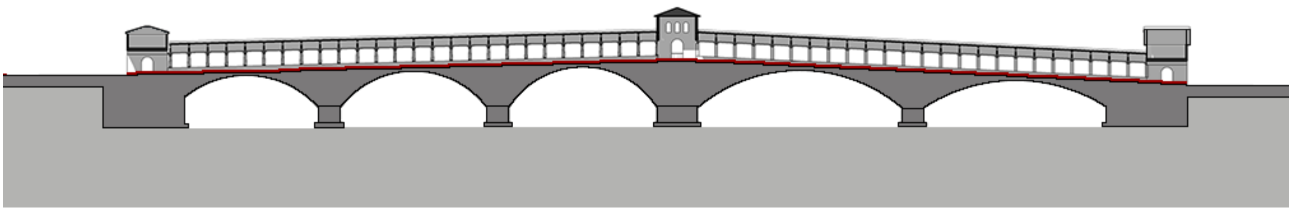
MOUNTAIN PASS

OPOSSED DOUBLE RAMP

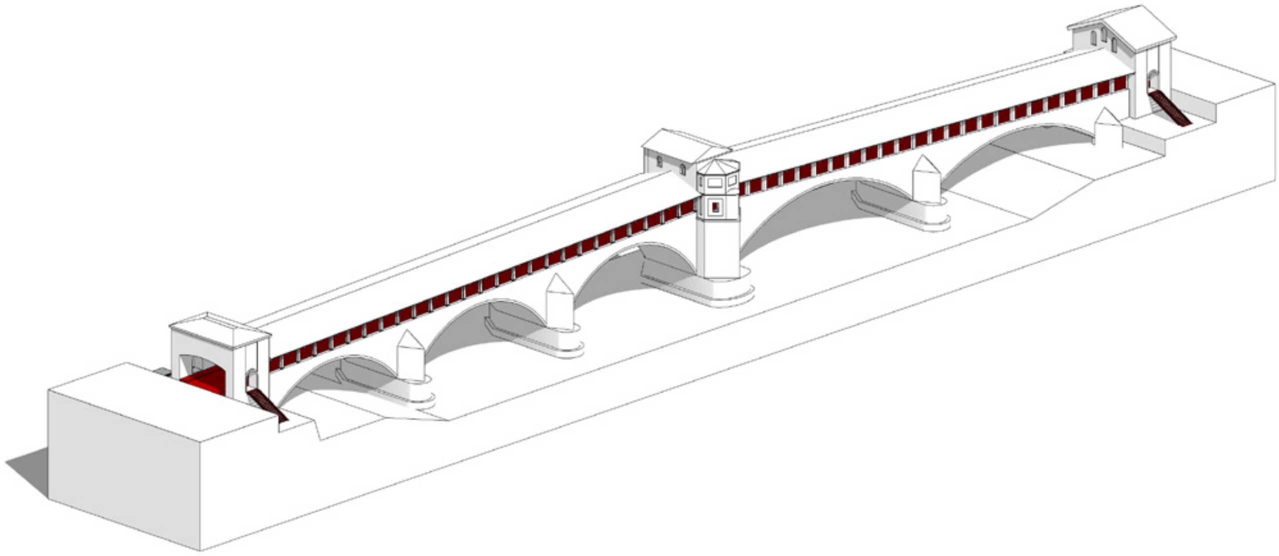
MP-08







The Ponte Coperto bridge spans the Ticino river and has a distribution system allowing it to pass through it. The bridge is primarily a pedestrian and bicycle-friendly zone with stairs and access ramps. The bridge is well-known for its covered archway that protects people from harsh weather conditions and offers a beautiful view of the river. The width of the ramp allows people to walk and enjoy the view and, at the same time, have spaces to stay. The type of distribution is punctual since the stairs lead directly to the space to be distributed.



ARCHITECT:	Giovanni da Ferrara
NAME:	Ponte Coperto
DATE:	1351
LOCATION:	Pavia, Italy
PROGRAM:	Bridge

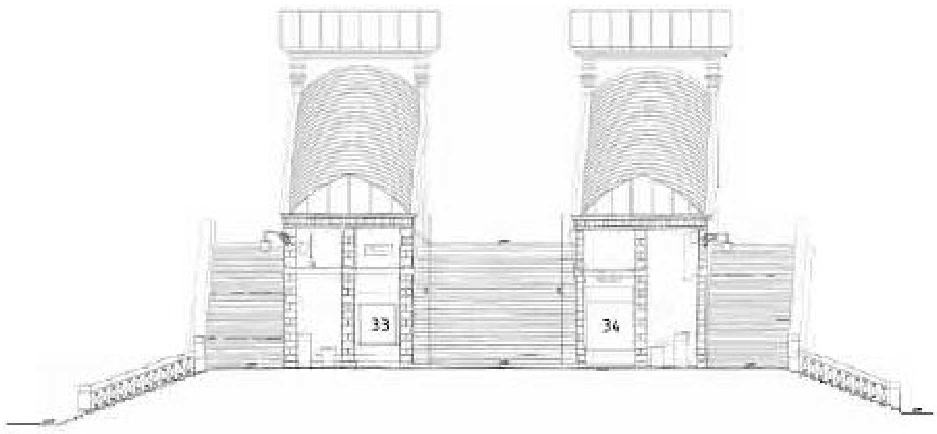
LEGEND:

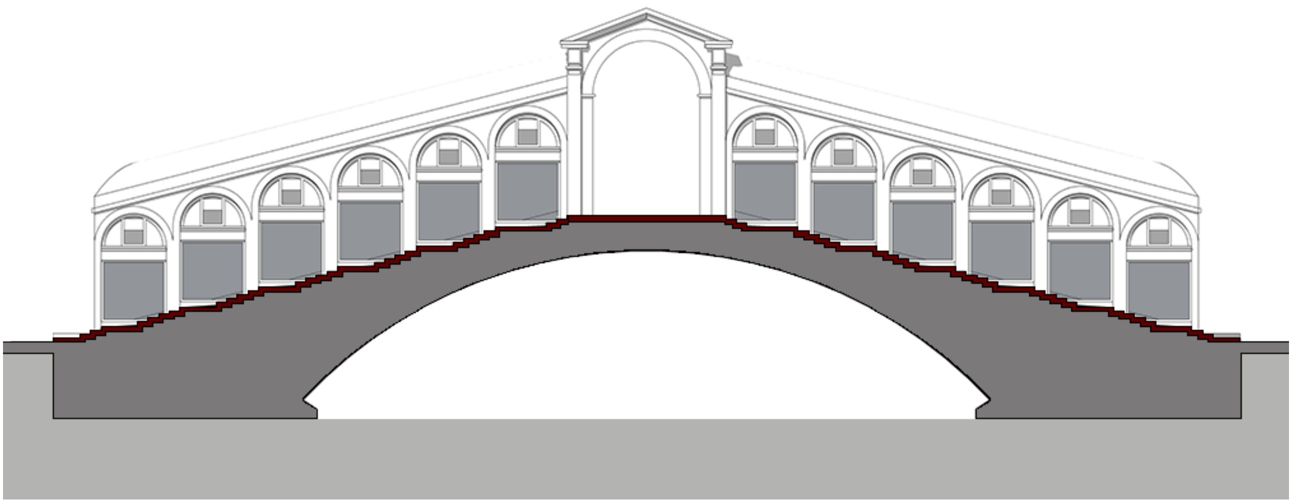
- ~~SERVED SPACES~~
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- ~~INTERNAL STAIRS~~
- EXTERNAL STAIRS
- — *non-present*

MOUNTAIN PASS

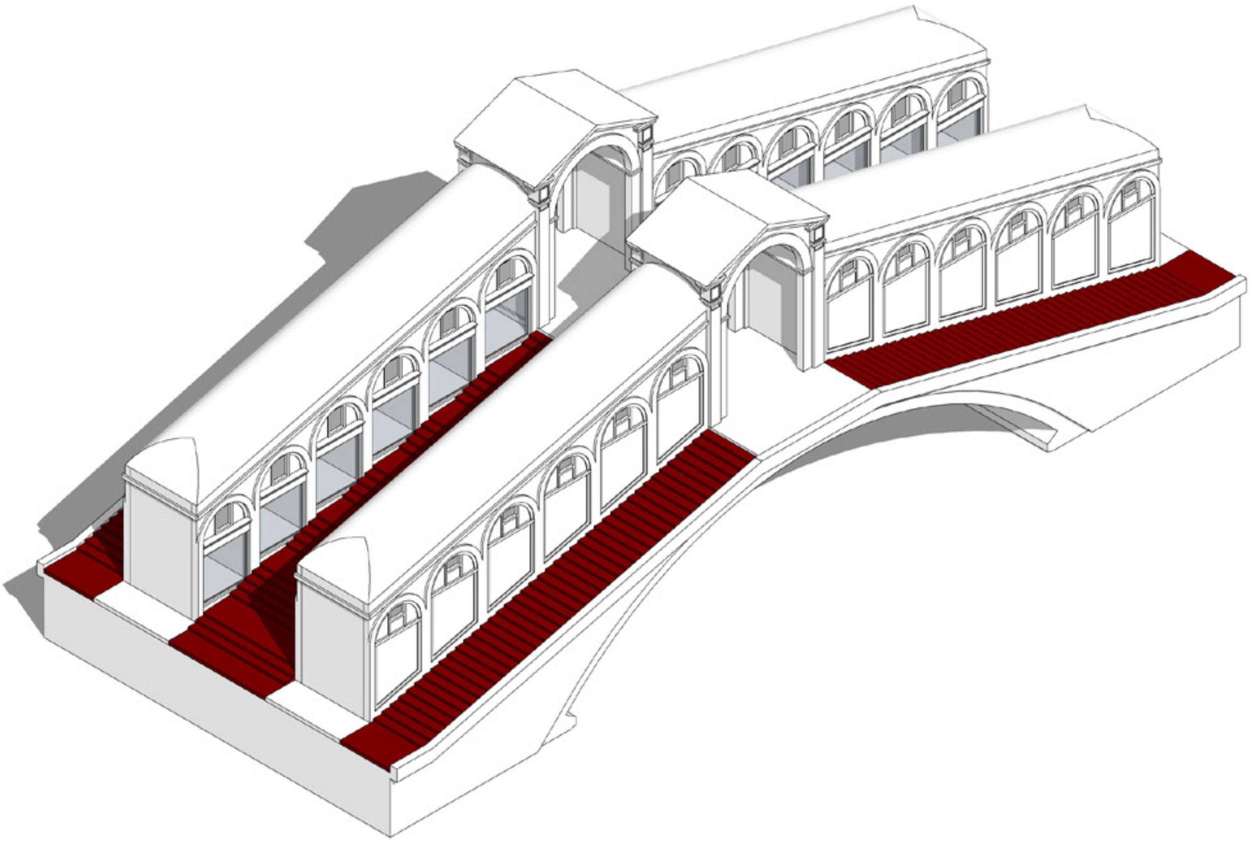
OPOSSED DOUBLE RAMP

MP-09





The Ponte di Rialto has a distribution system with three walkways: two on the outer edges and one in the centre. The wider central walkway was used for market stalls, while the two outer walkways were used for pedestrian traffic. The bridge is known for its distinctive ramp, which provides a gradual ascent and descent for pedestrians and a platform for taking in the views of the Grand Canal. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT: Antonio da Ponte
NAME: Ponte di Rialto
DATE: 1588-1591
LOCATION: Venezia, Italy
PROGRAM: Bridge

LEGEND:

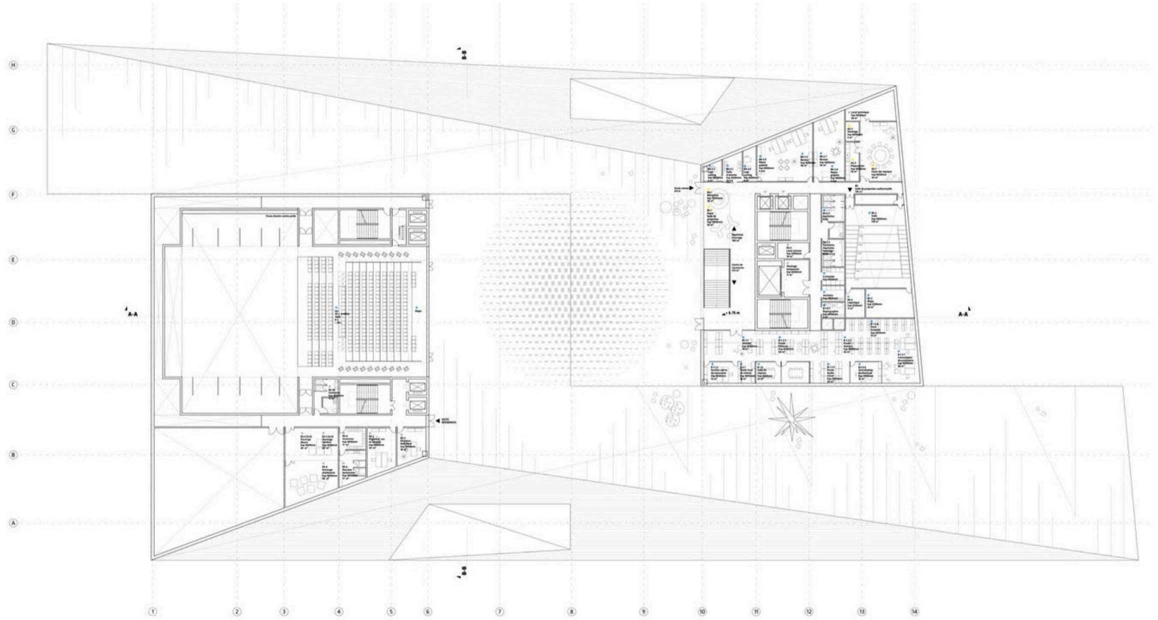
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- ~~EXTERNAL RAMPS~~
- ~~INTERNAL STAIRS~~
- EXTERNAL STAIRS

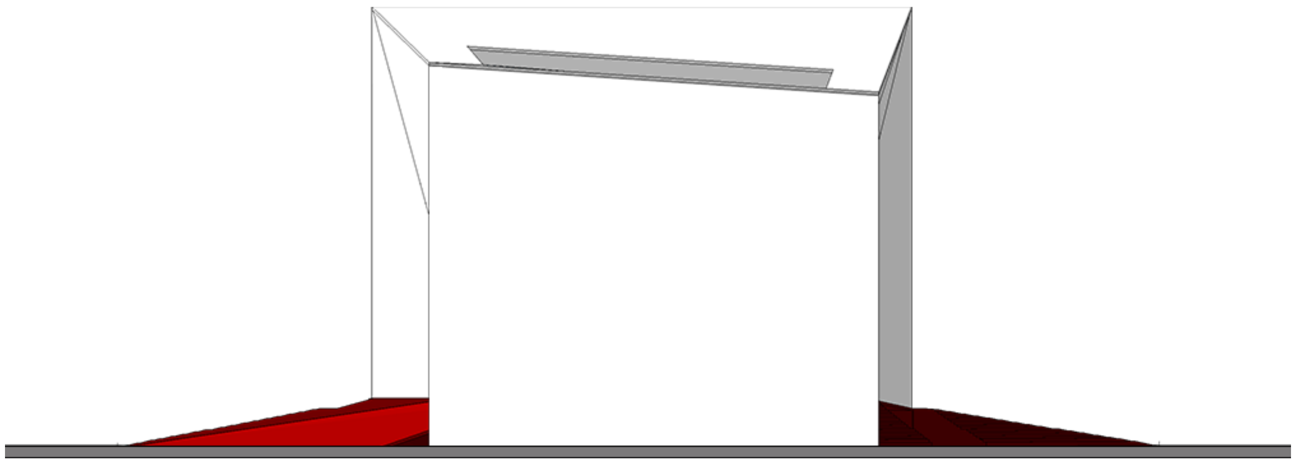
— *non-present*

MOUNTAIN PASS

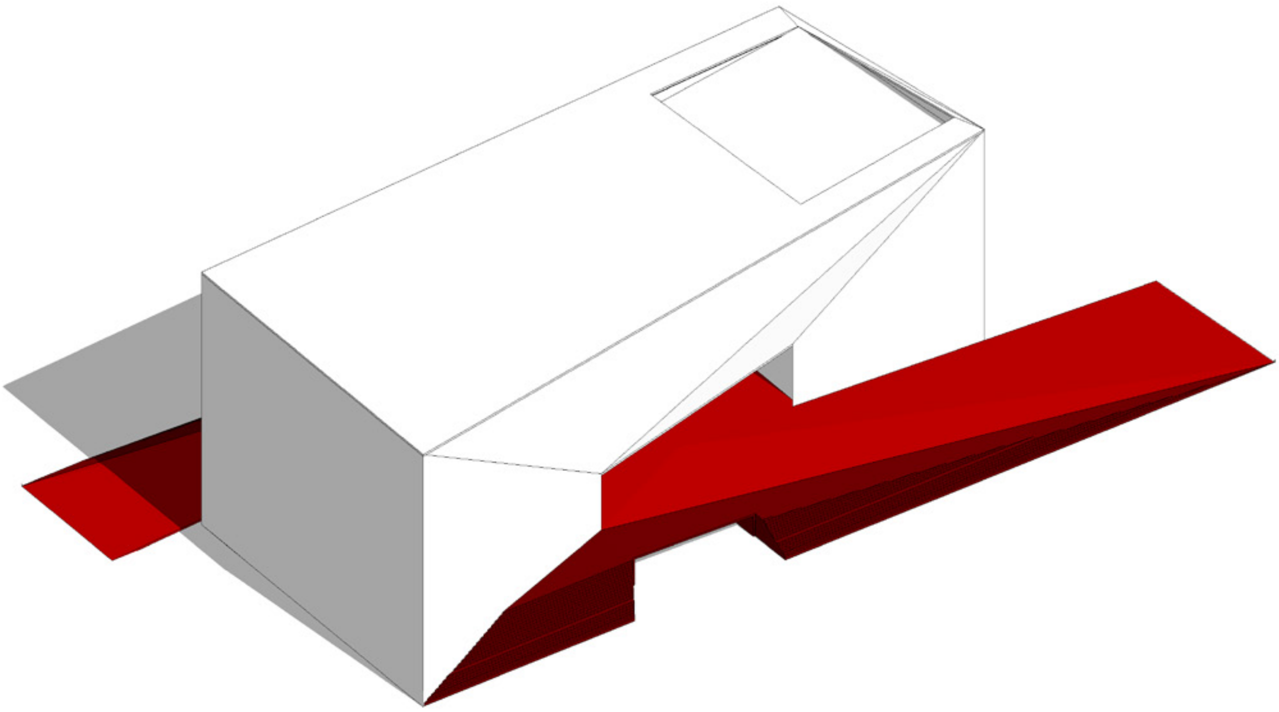
OPOSSED DOUBLE RAMP

MP-10





MÉCA is a cultural centre featuring three programmatic volumes linked by a central public space. The building's distribution system is centred around this public space, which functions as a nexus for the various cultural activities within the centre. The most striking feature of the building is its massive exterior ramp, which curves around the corner of the building and doubles as a public arena. This ramp is a unique circulation element, providing visitors access to different building levels and functioning as a public gathering space. The type of distribution is punctual since the stairs lead directly to the space to be distributed.



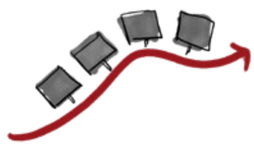
ARCHITECT:	BIG Architects
NAME:	MÉCA - Maison de l'Économie Créative
DATE:	2019
LOCATION:	Bordeaux, France
PROGRAM:	Cultural Center

LEGEND:

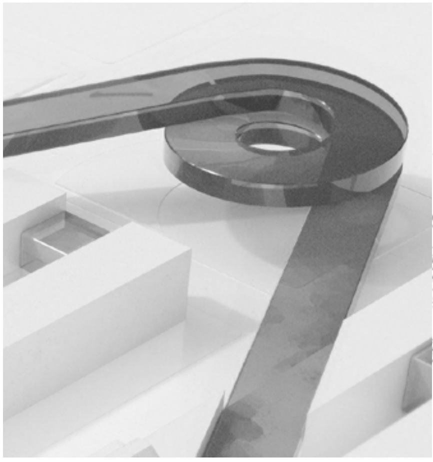
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- EXTERNAL STAIRS
- — *non-present*

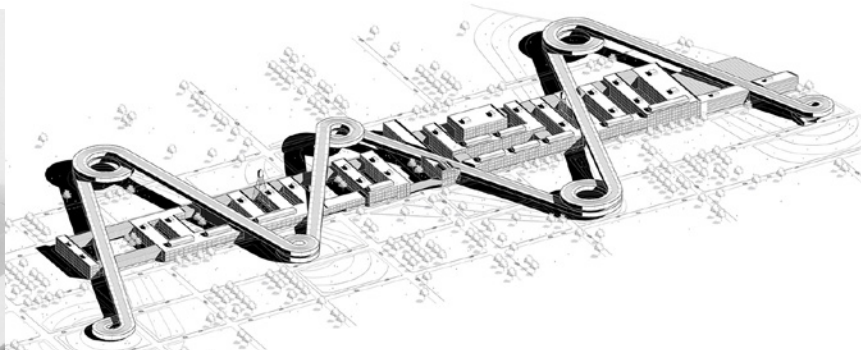
MOUNTAIN PASS

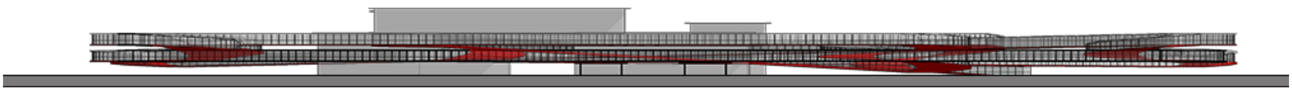
OPOSSED DOUBLE RAMP



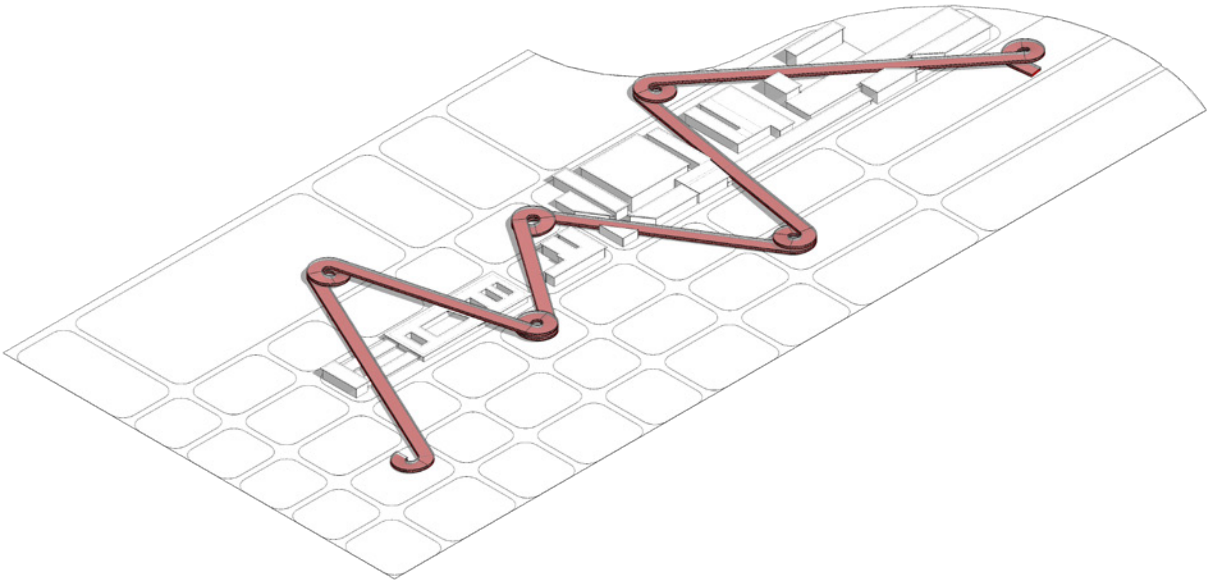
MP-11







The Packard Belt's distribution system is a ramp that intertwines different points of a former factory to generate a tour of all its facilities. The ramp stands out for separating access and exit to the museum. Thanks to this ramp, the distribution system connects multiple levels, thus allowing the possibility of a dynamic and fluid route for pedestrians and cars. The distributive system also allowed for flexible spaces that could be used for various purposes, including offices, exhibition spaces and workshops. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT:	Javier Galindo
NAME:	The Packard Belt (Second prize winner)
DATE:	2014
LOCATION:	Detroit, United States
PROGRAM:	Museum

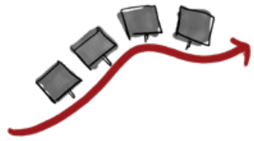
LEGEND:

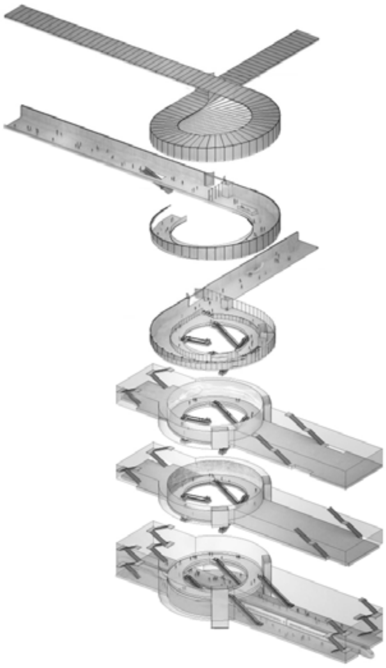
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- ~~INTERNAL STAIRS~~
- ~~EXTERNAL STAIRS~~
- — *non-present*

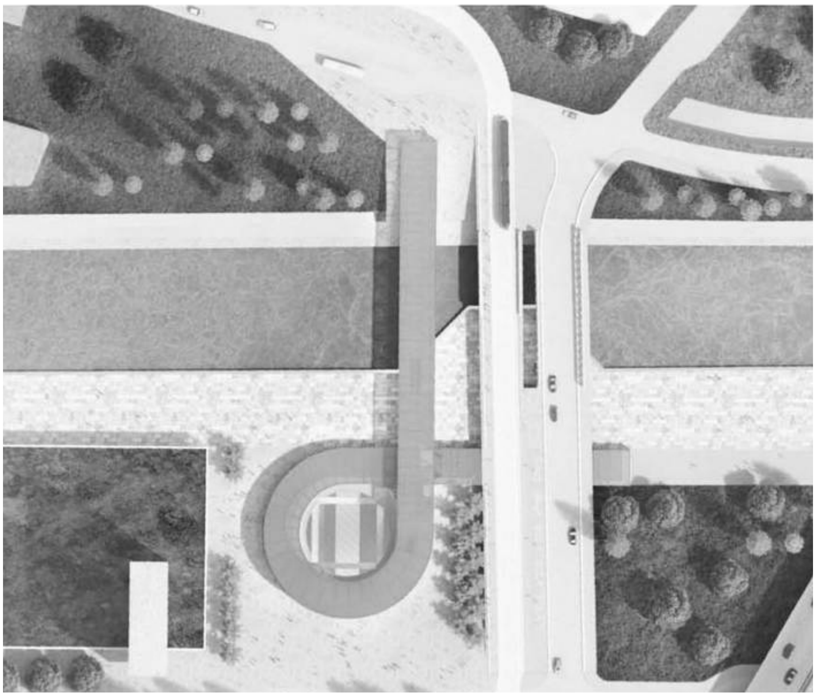
MOUNTAIN PASS

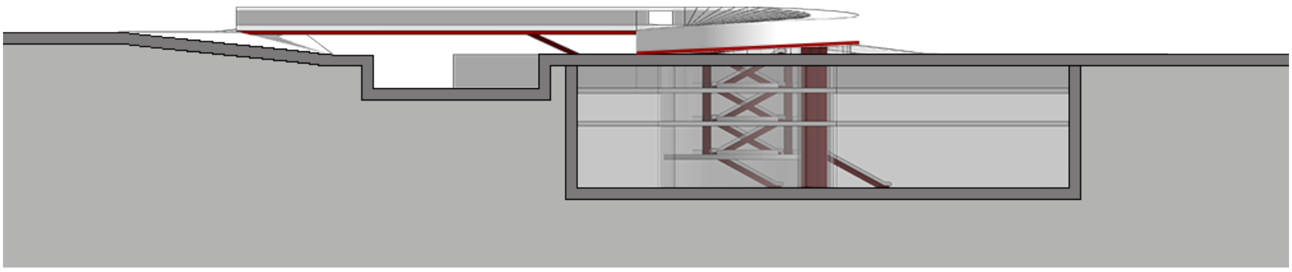
OPOSSED DOUBLE RAMP

MP-12

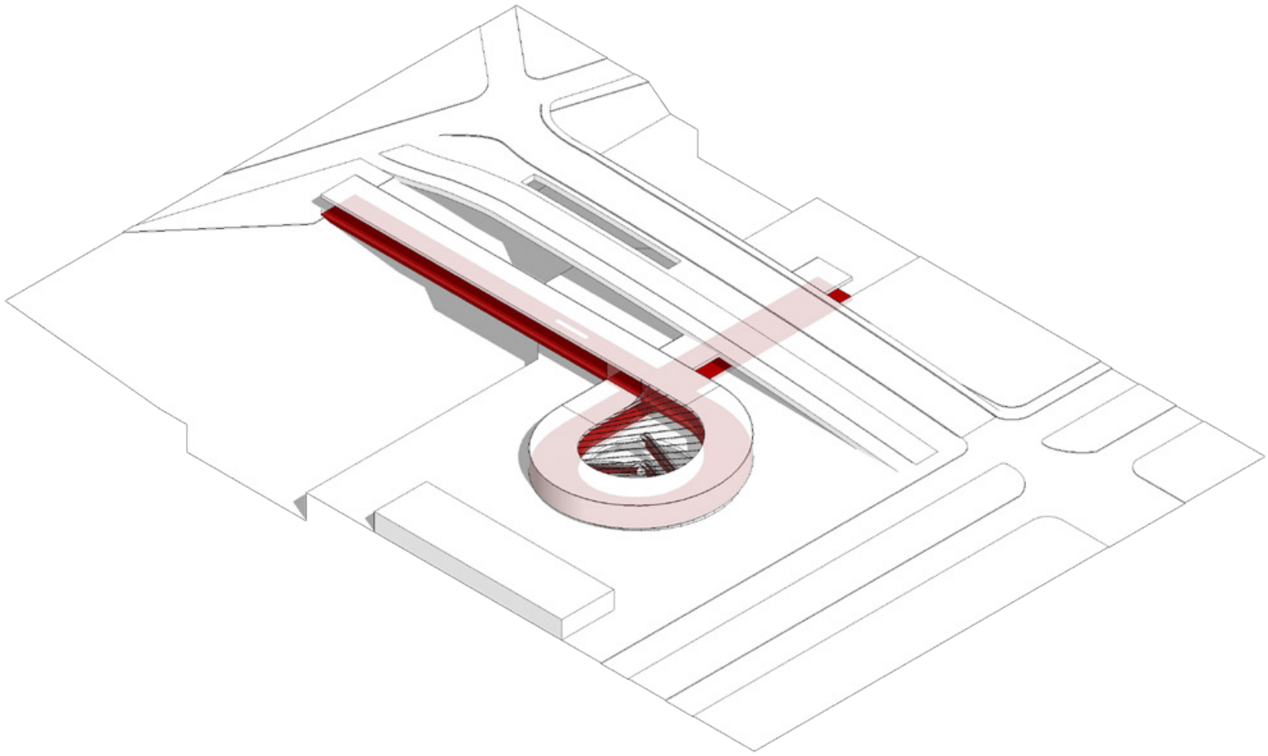








The Pont de Bondy Metro Station's distribution system emphasises accessibility and mobility. The station is at a central transportation hub, serving as an interchange point for two metro lines, bus routes, and bicycle paths. The building's design includes a large central atrium with ramps that connect all levels, providing an easy and intuitive circulation flow for passengers. The ramps serve not only as a functional distribution system but also as an element of passage and connection from one side of the city to the other. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



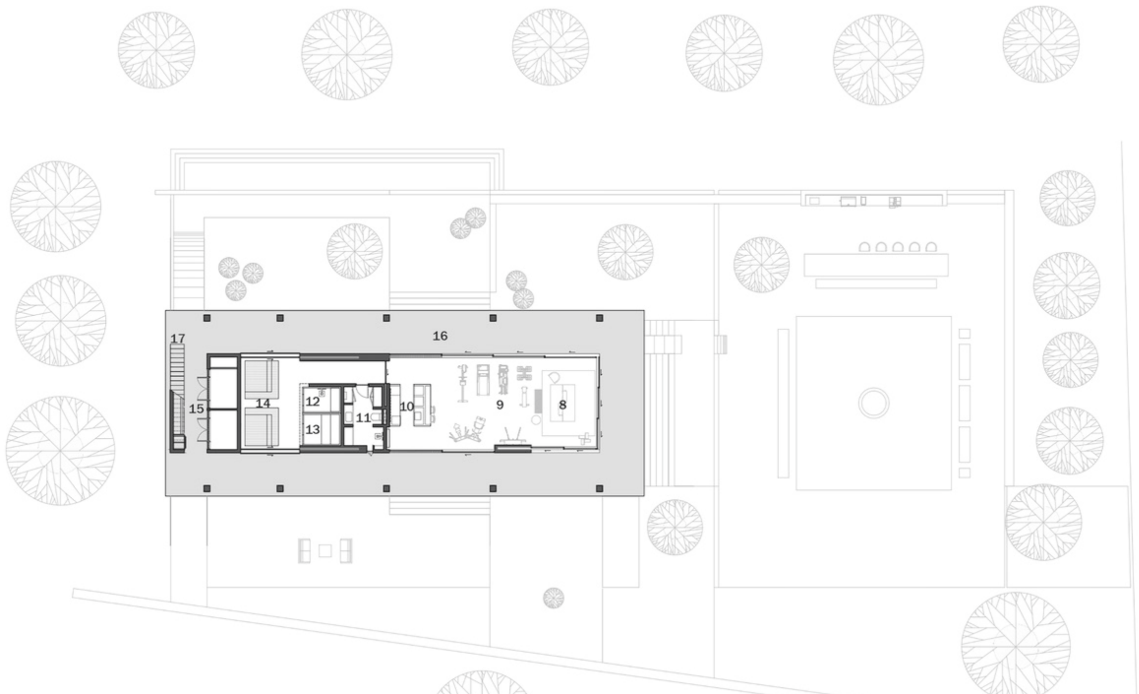
ARCHITECT: BIG + Silvio d'Ascia Architecture
NAME: Pont de Bondy Metro Station
DATE: 2016
LOCATION: Paris, France
PROGRAM: Metro Station

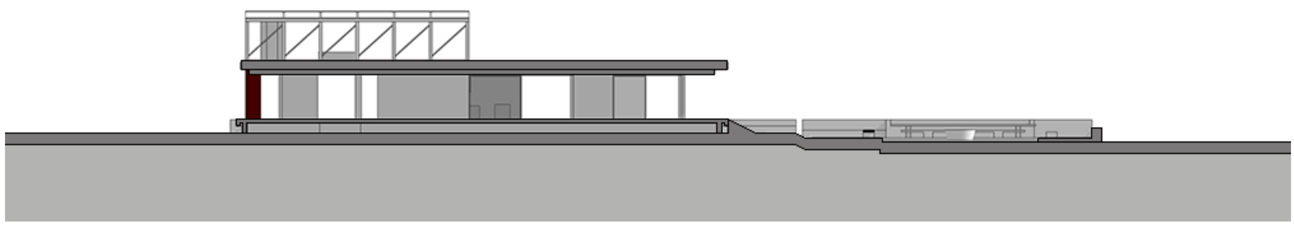
LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAIN PASS

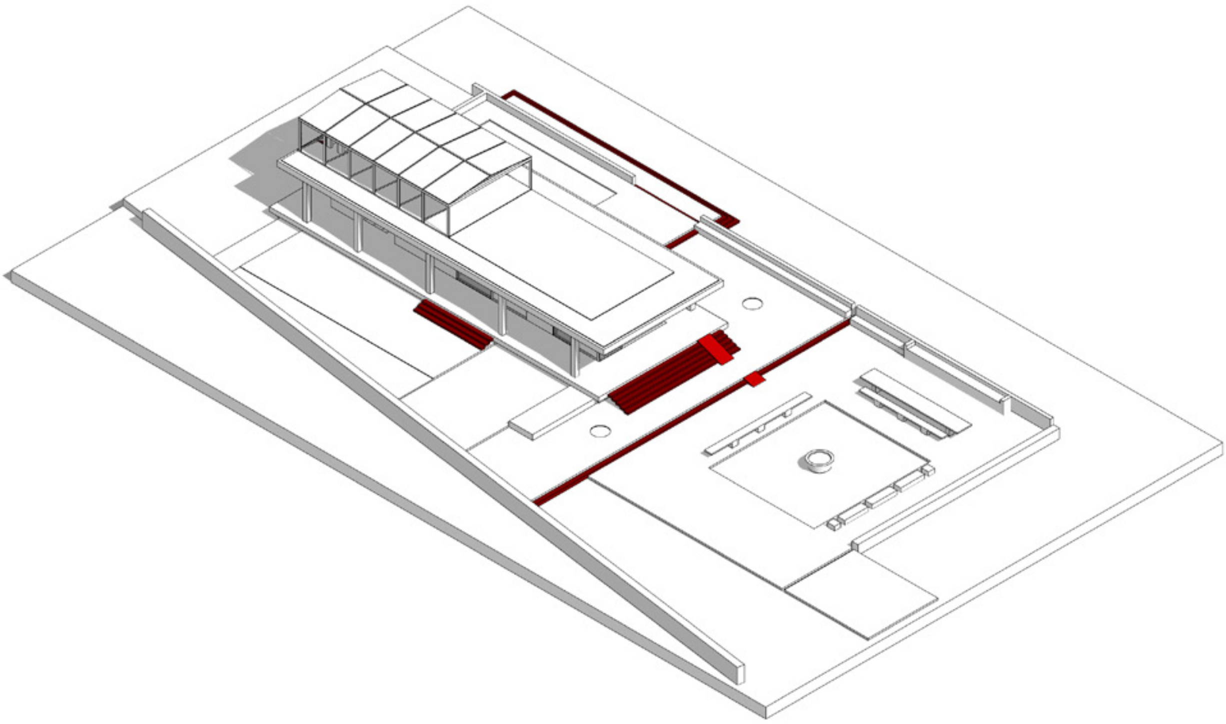
OPOSSED DOUBLE RAMP

MP-13





The CG Villa's distribution system is centred around an open-plan layout that provides ample space for movement and natural light. The large, open living area connects the bedrooms, kitchen, and outdoor spaces, creating a seamless flow throughout the villa. The ramp, one of the villa's most essential characteristics, provides easy access to the different areas of the house. The type of distribution is punctual since the stairs lead directly to the space to be distributed.



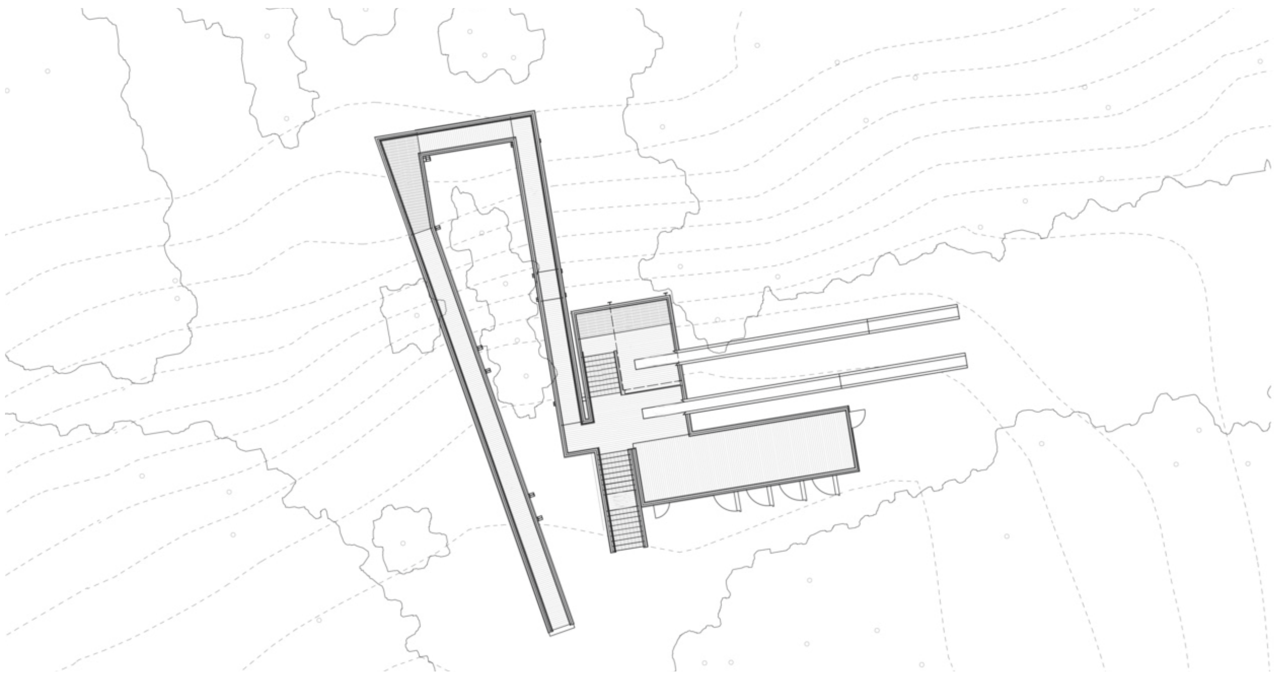
ARCHITECT: 8x8 Design Studio Co.
NAME: CG Villa (Calatagan Gym Villa)
DATE: 2021
LOCATION: Calatagan, Philippines
PROGRAM: House

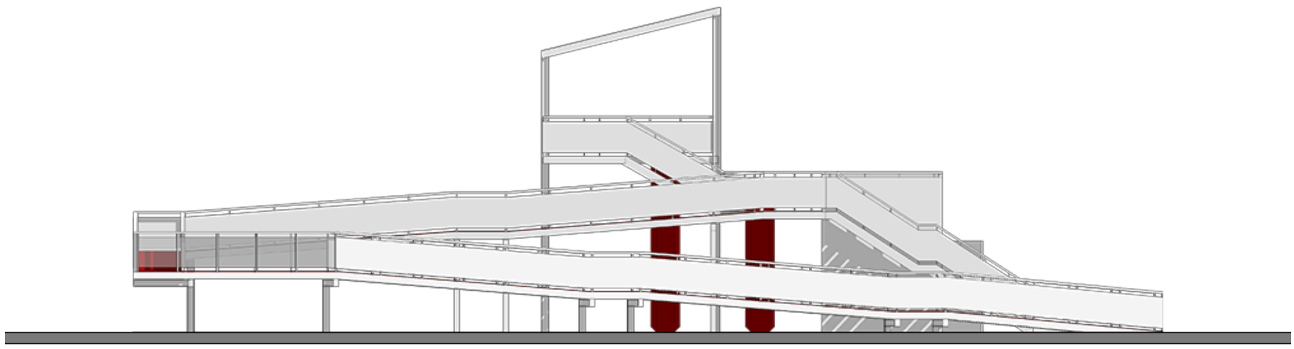
LEGEND:
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- EXTERNAL STAIRS
- — *non-present*

MOUNTAIN PASS

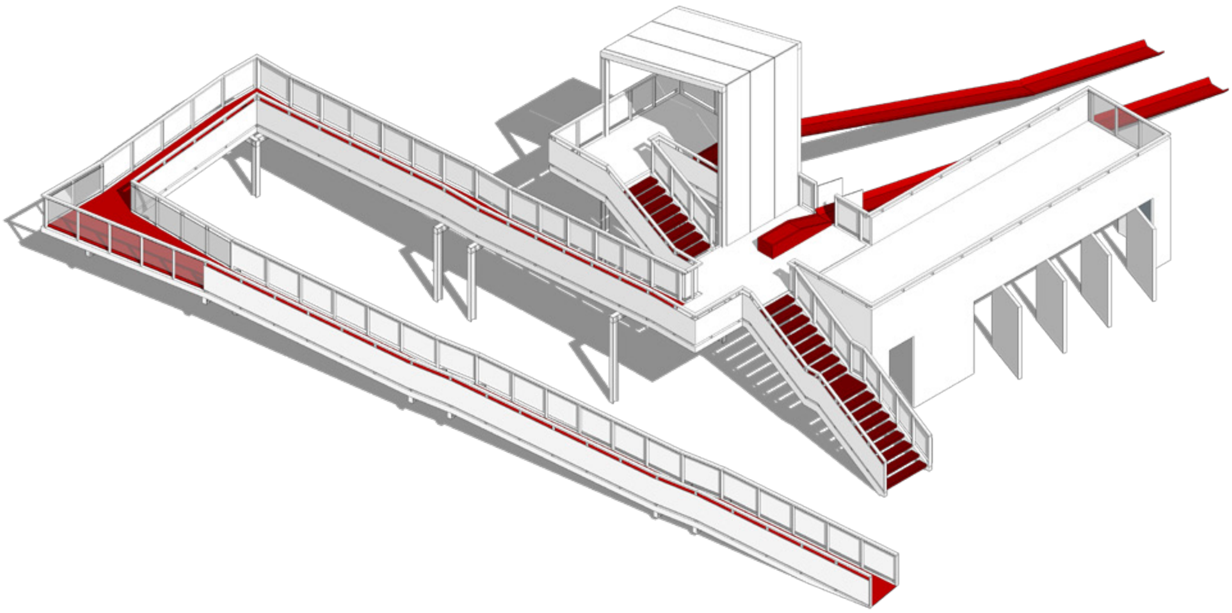
OPOSSED DOUBLE RAMP

MP-14





The Manitoboggan Slide is a playful and engaging installation. It has a distribution system of the structure that allows visitors to climb up to the top of the slide and descend to the bottom. The ramp is designed to accommodate people of all ages and abilities, with gentle curves and a non-slip surface. The fall also incorporates seating areas and shade structures for visitors to relax and enjoy the landscape. The type of distribution is punctual since the stairs lead directly to the space to be distributed.

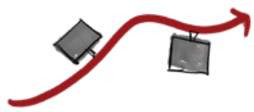


ARCHITECT: Public City Architecture
NAME: Manitoboggan Slide
DATE: 2018
LOCATION: Winnipeg, Canada
PROGRAM: Park

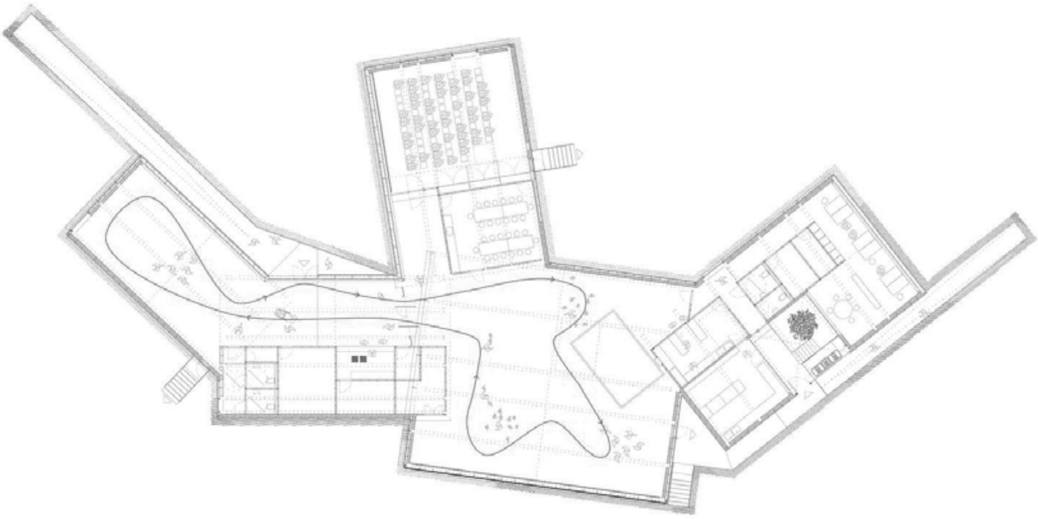
LEGEND:

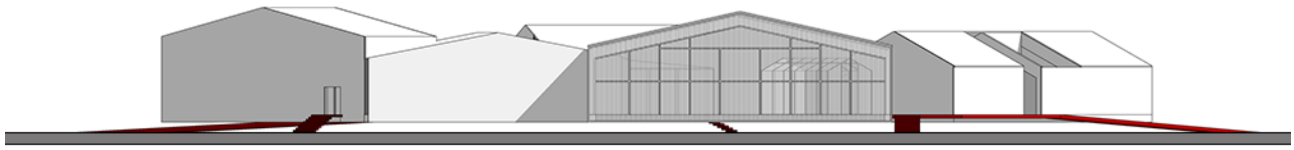
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- ~~INTERNAL STAIRS~~
- EXTERNAL STAIRS
- — *non-present*

MOUNTAIN PASS
OPOSSED DOUBLE RAMP

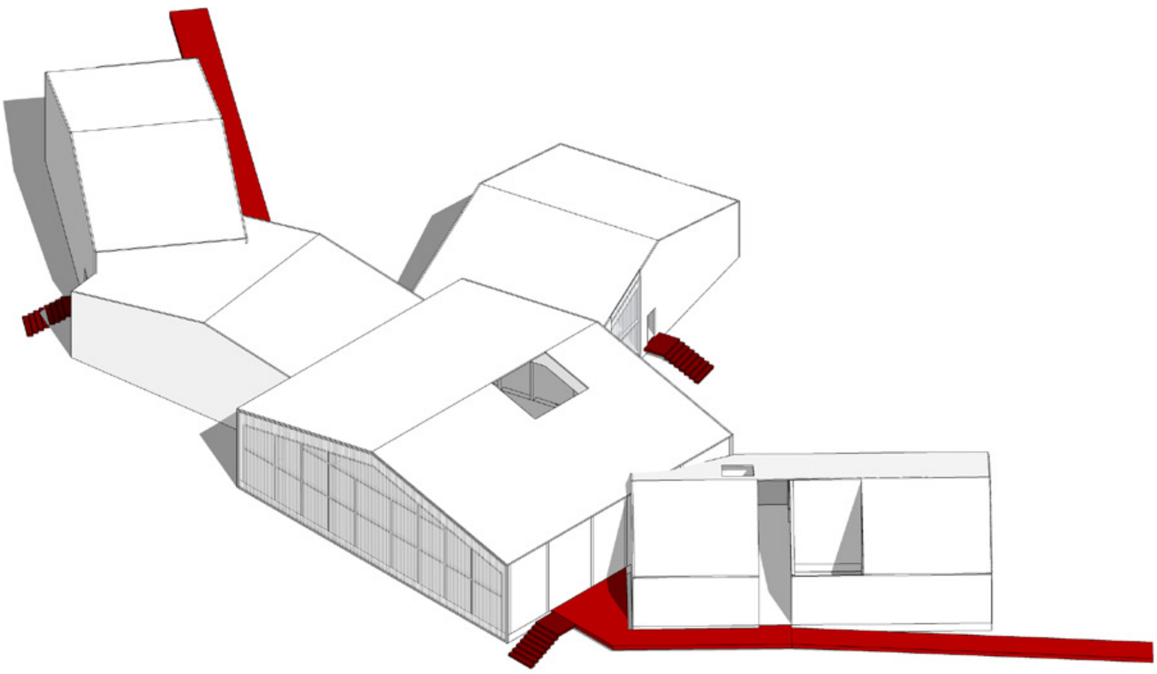


MP-15





The Musée des insectes features an open-plan design that encourages free-flowing movement and exploration of the exhibits. The museum is divided into two distinct zones, with a central atrium as a transition space between the two. The distribution system works around this central space, with different exhibition areas branching off from it. The museum's main feature is its ramp that differentiates the access from the exit and takes visitors to the upper level, offering a viewing perspective of all the exhibits. The type of distribution is diffuse since the spaces to be distributed are not found serially but sporadically.



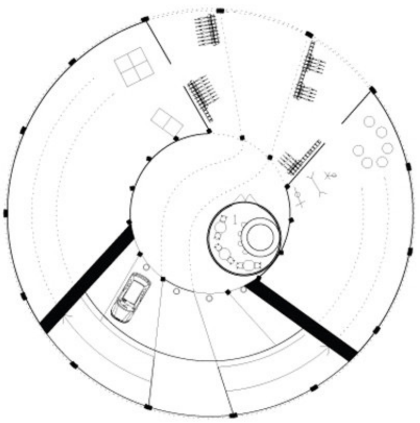
ARCHITECT:	AWP Office for Territorial Reconfiguration
NAME:	Musée des insectes
DATE:	2016
LOCATION:	Poissy, France
PROGRAM:	Museum

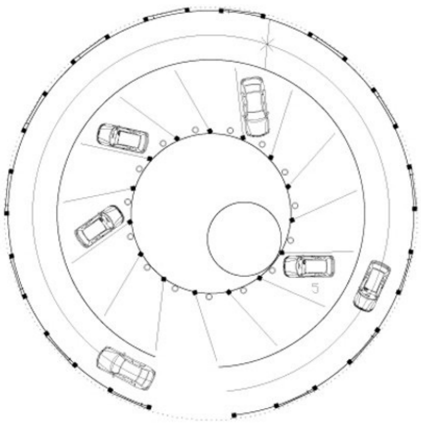
LEGEND:

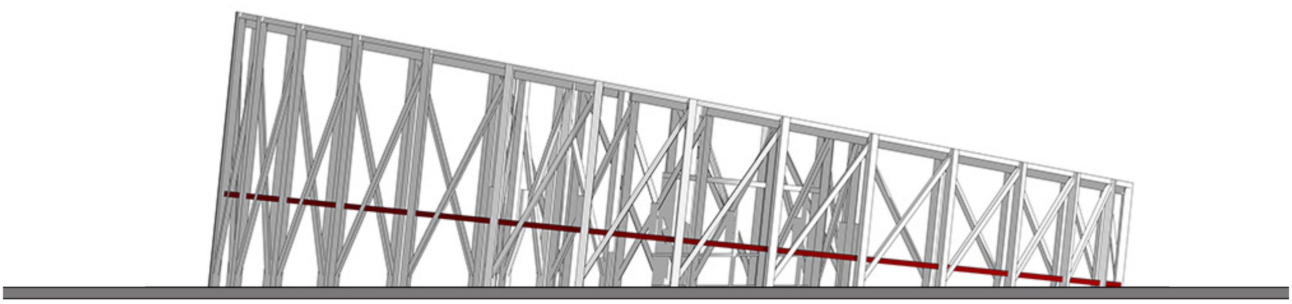
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- ~~INTERNAL STAIRS~~
- EXTERNAL STAIRS
- — *non-present*

MOUNTAIN PASS
OPOSSED DOUBLE RAMP

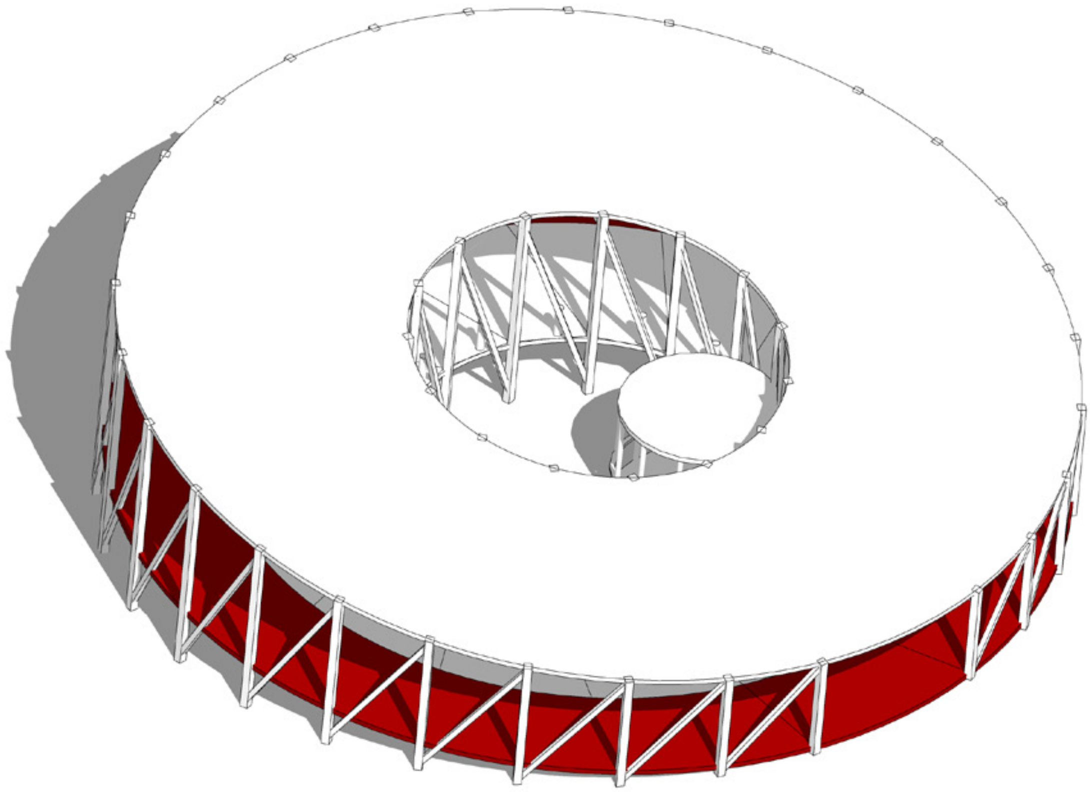
MP-16







The KKA designs electric vehicle charging stations and has a distribution system designed to be accessible and user-friendly. The stations are designed to adapt to various vehicles and to make access simple and intuitive. The ramp distinguishes the entrance and exit in opposite places. The ramp guarantees an efficient traffic flow, being a single access and exit route. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT: Kaminsky Arkitektur
NAME: KKA Designs Electric Vehicle Charging Stations
DATE: 2013
LOCATION: Sweden
PROGRAM: Charging Station

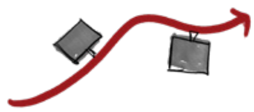
LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- ~~INTERNAL STAIRS~~
- ~~EXTERNAL STAIRS~~

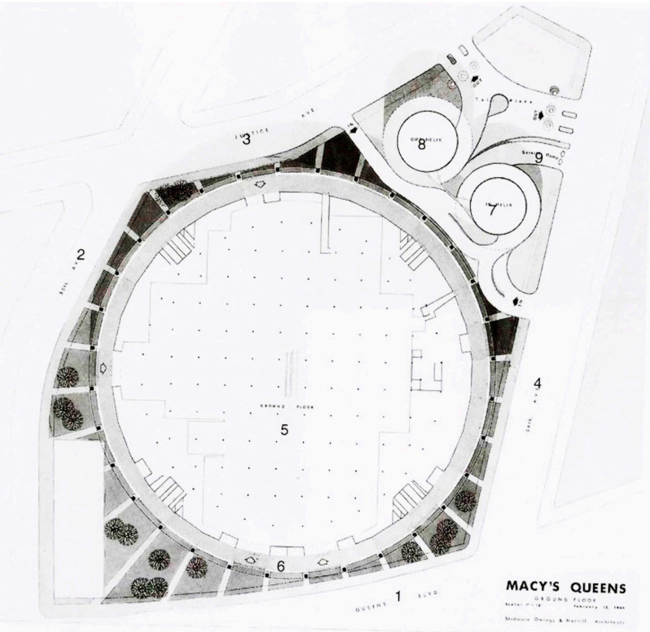
— *non-present*

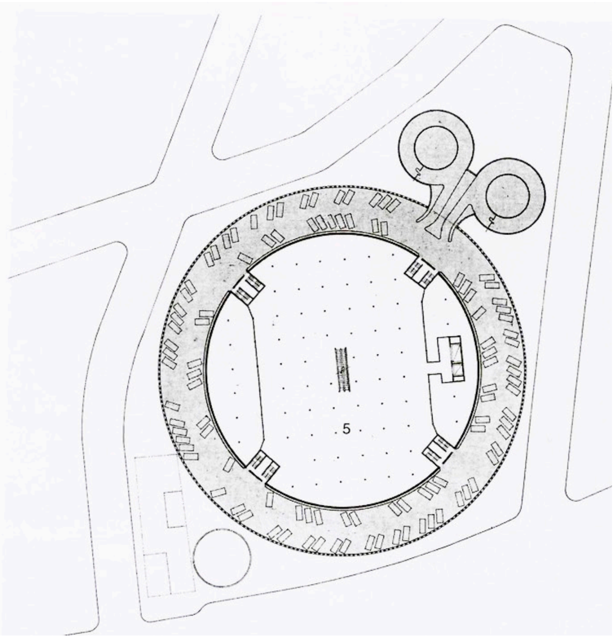
MOUNTAIN PASS

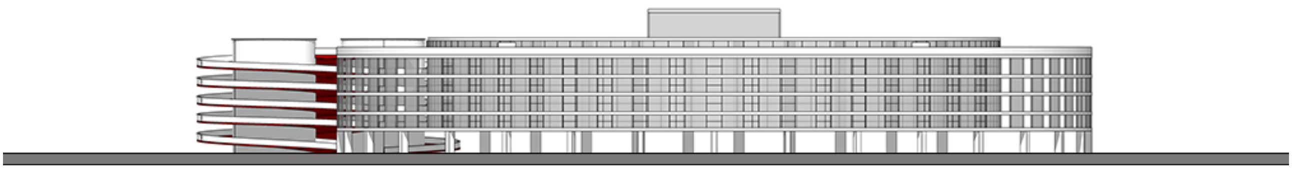
OPOSSED DOUBLE RAMP

MP-17

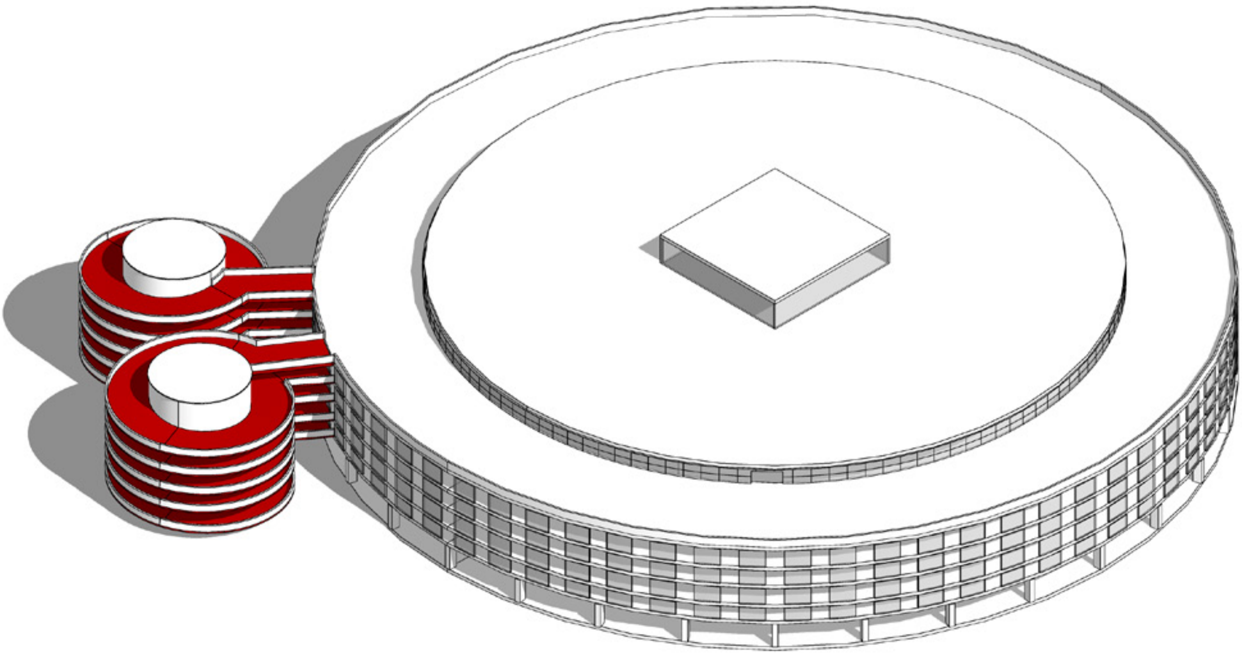








The Macy's Queens Plaza has a central atrium that runs the full height of the building and is surrounded by retail floors on each level. People are distributed in the building using escalators, elevators, and staircases, which connect the different levels of the retail feet. The ramp of the building is divided into two blocks, one for going up and the other for going down; these allow access to cars at different levels. The tour is always continuous from the moment you enter until you leave. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



ARCHITECT:	Skidmore Owings & Merrill
NAME:	Macy's Queens Plaza
DATE:	1965
LOCATION:	New York, United States
PROGRAM:	Shopping Center

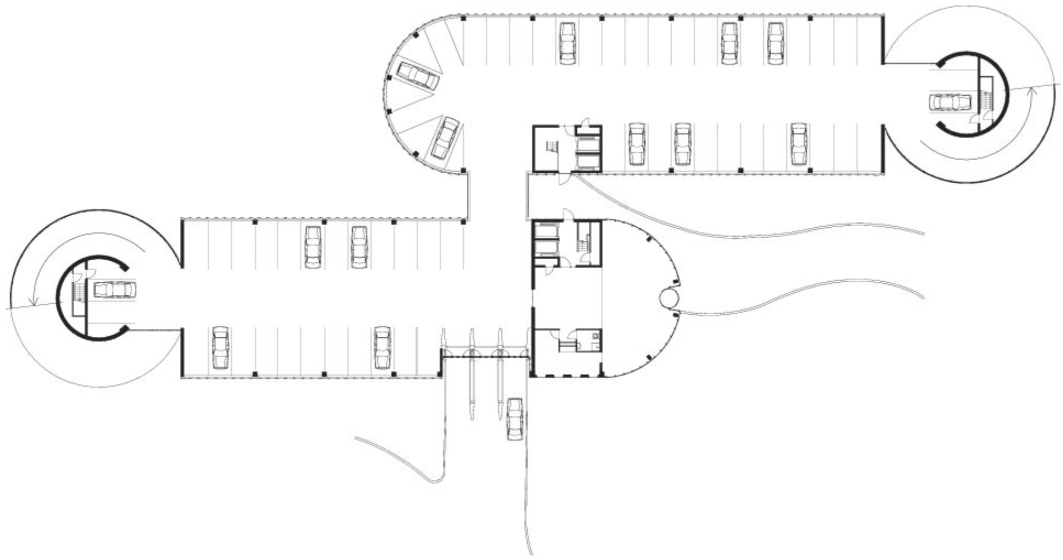
LEGEND:

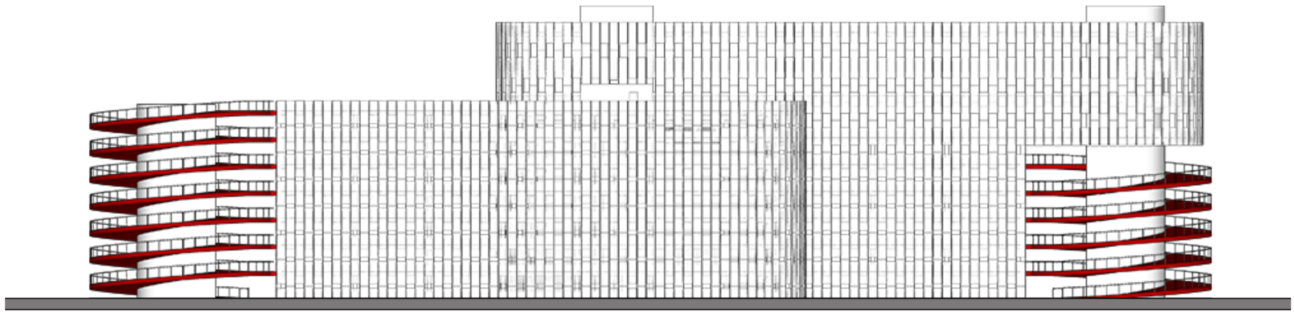
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAIN PASS

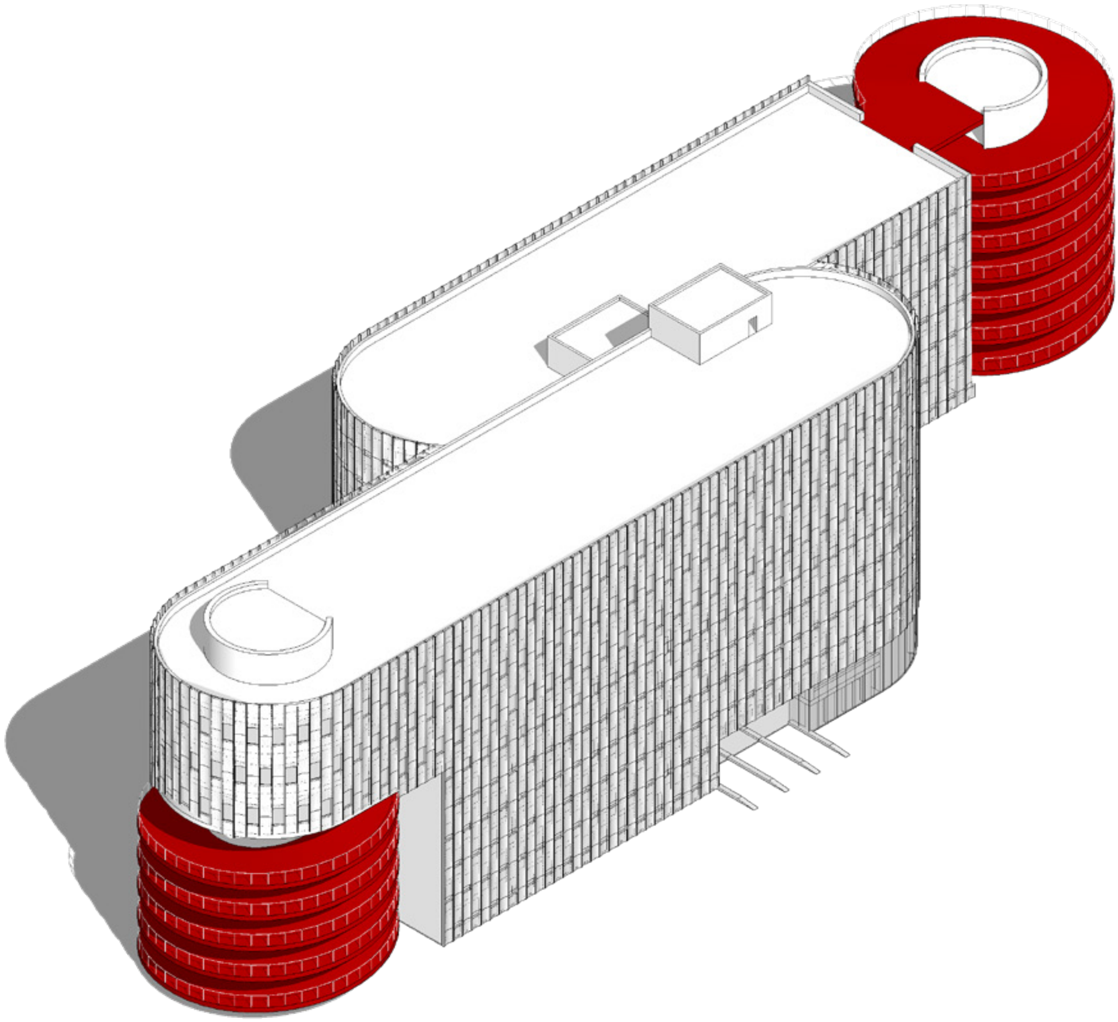
OPOSSED DOUBLE RAMP

MP-18





The Parking "de Cope" has a distribution system that works by having two points, one of access and another of exit. The garage ramp is an important feature. It is designed to optimise the use of space while providing efficient movement of vehicles between levels, as the path is always continuous, and there is no need to reverse to exit. The type of distribution is punctual since the ramp distributes the different levels of the building punctually.



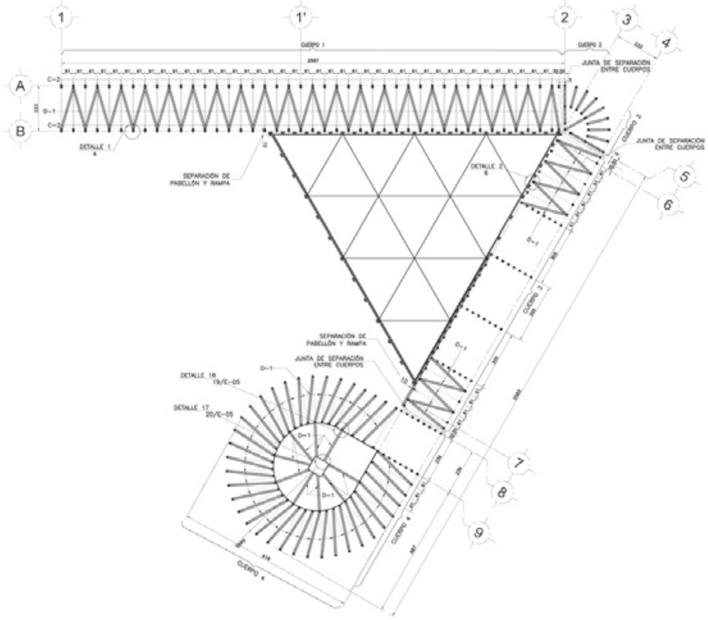
ARCHITECT: JHK Architecten
NAME: Parking “de Cope”
DATE: 2008
LOCATION: Utrecht, Netherlands
PROGRAM: Parking

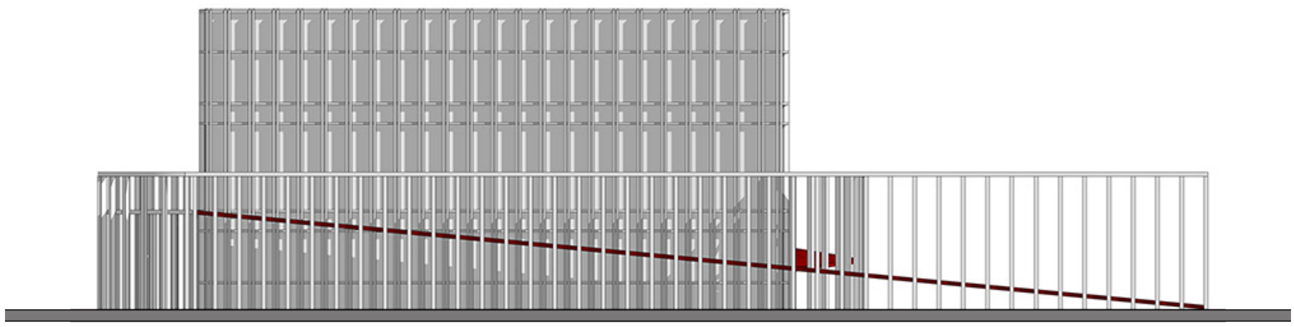
LEGEND:
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAIN PASS

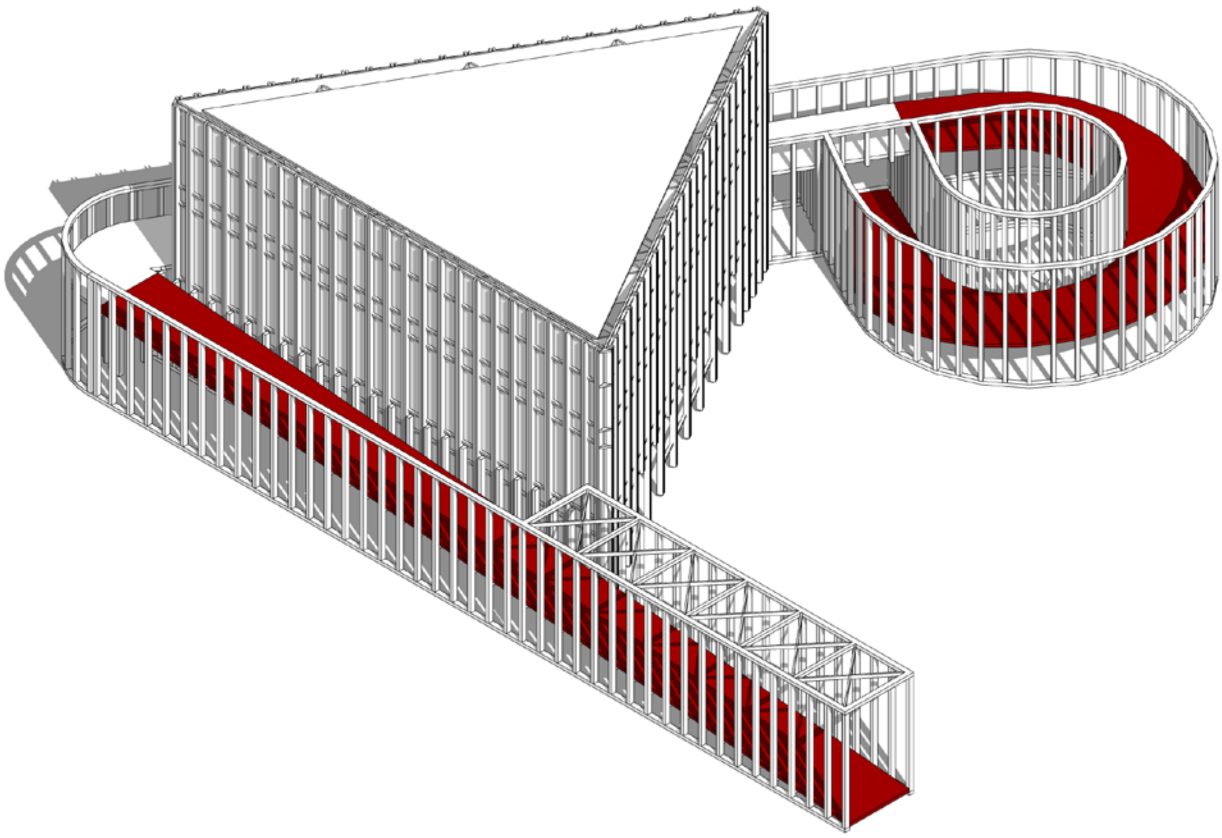
OPOSSED DOUBLE RAMP

MP-19





The Pavilion for the culture fair has a fluid distribution system relevant to the functional program. The ramp of the pavilion has an essential characteristic that it is a single route that allows the flow of visitors through the entire pavilion without interruptions. The access is distinguished from the exit in opposite corners. The ramp along its way offers a visual relationship with the context. The distribution system with a single route maximises the visitors' experience in the pavilion. The type of distribution is punctual since the stairs lead directly to the space to be distributed.



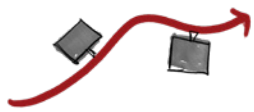
ARCHITECT: PRODUCTORA
NAME: Pavilion for the Culture Fair
DATE: 2014
LOCATION: Ciudad de Mexico, Mexico
PROGRAM: Pavilion

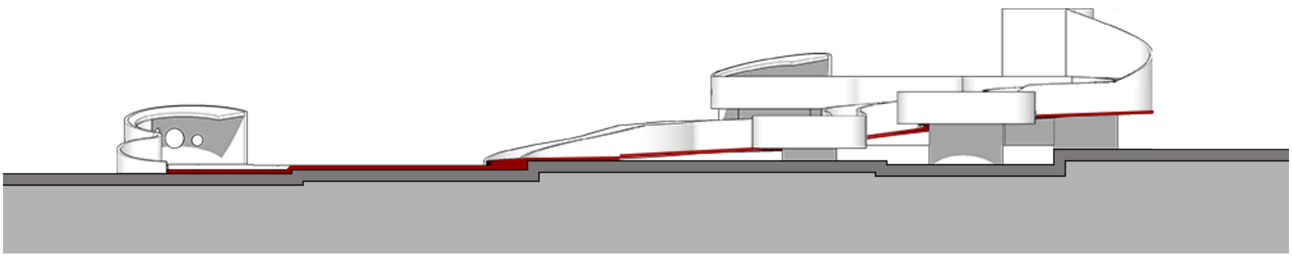
LEGEND:
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- ~~INTERNAL STAIRS~~
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAIN PASS

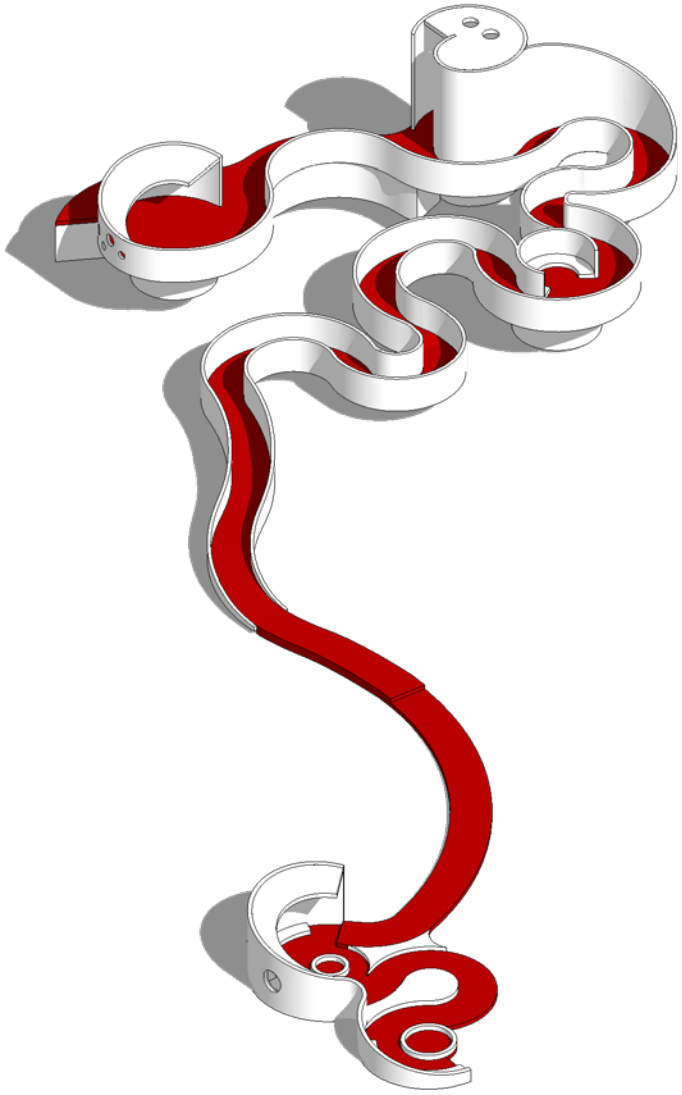
OPOSSED DOUBLE RAMP

MP-20





The Selvika is a scenic rest stop with a distribution system consisting of a ramp connecting two levels and a staircase. The ramp is a striking feature of the building, as it appears to be floating over the landscape and provides a gradual ascent to the upper level. The building is mainly a public space for people to relax and enjoy the beautiful view. The interior is designed to be simple and minimalist, with large windows that provide an unobstructed view of the surrounding landscape. The type of distribution is diffuse since the spaces to be distributed are not found serially but sporadically.



ARCHITECT: Reiulf Ramstad Arkitekter
NAME: Selvika
DATE: 2012
LOCATION: Havøysund, Norway
PROGRAM: Pavilion

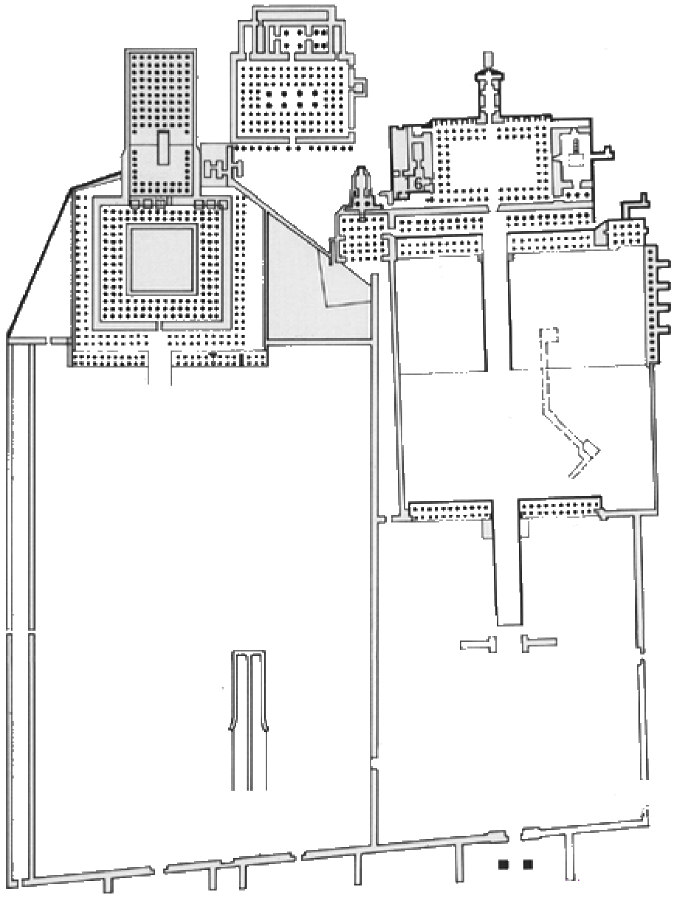
LEGEND:
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- ~~INTERNAL STAIRS~~
- ~~EXTERNAL STAIRS~~
- — *non-present*

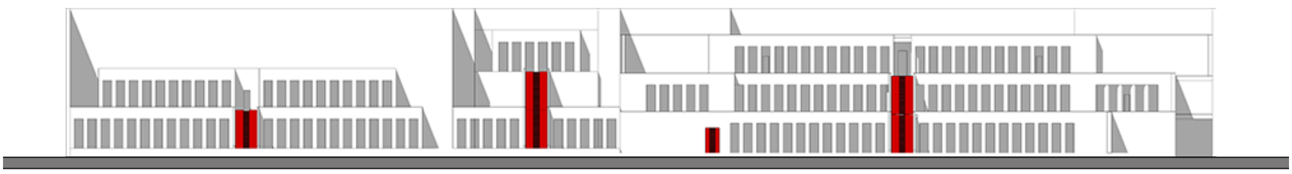
ARCHITECTURAL FORM

3.2.4. MOUNTAIN RIDGE STRAIGHT RAMP

MOUNTAIN RIDGE
STRAIGHT RAMP

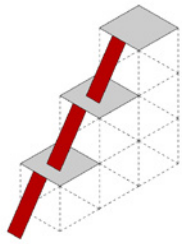
MR-01

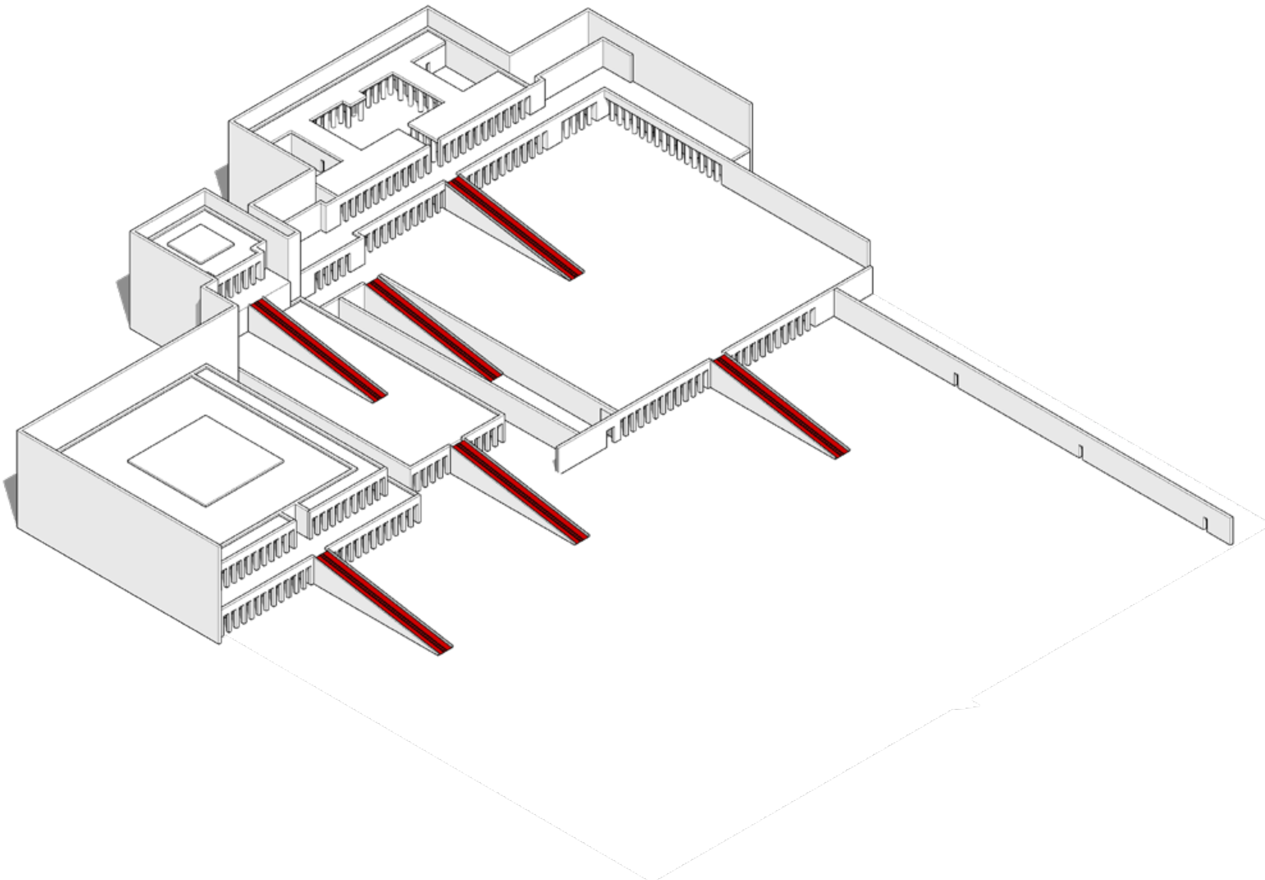




The Mortuary Temple of Hatshepsut has a distribution system consisting of ramps and stairways leading through the various levels and places of the complex. All ramps have a gentle slope that allows people to move slowly and serve mortuary services and make offerings. Straight ramps allow direct distribution to specific points. The type of distribution is diffuse since the spaces to be distributed are not found serially but sporadically.

Distribution Scheme





ARCHITECT: -

NAME: Mortuary Temple of Hatshepsut

DATE: 15th century BC

LOCATION: Plain of Deir el-Bahari, Egypt

PROGRAM: Temple

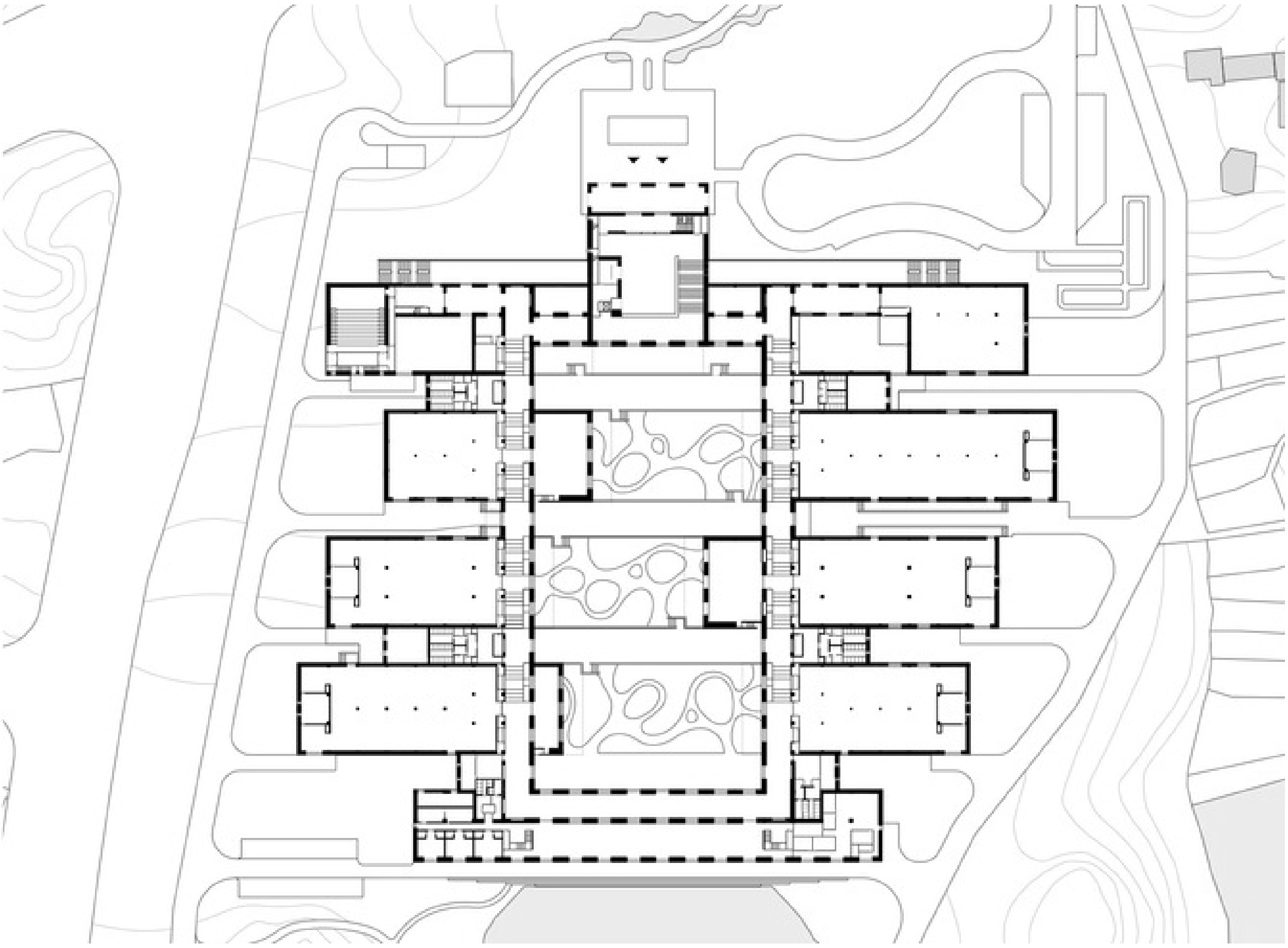
LEGEND:

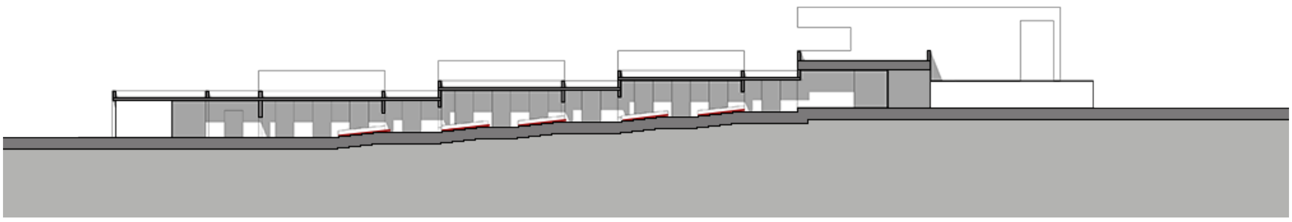
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- ~~INTERNAL STAIRS~~
- EXTERNAL STAIRS
- — *non-present*

MOUNTAIN RIDGE

STRAIGHT RAMP

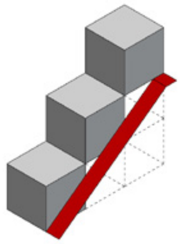
MR-02

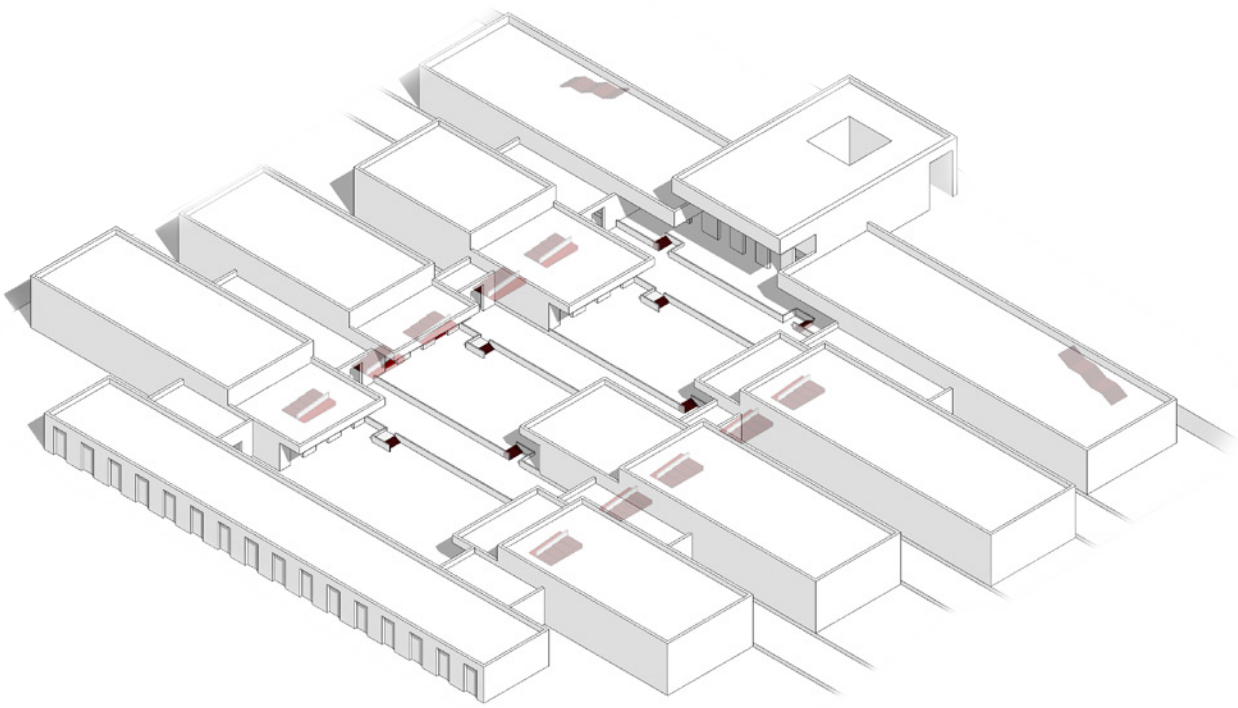




The Museum of Natural History in Huzhou features a linear design around two ramps. The ramp serves as the primary circulation path, allowing visitors to move through the exhibition spaces seamlessly. The ramp also connects the museum to the surrounding landscape, enhancing the building's relationship with its natural surroundings. The ramps accompany the museum tour connecting laterally with all the exhibition rooms. The type of distribution is continuous since the ramps along its route contain the space to be distributed.

Distribution Scheme





ARCHITECT: David Chipperfield
NAME: Museum of Natural History
DATE: 2018
LOCATION: Huzhou, China
PROGRAM: Museum

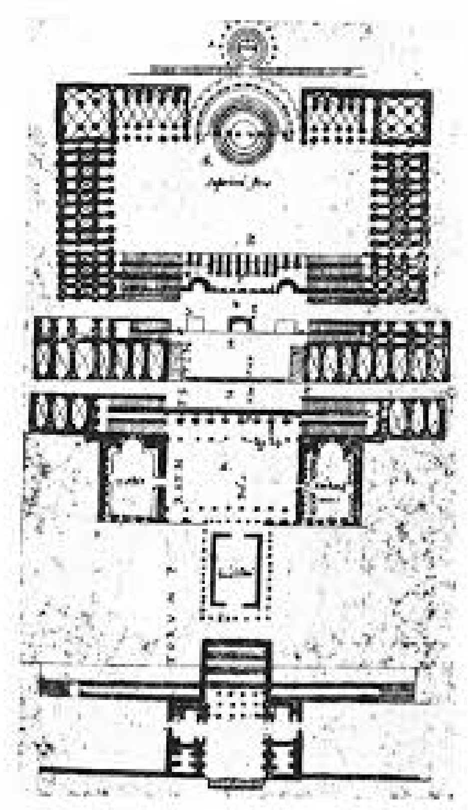
LEGEND:

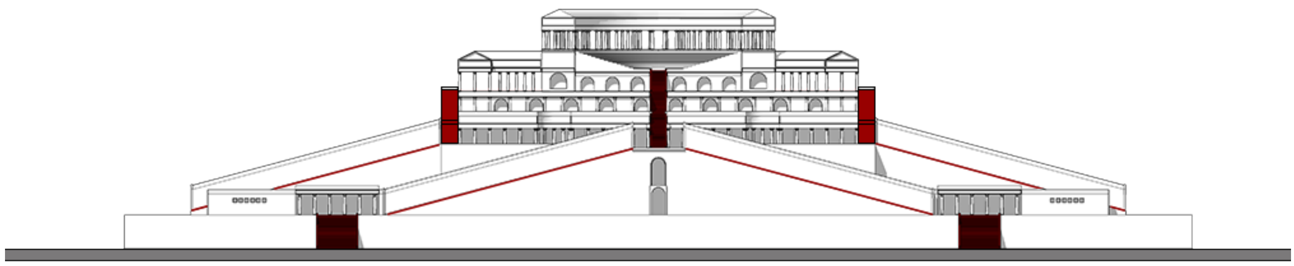
SERVED SPACES
~~INTERNAL RAMPS~~
~~EXTERNAL RAMPS~~
INTERNAL STAIRS
EXTERNAL STAIRS
non-present

MOUNTAIN RIDGE

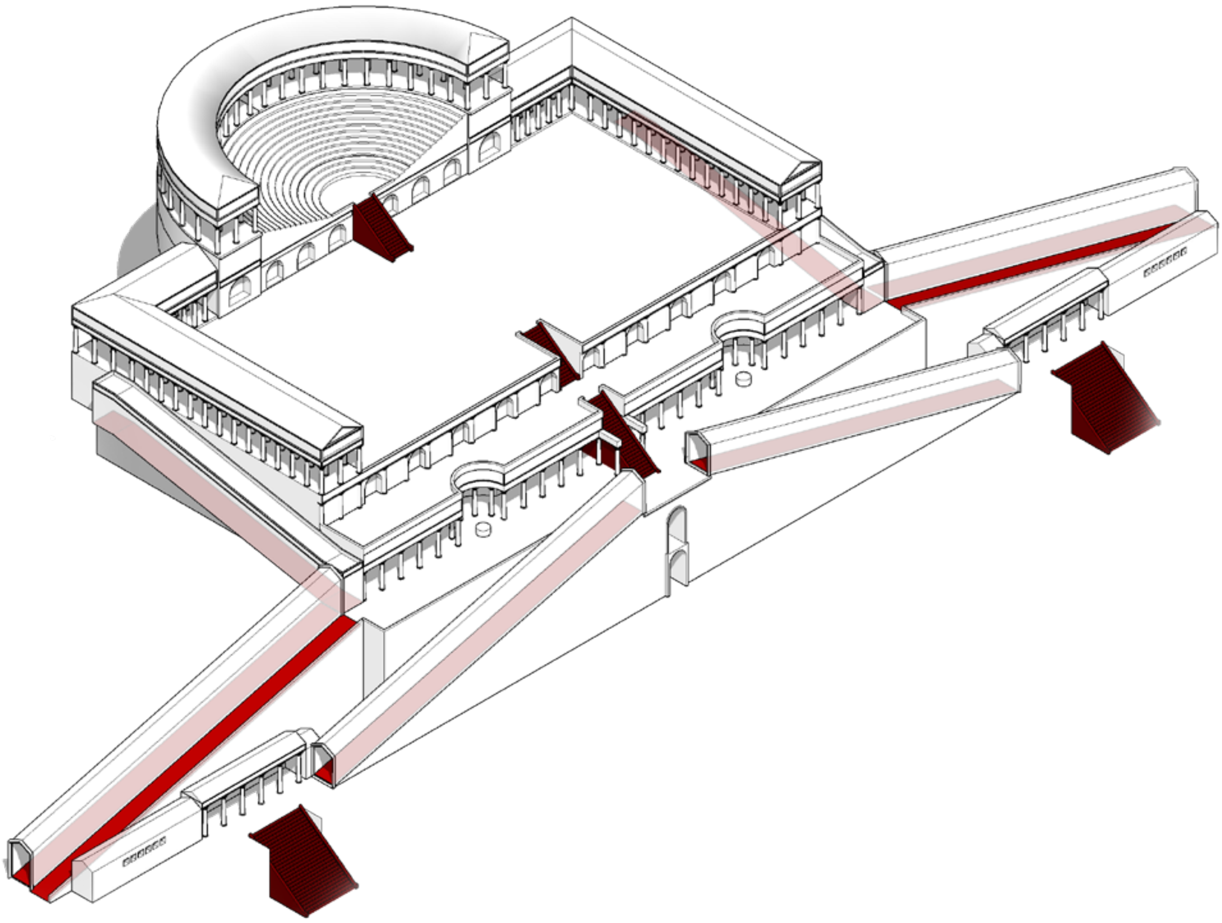
STRAIGHT RAMP

MR-03





The Santuario della Fortuna Primigenia is built into a hillside with a complex distribution system incorporating numerous terraces, ramps, and stairs. The main characteristic is that the distributive system of ramps and stairs allows access to different temple levels. Various courtyards, buildings, and spaces are crossed throughout the route, creating a dynamic experience. The type of distribution is diffuse since the spaces to be distributed are not found serially but sporadically.



ARCHITECT: -

NAME: Santuario della Fortuna Primigenia

DATE: End of the 2nd century BC

LOCATION: Preneste, Italy

PROGRAM: Sanctuary

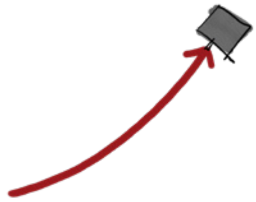
LEGEND:

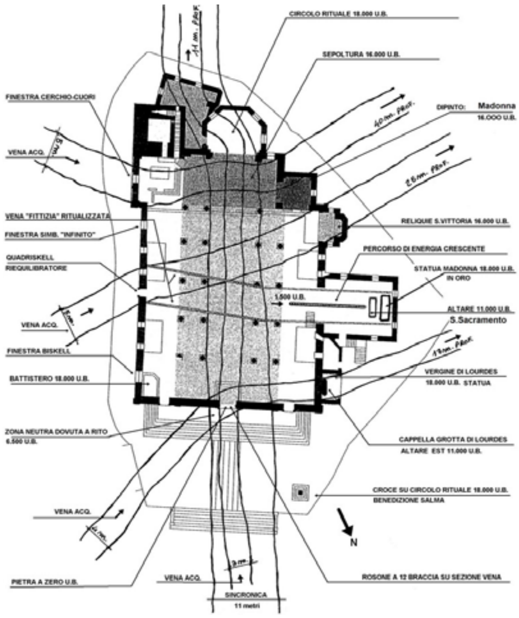
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- ~~INTERNAL STAIRS~~
- EXTERNAL STAIRS
- — *non-present*

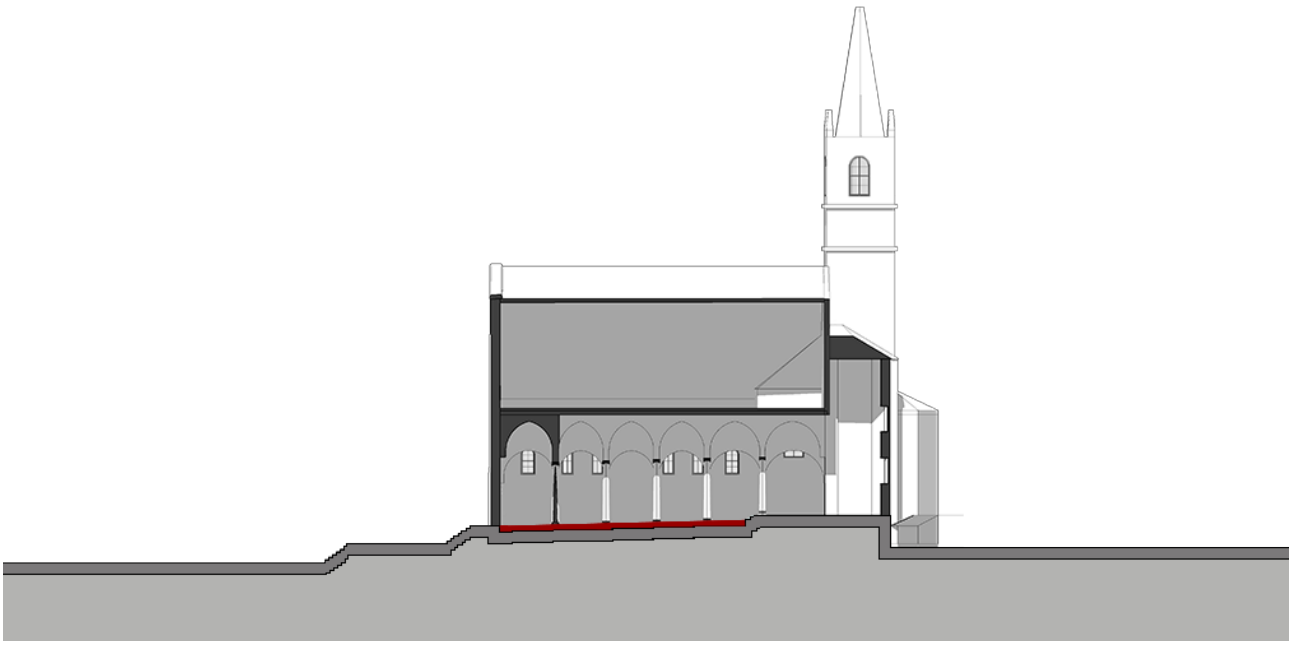
MOUNTAIN RIDGE

STRAIGHT RAMP

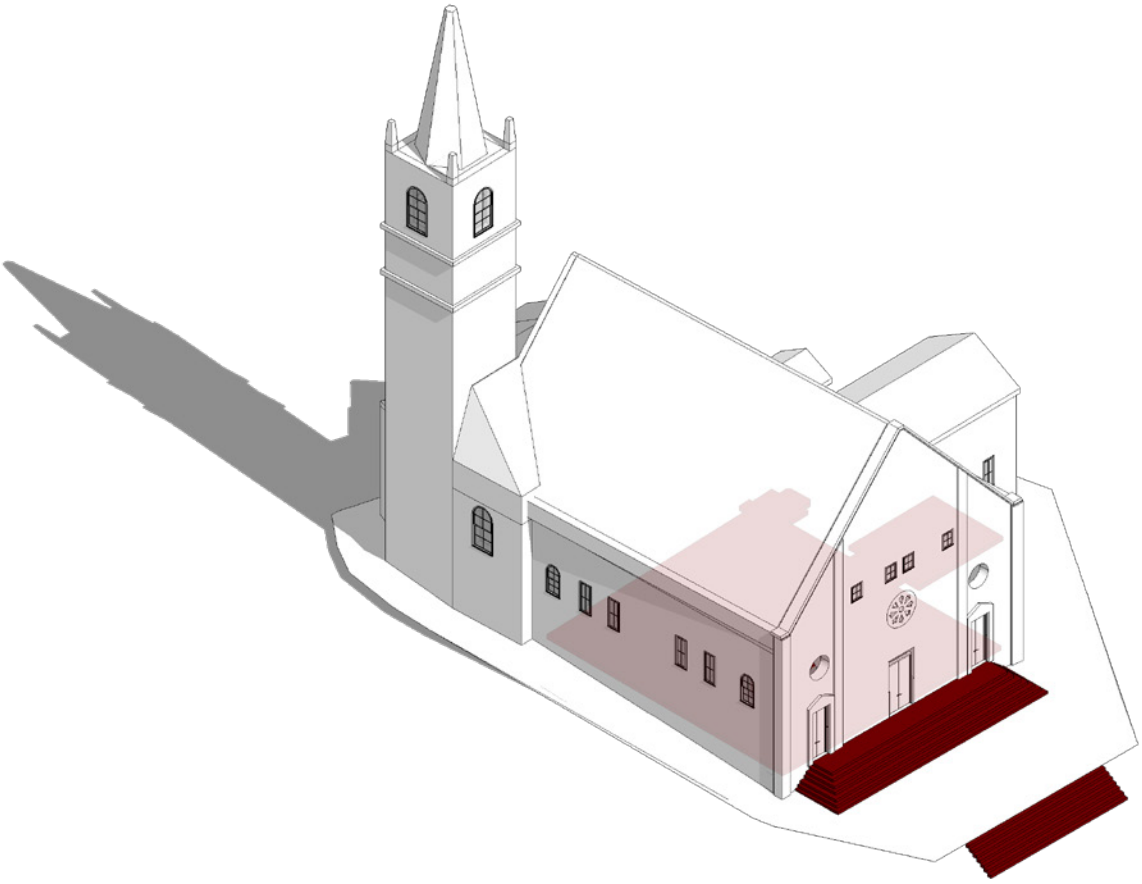
MR-04







The Chiesa Monumentale di San Gaudenzio is characterised by a central nave and four smaller lateral naves connected through arches. The church stands in the central part of the town on a rock spur. This construction on the rock allows the inclination of the church's floor, like a large ramp leading to the altar. The distribution system of the building works by leading visitors to an inclined plane through three access. The type of distribution is punctual since the stairs lead directly to the space to be distributed.



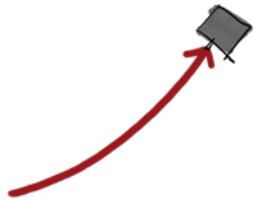
ARCHITECT: -
NAME: Chiesa Monumentale di San Gaudenzio
DATE: 10th century
LOCATION: Baceno, Italy
PROGRAM: Church

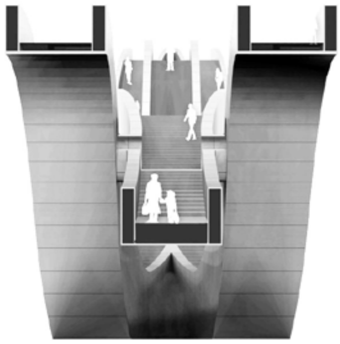
LEGEND:
SERVED SPACES
INTERNAL RAMPS
~~EXTERNAL RAMPS~~
~~INTERNAL STAIRS~~
EXTERNAL STAIRS
non-present

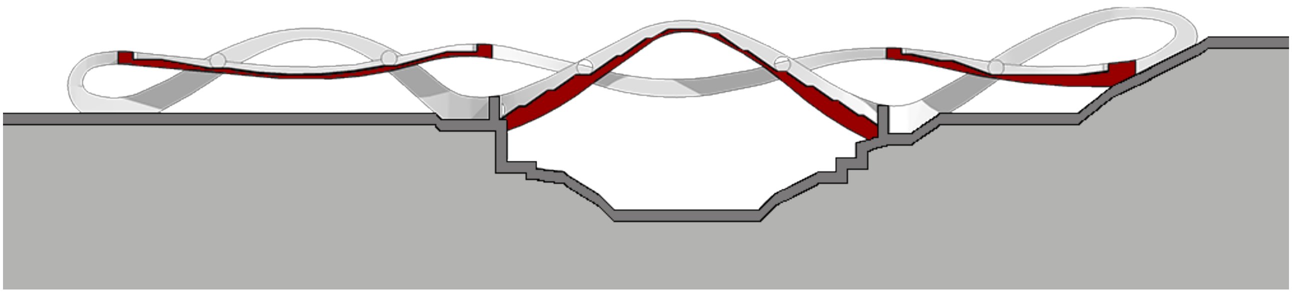
MOUNTAIN RIDGE

STRAIGHT RAMP

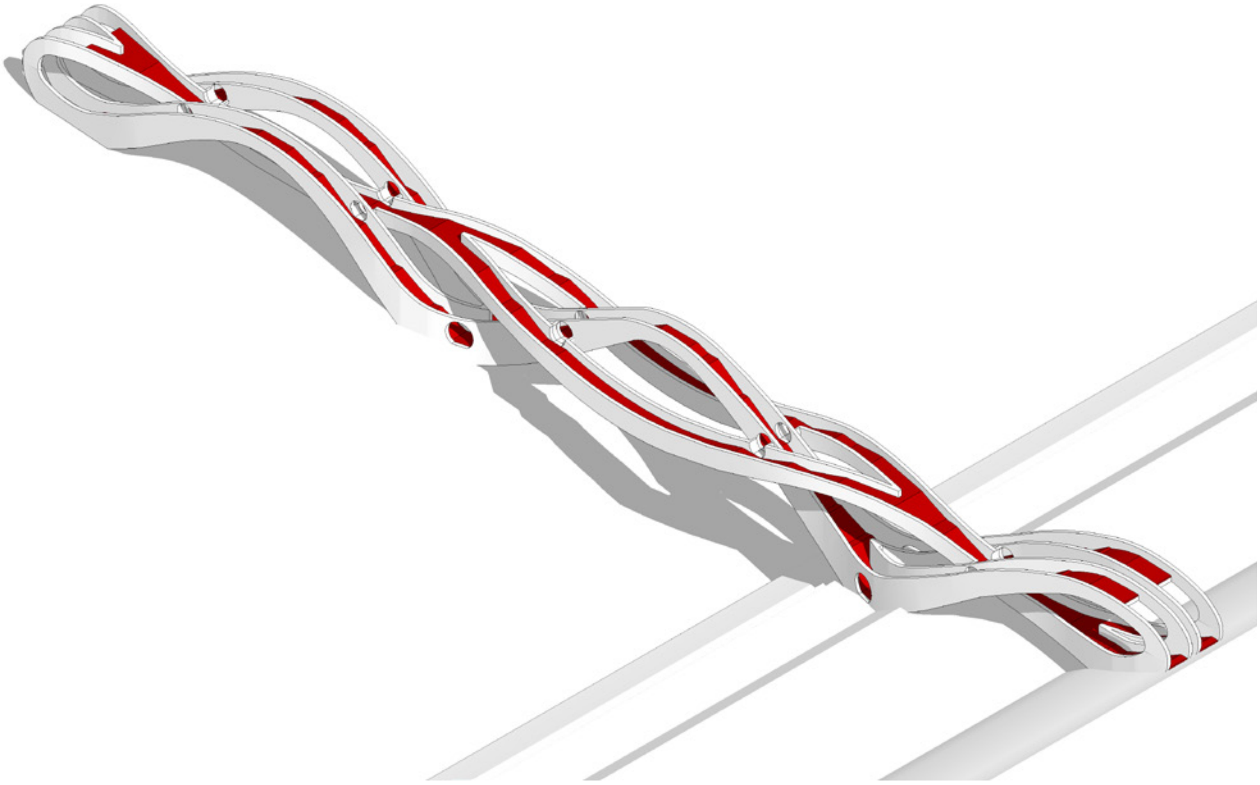
MR-05







The Nudo de la Suerte's distribution system allows for easy and efficient movement of pedestrians, with ramps and stairs leading up to the central platform, where visitors can enjoy city views. The ramp is a significant feature, as it winds around the knot shape, allowing for a gentle ascent and descent while creating an impressive visual experience for those crossing the bridge. The type of distribution is punctual since the stairs lead directly to the space to be distributed.



ARCHITECT: NEXT Architects
NAME: Nudo de la suerte
DATE: 2016
LOCATION: Changsha Shi, China
PROGRAM: Bridge

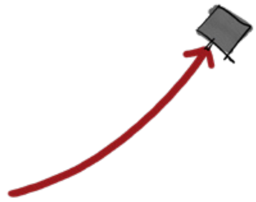
LEGEND:

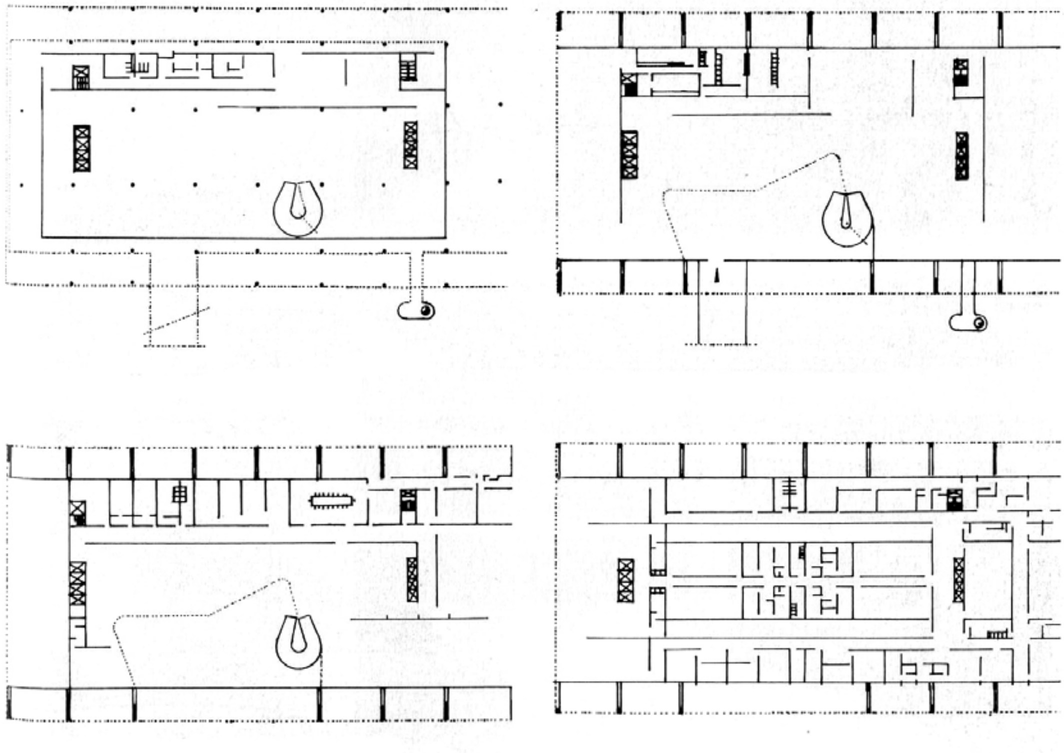
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- ~~INTERNAL STAIRS~~
- EXTERNAL STAIRS
- — *non-present*

MOUNTAIN RIDGE

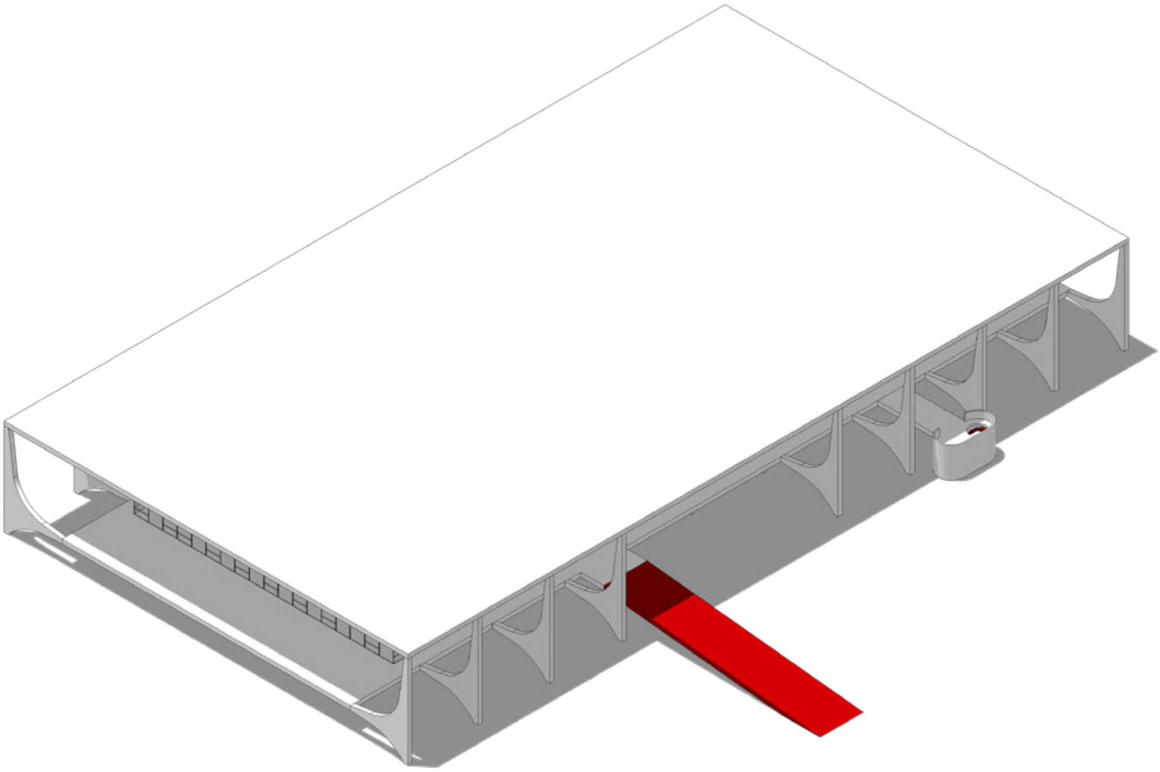
STRAIGHT RAMP

MR-06





The Palácio do Planalto has a distribution system designed to provide easy access to the building's various offices and meeting spaces. People are distributed in the building through a series of ramps and elevators that connect the different levels. The essential characteristic of the ramp is that it allows for easy movement between the different levels of the building, creating a seamless circulation system. The type of distribution is punctual since the stairs lead directly to the space to be distributed.



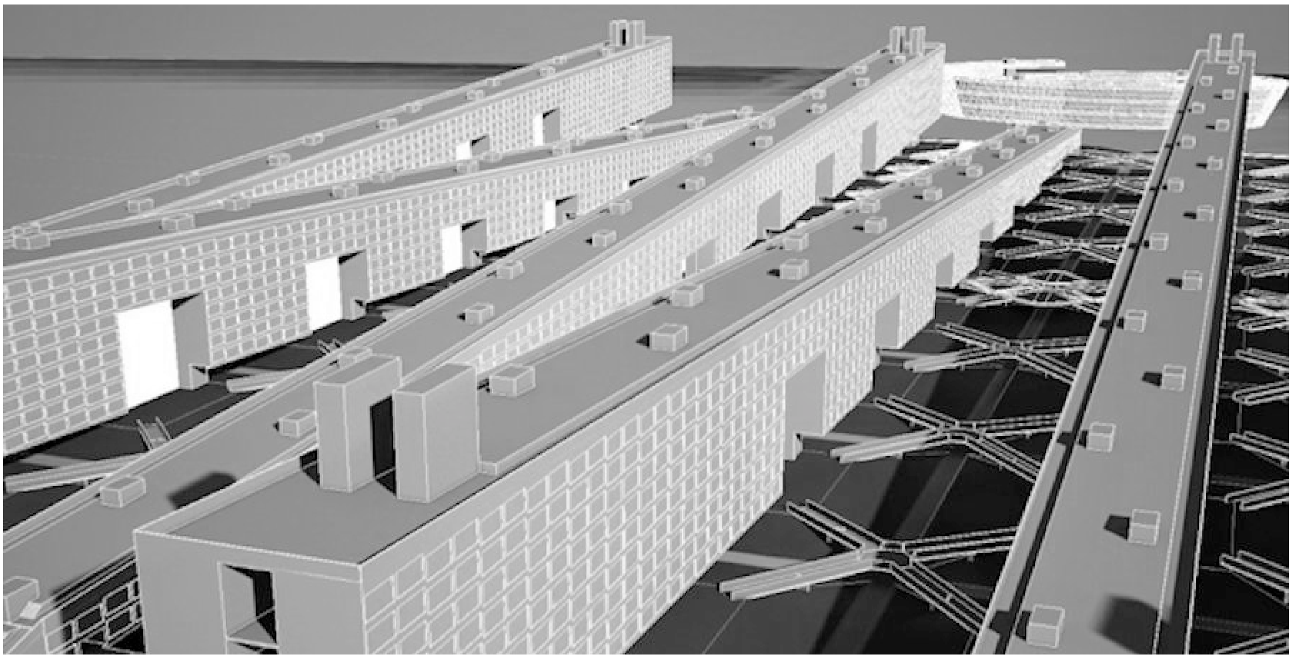
ARCHITECT: Oscar Niemeyer
NAME: Palácio do Planalto
DATE: 1960
LOCATION: São Paulo, Brazil
PROGRAM: Office Building

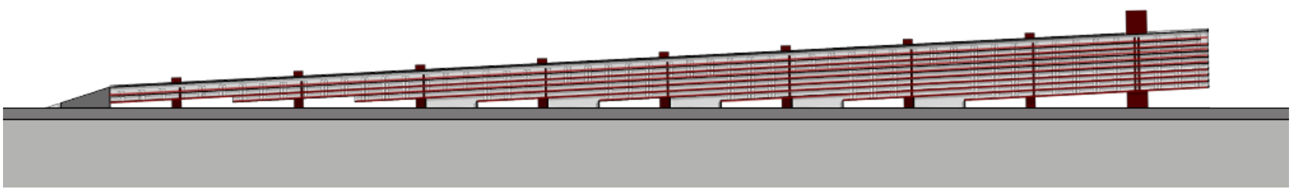
LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAIN RIDGE

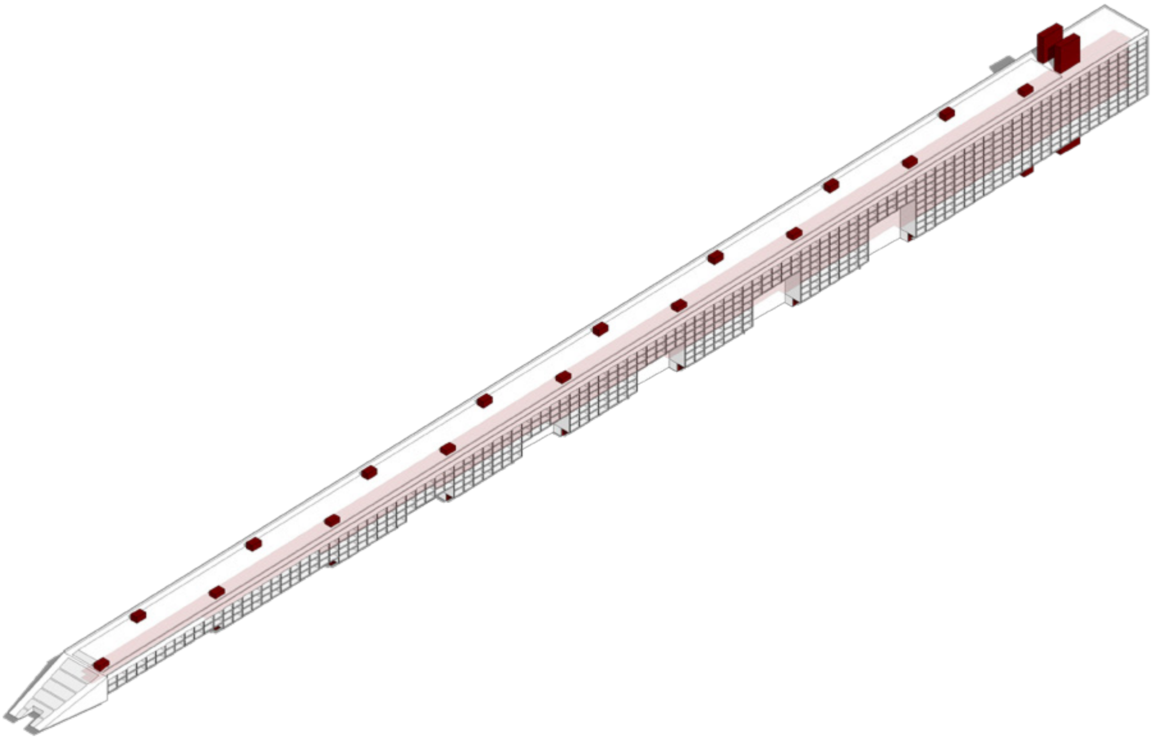
STRAIGHT RAMP

MR-07





The Slab Block is a concept proposed by Steven Fleming as part of his vision for Velotopia, a car-free urban utopia. It is a ramped structure that allows for bicycle circulation. The ramped design runs continuously through the building, connecting the ground floor and the rooftop garden and creating a "bicycle highway" that allows easy movement. The ramp also serves as a social space, encouraging interaction and community-building among residents. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



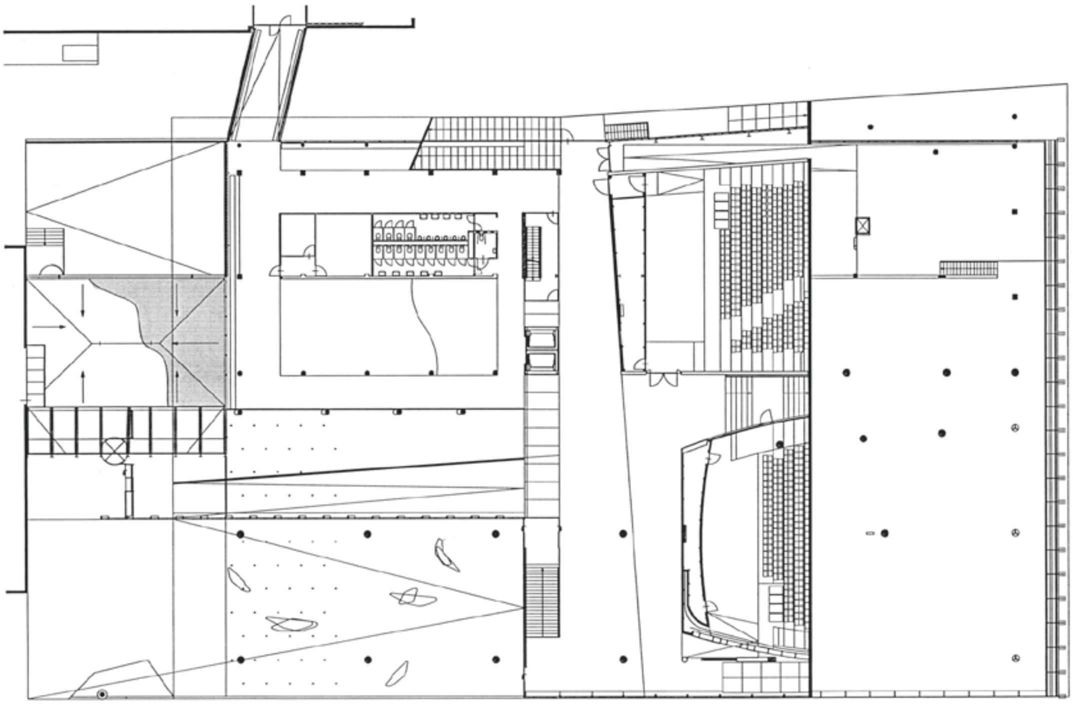
ARCHITECT: Steven Fleming
NAME: Slab Block
DATE: 2017
LOCATION: Velotopia
PROGRAM: Residential Building

LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

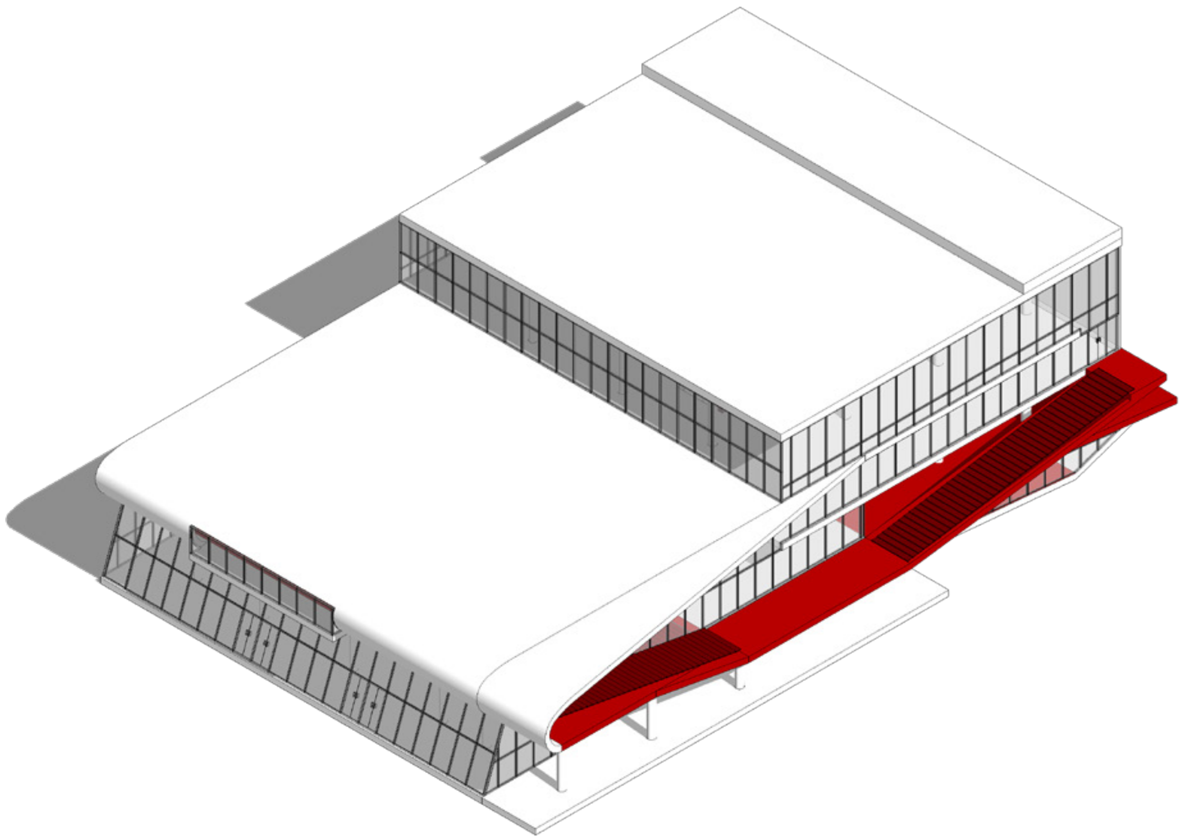
MOUNTAIN RIDGE

STRAIGHT RAMP

MR-08



The Educatorium has a distribution system consisting of a central atrium as a communal space. At the same time, various rooms and corridors spiral around it, creating a seamless flow of movement. The building's ramp is essential, connecting the lower level to the upper floors and allowing easy access to the lecture halls and offices. The ramp is also a spatial element that encourages student interaction, making the building a lively educational space. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



ARCHITECT:	Rem Koolhaas – OMA
NAME:	Educatorium
DATE:	1992-1995
LOCATION:	Utrecht, Netherlands
PROGRAM:	University

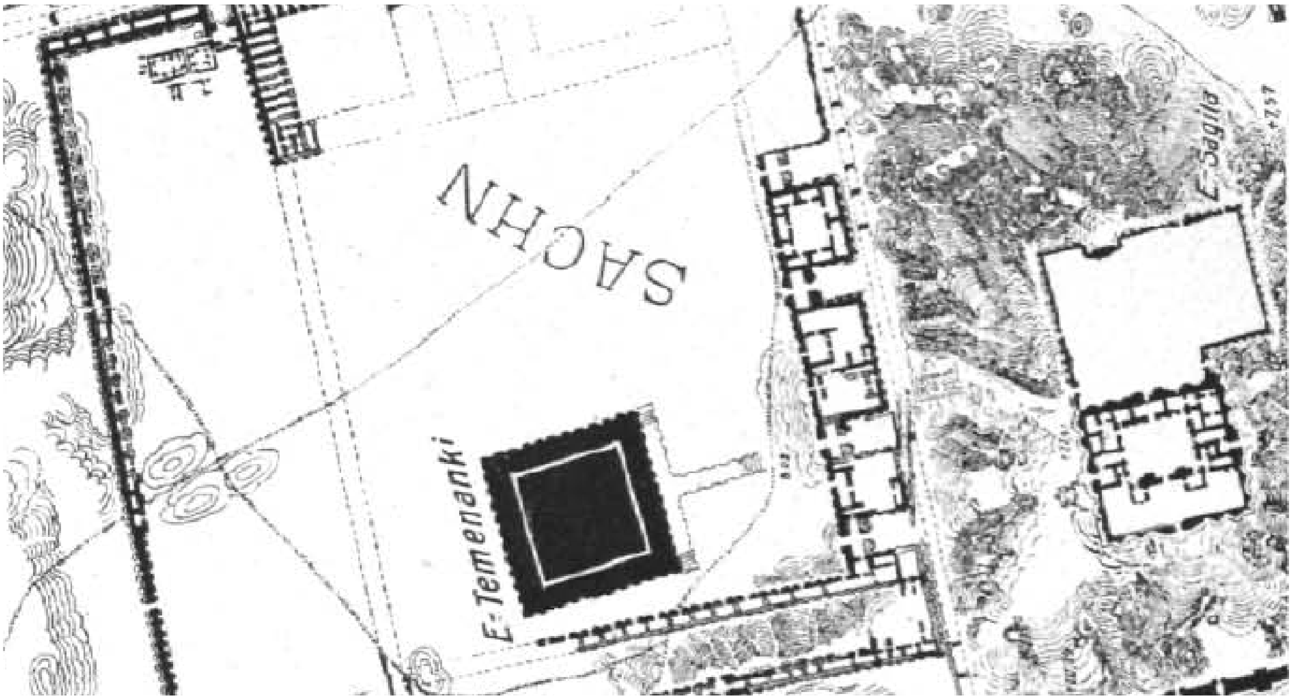
LEGEND:

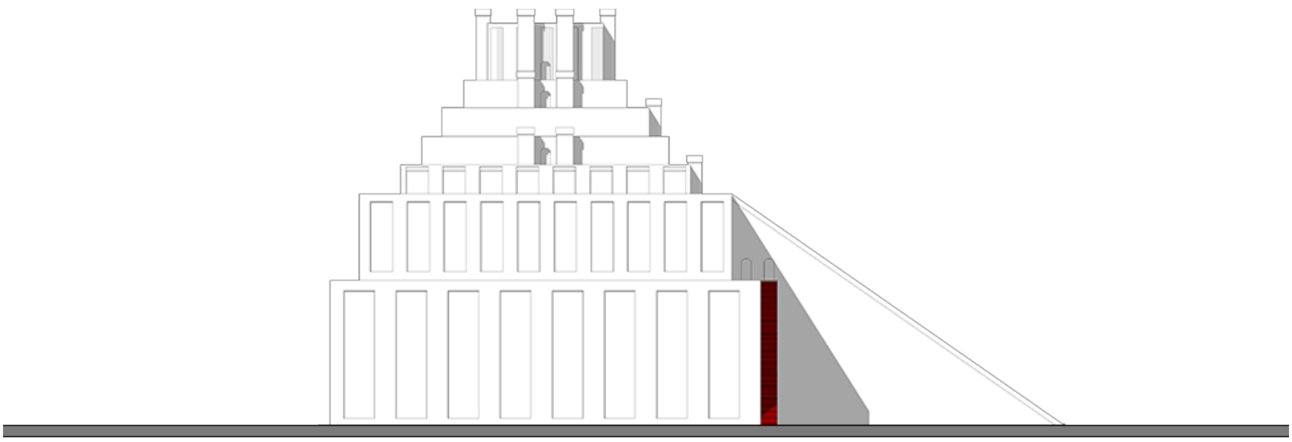
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- EXTERNAL STAIRS
- — *non-present*

MOUNTAIN RIDGE

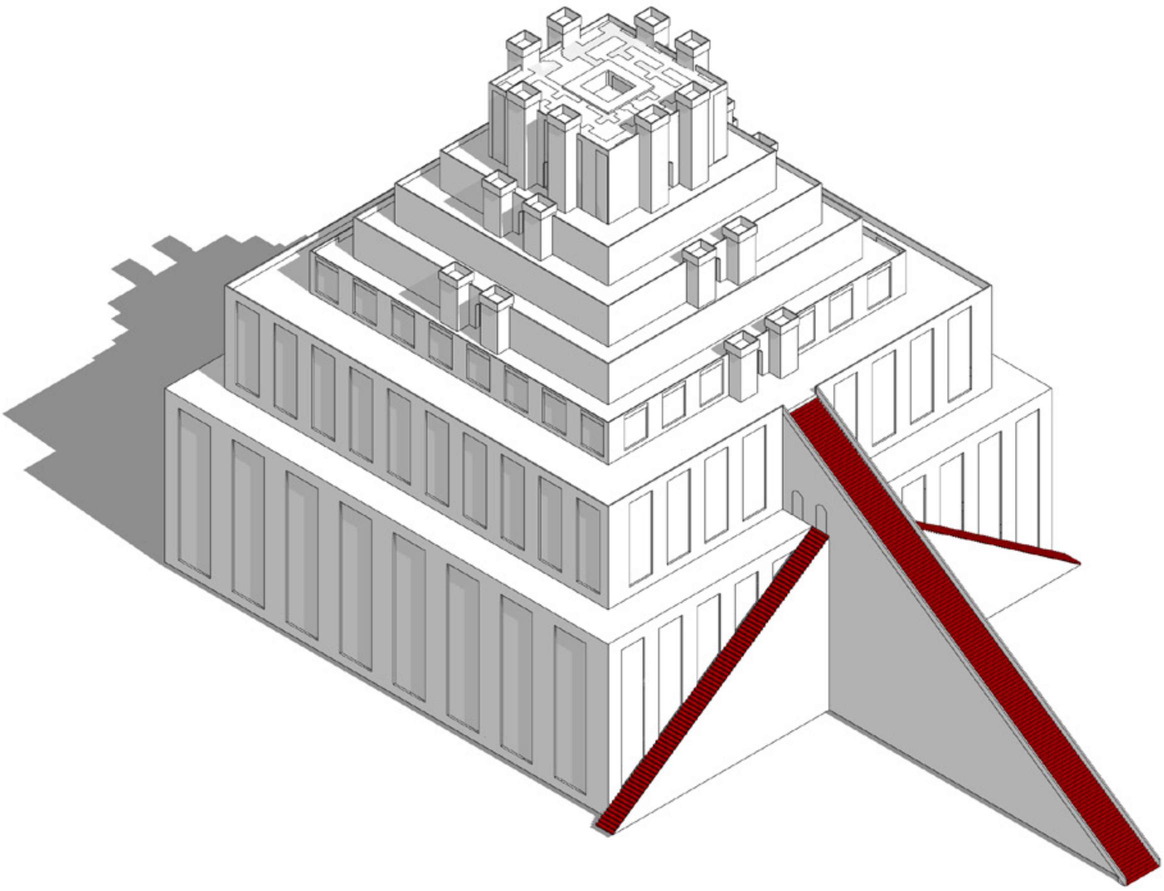
STRAIGHT RAMP

MR-09





The Temple of Etemenanki has a distribution system consisting of ramps and stairways leading through the various levels and places of the complex. All ramps have a gentle slope that allows people to slowly access the temple. Straight ramps allow direct distribution to specific points. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



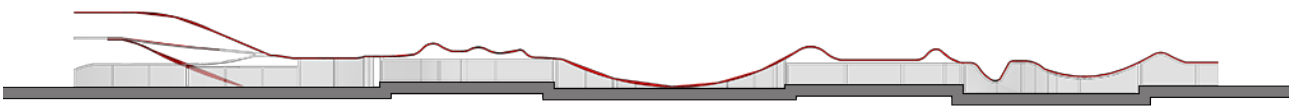
ARCHITECT:	-
NAME:	Temple of Etemenanki
DATE:	9th century BCE
LOCATION:	Babylon, Iraq
PROGRAM:	Temple

LEGEND:
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- EXTERNAL STAIRS
- — *non-present*

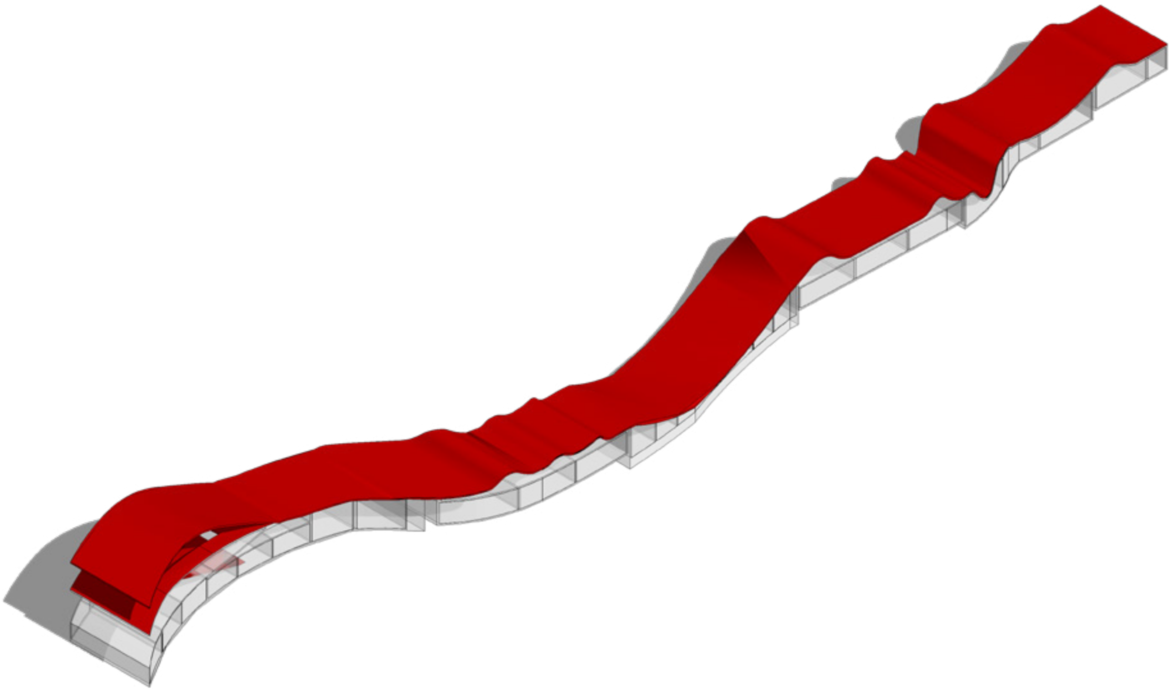
MOUNTAIN RIDGE

STRAIGHT RAMP

MR-10



The Season Scape is a temporary installation composed of ramps and platforms that create a continuous flow of movement for visitors. The ramp is the main feature of the installation, creating a sinuous path that leads visitors through different levels and viewpoints of the festival. The distribution system of the installation is designed to create a playful and immersive experience for visitors, inviting them to explore the space and interact with the installation. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT:	J. Mayer H.
NAME:	Season Escape
DATE:	2000
LOCATION:	Ascona, Switzerland
PROGRAM:	Pavilion

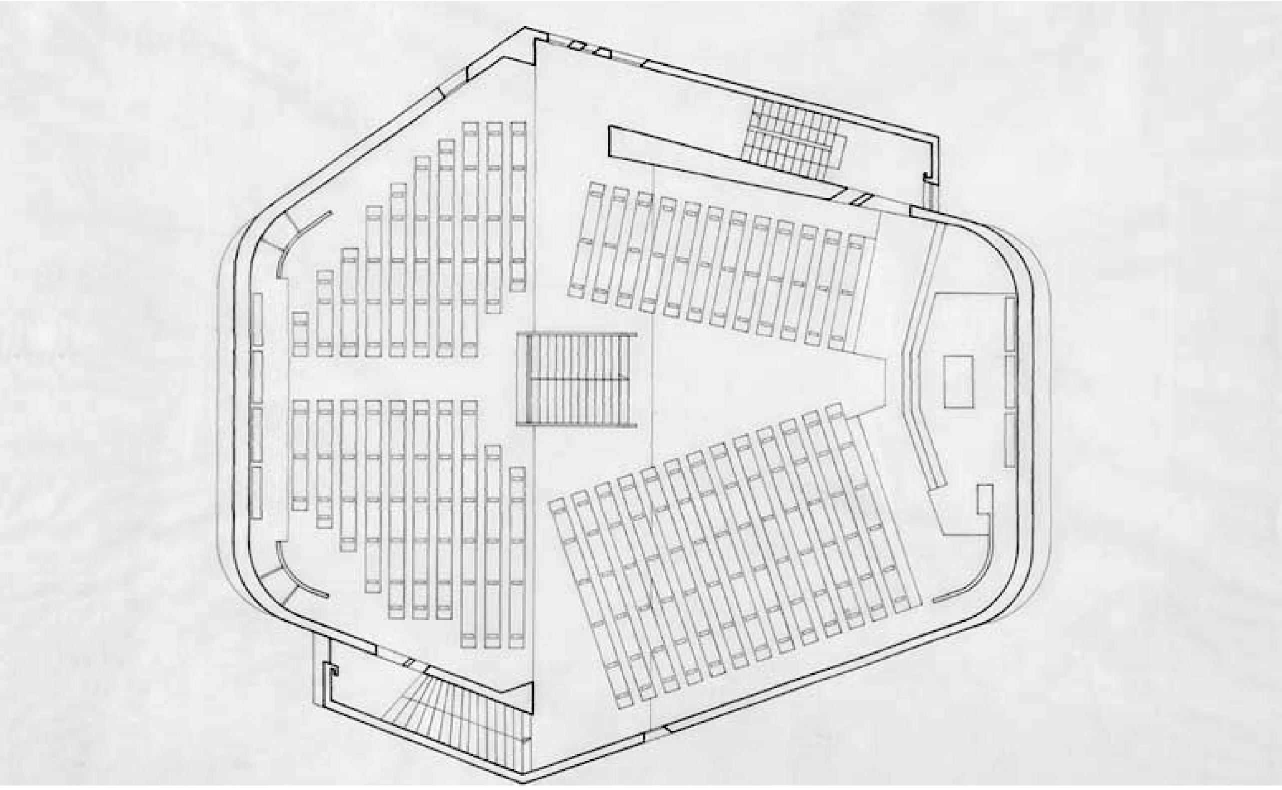
LEGEND:

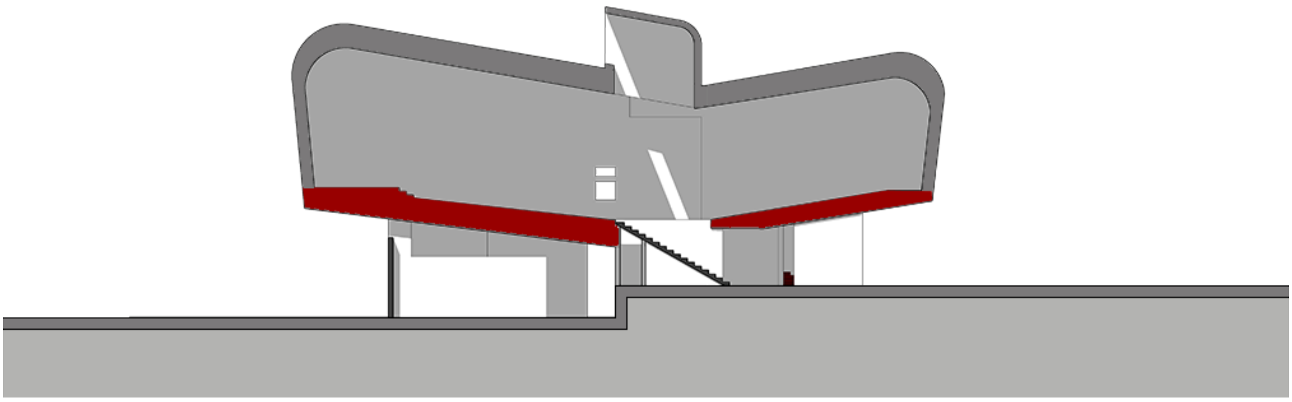
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAIN RIDGE

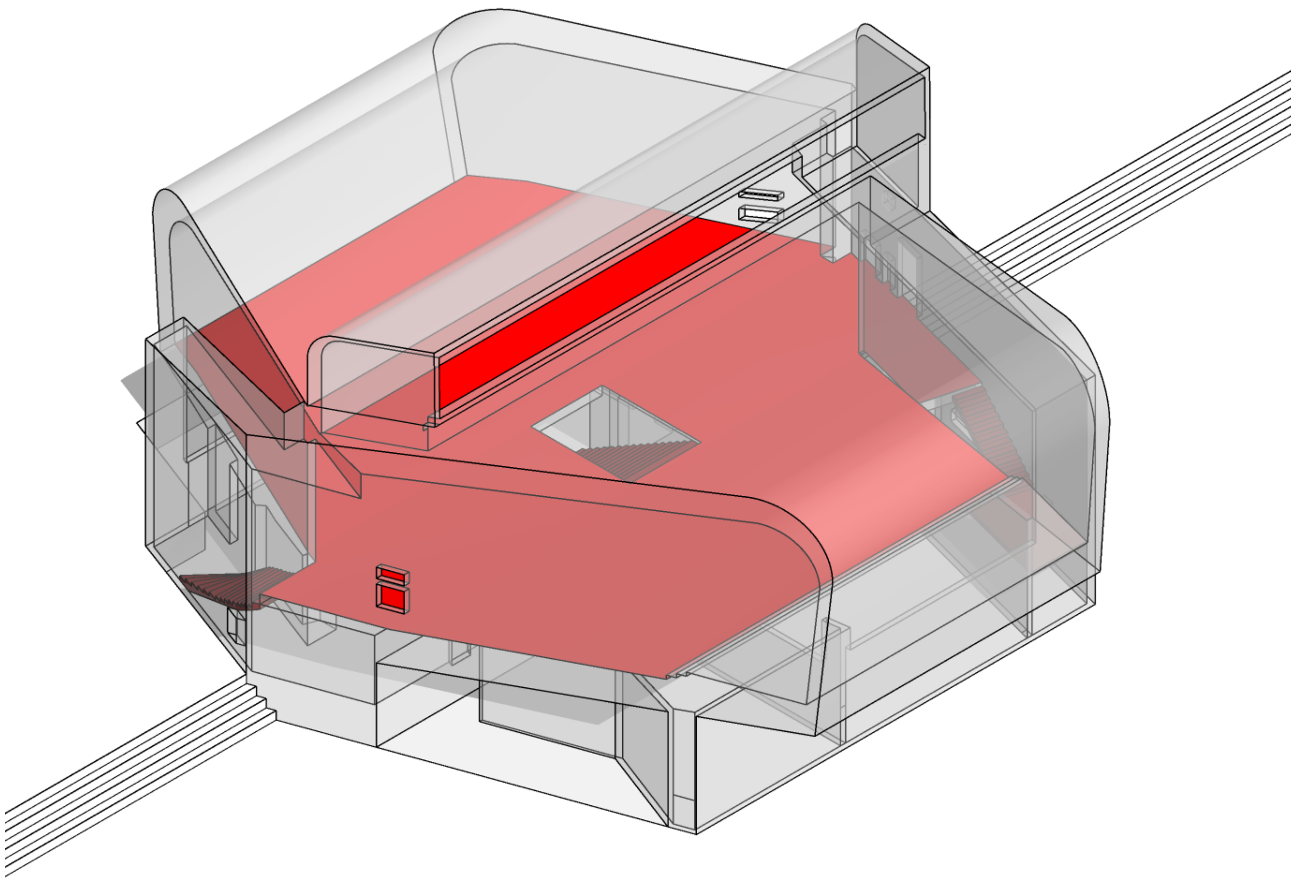
STRAIGHT RAMP

MR-11





The Sainte Bernadette de Banlay's unique ramps system organises the building's circulation. The vertical circulation module in the centre of the building takes you to the first floor, where two ramps are located on the first level, and the slope ascends towards both ends from the midpoint of the building. The inclined planes allow the organisation of visitors inside the church, always favouring the view towards the altar. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



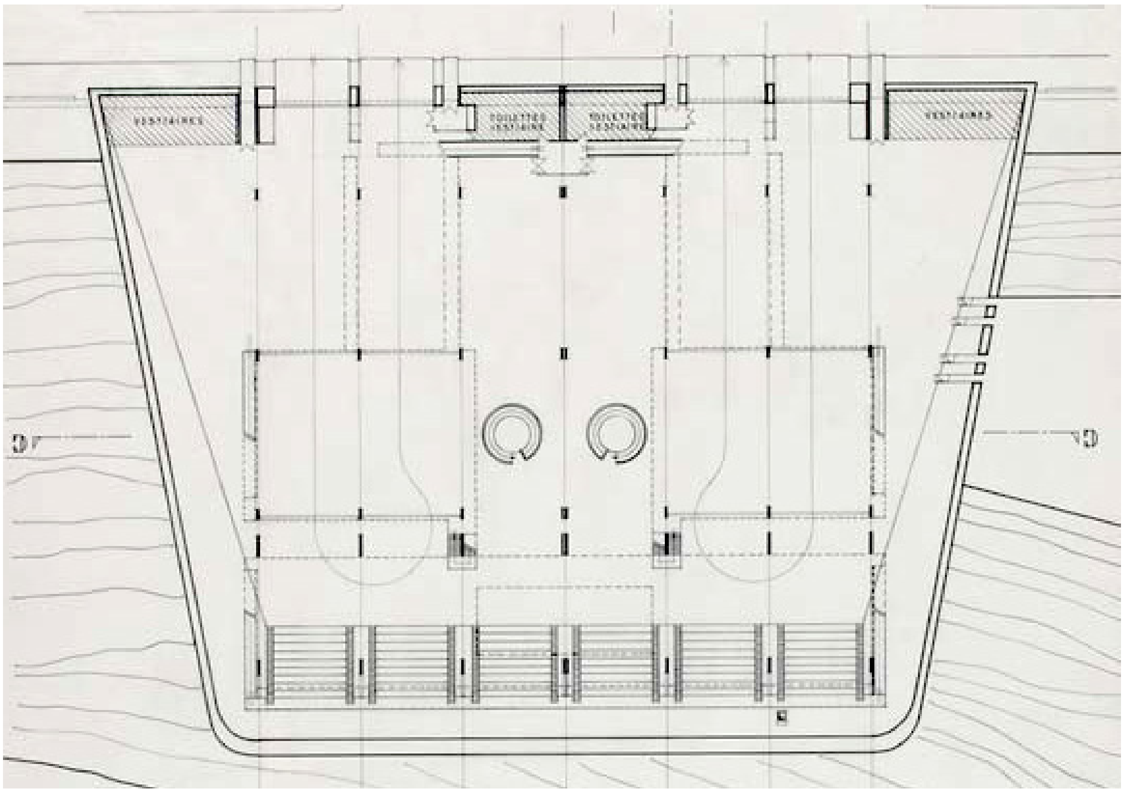
ARCHITECT: Claude Parent, Paul Virilio
NAME: Sainte Bernadette de Banlay
DATE: 1963
LOCATION: Nevers, France
PROGRAM: Church

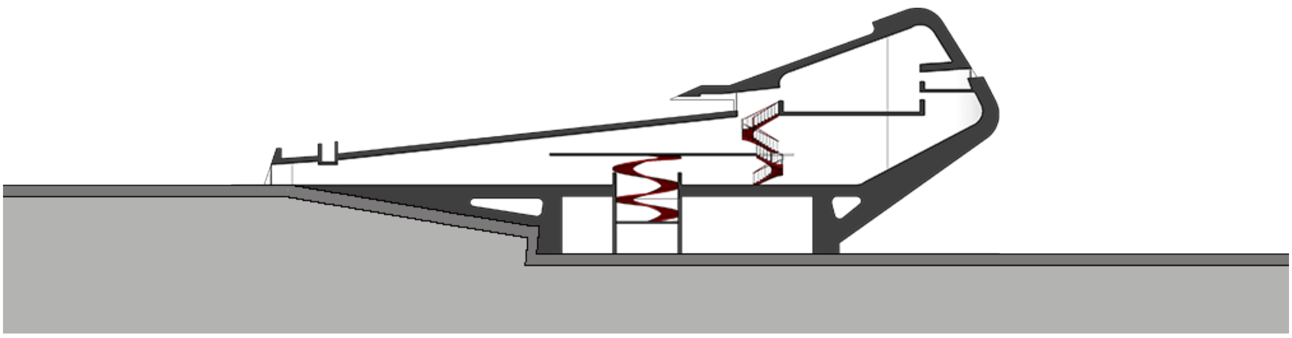
LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAIN RIDGE

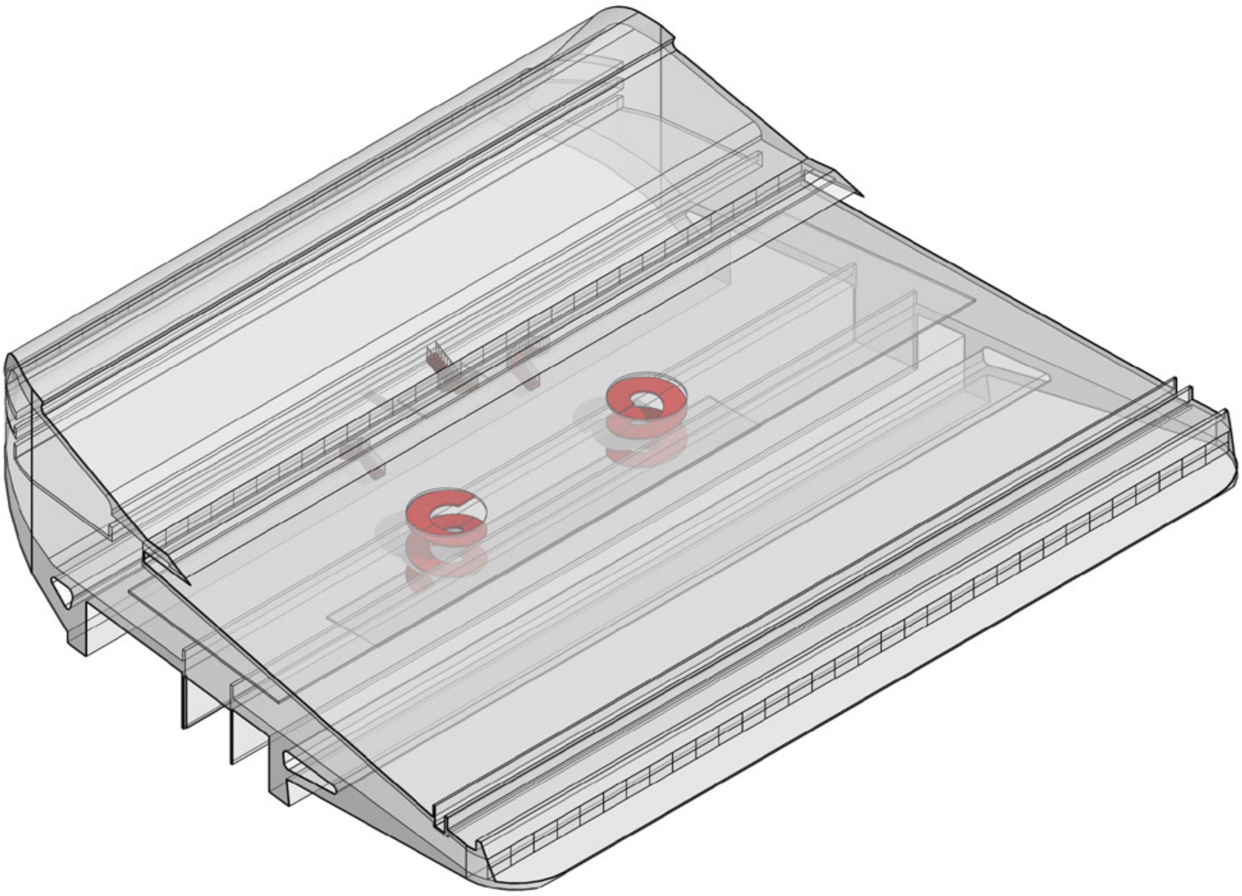
STRAIGHT RAMP

MR-12





The Palais des expositions have a distribution system based on a series of ramps that connect the exhibition spaces, allowing for a continuous flow of people. The ramps create a sense of movement and dynamism throughout the building while providing a unique perspective on the exhibits. One of the essential characteristics of the ramp is that it blurs the boundaries between interior and exterior, as visitors can view the cityscape from various vantage points. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



ARCHITECT:	Claude Parent, Paul Virilio
NAME:	Palais des expositions
DATE:	1966-1967
LOCATION:	Charleville, France
PROGRAM:	Exhibition Center

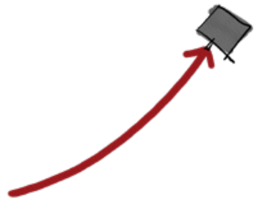
LEGEND:

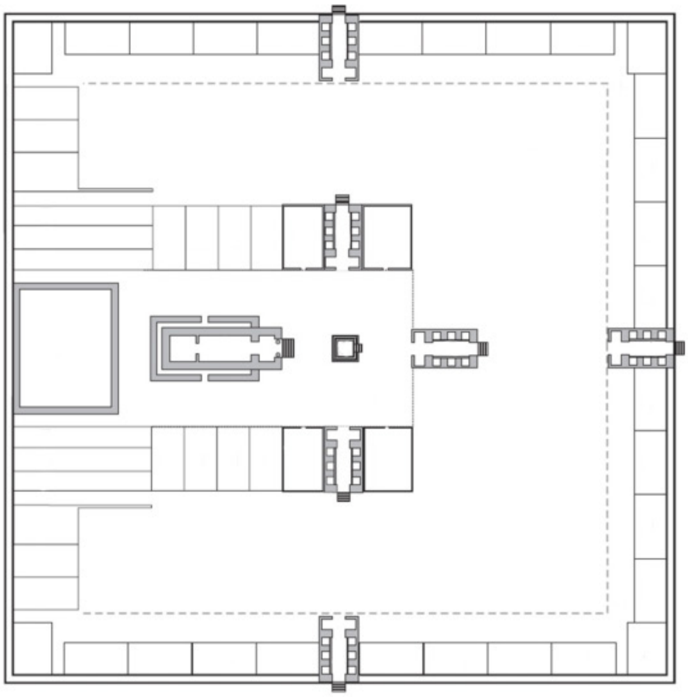
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

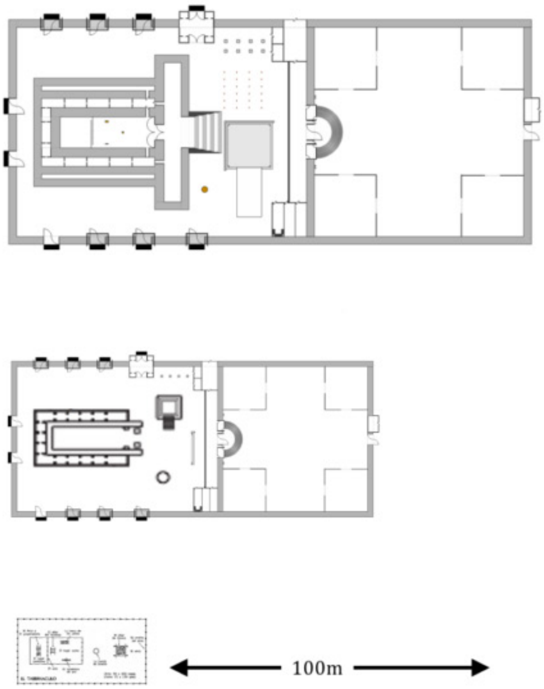
MOUNTAIN RIDGE

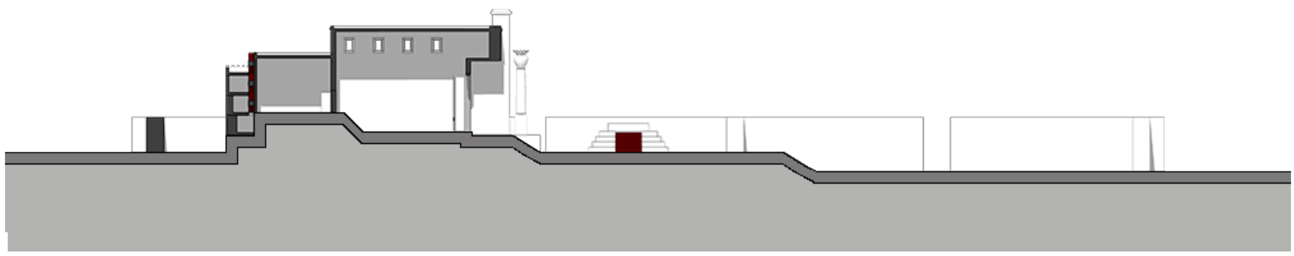
STRAIGHT RAMP

MR-13

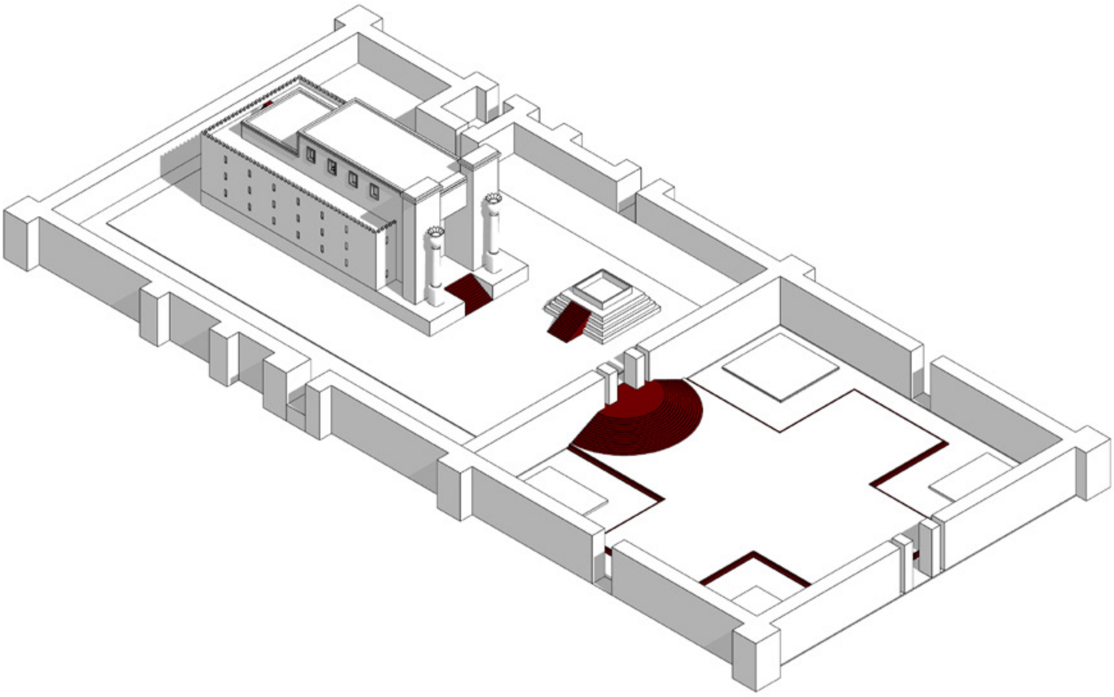








The Temple of Solomon has a distribution system featuring a series of chambers and halls arranged in a hierarchical layout, reflecting the importance of different rituals. The big ramp leading up to the Temple was a significant feature, providing a grand approach to the holy site and allowing for the transport of goods and offerings. The principal stairs played a crucial role in the Temple's distribution system, allowing people to move up and down the Temple quickly and easily. The type of distribution is punctual since the stairs lead directly to the space to be distributed.



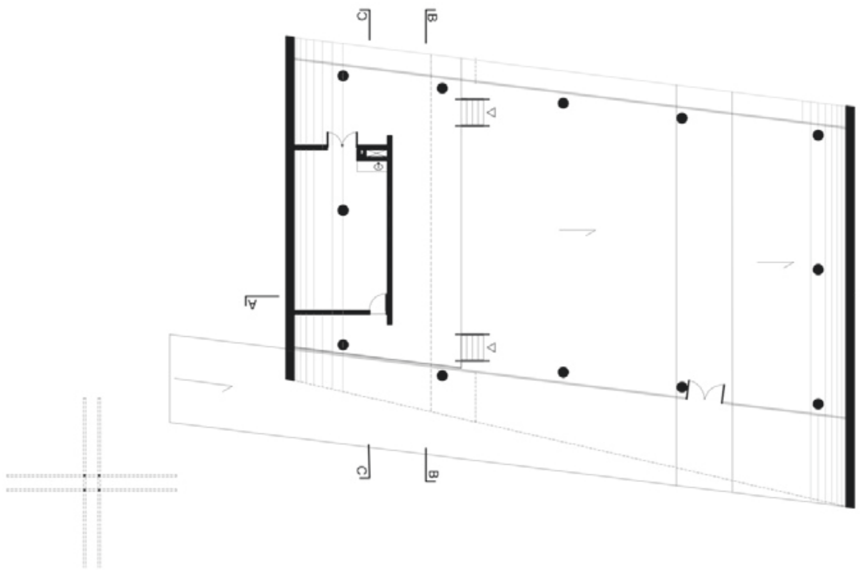
ARCHITECT: -
NAME: Temple of Solomon
DATE: 957 BC
LOCATION: Jerusalem, Israel
PROGRAM: Temple

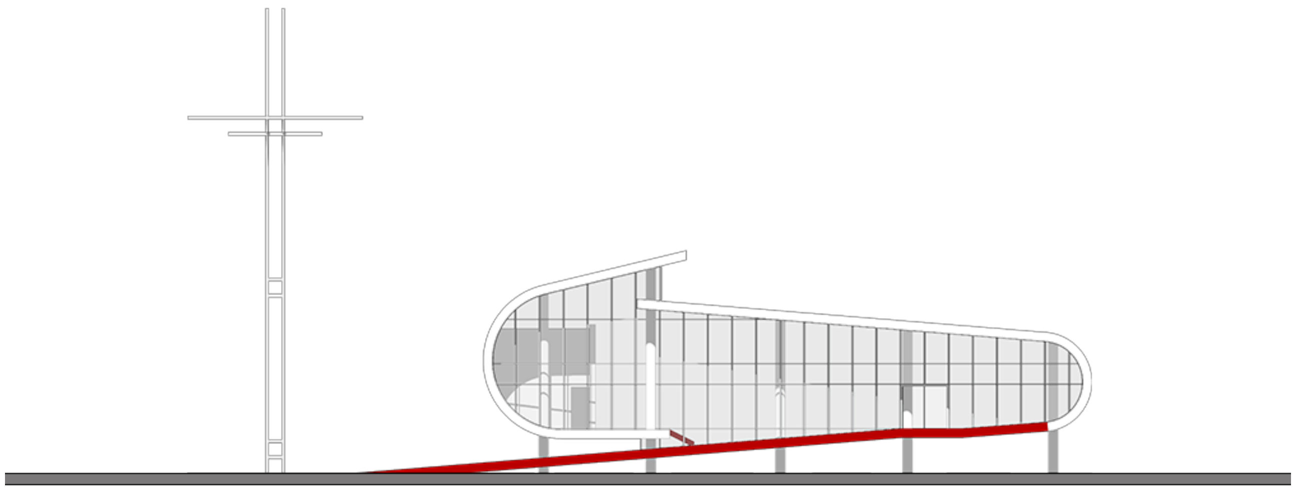
LEGEND:
SERVED SPACES
~~INTERNAL RAMPS~~
~~EXTERNAL RAMPS~~
INTERNAL STAIRS
EXTERNAL STAIRS
non-present

MOUNTAIN RIDGE

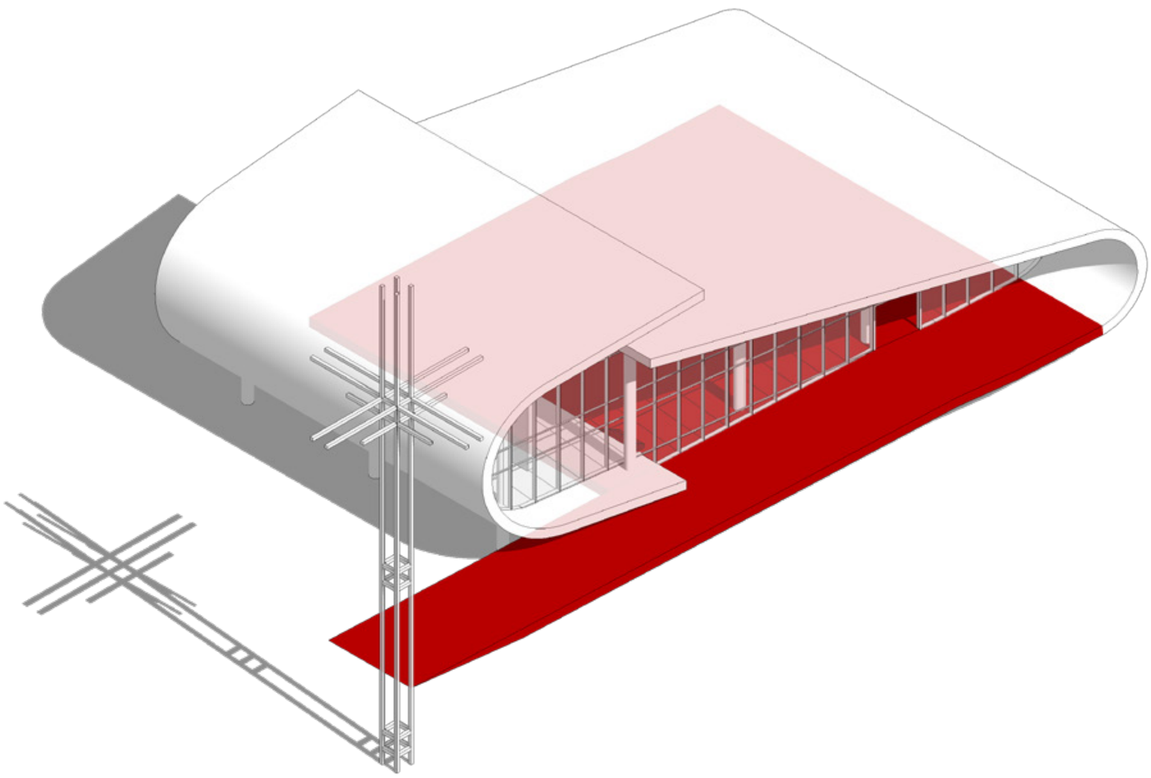
STRAIGHT RAMP

MR-14





The Chapel in Lagoa Santa has a distribution system that integrates with the natural landscape. The ramp directly accesses the chapel and creates a contemplative path for visitors. The inclined plane allows the organisation of visitors inside the church fluently, favouring the view towards the altar. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT:	João Diniz Arquitetura
NAME:	Chapel in Lagoa Santa
DATE:	2018
LOCATION:	Lagoa Santa, Brazil
PROGRAM:	Church

LEGEND:

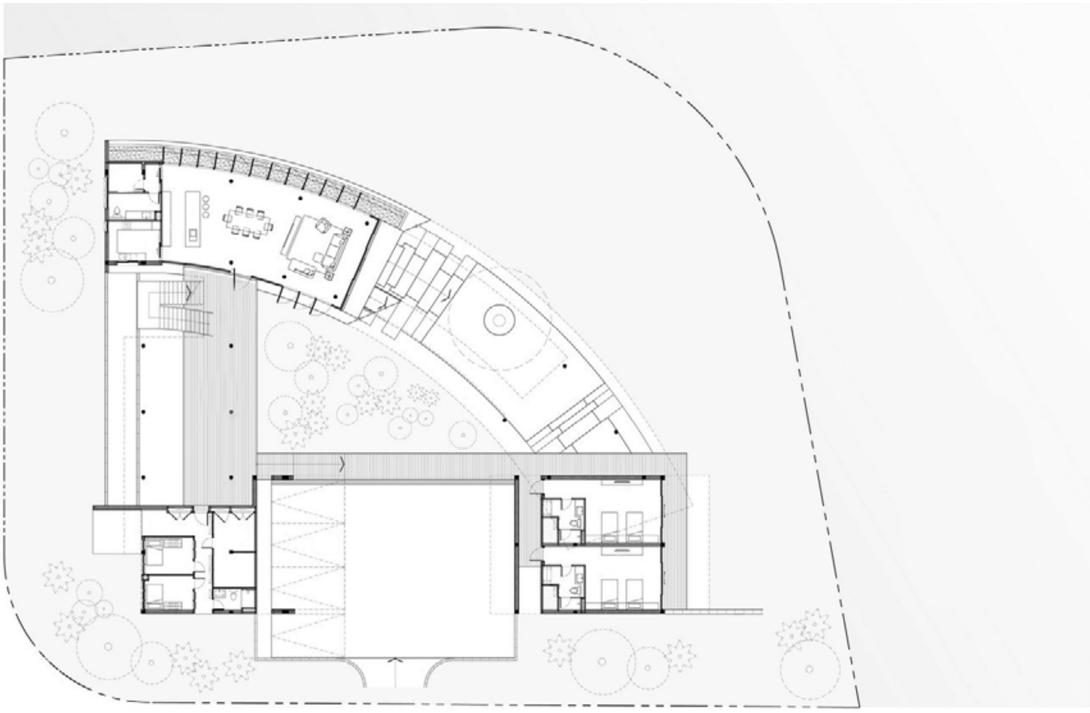
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~

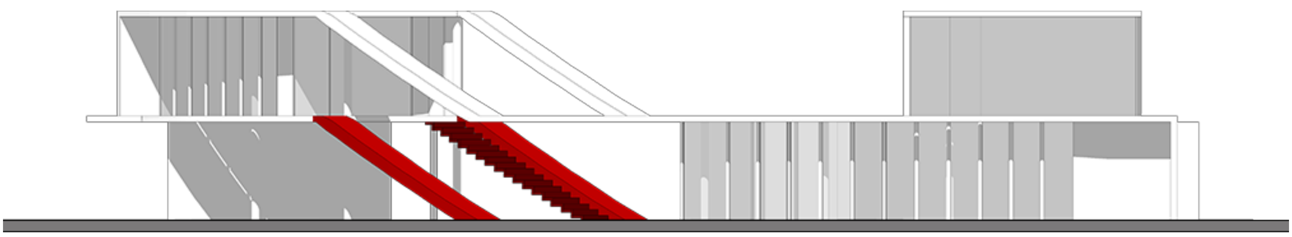
— *non-present*

MOUNTAIN RIDGE

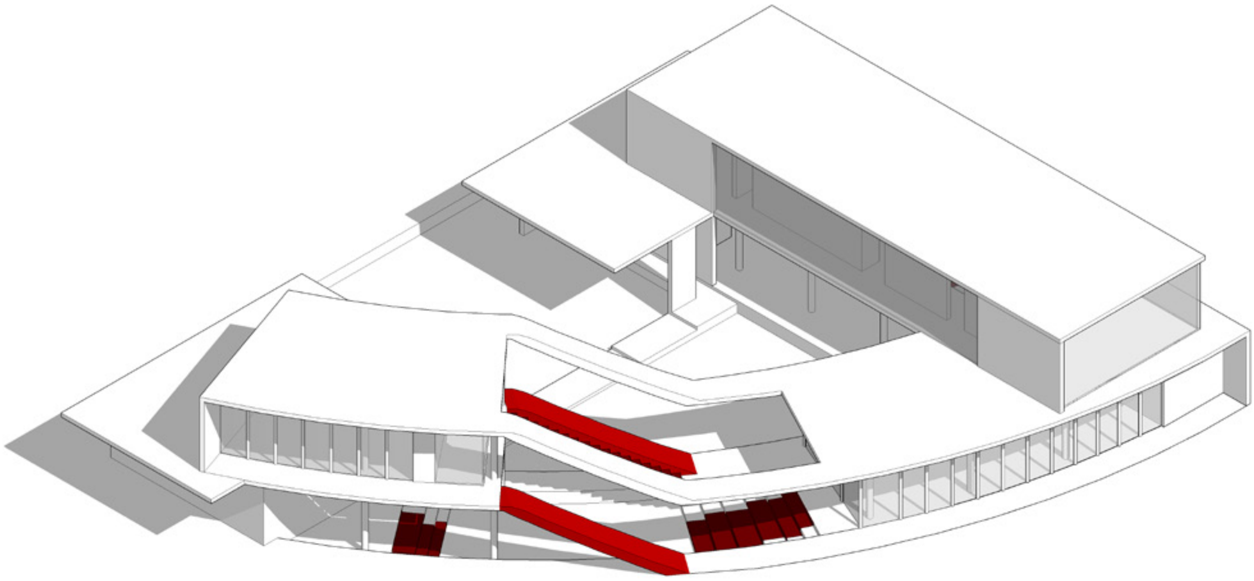
STRAIGHT RAMP

MR-15





The Radial House has a distribution system that is organised around a courtyard. The two volumes of the house are connected by a ramp and stair distribution system, allowing accessibility for people with different abilities throughout the house. The ramp fluidly connects public and private spaces while simultaneously separating the spaces efficiently. The type of distribution is diffuse since the spaces to be distributed are not found serially but sporadically.



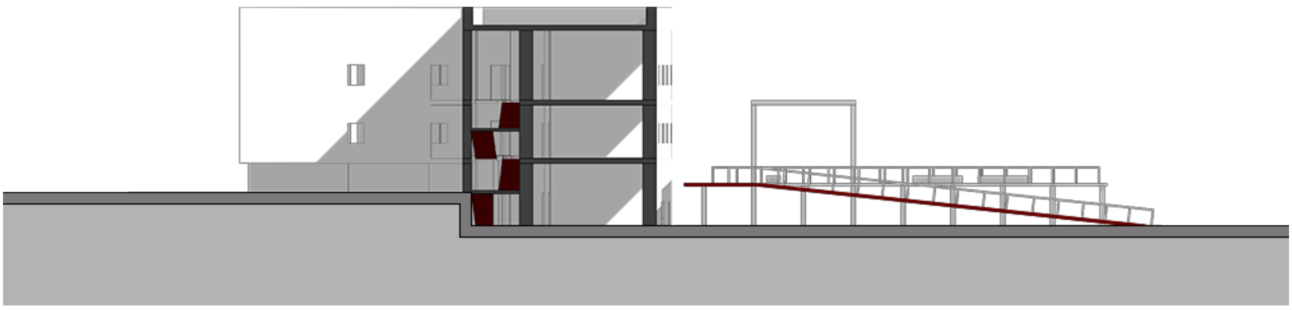
ARCHITECT: Stu/D/O Architects
NAME: Radial House
DATE: 2020
LOCATION: MU SI, Thailand
PROGRAM: House

LEGEND:
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- EXTERNAL STAIRS
- — *non-present*

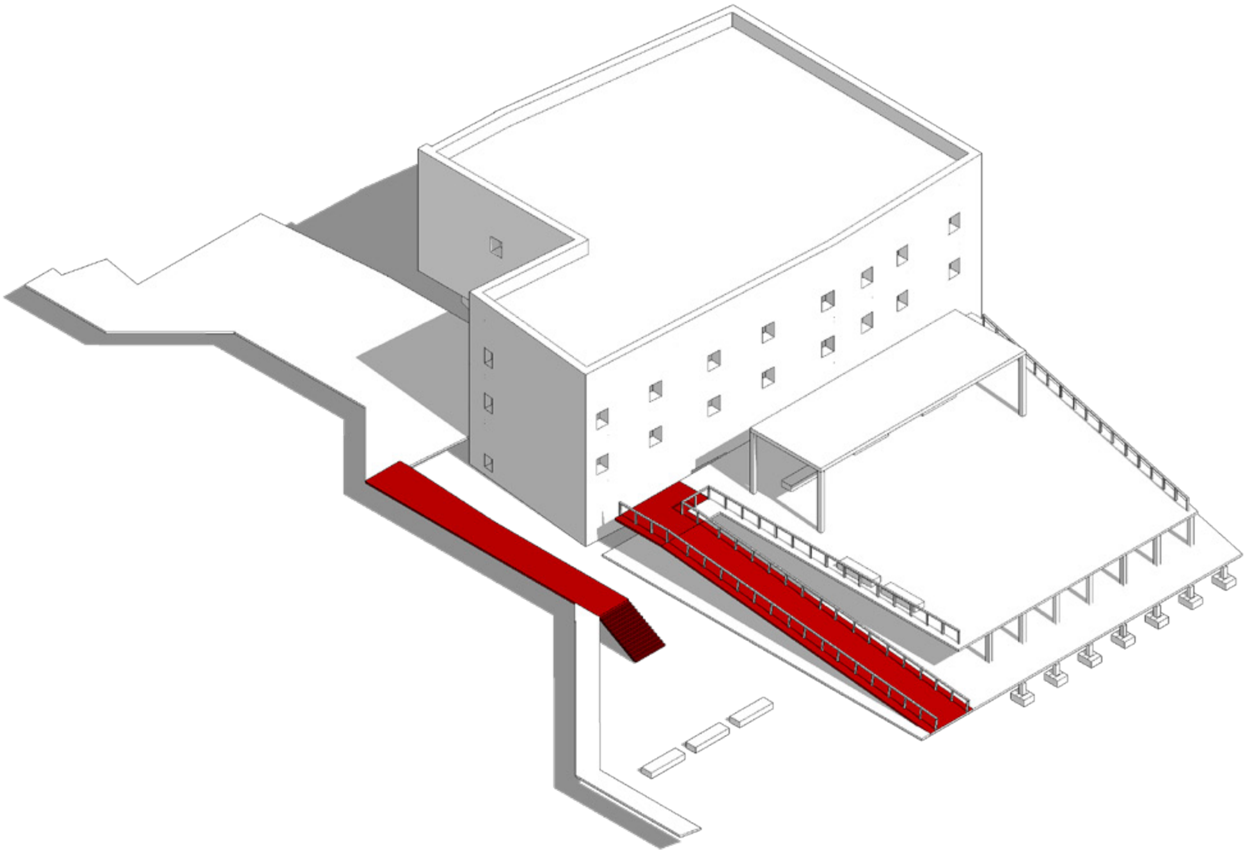
MOUNTAIN RIDGE

STRAIGHT RAMP

MR-16



The Between Cathedrals. The design features a sunken courtyard with a ramp that descends from street level to the open space. This ramp serves as the main circulation element, connecting visitors to the underground area where they can gather, relax, and enjoy the surrounding architecture. The configuration of the distribution system allows the flexibility of the spaces. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.

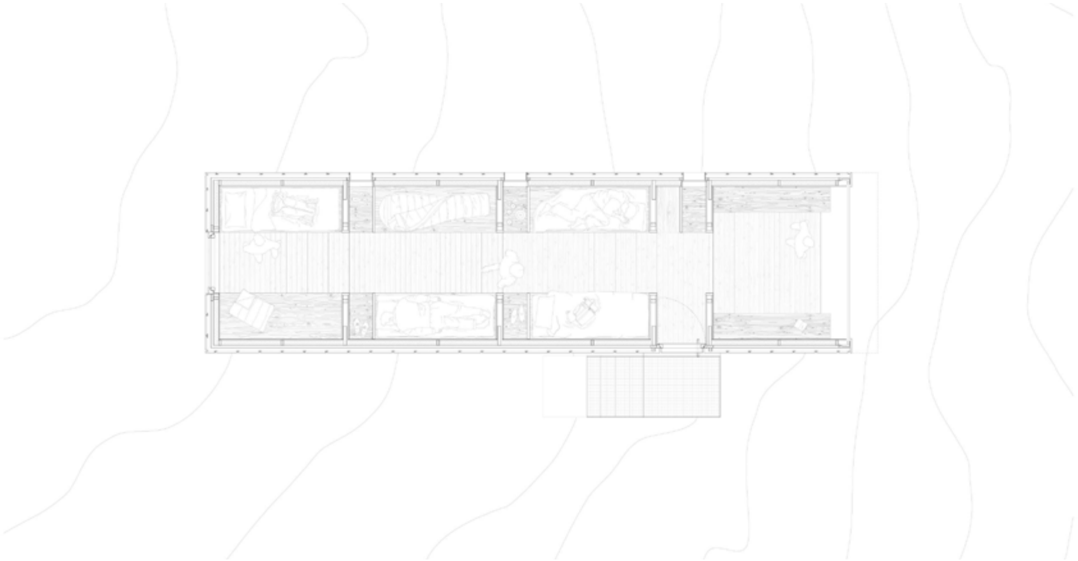


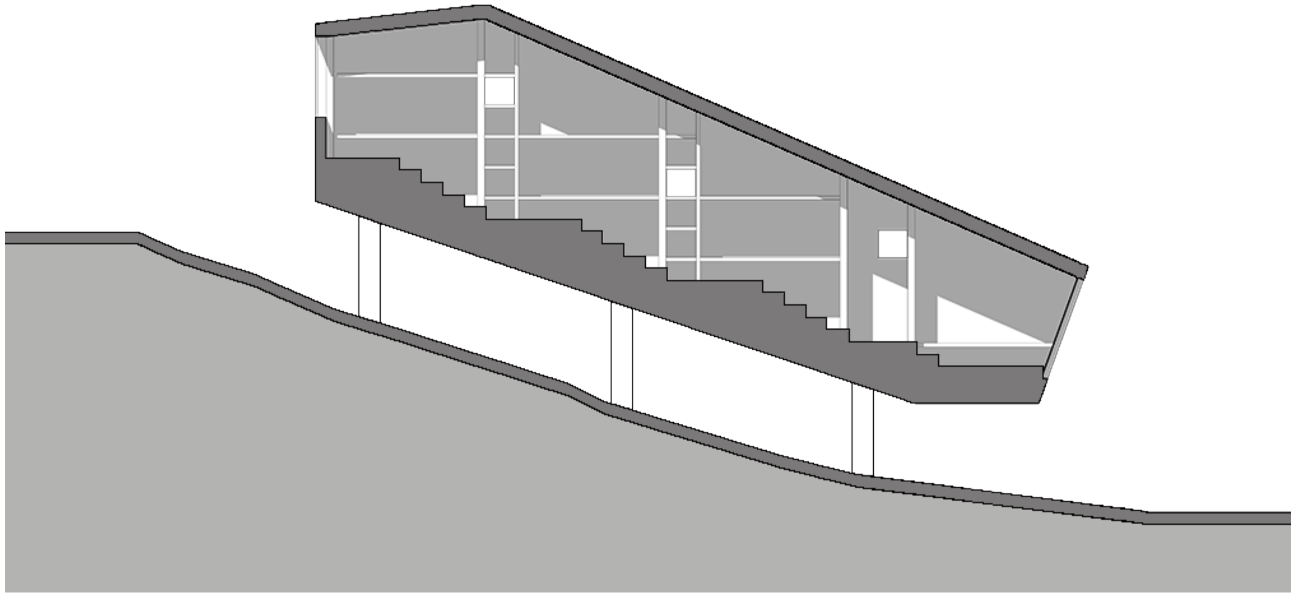
ARCHITECT: Alberto Campo Baeza
NAME: Between Cathedrals
DATE: 2009
LOCATION: Cadiz, Spain
PROGRAM: Museum

LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- EXTERNAL STAIRS
- — *non-present*

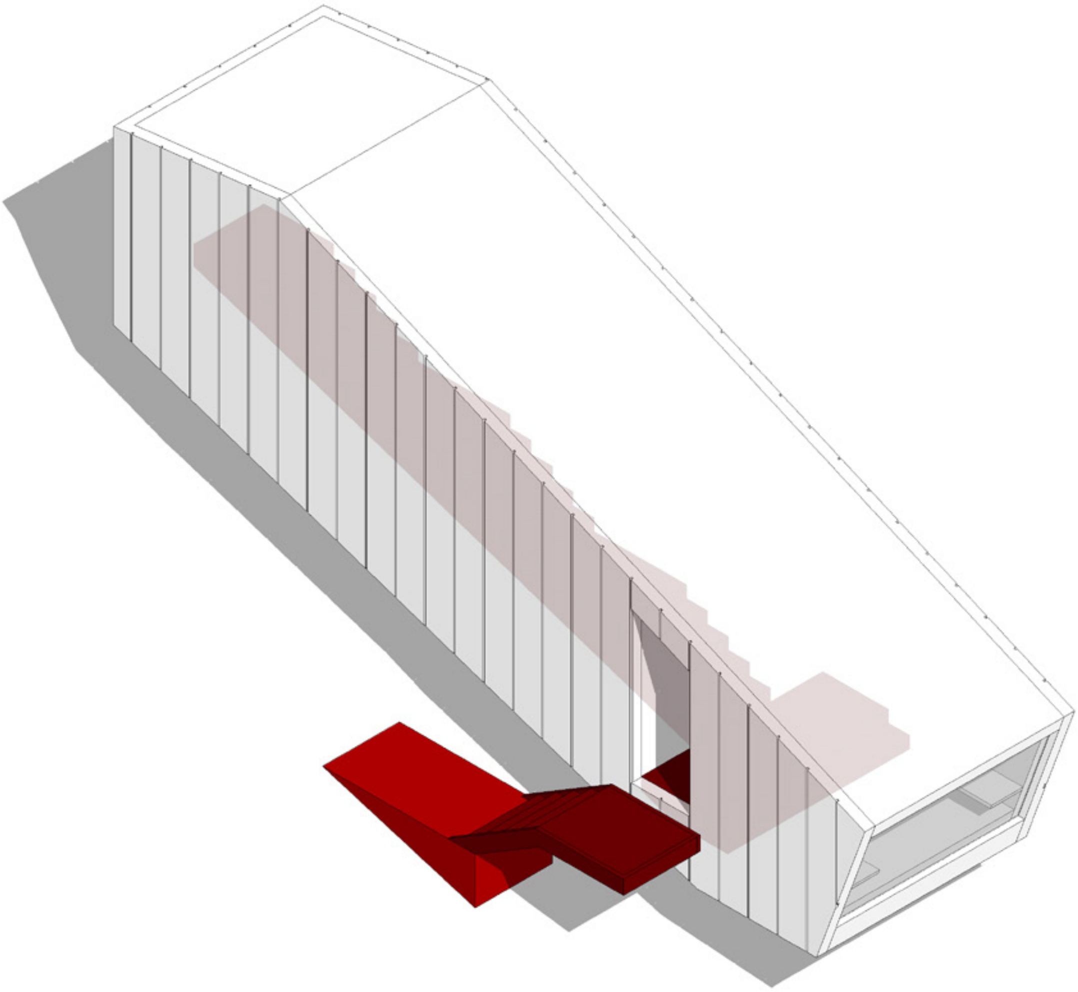
MOUNTAIN RIDGE
STRAIGHT RAMP

MR-17





The Bivacco F.lli Fanton is a mountain shelter built on a steep slope and features a unique distribution system that uses a central staircase to connect different levels; the spaces are continuously on the sides of the stair. The staircase serves as the central axis of the building and leads to other rooms, such as the kitchen, dining area, and sleeping quarters. The configuration also provides breathtaking views of the surrounding mountains. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT:	Simone Gobbo
NAME:	Bivacco F.lli Fanton
DATE:	2015
LOCATION:	Belluno, Italy
PROGRAM:	Habitat module

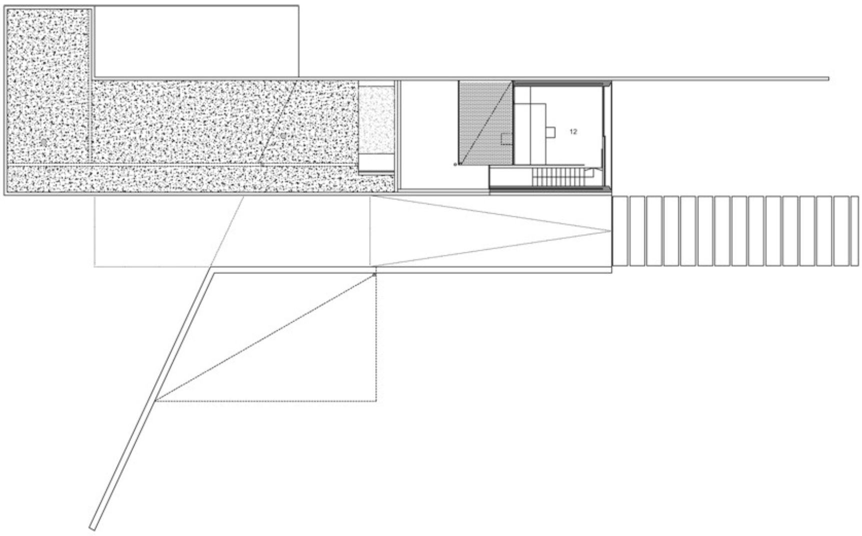
LEGEND:

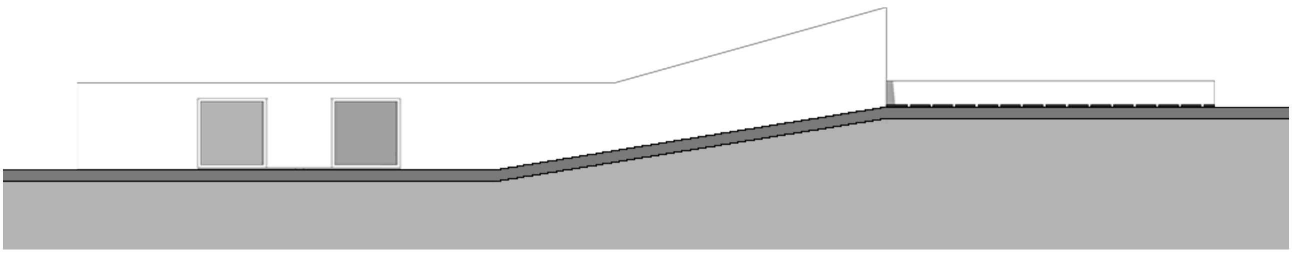
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- EXTERNAL STAIRS
- — *non-present*

MOUNTAIN RIDGE

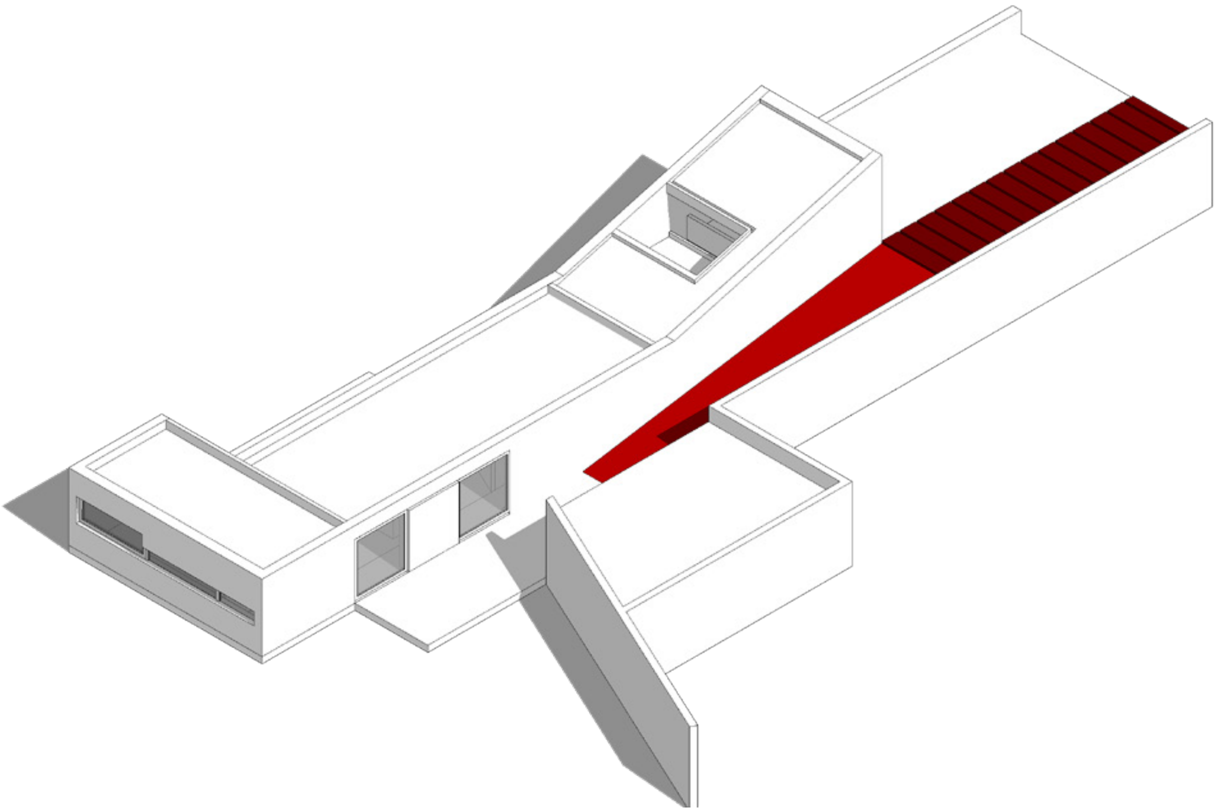
STRAIGHT RAMP

MR-18





The Bianna House is built on a level below street level. It has an access ramp that leads directly from the street to the social spaces of the house. The distribution system allows the movement of people with different abilities in the house. The ramp becomes one of the main features of the house and a welcoming space that invites guests to enter. The type of distribution is diffuse since the spaces to be distributed are not found serially but sporadically.



ARCHITECT:	Hidalgo Hartmann
NAME:	Bianna House
DATE:	2006
LOCATION:	Olot, Spain
PROGRAM:	House

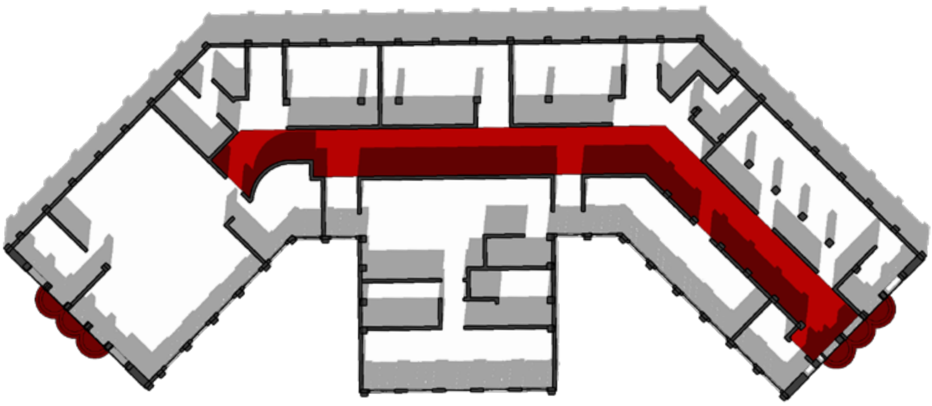
LEGEND:

- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- EXTERNAL STAIRS
- — *non-present*

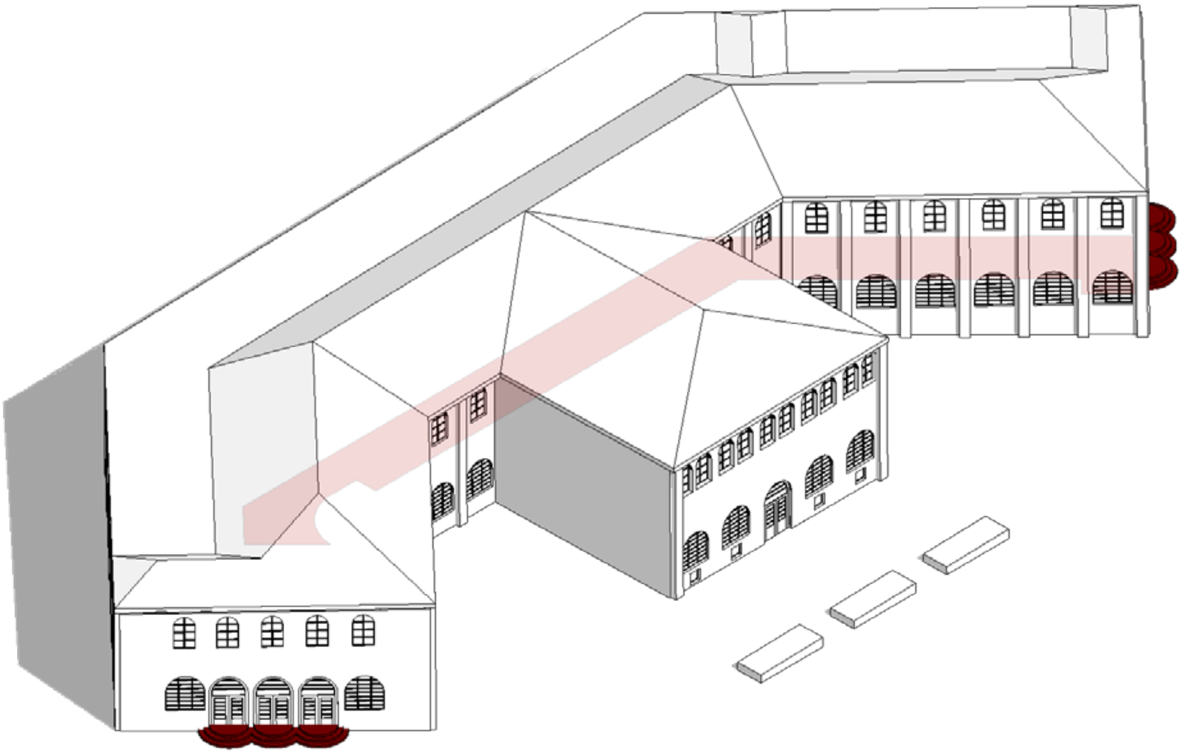
MOUNTAIN RIDGE

STRAIGHT RAMP

MR-19



The Padiglione II - Mercato Ittico, thanks to the topography of the place, the distribution system develops along an inclined plane. The ramp that functions as the central axis distributes the businesses that are throughout the entire length of the building to its sides. The slope of the ramp is subtle but allows the route to be fluid, accompanying people from one end to the other almost intuitively. The circulation system allows entry and exit of the building at different points after having travelled through it. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT:	G. Barone
NAME:	Padiglione II - Mercato Ittico
DATE:	1836
LOCATION:	Torino, Italy
PROGRAM:	Market

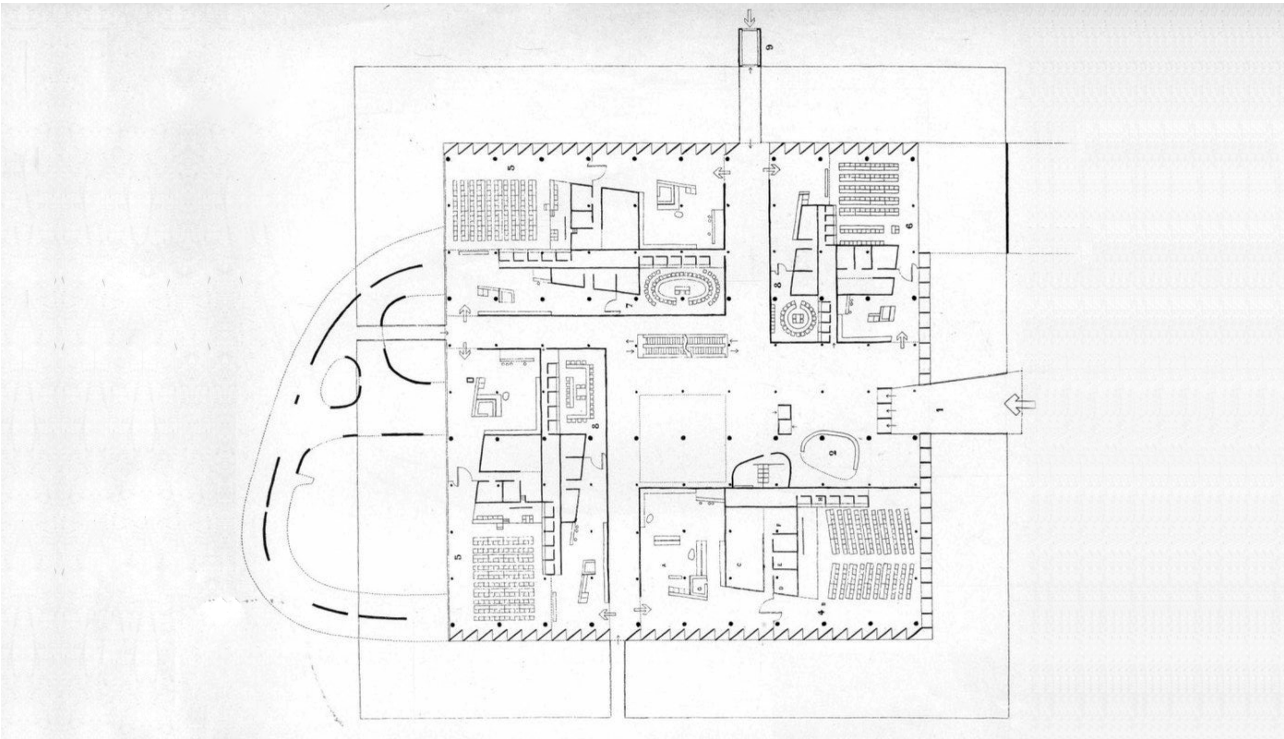
LEGEND:

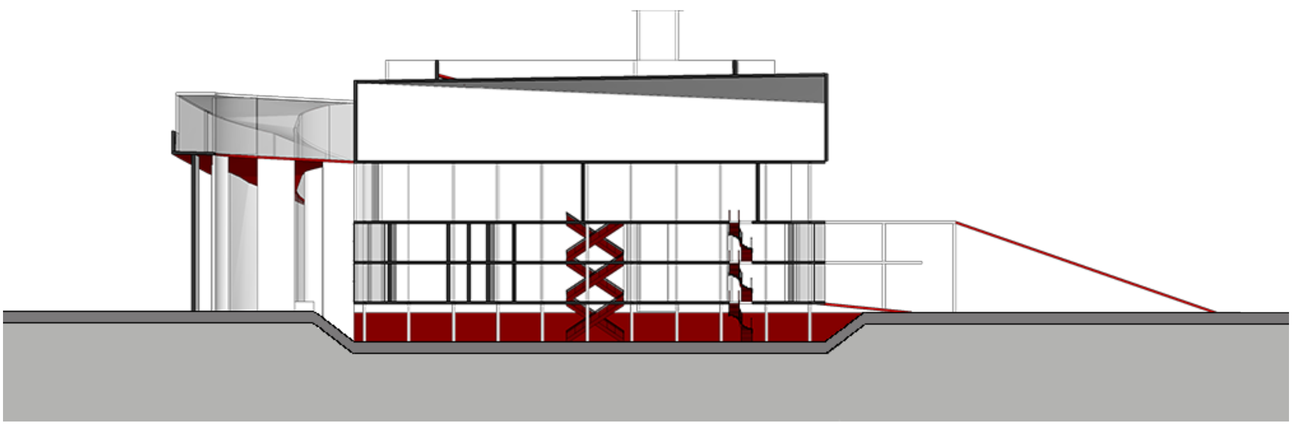
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- ~~INTERNAL STAIRS~~
- EXTERNAL STAIRS
- — *non-present*

MOUNTAIN RIDGE

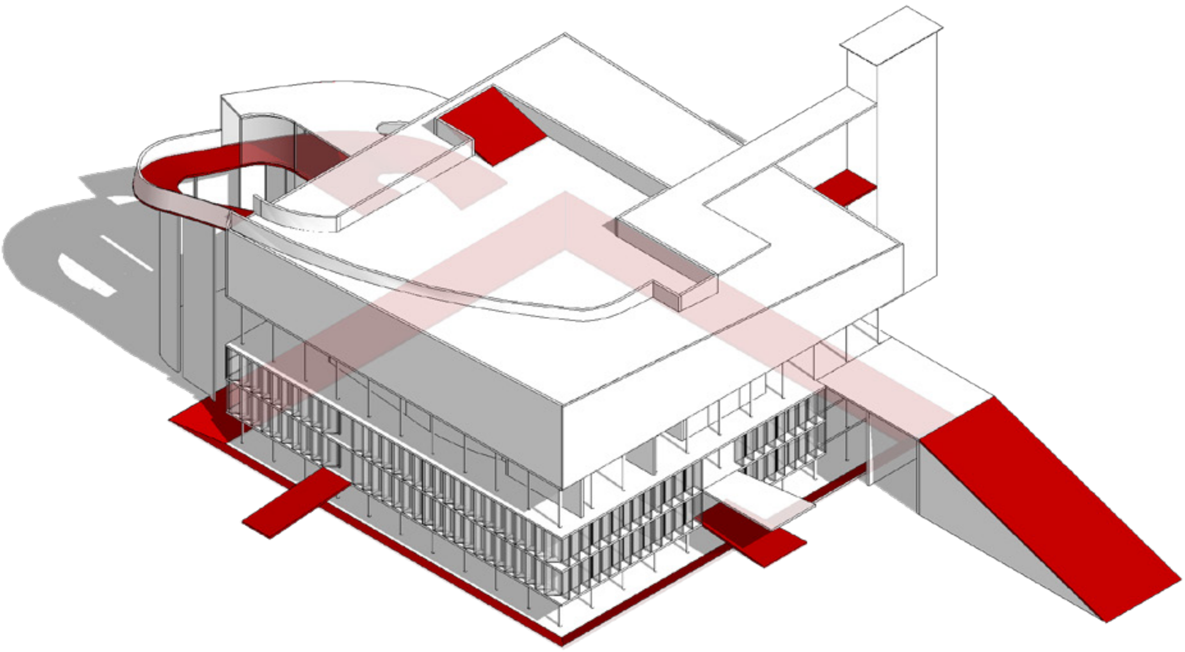
STRAIGHT RAMP

MR-20





The Palais de Congrès has a distribution system based on its modular design, allowing maximum flexibility in configuring the space. The main entrance leads to a central circulation space, with ramps and stairs leading to various levels. The distributive system allows continuous circulation within the space. The ramp allows easy access from the street. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



ARCHITECT:	Le Corbusier
NAME:	Palais des Congrès
DATE:	1962
LOCATION:	Strasbourg, France
PROGRAM:	Congress Palace

LEGEND:

- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~

— *non-present*

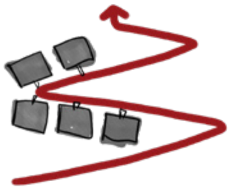
ARCHITECTURAL FORM

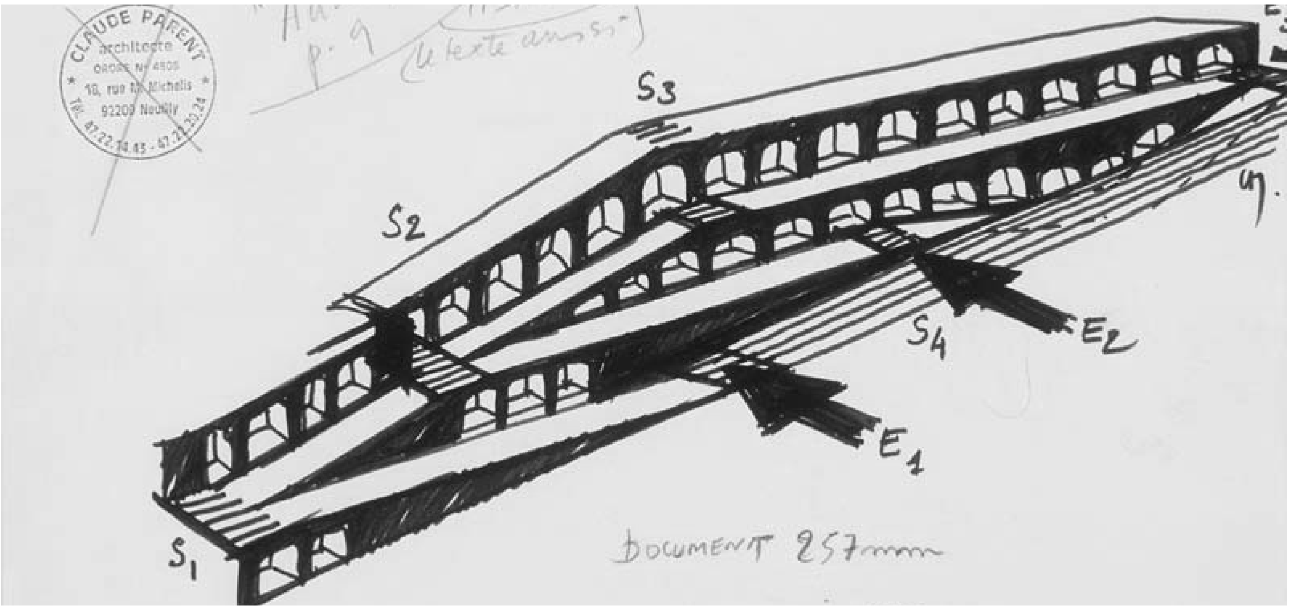
3.2.5. MOUNTAINSIDE HAIRPIN BEND RAMP

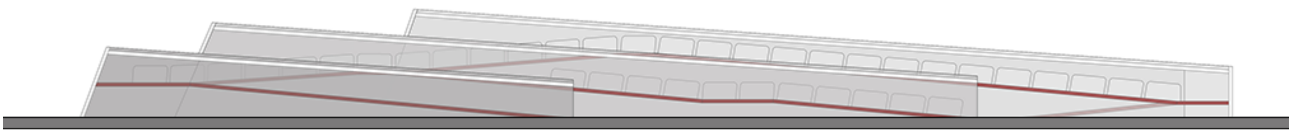
MOUNTAINSIDE

HAIRPIN BEND RAMP

MS-01

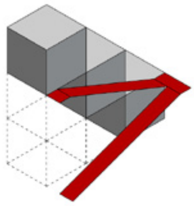


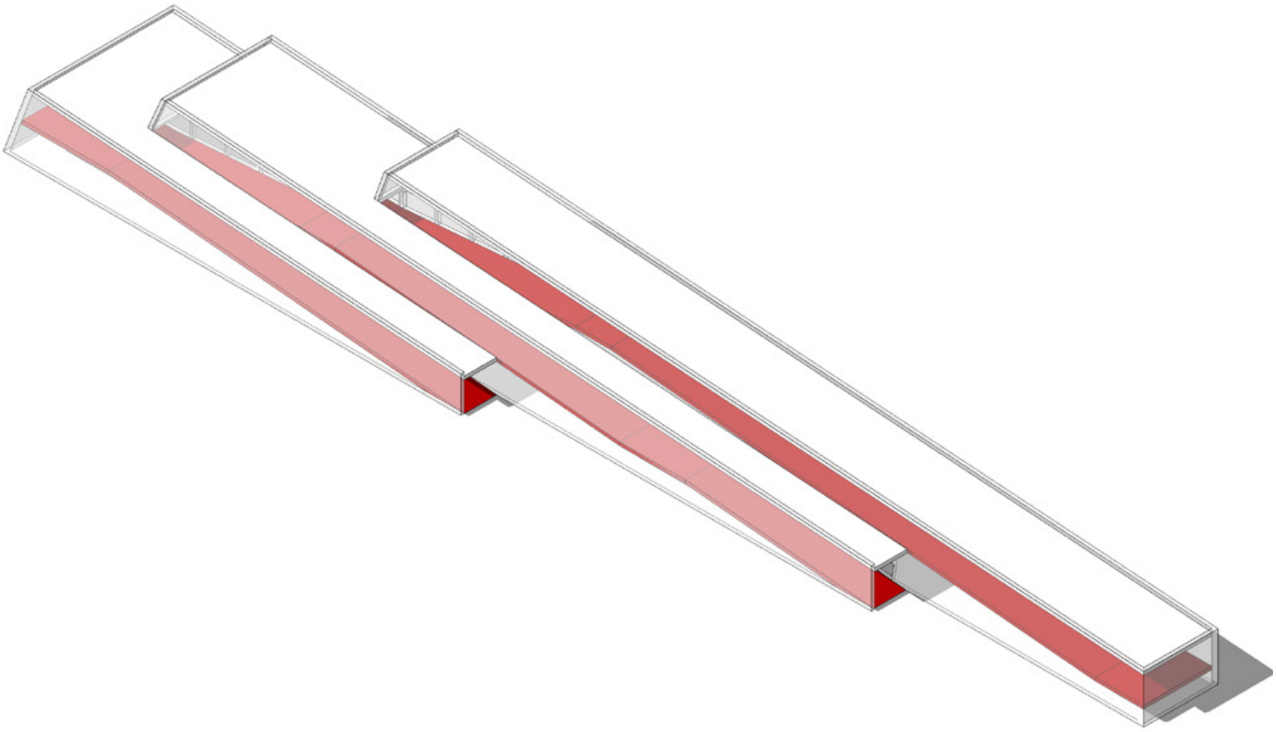




The Supermarché Carrefour has a distribution system that allows easy access to the different levels. The ramp plays a significant role in the building's functionality, allowing for easy movement of goods and shoppers between levels. The circulation system allows entry and exit of the building at different points after having travelled through it. The type of distribution is continuous since the ramps along its route contain the space to be distributed.

Distribution Scheme





ARCHITECT:	Claude Parent
NAME:	Supermarché Carrefour
DATE:	1970
LOCATION:	Sens-Maillot, France
PROGRAM:	Mall

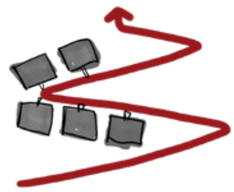
LEGEND:

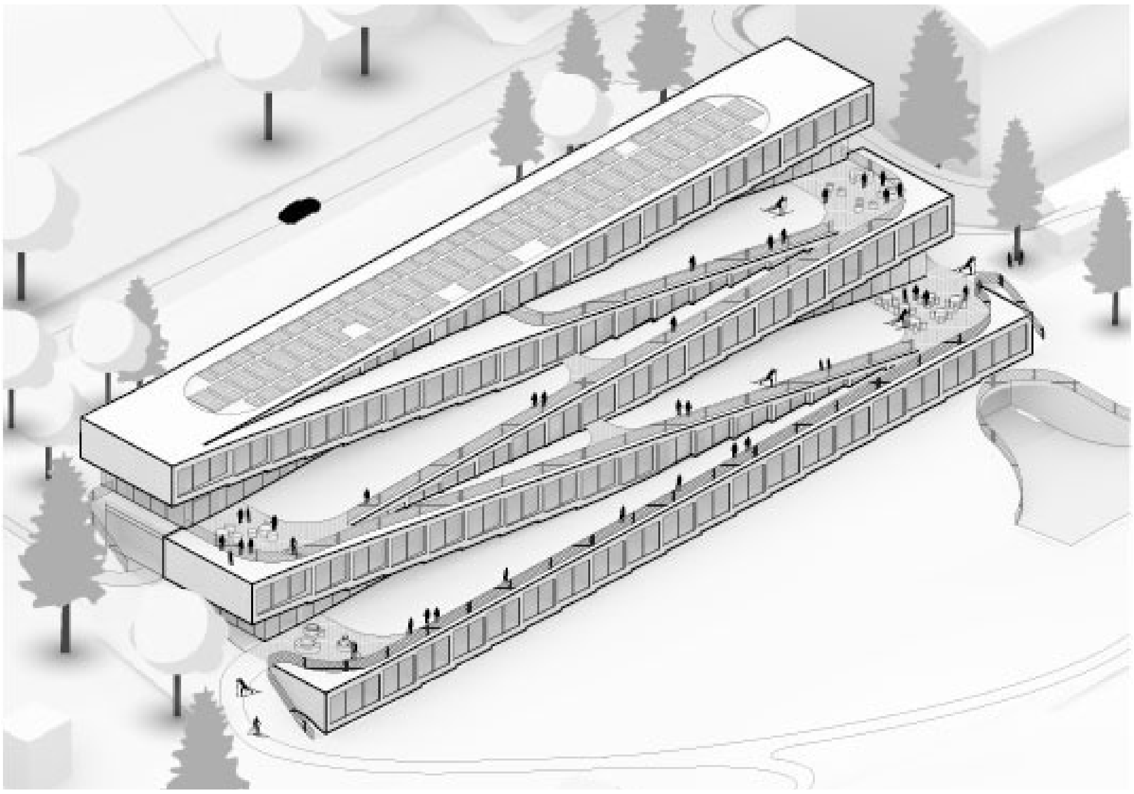
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- ~~INTERNAL STAIRS~~
- ~~EXTERNAL STAIRS~~
- — *non-present*

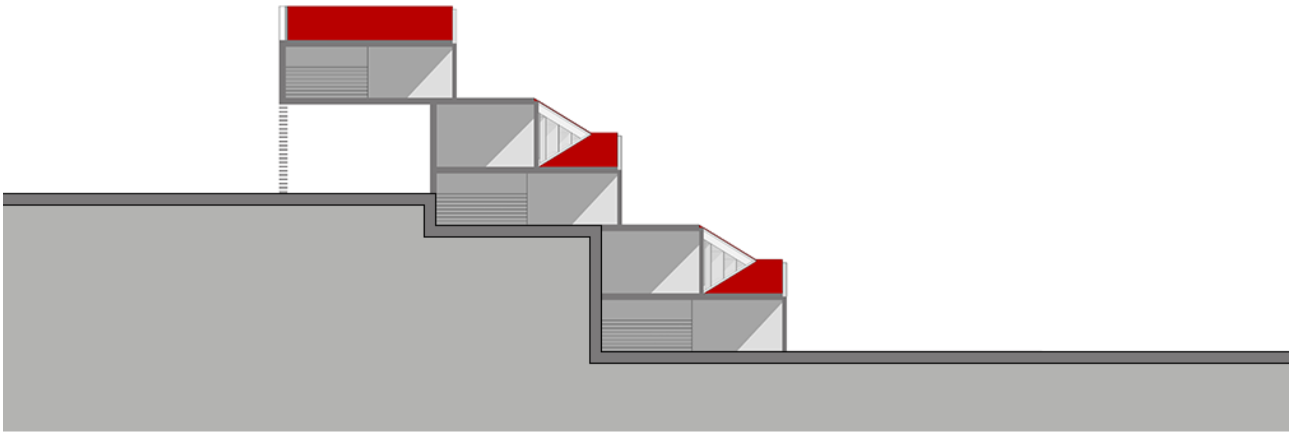
MOUNTAINSIDE

HAIRPIN BEND RAMP

MS-02

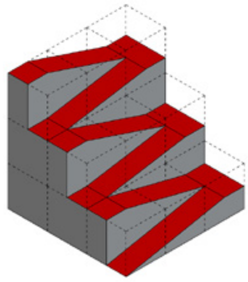


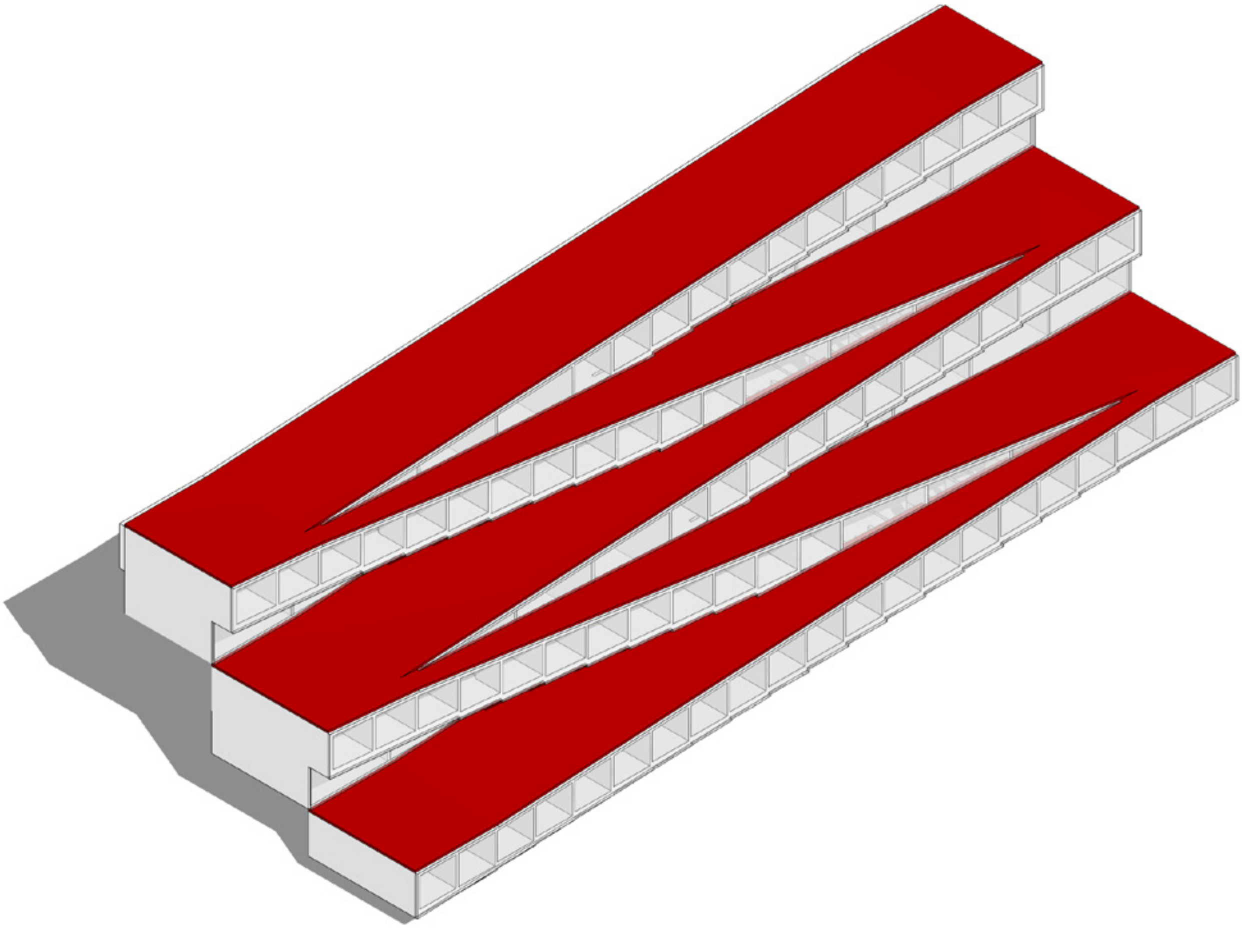




The Hotel Zig-Zag Ski features a unique zig-zag shape that follows the site's topography. The distribution system inside the hotel is based on a central circulation core that houses elevators and stairs, allowing for easy access to each floor. People are distributed in the building through a series of corridors and rooms arranged in a staggered formation, providing a dynamic and playful experience. Outside, a ramp connects the hotel at all levels with the ski slopes. The type of distribution is continuous since the ramps along its route contain the space to be distributed.

Distribution Scheme





ARCHITECT: BIG Architects

NAME: Hotel Zig-Zag Ski

DATE: 2018

LOCATION: Vallée de Joux, Switzerland

PROGRAM: Hotel

LEGEND:

SERVED SPACES

~~INTERNAL RAMPS~~

EXTERNAL RAMPS

INTERNAL STAIRS

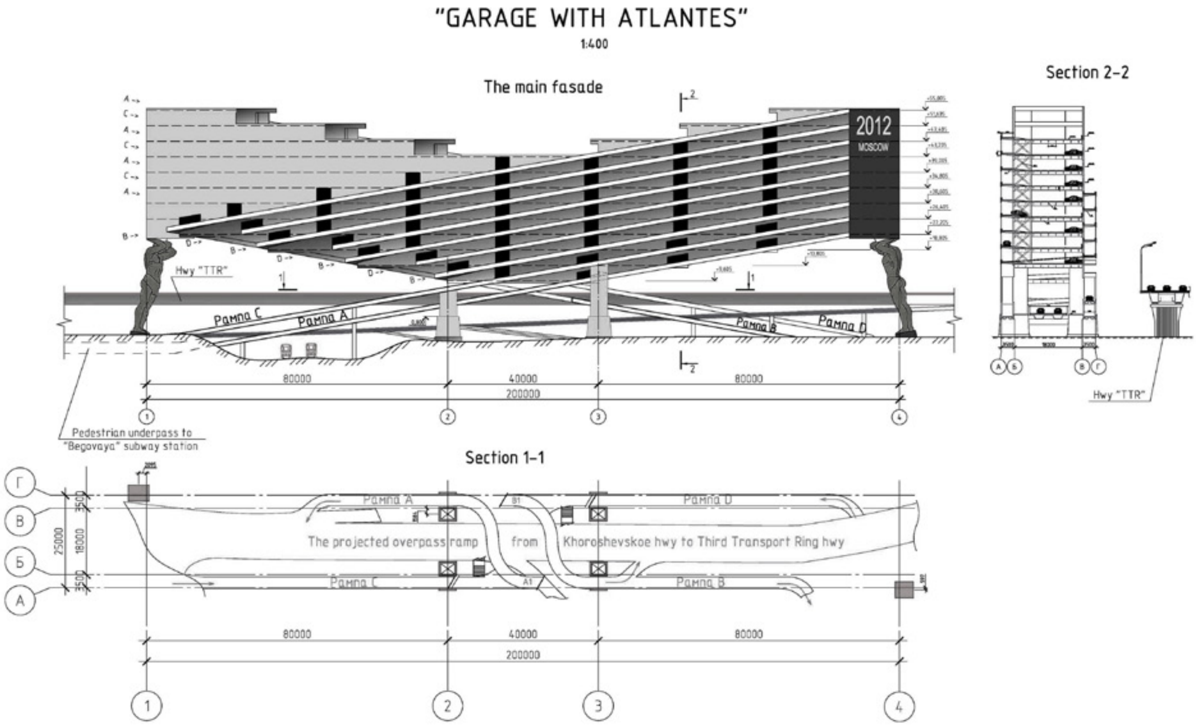
~~EXTERNAL STAIRS~~

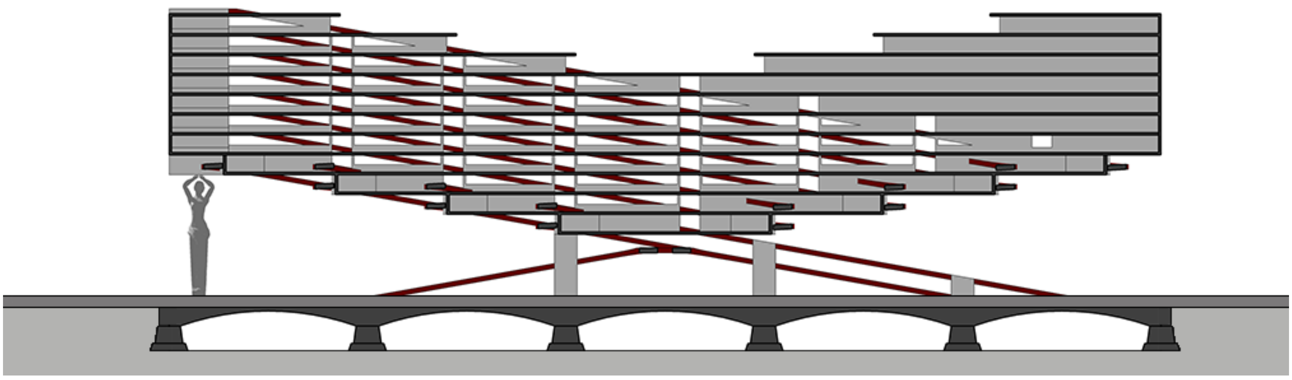
non-present

MOUNTAINSIDE

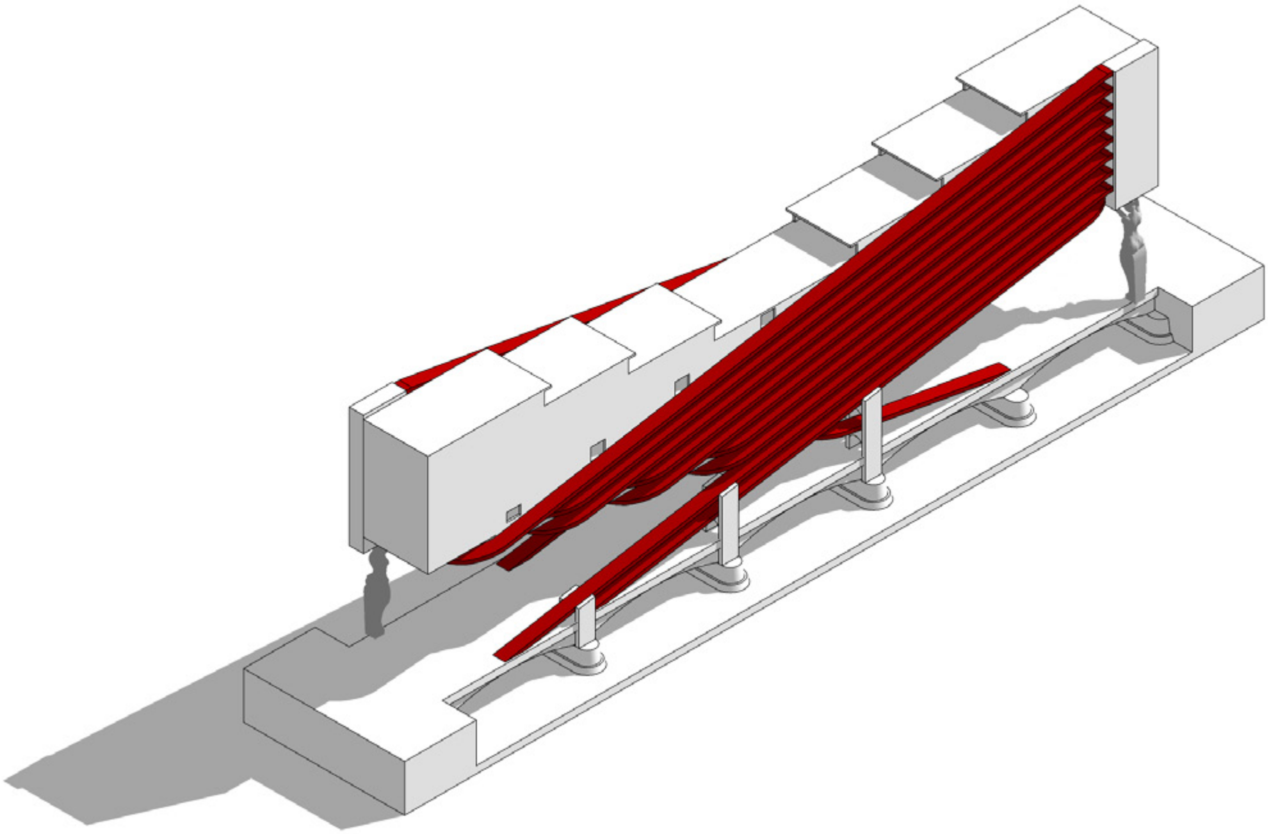
HAIRPIN BEND RAMP

MS-03





The Parking on a Bridge has a distribution system consisting of ramps that run through all building levels continuously. Access and exit are arranged at different points, thus allowing the car to enter and exit smoothly without having to return. The ramps become the main feature of the project also playing an important role in the spatial and structural composition. The type of distribution is punctual since the ramp distributes the different levels of the building punctually.



ARCHITECT:	Konstantin Stepanovich Melnikov
NAME:	Parking on a Bridge
DATE:	1925
LOCATION:	Paris, France
PROGRAM:	Parking

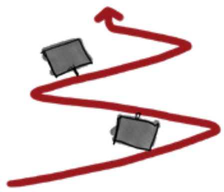
LEGEND:

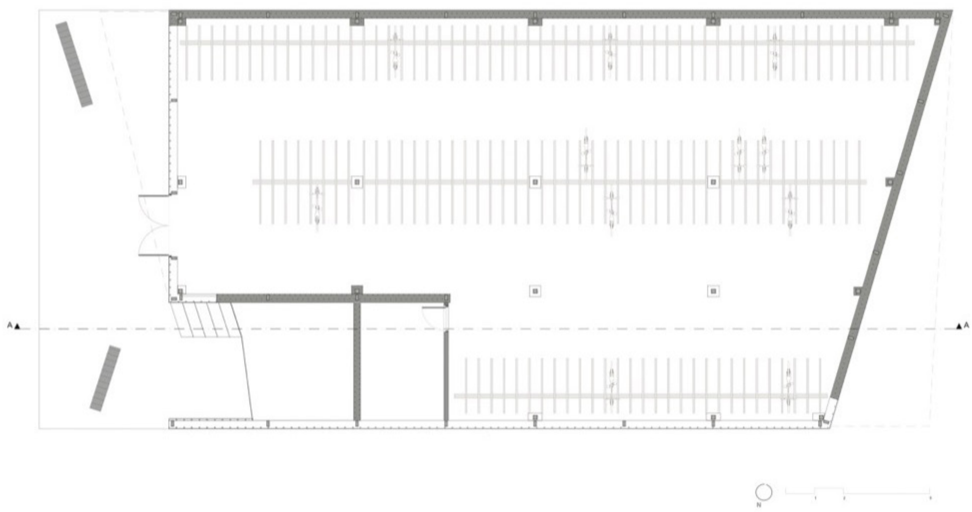
- ~~SERVED SPACES~~
- INTERNAL RAMPS
- EXTERNAL RAMPS
- ~~INTERNAL STAIRS~~
- ~~EXTERNAL STAIRS~~
- — *non-present*

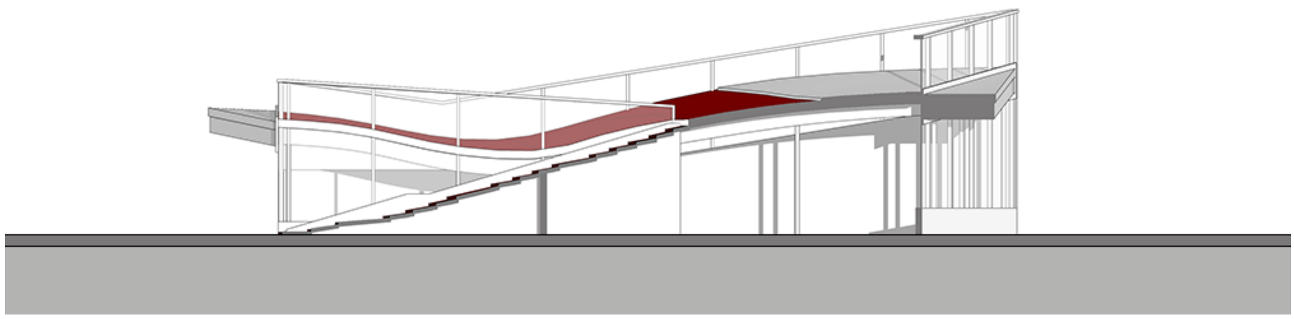
MOUNTAINSIDE

HAIRPIN BEND RAMP

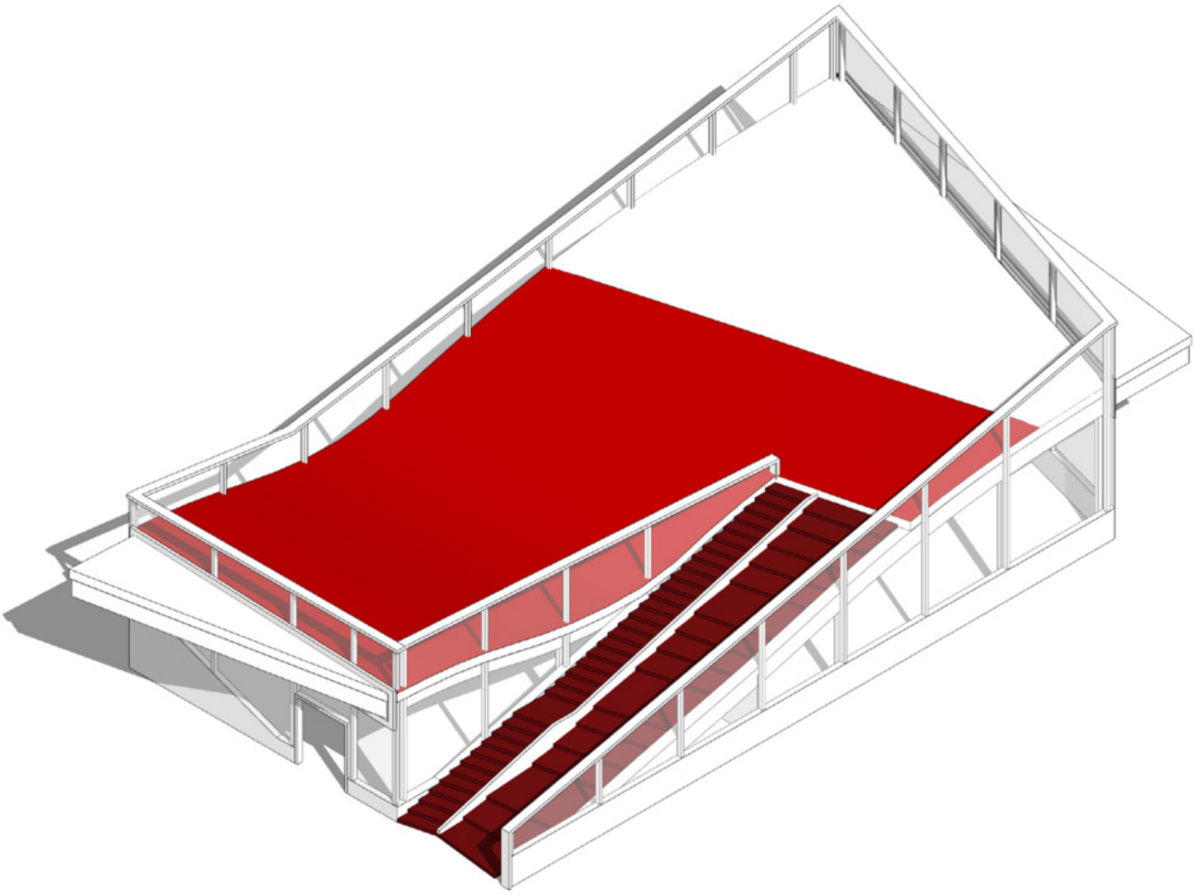
MS-04







The Bicycle Hotel is a two-level building where all the activities corresponding to parking and bicycle repair are on the first level. While on the outside, there is a ramp that accesses the terrace of the building. It is a flexible space with easy access that allows the continuous flow of people. This roof makes the building unique and becomes the protagonist of a realively small building. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



ARCHITECT:	Various Architects
NAME:	Bicycle Hotel
DATE:	2016
LOCATION:	Lillestrom, Norway
PROGRAM:	Cyclestation

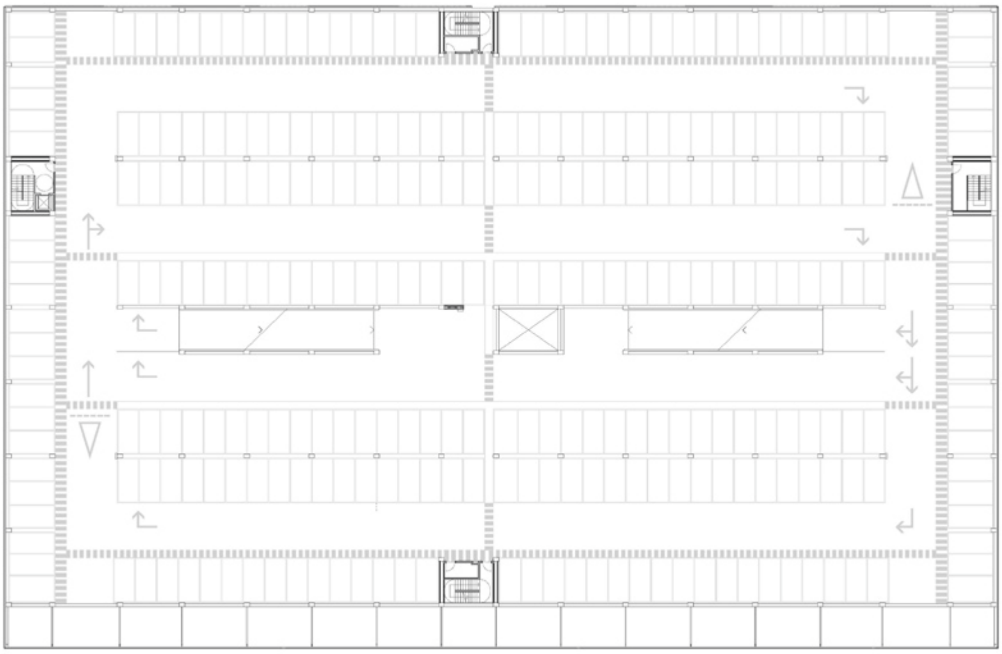
LEGEND:

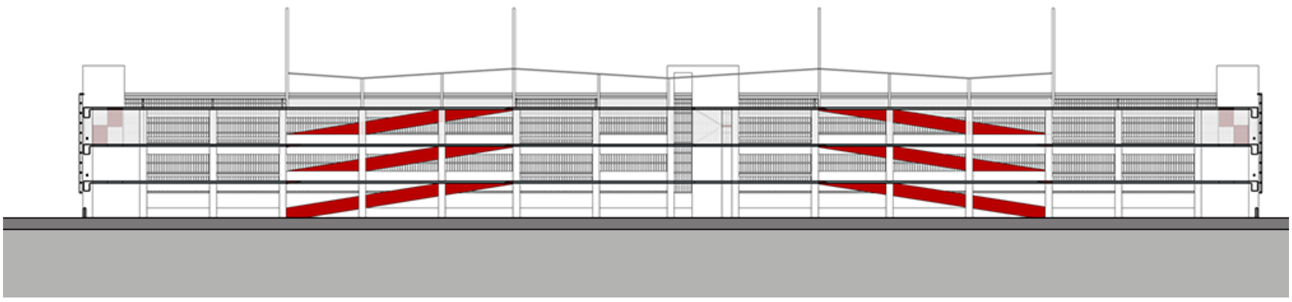
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- ~~INTERNAL STAIRS~~
- EXTERNAL STAIRS
- — *non-present*

MOUNTAINSIDE

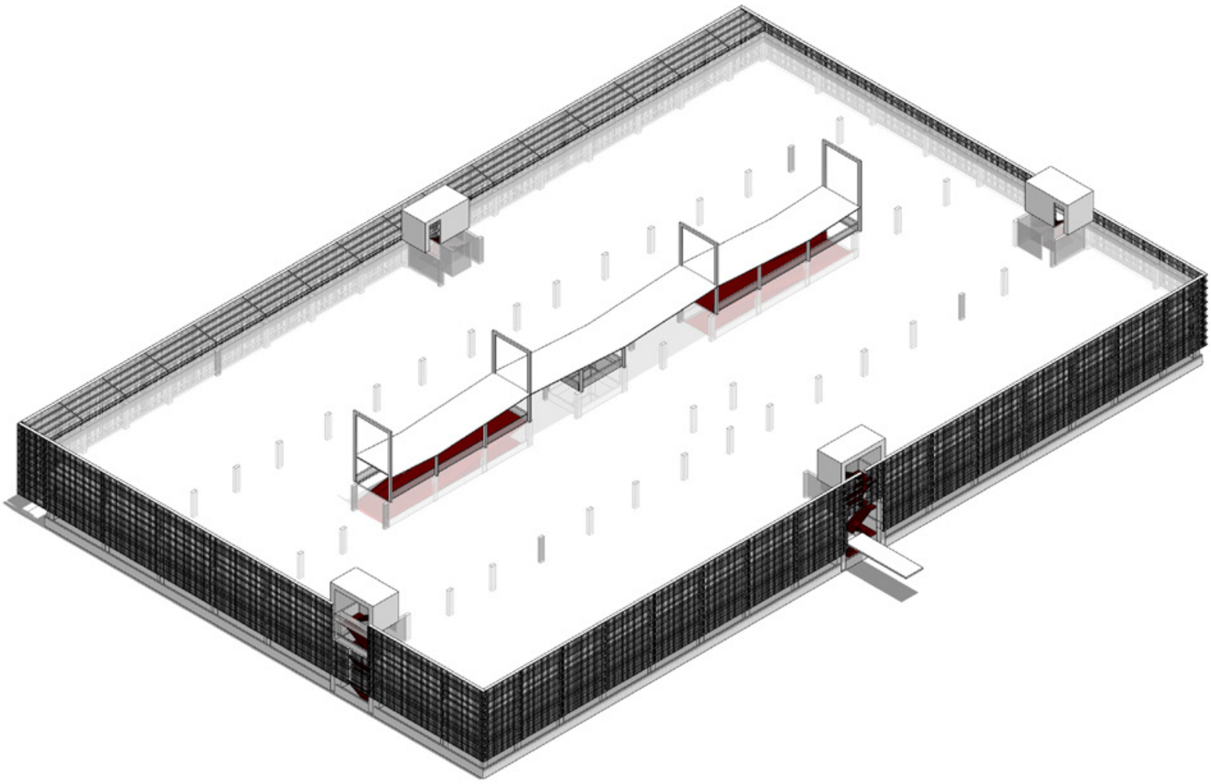
HAIRPIN BEND RAMP

MS-05





The Parking Building has a highly functional distribution system that allows efficient movement and parking of vehicles. The building is organised through two perpendicularly central ramps, one that goes up and the other that goes down, connecting the different levels and parking areas. The ramp is an essential element of the building's design, with a width and slope allow cars safe and easy movement throughout the space. The type of distribution is punctual since the ramp distributes the different levels of the building punctually.



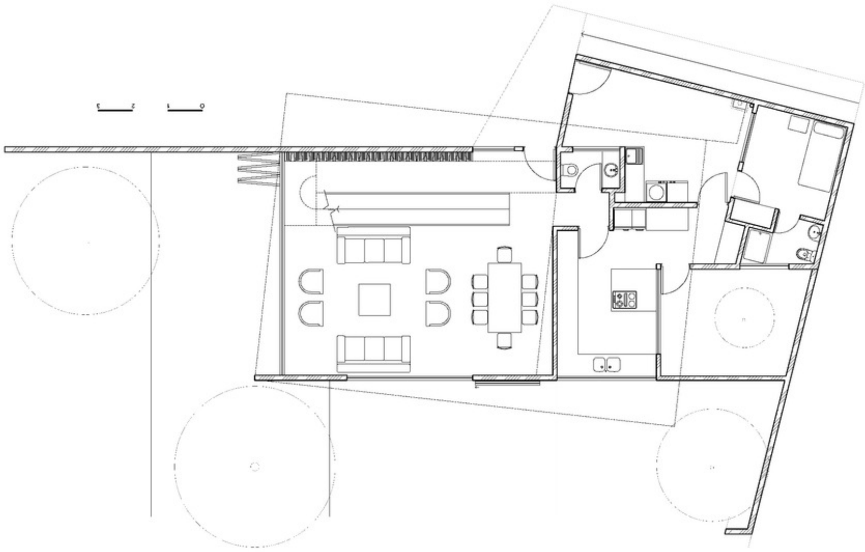
ARCHITECT: JAAM Sociedad de Arquitectura
NAME: Parking Building
DATE: 2013
LOCATION: Leioa, Spain
PROGRAM: Parking

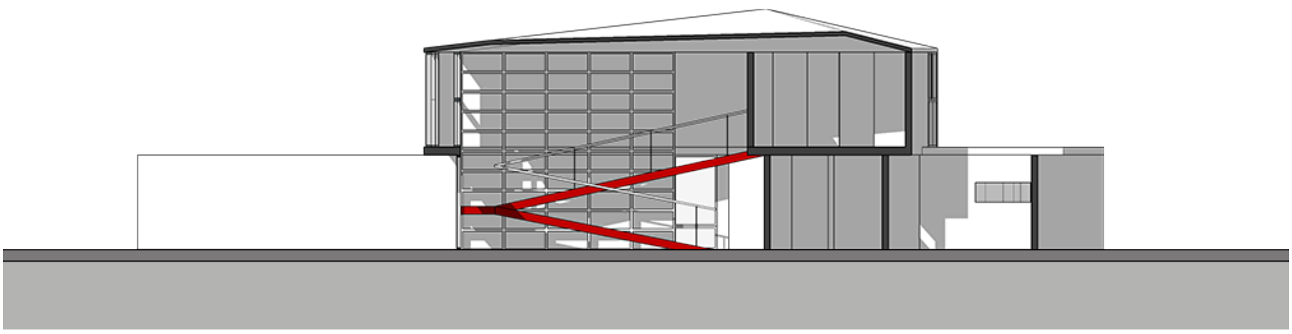
LEGEND:
- ~~SERVED SPACES~~
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAINSIDE

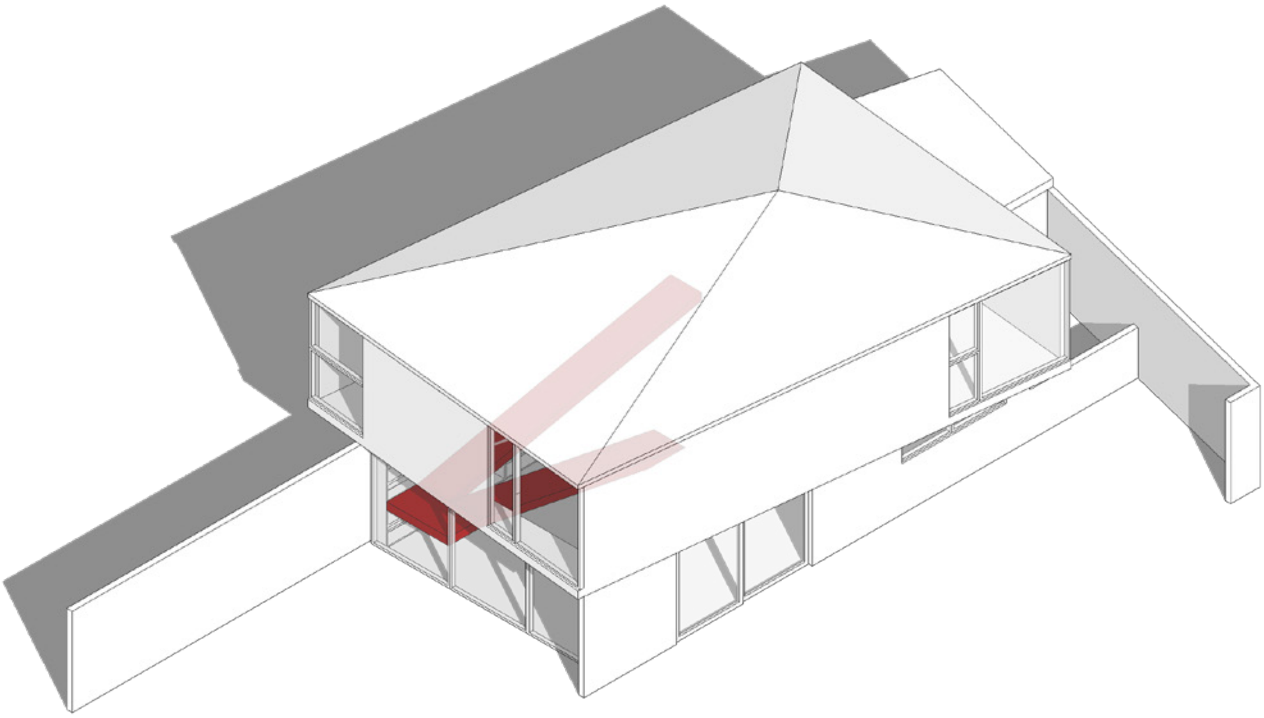
HAIRPIN BEND RAMP

MS-06





The Noguera House has an internal ramp as a distribution element for the two levels. The ramp is located in the house's social and most significant area. Allows easy connection between public and private spaces. It is gently sloping, enabling easy access and a smooth transition between levels for people of varying abilities. The type of distribution is punctual since the ramp distributes the different levels of the building punctually.



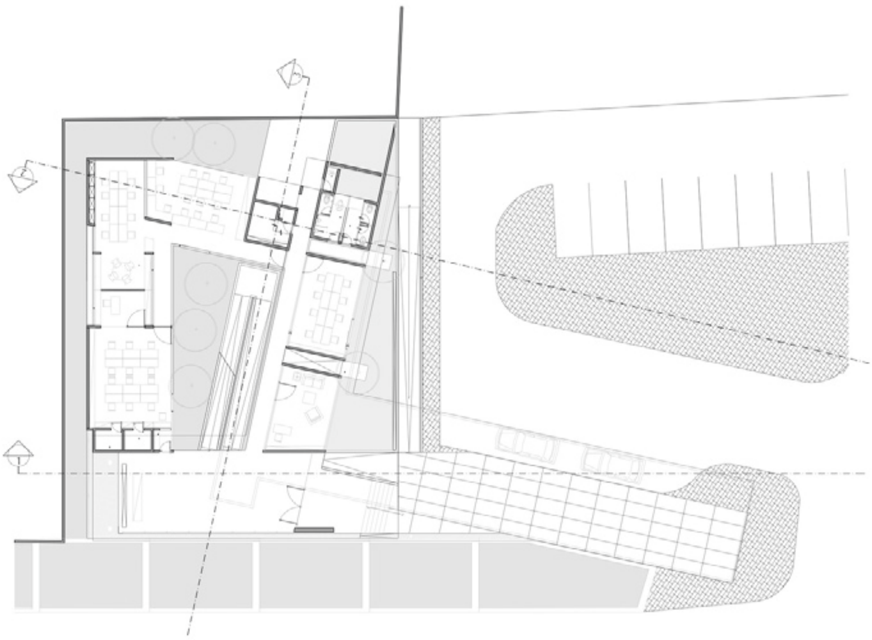
ARCHITECT: Riesco + Rivera Arquitectos
NAME: Noguera House
DATE: 2011
LOCATION: Las Condes, Chile
PROGRAM: House

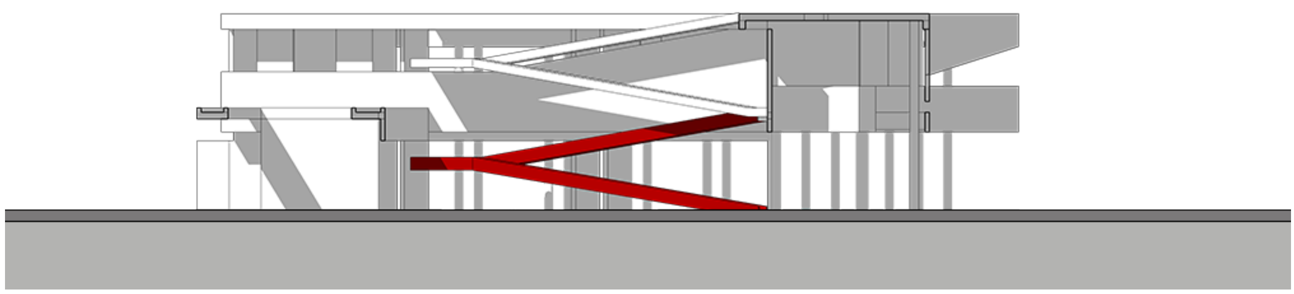
LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- ~~INTERNAL STAIRS~~
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAINSIDE

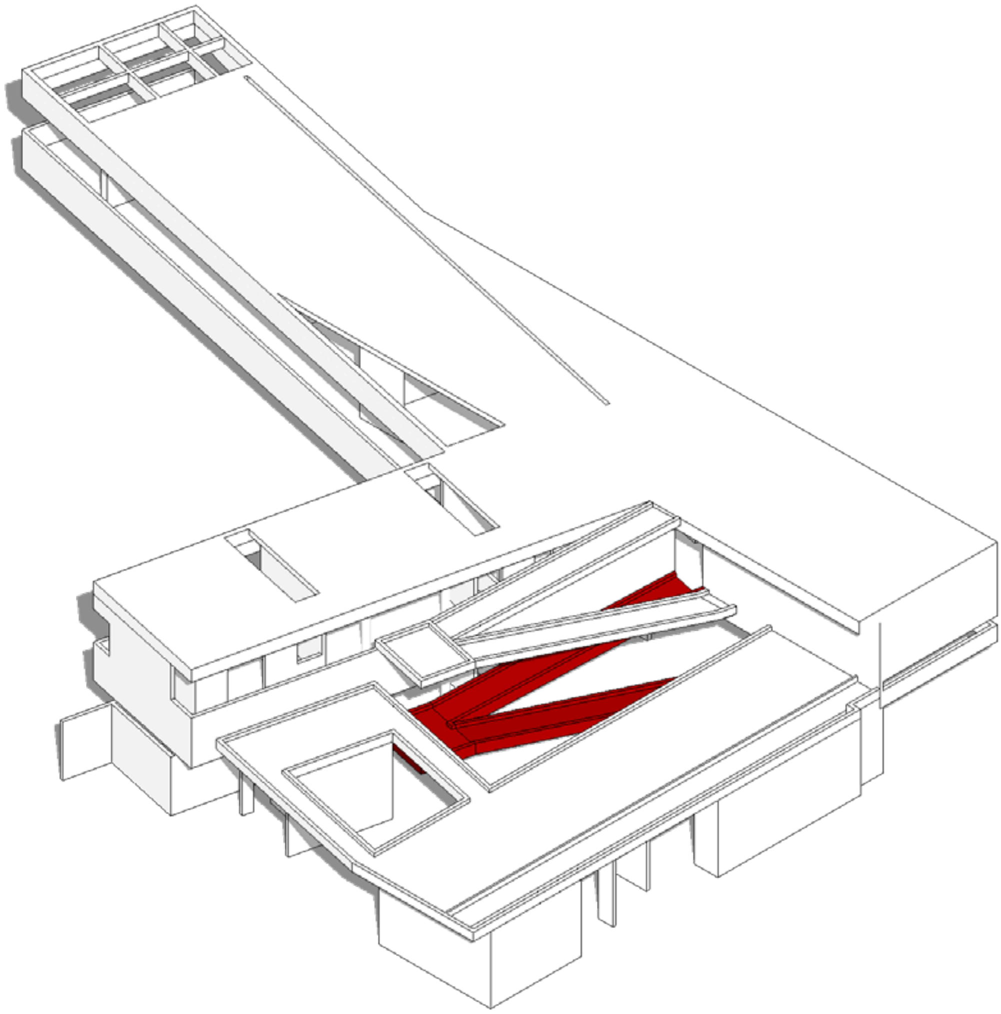
HAIRPIN BEND RAMP

MS-07





The Vida Bekasi Marketing Office has a distribution system emphasising fluidity and flexibility. The building comprises a series of interconnected spaces that create a seamless visitor flow. People are distributed throughout the building via a series of ramps and platforms that connect the two levels. The house is organised around a courtyard where the ramp is located. The ramp is a prominent feature in the building's design, functioning as a circulation device that connects all levels. The type of distribution is punctual since the ramp distributes the different levels of the building punctually.



ARCHITECT: Andramartin
NAME: Vida Bekasi Marketing Office
DATE: 2014
LOCATION: Bantargebang, Indonesia
PROGRAM: Office Building

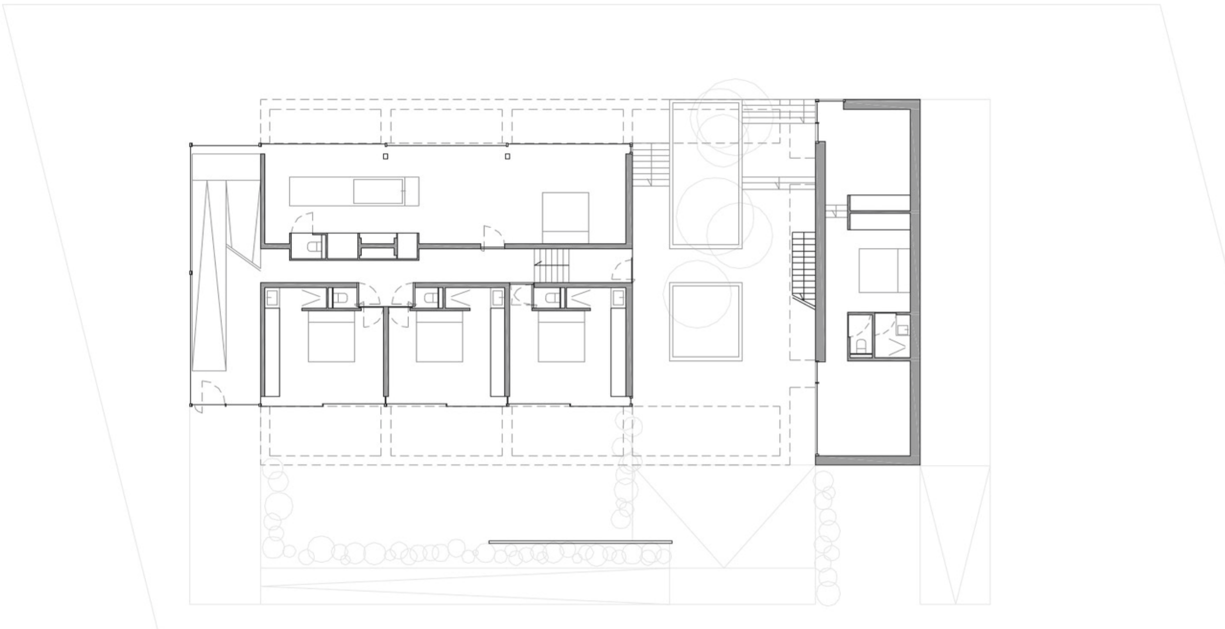
LEGEND:

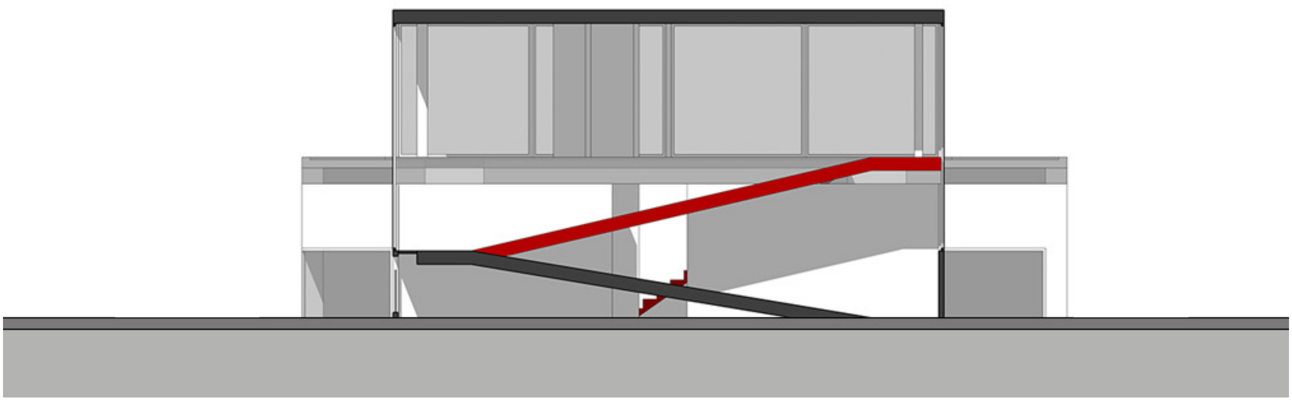
SERVED SPACES
INTERNAL RAMPS
~~EXTERNAL RAMPS~~
~~INTERNAL STAIRS~~
~~EXTERNAL STAIRS~~
non-present

MOUNTAINSIDE

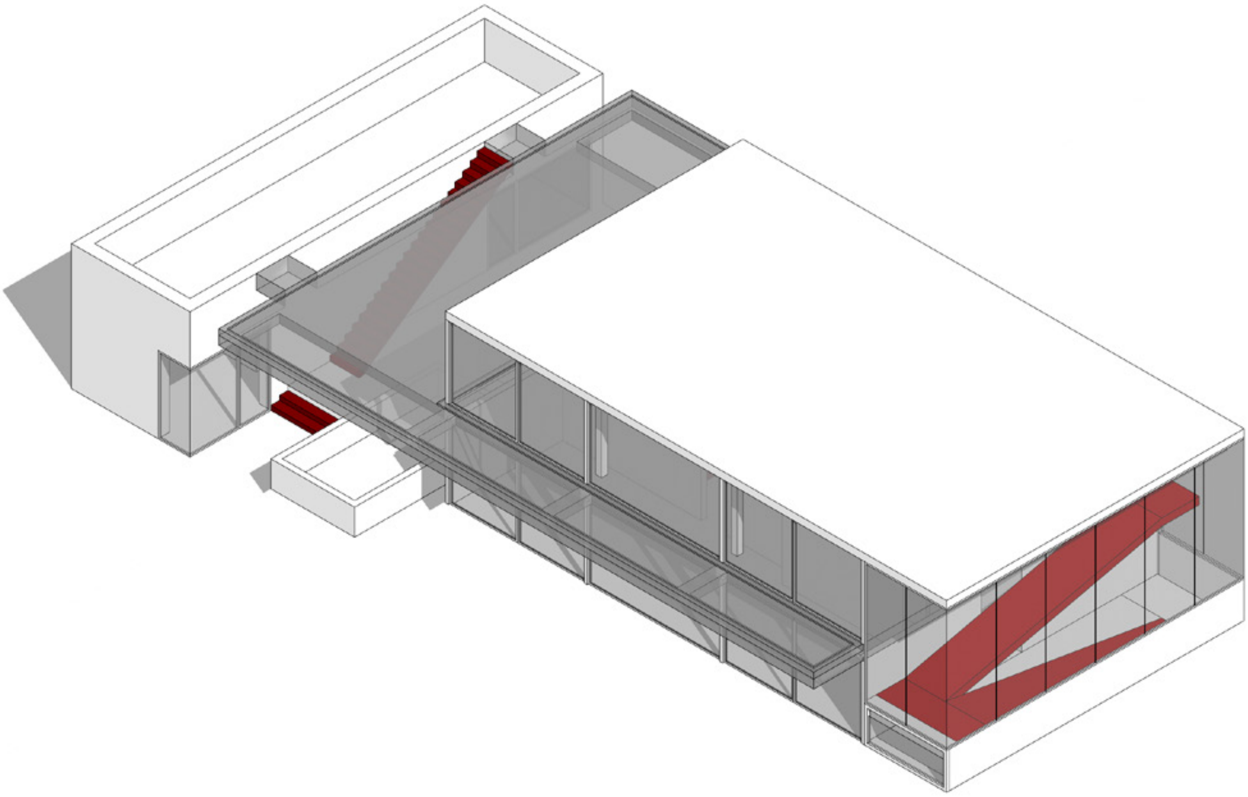
HAIRPIN BEND RAMP

MS-08





The Can Mana has a distribution system designed to maximise natural light and create a sense of spaciousness. People are distributed throughout the house in a way that prioritises privacy and views of the surrounding landscape. The ramp is an essential feature of the building, as it is a crucial design element that connects the different levels of the villa while organising the distribution of the spaces in the house. The type of distribution is punctual since the ramp distributes the different levels of the building punctually.



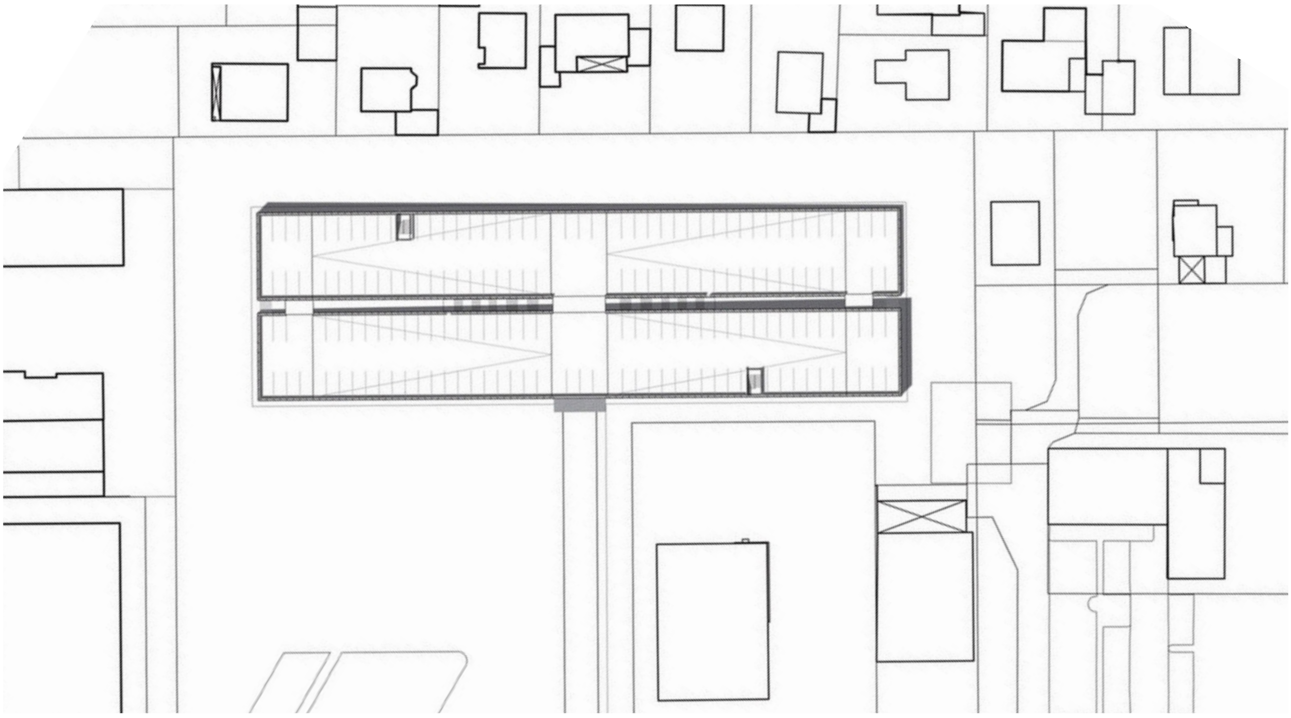
ARCHITECT: Atelier d'Architecture Bruno Erpicum & Partners
NAME: Can Mana
DATE: 2008
LOCATION: Balearic Islands, Spain
PROGRAM: House

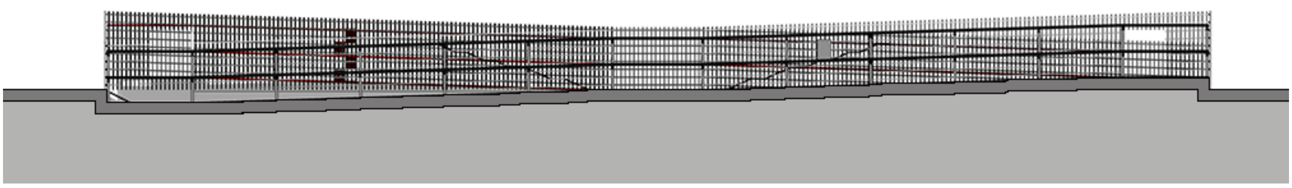
LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- EXTERNAL STAIRS
- — *non-present*

MOUNTAINSIDE

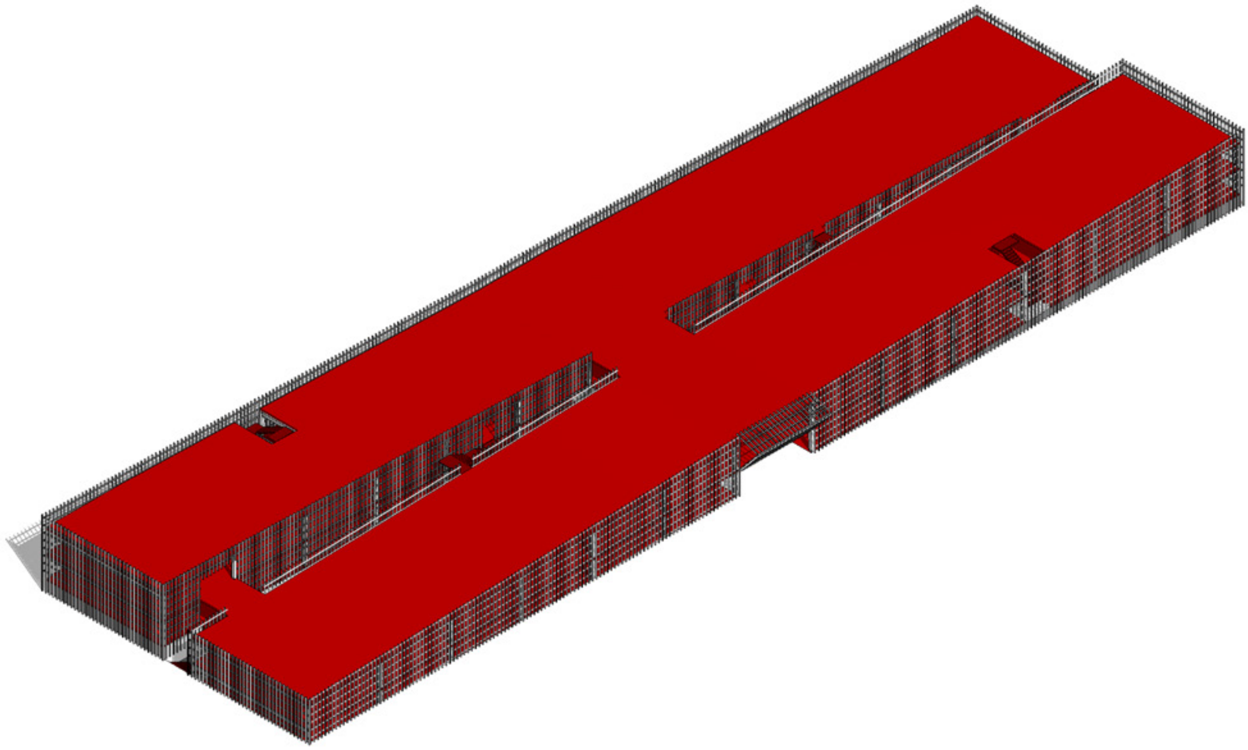
HAIRPIN BEND RAMP

MS-09





The Parking Garage has an innovative distribution system. The building's layout is designed to maximise efficiency and ease of use. Two modules of inclined planes allow a continuous route; the access is in the middle of the parallelepiped. The design allows you to decide whether to go down or continue up at all levels in the central space. The ramps contain parking spaces, and the gradual slope ensures a smooth driving experience facilitating movement within the area. The type of distribution is punctual since the ramp distributes the different levels of the building punctually.



ARCHITECT:	Birk-Heilmeyer + Frenzel Architekten
NAME:	Parking Garage
DATE:	2007
LOCATION:	Coesfield, Germany
PROGRAM:	Parking

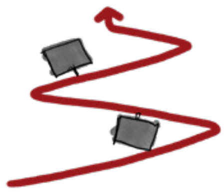
LEGEND:

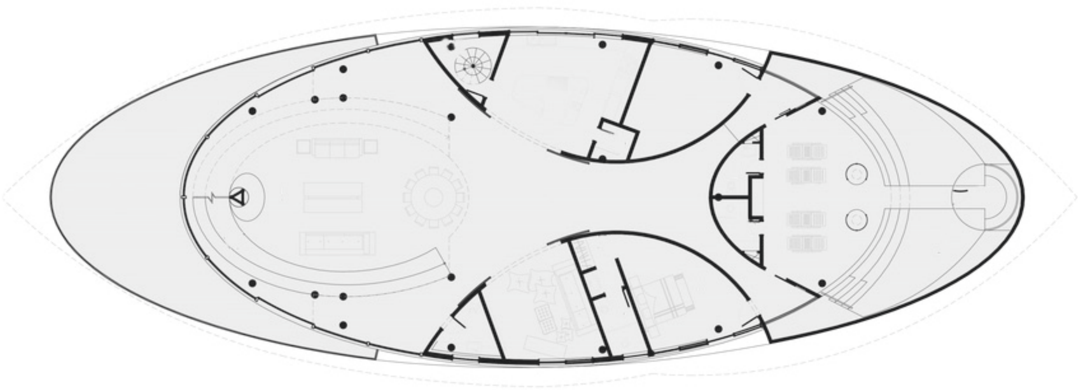
- ~~SERVED SPACES~~
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

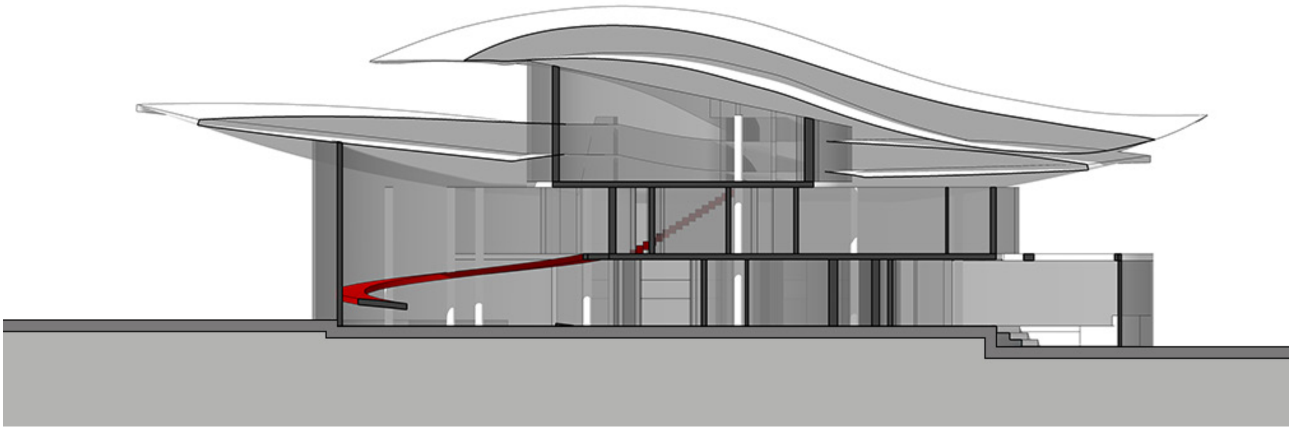
MOUNTAINSIDE

HAIRPIN BEND RAMP

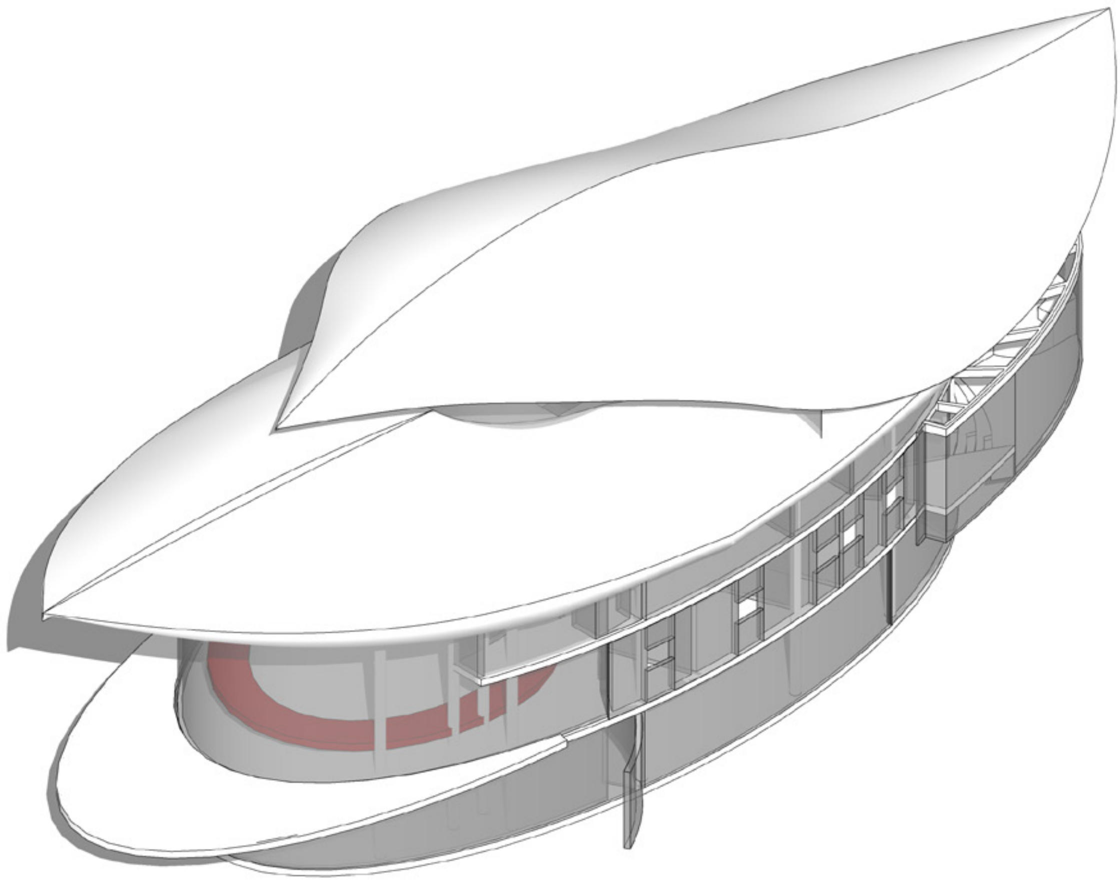
MS-10







The Casa Pinhão has a distribution system with various levels connected by a ramp. The ramp serves as a distribution system and a vital feature of the house, providing stunning views of the natural landscape. People are distributed throughout the house via the ramp, which leads to different levels of the house, each with its purpose. The ramp is located around the social area, connecting the public spaces with the private ones of the house, allowing a continuous relationship with the different spaces. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



ARCHITECT:	Mareines Arquitectura + Patalano Arquitectura
NAME:	Casa Pinhão
DATE:	2016
LOCATION:	Campos de Jordão, Brazil
PROGRAM:	House

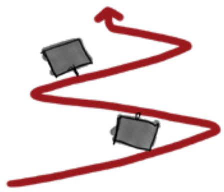
LEGEND:

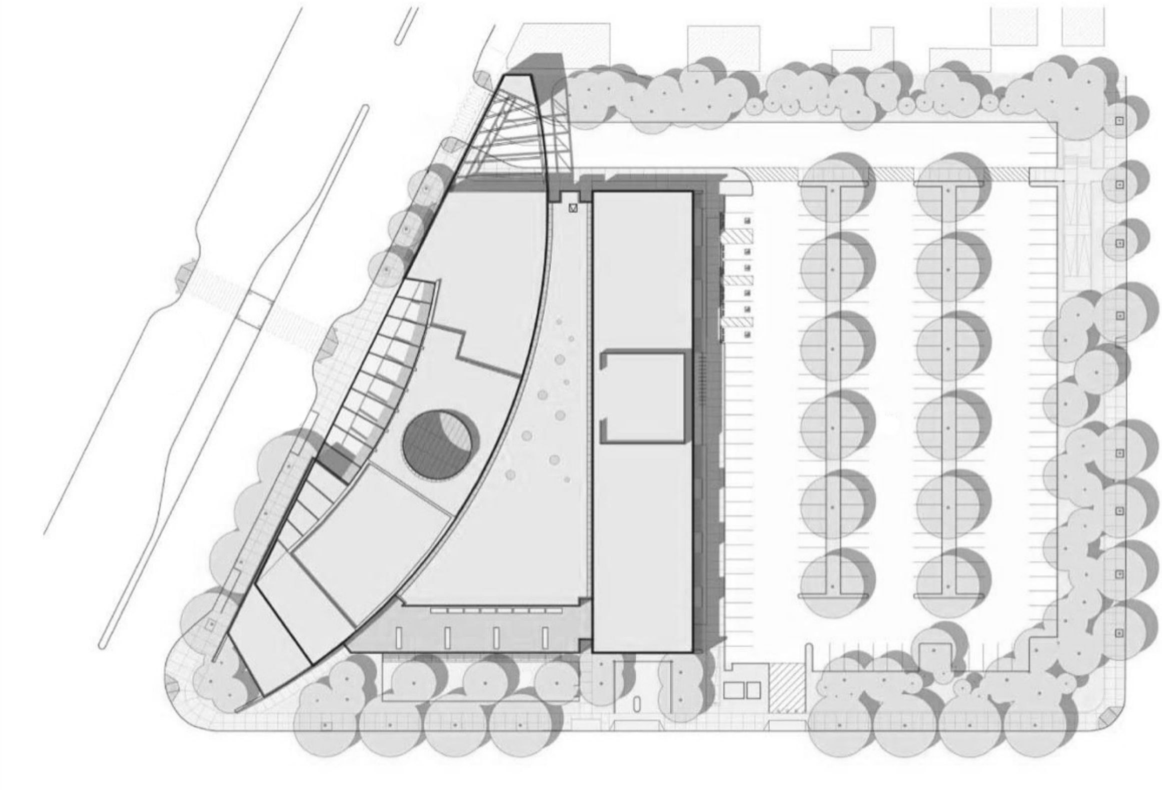
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

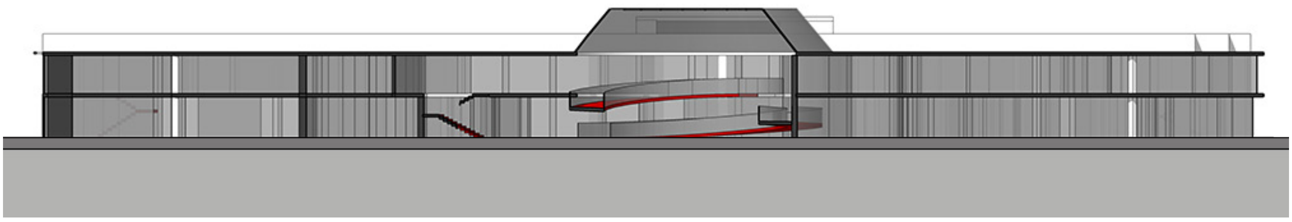
MOUNTAINSIDE

HAIRPIN BEND RAMP

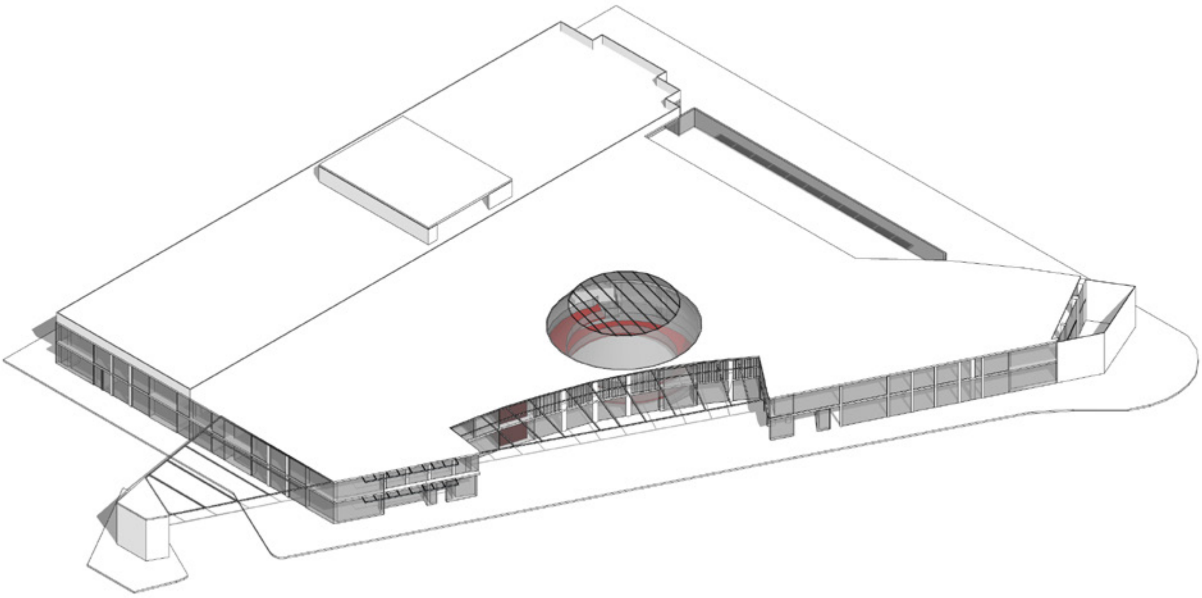
MS-11







The Ed Roberts Campus is a multi-use facility that serves people with disabilities. The distribution system provides easy access for people with disabilities through ramps, elevators, and wide corridors. People are distributed in the building based on their needs, with facilities for rehabilitation, education, socialising, and more. The ramp in the building is an essential characteristic as it allows people with mobility impairments to access all areas of the campus quickly. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



ARCHITECT:	LSM Architects
NAME:	Ed Roberts Campus
DATE:	2011
LOCATION:	Berkeley, United States
PROGRAM:	University

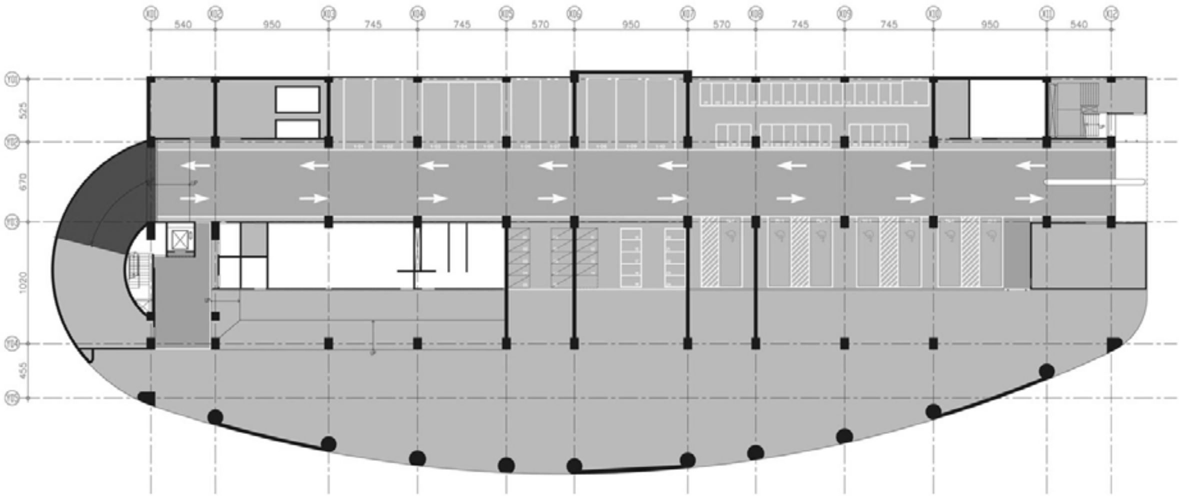
LEGEND:

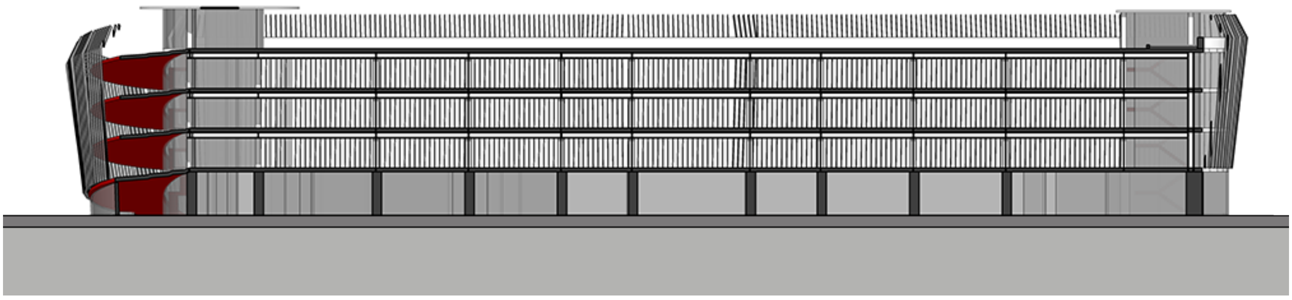
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAINSIDE

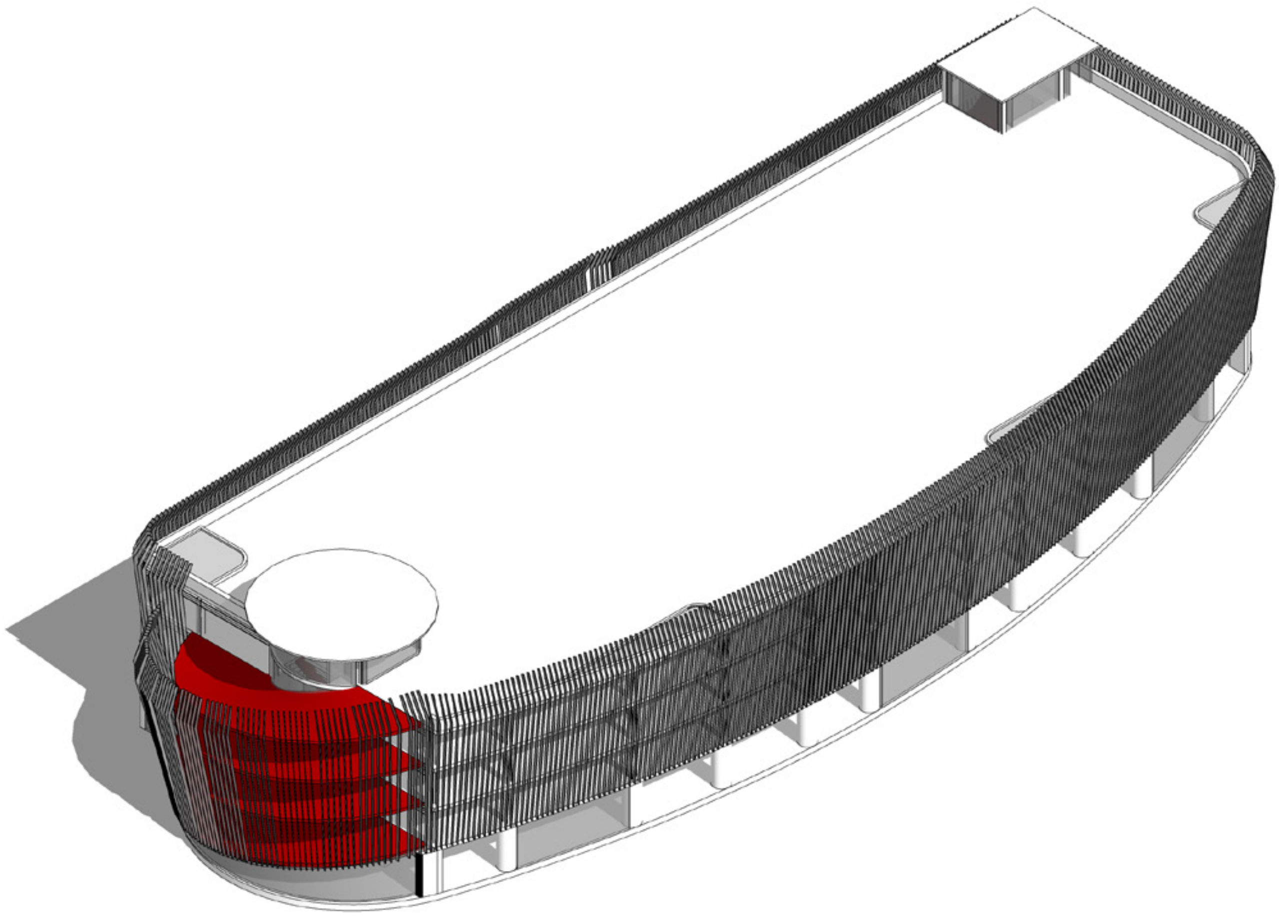
HAIRPIN BEND RAMP

MS-12





The Wulai Parking Structure has a distribution system located at one end of the building. The ramp contains the ascent and descent of the cars to the different levels. The route in each level is organised in one direction and in a circular way, facilitating the entry and exit of the cars. The parking stalls are along the course at each level. The ramps are carefully designed for smooth traffic flow and easy navigation. The type of distribution is punctual since the ramp distributes the different levels of the building punctually.



ARCHITECT: QLAB
NAME: Wulai Parking Structure
DATE: 2012
LOCATION: New Taipei City, Taiwan
PROGRAM: Parking

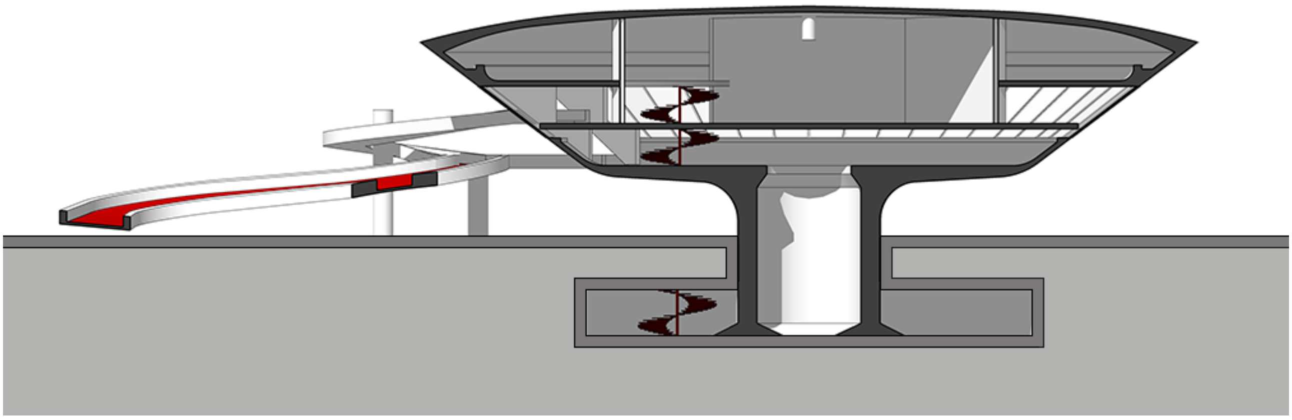
LEGEND:

- ~~SERVED SPACES~~
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

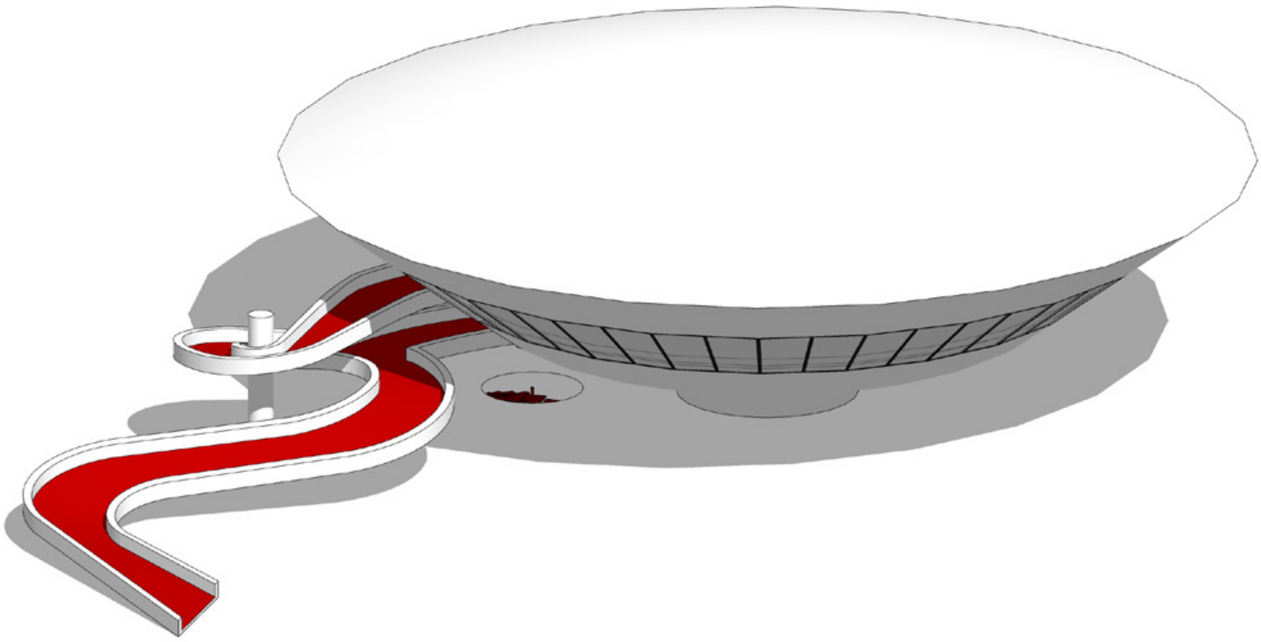
MOUNTAINSIDE

HAIRPIN BEND RAMP

MS-13



The Museo de Arte Contemporáneo is situated on a cliff overlooking the sea, and the distribution system is designed to take advantage of this location. Visitors enter the building at the base of the cliff and ascend via a winding ramp to the top of the museum, where they can enjoy panoramic views of the surroundings. It also has a gentle slope that allows the enjoyment of the tour. The distributive system and the shape of the building allow visitors to enter the exhibition halls and easily find the exit. The type of distribution is punctual since the ramp distributes the different levels of the building punctually.



ARCHITECT:	Oscar Niemeyer
NAME:	Museo de Arte Contemporáneo
DATE:	1996
LOCATION:	Niterói, Brazil
PROGRAM:	Museum

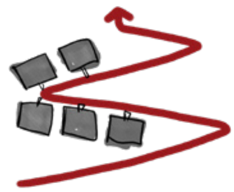
LEGEND:

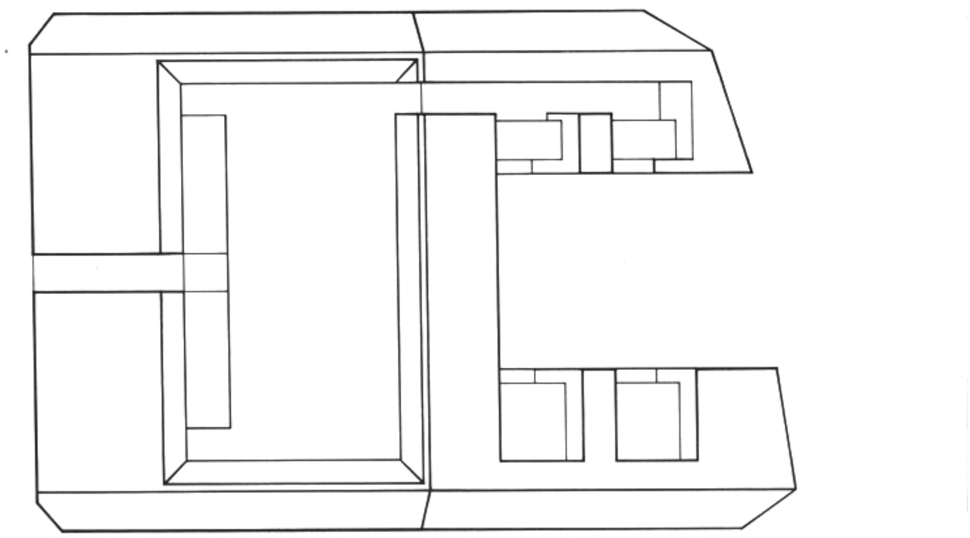
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

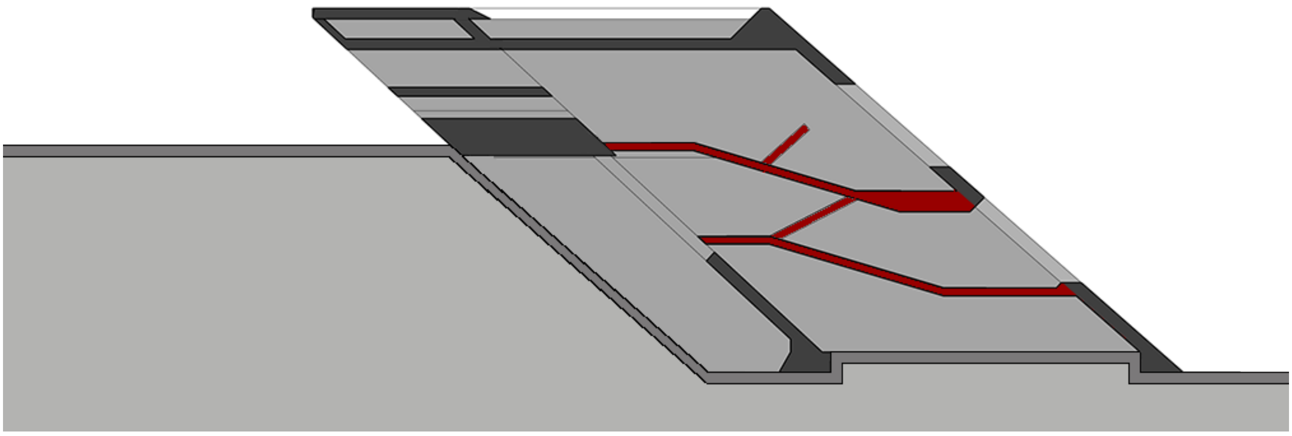
MOUNTAINSIDE

HAIRPIN BEND RAMP

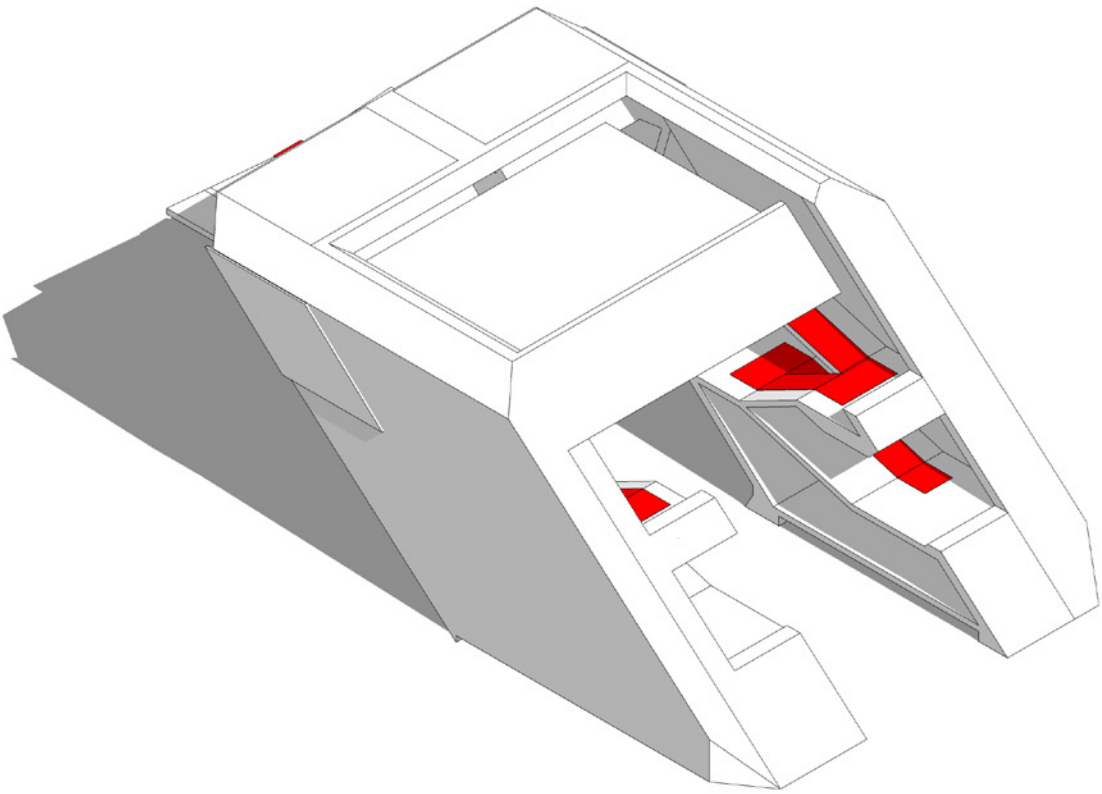
MS-14







The Maison Mariotti features two lateral ramps that act as the central circulation system for the building. The ramp runs through the entire structure, connecting the various levels and providing an alternative to traditional stairs. This distribution system allows for continuous movement throughout the house, creating a dynamic and fluid spatial experience for its occupants. The distribution system also provides access and circulation to people with different abilities. The type of distribution is continuous since the ramps throughout their route distribute the spaces.



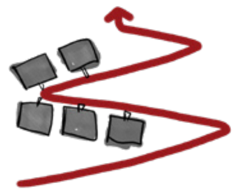
ARCHITECT: Claude Parent, Paul Virilio
NAME: Maison Mariotti
DATE: 1967-1970
LOCATION: Saint-Germain-en-Laye, France
PROGRAM: House

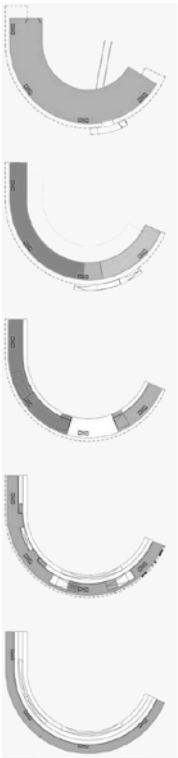
LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- ~~INTERNAL STAIRS~~
- ~~EXTERNAL STAIRS~~
- — *non-present*

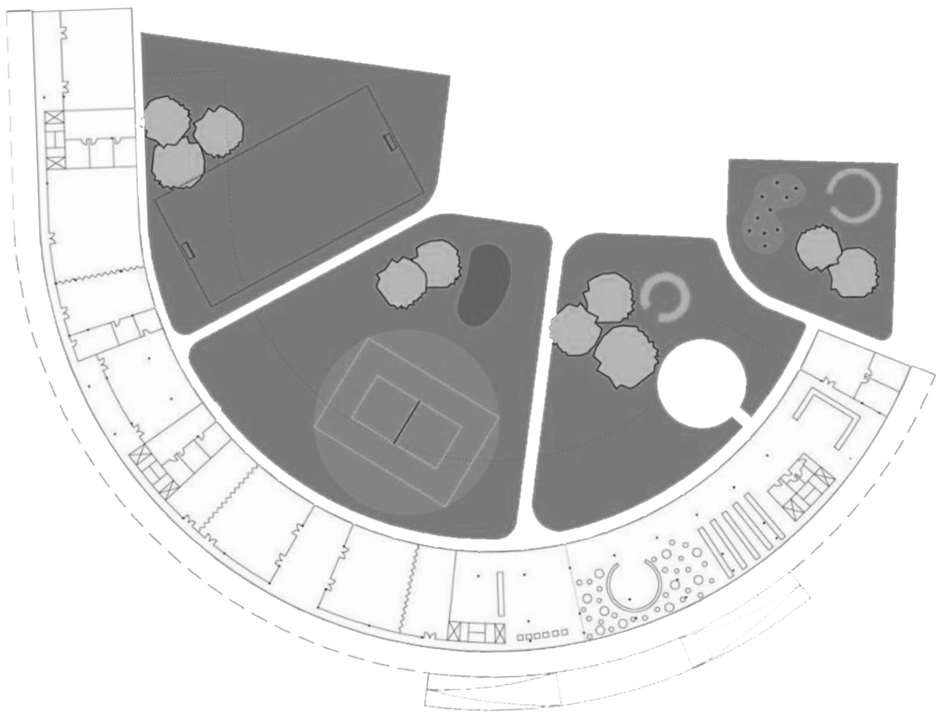
MOUNTAINSIDE

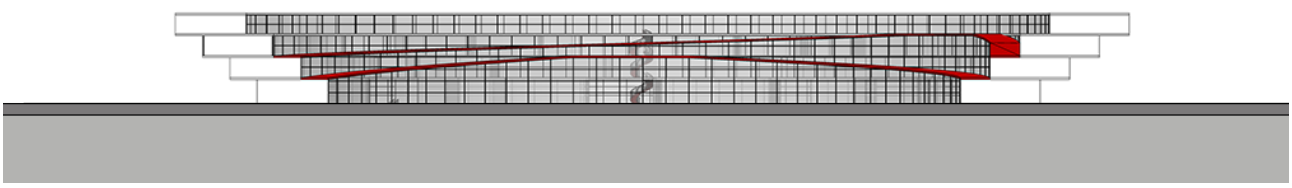
HAIRPIN BEND RAMP

MS-15

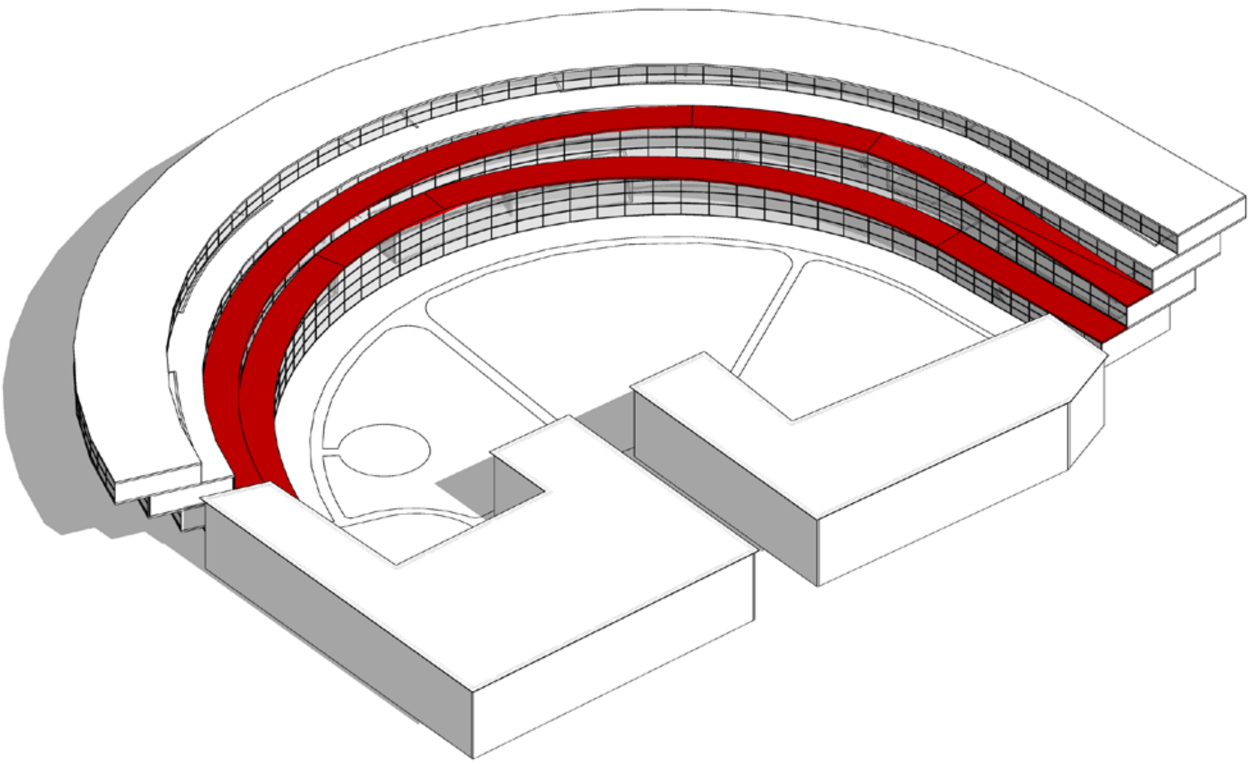








The Nike Arena is a sports centre organised in a semicircle around a courtyard through which a circulation system is developed with ramps that ascend, creating a kind of open-air theatre that connects with all building levels. The ramps are a flexible space that allows not only the circulation of people but also the development of other sports and social activities in the open air. In addition to having an internal circulation system with stairs and an elevator, all the interior spaces have direct access to the ramps. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT:	NL Architects
NAME:	Nike Arena
DATE:	2007
LOCATION:	Hilversum, Holland
PROGRAM:	Sport Center

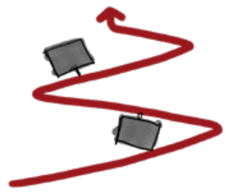
LEGEND:

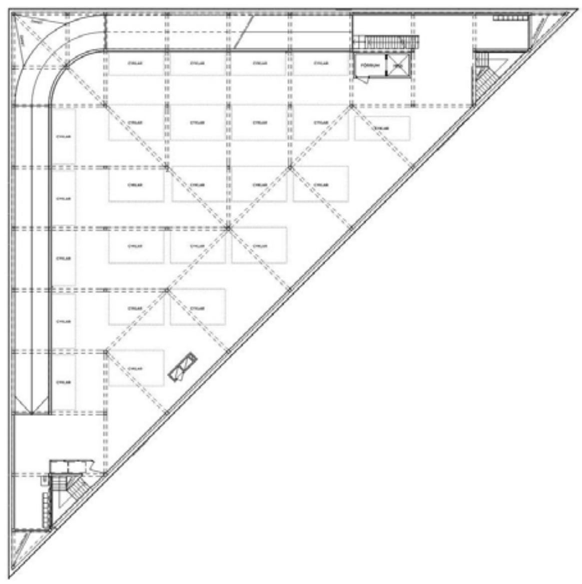
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

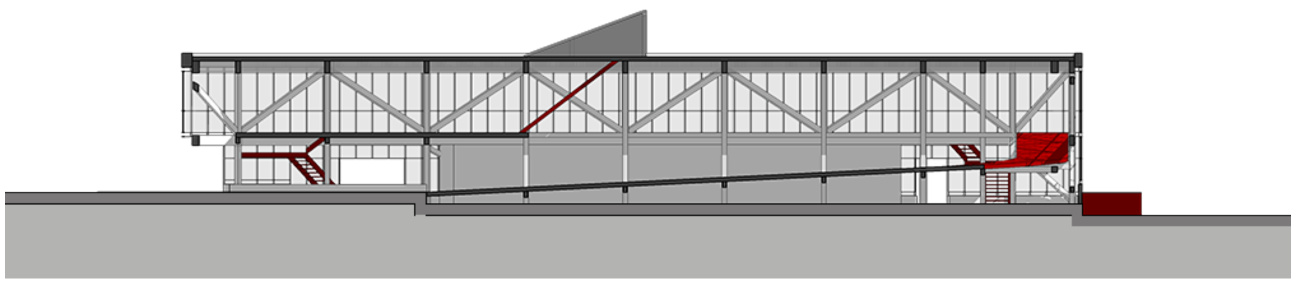
MOUNTAINSIDE

HAIRPIN BEND RAMP

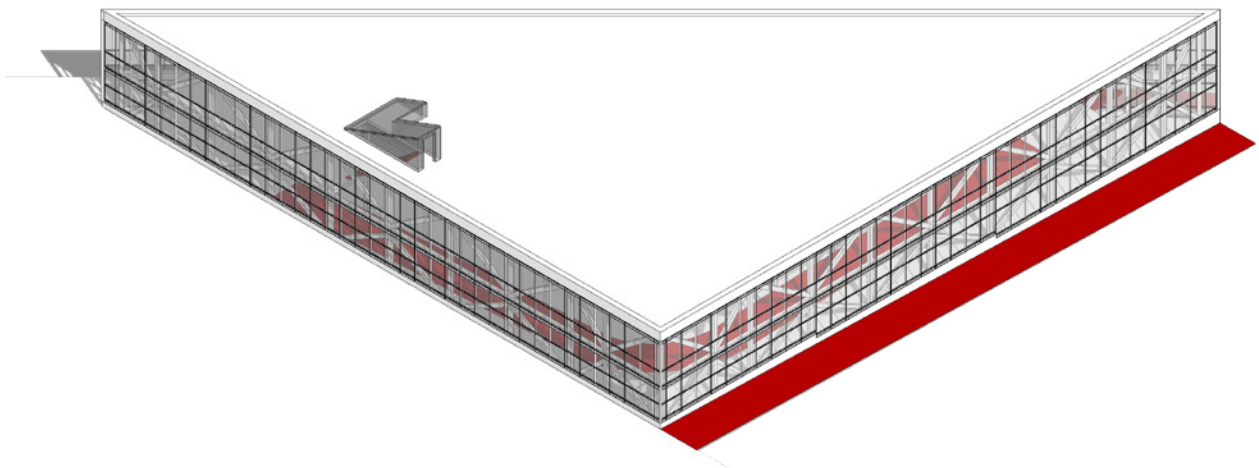
MS-16







The Bicycle Garage is a building designed for storing bicycles. The distribution system works through a central ramp that leads cyclists to their designated parking spot. The ramp allows easy access to the storage area, and the parking spots are arranged in a grid-like pattern, maximising space efficiency. Cyclists are distributed on different levels according to their type of bike and the desired level of security. The ramp's incline is gradual and easily navigable, ensuring that cyclists can comfortably ascend and descend. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



ARCHITECT: Tengbom
NAME: The Bicycle Garage
DATE: 2019
LOCATION: Kungsängen, Sweden
PROGRAM: Cyclestation

LEGEND:

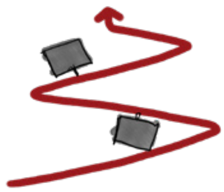
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~

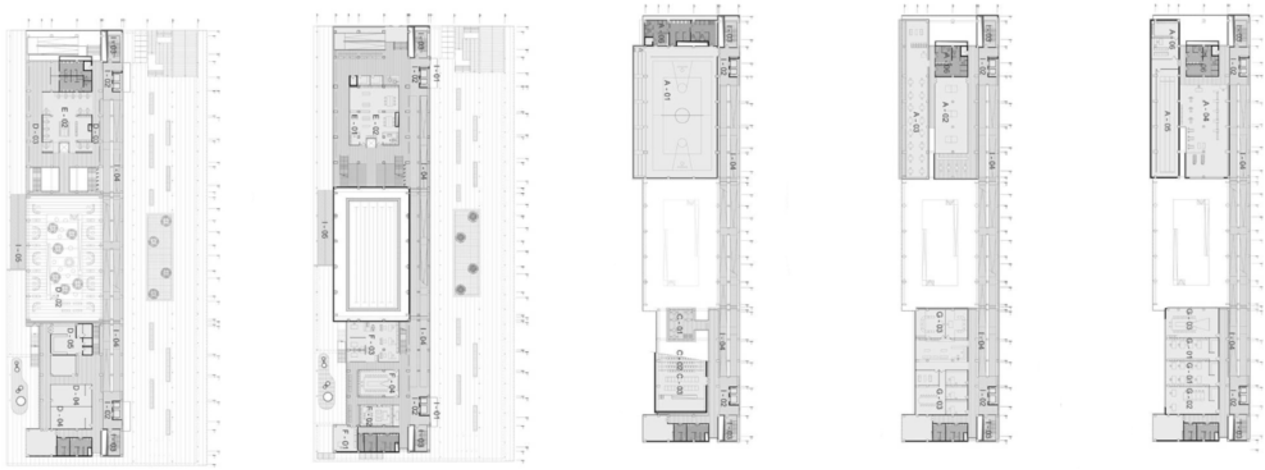
— *non-present*

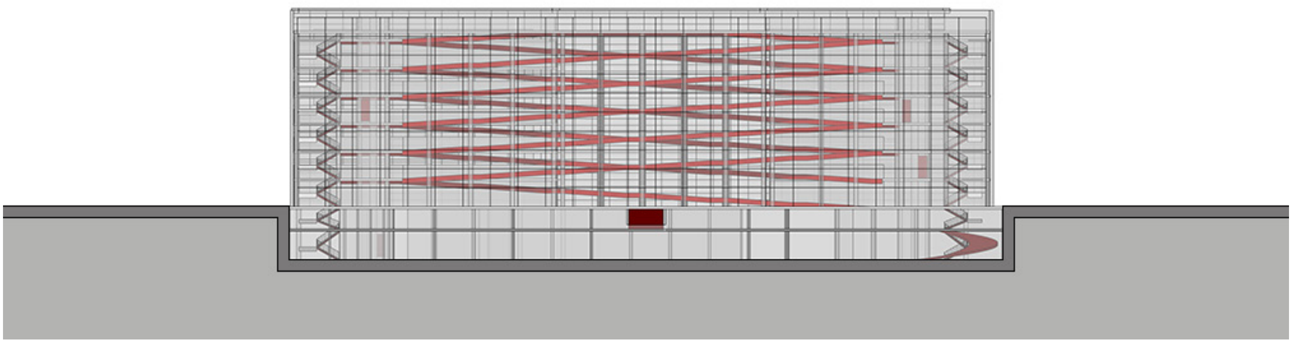
MOUNTAINSIDE

HAIRPIN BEND RAMP

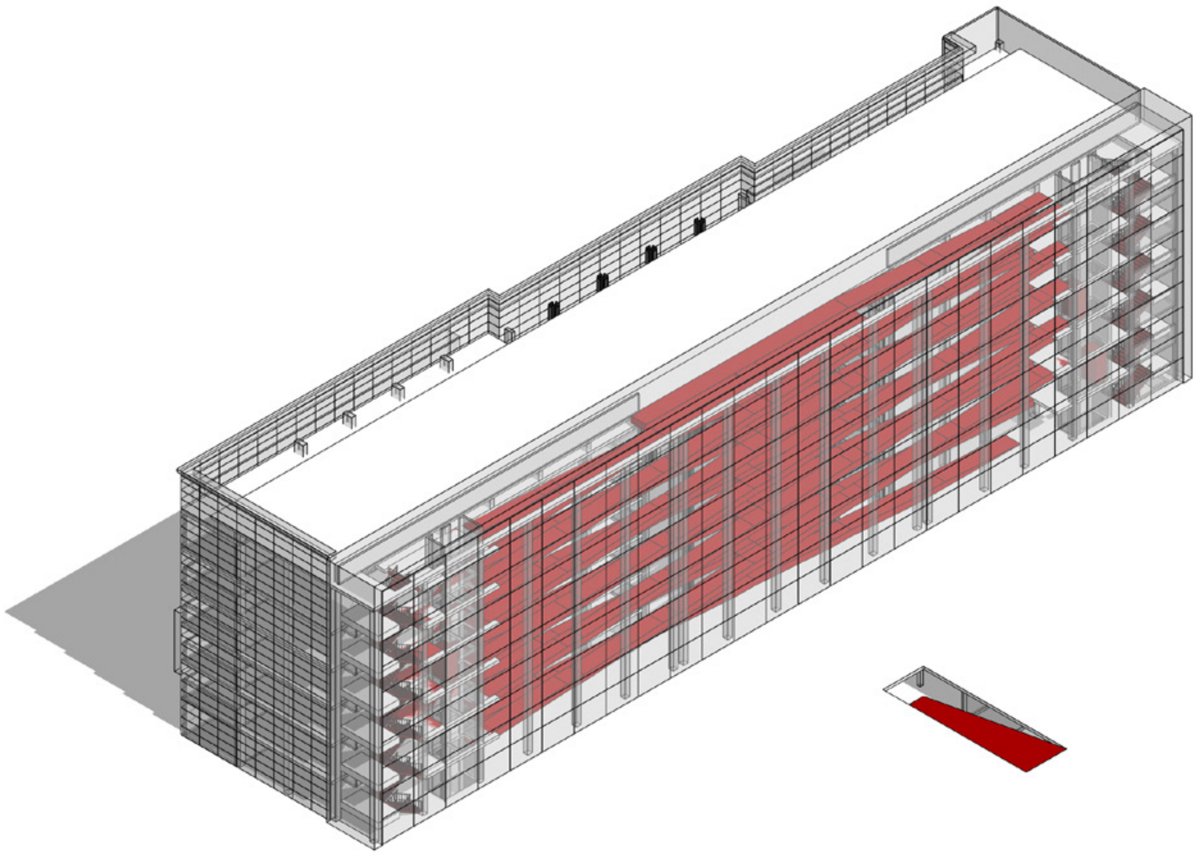
MS-17







The Cultural-Sport Complex for the Disabled is a project designed to provide accessibility to disabled individuals. The distribution system of the building includes several ramps and elevators to ensure that people can move around quickly. The ramp module is located on the longest side of the building, while the stair and elevator modules are on the shorter ends. The ramps allow easy access to all levels of the building and have a slope according to the users' needs. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



ARCHITECT:	Experimental Branch of Architecture
NAME:	Cultural - Sport Complex for Disabled
DATE:	2011
LOCATION:	Tehran, Iran
PROGRAM:	Sport Center

LEGEND:

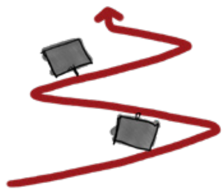
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~

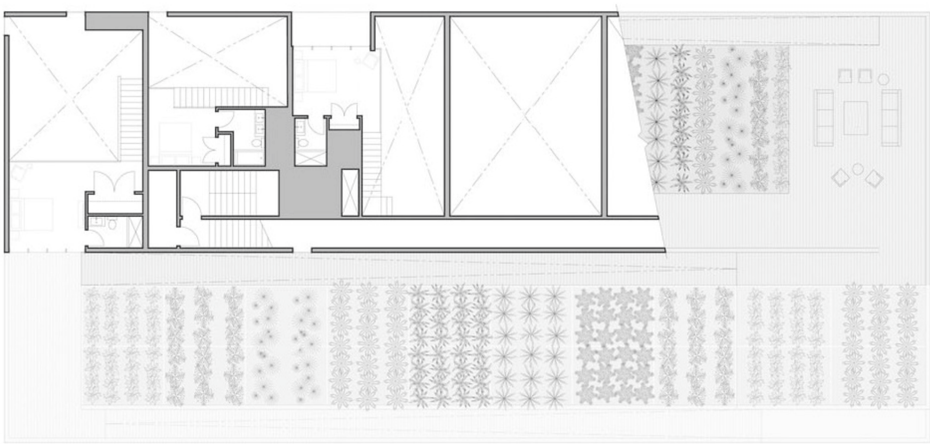
— *non-present*

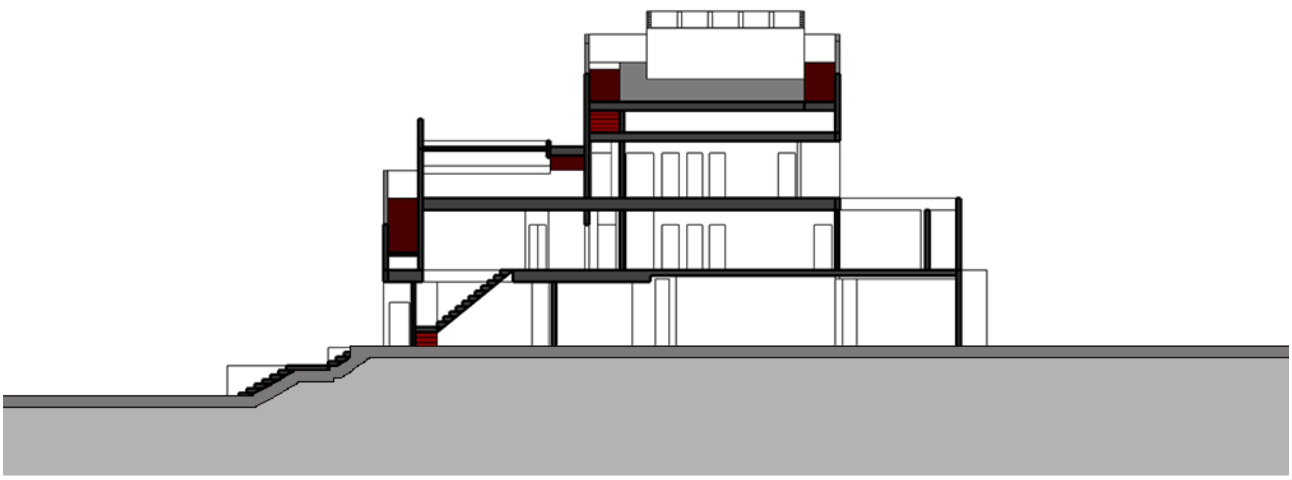
MOUNTAINSIDE

HAIRPIN BEND RAMP

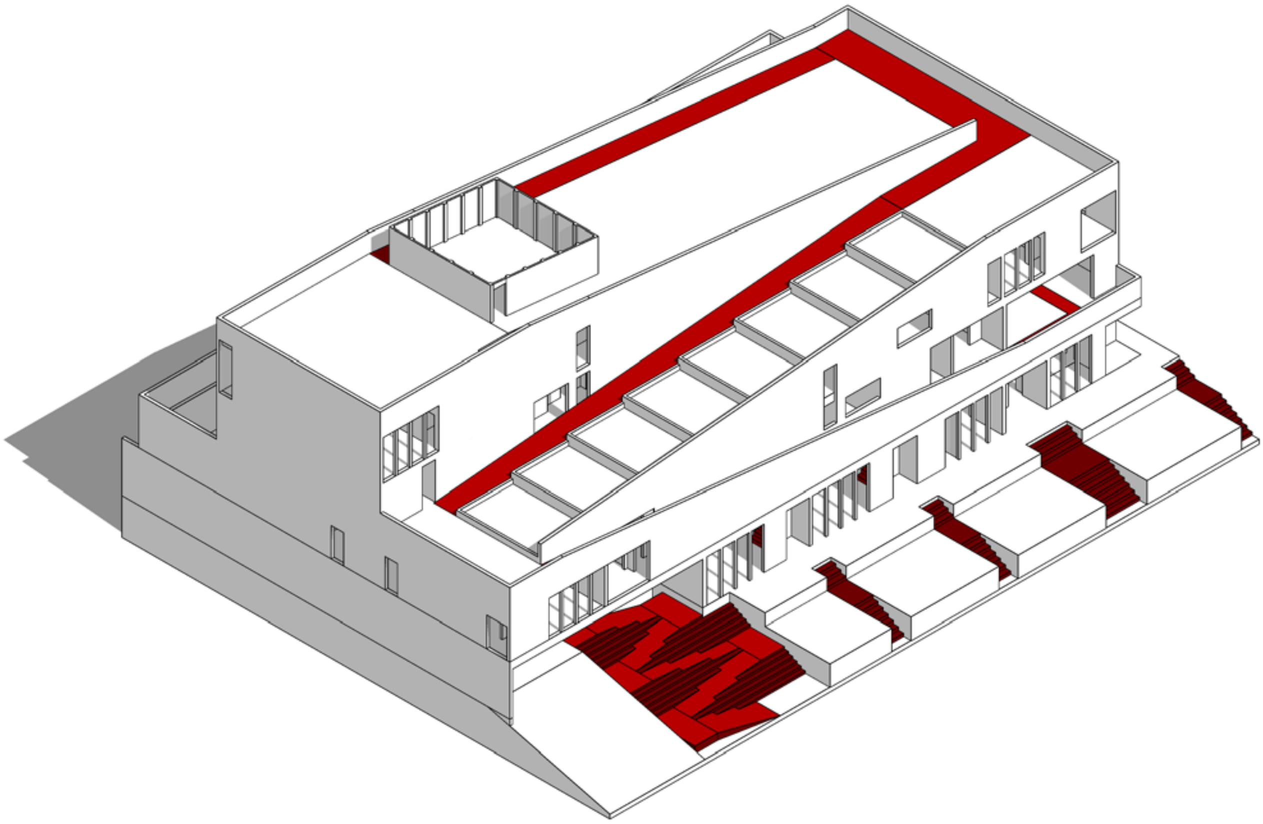
MS-18







The GROW Housing is a residential building that has common gardens that are located on the terraces of the building, accessible by all the inhabitants, and developed through inclined planes that run through the three levels of the building. The ramps, in addition to being a community garden, contain social spaces for the community. At some points, there is the possibility of connecting with the external ramps from inside the building. The access to the building also has a system of ramps that allows the fluidity of the space. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



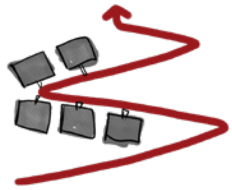
ARCHITECT: Modern Office of Design and Architecture
NAME: GROW Housing
DATE: 2021
LOCATION: Calgary, Canada
PROGRAM: Residential Building

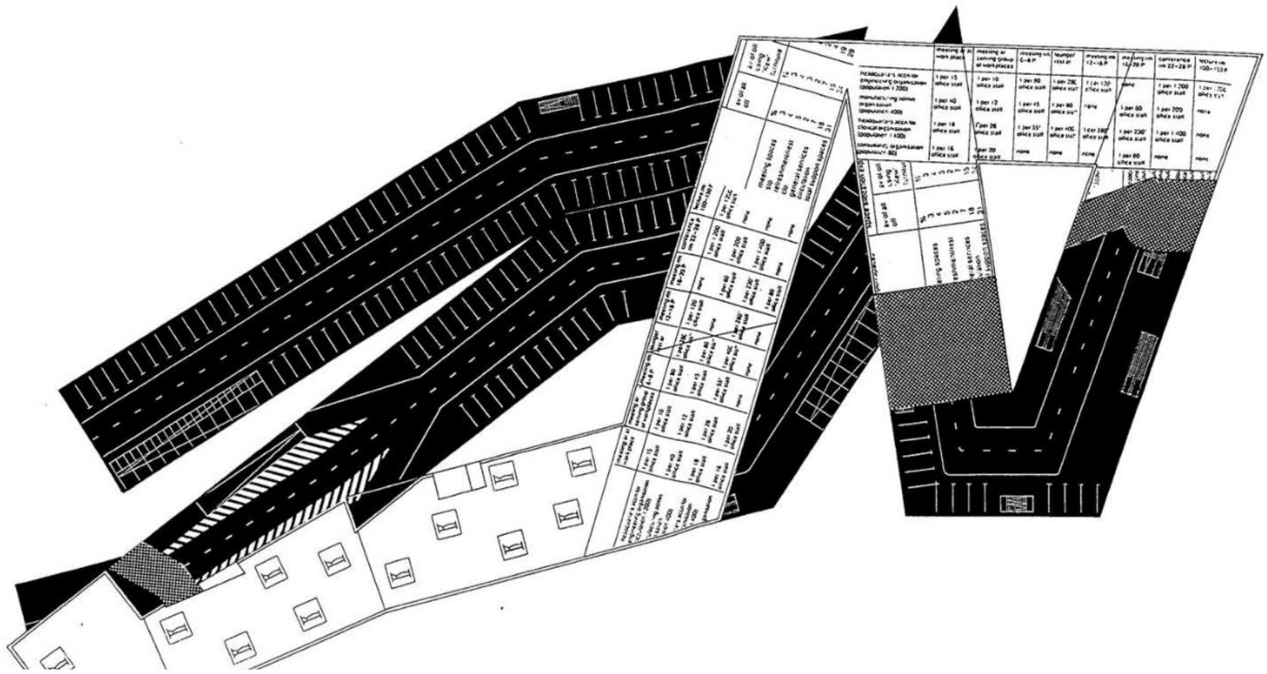
LEGEND:
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- EXTERNAL STAIRS
- — *non-present*

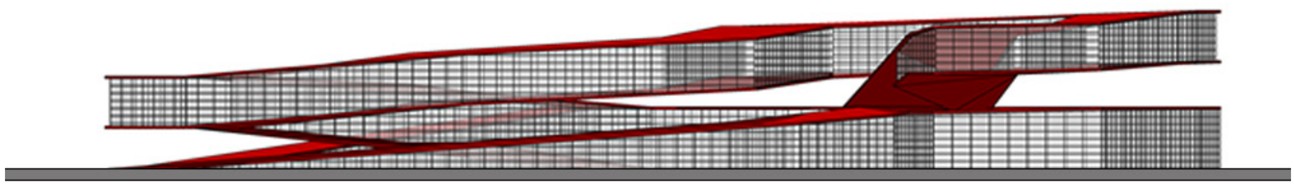
MOUNTAINSIDE

HAIRPIN BEND RAMP

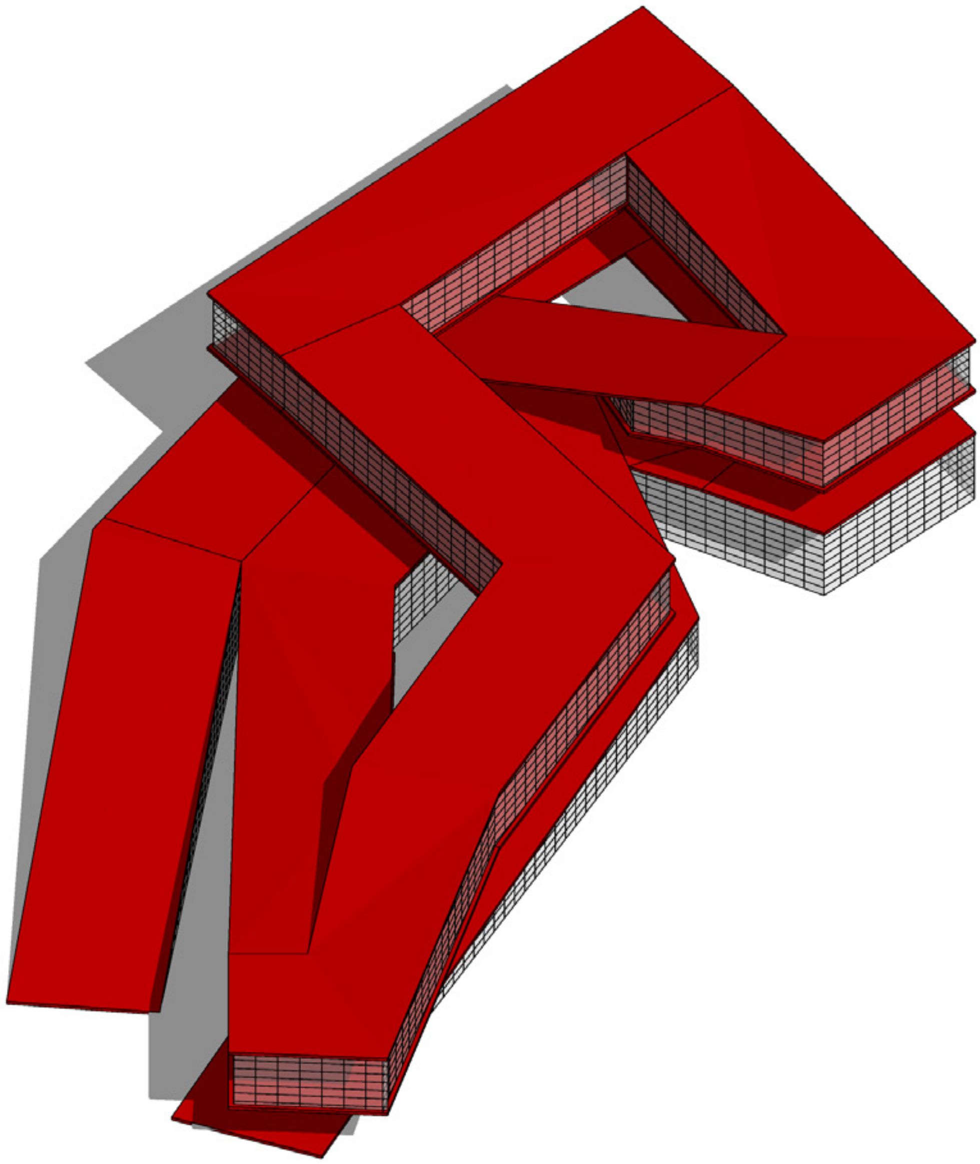
MS-19







The Parkhouse / Carstadt is a continuous ramp that goes up and intertwines all the levels. This same ramp allows the descent without having to go back. The entrance and exit are located in separate places, which allows traffic to flow more smoothly. The ramps contain parking spaces, and the gradual slope ensures a smooth driving experience that facilitates movement. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



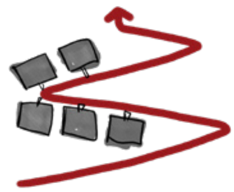
ARCHITECT:	NL Architects
NAME:	Parkhouse / Carstadt
DATE:	1994 - 1995
LOCATION:	Amsterdam, Holland
PROGRAM:	Residential Building

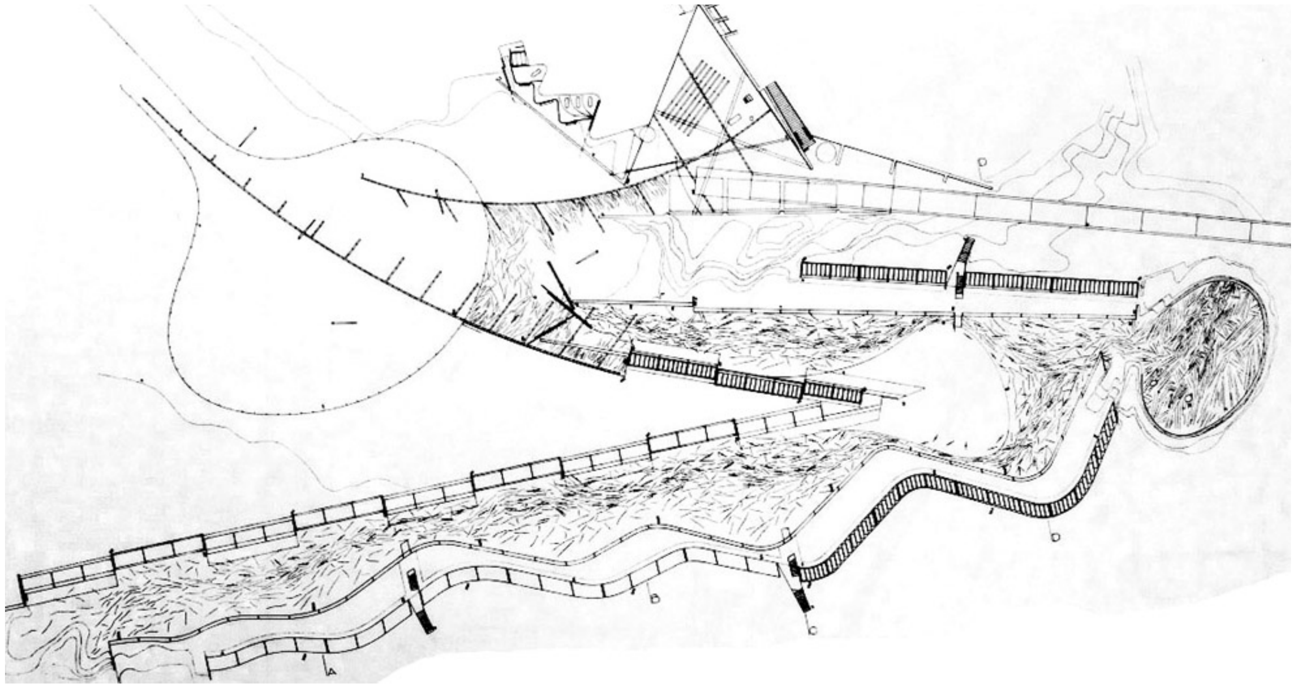
LEGEND:

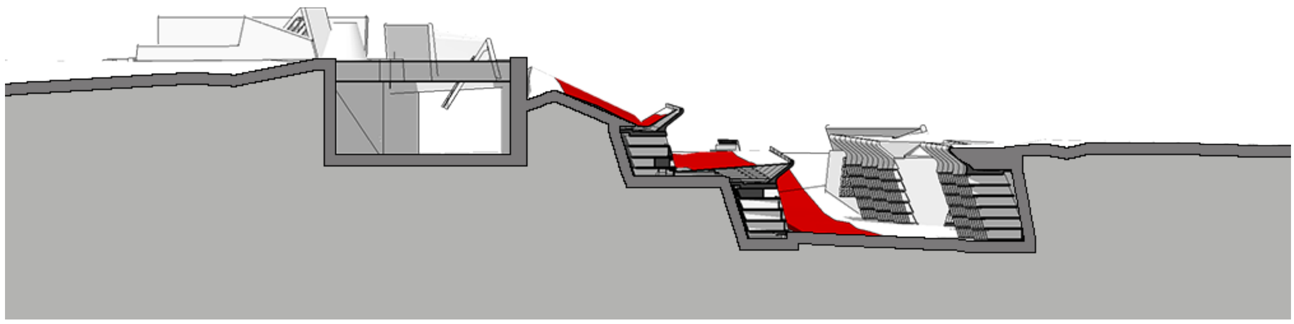
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- ~~INTERNAL STAIRS~~
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAINSIDE
HAIRPIN BEND RAMP

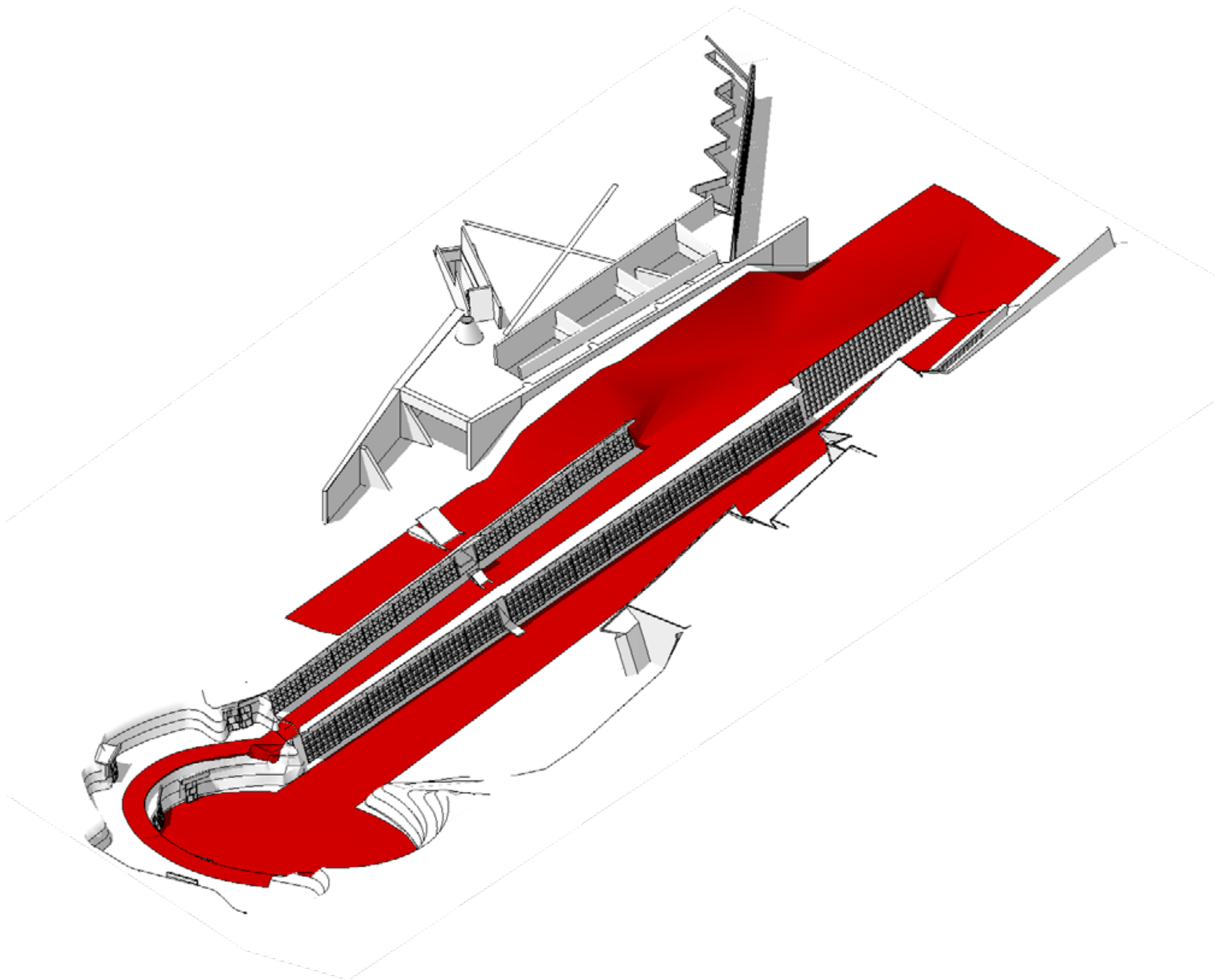
MS-20







The Cementerio de la Igualada has a distribution system organized around a hairpin bend ramp that connects the different levels of the site. The ramp acts as a spine and connects the various paths that lead to the tombs. People are distributed in the cemetery along the different levels and courses, creating a sense of movement and flow throughout the site. The ramp provides a continuous circulation path for visitors to move through the site and experience the various tombs and memorials. The type of distribution is continuous since the ramps along its route contain the space to be distributed.



ARCHITECT: Enric Miralles & Carme Pinós
NAME: Cementerio de la Igualada
DATE: 1994
LOCATION: Barcelona, Spain
PROGRAM: Graveyard

LEGEND:
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- ~~INTERNAL STAIRS~~
- ~~EXTERNAL STAIRS~~
- — *non-present*

CONCLUSIONS

FINAL

4.1. The Oblique Island, the cycling city*

The Oblique Island needs our imagination. In about thirty years, thinking about the city of the future means thinking and designing a place where the bicycle redraws the limits of space, creates new routes and configures an old but also new or renewed lifestyle through different uses, exchanges, meetings and daily activities.

> Oggi cambiare la vita significa per primo cambiare la città. C'è molto da fare, e quanto viene fatto spesso non viene fatto bene. Ma che un'utopia abbia adesso il luogo dove realizzarsi è già qualcosa [...] E l'utopia? La trasformazione della città è un sogno possibile? E la bicicletta può avere un ruolo in questa rivoluzione? Perché la città avrebbe proprio bisogno di una rivoluzione, nel senso letterale del termine, per trasformarsi[71] (Augé, 2009).

The Oblique Architecture materializes as a democratic spatial form that grants everyone the right to live in a barrier-free city. The oblique is an expression of living in freedom through dynamic landscapes where elevation is achieved through movement and without interrupting the continuity of the journey. The oblique movement changes the perception of space. "An ordinary place" is created where experimentation replaces contemplation, where architecture is experienced through movement and the quality of that movement (Parent & Virilio, 1996).

Claude Parent and Paul Virilio proposed their theory on using and exploring the inclined plane as a unique configuration. It represents a modification not only of private space but also of public space precisely through the manipulation of the ground; the idea was to inhabit the inclined plane by assuming the place in the architectural and distributive form of the project.

According to Juan Caramuel, Oblique Architecture was born as an art whose first architect was God

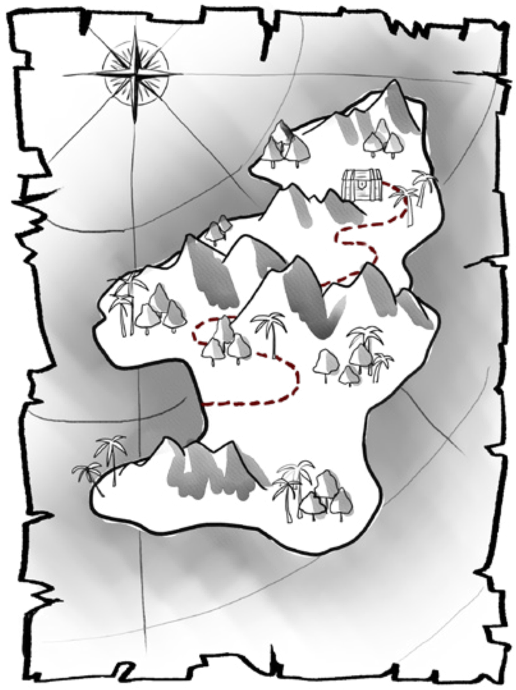


Figure 4.01. Representation of the Tresure Island.

and whose first building was the world itself. God made oblique lines in the sky and at the same time, ordained that mountains should rise obliquely over the Earth and rivers and streams obliquely flow through its valleys (Caramuel Lobkowitz, 1678).

This "oblique creation of the world" leads us to imagine the Oblique Island, the cycling city. A complex system comprised of different machines which, connected, form a new unit. A system where the architecture does not rise above the ground but is born from it: the land rises and shapes it becoming architecture. The three primary machines of the oblique island are the relationship between territory and architecture, the ramp and the bicycle.

Relationship between territory and architecture

Even the territory of the Oblique Island is a complex machine, created by nature and made up of several simple machines, that is, of the forms of the ground. To meet the needs of distribution, architecture reproduces the forms of the territory, becoming the equivalent of a geographical reality. The architecture changes its dimensions and becomes a geographical architecture, an artificial territory, a built landscape. Architecture feeds on the forms of the territory and interprets the landscape. In other words, it is a question of creating paths in the form of buildings and artificial relief, looking at the masses of hills at the mountains, and fixing an image that the intended use cannot destroy (Parent, 1970).

> I luoghi, con le loro particolarità, con le infinite varietà di forme offerte da quel grande edificio architettonico che chiamiamo Terra, con le sempre diverse relazioni che queste forme intrattengono con l'architettura [...] Ri-conoscere i luoghi significa ri-conoscersi in una comunità di abitanti che condivide lo stesso immaginario geografico[72] (Occelli & Palma, 2011).

The Ramp

Machines allow us to work and move more efficiently (Norbury, 2006). A ramp is a simple machine; it is a device that shapes a new lifestyle. Ramps are identified in the staircase. The ramp is the vaguely remembered, grand and platonic staircase. If you remove the vertical and horizontal lines, you get a staircase reduced to its bare essence: the inclined plane (Dean, 2005). For Claude Parent and Paul Virilio the inclined plane is a new form of appropriation of space that favors continuous and fluid movement. Fluidity is defined by the inclination of straight lines drawn in section, giving visual continuity, freedom of movement and uninterrupted perception. Creating an uninterrupted flow between outside and inside strengthens the principle of inclined planes (Parent & Virilio, 1996). In any case, the Oblique Architecture is configured thanks to the relief that detach themselves from the horizontal plane to create a habitable space inside, relief which, in any case, will always see their construction linked to the terrestrial dimension, assuming the shape of the territory as reference (Parent, 1970).

The Bicycle

A bicycle is also a complex machine (Jensen, 2018). It is an economical means of transport that needs little space and democratises mobility because, in addition to being within reach of most of the population, the large surfaces that allow movement facilitate mobility for the elderly, children and the disabled.

"L'idea di una città in cui prevale la bicicletta non è pura fantasia"[73] (Augé, 2009) and represents an experience of freedom because it is a machine that responds to the desire of the body and mind. Through the movement on the bicycle, the shape of the territory and also of the landscape is perceived, spaces are created for socialization but also for rooting because "[...] la bicicletta forse acquista un ruolo determinante per aiutare gli uomini a riprendere coscienza di loro stessi e dei luoghi in cui vivono, invertendo, per quanto li riguarda, il movimento che proietta le città fuori da loro stesse"[74] (Augé, 2009). The bicycle allows a journey of reconnection with us but also offers the opportunity to build a community of explorers of the everyday and the extraordinary. Ultimately, it is a question of attributing a regular character to using the bicycle and designing spaces that allow free movement. In other words, through freedom of movement, fluidity, lightness, but also the possibility of freely choosing paths, "la bicicletta [...] permette alla gente di creare un nuovo rapporto tra il proprio spazio e il proprio tempo, tra il proprio territorio e le pulsazioni del proprio essere"[75] (Illich, 2006).

The Oblique Island

The combination of these elements gives life to the Oblique Island. In this settlement, architecture is not a simple object that rests on the ground but is a geography component. The island's architecture is formed by creating distribution elements that intertwine with the geographical imagination. It is the ground itself which, by rising, straightening, digging and modeling itself, becomes the parts of this machine formed by the levels necessary for daily activity: a habitable ground (Parent, 1970). On the Island of Inclined Planes, the surface area of public spaces is increased, social gatherings are encouraged, the global sense of the territory is revitalized; an Island where there are now bridges, paths and ramps instead of hills, mountains and craters.

Inside this machine there is another machine: "senza nessun altro aiuto oltre alla forza frammentata del corpo, la bicicletta permette di realizzare l'ideale della mobilità facile"[76] (Augé, 2009). Thus the cyclist has the opportunity to connect with nature, because "Il sogno del ciclista è quello di identificarsi, sulla terra, con il pesce nell'acqua o con l'uccello nel cielo, anche se deve comunque confrontarsi con i limiti dello spazio"[77] (Augé, 2009). The Oblique Island is therefore a city that explains the geography through its architecture.

Figure 4.02. Architectures reinterpreting the shape of the Earth in a continuos and system.

The oblique paths of this city contain "mountain passes" as Le Corbusier said (Frampton, 1986). Oblique Architecture aims to build geographical architectures, whose distributive systems reproduce the shapes of the Earth.

The Oblique Island does not invent the ramp as the machine that lifts but proposes a lifting device that can also be inhabited and embodies an architectural figure belonging to the territory. The Oblique Island is a machine that allows everyone to move without discrimination of speed or skill. The bicycle guarantees the functioning of this system, allowing for the construction of an ecological relationship between natural and artificial machines which have coexisted for centuries.

With a bit of imagination, an attempt has been made to dream of a city where anyone can move around. A city made up of journeys through routes accessible to anyone, an unhurried city where it is possible to have a direct relationship with one's territory. The Oblique Island is not a simple whim that invites people to move, walk and live through inclined planes. The idea of an architecture that recovers the relationship with the Earth's form means integrating with the ground, becoming part of it, and shaping it, thus extending the ground's shape.

The integration allows for elements such as slopes, overhangs, and other features that are part of the natural terrain to become part of the architecture. This type of architecture creates a new relationship between the built environment and the natural world, blurring the boundaries and allowing people to find themselves within the architecture as they move through the space. This approach to architecture may bring together the built and natural environments in a harmonious and integrated way, creating a more holistic relationship between people and their surroundings.

* *A first version of this text has been published in the book I corpi della macchina. Scritti meta-scientifici (see Franco Gonzalez, 2021, pp. 31–38).*

4.2. Closing Comments

From Caramuel (Caramuel Lobkowitz, 1678) to Parent and Virilio (Parent & Virilio, 1996), and later others, a theory has been trying to define Oblique Architecture. Interesting examples have existed since the first buildings as geometries and shapes designed to facilitate movement and provide a functional space. This reflection on the past can also inspire us to consider the impact of our current modes of transportation and their effect on architecture. As we move towards a more sustainable future, we may need to rethink the design of our buildings and the way we move through them. In the same way that the XX Century discussed, designed, and built the architecture for the car, the XXI Century may have to focus on the architecture for the bike.

“As with any war, some soldiers will die” (Fleming, 2012, p. 90). That is one of Fleming’s conclusions about adapting societies to the bicycle. It sounds like a cruel statement because it is a harsh statement. The saddest part is that it may be true. Thinking about oblique cities and architectures that would allow the fluent existence of the bike may be a long-term objective that requires a significative transformation and a necessary sacrifice. Much must be researched and designed to move faster in this direction.

After years of studying Oblique Architecture, finding precise answers to such complex and novel topics has not been possible. Still, this research has helped understand a few trends, for example:

- Circulation through ramps, in some cases, is an integrated system that runs through the entire building; in other cases, they partially help with accessibility.
- Some vertical circulation systems, such as stairs, if they are integral throughout the building, could be adapted to the stairs with ramp or ramp with steps format to facilitate movement by bicycle.

- When circulation systems seek to be integrated into the building, it is usually done with a spiral ramp that runs through the entire building.
- There are buildings where the ramps allow to connect every space; there are others that only allow partial access and other examples where they propose an alternative path.
- Ramps can be seen in architecture, even with very different scales. This could be useful when considering tiny houses, bed and breakfasts, and more extensive examples such as a library.
- Broader typologies can later be subdivided into variations according to each case study.

As a collection of notes, these are just the first approach to a deeper analysis still to be done in the Atlas and projected to happen in further steps of this research. This PhD thesis is theoretical, but it has been designed to be operational and place itself within a natural world with significant problems to solve. One of those problems is related to mobility as one of the leading causes of Climate Change and accessibility as one of the first space-related causes of inequality. Architecture is vital in defining a more sustainable future, and Oblique Architecture could be essential to achieve that future.

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EXPERIMENTS WITH THE ATLAS OF OBLIQUE ARCHITECTURE

ANNEX

A1.1. Application of the distribution systems of the Atlas in a Design Studio

Annex I is built based on a series of design solutions that resulted in a design laboratory developed within the *Laurea Triennale in Architettura del Politecnico di Torino* in the *Atelier di Costruzione D*. This studio course was carried out during the academic year 2021-2022 under the multidisciplinary direction of Luca Caneparo of *Tecnologia dell'architettura*, Stefano Invernizzi of *Scienza delle Costruzioni* and Riccardo Palma of *Composizione architettonica e urbana*.

The studio course proposed designing an architectural project for a building that combines temporary lodging with permanent residence and responds to the needs of active mobility in Turin - Italy. The students had to design a residential project aimed at tourists and residents who use bicycles daily, either for commuting to work and school, sports and leisure, or travel.

This design proposal aimed to study and experiment with the architectural project and the technological, structural and distributive characteristics that a mixed accommodation/ residence structure dedicated to cyclists must have to be attractive and effective in satisfying the new demands these categories pose. Precisely, one of the essential aspects to highlight of these projects was their distribution systems. In addition to the usual elements of vertical distribution, such as stairs and elevators, all the rooms and dwellings in the building had to be accessible by bicycle through ramps that had a maximum slope of 6% if they were uncovered and 10% if they are covered, always with a minimum width of 2.50 m.

The professors distributed the references used in the project based on the *Atlas of the Oblique Architecture: distribution systems and landforms* developed in this thesis. The atlas illustrates architectures characterized by a distribution solved through ramps and inclined planes regardless of the historical location. Each case study in the atlas is illustrated by a distributive scheme that represents the binding distributive characteristics of the project.

These references and schemes were assigned to teams of students for their study, redesign and later use in the solution of the architecture project, considering that the Atlas architectures are mainly not dedicated to the bicycle.

Applying these distribution models required some degree of interpretation without modifying the main distribution scheme. Likewise, the exercise required identifying and developing an effective distribution method without interference or points of conflict between the service spaces and the served spaces so that they could respond to the needs of the cyclists.

A1.2. Distribution systems

In addition to the typical vertical distribution elements - stairs and lifts - all the rooms and all the housing units must be accessible by bicycle via cycle ramps. The shared services must be easily accessible through covered and warm paths from all the housing units and rooms.

The teacher has attributed the distributive references used in the project based on the Atlas of the Oblique Architecture developed in the context of this doctoral thesis.

The Atlas illustrates a corpus of architectures chosen independently of their historical location and characterized by a distribution resolved through ramps and inclined planes. In the Atlas, each architecture is represented by an axonometric distribution scheme that represents the binding distribution characteristics for the project.

Each project group has been assigned a pair of distributive references in the same typology. The reference must be studied, redesigned, and used in the project solution.

Since most of the architectures that make up the Atlas are not expressly dedicated to cycling, their application to the project must be mediated by interpretative operations, which, however, must not modify the distribution scheme assigned by the teacher.

The two profile cards of cases studies of the Atlas of the Oblique Architecture: distribution systems, and landforms that were selected for each category were the following:

- Crater:

  CR_01 Colonia Fiat Torre Balilla

  CR_02 Hanoi Museum

- Mountain:

  MT_01 Castel Sant'Elmo

  MT_02 El Helicoide

- Mountain pass:

  MP_01 Carpenter Center

  MP_02 Stabilimento FIAT Lingotto

- Mountain ridge:

  MR_01 Mortuary Temple of Hatshepsut

  MR_02 Museum of Natural History

- Mountainside:

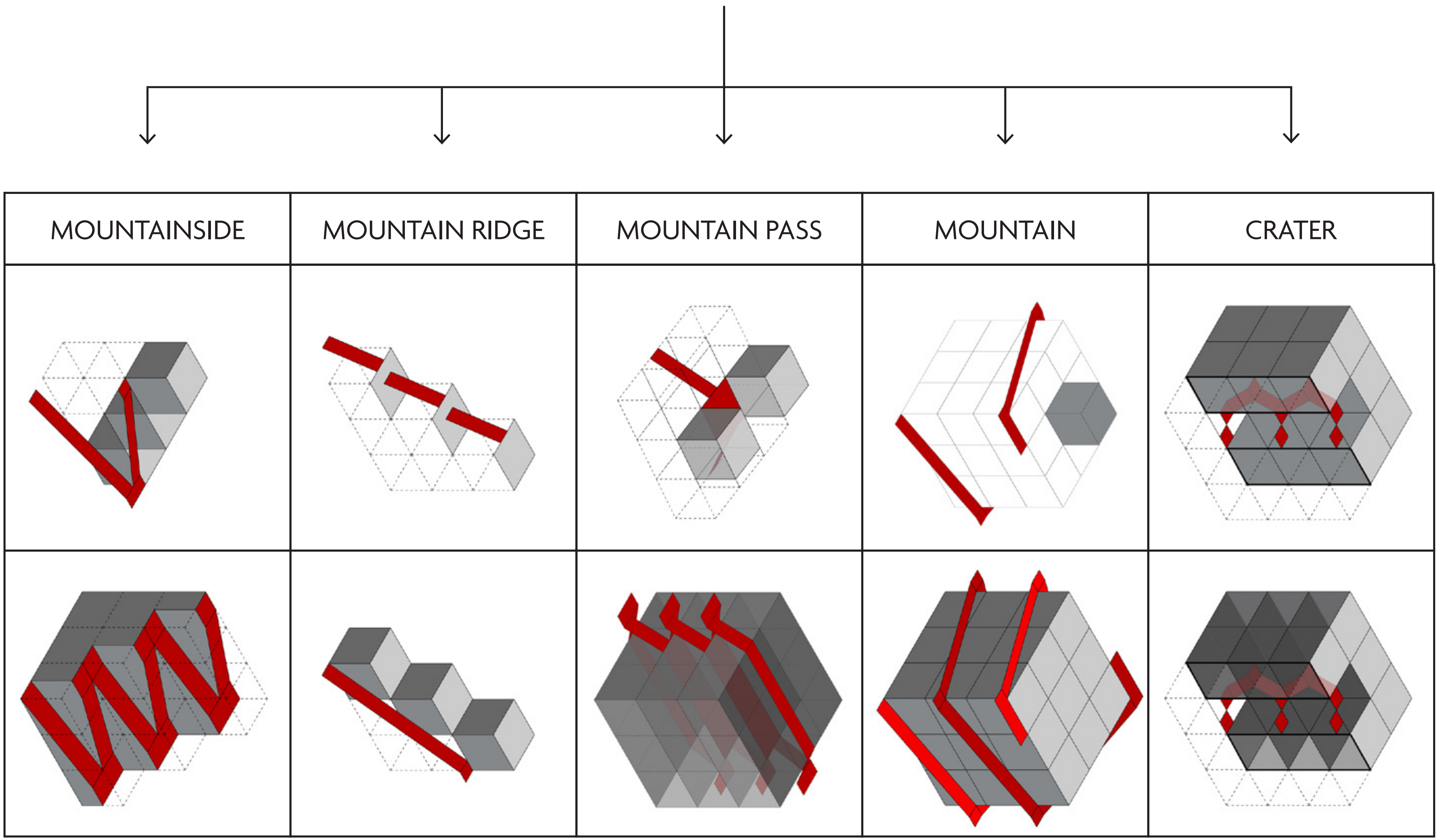
  MS_01 Supermarché Carrefour

  MS_02 Hotel Zig-Zag Ski

A1.4. Representation rules

For a general and efficient reading of the projects, certain norms were established for the graphic production of the projects.

TYPES OF DISTRIBUTION



The final boards must contain exclusively original materials produced by the students. Materials (drawings, photographs, etc.) produced by third parties cannot appear. No more than two colors should be used on the boards. The colors must be the same for all the group tables, and their use must be aimed at the hierarchy of the elements represented. The horizontal and vertical sections should be drawn with a thicker line and filled with a solid fill. Elevations and sections should be drawn with shadows. The views must not contain vertical vanishing points, and the overall views, distinct from an impossible point of view (aerial observer), from the particular views, distinct from a realistic point of view (observer on the ground), must be distinguished. The legend of the symbols used must always accompany the cards and schemes.

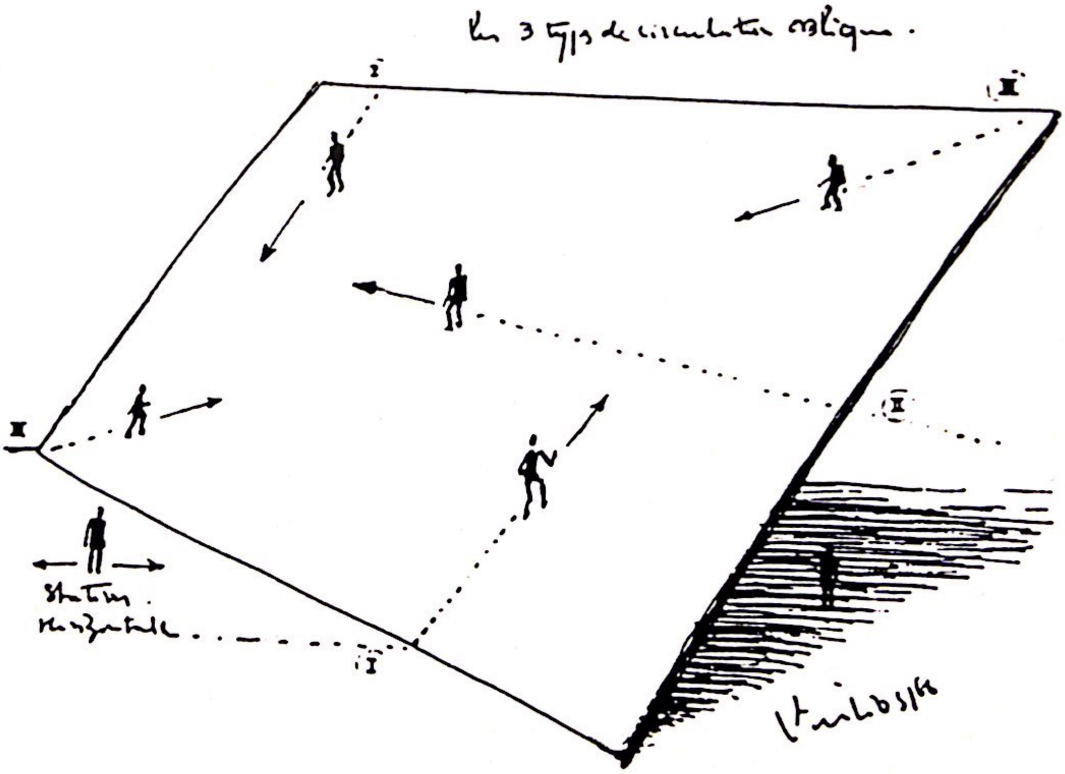
In addition to these general rules, they were given a small summary manual highlighting essential aspects to consider when making plans, sections, and façades.

A1.5. Profile card of the projects: Architectural form

Moreover, for a better understanding, the results of the studio are presented in the same way in which all the case studies have been classified and organized in the *Atlas of the Oblique Architecture: distribution systems and landforms*. The material presented in the sheets has been prepared by each group of students belonging to the studio.

REGOLE DI RAPPRESENTAZIONE:

BIKE HOTEL


Les 3 types de circulation oblique.
Station horizontale

CHE COLORI USARE?

Per gli schemi distributivi

Colore da utilizzare per le rampe:

R: 152
G: 0
B: 0
#980000

Colore da utilizzare per i collegamenti verticali:

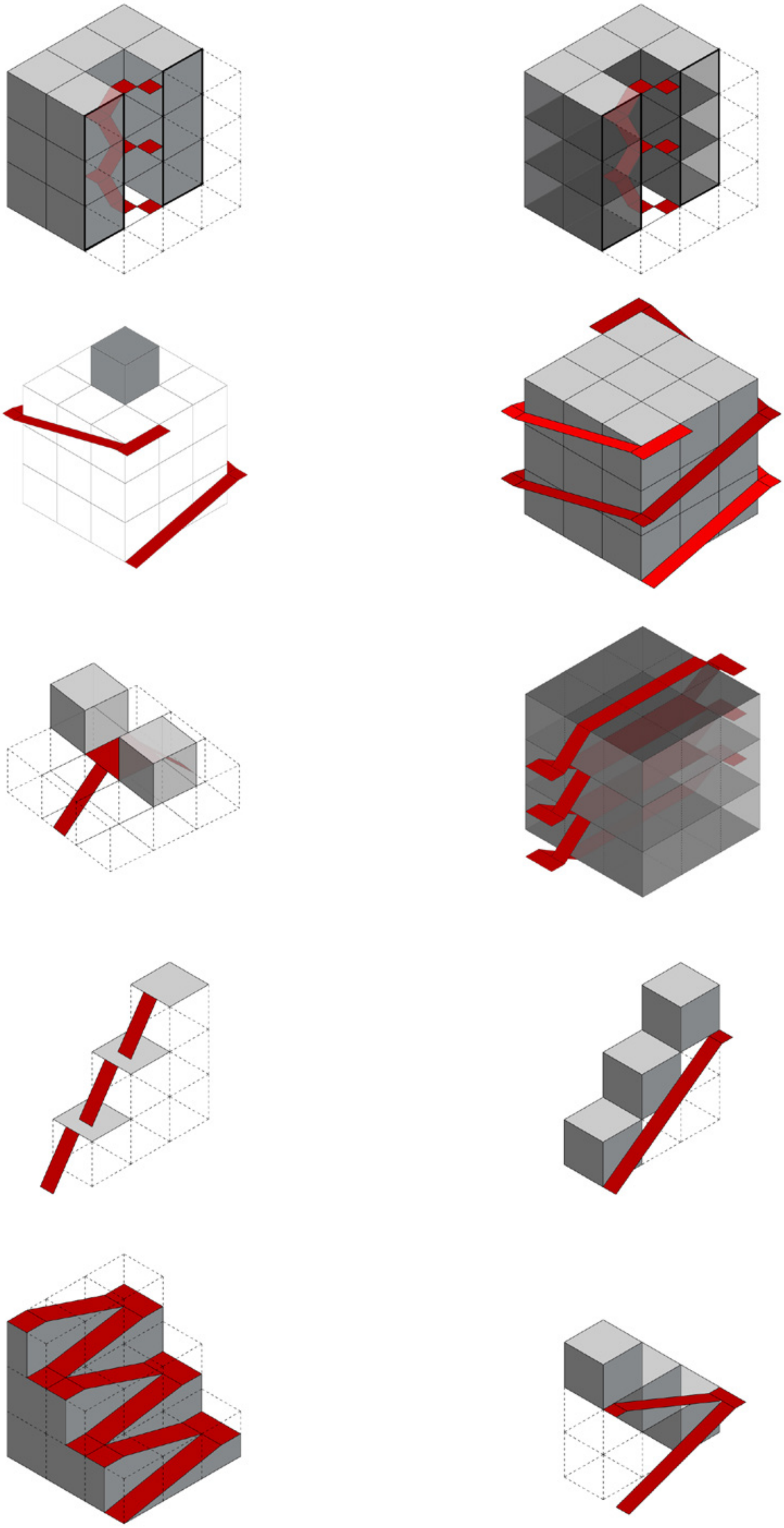
R: 92
G: 0
B: 1
#5c0001

Colore da utilizzare per i servizi:

R: 111
G: 113
B: 115
#6f7170

Gli schemi devono sempre avere una leggenda:

LEGGENDA:
SPAZI
SERVIZI
ELEMENTI DISTRIBUTIVI
RAMPE
COLLEGAMENTI VERTICALI



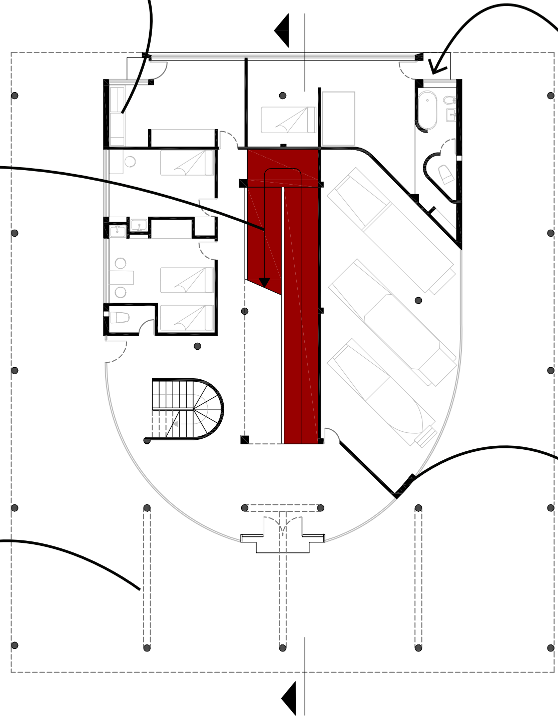
PER I DISEGNI

In pianta:

La linea di sezione deve essere segnata

I mobili in vista vanno in grigio

Le linee in vista sono più sottili



Le rampe vanno riempite in rosso

Tutto ciò che viene sezionato è riempito di nero

Le linee in proiezione vanno tratteggiate

PIANO TERRA
Scala. 1:200

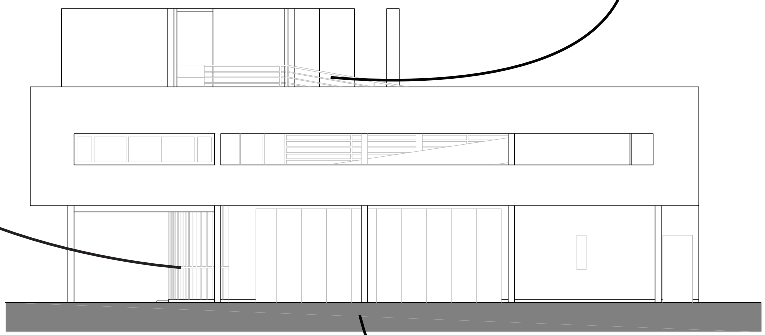
Segnare il nord

Gli elaborati devono avere titolo e scala

In facciata:

Rendere la differenza tra ciò che sta davanti e ciò che sta dietro. Più avanti (Nero-Spesso) Più indietro (Grigio-Sottile)

Le linee in vista sono più sottili



PROSPETTO LATERALE DESTRO
Scala. 1:200

Il suolo va sezionato e dev'essere riempito di grigio

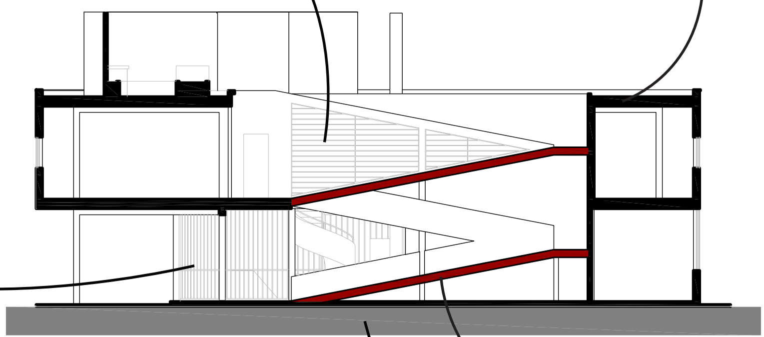
Gli elaborati devono avere titolo e scala

In sezione:

Rendere la differenza tra ciò che sta davanti e ciò che sta dietro. Più avanti (Nero-Spesso) Più indietro (Grigio-Sottile)

Tutto ciò che viene sezionato è riempito di nero

Le linee in vista sono più sottili



SEZIONE A-A
Scala. 1:200

Le rampe vanno riempite in rosso

Il suolo va sezionato e dev'essere riempito di grigio

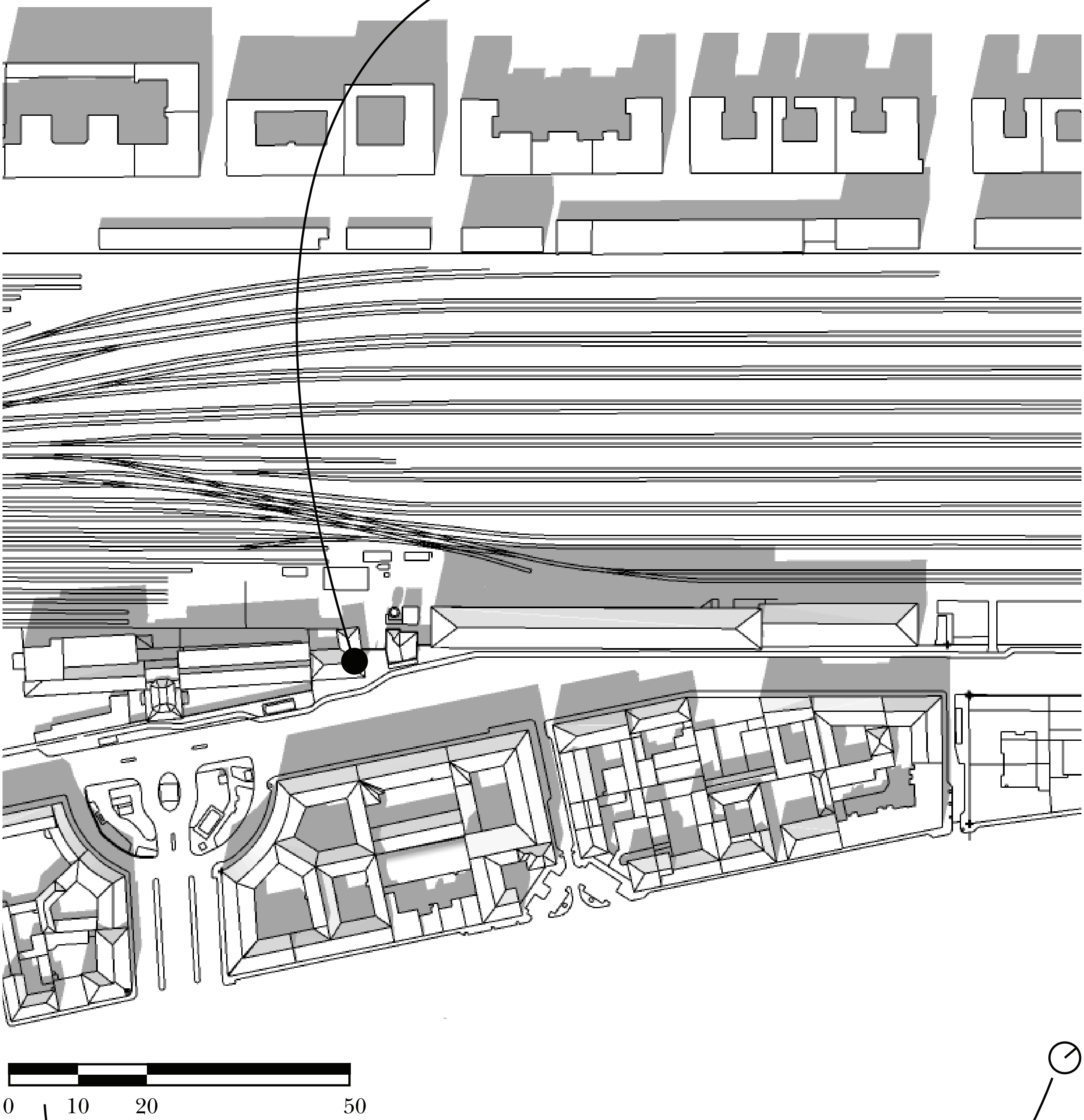
Gli elaborati devono avere titolo e scala

Per le planimetrie con le ombre:

Gli elaborati devono avere titolo

PIANTA CON LE OMBRE

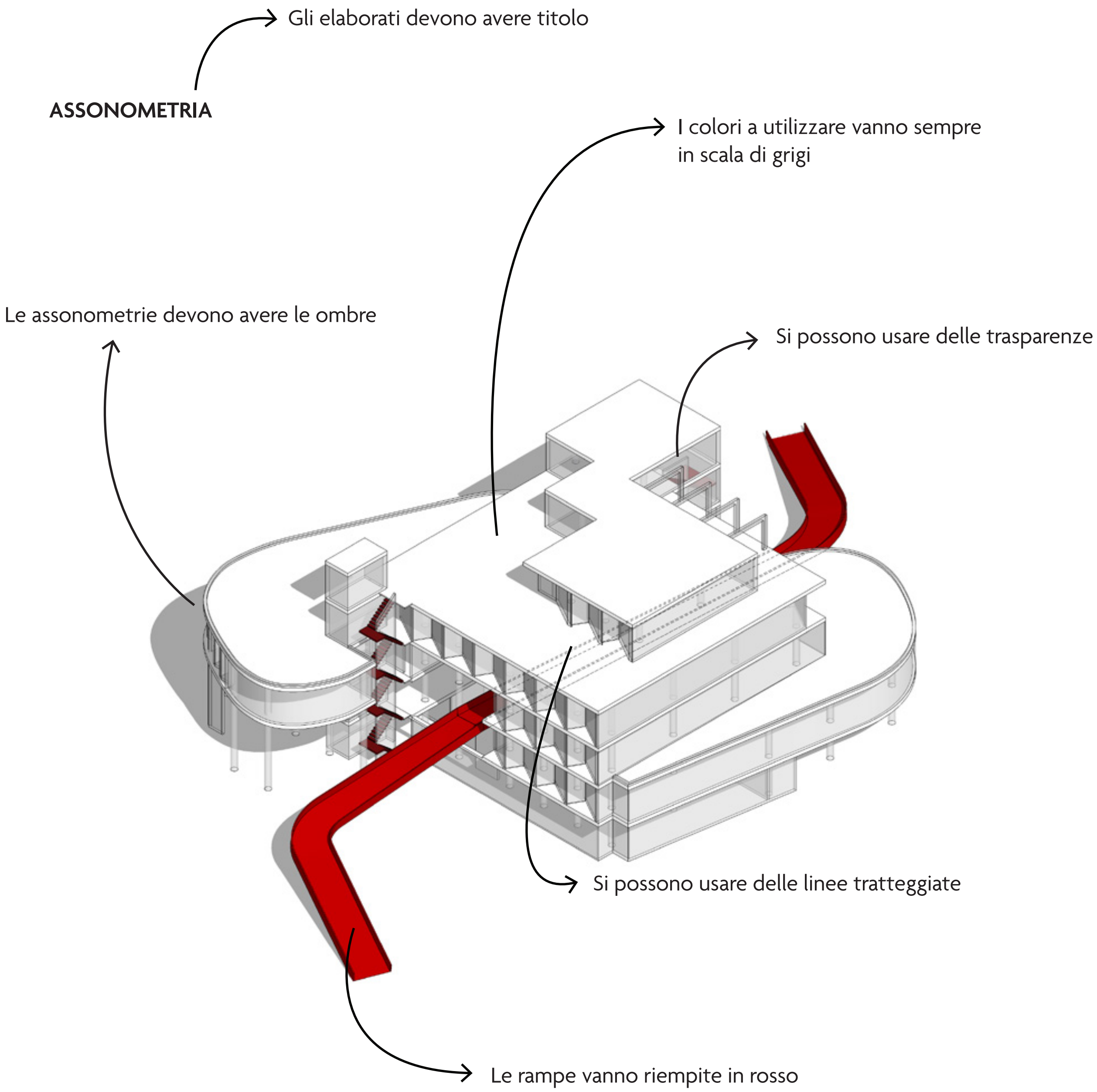
Il progetto dev'essere inserito nel contesto



Segnare il nord

Gli elaborati possono avere una scala grafica

Per le assonometrie:

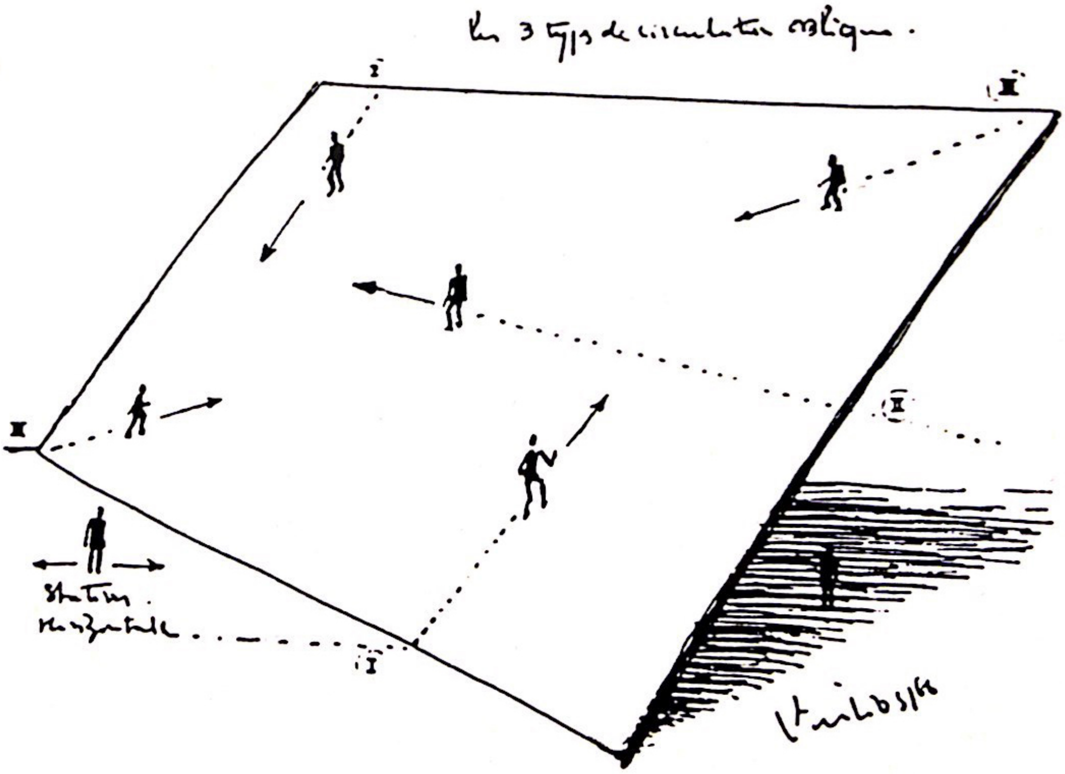


NOTA per i files:

Tutti i files devono essere nominati nella seguente maniera:
Gruppo numero _ Nome dell'elaborato. Esempio: "G01_Assonometria"

ATLAS OF THE OBLIQUE ARCHITECTURE:

DISTRIBUTION SYSTEMS AND LANDFORMS


Les 3 types de circulation oblique.
Station horizontale

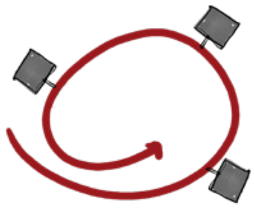
ARCHITECTURAL FORM

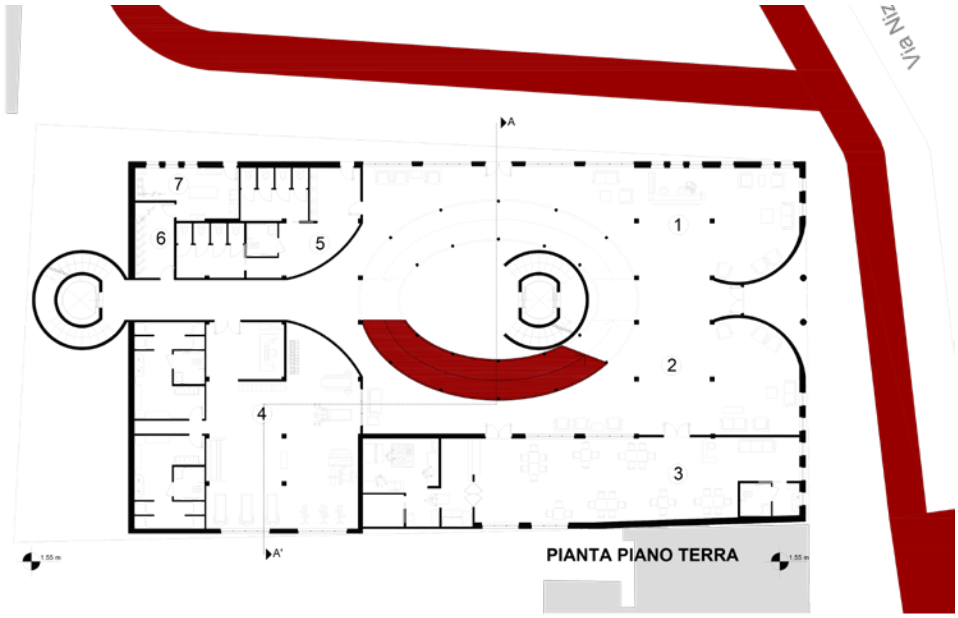
A1.5.1. **CRATER SPIRAL INTERNAL RAMP**

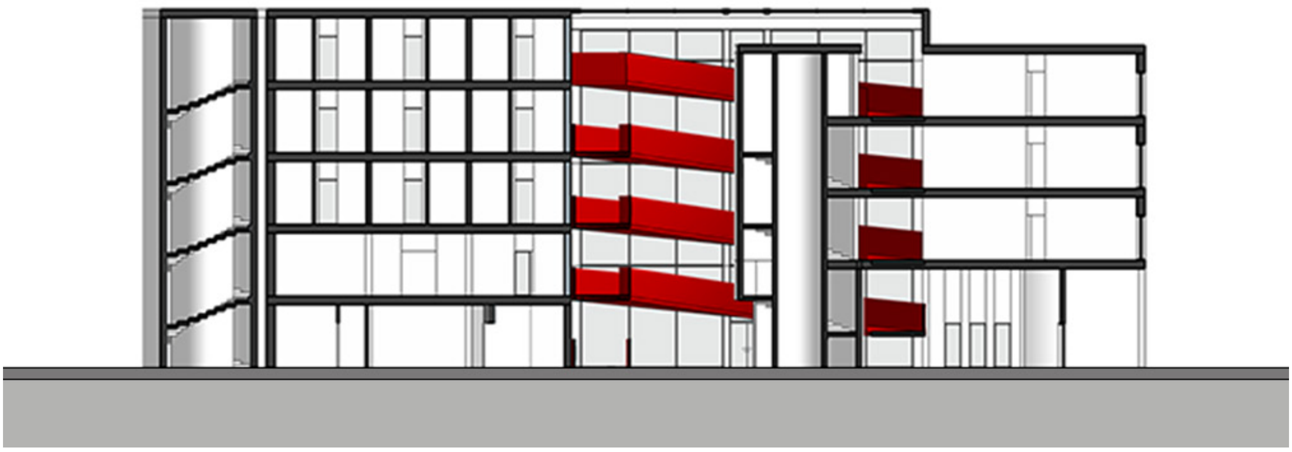
CRATER

SPIRAL INTERNAL RAMP

CR-21

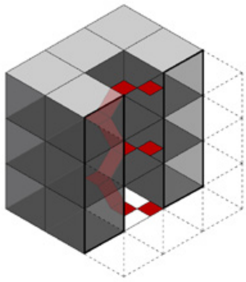


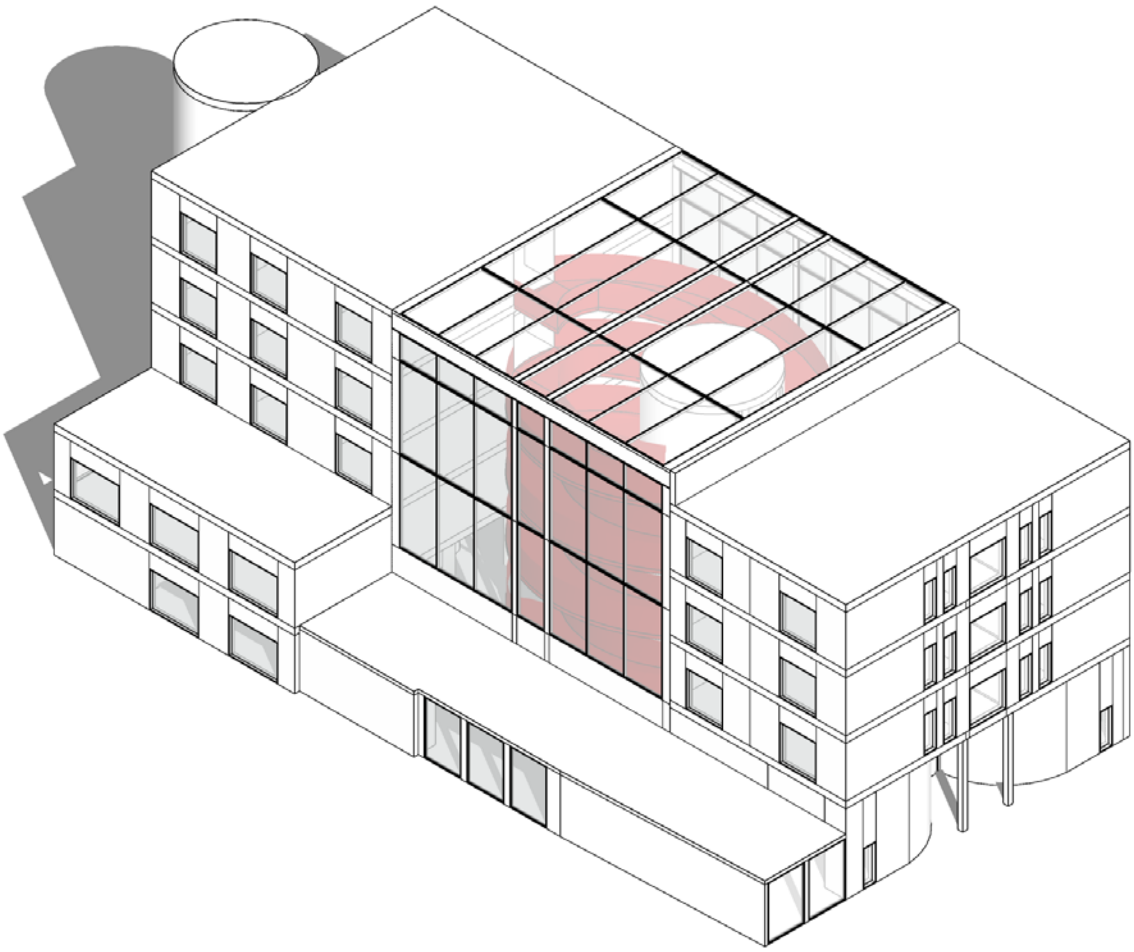




The Bike hotel distribution system focuses on easy and direct access for cyclists to their rooms and areas of interest so they can get in and out quickly, safely, and efficiently. To facilitate this, the building has a spiral ramp in the center of the building that provides access to all levels. The ramp is designed to be wide enough to contain two bike lanes, allowing cyclists to get around without the need to use elevators or stairs. Overall, the distribution system prioritizes the needs and comforts of riders, creating a seamless and efficient experience. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.

Distribution Scheme





STUDENTS: Lombardo Cecilia
Morana Yvonne
Porcaro Edoardo

LOCATION: Turin, Italy

PROGRAM: Bike-Hotel

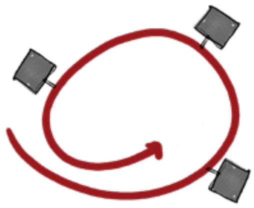
LEGEND:

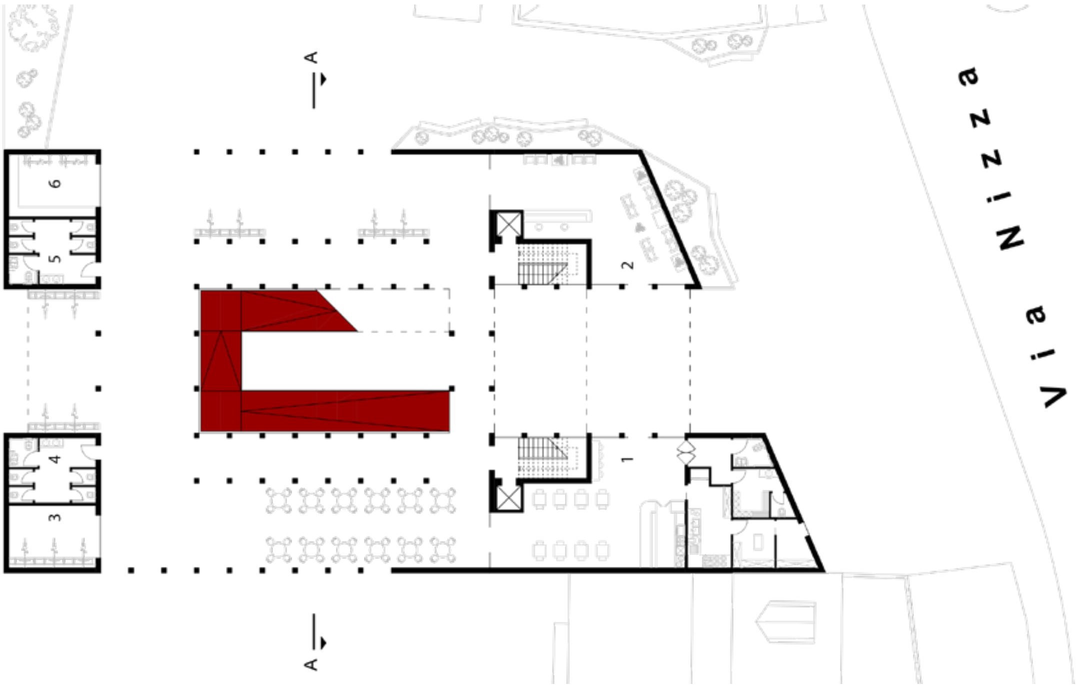
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

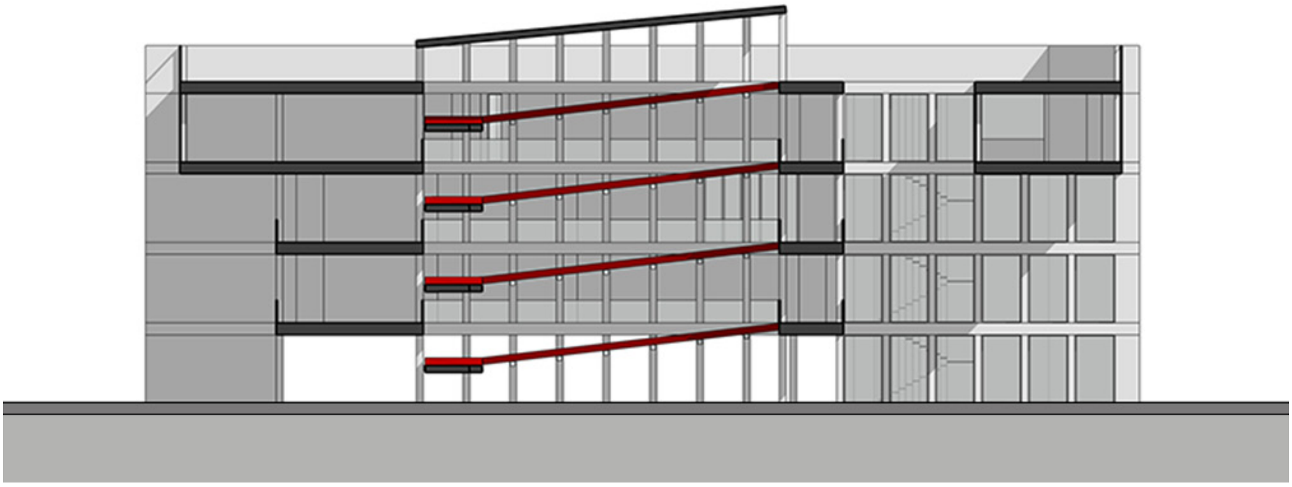
CRATER

SPIRAL INTERNAL RAMP

CR-22







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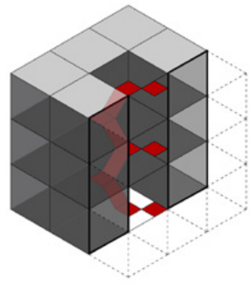
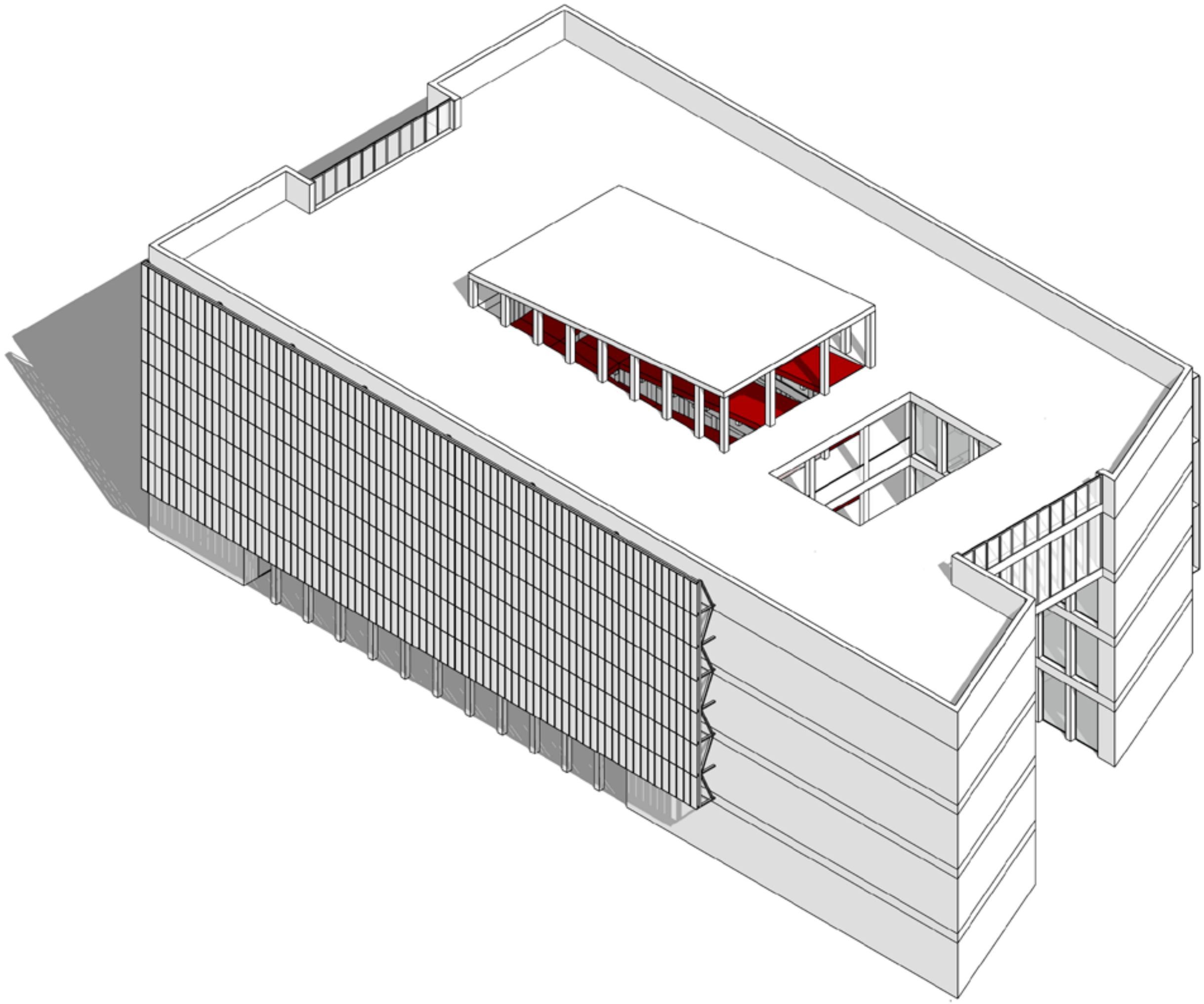
Distribution Scheme





STUDENTS: Cianciaruso, Giovina Elèna
Di Pasquale, Alberto
Delogu, Carlo
LOCATION: Turin, Italy
PROGRAM: Bike-Hotel

LEGEND:

- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

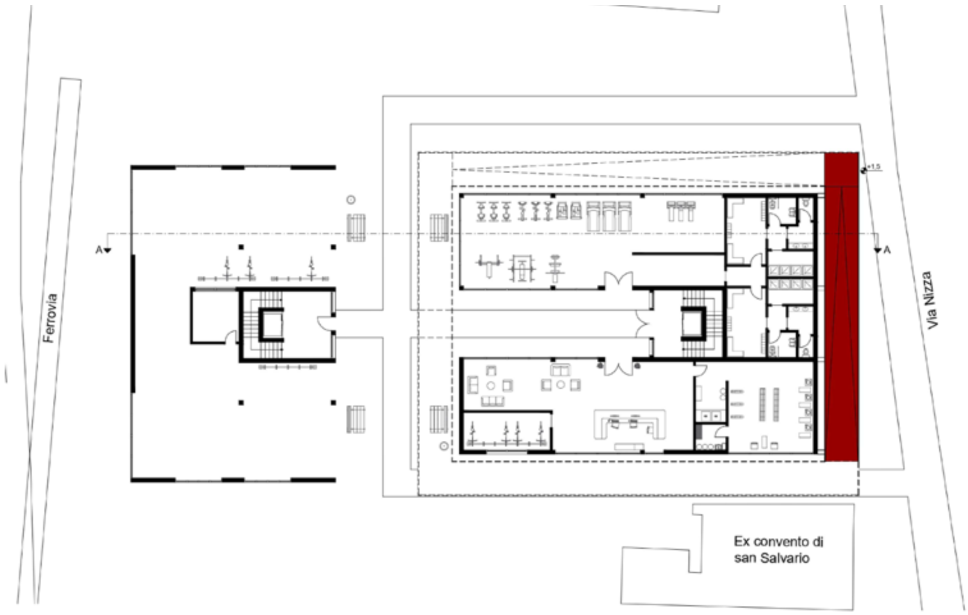
ARCHITECTURAL FORM

A1.5.2. **MOUNTAIN SPIRAL EXTERNAL RAMP**

MOUNTAIN

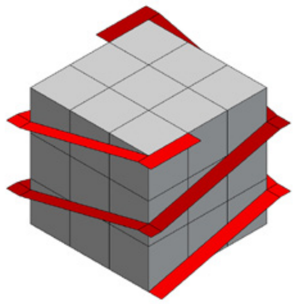
SPIRAL EXTERNAL RAMP

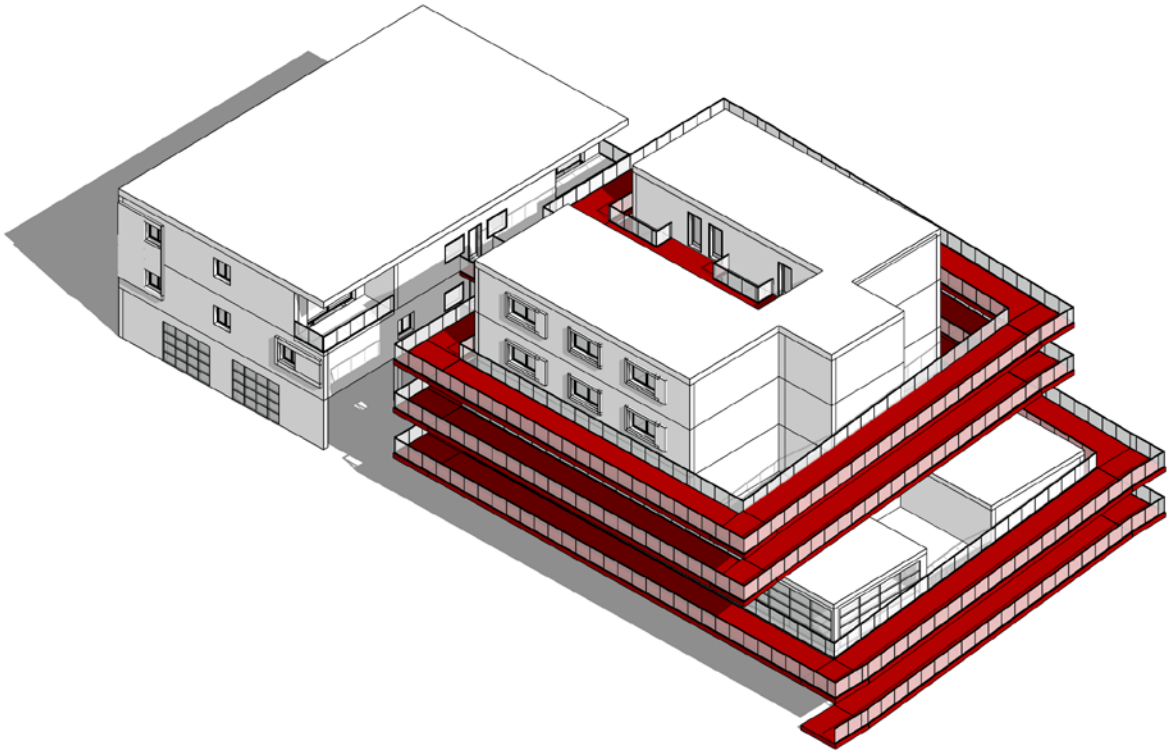
MT-21



The Bike hotel distribution system focuses on easy and direct access for cyclists to their rooms and areas of interest so they can get in and out quickly, safely, and efficiently. To facilitate this, it has a ramp that surrounds one of the hotel blocks and provides access to all levels through bridges. The ramp is designed to be wide enough to contain two bike lanes, allowing cyclists to get around without the need to use elevators or stairs. Overall, the distribution system prioritizes the needs and comforts of riders, creating a seamless and efficient experience. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.

Distribution Scheme





STUDENTS: Amodeo Chiara
Del Sordo Giulia
Mangano Giuliana

LOCATION: Turin, Italy

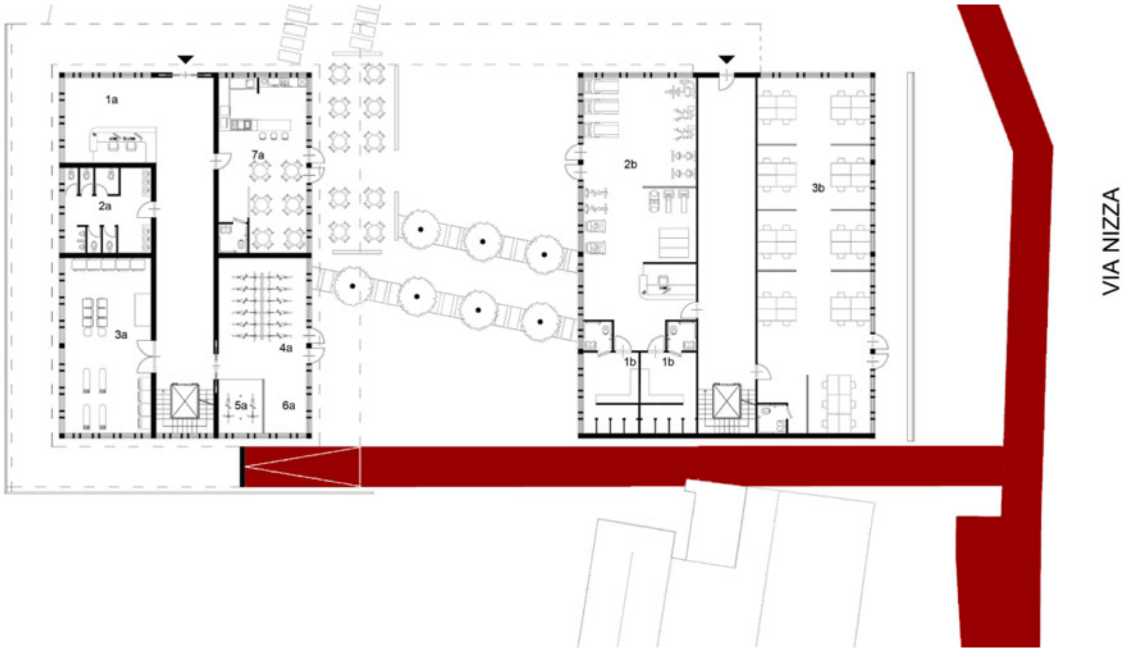
PROGRAM: Bike-Hotel

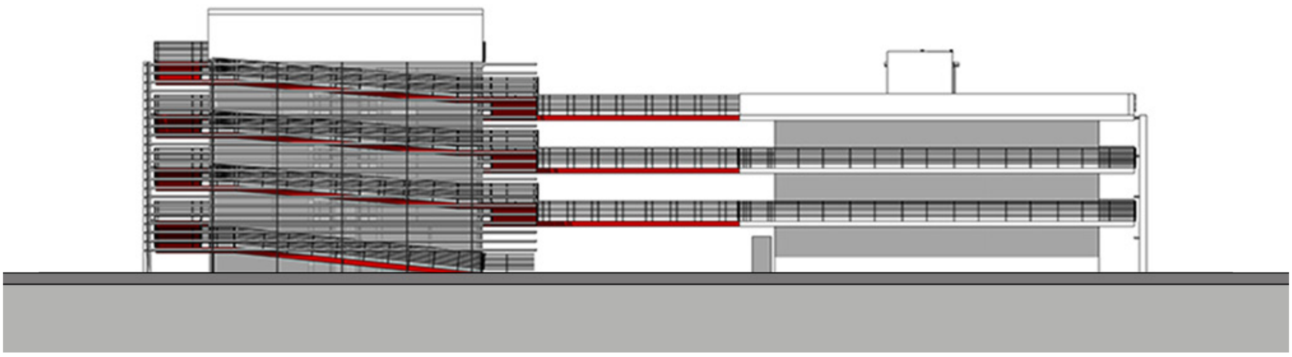
LEGEND:
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

MOUNTAIN

SPIRAL EXTERNAL RAMP

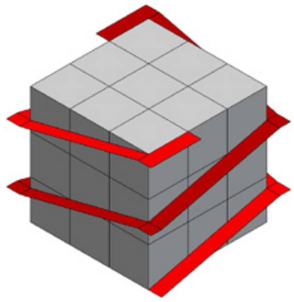
MT-22

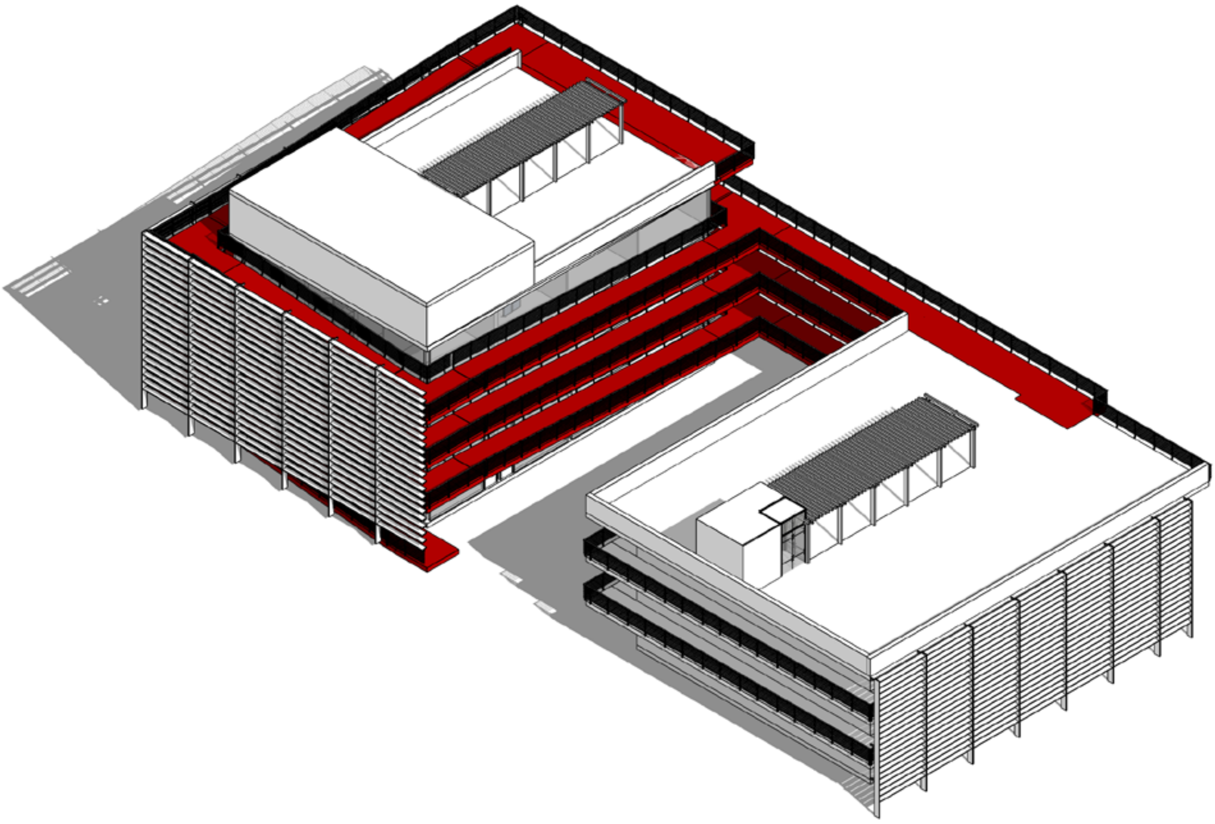




The Bike hotel distribution system focuses on easy and direct access for cyclists to their rooms and areas of interest so they can get in and out quickly, safely, and efficiently. To facilitate this, it has a ramp that surrounds one of the hotel blocks and provides access to all levels through bridges. The ramp is designed to be wide enough to contain two bike lanes, allowing cyclists to get around without the need to use elevators or stairs. Overall, the distribution system prioritizes the needs and comforts of riders, creating a seamless and efficient experience. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.

Distribution Scheme

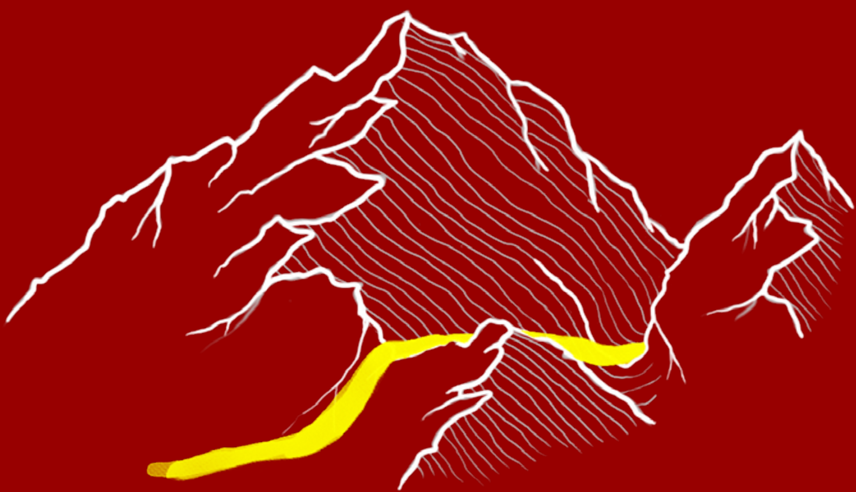




STUDENTS: Bartalini, Pietro
Gariglio, Martina
Murgia, Eleonora
LOCATION: Turin, Italy
PROGRAM: Bike-Hotel

LEGEND:
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

ARCHITECTURAL FORM

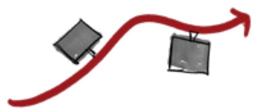


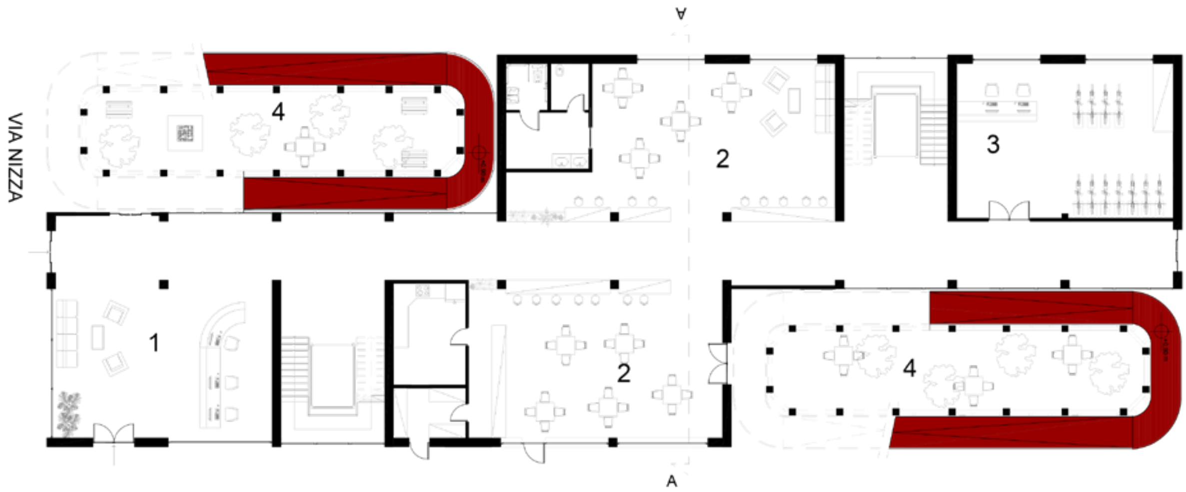
A1.5.3. MOUNTAIN PASS OPPOSED DOUBLE RAMP

MOUNTAIN PASS

OPPOSED DOUBLE RAMP

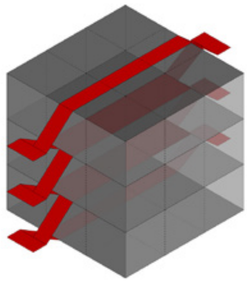
MP-21

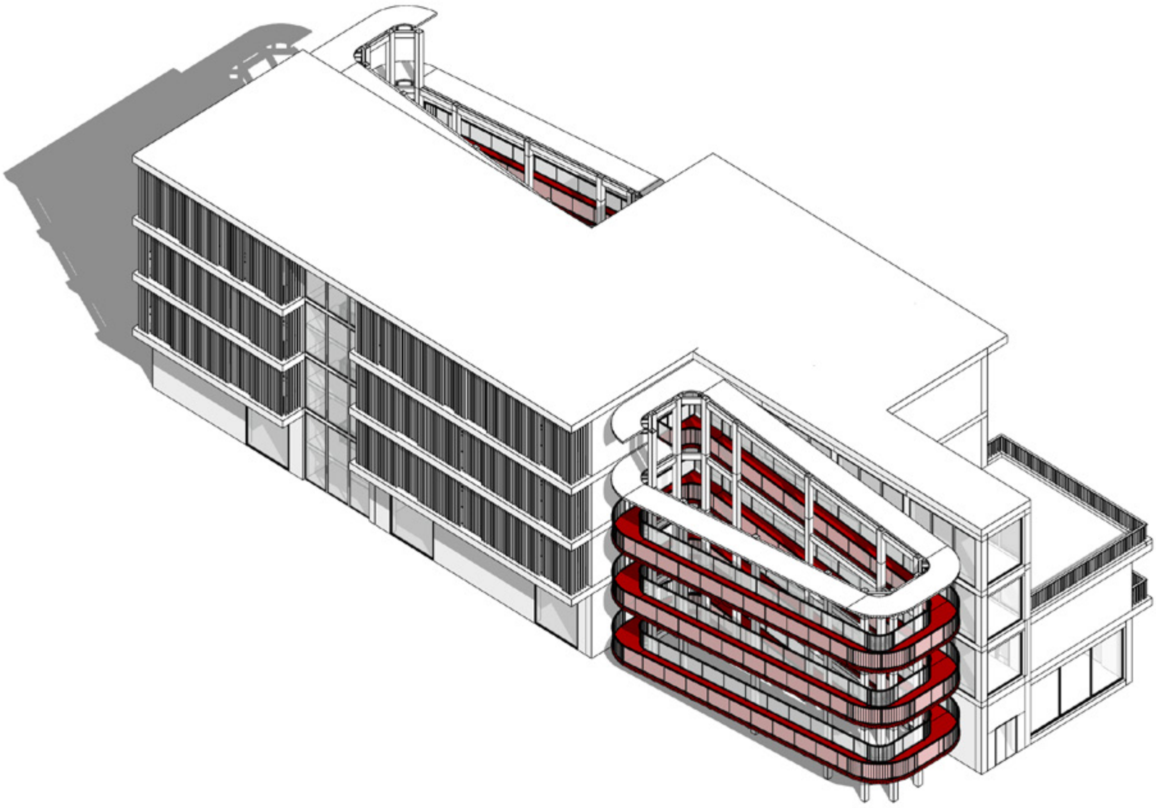




The Bike hotel distribution system focuses on easy and direct access for cyclists to their rooms and areas of interest. The distribution system focuses on two blocks of ramps that, due to the rectangular shape of the building, are located diagonally, allowing it to be possible to go up through one module and down through the other, making it easier for cyclists to move without the need of using elevators or stairs and allowing access on all levels. The distribution system prioritizes the needs and comforts of riders, creating a seamless and efficient experience. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.

Distribution Scheme





STUDENTS: Bertolone, Andrea
Attinà, Rachele
Leobilla, Vito

LOCATION: Turin, Italy

PROGRAM: Bike-Hotel

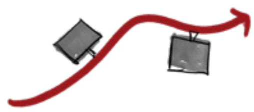
LEGEND:

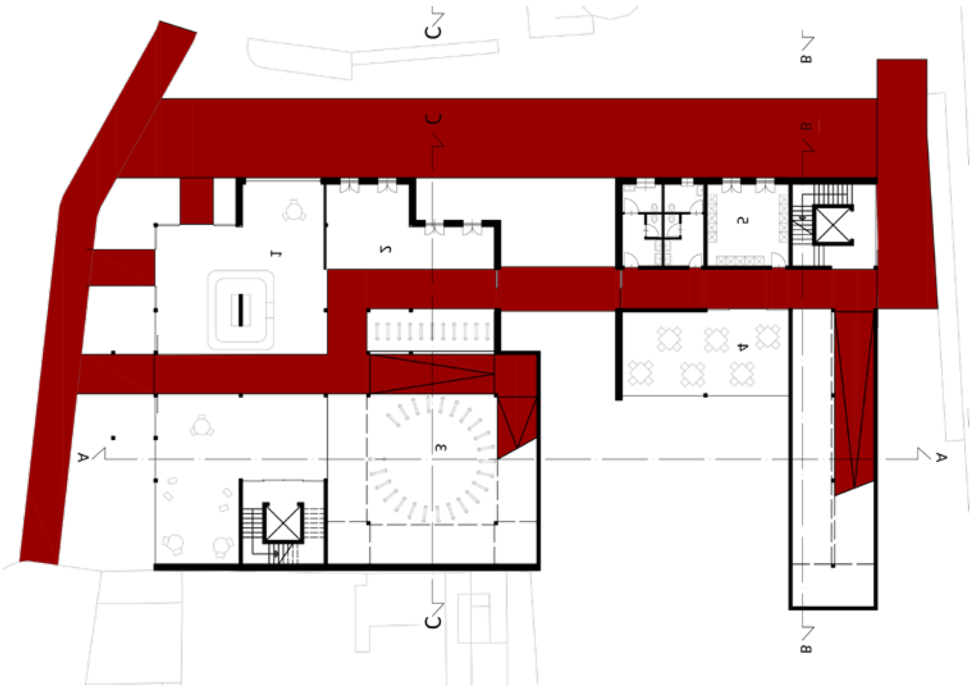
- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

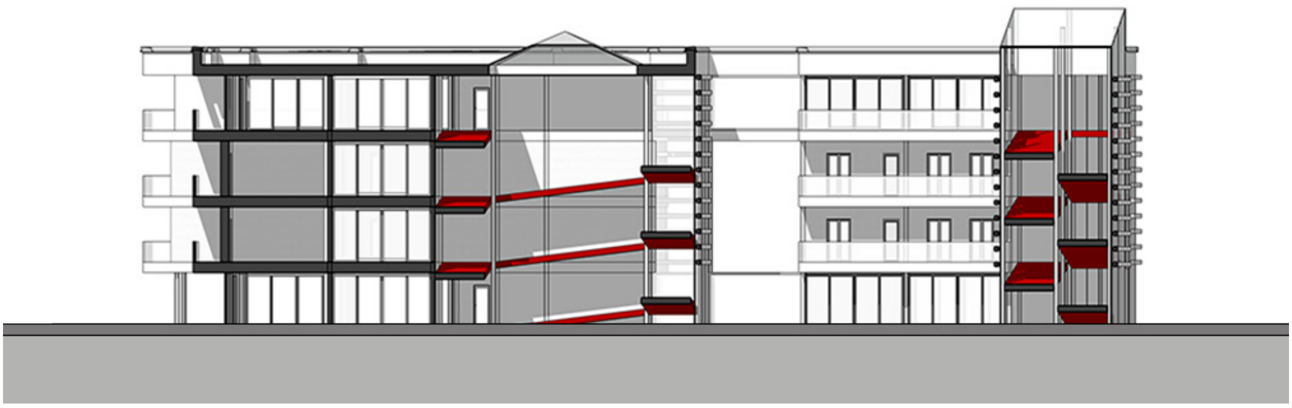
MOUNTAIN PASS

OPPOSED DOUBLE RAMP

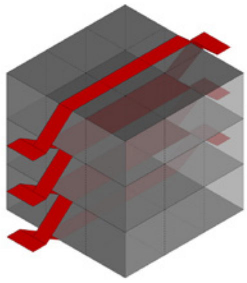
MP-22



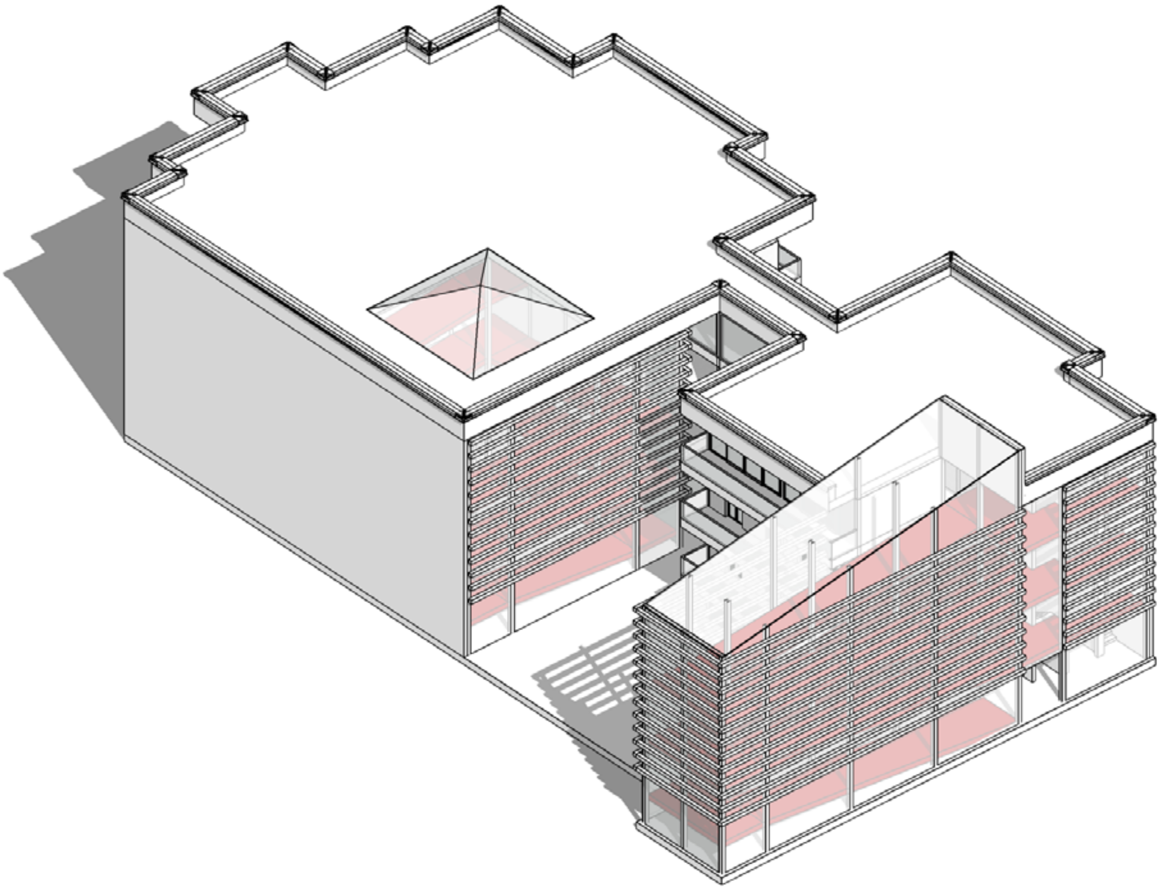




The Bike Hotel is organized in two blocks, one for hotel rooms and the other for apartments. Due to its functional program, the distribution system allows this distinction. It is centered on two blocks of ramps that give access to the different areas, possibly connecting on all levels if necessary but also allowing for programmatic separation. The ramp is designed to be wide enough to contain two bike lanes, allowing cyclists to get around without using elevators or stairs. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



Distribution Scheme



STUDENTS:	Testa, Gabriele
	Cavallardo, Nicolas
	El Rhorfi, Khadija
LOCATION:	Turin, Italy
PROGRAM:	Bike-Hotel

LEGEND:

- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

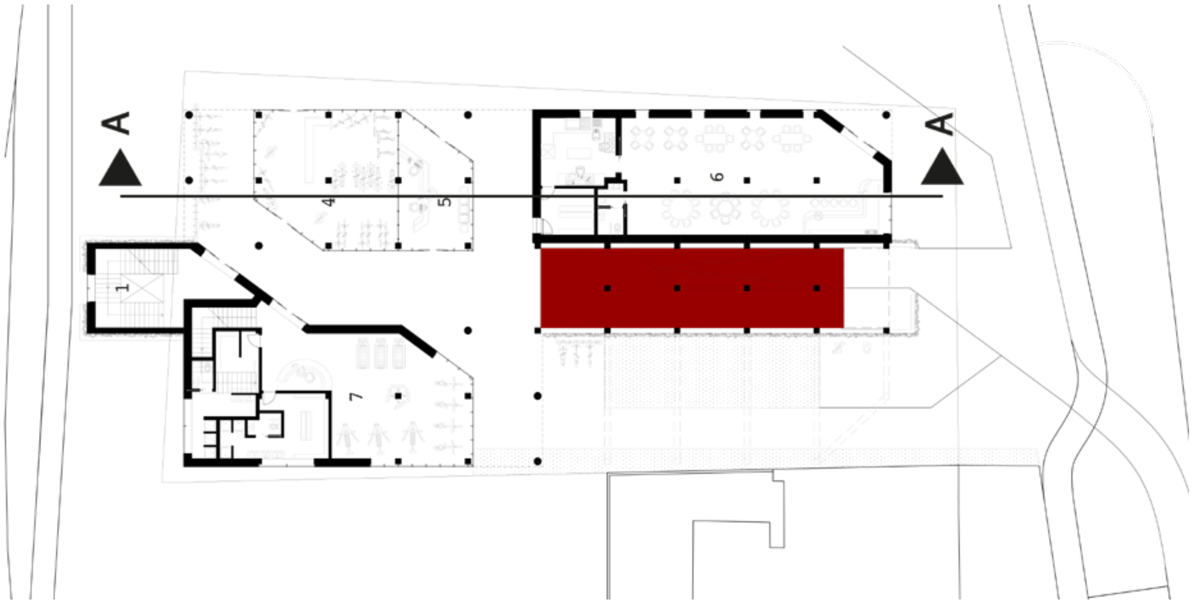
ARCHITECTURAL FORM

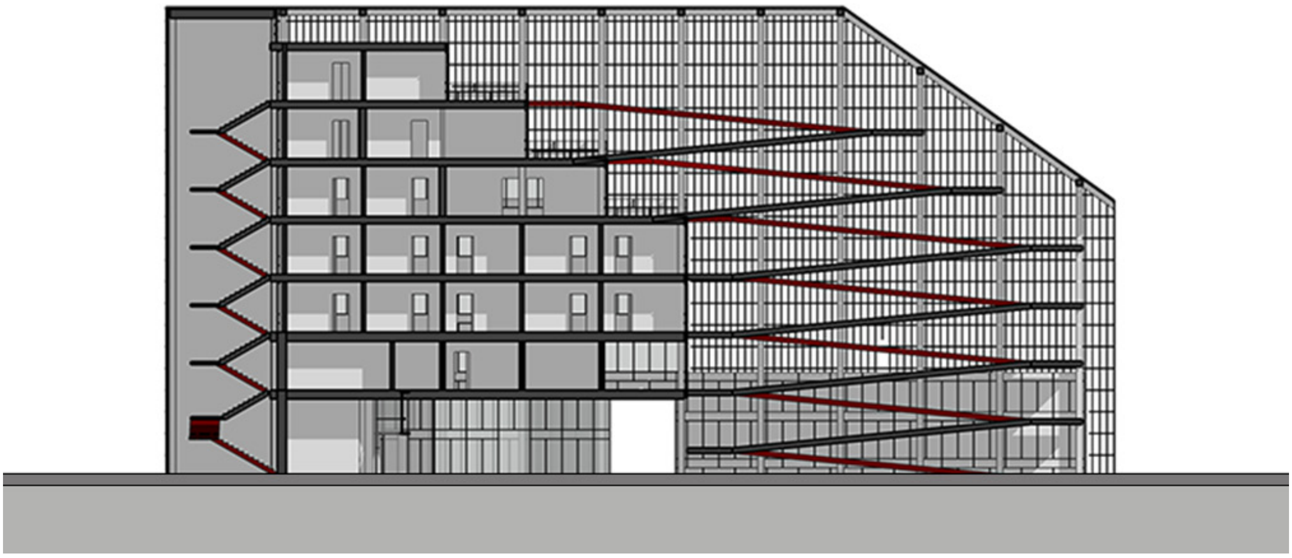
A1.5.4. **MOUNTAIN RIDGE STRAIGHT RAMP**

MOUNTAIN RIDGE

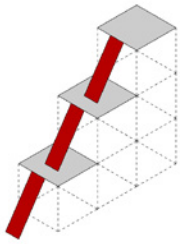
STRAIGHT RAMP

MR-21

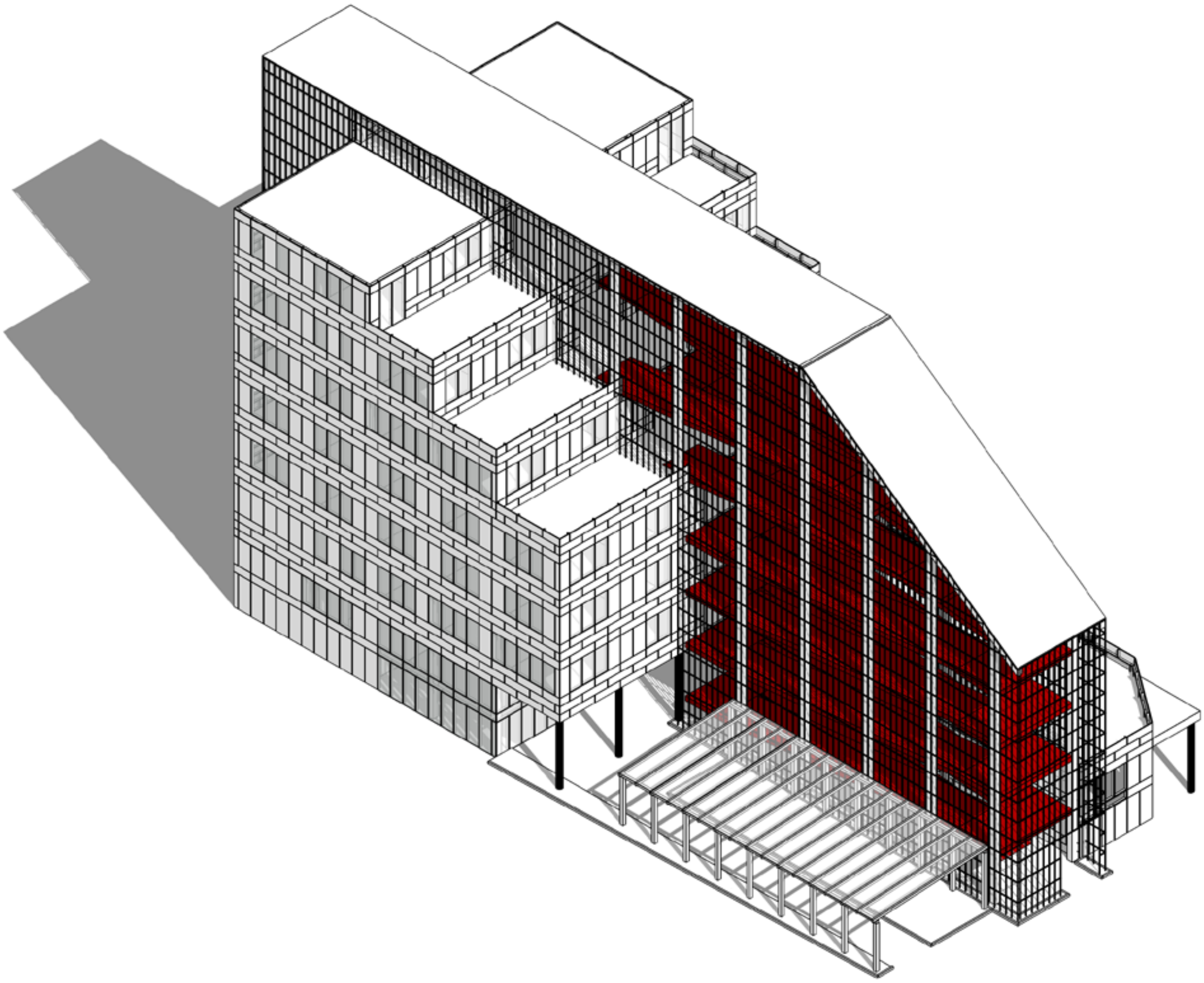




The Bike hotel distribution system focuses on easy and direct access for cyclists to their rooms and areas of interest so they can get in and out quickly, safely, and efficiently. The building has a ramp located perpendicular to the building, giving access to all levels. The ramp is designed to be wide enough to contain two bike lanes, allowing cyclists to get around without using elevators or stairs. Overall, the distribution system prioritizes the needs and comfort of passengers, creating a seamless and efficient experience. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.



Distribution Scheme



STUDENTS: Godino, Paolo
Rocca, Enrico
Scibetta, Michelangelo

LOCATION: Turin, Italy

PROGRAM: Bike-Hotel

LEGEND:

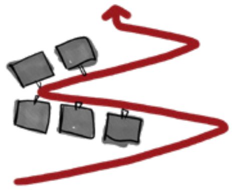
- SERVED SPACES
- INTERNAL RAMPS
- ~~EXTERNAL RAMPS~~
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~
- — *non-present*

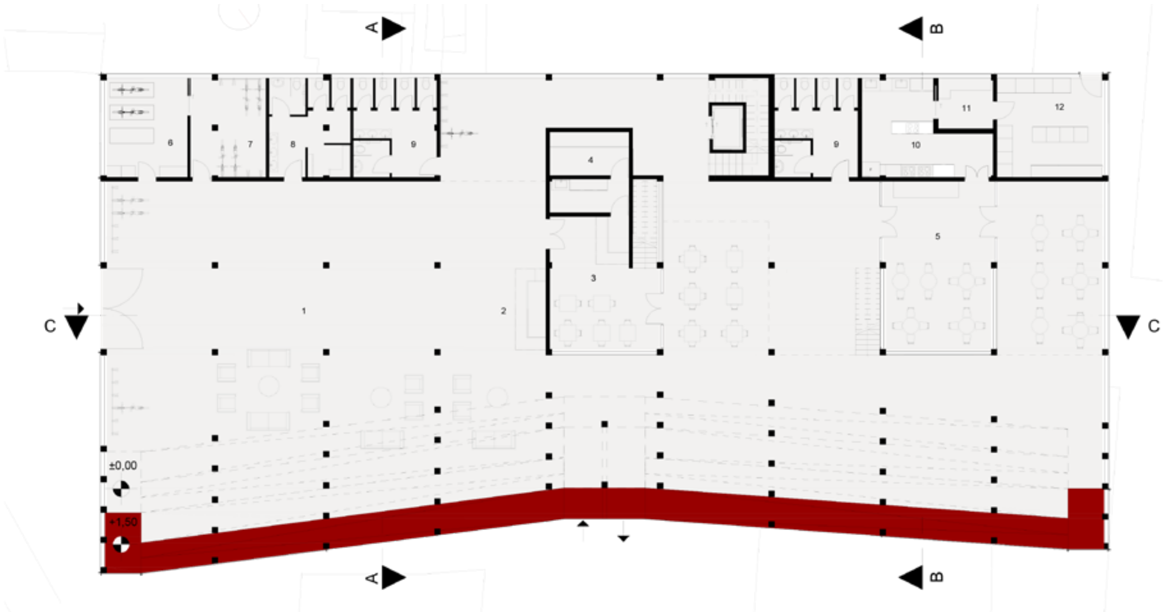
ARCHITECTURAL FORM

A1.5.5. MOUNTAINSIDE HAIRPIN BEND RAMP

MOUNTAINSIDE
HAIRPIN BEND RAMP

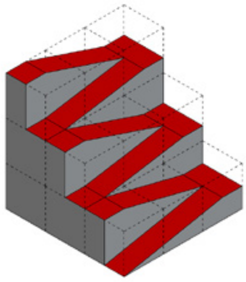
MS-21

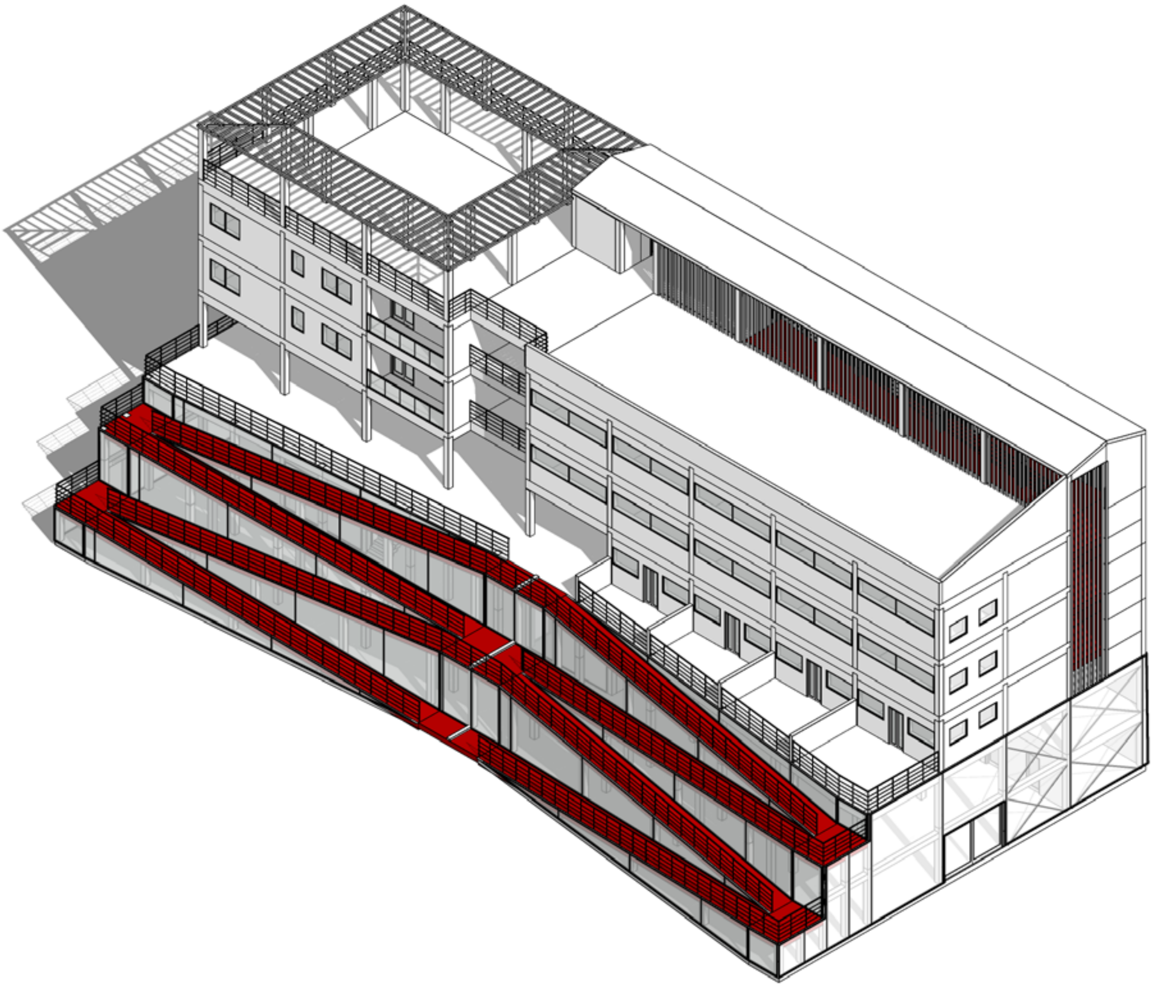




The Bike hotel distribution system focuses on easy and direct access for cyclists to their rooms and areas of interest so they can get in and out quickly, safely, and efficiently. To facilitate this, the building has a hairpin bend ramp parallel to the building, giving access to all levels. The ramp is designed to be two modules perpendicular to each other, which allows the distinction of going up and down. Overall, the distribution system prioritizes the needs and comfort of passengers, creating a seamless and efficient experience. The type of distribution is continuous since the spaces are on the outside along the ramp.

Distribution
Scheme





STUDENTS:	Lucchesi, Laura Miniotti, Francesca Pischedda, Laura
LOCATION:	Turin, Italy
PROGRAM:	Bike-Hotel

LEGEND:

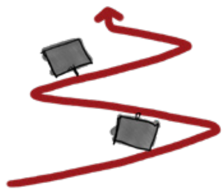
- SERVED SPACES
- INTERNAL RAMPS
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~

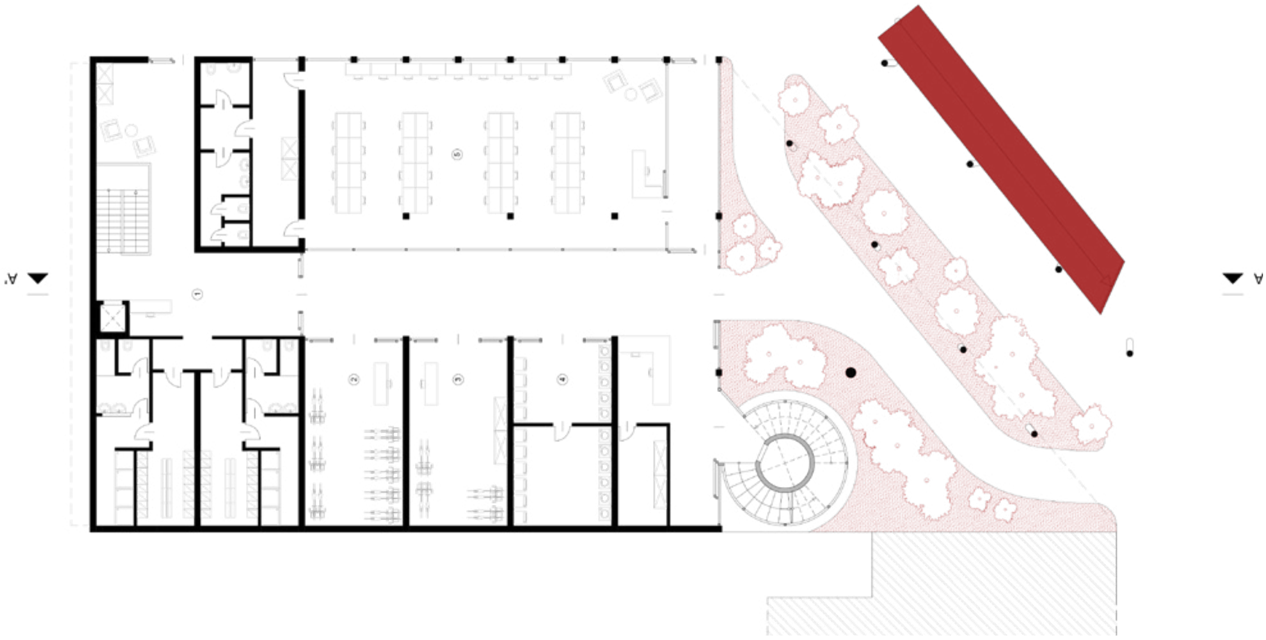
— *non-present*

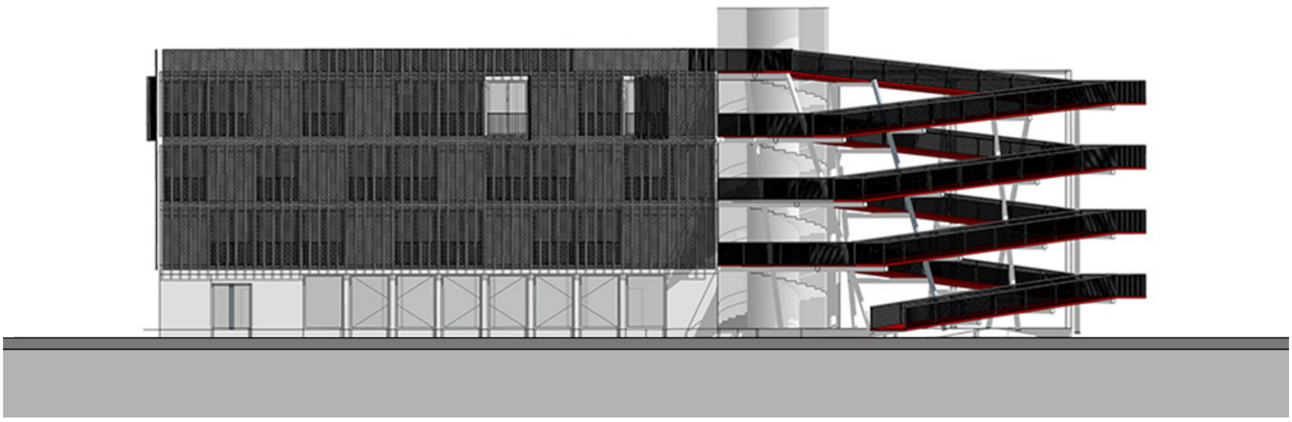
MOUNTAINSIDE

HAIRPIN BEND RAMP

MS-22

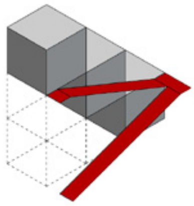


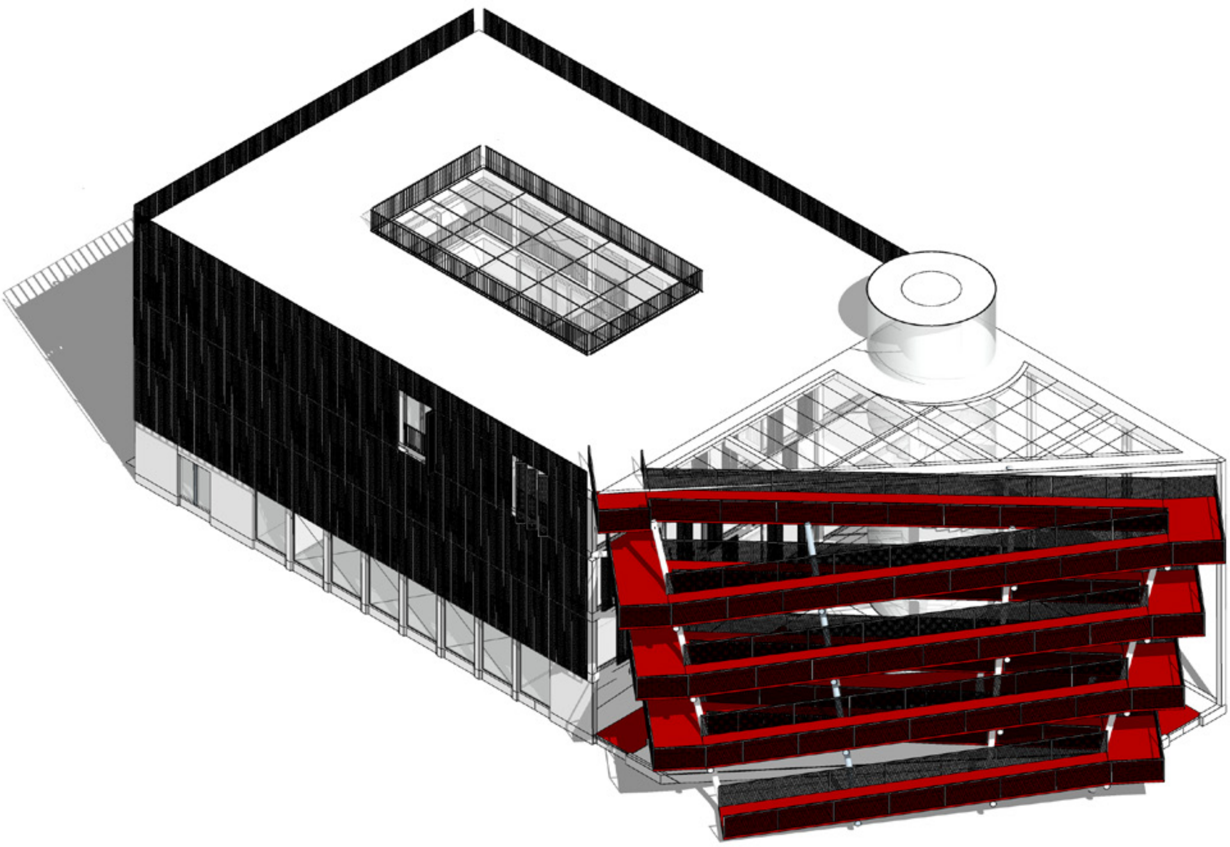




The Bike hotel distribution system focuses on easy and direct access for cyclists to their rooms and areas of interest so they can get in and out quickly, safely, and efficiently. To facilitate this, the building has a ramp located in the corner, giving access to all levels. The ramp is designed to be wide enough to contain two bike lanes, allowing cyclists to get around without using elevators or stairs. Overall, the distribution system prioritizes the needs and comfort of passengers, creating a seamless and efficient experience. The type of distribution is diffuse, and the ramp distributes the spaces through different levels.

Distribution Scheme





STUDENTS: Barbi Cinti, Edin
Poggio, Marco
-
LOCATION: Turin, Italy
PROGRAM: Bike-Hotel

LEGEND:

- SERVED SPACES
- ~~INTERNAL RAMPS~~
- EXTERNAL RAMPS
- INTERNAL STAIRS
- ~~EXTERNAL STAIRS~~

— *non-present*

TRANSLATED QUOTATIONS BY THE AUTHOR

ANNEX II

Translated quotations by the author

INTRODUCTION

[1] Public architectures that stage geographical facts have the objective of enabling a community to recognize the shape of the Earth as one of the many identities that shape the settlement.

CHAPTER I.
CYCLING TRANSITIONS

[2] The bicycle is simply a combination of elements ingeniously assembled by human ingenuity. It consists of a slender and lightweight system of tubes and basic gears, all governed by the cyclical motion of the wheel. Achieving balance on a bicycle requires the inherent coordination of the individual's body movements through muscular receptors. In the enclosed space of a car's cockpit, one experiences a microcosm of artificial sounds, smells, and sensations. A physical barrier separates the occupant from the surrounding subjects and objects. In contrast, on a bicycle, the contact is direct, allowing for verbal, visual, auditory, and overall sensory interactions. The cyclobody, a term that encompasses the symbiotic relationship between the body and the bicycle during movement, offers a completely novel experience of place and space.

CHAPTER II.
INCLINED PLANE: TWO THEORETICAL PRECEDENTS IN ARCHITECTURE

[3] I began to write and outline these ideas when I was a young man in Spain, back in the year 1624. It was inspired by the construction of a beautiful chapel in our monastery. Now, as I find myself in

old age, I continue to refine and perfect these ideas.

[4] **VOLUME I**

- **PROEMIAL TREATISE.** in which the Temple of Jerusalem is drawn and explained: first principle of all good architecture.
- **TREATY I**. In which all literary arts and faculties are proposed, and taught briefly and clearly, which an Architect must know and exercise.
- **TREATY II**. In which arithmetic is explained by a new and brief way; and all accounts of square, cubic roots, and all kinds of proportions are reduced to rules of great ease.
- **TREATY III**. Of the logarithmic, new art, and until now never treated in Spanish. Put five tables to shorten the calculation, when the assumptions are long, and difficult.
- **TREATY IV**. In which geometry is taught, whose maxims, being very necessary in Architecture, are explained with great curiosity.

VOLUME II

- **TREATY V**. On straight architecture. It has two parts. In the first one, architecture in general is disputed; and in the second the Tyrian, Tuscan, Doric, Ionic, Corinthian, Attic, Italian, Mosaic, Gothic, Atlantic and Paranimic Columns are measured and drawn.
- **TREATY VI**. Oblique Architecture. Science ignored today of artifices that are considered great, and because they lack it, they commit infinite mistakes every day. He reduces to his geometric foundations in this book, which is the first, that this matter has been written about.
- **TREATY VII**. Of some sciences and arts that, although not exactly necessary, accompany and adorn architecture. Very curious observations are put in all of them, until now no one has been warned about.

[5] I have spent over forty years carving and engraving them, as I have been employing excellent techniques since the year M.DC.XXXV.

[6] It deals with the alignment of buildings, where their floors are parallel to the horizon, constructed meticulously, and with vertical lines that are perfectly plumb. On these surfaces, erect straight walls to create halls, chambers, and galleries.

[7] Pay attention to the oblique elements, such as the sloping floors found in stairs, passages, and doors. These structures can be found in circular temples or have an elliptical shape. Also, consider the crowns that are placed on windows.

[8] Architecture is the art of building, which can be divided into straight and oblique. I assert that this division is made by me, as although many have addressed it accurately, until now no one has written or delved into it.

[9] My primary endeavor was to write about Oblique Architecture, which, to the best of my knowledge, has not been covered in any book. However, since all measurements in architecture originate from the straight line, I found it necessary to explain it along with any additional curiosity I could offer based on my knowledge.

[10] The first architect, who, in heaven and Earth, made oblique lines, was God. He commanded on Earth that mountains would be formed with oblique slopes, gray and upright. He also commanded that rivers and streams would flow obliquely through their valleys.

[11] Originates and proceeds from the common teachings of Vitruvius, as expressed in his books.

[12] I have witnessed many well-carved structures where the principles of Oblique Architecture are skillfully executed. However, I have also seen numerous errors in royal buildings. This is because there is no book that specifically addresses Oblique Architecture, and these constructions are usually carried out by masons.

[13] The inclination, being more common, is better known but often poorly executed.

[14] Those who construct buildings in straight architecture must necessarily understand it, as there are many floors that require inclinations.

[15] Today, a new art is born, ranking eighth among the liberal arts and tenth among the muses, which has not been written about by anyone in the world. I refer to Oblique Architecture, as it combines elements from straight architecture, the Temple of Jerusalem, arithmetic, geometry, logarithmic, pictorial, statuary, perspective, and various other sciences that are discussed in this book.

[16] Valleys and slopes exist not only in the mountains but also in cities, where palaces are constructed upon them. Since not everyone is skilled in building on sloping terrain, it is essential to provide this warning.

[17] Regarding painting, ΔΙΆΓΡΑΜΜΑ is a Greek word that signifies the extent to which these faculties and sciences, such as pictorial art, statuary, perspective, music, and astronomy, embellish architecture through their splendid speculations. It is evident that diagrams serve as the objects of all these sciences. For instance, the initial lines drawn by a painter on a canvas are διαγράμματα (diagrams). Similarly, architects and sculptors create small models to envision the shape and form of the palace or colossal statue to be constructed without incurring significant expenses. The term "διαγράμματα" also applies to the hidden lines drawn on a perspective table and later covered with different colors. This insight is shared by Bernardo Baldo, Abbad de Guastalla, in the Vitruvian vocabulary. *Est itaque diagramma, cuius rei per lineas expressa figura, imago ve. Nos (Itali) voce pene Latina Disegni, e figure lineatones istas dicimus*. This also sheds light on the significance of the term "voice" because "Διάγραμμα" derives from the Greek word "΄απὸ τω διαγραφειν" which means to paint, describe, draw, or outline. It is noteworthy that the musical scores, where musicians write their melodies with notes, are

also considered “Διάγραμμα” aligning with what is mentioned in Vitruvius.

[18] I will simply state that the architect must possess the skill of drawing because a palace will never be constructed effectively unless it is well outlined on a plan beforehand.

[19] Heresies have existed and continue to exist in the world, and among them, there have been and are today many foolish ones. However, in my opinion, none is more misguided than the condemnation of images. Images can be classified into two genres: portraits and symbols. The former represent a living thing as it is, while the latter are hieroglyphics that elucidate a particular quality or virtue of the thing being portrayed.

[20] To depict a Seraphin or a Cherubin, we paint a head with two wings. This is not meant to persuade that such a creature exists in the physical world, but rather to elucidate its properties and characteristics.

[21] To live on Earth, the ancients needed houses and a place to erect them. Hence, two different sciences were born: architecture and cosmography. The former is used in making houses, while the latter is used in delineating and describing the territories and provinces in which the houses are placed.

[22] Hiran, a senior engineer, exerted all his intelligence, employing every possible means and knowledge at his disposal, to ensure that his work became a marvel of the world.

[23] The summits of mountains are typically sharp, with inclined sides. Therefore, Solomon had to construct thick walls from the valleys to ensure that the sides of Mount Moria would be vertical, while the upper part remained level. The voids were filled with rough stones or soil.

[24] In reality, the journal *Architecture Principe* had a dual purpose. Firstly, it aimed to establish the essential principles that would create favorable conditions for architecture. Secondly, it highlighted the fundamental propositions of the oblique function. It certainly denounced the urban crisis,

specifically the absence of vertical and horizontal urbanism, in favor of the emergence of the oblique order. The journal also exposed the societal crisis and the scarcity of raw materials starting in 1966. It argued that the economy of wasted space should be replaced in architecture by optimal utilization of the ground through the use of inclined planes. Thus, it entailed a constant juxtaposition of the oblique function and the realities of daily life.

[25] It all began, as I mentioned, with the concept of constructing imbalance, particularly through the privileged use of the inclined plane. I must admit that initially I was contemplating a plan or something similar. However, Virilio had a unique experience when he entered a bunker that had been tipped over, and he was profoundly affected by the impact it had on him. He felt a sensation of dizziness... In a way, there is a bit of Hoffmann's influence at the core of it! [Laughs] Well, he thought, "Something significant is happening here!" As he had often observed bunkers from the outside and even filmed many of them himself, but they were typically made of concrete and inaccessible. However, on one occasion, he unexpectedly found an open bunker, and due to the shifting sand, the construction had become tilted, creating an inclined plane. This experience triggered a sense of dizziness within him. Consequently, we decided to consult a renowned psychiatrist who worked in a psychiatric institution outside Paris, which had a beautiful garden and was highly esteemed at that time.

But let's return to Virilio. Following his experience in the bunker, we decided to consult this psychiatrist to analyze and delve deeper into the phenomenon of vertigo. What we discovered was quite astonishing. It was around 1964, and at that time there were hardly any studies on the subject. The information we received was essentially that vertigo was a highly complex problem, and our understanding of it was limited. We knew very little about how and why it occurred, who it affected, and who it did not. Why could some individuals effortlessly walk on a narrow wall ten meters high without any hesitation, while others would stumble and potentially injure themselves from a mere meter's height? Vertigo, I believe, became a pivotal starting point for all our discussions. During our extensive conversations with Virilio, which lasted for hours on end, we began sketching our inclined plane for the church.

[26] The oblique provokes and enables the reexamination of knowledge. It is revolutionary in its capacity to question and consider everything anew, starting from a clean slate. The oblique liberates architects who may feel trapped in outdated beliefs that they are hesitant to challenge, despite knowing deep down that those beliefs are no longer relevant.

To live obliquely is to naturally and effortlessly engage in the daily practice of one's existence. It is to have the freedom to reject conformity. Living obliquely involves rediscovering the sense of spaciousness in one's living environment. It is a definitive departure from conventional furniture, allowing for a rejuvenation of space by challenging the influence of the past and habitual norms through architectural design. Living obliquely signifies embracing the spirit of adventure and exploration. It is to experience true freedom.

[27] To reconstitute is to recreate the continuous surface of the Earth that will sustain us once more and secure our survival.

[28] Two specific natural states.

[29] Constant modification of space, thus resulting in a shifting interpretation of place.

[30] A place to live that can be bought, observed, touched, invested in, and abandoned like an old fortress.

[31] The architecture of the "Inclisite world" finds its models in the dynamic events and preserved remnants of movement that shape our perception of the planet: the rocks cascading into the sea, the surging waves of storms, the undulating geological stratifications disrupted by seismic cataclysms. The "Fonction Oblique" is the reclamation of the inherent complexity in human nature, imposing perspectives that have never been confined to

the banality of the orthogonal, surpassing the constraining construction of the horizon.

[32] The analogy to natural relief is interesting to analyze because we can compare the various groupings of inclisites to different geometric figures (waves, turbosites, conches, crosses) resembling artificial hills.

[33] In the face of needs and constraints, architecture must strive to dominate the site, become equivalent to natural reliefs, and transcend dimensions. It must transform into an artificial relief, shaping the landscape.

[34] We aim to elevate housing to the level of the site, even surpassing it by achieving a higher dimension (domination of the place). Simultaneously, we seek to assimilate the integration of the existing natural site into a work of art, akin to taking possession of it.

[35] Architecture is not merely integrated into the site; it exists independently, establishing a qualitative and dimensional relationship with the surrounding landscape.

[36] Claude Parent's drawings depict a city inscribed within a landscape that extends beyond the confines of urbanity. While his early drawings during the "oblique function" period showcased the juxtaposition of large-scale architecture and natural expanses, his recent drawings blur the boundaries between architecture and landscape. Parent challenged the dualism of the modern movement, which pitted built structures against the natural environment, by hybridizing the two. His approach involved more than simply adding constructed elements to an existing site. In 1966, he wrote that architecture should not proceed through accumulation, juxtaposition, or addition. Instead, he envisioned processes that dig into, encrust, or cling to existing reliefs, blurring the line between emergence and burial. Penetration, incision, and invasion replaced traditional notions of integration or insertion of architecture into a site. Parent advocated rejecting the artifice of integration and the false claim of formal continuity

between architecture and nature. He often used the ivy metaphor to describe the oblique function, emphasizing a metamorphosis and crossbreeding where artificial and natural elements merge. In the drawings of the "Open limit" series, structures that appear to shelter humans form a vast landscape. These structures possess both repetitive and random geometries. Although they may initially seem artificial, they draw inspiration from the contours and folds of the Earth's crust.

[37] To qualify as Oblique Architecture according to the theory, it is not merely a matter of adding a few ramps or tilting the facades of a building to establish a connection between horizontal planes. True Oblique Architecture requires that the internal spaces themselves be defined by inclined planes. Both the interior and exterior structures must be sloping. It entails a profound transformation of space, a comprehensive alteration of the foundation.

[38] In order for humans to thrive and survive in their living environment, they must be engaged, energized, and challenged by the space they inhabit. The place should not simply provide comfort and tranquility, but instead should stimulate individuals, present them with problems to solve, inspire them, provoke their impulses, encourage dialogue, and push them out of their psychological comfort zones, ultimately shaping their experiences and behavior.

[39] The body's interaction with the oblique structure intensifies the awareness of gravity. Even in a stationary position, the weight of the body is felt and expressed on a slope, as it requires a muscular effort to maintain balance. This heightened bodily awareness becomes even more acute when moving on ramps. The body weight becomes an internal driving force. Descending a slope induces acceleration, utilizing the body weight in a controlled manner to maintain balance, while ascending a ramp involves restraint and a slowing down of movement. The sensations of exhilaration (when going downhill) and effort (when going uphill) are intrinsically linked to the chosen trajectory. In other words, both stationary and dynamic states

are not neutral within the context of the oblique structure, unlike on a horizontal plane. There is a continuous exchange of energy between the human body and its support.

[40] The freedom of movement on the inhabitable ramp enables individuals to gauge their effort and adapt it to their mood or current capabilities. The oblique structure accommodates the human body and adjusts to each specific circumstance.

[41] The second precise physiological impact is that of tactility. The slope is directly sensed through the phenomenon of adhesion, particularly at the level of the feet during movement. The foot, playing a crucial role in the support system, provides immediate and unencoded information about the slope, course difficulties, loss of grip, and more. Visual perception is no longer the primary source of information. As humans, we are liberated from the detrimental hierarchy of information that favored the visual sense, often obscuring our judgment and subjecting it to various ideologies related to the perception of living space.

[42] The oblique function stabilizes its forms. However, it caters to the human desire for constant modification in the way we perceive space. By utilizing the third dimension (vertical) in movement, without physically altering the volume, space is transformed. The volume remains fixed, but as humans move within it, our perception of the place changes.

[43] “Unstable equilibrium”: there is a gravitational pull towards the void, a sense of fatigue when ascending, in essence, your body is in an unstable equilibrium.

[44] In the oblique function, the distinction between interior and exterior no longer exists. Instead, there is a distinction between space above and space below. The ramps serve as boundaries between these spaces, but unlike the orthogonal structure that requires breaking through the boundaries to connect the spaces, the ramps naturally facilitate communication through their lateral overflow.

[45] The oblique is the only structure that allows for elevation in the continuity of movement.

[46] We are therefore compelled to abandon the elementary logic of spatial partitioning and enter the realm of hypothesis because the oblique function assumes an initial hypothesis: in their new urban era, people will live on inclined planes.

[47] "Circulation" emerged as a distinct concept separate from "Dwelling".

[48] The descending spaces provide a view of the elevated slope, while the ascending spaces reveal the supporting ground. The constricted spaces, characterized by closed acute angles or extracted spaces with inverted inclined planes, serve as innovative structural supports and serve as launching pads for artistic endeavors yet to be envisioned.

[49] It becomes an extension of the ramp. The ground itself rises, straightens, digs, and molds to form the necessary horizontal planes for life: the soil on which to live.

[50] Furniture will be intimately integrated and will play a role in enhancing human dynamics by becoming a means to diversify the ground through its volumes, materials, and colors.

[51] Demand that we consider this crucial intermediate layer, this stratum that, on its own, generates the wealth of the world. Advocate for a continuous architecture that transcends a mere assemblage of enclosed structures, but rather embraces a fabric, a layer that maintains a constant proximity to the Earth's surface through vast urban bridges. Invent human settlements that embrace the concept of outdoor living. Science provides you with the means. It is simply a matter of asserting your rights and, above all, refusing to succumb to the demands imposed by those in power. The goal is to invent simpler, more direct relationships with nature and the land, and to regain control over the water that poses a short-term threat. United in a grand project that will rapidly become global,

you will reclaim your role as generators of sites and work together to reshape our Earth.

[52] The oblique has already infiltrated beneath the arches. The Eiffel Tower is besieged, and Neuilly is under attack via the Pont de Puteaux. From east to west, the connection was made at Porte Maillot, encircling the Palais des Congrès, which, after suffocating you so much, is now suffocating in return. Then, with a single stroke, the oblique flows onto the ring road. Like a massive concrete river, it advances, extending its branches at each exit towards the 5th arrondissement or the Italy district, retracting at the entrances towards Porte d'Orléans or Saint-Ouen. But it prefers cunning. It coils around the inanimate vertical structures, clinging to veranda posts like ivy. Everything becomes its support, its stepping stone, its means of reunification, contradicting a century of foolish and criminal urban planning. Yet, the oblique soon becomes satiated. Its concrete has healed all the city's wounds—no more ring roads, no more undergrounds, no more parking lots. It has enclosed automobiles within its network. Those who managed to escape in time wander from town to town, futilely searching for new wounds to feed on. But the slant is omnipresent. So they stop, lacking purpose, in open country. Soon abandoned and permanently halted, they become playgrounds for children, perches for birds, shelters for farmers and walkers. The ivy takes root there, forming grand bouquets where glimmers of stainless steel still occasionally sparkle. But not for long... The sated oblique has settled into the streets. It has lent its back, its space above, to the peaceful footsteps of pedestrians, to the unhurried pace of its inhabitants. Ultimately, it is the city, the city of encounters and communication.

[53] Artificial reliefs constructed to the scale of natural sites.

[54] "Turbosites, nautas, waves, craters, diversion sites" that will serve as shelters for people

[55] It must be emphasized that these courses on the oblique are implemented at the scale of both individual dwellings and the entire city. In this

new paradigm, dwellings are no longer accessed through elevators but through the external slope of the building or the city itself. Facades become passable, and walking continuously on slopes and counter-slopes becomes an integral part of daily activities. The maintenance of the body in this context becomes a constant and natural aspect of life. It is crucial to envision the daily life course from an oblique perspective. With its high concentration, this city becomes primarily designed for pedestrians, while vehicles are primarily utilized for transporting patients or delivering goods.

[56] The distributed spaces are intentionally divided and isolated, designed in a manner that their sole connection with the outside world is a glazed balcony surface overlooking the void. This design highlights the isolation that the vertical structure creates while also emphasizing the inefficiency it entails. Each inhabited space provides only a usable surface as a floor, neglecting the other five faces that could contribute to its livability. These micro-ghettos, stacked like silos, store individuals like commodities but fail to provide them with a fulfilling or vibrant living experience.

[57] History, however, dictates a different outcome..

CHAPTER III.
ATLAS OF THE OBLIQUE ARCHITECTURE

[58] The response we provide pertains to the necessity of acknowledging how architecture, having detached itself from its urban connotation, can serve as a tool for both describing and actively planning in relation to the natural elements it interacts with. This shift allows for the substitution of the architecture of the city with an architecture that embraces rivers, waters, mountains, islands, coasts, and ultimately, an architecture that harmonizes with the Earth.

[59] The archetype establishes the connection between architecture and nature by transforming natural elements into built structures. This occurs when the various elements, such as air, water, Earth, and fire, are incorporated and represented in

architecture. These elements interact and transition from one to another, such as from water to Earth or between different terrains, and even from Earth to fire and fire to air. As a result, archetypal forms such as emerged Earth or pyramids emerge, characterized by bases, enclosures, arks, temples, towers, hollows, chimneys, dams, sea gates, and bridges.

[60] The hypothesis of these studies is that it is feasible to establish and substantiate a tradition of research that views architecture as a powerful reference and model for describing the Earth, its diverse regions, environments, and geographical elements. Moreover, this perspective involves architecture extensively in representing the analyzed locations, developing images, and constructing visual representations, to the extent that these practices become ingrained in the architectural repertoire and figurative tradition.

[61] The vestibule and entrance hall function as effective "machines" for classification. They guide various users along specific itineraries, allowing them to see each other while automatically reaching their intended destinations. These designated paths, including inclined planes, can be likened to "mountain passes" in a metaphorical sense.

[62] What is our purpose there? We are born from nature. We rebel against it, seeking to break free from its embrace, attempting to control and conquer it. While it is the vast universe, we have always desired to shape our own universe. And we protect it; it is our daily labor. However, we are children of the Earth, and we have referred to it as mother Earth. Geometry, the only language we know, we have derived from nature, as chaos exists only outside; within, everything is orderly, an unyielding order.

[63] When we draw, we make marks on a surface to visually depict what we observe or envision. Drawing is a natural form of expression that generates a separate, yet interconnected, realm of images that appeals to our sense of sight. The act of drawing is inseparable from vision and contemplation of

the subject being represented. It is only possible to draw an object or a scene if we have it as a reference before us or if we are familiar enough to recreate it from memory or imagination. Therefore, proficiency in drawing requires an understanding of the subject matter we aim to depict graphically.

[64] Each representation occurs at the intersection of two sets or groups of figures: those that depict the object and those that pertain to the theme and technique of representation. Analysis always involves a dual action - constructing the figure that represents the object while also identifying the figures that preceded the object and in which the analyzed figure is also embedded. This process outlines a chain or a network of references and similarities in which the object is situated without necessarily being the origin. It becomes evident that the object is no longer deemed essential in the same way as it was once believed to be, as the source from which representation arises.

[65] We engage in analysis not primarily to understand the object, but rather to generate meaningful figures. Therefore, analysis is not necessarily a tool for acquiring knowledge about the work itself. We analyze in order to construct images that may not even directly relate to the entirety of what is being analyzed. The process of analysis involves isolating, extracting, and separating figures with the aim of establishing them as autonomous entities.

[66] Formal analysis relies on drawing as its fundamental and essential tool. It does not exist as an external viewpoint detached from architecture, nor does it adopt a neutral gaze. Its purpose is not merely to explain the object of analysis, but rather to visually depict and examine it from different perspectives, dissecting it in various ways. Consequently, a formal analysis is inherently embedded within architecture itself, particularly within its techniques, drawing, and representation—thus utilizing the very tools employed in the architectural design process.

[67] The concept of “type” is closely associated with the notion of classification. It represents the element from which the characteristics of a species are described and defined. The type serves

as an abstract construct that can encompass a whole range of variations in an economical manner. Typology aims to eliminate specific details of an object and focus only on its general characteristics, providing a basis for taxonomy. Through successive reductions, typology goes beyond mere classification and presents a comprehensive articulation of the field of study, guided by a universalist perspective.

[68] The partiality of the representation allows for a departure from the reference architecture, freeing it from any value judgments or the obligation to fully adopt it as a model. The reference architecture should be seen simply as a source of inspiration for the research and construction of materials and figures that are relevant and useful for the project.

[69] With the representation of the reference architecture, a mechanism of continuous associations begins, similar to those that occur in the analysis. The resulting image gains meaning only when it evokes another image. The project functions as a mechanism through which chains of images are produced, problem by problem, with each chain culminating in the figures of the project.

[70] In this research, the theme of representation plays a fundamental role. It encompasses the aspects of repetition and difference that we consider essential for interpreting architecture when our intention is to achieve a more precise definition of design culture and the techniques employed to guide the imagination.

CONCLUSIONS

[71] Today, the transformation of life necessitates, above all, the transformation of the city. There is much work to be done, and the work that is being done often falls short. However, the fact that there is now space for utopia to be realized is already a significant development. But what about utopia? Can the city truly undergo a transformative dream? And could the bicycle play a pivotal role in this revolution? For the city is indeed in dire need of a

revolution, in the most literal sense of the term, in order to undergo a true transformation.

[72] Places, with their unique characteristics and the infinite variety of forms found in the vast architectural structure we call Earth, continually evolve and establish dynamic relationships with architecture. Recognizing and understanding places involves rediscovering and reconnecting with each other as a community of residents who share a common geographical imagery.

[73] The concept of a city dominated by bicycles is not purely a fantasy.

[74] Perhaps the bicycle plays a crucial role in helping individuals regain self-awareness and reconnect with the places they inhabit, reversing the trend of cities expanding beyond their boundaries.

[75] The bicycle enables individuals to establish a fresh connection between their space and time, their territory, and the rhythms of their existence.

[76] With only the fragmented strength of the body, the bicycle allows for the realization of the ideal of effortless mobility.

[77] The cyclist's dream is to identify with the fish in the water or the bird in the sky, even while having to contend with the limitations of space on land.

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